

# **GÜHRING**

## **MATKAP UCU TAKIMLARI**



# **DAKİKLİK**



Dr. Jörg Gühring

Başkan



Oliver Gühring

Satış ve Pazarlama Direktörü

7000

Dünya geneli  
çalışan sayısı



3500

Almanya  
çalışan sayısı



İç eğitim programı



Uluslararası bilgi paylaşımı sayesinde  
çalışanlar için dünya çapında değişim  
programı



Dietmar Pfranger

AR&GE, Lojistik,  
Teknik ve retim Mdr



Bernd Schatz

Finans ve Ticaret Mdr



z segment  
takımları

90000

Standart Takımlar

4000

Takım Tipi

55%  
45%



■ Standart Takım  
■ zel Takım

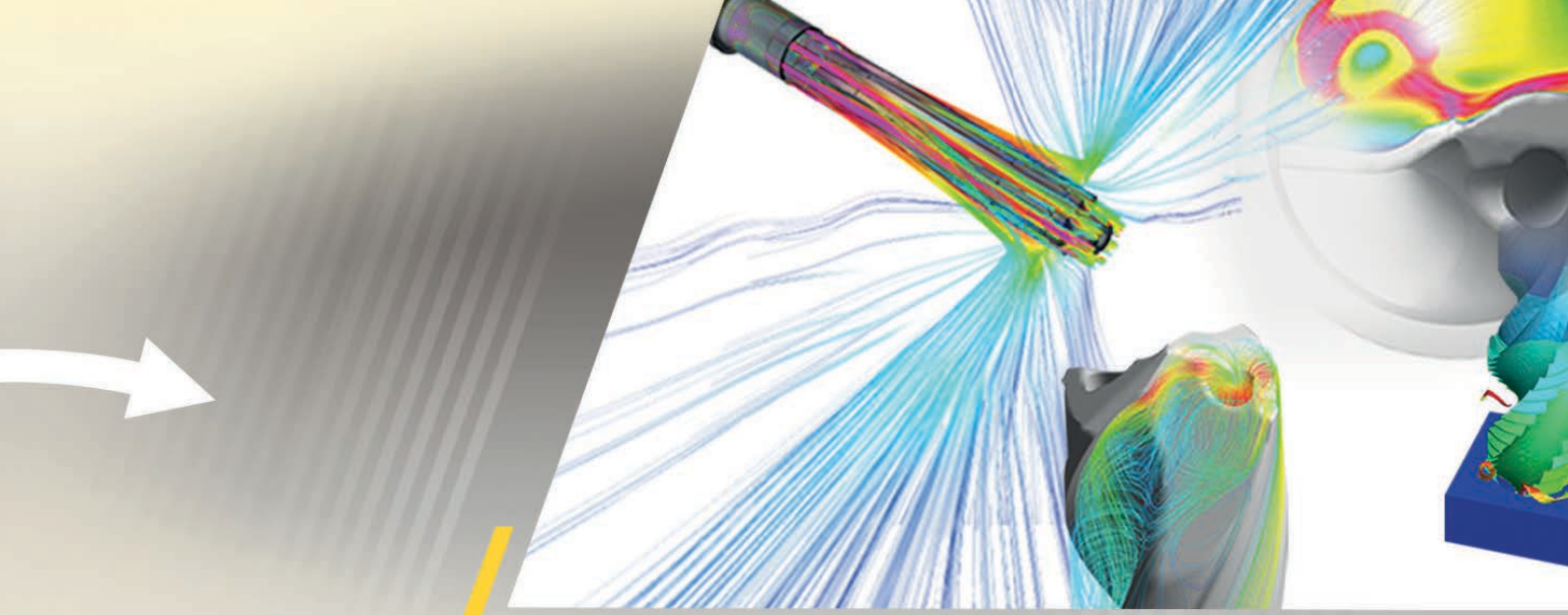


## TAKIM MALZEMELERİ Karbür Üretimimiz

Tüm Takım Parametlerindeki  
en uygun koordinasyon  
için AR&GE bölümümüze  
teşekkür ederiz.

## MAKİNA & EKİPMAN BÖLÜMÜ Makina Parçalarımız ve Ekipman Bölümlerimiz





GEOMETRİLER  
Takım Geliştirmelerimiz  
için Ar&Ge Bölümümüz



KAPLAMALAR  
Kaplama Sistemlerimiz ve  
Kaplama Geliştirmelerimiz



# Herşey tek tedarikçiden – kapsamlı ve küresel

Üretim yerlerinin global ağı ile birlikte, Gühring bütün önemli pazarlar için hassas takımlar üretir ve geliştirir. Otomotiv endüstrisindeki kullanıcılar, havacılık endüstrisi veya işleme takımları ve genel endüstri kalite standartları için en yüksek seviyedeki geniş eğilime güvenirlir.

48  
İŞTİRAKÇI

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FAZLA 70  
ÜRETİM VE SERVİS  
MERKEZİ



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Yenilikçi teknolojiler ile birlikte, Gühring bütün önemli pazarlar için, hassas takımların süreç önerilerinden seri uygulamaya kadar müşterinin özel taleplerini karşılar.

– esneklikle, hızlı şekilde, küresel bazda.

Bunun için, uzmanlarımız uluslararası aksiyonlarda müşteri ile sahada ilgilenmektedir.

Üretim, hizmet ve kişiler ile iletişim bir tedarikçi tarafından dünya genelinde mümkündür.

Karbür Üretimimiz

Makina Üretimlerimiz

Kapmala Tesislerimiz

Dünya Genelinde Yüksek Kalite Standartları



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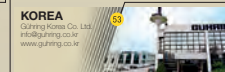
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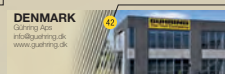
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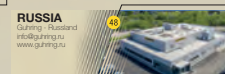
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# HERŞEY TEK TEDARİKÇİDEN

Matkap çeşitliliğimiz her uygulama için, Ø0,05 mm mikro hassas matkaplar, özel çözümler Ø180 mm ve HSS'in yanı sıra komple karbür, 50,000 ürünüde içermektedir.

## KOMPLE KARBÜR RATIO MATKAP

Sayfa 3

## HT 800 INTER-DEĞİŞTİRİLEBİLİR UÇLU MATKAP SİSTEMLERİ

Sayfa 123

## HSS/HSCO TWIST DRILLS

- ▬▬▬ Silindirik Sap
- ▬▬▬ Mors Konik Sap

Sayfa 175, 435



## DERİN DELME MATKAPLARI

▄▄▄ Tek kanallı ve iki kanallı derin delik matkabı

▄▄▄ Helisel Derin Delik Matkaları

Sayfa 515

1:1

## MİKRO HASSAS MATKAPLAR KOMPLE KARBÜR + HSSE

Sayfa 645

ZOOM

## NC SPOT MATKAPLARI & MERKEZ MATKAP

Sayfa 665

## KADEMELİ MATKAP & ÖZ MATKAP

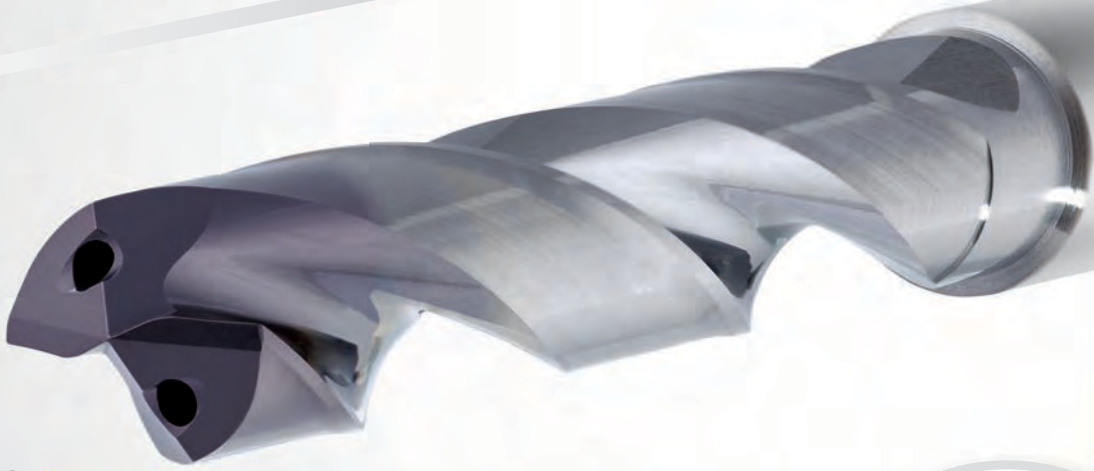
Sayfa 711

# Yenilikler

Gühring her yenilik ile standartlarını ayarlar. Her bölüm başına, araştırma geliştirme ve takım imalatı. İşlemede mükemmellik arzumuz.

ÇELİK İŞLEMELERDE  
YÜKSEK TEKNOLOJİ

NEW



//RATIO//

## RT 100 S

- // Çelik için optimize edilmiş mikro-geometri
- // Yüksek kesme parametreleri
- // İstikrarlı uzun takım ömrü

→ Sayfa 59, 96



NEW

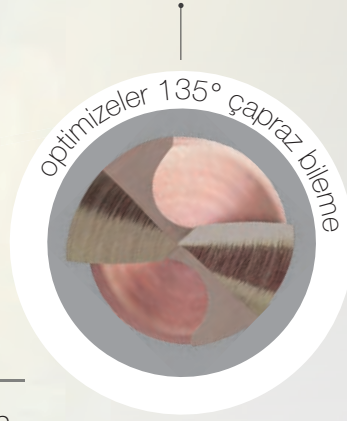
## AeroX

- // HSCO8 genel veya yüksek montaj işi için twist matkaplar-alaşım malzemeler, titanyum ve alüminyum malzemeler
- // optimizeler sayesinde hızlı delme
- 135° çapraz bileme

→ Sayfa 313

### OPTİMİZE EDİLMİŞ MATKAP ÖZÜ

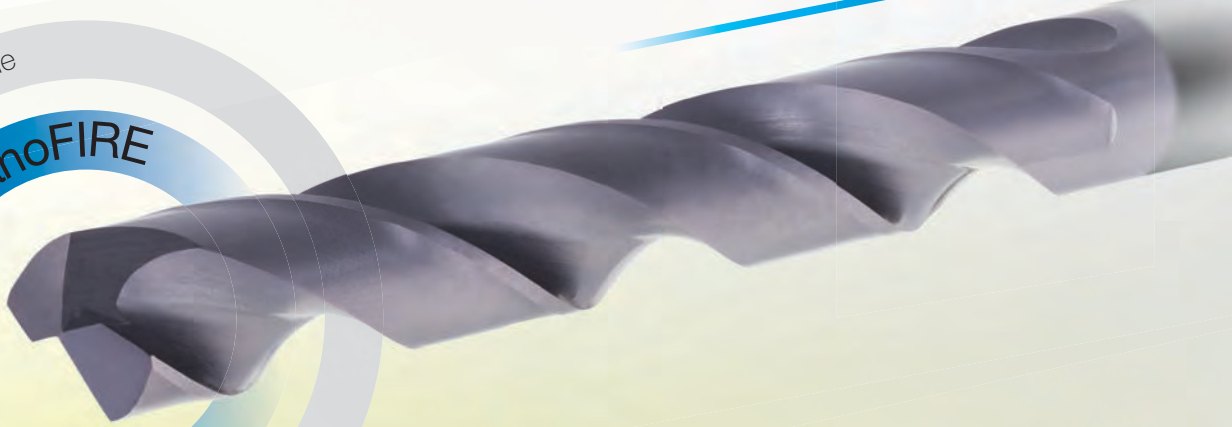
Kuvvetler eş zamanlı olarak minimize edildiği sırada ek takım stabilizasyonu için ağırlıkla azaltılmış konik öz.



NEW

135° çapraz bileme

kaplama NanoFIRE



Maksimum aşınma ve ısı direnci

## M42 nanoFire

- // özellikle yüksek alaşım ve yüksek mukavemetli çeliklerde ve özel alaşımlarda maksimum performans
- // sert çekirdek sayesinde sağlam tasarım, 135° çapraz bileme

→ Sayfa 317

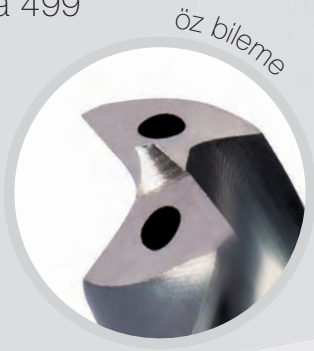
**GÜHRING**

NEW

## HSS coolant duct drills

- // çelik kirişler işlenmesinde ve istikrarsız koşullarda
- // aksenal ve radyal kesme sıvısı temini ile optimum soğutma
- // minimum çapak geliştirme

→ Sayfa 499



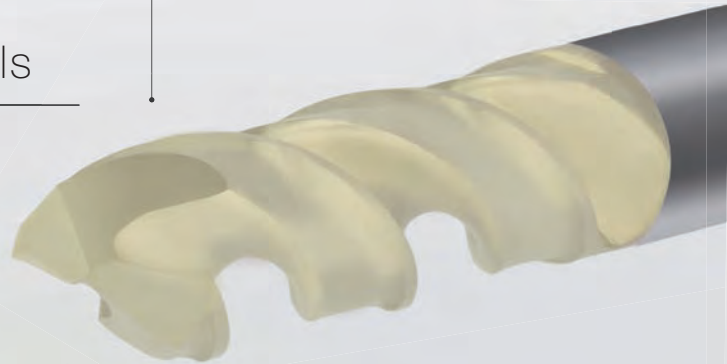
NEW

## VA-HSCO Sirius twist drills

- // özellikle paslanmaz çelikler için maksimum performans

→ Sayfa 231

**SIRIUS**-kaplama  
özellikle paslanmaz çelikler için  
maksimum performans



**NanoFIRE-kaplama**  
maksimum aşınma ve ısı direnci

**NEW**

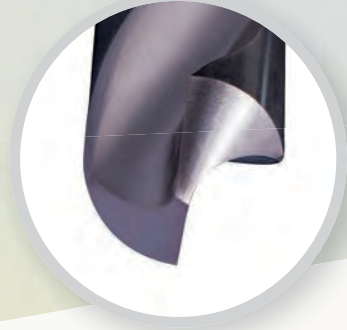
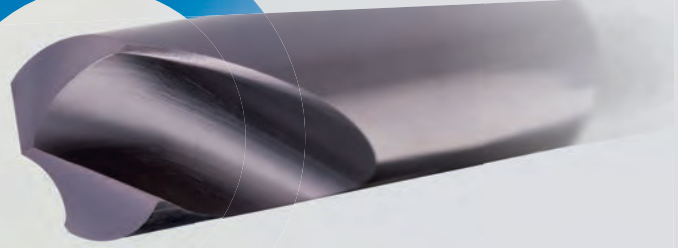
## HSCO NC Spot Matkaplar

NanoFIRE-kaplama ile

- // maksimum kesme değerleri ve takım ömrü ile doğru spotlama
- // nanoFire-kaplama sayesinde maksimum performans

→ Sayfa 705

NanoFIRE-kaplama



**NEW**

## EB800 yataklar ve uçlar

Yeni kaplama ile

- // Farklı kaplamalar sayesinde malzemeye uygun optimum işleme

→ Sayfa 556



**GÜHRING**

# Yenilikler

Gelişmiş malzemelerde ileri işleme prosesleri gereklidir. Gühring trend oluşturan araştırma ile teknoloji liderliğini ve döner kesici takımlar için yaratıcı fikirlerini korur.

**YENİLİKÇİ DİZAYN**  
daha etkili soğutma için

NEW

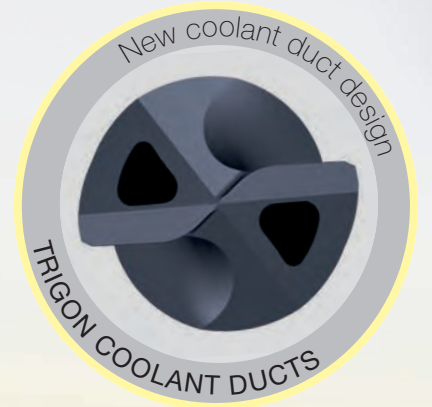
NEW



## RT 100 Trigon®

- // optimize edilmiş akış hızı
- // paslanmaz çelikler, Titanyum ve özel alaşımların işlenmesi için uygundur
- // artan soğutucu hacmi

→ Sayfa 813



# NEW

**DAHA EKONOMİK VERİMLİ**  
Alüminyum malzemelerin delmesinde



## RT 100 AL

- // yumuşak ve sert alüminyum tüm malzeme yelpazesi hemde dövme ve döküm alaşımları için bulundu.
- // Ø 3 mm - Ø 20 mm aralığı ve 12xD üstü için özel matkaplar
- // Sulu işleme ve MQL mümkün

→ Sayfa 815

# NEW

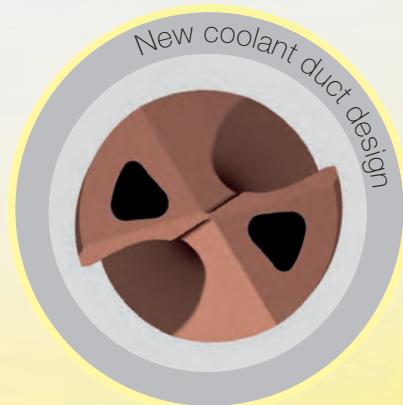
# NEW



## RT 100 type C

- // Özellikle uzun talaş çeliklerin işlenmesi için uygundur
- // Hatta azaltılmış kesme hızları ile mükemmel talaş boşaltma
- // Oyuk formu ve kesme kenarı geometrisi optimal işleme görevine adapte

→ Sayfa 814



**GÜHRING**

# R&D FIBRE KOMPOZİT PLASTİK

Yüksek aşındırıcı malzemeler için kalıp çözümleri

## FCP İŞLENMESİ

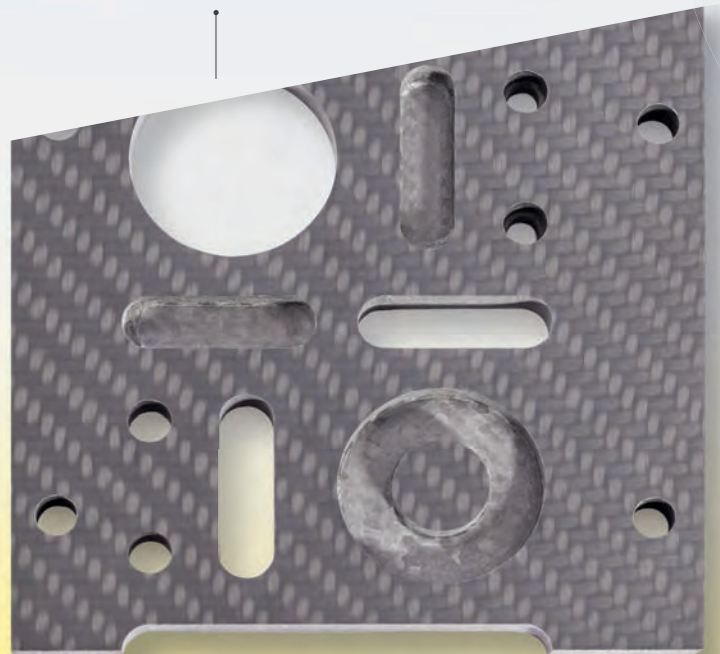
Glass fibre reinforced plastics işlenmesi için optimize edilmiş takımlar (GFRP) ve karbon lif takviyeli plastiklerin(CFRP) yanı sıra yığın materyaller.

- // Fibre çikintıları olmayan bileşenler
- // delaminasyon ücretsiz bileşen yüzeyi
- // hasar oluşmaması için bileşenlerin yukarı doğru soyulması veya dışarı atılması
- // bileşende lif'in dışarı doğru itilmesini önlemek
- // çapak uzamasının en aza indirilmesi
- // Termal hasarın önlenmesi

→ Sayfa 816

## FCP DELME OPERASYONU

Optimum işleme kalitesi ile



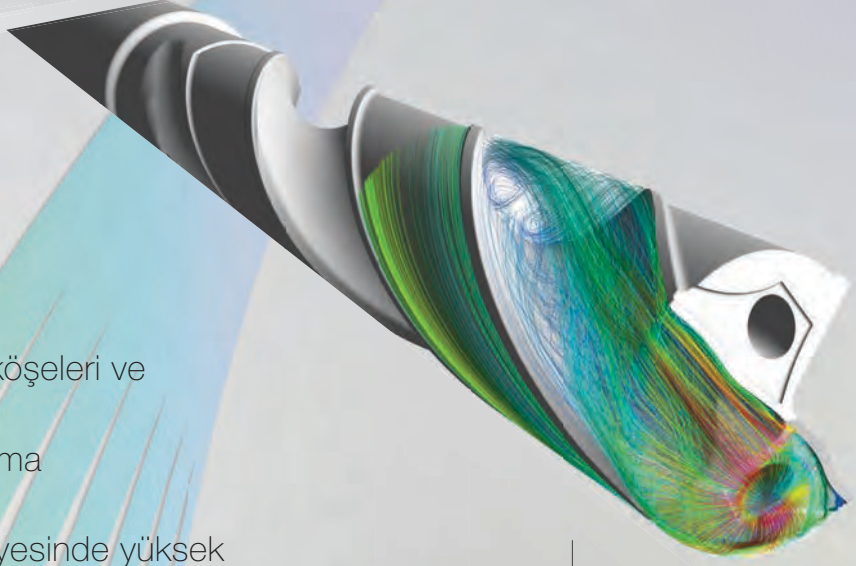


## LASER YAPISAL ARALIĞININ takım ömrü optimizasyonu soğutma yağlarının rehberliği sayesinde hedef konumla

EW

- // termal gerilmeler, yani dış köşeleri ve kesme ağzının azaltılması
- // Geliştirilmiş soğutma yağlama
- // artan delik kalitesi
- // lazer işlemenin boşluğu sayesinde yüksek tasarım esnekliği

→ Sayfa 819



Computational Fluid Dynamics simülasyonu (CFD)

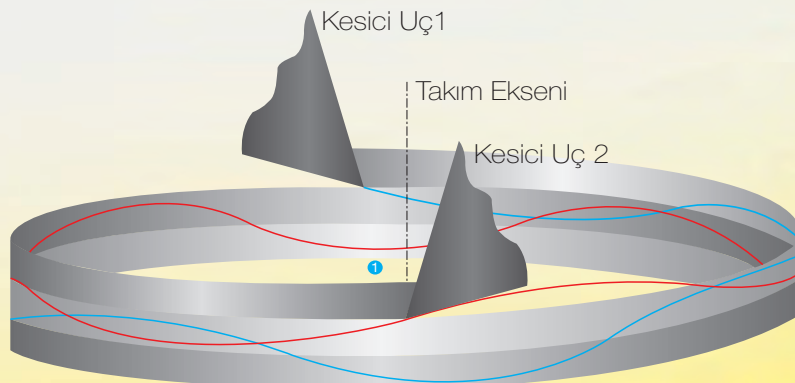
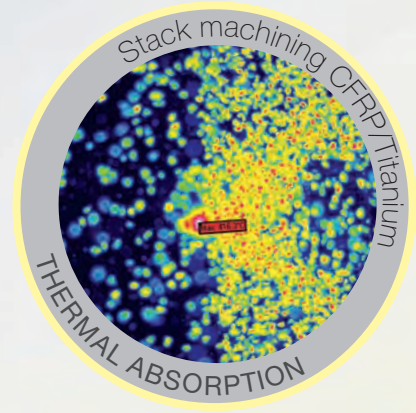
## TITREŞİM DESTEKLİ İŞLEME

proses optimizasyonu sayesinde bindirme hareketi

NEW

- // daha uygun talaş geliştirme / gelişmiş talaş kırığı
- // Geliştirilmiş talaş boşaltma
- // talaş nominal kırılma noktalarının üretimi
- // indirgenmiş biriken kenar
- // Alt işleme kuvvetleri ve sıcaklıklar

→ Sayfa 821



YENİDEN BİLEME, KAPLAMA, KAPLAMA SÖKÜMÜ  
TAKIM MODİFİKASYONLARI, KÜÇÜK ÖLÇEKLİ ÜRETİM

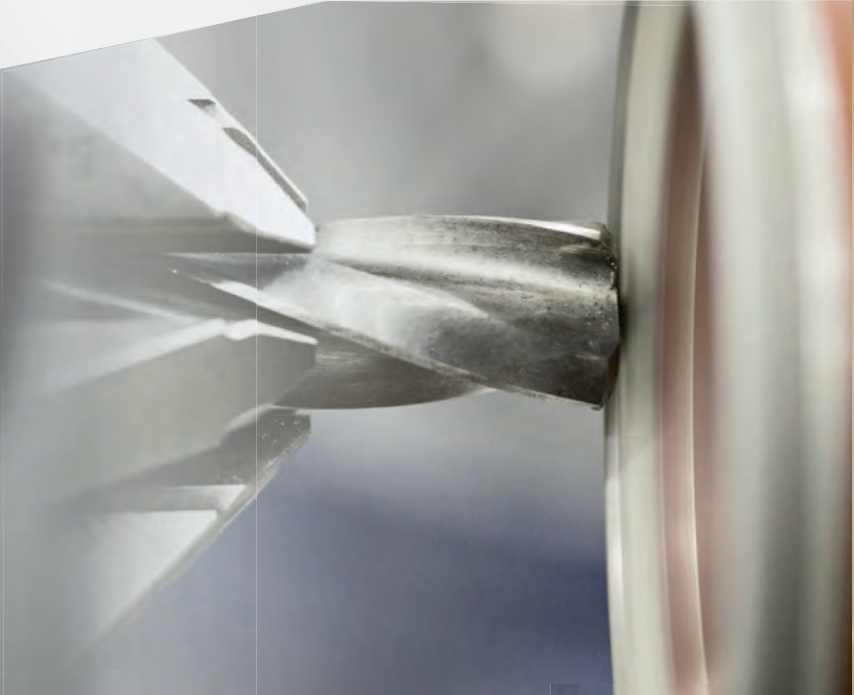
HER ZAMAN YANINIZDA



BİLEME VE



KAPLAMA SERVİSİ



# Müşteri taleplerine bireysel özel takımlar – Başarı için Guhring

İşleme mükemmelliği ile müşteri taleplerini karşılıyoruz. GUHRING yaratıcılığı ve yenilikçi teknolojiler ile birlikte aynı zamanda hassas takımların spesifik seri üretimleri için dizayn sürecini uzmanları tarafından sağlamaktadır.



**GUHRING**

Üretim Yeri Treuen



**GUHRING**



LOKASYON

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TREUEN



**PIKTOGRAM**

BİR BAKIŞTA

# ISO code

<b>P</b>	Çelik, yüksek alaşımli çelik
<b>M</b>	Paslanmaz çelikler
<b>K</b>	Pik döküm, temper döküm ve küresel döküm
<b>N</b>	Aluminyum ve diğer demir dışı metaller
<b>S</b>	Özel-, süper- ve Ti- alaşımları
<b>H</b>	Sertleştirilmiş çelikler ve sert dökme demir

uygulama grupları için aracı uygunluğuna ilişkin öneriler takip eden fiyat ve program sayfalarında bulunabilir:

- optimum uygunluk
- sınırlı uygunluk

# Pictograms

Malzeme	<b>HSS</b>	<b>HSS-E</b>	<b>HSCO</b>	<b>M42</b>	<b>HSS-E-PM</b>				
	High-speed steel								
	<b>HM</b>	<b>VHM</b>							
	Komple sert metal (HM-UF)								
Delik derinliği	<b>1xD</b>	<b>1,5xD</b>	<b>3xD</b>	<b>4xD</b>	<b>5xD</b>	<b>7xD</b>	<b>8xD</b>	<b>10xD</b>	....
Ø-Tolerans	<b>m7</b>	<b>h5</b>	<b>h6</b>	<b>h7</b>	<b>h8</b>	<b>0/-0,004</b>	....		
Sap formu	<b>HA</b>	<b>HB</b>	<b>HE</b>	<b>Cyl</b>	<b>MK</b>				
	to DIN 6535			silindirik		Mors Konik			
Kesme yönü	<b>R</b>			<b>L</b>			<b>N</b>		
	sağ			sol		neutral			
İçten soğutmalı									
	içten soğutmalı			içten su vermesiz					
Form	<b>A</b>	<b>B</b>	<b>R</b>	....					
Uç açısı	<b>90°</b>	<b>118°</b>	<b>120°</b>	<b>130°</b>	<b>135°</b>	<b>140°</b>	<b>150°</b>	....	
Öz bileme									
Standart	<b>DIN 333</b>	<b>DIN 338</b>	<b>DIN 340</b>	<b>DIN 345</b>	<b>DIN 1869</b>	<b>DIN 6537K</b>	<b>DIN 6537L</b>	<b>DIN 6539</b>	....
	to DIN								
	<b>WN</b>								
	firma standartı								
Tip	<b>EB 100</b>	<b>GT 100</b>	<b>HT 800 WP</b>	<b>H</b>	<b>N</b>	<b>RT 100 T</b>	<b>RT 100 U</b>	<b>W</b>	....

# Yüzey

- kaplamasız
- altınsı kahverengi
- FIRE/nanoFIRE
- Signum
- buhar menevişi
- TiAlN
- TiCN
- Ni nikelajlı
- nitrürlü
- TiAlN SuperA
- TiN
- MolyGlide
- zırlı nitrürlü
- TiAlN nanoA
- Sirius
- Cb Carbo

## QUICKFINDER

Sizin uygulamanıza göre ideal Takıma hızlı ve kolay ulaşım

RASYO MATKAP UCU
RASYO MATKAP UCU

P ÇELİK
H SERTLEŞTİRİLMİŞ ÇELİKLER

# QUICKFINDER

N/mm <sup>2</sup>	3xD	4xD	5xD	7xD	8xD	12xD	No 1 İdeal takım genel çelik işleme için
	No 1 İdeal takım 1500 N/mm <sup>2</sup> ye kadar olan genel ve yüksek çeliklere mukavemetli çelikler						
≤ 1400	No 1 Ø 3,00 - 20,00 mm Ürün no 2477 den itibaren 39	No 1 Ø 3,00 - 20,00 mm Ürün no 5405	No 1 Ø 3,00 - 20,00 mm Ürün no 2479 den itibaren 61	No 1 Ø 3,00 - 20,00 mm Ürün no 4044 den itibaren 85	No 1 Ø 3,00 - 20,00 mm Ürün no 5760 den itibaren 96	No 1 Ø 3,00 - 20,00 mm Ürün no 5525 den itibaren 100	RT100 S için soğutmalı RT100 U için soğutmalı
≤ 1400	Ø 3,00 - 20,00 mm Ürün no 2480 den itibaren 16	Ø 3,00 - 20,00 mm Ürün no 5405	Ø 3,00 - 20,00 mm Ürün no 2996	Ø 3,00 - 20,00 mm Ürün no 5401	Ø 3,00 - 20,00 mm Ürün no 5401	Ø 3,00 - 20,00 mm Ürün no 5401	RT100 U için su vermesiz RT100 HF için soğutmalı
≤ 1600	No 1 Ø 3,00 - 20,00 mm Ürün no 8520	No 1 Ø 3,00 - 20,00 mm Ürün no 8521	No 1 Ø 3,00 - 20,00 mm Ürün no 8521	No 1 Ø 3,00 - 16,00 mm Ürün no 8522	No 1 Ø 3,00 - 16,00 mm Ürün no 8522	No 1 Ø 3,00 - 16,00 mm Ürün no 8522	E2 HRC ye kadar sertleştirilmiş çelikler için uygun Ürün no 1946, 6-399
≤ 1400	Ø 0,50 - 3,00 mm den itibaren 108	Ø 0,50 - 3,00 mm den itibaren 110	Ø 0,50 - 3,00 mm den itibaren 109	Ø 1,40 - 3,00 mm Ürün no 5405	Ø 1,40 - 3,00 mm Ürün no 5405	Ø 1,40 - 3,00 mm Ürün no 5405	ExclusiveLine Kılcal matkap ucu için soğutmalı ExclusiveLine Kılcal matkap uçları, soğutma kanalsız

## NAVIGATOR

Uygulama tavsiyeleri ve kesme parametreleriyle programın bütününe genel bir bakış

RASYO MATKAP UCU
RASYO MATKAP UCU

### GÜHRTING NAVİGATOR

Kısa herf basılı herleme kod no 3 ile takımın herf ediniz. İdeal takım seçimi ve kesme değerleri tavsiyemiz için www.guehring.de adresinde Gühring Navigator'un elektronik versiyonuna bakabilirsiniz.

**Ürün No:** Standard DIN  
**Kesilici tak. matz.:** HM Uyuş. grubu  
**Tip:** Kapsama tipi  
**Program sayfası:**

#### ≤3xD Delik derinliği

11T1	1650	1160	1181	2408	2477	2495	8510	8510	8520	8520
ES57K	ES57K	ES57K	ES57K	ES57K	ES57K	ES57K	ES57K	ES57K	ES57K	ES57K
Sert metal	KSM	KSM	KSM	KSM	KSM	KSM	KSM	KSM	KSM	KSM
K/P	K/P	K/P	K/P	K/P	K/P	K/P	K/P	K/P	K/P	K/P
RT 80 U	RT 100 F	RT 100 F	RT 100 U	RT 100 F	RT 100 U	RT 100 U	RT 100 U	RT 100 U	RT 100 U	RT 100 HF
aksiyel	aksiyel	aksiyel	aksiyel	aksiyel	aksiyel	aksiyel	aksiyel	aksiyel	aksiyel	aksiyel
55	53	54	43	52	39	41	48	50	44	46

matkap Ø mm	Herleme hız kodları								
	1	2	3	4	5	6	7	8	9
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025	
2,00	0,015	0,022	0,026	0,030	0,036	0,040	0,100	0,120	
3,15	0,022	0,032	0,036	0,040	0,045	0,050	0,100	0,120	
4,00	0,030	0,040	0,045	0,050	0,055	0,060	0,100	0,120	
5,00	0,040	0,050	0,055	0,060	0,100	0,120	0,160	0,200	
6,30	0,050	0,060	0,065	0,070	0,100	0,120	0,160	0,200	
8,00	0,060	0,080	0,100	0,120	0,160	0,200	0,250	0,315	
10,00	0,080	0,100	0,120	0,160	0,200	0,250	0,315	0,400	
12,50	0,080	0,100	0,120	0,160	0,200	0,250	0,315	0,400	
16,00	0,100	0,120	0,160	0,200	0,250	0,315	0,400	0,500	
20,00	0,120	0,160	0,200	0,250	0,315	0,400	0,500	0,630	
25,00	0,140	0,200	0,250	0,315	0,400	0,500	0,630	0,800	
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	
50,00	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250	
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,500	
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,500	2,000	

matkap grubu	Herleme hız kodları									Kesme mukavemeti	Sertlik	Süsl. avuç	
	1	2	3	4	5	6	7	8	9				
genel amaç çelikler	1.0035 P18G3S3, 1.0488 P25N3E2E2, 1.0494 P25G3H1E, 1.0495 P25G3H2E										≤500	○	○
alüminyum çelikler	1.0050 S05G3S3, 1.0070 S10G3S3, 1.0071 S15G3S3, 1.0072 S20G3S3										≤1000	○	○
alüminyum çelikler	1.0718 118MnP20 (85MnP20), 1.0718 118MnG7 (85MnG7)										≤800	○	○
pasız çelikler	1.0227 A05G3S3, 1.0228 A10G3S3, 1.0229 A15G3S3, 1.0230 A20G3S3										≤1000	○	○
pasız çelikler	1.0402 C22, 1.1178 C30S (C30S)										≤700	○	○
pasız çelikler	1.0003 C40, 1.1191 C40S (C40S)										≤800	○	○
pasız çelikler	1.0061 C50, 1.1251 C50S (C50S)										≤1000	○	○
pasız çelikler	1.0731 10MnSi4, 1.7000 30Cr, 1.7030 28Cr4										≤1000	○	○
pasız çelikler	1.2710 30NiCr15, 1.7036 30Cr, 1.7252 30CrMo4										≤1400	○	○
pasız çelikler	1.0201 Cr15, 1.1121 Cr15E (Cr15E)										≤800	○	○
pasız çelikler	1.2718 30NiCr15, 1.0218 11MnSi3										≤1000	○	○
pasız çelikler	1.5032 12AlCr13, 1.7131 16MnCr5, 1.7264 20CrMn5G										≤1400	○	○
pasız çelikler	1.5034 12AlCr16										≤1400	○	○
pasız çelikler	1.2619 12CrAl9, 1.8550 34CrNi7										≤1400	○	○
pasız çelikler	1.7190 Cr16, 1.2087 12Cr16, 1.2089 20CrMn4										≤800	○	○
pasız çelikler	1.2080 X12Cr12, 1.2083 X3Cr13, 1.2419 10Cr16, 1.2787 X6NiCrMo4										≤1400	○	○
pasız çelikler	1.2403 S1-S1-2, 1.2404 S1-S1-2, 1.2404 S1-S1-3										≤1400	○	○
pasız çelikler	1.2028 S05T, 1.1716 S5Cr3, 1.8158 S1Cr4 (S1Cr4)										≤350 HB	○	○
sertleştirilmiş çelikler	-										≤48 HRC	○	○
pasız çelikler, kükürtlü çelikler, malzemeler	1.4005 X12Cr13, 1.4104 X14CrMoS17, 1.4165 X6CrMoS17, 1.4305 X6CrNiS18-8										≤300	○	○
pasız çelikler, malzemeler	1.4301 X2CrNi18-9, 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi17-12-2 (X4A)										≤1100	○	○
pasız çelikler, malzemeler	1.4667 X2CrNi17 (X1CrNi16-2), 1.4122 X3CrMo17-1, 1.4521 X2CrMoTi18-2										≤1500	○	○
pasız çelikler	0.8025 EN-GJS-250 (GJS250), 0.8026 EN-GJS-250 (GJS250)										≤240 HB	○	○
pasız çelikler, malzemeler	0.7020 EN-GJS-200 (GJS200), 0.8026 EN-GJS-250 (GJS250)										≤240 HB	○	○
pasız çelikler, malzemeler	0.7070 EN-GJS-700-2 (GJS700-2), 0.8170 EN-GJS-700-2 (GJS700-2)										≤350 HB	○	○
pasız çelikler, malzemeler	EN-GJW550 (GJS550), EN-GJW550 (GJS550)										≤350 HB	○	○
pasız çelikler, malzemeler	EN-GJW400 (GJS400), EN-GJW500 (GJS500), S160-6										≤300 HB	○	○



## ÜRÜN SAYFASI

Herşey bir bakışta

### İçten soğutma kanallı rasyo matkap



**P** • öz bileme  $\geq \varnothing 3,300$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi

**M** ○

**K** •

**N** ○

**S** ○

**H** ○

yapı ve sementasyon çelikleri • otomat çelikleri, işlah çelikleri • alaşimli çelikler 1200 N/mm<sup>2</sup>'ye kadar • döküm malzemeler • bronz / pirinç • yüksek alaşimli AISi-Alaşımları

**GÜHRINGNAVIGATOR**

Kesme verileri sayfası 750

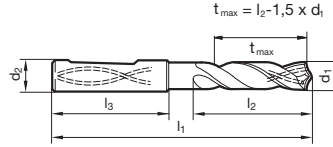
Malzeme **Kom. sert metal**

Yüzey **S**

sap formu HE

### Uygulama tavsiyesi:

- optimum uygunluk
- sınırlı uygunluk



Ürün no **1181**

**1**

Ürün no

d1	d2 h6	l1	l2	l3	d1	d2 h6	l1	l2	l3
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
3,300	6,000	62,000	20,000	36,000	10,500	12,000	102,000	55,000	45,000
3,400	6,000	62,000	20,000	36,000	10,600	12,000	102,000	55,000	45,000
4,000	6,000	66,000	24,000	36,000	10,700	12,000	102,000	55,000	45,000
5,000	6,000	66,000	28,000	36,000	10,800	12,000	102,000	55,000	45,000
5,500	6,000	66,000	28,000	36,000	11,000	12,000	102,000	55,000	45,000
5,600	6,000	66,000	28,000	36,000	11,300	12,000	102,000	55,000	45,000
5,800	6,000	66,000	28,000	36,000	11,500	12,000	102,000	55,000	45,000
6,000	6,000	66,000	28,000	36,000	11,510	29/64	12,000	102,000	55,000
6,100	8,000	79,000	34,000	36,000	11,910	15/32	12,000	102,000	55,000
6,200	8,000	79,000	34,000	36,000	12,000	12,000	102,000	55,000	45,000
6,300	8,000	79,000	34,000	36,000	12,100	14,000	107,000	60,000	45,000
6,400	8,000	79,000	34,000	36,000	12,300	31/64	14,000	107,000	60,000
6,600	8,000	79,000	34,000	36,000	12,500	14,000	107,000	60,000	45,000
6,800	8,000	79,000	34,000	36,000	12,700	1/2	14,000	107,000	60,000
7,000	8,000	79,000	34,000	36,000	12,900	14,000	107,000	60,000	45,000
7,100	8,000	79,000	41,000	36,000	13,000	14,000	107,000	60,000	45,000
7,140	9/32	8,000	79,000	41,000	13,500	14,000	107,000	60,000	45,000
7,400	8,000	79,000	41,000	36,000	13,890	35/64	14,000	107,000	60,000
7,500	8,000	79,000	41,000	36,000	14,000	14,000	107,000	60,000	45,000
7,540	19/64	8,000	79,000	41,000	14,500	16,000	115,000	65,000	48,000
7,800	8,000	79,000	41,000	36,000	14,680	37/64	16,000	115,000	65,000

**2**

Anma çapı

Sipariş verirken lütfen Artikel No ve anma Çapını belirtiniz örneğin,  
5,5 Çapında İçten soğutma kanallı rasyo matkap = **1181 5,500**

### Son fiyatlarımız için lütfen ayrılmış olan fiyat listelerimize bakın

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E-Mail: info@guehring.de




## Rasyo matkap ucu

 Malzeme sınıflarını hızlı bul .....	4'den itibaren
Kılavuz .....	12'den itibaren
Program .....	16'den itibaren


## Takma uçlu delme sistemleri T 800

Kılavuz .....	124'den itibaren
Program .....	128'den itibaren

## Silindir Şaftlı Matkap ucu

Kılavuz .....	176'den itibaren
 Malzeme sınıflarını hızlı bul .....	184'den itibaren
Program .....	192'den itibaren

## Mors Konik Şaftlı Matkap Ucu

Kılavuz .....	436'den itibaren
 Malzeme sınıflarını hızlı bul .....	440'den itibaren
Program .....	448'den itibaren

## Derin Delik Matkap Ucu

Kılavuz .....	516'den itibaren
Program .....	523'den itibaren

## Kılcal matkap

Kılavuz .....	646'den itibaren
Program .....	649'den itibaren

## Merkez deliciler / NC spor deliciler

Kılavuz .....	666'den itibaren
Program .....	668'den itibaren

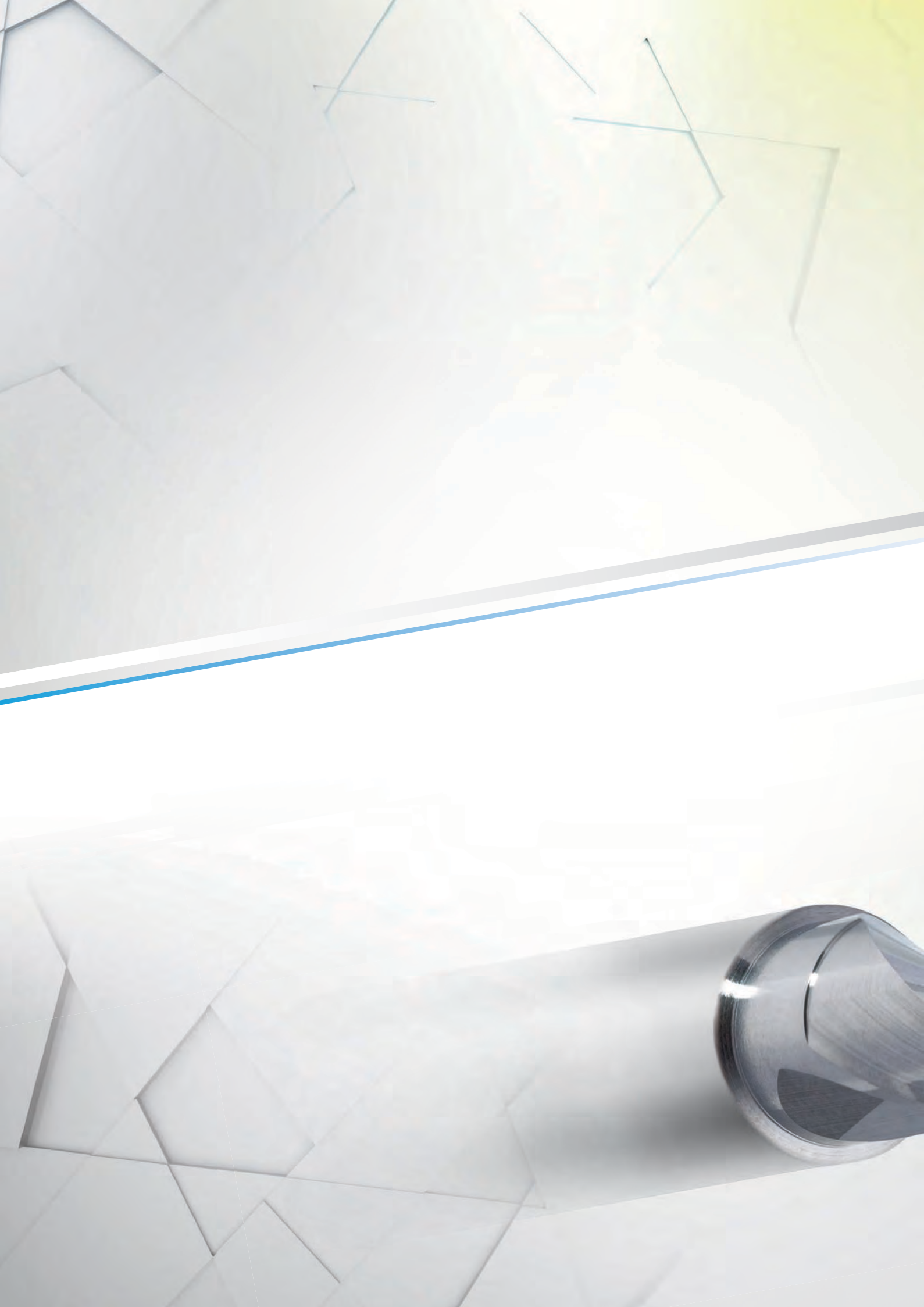
## Kademeli matkap ucu / Genişletic

Kılavuz .....	712'den itibaren
Program .....	714'den itibaren

<b>GÜHRING</b> NAVIGATOR .....	749'den itibaren
--------------------------------	------------------

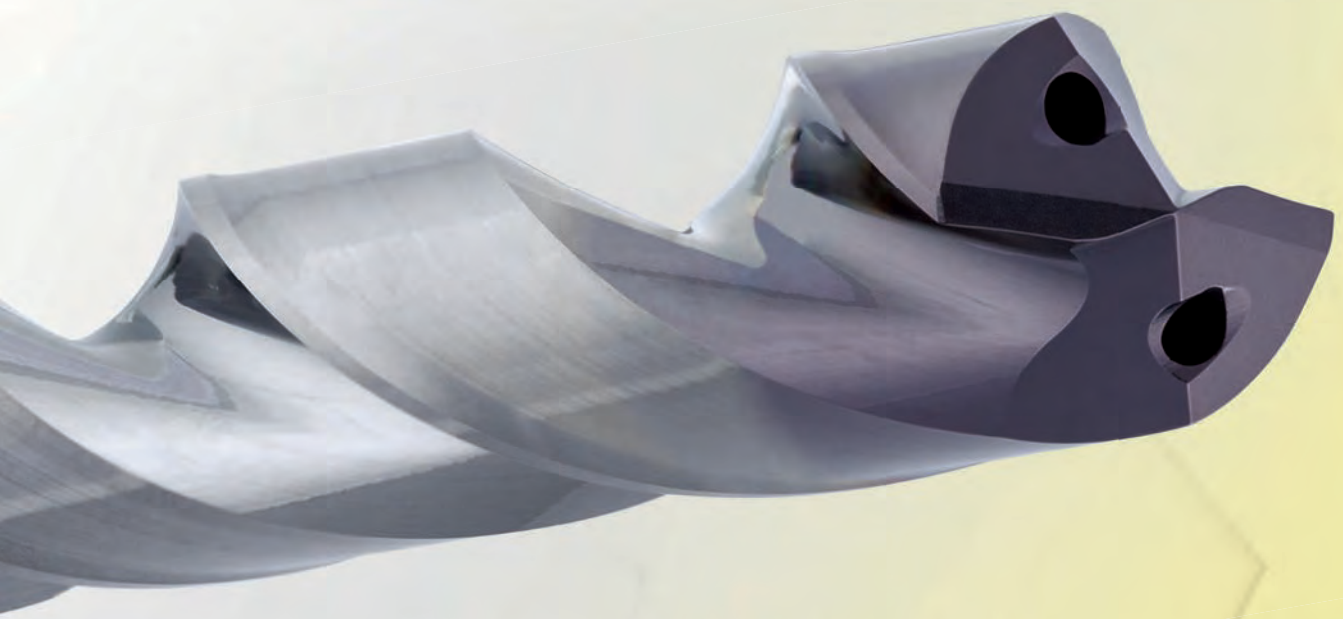
<b>Teknik bölüm</b> .....	811'den itibaren
---------------------------	------------------

<b>Ürün numara listesi</b> .....	871'den itibaren
----------------------------------	------------------



# RASYO MATKAP UCU

Ratio®





ÇELİK

SERTLEŞTİRİLMİŞ  
ÇELİKLER

3xD

4xD

5xD

7xD

 $\leq 1400$   
N/mm<sup>2</sup>

No 1

Ø 3,00 - 20,00 mm  
Ürün no 2477  
den itibaren 39

No 1

Ø 3,00 - 20,00 mm  
Ürün no 5759  
den itibaren 59Ø 3,00 - 20,00 mm  
Ürün no 2479  
den itibaren 61Ø 3,00 - 20,00 mm  
Ürün no 4044  
den itibaren 85 $\leq 1400$   
N/mm<sup>2</sup>Ø 3,00 - 20,00 mm  
Ürün no 2480  
den itibaren 16Ø 3,00 - 20,00 mm  
Ürün no 2996  
den itibaren 30

No 1

Ø 3,00 - 20,00 mm  
Ürün no 8520  
den itibaren 44

No 1

Ø 3,00 - 20,00 mm  
Ürün no 8521  
den itibaren 68

No 1

Ø 3,00 - 16,00 mm  
Ürün no 8522  
den itibaren 90 $\leq 1400$   
N/mm<sup>2</sup>

No 1

Ø 1,40 - 3,00 mm  
Ürün no 6405  
den itibaren 110Ø 0,50 - 3,00 mm  
Ürün no 6400  
den itibaren 108Ø 0,50 - 3,00 mm  
Ürün no 6401  
den itibaren 109

15xD

20xD

25xD

30xD

No 1

Ø 1,40 - 3,00 mm  
Ürün no 6412  
den itibaren 112

No 1

Ø 3,00 - 14,00 mm  
Ürün no 6509  
den itibaren 102

No 1

Ø 3,00 - 14,00 mm  
Ürün no 6511  
den itibaren 104

No 1

Ø 3,00 - 12,00 mm  
Ürün no 6512  
den itibaren 105

No 1

Ø 3,00 - 10,00 mm  
Ürün no 6513  
den itibaren 106 $\leq 1400$   
N/mm<sup>2</sup>



# QUICKFINDER

8xD

12xD

**No 1** ideal takım  
genel çelik işleme için

**No 1** ideal takım  
1600 N/mm<sup>2</sup> ye kadar olan genel ve  
yüksek çekme mukavemetli çelikler

**No 1**

Ø 3,00 - 20,00 mm  
Ürün no 5760  
den itibaren 96



RT100 S içten soğutmalı

**No 1**

Ø 3,00 - 20,00 mm  
Ürün no 5525  
den itibaren 100



RT100 U içten soğutmalı

62 HRC ye kadar sertleştirilmiş  
çelikler için tip H  
Ürün no 1946, s. 389



RT100 U içten su vermesiz



RT100 HF içten soğutmalı

**No 1**

Ø 1,40 - 3,00 mm  
Ürün no 6408  
den itibaren 111



ExclusiveLine Kılcal matkap ucu içten  
soğutmalı



ExclusiveLine Kılcal matkap uçları,  
soğutma kanalsız

40xD

**No 1**

Ø 3,00 - 8,00 mm  
Ürün no 6514  
den itibaren 107



ExclusiveLine Kılcal matkap ucu içten  
soğutmalı



RT 100 T



PASLANMAZ  
ÇELIKLER



TITAN &  
ÖZEL ALAŞIMLAR.

3xD

4xD

5xD

7xD

No 1 No 1

Ø 3,00 - 20,00 mm  
Ürün no 8510  
den itibaren 48

No 1 No 1

Ø 3,00 - 20,00 mm  
Ürün no 8511  
den itibaren 72

No 1

Ø 3,00 - 20,00 mm  
Ürün no 8520  
den itibaren 44

No 1

Ø 3,00 - 20,00 mm  
Ürün no 8521  
den itibaren 68

No 1

Ø 3,00 - 16,00 mm  
Ürün no 8522  
den itibaren 90

S

Ø 3,50 - 20,00 mm  
Ürün no 2468  
den itibaren 52

S

Ø 3,00 - 20,00 mm  
Ürün no 2478  
den itibaren 76

No 1 No 1

Ø 1,40 - 3,00 mm  
Ürün no 6405  
den itibaren 110

15xD

20xD

25xD

30xD

No 1 No 1

Ø 1,40 - 3,00 mm  
Ürün no 6412  
den itibaren 112

No 1 No 1

Ø 3,00 - 14,00 mm  
Ürün no 6509  
den itibaren 102

No 1 No 1

Ø 3,00 - 14,00 mm  
Ürün no 6511  
den itibaren 104

No 1 No 1

Ø 3,00 - 12,00 mm  
Ürün no 6512  
den itibaren 105

No 1 No 1

Ø 3,00 - 10,00 mm  
Ürün no 6513  
den itibaren 106





# QUICKFINDER

8xD

**No 1** ideal takım paslanmaz çelikler için

**No 1** ideal takım özel alaşım ve titanyum alaşımları için



RT100 VA



RT100 HF içten soğutmalı



RT100 F içten soğutmalı

**No 1** **No 1**

Ø 1,40 - 3,00 mm  
Ürün no 6408  
den itibaren 111



ExclusiveLine Kılcal matkap ucu içten soğutmalı

40xD



ExclusiveLine Kılcal matkap ucu içten soğutmalı

**No 1** **No 1**

Ø 3,00 - 8,00 mm  
Ürün no 6514  
den itibaren 107



RT 100 T



## K DÖKME DEMİR

3xD

4xD

5xD

7xD

No 1

Ø 3,00 - 20,00 mm  
Ürün no 2477  
den itibaren 39

Ø 3,00 - 20,00 mm  
Ürün no 2480  
den itibaren 16

No 1

Ø 3,00 - 20,00 mm  
Ürün no 6501  
den itibaren 82

Ø 3,00 - 20,00 mm  
Ürün no 2479  
den itibaren 61

Ø 3,00 - 20,00 mm  
Ürün no 2996  
den itibaren 30

No 1

Ø 4,00 - 20,00 mm  
Ürün no 6502  
den itibaren 91

Ø 3,00 - 20,00 mm  
Ürün no 4044  
den itibaren 85

No 1

Ø 3,00 - 20,00 mm  
Ürün no 768  
den itibaren 56

Ø 3,00 - 20,00 mm  
Ürün no 769  
den itibaren 93

No 1

Ø 1,40 - 3,00 mm  
Ürün no 6405  
den itibaren 110

Ø 0,50 - 3,00 mm  
Ürün no 6400  
den itibaren 108

Ø 0,50 - 3,00 mm  
Ürün no 6401  
den itibaren 109

15xD

20xD

25xD

30xD

No 1

Ø 1,40 - 3,00 mm  
Ürün no 6412  
den itibaren 112

No 1

Ø 3,00 - 14,00 mm  
Ürün no 6509  
den itibaren 102

Ø 5,00 - 14,00 mm  
Ürün no 773  
den itibaren 103

No 1

Ø 3,00 - 14,00 mm  
Ürün no 6511  
den itibaren 104

No 1

Ø 3,00 - 12,00 mm  
Ürün no 6512  
den itibaren 105

No 1

Ø 3,00 - 10,00 mm  
Ürün no 6513  
den itibaren 106



# QUICKFINDER

8xD

10xD

12xD

No 1 ideal  
takım

Rasyo matkap ucu



RT 100 R

No 1

Ø 3,00 - 20,00 mm  
Ürün no 5525  
den itibaren 100



RT100 U içten soğutmalı



RT100 U içten su vermesiz

No 1

Ø 3,00 - 20,00 mm  
Ürün no 770  
den itibaren 98



RT100 GG Dökme demir

No 1

Ø 1,40 - 3,00 mm  
Ürün no 6408  
den itibaren 111



ExclusiveLine Kılcal matkap ucu içten soğutmalı

ExclusiveLine kılcal matkap uçları,  
soğutma kanalsız

40xD



ExclusiveLine Kılcal matkap ucu içten soğutmalı

No 1

Ø 3,00 - 8,00 mm  
Ürün no 6514  
den itibaren 107



RT 100 T



RT 150 GN



ALUMINYUMMİYUM, NE, PLASTİKLER

4xD

No 1

Ø 3,00 - 20,00 mm  
Ürün no 6068  
den itibaren 58

5xD

7xD

8xD

No 1

Ø 3,00 - 19,50 mm  
Ürün no 6069  
den itibaren 94

Ø 3,00 - 20,00 mm  
Ürün no 2713  
den itibaren 113

No 1

Ø 3,00 - 20,00 mm\*

No 1

Ø 1,40 - 3,00 mm  
Ürün no 6405  
den itibaren 110

No 1

Ø 1,40 - 3,00 mm  
Ürün no 6408  
den itibaren 111

15xD

20xD

25xD

30xD

No 1

Ø 5,00 - 14,00 mm  
Ürün no 773  
den itibaren 103

No 1

Ø 3,00 - max. 14,00 mm\*

No 1

Ø 1,40 - 3,00 mm  
Ürün no 6412  
den itibaren 112

\*talep üzerine özel takımlar



# QUICKFINDER

10xD

No 1 ideal takım

No 1

Ø 3,00 - 19,50 mm  
Ürün no 6070  
den itibaren 99



RT150 GG



FT 200 G içten soğutmalı



RT100 AL



ExclusiveLine Kılcal matkap ucu içten soğutmalı



RT 150 GN

Kevlar matkapları  
Ürün no 1149  
s. 431



RT 100 T Alüminyum

Alüminyum ve plastik  
işlemek için tip N  
Ürün no 732 s. 319



ExclusiveLine Kılcal matkap ucu içten soğutmalı



P	M	K	N	S	H	takım görüntüsü	delik derinliği	sap formu	Tip	Standart	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayısı	Sayfa
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## Rasyo matkap uçları, soğutma kanalsız

•	•	•	•	•	•		3xD	HA	RT 100 U	DIN 6537K	VHM	F	3,000 - 20,000	2480	752	16
•	•	•	•	•	•		3xD	HE	RT 100 U	DIN 6537K	VHM	F	3,100 - 20,000	2472	752	18
•	•	•	•	•	•		3xD	Cyl	RT 100 U	DIN 6539	VHM	F	3,000 - 15,500	2473	752	20
•	•	•	•	•	•		3xD	HE	RT 100 U	DIN 6537K	VHM	S	3,000 - 20,000	1184	752	21
•	•	•	•	•	•		3xD	Cyl	RT 100 U	DIN 6539	VHM	S	3,000 - 16,000	1242	752	23
•	•	•	•	•	•		3xD	HA	RT 100 HF	DIN 6537K	VHM	Y	3,000 - 20,000	8524	752	25
•	•	•	•	•	•		3xD	HA	RT 100 F	DIN 6537K	VHM	F	3,700 - 12,000	2475	752	27
•	•	•	•	•	•		3xD	Cyl	RT 100 F	DIN 6539	VHM	S	3,000 - 14,000	1702	752	28
•	•	•	•	•	•		5xD	HA	RT 100 U	DIN 6537L	VHM	F	3,000 - 20,000	2996	756	30
•	•	•	•	•	•		5xD	HE	RT 100 U	DIN 6537L	VHM	F	3,100 - 20,000	2719	756	32
•	•	•	•	•	•		5xD	Cyl	RT 100 U	WN	VHM	F	5,000 - 14,000	2474	756	34
•	•	•	•	•	•		5xD	HA	RT 100 U	DIN 6537L	VHM	S	3,300 - 12,000	2717	756	35
•	•	•	•	•	•		5xD	Cyl	RT 100 U	WN	VHM	S	5,000 - 16,000	1243	756	36
•	•	•	•	•	•		5xD	HA	RT 100 F	DIN 6537L	VHM	F	3,000 - 15,000	2712	756	38

## İçten soğutma kanallı rasyo matkap

•	•	•	•	•	•		3xD	HA	RT 100 U	DIN 6537K	VHM	F	3,000 - 20,000	2477	750	39
•	•	•	•	•	•		3xD	HE	RT 100 U	DIN 6537K	VHM	F	3,000 - 20,000	2469	750	41
•	•	•	•	•	•		3xD	HE	RT 100 U	DIN 6537K	VHM	S	3,300 - 19,500	1181	750	43
•	•	•	•	•	•		3xD	HA	RT 100 HF	DIN 6537K	VHM	Y	3,000 - 20,000	8520	750	44
•	•	•	•	•	•		3xD	HE	RT 100 HF	DIN 6537K	VHM	Y	3,000 - 20,000	8620	750	46
•	•	•	•	•	•		3xD	HA	RT 100 VA	DIN 6537K	VHM	a	3,000 - 20,000	8510	750	48
•	•	•	•	•	•		3xD	HE	RT 100 VA	DIN 6537K	VHM	a	3,000 - 20,000	8610	750	50
•	•	•	•	•	•		3xD	HE	RT 100 F	DIN 6537K	VHM	F	3,500 - 20,000	2468	750	52
•	•	•	•	•	•		3xD	HA	RT 100 F	DIN 6537K	VHM	S	3,100 - 22,000	1660	750	53



P	M	K	N	S	H	takım görüntüsü	delik derinliği	sap formu	Tip	Standart	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayfası	Sayfa
○	○	○	○	●	○		3xD	HE	RT 100 F	DIN 6537 K	VHM	S	4,000 - 25,000	1180	750	54
●	○	○	○				3xD	HE	RT 80 U	DIN 6538 K	HM	S	9,500 - 25,500	1171	750	55
		●	○				4xD	HA	RT 150 GG	WN	VHM	○	3,000 - 20,000	768	752	56
		○	●				4xD	HA	RT 150 GG	WN	VHM	○	3,000 - 20,000	6068	752	58
●	○	○	○	○	○		5xD	HA	RT 100 S	DIN 6537 L	VHM	F	3,000 - 20,000	5759	754	59
●	○	●	○	○	○		5xD	HA	RT 100 U	DIN 6537 L	VHM	F	3,000 - 20,000	2479	754	61
●	○	●	○	○	○		5xD	HE	RT 100 U	DIN 6537 L	VHM	F	3,300 - 20,000	2471	754	63
●	○	●	○	○	○		5xD	HA	RT 100 U	DIN 6537 L	VHM	S	3,000 - 19,500	1663	754	65
●	○	●	○	○	○		5xD	HE	RT 100 U	DIN 6537 L	VHM	S	3,300 - 20,000	1183	754	66
●		●	○				5xD	HA	RT 100 HF	DIN 6537 L	VHM	Y	3,000 - 20,000	8521	756	68
●		●	○				5xD	HE	RT 100 HF	DIN 6537 L	VHM	Y	3,000 - 20,000	8621	756	70
	●		●				5xD	HA	RT 100 VA	DIN 6537 L	VHM	a	3,000 - 20,000	8511	756	72
	●		●				5xD	HE	RT 100 VA	DIN 6537 L	VHM	a	3,000 - 20,000	8611	756	74
○	○	○	○	●	○		5xD	HA	RT 100 F	DIN 6537 L	VHM	F	3,000 - 20,000	2478	754	76
○	○	○	○	●	○		5xD	HE	RT 100 F	DIN 6537 L	VHM	F	3,000 - 20,000	2470	754	77
○	○	○	○	●	○		5xD	HA	RT 100 F	DIN 6537 L	VHM	S	3,000 - 23,500	1662	754	78
○	○	○	○	●	○		5xD	HE	RT 100 F	DIN 6537 L	VHM	S	3,000 - 25,000	1182	754	80
		●					5xD	HA	RT 100 R	DIN 6537 L	VHM	F	3,000 - 20,000	6501	754	82
●	○	○	○				5xD	HE	RT 80 U	DIN 6538 M	HM	S	9,800 - 25,500	1172	754	84
●	○	●	○	○	○		7xD	HA	RT 100 U	WN	VHM	F	3,000 - 20,000	4044	758	85
●	○	●	○	○	○		7xD	HE	RT 100 U	WN	VHM	F	3,000 - 19,500	4045	758	87
●	○	●	○	○	○		7xD	HA	RT 100 U	WN	VHM	S	3,000 - 19,500	2711	758	89
●		●			○		7xD	HA	RT 100 HF	WN	VHM	Y	3,000 - 16,000	8522	758	90
		●					7xD	HA	RT 100 R	WN	VHM	F	4,000 - 20,000	6502	758	91



P	M	K	N	S	H	takım görüntüsü	delik derinliği	sap formu	Tip	Standart	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayfası	Sayfa
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## İçten soğutma kanallı rasyo matkap

							7xD	HA	RT 150 GG	WN	VHM	○	3,000 - 20,000	769	758	93
							7xD	HA	RT 150 GG	WN	VHM	○	3,000 - 19,500	6069	758	94
							7xD	HE	RT80U	DIN 6538L	HM	Ⓢ	9,600 - 25,000	1173	758	95
							8xD	HA	RT 100 S	WN	VHM	Ⓡ	3,000 - 20,000	5760	758	96
							10xD	HA	RT 150 GG	WN	VHM	○	3,000 - 20,000	770	758	98
							10xD	HA	RT 150 GG	WN	VHM	○	3,000 - 19,500	6070	758	99
							12xD	HA	RT 100 U	WN	VHM	Ⓡ	3,000 - 20,000	5525	758	100
							15xD	HA	RT 100 T	WN	VHM	Ⓡ	3,000 - 14,000	6509	760	102
							15xD	HA	RT 150 GN	WN	VHM	○	5,000 - 14,000	773	760	103
							20xD	HA	RT 100 T	WN	VHM	Ⓡ	3,000 - 14,000	6511	760	104
							25xD	HA	RT 100 T	WN	VHM	Ⓡ	3,000 - 12,000	6512	760	105
							30xD	HA	RT 100 T	WN	VHM	Ⓡ	3,000 - 10,000	6513	760	106
							40xD	HA	RT 100 T	WN	VHM	Ⓡ	3,000 - 8,000	6514	760	107

## ExclusiveLine kılcal matkap uçları, soğutma kanalsız

							4xD	Cyl	N	WN	VHM	Ⓡ	0,500 - 3,000	6400	796	108
							7xD	Cyl	N	WN	VHM	Ⓡ	0,500 - 3,000	6401	796	109

## ExclusiveLine kılcal matkap ucu, soğutma kanallı

							5xD	Cyl	N	WN	VHM	Ⓡ	1,400 - 3,000	6405	796	110
							8xD	Cyl	N	WN	VHM	Ⓡ	1,400 - 3,000	6408	796	111
							15xD	Cyl	N	WN	VHM	Ⓡ	1,400 - 3,000	6412	796	112

## 3 ağızlı rasyo matkap

							5xD	HA	FT 200 G	DIN 6537L	VHM	○	3,000 - 20,000	2713	762	113
							5xD	Cyl	GS 200 U	DIN 6539	VHM	Ⓢ	3,000 - 14,400	611	762	114
							5xD	Cyl	GS 200 U	DIN 6539	VHM	○	3,000 - 20,000	731	762	115
							5xD	Cyl	GS 200 G	DIN 6539	VHM	○	3,570 - 12,500	745	762	116





P	M	K	N	S	H	takım görüntüsü	delik derinliği	sap formu	Tip	Standart	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayfası	Sayfa
						<b>3 ağızlı rasyo matkap</b>										
							5xD	Cyl	GS 200 G	DIN 6539	VHM	○	3,000 - 20,000	1025	762	117
							5xD	Cyl	GS 200 F	DIN 6539	VHM	Ⓢ	3,000 - 11,000	1027	762	119
						<b>3 ağızlı kademeli rasyo matkap ucu</b>										
							3xD	Cyl	GS 200 G	WN	VHM	○	3,400 - 20,000	1032		120



## Rasyo matkap uçları, soğutma kanalsız



**P** • öz bileme  $\geq \varnothing 3,000$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi

**M** ○

**K** •

**N** ○ yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm<sup>2</sup>'ye kadar • döküm malzemeler • bronz / pirinç • yüksek alaşımli AISi-Alaşımları

**S** ○

**H** ○

Malzeme

Kom. sert metal

Yüzey

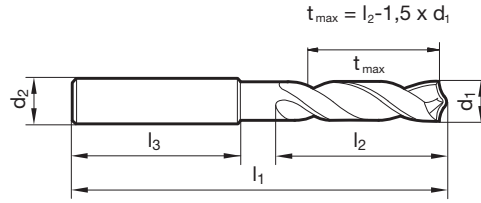
F

sap formu

HA

## GÜHRING NAVIGATOR

Kesme verileri sayfası 752



Ürün no

2480

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	6,500		8,000	79,000	34,000	36,000
3,100		6,000	62,000	20,000	36,000	6,600		8,000	79,000	34,000	36,000
3,200		6,000	62,000	20,000	36,000	6,700		8,000	79,000	34,000	36,000
3,250		6,000	62,000	20,000	36,000	6,750	17/64	8,000	79,000	34,000	36,000
3,300		6,000	62,000	20,000	36,000	6,800		8,000	79,000	34,000	36,000
3,400		6,000	62,000	20,000	36,000	6,900		8,000	79,000	34,000	36,000
3,500		6,000	62,000	20,000	36,000	7,000		8,000	79,000	34,000	36,000
3,570	9/64	6,000	62,000	20,000	36,000	7,200		8,000	79,000	41,000	36,000
3,600		6,000	62,000	20,000	36,000	7,300		8,000	79,000	41,000	36,000
3,700		6,000	62,000	20,000	36,000	7,500		8,000	79,000	41,000	36,000
3,800		6,000	66,000	24,000	36,000	7,700		8,000	79,000	41,000	36,000
3,900		6,000	66,000	24,000	36,000	7,900		8,000	79,000	41,000	36,000
4,000		6,000	66,000	24,000	36,000	7,940	5/16	8,000	79,000	41,000	36,000
4,100		6,000	66,000	24,000	36,000	8,000		8,000	79,000	41,000	36,000
4,200		6,000	66,000	24,000	36,000	8,100		10,000	89,000	47,000	40,000
4,300		6,000	66,000	24,000	36,000	8,200		10,000	89,000	47,000	40,000
4,400		6,000	66,000	24,000	36,000	8,330	21/64	10,000	89,000	47,000	40,000
4,500		6,000	66,000	24,000	36,000	8,400		10,000	89,000	47,000	40,000
4,600		6,000	66,000	24,000	36,000	8,500		10,000	89,000	47,000	40,000
4,650		6,000	66,000	24,000	36,000	8,700		10,000	89,000	47,000	40,000
4,760	3/16	6,000	66,000	28,000	36,000	8,800		10,000	89,000	47,000	40,000
4,800		6,000	66,000	28,000	36,000	8,900		10,000	89,000	47,000	40,000
4,900		6,000	66,000	28,000	36,000	9,250		10,000	89,000	47,000	40,000
5,000		6,000	66,000	28,000	36,000	9,400		10,000	89,000	47,000	40,000
5,100		6,000	66,000	28,000	36,000	9,500		10,000	89,000	47,000	40,000
5,160	13/64	6,000	66,000	28,000	36,000	9,700		10,000	89,000	47,000	40,000
5,200		6,000	66,000	28,000	36,000	9,800		10,000	89,000	47,000	40,000
5,300		6,000	66,000	28,000	36,000	9,900		10,000	89,000	47,000	40,000
5,400		6,000	66,000	28,000	36,000	10,000		10,000	89,000	47,000	40,000
5,500		6,000	66,000	28,000	36,000	10,100		12,000	102,000	55,000	45,000
5,550		6,000	66,000	28,000	36,000	10,200		12,000	102,000	55,000	45,000
5,560	7/32	6,000	66,000	28,000	36,000	10,320	13/32	12,000	102,000	55,000	45,000
5,600		6,000	66,000	28,000	36,000	10,400		12,000	102,000	55,000	45,000
5,650		6,000	66,000	28,000	36,000	10,500		12,000	102,000	55,000	45,000
5,700		6,000	66,000	28,000	36,000	10,700		12,000	102,000	55,000	45,000
5,800		6,000	66,000	28,000	36,000	10,800		12,000	102,000	55,000	45,000
5,900		6,000	66,000	28,000	36,000	10,900		12,000	102,000	55,000	45,000
6,000		6,000	66,000	28,000	36,000	11,000		12,000	102,000	55,000	45,000
6,100		8,000	79,000	34,000	36,000	11,110	7/16	12,000	102,000	55,000	45,000
6,200		8,000	79,000	34,000	36,000	11,500		12,000	102,000	55,000	45,000
6,350	1/4	8,000	79,000	34,000	36,000	11,600		12,000	102,000	55,000	45,000
6,400		8,000	79,000	34,000	36,000	11,800		12,000	102,000	55,000	45,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
11,910	15/32	12,000	102,000	55,000	45,000
12,000		12,000	102,000	55,000	45,000
12,100		14,000	107,000	60,000	45,000
12,200		14,000	107,000	60,000	45,000
12,500		14,000	107,000	60,000	45,000
12,700	1/2	14,000	107,000	60,000	45,000
12,800		14,000	107,000	60,000	45,000
13,000		14,000	107,000	60,000	45,000
13,100	33/64	14,000	107,000	60,000	45,000
13,500		14,000	107,000	60,000	45,000
14,000		14,000	107,000	60,000	45,000
14,200		16,000	115,000	65,000	48,000
14,290	9/16	16,000	115,000	65,000	48,000
14,400		16,000	115,000	65,000	48,000
14,500		16,000	115,000	65,000	48,000
14,700		16,000	115,000	65,000	48,000
14,800		16,000	115,000	65,000	48,000
15,000		16,000	115,000	65,000	48,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
15,100		16,000	115,000	65,000	48,000
15,200		16,000	115,000	65,000	48,000
15,300		16,000	115,000	65,000	48,000
15,500		16,000	115,000	65,000	48,000
15,600		16,000	115,000	65,000	48,000
15,700		16,000	115,000	65,000	48,000
16,000		16,000	115,000	65,000	48,000
16,500		18,000	123,000	73,000	48,000
17,000		18,000	123,000	73,000	48,000
17,500		18,000	123,000	73,000	48,000
18,000		18,000	123,000	73,000	48,000
18,500		20,000	131,000	79,000	50,000
19,000		20,000	131,000	79,000	50,000
19,500		20,000	131,000	79,000	50,000
20,000		20,000	131,000	79,000	50,000



## Rasyo matkap uçları, soğutma kanalsız



**P** • öz bileme  $\geq \varnothing 3,100$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi

**M** ○

**K** •

**N** ○

**S** ○

**H** ○

yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşimli çelikler 1200 N/mm<sup>2</sup>'ye kadar • döküm malzemeler • bronz / pirinç • yüksek alaşimli AISi-Alaşımları

## GÜHRING NAVIGATOR

Kesme verileri sayfası 752

Malzeme

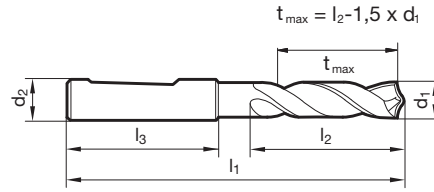
Kom. sert metal

Yüzey

F

sap formu

HE



Ürün no

2472

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,100		6,000	62,000	20,000	36,000	9,250		10,000	89,000	47,000	40,000
3,200		6,000	62,000	20,000	36,000	9,400		10,000	89,000	47,000	40,000
3,500		6,000	62,000	20,000	36,000	9,500		10,000	89,000	47,000	40,000
3,600		6,000	62,000	20,000	36,000	9,800		10,000	89,000	47,000	40,000
3,700		6,000	62,000	20,000	36,000	10,000		10,000	89,000	47,000	40,000
3,900		6,000	66,000	24,000	36,000	10,100		12,000	102,000	55,000	45,000
4,000		6,000	66,000	24,000	36,000	10,200		12,000	102,000	55,000	45,000
4,200		6,000	66,000	24,000	36,000	10,300		12,000	102,000	55,000	45,000
4,500		6,000	66,000	24,000	36,000	10,320	13/32	12,000	102,000	55,000	45,000
4,600		6,000	66,000	24,000	36,000	10,400		12,000	102,000	55,000	45,000
4,900		6,000	66,000	28,000	36,000	10,500		12,000	102,000	55,000	45,000
5,000		6,000	66,000	28,000	36,000	10,600		12,000	102,000	55,000	45,000
5,100		6,000	66,000	28,000	36,000	10,700		12,000	102,000	55,000	45,000
5,200		6,000	66,000	28,000	36,000	10,800		12,000	102,000	55,000	45,000
5,300		6,000	66,000	28,000	36,000	10,900		12,000	102,000	55,000	45,000
5,400		6,000	66,000	28,000	36,000	11,000		12,000	102,000	55,000	45,000
5,500		6,000	66,000	28,000	36,000	11,110	7/16	12,000	102,000	55,000	45,000
5,800		6,000	66,000	28,000	36,000	11,200		12,000	102,000	55,000	45,000
5,900		6,000	66,000	28,000	36,000	11,300		12,000	102,000	55,000	45,000
6,000		6,000	66,000	28,000	36,000	11,500		12,000	102,000	55,000	45,000
6,100		8,000	79,000	34,000	36,000	11,800		12,000	102,000	55,000	45,000
6,500		8,000	79,000	34,000	36,000	11,910	15/32	12,000	102,000	55,000	45,000
6,600		8,000	79,000	34,000	36,000	12,000		12,000	102,000	55,000	45,000
6,800		8,000	79,000	34,000	36,000	12,100		14,000	107,000	60,000	45,000
7,000		8,000	79,000	34,000	36,000	12,200		14,000	107,000	60,000	45,000
7,100		8,000	79,000	41,000	36,000	12,500		14,000	107,000	60,000	45,000
7,200		8,000	79,000	41,000	36,000	12,600		14,000	107,000	60,000	45,000
7,300		8,000	79,000	41,000	36,000	12,700	1/2	14,000	107,000	60,000	45,000
7,500		8,000	79,000	41,000	36,000	13,000		14,000	107,000	60,000	45,000
7,700		8,000	79,000	41,000	36,000	13,300		14,000	107,000	60,000	45,000
7,900		8,000	79,000	41,000	36,000	13,500		14,000	107,000	60,000	45,000
8,000		8,000	79,000	41,000	36,000	14,000		14,000	107,000	60,000	45,000
8,100		10,000	89,000	47,000	40,000	14,200		16,000	115,000	65,000	48,000
8,200		10,000	89,000	47,000	40,000	14,290	9/16	16,000	115,000	65,000	48,000
8,300		10,000	89,000	47,000	40,000	14,500		16,000	115,000	65,000	48,000
8,500		10,000	89,000	47,000	40,000	14,700		16,000	115,000	65,000	48,000
8,600		10,000	89,000	47,000	40,000	15,000		16,000	115,000	65,000	48,000
8,700		10,000	89,000	47,000	40,000	15,200		16,000	115,000	65,000	48,000
8,900		10,000	89,000	47,000	40,000	15,500		16,000	115,000	65,000	48,000
9,000		10,000	89,000	47,000	40,000	15,700		16,000	115,000	65,000	48,000
9,100		10,000	89,000	47,000	40,000	15,800		16,000	115,000	65,000	48,000
9,200		10,000	89,000	47,000	40,000	16,200		18,000	123,000	73,000	48,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
16,300		18,000	123,000	73,000	48,000
16,500		18,000	123,000	73,000	48,000
17,000		18,000	123,000	73,000	48,000
17,500		18,000	123,000	73,000	48,000
18,000		18,000	123,000	73,000	48,000
18,300		20,000	131,000	79,000	50,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
18,500		20,000	131,000	79,000	50,000
19,000		20,000	131,000	79,000	50,000
19,500		20,000	131,000	79,000	50,000
20,000		20,000	131,000	79,000	50,000



## Rasyo matkap uçları, soğutma kanalsız



**P** • öz bileme  $\geq \varnothing 3,000$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi

**M** ○

**K** •

**N** ○

**S** ○

**H** ○

yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşimli çelikler 1200 N/mm<sup>2</sup>'ye kadar • döküm malzemeler • bronz / pirinç • yüksek alaşimli AISi-Alaşımları

## GÜHRING NAVIGATOR

Kesme verileri sayfası 752

Malzeme

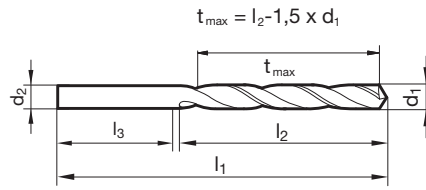
Kom. sert metal

Yüzey

F

sap formu

cyl.



Ürün no

2473

d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		3,000	46,000	16,000	30,000
3,200		3,200	49,000	18,000	31,000
3,300		3,300	49,000	18,000	31,000
3,500		3,500	52,000	20,000	32,000
3,800		3,800	55,000	22,000	33,000
3,900		3,900	55,000	22,000	33,000
4,000		4,000	55,000	22,000	33,000
4,200		4,200	55,000	22,000	33,000
4,500		4,500	58,000	24,000	34,000
4,600		4,600	58,000	24,000	34,000
4,900		4,900	62,000	26,000	36,000
5,000		5,000	62,000	26,000	36,000
5,200		5,200	62,000	26,000	36,000
5,500		5,500	66,000	28,000	38,000
5,800		5,800	66,000	28,000	38,000
6,000		6,000	66,000	28,000	38,000
6,100		6,100	70,000	31,000	39,000
6,200		6,200	70,000	31,000	39,000

d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
6,400		6,400	70,000	31,000	39,000
7,000		7,000	74,000	34,000	40,000
7,400		7,400	74,000	34,000	40,000
8,100		8,100	79,000	37,000	42,000
8,500		8,500	79,000	37,000	42,000
8,800		8,800	84,000	40,000	44,000
9,100		9,100	84,000	40,000	44,000
9,400		9,400	84,000	40,000	44,000
10,000		10,000	89,000	43,000	46,000
10,200		10,200	89,000	43,000	46,000
10,500		10,500	89,000	43,000	46,000
11,500		11,500	95,000	47,000	48,000
11,800		11,800	95,000	47,000	48,000
12,000		12,000	102,000	51,000	51,000
12,500		12,500	102,000	51,000	51,000
14,000		14,000	107,000	54,000	53,000
15,500		15,500	115,000	58,000	57,000



Rasyo matkap uçları, soğutma kanalsız



- P** • öz bileme  $\geq \varnothing 3,000$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi
- M** ○
- K** •
- N** ○ yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşimli çelikler 1200 N/mm<sup>2</sup>'ye kadar • döküm malzemeler • bronz / pirinç • yüksek alaşimli AISi-Alaşımları
- S** ○
- H** ○

Malzeme **Kom. sert metal**

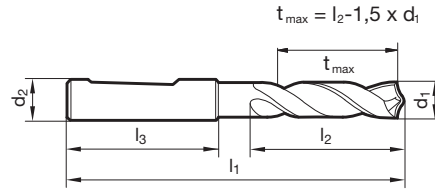
Yüzey **S**

sap formu HE

Rasyo matkap ucu

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 752



Ürün no **1184**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	6,700		8,000	79,000	34,000	36,000
3,100		6,000	62,000	20,000	36,000	6,750	17/64	8,000	79,000	34,000	36,000
3,200		6,000	62,000	20,000	36,000	6,800		8,000	79,000	34,000	36,000
3,300		6,000	62,000	20,000	36,000	7,000		8,000	79,000	34,000	36,000
3,400		6,000	62,000	20,000	36,000	7,140	9/32	8,000	79,000	41,000	36,000
3,500		6,000	62,000	20,000	36,000	7,200		8,000	79,000	41,000	36,000
3,570	9/64	6,000	62,000	20,000	36,000	7,300		8,000	79,000	41,000	36,000
3,600		6,000	62,000	20,000	36,000	7,400		8,000	79,000	41,000	36,000
3,700		6,000	62,000	20,000	36,000	7,500		8,000	79,000	41,000	36,000
3,800		6,000	66,000	24,000	36,000	7,540	19/64	8,000	79,000	41,000	36,000
3,900		6,000	66,000	24,000	36,000	7,600		8,000	79,000	41,000	36,000
3,970	5/32	6,000	66,000	24,000	36,000	7,700		8,000	79,000	41,000	36,000
4,000		6,000	66,000	24,000	36,000	7,900		8,000	79,000	41,000	36,000
4,100		6,000	66,000	24,000	36,000	7,940	5/16	8,000	79,000	41,000	36,000
4,200		6,000	66,000	24,000	36,000	8,000		8,000	79,000	41,000	36,000
4,400		6,000	66,000	24,000	36,000	8,100		10,000	89,000	47,000	40,000
4,500		6,000	66,000	24,000	36,000	8,200		10,000	89,000	47,000	40,000
4,600		6,000	66,000	24,000	36,000	8,300		10,000	89,000	47,000	40,000
4,700		6,000	66,000	24,000	36,000	8,330	21/64	10,000	89,000	47,000	40,000
4,760	3/16	6,000	66,000	28,000	36,000	8,400		10,000	89,000	47,000	40,000
4,800		6,000	66,000	28,000	36,000	8,500		10,000	89,000	47,000	40,000
4,900		6,000	66,000	28,000	36,000	8,700		10,000	89,000	47,000	40,000
5,000		6,000	66,000	28,000	36,000	8,800		10,000	89,000	47,000	40,000
5,100		6,000	66,000	28,000	36,000	8,900		10,000	89,000	47,000	40,000
5,160	13/64	6,000	66,000	28,000	36,000	9,000		10,000	89,000	47,000	40,000
5,200		6,000	66,000	28,000	36,000	9,100		10,000	89,000	47,000	40,000
5,300		6,000	66,000	28,000	36,000	9,200		10,000	89,000	47,000	40,000
5,400		6,000	66,000	28,000	36,000	9,300		10,000	89,000	47,000	40,000
5,500		6,000	66,000	28,000	36,000	9,400		10,000	89,000	47,000	40,000
5,560	7/32	6,000	66,000	28,000	36,000	9,500		10,000	89,000	47,000	40,000
5,600		6,000	66,000	28,000	36,000	9,520	3/8	10,000	89,000	47,000	40,000
5,700		6,000	66,000	28,000	36,000	9,600		10,000	89,000	47,000	40,000
5,900		6,000	66,000	28,000	36,000	9,700		10,000	89,000	47,000	40,000
5,950	15/64	6,000	66,000	28,000	36,000	9,800		10,000	89,000	47,000	40,000
6,000		6,000	66,000	28,000	36,000	9,900		10,000	89,000	47,000	40,000
6,100		8,000	79,000	34,000	36,000	9,920	25/64	10,000	89,000	47,000	40,000
6,200		8,000	79,000	34,000	36,000	10,000		10,000	89,000	47,000	40,000
6,300		8,000	79,000	34,000	36,000	10,100		12,000	102,000	55,000	45,000
6,350	1/4	8,000	79,000	34,000	36,000	10,200		12,000	102,000	55,000	45,000
6,400		8,000	79,000	34,000	36,000	10,300		12,000	102,000	55,000	45,000
6,500		8,000	79,000	34,000	36,000	10,320	13/32	12,000	102,000	55,000	45,000
6,600		8,000	79,000	34,000	36,000	10,500		12,000	102,000	55,000	45,000



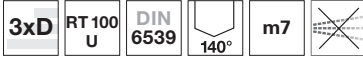
d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
10,600		12,000	102,000	55,000	45,000
10,720	27/64	12,000	102,000	55,000	45,000
10,800		12,000	102,000	55,000	45,000
11,000		12,000	102,000	55,000	45,000
11,100		12,000	102,000	55,000	45,000
11,110	7/16	12,000	102,000	55,000	45,000
11,200		12,000	102,000	55,000	45,000
11,400		12,000	102,000	55,000	45,000
11,500		12,000	102,000	55,000	45,000
11,600		12,000	102,000	55,000	45,000
11,700		12,000	102,000	55,000	45,000
11,800		12,000	102,000	55,000	45,000
11,910	15/32	12,000	102,000	55,000	45,000
12,000		12,000	102,000	55,000	45,000
12,100		14,000	107,000	60,000	45,000
12,200		14,000	107,000	60,000	45,000
12,300	31/64	14,000	107,000	60,000	45,000
12,400		14,000	107,000	60,000	45,000
12,700	1/2	14,000	107,000	60,000	45,000
13,000		14,000	107,000	60,000	45,000
13,100	33/64	14,000	107,000	60,000	45,000
13,200		14,000	107,000	60,000	45,000
13,300		14,000	107,000	60,000	45,000
13,400		14,000	107,000	60,000	45,000
13,500		14,000	107,000	60,000	45,000
13,800		14,000	107,000	60,000	45,000
13,890	35/64	14,000	107,000	60,000	45,000
14,000		14,000	107,000	60,000	45,000
14,200		16,000	115,000	65,000	48,000
14,290	9/16	16,000	115,000	65,000	48,000
14,300		16,000	115,000	65,000	48,000
14,400		16,000	115,000	65,000	48,000
14,700		16,000	115,000	65,000	48,000
14,800		16,000	115,000	65,000	48,000
15,000		16,000	115,000	65,000	48,000
15,100		16,000	115,000	65,000	48,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
15,200		16,000	115,000	65,000	48,000
15,480	39/64	16,000	115,000	65,000	48,000
15,700		16,000	115,000	65,000	48,000
15,800		16,000	115,000	65,000	48,000
15,870	5/8	16,000	115,000	65,000	48,000
15,900		16,000	115,000	65,000	48,000
16,000		16,000	115,000	65,000	48,000
16,100		18,000	123,000	73,000	48,000
16,270	41/64	18,000	123,000	73,000	48,000
16,300		18,000	123,000	73,000	48,000
16,500		18,000	123,000	73,000	48,000
16,800		18,000	123,000	73,000	48,000
17,000		18,000	123,000	73,000	48,000
17,300		18,000	123,000	73,000	48,000
17,460	11/16	18,000	123,000	73,000	48,000
17,500		18,000	123,000	73,000	48,000
17,700		18,000	123,000	73,000	48,000
17,860	45/64	18,000	123,000	73,000	48,000
18,000		18,000	123,000	73,000	48,000
18,100		20,000	131,000	79,000	50,000
18,300		20,000	131,000	79,000	50,000
18,500		20,000	131,000	79,000	50,000
18,650	47/64	20,000	131,000	79,000	50,000
19,000		20,000	131,000	79,000	50,000
19,050	3/4	20,000	131,000	79,000	50,000
19,200		20,000	131,000	79,000	50,000
19,500		20,000	131,000	79,000	50,000
19,600		20,000	131,000	79,000	50,000
20,000		20,000	131,000	79,000	50,000





Rasyo matkap uçları, soğutma kanalsız



- P** • öz bileme  $\geq \varnothing 3,000$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi
- M** ○
- K** •
- N** ○ yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm<sup>2</sup>'ye kadar • döküm malzemeler • bronz / pirinç • yüksek alaşımli AISi-Alaşımları
- S** ○
- H** ○

Malzeme **Kom. sert metal**

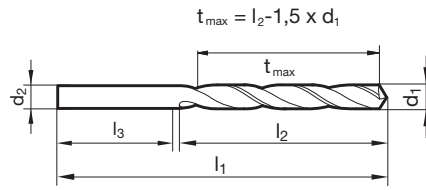
Yüzey **S**

sap formu cyl.

Rasyo matkap ucu

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 752



Ürün no **1242**

d1		d2	l1	l2	l3	d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		3,000	46,000	16,000	30,000	6,350	1/4	6,350	70,000	31,000	39,000
3,100		3,100	49,000	18,000	31,000	6,400		6,400	70,000	31,000	39,000
3,170	1/8	3,170	49,000	18,000	31,000	6,500		6,500	70,000	31,000	39,000
3,200		3,200	49,000	18,000	31,000	6,600		6,600	70,000	31,000	39,000
3,300		3,300	49,000	18,000	31,000	6,700		6,700	70,000	31,000	39,000
3,400		3,400	52,000	20,000	32,000	6,750	17/64	6,750	74,000	34,000	40,000
3,500		3,500	52,000	20,000	32,000	6,800		6,800	74,000	34,000	40,000
3,570	9/64	3,570	52,000	20,000	32,000	6,900		6,900	74,000	34,000	40,000
3,600		3,600	52,000	20,000	32,000	7,000		7,000	74,000	34,000	40,000
3,700		3,700	52,000	20,000	32,000	7,100		7,100	74,000	34,000	40,000
3,800		3,800	55,000	22,000	33,000	7,140	9/32	7,140	74,000	34,000	40,000
3,900		3,900	55,000	22,000	33,000	7,200		7,200	74,000	34,000	40,000
3,970	5/32	3,970	55,000	22,000	33,000	7,300		7,300	74,000	34,000	40,000
4,000		4,000	55,000	22,000	33,000	7,400		7,400	74,000	34,000	40,000
4,100		4,100	55,000	22,000	33,000	7,500		7,500	74,000	34,000	40,000
4,200		4,200	55,000	22,000	33,000	7,540	19/64	7,540	79,000	37,000	42,000
4,300		4,300	58,000	24,000	34,000	7,600		7,600	79,000	37,000	42,000
4,370	11/64	4,370	58,000	24,000	34,000	7,700		7,700	79,000	37,000	42,000
4,400		4,400	58,000	24,000	34,000	7,800		7,800	79,000	37,000	42,000
4,500		4,500	58,000	24,000	34,000	7,900		7,900	79,000	37,000	42,000
4,600		4,600	58,000	24,000	34,000	7,940	5/16	7,940	79,000	37,000	42,000
4,700		4,700	58,000	24,000	34,000	8,000		8,000	79,000	37,000	42,000
4,760	3/16	4,760	62,000	26,000	36,000	8,100		8,100	79,000	37,000	42,000
4,800		4,800	62,000	26,000	36,000	8,200		8,200	79,000	37,000	42,000
4,900		4,900	62,000	26,000	36,000	8,300		8,300	79,000	37,000	42,000
5,000		5,000	62,000	26,000	36,000	8,330	21/64	8,330	79,000	37,000	42,000
5,100		5,100	62,000	26,000	36,000	8,400		8,400	79,000	37,000	42,000
5,160	13/64	5,160	62,000	26,000	36,000	8,500		8,500	79,000	37,000	42,000
5,200		5,200	62,000	26,000	36,000	8,600		8,600	84,000	40,000	44,000
5,300		5,300	62,000	26,000	36,000	8,700		8,700	84,000	40,000	44,000
5,400		5,400	66,000	28,000	38,000	8,730	11/32	8,730	84,000	40,000	44,000
5,500		5,500	66,000	28,000	38,000	8,800		8,800	84,000	40,000	44,000
5,560	7/32	5,560	66,000	28,000	38,000	8,900		8,900	84,000	40,000	44,000
5,600		5,600	66,000	28,000	38,000	9,000		9,000	84,000	40,000	44,000
5,700		5,700	66,000	28,000	38,000	9,100		9,100	84,000	40,000	44,000
5,800		5,800	66,000	28,000	38,000	9,130	23/64	9,130	84,000	40,000	44,000
5,900		5,900	66,000	28,000	38,000	9,200		9,200	84,000	40,000	44,000
5,950	15/64	5,950	66,000	28,000	38,000	9,300		9,300	84,000	40,000	44,000
6,000		6,000	66,000	28,000	38,000	9,400		9,400	84,000	40,000	44,000
6,100		6,100	70,000	31,000	39,000	9,500		9,500	84,000	40,000	44,000
6,200		6,200	70,000	31,000	39,000	9,520	3/8	9,520	89,000	43,000	46,000
6,300		6,300	70,000	31,000	39,000	9,600		9,600	89,000	43,000	46,000

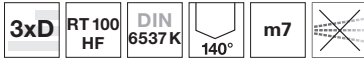


d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,700		9,700	89,000	43,000	46,000
9,800		9,800	89,000	43,000	46,000
9,900		9,900	89,000	43,000	46,000
9,920	25/64	9,920	89,000	43,000	46,000
10,000		10,000	89,000	43,000	46,000
10,100		10,100	89,000	43,000	46,000
10,200		10,200	89,000	43,000	46,000
10,300		10,300	89,000	43,000	46,000
10,320	13/32	10,320	89,000	43,000	46,000
10,400		10,400	89,000	43,000	46,000
10,500		10,500	89,000	43,000	46,000
10,600		10,600	89,000	43,000	46,000
10,700		10,700	95,000	47,000	48,000
10,720	27/64	10,720	95,000	47,000	48,000
10,800		10,800	95,000	47,000	48,000
10,900		10,900	95,000	47,000	48,000
11,000		11,000	95,000	47,000	48,000
11,100		11,100	95,000	47,000	48,000
11,110	7/16	11,110	95,000	47,000	48,000
11,200		11,200	95,000	47,000	48,000
11,300		11,300	95,000	47,000	48,000
11,400		11,400	95,000	47,000	48,000
11,500		11,500	95,000	47,000	48,000
11,510	29/64	11,510	95,000	47,000	48,000

d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
11,600		11,600	95,000	47,000	48,000
11,800		11,800	95,000	47,000	48,000
11,900		11,900	102,000	51,000	51,000
11,910	15/32	11,910	102,000	51,000	51,000
12,000		12,000	102,000	51,000	51,000
12,500		12,500	102,000	51,000	51,000
12,700	1/2	12,700	102,000	51,000	51,000
13,000		13,000	102,000	51,000	51,000
13,500		13,500	107,000	54,000	53,000
14,000		14,000	107,000	54,000	53,000
14,500		14,500	111,000	56,000	55,000
15,000		15,000	111,000	56,000	55,000
15,500		15,500	115,000	58,000	57,000
16,000		16,000	115,000	58,000	57,000



Rasyo matkap uçları, soğutma kanalsız



Malzeme **Kom. sert metal**

Yüzey **Y**

sap formu HA

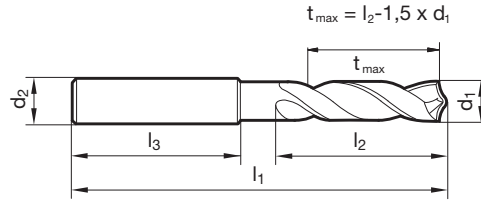
**P** • öz bileme  $\geq \varnothing 3,000$  • koni bileme • ana kesici ağız hafif konkavdır • optimize edilmiş kesme geometrisi

- M**
- K**
- N**
- S** •
- H** ○

1600 N/mm<sup>2</sup> ye kadar alışımlı ve yüksek mukavemetli çelikler • Inconel, Hastelloy, Monel • Titanyum ve Ti alaşımları

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 752



Rasyo matkap ucu

Ürün no **8524**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	6,100		8,000	79,000	34,000	36,000
3,100		6,000	62,000	20,000	36,000	6,200		8,000	79,000	34,000	36,000
3,170	1/8	6,000	62,000	20,000	36,000	6,300		8,000	79,000	34,000	36,000
3,200		6,000	62,000	20,000	36,000	6,350	1/4	8,000	79,000	34,000	36,000
3,250		6,000	62,000	20,000	36,000	6,400		8,000	79,000	34,000	36,000
3,300		6,000	62,000	20,000	36,000	6,500		8,000	79,000	34,000	36,000
3,400		6,000	62,000	20,000	36,000	6,600		8,000	79,000	34,000	36,000
3,500		6,000	62,000	20,000	36,000	6,700		8,000	79,000	34,000	36,000
3,570	9/64	6,000	62,000	20,000	36,000	6,750	17/64	8,000	79,000	34,000	36,000
3,600		6,000	62,000	20,000	36,000	6,800		8,000	79,000	34,000	36,000
3,700		6,000	62,000	20,000	36,000	6,900		8,000	79,000	34,000	36,000
3,800		6,000	66,000	24,000	36,000	7,000		8,000	79,000	34,000	36,000
3,900		6,000	66,000	24,000	36,000	7,100		8,000	79,000	41,000	36,000
3,970	5/32	6,000	66,000	24,000	36,000	7,140	9/32	8,000	79,000	41,000	36,000
4,000		6,000	66,000	24,000	36,000	7,200		8,000	79,000	41,000	36,000
4,100		6,000	66,000	24,000	36,000	7,300		8,000	79,000	41,000	36,000
4,200		6,000	66,000	24,000	36,000	7,400		8,000	79,000	41,000	36,000
4,300		6,000	66,000	24,000	36,000	7,500		8,000	79,000	41,000	36,000
4,370	11/64	6,000	66,000	24,000	36,000	7,540	19/64	8,000	79,000	41,000	36,000
4,400		6,000	66,000	24,000	36,000	7,600		8,000	79,000	41,000	36,000
4,500		6,000	66,000	24,000	36,000	7,700		8,000	79,000	41,000	36,000
4,600		6,000	66,000	24,000	36,000	7,800		8,000	79,000	41,000	36,000
4,650		6,000	66,000	24,000	36,000	7,900		8,000	79,000	41,000	36,000
4,700		6,000	66,000	24,000	36,000	7,940	5/16	8,000	79,000	41,000	36,000
4,760	3/16	6,000	66,000	28,000	36,000	8,000		8,000	79,000	41,000	36,000
4,800		6,000	66,000	28,000	36,000	8,100		10,000	89,000	47,000	40,000
4,900		6,000	66,000	28,000	36,000	8,200		10,000	89,000	47,000	40,000
5,000		6,000	66,000	28,000	36,000	8,300		10,000	89,000	47,000	40,000
5,100		6,000	66,000	28,000	36,000	8,330	21/64	10,000	89,000	47,000	40,000
5,160	13/64	6,000	66,000	28,000	36,000	8,400		10,000	89,000	47,000	40,000
5,200		6,000	66,000	28,000	36,000	8,500		10,000	89,000	47,000	40,000
5,300		6,000	66,000	28,000	36,000	8,600		10,000	89,000	47,000	40,000
5,400		6,000	66,000	28,000	36,000	8,700		10,000	89,000	47,000	40,000
5,500		6,000	66,000	28,000	36,000	8,730	11/32	10,000	89,000	47,000	40,000
5,550		6,000	66,000	28,000	36,000	8,800		10,000	89,000	47,000	40,000
5,560	7/32	6,000	66,000	28,000	36,000	8,900		10,000	89,000	47,000	40,000
5,600		6,000	66,000	28,000	36,000	9,000		10,000	89,000	47,000	40,000
5,700		6,000	66,000	28,000	36,000	9,100		10,000	89,000	47,000	40,000
5,800		6,000	66,000	28,000	36,000	9,130	23/64	10,000	89,000	47,000	40,000
5,900		6,000	66,000	28,000	36,000	9,200		10,000	89,000	47,000	40,000
5,950	15/64	6,000	66,000	28,000	36,000	9,250		10,000	89,000	47,000	40,000
6,000		6,000	66,000	28,000	36,000	9,300		10,000	89,000	47,000	40,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,400		10,000	89,000	47,000	40,000
9,500		10,000	89,000	47,000	40,000
9,520	3/8	10,000	89,000	47,000	40,000
9,600		10,000	89,000	47,000	40,000
9,700		10,000	89,000	47,000	40,000
9,800		10,000	89,000	47,000	40,000
9,900		10,000	89,000	47,000	40,000
9,920	25/64	10,000	89,000	47,000	40,000
10,000		10,000	89,000	47,000	40,000
10,100		12,000	102,000	55,000	45,000
10,200		12,000	102,000	55,000	45,000
10,300		12,000	102,000	55,000	45,000
10,320	13/32	12,000	102,000	55,000	45,000
10,400		12,000	102,000	55,000	45,000
10,500		12,000	102,000	55,000	45,000
10,600		12,000	102,000	55,000	45,000
10,700		12,000	102,000	55,000	45,000
10,800		12,000	102,000	55,000	45,000
10,900		12,000	102,000	55,000	45,000
11,000		12,000	102,000	55,000	45,000
11,100		12,000	102,000	55,000	45,000
11,110	7/16	12,000	102,000	55,000	45,000
11,200		12,000	102,000	55,000	45,000
11,300		12,000	102,000	55,000	45,000
11,400		12,000	102,000	55,000	45,000
11,500		12,000	102,000	55,000	45,000
11,600		12,000	102,000	55,000	45,000
11,700		12,000	102,000	55,000	45,000
11,800		12,000	102,000	55,000	45,000
11,900		12,000	102,000	55,000	45,000
11,910	15/32	12,000	102,000	55,000	45,000
12,000		12,000	102,000	55,000	45,000
12,200		14,000	107,000	60,000	45,000
12,500		14,000	107,000	60,000	45,000
12,700	1/2	14,000	107,000	60,000	45,000
12,800		14,000	107,000	60,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,000		14,000	107,000	60,000	45,000
13,300		14,000	107,000	60,000	45,000
13,500		14,000	107,000	60,000	45,000
13,700		14,000	107,000	60,000	45,000
14,000		14,000	107,000	60,000	45,000
14,200		16,000	115,000	65,000	48,000
14,290	9/16	16,000	115,000	65,000	48,000
14,300		16,000	115,000	65,000	48,000
14,500		16,000	115,000	65,000	48,000
14,700		16,000	115,000	65,000	48,000
15,000		16,000	115,000	65,000	48,000
15,200		16,000	115,000	65,000	48,000
15,300		16,000	115,000	65,000	48,000
15,500		16,000	115,000	65,000	48,000
15,700		16,000	115,000	65,000	48,000
16,000		16,000	115,000	65,000	48,000
16,300		18,000	123,000	73,000	48,000
16,500		18,000	123,000	73,000	48,000
16,900		18,000	123,000	73,000	48,000
17,000		18,000	123,000	73,000	48,000
17,300		18,000	123,000	73,000	48,000
17,500		18,000	123,000	73,000	48,000
18,000		18,000	123,000	73,000	48,000
18,500		20,000	131,000	79,000	50,000
18,900		20,000	131,000	79,000	50,000
19,000		20,000	131,000	79,000	50,000
19,050	3/4	20,000	131,000	79,000	50,000
19,300		20,000	131,000	79,000	50,000
19,500		20,000	131,000	79,000	50,000
20,000		20,000	131,000	79,000	50,000



## Rasyo matkap uçları, soğutma kanalsız



<b>P</b>	○	öz bileme $\geq \varnothing 5,000$ • koni bileme • ana kesici ağız form konkav • optimize edilmiş kesme geometrisi • keskin kesme davranışı
<b>M</b>	○	
<b>K</b>	○	
<b>N</b>	○	yüksek alaşımlı çelikleri • pas/asit/ısıya dayanıklı çelikler • Inconel, Hastelloy, Monel • pirinç, bronzlar • Alüminyum ve Al-Alaşımları • Magnezyum ve Mg-alışımları • Titanyum ve Ti alaşımları • toz metaller
<b>S</b>	●	
<b>H</b>	○	

Malzeme

Kom. sert metal

Yüzey

F

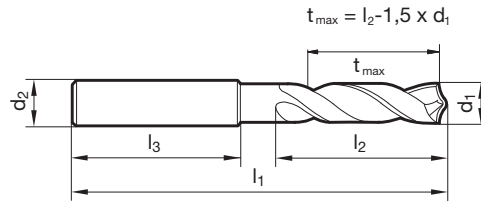
sap formu

HA

Rasyo matkap ucu

## GÜHRING NAVIGATOR

Kesme verileri sayfası 752



Ürün no

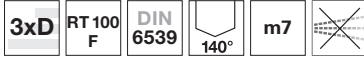
2475

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,700		6,000	62,000	20,000	36,000
4,650		6,000	66,000	24,000	36,000
5,000		6,000	66,000	28,000	36,000
5,500		6,000	66,000	28,000	36,000
6,000		6,000	66,000	28,000	36,000
6,500		8,000	79,000	34,000	36,000
6,800		8,000	79,000	34,000	36,000
7,000		8,000	79,000	34,000	36,000
8,000		8,000	79,000	41,000	36,000
8,500		10,000	89,000	47,000	40,000
9,000		10,000	89,000	47,000	40,000
9,300		10,000	89,000	47,000	40,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
10,000		10,000	89,000	47,000	40,000
10,500		12,000	102,000	55,000	45,000
11,200		12,000	102,000	55,000	45,000
12,000		12,000	102,000	55,000	45,000



## Rasyo matkap uçları, soğutma kanalsız



<b>P</b>	○	öz bileme $\geq \varnothing 3,000$ • koni bileme • ana kesici ağız form konkav • optimize edilmiş kesme geometrisi • keskin kesme davranışı
<b>M</b>	●	
<b>K</b>	○	
<b>N</b>	○	pas/asit/ısıya dayanıklı çelikler • Inconel, Hastelloy, Monel • piring, bronzlar
<b>S</b>	○	Aluminyum ve Al-Alaşımları • Magnezyum ve Mg-alışımları • Titanyum ve Ti alaşımları • toz metaller • yüksek alaşımlı çelikleri
<b>H</b>	○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 752

Malzeme

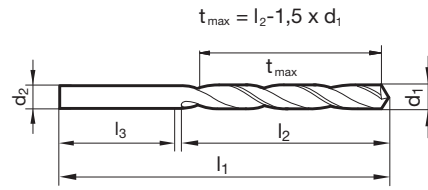
Kom. sert metal

Yüzey

S

sap formu

cyl.



Ürün no

1702

d1		d2	l1	l2	l3	d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		3,000	46,000	16,000	30,000	6,400		6,400	70,000	31,000	39,000
3,100		3,100	49,000	18,000	31,000	6,500		6,500	70,000	31,000	39,000
3,170	1/8	3,170	49,000	18,000	31,000	6,600		6,600	70,000	31,000	39,000
3,200		3,200	49,000	18,000	31,000	6,700		6,700	70,000	31,000	39,000
3,300		3,300	49,000	18,000	31,000	6,750	17/64	6,750	74,000	34,000	40,000
3,400		3,400	52,000	20,000	32,000	6,800		6,800	74,000	34,000	40,000
3,500		3,500	52,000	20,000	32,000	6,900		6,900	74,000	34,000	40,000
3,570	9/64	3,570	52,000	20,000	32,000	7,000		7,000	74,000	34,000	40,000
3,600		3,600	52,000	20,000	32,000	7,100		7,100	74,000	34,000	40,000
3,700		3,700	52,000	20,000	32,000	7,140	9/32	7,140	74,000	34,000	40,000
3,800		3,800	55,000	22,000	33,000	7,200		7,200	74,000	34,000	40,000
3,900		3,900	55,000	22,000	33,000	7,300		7,300	74,000	34,000	40,000
3,970	5/32	3,970	55,000	22,000	33,000	7,400		7,400	74,000	34,000	40,000
4,000		4,000	55,000	22,000	33,000	7,540	19/64	7,540	79,000	37,000	42,000
4,100		4,100	55,000	22,000	33,000	7,600		7,600	79,000	37,000	42,000
4,200		4,200	55,000	22,000	33,000	7,700		7,700	79,000	37,000	42,000
4,300		4,300	58,000	24,000	34,000	7,800		7,800	79,000	37,000	42,000
4,370	11/64	4,370	58,000	24,000	34,000	7,900		7,900	79,000	37,000	42,000
4,400		4,400	58,000	24,000	34,000	7,940	5/16	7,940	79,000	37,000	42,000
4,500		4,500	58,000	24,000	34,000	8,000		8,000	79,000	37,000	42,000
4,600		4,600	58,000	24,000	34,000	8,100		8,100	79,000	37,000	42,000
4,700		4,700	58,000	24,000	34,000	8,200		8,200	79,000	37,000	42,000
4,760	3/16	4,760	62,000	26,000	36,000	8,300		8,300	79,000	37,000	42,000
4,800		4,800	62,000	26,000	36,000	8,330	21/64	8,330	79,000	37,000	42,000
4,900		4,900	62,000	26,000	36,000	8,400		8,400	79,000	37,000	42,000
5,000		5,000	62,000	26,000	36,000	8,500		8,500	79,000	37,000	42,000
5,100		5,100	62,000	26,000	36,000	8,600		8,600	84,000	40,000	44,000
5,160	13/64	5,160	62,000	26,000	36,000	8,700		8,700	84,000	40,000	44,000
5,200		5,200	62,000	26,000	36,000	8,730	11/32	8,730	84,000	40,000	44,000
5,300		5,300	62,000	26,000	36,000	8,800		8,800	84,000	40,000	44,000
5,400		5,400	66,000	28,000	38,000	8,900		8,900	84,000	40,000	44,000
5,500		5,500	66,000	28,000	38,000	9,000		9,000	84,000	40,000	44,000
5,560	7/32	5,560	66,000	28,000	38,000	9,100		9,100	84,000	40,000	44,000
5,600		5,600	66,000	28,000	38,000	9,130	23/64	9,130	84,000	40,000	44,000
5,700		5,700	66,000	28,000	38,000	9,400		9,400	84,000	40,000	44,000
5,800		5,800	66,000	28,000	38,000	9,500		9,500	84,000	40,000	44,000
5,950	15/64	5,950	66,000	28,000	38,000	9,520	3/8	9,520	89,000	43,000	46,000
6,000		6,000	66,000	28,000	38,000	9,600		9,600	89,000	43,000	46,000
6,100		6,100	70,000	31,000	39,000	9,700		9,700	89,000	43,000	46,000
6,200		6,200	70,000	31,000	39,000	9,800		9,800	89,000	43,000	46,000
6,300		6,300	70,000	31,000	39,000	9,900		9,900	89,000	43,000	46,000
6,350	1/4	6,350	70,000	31,000	39,000	9,920	25/64	9,920	89,000	43,000	46,000



d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
10,000		10,000	89,000	43,000	46,000
10,200		10,200	89,000	43,000	46,000
10,300		10,300	89,000	43,000	46,000
10,320	13/32	10,320	89,000	43,000	46,000
10,720	27/64	10,720	95,000	47,000	48,000
11,000		11,000	95,000	47,000	48,000
11,110	7/16	11,110	95,000	47,000	48,000
11,300		11,300	95,000	47,000	48,000
11,500		11,500	95,000	47,000	48,000
11,510	29/64	11,510	95,000	47,000	48,000
11,910	15/32	11,910	102,000	51,000	51,000
12,000		12,000	102,000	51,000	51,000

d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
12,300	31/64	12,300	102,000	51,000	51,000
12,500		12,500	102,000	51,000	51,000
12,700	1/2	12,700	102,000	51,000	51,000
13,000		13,000	102,000	51,000	51,000
13,500		13,500	107,000	54,000	53,000
14,000		14,000	107,000	54,000	53,000



## Rasyo matkap uçları, soğutma kanalsız



**P** • öz bileme  $\geq \varnothing 3,000$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi

**M** ○

**K** •

**N** ○

**S** ○

**H** ○

yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşimli çelikler 1200 N/mm<sup>2</sup>'ye kadar • döküm malzemeler • bronz / pirinç • yüksek alaşimli AISi-Alaşımları

## GÜHRING NAVIGATOR

Kesme verileri sayfası 756

Malzeme

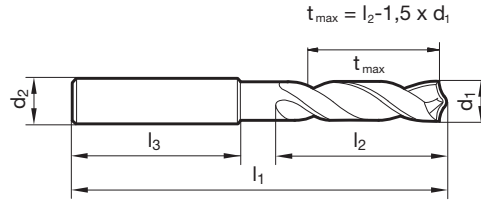
Kom. sert metal

Yüzey

F

sap formu

HA



Ürün no

2996

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	7,000		8,000	91,000	53,000	36,000
3,100		6,000	66,000	28,000	36,000	7,100		8,000	91,000	53,000	36,000
3,200		6,000	66,000	28,000	36,000	7,140	9/32	8,000	91,000	53,000	36,000
3,250		6,000	66,000	28,000	36,000	7,200		8,000	91,000	53,000	36,000
3,300		6,000	66,000	28,000	36,000	7,300		8,000	91,000	53,000	36,000
3,400		6,000	66,000	28,000	36,000	7,500		8,000	91,000	53,000	36,000
3,500		6,000	66,000	28,000	36,000	7,600		8,000	91,000	53,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	7,700		8,000	91,000	53,000	36,000
3,600		6,000	66,000	28,000	36,000	7,800		8,000	91,000	53,000	36,000
3,700		6,000	66,000	28,000	36,000	7,900		8,000	91,000	53,000	36,000
3,800		6,000	74,000	36,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
3,900		6,000	74,000	36,000	36,000	8,000		8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	8,100		10,000	103,000	61,000	40,000
4,100		6,000	74,000	36,000	36,000	8,200		10,000	103,000	61,000	40,000
4,200		6,000	74,000	36,000	36,000	8,400		10,000	103,000	61,000	40,000
4,300		6,000	74,000	36,000	36,000	8,500		10,000	103,000	61,000	40,000
4,400		6,000	74,000	36,000	36,000	8,700		10,000	103,000	61,000	40,000
4,500		6,000	74,000	36,000	36,000	8,800		10,000	103,000	61,000	40,000
4,650		6,000	74,000	36,000	36,000	9,000		10,000	103,000	61,000	40,000
4,700		6,000	74,000	36,000	36,000	9,200		10,000	103,000	61,000	40,000
4,800		6,000	82,000	44,000	36,000	9,250		10,000	103,000	61,000	40,000
4,900		6,000	82,000	44,000	36,000	9,500		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	9,520	3/8	10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	9,700		10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	9,800		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	10,000		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	10,100		12,000	118,000	71,000	45,000
5,500		6,000	82,000	44,000	36,000	10,200		12,000	118,000	71,000	45,000
5,600		6,000	82,000	44,000	36,000	10,300		12,000	118,000	71,000	45,000
5,800		6,000	82,000	44,000	36,000	10,320	13/32	12,000	118,000	71,000	45,000
5,900		6,000	82,000	44,000	36,000	10,500		12,000	118,000	71,000	45,000
6,000		6,000	82,000	44,000	36,000	10,700		12,000	118,000	71,000	45,000
6,100		8,000	91,000	53,000	36,000	10,800		12,000	118,000	71,000	45,000
6,200		8,000	91,000	53,000	36,000	10,900		12,000	118,000	71,000	45,000
6,300		8,000	91,000	53,000	36,000	11,000		12,000	118,000	71,000	45,000
6,350	1/4	8,000	91,000	53,000	36,000	11,100		12,000	118,000	71,000	45,000
6,400		8,000	91,000	53,000	36,000	11,110	7/16	12,000	118,000	71,000	45,000
6,500		8,000	91,000	53,000	36,000	11,500		12,000	118,000	71,000	45,000
6,600		8,000	91,000	53,000	36,000	11,600		12,000	118,000	71,000	45,000
6,700		8,000	91,000	53,000	36,000	11,700		12,000	118,000	71,000	45,000
6,800		8,000	91,000	53,000	36,000	11,800		12,000	118,000	71,000	45,000
6,900		8,000	91,000	53,000	36,000	11,910	15/32	12,000	118,000	71,000	45,000





d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
12,000		12,000	118,000	71,000	45,000
12,100		14,000	124,000	77,000	45,000
12,200		14,000	124,000	77,000	45,000
12,400		14,000	124,000	77,000	45,000
12,500		14,000	124,000	77,000	45,000
12,600		14,000	124,000	77,000	45,000
12,700	1/2	14,000	124,000	77,000	45,000
12,800		14,000	124,000	77,000	45,000
13,100	33/64	14,000	124,000	77,000	45,000
13,300		14,000	124,000	77,000	45,000
13,500		14,000	124,000	77,000	45,000
13,700		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,200		16,000	133,000	83,000	48,000
14,290	9/16	16,000	133,000	83,000	48,000
14,300		16,000	133,000	83,000	48,000
14,400		16,000	133,000	83,000	48,000
14,500		16,000	133,000	83,000	48,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
14,700		16,000	133,000	83,000	48,000
14,800		16,000	133,000	83,000	48,000
15,100		16,000	133,000	83,000	48,000
15,200		16,000	133,000	83,000	48,000
15,300		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
15,600		16,000	133,000	83,000	48,000
15,700		16,000	133,000	83,000	48,000
15,800		16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,500		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,500		20,000	153,000	101,000	50,000
19,000		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



Rasyo matkap uçları, soğutma kanalsız



**P** • öz bileme  $\geq \varnothing 3,100$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi

**M** ○

**K** •

**N** ○ yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşimli çelikler 1200 N/mm<sup>2</sup>'ye kadar • döküm malzemeler • bronz / pirinç • yüksek alaşimli AISi-Alaşımları

**S** ○

**H** ○

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 756

Malzeme

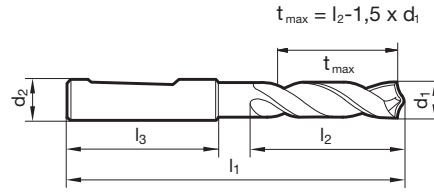
**Kom. sert metal**

Yüzey

**F**

sap formu

HE



Ürün no

**2719**

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,100		6,000	66,000	28,000	36,000
3,200		6,000	66,000	28,000	36,000
3,500		6,000	66,000	28,000	36,000
3,600		6,000	66,000	28,000	36,000
3,700		6,000	66,000	28,000	36,000
3,800		6,000	74,000	36,000	36,000
3,900		6,000	74,000	36,000	36,000
4,000		6,000	74,000	36,000	36,000
4,100		6,000	74,000	36,000	36,000
4,200		6,000	74,000	36,000	36,000
4,400		6,000	74,000	36,000	36,000
4,500		6,000	74,000	36,000	36,000
4,600		6,000	74,000	36,000	36,000
4,700		6,000	74,000	36,000	36,000
4,800		6,000	82,000	44,000	36,000
4,900		6,000	82,000	44,000	36,000
5,000		6,000	82,000	44,000	36,000
5,160	13/64	6,000	82,000	44,000	36,000
5,200		6,000	82,000	44,000	36,000
5,300		6,000	82,000	44,000	36,000
5,400		6,000	82,000	44,000	36,000
5,500		6,000	82,000	44,000	36,000
5,550		6,000	82,000	44,000	36,000
5,600		6,000	82,000	44,000	36,000
5,700		6,000	82,000	44,000	36,000
5,900		6,000	82,000	44,000	36,000
6,000		6,000	82,000	44,000	36,000
6,100		8,000	91,000	53,000	36,000
6,200		8,000	91,000	53,000	36,000
6,300		8,000	91,000	53,000	36,000
6,400		8,000	91,000	53,000	36,000
6,500		8,000	91,000	53,000	36,000
6,600		8,000	91,000	53,000	36,000
6,700		8,000	91,000	53,000	36,000
6,800		8,000	91,000	53,000	36,000
7,000		8,000	91,000	53,000	36,000
7,100		8,000	91,000	53,000	36,000
7,200		8,000	91,000	53,000	36,000
7,300		8,000	91,000	53,000	36,000
7,500		8,000	91,000	53,000	36,000
7,600		8,000	91,000	53,000	36,000
7,700		8,000	91,000	53,000	36,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
7,800		8,000	91,000	53,000	36,000
7,900		8,000	91,000	53,000	36,000
8,000		8,000	91,000	53,000	36,000
8,100		10,000	103,000	61,000	40,000
8,200		10,000	103,000	61,000	40,000
8,300		10,000	103,000	61,000	40,000
8,400		10,000	103,000	61,000	40,000
8,500		10,000	103,000	61,000	40,000
8,600		10,000	103,000	61,000	40,000
8,700		10,000	103,000	61,000	40,000
8,900		10,000	103,000	61,000	40,000
9,000		10,000	103,000	61,000	40,000
9,100		10,000	103,000	61,000	40,000
9,200		10,000	103,000	61,000	40,000
9,250		10,000	103,000	61,000	40,000
9,400		10,000	103,000	61,000	40,000
9,500		10,000	103,000	61,000	40,000
9,600		10,000	103,000	61,000	40,000
9,700		10,000	103,000	61,000	40,000
9,900		10,000	103,000	61,000	40,000
10,100		12,000	118,000	71,000	45,000
10,320	13/32	12,000	118,000	71,000	45,000
10,400		12,000	118,000	71,000	45,000
10,500		12,000	118,000	71,000	45,000
10,600		12,000	118,000	71,000	45,000
10,700		12,000	118,000	71,000	45,000
10,800		12,000	118,000	71,000	45,000
10,900		12,000	118,000	71,000	45,000
11,100		12,000	118,000	71,000	45,000
11,110	7/16	12,000	118,000	71,000	45,000
11,200		12,000	118,000	71,000	45,000
11,300		12,000	118,000	71,000	45,000
11,400		12,000	118,000	71,000	45,000
11,500		12,000	118,000	71,000	45,000
11,600		12,000	118,000	71,000	45,000
11,700		12,000	118,000	71,000	45,000
11,800		12,000	118,000	71,000	45,000
11,900		12,000	118,000	71,000	45,000
11,910	15/32	12,000	118,000	71,000	45,000
12,200		14,000	124,000	77,000	45,000
12,500		14,000	124,000	77,000	45,000
12,700	1/2	14,000	124,000	77,000	45,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,500		14,000	124,000	77,000	45,000
13,700		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,200		16,000	133,000	83,000	48,000
14,290	9/16	16,000	133,000	83,000	48,000
14,500		16,000	133,000	83,000	48,000
14,700		16,000	133,000	83,000	48,000
15,200		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
15,700		16,000	133,000	83,000	48,000
16,500		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,500		20,000	153,000	101,000	50,000
19,000		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



## Rasyo matkap uçları, soğutma kanalsız



**P** • öz bileme  $\geq \varnothing 5,000$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi

**M** ○

**K** •

**N** ○

**S** ○

**H** ○

yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşimli çelikler 1200 N/mm<sup>2</sup>'ye kadar • döküm malzemeler • bronz / pirinç • yüksek alaşimli AISi-Alaşımları

## GÜHRING NAVIGATOR

Kesme verileri sayfası 756

Malzeme

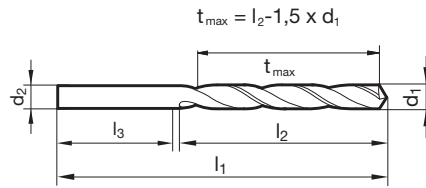
Kom. sert metal

Yüzey

F

sap formu

cyl.



Ürün no

2474

d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
5,000		5,000	73,000	34,000	39,000
5,400		5,400	76,000	38,000	38,000
5,500		5,500	76,000	38,000	38,000
5,600		5,600	81,000	41,000	40,000
5,700		5,700	81,000	41,000	40,000
6,200		6,200	81,000	41,000	40,000
6,400		6,400	81,000	41,000	40,000
6,500		6,500	81,000	41,000	40,000
6,600		6,600	83,000	43,000	40,000
6,800		6,800	83,000	43,000	40,000
7,100		7,100	87,000	45,000	42,000
7,200		7,200	87,000	45,000	42,000
7,400		7,400	87,000	45,000	42,000
7,700		7,700	90,000	48,000	42,000
8,000		8,000	90,000	48,000	42,000
8,100		8,100	96,000	53,000	43,000
8,500		8,500	96,000	53,000	43,000
8,700		8,700	98,000	55,000	43,000

d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,000		9,000	98,000	55,000	43,000
9,200		9,200	102,000	58,000	44,000
9,300		9,300	102,000	58,000	44,000
9,700		9,700	105,000	60,000	45,000
9,800		9,800	105,000	60,000	45,000
10,200		10,200	112,000	66,000	46,000
10,300		10,300	112,000	66,000	46,000
10,400		10,400	112,000	66,000	46,000
10,500		10,500	112,000	66,000	46,000
10,600		10,600	114,000	68,000	46,000
10,800		10,800	114,000	68,000	46,000
10,900		10,900	114,000	68,000	46,000
11,000		11,000	114,000	68,000	46,000
11,600		11,600	121,000	73,000	48,000
11,800		11,800	121,000	73,000	48,000
13,000		13,000	137,000	78,000	59,000
14,000		14,000	147,000	86,000	61,000



## Rasyo matkap uçları, soğutma kanalsız



**P** • öz bileme  $\geq \varnothing 3,300$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi

**M** ○

**K** •

**N** ○

**S** ○

**H** ○

yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm<sup>2</sup>'ye kadar • döküm malzemeler • bronz / piriç • yüksek alaşımli AISi-Alaşımları

## GÜHRING NAVIGATOR

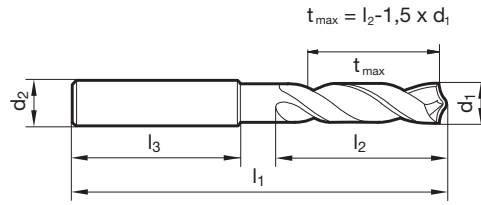
Kesme verileri sayfası 756

Malzeme **Kom. sert metal**

Yüzey **S**

sap formu HA

Rasyo matkap ucu



Ürün no

2717

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,300		6,000	66,000	28,000	36,000
3,500		6,000	66,000	28,000	36,000
5,000		6,000	82,000	44,000	36,000
5,500		6,000	82,000	44,000	36,000
6,800		8,000	91,000	53,000	36,000
7,500		8,000	91,000	53,000	36,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
8,000		8,000	91,000	53,000	36,000
8,500		10,000	103,000	61,000	40,000
10,200		12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,200		12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000



Rasyo matkap uçları, soğutma kanalsız



**P** • öz bileme  $\geq \varnothing 5,000$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi

**M** ○

**K** •

**N** ○ yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm<sup>2</sup>'ye kadar • döküm malzemeler • bronz / pirinç • yüksek alaşımli AISi-Alaşımları

**S** ○

**H** ○

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 756

Malzeme

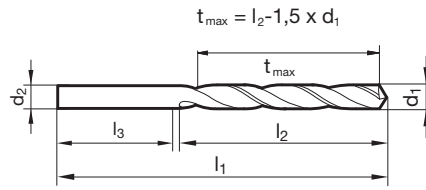
Kom. sert metal

Yüzey

Ⓢ

sap formu

cyl.



Ürün no

1243

d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
5,000		5,000	73,000	34,000	39,000
5,100		5,100	76,000	38,000	38,000
5,160	13/64	5,160	76,000	38,000	38,000
5,200		5,200	76,000	38,000	38,000
5,300		5,300	76,000	38,000	38,000
5,400		5,400	76,000	38,000	38,000
5,500		5,500	76,000	38,000	38,000
5,560	7/32	5,560	81,000	41,000	40,000
5,600		5,600	81,000	41,000	40,000
5,700		5,700	81,000	41,000	40,000
5,800		5,800	81,000	41,000	40,000
5,900		5,900	81,000	41,000	40,000
5,950	15/64	5,950	81,000	41,000	40,000
6,000		6,000	81,000	41,000	40,000
6,100		6,100	81,000	41,000	40,000
6,200		6,200	81,000	41,000	40,000
6,300		6,300	81,000	41,000	40,000
6,350	1/4	6,350	81,000	41,000	40,000
6,400		6,400	81,000	41,000	40,000
6,500		6,500	81,000	41,000	40,000
6,600		6,600	83,000	43,000	40,000
6,700		6,700	83,000	43,000	40,000
6,750	17/64	6,750	83,000	43,000	40,000
6,800		6,800	83,000	43,000	40,000
6,900		6,900	83,000	43,000	40,000
7,000		7,000	83,000	43,000	40,000
7,100		7,100	87,000	45,000	42,000
7,140	9/32	7,140	87,000	45,000	42,000
7,200		7,200	87,000	45,000	42,000
7,300		7,300	87,000	45,000	42,000
7,400		7,400	87,000	45,000	42,000
7,500		7,500	87,000	45,000	42,000
7,540	19/64	7,540	90,000	48,000	42,000
7,600		7,600	90,000	48,000	42,000
7,700		7,700	90,000	48,000	42,000
7,800		7,800	90,000	48,000	42,000
7,900		7,900	90,000	48,000	42,000
7,940	5/16	7,940	90,000	48,000	42,000
8,000		8,000	90,000	48,000	42,000
8,100		8,100	96,000	53,000	43,000
8,200		8,200	96,000	53,000	43,000
8,300		8,300	96,000	53,000	43,000

d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
8,330	21/64	8,330	96,000	53,000	43,000
8,400		8,400	96,000	53,000	43,000
8,500		8,500	96,000	53,000	43,000
8,600		8,600	98,000	55,000	43,000
8,700		8,700	98,000	55,000	43,000
8,730	11/32	8,730	98,000	55,000	43,000
8,800		8,800	98,000	55,000	43,000
8,900		8,900	98,000	55,000	43,000
9,000		9,000	98,000	55,000	43,000
9,100		9,100	102,000	58,000	44,000
9,130	23/64	9,130	102,000	58,000	44,000
9,200		9,200	102,000	58,000	44,000
9,300		9,300	102,000	58,000	44,000
9,500		9,500	102,000	58,000	44,000
9,520	3/8	9,520	105,000	60,000	45,000
9,600		9,600	105,000	60,000	45,000
9,700		9,700	105,000	60,000	45,000
9,800		9,800	105,000	60,000	45,000
9,900		9,900	105,000	60,000	45,000
9,920	25/64	9,920	105,000	60,000	45,000
10,000		10,000	105,000	60,000	45,000
10,100		10,100	112,000	66,000	46,000
10,200		10,200	112,000	66,000	46,000
10,300		10,300	112,000	66,000	46,000
10,320	13/32	10,320	112,000	66,000	46,000
10,400		10,400	112,000	66,000	46,000
10,500		10,500	112,000	66,000	46,000
10,600		10,600	114,000	68,000	46,000
10,700		10,700	114,000	68,000	46,000
10,720	27/64	10,720	114,000	68,000	46,000
10,800		10,800	114,000	68,000	46,000
10,900		10,900	114,000	68,000	46,000
11,000		11,000	114,000	68,000	46,000
11,100		11,100	118,000	71,000	47,000
11,110	7/16	11,110	118,000	71,000	47,000
11,400		11,400	118,000	71,000	47,000
11,500		11,500	118,000	71,000	47,000
11,600		11,600	121,000	73,000	48,000
11,700		11,700	121,000	73,000	48,000
11,800		11,800	121,000	73,000	48,000
11,900		11,900	121,000	73,000	48,000
11,910	15/32	11,910	121,000	73,000	48,000



d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
12,000		12,000	121,000	73,000	48,000
12,500		12,500	135,000	76,000	59,000
12,700	1/2	12,700	137,000	78,000	59,000
13,000		13,000	137,000	78,000	59,000
13,500		13,500	144,000	84,000	60,000
14,000		14,000	147,000	86,000	61,000

d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
14,500		14,500	151,000	89,000	62,000
15,000		15,000	153,000	91,000	62,000
15,500		15,500	157,000	94,000	63,000
16,000		16,000	160,000	96,000	64,000



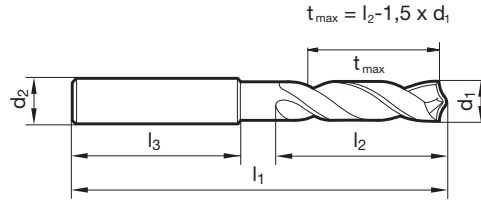
## Rasyo matkap uçları, soğutma kanalsız



<b>P</b>	○	öz bileme $\geq \varnothing 3,000$ • koni bileme • ana kesici ağız form konkav • optimize edilmiş kesme geometrisi • keskin kesme davranışı
<b>M</b>	○	
<b>K</b>	○	
<b>N</b>	○	yüksek alaşımlı çelikleri • pas/asit/ısıya dayanıklı çelikler • Inconel, Hastelloy, Monel • pirinç, bronzlar • Alüminyum ve Al-Alaşımları • Magnezyum ve Mg-alışımları • Titanyum ve Ti alaşımları • toz metaller
<b>S</b>	●	
<b>H</b>	○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 756



Ürün no

2712

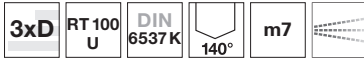
d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000
3,300		6,000	66,000	28,000	36,000
3,500		6,000	66,000	28,000	36,000
4,000		6,000	74,000	36,000	36,000
4,500		6,000	74,000	36,000	36,000
5,000		6,000	82,000	44,000	36,000
6,800		8,000	91,000	53,000	36,000
7,000		8,000	91,000	53,000	36,000
7,500		8,000	91,000	53,000	36,000
8,000		8,000	91,000	53,000	36,000
10,000		10,000	103,000	61,000	40,000
10,200		12,000	118,000	71,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
10,500		12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
15,000		16,000	133,000	83,000	48,000





İçten soğutma kanallı rasyo matkap



- P** • öz bileme  $\geq \varnothing 3,000$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi
- M** ○
- K** •
- N** ○ yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşimli çelikler 1200 N/mm<sup>2</sup>'ye kadar • döküm malzemeler • bronz / pirinç • yüksek alaşimli AISi-Alaşımları
- S** ○
- H** ○

Malzeme **Kom. sert metal**

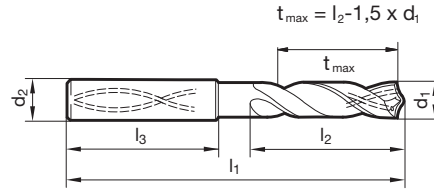
Yüzey **F**

sap formu HA

Rasyo matkap ucu

**GÜHRING NAVIGATOR**

Kesme verileri sayfası 750



Ürün no **2477**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	5,700		6,000	66,000	28,000	36,000
3,100		6,000	62,000	20,000	36,000	5,750		6,000	66,000	28,000	36,000
3,170	1/8	6,000	62,000	20,000	36,000	5,800		6,000	66,000	28,000	36,000
3,200		6,000	62,000	20,000	36,000	5,900		6,000	66,000	28,000	36,000
3,250		6,000	62,000	20,000	36,000	5,950	15/64	6,000	66,000	28,000	36,000
3,300		6,000	62,000	20,000	36,000	6,000		6,000	66,000	28,000	36,000
3,400		6,000	62,000	20,000	36,000	6,100		8,000	79,000	34,000	36,000
3,500		6,000	62,000	20,000	36,000	6,200		8,000	79,000	34,000	36,000
3,570	9/64	6,000	62,000	20,000	36,000	6,300		8,000	79,000	34,000	36,000
3,600		6,000	62,000	20,000	36,000	6,350	1/4	8,000	79,000	34,000	36,000
3,700		6,000	62,000	20,000	36,000	6,400		8,000	79,000	34,000	36,000
3,800		6,000	66,000	24,000	36,000	6,500		8,000	79,000	34,000	36,000
3,900		6,000	66,000	24,000	36,000	6,530		8,000	79,000	34,000	36,000
3,970	5/32	6,000	66,000	24,000	36,000	6,600		8,000	79,000	34,000	36,000
4,000		6,000	66,000	24,000	36,000	6,700		8,000	79,000	34,000	36,000
4,040		6,000	66,000	24,000	36,000	6,750	17/64	8,000	79,000	34,000	36,000
4,100		6,000	66,000	24,000	36,000	6,800		8,000	79,000	34,000	36,000
4,200		6,000	66,000	24,000	36,000	6,900		8,000	79,000	34,000	36,000
4,300		6,000	66,000	24,000	36,000	7,000		8,000	79,000	34,000	36,000
4,370	11/64	6,000	66,000	24,000	36,000	7,100		8,000	79,000	41,000	36,000
4,400		6,000	66,000	24,000	36,000	7,140	9/32	8,000	79,000	41,000	36,000
4,450		6,000	66,000	24,000	36,000	7,200		8,000	79,000	41,000	36,000
4,500		6,000	66,000	24,000	36,000	7,300		8,000	79,000	41,000	36,000
4,600		6,000	66,000	24,000	36,000	7,400		8,000	79,000	41,000	36,000
4,650		6,000	66,000	24,000	36,000	7,450		8,000	79,000	41,000	36,000
4,700		6,000	66,000	24,000	36,000	7,500		8,000	79,000	41,000	36,000
4,760	3/16	6,000	66,000	28,000	36,000	7,540	19/64	8,000	79,000	41,000	36,000
4,800		6,000	66,000	28,000	36,000	7,550		8,000	79,000	41,000	36,000
4,900		6,000	66,000	28,000	36,000	7,600		8,000	79,000	41,000	36,000
5,000		6,000	66,000	28,000	36,000	7,650		8,000	79,000	41,000	36,000
5,100		6,000	66,000	28,000	36,000	7,700		8,000	79,000	41,000	36,000
5,110		6,000	66,000	28,000	36,000	7,800		8,000	79,000	41,000	36,000
5,160	13/64	6,000	66,000	28,000	36,000	7,900		8,000	79,000	41,000	36,000
5,200		6,000	66,000	28,000	36,000	7,940	5/16	8,000	79,000	41,000	36,000
5,300		6,000	66,000	28,000	36,000	8,000		8,000	79,000	41,000	36,000
5,400		6,000	66,000	28,000	36,000	8,100		10,000	89,000	47,000	40,000
5,410		6,000	66,000	28,000	36,000	8,200		10,000	89,000	47,000	40,000
5,500		6,000	66,000	28,000	36,000	8,300		10,000	89,000	47,000	40,000
5,550		6,000	66,000	28,000	36,000	8,330	21/64	10,000	89,000	47,000	40,000
5,560	7/32	6,000	66,000	28,000	36,000	8,400		10,000	89,000	47,000	40,000
5,600		6,000	66,000	28,000	36,000	8,500		10,000	89,000	47,000	40,000
5,650		6,000	66,000	28,000	36,000	8,550		10,000	89,000	47,000	40,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
8,600		10,000	89,000	47,000	40,000
8,700		10,000	89,000	47,000	40,000
8,730	11/32	10,000	89,000	47,000	40,000
8,800		10,000	89,000	47,000	40,000
8,900		10,000	89,000	47,000	40,000
9,000		10,000	89,000	47,000	40,000
9,050		10,000	89,000	47,000	40,000
9,100		10,000	89,000	47,000	40,000
9,130	23/64	10,000	89,000	47,000	40,000
9,200		10,000	89,000	47,000	40,000
9,250		10,000	89,000	47,000	40,000
9,300		10,000	89,000	47,000	40,000
9,340		10,000	89,000	47,000	40,000
9,400		10,000	89,000	47,000	40,000
9,500		10,000	89,000	47,000	40,000
9,520	3/8	10,000	89,000	47,000	40,000
9,550		10,000	89,000	47,000	40,000
9,600		10,000	89,000	47,000	40,000
9,700		10,000	89,000	47,000	40,000
9,800		10,000	89,000	47,000	40,000
9,900		10,000	89,000	47,000	40,000
9,920	25/64	10,000	89,000	47,000	40,000
10,000		10,000	89,000	15,000	40,000
10,100		12,000	102,000	55,000	45,000
10,200		12,000	102,000	55,000	45,000
10,300		12,000	102,000	55,000	45,000
10,320	13/32	12,000	102,000	55,000	45,000
10,400		12,000	102,000	55,000	45,000
10,500		12,000	102,000	55,000	45,000
10,600		12,000	102,000	55,000	45,000
10,700		12,000	102,000	55,000	45,000
10,720	27/64	12,000	102,000	55,000	45,000
10,800		12,000	102,000	55,000	45,000
10,900		12,000	102,000	55,000	45,000
11,000		12,000	102,000	55,000	45,000
11,100		12,000	102,000	55,000	45,000
11,110	7/16	12,000	102,000	55,000	45,000
11,200		12,000	102,000	55,000	45,000
11,300		12,000	102,000	55,000	45,000
11,400		12,000	102,000	55,000	45,000
11,500		12,000	102,000	55,000	45,000
11,510	29/64	12,000	102,000	55,000	45,000
11,600		12,000	102,000	55,000	45,000
11,700		12,000	102,000	55,000	45,000
11,800		12,000	102,000	55,000	45,000
11,900		12,000	102,000	55,000	45,000
11,910	15/32	12,000	102,000	55,000	45,000
12,000		12,000	102,000	55,000	45,000
12,100		14,000	107,000	60,000	45,000
12,200		14,000	107,000	60,000	45,000
12,300	31/64	14,000	107,000	60,000	45,000
12,400		14,000	107,000	60,000	45,000
12,500		14,000	107,000	60,000	45,000
12,600		14,000	107,000	60,000	45,000
12,700	1/2	14,000	107,000	60,000	45,000
12,800		14,000	107,000	60,000	45,000
12,900		14,000	107,000	60,000	45,000
13,000		14,000	107,000	60,000	45,000
13,200		14,000	107,000	60,000	45,000
13,300		14,000	107,000	60,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,490	17/32	14,000	107,000	60,000	45,000
13,500		14,000	107,000	60,000	45,000
13,550		14,000	107,000	60,000	45,000
13,700		14,000	107,000	60,000	45,000
13,890	35/64	14,000	107,000	60,000	45,000
13,900		14,000	107,000	60,000	45,000
14,000		14,000	107,000	60,000	45,000
14,200		16,000	115,000	65,000	48,000
14,290	9/16	16,000	115,000	65,000	48,000
14,300		16,000	115,000	65,000	48,000
14,500		16,000	115,000	65,000	48,000
14,680	37/64	16,000	115,000	65,000	48,000
14,700		16,000	115,000	65,000	48,000
14,900		16,000	115,000	65,000	48,000
15,000		16,000	115,000	65,000	48,000
15,080	19/32	16,000	115,000	65,000	48,000
15,100		16,000	115,000	65,000	48,000
15,300		16,000	115,000	65,000	48,000
15,480	39/64	16,000	115,000	65,000	48,000
15,500		16,000	115,000	65,000	48,000
15,700		16,000	115,000	65,000	48,000
15,800		16,000	115,000	65,000	48,000
15,870	5/8	16,000	115,000	65,000	48,000
15,900		16,000	115,000	65,000	48,000
16,000		16,000	115,000	65,000	48,000
16,270	41/64	18,000	123,000	73,000	48,000
16,500		18,000	123,000	73,000	48,000
16,670	21/32	18,000	123,000	73,000	48,000
16,700		18,000	123,000	73,000	48,000
16,900		18,000	123,000	73,000	48,000
17,000		18,000	123,000	73,000	48,000
17,070	43/64	18,000	123,000	73,000	48,000
17,300		18,000	123,000	73,000	48,000
17,460	11/16	18,000	123,000	73,000	48,000
17,500		18,000	123,000	73,000	48,000
17,700		18,000	123,000	73,000	48,000
17,860	45/64	18,000	123,000	73,000	48,000
17,900		18,000	123,000	73,000	48,000
18,000		18,000	123,000	73,000	48,000
18,260	23/32	20,000	131,000	79,000	50,000
18,300		20,000	131,000	79,000	50,000
18,500		20,000	131,000	79,000	50,000
18,700		20,000	131,000	79,000	50,000
19,000		20,000	131,000	79,000	50,000
19,050	3/4	20,000	131,000	79,000	50,000
19,250		20,000	131,000	79,000	50,000
19,446		20,000	131,000	79,000	50,000
19,500		20,000	131,000	79,000	50,000
19,700		20,000	131,000	79,000	50,000
19,840	25/32	20,000	131,000	79,000	50,000
19,900		20,000	131,000	79,000	50,000
20,000		20,000	131,000	79,000	50,000



İçten soğutma kanallı rasyo matkap



- P** • öz bileme  $\geq \varnothing 3,000$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi
- M** ○
- K** •
- N** ○ yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm<sup>2</sup>'ye kadar • döküm malzemeler • bronz / pirinç • yüksek alaşımli AISi-Alaşımları
- S** ○
- H** ○

Malzeme **Kom. sert metal**

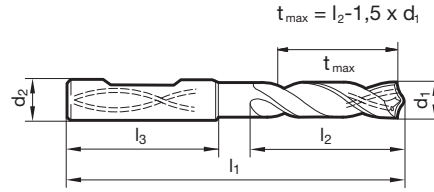
Yüzey **F**

sap formu HE

Rasyo matkap ucu

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 750



Ürün no **2469**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	8,550		10,000	89,000	47,000	40,000
3,200		6,000	62,000	20,000	36,000	8,600		10,000	89,000	47,000	40,000
3,250		6,000	62,000	20,000	36,000	8,700		10,000	89,000	47,000	40,000
3,300		6,000	62,000	20,000	36,000	8,800		10,000	89,000	47,000	40,000
3,400		6,000	62,000	20,000	36,000	9,000		10,000	89,000	47,000	40,000
3,500		6,000	62,000	20,000	36,000	9,050		10,000	89,000	47,000	40,000
3,800		6,000	66,000	24,000	36,000	9,200		10,000	89,000	47,000	40,000
3,970	5/32	6,000	66,000	24,000	36,000	9,250		10,000	89,000	47,000	40,000
4,000		6,000	66,000	24,000	36,000	9,300		10,000	89,000	47,000	40,000
4,100		6,000	66,000	24,000	36,000	9,500		10,000	89,000	47,000	40,000
4,200		6,000	66,000	24,000	36,000	9,550		10,000	89,000	47,000	40,000
4,300		6,000	66,000	24,000	36,000	9,600		10,000	89,000	47,000	40,000
4,370	11/64	6,000	66,000	24,000	36,000	9,800		10,000	89,000	47,000	40,000
4,400		6,000	66,000	24,000	36,000	10,100		12,000	102,000	55,000	45,000
4,450		6,000	66,000	24,000	36,000	10,200		12,000	102,000	55,000	45,000
4,500		6,000	66,000	24,000	36,000	10,300		12,000	102,000	55,000	45,000
4,700		6,000	66,000	24,000	36,000	10,400		12,000	102,000	55,000	45,000
4,800		6,000	66,000	28,000	36,000	10,500		12,000	102,000	55,000	45,000
5,000		6,000	66,000	28,000	36,000	10,700		12,000	102,000	55,000	45,000
5,100		6,000	66,000	28,000	36,000	10,900		12,000	102,000	55,000	45,000
5,300		6,000	66,000	28,000	36,000	11,000		12,000	102,000	55,000	45,000
5,500		6,000	66,000	28,000	36,000	11,110	7/16	12,000	102,000	55,000	45,000
5,600		6,000	66,000	28,000	36,000	11,300		12,000	102,000	55,000	45,000
5,650		6,000	66,000	28,000	36,000	11,400		12,000	102,000	55,000	45,000
5,750		6,000	66,000	28,000	36,000	11,500		12,000	102,000	55,000	45,000
5,800		6,000	66,000	28,000	36,000	11,550		12,000	102,000	55,000	45,000
6,100		8,000	79,000	34,000	36,000	11,600		12,000	102,000	55,000	45,000
6,200		8,000	79,000	34,000	36,000	11,700		12,000	102,000	55,000	45,000
6,500		8,000	79,000	34,000	36,000	11,800		12,000	102,000	55,000	45,000
6,600		8,000	79,000	34,000	36,000	11,900		12,000	102,000	55,000	45,000
6,700		8,000	79,000	34,000	36,000	11,910	15/32	12,000	102,000	55,000	45,000
6,800		8,000	79,000	34,000	36,000	12,000		12,000	102,000	55,000	45,000
7,000		8,000	79,000	34,000	36,000	12,100		14,000	107,000	60,000	45,000
7,100		8,000	79,000	41,000	36,000	12,200		14,000	107,000	60,000	45,000
7,200		8,000	79,000	41,000	36,000	12,500		14,000	107,000	60,000	45,000
7,450		8,000	79,000	41,000	36,000	12,700	1/2	14,000	107,000	60,000	45,000
7,500		8,000	79,000	41,000	36,000	13,000		14,000	107,000	60,000	45,000
7,650		8,000	79,000	41,000	36,000	13,100	33/64	14,000	107,000	60,000	45,000
8,000		8,000	79,000	41,000	36,000	13,300		14,000	107,000	60,000	45,000
8,200		10,000	89,000	47,000	40,000	13,400		14,000	107,000	60,000	45,000
8,400		10,000	89,000	47,000	40,000	13,500		14,000	107,000	60,000	45,000
8,500		10,000	89,000	47,000	40,000	13,550		14,000	107,000	60,000	45,000

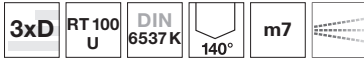


d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,700		14,000	107,000	60,000	45,000
14,200		16,000	115,000	65,000	48,000
14,290	9/16	16,000	115,000	65,000	48,000
14,500		16,000	115,000	65,000	48,000
14,800		16,000	115,000	65,000	48,000
15,000		16,000	115,000	65,000	48,000
15,100		16,000	115,000	65,000	48,000
15,200		16,000	115,000	65,000	48,000
15,300		16,000	115,000	65,000	48,000
15,500		16,000	115,000	65,000	48,000
15,550		16,000	115,000	65,000	48,000
15,600		16,000	115,000	65,000	48,000
15,700		16,000	115,000	65,000	48,000
15,900		16,000	115,000	65,000	48,000
16,000		16,000	115,000	65,000	48,000
16,100		18,000	123,000	73,000	48,000
16,200		18,000	123,000	73,000	48,000
16,500		18,000	123,000	73,000	48,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
16,900		18,000	123,000	73,000	48,000
17,000		18,000	123,000	73,000	48,000
17,300		18,000	123,000	73,000	48,000
17,500		18,000	123,000	73,000	48,000
17,550		18,000	123,000	73,000	48,000
17,900		18,000	123,000	73,000	48,000
18,000		18,000	123,000	73,000	48,000
18,300		20,000	131,000	79,000	50,000
18,500		20,000	131,000	79,000	50,000
18,900		20,000	131,000	79,000	50,000
19,000		20,000	131,000	79,000	50,000
19,300		20,000	131,000	79,000	50,000
19,500		20,000	131,000	79,000	50,000
19,550		20,000	131,000	79,000	50,000
19,900		20,000	131,000	79,000	50,000
20,000		20,000	131,000	79,000	50,000



İçten soğutma kanallı rasyo matkap



Malzeme **Kom. sert metal**

Yüzey **S**

sap formu HE

**P** • öz bileme  $\geq \varnothing 3,300$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi

**M** ○

**K** •

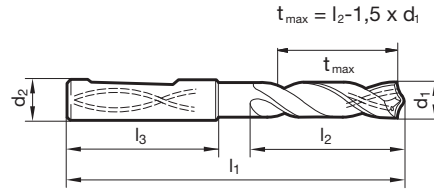
**N** ○ yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşimli çelikler 1200 N/mm<sup>2</sup>'ye kadar • döküm malzemeler • bronz / pirinç • yüksek alaşimli AISi-Alaşımları

**S** ○

**H** ○

**GÜHRING NAVIGATOR**

Kesme verileri sayfası 750



Rasyo matkap ucu

Ürün no **1181**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,300		6,000	62,000	20,000	36,000	10,500		12,000	102,000	55,000	45,000
3,400		6,000	62,000	20,000	36,000	10,600		12,000	102,000	55,000	45,000
4,000		6,000	66,000	24,000	36,000	10,700		12,000	102,000	55,000	45,000
5,000		6,000	66,000	28,000	36,000	10,800		12,000	102,000	55,000	45,000
5,500		6,000	66,000	28,000	36,000	11,000		12,000	102,000	55,000	45,000
5,600		6,000	66,000	28,000	36,000	11,300		12,000	102,000	55,000	45,000
5,800		6,000	66,000	28,000	36,000	11,500		12,000	102,000	55,000	45,000
6,000		6,000	66,000	28,000	36,000	11,510	29/64	12,000	102,000	55,000	45,000
6,100		8,000	79,000	34,000	36,000	11,910	15/32	12,000	102,000	55,000	45,000
6,200		8,000	79,000	34,000	36,000	12,000		12,000	102,000	55,000	45,000
6,300		8,000	79,000	34,000	36,000	12,100		14,000	107,000	60,000	45,000
6,400		8,000	79,000	34,000	36,000	12,300	31/64	14,000	107,000	60,000	45,000
6,600		8,000	79,000	34,000	36,000	12,500		14,000	107,000	60,000	45,000
6,800		8,000	79,000	34,000	36,000	12,700	1/2	14,000	107,000	60,000	45,000
7,000		8,000	79,000	34,000	36,000	12,900		14,000	107,000	60,000	45,000
7,100		8,000	79,000	41,000	36,000	13,000		14,000	107,000	60,000	45,000
7,140	9/32	8,000	79,000	41,000	36,000	13,500		14,000	107,000	60,000	45,000
7,400		8,000	79,000	41,000	36,000	13,890	35/64	14,000	107,000	60,000	45,000
7,500		8,000	79,000	41,000	36,000	14,000		14,000	107,000	60,000	45,000
7,540	19/64	8,000	79,000	41,000	36,000	14,500		16,000	115,000	65,000	48,000
7,800		8,000	79,000	41,000	36,000	14,680	37/64	16,000	115,000	65,000	48,000
7,940	5/16	8,000	79,000	41,000	36,000	14,900		16,000	115,000	65,000	48,000
8,000		8,000	79,000	41,000	36,000	15,000		16,000	115,000	65,000	48,000
8,100		10,000	89,000	47,000	40,000	15,480	39/64	16,000	115,000	65,000	48,000
8,200		10,000	89,000	47,000	40,000	15,500		16,000	115,000	65,000	48,000
8,400		10,000	89,000	47,000	40,000	16,100		18,000	123,000	73,000	48,000
8,500		10,000	89,000	47,000	40,000	16,200		18,000	123,000	73,000	48,000
8,700		10,000	89,000	47,000	40,000	16,500		18,000	123,000	73,000	48,000
8,800		10,000	89,000	47,000	40,000	17,000		18,000	123,000	73,000	48,000
9,000		10,000	89,000	47,000	40,000	17,500		18,000	123,000	73,000	48,000
9,200		10,000	89,000	47,000	40,000	17,700		18,000	123,000	73,000	48,000
9,700		10,000	89,000	47,000	40,000	18,000		18,000	123,000	73,000	48,000
9,800		10,000	89,000	47,000	40,000	18,700		20,000	131,000	79,000	50,000
10,000		10,000	89,000	47,000	40,000	19,000		20,000	131,000	79,000	50,000
10,200		12,000	102,000	55,000	45,000	19,500		20,000	131,000	79,000	50,000
10,300		12,000	102,000	55,000	45,000						



## İçten soğutma kanallı rasyo matkap



**P** • öz bileme  $\geq \varnothing 3,000$  • koni bileme • ana kesici ağız hafif konkavdır • optimize edilmiş kesme geometrisi

**M****K****N**

1600 N/mm<sup>2</sup> ye kadar alışımlı ve yüksek mukavemetli çelikler • Inconel, Hastelloy, Monel • Titanyum ve Ti alaşımları

**S****H**

Malzeme

Kom. sert metal

Yüzey

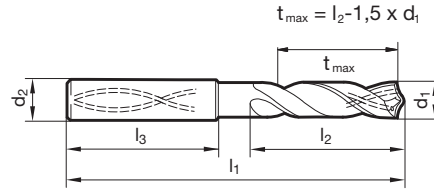
Y

sap formu

HA

## GÜHRING NAVIGATOR

Kesme verileri sayfası 750



Ürün no

8520

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	6,100		8,000	79,000	34,000	36,000
3,100		6,000	62,000	20,000	36,000	6,200		8,000	79,000	34,000	36,000
3,170	1/8	6,000	62,000	20,000	36,000	6,300		8,000	79,000	34,000	36,000
3,200		6,000	62,000	20,000	36,000	6,350	1/4	8,000	79,000	34,000	36,000
3,250		6,000	62,000	20,000	36,000	6,400		8,000	79,000	34,000	36,000
3,300		6,000	62,000	20,000	36,000	6,500		8,000	79,000	34,000	36,000
3,400		6,000	62,000	20,000	36,000	6,600		8,000	79,000	34,000	36,000
3,500		6,000	62,000	20,000	36,000	6,700		8,000	79,000	34,000	36,000
3,570	9/64	6,000	62,000	20,000	36,000	6,750	17/64	8,000	79,000	34,000	36,000
3,600		6,000	62,000	20,000	36,000	6,800		8,000	79,000	34,000	36,000
3,700		6,000	62,000	20,000	36,000	6,900		8,000	79,000	34,000	36,000
3,800		6,000	66,000	24,000	36,000	7,000		8,000	79,000	34,000	36,000
3,900		6,000	66,000	24,000	36,000	7,100		8,000	79,000	41,000	36,000
3,970	5/32	6,000	66,000	24,000	36,000	7,140	9/32	8,000	79,000	41,000	36,000
4,000		6,000	66,000	24,000	36,000	7,200		8,000	79,000	41,000	36,000
4,100		6,000	66,000	24,000	36,000	7,300		8,000	79,000	41,000	36,000
4,200		6,000	66,000	24,000	36,000	7,400		8,000	79,000	41,000	36,000
4,300		6,000	66,000	24,000	36,000	7,500		8,000	79,000	41,000	36,000
4,370	11/64	6,000	66,000	24,000	36,000	7,540	19/64	8,000	79,000	41,000	36,000
4,400		6,000	66,000	24,000	36,000	7,600		8,000	79,000	41,000	36,000
4,500		6,000	66,000	24,000	36,000	7,700		8,000	79,000	41,000	36,000
4,600		6,000	66,000	24,000	36,000	7,800		8,000	79,000	41,000	36,000
4,650		6,000	66,000	24,000	36,000	7,900		8,000	79,000	41,000	36,000
4,700		6,000	66,000	24,000	36,000	7,940	5/16	8,000	79,000	41,000	36,000
4,760	3/16	6,000	66,000	28,000	36,000	8,000		8,000	79,000	41,000	36,000
4,800		6,000	66,000	28,000	36,000	8,100		10,000	89,000	47,000	40,000
4,900		6,000	66,000	28,000	36,000	8,200		10,000	89,000	47,000	40,000
5,000		6,000	66,000	28,000	36,000	8,300		10,000	89,000	47,000	40,000
5,100		6,000	66,000	28,000	36,000	8,330	21/64	10,000	89,000	47,000	40,000
5,160	13/64	6,000	66,000	28,000	36,000	8,400		10,000	89,000	47,000	40,000
5,200		6,000	66,000	28,000	36,000	8,500		10,000	89,000	47,000	40,000
5,300		6,000	66,000	28,000	36,000	8,600		10,000	89,000	47,000	40,000
5,400		6,000	66,000	28,000	36,000	8,700		10,000	89,000	47,000	40,000
5,500		6,000	66,000	28,000	36,000	8,730	11/32	10,000	89,000	47,000	40,000
5,550		6,000	66,000	28,000	36,000	8,800		10,000	89,000	47,000	40,000
5,560	7/32	6,000	66,000	28,000	36,000	8,900		10,000	89,000	47,000	40,000
5,600		6,000	66,000	28,000	36,000	9,000		10,000	89,000	47,000	40,000
5,700		6,000	66,000	28,000	36,000	9,100		10,000	89,000	47,000	40,000
5,800		6,000	66,000	28,000	36,000	9,130	23/64	10,000	89,000	47,000	40,000
5,900		6,000	66,000	28,000	36,000	9,200		10,000	89,000	47,000	40,000
5,950	15/64	6,000	66,000	28,000	36,000	9,250		10,000	89,000	47,000	40,000
6,000		6,000	66,000	28,000	36,000	9,300		10,000	89,000	47,000	40,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,400		10,000	89,000	47,000	40,000
9,500		10,000	89,000	47,000	40,000
9,520	3/8	10,000	89,000	47,000	40,000
9,600		10,000	89,000	47,000	40,000
9,700		10,000	89,000	47,000	40,000
9,800		10,000	89,000	47,000	40,000
9,900		10,000	89,000	47,000	40,000
9,920	25/64	10,000	89,000	47,000	40,000
10,000		10,000	89,000	47,000	40,000
10,100		12,000	102,000	55,000	45,000
10,200		12,000	102,000	55,000	45,000
10,300		12,000	102,000	55,000	45,000
10,320	13/32	12,000	102,000	55,000	45,000
10,400		12,000	102,000	55,000	45,000
10,500		12,000	102,000	55,000	45,000
10,600		12,000	102,000	55,000	45,000
10,700		12,000	102,000	55,000	45,000
10,720	27/64	12,000	102,000	55,000	45,000
10,800		12,000	102,000	55,000	45,000
10,900		12,000	102,000	55,000	45,000
11,000		12,000	102,000	55,000	45,000
11,100		12,000	102,000	55,000	45,000
11,110	7/16	12,000	102,000	55,000	45,000
11,200		12,000	102,000	55,000	45,000
11,300		12,000	102,000	55,000	45,000
11,400		12,000	102,000	55,000	45,000
11,500		12,000	102,000	55,000	45,000
11,600		12,000	102,000	55,000	45,000
11,700		12,000	102,000	55,000	45,000
11,800		12,000	102,000	55,000	45,000
11,900		12,000	102,000	55,000	45,000
11,910	15/32	12,000	102,000	55,000	45,000
12,000		12,000	102,000	55,000	45,000
12,200		14,000	107,000	60,000	45,000
12,300	31/64	14,000	107,000	60,000	45,000
12,500		14,000	107,000	60,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
12,700	1/2	14,000	107,000	60,000	45,000
12,800		14,000	107,000	60,000	45,000
13,000		14,000	107,000	60,000	45,000
13,300		14,000	107,000	60,000	45,000
13,490	17/32	14,000	107,000	60,000	45,000
13,500		14,000	107,000	60,000	45,000
13,700		14,000	107,000	60,000	45,000
14,000		14,000	107,000	60,000	45,000
14,200		16,000	115,000	65,000	48,000
14,290	9/16	16,000	115,000	65,000	48,000
14,300		16,000	115,000	65,000	48,000
14,500		16,000	115,000	65,000	48,000
14,700		16,000	115,000	65,000	48,000
15,000		16,000	115,000	65,000	48,000
15,200		16,000	115,000	65,000	48,000
15,300		16,000	115,000	65,000	48,000
15,500		16,000	115,000	65,000	48,000
15,700		16,000	115,000	65,000	48,000
16,000		16,000	115,000	65,000	48,000
16,300		18,000	123,000	73,000	48,000
16,500		18,000	123,000	73,000	48,000
16,900		18,000	123,000	73,000	48,000
17,000		18,000	123,000	73,000	48,000
17,300		18,000	123,000	73,000	48,000
17,500		18,000	123,000	73,000	48,000
18,000		18,000	123,000	73,000	48,000
18,500		20,000	131,000	79,000	50,000
18,900		20,000	131,000	79,000	50,000
19,000		20,000	131,000	79,000	50,000
19,050	3/4	20,000	131,000	79,000	50,000
19,300		20,000	131,000	79,000	50,000
19,500		20,000	131,000	79,000	50,000
20,000		20,000	131,000	79,000	50,000



## İçten soğutma kanallı rasyo matkap



**P** • öz bileme  $\geq \varnothing 3,000$  • koni bileme • ana kesici ağız hafif konkavdır • optimize edilmiş kesme geometrisi

**M****K****N****S** •**H** ○

1600 N/mm<sup>2</sup> ye kadar alışımlı ve yüksek mukavemetli çelikler • Inconel, Hastelloy, Monel • Titanyum ve Ti alaşımları

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 750

Malzeme

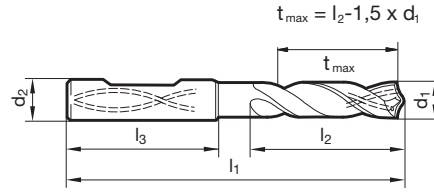
Kom. sert metal

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Y

sap formu

HE



Ürün no

8620

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	6,100		8,000	79,000	34,000	36,000
3,100		6,000	62,000	20,000	36,000	6,200		8,000	79,000	34,000	36,000
3,170	1/8	6,000	62,000	20,000	36,000	6,300		8,000	79,000	34,000	36,000
3,200		6,000	62,000	20,000	36,000	6,350	1/4	8,000	79,000	34,000	36,000
3,250		6,000	62,000	20,000	36,000	6,400		8,000	79,000	34,000	36,000
3,300		6,000	62,000	20,000	36,000	6,500		8,000	79,000	34,000	36,000
3,400		6,000	62,000	20,000	36,000	6,600		8,000	79,000	34,000	36,000
3,500		6,000	62,000	20,000	36,000	6,700		8,000	79,000	34,000	36,000
3,570	9/64	6,000	62,000	20,000	36,000	6,750	17/64	8,000	79,000	34,000	36,000
3,600		6,000	62,000	20,000	36,000	6,800		8,000	79,000	34,000	36,000
3,700		6,000	62,000	20,000	36,000	6,900		8,000	79,000	34,000	36,000
3,800		6,000	66,000	24,000	36,000	7,000		8,000	79,000	34,000	36,000
3,900		6,000	66,000	24,000	36,000	7,100		8,000	79,000	41,000	36,000
3,970	5/32	6,000	66,000	24,000	36,000	7,140	9/32	8,000	79,000	41,000	36,000
4,000		6,000	66,000	24,000	36,000	7,200		8,000	79,000	41,000	36,000
4,100		6,000	66,000	24,000	36,000	7,300		8,000	79,000	41,000	36,000
4,200		6,000	66,000	24,000	36,000	7,400		8,000	79,000	41,000	36,000
4,300		6,000	66,000	24,000	36,000	7,500		8,000	79,000	41,000	36,000
4,370	11/64	6,000	66,000	24,000	36,000	7,540	19/64	8,000	79,000	41,000	36,000
4,400		6,000	66,000	24,000	36,000	7,600		8,000	79,000	41,000	36,000
4,500		6,000	66,000	24,000	36,000	7,700		8,000	79,000	41,000	36,000
4,600		6,000	66,000	24,000	36,000	7,800		8,000	79,000	41,000	36,000
4,650		6,000	66,000	24,000	36,000	7,900		8,000	79,000	41,000	36,000
4,700		6,000	66,000	24,000	36,000	7,940	5/16	8,000	79,000	41,000	36,000
4,760	3/16	6,000	66,000	28,000	36,000	8,000		8,000	79,000	41,000	36,000
4,800		6,000	66,000	28,000	36,000	8,100		10,000	89,000	47,000	40,000
4,900		6,000	66,000	28,000	36,000	8,200		10,000	89,000	47,000	40,000
5,000		6,000	66,000	28,000	36,000	8,300		10,000	89,000	47,000	40,000
5,100		6,000	66,000	28,000	36,000	8,330	21/64	10,000	89,000	47,000	40,000
5,160	13/64	6,000	66,000	28,000	36,000	8,400		10,000	89,000	47,000	40,000
5,200		6,000	66,000	28,000	36,000	8,500		10,000	89,000	47,000	40,000
5,300		6,000	66,000	28,000	36,000	8,600		10,000	89,000	47,000	40,000
5,400		6,000	66,000	28,000	36,000	8,700		10,000	89,000	47,000	40,000
5,500		6,000	66,000	28,000	36,000	8,730	11/32	10,000	89,000	47,000	40,000
5,550		6,000	66,000	28,000	36,000	8,800		10,000	89,000	47,000	40,000
5,560	7/32	6,000	66,000	28,000	36,000	8,900		10,000	89,000	47,000	40,000
5,600		6,000	66,000	28,000	36,000	9,000		10,000	89,000	47,000	40,000
5,700		6,000	66,000	28,000	36,000	9,100		10,000	89,000	47,000	40,000
5,800		6,000	66,000	28,000	36,000	9,130	23/64	10,000	89,000	47,000	40,000
5,900		6,000	66,000	28,000	36,000	9,200		10,000	89,000	47,000	40,000
5,950	15/64	6,000	66,000	28,000	36,000	9,250		10,000	89,000	47,000	40,000
6,000		6,000	66,000	28,000	36,000	9,300		10,000	89,000	47,000	40,000





d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,400		10,000	89,000	47,000	40,000
9,500		10,000	89,000	47,000	40,000
9,520	3/8	10,000	89,000	47,000	40,000
9,600		10,000	89,000	47,000	40,000
9,700		10,000	89,000	47,000	40,000
9,800		10,000	89,000	47,000	40,000
9,900		10,000	89,000	47,000	40,000
9,920	25/64	10,000	89,000	47,000	40,000
10,000		10,000	89,000	47,000	40,000
10,100		12,000	102,000	55,000	45,000
10,200		12,000	102,000	55,000	45,000
10,300		12,000	102,000	55,000	45,000
10,320	13/32	12,000	102,000	55,000	45,000
10,400		12,000	102,000	55,000	45,000
10,500		12,000	102,000	55,000	45,000
10,600		12,000	102,000	55,000	45,000
10,700		12,000	102,000	55,000	45,000
10,800		12,000	102,000	55,000	45,000
10,900		12,000	102,000	55,000	45,000
11,000		12,000	102,000	55,000	45,000
11,100		12,000	102,000	55,000	45,000
11,110	7/16	12,000	102,000	55,000	45,000
11,200		12,000	102,000	55,000	45,000
11,300		12,000	102,000	55,000	45,000
11,400		12,000	102,000	55,000	45,000
11,500		12,000	102,000	55,000	45,000
11,600		12,000	102,000	55,000	45,000
11,700		12,000	102,000	55,000	45,000
11,800		12,000	102,000	55,000	45,000
11,900		12,000	102,000	55,000	45,000
11,910	15/32	12,000	102,000	55,000	45,000
12,000		12,000	102,000	55,000	45,000
12,200		14,000	107,000	60,000	45,000
12,500		14,000	107,000	60,000	45,000
12,700	1/2	14,000	107,000	60,000	45,000
12,800		14,000	107,000	60,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,000		14,000	107,000	60,000	45,000
13,300		14,000	107,000	60,000	45,000
13,500		14,000	107,000	60,000	45,000
13,700		14,000	107,000	60,000	45,000
14,000		14,000	107,000	60,000	45,000
14,200		16,000	115,000	65,000	48,000
14,290	9/16	16,000	115,000	65,000	48,000
14,300		16,000	115,000	65,000	48,000
14,500		16,000	115,000	65,000	48,000
14,700		16,000	115,000	65,000	48,000
15,000		16,000	115,000	65,000	48,000
15,200		16,000	115,000	65,000	48,000
15,300		16,000	115,000	65,000	48,000
15,500		16,000	115,000	65,000	48,000
15,700		16,000	115,000	65,000	48,000
16,000		16,000	115,000	65,000	48,000
16,300		18,000	123,000	73,000	48,000
16,500		18,000	123,000	73,000	48,000
16,900		18,000	123,000	73,000	48,000
17,000		18,000	123,000	73,000	48,000
17,300		18,000	123,000	73,000	48,000
17,500		18,000	123,000	73,000	48,000
18,000		18,000	123,000	73,000	48,000
18,500		20,000	131,000	79,000	50,000
18,900		20,000	131,000	79,000	50,000
19,000		20,000	131,000	79,000	50,000
19,050	3/4	20,000	131,000	79,000	50,000
19,300		20,000	131,000	79,000	50,000
19,500		20,000	131,000	79,000	50,000
20,000		20,000	131,000	79,000	50,000



## İçten soğutma kanallı rasyo matkap



**P** öz bileme  $\geq \varnothing 3,000$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi

**M** •**K**

**N** pas/asit/ısıya dayanıklı çelikler • Titanyum ve Ti alaşımları • Inconel, Hastelloy, Monel

**S** •**H**

Malzeme

Kom. sert metal

Yüzey

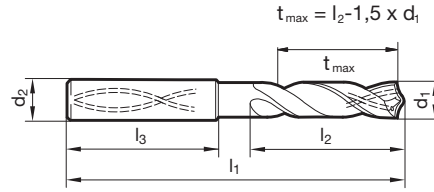
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HA

## GÜHRING NAVIGATOR

Kesme verileri sayfası 750



Ürün no

8510

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	6,100		8,000	79,000	34,000	36,000
3,100		6,000	62,000	20,000	36,000	6,200		8,000	79,000	34,000	36,000
3,170	1/8	6,000	62,000	20,000	36,000	6,300		8,000	79,000	34,000	36,000
3,200		6,000	62,000	20,000	36,000	6,350	1/4	8,000	79,000	34,000	36,000
3,250		6,000	62,000	20,000	36,000	6,400		8,000	79,000	34,000	36,000
3,300		6,000	62,000	20,000	36,000	6,500		8,000	79,000	34,000	36,000
3,400		6,000	62,000	20,000	36,000	6,600		8,000	79,000	34,000	36,000
3,500		6,000	62,000	20,000	36,000	6,700		8,000	79,000	34,000	36,000
3,570	9/64	6,000	62,000	20,000	36,000	6,750	17/64	8,000	79,000	34,000	36,000
3,600		6,000	62,000	20,000	36,000	6,800		8,000	79,000	34,000	36,000
3,700		6,000	62,000	20,000	36,000	6,900		8,000	79,000	34,000	36,000
3,800		6,000	66,000	24,000	36,000	7,000		8,000	79,000	34,000	36,000
3,900		6,000	66,000	24,000	36,000	7,100		8,000	79,000	41,000	36,000
3,970	5/32	6,000	66,000	24,000	36,000	7,140	9/32	8,000	79,000	41,000	36,000
4,000		6,000	66,000	24,000	36,000	7,200		8,000	79,000	41,000	36,000
4,100		6,000	66,000	24,000	36,000	7,300		8,000	79,000	41,000	36,000
4,200		6,000	66,000	24,000	36,000	7,400		8,000	79,000	41,000	36,000
4,300		6,000	66,000	24,000	36,000	7,500		8,000	79,000	41,000	36,000
4,370	11/64	6,000	66,000	24,000	36,000	7,540	19/64	8,000	79,000	41,000	36,000
4,400		6,000	66,000	24,000	36,000	7,600		8,000	79,000	41,000	36,000
4,500		6,000	66,000	24,000	36,000	7,700		8,000	79,000	41,000	36,000
4,600		6,000	66,000	24,000	36,000	7,800		8,000	79,000	41,000	36,000
4,650		6,000	66,000	24,000	36,000	7,900		8,000	79,000	41,000	36,000
4,700		6,000	66,000	24,000	36,000	7,940	5/16	8,000	79,000	41,000	36,000
4,760	3/16	6,000	66,000	28,000	36,000	8,000		8,000	79,000	41,000	36,000
4,800		6,000	66,000	28,000	36,000	8,100		10,000	89,000	47,000	40,000
4,900		6,000	66,000	28,000	36,000	8,200		10,000	89,000	47,000	40,000
5,000		6,000	66,000	28,000	36,000	8,300		10,000	89,000	47,000	40,000
5,100		6,000	66,000	28,000	36,000	8,330	21/64	10,000	89,000	47,000	40,000
5,160	13/64	6,000	66,000	28,000	36,000	8,400		10,000	89,000	47,000	40,000
5,200		6,000	66,000	28,000	36,000	8,500		10,000	89,000	47,000	40,000
5,300		6,000	66,000	28,000	36,000	8,600		10,000	89,000	47,000	40,000
5,400		6,000	66,000	28,000	36,000	8,700		10,000	89,000	47,000	40,000
5,500		6,000	66,000	28,000	36,000	8,730	11/32	10,000	89,000	47,000	40,000
5,550		6,000	66,000	28,000	36,000	8,800		10,000	89,000	47,000	40,000
5,560	7/32	6,000	66,000	28,000	36,000	8,900		10,000	89,000	47,000	40,000
5,600		6,000	66,000	28,000	36,000	9,000		10,000	89,000	47,000	40,000
5,700		6,000	66,000	28,000	36,000	9,100		10,000	89,000	47,000	40,000
5,800		6,000	66,000	28,000	36,000	9,130	23/64	10,000	89,000	47,000	40,000
5,900		6,000	66,000	28,000	36,000	9,200		10,000	89,000	47,000	40,000
5,950	15/64	6,000	66,000	28,000	36,000	9,250		10,000	89,000	47,000	40,000
6,000		6,000	66,000	28,000	36,000	9,300		10,000	89,000	47,000	40,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,400		10,000	89,000	47,000	40,000
9,500		10,000	89,000	47,000	40,000
9,520	3/8	10,000	89,000	47,000	40,000
9,600		10,000	89,000	47,000	40,000
9,700		10,000	89,000	47,000	40,000
9,800		10,000	89,000	47,000	40,000
9,900		10,000	89,000	47,000	40,000
9,920	25/64	10,000	89,000	47,000	40,000
10,000		10,000	89,000	47,000	40,000
10,100		12,000	102,000	55,000	45,000
10,200		12,000	102,000	55,000	45,000
10,300		12,000	102,000	55,000	45,000
10,320	13/32	12,000	102,000	55,000	45,000
10,400		12,000	102,000	55,000	45,000
10,500		12,000	102,000	55,000	45,000
10,600		12,000	102,000	55,000	45,000
10,700		12,000	102,000	55,000	45,000
10,800		12,000	102,000	55,000	45,000
10,900		12,000	102,000	55,000	45,000
11,000		12,000	102,000	55,000	45,000
11,100		12,000	102,000	55,000	45,000
11,110	7/16	12,000	102,000	55,000	45,000
11,200		12,000	102,000	55,000	45,000
11,300		12,000	102,000	55,000	45,000
11,400		12,000	102,000	55,000	45,000
11,500		12,000	102,000	55,000	45,000
11,600		12,000	102,000	55,000	45,000
11,700		12,000	102,000	55,000	45,000
11,800		12,000	102,000	55,000	45,000
11,900		12,000	102,000	55,000	45,000
11,910	15/32	12,000	102,000	55,000	45,000
12,000		12,000	102,000	55,000	45,000
12,200		14,000	107,000	60,000	45,000
12,500		14,000	107,000	60,000	45,000
12,700	1/2	14,000	107,000	60,000	45,000
12,800		14,000	107,000	60,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,000		14,000	107,000	60,000	45,000
13,300		14,000	107,000	60,000	45,000
13,500		14,000	107,000	60,000	45,000
13,700		14,000	107,000	60,000	45,000
14,000		14,000	107,000	60,000	45,000
14,200		16,000	115,000	65,000	48,000
14,290	9/16	16,000	115,000	65,000	48,000
14,300		16,000	115,000	65,000	48,000
14,500		16,000	115,000	65,000	48,000
14,700		16,000	115,000	65,000	48,000
15,000		16,000	115,000	65,000	48,000
15,200		16,000	115,000	65,000	48,000
15,300		16,000	115,000	65,000	48,000
15,500		16,000	115,000	65,000	48,000
15,700		16,000	115,000	65,000	48,000
16,000		16,000	115,000	65,000	48,000
16,300		18,000	123,000	73,000	48,000
16,500		18,000	123,000	73,000	48,000
16,900		18,000	123,000	73,000	48,000
17,000		18,000	123,000	73,000	48,000
17,300		18,000	123,000	73,000	48,000
17,500		18,000	123,000	73,000	48,000
18,000		18,000	123,000	73,000	48,000
18,500		20,000	131,000	79,000	50,000
18,900		20,000	131,000	79,000	50,000
19,000		20,000	131,000	79,000	50,000
19,050	3/4	20,000	131,000	79,000	50,000
19,300		20,000	131,000	79,000	50,000
19,500		20,000	131,000	79,000	50,000
20,000		20,000	131,000	79,000	50,000



## İçten soğutma kanallı rasyo matkap



**P** öz bileme  $\geq \text{Ø } 3,000$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi

**M** •**K**

**N** pas/asit/ısıya dayanıklı çelikler • Titanyum ve Ti alaşımları • Inconel, Hastelloy, Monel

**S** •**H**

Malzeme

Kom. sert metal

Yüzey

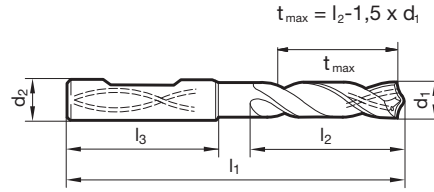
Ⓟ

sap formu

HE

## GÜHRING NAVIGATOR

Kesme verileri sayfası 750



Ürün no

8610

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	6,100		8,000	79,000	34,000	36,000
3,100		6,000	62,000	20,000	36,000	6,200		8,000	79,000	34,000	36,000
3,170	1/8	6,000	62,000	20,000	36,000	6,300		8,000	79,000	34,000	36,000
3,200		6,000	62,000	20,000	36,000	6,350	1/4	8,000	79,000	34,000	36,000
3,250		6,000	62,000	20,000	36,000	6,400		8,000	79,000	34,000	36,000
3,300		6,000	62,000	20,000	36,000	6,500		8,000	79,000	34,000	36,000
3,400		6,000	62,000	20,000	36,000	6,600		8,000	79,000	34,000	36,000
3,500		6,000	62,000	20,000	36,000	6,700		8,000	79,000	34,000	36,000
3,570	9/64	6,000	62,000	20,000	36,000	6,750	17/64	8,000	79,000	34,000	36,000
3,600		6,000	62,000	20,000	36,000	6,800		8,000	79,000	34,000	36,000
3,700		6,000	62,000	20,000	36,000	6,900		8,000	79,000	34,000	36,000
3,800		6,000	66,000	24,000	36,000	7,000		8,000	79,000	34,000	36,000
3,900		6,000	66,000	24,000	36,000	7,100		8,000	79,000	41,000	36,000
3,970	5/32	6,000	66,000	24,000	36,000	7,140	9/32	8,000	79,000	41,000	36,000
4,000		6,000	66,000	24,000	36,000	7,200		8,000	79,000	41,000	36,000
4,100		6,000	66,000	24,000	36,000	7,300		8,000	79,000	41,000	36,000
4,200		6,000	66,000	24,000	36,000	7,400		8,000	79,000	41,000	36,000
4,300		6,000	66,000	24,000	36,000	7,500		8,000	79,000	41,000	36,000
4,370	11/64	6,000	66,000	24,000	36,000	7,540	19/64	8,000	79,000	41,000	36,000
4,400		6,000	66,000	24,000	36,000	7,600		8,000	79,000	41,000	36,000
4,500		6,000	66,000	24,000	36,000	7,700		8,000	79,000	41,000	36,000
4,600		6,000	66,000	24,000	36,000	7,800		8,000	79,000	41,000	36,000
4,650		6,000	66,000	24,000	36,000	7,900		8,000	79,000	41,000	36,000
4,700		6,000	66,000	24,000	36,000	7,940	5/16	8,000	79,000	41,000	36,000
4,760	3/16	6,000	66,000	28,000	36,000	8,000		8,000	79,000	41,000	36,000
4,800		6,000	66,000	28,000	36,000	8,100		10,000	89,000	47,000	40,000
4,900		6,000	66,000	28,000	36,000	8,200		10,000	89,000	47,000	40,000
5,000		6,000	66,000	28,000	36,000	8,300		10,000	89,000	47,000	40,000
5,100		6,000	66,000	28,000	36,000	8,330	21/64	10,000	89,000	47,000	40,000
5,160	13/64	6,000	66,000	28,000	36,000	8,400		10,000	89,000	47,000	40,000
5,200		6,000	66,000	28,000	36,000	8,500		10,000	89,000	47,000	40,000
5,300		6,000	66,000	28,000	36,000	8,600		10,000	89,000	47,000	40,000
5,400		6,000	66,000	28,000	36,000	8,700		10,000	89,000	47,000	40,000
5,500		6,000	66,000	28,000	36,000	8,730	11/32	10,000	89,000	47,000	40,000
5,550		6,000	66,000	28,000	36,000	8,800		10,000	89,000	47,000	40,000
5,560	7/32	6,000	66,000	28,000	36,000	8,900		10,000	89,000	47,000	40,000
5,600		6,000	66,000	28,000	36,000	9,000		10,000	89,000	47,000	40,000
5,700		6,000	66,000	28,000	36,000	9,100		10,000	89,000	47,000	40,000
5,800		6,000	66,000	28,000	36,000	9,130	23/64	10,000	89,000	47,000	40,000
5,900		6,000	66,000	28,000	36,000	9,200		10,000	89,000	47,000	40,000
5,950	15/64	6,000	66,000	28,000	36,000	9,250		10,000	89,000	47,000	40,000
6,000		6,000	66,000	28,000	36,000	9,300		10,000	89,000	47,000	40,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,400		10,000	89,000	47,000	40,000
9,500		10,000	89,000	47,000	40,000
9,520	3/8	10,000	89,000	47,000	40,000
9,600		10,000	89,000	47,000	40,000
9,700		10,000	89,000	47,000	40,000
9,800		10,000	89,000	47,000	40,000
9,900		10,000	89,000	47,000	40,000
9,920	25/64	10,000	89,000	47,000	40,000
10,000		10,000	89,000	47,000	40,000
10,100		12,000	102,000	55,000	45,000
10,200		12,000	102,000	55,000	45,000
10,300		12,000	102,000	55,000	45,000
10,320	13/32	12,000	102,000	55,000	45,000
10,400		12,000	102,000	55,000	45,000
10,500		12,000	102,000	55,000	45,000
10,600		12,000	102,000	55,000	45,000
10,700		12,000	102,000	55,000	45,000
10,800		12,000	102,000	55,000	45,000
10,900		12,000	102,000	55,000	45,000
11,000		12,000	102,000	55,000	45,000
11,100		12,000	102,000	55,000	45,000
11,110	7/16	12,000	102,000	55,000	45,000
11,200		12,000	102,000	55,000	45,000
11,300		12,000	102,000	55,000	45,000
11,400		12,000	102,000	55,000	45,000
11,500		12,000	102,000	55,000	45,000
11,600		12,000	102,000	55,000	45,000
11,700		12,000	102,000	55,000	45,000
11,800		12,000	102,000	55,000	45,000
11,900		12,000	102,000	55,000	45,000
11,910	15/32	12,000	102,000	55,000	45,000
12,000		12,000	102,000	55,000	45,000
12,200		14,000	107,000	60,000	45,000
12,500		14,000	107,000	60,000	45,000
12,700	1/2	14,000	107,000	60,000	45,000
12,800		14,000	107,000	60,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,000		14,000	107,000	60,000	45,000
13,300		14,000	107,000	60,000	45,000
13,500		14,000	107,000	60,000	45,000
13,700		14,000	107,000	60,000	45,000
14,000		14,000	107,000	60,000	45,000
14,200		16,000	115,000	65,000	48,000
14,290	9/16	16,000	115,000	65,000	48,000
14,300		16,000	115,000	65,000	48,000
14,500		16,000	115,000	65,000	48,000
14,700		16,000	115,000	65,000	48,000
15,000		16,000	115,000	65,000	48,000
15,200		16,000	115,000	65,000	48,000
15,300		16,000	115,000	65,000	48,000
15,500		16,000	115,000	65,000	48,000
15,700		16,000	115,000	65,000	48,000
16,000		16,000	115,000	65,000	48,000
16,300		18,000	123,000	73,000	48,000
16,500		18,000	123,000	73,000	48,000
16,900		18,000	123,000	73,000	48,000
17,000		18,000	123,000	73,000	48,000
17,300		18,000	123,000	73,000	48,000
17,500		18,000	123,000	73,000	48,000
18,000		18,000	123,000	73,000	48,000
18,500		20,000	131,000	79,000	50,000
18,900		20,000	131,000	79,000	50,000
19,000		20,000	131,000	79,000	50,000
19,050	3/4	20,000	131,000	79,000	50,000
19,300		20,000	131,000	79,000	50,000
19,500		20,000	131,000	79,000	50,000
20,000		20,000	131,000	79,000	50,000



## İçten soğutma kanallı rasyo matkap



**P** öz bileme  $\geq \varnothing 3,000$  • koni bileme • ana kesici ağız form konkav • optimize edilmiş kesme geometrisi • keskin kesme davranışı

**M**

**K**

**N** yüksek alaşımlı çelikleri • pas/asit/ısıya dayanıklı çelikler • Inconel, Hastelloy, Monel • pirinç, bronzlar • Alüminyum ve Al-Alaşımları • Magnezyum ve Mg-alışımları • Titanyum ve Ti alaşımları • toz metaller

**S**

**H**

Malzeme

Kom. sert metal

Yüzey

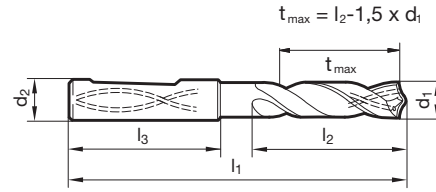
F

sap formu

HE

## GÜHRING NAVIGATOR

Kesme verileri sayfası 750



Ürün no

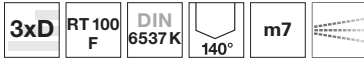
2468

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,500		6,000	62,000	20,000	36,000
3,700		6,000	62,000	20,000	36,000
3,800		6,000	66,000	24,000	36,000
4,000		6,000	66,000	24,000	36,000
4,200		6,000	66,000	24,000	36,000
4,500		6,000	66,000	24,000	36,000
5,000		6,000	66,000	28,000	36,000
5,200		6,000	66,000	28,000	36,000
5,500		6,000	66,000	28,000	36,000
5,800		6,000	66,000	28,000	36,000
6,000		6,000	66,000	28,000	36,000
6,300		8,000	79,000	34,000	36,000
6,800		8,000	79,000	34,000	36,000
6,900		8,000	79,000	34,000	36,000
7,000		8,000	79,000	34,000	36,000
7,500		8,000	79,000	41,000	36,000
8,000		8,000	79,000	41,000	36,000
8,100		10,000	89,000	47,000	40,000
8,200		10,000	89,000	47,000	40,000
8,300		10,000	89,000	47,000	40,000
8,500		10,000	89,000	47,000	40,000
8,600		10,000	89,000	47,000	40,000
9,000		10,000	89,000	47,000	40,000
9,500		10,000	89,000	47,000	40,000
10,000		10,000	89,000	47,000	40,000
10,100		12,000	102,000	55,000	45,000
10,200		12,000	102,000	55,000	45,000
10,300		12,000	102,000	55,000	45,000
10,400		12,000	102,000	55,000	45,000
10,500		12,000	102,000	55,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
10,800		12,000	102,000	55,000	45,000
11,000		12,000	102,000	55,000	45,000
11,300		12,000	102,000	55,000	45,000
11,500		12,000	102,000	55,000	45,000
11,800		12,000	102,000	55,000	45,000
12,000		12,000	102,000	55,000	45,000
12,200		14,000	107,000	60,000	45,000
12,300	31/64	14,000	107,000	60,000	45,000
12,500		14,000	107,000	60,000	45,000
12,700	1/2	14,000	107,000	60,000	45,000
13,000		14,000	107,000	60,000	45,000
13,500		14,000	107,000	60,000	45,000
14,000		14,000	107,000	60,000	45,000
14,500		16,000	115,000	65,000	48,000
15,000		16,000	115,000	65,000	48,000
15,500		16,000	115,000	65,000	48,000
16,000		16,000	115,000	65,000	48,000
16,500		18,000	123,000	73,000	48,000
17,000		18,000	123,000	73,000	48,000
17,500		18,000	123,000	73,000	48,000
18,000		18,000	123,000	73,000	48,000
20,000		20,000	131,000	79,000	50,000



İçten soğutma kanallı rasyo matkap



- P** ○ öz bileme  $\geq \varnothing 3,000$  • koni bileme • ana kesici ağız form konkav • optimize edilmiş kesme geometrisi • keskin kesme davranışı
- M** ○
- K** ○
- N** ○ yüksek alaşımlı çelikleri • pas/asit/ısıya dayanıklı çelikler • Inconel, Hastelloy, Monel • pirinç, bronzlar • Alüminyum ve Al-Alaşımları • Magnezyum ve Mg-alışımları • Titanyum ve Ti alaşımları • toz metaller
- S** •
- H** ○

Malzeme **Kom. sert metal**

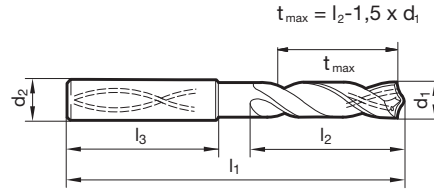
Yüzey **Ⓢ**

sap formu HA

Rasyo matkap ucu

**GÜHRING NAVIGATOR**

Kesme verileri sayfası 750



Ürün no **1660**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,100		6,000	62,000	20,000	36,000	9,500		10,000	89,000	47,000	40,000
4,000		6,000	66,000	24,000	36,000	9,700		10,000	89,000	47,000	40,000
4,100		6,000	66,000	24,000	36,000	9,800		10,000	89,000	47,000	40,000
4,200		6,000	66,000	24,000	36,000	10,000		10,000	89,000	47,000	40,000
4,300		6,000	66,000	24,000	36,000	10,200		12,000	102,000	55,000	45,000
4,700		6,000	66,000	24,000	36,000	10,320	13/32	12,000	102,000	55,000	45,000
5,000		6,000	66,000	28,000	36,000	10,500		12,000	102,000	55,000	45,000
5,300		6,000	66,000	28,000	36,000	10,700		12,000	102,000	55,000	45,000
5,400		6,000	66,000	28,000	36,000	11,000		12,000	102,000	55,000	45,000
5,500		6,000	66,000	28,000	36,000	11,200		12,000	102,000	55,000	45,000
5,600		6,000	66,000	28,000	36,000	11,500		12,000	102,000	55,000	45,000
6,000		6,000	66,000	28,000	36,000	11,800		12,000	102,000	55,000	45,000
6,100		8,000	79,000	34,000	36,000	12,000		12,000	102,000	55,000	45,000
6,200		8,000	79,000	34,000	36,000	12,500		14,000	107,000	60,000	45,000
6,500		8,000	79,000	34,000	36,000	13,000		14,000	107,000	60,000	45,000
6,700		8,000	79,000	34,000	36,000	13,100	33/64	14,000	107,000	60,000	45,000
6,800		8,000	79,000	34,000	36,000	13,200		14,000	107,000	60,000	45,000
7,000		8,000	79,000	34,000	36,000	13,500		14,000	107,000	60,000	45,000
7,400		8,000	79,000	41,000	36,000	14,000		14,000	107,000	60,000	45,000
7,500		8,000	79,000	41,000	36,000	15,000		16,000	115,000	65,000	48,000
7,600		8,000	79,000	41,000	36,000	15,500		16,000	115,000	65,000	48,000
7,800		8,000	79,000	41,000	36,000	16,500		18,000	123,000	73,000	48,000
8,000		8,000	79,000	41,000	36,000	19,600		20,000	131,000	79,000	50,000
8,100		10,000	89,000	47,000	40,000	20,500		25,000	146,000	84,000	56,000
8,300		10,000	89,000	47,000	40,000	21,500		25,000	146,000	84,000	56,000
8,400		10,000	89,000	47,000	40,000	22,000		25,000	146,000	84,000	56,000
8,500		10,000	89,000	47,000	40,000						
8,800		10,000	89,000	47,000	40,000						
9,000		10,000	89,000	47,000	40,000						
9,200		10,000	89,000	47,000	40,000						



## İçten soğutma kanallı rasyo matkap



<b>P</b>	○	öz bileme $\geq \varnothing 3,000$ • koni bileme • ana kesici ağız form konkav • optimize edilmiş kesme geometrisi • keskin kesme davranışı
<b>M</b>	○	
<b>K</b>	○	
<b>N</b>	○	yüksek alaşımlı çelikleri • pas/asit/ısıya dayanıklı çelikler • Inconel, Hastelloy, Monel • pirinç, bronzlar • Alüminyum ve Al-Alaşımları • Magnezyum ve Mg-alışımları • Titanyum ve Ti alaşımları • toz metaller
<b>S</b>	●	
<b>H</b>	○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 750

Malzeme

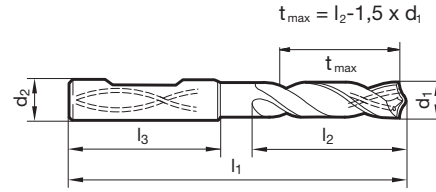
Kom. sert metal

Yüzey

S

sap formu

HE



Ürün no

1180

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
4,000		6,000	66,000	24,000	36,000	10,720	27/64	12,000	102,000	55,000	45,000
4,100		6,000	66,000	24,000	36,000	10,800		12,000	102,000	55,000	45,000
4,200		6,000	66,000	24,000	36,000	11,000		12,000	102,000	55,000	45,000
4,300		6,000	66,000	24,000	36,000	11,100		12,000	102,000	55,000	45,000
4,500		6,000	66,000	24,000	36,000	11,200		12,000	102,000	55,000	45,000
5,000		6,000	66,000	28,000	36,000	11,400		12,000	102,000	55,000	45,000
5,200		6,000	66,000	28,000	36,000	11,500		12,000	102,000	55,000	45,000
5,300		6,000	66,000	28,000	36,000	11,510	29/64	12,000	102,000	55,000	45,000
5,400		6,000	66,000	28,000	36,000	11,800		12,000	102,000	55,000	45,000
5,500		6,000	66,000	28,000	36,000	11,910	15/32	12,000	102,000	55,000	45,000
5,800		6,000	66,000	28,000	36,000	12,000		12,000	102,000	55,000	45,000
5,950	15/64	6,000	66,000	28,000	36,000	12,200		14,000	107,000	60,000	45,000
6,000		6,000	66,000	28,000	36,000	12,300	31/64	14,000	107,000	60,000	45,000
6,200		8,000	79,000	34,000	36,000	12,600		14,000	107,000	60,000	45,000
6,300		8,000	79,000	34,000	36,000	13,000		14,000	107,000	60,000	45,000
6,500		8,000	79,000	34,000	36,000	13,500		14,000	107,000	60,000	45,000
6,600		8,000	79,000	34,000	36,000	14,000		14,000	107,000	60,000	45,000
6,800		8,000	79,000	34,000	36,000	14,290	9/16	16,000	115,000	65,000	48,000
7,000		8,000	79,000	34,000	36,000	14,500		16,000	115,000	65,000	48,000
7,140	9/32	8,000	79,000	41,000	36,000	15,000		16,000	115,000	65,000	48,000
7,300		8,000	79,000	41,000	36,000	15,500		16,000	115,000	65,000	48,000
7,600		8,000	79,000	41,000	36,000	16,000		16,000	115,000	65,000	48,000
7,800		8,000	79,000	41,000	36,000	16,500		18,000	123,000	73,000	48,000
8,000		8,000	79,000	41,000	36,000	17,500		18,000	123,000	73,000	48,000
8,100		10,000	89,000	47,000	40,000	18,000		18,000	123,000	73,000	48,000
8,200		10,000	89,000	47,000	40,000	18,500		20,000	131,000	79,000	50,000
8,330	21/64	10,000	89,000	47,000	40,000	19,000		20,000	131,000	79,000	50,000
8,400		10,000	89,000	47,000	40,000	19,450	49/64	20,000	131,000	79,000	50,000
8,500		10,000	89,000	47,000	40,000	20,000		20,000	131,000	79,000	50,000
8,800		10,000	89,000	47,000	40,000	20,500		25,000	146,000	84,000	56,000
9,200		10,000	89,000	47,000	40,000	21,000		25,000	146,000	84,000	56,000
9,500		10,000	89,000	47,000	40,000	22,000		25,000	146,000	84,000	56,000
9,600		10,000	89,000	47,000	40,000	22,500		25,000	153,000	91,000	56,000
9,700		10,000	89,000	47,000	40,000	23,000		25,000	153,000	91,000	56,000
9,800		10,000	89,000	47,000	40,000	24,000		25,000	153,000	91,000	56,000
10,000		10,000	89,000	47,000	40,000	25,000	63/64	25,000	153,000	91,000	56,000
10,100		12,000	102,000	55,000	45,000						
10,200		12,000	102,000	55,000	45,000						
10,300		12,000	102,000	55,000	45,000						
10,320	13/32	12,000	102,000	55,000	45,000						
10,400		12,000	102,000	55,000	45,000						
10,500		12,000	102,000	55,000	45,000						





İçten soğutma kanallı rasyo matkap



Malzeme **Sert metal**

Yüzey **S**

sap formu HE

**P** • öz bileme  $\geq \varnothing 9,500$  • koni bileme • Lehimli HM plaketti HSS gövde • Darbe ve titreşimleri önler

**M** ○

**K** ○

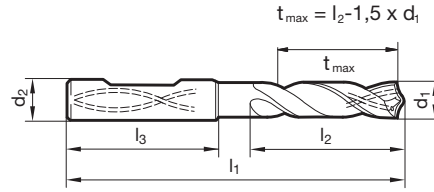
**N** ○ alaşimsız/düşük alaşimli çelikler • pik döküm, küresel grafit döküm • pirinç, bronzlar, plastikler, grafit

**S** ○

**H** ○

**GÜHRING NAVIGATOR**

Kesme verileri sayfası 750



Ürün no **1171**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
9,500		16,000	103,000	51,000	48,000	15,100		20,000	122,000	68,000	50,000
9,700		16,000	103,000	51,000	48,000	15,500		20,000	122,000	68,000	50,000
9,800		16,000	103,000	51,000	48,000	15,600		20,000	122,000	68,000	50,000
9,900		16,000	103,000	51,000	48,000	15,700		20,000	122,000	68,000	50,000
10,000		16,000	103,000	51,000	48,000	15,800		20,000	122,000	68,000	50,000
10,100		16,000	103,000	51,000	48,000	16,000		20,000	122,000	68,000	50,000
10,200		16,000	103,000	51,000	48,000	16,200		20,000	130,000	76,000	50,000
10,400		16,000	103,000	51,000	48,000	16,500		20,000	130,000	76,000	50,000
10,500		16,000	103,000	51,000	48,000	16,700		20,000	130,000	76,000	50,000
10,600		16,000	103,000	51,000	48,000	17,000		20,000	130,000	76,000	50,000
10,700		16,000	103,000	51,000	48,000	17,300		20,000	130,000	76,000	50,000
10,800		16,000	103,000	51,000	48,000	17,500		20,000	130,000	76,000	50,000
10,900		16,000	103,000	51,000	48,000	17,700		20,000	130,000	76,000	50,000
11,000		16,000	103,000	51,000	48,000	17,800		20,000	130,000	76,000	50,000
11,200		16,000	103,000	51,000	48,000	17,860	45/64	20,000	130,000	76,000	50,000
11,500		16,000	103,000	51,000	48,000	18,000		20,000	130,000	76,000	50,000
11,600		16,000	103,000	51,000	48,000	18,500		25,000	144,000	84,000	56,000
11,700		16,000	103,000	51,000	48,000	19,000		25,000	144,000	84,000	56,000
12,000		16,000	103,000	51,000	48,000	19,500		25,000	144,000	84,000	56,000
12,100		16,000	111,000	59,000	48,000	19,600		25,000	144,000	84,000	56,000
12,200		16,000	111,000	59,000	48,000	19,700		25,000	144,000	84,000	56,000
12,300	31/64	16,000	111,000	59,000	48,000	20,000		25,000	144,000	84,000	56,000
12,400		16,000	111,000	59,000	48,000	20,500		25,000	153,000	93,000	56,000
12,500		16,000	111,000	59,000	48,000	21,000		25,000	153,000	93,000	56,000
12,600		16,000	111,000	59,000	48,000	21,500		25,000	153,000	93,000	56,000
12,700	1/2	16,000	111,000	59,000	48,000	22,000		25,000	153,000	93,000	56,000
13,000		16,000	111,000	59,000	48,000	22,220	7/8	25,000	161,000	101,000	56,000
13,500		16,000	111,000	59,000	48,000	22,500		25,000	161,000	101,000	56,000
13,700		16,000	111,000	59,000	48,000	23,000		25,000	161,000	101,000	56,000
13,800		16,000	111,000	59,000	48,000	23,500		25,000	161,000	101,000	56,000
14,000		16,000	111,000	59,000	48,000	24,000		25,000	161,000	101,000	56,000
14,200		20,000	122,000	68,000	50,000	24,500		32,000	174,000	110,000	60,000
14,400		20,000	122,000	68,000	50,000	25,000	63/64	32,000	174,000	110,000	60,000
14,600		20,000	122,000	68,000	50,000	25,500		32,000	174,000	110,000	60,000
14,700		20,000	122,000	68,000	50,000						
15,000		20,000	122,000	68,000	50,000						



## İçten soğutma kanallı rasyo matkap



**P** öz bileme  $\geq \varnothing 3,000$  • koni bileme • dar çap toleransları • delik yüzey finişleri çok iyi • yağ basıncına dikkat edin

**M****K** •**N** ○

pik döküm, temper döküm ve küresel döküm

**S****H**

Malzeme

Kom. sert metal

Yüzey

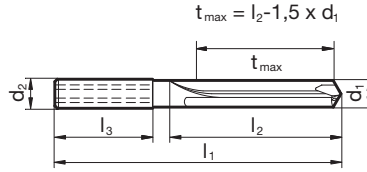
○

sap formu

HA

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 752



Ürün no

768

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	24,000	36,000
3,100		6,000	66,000	24,000	36,000
3,200		6,000	66,000	24,000	36,000
3,300		6,000	66,000	24,000	36,000
3,400		6,000	66,000	24,000	36,000
3,500		6,000	66,000	24,000	36,000
3,600		6,000	66,000	24,000	36,000
3,700		6,000	66,000	24,000	36,000
3,800		6,000	74,000	30,000	36,000
3,900		6,000	74,000	30,000	36,000
4,000		6,000	74,000	30,000	36,000
4,100		6,000	74,000	30,000	36,000
4,200		6,000	74,000	30,000	36,000
4,300		6,000	74,000	30,000	36,000
4,400		6,000	74,000	30,000	36,000
4,500		6,000	74,000	30,000	36,000
4,600		6,000	74,000	30,000	36,000
4,700		6,000	74,000	30,000	36,000
4,800		6,000	74,000	36,000	36,000
4,900		6,000	74,000	36,000	36,000
5,000		6,000	74,000	36,000	36,000
5,100		6,000	74,000	36,000	36,000
5,160	13/64	6,000	74,000	36,000	36,000
5,200		6,000	74,000	36,000	36,000
5,300		6,000	74,000	36,000	36,000
5,400		6,000	74,000	36,000	36,000
5,500		6,000	74,000	36,000	36,000
5,560	7/32	6,000	74,000	36,000	36,000
5,600		6,000	74,000	36,000	36,000
5,700		6,000	74,000	36,000	36,000
5,800		6,000	74,000	36,000	36,000
5,900		6,000	74,000	36,000	36,000
5,950	15/64	6,000	74,000	36,000	36,000
6,000		6,000	74,000	36,000	36,000
6,100		8,000	91,000	53,000	36,000
6,200		8,000	91,000	53,000	36,000
6,300		8,000	91,000	53,000	36,000
6,350	1/4	8,000	91,000	53,000	36,000
6,400		8,000	91,000	53,000	36,000
6,500		8,000	91,000	53,000	36,000
6,600		8,000	91,000	53,000	36,000
6,700		8,000	91,000	53,000	36,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
6,750	17/64	8,000	91,000	53,000	36,000
6,800		8,000	91,000	53,000	36,000
6,900		8,000	91,000	53,000	36,000
7,000		8,000	91,000	53,000	36,000
7,100		8,000	91,000	53,000	36,000
7,140	9/32	8,000	91,000	53,000	36,000
7,200		8,000	91,000	53,000	36,000
7,300		8,000	91,000	53,000	36,000
7,400		8,000	91,000	53,000	36,000
7,500		8,000	91,000	53,000	36,000
7,540	19/64	8,000	91,000	53,000	36,000
7,600		8,000	91,000	53,000	36,000
7,700		8,000	91,000	53,000	36,000
7,800		8,000	91,000	53,000	36,000
7,900		8,000	91,000	53,000	36,000
7,940	5/16	8,000	91,000	53,000	36,000
8,000		8,000	91,000	53,000	36,000
8,100		10,000	103,000	61,000	40,000
8,200		10,000	103,000	61,000	40,000
8,300		10,000	103,000	61,000	40,000
8,330	21/64	10,000	103,000	61,000	40,000
8,400		10,000	103,000	61,000	40,000
8,500		10,000	103,000	61,000	40,000
8,600		10,000	103,000	61,000	40,000
8,700		10,000	103,000	61,000	40,000
8,730	11/32	10,000	103,000	61,000	40,000
8,800		10,000	103,000	61,000	40,000
8,900		10,000	103,000	61,000	40,000
9,000		10,000	103,000	61,000	40,000
9,100		10,000	103,000	61,000	40,000
9,130	23/64	10,000	103,000	61,000	40,000
9,200		10,000	103,000	61,000	40,000
9,300		10,000	103,000	61,000	40,000
9,400		10,000	103,000	61,000	40,000
9,500		10,000	103,000	61,000	40,000
9,520	3/8	10,000	103,000	61,000	40,000
9,600		10,000	103,000	61,000	40,000
9,700		10,000	103,000	61,000	40,000
9,800		10,000	103,000	61,000	40,000
9,900		10,000	103,000	61,000	40,000
9,920	25/64	10,000	103,000	61,000	40,000
10,000		10,000	103,000	61,000	40,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
10,200		12,000	118,000	71,000	45,000
10,320	13/32	12,000	118,000	71,000	45,000
10,500		12,000	118,000	71,000	45,000
10,720	27/64	12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,110	7/16	12,000	118,000	71,000	45,000
11,200		12,000	118,000	71,000	45,000
11,500		12,000	118,000	71,000	45,000
11,510	29/64	12,000	118,000	71,000	45,000
11,910	15/32	12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,300	31/64	14,000	124,000	74,000	45,000
12,500		14,000	124,000	74,000	45,000
12,700	1/2	14,000	124,000	74,000	45,000
13,000		14,000	124,000	74,000	45,000
13,500		14,000	124,000	74,000	45,000
14,000		14,000	124,000	74,000	45,000
14,500		16,000	133,000	83,000	48,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
15,000		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,500		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,500		20,000	153,000	101,000	50,000
19,000		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



## İçten soğutma kanallı rasyo matkap



**P** öz bileme  $\geq \varnothing 3,000$  • yüzey Bileme • dar çap toleransları • delik yüzey finişleri çok iyi • ideal yağ basıncına dikkat edin

**M****K** ○**N** •**S****H**

Alüminyum ve Al-Alaşımaları • Yüksek Si içerikli Al malzemeler

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 752

Malzeme

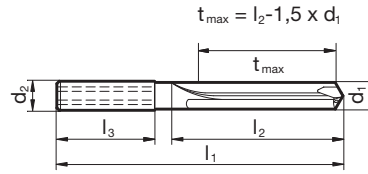
Kom. sert metal

Yüzey

○

sap formu

HA



Ürün no

6068

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	24,000	36,000
3,200		6,000	66,000	24,000	36,000
3,300		6,000	66,000	24,000	36,000
3,500		6,000	66,000	24,000	36,000
3,800		6,000	74,000	30,000	36,000
3,900		6,000	74,000	30,000	36,000
4,000		6,000	74,000	30,000	36,000
4,200		6,000	74,000	30,000	36,000
5,000		6,000	74,000	36,000	36,000
5,300		6,000	74,000	36,000	36,000
5,400		6,000	74,000	36,000	36,000
5,500		6,000	74,000	36,000	36,000
5,800		6,000	74,000	36,000	36,000
6,000		6,000	74,000	36,000	36,000
6,100		8,000	91,000	53,000	36,000
6,350	1/4	8,000	91,000	53,000	36,000
6,400		8,000	91,000	53,000	36,000
6,800		8,000	91,000	53,000	36,000
7,000		8,000	91,000	53,000	36,000
7,100		8,000	91,000	53,000	36,000
7,300		8,000	91,000	53,000	36,000
7,800		8,000	91,000	53,000	36,000
8,100		10,000	103,000	61,000	40,000
8,300		10,000	103,000	61,000	40,000
8,500		10,000	103,000	61,000	40,000
8,700		10,000	103,000	61,000	40,000
8,730	11/32	10,000	103,000	61,000	40,000
9,000		10,000	103,000	61,000	40,000
9,200		10,000	103,000	61,000	40,000
9,700		10,000	103,000	61,000	40,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
10,000		10,000	103,000	61,000	40,000
10,200		12,000	118,000	71,000	45,000
10,500		12,000	118,000	71,000	45,000
10,720	27/64	12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,110	7/16	12,000	118,000	71,000	45,000
11,500		12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,300	31/64	14,000	124,000	74,000	45,000
12,500		14,000	124,000	74,000	45,000
12,700	1/2	14,000	124,000	74,000	45,000
13,000		14,000	124,000	74,000	45,000
13,500		14,000	124,000	74,000	45,000
14,000		14,000	124,000	74,000	45,000
15,000		16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,500		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,500		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



İçten soğutma kanallı rasyo matkap



- P** • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi • maksimum performans
- M** ○
- K** ○
- N** ○ yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • 1400 N/mm<sup>2</sup> ye kadar alaşımlı/alaşımsız çelikler
- S** ○
- H** ○

Malzeme **Kom. sert metal**

Yüzey **F**

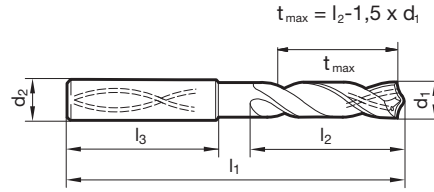
sap formu **HA**



Rasyo matkap ucu

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 754



Ürün no **5759**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	5,800		6,000	82,000	44,000	36,000
3,100		6,000	66,000	28,000	36,000	5,900		6,000	82,000	44,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	5,950	15/64	6,000	82,000	44,000	36,000
3,200		6,000	66,000	28,000	36,000	6,000		6,000	82,000	44,000	36,000
3,250		6,000	66,000	28,000	36,000	6,100		8,000	91,000	53,000	36,000
3,300		6,000	66,000	28,000	36,000	6,200		8,000	91,000	53,000	36,000
3,400		6,000	66,000	28,000	36,000	6,300		8,000	91,000	53,000	36,000
3,500		6,000	66,000	28,000	36,000	6,350	1/4	8,000	91,000	53,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	6,400		8,000	91,000	53,000	36,000
3,600		6,000	66,000	28,000	36,000	6,500		8,000	91,000	53,000	36,000
3,700		6,000	66,000	28,000	36,000	6,530		8,000	91,000	53,000	36,000
3,800		6,000	74,000	36,000	36,000	6,600		8,000	91,000	53,000	36,000
3,900		6,000	74,000	36,000	36,000	6,700		8,000	91,000	53,000	36,000
3,970	5/32	6,000	74,000	36,000	36,000	6,750	17/64	8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	6,800		8,000	91,000	53,000	36,000
4,040		6,000	74,000	36,000	36,000	6,900		8,000	91,000	53,000	36,000
4,100		6,000	74,000	36,000	36,000	7,000		8,000	91,000	53,000	36,000
4,200		6,000	74,000	36,000	36,000	7,100		8,000	91,000	53,000	36,000
4,300		6,000	74,000	36,000	36,000	7,140	9/32	8,000	91,000	53,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	7,200		8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	7,300		8,000	91,000	53,000	36,000
4,500		6,000	74,000	36,000	36,000	7,400		8,000	91,000	53,000	36,000
4,600		6,000	74,000	36,000	36,000	7,500		8,000	91,000	53,000	36,000
4,650		6,000	74,000	36,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
4,700		6,000	74,000	36,000	36,000	7,550		8,000	91,000	53,000	36,000
4,760	3/16	6,000	82,000	44,000	36,000	7,600		8,000	91,000	53,000	36,000
4,800		6,000	82,000	44,000	36,000	7,650		8,000	91,000	53,000	36,000
4,900		6,000	82,000	44,000	36,000	7,700		8,000	91,000	53,000	36,000
5,000		6,000	82,000	44,000	36,000	7,800		8,000	91,000	53,000	36,000
5,100		6,000	82,000	44,000	36,000	7,900		8,000	91,000	53,000	36,000
5,110		6,000	82,000	44,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
5,160	13/64	6,000	82,000	44,000	36,000	8,000		8,000	91,000	53,000	36,000
5,200		6,000	82,000	44,000	36,000	8,100		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	8,200		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	8,300		10,000	103,000	61,000	40,000
5,410		6,000	82,000	44,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	8,400		10,000	103,000	61,000	40,000
5,550		6,000	82,000	44,000	36,000	8,500		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	8,600		10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	8,700		10,000	103,000	61,000	40,000
5,650		6,000	82,000	44,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	8,800		10,000	103,000	61,000	40,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
8,900		10,000	103,000	61,000	40,000
9,000		10,000	103,000	61,000	40,000
9,100		10,000	103,000	61,000	40,000
9,130	23/64	10,000	103,000	61,000	40,000
9,200		10,000	103,000	61,000	40,000
9,250		10,000	103,000	61,000	40,000
9,300		10,000	103,000	61,000	40,000
9,340		10,000	103,000	61,000	40,000
9,400		10,000	103,000	61,000	40,000
9,500		10,000	103,000	61,000	40,000
9,520	3/8	10,000	103,000	61,000	40,000
9,550		10,000	103,000	61,000	40,000
9,600		10,000	103,000	61,000	40,000
9,700		10,000	103,000	61,000	40,000
9,800		10,000	103,000	61,000	40,000
9,900		10,000	103,000	61,000	40,000
9,920	25/64	10,000	103,000	61,000	40,000
10,000		10,000	103,000	61,000	40,000
10,100		12,000	118,000	71,000	45,000
10,200		12,000	118,000	71,000	45,000
10,300		12,000	118,000	71,000	45,000
10,320	13/32	12,000	118,000	71,000	45,000
10,400		12,000	118,000	71,000	45,000
10,500		12,000	118,000	71,000	45,000
10,600		12,000	118,000	71,000	45,000
10,700		12,000	118,000	71,000	45,000
10,720		12,000	118,000	71,000	45,000
10,800		12,000	118,000	71,000	45,000
10,900		12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,100		12,000	118,000	71,000	45,000
11,110	7/16	12,000	118,000	71,000	45,000
11,200		12,000	118,000	71,000	45,000
11,300		12,000	118,000	71,000	45,000
11,400		12,000	118,000	71,000	45,000
11,500		12,000	118,000	71,000	45,000
11,510		12,000	118,000	71,000	45,000
11,550		12,000	118,000	71,000	45,000
11,600		12,000	118,000	71,000	45,000
11,700		12,000	118,000	71,000	45,000
11,800		12,000	118,000	71,000	45,000
11,900		12,000	118,000	71,000	45,000
11,910	15/32	12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,100		14,000	124,000	77,000	45,000
12,200		14,000	124,000	77,000	45,000
12,300		14,000	124,000	77,000	45,000
12,400		14,000	124,000	77,000	45,000
12,500		14,000	124,000	77,000	45,000
12,600		14,000	124,000	77,000	45,000
12,700	1/2	14,000	124,000	77,000	45,000
12,800		14,000	124,000	77,000	45,000
12,900		14,000	124,000	77,000	45,000
13,000		14,000	124,000	77,000	45,000
13,100		14,000	124,000	77,000	45,000
13,200		14,000	124,000	77,000	45,000
13,300		14,000	124,000	77,000	45,000
13,400		14,000	124,000	77,000	45,000
13,490		14,000	124,000	77,000	45,000
13,500		14,000	124,000	77,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,600		14,000	124,000	77,000	45,000
13,700		14,000	124,000	77,000	45,000
13,800		14,000	124,000	77,000	45,000
13,890		14,000	124,000	77,000	45,000
13,900		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,100		16,000	133,000	83,000	48,000
14,200		16,000	133,000	83,000	48,000
14,290	9/16	16,000	133,000	83,000	48,000
14,400		16,000	133,000	83,000	48,000
14,500		16,000	133,000	83,000	48,000
14,600		16,000	133,000	83,000	48,000
14,680		16,000	133,000	83,000	48,000
14,700		16,000	133,000	83,000	48,000
14,800		16,000	133,000	83,000	48,000
14,900		16,000	133,000	83,000	48,000
15,000		16,000	133,000	83,000	48,000
15,080		16,000	133,000	83,000	48,000
15,100		16,000	133,000	83,000	48,000
15,200		16,000	133,000	83,000	48,000
15,300		16,000	133,000	83,000	48,000
15,400		16,000	133,000	83,000	48,000
15,480		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
15,550		16,000	133,000	83,000	48,000
15,600		16,000	133,000	83,000	48,000
15,700		16,000	133,000	83,000	48,000
15,800		16,000	133,000	83,000	48,000
15,870		16,000	133,000	83,000	48,000
15,900		16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,270		18,000	143,000	93,000	48,000
16,500		18,000	143,000	93,000	48,000
16,670		18,000	143,000	93,000	48,000
16,700		18,000	143,000	93,000	48,000
16,900		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,070		18,000	143,000	93,000	48,000
17,460		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
17,550		18,000	143,000	93,000	48,000
17,700		18,000	143,000	93,000	48,000
17,860		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,260		20,000	153,000	101,000	50,000
18,500		20,000	153,000	101,000	50,000
18,700		20,000	153,000	101,000	50,000
18,900		20,000	153,000	101,000	50,000
19,000		20,000	153,000	101,000	50,000
19,050	3/4	20,000	153,000	101,000	50,000
19,250		20,000	153,000	101,000	50,000
19,300		20,000	153,000	101,000	50,000
19,446		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
19,550		20,000	153,000	101,000	50,000
19,700		20,000	153,000	101,000	50,000
19,840		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



İçten soğutma kanallı rasyo matkap



- P** • öz bileme  $\geq \varnothing 3,000$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi
- M** ○
- K** •
- N** ○ yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşimli çelikler 1200 N/mm<sup>2</sup>'ye kadar • döküm malzemeler • bronz / pirinç • yüksek alaşimli AISi-Alaşımları
- S** ○
- H** ○

Malzeme **Kom. sert metal**

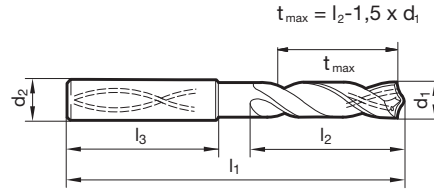
Yüzey **F**

sap formu HA

Rasyo matkap ucu

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 754



Ürün no **2479**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	5,800		6,000	82,000	44,000	36,000
3,100		6,000	66,000	28,000	36,000	5,900		6,000	82,000	44,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	5,950	15/64	6,000	82,000	44,000	36,000
3,200		6,000	66,000	28,000	36,000	6,000		6,000	82,000	44,000	36,000
3,250		6,000	66,000	28,000	36,000	6,100		8,000	91,000	53,000	36,000
3,300		6,000	66,000	28,000	36,000	6,200		8,000	91,000	53,000	36,000
3,400		6,000	66,000	28,000	36,000	6,300		8,000	91,000	53,000	36,000
3,500		6,000	66,000	28,000	36,000	6,350	1/4	8,000	91,000	53,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	6,400		8,000	91,000	53,000	36,000
3,600		6,000	66,000	28,000	36,000	6,500		8,000	91,000	53,000	36,000
3,700		6,000	66,000	28,000	36,000	6,530		8,000	91,000	53,000	36,000
3,800		6,000	74,000	36,000	36,000	6,600		8,000	91,000	53,000	36,000
3,900		6,000	74,000	36,000	36,000	6,700		8,000	91,000	53,000	36,000
3,970	5/32	6,000	74,000	36,000	36,000	6,750	17/64	8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	6,800		8,000	91,000	53,000	36,000
4,040		6,000	74,000	36,000	36,000	6,900		8,000	91,000	53,000	36,000
4,100		6,000	74,000	36,000	36,000	7,000		8,000	91,000	53,000	36,000
4,200		6,000	74,000	36,000	36,000	7,100		8,000	91,000	53,000	36,000
4,300		6,000	74,000	36,000	36,000	7,140	9/32	8,000	91,000	53,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	7,200		8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	7,300		8,000	91,000	53,000	36,000
4,500		6,000	74,000	36,000	36,000	7,400		8,000	91,000	53,000	36,000
4,600		6,000	74,000	36,000	36,000	7,500		8,000	91,000	53,000	36,000
4,650		6,000	74,000	36,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
4,700		6,000	74,000	36,000	36,000	7,550		8,000	91,000	53,000	36,000
4,760	3/16	6,000	82,000	44,000	36,000	7,600		8,000	91,000	53,000	36,000
4,800		6,000	82,000	44,000	36,000	7,650		8,000	91,000	53,000	36,000
4,900		6,000	82,000	44,000	36,000	7,700		8,000	91,000	53,000	36,000
5,000		6,000	82,000	44,000	36,000	7,800		8,000	91,000	53,000	36,000
5,100		6,000	82,000	44,000	36,000	7,900		8,000	91,000	53,000	36,000
5,110		6,000	82,000	44,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
5,160	13/64	6,000	82,000	44,000	36,000	8,000		8,000	91,000	53,000	36,000
5,200		6,000	82,000	44,000	36,000	8,100		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	8,200		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	8,300		10,000	103,000	61,000	40,000
5,410		6,000	82,000	44,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	8,400		10,000	103,000	61,000	40,000
5,550		6,000	82,000	44,000	36,000	8,500		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	8,600		10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	8,700		10,000	103,000	61,000	40,000
5,650		6,000	82,000	44,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	8,800		10,000	103,000	61,000	40,000



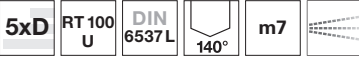
d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
8,900		10,000	103,000	61,000	40,000
9,000		10,000	103,000	61,000	40,000
9,100		10,000	103,000	61,000	40,000
9,130	23/64	10,000	103,000	61,000	40,000
9,200		10,000	103,000	61,000	40,000
9,250		10,000	103,000	61,000	40,000
9,300		10,000	103,000	61,000	40,000
9,340		10,000	103,000	61,000	40,000
9,400		10,000	103,000	61,000	40,000
9,500		10,000	103,000	61,000	40,000
9,520	3/8	10,000	103,000	61,000	40,000
9,550		10,000	103,000	61,000	40,000
9,600		10,000	103,000	61,000	40,000
9,700		10,000	103,000	61,000	40,000
9,800		10,000	103,000	61,000	40,000
9,900		10,000	103,000	61,000	40,000
9,920	25/64	10,000	103,000	61,000	40,000
10,000		10,000	103,000	61,000	40,000
10,100		12,000	118,000	71,000	45,000
10,200		12,000	118,000	71,000	45,000
10,300		12,000	118,000	71,000	45,000
10,320	13/32	12,000	118,000	71,000	45,000
10,400		12,000	118,000	71,000	45,000
10,500		12,000	118,000	71,000	45,000
10,600		12,000	118,000	71,000	45,000
10,700		12,000	118,000	71,000	45,000
10,720	27/64	12,000	118,000	71,000	45,000
10,800		12,000	118,000	71,000	45,000
10,900		12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,100		12,000	118,000	71,000	45,000
11,110	7/16	12,000	118,000	71,000	45,000
11,200		12,000	118,000	71,000	45,000
11,300		12,000	118,000	71,000	45,000
11,400		12,000	118,000	71,000	45,000
11,500		12,000	118,000	71,000	45,000
11,510	29/64	12,000	118,000	71,000	45,000
11,550		12,000	118,000	71,000	45,000
11,600		12,000	118,000	71,000	45,000
11,700		12,000	118,000	71,000	45,000
11,800		12,000	118,000	71,000	45,000
11,900		12,000	118,000	71,000	45,000
11,910	15/32	12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,100		14,000	124,000	77,000	45,000
12,200		14,000	124,000	77,000	45,000
12,300	31/64	14,000	124,000	77,000	45,000
12,400		14,000	124,000	77,000	45,000
12,500		14,000	124,000	77,000	45,000
12,600		14,000	124,000	77,000	45,000
12,700	1/2	14,000	124,000	77,000	45,000
12,800		14,000	124,000	77,000	45,000
13,000		14,000	124,000	77,000	45,000
13,100	33/64	14,000	124,000	77,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,200		14,000	124,000	77,000	45,000
13,490	17/32	14,000	124,000	77,000	45,000
13,500		14,000	124,000	77,000	45,000
13,600		14,000	124,000	77,000	45,000
13,700		14,000	124,000	77,000	45,000
13,800		14,000	124,000	77,000	45,000
13,890	35/64	14,000	124,000	77,000	45,000
13,900		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,100		16,000	133,000	83,000	48,000
14,200		16,000	133,000	83,000	48,000
14,290	9/16	16,000	133,000	83,000	48,000
14,500		16,000	133,000	83,000	48,000
14,680	37/64	16,000	133,000	83,000	48,000
14,700		16,000	133,000	83,000	48,000
14,800		16,000	133,000	83,000	48,000
15,000		16,000	133,000	83,000	48,000
15,080	19/32	16,000	133,000	83,000	48,000
15,100		16,000	133,000	83,000	48,000
15,200		16,000	133,000	83,000	48,000
15,480	39/64	16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
15,600		16,000	133,000	83,000	48,000
15,700		16,000	133,000	83,000	48,000
15,800		16,000	133,000	83,000	48,000
15,870	5/8	16,000	133,000	83,000	48,000
15,900		16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,270	41/64	18,000	143,000	93,000	48,000
16,500		18,000	143,000	93,000	48,000
16,670	21/32	18,000	143,000	93,000	48,000
16,700		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,070	43/64	18,000	143,000	93,000	48,000
17,460	11/16	18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
17,700		18,000	143,000	93,000	48,000
17,860	45/64	18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,260	23/32	20,000	153,000	101,000	50,000
18,500		20,000	153,000	101,000	50,000
18,700		20,000	153,000	101,000	50,000
18,900		20,000	153,000	101,000	50,000
19,000		20,000	153,000	101,000	50,000
19,050	3/4	20,000	153,000	101,000	50,000
19,250		20,000	153,000	101,000	50,000
19,300		20,000	153,000	101,000	50,000
19,446		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
19,700		20,000	153,000	101,000	50,000
19,840	25/32	20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000





İçten soğutma kanallı rasyo matkap



**P** • öz bileme  $\geq \varnothing 3,300$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi

**M** ○

**K** •

**N** ○ yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşimli çelikler 1200 N/mm<sup>2</sup>'ye kadar • döküm malzemeler • bronz / pirinç • yüksek alaşimli AISi-Alaşımları

**S** ○

**H** ○

Malzeme **Kom. sert metal**

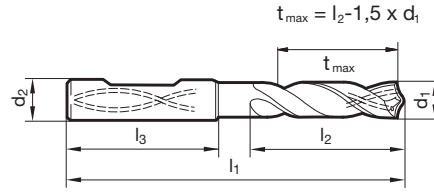
Yüzey **F**

sap formu HE

Rasyo matkap ucu

**GÜHRINGNAVIGATOR**

Kesme verileri sayfası 754



Ürün no **2471**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,300		6,000	66,000	28,000	36,000	8,600		10,000	103,000	61,000	40,000
3,500		6,000	66,000	28,000	36,000	8,900		10,000	103,000	61,000	40,000
3,700		6,000	66,000	28,000	36,000	9,000		10,000	103,000	61,000	40,000
4,000		6,000	74,000	36,000	36,000	9,130	23/64	10,000	103,000	61,000	40,000
4,100		6,000	74,000	36,000	36,000	9,200		10,000	103,000	61,000	40,000
4,200		6,000	74,000	36,000	36,000	9,250		10,000	103,000	61,000	40,000
4,300		6,000	74,000	36,000	36,000	9,500		10,000	103,000	61,000	40,000
4,400		6,000	74,000	36,000	36,000	9,700		10,000	103,000	61,000	40,000
4,500		6,000	74,000	36,000	36,000	9,800		10,000	103,000	61,000	40,000
4,650		6,000	74,000	36,000	36,000	9,900		10,000	103,000	61,000	40,000
4,700		6,000	74,000	36,000	36,000	10,000		10,000	103,000	61,000	40,000
4,900		6,000	82,000	44,000	36,000	10,100		12,000	118,000	71,000	45,000
5,000		6,000	82,000	44,000	36,000	10,200		12,000	118,000	71,000	45,000
5,100		6,000	82,000	44,000	36,000	10,300		12,000	118,000	71,000	45,000
5,200		6,000	82,000	44,000	36,000	10,400		12,000	118,000	71,000	45,000
5,300		6,000	82,000	44,000	36,000	10,500		12,000	118,000	71,000	45,000
5,400		6,000	82,000	44,000	36,000	10,600		12,000	118,000	71,000	45,000
5,500		6,000	82,000	44,000	36,000	10,800		12,000	118,000	71,000	45,000
5,550		6,000	82,000	44,000	36,000	11,000		12,000	118,000	71,000	45,000
5,700		6,000	82,000	44,000	36,000	11,100		12,000	118,000	71,000	45,000
6,000		6,000	82,000	44,000	36,000	11,300		12,000	118,000	71,000	45,000
6,100		8,000	91,000	53,000	36,000	11,400		12,000	118,000	71,000	45,000
6,200		8,000	91,000	53,000	36,000	11,500		12,000	118,000	71,000	45,000
6,300		8,000	91,000	53,000	36,000	11,600		12,000	118,000	71,000	45,000
6,350	1/4	8,000	91,000	53,000	36,000	11,700		12,000	118,000	71,000	45,000
6,400		8,000	91,000	53,000	36,000	11,800		12,000	118,000	71,000	45,000
6,500		8,000	91,000	53,000	36,000	11,900		12,000	118,000	71,000	45,000
6,600		8,000	91,000	53,000	36,000	12,000		12,000	118,000	71,000	45,000
6,800		8,000	91,000	53,000	36,000	12,100		14,000	124,000	77,000	45,000
6,900		8,000	91,000	53,000	36,000	12,200		14,000	124,000	77,000	45,000
7,000		8,000	91,000	53,000	36,000	12,300	31/64	14,000	124,000	77,000	45,000
7,100		8,000	91,000	53,000	36,000	12,400		14,000	124,000	77,000	45,000
7,200		8,000	91,000	53,000	36,000	12,500		14,000	124,000	77,000	45,000
7,300		8,000	91,000	53,000	36,000	12,700	1/2	14,000	124,000	77,000	45,000
7,500		8,000	91,000	53,000	36,000	13,000		14,000	124,000	77,000	45,000
7,700		8,000	91,000	53,000	36,000	13,500		14,000	124,000	77,000	45,000
7,800		8,000	91,000	53,000	36,000	13,800		14,000	124,000	77,000	45,000
8,000		8,000	91,000	53,000	36,000	14,000		14,000	124,000	77,000	45,000
8,100		10,000	103,000	61,000	40,000	14,100		16,000	133,000	83,000	48,000
8,200		10,000	103,000	61,000	40,000	14,200		16,000	133,000	83,000	48,000
8,300		10,000	103,000	61,000	40,000	14,500		16,000	133,000	83,000	48,000
8,500		10,000	103,000	61,000	40,000	14,700		16,000	133,000	83,000	48,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
15,000		16,000	133,000	83,000	48,000
15,200		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
15,800		16,000	133,000	83,000	48,000
16,500		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,300		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,200		20,000	153,000	101,000	50,000
18,500		20,000	153,000	101,000	50,000
18,600		20,000	153,000	101,000	50,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
19,000		20,000	153,000	101,000	50,000
19,050	3/4	20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



İçten soğutma kanallı rasyo matkap



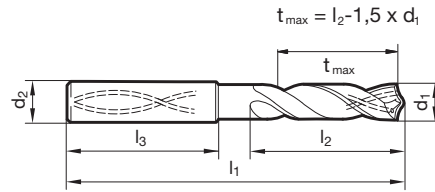
P	•	öz bileme $\geq \varnothing 3,000$ • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi
M	○	
K	•	
N	○	yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşimli çelikler 1200 N/mm <sup>2</sup> 'ye kadar • döküm malzemeler • bronz / pirinç • yüksek alaşimli AISi-Alaşımları
S	○	
H	○	

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 754

Malzeme	<b>Kom. sert metal</b>
Yüzey	<b>S</b>
sap formu	HA

Rasyo matkap ucu



Ürün no **1663**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	8,200		10,000	103,000	61,000	40,000
3,700		6,000	66,000	28,000	36,000	8,400		10,000	103,000	61,000	40,000
4,000		6,000	74,000	36,000	36,000	8,500		10,000	103,000	61,000	40,000
4,500		6,000	74,000	36,000	36,000	8,800		10,000	103,000	61,000	40,000
4,650		6,000	74,000	36,000	36,000	9,000		10,000	103,000	61,000	40,000
4,700		6,000	74,000	36,000	36,000	9,200		10,000	103,000	61,000	40,000
4,800		6,000	82,000	44,000	36,000	9,400		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	9,500		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	10,500		12,000	118,000	71,000	45,000
5,800		6,000	82,000	44,000	36,000	11,000		12,000	118,000	71,000	45,000
6,000		6,000	82,000	44,000	36,000	11,500		12,000	118,000	71,000	45,000
6,100		8,000	91,000	53,000	36,000	11,800		12,000	118,000	71,000	45,000
6,200		8,000	91,000	53,000	36,000	12,000		12,000	118,000	71,000	45,000
6,300		8,000	91,000	53,000	36,000	13,000		14,000	124,000	77,000	45,000
6,350	1/4	8,000	91,000	53,000	36,000	14,000		14,000	124,000	77,000	45,000
6,400		8,000	91,000	53,000	36,000	14,200		16,000	133,000	83,000	48,000
6,500		8,000	91,000	53,000	36,000	14,500		16,000	133,000	83,000	48,000
6,700		8,000	91,000	53,000	36,000	15,000		16,000	133,000	83,000	48,000
6,800		8,000	91,000	53,000	36,000	15,500		16,000	133,000	83,000	48,000
7,000		8,000	91,000	53,000	36,000	16,000		16,000	133,000	83,000	48,000
7,100		8,000	91,000	53,000	36,000	17,000		18,000	143,000	93,000	48,000
7,500		8,000	91,000	53,000	36,000	17,500		18,000	143,000	93,000	48,000
7,800		8,000	91,000	53,000	36,000	19,000		20,000	153,000	101,000	50,000
8,000		8,000	91,000	53,000	36,000	19,500		20,000	153,000	101,000	50,000



## İçten soğutma kanallı rasyo matkap



**P** • öz bileme  $\geq \varnothing 3,300$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi

**M** ○

**K** •

**N** ○

**S** ○

**H** ○

yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşimli çelikler 1200 N/mm<sup>2</sup>'ye kadar • döküm malzemeler • bronz / pirinç • yüksek alaşimli AISi-Alaşımları

## GÜHRING NAVIGATOR

Kesme verileri sayfası 754

Malzeme

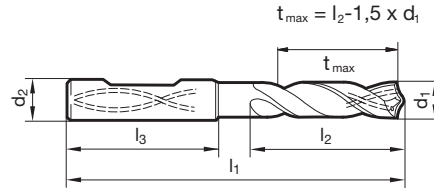
Kom. sert metal

Yüzey

S

sap formu

HE



Ürün no

1183

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,300		6,000	66,000	28,000	36,000	7,200		8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	7,300		8,000	91,000	53,000	36,000
4,100		6,000	74,000	36,000	36,000	7,400		8,000	91,000	53,000	36,000
4,200		6,000	74,000	36,000	36,000	7,500		8,000	91,000	53,000	36,000
4,300		6,000	74,000	36,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	7,600		8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	7,700		8,000	91,000	53,000	36,000
4,500		6,000	74,000	36,000	36,000	7,800		8,000	91,000	53,000	36,000
4,600		6,000	74,000	36,000	36,000	7,900		8,000	91,000	53,000	36,000
4,650		6,000	74,000	36,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
4,700		6,000	74,000	36,000	36,000	8,000		8,000	91,000	53,000	36,000
4,760	3/16	6,000	82,000	44,000	36,000	8,100		10,000	103,000	61,000	40,000
4,800		6,000	82,000	44,000	36,000	8,200		10,000	103,000	61,000	40,000
4,900		6,000	82,000	44,000	36,000	8,300		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	8,400		10,000	103,000	61,000	40,000
5,160	13/64	6,000	82,000	44,000	36,000	8,500		10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	8,600		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	8,700		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	8,800		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	8,900		10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	9,000		10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	9,100		10,000	103,000	61,000	40,000
5,800		6,000	82,000	44,000	36,000	9,130	23/64	10,000	103,000	61,000	40,000
5,900		6,000	82,000	44,000	36,000	9,200		10,000	103,000	61,000	40,000
5,950	15/64	6,000	82,000	44,000	36,000	9,300		10,000	103,000	61,000	40,000
6,000		6,000	82,000	44,000	36,000	9,400		10,000	103,000	61,000	40,000
6,100		8,000	91,000	53,000	36,000	9,500		10,000	103,000	61,000	40,000
6,200		8,000	91,000	53,000	36,000	9,520	3/8	10,000	103,000	61,000	40,000
6,300		8,000	91,000	53,000	36,000	9,600		10,000	103,000	61,000	40,000
6,350	1/4	8,000	91,000	53,000	36,000	9,700		10,000	103,000	61,000	40,000
6,400		8,000	91,000	53,000	36,000	9,800		10,000	103,000	61,000	40,000
6,500		8,000	91,000	53,000	36,000	9,900		10,000	103,000	61,000	40,000
6,600		8,000	91,000	53,000	36,000	9,920	25/64	10,000	103,000	61,000	40,000
6,700		8,000	91,000	53,000	36,000	10,000		10,000	103,000	61,000	40,000
6,750	17/64	8,000	91,000	53,000	36,000	10,100		12,000	118,000	71,000	45,000
6,800		8,000	91,000	53,000	36,000	10,200		12,000	118,000	71,000	45,000
6,900		8,000	91,000	53,000	36,000	10,300		12,000	118,000	71,000	45,000
7,000		8,000	91,000	53,000	36,000	10,320	13/32	12,000	118,000	71,000	45,000
7,100		8,000	91,000	53,000	36,000	10,400		12,000	118,000	71,000	45,000
7,140	9/32	8,000	91,000	53,000	36,000	10,500		12,000	118,000	71,000	45,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
10,600		12,000	118,000	71,000	45,000
10,700		12,000	118,000	71,000	45,000
10,720	27/64	12,000	118,000	71,000	45,000
10,800		12,000	118,000	71,000	45,000
10,900		12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,100		12,000	118,000	71,000	45,000
11,110	7/16	12,000	118,000	71,000	45,000
11,200		12,000	118,000	71,000	45,000
11,300		12,000	118,000	71,000	45,000
11,400		12,000	118,000	71,000	45,000
11,500		12,000	118,000	71,000	45,000
11,510	29/64	12,000	118,000	71,000	45,000
11,600		12,000	118,000	71,000	45,000
11,700		12,000	118,000	71,000	45,000
11,800		12,000	118,000	71,000	45,000
11,900		12,000	118,000	71,000	45,000
11,910	15/32	12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,100		14,000	124,000	77,000	45,000
12,200		14,000	124,000	77,000	45,000
12,300	31/64	14,000	124,000	77,000	45,000
12,400		14,000	124,000	77,000	45,000
12,500		14,000	124,000	77,000	45,000
12,600		14,000	124,000	77,000	45,000
12,700	1/2	14,000	124,000	77,000	45,000
12,800		14,000	124,000	77,000	45,000
12,900		14,000	124,000	77,000	45,000
13,000		14,000	124,000	77,000	45,000
13,100	33/64	14,000	124,000	77,000	45,000
13,200		14,000	124,000	77,000	45,000
13,300		14,000	124,000	77,000	45,000
13,400		14,000	124,000	77,000	45,000
13,500		14,000	124,000	77,000	45,000
13,600		14,000	124,000	77,000	45,000
13,700		14,000	124,000	77,000	45,000
13,800		14,000	124,000	77,000	45,000
13,890	35/64	14,000	124,000	77,000	45,000
13,900		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,100		16,000	133,000	83,000	48,000
14,200		16,000	133,000	83,000	48,000
14,290	9/16	16,000	133,000	83,000	48,000
14,300		16,000	133,000	83,000	48,000
14,400		16,000	133,000	83,000	48,000
14,500		16,000	133,000	83,000	48,000
14,600		16,000	133,000	83,000	48,000
14,680	37/64	16,000	133,000	83,000	48,000
14,700		16,000	133,000	83,000	48,000
14,800		16,000	133,000	83,000	48,000
14,900		16,000	133,000	83,000	48,000
15,000		16,000	133,000	83,000	48,000
15,100		16,000	133,000	83,000	48,000
15,200		16,000	133,000	83,000	48,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
15,300		16,000	133,000	83,000	48,000
15,400		16,000	133,000	83,000	48,000
15,480	39/64	16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
15,800		16,000	133,000	83,000	48,000
15,870	5/8	16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,100		18,000	143,000	93,000	48,000
16,200		18,000	143,000	93,000	48,000
16,270	41/64	18,000	143,000	93,000	48,000
16,400		18,000	143,000	93,000	48,000
16,500		18,000	143,000	93,000	48,000
16,600		18,000	143,000	93,000	48,000
16,700		18,000	143,000	93,000	48,000
16,800		18,000	143,000	93,000	48,000
16,900		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,070	43/64	18,000	143,000	93,000	48,000
17,200		18,000	143,000	93,000	48,000
17,300		18,000	143,000	93,000	48,000
17,400		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
17,600		18,000	143,000	93,000	48,000
17,700		18,000	143,000	93,000	48,000
17,800		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,100		20,000	153,000	101,000	50,000
18,200		20,000	153,000	101,000	50,000
18,300		20,000	153,000	101,000	50,000
18,400		20,000	153,000	101,000	50,000
18,500		20,000	153,000	101,000	50,000
18,600		20,000	153,000	101,000	50,000
18,650	47/64	20,000	153,000	101,000	50,000
18,700		20,000	153,000	101,000	50,000
18,800		20,000	153,000	101,000	50,000
18,900		20,000	153,000	101,000	50,000
19,000		20,000	153,000	101,000	50,000
19,050	3/4	20,000	153,000	101,000	50,000
19,300		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
19,700		20,000	153,000	101,000	50,000
19,800		20,000	153,000	101,000	50,000
19,900		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



## İçten soğutma kanallı rasyo matkap



**P** • öz bileme  $\geq \varnothing 3,000$  • koni bileme • ana kesici ağız hafif konkavdır • optimize edilmiş kesme geometrisi

**M****K****N****S** •**H** ○

1600 N/mm<sup>2</sup> ye kadar alışımlı ve yüksek mukavemetli çelikler • Inconel, Hastelloy, Monel • Titanyum ve Ti alaşımları

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 756

Malzeme

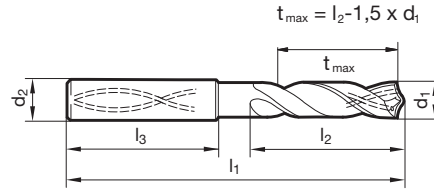
Kom. sert metal

Yüzeý

Y

sap formu

HA



Ürün no

8521

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	6,100		8,000	91,000	53,000	36,000
3,100		6,000	66,000	28,000	36,000	6,200		8,000	91,000	53,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	6,300		8,000	91,000	53,000	36,000
3,200		6,000	66,000	28,000	36,000	6,350	1/4	8,000	91,000	53,000	36,000
3,250		6,000	66,000	28,000	36,000	6,400		8,000	91,000	53,000	36,000
3,300		6,000	66,000	28,000	36,000	6,500		8,000	91,000	53,000	36,000
3,400		6,000	66,000	28,000	36,000	6,600		8,000	91,000	53,000	36,000
3,500		6,000	66,000	28,000	36,000	6,700		8,000	91,000	53,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	6,750	17/64	8,000	91,000	53,000	36,000
3,600		6,000	66,000	28,000	36,000	6,800		8,000	91,000	53,000	36,000
3,700		6,000	66,000	28,000	36,000	6,900		8,000	91,000	53,000	36,000
3,800		6,000	74,000	36,000	36,000	7,000		8,000	91,000	53,000	36,000
3,900		6,000	74,000	36,000	36,000	7,100		8,000	91,000	53,000	36,000
3,970	5/32	6,000	74,000	36,000	36,000	7,140	9/32	8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	7,200		8,000	91,000	53,000	36,000
4,100		6,000	74,000	36,000	36,000	7,300		8,000	91,000	53,000	36,000
4,200		6,000	74,000	36,000	36,000	7,400		8,000	91,000	53,000	36,000
4,300		6,000	74,000	36,000	36,000	7,500		8,000	91,000	53,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	7,600		8,000	91,000	53,000	36,000
4,500		6,000	74,000	36,000	36,000	7,700		8,000	91,000	53,000	36,000
4,600		6,000	74,000	36,000	36,000	7,800		8,000	91,000	53,000	36,000
4,650		6,000	74,000	36,000	36,000	7,900		8,000	91,000	53,000	36,000
4,700		6,000	74,000	36,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
4,760	3/16	6,000	82,000	44,000	36,000	8,000		8,000	91,000	53,000	36,000
4,800		6,000	82,000	44,000	36,000	8,100		10,000	103,000	61,000	40,000
4,900		6,000	82,000	44,000	36,000	8,200		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	8,300		10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
5,160	13/64	6,000	82,000	44,000	36,000	8,400		10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	8,500		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	8,600		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	8,700		10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,550		6,000	82,000	44,000	36,000	8,800		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	8,900		10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	9,000		10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	9,100		10,000	103,000	61,000	40,000
5,800		6,000	82,000	44,000	36,000	9,130	23/64	10,000	103,000	61,000	40,000
5,900		6,000	82,000	44,000	36,000	9,200		10,000	103,000	61,000	40,000
5,950	15/64	6,000	82,000	44,000	36,000	9,250		10,000	103,000	61,000	40,000
6,000		6,000	82,000	44,000	36,000	9,300		10,000	103,000	61,000	40,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,400		10,000	103,000	61,000	40,000
9,500		10,000	103,000	61,000	40,000
9,520	3/8	10,000	103,000	61,000	40,000
9,600		10,000	103,000	61,000	40,000
9,700		10,000	103,000	61,000	40,000
9,800		10,000	103,000	61,000	40,000
9,900		10,000	103,000	61,000	40,000
9,920	25/64	10,000	103,000	61,000	40,000
10,000		10,000	103,000	61,000	40,000
10,100		12,000	118,000	71,000	45,000
10,200		12,000	118,000	71,000	45,000
10,300		12,000	118,000	71,000	45,000
10,320	13/32	12,000	118,000	71,000	45,000
10,400		12,000	118,000	71,000	45,000
10,500		12,000	118,000	71,000	45,000
10,600		12,000	118,000	71,000	45,000
10,700		12,000	118,000	71,000	45,000
10,720	27/64	12,000	118,000	71,000	45,000
10,800		12,000	118,000	71,000	45,000
10,900		12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,100		12,000	118,000	71,000	45,000
11,110	7/16	12,000	118,000	71,000	45,000
11,200		12,000	118,000	71,000	45,000
11,300		12,000	118,000	71,000	45,000
11,400		12,000	118,000	71,000	45,000
11,500		12,000	118,000	71,000	45,000
11,510	29/64	12,000	118,000	71,000	45,000
11,600		12,000	118,000	71,000	45,000
11,700		12,000	118,000	71,000	45,000
11,800		12,000	118,000	71,000	45,000
11,900		12,000	118,000	71,000	45,000
11,910	15/32	12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,200		14,000	124,000	77,000	45,000
12,500		14,000	124,000	77,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
12,700	1/2	14,000	124,000	77,000	45,000
12,800		14,000	124,000	77,000	45,000
13,000		14,000	124,000	77,000	45,000
13,300		14,000	124,000	77,000	45,000
13,500		14,000	124,000	77,000	45,000
13,700		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,200		16,000	133,000	83,000	48,000
14,290	9/16	16,000	133,000	83,000	48,000
14,300		16,000	133,000	83,000	48,000
14,500		16,000	133,000	83,000	48,000
14,700		16,000	133,000	83,000	48,000
15,000		16,000	133,000	83,000	48,000
15,200		16,000	133,000	83,000	48,000
15,300		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
15,700		16,000	133,000	83,000	48,000
15,870	5/8	16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,300		18,000	143,000	93,000	48,000
16,500		18,000	143,000	93,000	48,000
16,900		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,300		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,500		20,000	153,000	101,000	50,000
18,900		20,000	153,000	101,000	50,000
19,000		20,000	153,000	101,000	50,000
19,050	3/4	20,000	153,000	101,000	50,000
19,300		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



## İçten soğutma kanallı rasyo matkap



**P** • öz bileme  $\geq \varnothing 3,000$  • koni bileme • ana kesici ağız hafif konkavdır • optimize edilmiş kesme geometrisi

**M****K****N****S** •**H** ○

1600 N/mm<sup>2</sup> ye kadar alışımlı ve yüksek mukavemetli çelikler • Inconel, Hastelloy, Monel • Titanyum ve Ti alaşımları

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 756

Malzeme

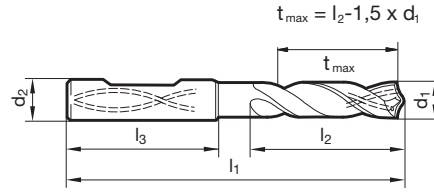
Kom. sert metal

Yüzeý

Y

sap formu

HE



Ürün no

8621

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	6,100		8,000	91,000	53,000	36,000
3,100		6,000	66,000	28,000	36,000	6,200		8,000	91,000	53,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	6,300		8,000	91,000	53,000	36,000
3,200		6,000	66,000	28,000	36,000	6,350	1/4	8,000	91,000	53,000	36,000
3,250		6,000	66,000	28,000	36,000	6,400		8,000	91,000	53,000	36,000
3,300		6,000	66,000	28,000	36,000	6,500		8,000	91,000	53,000	36,000
3,400		6,000	66,000	28,000	36,000	6,600		8,000	91,000	53,000	36,000
3,500		6,000	66,000	28,000	36,000	6,700		8,000	91,000	53,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	6,750	17/64	8,000	91,000	53,000	36,000
3,600		6,000	66,000	28,000	36,000	6,800		8,000	91,000	53,000	36,000
3,700		6,000	66,000	28,000	36,000	6,900		8,000	91,000	53,000	36,000
3,800		6,000	74,000	36,000	36,000	7,000		8,000	91,000	53,000	36,000
3,900		6,000	74,000	36,000	36,000	7,100		8,000	91,000	53,000	36,000
3,970	5/32	6,000	74,000	36,000	36,000	7,140	9/32	8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	7,200		8,000	91,000	53,000	36,000
4,100		6,000	74,000	36,000	36,000	7,300		8,000	91,000	53,000	36,000
4,200		6,000	74,000	36,000	36,000	7,400		8,000	91,000	53,000	36,000
4,300		6,000	74,000	36,000	36,000	7,500		8,000	91,000	53,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	7,600		8,000	91,000	53,000	36,000
4,500		6,000	74,000	36,000	36,000	7,700		8,000	91,000	53,000	36,000
4,600		6,000	74,000	36,000	36,000	7,800		8,000	91,000	53,000	36,000
4,650		6,000	74,000	36,000	36,000	7,900		8,000	91,000	53,000	36,000
4,700		6,000	74,000	36,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
4,760	3/16	6,000	82,000	44,000	36,000	8,000		8,000	91,000	53,000	36,000
4,800		6,000	82,000	44,000	36,000	8,100		10,000	103,000	61,000	40,000
4,900		6,000	82,000	44,000	36,000	8,200		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	8,300		10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
5,160	13/64	6,000	82,000	44,000	36,000	8,400		10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	8,500		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	8,600		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	8,700		10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,550		6,000	82,000	44,000	36,000	8,800		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	8,900		10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	9,000		10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	9,100		10,000	103,000	61,000	40,000
5,800		6,000	82,000	44,000	36,000	9,130	23/64	10,000	103,000	61,000	40,000
5,900		6,000	82,000	44,000	36,000	9,200		10,000	103,000	61,000	40,000
5,950	15/64	6,000	82,000	44,000	36,000	9,250		10,000	103,000	61,000	40,000
6,000		6,000	82,000	44,000	36,000	9,300		10,000	103,000	61,000	40,000





d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,400		10,000	103,000	61,000	40,000
9,500		10,000	103,000	61,000	40,000
9,520	3/8	10,000	103,000	61,000	40,000
9,600		10,000	103,000	61,000	40,000
9,700		10,000	103,000	61,000	40,000
9,800		10,000	103,000	61,000	40,000
9,900		10,000	103,000	61,000	40,000
9,920	25/64	10,000	103,000	61,000	40,000
10,000		10,000	103,000	61,000	40,000
10,100		12,000	118,000	71,000	45,000
10,200		12,000	118,000	71,000	45,000
10,300		12,000	118,000	71,000	45,000
10,320	13/32	12,000	118,000	71,000	45,000
10,400		12,000	118,000	71,000	45,000
10,500		12,000	118,000	71,000	45,000
10,600		12,000	118,000	71,000	45,000
10,700		12,000	118,000	71,000	45,000
10,800		12,000	118,000	71,000	45,000
10,900		12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,100		12,000	118,000	71,000	45,000
11,110	7/16	12,000	118,000	71,000	45,000
11,200		12,000	118,000	71,000	45,000
11,300		12,000	118,000	71,000	45,000
11,400		12,000	118,000	71,000	45,000
11,500		12,000	118,000	71,000	45,000
11,600		12,000	118,000	71,000	45,000
11,700		12,000	118,000	71,000	45,000
11,800		12,000	118,000	71,000	45,000
11,900		12,000	118,000	71,000	45,000
11,910	15/32	12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,200		14,000	124,000	77,000	45,000
12,500		14,000	124,000	77,000	45,000
12,700	1/2	14,000	124,000	77,000	45,000
12,800		14,000	124,000	77,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,000		14,000	124,000	77,000	45,000
13,300		14,000	124,000	77,000	45,000
13,500		14,000	124,000	77,000	45,000
13,700		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,200		16,000	133,000	83,000	48,000
14,290	9/16	16,000	133,000	83,000	48,000
14,300		16,000	133,000	83,000	48,000
14,500		16,000	133,000	83,000	48,000
14,700		16,000	133,000	83,000	48,000
15,000		16,000	133,000	83,000	48,000
15,200		16,000	133,000	83,000	48,000
15,300		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
15,700		16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,300		18,000	143,000	93,000	48,000
16,500		18,000	143,000	93,000	48,000
16,900		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,300		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,500		20,000	153,000	101,000	50,000
18,900		20,000	153,000	101,000	50,000
19,000		20,000	153,000	101,000	50,000
19,050	3/4	20,000	153,000	101,000	50,000
19,300		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



## İçten soğutma kanallı rasyo matkap



**P** öz bileme  $\geq \varnothing 3,000$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi

**M** •**K**

**N** pas/asit/ısıya dayanıklı çelikler • Titanyum ve Ti alaşımları • Inconel, Hastelloy, Monel

**S** •**H**

Malzeme

Kom. sert metal

Yüzey

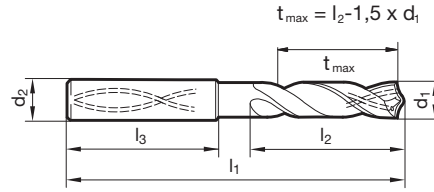
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## GÜHRING NAVIGATOR

Kesme verileri sayfası 756



Ürün no

8511

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	6,100		8,000	91,000	53,000	36,000
3,100		6,000	66,000	28,000	36,000	6,200		8,000	91,000	53,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	6,300		8,000	91,000	53,000	36,000
3,200		6,000	66,000	28,000	36,000	6,350	1/4	8,000	91,000	53,000	36,000
3,250		6,000	66,000	28,000	36,000	6,400		8,000	91,000	53,000	36,000
3,300		6,000	66,000	28,000	36,000	6,500		8,000	91,000	53,000	36,000
3,400		6,000	66,000	28,000	36,000	6,600		8,000	91,000	53,000	36,000
3,500		6,000	66,000	28,000	36,000	6,700		8,000	91,000	53,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	6,750	17/64	8,000	91,000	53,000	36,000
3,600		6,000	66,000	28,000	36,000	6,800		8,000	91,000	53,000	36,000
3,700		6,000	66,000	28,000	36,000	6,900		8,000	91,000	53,000	36,000
3,800		6,000	74,000	36,000	36,000	7,000		8,000	91,000	53,000	36,000
3,900		6,000	74,000	36,000	36,000	7,100		8,000	91,000	53,000	36,000
3,970	5/32	6,000	74,000	36,000	36,000	7,140	9/32	8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	7,200		8,000	91,000	53,000	36,000
4,100		6,000	74,000	36,000	36,000	7,300		8,000	91,000	53,000	36,000
4,200		6,000	74,000	36,000	36,000	7,400		8,000	91,000	53,000	36,000
4,300		6,000	74,000	36,000	36,000	7,500		8,000	91,000	53,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	7,600		8,000	91,000	53,000	36,000
4,500		6,000	74,000	36,000	36,000	7,700		8,000	91,000	53,000	36,000
4,600		6,000	74,000	36,000	36,000	7,800		8,000	91,000	53,000	36,000
4,650		6,000	74,000	36,000	36,000	7,900		8,000	91,000	53,000	36,000
4,700		6,000	74,000	36,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
4,760	3/16	6,000	82,000	44,000	36,000	8,000		8,000	91,000	53,000	36,000
4,800		6,000	82,000	44,000	36,000	8,100		10,000	103,000	61,000	40,000
4,900		6,000	82,000	44,000	36,000	8,200		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	8,300		10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
5,160	13/64	6,000	82,000	44,000	36,000	8,400		10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	8,500		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	8,600		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	8,700		10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,550		6,000	82,000	44,000	36,000	8,800		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	8,900		10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	9,000		10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	9,100		10,000	103,000	61,000	40,000
5,800		6,000	82,000	44,000	36,000	9,130	23/64	10,000	103,000	61,000	40,000
5,900		6,000	82,000	44,000	36,000	9,200		10,000	103,000	61,000	40,000
5,950	15/64	6,000	82,000	44,000	36,000	9,250		10,000	103,000	61,000	40,000
6,000		6,000	82,000	44,000	36,000	9,300		10,000	103,000	61,000	40,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,400		10,000	103,000	61,000	40,000
9,500		10,000	103,000	61,000	40,000
9,520	3/8	10,000	103,000	61,000	40,000
9,600		10,000	103,000	61,000	40,000
9,700		10,000	103,000	61,000	40,000
9,800		10,000	103,000	61,000	40,000
9,900		10,000	103,000	61,000	40,000
9,920	25/64	10,000	103,000	61,000	40,000
10,000		10,000	103,000	61,000	40,000
10,100		12,000	118,000	71,000	45,000
10,200		12,000	118,000	71,000	45,000
10,300		12,000	118,000	71,000	45,000
10,320	13/32	12,000	118,000	71,000	45,000
10,400		12,000	118,000	71,000	45,000
10,500		12,000	118,000	71,000	45,000
10,600		12,000	118,000	71,000	45,000
10,700		12,000	118,000	71,000	45,000
10,800		12,000	118,000	71,000	45,000
10,900		12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,100		12,000	118,000	71,000	45,000
11,110	7/16	12,000	118,000	71,000	45,000
11,200		12,000	118,000	71,000	45,000
11,300		12,000	118,000	71,000	45,000
11,400		12,000	118,000	71,000	45,000
11,500		12,000	118,000	71,000	45,000
11,600		12,000	118,000	71,000	45,000
11,700		12,000	118,000	71,000	45,000
11,800		12,000	118,000	71,000	45,000
11,900		12,000	118,000	71,000	45,000
11,910	15/32	12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,200		14,000	124,000	77,000	45,000
12,500		14,000	124,000	77,000	45,000
12,700	1/2	14,000	124,000	77,000	45,000
12,800		14,000	124,000	77,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,000		14,000	124,000	77,000	45,000
13,300		14,000	124,000	77,000	45,000
13,500		14,000	124,000	77,000	45,000
13,700		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,200		16,000	133,000	83,000	48,000
14,290	9/16	16,000	133,000	83,000	48,000
14,300		16,000	133,000	83,000	48,000
14,500		16,000	133,000	83,000	48,000
14,700		16,000	133,000	83,000	48,000
15,000		16,000	133,000	83,000	48,000
15,200		16,000	133,000	83,000	48,000
15,300		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
15,700		16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,300		18,000	143,000	93,000	48,000
16,500		18,000	143,000	93,000	48,000
16,900		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,300		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,500		20,000	153,000	101,000	50,000
18,900		20,000	153,000	101,000	50,000
19,000		20,000	153,000	101,000	50,000
19,050	3/4	20,000	153,000	101,000	50,000
19,300		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



## İçten soğutma kanallı rasyo matkap



**P** öz bileme  $\geq \varnothing 3,000$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi

**M** •**K**

**N** pas/asit/ısıya dayanıklı çelikler • Titanyum ve Ti alaşımları • Inconel, Hastelloy, Monel

**S** •**H**

Malzeme

Kom. sert metal

Yüzey

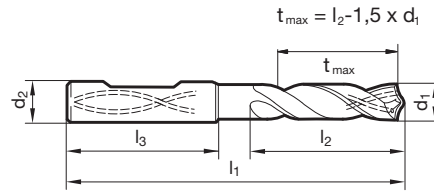
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HE

## GÜHRING NAVIGATOR

Kesme verileri sayfası 756



Ürün no

8611

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	6,100		8,000	91,000	53,000	36,000
3,100		6,000	66,000	28,000	36,000	6,200		8,000	91,000	53,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	6,300		8,000	91,000	53,000	36,000
3,200		6,000	66,000	28,000	36,000	6,350	1/4	8,000	91,000	53,000	36,000
3,250		6,000	66,000	28,000	36,000	6,400		8,000	91,000	53,000	36,000
3,300		6,000	66,000	28,000	36,000	6,500		8,000	91,000	53,000	36,000
3,400		6,000	66,000	28,000	36,000	6,600		8,000	91,000	53,000	36,000
3,500		6,000	66,000	28,000	36,000	6,700		8,000	91,000	53,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	6,750	17/64	8,000	91,000	53,000	36,000
3,600		6,000	66,000	28,000	36,000	6,800		8,000	91,000	53,000	36,000
3,700		6,000	66,000	28,000	36,000	6,900		8,000	91,000	53,000	36,000
3,800		6,000	74,000	36,000	36,000	7,000		8,000	91,000	53,000	36,000
3,900		6,000	74,000	36,000	36,000	7,100		8,000	91,000	53,000	36,000
3,970	5/32	6,000	74,000	36,000	36,000	7,140	9/32	8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	7,200		8,000	91,000	53,000	36,000
4,100		6,000	74,000	36,000	36,000	7,300		8,000	91,000	53,000	36,000
4,200		6,000	74,000	36,000	36,000	7,400		8,000	91,000	53,000	36,000
4,300		6,000	74,000	36,000	36,000	7,500		8,000	91,000	53,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	7,600		8,000	91,000	53,000	36,000
4,500		6,000	74,000	36,000	36,000	7,700		8,000	91,000	53,000	36,000
4,600		6,000	74,000	36,000	36,000	7,800		8,000	91,000	53,000	36,000
4,650		6,000	74,000	36,000	36,000	7,900		8,000	91,000	53,000	36,000
4,700		6,000	74,000	36,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
4,760	3/16	6,000	82,000	44,000	36,000	8,000		8,000	91,000	53,000	36,000
4,800		6,000	82,000	44,000	36,000	8,100		10,000	103,000	61,000	40,000
4,900		6,000	82,000	44,000	36,000	8,200		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	8,300		10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
5,160	13/64	6,000	82,000	44,000	36,000	8,400		10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	8,500		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	8,600		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	8,700		10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,550		6,000	82,000	44,000	36,000	8,800		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	8,900		10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	9,000		10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	9,100		10,000	103,000	61,000	40,000
5,800		6,000	82,000	44,000	36,000	9,130	23/64	10,000	103,000	61,000	40,000
5,900		6,000	82,000	44,000	36,000	9,200		10,000	103,000	61,000	40,000
5,950	15/64	6,000	82,000	44,000	36,000	9,250		10,000	103,000	61,000	40,000
6,000		6,000	82,000	44,000	36,000	9,300		10,000	103,000	61,000	40,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,400		10,000	103,000	61,000	40,000
9,500		10,000	103,000	61,000	40,000
9,520	3/8	10,000	103,000	61,000	40,000
9,600		10,000	103,000	61,000	40,000
9,700		10,000	103,000	61,000	40,000
9,800		10,000	103,000	61,000	40,000
9,900		10,000	103,000	61,000	40,000
9,920	25/64	10,000	103,000	61,000	40,000
10,000		10,000	103,000	61,000	40,000
10,100		12,000	118,000	71,000	45,000
10,200		12,000	118,000	71,000	45,000
10,300		12,000	118,000	71,000	45,000
10,320	13/32	12,000	118,000	71,000	45,000
10,400		12,000	118,000	71,000	45,000
10,500		12,000	118,000	71,000	45,000
10,600		12,000	118,000	71,000	45,000
10,700		12,000	118,000	71,000	45,000
10,800		12,000	118,000	71,000	45,000
10,900		12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,100		12,000	118,000	71,000	45,000
11,110	7/16	12,000	118,000	71,000	45,000
11,200		12,000	118,000	71,000	45,000
11,300		12,000	118,000	71,000	45,000
11,400		12,000	118,000	71,000	45,000
11,500		12,000	118,000	71,000	45,000
11,600		12,000	118,000	71,000	45,000
11,700		12,000	118,000	71,000	45,000
11,800		12,000	118,000	71,000	45,000
11,900		12,000	118,000	71,000	45,000
11,910	15/32	12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,200		14,000	124,000	77,000	45,000
12,500		14,000	124,000	77,000	45,000
12,700	1/2	14,000	124,000	77,000	45,000
12,800		14,000	124,000	77,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,000		14,000	124,000	77,000	45,000
13,300		14,000	124,000	77,000	45,000
13,500		14,000	124,000	77,000	45,000
13,700		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,200		16,000	133,000	83,000	48,000
14,290	9/16	16,000	133,000	83,000	48,000
14,300		16,000	133,000	83,000	48,000
14,500		16,000	133,000	83,000	48,000
14,700		16,000	133,000	83,000	48,000
15,000		16,000	133,000	83,000	48,000
15,200		16,000	133,000	83,000	48,000
15,300		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
15,700		16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,300		18,000	143,000	93,000	48,000
16,500		18,000	143,000	93,000	48,000
16,900		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,300		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,500		20,000	153,000	101,000	50,000
18,900		20,000	153,000	101,000	50,000
19,000		20,000	153,000	101,000	50,000
19,050	3/4	20,000	153,000	101,000	50,000
19,300		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



## İçten soğutma kanallı rasyo matkap



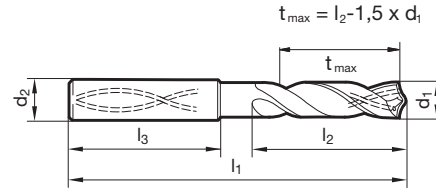
<b>P</b>	○	öz bileme $\geq \varnothing 3,000$ • koni bileme • ana kesici ağız form konkav • optimize edilmiş kesme geometrisi • keskin kesme davranışı
<b>M</b>	○	
<b>K</b>	○	
<b>N</b>	○	yüksek alaşımlı çelikleri • pas/asit/ısıya dayanıklı çelikler • Inconel, Hastelloy, Monel • pirinç, bronzlar • Alüminyum ve Al-Alaşımları • Magnezyum ve Mg-alışımları • Titanyum ve Ti alaşımları • toz metaller
<b>S</b>	●	
<b>H</b>	○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 754

Malzeme **Kom. sert metal**Yüzey **F**

sap formu HA

Ürün no **2478**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	9,000		10,000	103,000	61,000	40,000
3,300		6,000	66,000	28,000	36,000	9,500		10,000	103,000	61,000	40,000
3,500		6,000	66,000	28,000	36,000	10,000		10,000	103,000	61,000	40,000
4,000		6,000	74,000	36,000	36,000	10,200		12,000	118,000	71,000	45,000
4,200		6,000	74,000	36,000	36,000	11,000		12,000	118,000	71,000	45,000
4,800		6,000	82,000	44,000	36,000	11,200		12,000	118,000	71,000	45,000
5,000		6,000	82,000	44,000	36,000	11,300		12,000	118,000	71,000	45,000
5,500		6,000	82,000	44,000	36,000	12,000		12,000	118,000	71,000	45,000
6,000		6,000	82,000	44,000	36,000	13,000		14,000	124,000	77,000	45,000
6,500		8,000	91,000	53,000	36,000	13,500		14,000	124,000	77,000	45,000
6,800		8,000	91,000	53,000	36,000	14,000		14,000	124,000	77,000	45,000
7,000		8,000	91,000	53,000	36,000	14,500		16,000	133,000	83,000	48,000
7,400		8,000	91,000	53,000	36,000	16,000		16,000	133,000	83,000	48,000
7,500		8,000	91,000	53,000	36,000	17,000		18,000	143,000	93,000	48,000
7,550		8,000	91,000	53,000	36,000	17,500		18,000	143,000	93,000	48,000
7,700		8,000	91,000	53,000	36,000	20,000		20,000	153,000	101,000	50,000
8,000		8,000	91,000	53,000	36,000						
8,500		10,000	103,000	61,000	40,000						



İçten soğutma kanallı rasyo matkap



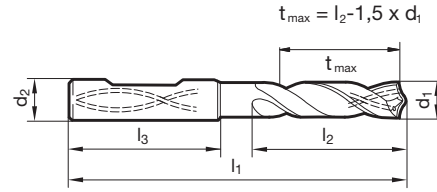
- P** ○ öz bileme  $\geq \varnothing 3,000$  • koni bileme • ana kesici ağız form konkav • optimize edilmiş kesme geometrisi • keskin kesme davranışı
- M** ○
- K** ○
- N** ○ yüksek alaşımlı çelikleri • pas/asit/ısıya dayanıklı çelikler • Inconel, Hastelloy, Monel • pirinç, bronzlar • Alüminyum ve Al-Alaşımları • Magnezyum ve Mg-alışımları • Titanyum ve Ti alaşımları • toz metaller
- S** •
- H** ○

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 754

Malzeme	<b>Kom. sert metal</b>
Yüzey	<b>F</b>
sap formu	HE

Rasyo matkap ucu



Ürün no **2470**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	9,000		10,000	103,000	61,000	40,000
3,500		6,000	66,000	28,000	36,000	9,200		10,000	103,000	61,000	40,000
4,000		6,000	74,000	36,000	36,000	9,300		10,000	103,000	61,000	40,000
4,200		6,000	74,000	36,000	36,000	9,500		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	9,700		10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	10,000		10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	10,100		12,000	118,000	71,000	45,000
5,300		6,000	82,000	44,000	36,000	10,200		12,000	118,000	71,000	45,000
5,400		6,000	82,000	44,000	36,000	10,500		12,000	118,000	71,000	45,000
5,500		6,000	82,000	44,000	36,000	11,000		12,000	118,000	71,000	45,000
5,600		6,000	82,000	44,000	36,000	11,100		12,000	118,000	71,000	45,000
5,800		6,000	82,000	44,000	36,000	11,400		12,000	118,000	71,000	45,000
6,000		6,000	82,000	44,000	36,000	11,500		12,000	118,000	71,000	45,000
6,100		8,000	91,000	53,000	36,000	11,700		12,000	118,000	71,000	45,000
6,200		8,000	91,000	53,000	36,000	11,800		12,000	118,000	71,000	45,000
6,500		8,000	91,000	53,000	36,000	12,000		12,000	118,000	71,000	45,000
6,600		8,000	91,000	53,000	36,000	12,200		14,000	124,000	77,000	45,000
6,700		8,000	91,000	53,000	36,000	12,500		14,000	124,000	77,000	45,000
6,800		8,000	91,000	53,000	36,000	13,000		14,000	124,000	77,000	45,000
7,000		8,000	91,000	53,000	36,000	13,500		14,000	124,000	77,000	45,000
7,100		8,000	91,000	53,000	36,000	14,000		14,000	124,000	77,000	45,000
7,200		8,000	91,000	53,000	36,000	14,100		16,000	133,000	83,000	48,000
7,600		8,000	91,000	53,000	36,000	14,500		16,000	133,000	83,000	48,000
7,700		8,000	91,000	53,000	36,000	15,000		16,000	133,000	83,000	48,000
8,000		8,000	91,000	53,000	36,000	16,000		16,000	133,000	83,000	48,000
8,100		10,000	103,000	61,000	40,000	16,500		18,000	143,000	93,000	48,000
8,500		10,000	103,000	61,000	40,000	17,000		18,000	143,000	93,000	48,000
8,600		10,000	103,000	61,000	40,000	17,500		18,000	143,000	93,000	48,000
8,700		10,000	103,000	61,000	40,000	18,000		18,000	143,000	93,000	48,000
8,800		10,000	103,000	61,000	40,000	20,000		20,000	153,000	101,000	50,000



## İçten soğutma kanallı rasyo matkap



<b>P</b>	○	öz bileme $\geq \varnothing 3,000$ • koni bileme • ana kesici ağız form konkav • optimize edilmiş kesme geometrisi • keskin kesme davranışı
<b>M</b>	○	
<b>K</b>	○	
<b>N</b>	○	yüksek alaşımlı çelikleri • pas/asit/ısıya dayanıklı çelikler • Inconel, Hastelloy, Monel • pirinç, bronzlar • Alüminyum ve Al-Alaşımları • Magnezyum ve Mg-alışımları • Titanyum ve Ti alaşımları • toz metaller
<b>S</b>	●	
<b>H</b>	○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 754

Malzeme

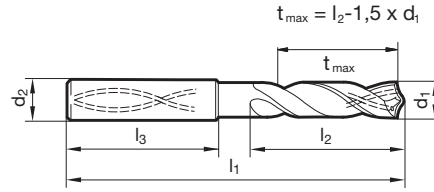
Kom. sert metal

Yüzey

S

sap formu

HA



Ürün no

1662

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	6,200		8,000	91,000	53,000	36,000
3,100		6,000	66,000	28,000	36,000	6,300		8,000	91,000	53,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	6,350	1/4	8,000	91,000	53,000	36,000
3,200		6,000	66,000	28,000	36,000	6,400		8,000	91,000	53,000	36,000
3,300		6,000	66,000	28,000	36,000	6,500		8,000	91,000	53,000	36,000
3,400		6,000	66,000	28,000	36,000	6,600		8,000	91,000	53,000	36,000
3,500		6,000	66,000	28,000	36,000	6,700		8,000	91,000	53,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	6,750	17/64	8,000	91,000	53,000	36,000
3,600		6,000	66,000	28,000	36,000	6,800		8,000	91,000	53,000	36,000
3,700		6,000	66,000	28,000	36,000	6,900		8,000	91,000	53,000	36,000
3,800		6,000	74,000	36,000	36,000	7,000		8,000	91,000	53,000	36,000
3,900		6,000	74,000	36,000	36,000	7,100		8,000	91,000	53,000	36,000
3,970	5/32	6,000	74,000	36,000	36,000	7,140	9/32	8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	7,200		8,000	91,000	53,000	36,000
4,100		6,000	74,000	36,000	36,000	7,300		8,000	91,000	53,000	36,000
4,200		6,000	74,000	36,000	36,000	7,400		8,000	91,000	53,000	36,000
4,300		6,000	74,000	36,000	36,000	7,500		8,000	91,000	53,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	7,550		8,000	91,000	53,000	36,000
4,500		6,000	74,000	36,000	36,000	7,600		8,000	91,000	53,000	36,000
4,600		6,000	74,000	36,000	36,000	7,700		8,000	91,000	53,000	36,000
4,650		6,000	74,000	36,000	36,000	7,800		8,000	91,000	53,000	36,000
4,700		6,000	74,000	36,000	36,000	7,900		8,000	91,000	53,000	36,000
4,760	3/16	6,000	82,000	44,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
4,800		6,000	82,000	44,000	36,000	8,000		8,000	91,000	53,000	36,000
4,900		6,000	82,000	44,000	36,000	8,100		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	8,200		10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	8,300		10,000	103,000	61,000	40,000
5,160	13/64	6,000	82,000	44,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	8,500		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	8,600		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	8,700		10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,550		6,000	82,000	44,000	36,000	8,800		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	8,900		10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	9,000		10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	9,100		10,000	103,000	61,000	40,000
5,800		6,000	82,000	44,000	36,000	9,130	23/64	10,000	103,000	61,000	40,000
5,900		6,000	82,000	44,000	36,000	9,200		10,000	103,000	61,000	40,000
5,950	15/64	6,000	82,000	44,000	36,000	9,250		10,000	103,000	61,000	40,000
6,000		6,000	82,000	44,000	36,000	9,300		10,000	103,000	61,000	40,000
6,100		8,000	91,000	53,000	36,000	9,400		10,000	103,000	61,000	40,000





d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,500		10,000	103,000	61,000	40,000
9,520	3/8	10,000	103,000	61,000	40,000
9,600		10,000	103,000	61,000	40,000
9,800		10,000	103,000	61,000	40,000
9,900		10,000	103,000	61,000	40,000
9,920	25/64	10,000	103,000	61,000	40,000
10,000		10,000	103,000	61,000	40,000
10,100		12,000	118,000	71,000	45,000
10,200		12,000	118,000	71,000	45,000
10,300		12,000	118,000	71,000	45,000
10,320	13/32	12,000	118,000	71,000	45,000
10,500		12,000	118,000	71,000	45,000
10,700		12,000	118,000	71,000	45,000
10,720	27/64	12,000	118,000	71,000	45,000
10,800		12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,100		12,000	118,000	71,000	45,000
11,110	7/16	12,000	118,000	71,000	45,000
11,200		12,000	118,000	71,000	45,000
11,300		12,000	118,000	71,000	45,000
11,400		12,000	118,000	71,000	45,000
11,500		12,000	118,000	71,000	45,000
11,510	29/64	12,000	118,000	71,000	45,000
11,700		12,000	118,000	71,000	45,000
11,910	15/32	12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,100		14,000	124,000	77,000	45,000
12,200		14,000	124,000	77,000	45,000
12,300	31/64	14,000	124,000	77,000	45,000
12,500		14,000	124,000	77,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
12,700	1/2	14,000	124,000	77,000	45,000
12,800		14,000	124,000	77,000	45,000
13,000		14,000	124,000	77,000	45,000
13,200		14,000	124,000	77,000	45,000
13,500		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,500		16,000	133,000	83,000	48,000
15,000		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,500		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
19,000		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000
20,500		25,000	165,000	105,000	56,000
21,000		25,000	165,000	105,000	56,000
22,500		25,000	180,000	117,000	56,000
23,500		25,000	180,000	117,000	56,000



## İçten soğutma kanallı rasyo matkap



**P** ○ öz bileme  $\geq \varnothing 10,100$  • koni bileme • ana kesici ağız form konkav • optimize edilmiş kesme geometrisi • keskin kesme davranışı

**M** ○

**K** ○

**N** ○ yüksek alaşımlı çelikleri • pas/asit/ısıya dayanıklı çelikler • Inconel, Hastelloy, Monel • pirinç, bronzlar • Alüminyum ve Al-Alaşımları • Magnezyum ve Mg-alışımları • Titanyum ve Ti alaşımları • toz metaller

**S** •

**H** ○

## GÜHRING NAVIGATOR

Kesme verileri sayfası 754

Malzeme

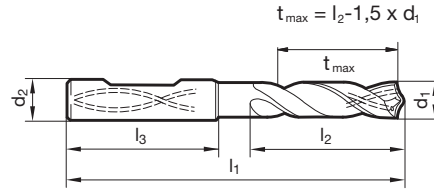
Kom. sert metal

Yüzey

S

sap formu

HE



Ürün no

1182

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	9,000		10,000	103,000	61,000	40,000
4,000		6,000	74,000	36,000	36,000	9,130	23/64	10,000	103,000	61,000	40,000
4,200		6,000	74,000	36,000	36,000	9,200		10,000	103,000	61,000	40,000
4,300		6,000	74,000	36,000	36,000	9,300		10,000	103,000	61,000	40,000
4,400		6,000	74,000	36,000	36,000	9,400		10,000	103,000	61,000	40,000
4,500		6,000	74,000	36,000	36,000	9,500		10,000	103,000	61,000	40,000
4,600		6,000	74,000	36,000	36,000	9,600		10,000	103,000	61,000	40,000
4,800		6,000	82,000	44,000	36,000	9,700		10,000	103,000	61,000	40,000
4,900		6,000	82,000	44,000	36,000	9,800		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	9,920	25/64	10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	10,000		10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	10,100		12,000	118,000	71,000	45,000
5,300		6,000	82,000	44,000	36,000	10,200		12,000	118,000	71,000	45,000
5,400		6,000	82,000	44,000	36,000	10,300		12,000	118,000	71,000	45,000
5,500		6,000	82,000	44,000	36,000	10,500		12,000	118,000	71,000	45,000
5,600		6,000	82,000	44,000	36,000	10,700		12,000	118,000	71,000	45,000
5,800		6,000	82,000	44,000	36,000	10,800		12,000	118,000	71,000	45,000
6,000		6,000	82,000	44,000	36,000	11,000		12,000	118,000	71,000	45,000
6,100		8,000	91,000	53,000	36,000	11,100		12,000	118,000	71,000	45,000
6,200		8,000	91,000	53,000	36,000	11,200		12,000	118,000	71,000	45,000
6,300		8,000	91,000	53,000	36,000	11,500		12,000	118,000	71,000	45,000
6,500		8,000	91,000	53,000	36,000	11,800		12,000	118,000	71,000	45,000
6,600		8,000	91,000	53,000	36,000	12,000		12,000	118,000	71,000	45,000
6,700		8,000	91,000	53,000	36,000	12,500		14,000	124,000	77,000	45,000
6,800		8,000	91,000	53,000	36,000	12,800		14,000	124,000	77,000	45,000
6,900		8,000	91,000	53,000	36,000	12,900		14,000	124,000	77,000	45,000
7,000		8,000	91,000	53,000	36,000	13,000		14,000	124,000	77,000	45,000
7,140	9/32	8,000	91,000	53,000	36,000	13,200		14,000	124,000	77,000	45,000
7,200		8,000	91,000	53,000	36,000	13,500		14,000	124,000	77,000	45,000
7,400		8,000	91,000	53,000	36,000	13,890	35/64	14,000	124,000	77,000	45,000
7,500		8,000	91,000	53,000	36,000	14,000		14,000	124,000	77,000	45,000
7,600		8,000	91,000	53,000	36,000	14,100		16,000	133,000	83,000	48,000
7,800		8,000	91,000	53,000	36,000	14,500		16,000	133,000	83,000	48,000
7,900		8,000	91,000	53,000	36,000	14,600		16,000	133,000	83,000	48,000
8,000		8,000	91,000	53,000	36,000	15,000		16,000	133,000	83,000	48,000
8,100		10,000	103,000	61,000	40,000	15,500		16,000	133,000	83,000	48,000
8,200		10,000	103,000	61,000	40,000	16,000		16,000	133,000	83,000	48,000
8,300		10,000	103,000	61,000	40,000	16,500		18,000	143,000	93,000	48,000
8,500		10,000	103,000	61,000	40,000	16,600		18,000	143,000	93,000	48,000
8,600		10,000	103,000	61,000	40,000	17,000		18,000	143,000	93,000	48,000
8,700		10,000	103,000	61,000	40,000	17,500		18,000	143,000	93,000	48,000
8,800		10,000	103,000	61,000	40,000	18,000		18,000	143,000	93,000	48,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
20,000		20,000	153,000	101,000	50,000
20,500		25,000	165,000	105,000	56,000
21,000		25,000	165,000	105,000	56,000
21,500		25,000	165,000	105,000	56,000
22,000		25,000	165,000	105,000	56,000
22,500		25,000	180,000	117,000	56,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
24,000		25,000	180,000	117,000	56,000
24,500		25,000	180,000	117,000	56,000
25,000	63/64	25,000	180,000	117,000	56,000



## İçten soğutma kanallı rasyo matkap



**P** öz bileme  $\geq \varnothing 3,000$  • patentlenmiş radyuslu uç bilemesi • ana kesici ağız düz form (düzeltmeden sonra)

**M****K** •**N****S****H**

vermikular dökme demir GGK , ADI, CDI • pik döküm, temper döküm ve küresel döküm

**GÜHRING NAVIGATOR**

Kesme verileri sayfası 754

Malzeme

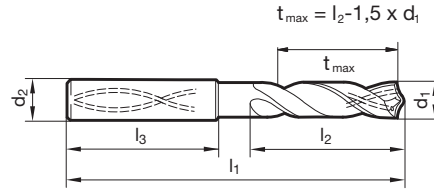
Kom. sert metal

Yüzeysel

F

sap formu

HA



Ürün no

6501

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	8,000		8,000	91,000	53,000	36,000
3,200		6,000	66,000	28,000	36,000	8,100		10,000	103,000	61,000	40,000
3,300		6,000	66,000	28,000	36,000	8,200		10,000	103,000	61,000	40,000
3,400		6,000	66,000	28,000	36,000	8,300		10,000	103,000	61,000	40,000
3,500		6,000	66,000	28,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
3,600		6,000	66,000	28,000	36,000	8,500		10,000	103,000	61,000	40,000
3,800		6,000	74,000	36,000	36,000	8,600		10,000	103,000	61,000	40,000
4,000		6,000	74,000	36,000	36,000	8,700		10,000	103,000	61,000	40,000
4,100		6,000	74,000	36,000	36,000	8,800		10,000	103,000	61,000	40,000
4,200		6,000	74,000	36,000	36,000	8,900		10,000	103,000	61,000	40,000
4,300		6,000	74,000	36,000	36,000	9,000		10,000	103,000	61,000	40,000
4,400		6,000	74,000	36,000	36,000	9,100		10,000	103,000	61,000	40,000
4,500		6,000	74,000	36,000	36,000	9,200		10,000	103,000	61,000	40,000
4,600		6,000	74,000	36,000	36,000	9,250		10,000	103,000	61,000	40,000
4,650		6,000	74,000	36,000	36,000	9,300		10,000	103,000	61,000	40,000
4,800		6,000	82,000	44,000	36,000	9,400		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	9,500		10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	9,520	3/8	10,000	103,000	61,000	40,000
5,160	13/64	6,000	82,000	44,000	36,000	9,600		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	9,700		10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	9,800		10,000	103,000	61,000	40,000
5,550		6,000	82,000	44,000	36,000	9,900		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	9,920	25/64	10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	10,000		10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	10,100		12,000	118,000	71,000	45,000
5,800		6,000	82,000	44,000	36,000	10,200		12,000	118,000	71,000	45,000
5,900		6,000	82,000	44,000	36,000	10,400		12,000	118,000	71,000	45,000
6,000		6,000	82,000	44,000	36,000	10,500		12,000	118,000	71,000	45,000
6,350	1/4	8,000	91,000	53,000	36,000	10,600		12,000	118,000	71,000	45,000
6,500		8,000	91,000	53,000	36,000	10,700		12,000	118,000	71,000	45,000
6,600		8,000	91,000	53,000	36,000	10,720	27/64	12,000	118,000	71,000	45,000
6,750	17/64	8,000	91,000	53,000	36,000	10,800		12,000	118,000	71,000	45,000
6,800		8,000	91,000	53,000	36,000	10,900		12,000	118,000	71,000	45,000
6,900		8,000	91,000	53,000	36,000	11,000		12,000	118,000	71,000	45,000
7,000		8,000	91,000	53,000	36,000	11,100		12,000	118,000	71,000	45,000
7,200		8,000	91,000	53,000	36,000	11,110	7/16	12,000	118,000	71,000	45,000
7,300		8,000	91,000	53,000	36,000	11,200		12,000	118,000	71,000	45,000
7,400		8,000	91,000	53,000	36,000	11,300		12,000	118,000	71,000	45,000
7,500		8,000	91,000	53,000	36,000	11,500		12,000	118,000	71,000	45,000
7,800		8,000	91,000	53,000	36,000	11,600		12,000	118,000	71,000	45,000
7,900		8,000	91,000	53,000	36,000	11,700		12,000	118,000	71,000	45,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
11,800		12,000	118,000	71,000	45,000
11,900		12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,100		14,000	124,000	77,000	45,000
12,200		14,000	124,000	77,000	45,000
12,500		14,000	124,000	77,000	45,000
12,700	1/2	14,000	124,000	77,000	45,000
12,800		14,000	124,000	77,000	45,000
13,000		14,000	124,000	77,000	45,000
13,100	33/64	14,000	124,000	77,000	45,000
13,300		14,000	124,000	77,000	45,000
13,400		14,000	124,000	77,000	45,000
13,500		14,000	124,000	77,000	45,000
13,700		14,000	124,000	77,000	45,000
13,900		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,200		16,000	133,000	83,000	48,000
14,290	9/16	16,000	133,000	83,000	48,000
14,300		16,000	133,000	83,000	48,000
14,400		16,000	133,000	83,000	48,000
14,500		16,000	133,000	83,000	48,000
14,600		16,000	133,000	83,000	48,000
14,700		16,000	133,000	83,000	48,000
15,000		16,000	133,000	83,000	48,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
15,100		16,000	133,000	83,000	48,000
15,300		16,000	133,000	83,000	48,000
15,400		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
15,600		16,000	133,000	83,000	48,000
15,700		16,000	133,000	83,000	48,000
15,800		16,000	133,000	83,000	48,000
15,870	5/8	16,000	133,000	83,000	48,000
15,900		16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,500		18,000	143,000	93,000	48,000
16,670	21/32	18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,500		20,000	153,000	101,000	50,000
19,000		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



## İçten soğutma kanallı rasyo matkap



**P** • öz bileme  $\geq \varnothing 9,800$  • koni bileme • Lehimli HM plakettli HSS gövde • Darbe ve titreşimleri önler

**M** ○

**K** ○

**N** ○

**S** ○

**H** ○

alaşimsız/düşük alaşimli çelikler • pik döküm, küresel grafit döküm • piring, bronzlar, plastikler, grafit

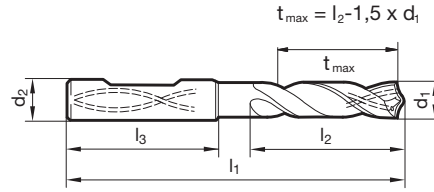
## GÜHRING NAVIGATOR

Kesme verileri sayfası 754

Malzeme **Sert metal**

Yüzey **S**

sap formu HE



Ürün no **1172**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
9,800	W	16,000	127,000	75,000	48,000	16,700		20,000	166,000	112,000	50,000
10,000		16,000	127,000	75,000	48,000	16,800		20,000	166,000	112,000	50,000
10,200		16,000	127,000	75,000	48,000	17,000		20,000	166,000	112,000	50,000
10,500		16,000	127,000	75,000	48,000	17,200		20,000	166,000	112,000	50,000
10,600		16,000	127,000	75,000	48,000	17,300		20,000	166,000	112,000	50,000
10,700		16,000	127,000	75,000	48,000	17,500		20,000	166,000	112,000	50,000
10,800		16,000	127,000	75,000	48,000	18,000		20,000	166,000	112,000	50,000
11,000		16,000	127,000	75,000	48,000	18,500		25,000	184,000	124,000	56,000
11,500		16,000	127,000	75,000	48,000	19,000		25,000	184,000	124,000	56,000
11,900		16,000	127,000	75,000	48,000	19,500		25,000	184,000	124,000	56,000
12,000		16,000	127,000	75,000	48,000	19,600		25,000	184,000	124,000	56,000
12,300	31/64	16,000	139,000	87,000	48,000	19,700		25,000	184,000	124,000	56,000
12,500		16,000	139,000	87,000	48,000	20,000		25,000	184,000	124,000	56,000
12,700	1/2	16,000	139,000	87,000	48,000	20,500		25,000	197,000	137,000	56,000
12,900		16,000	139,000	87,000	48,000	21,000		25,000	197,000	137,000	56,000
13,000		16,000	139,000	87,000	48,000	21,500		25,000	197,000	137,000	56,000
13,100	33/64	16,000	139,000	87,000	48,000	22,000		25,000	197,000	137,000	56,000
13,500		16,000	139,000	87,000	48,000	22,220	7/8	25,000	209,000	149,000	56,000
13,700		16,000	139,000	87,000	48,000	22,500		25,000	209,000	149,000	56,000
13,900		16,000	139,000	87,000	48,000	23,000		25,000	209,000	149,000	56,000
14,000		16,000	139,000	87,000	48,000	23,500		25,000	209,000	149,000	56,000
14,500		20,000	154,000	100,000	50,000	24,000		25,000	209,000	149,000	56,000
14,600		20,000	154,000	100,000	50,000	24,500		32,000	226,000	162,000	60,000
15,000		20,000	154,000	100,000	50,000	25,000	63/64	32,000	226,000	162,000	60,000
15,200		20,000	154,000	100,000	50,000	25,500		32,000	226,000	162,000	60,000
15,500		20,000	154,000	100,000	50,000						
15,700		20,000	154,000	100,000	50,000						
16,000		20,000	154,000	100,000	50,000						
16,200		20,000	166,000	112,000	50,000						
16,500		20,000	166,000	112,000	50,000						



İçten soğutma kanallı rasyo matkap



- P** • öz bileme  $\geq \varnothing 3,000$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi
- M** ○
- K** •
- N** ○ yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm<sup>2</sup>'ye kadar • döküm malzemeler • bronz / pirinç • yüksek alaşımli AISi-Alaşımları
- S** ○
- H** ○

Malzeme **Kom. sert metal**

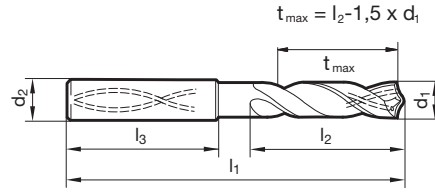
Yüzey **F**

sap formu HA

Rasyo matkap ucu

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 758



Ürün no **4044**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	70,000	30,000	36,000	5,900		6,000	97,000	57,000	36,000
3,100		6,000	70,000	30,000	36,000	5,950	15/64	6,000	97,000	57,000	36,000
3,170	1/8	6,000	70,000	30,000	36,000	6,000		6,000	97,000	57,000	36,000
3,200		6,000	70,000	30,000	36,000	6,100		8,000	106,000	66,000	36,000
3,250		6,000	70,000	30,000	36,000	6,200		8,000	106,000	66,000	36,000
3,300		6,000	70,000	30,000	36,000	6,300		8,000	106,000	66,000	36,000
3,400		6,000	75,000	35,500	36,000	6,350	1/4	8,000	106,000	66,000	36,000
3,500		6,000	75,000	35,500	36,000	6,400		8,000	106,000	66,000	36,000
3,570	9/64	6,000	75,000	35,500	36,000	6,500		8,000	106,000	66,000	36,000
3,600		6,000	75,000	35,500	36,000	6,530		8,000	106,000	66,000	36,000
3,700		6,000	75,000	35,500	36,000	6,600		8,000	106,000	66,000	36,000
3,800		6,000	75,000	37,500	36,000	6,700		8,000	106,000	66,000	36,000
3,900		6,000	75,000	37,500	36,000	6,750	17/64	8,000	106,000	66,000	36,000
3,970	5/32	6,000	75,000	37,500	36,000	6,800		8,000	106,000	66,000	36,000
4,000		6,000	75,000	37,500	36,000	6,900		8,000	116,000	76,000	36,000
4,040		6,000	75,000	37,500	36,000	7,000		8,000	116,000	76,000	36,000
4,100		6,000	75,000	37,500	36,000	7,100		8,000	116,000	76,000	36,000
4,200		6,000	75,000	37,500	36,000	7,140	9/32	8,000	116,000	76,000	36,000
4,300		6,000	85,000	45,000	36,000	7,200		8,000	116,000	76,000	36,000
4,370	11/64	6,000	85,000	45,000	36,000	7,300		8,000	116,000	76,000	36,000
4,400		6,000	85,000	45,000	36,000	7,400		8,000	116,000	76,000	36,000
4,500		6,000	85,000	45,000	36,000	7,500		8,000	116,000	76,000	36,000
4,600		6,000	85,000	45,000	36,000	7,540	19/64	8,000	116,000	76,000	36,000
4,650		6,000	85,000	45,000	36,000	7,600		8,000	116,000	76,000	36,000
4,700		6,000	85,000	45,000	36,000	7,700		8,000	116,000	76,000	36,000
4,760	3/16	6,000	90,000	50,000	36,000	7,800		8,000	116,000	76,000	36,000
4,800		6,000	90,000	50,000	36,000	7,900		8,000	116,000	76,000	36,000
4,900		6,000	90,000	50,000	36,000	7,940	5/16	8,000	116,000	76,000	36,000
5,000		6,000	90,000	50,000	36,000	8,000		8,000	116,000	76,000	36,000
5,100		6,000	90,000	50,000	36,000	8,100		10,000	131,000	87,000	40,000
5,110		6,000	90,000	50,000	36,000	8,200		10,000	131,000	87,000	40,000
5,160	13/64	6,000	90,000	50,000	36,000	8,300		10,000	131,000	87,000	40,000
5,200		6,000	90,000	50,000	36,000	8,330	21/64	10,000	131,000	87,000	40,000
5,300		6,000	90,000	50,000	36,000	8,400		10,000	131,000	87,000	40,000
5,400		6,000	97,000	57,000	36,000	8,500		10,000	131,000	87,000	40,000
5,410		6,000	97,000	57,000	36,000	8,600		10,000	131,000	87,000	40,000
5,500		6,000	97,000	57,000	36,000	8,700		10,000	131,000	87,000	40,000
5,550		6,000	97,000	57,000	36,000	8,730	11/32	10,000	131,000	87,000	40,000
5,560	7/32	6,000	97,000	57,000	36,000	8,800		10,000	131,000	87,000	40,000
5,600		6,000	97,000	57,000	36,000	8,900		10,000	131,000	87,000	40,000
5,700		6,000	97,000	57,000	36,000	9,000		10,000	131,000	87,000	40,000
5,800		6,000	97,000	57,000	36,000	9,100		10,000	139,000	95,000	40,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,130	23/64	10,000	139,000	95,000	40,000
9,200		10,000	139,000	95,000	40,000
9,250		10,000	139,000	95,000	40,000
9,300		10,000	139,000	95,000	40,000
9,340		10,000	139,000	95,000	40,000
9,400		10,000	139,000	95,000	40,000
9,500		10,000	139,000	95,000	40,000
9,520	3/8	10,000	139,000	95,000	40,000
9,600		10,000	139,000	95,000	40,000
9,700		10,000	139,000	95,000	40,000
9,800		10,000	139,000	95,000	40,000
9,900		10,000	139,000	95,000	40,000
9,920	25/64	10,000	139,000	95,000	40,000
10,000		10,000	139,000	95,000	40,000
10,100		12,000	155,000	106,000	45,000
10,200		12,000	155,000	106,000	45,000
10,300		12,000	155,000	106,000	45,000
10,320	13/32	12,000	155,000	106,000	45,000
10,400		12,000	155,000	106,000	45,000
10,500		12,000	155,000	106,000	45,000
10,600		12,000	155,000	106,000	45,000
10,700		12,000	155,000	106,000	45,000
10,720	27/64	12,000	155,000	106,000	45,000
10,800		12,000	155,000	106,000	45,000
10,900		12,000	155,000	106,000	45,000
11,000		12,000	155,000	106,000	45,000
11,100		12,000	163,000	114,000	45,000
11,110	7/16	12,000	163,000	114,000	45,000
11,200		12,000	163,000	114,000	45,000
11,300		12,000	163,000	114,000	45,000
11,400		12,000	163,000	114,000	45,000
11,500		12,000	163,000	114,000	45,000
11,510	29/64	12,000	163,000	114,000	45,000
11,600		12,000	163,000	114,000	45,000
11,700		12,000	163,000	114,000	45,000
11,800		12,000	163,000	114,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
11,900		12,000	163,000	114,000	45,000
11,910	15/32	12,000	163,000	114,000	45,000
12,000		12,000	163,000	114,000	45,000
12,100		14,000	182,000	133,000	45,000
12,200		14,000	182,000	133,000	45,000
12,300	31/64	14,000	182,000	133,000	45,000
12,500		14,000	182,000	133,000	45,000
12,700	1/2	14,000	182,000	133,000	45,000
13,000		14,000	182,000	133,000	45,000
13,100	33/64	14,000	182,000	133,000	45,000
13,490	17/32	14,000	182,000	133,000	45,000
13,500		14,000	182,000	133,000	45,000
13,890	35/64	14,000	182,000	133,000	45,000
14,000		14,000	182,000	133,000	45,000
14,100		16,000	204,000	152,000	48,000
14,200		16,000	204,000	152,000	48,000
14,290	9/16	16,000	204,000	152,000	48,000
14,500		16,000	204,000	152,000	48,000
15,000		16,000	204,000	152,000	48,000
15,100		16,000	204,000	152,000	48,000
15,480	39/64	16,000	204,000	152,000	48,000
15,500		16,000	204,000	152,000	48,000
15,870	5/8	16,000	204,000	152,000	48,000
16,000		16,000	204,000	152,000	48,000
16,500		18,000	223,000	171,000	48,000
16,900		18,000	223,000	171,000	48,000
17,000		18,000	223,000	171,000	48,000
17,500		18,000	223,000	171,000	48,000
18,000		18,000	223,000	171,000	48,000
18,500		20,000	244,000	190,000	50,000
18,900		20,000	244,000	190,000	50,000
19,000		20,000	244,000	190,000	50,000
19,050	3/4	20,000	244,000	190,000	50,000
19,500		20,000	244,000	190,000	50,000
20,000		20,000	244,000	190,000	50,000





İçten soğutma kanallı rasyo matkap



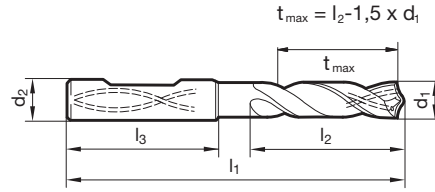
- P** • öz bileme  $\geq \varnothing 3,000$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi
- M** ○
- K** •
- N** ○ yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm<sup>2</sup>'ye kadar • döküm malzemeler • bronz / pirinç • yüksek alaşımli AISi-Alaşımları
- S** ○
- H** ○

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 758

Malzeme	<b>Kom. sert metal</b>
Yüzey	<b>F</b>
sap formu	HE

Rasyo matkap ucu



Ürün no **4045**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	70,000	30,000	36,000	7,100		8,000	116,000	76,000	36,000
3,100		6,000	70,000	30,000	36,000	7,200		8,000	116,000	76,000	36,000
3,170	1/8	6,000	70,000	30,000	36,000	7,400		8,000	116,000	76,000	36,000
3,200		6,000	70,000	30,000	36,000	7,500		8,000	116,000	76,000	36,000
3,250		6,000	70,000	30,000	36,000	7,600		8,000	116,000	76,000	36,000
3,300		6,000	70,000	30,000	36,000	7,700		8,000	116,000	76,000	36,000
3,400		6,000	75,000	35,500	36,000	8,000		8,000	116,000	76,000	36,000
3,500		6,000	75,000	35,500	36,000	8,100		10,000	131,000	87,000	40,000
3,570	9/64	6,000	75,000	35,500	36,000	8,200		10,000	131,000	87,000	40,000
3,600		6,000	75,000	35,500	36,000	8,400		10,000	131,000	87,000	40,000
3,700		6,000	75,000	35,500	36,000	8,500		10,000	131,000	87,000	40,000
3,800		6,000	75,000	37,500	36,000	8,600		10,000	131,000	87,000	40,000
3,900		6,000	75,000	37,500	36,000	8,700		10,000	131,000	87,000	40,000
3,970	5/32	6,000	75,000	37,500	36,000	9,000		10,000	131,000	87,000	40,000
4,000		6,000	75,000	37,500	36,000	9,100		10,000	139,000	95,000	40,000
4,100		6,000	75,000	37,500	36,000	9,300		10,000	139,000	95,000	40,000
4,300		6,000	85,000	45,000	36,000	9,400		10,000	139,000	95,000	40,000
4,400		6,000	85,000	45,000	36,000	9,500		10,000	139,000	95,000	40,000
4,500		6,000	85,000	45,000	36,000	9,700		10,000	139,000	95,000	40,000
4,650		6,000	85,000	45,000	36,000	9,800		10,000	139,000	95,000	40,000
4,700		6,000	85,000	45,000	36,000	9,900		10,000	139,000	95,000	40,000
4,900		6,000	90,000	50,000	36,000	10,000		10,000	139,000	95,000	40,000
5,000		6,000	90,000	50,000	36,000	10,200		12,000	155,000	106,000	45,000
5,100		6,000	90,000	50,000	36,000	10,300		12,000	155,000	106,000	45,000
5,160	13/64	6,000	90,000	50,000	36,000	10,500		12,000	155,000	106,000	45,000
5,200		6,000	90,000	50,000	36,000	10,800		12,000	155,000	106,000	45,000
5,300		6,000	90,000	50,000	36,000	11,000		12,000	155,000	106,000	45,000
5,400		6,000	97,000	57,000	36,000	11,200		12,000	163,000	114,000	45,000
5,500		6,000	97,000	57,000	36,000	11,500		12,000	163,000	114,000	45,000
5,700		6,000	97,000	57,000	36,000	11,800		12,000	163,000	114,000	45,000
5,800		6,000	97,000	57,000	36,000	12,000		12,000	163,000	114,000	45,000
5,900		6,000	97,000	57,000	36,000	12,200		14,000	182,000	133,000	45,000
6,000		6,000	97,000	57,000	36,000	12,500		14,000	182,000	133,000	45,000
6,200		8,000	106,000	66,000	36,000	13,500		14,000	182,000	133,000	45,000
6,300		8,000	106,000	66,000	36,000	14,000		14,000	182,000	133,000	45,000
6,350	1/4	8,000	106,000	66,000	36,000	14,200		16,000	204,000	152,000	48,000
6,500		8,000	106,000	66,000	36,000	14,500		16,000	204,000	152,000	48,000
6,600		8,000	106,000	66,000	36,000	15,000		16,000	204,000	152,000	48,000
6,700		8,000	106,000	66,000	36,000	15,500		16,000	204,000	152,000	48,000
6,800		8,000	106,000	66,000	36,000	16,000		16,000	204,000	152,000	48,000
6,900		8,000	116,000	76,000	36,000	16,500		18,000	223,000	171,000	48,000
7,000		8,000	116,000	76,000	36,000	17,000		18,000	223,000	171,000	48,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
17,500		18,000	223,000	171,000	48,000
18,000		18,000	223,000	171,000	48,000
18,500		20,000	244,000	190,000	50,000
19,050	3/4	20,000	244,000	190,000	50,000
19,500		20,000	244,000	190,000	50,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm



İçten soğutma kanallı rasyo matkap



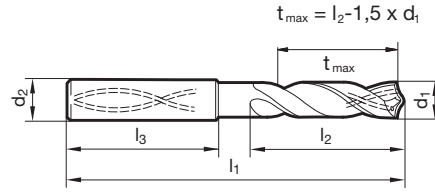
- P** • öz bileme  $\geq \varnothing 3,000$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi
- M** ○
- K** •
- N** ○ yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm<sup>2</sup>'ye kadar • döküm malzemeler • bronz / pirinç • yüksek alaşımli AISi-Alaşımları
- S** ○
- H** ○

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 758

Malzeme	<b>Kom. sert metal</b>
Yüzey	<b>S</b>
sap formu	HA

Rasyo matkap ucu



Ürün no **2711**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	70,000	30,000	36,000	9,300		10,000	139,000	95,000	40,000
3,100		6,000	70,000	30,000	36,000	9,500		10,000	139,000	95,000	40,000
3,170	1/8	6,000	70,000	30,000	36,000	9,700		10,000	139,000	95,000	40,000
3,200		6,000	70,000	30,000	36,000	9,800		10,000	139,000	95,000	40,000
3,250		6,000	70,000	30,000	36,000	10,000		10,000	139,000	95,000	40,000
3,300		6,000	70,000	30,000	36,000	10,200		12,000	155,000	106,000	45,000
3,400		6,000	75,000	35,500	36,000	10,500		12,000	155,000	106,000	45,000
3,500		6,000	75,000	35,500	36,000	11,000		12,000	155,000	106,000	45,000
3,570	9/64	6,000	75,000	35,500	36,000	11,500		12,000	163,000	114,000	45,000
3,600		6,000	75,000	35,500	36,000	12,000		12,000	163,000	114,000	45,000
3,700		6,000	75,000	35,500	36,000	12,200		14,000	182,000	133,000	45,000
3,800		6,000	75,000	37,500	36,000	12,500		14,000	182,000	133,000	45,000
3,900		6,000	75,000	37,500	36,000	13,000		14,000	182,000	133,000	45,000
3,970	5/32	6,000	75,000	37,500	36,000	13,500		14,000	182,000	133,000	45,000
4,300		6,000	85,000	45,000	36,000	13,800		14,000	182,000	133,000	45,000
4,400		6,000	85,000	45,000	36,000	14,000		14,000	182,000	133,000	45,000
5,000		6,000	90,000	50,000	36,000	15,000		16,000	204,000	152,000	48,000
5,200		6,000	90,000	50,000	36,000	15,200		16,000	204,000	152,000	48,000
5,500		6,000	97,000	57,000	36,000	15,500		16,000	204,000	152,000	48,000
6,000		6,000	97,000	57,000	36,000	15,800		16,000	204,000	152,000	48,000
6,100		8,000	106,000	66,000	36,000	16,000		16,000	204,000	152,000	48,000
6,200		8,000	106,000	66,000	36,000	16,500		18,000	223,000	171,000	48,000
6,500		8,000	106,000	66,000	36,000	17,500		18,000	223,000	171,000	48,000
6,600		8,000	106,000	66,000	36,000	18,500		20,000	244,000	190,000	50,000
6,800		8,000	106,000	66,000	36,000	19,500		20,000	244,000	190,000	50,000
7,000		8,000	116,000	76,000	36,000						
7,100		8,000	116,000	76,000	36,000						
7,300		8,000	116,000	76,000	36,000						
7,500		8,000	116,000	76,000	36,000						
8,000		8,000	116,000	76,000	36,000						
8,500		10,000	131,000	87,000	40,000						
8,600		10,000	131,000	87,000	40,000						
8,700		10,000	131,000	87,000	40,000						
9,000		10,000	131,000	87,000	40,000						
9,100		10,000	139,000	95,000	40,000						
9,200		10,000	139,000	95,000	40,000						



## İçten soğutma kanallı rasyo matkap



Malzeme

Kom. sert metal

Yüzey

Y

sap formu

HA

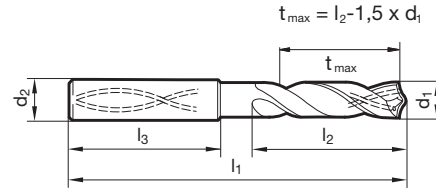
**P** • öz bileme  $\geq \varnothing 3,000$  • koni bileme • ana kesici ağız hafif konkavdır • optimize edilmiş kesme geometrisi

**M****K****N****S** •**H** ○

1600 N/mm<sup>2</sup> ye kadar alışımlı ve yüksek mukavemetli çelikler • Inconel, Hastelloy, Monel • Titanyum ve Ti alaşımları

## GÜHRING NAVIGATOR

Kesme verileri sayfası 758



Ürün no

8522

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	70,000	30,000	36,000	8,730	11/32	10,000	131,000	87,000	40,000
3,170	1/8	6,000	70,000	30,000	36,000	8,800		10,000	131,000	87,000	40,000
3,250		6,000	70,000	30,000	36,000	9,000		10,000	131,000	87,000	40,000
3,300		6,000	70,000	30,000	36,000	9,130	23/64	10,000	139,000	95,000	40,000
3,400		6,000	75,000	35,500	36,000	9,250		10,000	139,000	95,000	40,000
3,500		6,000	75,000	35,500	36,000	9,340		10,000	139,000	95,000	40,000
3,570	9/64	6,000	75,000	35,500	36,000	9,400		10,000	139,000	95,000	40,000
3,700		6,000	75,000	35,500	36,000	9,500		10,000	139,000	95,000	40,000
3,970	5/32	6,000	75,000	37,500	36,000	9,520	3/8	10,000	139,000	95,000	40,000
4,000		6,000	75,000	37,500	36,000	9,920	25/64	10,000	139,000	95,000	40,000
4,200		6,000	75,000	37,500	36,000	10,000		10,000	139,000	95,000	40,000
4,300		6,000	85,000	45,000	36,000	10,200		12,000	155,000	106,000	45,000
4,370	11/64	6,000	85,000	45,000	36,000	10,320	13/32	12,000	155,000	106,000	45,000
4,500		6,000	85,000	45,000	36,000	10,400		12,000	155,000	106,000	45,000
4,650		6,000	85,000	45,000	36,000	10,500		12,000	155,000	106,000	45,000
4,760	3/16	6,000	90,000	50,000	36,000	10,720	27/64	12,000	155,000	106,000	45,000
5,000		6,000	90,000	50,000	36,000	10,800		12,000	155,000	106,000	45,000
5,100		6,000	90,000	50,000	36,000	11,000		12,000	155,000	106,000	45,000
5,160	13/64	6,000	90,000	50,000	36,000	11,110	7/16	12,000	163,000	114,000	45,000
5,200		6,000	90,000	50,000	36,000	11,300		12,000	163,000	114,000	45,000
5,500		6,000	97,000	57,000	36,000	11,400		12,000	163,000	114,000	45,000
5,550		6,000	97,000	57,000	36,000	11,500		12,000	163,000	114,000	45,000
5,560	7/32	6,000	97,000	57,000	36,000	11,510	29/64	12,000	163,000	114,000	45,000
5,950	15/64	6,000	97,000	57,000	36,000	11,910	15/32	12,000	163,000	114,000	45,000
6,000		6,000	97,000	57,000	36,000	12,000		12,000	163,000	114,000	45,000
6,350	1/4	8,000	106,000	66,000	36,000	12,300	31/64	14,000	182,000	133,000	45,000
6,500		8,000	106,000	66,000	36,000	12,500		14,000	182,000	133,000	45,000
6,530		8,000	106,000	66,000	36,000	12,700	1/2	14,000	182,000	133,000	45,000
6,750	17/64	8,000	106,000	66,000	36,000	13,000		14,000	182,000	133,000	45,000
6,800		8,000	106,000	66,000	36,000	13,100	33/64	14,000	182,000	133,000	45,000
6,900		8,000	116,000	76,000	36,000	13,490	17/32	14,000	182,000	133,000	45,000
7,000		8,000	116,000	76,000	36,000	13,500		14,000	182,000	133,000	45,000
7,140	9/32	8,000	116,000	76,000	36,000	14,000		14,000	182,000	133,000	45,000
7,400		8,000	116,000	76,000	36,000	14,290	9/16	16,000	204,000	152,000	48,000
7,500		8,000	116,000	76,000	36,000	14,500		16,000	204,000	152,000	48,000
7,540	19/64	8,000	116,000	76,000	36,000	15,000		16,000	204,000	152,000	48,000
7,800		8,000	116,000	76,000	36,000	15,100		16,000	204,000	152,000	48,000
7,940	5/16	8,000	116,000	76,000	36,000	15,500		16,000	204,000	152,000	48,000
8,000		8,000	116,000	76,000	36,000	15,870	5/8	16,000	204,000	152,000	48,000
8,330	21/64	10,000	131,000	87,000	40,000	16,000		16,000	204,000	152,000	48,000
8,500		10,000	131,000	87,000	40,000						
8,600		10,000	131,000	87,000	40,000						



İçten soğutma kanallı rasyo matkap



<b>P</b>	öz bileme $\geq \varnothing 4,000$ • patentlenmiş radyuslu uç bilemesi • ana kesici ağız düz form (düzeltmeden sonra)
<b>M</b>	
<b>K</b>	•
<b>N</b>	vermikular dökme demir GGK , ADI, CDI • pik döküm, temper döküm ve küresel döküm
<b>S</b>	
<b>H</b>	

**GÜHRING NAVIGATOR**

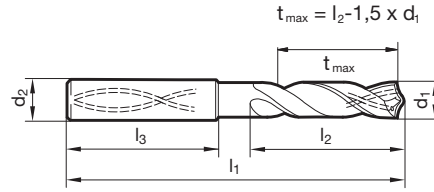
Kesme verileri sayfası 758

Malzeme **Kom. sert metal**

Yüzey **F**

sap formu HA

Rasyo matkap ucu



Ürün no **6502**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
4,000		6,000	75,000	37,500	36,000	8,800		10,000	131,000	87,000	40,000
4,300		6,000	85,000	45,000	36,000	8,900		10,000	131,000	87,000	40,000
4,370	11/64	6,000	85,000	45,000	36,000	9,000		10,000	131,000	87,000	40,000
4,400		6,000	85,000	45,000	36,000	9,100		10,000	139,000	95,000	40,000
4,500		6,000	85,000	45,000	36,000	9,250		10,000	139,000	95,000	40,000
4,600		6,000	85,000	45,000	36,000	9,300		10,000	139,000	95,000	40,000
4,700		6,000	85,000	45,000	36,000	9,400		10,000	139,000	95,000	40,000
4,760	3/16	6,000	90,000	50,000	36,000	9,500		10,000	139,000	95,000	40,000
4,900		6,000	90,000	50,000	36,000	9,600		10,000	139,000	95,000	40,000
5,000		6,000	90,000	50,000	36,000	9,700		10,000	139,000	95,000	40,000
5,160	13/64	6,000	90,000	50,000	36,000	9,800		10,000	139,000	95,000	40,000
5,300		6,000	90,000	50,000	36,000	9,900		10,000	139,000	95,000	40,000
5,500		6,000	97,000	57,000	36,000	10,000		10,000	139,000	95,000	40,000
5,550		6,000	97,000	57,000	36,000	10,100		12,000	155,000	106,000	45,000
5,560	7/32	6,000	97,000	57,000	36,000	10,200		12,000	155,000	106,000	45,000
5,600		6,000	97,000	57,000	36,000	10,300		12,000	155,000	106,000	45,000
5,700		6,000	97,000	57,000	36,000	10,320	13/32	12,000	155,000	106,000	45,000
5,800		6,000	97,000	57,000	36,000	10,400		12,000	155,000	106,000	45,000
5,900		6,000	97,000	57,000	36,000	10,500		12,000	155,000	106,000	45,000
6,000		6,000	97,000	57,000	36,000	10,700		12,000	155,000	106,000	45,000
6,100		8,000	106,000	66,000	36,000	10,800		12,000	155,000	106,000	45,000
6,200		8,000	106,000	66,000	36,000	10,900		12,000	155,000	106,000	45,000
6,300		8,000	106,000	66,000	36,000	11,000		12,000	155,000	106,000	45,000
6,400		8,000	106,000	66,000	36,000	11,100		12,000	163,000	114,000	45,000
6,500		8,000	106,000	66,000	36,000	11,200		12,000	163,000	114,000	45,000
6,700		8,000	106,000	66,000	36,000	11,300		12,000	163,000	114,000	45,000
6,800		8,000	106,000	66,000	36,000	11,500		12,000	163,000	114,000	45,000
6,900		8,000	116,000	76,000	36,000	11,600		12,000	163,000	114,000	45,000
7,000		8,000	116,000	76,000	36,000	11,700		12,000	163,000	114,000	45,000
7,140	9/32	8,000	116,000	76,000	36,000	11,800		12,000	163,000	114,000	45,000
7,200		8,000	116,000	76,000	36,000	12,000		12,000	163,000	114,000	45,000
7,500		8,000	116,000	76,000	36,000	12,100		14,000	182,000	133,000	45,000
7,600		8,000	116,000	76,000	36,000	12,300	31/64	14,000	182,000	133,000	45,000
7,700		8,000	116,000	76,000	36,000	12,400		14,000	182,000	133,000	45,000
8,000		8,000	116,000	76,000	36,000	12,500		14,000	182,000	133,000	45,000
8,100		10,000	131,000	87,000	40,000	12,600		14,000	182,000	133,000	45,000
8,200		10,000	131,000	87,000	40,000	12,700	1/2	14,000	182,000	133,000	45,000
8,300		10,000	131,000	87,000	40,000	12,800		14,000	182,000	133,000	45,000
8,330	21/64	10,000	131,000	87,000	40,000	13,000		14,000	182,000	133,000	45,000
8,400		10,000	131,000	87,000	40,000	13,100	33/64	14,000	182,000	133,000	45,000
8,500		10,000	131,000	87,000	40,000	13,300		14,000	182,000	133,000	45,000
8,600		10,000	131,000	87,000	40,000	13,500		14,000	182,000	133,000	45,000



Rasyo matkap ucu

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,700		14,000	182,000	133,000	45,000
13,900		14,000	182,000	133,000	45,000
14,000		14,000	182,000	133,000	45,000
14,100		16,000	204,000	152,000	48,000
14,290	9/16	16,000	204,000	152,000	48,000
14,400		16,000	204,000	152,000	48,000
14,500		16,000	204,000	152,000	48,000
14,600		16,000	204,000	152,000	48,000
14,700		16,000	204,000	152,000	48,000
15,000		16,000	204,000	152,000	48,000
15,100		16,000	204,000	152,000	48,000
15,200		16,000	204,000	152,000	48,000
15,500		16,000	204,000	152,000	48,000
15,600		16,000	204,000	152,000	48,000
15,800		16,000	204,000	152,000	48,000
15,900		16,000	204,000	152,000	48,000
16,000		16,000	204,000	152,000	48,000
16,500		18,000	223,000	171,000	48,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
16,670	21/32	18,000	223,000	171,000	48,000
17,000		18,000	223,000	171,000	48,000
17,500		18,000	223,000	171,000	48,000
18,000		18,000	223,000	171,000	48,000
18,500		20,000	244,000	190,000	50,000
19,000		20,000	244,000	190,000	50,000
19,500		20,000	244,000	190,000	50,000
20,000		20,000	244,000	190,000	50,000



İçten soğutma kanallı rasyo matkap



Malzeme **Kom. sert metal**

Yüzey ○

sap formu HA

**P** öz bileme ≥ Ø 3,000 • koni bileme • dar çap toleransları • delik yüzey finişleri çok iyi • yağ basıncına dikkat edin

**M**

**K** •

**N** ○

pik döküm, temper döküm ve küresel döküm

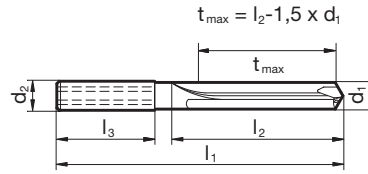
**S**

**H**

**GÜHRING NAVIGATOR**

Kesme verileri sayfası 758

Rasyo matkap ucu



Ürün no **769**

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		6,000	74,000	32,000	36,000
3,100		6,000	74,000	32,000	36,000
3,200		6,000	74,000	32,000	36,000
3,300		6,000	74,000	32,000	36,000
3,500		6,000	74,000	34,000	36,000
3,600		6,000	74,000	34,000	36,000
3,700		6,000	74,000	34,000	36,000
3,800		6,000	97,000	45,000	36,000
3,900		6,000	97,000	45,000	36,000
4,000		6,000	97,000	45,000	36,000
4,100		6,000	97,000	45,000	36,000
4,200		6,000	97,000	45,000	36,000
4,300		6,000	97,000	45,000	36,000
4,400		6,000	97,000	45,000	36,000
4,500		6,000	97,000	45,000	36,000
4,700		6,000	97,000	45,000	36,000
4,800		6,000	97,000	57,000	36,000
4,900		6,000	97,000	57,000	36,000
5,000		6,000	97,000	57,000	36,000
5,160	13/64	6,000	97,000	57,000	36,000
5,500		6,000	97,000	57,000	36,000
6,000		6,000	97,000	57,000	36,000
6,350	1/4	8,000	116,000	76,000	36,000
6,500		8,000	116,000	76,000	36,000
6,800		8,000	116,000	76,000	36,000
7,000		8,000	116,000	76,000	36,000
7,140	9/32	8,000	116,000	76,000	36,000
7,500		8,000	116,000	76,000	36,000
7,800		8,000	116,000	76,000	36,000
7,940	5/16	8,000	116,000	76,000	36,000
8,000		8,000	116,000	76,000	36,000
8,330	21/64	10,000	139,000	95,000	40,000
8,500		10,000	139,000	95,000	40,000
8,730	11/32	10,000	139,000	95,000	40,000
9,000		10,000	139,000	95,000	40,000
9,130	23/64	10,000	139,000	95,000	40,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,500		10,000	139,000	95,000	40,000
9,520	3/8	10,000	139,000	95,000	40,000
10,000		10,000	139,000	95,000	40,000
10,200		12,000	163,000	114,000	45,000
10,320	13/32	12,000	163,000	114,000	45,000
10,500		12,000	163,000	114,000	45,000
10,720	27/64	12,000	163,000	114,000	45,000
11,000		12,000	163,000	114,000	45,000
11,110	7/16	12,000	163,000	114,000	45,000
11,500		12,000	163,000	114,000	45,000
11,510	29/64	12,000	163,000	114,000	45,000
12,000		12,000	163,000	114,000	45,000
12,300	31/64	14,000	182,000	133,000	45,000
12,500		14,000	182,000	133,000	45,000
12,700	1/2	14,000	182,000	133,000	45,000
13,000		14,000	182,000	133,000	45,000
13,500		14,000	182,000	133,000	45,000
14,000		14,000	182,000	133,000	45,000
14,500		16,000	204,000	152,000	48,000
15,000		16,000	204,000	152,000	48,000
15,500		16,000	204,000	152,000	48,000
16,000		16,000	204,000	152,000	48,000
16,500		18,000	223,000	171,000	48,000
17,000		18,000	223,000	171,000	48,000
17,500		18,000	223,000	171,000	48,000
18,000		18,000	223,000	171,000	48,000
18,500		20,000	244,000	190,000	50,000
19,000		20,000	244,000	190,000	50,000
20,000		20,000	244,000	190,000	50,000



## İçten soğutma kanallı rasyo matkap



**P** öz bileme  $\geq \text{Ø } 3,000$  • yüzey Bileme • dar çap toleransları • delik yüzey finişleri çok iyi • ideal yağ basıncına dikkat edin

**M****K** ○**N** •**S****H**

Alüminyum ve Al-Alaşımaları • Yüksek Si içerikli Al malzemeler

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 758

Malzeme

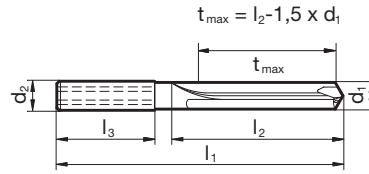
Kom. sert metal

Yüzey

○

sap formu

HA



Ürün no

6069

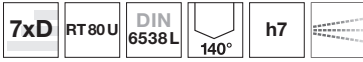
d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		6,000	74,000	32,000	36,000
3,200		6,000	74,000	32,000	36,000
3,300		6,000	74,000	32,000	36,000
3,500		6,000	74,000	34,000	36,000
3,600		6,000	74,000	34,000	36,000
4,000		6,000	97,000	45,000	36,000
4,200		6,000	97,000	45,000	36,000
4,300		6,000	97,000	45,000	36,000
4,500		6,000	97,000	45,000	36,000
5,000		6,000	97,000	57,000	36,000
6,000		6,000	97,000	57,000	36,000
6,350	1/4	8,000	116,000	76,000	36,000
6,500		8,000	116,000	76,000	36,000
6,800		8,000	116,000	76,000	36,000
7,000		8,000	116,000	76,000	36,000
7,800		8,000	116,000	76,000	36,000
8,000		8,000	116,000	76,000	36,000
8,500		10,000	139,000	95,000	40,000
8,730	11/32	10,000	139,000	95,000	40,000
9,000		10,000	139,000	95,000	40,000
9,500		10,000	139,000	95,000	40,000
9,520	3/8	10,000	139,000	95,000	40,000
10,000		10,000	139,000	95,000	40,000
10,200		12,000	163,000	114,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
10,320	13/32	12,000	163,000	114,000	45,000
10,500		12,000	163,000	114,000	45,000
10,720	27/64	12,000	163,000	114,000	45,000
11,000		12,000	163,000	114,000	45,000
12,000		12,000	163,000	114,000	45,000
12,300	31/64	14,000	182,000	133,000	45,000
12,500		14,000	182,000	133,000	45,000
12,700	1/2	14,000	182,000	133,000	45,000
13,000		14,000	182,000	133,000	45,000
13,500		14,000	182,000	133,000	45,000
14,000		14,000	182,000	133,000	45,000
14,500		16,000	204,000	152,000	48,000
15,000		16,000	204,000	152,000	48,000
15,500		16,000	204,000	152,000	48,000
16,000		16,000	204,000	152,000	48,000
16,500		18,000	223,000	171,000	48,000
17,000		18,000	223,000	171,000	48,000
18,000		18,000	223,000	171,000	48,000
18,500		20,000	244,000	190,000	50,000
19,000		20,000	244,000	190,000	50,000
19,500		20,000	244,000	190,000	50,000





İçten soğutma kanallı rasyo matkap



Malzeme **Sert metal**

Yüzey **S**

sap formu HE

**P** • öz bileme  $\geq \varnothing 9,600$  • koni bileme • Lehimli HM plaketti HSS gövde • Darbe ve titreşimleri önler

**M** ○

**K** ○

**N** ○

**S** ○

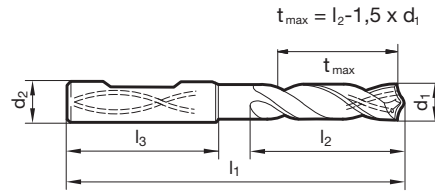
**H** ○

alaşimsız/düşük alaşimli çelikler • pik döküm, küresel grafit döküm • pirinç, bronzlar, plastikler, grafit

**GÜHRING NAVIGATOR**

Kesme verileri sayfası 758

Rasyo matkap ucu



Ürün no **1173**

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,600		16,000	151,000	99,000	48,000
9,700		16,000	151,000	99,000	48,000
10,000		16,000	151,000	99,000	48,000
10,200		16,000	151,000	99,000	48,000
10,400		16,000	151,000	99,000	48,000
11,000		16,000	151,000	99,000	48,000
11,500		16,000	151,000	99,000	48,000
11,700		16,000	151,000	99,000	48,000
12,000		16,000	151,000	99,000	48,000
12,200		16,000	167,000	115,000	48,000
12,400		16,000	167,000	115,000	48,000
12,500		16,000	167,000	115,000	48,000
12,700	1/2	16,000	167,000	115,000	48,000
13,000		16,000	167,000	115,000	48,000
13,500		16,000	167,000	115,000	48,000
14,000		16,000	167,000	115,000	48,000
14,500		20,000	186,000	132,000	50,000
15,000		20,000	186,000	132,000	50,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
15,700		20,000	186,000	132,000	50,000
15,800		20,000	186,000	132,000	50,000
16,000		20,000	186,000	132,000	50,000
16,500		20,000	202,000	148,000	50,000
17,000		20,000	202,000	148,000	50,000
17,200		20,000	202,000	148,000	50,000
17,460	11/16	20,000	202,000	148,000	50,000
17,500		20,000	202,000	148,000	50,000
18,000		20,000	202,000	148,000	50,000
18,500		25,000	224,000	164,000	56,000
19,000		25,000	224,000	164,000	56,000
20,000		25,000	224,000	164,000	56,000
21,000		25,000	241,000	181,000	56,000
22,000		25,000	241,000	181,000	56,000
22,500		25,000	257,000	197,000	56,000
25,000	63/64	32,000	278,000	214,000	60,000



## İçten soğutma kanallı rasyo matkap



<b>P</b>	•	yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi • maksimum performans
<b>M</b>	○	
<b>K</b>	○	
<b>N</b>	○	yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • 1400 N/mm <sup>2</sup> ye kadar alaşımlı/alaşımsız çelikler
<b>S</b>	○	
<b>H</b>	○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 758

Malzeme

Kom. sert metal

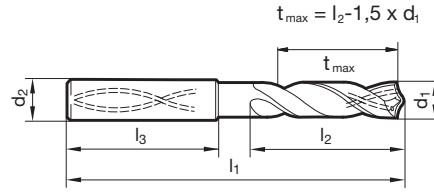
Yüzey

F

sap formu

HA

NEW



Ürün no

5760

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	70,000	30,000	36,000	5,900		6,000	97,000	57,000	36,000
3,100		6,000	70,000	30,000	36,000	5,950		6,000	97,000	57,000	36,000
3,170	1/8	6,000	70,000	30,000	36,000	6,000		6,000	97,000	57,000	36,000
3,200		6,000	70,000	30,000	36,000	6,100		8,000	106,000	66,000	36,000
3,250		6,000	70,000	30,000	36,000	6,200		8,000	106,000	66,000	36,000
3,300		6,000	70,000	30,000	36,000	6,300		8,000	106,000	66,000	36,000
3,400		6,000	75,000	35,500	36,000	6,350	1/4	8,000	106,000	66,000	36,000
3,500		6,000	75,000	35,500	36,000	6,400		8,000	106,000	66,000	36,000
3,570	9/64	6,000	75,000	35,500	36,000	6,500		8,000	106,000	66,000	36,000
3,600		6,000	75,000	35,500	36,000	6,530		8,000	106,000	66,000	36,000
3,700		6,000	75,000	35,500	36,000	6,600		8,000	106,000	66,000	36,000
3,800		6,000	75,000	37,500	36,000	6,700		8,000	106,000	66,000	36,000
3,900		6,000	75,000	37,500	36,000	6,750		8,000	106,000	66,000	36,000
3,970	5/32	6,000	75,000	37,500	36,000	6,800		8,000	106,000	66,000	36,000
4,000		6,000	75,000	37,500	36,000	6,900		8,000	116,000	76,000	36,000
4,040		6,000	75,000	37,500	36,000	7,000		8,000	116,000	76,000	36,000
4,100		6,000	75,000	37,500	36,000	7,100		8,000	116,000	76,000	36,000
4,200		6,000	75,000	37,500	36,000	7,140		8,000	116,000	76,000	36,000
4,300		6,000	85,000	45,000	36,000	7,200		8,000	116,000	76,000	36,000
4,370	11/64	6,000	85,000	45,000	36,000	7,300		8,000	116,000	76,000	36,000
4,400		6,000	85,000	45,000	36,000	7,400		8,000	116,000	76,000	36,000
4,500		6,000	85,000	45,000	36,000	7,500		8,000	116,000	76,000	36,000
4,600		6,000	85,000	45,000	36,000	7,540		8,000	116,000	76,000	36,000
4,650		6,000	85,000	45,000	36,000	7,600		8,000	116,000	76,000	36,000
4,700		6,000	85,000	45,000	36,000	7,700		8,000	116,000	76,000	36,000
4,760	3/16	6,000	90,000	50,000	36,000	7,800		8,000	116,000	76,000	36,000
4,800		6,000	90,000	50,000	36,000	7,900		8,000	116,000	76,000	36,000
4,900		6,000	90,000	50,000	36,000	7,940		8,000	116,000	76,000	36,000
5,000		6,000	90,000	50,000	36,000	8,000		8,000	116,000	76,000	36,000
5,100		6,000	90,000	50,000	36,000	8,100		10,000	131,000	87,000	40,000
5,110		6,000	90,000	50,000	36,000	8,200		10,000	131,000	87,000	40,000
5,160	13/64	6,000	90,000	50,000	36,000	8,300		10,000	131,000	87,000	40,000
5,200		6,000	90,000	50,000	36,000	8,330		10,000	131,000	87,000	40,000
5,300		6,000	90,000	50,000	36,000	8,400		10,000	131,000	87,000	40,000
5,400		6,000	97,000	57,000	36,000	8,500		10,000	131,000	87,000	40,000
5,410		6,000	97,000	57,000	36,000	8,600		10,000	131,000	87,000	40,000
5,500		6,000	97,000	57,000	36,000	8,700		10,000	131,000	87,000	40,000
5,550		6,000	97,000	57,000	36,000	8,730		10,000	131,000	87,000	40,000
5,560		6,000	97,000	57,000	36,000	8,800		10,000	131,000	87,000	40,000
5,600		6,000	97,000	57,000	36,000	8,900		10,000	131,000	87,000	40,000
5,700		6,000	97,000	57,000	36,000	9,000		10,000	131,000	87,000	40,000
5,800		6,000	97,000	57,000	36,000	9,100		10,000	139,000	95,000	40,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,130		10,000	139,000	95,000	40,000
9,200		10,000	139,000	95,000	40,000
9,250		10,000	139,000	95,000	40,000
9,300		10,000	139,000	95,000	40,000
9,340		10,000	139,000	95,000	40,000
9,400		10,000	139,000	95,000	40,000
9,500		10,000	139,000	95,000	40,000
9,520	3/8	10,000	139,000	95,000	40,000
9,600		10,000	139,000	95,000	40,000
9,700		10,000	139,000	95,000	40,000
9,800		10,000	139,000	95,000	40,000
9,900		10,000	139,000	95,000	40,000
9,920		10,000	139,000	95,000	40,000
10,000		10,000	139,000	95,000	40,000
10,100		12,000	155,000	106,000	45,000
10,200		12,000	155,000	106,000	45,000
10,300		12,000	155,000	106,000	45,000
10,320		12,000	155,000	106,000	45,000
10,400		12,000	155,000	106,000	45,000
10,500		12,000	155,000	106,000	45,000
10,600		12,000	155,000	106,000	45,000
10,700		12,000	155,000	106,000	45,000
10,720		12,000	155,000	106,000	45,000
10,800		12,000	155,000	106,000	45,000
10,900		12,000	155,000	106,000	45,000
11,000		12,000	155,000	106,000	45,000
11,100		12,000	163,000	114,000	45,000
11,110		12,000	163,000	114,000	45,000
11,200		12,000	163,000	114,000	45,000
11,300		12,000	163,000	114,000	45,000
11,400		12,000	163,000	114,000	45,000
11,500		12,000	163,000	114,000	45,000
11,510		12,000	163,000	114,000	45,000
11,600		12,000	163,000	114,000	45,000
11,700		12,000	163,000	114,000	45,000
11,800		12,000	163,000	114,000	45,000
11,900		12,000	163,000	114,000	45,000
11,910		12,000	163,000	114,000	45,000
12,000		12,000	163,000	114,000	45,000
12,100		14,000	182,000	133,000	45,000
12,200		14,000	182,000	133,000	45,000
12,300		14,000	182,000	133,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
12,500		14,000	182,000	133,000	45,000
12,700	1/2	14,000	182,000	133,000	45,000
13,000		14,000	182,000	133,000	45,000
13,100		14,000	182,000	133,000	45,000
13,490		14,000	182,000	133,000	45,000
13,500		14,000	182,000	133,000	45,000
13,700		14,000	182,000	133,000	45,000
13,890		14,000	182,000	133,000	45,000
14,000		14,000	182,000	133,000	45,000
14,100		16,000	204,000	152,000	48,000
14,200		16,000	204,000	152,000	48,000
14,290		16,000	204,000	152,000	48,000
14,500		16,000	204,000	152,000	48,000
14,700		16,000	204,000	152,000	48,000
15,000		16,000	204,000	152,000	48,000
15,100		16,000	204,000	152,000	48,000
15,480		16,000	204,000	152,000	48,000
15,500		16,000	204,000	152,000	48,000
15,700		16,000	204,000	152,000	48,000
15,870		16,000	204,000	152,000	48,000
16,000		16,000	204,000	152,000	48,000
16,500		18,000	223,000	171,000	48,000
16,900		18,000	223,000	171,000	48,000
17,000		18,000	223,000	171,000	48,000
17,500		18,000	223,000	171,000	48,000
17,700		18,000	223,000	171,000	48,000
18,000		18,000	223,000	171,000	48,000
18,500		20,000	244,000	190,000	50,000
18,900		20,000	244,000	190,000	50,000
19,000		20,000	244,000	190,000	50,000
19,050	3/4	20,000	244,000	190,000	50,000
19,500		20,000	244,000	190,000	50,000
20,000		20,000	244,000	190,000	50,000



## İçten soğutma kanallı rasyo matkap



**P** öz bileme  $\geq \varnothing 3,000$  • koni bileme • dar çap toleransları • delik yüzey finişleri çok iyi • yağ basıncına dikkat edin

**M****K** •**N** ○

pik döküm, temper döküm ve küresel döküm

**S****H****GÜHRING**NAVIGATOR

Kesme verileri sayfası 758

Malzeme

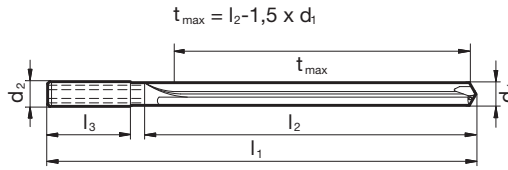
Kom. sert metal

Yüzey

○

sap formu

HA



Ürün no

770

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		6,000	91,000	42,000	36,000
3,100		6,000	91,000	42,000	36,000
3,300		6,000	91,000	42,000	36,000
3,800		6,000	121,000	77,000	36,000
4,000		6,000	121,000	77,000	36,000
4,100		6,000	121,000	77,000	36,000
4,200		6,000	121,000	77,000	36,000
4,300		6,000	121,000	77,000	36,000
4,400		6,000	121,000	77,000	36,000
4,500		6,000	121,000	77,000	36,000
4,800		6,000	121,000	82,000	36,000
4,900		6,000	121,000	82,000	36,000
5,000		6,000	121,000	82,000	36,000
5,160	13/64	6,000	121,000	82,000	36,000
5,500		6,000	121,000	82,000	36,000
5,560	7/32	6,000	121,000	82,000	36,000
6,000		6,000	121,000	82,000	36,000
6,500		8,000	146,000	106,000	36,000
6,750	17/64	8,000	146,000	106,000	36,000
6,800		8,000	146,000	106,000	36,000
7,000		8,000	146,000	106,000	36,000
7,140	9/32	8,000	146,000	106,000	36,000
7,500		8,000	146,000	106,000	36,000
7,800		8,000	146,000	106,000	36,000
7,940	5/16	8,000	146,000	106,000	36,000
8,000		8,000	146,000	106,000	36,000
8,500		10,000	175,000	130,000	40,000
8,730	11/32	10,000	175,000	130,000	40,000
9,000		10,000	175,000	130,000	40,000
9,500		10,000	175,000	130,000	40,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
10,000		10,000	175,000	130,000	40,000
10,200		12,000	209,000	159,000	45,000
10,500		12,000	209,000	159,000	45,000
10,720	27/64	12,000	209,000	159,000	45,000
11,000		12,000	209,000	159,000	45,000
11,500		12,000	209,000	159,000	45,000
11,510	29/64	12,000	209,000	159,000	45,000
12,000		12,000	209,000	159,000	45,000
12,300	31/64	14,000	233,000	183,000	45,000
12,500		14,000	233,000	183,000	45,000
12,700	1/2	14,000	233,000	183,000	45,000
13,000		14,000	233,000	183,000	45,000
13,500		14,000	233,000	183,000	45,000
14,000		14,000	233,000	183,000	45,000
14,500		16,000	260,000	207,000	48,000
15,000		16,000	260,000	207,000	48,000
15,500		16,000	260,000	207,000	48,000
16,500		18,000	284,000	231,000	48,000
17,000		18,000	284,000	231,000	48,000
17,500		18,000	284,000	231,000	48,000
18,000		18,000	284,000	231,000	48,000
19,000		20,000	308,000	255,000	50,000
20,000		20,000	308,000	255,000	50,000



İçten soğutma kanallı rasyo matkap



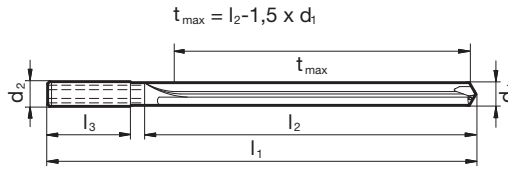
<b>P</b>	öz bileme $\geq \text{Ø } 3,000$ • yüzey Bileme • dar çap toleransları • delik yüzey finişleri çok iyi • ideal yağ basıncına dikkat edin
<b>M</b>	
<b>K</b>	○
<b>N</b>	• Alüminyum ve Al-Alaşımaları • Yüksek Si içerikli Al malzemeler
<b>S</b>	
<b>H</b>	

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 758

Malzeme	<b>Kom. sert metal</b>
Yüzey	○
sap formu	HA

Rasyo matkap ucu



Ürün no **6070**

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		6,000	91,000	42,000	36,000
3,100		6,000	91,000	42,000	36,000
3,300		6,000	91,000	42,000	36,000
3,500		6,000	91,000	48,000	36,000
3,800		6,000	121,000	77,000	36,000
4,000		6,000	121,000	77,000	36,000
4,700		6,000	121,000	77,000	36,000
4,800		6,000	121,000	82,000	36,000
5,000		6,000	121,000	82,000	36,000
5,500		6,000	121,000	82,000	36,000
6,000		6,000	121,000	82,000	36,000
6,350	1/4	8,000	146,000	106,000	36,000
6,500		8,000	146,000	106,000	36,000
6,800		8,000	146,000	106,000	36,000
7,500		8,000	146,000	106,000	36,000
7,800		8,000	146,000	106,000	36,000
7,940	5/16	8,000	146,000	106,000	36,000
8,000		8,000	146,000	106,000	36,000
8,500		10,000	175,000	130,000	40,000
8,730	11/32	10,000	175,000	130,000	40,000
9,000		10,000	175,000	130,000	40,000
9,500		10,000	175,000	130,000	40,000
9,520	3/8	10,000	175,000	130,000	40,000
10,000		10,000	175,000	130,000	40,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
10,500		12,000	209,000	159,000	45,000
11,000		12,000	209,000	159,000	45,000
11,110	7/16	12,000	209,000	159,000	45,000
12,000		12,000	209,000	159,000	45,000
12,700	1/2	14,000	233,000	183,000	45,000
13,000		14,000	233,000	183,000	45,000
14,000		14,000	233,000	183,000	45,000
15,000		16,000	260,000	207,000	48,000
16,000		16,000	260,000	207,000	48,000
17,000		18,000	284,000	231,000	48,000
17,500		18,000	284,000	231,000	48,000
18,000		18,000	284,000	231,000	48,000
18,500		20,000	308,000	255,000	50,000
19,500		20,000	308,000	255,000	50,000



## İçten soğutma kanallı rasyo matkap



**P** • öz bileme  $\geq \varnothing 3,000$  • yüzey Bileme • ana kesici ağız düz form • optimize edilmiş kesme geometrisi

**M** ○

**K** •

**N** ○ yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşimli çelikler 1200 N/mm<sup>2</sup>'ye kadar • döküm malzemeler • bronz / pirinç • yüksek alaşimli AISi-Alaşımları

**S** ○

**H** ○

## GÜHRING NAVIGATOR

Kesme verileri sayfası 758

Malzeme

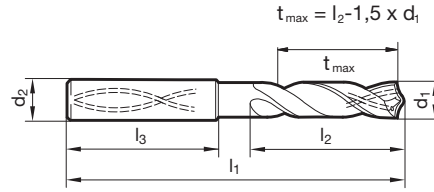
Kom. sert metal

Yüzey

F

sap formu

HA



Ürün no

5525

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	90,000	50,000	36,000	7,000		8,000	146,000	108,000	36,000
3,100		6,000	90,000	50,000	36,000	7,100		8,000	146,000	108,000	36,000
3,170	1/8	6,000	90,000	50,000	36,000	7,200		8,000	146,000	108,000	36,000
3,200		6,000	90,000	50,000	36,000	7,300		8,000	146,000	108,000	36,000
3,300		6,000	90,000	50,000	36,000	7,400		8,000	146,000	108,000	36,000
3,400		6,000	90,000	50,000	36,000	7,500		8,000	146,000	108,000	36,000
3,500		6,000	90,000	50,000	36,000	7,600		8,000	146,000	108,000	36,000
3,600		6,000	90,000	50,000	36,000	7,700		8,000	146,000	108,000	36,000
3,700		6,000	90,000	50,000	36,000	7,800		8,000	146,000	108,000	36,000
3,800		6,000	102,000	64,000	36,000	7,900		8,000	146,000	108,000	36,000
3,900		6,000	102,000	64,000	36,000	8,000		8,000	146,000	108,000	36,000
4,000		6,000	102,000	64,000	36,000	8,100		10,000	162,000	120,000	40,000
4,100		6,000	102,000	64,000	36,000	8,200		10,000	162,000	120,000	40,000
4,200		6,000	102,000	64,000	36,000	8,300		10,000	162,000	120,000	40,000
4,300		6,000	102,000	64,000	36,000	8,400		10,000	162,000	120,000	40,000
4,400		6,000	102,000	64,000	36,000	8,500		10,000	162,000	120,000	40,000
4,500		6,000	102,000	64,000	36,000	8,600		10,000	162,000	120,000	40,000
4,600		6,000	102,000	64,000	36,000	8,700		10,000	162,000	120,000	40,000
4,700		6,000	102,000	64,000	36,000	8,800		10,000	162,000	120,000	40,000
4,800		6,000	116,000	78,000	36,000	8,900		10,000	162,000	120,000	40,000
4,900		6,000	116,000	78,000	36,000	9,000		10,000	162,000	120,000	40,000
5,000		6,000	116,000	78,000	36,000	9,100		10,000	162,000	120,000	40,000
5,100		6,000	116,000	78,000	36,000	9,200		10,000	162,000	120,000	40,000
5,200		6,000	116,000	78,000	36,000	9,300		10,000	162,000	120,000	40,000
5,300		6,000	116,000	78,000	36,000	9,400		10,000	162,000	120,000	40,000
5,400		6,000	116,000	78,000	36,000	9,500		10,000	162,000	120,000	40,000
5,500		6,000	116,000	78,000	36,000	9,520	3/8	10,000	162,000	120,000	40,000
5,600		6,000	116,000	78,000	36,000	9,600		10,000	162,000	120,000	40,000
5,700		6,000	116,000	78,000	36,000	9,700		10,000	162,000	120,000	40,000
5,800		6,000	116,000	78,000	36,000	9,800		10,000	162,000	120,000	40,000
5,900		6,000	116,000	78,000	36,000	9,900		10,000	162,000	120,000	40,000
6,000		6,000	116,000	78,000	36,000	10,000		10,000	162,000	120,000	40,000
6,100		8,000	146,000	108,000	36,000	10,200		12,000	204,000	156,000	45,000
6,200		8,000	146,000	108,000	36,000	10,500		12,000	204,000	156,000	45,000
6,300		8,000	146,000	108,000	36,000	11,000		12,000	204,000	156,000	45,000
6,350	1/4	8,000	146,000	108,000	36,000	11,500		12,000	204,000	156,000	45,000
6,400		8,000	146,000	108,000	36,000	12,000		12,000	204,000	156,000	45,000
6,500		8,000	146,000	108,000	36,000	12,500		14,000	230,000	182,000	45,000
6,600		8,000	146,000	108,000	36,000	12,700	1/2	14,000	230,000	182,000	45,000
6,700		8,000	146,000	108,000	36,000	13,000		14,000	230,000	182,000	45,000
6,800		8,000	146,000	108,000	36,000	13,500		14,000	230,000	182,000	45,000
6,900		8,000	146,000	108,000	36,000	14,000		14,000	230,000	182,000	45,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
14,500		16,000	260,000	208,000	48,000
15,000		16,000	260,000	208,000	48,000
15,500		16,000	260,000	208,000	48,000
16,000		16,000	260,000	208,000	48,000
16,500		18,000	285,000	234,000	48,000
17,000		18,000	285,000	234,000	48,000
17,500		18,000	285,000	234,000	48,000
18,000		18,000	285,000	234,000	48,000
18,500		20,000	310,000	258,000	50,000
19,000		20,000	310,000	258,000	50,000
19,050	3/4	20,000	310,000	258,000	50,000
19,500		20,000	310,000	258,000	50,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
20,000		20,000	310,000	258,000	50,000

**İçten soğutma kanallı rasyo matkap**



- P** • öz bileme  $\geq \varnothing 3,000$  • koni bileme • ana kesici ağız form konkav • optimize edilmiş kanal kesit alanı • maksimal soğutma kanal delikleri alanı • yağ basıncına dikkat edin
- M** •
- K** •
- N** ○ yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm<sup>2</sup>'ye kadar • paslanmaz çelikler • döküm malzemeler
- S** ○
- H** ○

Malzeme

**Kom. sert metal**

Yüze

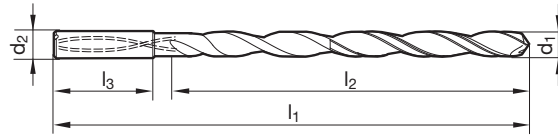
**A**

sap formu

HA

**GÜHRING NAVIGATOR**

Kesme verileri sayfası 760



Ürün no

**6509**

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		6,000	95,000	55,000	36,000
3,170	1/8	6,000	106,000	67,000	36,000
3,500		6,000	116,000	76,000	36,000
3,570	9/64	6,000	116,000	76,000	36,000
3,970	5/32	6,000	116,000	76,000	36,000
4,000		6,000	116,000	76,000	36,000
4,370	11/64	6,000	133,000	93,000	36,000
4,500		6,000	133,000	93,000	36,000
4,760	3/16	6,000	133,000	93,000	36,000
5,000		6,000	133,000	93,000	36,000
5,100		6,000	150,000	110,000	36,000
5,160	13/64	6,000	150,000	110,000	36,000
5,410		6,000	150,000	110,000	36,000
5,500		6,000	150,000	110,000	36,000
5,560	7/32	6,000	150,000	110,000	36,000
5,950	15/64	6,000	150,000	110,000	36,000
6,000		6,000	150,000	110,000	36,000
6,350	1/4	8,000	167,000	127,000	36,000
6,500		8,000	167,000	127,000	36,000
6,750	17/64	8,000	167,000	127,000	36,000
7,000		8,000	167,000	127,000	36,000
7,140	9/32	8,000	183,000	143,000	36,000
7,500		8,000	183,000	143,000	36,000
7,540	19/64	8,000	183,000	143,000	36,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
7,940	5/16	8,000	183,000	143,000	36,000
8,000		8,000	183,000	143,000	36,000
8,330	21/64	10,000	204,000	160,000	40,000
8,500		10,000	204,000	160,000	40,000
8,730	11/32	10,000	204,000	160,000	40,000
9,000		10,000	204,000	160,000	40,000
9,130	23/64	10,000	221,000	177,000	40,000
9,520	3/8	10,000	221,000	177,000	40,000
9,920	25/64	10,000	221,000	177,000	40,000
10,000		10,000	221,000	177,000	40,000
10,320	13/32	12,000	247,000	198,000	45,000
10,720	27/64	12,000	247,000	198,000	45,000
11,000		12,000	247,000	198,000	45,000
11,110	7/16	12,000	263,000	214,000	45,000
11,510	29/64	12,000	263,000	214,000	45,000
11,910	15/32	12,000	263,000	214,000	45,000
12,000		12,000	263,000	214,000	45,000
12,300	31/64	14,000	297,000	248,000	45,000
12,700	1/2	14,000	297,000	248,000	45,000
13,100	33/64	14,000	297,000	248,000	45,000
13,490	17/32	14,000	297,000	248,000	45,000
13,890	35/64	14,000	297,000	248,000	45,000
14,000		14,000	297,000	248,000	45,000





## İçten soğutma kanallı rasyo matkap



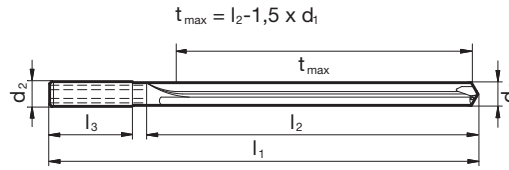
P	öz bileme $\geq \text{Ø } 5,000$ • koni bileme • negatif hatve • tam ölçülü delikler için
M	• delik yüzey finişleri çok iyi • yağ basıncına dikkat edin
K	•
N	Aluminyum ve Al-Alaşımları • Yüksek Si içerikli Al malzemeler • pik döküm, temper döküm ve küresel döküm
S	
H	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 760

Malzeme	Kom. sert metal
Yüzey	○
sap formu	HA

Rasyo matkap ucu



Ürün no 773

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
5,000		6,000	145,000	105,000	36,000
6,000		6,000	145,000	105,000	36,000
8,000		8,000	180,000	137,000	36,000
9,000		10,000	217,000	170,000	40,000
10,000		10,000	217,000	170,000	40,000
11,000		12,000	258,000	205,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
12,000		12,000	258,000	205,000	45,000
14,000		14,000	290,000	236,000	45,000

İçten soğutma kanallı rasyo matkap

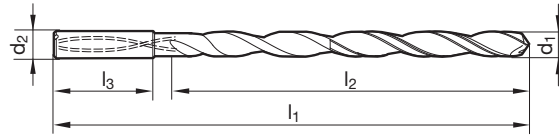


- P** • öz bileme  $\geq \varnothing 3,000$  • koni bileme • ana kesici ağız form konkav • optimize edilmiş kanal kesit alanı • maksimal soğutma kanal delikleri alanı • yağ basıncına dikkat edin
- M** •
- K** •
- N** ○ yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm<sup>2</sup>'ye kadar • paslanmaz çelikler • döküm malzemeler
- S** ○
- H** ○

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 760

Malzeme	<b>Kom. sert metal</b>
Yüzey	<b>A</b>
sap formu	HA



Ürün no **6511**

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		6,000	110,000	70,000	36,000
3,100		6,000	123,000	83,000	36,000
3,170	1/8	6,000	123,000	83,000	36,000
3,500		6,000	136,000	96,000	36,000
3,570	9/64	6,000	136,000	96,000	36,000
3,970	5/32	6,000	136,000	96,000	36,000
4,000		6,000	136,000	96,000	36,000
4,200		6,000	158,000	118,000	36,000
4,370	11/64	6,000	158,000	118,000	36,000
4,500		6,000	158,000	118,000	36,000
4,760	3/16	6,000	158,000	118,000	36,000
5,000		6,000	158,000	118,000	36,000
5,100		6,000	180,000	140,000	36,000
5,160	13/64	6,000	180,000	140,000	36,000
5,410		6,000	180,000	140,000	36,000
5,500		6,000	180,000	140,000	36,000
5,560	7/32	6,000	180,000	140,000	36,000
5,950	15/64	6,000	180,000	140,000	36,000
6,000		6,000	180,000	140,000	36,000
6,350	1/4	8,000	202,000	162,000	36,000
6,500		8,000	202,000	162,000	36,000
6,750	17/64	8,000	202,000	162,000	36,000
7,000		8,000	202,000	162,000	36,000
7,140	9/32	8,000	223,000	183,000	36,000
7,500		8,000	223,000	183,000	36,000
7,540	19/64	8,000	223,000	183,000	36,000
7,940	5/16	8,000	223,000	183,000	36,000
8,000		8,000	223,000	183,000	36,000
8,330	21/64	10,000	249,000	205,000	40,000
8,500		10,000	249,000	205,000	40,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
8,730	11/32	10,000	249,000	205,000	40,000
9,000		10,000	249,000	205,000	40,000
9,130	23/64	10,000	271,000	227,000	40,000
9,520	3/8	10,000	271,000	227,000	40,000
9,920	25/64	10,000	271,000	227,000	40,000
10,000		10,000	271,000	227,000	40,000
10,320	13/32	12,000	302,000	253,000	45,000
10,720	27/64	12,000	302,000	253,000	45,000
11,000		12,000	302,000	253,000	45,000
11,110	7/16	12,000	323,000	274,000	45,000
11,510	29/64	12,000	323,000	274,000	45,000
11,910	15/32	12,000	323,000	274,000	45,000
12,000		12,000	323,000	274,000	45,000
12,300	31/64	14,000	367,000	318,000	45,000
12,700	1/2	14,000	367,000	318,000	45,000
13,100	33/64	14,000	367,000	318,000	45,000
13,490	17/32	14,000	367,000	318,000	45,000
13,890	35/64	14,000	367,000	318,000	45,000
14,000		14,000	367,000	318,000	45,000



İçten soğutma kanallı rasyo matkap



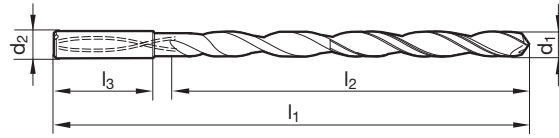
- P** • öz bileme  $\geq \text{Ø } 3,000$  • koni bileme • ana kesici ağız form konkav • optimize edilmiş kanal kesit alanı • maksimal soğutma kanal delikleri alanı • yağ basıncına dikkat edin
- M** •
- K** •
- N** ○ yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm<sup>2</sup>'ye kadar • paslanmaz çelikler • döküm malzemeler
- S** ○
- H** ○

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 760

Malzeme	<b>Kom. sert metal</b>
Yüzey	<b>A</b>
sap formu	HA

Rasyo matkap ucu



Ürün no **6512**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	125,000	85,000	36,000	7,000		8,000	237,000	197,000	36,000
3,100		6,000	141,000	101,000	36,000	7,140	9/32	8,000	263,000	223,000	36,000
3,170	1/8	6,000	141,000	101,000	36,000	7,500		8,000	263,000	223,000	36,000
3,500		6,000	156,000	116,000	36,000	7,540	19/64	8,000	263,000	223,000	36,000
3,570	9/64	6,000	156,000	116,000	36,000	7,940	5/16	8,000	263,000	223,000	36,000
3,800		6,000	156,000	116,000	36,000	8,000		8,000	263,000	223,000	36,000
3,970	5/32	6,000	156,000	116,000	36,000	8,330	21/64	10,000	294,000	250,000	40,000
4,000		6,000	156,000	116,000	36,000	8,500		10,000	294,000	250,000	40,000
4,200		6,000	183,000	143,000	36,000	8,730	11/32	10,000	294,000	250,000	40,000
4,370	11/64	6,000	183,000	143,000	36,000	8,800		10,000	294,000	250,000	40,000
4,500		6,000	183,000	143,000	36,000	9,000		10,000	294,000	250,000	40,000
4,760	3/16	6,000	183,000	143,000	36,000	9,130	23/64	10,000	321,000	277,000	40,000
5,000		6,000	183,000	143,000	36,000	9,520	3/8	10,000	321,000	277,000	40,000
5,100		6,000	210,000	170,000	36,000	9,920	25/64	10,000	321,000	277,000	40,000
5,160	13/64	6,000	210,000	170,000	36,000	10,000		10,000	321,000	277,000	40,000
5,410		6,000	210,000	170,000	36,000	10,320	13/32	12,000	359,000	310,000	45,000
5,500		6,000	210,000	170,000	36,000	10,720	27/64	12,000	359,000	310,000	45,000
5,560	7/32	6,000	210,000	170,000	36,000	11,000		12,000	359,000	310,000	45,000
5,950	15/64	6,000	210,000	170,000	36,000	11,110	7/16	12,000	386,000	337,000	45,000
6,000		6,000	210,000	170,000	36,000	11,510	29/64	12,000	386,000	337,000	45,000
6,300		8,000	237,000	197,000	36,000	11,910	15/32	12,000	386,000	337,000	45,000
6,350	1/4	8,000	237,000	197,000	36,000	12,000		12,000	386,000	337,000	45,000
6,500		8,000	237,000	197,000	36,000						
6,750	17/64	8,000	237,000	197,000	36,000						



## İçten soğutma kanallı rasyo matkap



<b>P</b>	•	öz bileme $\geq \varnothing 3,000$ • koni bileme • ana kesici ağız form konkav • optimize edilmiş kanal kesit alanı • maksimal soğutma kanal delikleri alanı • yağ basıncına dikkat edin
<b>M</b>	•	
<b>K</b>	•	
<b>N</b>	○	yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm <sup>2</sup> 'ye kadar • paslanmaz çelikler • döküm malzemeler
<b>S</b>	○	
<b>H</b>	○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 760

Malzeme

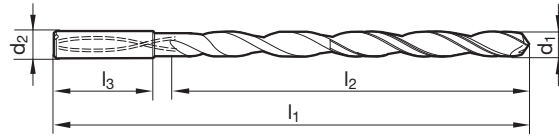
Kom. sert metal

Yüzey

A

sap formu

HA



Ürün no

6513

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		6,000	140,000	100,000	36,000
3,100		6,000	158,000	118,000	36,000
3,170	1/8	6,000	158,000	118,000	36,000
3,500		6,000	176,000	136,000	36,000
3,570	9/64	6,000	176,000	136,000	36,000
3,800		6,000	176,000	136,000	36,000
3,970	5/32	6,000	176,000	136,000	36,000
4,000		6,000	176,000	136,000	36,000
4,200		6,000	208,000	168,000	36,000
4,370	11/64	6,000	208,000	168,000	36,000
4,500		6,000	208,000	168,000	36,000
4,760	3/16	6,000	208,000	168,000	36,000
5,000		6,000	208,000	168,000	36,000
5,100		6,000	240,000	200,000	36,000
5,160	13/64	6,000	240,000	200,000	36,000
5,410		6,000	240,000	200,000	36,000
5,500		6,000	240,000	200,000	36,000
5,560	7/32	6,000	240,000	200,000	36,000
5,950	15/64	6,000	240,000	200,000	36,000
6,000		6,000	240,000	200,000	36,000
6,300		8,000	272,000	232,000	36,000
6,350	1/4	8,000	272,000	232,000	36,000
6,500		8,000	272,000	232,000	36,000
6,750	17/64	8,000	272,000	232,000	36,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
7,000		8,000	272,000	232,000	36,000
7,140	9/32	8,000	303,000	263,000	36,000
7,500		8,000	303,000	263,000	36,000
7,540	19/64	8,000	303,000	263,000	36,000
7,940	5/16	8,000	303,000	263,000	36,000
8,000		8,000	303,000	263,000	36,000
8,330	21/64	10,000	339,000	295,000	40,000
8,500		10,000	339,000	295,000	40,000
8,730	11/32	10,000	339,000	295,000	40,000
8,800		10,000	339,000	295,000	40,000
9,000		10,000	339,000	295,000	40,000
9,130	23/64	10,000	371,000	327,000	40,000
9,520	3/8	10,000	371,000	327,000	40,000
9,920	25/64	10,000	371,000	327,000	40,000
10,000		10,000	371,000	327,000	40,000



İçten soğutma kanallı rasyo matkap



Malzeme **Kom. sert metal**

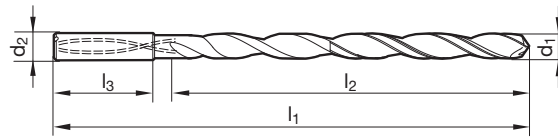
Yüzey **A**

sap formu HA

- P** • öz bileme  $\geq \text{Ø } 3,000$  • koni bileme • ana kesici ağız form konkav • optimize edilmiş kanal kesit alanı • maksimal soğutma kanal delikleri alanı • yağ basıncına dikkat edin
- M** •
- K** •
- N** ○ yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm<sup>2</sup>'ye kadar • paslanmaz çelikler • döküm malzemeler
- S** ○
- H** ○

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 760



Rasyo matkap ucu

Ürün no **6514**

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		6,000	170,000	130,000	36,000
3,100		6,000	193,000	153,000	36,000
3,170	1/8	6,000	193,000	153,000	36,000
3,500		6,000	193,000	153,000	36,000
3,570	9/64	6,000	216,000	176,000	36,000
3,800		6,000	216,000	176,000	36,000
3,970	5/32	6,000	216,000	176,000	36,000
4,000		6,000	216,000	176,000	36,000
4,200		6,000	238,000	198,000	36,000
4,370	11/64	6,000	238,000	198,000	36,000
4,500		6,000	238,000	198,000	36,000
4,760	3/16	6,000	258,000	218,000	36,000
5,000		6,000	258,000	218,000	36,000
5,100		6,000	280,000	240,000	36,000
5,160	13/64	6,000	280,000	240,000	36,000
5,410		6,000	280,000	240,000	36,000
5,500		6,000	280,000	240,000	36,000
5,560	7/32	6,000	300,000	260,000	36,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
5,950	15/64	6,000	300,000	260,000	36,000
6,000		6,000	300,000	260,000	36,000
6,300		8,000	322,000	282,000	36,000
6,350	1/4	8,000	322,000	282,000	36,000
6,500		8,000	322,000	282,000	36,000
6,750	17/64	8,000	342,000	302,000	36,000
7,000		8,000	342,000	302,000	36,000
7,140	9/32	8,000	363,000	323,000	36,000
7,500		8,000	363,000	323,000	36,000
7,540	19/64	8,000	383,000	343,000	36,000
7,940	5/16	8,000	383,000	343,000	36,000
8,000		8,000	383,000	343,000	36,000



## ExclusiveLine kılcal matkap uçları, soğutma kanalsız



<b>P</b>	•	öz bileme $\geq \varnothing 0,500$ • yüzey Bileme • ana kesici ağız düz form • taşlanmış kesme ağız yuvarlatması
<b>M</b>	•	
<b>K</b>	•	
<b>N</b>	○	yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm <sup>2</sup> 'ye kadar • paslanmaz çelikler • döküm malzemeler
<b>S</b>	○	
<b>H</b>		

## GÜHRING NAVIGATOR

Kesme verileri sayfası 796

Malzeme

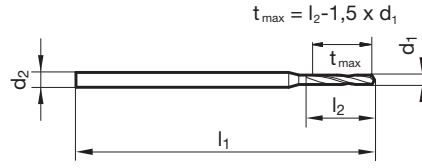
Kom. sert metal

Yüzey

A

Kesme yönü

R



Ürün no

6400

d1	d2 h6	l1	l2
mm	mm	mm	mm
0,500	3,000	47,000	3,000
0,550	3,000	47,000	3,300
0,600	3,000	47,000	3,600
0,650	3,000	47,000	3,900
0,700	3,000	47,000	4,200
0,750	3,000	47,000	4,500
0,800	3,000	47,000	4,800
0,850	3,000	47,000	5,100
0,900	3,000	47,000	5,400
0,950	3,000	47,000	5,700
1,000	3,000	47,000	6,000
1,050	3,000	47,000	6,300
1,100	3,000	47,000	6,600
1,150	3,000	47,000	6,900
1,200	3,000	47,000	7,200
1,250	3,000	47,000	7,500
1,300	3,000	47,000	7,800
1,350	3,000	47,000	8,100
1,400	3,000	47,000	8,400
1,450	3,000	47,000	8,700
1,500	3,000	47,000	9,000
1,550	3,000	47,000	9,300
1,590	3,000	47,000	9,600
1,600	3,000	47,000	9,600
1,650	3,000	47,000	9,900
1,700	3,000	47,000	10,200
1,750	3,000	47,000	10,500
1,800	3,000	52,000	10,800
1,850	3,000	52,000	11,100
1,900	3,000	52,000	11,400

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,950	3,000	52,000	11,700
1,980	4,000	59,000	12,000
2,000	4,000	59,000	12,000
2,050	4,000	59,000	12,300
2,100	4,000	59,000	12,600
2,150	4,000	59,000	12,900
2,200	4,000	59,000	13,200
2,250	4,000	59,000	13,500
2,300	4,000	59,000	13,800
2,350	4,000	59,000	14,100
2,380	4,000	59,000	14,400
2,400	4,000	59,000	14,400
2,450	4,000	59,000	14,700
2,500	4,000	59,000	15,000
2,550	4,000	59,000	15,300
2,600	4,000	59,000	15,600
2,650	4,000	59,000	15,900
2,700	4,000	59,000	16,200
2,750	4,000	59,000	16,500
2,780	4,000	59,000	16,800
2,800	4,000	59,000	16,800
2,850	4,000	59,000	17,100
2,900	4,000	59,000	17,400
2,950	4,000	59,000	17,700
3,000	4,000	59,000	18,000



ExclusiveLine kılcal matkap uçları, soğutma kanalsız



- P** • öz bileme  $\geq \varnothing 0,500$  • yüzey Bileme • ana kesici ağız düz form • taşlanmış kesme ağız yuvarlatması
- M** •
- K** •
- N** ○ yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alışımlı çelikler 1200 N/mm<sup>2</sup>'ye kadar • paslanmaz çelikler • döküm malzemeler
- S** ○
- H**

Malzeme **Kom. sert metal**

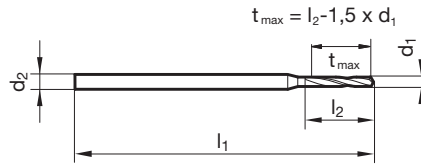
Yüzey **A**

Kesme yönü **R**

Rasyo matkap ucu

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 796



Ürün no **6401**

d1	d2 h6	l1	l2
mm	mm	mm	mm
0,500	3,000	47,000	4,000
0,550	3,000	47,000	4,400
0,600	3,000	47,000	4,800
0,650	3,000	47,000	5,200
0,700	3,000	47,000	5,600
0,750	3,000	47,000	6,000
0,800	3,000	47,000	6,400
0,850	3,000	47,000	6,800
0,900	3,000	47,000	7,200
0,950	3,000	47,000	7,600
1,000	3,000	47,000	8,000
1,050	3,000	47,000	8,400
1,100	3,000	47,000	8,800
1,150	3,000	47,000	9,200
1,200	3,000	52,000	10,800
1,250	3,000	52,000	11,300
1,300	3,000	52,000	11,700
1,350	3,000	52,000	12,200
1,400	3,000	52,000	12,600
1,450	3,000	52,000	13,100
1,500	3,000	52,000	13,500
1,550	3,000	52,000	14,000
1,590	3,000	52,000	14,400
1,600	3,000	52,000	14,400
1,650	3,000	52,000	14,900
1,700	3,000	52,000	15,300
1,750	3,000	52,000	15,800
1,800	3,000	52,000	16,200
1,850	3,000	52,000	16,700
1,900	3,000	52,000	17,100

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,950	3,000	52,000	17,600
1,980	4,000	63,000	18,000
2,000	4,000	63,000	18,000
2,050	4,000	63,000	18,500
2,100	4,000	63,000	18,900
2,150	4,000	63,000	19,400
2,200	4,000	63,000	19,800
2,250	4,000	63,000	20,300
2,300	4,000	63,000	20,700
2,350	4,000	63,000	21,200
2,380	4,000	63,000	21,600
2,400	4,000	63,000	21,600
2,450	4,000	63,000	22,100
2,500	4,000	63,000	22,500
2,550	4,000	63,000	23,000
2,600	4,000	67,000	23,400
2,650	4,000	67,000	23,900
2,700	4,000	67,000	24,300
2,750	4,000	67,000	24,800
2,780	4,000	67,000	25,200
2,800	4,000	67,000	25,200
2,850	4,000	67,000	25,700
2,900	4,000	67,000	26,100
2,950	4,000	67,000	26,600
3,000	4,000	67,000	27,000



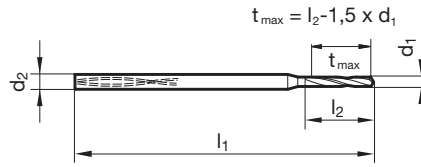
## ExclusiveLine kılcal matkap ucu, soğutma kanallı



P	•	öz bileme $\geq \text{Ø } 1,400$ • yüzey Bileme • ana kesici ağız düz form
M	•	• taşlanmış kesme ağız yuvarlatması
K	•	
N	○	yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli
S	○	çelikler 1200 N/mm <sup>2</sup> 'ye kadar • paslanmaz çelikler • döküm malzemeler
H		

## GÜHRING NAVIGATOR

Kesme verileri sayfası 796

Malzeme **Kom. sert metal**Yüzey **A**Kesme yönü **R****NEW**Ürün no **6405**

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,400	4,000	52,000	11,000
1,450	4,000	52,000	12,000
1,500	4,000	52,000	12,000
1,550	4,000	52,000	12,000
1,590	4,000	52,000	13,000
1,600	4,000	52,000	13,000
1,650	4,000	52,000	13,000
1,700	4,000	56,000	14,000
1,750	4,000	56,000	14,000
1,800	4,000	56,000	14,000
1,850	4,000	56,000	15,000
1,900	4,000	56,000	15,000
1,950	4,000	56,000	16,000
1,980	4,000	56,000	16,000
2,000	4,000	56,000	16,000
2,050	4,000	56,000	16,000
2,100	4,000	62,000	17,000
2,150	4,000	62,000	17,000
2,200	4,000	62,000	18,000
2,250	4,000	62,000	18,000
2,300	4,000	62,000	18,000
2,350	4,000	62,000	19,000
2,380	4,000	62,000	19,000
2,400	4,000	62,000	19,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
2,450	4,000	62,000	20,000
2,500	4,000	62,000	20,000
2,550	4,000	62,000	20,000
2,600	4,000	66,000	21,000
2,650	4,000	66,000	21,000
2,700	4,000	66,000	22,000
2,750	4,000	66,000	22,000
2,780	4,000	66,000	22,000
2,800	4,000	66,000	22,000
2,850	4,000	66,000	23,000
2,900	4,000	66,000	23,000
2,950	4,000	66,000	24,000
3,000	4,000	66,000	24,000





ExclusiveLine kılcal matkap ucu, soğutma kanallı



- |   |   |  |
|---|---|--|
| P | • | öz bileme $\geq \varnothing 1,400$ • yüzey Bileme • ana kesici ağız düz form   |
| M | • | • taşlanmış kesme ağız yuvarlatması  |
| K | • |  |
| N | ○ | yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alışımlı çelikler 1200 N/mm <sup>2</sup> 'ye kadar • paslanmaz çelikler • döküm malzemeler |
| S | ○ |  |
| H |   |  |

Malzeme **Kom. sert metal**

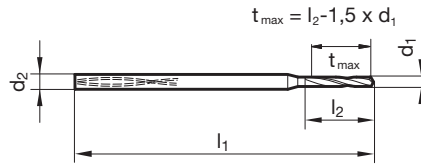
Yüzey **A**

Kesme yönü **R**

Rasyo matkap ucu

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 796



Ürün no **6408**

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,400	4,000	52,000	15,000
1,450	4,000	52,000	16,000
1,500	4,000	52,000	17,000
1,550	4,000	52,000	17,000
1,590	4,000	52,000	18,000
1,600	4,000	52,000	18,000
1,650	4,000	52,000	18,000
1,700	4,000	56,000	19,000
1,750	4,000	56,000	19,000
1,800	4,000	56,000	20,000
1,850	4,000	56,000	20,000
1,900	4,000	56,000	21,000
1,950	4,000	56,000	21,000
1,980	4,000	56,000	22,000
2,000	4,000	56,000	22,000
2,050	4,000	56,000	23,000
2,100	4,000	62,000	23,000
2,150	4,000	62,000	24,000
2,200	4,000	62,000	24,000
2,250	4,000	62,000	25,000
2,300	4,000	62,000	25,000
2,320	4,000	62,000	26,000
2,350	4,000	62,000	26,000
2,380	4,000	62,000	26,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
2,400	4,000	62,000	26,000
2,450	4,000	62,000	27,000
2,500	4,000	62,000	28,000
2,550	4,000	62,000	28,000
2,600	4,000	66,000	29,000
2,650	4,000	66,000	29,000
2,700	4,000	66,000	30,000
2,750	4,000	66,000	30,000
2,780	4,000	66,000	31,000
2,800	4,000	66,000	31,000
2,850	4,000	66,000	31,000
2,900	4,000	66,000	32,000
2,950	4,000	66,000	32,000
3,000	4,000	66,000	33,000



ExclusiveLine kılcal matkap ucu, soğutma kanallı

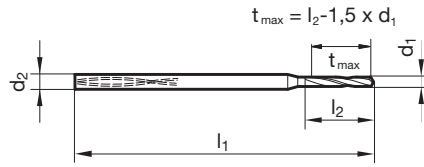


<b>P</b>	•	öz bileme $\geq \varnothing 1,400$ • yüzey Bileme • ana kesici ağız düz form • taşlanmış kesme ağız yuvarlatması
<b>M</b>	•	
<b>K</b>	•	
<b>N</b>	○	yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşimli çelikler 1200 N/mm <sup>2</sup> 'ye kadar • paslanmaz çelikler • döküm malzemeler
<b>S</b>	○	
<b>H</b>		

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 796

Malzeme	<b>Kom. sert metal</b>
Yüzey	<b>A</b>
Kesme yönü	<b>R</b>



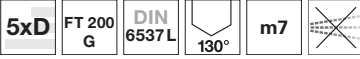
Ürün no **6412**

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,400	4,000	62,000	25,000
1,500	4,000	62,000	27,000
1,590	4,000	62,000	29,000
1,600	4,000	62,000	29,000
1,600	4,000	62,000	29,000
1,700	4,000	70,000	31,000
1,800	4,000	70,000	32,000
1,900	4,000	70,000	34,000
1,980	4,000	70,000	36,000
2,000	4,000	70,000	36,000
2,100	4,000	78,000	38,000
2,200	4,000	78,000	40,000
2,300	4,000	78,000	42,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
2,380	4,000	78,000	44,000
2,400	4,000	78,000	44,000
2,500	4,000	78,000	45,000
2,600	4,000	87,000	47,000
2,700	4,000	87,000	48,000
2,780	4,000	87,000	50,000
2,800	4,000	87,000	50,000
2,900	4,000	87,000	52,000
3,000	4,000	87,000	54,000



3 ağızlı rasyo matkap



Malzeme **Kom. sert metal**

Yüzey ○

sap formu HA

**P** öz bileme  $\geq \text{Ø } 3,000$  • spiropoint Bileme • geniş kanallı • ideal merkezleme  
• darbeli kesimler için uygun

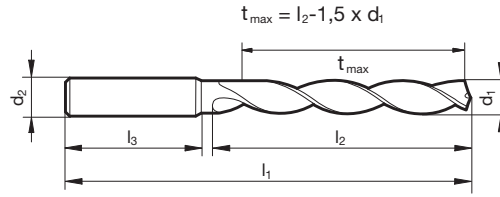


**N** • dökme demir • uzun talaşlı alüminyum alaşımları • pirinç, bronzlar

Rasyo matkap ucu

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 762

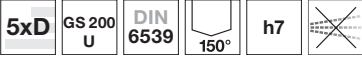


Ürün no **2713**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	8,700		10,000	103,000	61,000	40,000
3,100		6,000	66,000	28,000	36,000	8,800		10,000	103,000	61,000	40,000
3,200		6,000	66,000	28,000	36,000	9,000		10,000	103,000	61,000	40,000
3,300		6,000	66,000	28,000	36,000	9,100		10,000	103,000	61,000	40,000
3,500		6,000	66,000	28,000	36,000	9,500		10,000	103,000	61,000	40,000
3,700		6,000	66,000	28,000	36,000	9,800		10,000	103,000	61,000	40,000
3,800		6,000	74,000	36,000	36,000	10,000		10,000	103,000	61,000	40,000
4,000		6,000	74,000	36,000	36,000	10,100		12,000	118,000	71,000	45,000
4,100		6,000	74,000	36,000	36,000	10,200		12,000	118,000	71,000	45,000
4,200		6,000	74,000	36,000	36,000	10,300		12,000	118,000	71,000	45,000
4,500		6,000	74,000	36,000	36,000	10,500		12,000	118,000	71,000	45,000
4,800		6,000	82,000	44,000	36,000	11,000		12,000	118,000	71,000	45,000
5,000		6,000	82,000	44,000	36,000	11,200		12,000	118,000	71,000	45,000
5,100		6,000	82,000	44,000	36,000	11,500		12,000	118,000	71,000	45,000
5,200		6,000	82,000	44,000	36,000	11,800		12,000	118,000	71,000	45,000
5,300		6,000	82,000	44,000	36,000	12,000		12,000	118,000	71,000	45,000
5,500		6,000	82,000	44,000	36,000	12,100		14,000	124,000	77,000	45,000
5,800		6,000	82,000	44,000	36,000	12,500		14,000	124,000	77,000	45,000
6,000		6,000	82,000	44,000	36,000	13,000		14,000	124,000	77,000	45,000
6,100		8,000	91,000	53,000	36,000	13,500		14,000	124,000	77,000	45,000
6,200		8,000	91,000	53,000	36,000	14,000		14,000	124,000	77,000	45,000
6,400		8,000	91,000	53,000	36,000	14,500		16,000	133,000	83,000	48,000
6,500		8,000	91,000	53,000	36,000	15,000		16,000	133,000	83,000	48,000
6,700		8,000	91,000	53,000	36,000	15,500		16,000	133,000	83,000	48,000
6,800		8,000	91,000	53,000	36,000	16,000		16,000	133,000	83,000	48,000
7,000		8,000	91,000	53,000	36,000	16,500		18,000	143,000	93,000	48,000
7,100		8,000	91,000	53,000	36,000	17,000		18,000	143,000	93,000	48,000
7,400		8,000	91,000	53,000	36,000	17,500		18,000	143,000	93,000	48,000
7,500		8,000	91,000	53,000	36,000	18,000		18,000	143,000	93,000	48,000
7,800		8,000	91,000	53,000	36,000	18,500		20,000	153,000	101,000	50,000
8,000		8,000	91,000	53,000	36,000	19,000		20,000	153,000	101,000	50,000
8,100		10,000	103,000	61,000	40,000	19,500		20,000	153,000	101,000	50,000
8,200		10,000	103,000	61,000	40,000	20,000		20,000	153,000	101,000	50,000
8,400		10,000	103,000	61,000	40,000						
8,500		10,000	103,000	61,000	40,000						
8,600		10,000	103,000	61,000	40,000						



## 3 ağızlı rasyo matkap



**P** öz bileme  $\geq \varnothing 3,000$  • yüzey Bileme • tam ölçülü delikler için • delik yüzey finişleri çok iyi • darbeli kesimler için uygun

**M****K****N****S****H**

çelik döküm • alaşımlı/alaşımsız. çelikler 1000 N/mm<sup>2</sup>'ye kadar

Malzeme

Kom. sert metal

Yüzey

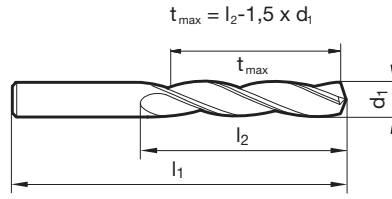
S

sap formu

cyl.

## GÜHRING NAVIGATOR

Kesme verileri sayfası 762



Ürün no

611

d1		l1	l2
mm	inch	mm	mm
3,000		46,000	22,000
3,100		49,000	24,000
3,900		55,000	30,000
4,000		55,000	30,000
4,100		55,000	30,000
4,200		55,000	30,000
5,000		62,000	35,000
6,000		66,000	39,000
6,200		70,000	42,000
6,800		74,000	45,000
7,000		74,000	45,000
8,000		79,000	48,000

d1		l1	l2
mm	inch	mm	mm
8,500		79,000	48,000
10,000		89,000	55,000
10,200		89,000	55,000
12,000		102,000	65,000
14,000		107,000	66,000
14,400		111,000	70,000



3 ağızlı rasyo matkap



Malzeme **Kom. sert metal**

Yüzey ○

sap formu cyl.

**P** ○ öz bileme  $\geq \varnothing 3,000$  • yüzey Bileme • tam ölçülü delikler için • delik yüzey finişleri çok iyi • darbeli kesimler için uygun

**M**

**K** ○

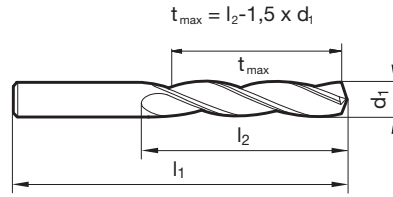
**N** ○ çelik döküm • alaşımlı/alaşımsız. çelikler 1000 N/mm<sup>2</sup>'ye kadar

**S**

**H**

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 762



Ürün no **731**

d1		l1	l2
mm	inch	mm	mm
3,000		46,000	22,000
3,100		49,000	24,000
3,200		49,000	24,000
3,300		49,000	24,000
3,400		52,000	27,000
3,500		52,000	27,000
3,600		52,000	27,000
3,700		52,000	27,000
3,800		55,000	30,000
3,900		55,000	30,000
3,970	5/32	55,000	30,000
4,000		55,000	30,000
4,200		55,000	30,000
4,300		58,000	32,000
4,500		58,000	32,000
4,700		58,000	32,000
4,760	3/16	62,000	35,000
4,800		62,000	35,000
5,000		62,000	35,000
5,100		62,000	35,000
5,200		62,000	35,000
5,300		62,000	35,000
5,400		66,000	39,000
5,500		66,000	39,000
5,600		66,000	39,000
5,800		66,000	39,000
6,000		66,000	39,000
6,100		70,000	42,000
6,400		70,000	42,000
6,500		70,000	42,000
6,700		70,000	42,000
6,750	17/64	74,000	45,000
6,800		74,000	45,000
7,000		74,000	45,000
7,500		74,000	45,000
7,700		79,000	48,000

d1		l1	l2
mm	inch	mm	mm
7,800		79,000	48,000
8,000		79,000	48,000
8,100		79,000	48,000
8,300		79,000	48,000
8,400		79,000	48,000
8,500		79,000	48,000
9,000		84,000	52,000
9,600		89,000	55,000
9,700		89,000	55,000
9,800		89,000	55,000
9,900		89,000	55,000
10,000		89,000	55,000
10,200		89,000	55,000
10,320	13/32	89,000	55,000
10,400		89,000	55,000
10,500		89,000	55,000
10,800		95,000	60,000
11,000		95,000	60,000
11,300		95,000	60,000
11,500		95,000	60,000
11,600		95,000	60,000
11,700		95,000	60,000
12,000		102,000	65,000
12,100		102,000	65,000
12,500		102,000	65,000
13,000		102,000	65,000
13,200		102,000	65,000
13,500		107,000	66,000
14,000		107,000	66,000
14,300		111,000	70,000
16,000		115,000	73,000
17,500		123,000	76,000
20,000		131,000	79,000



## 3 ağızlı rasyo matkap



**P** öz bileme  $\geq \text{Ø } 3,570$  • yüzey Bileme • tam ölçülü delikler için • delik yüzey finişleri çok iyi • darbeli kesimler için uygun

**M**

**K** ○

**N** ○

**S**

**H**

döküm malzemeler • Al-Döküm Alaşımları

Malzeme

Kom. sert metal

Yüzey

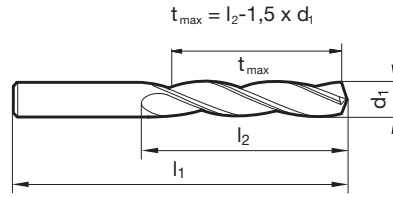
○

sap formu

cyl.

## GÜHRING NAVIGATOR

Kesme verileri sayfası 762



Ürün no

745

d1		l1	l2
mm	inch	mm	mm
3,570	9/64	52,000	27,000
4,370	11/64	58,000	32,000
6,900		74,000	45,000
7,300		74,000	45,000
7,940	5/16	79,000	48,000
8,330	21/64	79,000	48,000

d1		l1	l2
mm	inch	mm	mm
8,800		84,000	52,000
9,700		89,000	55,000
10,720	27/64	95,000	60,000
12,500		102,000	65,000



3 ağızlı rasyo matkap



Malzeme **Kom. sert metal**

Yüzey ○

sap formu cyl.

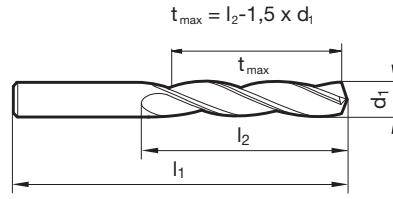
**P** öz bileme ≥ Ø 3,000 • yüzey Bileme • tam ölçülü delikler için • delik yüzey  
finişleri çok iyi • darbeli kesimler için uygun

**M**  
**K** ○  
**N** ○  
**S**  
**H**

döküm malzemeler • Al-Döküm Alaşımları

**GÜHRING NAVIGATOR**

Kesme verileri sayfası 762



Ürün no **1025**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
3,000		46,000	22,000	7,100		74,000	45,000
3,100		49,000	24,000	7,200		74,000	45,000
3,200		49,000	24,000	7,300		74,000	45,000
3,300		49,000	24,000	7,400		74,000	45,000
3,400		52,000	27,000	7,500		74,000	45,000
3,500		52,000	27,000	7,600		79,000	48,000
3,570	9/64	52,000	27,000	7,700		79,000	48,000
3,600		52,000	27,000	7,800		79,000	48,000
3,700		52,000	27,000	7,900		79,000	48,000
3,800		55,000	30,000	8,000		79,000	48,000
3,900		55,000	30,000	8,100		79,000	48,000
3,970	5/32	55,000	30,000	8,200		79,000	48,000
4,000		55,000	30,000	8,400		79,000	48,000
4,100		55,000	30,000	8,500		79,000	48,000
4,200		55,000	30,000	8,600		84,000	52,000
4,300		58,000	32,000	8,700		84,000	52,000
4,370	11/64	58,000	32,000	8,800		84,000	52,000
4,500		58,000	32,000	9,000		84,000	52,000
4,600		58,000	32,000	9,100		84,000	52,000
4,700		58,000	32,000	9,300		84,000	52,000
4,800		62,000	35,000	9,500		84,000	52,000
4,900		62,000	35,000	9,520	3/8	89,000	55,000
5,000		62,000	35,000	9,600		89,000	55,000
5,100		62,000	35,000	9,700		89,000	55,000
5,200		62,000	35,000	9,800		89,000	55,000
5,300		62,000	35,000	10,000		89,000	55,000
5,400		66,000	39,000	10,100		89,000	55,000
5,500		66,000	39,000	10,200		89,000	55,000
5,600		66,000	39,000	10,300		89,000	55,000
5,700		66,000	39,000	10,500		89,000	55,000
5,800		66,000	39,000	10,700		95,000	60,000
5,900		66,000	39,000	11,000		95,000	60,000
6,000		66,000	39,000	11,110	7/16	95,000	60,000
6,100		70,000	42,000	11,200		95,000	60,000
6,200		70,000	42,000	11,500		95,000	60,000
6,300		70,000	42,000	11,510	29/64	95,000	60,000
6,400		70,000	42,000	11,700		95,000	60,000
6,500		70,000	42,000	11,800		95,000	60,000
6,600		70,000	42,000	11,910	15/32	102,000	65,000
6,700		70,000	42,000	12,000		102,000	65,000
6,800		74,000	45,000	12,200		102,000	65,000
7,000		74,000	45,000	12,500		102,000	65,000



d1		l1	l2
mm	inch	mm	mm
12,700	1/2	102,000	65,000
13,000		102,000	65,000
13,500		107,000	66,000
13,800		107,000	66,000
14,000		107,000	66,000
14,300		111,000	70,000
14,500		111,000	70,000
15,000		111,000	70,000
15,870	5/8	115,000	73,000
16,000		115,000	73,000
17,000		119,000	73,000
18,500		127,000	76,000

d1		l1	l2
mm	inch	mm	mm
19,000		127,000	76,000
20,000		131,000	79,000





## 3 ağızlı rasyo matkap

Malzeme **Kom. sert metal**Yüzey **S**

sap formu cyl.

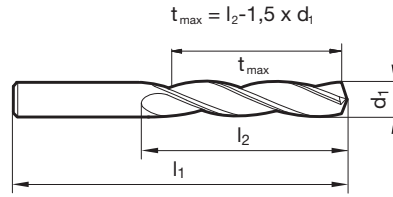
**P** öz bileme  $\geq \varnothing 3,000$  • yüzey Bileme • tam ölçülü delikler için • delik yüzey finişleri çok iyi • darbeli kesimler için uygun

**M****K**

**N** yapı çelikleri, otomat çelikleri • alaşımli/alaşimsız. çelikler 1000 N/mm<sup>2</sup>'ye kadar

**S****H****GÜHRING NAVIGATOR**

Kesme verileri sayfası 762



Ürün no

1027

d1		l1	l2
mm	inch	mm	mm
3,000		46,000	22,000
3,200		49,000	24,000
3,900		55,000	30,000
4,000		55,000	30,000
4,900		62,000	35,000
5,000		62,000	35,000
5,300		62,000	35,000
5,500		66,000	39,000
6,000		66,000	39,000
6,200		70,000	42,000
7,000		74,000	45,000
9,000		84,000	52,000

d1		l1	l2
mm	inch	mm	mm
10,000		89,000	55,000
11,000		95,000	60,000



## 3 ağızlı kademeli rasyo matkap ucu



**P** öz bileme  $\geq \varnothing 3,400$  • yüzey Bileme • tam ölçülü delikler için • delik yüzey  
finişleri çok iyi • darbeli kesimler için uygun

**M**

**K** ○

**N** ○

**S**

**H**

döküm malzemeler • Al-Döküm Alaşımları

Malzeme

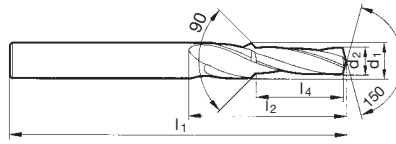
Kom. sert metal

Yüzey

○

sap formu

cyl.



Ürün no

1032

d1	d2	l1	l2	l4	vida dişleri için
mm	mm	mm	mm	mm	
3,400	2,500	52,000	27,000	9,000	M 3
4,500	3,300	58,000	32,000	11,000	M 4
5,500	4,200	66,000	39,000	14,000	M 5
5,500	4,700	66,000	39,000	14,000	
6,600	5,000	70,000	42,000	16,000	M 6
9,000	6,800	84,000	52,000	22,000	M 8
11,000	8,500	95,000	60,000	28,000	M10
11,000	8,800	95,000	60,000	28,000	M10X1,25
13,500	10,200	107,000	66,000	33,000	M12
15,500	13,200	115,000	73,000	38,000	
17,500	15,000	123,000	76,000	41,000	M16 X1
20,000	16,000	131,000	79,000	43,000	M18X2



# GM 300

Her uygulama için takım tutucuları ve bağlama sistemleri

Daha fazla bilgi GM300 kataloglarında bulunabilir.





# TAKMA UÇLU DELME SİSTEMLERİ T 800





# HT 800 WP modüler takımlandırma sistemi

Gühring yeni HT 800 WP değiştirilebilir maktap kafası sistemi ile yüksek performans ve Ø11 ile Ø40 arasında matkap kafası tutucuları için maliyet açısından verimlilik sağlar.

HT 800 WP delik delme sistemi enerji, otomotiv, makine uygulamaları ve çelik konstrüksyonları için yüksek hassasiyette, büyük deliklerin işlenmesi için idealdir.

## ARTTIRILMIŞ TAKIM ÖMRÜ

- değiştirilebilir uçlar uygulama alanına göre geometriye ve takım tasarımına göre uyarlanırlar
- çelik, paslanmaz çelik, alüminyum ve döküm için optimum işleme sonuçları

## OPTIMUM TALAŞ TAHLİYESİ

- özel kanal geçişi
- ultra hassas yüzey finışı

## RIJIT TUTUCULAR

- takım tutucuya çapına çıkan kapalı kademe boyu ile düşürülmüş aşınma
- arttırılmış malzeme yüzey kalitesi
- takım daha iyi yataklanması ile rijitlik artışı
- daha uzun takım ömrü

## YÜKSEK HASSASLIKTA VE RIJITLIKTE TAKMA UÇ YUVALARI

- makine içerisinde uç değişimi
- tutucular bağlı kalmaktadır
- takım değişimi ve yeniden ayarlama gerekli değildir
- arttırılmış proses güvenliği ve düşürülmüş ayar zamanları

## MÜKEMMEL YAĞLAMA

- kamsimum geçişli soğutma delikleri
- kanaldan çıkış





Her malzeme ve uygulama için doğru değiştirilebilir uç



Takma uçlu delme sistemleri T 800

# HT 800 WP

Her delme derinliği ve uygulama için doğru tutucu

Ürün no	4105	4106	4107	4108	4109	4110
delik derinliği	1 x D	1,5 x D	3 x D	5 x D	7 x D	10 x D
çap	11,0 - 40,00	11,0 - 40,00	11,0 - 40,00	11,0 - 40,00	11,0 - 31,99	11,0 - 31,99
sap formu	DIN 6535-HE	DIN 6535-HE	DIN 6535-HE	DIN 6535-HE	DIN 6535-HE	DIN 6535-HE



Pilot tutucu Gühring no. 4105 havşa ucu için ek donanıma sahiptir. Bu sayede pilot delme işlemi ile havşalama aynı anda yapılmaktadır.



P	M	K	N	S	H	takım görüntüsü	delik derinliği	sap formu	Tip	Standart	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayfası	Sayfa
---	---	---	---	---	---	-----------------	-----------------	-----------	-----	----------	---------	-------	-------	---------	------------------------	-------

## Takma uç gövdesi HT800



1xD

HT 800  
WP

Ni

4105

764 138



1,5xD

HT 800  
WP

Ni

4106

764 128



3xD

HT 800  
WP

Ni

4107

764 130



5xD

HT 800  
WP

Ni

4108

766 132



7xD

HT 800  
WP

Ni

4109

766 134



10xD

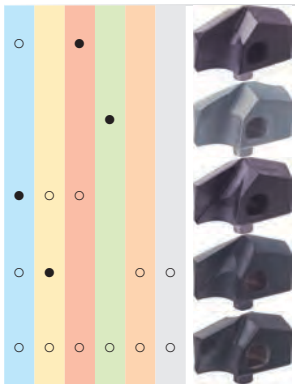
HT 800  
WP

Ni

4110

768 136

## HT 800 Takma uçlar

HT 800  
WP

VHM

F

11,000 - 40,000

4113

764 142

HT 800  
WP

VHM

O

11,000 - 40,000

4114

764 148

HT 800  
WP

VHM

F

11,000 - 40,000

4112

764 139

HT 800  
WP

VHM

a

11,000 - 40,000

4115

764 145

HT 800  
WP

VHM

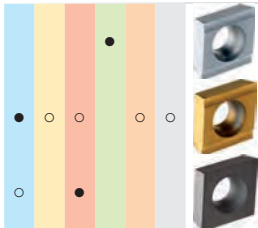
a

11,000 - 40,000

4111

768 151

## HT 800 Takma uçlar



VHM

O

7635

156



VHM

S

7645

154



VHM

A

7632

155

## Sıkma vidaları



6128

157



4071

158

## Takma uç gövdesi RT800



3xD

RT 800  
WP

Ni

5242

770 159



5xD

RT 800  
WP

Ni

5243

770 160



7xD

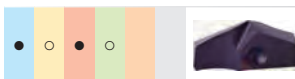
RT 800  
WP

Ni

5248

770 161

## RT 800 Takma uçları

RT 800  
WP

VHM

F

16,000 - 40,500

2485

770 164





P	M	K	N	S	H	takım görüntüsü	delik derinliği	sap formu	Tip	Standart	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayfası	Sayfa
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## RT 800 Takma uçları

						16,000 - 40,000	<b>2747</b>	770	166
						16,000 - 40,500	<b>1047</b>	770	162

## RT 800 Sıkma vidaları

		<b>1071</b>	168
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## Tork anahtarları

		<b>4915</b>	169
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## Torx-Bit uçları

		<b>4917</b>	170
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## Torx tornavida

		<b>1612</b>	171
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Takma uçlu delme sistemleri T 800



## Takma uç gövdesi HT800



**P** nikelajlı • özellikle yüksek aşınma dirençli • optimize edilmiş kanal kesit alanı • optimize edilmiş soğutma sıvısı çıkışı • sıkma vidaları  
**M** Ürün no. 4071 dahil • tomavida Art. no. 1612 dahil  
**K**  
**N**  
**S**  
**H**

Takma uçlu delme sistemleri T 800

Malzeme

Yüzey

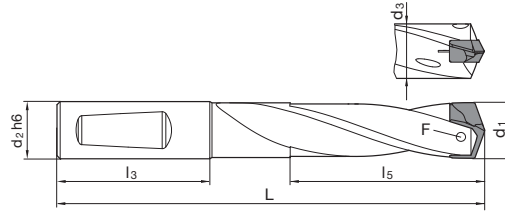
Ni

sap formu

HE

## GÜHRING NAVIGATOR

Kesme verileri sayfası 764-768



Ürün no 4106

d1	d2 h6	d3	L	l3	l5	F	Code-No.
mm	mm	mm	mm	mm	mm		
11,00-11,49	12,000	10,700	84,000	45,000	19,300	4071 2.200	11,000
11,00-11,49	12,700	10,700	84,000	45,000	19,300	4071 2.200	11,005
11,50-11,99	12,000	11,200	85,000	45,000	20,100	4071 2.200	11,500
11,50-11,99	12,700	11,200	85,000	45,000	20,100	4071 2.200	11,505
12,00-12,49	12,000	11,700	87,000	45,000	21,000	4071 2.201	12,000
12,00-12,49	12,700	11,700	87,000	45,000	21,000	4071 2.201	12,005
12,50-12,99	14,000	12,200	89,000	45,000	21,900	4071 2.201	12,500
12,50-12,99	15,875	12,200	89,000	45,000	21,900	4071 2.201	12,505
13,00-13,49	14,000	12,700	90,000	45,000	22,600	4071 2.500	13,000
13,00-13,49	15,875	12,700	90,000	45,000	22,600	4071 2.500	13,005
13,50-13,99	14,000	13,200	92,000	45,000	23,600	4071 2.500	13,500
13,50-13,99	15,875	13,200	92,000	45,000	23,600	4071 2.500	13,505
14,00-14,49	14,000	13,700	93,000	45,000	24,500	4071 3.000	14,000
14,00-14,49	15,875	13,700	93,000	45,000	24,500	4071 3.000	14,005
14,50-14,99	16,000	14,200	98,000	48,000	25,300	4071 3.000	14,500
14,50-14,99	15,875	14,200	98,000	48,000	25,300	4071 3.000	14,505
15,00-15,49	16,000	14,700	100,000	48,000	26,100	4071 3.001	15,000
15,00-15,49	15,875	14,700	100,000	48,000	26,100	4071 3.001	15,005
15,50-15,99	16,000	15,200	101,000	48,000	27,000	4071 3.001	15,500
15,50-15,99	15,875	15,200	101,000	48,000	27,000	4071 3.001	15,505
16,00-16,49	16,000	15,700	102,000	48,000	27,800	4071 3.500	16,000
16,00-16,49	15,875	15,700	102,000	48,000	27,800	4071 3.500	16,005
16,50-16,99	18,000	16,200	105,000	48,000	28,700	4071 3.500	16,500
16,50-16,99	19,050	16,200	105,000	48,000	28,700	4071 3.500	16,505
17,00-17,49	18,000	16,700	106,000	48,000	29,600	4071 3.500	17,000
17,00-17,49	19,050	16,700	106,000	48,000	29,600	4071 3.500	17,005
17,50-17,99	18,000	17,200	107,000	48,000	30,400	4071 3.500	17,500
17,50-17,99	19,050	17,200	107,000	48,000	30,400	4071 3.500	17,505
18,00-18,49	18,000	17,700	109,000	48,000	31,200	4071 4.000	18,000
18,00-18,49	19,050	17,700	109,000	48,000	31,200	4071 4.000	18,005
18,50-18,99	20,000	18,200	113,000	50,000	32,100	4071 4.000	18,500
18,50-18,99	19,050	18,200	113,000	50,000	32,100	4071 4.000	18,505
19,00-19,49	20,000	18,700	114,000	50,000	32,900	4071 4.000	19,000
19,00-19,49	19,050	18,700	114,000	50,000	32,900	4071 4.000	19,005
19,50-19,99	20,000	19,200	116,000	50,000	33,700	4071 4.000	19,500
19,50-19,99	19,050	19,200	116,000	50,000	33,700	4071 4.000	19,505
20,00-20,49	20,000	19,700	117,000	50,000	34,600	4071 4.500	20,000
20,00-20,49	19,050	19,700	117,000	50,000	34,600	4071 4.500	20,005
20,50-20,99	25,000	20,200	128,000	56,000	35,500	4071 4.500	20,500
20,50-20,99	25,400	20,200	128,000	56,000	35,500	4071 4.500	20,505
21,00-21,49	25,000	20,700	129,000	56,000	36,400	4071 4.500	21,000
21,00-21,49	25,400	20,700	129,000	56,000	36,400	4071 4.500	21,005



d1	d2 h6	d3	L	l3	l5	F	Code-No.
mm	mm	mm	mm	mm	mm		
21,50-21,99	25,000	21,200	130,000	56,000	37,200	4071 4.500	21,500
21,50-21,99	25,400	21,200	130,000	56,000	37,200	4071 4.500	21,505
22,00-22,49	25,000	21,700	131,000	56,000	38,000	4071 5.000	22,000
22,00-22,49	25,400	21,700	131,000	56,000	38,000	4071 5.000	22,005
22,50-22,99	25,000	22,200	134,000	56,000	38,900	4071 5.000	22,500
22,50-22,99	25,400	22,200	134,000	56,000	38,900	4071 5.000	22,505
23,00-23,49	25,000	22,700	135,000	56,000	39,800	4071 5.000	23,000
23,00-23,49	25,400	22,700	135,000	56,000	39,800	4071 5.000	23,005
23,50-23,99	25,000	23,200	137,000	56,000	40,600	4071 5.000	23,500
23,50-23,99	25,400	23,200	137,000	56,000	40,600	4071 5.000	23,505
24,00-24,49	25,000	23,700	138,000	56,000	41,500	4071 5.001	24,000
24,00-24,49	25,400	23,700	138,000	56,000	41,500	4071 5.001	24,005
24,50-24,99	25,000	24,200	140,000	56,000	42,300	4071 5.001	24,500
24,50-24,99	25,400	24,200	140,000	56,000	42,300	4071 5.001	24,505
25,00-25,49	25,000	24,700	142,000	56,000	43,200	4071 5.001	25,000
25,00-25,49	25,400	24,700	142,000	56,000	43,200	4071 5.001	25,005
25,50-25,99	32,000	25,200	148,000	60,000	44,000	4071 5.001	25,500
25,50-25,99	31,750	25,200	148,000	60,000	44,000	4071 5.001	25,505
26,00-26,49	32,000	25,700	151,000	60,000	44,300	4071 5.003	26,000
26,00-26,49	31,750	25,700	151,000	60,000	44,300	4071 5.003	26,005
26,50-26,99	32,000	26,200	153,000	60,000	45,100	4071 5.003	26,500
26,50-26,99	31,750	26,200	153,000	60,000	45,100	4071 5.003	26,505
27,00-27,49	32,000	26,700	155,000	60,000	46,000	4071 5.003	27,000
27,00-27,49	31,750	26,700	155,000	60,000	46,000	4071 5.003	27,005
27,50-27,99	32,000	27,200	156,000	60,000	46,800	4071 5.003	27,500
27,50-27,99	31,750	27,200	156,000	60,000	46,800	4071 5.003	27,505
28,00-28,49	32,000	27,700	157,000	60,000	47,700	4071 5.003	28,000
28,00-28,49	31,750	27,700	157,000	60,000	47,700	4071 5.003	28,005
28,50-28,99	32,000	28,200	159,000	60,000	48,500	4071 5.003	28,500
28,50-28,99	31,750	28,200	159,000	60,000	48,500	4071 5.003	28,505
29,00-29,49	32,000	28,700	161,000	60,000	49,400	4071 5.003	29,000
29,00-29,49	31,750	28,700	161,000	60,000	49,400	4071 5.003	29,005
29,50-29,99	32,000	29,200	162,000	60,000	50,200	4071 5.003	29,500
29,50-29,99	31,750	29,200	162,000	60,000	50,200	4071 5.003	29,505
30,00-30,49	32,000	29,700	164,000	60,000	50,900	4071 6.000	30,000
30,00-30,49	31,750	29,700	164,000	60,000	50,900	4071 6.000	30,005
30,50-30,99	32,000	30,200	166,000	60,000	51,700	4071 6.000	30,500
30,50-30,99	31,750	30,200	166,000	60,000	51,700	4071 6.000	30,505
31,00-31,49	32,000	30,700	167,000	60,000	52,600	4071 6.000	31,000
31,00-31,49	31,750	30,700	167,000	60,000	52,600	4071 6.000	31,005
31,50-31,99	32,000	31,200	168,000	60,000	53,400	4071 6.000	31,500
31,50-31,99	31,750	31,200	168,000	60,000	53,400	4071 6.000	31,505
32,00-32,99	32,000	31,700	172,000	60,000	55,100	4071 6.001	32,000
32,00-32,99	31,750	31,700	172,000	60,000	55,100	4071 6.001	32,005
33,00-33,99	32,000	32,700	175,000	60,000	56,800	4071 6.001	33,000
33,00-33,99	31,750	32,700	175,000	60,000	56,800	4071 6.001	33,005
34,00-34,99	32,000	33,700	178,000	60,000	58,500	4071 6.001	34,000
34,00-34,99	31,750	33,700	178,000	60,000	58,500	4071 6.001	34,005
35,00-35,99	32,000	34,700	181,000	60,000	60,200	4071 6.001	35,000
35,00-35,99	31,750	34,700	181,000	60,000	60,200	4071 6.001	35,005
36,00-36,99	32,000	35,700	184,000	60,000	61,800	4071 6.002	36,000
36,00-36,99	31,750	35,700	184,000	60,000	61,800	4071 6.002	36,005
37,00-37,99	32,000	36,700	188,000	60,000	63,500	4071 6.002	37,000
37,00-37,99	31,750	36,700	188,000	60,000	63,500	4071 6.002	37,005
38,00-38,99	32,000	37,700	191,000	60,000	65,200	4071 6.002	38,000
38,00-38,99	31,750	37,700	191,000	60,000	65,200	4071 6.002	38,005
39,00-40,00	32,000	38,700	194,000	60,000	66,900	4071 6.002	39,000
39,00-40,00	31,750	38,700	194,000	60,000	66,900	4071 6.002	39,005



## Takma uç gövdesi HT800



**P** nikelajlı • özellikle yüksek aşınma dirençli • optimize edilmiş kanal kesit alanı • optimize edilmiş soğutma sıvısı çıkışı • sıkı vidaları  
**M** Ürün no. 4071 dahil • tomavida Art. no. 1612 dahil  
**K**  
**N**  
**S**  
**H**

Takma uçlu delme sistemleri T 800

Malzeme

Yüzey

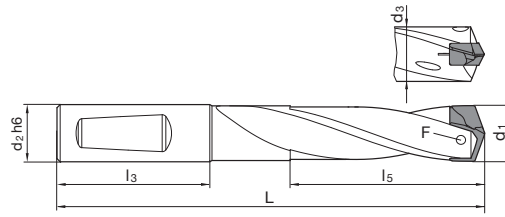
Ni

sap formu

HE

## GÜHRINGNAVIGATOR

Kesme verileri sayfası 764-768



Ürün no 4107

d1	d2 h6	d3	L	l3	l5	F	Code-No.
mm	mm	mm	mm	mm	mm		
11,00-11,49	12,000	10,700	101,000	45,000	36,600	4071 2.200	11,000
11,00-11,49	12,700	10,700	101,000	45,000	36,600	4071 2.200	11,005
11,50-11,99	12,000	11,200	103,000	45,000	38,100	4071 2.200	11,500
11,50-11,99	12,700	11,200	103,000	45,000	38,100	4071 2.200	11,505
12,00-12,49	12,000	11,700	106,000	45,000	39,700	4071 2.201	12,000
12,00-12,49	12,700	11,700	106,000	45,000	39,700	4071 2.201	12,005
12,50-12,99	14,000	12,200	108,000	45,000	41,300	4071 2.201	12,500
12,50-12,99	15,875	12,200	108,000	45,000	41,300	4071 2.201	12,505
13,00-13,49	14,000	12,700	110,000	45,000	42,900	4071 2.500	13,000
13,00-13,49	15,875	12,700	110,000	45,000	42,900	4071 2.500	13,005
13,50-13,99	14,000	13,200	113,000	45,000	44,600	4071 2.500	13,500
13,50-13,99	15,875	13,200	113,000	45,000	44,600	4071 2.500	13,505
14,00-14,49	14,000	13,700	115,000	45,000	46,200	4071 3.000	14,000
14,00-14,49	15,875	13,700	115,000	45,000	46,200	4071 3.000	14,005
14,50-14,99	16,000	14,200	120,000	48,000	47,800	4071 3.000	14,500
14,50-14,99	15,875	14,200	120,000	48,000	47,800	4071 3.000	14,505
15,00-15,49	16,000	14,700	123,000	48,000	49,300	4071 3.001	15,000
15,00-15,49	15,875	14,700	123,000	48,000	49,300	4071 3.001	15,005
15,50-15,99	16,000	15,200	125,000	48,000	50,900	4071 3.001	15,500
15,50-15,99	15,875	15,200	125,000	48,000	50,900	4071 3.001	15,505
16,00-16,49	16,000	15,700	127,000	48,000	52,900	4071 3.500	16,000
16,00-16,49	15,875	15,700	127,000	48,000	52,900	4071 3.500	16,005
16,50-16,99	18,000	16,200	130,000	48,000	54,100	4071 3.500	16,500
16,50-16,99	19,050	16,200	130,000	48,000	54,100	4071 3.500	16,505
17,00-17,49	18,000	16,700	132,000	48,000	55,800	4071 3.500	17,000
17,00-17,49	19,050	16,700	132,000	48,000	55,800	4071 3.500	17,005
17,50-17,99	18,000	17,200	134,000	48,000	57,400	4071 3.500	17,500
17,50-17,99	19,050	17,200	134,000	48,000	57,400	4071 3.500	17,505
18,00-18,49	18,000	17,700	137,000	48,000	58,900	4071 4.000	18,000
18,00-18,49	19,050	17,700	137,000	48,000	58,900	4071 4.000	18,005
18,50-18,99	20,000	18,200	141,000	50,000	60,500	4071 4.000	18,500
18,50-18,99	19,050	18,200	141,000	50,000	60,500	4071 4.000	18,505
19,00-19,49	20,000	18,700	143,000	50,000	62,100	4071 4.000	19,000
19,00-19,49	19,050	18,700	143,000	50,000	62,100	4071 4.000	19,005
19,50-19,99	20,000	19,200	146,000	50,000	63,700	4071 4.000	19,500
19,50-19,99	19,050	19,200	146,000	50,000	63,700	4071 4.000	19,505
20,00-20,49	20,000	19,700	148,000	50,000	65,300	4071 4.500	20,000
20,00-20,49	19,050	19,700	148,000	50,000	65,300	4071 4.500	20,005
20,50-20,99	25,000	20,200	159,000	56,000	67,000	4071 4.500	20,500
20,50-20,99	25,400	20,200	159,000	56,000	67,000	4071 4.500	20,505
21,00-21,49	25,000	20,700	161,000	56,000	68,600	4071 4.500	21,000
21,00-21,49	25,400	20,700	161,000	56,000	68,600	4071 4.500	21,005



d1	d2 h6	d3	L	l3	l5	F	Code-No.
mm	mm	mm	mm	mm	mm		
21,50-21,99	25,000	21,200	163,000	56,000	70,100	4071 4.500	21,500
21,50-21,99	25,400	21,200	163,000	56,000	70,100	4071 4.500	21,505
22,00-22,49	25,000	21,700	165,000	56,000	71,700	4071 5.000	22,000
22,00-22,49	25,400	21,700	165,000	56,000	71,700	4071 5.000	22,005
22,50-22,99	25,000	22,200	168,000	56,000	73,300	4071 5.000	22,500
22,50-22,99	25,400	22,200	168,000	56,000	73,300	4071 5.000	22,505
23,00-23,49	25,000	22,700	170,000	56,000	74,900	4071 5.000	23,000
23,00-23,49	25,400	22,700	170,000	56,000	74,900	4071 5.000	23,005
23,50-23,99	25,000	23,200	173,000	56,000	76,500	4071 5.000	23,500
23,50-23,99	25,400	23,200	173,000	56,000	76,500	4071 5.000	23,505
24,00-24,49	25,000	23,700	175,000	56,000	78,100	4071 5.001	24,000
24,00-24,49	25,400	23,700	175,000	56,000	78,100	4071 5.001	24,005
24,50-24,99	25,000	24,200	177,000	56,000	79,700	4071 5.001	24,500
24,50-24,99	25,400	24,200	177,000	56,000	79,700	4071 5.001	24,505
25,00-25,49	25,000	24,700	180,000	56,000	81,300	4071 5.001	25,000
25,00-25,49	25,400	24,700	180,000	56,000	81,300	4071 5.001	25,005
25,50-25,99	32,000	25,200	187,000	60,000	82,900	4071 5.001	25,500
25,50-25,99	31,750	25,200	187,000	60,000	82,900	4071 5.001	25,505
26,00-26,49	32,000	25,700	191,000	60,000	84,000	4071 5.003	26,000
26,00-26,49	31,750	25,700	191,000	60,000	84,000	4071 5.003	26,005
26,50-26,99	32,000	26,200	193,000	60,000	86,100	4071 5.003	26,500
26,50-26,99	31,750	26,200	193,000	60,000	86,100	4071 5.003	26,505
27,00-27,49	32,000	26,700	196,000	60,000	87,200	4071 5.003	27,000
27,00-27,49	31,750	26,700	196,000	60,000	87,200	4071 5.003	27,005
27,50-27,99	32,000	27,200	198,000	60,000	88,900	4071 5.003	27,500
27,50-27,99	31,750	27,200	198,000	60,000	88,900	4071 5.003	27,505
28,00-28,49	32,000	27,700	200,000	60,000	90,400	4071 5.003	28,000
28,00-28,49	31,750	27,700	200,000	60,000	90,400	4071 5.003	28,005
28,50-28,99	32,000	28,200	202,000	60,000	92,500	4071 5.003	28,500
28,50-28,99	31,750	28,200	202,000	60,000	92,500	4071 5.003	28,505
29,00-29,49	32,000	28,700	205,000	60,000	94,600	4071 5.003	29,000
29,00-29,49	31,750	28,700	205,000	60,000	94,600	4071 5.003	29,005
29,50-29,99	32,000	29,200	207,000	60,000	95,100	4071 5.003	29,500
29,50-29,99	31,750	29,200	207,000	60,000	95,100	4071 5.003	29,505
30,00-30,49	32,000	29,700	210,000	60,000	96,700	4071 6.000	30,000
30,00-30,49	31,750	29,700	210,000	60,000	96,700	4071 6.000	30,005
30,50-30,99	32,000	30,200	212,000	60,000	98,300	4071 6.000	30,500
30,50-30,99	31,750	30,200	212,000	60,000	98,300	4071 6.000	30,505
31,00-31,49	32,000	30,700	214,000	60,000	99,800	4071 6.000	31,000
31,00-31,49	31,750	30,700	214,000	60,000	99,800	4071 6.000	31,005
31,50-31,99	32,000	31,200	216,000	60,000	101,400	4071 6.000	31,500
31,50-31,99	31,750	31,200	216,000	60,000	101,400	4071 6.000	31,505
32,00-32,99	32,000	31,700	221,000	60,000	104,600	4071 6.001	32,000
32,00-32,99	31,750	31,700	221,000	60,000	104,600	4071 6.001	32,005
33,00-33,99	32,000	32,700	226,000	60,000	107,800	4071 6.001	33,000
33,00-33,99	31,750	32,700	226,000	60,000	107,800	4071 6.001	33,005
34,00-34,99	32,000	33,700	230,000	60,000	111,000	4071 6.001	34,000
34,00-34,99	31,750	33,700	230,000	60,000	111,000	4071 6.001	34,005
35,00-35,99	32,000	34,700	235,000	60,000	114,200	4071 6.001	35,000
35,00-35,99	31,750	34,700	235,000	60,000	114,200	4071 6.001	35,005
36,00-36,99	32,000	35,700	240,000	60,000	117,300	4071 6.002	36,000
36,00-36,99	31,750	35,700	240,000	60,000	117,300	4071 6.002	36,005
37,00-37,99	32,000	36,700	245,000	60,000	120,500	4071 6.002	37,000
37,00-37,99	31,750	36,700	245,000	60,000	120,500	4071 6.002	37,005
38,00-38,99	32,000	37,700	249,000	60,000	123,700	4071 6.002	38,000
38,00-38,99	31,750	37,700	249,000	60,000	123,700	4071 6.002	38,005
39,00-40,00	32,000	38,700	254,000	60,000	126,900	4071 6.002	39,000
39,00-40,00	31,750	38,700	254,000	60,000	126,900	4071 6.002	39,005



## Takma uç gövdesi HT800



**P** nikelajlı • özellikle yüksek aşınma dirençli • optimize edilmiş kanal kesit alanı • optimize edilmiş soğutma sıvısı çıkışı • sıkma vidaları  
**M** Ürün no. 4071 dahil • tomavida Art. no. 1612 dahil  
**K**  
**N**  
**S**  
**H**

Takma uçlu delme sistemleri T 800

Malzeme

Yüzey

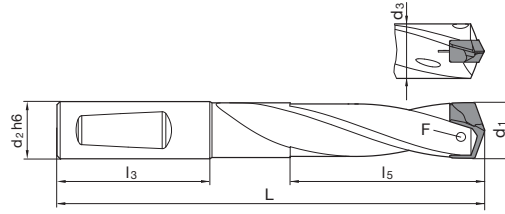
Ni

sap formu

HE

## GÜHRINGNAVIGATOR

Kesme verileri sayfası 764-768



Ürün no 4108

d1	d2 h6	d3	L	l3	l5	F	Code-No.
mm	mm	mm	mm	mm	mm		
11,00-11,49	12,000	10,700	124,000	45,000	59,600	4071 2.200	11,000
11,00-11,49	12,700	10,700	124,000	45,000	59,600	4071 2.200	11,005
11,50-11,99	12,000	11,200	127,000	45,000	62,100	4071 2.200	11,500
11,50-11,99	12,700	11,200	127,000	45,000	62,100	4071 2.200	11,505
12,00-12,49	12,000	11,700	131,000	45,000	64,700	4071 2.201	12,000
12,00-12,49	12,700	11,700	131,000	45,000	64,700	4071 2.201	12,005
12,50-12,99	14,000	12,200	134,000	45,000	67,300	4071 2.201	12,500
12,50-12,99	15,875	12,200	134,000	45,000	67,300	4071 2.201	12,505
13,00-13,49	14,000	12,700	137,000	45,000	69,900	4071 2.500	13,000
13,00-13,49	15,875	12,700	137,000	45,000	69,900	4071 2.500	13,005
13,50-13,99	14,000	13,200	141,000	45,000	72,600	4071 2.500	13,500
13,50-13,99	15,875	13,200	141,000	45,000	72,600	4071 2.500	13,505
14,00-14,49	14,000	13,700	144,000	45,000	75,200	4071 3.000	14,000
14,00-14,49	15,875	13,700	144,000	45,000	75,200	4071 3.000	14,005
14,50-14,99	16,000	14,200	150,000	48,000	77,800	4071 3.000	14,500
14,50-14,99	15,875	14,200	150,000	48,000	77,800	4071 3.000	14,505
15,00-15,49	16,000	14,700	154,000	48,000	80,300	4071 3.001	15,000
15,00-15,49	15,875	14,700	154,000	48,000	80,300	4071 3.001	15,005
15,50-15,99	16,000	15,200	157,000	48,000	82,900	4071 3.001	15,500
15,50-15,99	15,875	15,200	157,000	48,000	82,900	4071 3.001	15,505
16,00-16,49	16,000	15,700	160,000	48,000	85,900	4071 3.500	16,000
16,00-16,49	15,875	15,700	160,000	48,000	85,900	4071 3.500	16,005
16,50-16,99	18,000	16,200	164,000	48,000	88,100	4071 3.500	16,500
16,50-16,99	19,050	16,200	164,000	48,000	88,100	4071 3.500	16,505
17,00-17,49	18,000	16,700	167,000	48,000	90,800	4071 3.500	17,000
17,00-17,49	19,050	16,700	167,000	48,000	90,800	4071 3.500	17,005
17,50-17,99	18,000	17,200	170,000	48,000	93,400	4071 3.500	17,500
17,50-17,99	19,050	17,200	170,000	48,000	93,400	4071 3.500	17,505
18,00-18,49	18,000	17,700	174,000	48,000	95,900	4071 4.000	18,000
18,00-18,49	19,050	17,700	174,000	48,000	95,900	4071 4.000	18,005
18,50-18,99	20,000	18,200	179,000	50,000	98,500	4071 4.000	18,500
18,50-18,99	19,050	18,200	179,000	50,000	98,500	4071 4.000	18,505
19,00-19,49	20,000	18,700	182,000	50,000	101,100	4071 4.000	19,000
19,00-19,49	19,050	18,700	182,000	50,000	101,100	4071 4.000	19,005
19,50-19,99	20,000	19,200	186,000	50,000	103,700	4071 4.000	19,500
19,50-19,99	19,050	19,200	186,000	50,000	103,700	4071 4.000	19,505
20,00-20,49	20,000	19,700	189,000	50,000	106,300	4071 4.500	20,000
20,00-20,49	19,050	19,700	189,000	50,000	106,300	4071 4.500	20,005
20,50-20,99	25,000	20,200	201,000	56,000	109,000	4071 4.500	20,500
20,50-20,99	25,400	20,200	201,000	56,000	109,000	4071 4.500	20,505
21,00-21,49	25,000	20,700	204,000	56,000	111,600	4071 4.500	21,000
21,00-21,49	25,400	20,700	204,000	56,000	111,600	4071 4.500	21,005



d1	d2 h6	d3	L	l3	l5	F	Code-No.
mm	mm	mm	mm	mm	mm		
21,50-21,99	25,000	21,200	207,000	56,000	114,100	4071 4.500	21,500
21,50-21,99	25,400	21,200	207,000	56,000	114,100	4071 4.500	21,505
22,00-22,49	25,000	21,700	210,000	56,000	116,700	4071 5.000	22,000
22,00-22,49	25,400	21,700	210,000	56,000	116,700	4071 5.000	22,005
22,50-22,99	25,000	22,200	214,000	56,000	119,300	4071 5.000	22,500
22,50-22,99	25,400	22,200	214,000	56,000	119,300	4071 5.000	22,505
23,00-23,49	25,000	22,700	217,000	56,000	121,900	4071 5.000	23,000
23,00-23,49	25,400	22,700	217,000	56,000	121,900	4071 5.000	23,005
23,50-23,99	25,000	23,200	221,000	56,000	124,500	4071 5.000	23,500
23,50-23,99	25,400	23,200	221,000	56,000	124,500	4071 5.000	23,505
24,00-24,49	25,000	23,700	224,000	56,000	127,100	4071 5.001	24,000
24,00-24,49	25,400	23,700	224,000	56,000	127,100	4071 5.001	24,005
24,50-24,99	25,000	24,200	227,000	56,000	129,700	4071 5.001	24,500
24,50-24,99	25,400	24,200	227,000	56,000	129,700	4071 5.001	24,505
25,00-25,49	25,000	24,700	231,000	56,000	132,300	4071 5.001	25,000
25,00-25,49	25,400	24,700	231,000	56,000	132,300	4071 5.001	25,005
25,50-25,99	32,000	25,200	239,000	60,000	134,900	4071 5.001	25,500
25,50-25,99	31,750	25,200	239,000	60,000	134,900	4071 5.001	25,505
26,00-26,49	32,000	25,700	244,000	60,000	137,000	4071 5.003	26,000
26,00-26,49	31,750	25,700	244,000	60,000	137,000	4071 5.003	26,005
26,50-26,99	32,000	26,200	247,000	60,000	140,000	4071 5.003	26,500
26,50-26,99	31,750	26,200	247,000	60,000	140,000	4071 5.003	26,505
27,00-27,49	32,000	26,700	251,000	60,000	142,200	4071 5.003	27,000
27,00-27,49	31,750	26,700	251,000	60,000	142,200	4071 5.003	27,005
27,50-27,99	32,000	27,200	254,000	60,000	144,800	4071 5.003	27,500
28,00-28,49	32,000	27,700	257,000	60,000	147,400	4071 5.003	28,000
28,00-28,49	31,750	27,700	257,000	60,000	147,400	4071 5.003	28,005
28,50-28,99	32,000	28,200	260,000	60,000	150,400	4071 5.003	28,500
28,50-28,99	31,750	28,200	260,000	60,000	150,400	4071 5.003	28,505
29,00-29,49	32,000	28,700	264,000	60,000	153,500	4071 5.003	29,000
29,00-29,49	31,750	28,700	264,000	60,000	153,500	4071 5.003	29,005
29,50-29,99	32,000	29,200	267,000	60,000	155,100	4071 5.003	29,500
30,00-30,49	32,000	29,700	271,000	60,000	157,600	4071 6.000	30,000
30,00-30,49	31,750	29,700	271,000	60,000	157,600	4071 6.000	30,005
30,50-30,99	32,000	30,200	274,000	60,000	160,200	4071 6.000	30,500
31,00-31,49	32,000	30,700	277,000	60,000	162,800	4071 6.000	31,000
31,50-31,99	32,000	31,200	280,000	60,000	165,400	4071 6.000	31,500
32,00-32,99	32,000	31,700	287,000	60,000	170,600	4071 6.001	32,000
32,00-32,99	31,750	31,700	287,000	60,000	170,600	4071 6.001	32,005
33,00-33,99	32,000	32,700	294,000	60,000	175,800	4071 6.001	33,000
33,00-33,99	31,750	32,700	294,000	60,000	175,800	4071 6.001	33,005
34,00-34,99	32,000	33,700	300,000	60,000	181,000	4071 6.001	34,000
34,00-34,99	31,750	33,700	300,000	60,000	181,000	4071 6.001	34,005
35,00-35,99	32,000	34,700	307,000	60,000	186,200	4071 6.001	35,000
35,00-35,99	31,750	34,700	307,000	60,000	186,200	4071 6.001	35,005
36,00-36,99	32,000	35,700	314,000	60,000	191,300	4071 6.002	36,000
37,00-37,99	32,000	36,700	321,000	60,000	196,500	4071 6.002	37,000
37,00-37,99	31,750	36,700	321,000	60,000	196,500	4071 6.002	37,005
38,00-38,99	32,000	37,700	327,000	60,000	201,700	4071 6.002	38,000
38,00-38,99	31,750	37,700	327,000	60,000	201,700	4071 6.002	38,005
39,00-40,00	32,000	38,700	334,000	60,000	206,900	4071 6.002	39,000



## Takma uç gövdesi HT800



**P** nikelajlı • özellikle yüksek aşınma dirençli • optimize edilmiş kanal kesit alanı • optimize edilmiş soğutma sıvısı çıkışı • sıkma vidaları  
**M** Ürün no. 4071 dahil • tomavida Art. no. 1612 dahil  
**K**  
**N**  
**S**  
**H**

Takma uçlu delme sistemleri T 800

Malzeme

Yüzey

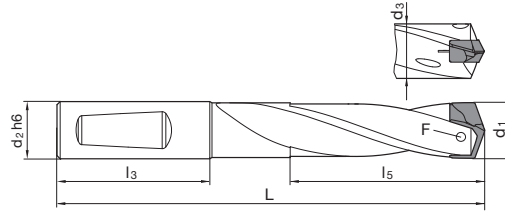
Ni

sap formu

HE

## GÜHRING NAVIGATOR

Kesme verileri sayfası 764-768



Ürün no

4109

d1	d2 h6	d3	L	l3	l5	F	Code-No.
mm	mm	mm	mm	mm	mm		
11,00-11,49	12,000	10,700	147,000	45,000	82,600	4071 2.200	11,000
11,00-11,49	12,700	10,700	147,000	45,000	82,600	4071 2.200	11,005
11,50-11,99	12,000	11,200	151,000	45,000	86,100	4071 2.200	11,500
11,50-11,99	12,700	11,200	151,000	45,000	86,100	4071 2.200	11,505
12,00-12,49	12,000	11,700	156,000	45,000	89,700	4071 2.201	12,000
12,00-12,49	12,700	11,700	156,000	45,000	89,700	4071 2.201	12,005
12,50-12,99	14,000	12,200	160,000	45,000	93,300	4071 2.201	12,500
12,50-12,99	15,875	12,200	160,000	45,000	93,300	4071 2.201	12,505
13,00-13,49	14,000	12,700	164,000	45,000	96,900	4071 2.500	13,000
13,00-13,49	15,875	12,700	164,000	45,000	96,900	4071 2.500	13,005
13,50-13,99	14,000	13,200	169,000	45,000	100,600	4071 2.500	13,500
13,50-13,99	15,875	13,200	169,000	45,000	100,600	4071 2.500	13,505
14,00-14,49	14,000	13,700	173,000	45,000	104,200	4071 3.000	14,000
14,00-14,49	15,875	13,700	173,000	45,000	104,200	4071 3.000	14,005
14,50-14,99	16,000	14,200	180,000	48,000	107,800	4071 3.000	14,500
14,50-14,99	15,875	14,200	180,000	48,000	107,800	4071 3.000	14,505
15,00-15,49	16,000	14,700	185,000	48,000	111,300	4071 3.001	15,000
15,00-15,49	15,875	14,700	185,000	48,000	111,300	4071 3.001	15,005
15,50-15,99	16,000	15,200	189,000	48,000	114,900	4071 3.001	15,500
15,50-15,99	15,875	15,200	189,000	48,000	114,900	4071 3.001	15,505
16,00-16,49	16,000	15,700	193,000	48,000	118,900	4071 3.500	16,000
16,00-16,49	15,875	15,700	193,000	48,000	118,900	4071 3.500	16,005
16,50-16,99	18,000	16,200	198,000	48,000	122,100	4071 3.500	16,500
16,50-16,99	19,050	16,200	198,000	48,000	122,100	4071 3.500	16,505
17,00-17,49	18,000	16,700	202,000	48,000	125,800	4071 3.500	17,000
17,00-17,49	19,050	16,700	202,000	48,000	125,800	4071 3.500	17,005
17,50-17,99	18,000	17,200	206,000	48,000	129,400	4071 3.500	17,500
17,50-17,99	19,050	17,200	206,000	48,000	129,400	4071 3.500	17,505
18,00-18,49	18,000	17,700	211,000	48,000	132,900	4071 4.000	18,000
18,00-18,49	19,050	17,700	211,000	48,000	132,900	4071 4.000	18,005
18,50-18,99	20,000	18,200	217,000	50,000	136,500	4071 4.000	18,500
18,50-18,99	19,050	18,200	217,000	50,000	136,500	4071 4.000	18,505
19,00-19,49	20,000	18,700	221,000	50,000	140,100	4071 4.000	19,000
19,00-19,49	19,050	18,700	221,000	50,000	140,100	4071 4.000	19,005
19,50-19,99	20,000	19,200	226,000	50,000	143,700	4071 4.000	19,500
19,50-19,99	19,050	19,200	226,000	50,000	143,700	4071 4.000	19,505
20,00-20,49	20,000	19,700	230,000	50,000	147,300	4071 4.500	20,000
20,00-20,49	19,050	19,700	230,000	50,000	147,300	4071 4.500	20,005
20,50-20,99	25,000	20,200	243,000	56,000	151,000	4071 4.500	20,500
20,50-20,99	25,400	20,200	243,000	56,000	151,000	4071 4.500	20,505
21,00-21,49	25,000	20,700	247,000	56,000	154,600	4071 4.500	21,000
21,00-21,49	25,400	20,700	247,000	56,000	154,600	4071 4.500	21,005





d1	d2 h6	d3	L	l3	l5	F	Code-No.
mm	mm	mm	mm	mm	mm		
21,50-21,99	25,000	21,200	251,000	56,000	158,100	4071 4.500	21,500
21,50-21,99	25,400	21,200	251,000	56,000	158,100	4071 4.500	21,505
22,00-22,49	25,000	21,700	255,000	56,000	161,700	4071 5.000	22,000
22,00-22,49	25,400	21,700	255,000	56,000	161,700	4071 5.000	22,005
22,50-22,99	25,000	22,200	260,000	56,000	165,300	4071 5.000	22,500
22,50-22,99	25,400	22,200	260,000	56,000	165,300	4071 5.000	22,505
23,00-23,49	25,000	22,700	264,000	56,000	168,900	4071 5.000	23,000
23,00-23,49	25,400	22,700	264,000	56,000	168,900	4071 5.000	23,005
23,50-23,99	25,000	23,200	269,000	56,000	172,500	4071 5.000	23,500
23,50-23,99	25,400	23,200	269,000	56,000	172,500	4071 5.000	23,505
24,00-24,49	25,000	23,700	273,000	56,000	176,100	4071 5.001	24,000
24,00-24,49	25,400	23,700	273,000	56,000	176,100	4071 5.001	24,005
24,50-24,99	25,000	24,200	277,000	56,000	179,700	4071 5.001	24,500
24,50-24,99	25,400	24,200	277,000	56,000	179,700	4071 5.001	24,505
25,00-25,49	25,000	24,700	282,000	56,000	183,300	4071 5.001	25,000
25,00-25,49	25,400	24,700	282,000	56,000	183,300	4071 5.001	25,005
25,50-25,99	32,000	25,200	291,000	60,000	186,900	4071 5.001	25,500
25,50-25,99	31,750	25,200	291,000	60,000	186,900	4071 5.001	25,505
26,00-26,49	32,000	25,700	297,000	60,000	190,000	4071 5.003	26,000
26,00-26,49	31,750	25,700	297,000	60,000	190,000	4071 5.003	26,005
26,50-26,99	32,000	26,200	301,000	60,000	194,000	4071 5.003	26,500
26,50-26,99	31,750	26,200	301,000	60,000	194,000	4071 5.003	26,505
27,00-27,49	32,000	26,700	306,000	60,000	197,200	4071 5.003	27,000
27,00-27,49	31,750	26,700	306,000	60,000	197,200	4071 5.003	27,005
27,50-27,99	32,000	27,200	310,000	60,000	200,800	4071 5.003	27,500
27,50-27,99	31,750	27,200	310,000	60,000	200,800	4071 5.003	27,505
28,00-28,49	32,000	27,700	314,000	60,000	204,400	4071 5.003	28,000
28,00-28,49	31,750	27,700	314,000	60,000	204,400	4071 5.003	28,005
28,50-28,99	32,000	28,200	318,000	60,000	208,400	4071 5.003	28,500
28,50-28,99	31,750	28,200	318,000	60,000	208,400	4071 5.003	28,505
29,00-29,49	32,000	28,700	323,000	60,000	212,500	4071 5.003	29,000
29,00-29,49	31,750	28,700	323,000	60,000	212,500	4071 5.003	29,005
29,50-29,99	32,000	29,200	327,000	60,000	215,100	4071 5.003	29,500
29,50-29,99	31,750	29,200	327,000	60,000	215,100	4071 5.003	29,505
30,00-30,49	32,000	29,700	332,000	60,000	218,600	4071 6.000	30,000
30,00-30,49	31,750	29,700	332,000	60,000	218,600	4071 6.000	30,005
30,50-30,99	32,000	30,200	336,000	60,000	222,200	4071 6.000	30,500
30,50-30,99	31,750	30,200	336,000	60,000	222,200	4071 6.000	30,505
31,00-31,49	32,000	30,700	340,000	60,000	225,800	4071 6.000	31,000
31,00-31,49	31,750	30,700	340,000	60,000	225,800	4071 6.000	31,005
31,50-31,99	32,000	31,200	344,000	60,000	229,400	4071 6.000	31,500
31,50-31,99	31,750	31,200	344,000	60,000	229,400	4071 6.000	31,505
33,00-33,99	32,000	32,700	362,000	60,000	244,600	4071 6.001	33,000
39,00-40,00	32,000	38,700	413,000	60,000	287,400	4071 6.002	39,000



## Takma uç gövdesi HT800



**P** nikelajlı • özellikle yüksek aşınma dirençli • optimize edilmiş kanal kesit alanı • optimize edilmiş soğutma sıvısı çıkışı • sıkıca vidaları  
**M** Ürün no. 4071 dahil • tomavida Art. no. 1612 dahil  
**K**  
**N**  
**S**  
**H**

Takma uçlu delme sistemleri T 800

## GÜHRING NAVIGATOR

Kesme verileri sayfası 764-768

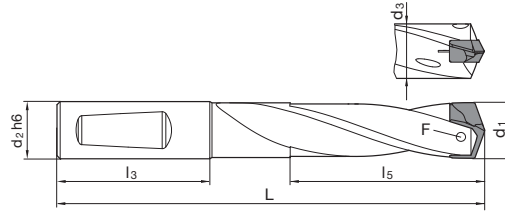
Malzeme

Yüzey

Ni

sap formu

HE



Ürün no

4110

d1	d2 h6	d3	L	l3	l5	F	Code-No.
mm	mm	mm	mm	mm	mm		
11,00-11,49	12,000	10,700	182,000	45,000	117,100	4071 2.200	11,000
11,00-11,49	12,700	10,700	182,000	45,000	117,100	4071 2.200	11,005
11,50-11,99	12,000	11,200	187,000	45,000	122,100	4071 2.200	11,500
11,50-11,99	12,700	11,200	187,000	45,000	122,100	4071 2.200	11,505
12,00-12,49	12,000	11,700	194,000	45,000	127,200	4071 2.201	12,000
12,00-12,49	12,700	11,700	194,000	45,000	127,200	4071 2.201	12,005
12,50-12,99	14,000	12,200	199,000	45,000	132,300	4071 2.201	12,500
12,50-12,99	15,875	12,200	199,000	45,000	132,300	4071 2.201	12,505
13,00-13,49	14,000	12,700	205,000	45,000	137,500	4071 2.500	13,000
13,00-13,49	15,875	12,700	205,000	45,000	137,500	4071 2.500	13,005
13,50-13,99	14,000	13,200	211,000	45,000	142,500	4071 2.500	13,500
13,50-13,99	15,875	13,200	211,000	45,000	142,500	4071 2.500	13,505
14,00-14,49	14,000	13,700	217,000	45,000	147,700	4071 3.000	14,000
14,00-14,49	15,875	13,700	217,000	45,000	147,700	4071 3.000	14,005
14,50-14,99	16,000	14,200	225,000	48,000	152,800	4071 3.000	14,500
14,50-14,99	15,875	14,200	225,000	48,000	152,800	4071 3.000	14,505
15,00-15,49	16,000	14,700	232,000	48,000	157,800	4071 3.001	15,000
15,00-15,49	15,875	14,700	232,000	48,000	157,800	4071 3.001	15,005
15,50-15,99	16,000	15,200	237,000	48,000	162,900	4071 3.001	15,500
15,50-15,99	15,875	15,200	237,000	48,000	162,900	4071 3.001	15,505
16,00-16,49	16,000	15,700	243,000	48,000	168,000	4071 3.500	16,000
16,00-16,49	15,875	15,700	243,000	48,000	168,000	4071 3.500	16,005
16,50-16,99	18,000	16,200	249,000	48,000	170,000	4071 3.500	16,500
16,50-16,99	19,050	16,200	249,000	48,000	170,000	4071 3.500	16,505
17,00-17,49	18,000	16,700	255,000	48,000	178,300	4071 3.500	17,000
17,00-17,49	19,050	16,700	255,000	48,000	178,300	4071 3.500	17,005
17,50-17,99	18,000	17,200	260,000	48,000	183,500	4071 3.500	17,500
17,50-17,99	19,050	17,200	260,000	48,000	183,500	4071 3.500	17,505
18,00-18,49	18,000	17,700	267,000	48,000	188,400	4071 4.000	18,000
18,00-18,49	19,050	17,700	267,000	48,000	188,400	4071 4.000	18,005
18,50-18,99	20,000	18,200	274,000	50,000	193,500	4071 4.000	18,500
18,50-18,99	19,050	18,200	274,000	50,000	193,500	4071 4.000	18,505
19,00-19,49	20,000	18,700	280,000	50,000	198,700	4071 4.000	19,000
19,00-19,49	19,050	18,700	280,000	50,000	198,700	4071 4.000	19,005
19,50-19,99	20,000	19,200	286,000	50,000	203,700	4071 4.000	19,500
19,50-19,99	19,050	19,200	286,000	50,000	203,700	4071 4.000	19,505
20,00-20,49	20,000	19,700	292,000	50,000	208,900	4071 4.500	20,000
20,00-20,49	19,050	19,700	292,000	50,000	208,900	4071 4.500	20,005
20,50-20,99	25,000	20,200	306,000	56,000	214,000	4071 4.500	20,500
20,50-20,99	25,400	20,200	306,000	56,000	214,000	4071 4.500	20,505
21,00-21,49	25,000	20,700	312,000	56,000	219,100	4071 4.500	21,000
21,00-21,49	25,400	20,700	312,000	56,000	219,100	4071 4.500	21,005



d1	d2 h6	d3	L	l3	l5	F	Code-No.
mm	mm	mm	mm	mm	mm		
21,50-21,99	25,000	21,200	317,000	56,000	224,200	4071 4.500	21,500
21,50-21,99	25,400	21,200	317,000	56,000	224,200	4071 4.500	21,505
22,00-22,49	25,000	21,700	323,000	56,000	229,300	4071 5.000	22,000
22,00-22,49	25,400	21,700	323,000	56,000	229,300	4071 5.000	22,005
22,50-22,99	25,000	22,200	329,000	56,000	234,400	4071 5.000	22,500
22,50-22,99	25,400	22,200	329,000	56,000	234,400	4071 5.000	22,505
23,00-23,49	25,000	22,700	335,000	56,000	239,500	4071 5.000	23,000
23,00-23,49	25,400	22,700	335,000	56,000	239,500	4071 5.000	23,005
23,50-23,99	25,000	23,200	341,000	56,000	244,600	4071 5.000	23,500
23,50-23,99	25,400	23,200	341,000	56,000	244,600	4071 5.000	23,505
24,00-24,49	25,000	23,700	347,000	56,000	249,700	4071 5.001	24,000
24,00-24,49	25,400	23,700	347,000	56,000	249,700	4071 5.001	24,005
24,50-24,99	25,000	24,200	352,000	56,000	254,800	4071 5.001	24,500
24,50-24,99	25,400	24,200	352,000	56,000	254,800	4071 5.001	24,505
25,00-25,49	25,000	24,700	359,000	56,000	259,900	4071 5.001	25,000
25,00-25,49	25,400	24,700	359,000	56,000	259,900	4071 5.001	25,005
25,50-25,99	32,000	25,200	369,000	60,000	265,000	4071 5.001	25,500
25,50-25,99	31,750	25,200	369,000	60,000	265,000	4071 5.001	25,505
26,00-26,49	32,000	25,700	377,000	60,000	270,000	4071 5.003	26,000
26,00-26,49	31,750	25,700	377,000	60,000	270,000	4071 5.003	26,005
26,50-26,99	32,000	26,200	382,000	60,000	275,000	4071 5.003	26,500
26,50-26,99	31,750	26,200	382,000	60,000	275,000	4071 5.003	26,505
27,00-27,49	32,000	26,700	388,000	60,000	280,100	4071 5.003	27,000
27,00-27,49	31,750	26,700	388,000	60,000	280,100	4071 5.003	27,005
27,50-27,99	32,000	27,200	394,000	60,000	285,200	4071 5.003	27,500
27,50-27,99	31,750	27,200	394,000	60,000	285,200	4071 5.003	27,505
28,00-28,49	32,000	27,700	400,000	60,000	290,300	4071 5.003	28,000
28,00-28,49	31,750	27,700	400,000	60,000	290,300	4071 5.003	28,005
28,50-28,99	32,000	28,200	405,000	60,000	295,400	4071 5.003	28,500
28,50-28,99	31,750	28,200	405,000	60,000	295,400	4071 5.003	28,505
29,00-29,49	32,000	28,700	412,000	60,000	300,500	4071 5.003	29,000
29,00-29,49	31,750	28,700	412,000	60,000	300,500	4071 5.003	29,005
29,50-29,99	32,000	29,200	418,000	60,000	305,600	4071 5.003	29,500
29,50-29,99	31,750	29,200	418,000	60,000	305,600	4071 5.003	29,505
30,00-30,49	32,000	29,700	424,000	60,000	310,600	4071 6.000	30,000
30,00-30,49	31,750	29,700	424,000	60,000	310,600	4071 6.000	30,005
30,50-30,99	32,000	30,200	429,000	60,000	315,700	4071 6.000	30,500
30,50-30,99	31,750	30,200	429,000	60,000	315,700	4071 6.000	30,505
31,00-31,49	32,000	30,700	435,000	60,000	320,800	4071 6.000	31,000
31,00-31,49	31,750	30,700	435,000	60,000	320,800	4071 6.000	31,005
31,50-31,99	32,000	31,200	441,000	60,000	325,900	4071 6.000	31,500
31,50-31,99	31,750	31,200	441,000	60,000	325,900	4071 6.000	31,505



## Takma uç gövdesi HT800



**P** nikelajlı • özellikle yüksek aşınma dirençli • optimize edilmiş kanal kesit alanı • optimize edilmiş soğutma sıvısı çıkışı • sıkma vidaları ürün no. 4071 ve 6128 dahil • tornavida Art. no. 1612 dahil

**M**  
**K**  
**N**  
**S**  
**H**

pilotlama ve 45 derece havşa için

## GÜHRING NAVIGATOR

Kesme verileri sayfası 764-768

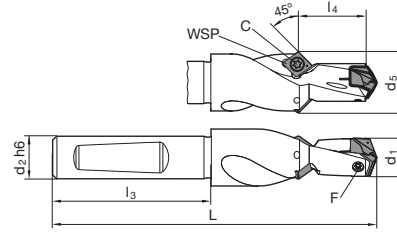
Malzeme

Yüzey

Ni

sap formu

HE



Ürün no 4105

d1	d2 h6	d5	L	l3	l4	WSP	C	F	Code-No.
mm	mm	mm	mm	mm	mm				
11,00-11,99	12,000	17,000	81,000	45,000	12,000	CP..0502..	6128 2.000	4071 2.200	11,000
11,00-11,99	12,700	17,000	81,000	45,000	12,000	CP..0502..	6128 2.000	4071 2.200	11,005
12,00-12,99	12,000	18,000	84,000	45,000	13,000	CP..0502..	6128 2.000	4071 2.201	12,000
12,00-12,99	12,700	18,000	84,000	45,000	13,000	CP..0502..	6128 2.000	4071 2.201	12,005
13,00-13,99	14,000	18,000	86,000	45,000	14,000	CP..0502..	6128 2.000	4071 2.500	13,000
13,00-13,99	15,875	18,000	86,000	45,000	14,000	CP..0502..	6128 2.000	4071 2.500	13,005
14,00-15,99	16,000	18,000	93,000	48,000	16,000	CP..0502..	6128 2.000	4071 3.000	14,000
14,00-15,99	15,875	18,000	93,000	48,000	16,000	CP..0502..	6128 2.000	4071 3.000	14,005
16,00-17,99	18,000	20,000	99,000	48,000	18,000	CP..0602..	6128 2.500	4071 3.500	16,000
16,00-17,99	19,050	20,000	99,000	48,000	18,000	CP..0602..	6128 2.500	4071 3.500	16,005
18,00-19,99	20,000	22,000	106,000	50,000	20,000	CP..0602..	6128 2.500	4071 4.000	18,000
18,00-19,99	19,050	22,000	106,000	50,000	20,000	CP..0602..	6128 2.500	4071 4.000	18,005
20,00-21,99	25,000	25,000	117,000	56,000	22,000	CP..0602..	6128 2.500	4071 4.500	20,000
20,00-21,99	25,400	25,400	117,000	56,000	22,000	CP..0602..	6128 2.500	4071 4.500	20,005
22,00-23,99	25,000	26,000	122,000	56,000	24,000	CP..0602..	6128 2.500	4071 5.000	22,000
22,00-23,99	25,400	26,000	122,000	56,000	24,000	CP..0602..	6128 2.500	4071 5.000	22,005
24,00-25,99	25,000	28,000	128,000	56,000	26,000	CP..0602..	6128 2.500	4071 5.001	24,000
24,00-25,99	25,400	28,000	128,000	56,000	26,000	CP..0602..	6128 2.500	4071 5.001	24,005
26,00-27,99	32,000	32,000	142,000	60,000	28,000	CP..0602..	6128 2.500	4071 5.003	26,000
26,00-27,99	31,750	32,000	142,000	60,000	28,000	CP..0602..	6128 2.500	4071 5.003	26,005
28,00-29,99	32,000	34,000	147,000	60,000	30,000	CP..0602..	6128 2.500	4071 5.003	28,000
28,00-29,99	31,750	34,000	147,000	60,000	30,000	CP..09T3..	6128 2.500	4071 5.003	28,005
30,00-31,99	32,000	38,000	152,000	60,000	32,000	CP..09T3..	6128 4.006	4071 6.000	30,000
30,00-31,99	31,750	38,000	152,000	60,000	32,000	CP..09T3..	6128 4.006	4071 6.000	30,005
32,00-35,99	32,000	42,000	163,000	60,000	36,000	CP..09T3..	6128 4.006	4071 6.001	32,000
32,00-35,99	31,750	42,000	163,000	60,000	36,000	CP..09T3..	6128 4.006	4071 6.001	32,005
36,00-40,00	32,000	46,000	173,000	60,000	40,000	CP..09T3..	6128 4.006	4071 6.002	36,000
36,00-40,00	31,750	46,000	173,000	60,000	40,000	CP..09T3..	6128 4.006	4071 6.002	36,005



## HT 800 Takma uçlar



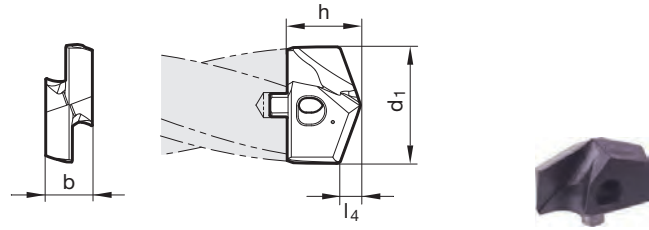
<b>P</b>	•	öz bileme $\geq \varnothing 11,000$ • yüzey Bileme • ana kesici ağız düz form (düzeltmeden sonra) • sıkma vidaları Ürün no. 4071 dahil
<b>M</b>	○	
<b>K</b>	○	
<b>N</b>	○	
<b>S</b>	○	yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm <sup>2</sup> 'ye kadar
<b>H</b>	○	

Malzeme **Kom. sert metal**Yüzey **F**

sap formu

## GÜHRING NAVIGATOR

Kesme verileri sayfası 764-768

Ürün no **4112**

d1		l4	b	h	Code-No.
mm	inch	mm	mm	mm	
11,000		2,100	4,500	7,500	11,000
11,200		2,100	4,500	7,500	11,200
11,500		2,100	4,500	7,500	11,500
11,510	29/64	2,100	4,500	7,500	11,510
11,700		2,200	4,500	7,500	11,700
11,800		2,200	4,500	7,500	11,800
11,910	15/32	2,200	4,500	7,500	11,910
12,000		2,200	5,000	7,700	12,000
12,100		2,300	5,000	7,700	12,100
12,200		2,300	5,000	7,700	12,200
12,300	31/64	2,300	5,000	7,700	12,300
12,500		2,300	5,000	7,700	12,500
12,600		2,300	5,000	7,700	12,600
12,700	1/2	2,400	5,000	7,700	12,700
12,800		2,400	5,000	7,700	12,800
12,900		2,400	5,000	7,700	12,900
13,000		2,400	5,500	8,500	13,000
13,100	33/64	2,400	5,500	8,500	13,100
13,300		2,500	5,500	8,500	13,300
13,490	17/32	2,500	5,500	8,500	13,490
13,500		2,500	5,500	8,500	13,500
13,600		2,500	5,500	8,500	13,600
13,700		2,500	5,500	8,500	13,700
13,800		2,600	5,500	8,500	13,800
13,890	35/64	2,600	5,500	8,500	13,890
14,000		2,600	6,000	9,600	14,000
14,100		2,600	6,000	9,600	14,100
14,290	9/16	2,700	6,000	9,600	14,290
14,400		2,700	6,000	9,600	14,400
14,500		2,700	6,000	9,600	14,500
14,600		2,700	6,000	9,600	14,600
14,680	37/64	2,700	6,000	9,600	14,680
14,700		2,700	6,000	9,600	14,700
14,800		2,700	6,000	9,600	14,800
15,000		2,800	6,000	9,800	15,000
15,080	19/32	2,800	6,000	9,800	15,080
15,100		2,800	6,000	9,800	15,100
15,200		2,800	6,000	9,800	15,200
15,300		2,800	6,000	9,800	15,300
15,480	39/64	2,900	6,000	9,800	15,480
15,500		2,900	6,000	9,800	15,500
15,600		2,900	6,000	9,800	15,600



d1		l4	b	h	Code-No.
mm	inch	mm	mm	mm	
15,700		2,900	6,000	9,800	15,700
15,800		2,900	6,000	9,800	15,800
15,870	5/8	2,900	6,000	9,800	15,870
16,000		3,000	7,000	11,000	16,000
16,270	41/64	3,000	7,000	11,000	16,270
16,500		3,100	7,000	11,000	16,500
16,670	21/32	3,100	7,000	11,000	16,670
17,000		3,100	7,000	11,000	17,000
17,070	43/64	3,200	7,000	11,000	17,070
17,300		3,200	7,000	11,000	17,300
17,460	11/16	3,200	7,000	11,000	17,460
17,500		3,200	7,000	11,000	17,500
17,600		3,300	7,000	11,000	17,600
17,860	45/64	3,300	7,000	11,000	17,860
18,000		3,300	8,000	12,600	18,000
18,260	23/32	3,400	8,000	12,600	18,260
18,500		3,400	8,000	12,600	18,500
18,650	47/64	3,400	8,000	12,600	18,650
18,900		3,500	8,000	12,600	18,900
19,000		3,500	8,000	12,600	19,000
19,050	3/4	3,500	8,000	12,600	19,050
19,250		3,600	8,000	12,600	19,250
19,300		3,600	8,000	12,600	19,300
19,450	49/64	3,600	8,000	12,600	19,450
19,500		3,600	8,000	12,600	19,500
19,600		3,600	8,000	12,600	19,600
19,840	25/32	3,700	8,000	12,600	19,840
20,000		3,700	9,000	13,900	20,000
20,240	51/64	3,700	9,000	13,900	20,240
20,500		3,800	9,000	13,900	20,500
20,640	13/16	3,800	9,000	13,900	20,640
20,900		3,900	9,000	13,900	20,900
21,000		3,900	9,000	13,900	21,000
21,030	53/64	3,900	9,000	13,900	21,030
21,100		3,900	9,000	13,900	21,100
21,430	27/32	3,900	9,000	13,900	21,430
21,500		4,000	9,000	13,900	21,500
21,700		4,000	9,000	13,900	21,700
21,830	55/64	4,000	9,000	13,900	21,830
22,000		4,100	10,000	15,300	22,000
22,220	7/8	4,100	10,000	15,300	22,220
22,500		4,100	10,000	15,300	22,500
22,620	57/64	4,200	10,000	15,300	22,620
22,700		4,200	10,000	15,300	22,700
23,000		4,200	10,000	15,300	23,000
23,020	29/32	4,200	10,000	15,300	23,020
23,420	59/64	4,300	10,000	15,300	23,420
23,500		4,300	10,000	15,300	23,500
23,700		4,400	10,000	15,300	23,700
23,810	15/16	4,400	10,000	15,300	23,810
24,000		4,400	11,000	15,800	24,000
24,100		4,400	11,000	15,800	24,100
24,210	61/64	4,500	11,000	15,800	24,210
24,500		4,500	11,000	15,800	24,500
24,610	31/32	4,500	11,000	15,800	24,610
25,000	63/64	4,600	11,000	15,800	25,000
25,400	1	4,700	11,000	15,800	25,400
25,500		4,700	11,000	15,800	25,500
25,670		4,700	11,000	15,800	25,670
25,700		4,700	11,000	15,800	25,700
25,810		4,700	11,000	15,800	25,810
26,000		4,800	12,000	20,000	26,000
26,190	1 1/32	4,800	12,000	20,000	26,190
26,500		4,900	12,000	20,000	26,500
26,590	1 3/64	4,900	12,000	20,000	26,590
27,000		5,000	12,000	20,000	27,000
27,500		5,100	12,000	20,000	27,500
27,700		5,100	12,000	20,000	27,700
27,780	1 3/32	5,100	12,000	20,000	27,780
28,000		5,100	13,000	20,700	28,000
28,180	1 7/64	5,200	13,000	20,700	28,180
28,500		5,200	13,000	20,700	28,500



d1		l4	b	h	Code-No.
mm	inch	mm	mm	mm	
28,580		5,300	13,000	20,700	28,580
29,000		5,300	13,000	20,700	29,000
29,370	1 5/32	5,400	13,000	20,700	29,370
29,500		5,400	13,000	20,700	29,500
29,600		5,400	13,000	20,700	29,600
29,770	1 11/64	5,500	13,000	20,700	29,770
30,000		5,500	14,000	22,300	30,000
30,160	1 3/16	5,500	14,000	22,300	30,160
30,500		5,600	14,000	22,300	30,500
30,960	1 7/32	5,700	14,000	22,300	30,960
31,000		5,700	14,000	22,300	31,000
31,500		5,800	14,000	22,300	31,500
31,750	1 1/4	5,800	14,000	22,300	31,750
32,000		5,900	15,000	23,100	32,000
32,500		6,000	15,000	23,100	32,500
32,540	1 9/32	6,000	15,000	23,100	32,540
32,940	1 19/64	6,000	15,000	23,100	32,940
33,000		6,100	15,000	23,100	33,000
33,340	1 5/16	6,100	15,000	23,100	33,340
33,500		6,100	15,000	23,100	33,500
34,000		6,200	15,000	23,100	34,000
34,130	1 11/32	6,300	15,000	23,100	34,130
34,500		6,300	15,000	23,100	34,500
34,930		6,400	15,000	23,100	34,930
35,000		6,400	15,000	23,100	35,000
35,500		6,500	15,000	23,100	35,500
35,720	1 13/32	6,600	15,000	23,100	35,720
36,000		6,600	16,000	23,900	36,000
36,500		6,700	16,000	23,900	36,500
36,510	1 7/16	6,700	16,000	23,900	36,510
37,000		6,800	16,000	23,900	37,000
37,310	1 15/32	6,800	16,000	23,900	37,310
37,500		6,900	16,000	23,900	37,500
38,000		7,000	16,000	23,900	38,000
38,100	1 1/2	7,000	16,000	23,900	38,100
38,500	1 33/64	7,100	16,000	23,900	38,500
39,000		7,100	16,000	23,900	39,000
39,500		7,200	16,000	23,900	39,500
40,000		7,300	16,000	23,900	40,000



## HT 800 Takma uçlar

Malzeme **Kom. sert metal**Yüzey **F**

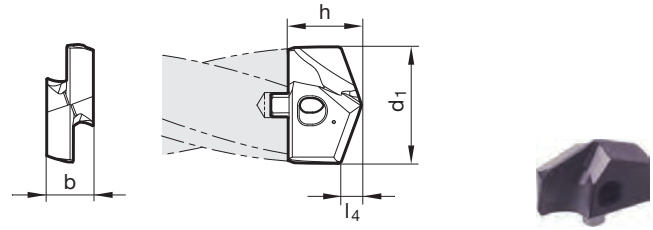
sap formu

<b>P</b>	öz bileme $\geq \varnothing 11,000$ • yüzey Bileme • ana kesici ağız düz form (düzeltmeden sonra) • sıkma vidaları Ürün no. 4071 dahil
<b>M</b>	
<b>K</b>	
<b>N</b>	
<b>S</b>	vermikular dökme demir • pik döküm, temper döküm ve küresel döküm
<b>H</b>	

Takma uçlu delme sistemleri T 800

## GÜHRING NAVIGATOR

Kesme verileri sayfası 764-768

Ürün no **4113**

d1		l4	b	h	Code-No.
mm	inch	mm	mm	mm	
11,000		2,700	4,500	7,500	11,000
11,200		2,700	4,500	7,500	11,200
11,500		2,800	4,500	7,500	11,500
11,510	29/64	2,800	4,500	7,500	11,510
11,700		2,800	4,500	7,500	11,700
11,800		2,800	4,500	7,500	11,800
11,910	15/32	2,800	4,500	7,500	11,910
12,000		2,900	5,000	7,700	12,000
12,100		2,900	5,000	7,700	12,100
12,200		2,900	5,000	7,700	12,200
12,300	31/64	2,900	5,000	7,700	12,300
12,500		3,100	5,000	7,700	12,500
12,600		3,100	5,000	7,700	12,600
12,700	1/2	3,100	5,000	7,700	12,700
12,800		3,100	5,000	7,700	12,800
12,900		3,100	5,000	7,700	12,900
13,000		3,200	5,500	8,500	13,000
13,100	33/64	3,200	5,500	8,500	13,100
13,300		3,200	5,500	8,500	13,300
13,490	17/32	3,200	5,500	8,500	13,490
13,500		3,300	5,500	8,500	13,500
13,600		3,300	5,500	8,500	13,600
13,700		3,300	5,500	8,500	13,700
13,800		3,300	5,500	8,500	13,800
13,890	35/64	3,300	5,500	8,500	13,890
14,000		3,400	6,000	9,600	14,000
14,100		3,400	6,000	9,600	14,100
14,290	9/16	3,400	6,000	9,600	14,290
14,400		3,400	6,000	9,600	14,400
14,500		3,600	6,000	9,600	14,500
14,600		3,600	6,000	9,600	14,600
14,680	37/64	3,600	6,000	9,600	14,680
14,700		3,600	6,000	9,600	14,700
14,800		3,600	6,000	9,600	14,800
15,000		3,700	6,000	9,800	15,000
15,080	19/32	3,700	6,000	9,800	15,080
15,100		3,700	6,000	9,800	15,100
15,200		3,700	6,000	9,800	15,200
15,300		3,700	6,000	9,800	15,300
15,480	39/64	3,700	6,000	9,800	15,480
15,500		3,800	6,000	9,800	15,500
15,600		3,800	6,000	9,800	15,600





d1		l4	b	h	Code-No.
mm	inch	mm	mm	mm	
15,700		3,800	6,000	9,800	15,700
15,800		3,800	6,000	9,800	15,800
15,870	5/8	3,800	6,000	9,800	15,870
16,000		3,900	7,000	11,000	16,000
16,270	41/64	3,900	7,000	11,000	16,270
16,500		4,100	7,000	11,000	16,500
16,670	21/32	4,100	7,000	11,000	16,670
17,000		4,200	7,000	11,000	17,000
17,070	43/64	4,200	7,000	11,000	17,070
17,300		4,200	7,000	11,000	17,300
17,460	11/16	4,200	7,000	11,000	17,460
17,500		4,300	7,000	11,000	17,500
17,600		4,300	7,000	11,000	17,600
17,860	45/64	4,300	7,000	11,000	17,860
18,000		4,400	8,000	12,600	18,000
18,260	23/32	4,400	8,000	12,600	18,260
18,500		4,500	8,000	12,600	18,500
18,650	47/64	4,500	8,000	12,600	18,650
18,900		4,500	8,000	12,600	18,900
19,000		4,700	8,000	12,600	19,000
19,050	3/4	4,700	8,000	12,600	19,050
19,250		4,700	8,000	12,600	19,250
19,300		4,700	8,000	12,600	19,300
19,450	49/64	4,700	8,000	12,600	19,450
19,500		4,800	8,000	12,600	19,500
19,600		4,800	8,000	12,600	19,600
19,840	25/32	4,800	8,000	12,600	19,840
20,000		4,900	9,000	13,900	20,000
20,240	51/64	4,900	9,000	13,900	20,240
20,500		5,100	9,000	13,900	20,500
20,640	13/16	5,100	9,000	13,900	20,640
20,900		5,100	9,000	13,900	20,900
21,000		5,200	9,000	13,900	21,000
21,030	53/64	5,200	9,000	13,900	21,030
21,100		5,200	9,000	13,900	21,100
21,430	27/32	5,200	9,000	13,900	21,430
21,500		5,300	9,000	13,900	21,500
21,700		5,300	9,000	13,900	21,700
21,830	55/64	5,300	9,000	13,900	21,830
22,000		5,400	10,000	15,300	22,000
22,220	7/8	5,400	10,000	15,300	22,220
22,500		5,600	10,000	15,300	22,500
22,620	57/64	5,600	10,000	15,300	22,620
22,700		5,600	10,000	15,300	22,700
23,000		5,700	10,000	15,300	23,000
23,020	29/32	5,700	10,000	15,300	23,020
23,420	59/64	5,700	10,000	15,300	23,420
23,500		5,800	10,000	15,300	23,500
23,700		5,800	10,000	15,300	23,700
23,810	15/16	5,800	10,000	15,300	23,810
24,000		6,000	11,000	15,800	24,000
24,100		6,000	11,000	15,800	24,100
24,210	61/64	6,000	11,000	15,800	24,210
24,500		6,100	11,000	15,800	24,500
24,610	31/32	6,100	11,000	15,800	24,610
25,000	63/64	6,200	11,000	15,800	25,000
25,400	1	6,200	11,000	15,800	25,400
25,500		6,300	11,000	15,800	25,500
25,670		6,300	11,000	15,800	25,670
25,700		6,300	11,000	15,800	25,700
25,810		6,300	11,000	15,800	25,810
26,000		6,400	12,000	20,000	26,000
26,190	1 1/32	6,400	12,000	20,000	26,190
26,500		6,500	12,000	20,000	26,500
26,590	1 3/64	6,500	12,000	20,000	26,590
27,000		6,600	12,000	20,000	27,000
27,500		6,700	12,000	20,000	27,500
27,700		6,700	12,000	20,000	27,700
27,780	1 3/32	6,700	12,000	20,000	27,780
28,000		6,800	13,000	20,700	28,000
28,180	1 7/64	6,800	13,000	20,700	28,180
28,500		6,900	13,000	20,700	28,500



d1		l4	b	h	Code-No.
mm	inch	mm	mm	mm	
28,580		6,900	13,000	20,700	28,580
29,000		7,100	13,000	20,700	29,000
29,370	1 5/32	7,100	13,000	20,700	29,370
29,500		7,200	13,000	20,700	29,500
29,770	1 11/64	7,200	13,000	20,700	29,770
30,000		7,300	14,000	22,300	30,000
30,160	1 3/16	7,300	14,000	22,300	30,160
30,500		7,400	14,000	22,300	30,500
30,960	1 7/32	7,400	14,000	22,300	30,960
31,000		7,500	14,000	22,300	31,000
31,500		7,600	14,000	22,300	31,500
31,750	1 1/4	7,600	14,000	22,300	31,750
32,000		7,700	15,000	23,100	32,000
32,500		7,800	15,000	23,100	32,500
32,540	1 9/32	7,800	15,000	23,100	32,540
32,940	1 19/64	7,800	15,000	23,100	32,940
33,000		7,900	15,000	23,100	33,000
33,340	1 5/16	7,900	15,000	23,100	33,340
33,500		8,100	15,000	23,100	33,500
34,000		8,200	15,000	23,100	34,000
34,130	1 11/32	8,200	15,000	23,100	34,130
34,500		8,400	15,000	23,100	34,500
34,930		8,400	15,000	23,100	34,930
35,000		8,500	15,000	23,100	35,000
35,500		8,600	15,000	23,100	35,500
35,720	1 13/32	8,600	15,000	23,100	35,720
36,000		8,700	16,000	23,900	36,000
36,500		8,800	16,000	23,900	36,500
36,510	1 7/16	8,800	16,000	23,900	36,510
37,000		9,000	16,000	23,900	37,000
37,310	1 15/32	9,000	16,000	23,900	37,310
37,500		9,100	16,000	23,900	37,500
38,000		9,200	16,000	23,900	38,000
38,100	1 1/2	9,200	16,000	23,900	38,100
38,500	1 33/64	9,400	16,000	23,900	38,500
39,000		9,500	16,000	23,900	39,000
39,500		9,700	16,000	23,900	39,500
40,000		9,700	16,000	23,900	40,000



## HT 800 Takma uçlar



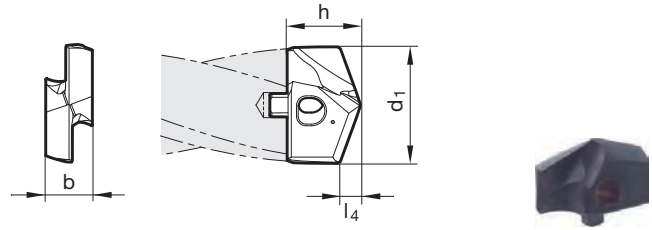
P	○	öz bileme $\geq \varnothing 11,000$ • koni bileme • ana kesici ağız düz form (düzeltmeden sonra) • sıkma vidaları Ürün no. 4071 dahil
M	●	
K	●	
N	○	paslanmaz çelikler
S	○	
H	○	

Malzeme **Kom. sert metal**Yüzey **a**

sap formu

## GÜHRING NAVIGATOR

Kesme verileri sayfası 764-768

Ürün no **4115**

d1		l4	b	h	Code-No.
mm	inch	mm	mm	mm	
11,000		2,100	4,500	7,500	11,000
11,200		2,100	4,500	7,500	11,200
11,500		2,100	4,500	7,500	11,500
11,510	29/64	2,100	4,500	7,500	11,510
11,700		2,200	4,500	7,500	11,700
11,800		2,200	4,500	7,500	11,800
11,910	15/32	2,200	4,500	7,500	11,910
12,000		2,200	5,000	7,700	12,000
12,100		2,300	5,000	7,700	12,100
12,200		2,300	5,000	7,700	12,200
12,300	31/64	2,300	5,000	7,700	12,300
12,500		2,300	5,000	7,700	12,500
12,600		2,300	5,000	7,700	12,600
12,700	1/2	2,400	5,000	7,700	12,700
12,800		2,400	5,000	7,700	12,800
12,900		2,400	5,000	7,700	12,900
13,000		2,400	5,500	8,500	13,000
13,100	33/64	2,400	5,500	8,500	13,100
13,490	17/32	2,500	5,500	8,500	13,490
13,500		2,500	5,500	8,500	13,500
13,600		2,500	5,500	8,500	13,600
13,700		2,500	5,500	8,500	13,700
13,800		2,600	5,500	8,500	13,800
13,890	35/64	2,600	5,500	8,500	13,890
14,000		2,600	6,000	9,600	14,000
14,100		2,600	6,000	9,600	14,100
14,290	9/16	2,700	6,000	9,600	14,290
14,400		2,700	6,000	9,600	14,400
14,500		2,700	6,000	9,600	14,500
14,600		2,700	6,000	9,600	14,600
14,700		2,700	6,000	9,600	14,700
14,800		2,700	6,000	9,600	14,800
15,000		2,800	6,000	9,800	15,000
15,080	19/32	2,800	6,000	9,800	15,080
15,100		2,800	6,000	9,800	15,100
15,200		2,800	6,000	9,800	15,200
15,300		2,800	6,000	9,800	15,300
15,500		2,900	6,000	9,800	15,500
15,600		2,900	6,000	9,800	15,600
15,700		2,900	6,000	9,800	15,700
15,800		2,900	6,000	9,800	15,800
15,870	5/8	2,900	6,000	9,800	15,870



d1		l4	b	h	Code-No.
mm	inch				
16,000		3,000	7,000	11,000	16,000
16,270	41/64	3,000	7,000	11,000	16,270
16,500		3,100	7,000	11,000	16,500
16,670	21/32	3,100	7,000	11,000	16,670
17,000		3,100	7,000	11,000	17,000
17,070	43/64	3,200	7,000	11,000	17,070
17,460	11/16	3,200	7,000	11,000	17,460
17,500		3,200	7,000	11,000	17,500
17,600		3,300	7,000	11,000	17,600
17,860	45/64	3,300	7,000	11,000	17,860
18,000		3,300	8,000	12,600	18,000
18,260	23/32	3,400	8,000	12,600	18,260
18,500		3,400	8,000	12,600	18,500
18,650	47/64	3,400	8,000	12,600	18,650
19,000		3,500	8,000	12,600	19,000
19,050	3/4	3,500	8,000	12,600	19,050
19,250		3,600	8,000	12,600	19,250
19,450	49/64	3,600	8,000	12,600	19,450
19,500		3,600	8,000	12,600	19,500
19,600		3,600	8,000	12,600	19,600
19,840	25/32	3,700	8,000	12,600	19,840
20,000		3,700	9,000	13,900	20,000
20,240	51/64	3,700	9,000	13,900	20,240
20,500		3,800	9,000	13,900	20,500
20,640	13/16	3,800	9,000	13,900	20,640
21,000		3,900	9,000	13,900	21,000
21,030	53/64	3,900	9,000	13,900	21,030
21,100		3,900	9,000	13,900	21,100
21,430	27/32	3,900	9,000	13,900	21,430
21,500		4,000	9,000	13,900	21,500
21,830	55/64	4,000	9,000	13,900	21,830
22,000		4,100	10,000	15,300	22,000
22,220	7/8	4,100	10,000	15,300	22,220
22,500		4,100	10,000	15,300	22,500
22,620	57/64	4,200	10,000	15,300	22,620
23,000		4,200	10,000	15,300	23,000
23,020	29/32	4,200	10,000	15,300	23,020
23,420	59/64	4,300	10,000	15,300	23,420
23,500		4,300	10,000	15,300	23,500
23,810	15/16	4,400	10,000	15,300	23,810
24,000		4,400	11,000	15,800	24,000
24,100		4,400	11,000	15,800	24,100
24,210	61/64	4,500	11,000	15,800	24,210
24,500		4,500	11,000	15,800	24,500
24,610	31/32	4,500	11,000	15,800	24,610
25,000	63/64	4,600	11,000	15,800	25,000
25,400	1	4,700	11,000	15,800	25,400
25,500		4,700	11,000	15,800	25,500
25,700		4,700	11,000	15,800	25,700
26,000		4,800	12,000	20,000	26,000
26,190	1 1/32	4,800	12,000	20,000	26,190
26,500		4,900	12,000	20,000	26,500
26,590	1 3/64	4,900	12,000	20,000	26,590
27,000		5,000	12,000	20,000	27,000
27,500		5,100	12,000	20,000	27,500
27,700		5,100	12,000	20,000	27,700
27,780	1 3/32	5,100	12,000	20,000	27,780
28,000		5,100	13,000	20,700	28,000
28,180	1 7/64	5,200	13,000	20,700	28,180
28,500		5,200	13,000	20,700	28,500
28,580		5,300	13,000	20,700	28,580
29,000		5,300	13,000	20,700	29,000
29,370	1 5/32	5,400	13,000	20,700	29,370
29,500		5,400	13,000	20,700	29,500
29,770	1 11/64	5,500	13,000	20,700	29,770
30,000		5,500	14,000	22,300	30,000
30,160	1 3/16	5,500	14,000	22,300	30,160
30,500		5,600	14,000	22,300	30,500
30,960	1 7/32	5,700	14,000	22,300	30,960
31,000		5,700	14,000	22,300	31,000
31,500		5,800	14,000	22,300	31,500
31,750	1 1/4	5,800	14,000	22,300	31,750



d1		l4	b	h	Code-No.
mm	inch	mm	mm	mm	
32,000		5,900	15,000	23,100	32,000
32,500		6,000	15,000	23,100	32,500
32,540	1 9/32	6,000	15,000	23,100	32,540
33,000		6,100	15,000	23,100	33,000
33,340	1 5/16	6,100	15,000	23,100	33,340
33,500		6,100	15,000	23,100	33,500
34,000		6,200	15,000	23,100	34,000
34,130	1 11/32	6,300	15,000	23,100	34,130
34,500		6,300	15,000	23,100	34,500
34,930		6,400	15,000	23,100	34,930
35,000		6,400	15,000	23,100	35,000
35,500		6,500	15,000	23,100	35,500
35,720	1 13/32	6,600	15,000	23,100	35,720
36,000		6,600	16,000	23,900	36,000
36,500		6,700	16,000	23,900	36,500
36,510	1 7/16	6,700	16,000	23,900	36,510
37,000		6,800	16,000	23,900	37,000
37,310	1 15/32	6,800	16,000	23,900	37,310
37,500		6,900	16,000	23,900	37,500
38,000		7,000	16,000	23,900	38,000
38,100	1 1/2	7,000	16,000	23,900	38,100
38,500	1 33/64	7,100	16,000	23,900	38,500
39,000		7,100	16,000	23,900	39,000
39,500		7,200	16,000	23,900	39,500
40,000		7,300	16,000	23,900	40,000

Takma uçlu delme sistemleri T 800



## HT 800 Takma uçlar

Malzeme **Kom. sert metal**Yüzey 

sap formu

**P** öz bileme  $\geq \text{Ø } 11,000$  • koni bileme • ana kesici ağız form konkav  
• sıkma vidaları Ürün no. 4071 dahil

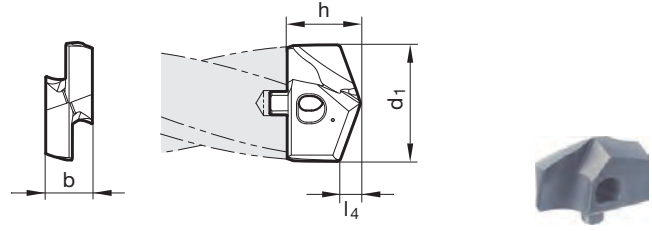
**M****K****N** •**S****H**

Aluminyum ve Al-Alaşımları • demir dışı metaller

Takma uçlu delme sistemleri T 800

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 764-768

Ürün no **4114**

d1		l4	b	h	Code-No.
mm	inch	mm	mm	mm	
11,000		2,100	4,500	7,500	11,000
11,200		2,100	4,500	7,500	11,200
11,500		2,100	4,500	7,500	11,500
11,510	29/64	2,100	4,500	7,500	11,510
11,700		2,200	4,500	7,500	11,700
11,800		2,200	4,500	7,500	11,800
11,910	15/32	2,200	4,500	7,500	11,910
12,000		2,200	5,000	7,700	12,000
12,100		2,300	5,000	7,700	12,100
12,200		2,300	5,000	7,700	12,200
12,300	31/64	2,300	5,000	7,700	12,300
12,500		2,300	5,000	7,700	12,500
12,600		2,300	5,000	7,700	12,600
12,700	1/2	2,400	5,000	7,700	12,700
12,800		2,400	5,000	7,700	12,800
12,900		2,400	5,000	7,700	12,900
13,000		2,400	5,500	8,500	13,000
13,100	33/64	2,400	5,500	8,500	13,100
13,490	17/32	2,500	5,500	8,500	13,490
13,500		2,500	5,500	8,500	13,500
13,600		2,500	5,500	8,500	13,600
13,700		2,500	5,500	8,500	13,700
13,800		2,600	5,500	8,500	13,800
13,890	35/64	2,600	5,500	8,500	13,890
14,000		2,600	6,000	9,600	14,000
14,100		2,600	6,000	9,600	14,100
14,290	9/16	2,700	6,000	9,600	14,290
14,400		2,700	6,000	9,600	14,400
14,500		2,700	6,000	9,600	14,500
14,600		2,700	6,000	9,600	14,600
14,680	37/64	2,700	6,000	9,600	14,680
14,700		2,700	6,000	9,600	14,700
14,800		2,700	6,000	9,600	14,800
15,000		2,800	6,000	9,800	15,000
15,080	19/32	2,800	6,000	9,800	15,080
15,100		2,800	6,000	9,800	15,100
15,200		2,800	6,000	9,800	15,200
15,300		2,800	6,000	9,800	15,300
15,480	39/64	2,900	6,000	9,800	15,480
15,500		2,900	6,000	9,800	15,500
15,600		2,900	6,000	9,800	15,600
15,700		2,900	6,000	9,800	15,700



d1		l4	b	h	Code-No.
mm	inch	mm	mm	mm	
15,800		2,900	6,000	9,800	15,800
15,870	5/8	2,900	6,000	9,800	15,870
16,000		3,000	7,000	11,000	16,000
16,270	41/64	3,000	7,000	11,000	16,270
16,500		3,100	7,000	11,000	16,500
16,670	21/32	3,100	7,000	11,000	16,670
17,000		3,100	7,000	11,000	17,000
17,070	43/64	3,200	7,000	11,000	17,070
17,460	11/16	3,200	7,000	11,000	17,460
17,500		3,200	7,000	11,000	17,500
17,600		3,300	7,000	11,000	17,600
17,860	45/64	3,300	7,000	11,000	17,860
18,000		3,300	8,000	12,600	18,000
18,260	23/32	3,400	8,000	12,600	18,260
18,500		3,400	8,000	12,600	18,500
18,650	47/64	3,400	8,000	12,600	18,650
19,000		3,500	8,000	12,600	19,000
19,050	3/4	3,500	8,000	12,600	19,050
19,250		3,600	8,000	12,600	19,250
19,450	49/64	3,600	8,000	12,600	19,450
19,500		3,600	8,000	12,600	19,500
19,600		3,600	8,000	12,600	19,600
19,840	25/32	3,700	8,000	12,600	19,840
20,000		3,700	9,000	13,900	20,000
20,240	51/64	3,700	9,000	13,900	20,240
20,500		3,800	9,000	13,900	20,500
20,640	13/16	3,800	9,000	13,900	20,640
21,000		3,900	9,000	13,900	21,000
21,030	53/64	3,900	9,000	13,900	21,030
21,100		3,900	9,000	13,900	21,100
21,430	27/32	3,900	9,000	13,900	21,430
21,500		4,000	9,000	13,900	21,500
21,830	55/64	4,000	9,000	13,900	21,830
22,000		4,100	10,000	15,300	22,000
22,220	7/8	4,100	10,000	15,300	22,220
22,500		4,100	10,000	15,300	22,500
22,620	57/64	4,200	10,000	15,300	22,620
23,000		4,200	10,000	15,300	23,000
23,020	29/32	4,200	10,000	15,300	23,020
23,420	59/64	4,300	10,000	15,300	23,420
23,500		4,300	10,000	15,300	23,500
23,810	15/16	4,400	10,000	15,300	23,810
24,000		4,400	11,000	15,800	24,000
24,100		4,400	11,000	15,800	24,100
24,210	61/64	4,500	11,000	15,800	24,210
24,500		4,500	11,000	15,800	24,500
24,610	31/32	4,500	11,000	15,800	24,610
25,000	63/64	4,600	11,000	15,800	25,000
25,400	1	4,700	11,000	15,800	25,400
25,500		4,700	11,000	15,800	25,500
25,670		4,700	11,000	15,800	25,670
25,700		4,700	11,000	15,800	25,700
25,810		4,700	11,000	15,800	25,810
26,000		4,800	12,000	20,000	26,000
26,190	1 1/32	4,800	12,000	20,000	26,190
26,500		4,900	12,000	20,000	26,500
26,590	1 3/64	4,900	12,000	20,000	26,590
27,000		5,000	12,000	20,000	27,000
27,500		5,100	12,000	20,000	27,500
27,700		5,100	12,000	20,000	27,700
27,780	1 3/32	5,100	12,000	20,000	27,780
28,000		5,100	13,000	20,700	28,000
28,180	1 7/64	5,200	13,000	20,700	28,180
28,500		5,200	13,000	20,700	28,500
28,580		5,300	13,000	20,700	28,580
29,000		5,300	13,000	20,700	29,000
29,370	1 5/32	5,400	13,000	20,700	29,370
29,500		5,400	13,000	20,700	29,500
29,770	1 11/64	5,500	13,000	20,700	29,770
30,000		5,500	14,000	22,300	30,000
30,160	1 3/16	5,500	14,000	22,300	30,160
30,500		5,600	14,000	22,300	30,500



d1		l4	b	h	Code-No.
mm	inch				
30,960	1 7/32	5,700	14,000	22,300	30,960
31,000		5,700	14,000	22,300	31,000
31,500		5,800	14,000	22,300	31,500
31,750	1 1/4	5,800	14,000	22,300	31,750
32,000		5,900	15,000	23,100	32,000
32,500		6,000	15,000	23,100	32,500
32,540	1 9/32	6,000	15,000	23,100	32,540
32,940	1 19/64	6,000	15,000	23,100	32,940
33,000		6,100	15,000	23,100	33,000
33,340		6,100	15,000	23,100	33,340
33,500	1 5/16	6,100	15,000	23,100	33,500
34,000		6,200	15,000	23,100	34,000
34,130		6,300	15,000	23,100	34,130
34,500	1 11/32	6,300	15,000	23,100	34,500
34,930		6,400	15,000	23,100	34,930
35,000		6,400	15,000	23,100	35,000
35,500	1 13/32	6,500	15,000	23,100	35,500
35,720		6,600	15,000	23,100	35,720
36,000		6,600	16,000	23,900	36,000
36,500	1 7/16	6,700	16,000	23,900	36,500
36,510		6,700	16,000	23,900	36,510
37,000		6,800	16,000	23,900	37,000
37,310	1 15/32	6,800	16,000	23,900	37,310
37,500		6,900	16,000	23,900	37,500
38,000		7,000	16,000	23,900	38,000
38,100	1 1/2	7,000	16,000	23,900	38,100
38,500		7,100	16,000	23,900	38,500
39,000		7,100	16,000	23,900	39,000
39,500	1 33/64	7,200	16,000	23,900	39,500
39,500		7,200	16,000	23,900	39,500
40,000		7,300	16,000	23,900	40,000





## HT 800 Takma uçlar



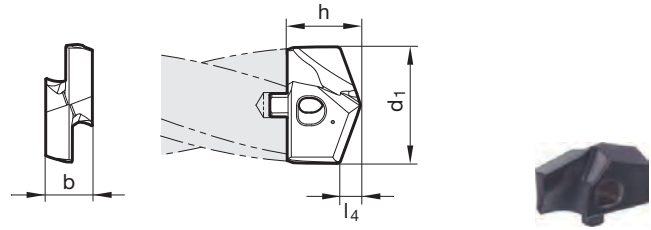
P	öz bileme $\geq \varnothing 11,000$ • yüzey Bileme • ana kesici ağız düz form (düzeltmeden sonra) • sıkma vidaları Ürün no. 4071 dahil
M	
K	
N	
S	Piloting in all materials
H	

Malzeme **Kom. sert metal**Yüzey **a**

sap formu

## GÜHRING NAVIGATOR

Kesme verileri sayfası 768

Ürün no **4111**

d1		l4	b	h	Code-No.
mm	inch	mm	mm	mm	
11,000		1,800	4,500	7,200	11,000
11,200		1,800	4,500	7,200	11,200
11,500		1,900	4,500	7,200	11,500
11,510	29/64	1,900	4,500	7,200	11,510
11,700		1,900	4,500	7,200	11,700
11,800		1,900	4,500	7,200	11,800
11,910	15/32	1,900	4,500	7,200	11,910
12,000		1,900	5,000	7,400	12,000
12,100		2,000	5,000	7,400	12,100
12,200		2,000	5,000	7,400	12,200
12,300	31/64	2,000	5,000	7,400	12,300
12,500		2,000	5,000	7,400	12,500
12,600		2,000	5,000	7,400	12,600
12,700	1/2	2,100	5,000	7,400	12,700
12,800		2,100	5,000	7,400	12,800
12,900		2,100	5,000	7,400	12,900
13,000		2,100	5,500	8,200	13,000
13,100	33/64	2,100	5,500	8,200	13,100
13,490	17/32	2,200	5,500	8,200	13,490
13,500		2,200	5,500	8,200	13,500
13,600		2,200	5,500	8,200	13,600
13,700		2,200	5,500	8,200	13,700
13,800		2,200	5,500	8,200	13,800
13,890	35/64	2,200	5,500	8,200	13,890
14,000		2,300	6,000	9,400	14,000
14,100		2,300	6,000	9,400	14,100
14,290	9/16	2,300	6,000	9,400	14,290
14,400		2,300	6,000	9,400	14,400
14,500		2,300	6,000	9,400	14,500
14,600		2,400	6,000	9,400	14,600
14,680	37/64	2,400	6,000	9,400	14,680
14,700		2,400	6,000	9,400	14,700
14,800		2,400	6,000	9,400	14,800
15,000		2,400	6,000	9,400	15,000
15,080	19/32	2,400	6,000	9,400	15,080
15,100		2,400	6,000	9,400	15,100
15,200		2,400	6,000	9,400	15,200
15,300		2,500	6,000	9,400	15,300
15,480	39/64	2,500	6,000	9,400	15,480
15,500		2,500	6,000	9,400	15,500
15,600		2,500	6,000	9,400	15,600
15,700		2,500	6,000	9,400	15,700



d1		l4	b	h	Code-No.
mm	inch				
15,800		2,500	6,000	9,400	15,800
15,870	5/8	2,600	6,000	9,400	15,870
16,000		2,600	7,000	10,600	16,000
16,270	41/64	2,600	7,000	10,600	16,270
16,500		2,700	7,000	10,600	16,500
16,670	21/32	2,700	7,000	10,600	16,670
17,000		2,700	7,000	10,600	17,000
17,070	43/64	2,700	7,000	10,600	17,070
17,460	11/16	2,800	7,000	10,600	17,460
17,500		2,800	7,000	10,600	17,500
17,600		2,800	7,000	10,600	17,600
17,860	45/64	2,900	7,000	10,600	17,860
18,000		2,900	8,000	12,100	18,000
18,260	23/32	2,900	8,000	12,100	18,260
18,500		3,000	8,000	12,100	18,500
18,650	47/64	3,000	8,000	12,100	18,650
19,000		3,000	8,000	12,100	19,000
19,050	3/4	3,100	8,000	12,100	19,050
19,450	49/64	3,100	8,000	12,100	19,450
19,500		3,100	8,000	12,100	19,500
19,600		3,100	8,000	12,100	19,600
19,840	25/32	3,200	8,000	12,100	19,840
20,000		3,200	9,000	13,300	20,000
20,240	51/64	3,200	9,000	13,300	20,240
20,500		3,300	9,000	13,300	20,500
20,640	13/16	3,300	9,000	13,300	20,640
21,000		3,400	9,000	13,300	21,000
21,030	53/64	3,400	9,000	13,300	21,030
21,100		3,400	9,000	13,300	21,100
21,430	27/32	3,400	9,000	13,300	21,430
21,500		3,400	9,000	13,300	21,500
21,830	55/64	3,500	9,000	13,300	21,830
22,000		3,500	10,000	14,800	22,000
22,220	7/8	3,600	10,000	14,800	22,220
22,500		3,600	10,000	14,800	22,500
22,620	57/64	3,600	10,000	14,800	22,620
23,000		3,700	10,000	14,800	23,000
23,020	29/32	3,700	10,000	14,800	23,020
23,420	59/64	3,700	10,000	14,800	23,420
23,500		3,800	10,000	14,800	23,500
23,810	15/16	3,800	10,000	14,800	23,810
24,000		3,800	11,000	15,300	24,000
24,100		3,800	11,000	15,300	24,100
24,210	61/64	3,900	11,000	15,300	24,210
24,500		3,900	11,000	15,300	24,500
24,610	31/32	3,900	11,000	15,300	24,610
25,000	63/64	4,000	11,000	15,300	25,000
25,400	1	4,100	11,000	15,300	25,400
25,500		4,100	11,000	15,300	25,500
25,700		4,100	11,000	15,300	25,700
26,000		4,100	12,000	19,400	26,000
26,190	1 1/32	4,200	12,000	19,400	26,190
26,500		4,200	12,000	19,400	26,500
26,590	1 3/64	4,200	12,000	19,400	26,590
27,000		4,300	12,000	19,400	27,000
27,500		4,400	12,000	19,400	27,500
27,700		4,400	12,000	19,400	27,700
27,780	1 3/32	4,400	12,000	19,400	27,780
28,000		4,500	13,000	20,100	28,000
28,180	1 7/64	4,500	13,000	20,100	28,180
28,500		4,500	13,000	20,100	28,500
28,580		4,600	13,000	20,100	28,580
29,000		4,600	13,000	20,100	29,000
29,370	1 5/32	4,700	13,000	20,100	29,370
29,500		4,700	13,000	20,100	29,500
30,000		4,800	14,000	21,700	30,000
30,160	1 3/16	4,800	14,000	21,700	30,160
30,500		4,900	14,000	21,700	30,500
30,960	1 7/32	4,900	14,000	21,700	30,960
31,000		4,900	14,000	21,700	31,000
31,500		5,000	14,000	21,700	31,500
31,750	1 1/4	5,100	14,000	21,700	31,750



d1		l4	b	h	Code-No.
mm	inch	mm	mm	mm	
32,000		5,100	15,000	22,400	32,000
32,500		5,200	15,000	22,400	32,500
32,540	1 9/32	5,200	15,000	22,400	32,540
33,000		5,300	15,000	22,400	33,000
33,340	1 5/16	5,300	15,000	22,400	33,340
33,500		5,300	15,000	22,400	33,500
34,000		5,400	15,000	22,400	34,000
34,130	1 11/32	5,400	15,000	22,400	34,130
34,500		5,500	15,000	22,400	34,500
34,930		5,600	15,000	22,400	34,930
35,000		5,600	15,000	22,400	35,000
35,500		5,600	15,000	22,400	35,500
35,720	1 13/32	5,700	15,000	22,400	35,720
36,000		5,700	16,000	23,200	36,000
36,500		5,800	16,000	23,200	36,500
36,510	1 7/16	5,800	16,000	23,200	36,510
37,000		5,900	16,000	23,200	37,000
37,310	1 15/32	5,900	16,000	23,200	37,310
37,500		6,000	16,000	23,200	37,500
38,000		6,000	16,000	23,200	38,000
38,100	1 1/2	6,100	16,000	23,200	38,100
38,500	1 33/64	6,100	16,000	23,200	38,500
39,000		6,200	16,000	23,200	39,000
39,500		6,300	16,000	23,200	39,500
40,000		6,400	16,000	23,200	40,000

Takma uçlu delme sistemleri T 800



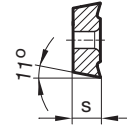
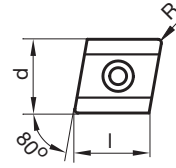
## HT 800 Takma uçlar



Malzeme **Kom. sert metal**  
Yüzey **S**  
sap formu

<b>P</b>	•	sıkma vidaları art. no. 6128 dahil değildir
<b>M</b>	○	
<b>K</b>	○	
<b>N</b>	○	
<b>S</b>	○	alaşımli/alaşimsız. çelikler ve çelik dökümlerde
<b>H</b>	○	

Takma uçlu delme sistemleri T 800

Ürün no **7645**

ISO	d	s	R	l	Code-No.
	mm	mm	mm	mm	
CPGT050202FR-P	5,560	2,380	0,200	5,640	52,020
CPGT050204FR-P	5,560	2,380	0,400	5,640	52,040
CPGT060202FR-P	6,350	2,380	0,200	6,450	62,020
CPGT060204FR-P	6,350	2,380	0,400	6,450	62,040
CPGT09T308FR-P	9,525	3,970	0,800	9,670	93,080



## HT 800 Takma uçlar



**P** ○ sıkma vidaları art. no. 6128 dahil değildir

**M**

**K** ●

**N**

**S**

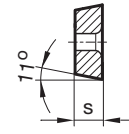
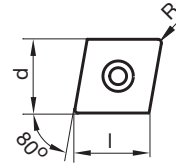
**H**

pik döküm, temper döküm ve küresel döküm

Malzeme **Kom. sert metal**

Yüzey **A**

sap formu



Ürün no **7632**

ISO	d	s	R	l	Code-No.
	mm	mm	mm	mm	
CPGW050202FN-K	5,560	2,380	0,200	5,640	52,020
CPGW050204FN-K	5,560	2,380	0,400	5,640	52,040
CPGW060202FN-K	6,350	2,380	0,200	6,450	62,020
CPGW060204FN-K	6,350	2,380	0,400	6,450	62,040
CPGW09T308FN-K	9,525	3,970	0,800	9,670	93,080



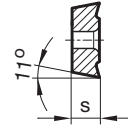
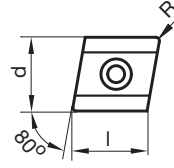
## HT 800 Takma uçlar



Malzeme **Kom. sert metal**  
Yüzey   
sap formu

P	sıkma vidaları art. no. 6128 dahil değildir
M	
K	
N	•
S	Aluminyum ve Al-Alaşımları • demir dışı metaller
H	

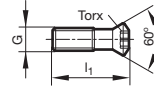
Takma uçlu delme sistemleri T 800

Ürün no **7635**

ISO	d	s	R	l	Code-No.
	mm	mm	mm	mm	
CPGT050202FR-AL	5,560	2,380	0,200	5,640	52,020
CPGT050204FR-AL	5,560	2,380	0,400	5,640	52,040
CPGT060202FR-AL	6,350	2,380	0,200	6,450	62,020
CPGT060204FR-AL	6,350	2,380	0,400	6,450	62,040
CPGT09T308FR-AL	9,525	3,970	0,800	9,670	93,080



## Sıkma vidaları



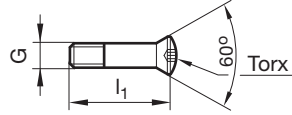
Ürün no

6128

G	l1	Torx	Code-No.
	mm		
M2 x 5,5	5,500	T6	2,000
M2,2 x 5	5,000	T6	2,200
M2 x 5,3	5,300	T7	2,500
M2,5 x 6,5	6,500	T7	2,501
M2,5 x 5,7	5,700	T7	2,502
M3,5 x 10	10,000	T15	3,500
M3,5 x 12	12,000	T15	3,501
M3,5 x 8,5	8,500	T15	3,502
M3,5 x 8	8,000	T15	3,503
M4 x 13,5	13,500	T15	4,000
M4 x 8,4	8,400	T15	4,001
M4 x 10,8	10,800	T15	4,002
M4 x 0,5	11,000	T15	4,003
M4 x 9,5	9,500	T20	4,004
M4 x 0,5	9,000	T15	4,005
M4 x 9,5	9,500	T15	4,006
M4,5 x 11	11,000	T15	4,500
M4,5 x 7,5	7,500	T15	4,501
M4,5 x 11	11,000	T20	4,502
M5 x 17	17,000	T20	5,000
M5 x 11	11,000	T20	5,001



## Sıkma vidaları



Ürün no

4071

G	l1 mm	Torx	Code-No.
M1,6	4,000	T5	1,600
M1,6	4,400	T5	1,601
M2,2	9,500	T7	2,200
M2,2	10,500	T7	2,201
M2,2	5,600	T7	2,202
M2,2	4,600	T7	2,203
M2,5	11,400	T8	2,500
M2,5	6,400	T8	2,501
M2,5	5,200	T8	2,502
M3	13,100	T9	3,001
M3	6,400	T9	3,002
M3	8,000	T9	3,003
M3,5	14,250	T10	3,500
M4	16,000	T15	4,000
M4	7,700	T15	4,001
M4	10,600	T15	4,002
M4,5	18,000	T15	4,500
M5	19,750	T20	5,000
M5	21,750	T20	5,001
M5	14,200	T20	5,002
M5	23,400	T20	5,003
M6	27,000	T25	6,000
M6	28,500	T25	6,001
M6	32,500	T25	6,002





## Takma uç gövdesi RT800



**P** öz bileme  $\geq \text{Ø } 17,000$  • Kompak yapım tarzı • Gövdede plaketin güvenli sıkılması • sıkma vidaları Ürün no. 1071 dahil • tornavida Art. no. 1612 dahil



## GÜHRING NAVIGATOR

Kesme verileri sayfası 770

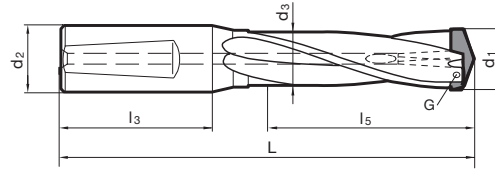
Malzeme

Yüzey

Ni

sap formu

HE



Ürün no 5242

d1	d2	d3	L	l3	l5	G	Code-No.
mm	mm	mm	mm	mm	mm		
16,00-17,00	20,000	15,700	130,000	50,000	54,000	1071 3.006	17,000
16,00-17,00	19,050	15,700	130,000	50,000	54,000	1071 3.006	17,005
17,01-17,99	20,000	16,700	130,000	50,000	54,000	1071 3.006	17,990
17,01-17,99	19,050	16,700	130,000	50,000	54,000	1071 3.006	17,995
18,00-19,00	20,000	17,700	138,000	50,000	60,000	1071 3.000	19,000
18,00-19,00	19,050	17,700	138,000	50,000	60,000	1071 3.000	19,005
19,01-20,00	20,000	18,700	138,000	50,000	60,000	1071 3.000	20,000
19,01-20,00	19,050	18,700	138,000	50,000	60,000	1071 3.000	20,005
20,01-21,00	25,000	19,700	153,000	56,000	66,000	1071 3.000	21,000
20,01-21,00	25,400	19,700	153,000	56,000	66,000	1071 3.000	21,005
21,01-22,50	25,000	20,700	153,000	56,000	66,000	1071 3.000	22,500
21,01-22,50	25,400	21,200	153,000	56,000	66,000	1071 3.000	22,505
22,51-24,00	25,000	22,200	161,000	56,000	72,000	1071 3.500	24,000
22,51-24,00	25,400	22,700	161,000	56,000	72,000	1071 3.500	24,005
24,01-25,50	25,000	23,700	170,000	56,000	78,000	1071 3.500	25,500
24,01-25,50	25,400	24,200	170,000	56,000	78,000	1071 3.500	25,505
25,51-27,50	32,000	25,200	182,000	60,000	84,000	1071 4.000	27,500
25,51-27,50	31,750	26,200	182,000	60,000	84,000	1071 4.000	27,505
27,51-29,50	32,000	27,200	190,000	60,000	90,000	1071 4.000	29,500
27,51-29,50	31,750	28,200	190,000	60,000	90,000	1071 4.000	29,505
29,51-32,00	32,000	29,200	198,000	60,000	96,000	1071 4.500	32,000
29,51-32,00	31,750	30,700	198,000	60,000	96,000	1071 4.500	32,005
32,01-34,50	32,000	31,700	206,000	60,000	102,000	1071 4.500	34,500
32,01-34,50	31,750	33,200	206,000	60,000	102,000	1071 4.500	34,505
34,51-37,50	32,000	34,000	218,000	60,000	114,000	1071 5.000	37,500
34,51-37,50	31,750	36,200	218,000	60,000	114,000	1071 5.000	37,505
37,51-40,50	32,000	37,000	231,000	60,000	120,000	1071 5.000	40,500
37,51-40,50	31,750	39,200	231,000	60,000	120,000	1071 5.000	40,505



## Takma uç gövdesi RT800



**P** öz bileme  $\geq \text{Ø } 17,000$  • Kompak yapım tarzı • Gövdede plaketin güvenli sıkılması • sıkma vidaları Ürün no. 1071 dahil • tornavida Art. no. 1612 dahil



Takma uçlu delme sistemleri T 800

## GÜHRING NAVIGATOR

Kesme verileri sayfası 770

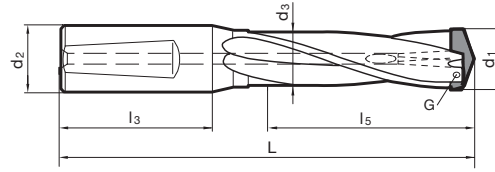
Malzeme

Yüzey

Ni

sap formu

HE



Ürün no 5243

d1	d2	d3	L	l3	l5	G	Code-No.
mm	mm	mm	mm	mm	mm		
16,00-17,00	20,000	15,700	166,000	50,000	90,000	1071 3.006	17,000
16,00-17,00	19,050	15,700	166,000	50,000	90,000	1071 3.006	17,005
17,01-17,99	20,000	16,700	166,000	50,000	90,000	1071 3.006	17,990
17,01-17,99	19,050	16,700	166,000	50,000	90,000	1071 3.006	17,995
18,00-19,00	20,000	17,700	178,000	50,000	100,000	1071 3.000	19,000
18,00-19,00	19,050	17,700	178,000	50,000	100,000	1071 3.000	19,005
19,01-20,00	20,000	18,700	178,000	50,000	100,000	1071 3.000	20,000
19,01-20,00	19,050	18,700	178,000	50,000	100,000	1071 3.000	20,005
20,01-21,00	25,000	19,700	197,000	56,000	110,000	1071 3.000	21,000
20,01-21,00	25,400	19,700	197,000	56,000	110,000	1071 3.000	21,005
21,01-22,50	25,000	20,700	197,000	56,000	110,000	1071 3.000	22,500
21,01-22,50	25,400	21,200	197,000	56,000	110,000	1071 3.000	22,505
22,51-24,00	25,000	22,200	209,000	56,000	120,000	1071 3.500	24,000
22,51-24,00	25,400	22,700	209,000	56,000	120,000	1071 3.500	24,005
24,01-25,50	25,000	23,700	222,000	56,000	130,000	1071 3.500	25,500
24,01-25,50	25,400	24,200	222,000	56,000	130,000	1071 3.500	25,505
25,51-27,50	32,000	25,200	238,000	60,000	140,000	1071 4.000	27,500
25,51-27,50	31,750	26,200	238,000	60,000	140,000	1071 4.000	27,505
27,51-29,50	32,000	27,200	250,000	60,000	150,000	1071 4.000	29,500
27,51-29,50	31,750	28,200	250,000	60,000	150,000	1071 4.000	29,505
29,51-32,00	32,000	29,200	262,000	60,000	160,000	1071 4.500	32,000
29,51-32,00	31,750	30,700	262,000	60,000	160,000	1071 4.500	32,005
32,01-34,50	32,000	31,700	274,000	60,000	170,000	1071 4.500	34,500
32,01-34,50	31,750	33,200	274,000	60,000	170,000	1071 4.500	34,505
34,51-37,50	32,000	34,000	292,000	60,000	190,000	1071 5.000	37,500
34,51-37,50	31,750	36,200	292,000	60,000	190,000	1071 5.000	37,505
37,51-40,50	32,000	37,000	311,000	60,000	200,000	1071 5.000	40,500
37,51-40,50	31,750	39,200	311,000	60,000	200,000	1071 5.000	40,505



## Takma uç gövdesi RT800



**P** öz bileme  $\geq \text{Ø} 17,000$  • Kompak yapım tarzı • Gövdede plaketin güvenli sıkılması • sıkma vidaları Ürün no. 1071 dahil • tornavida Art. no. 1612 dahil



## GÜHRING NAVIGATOR

Kesme verileri sayfası 770

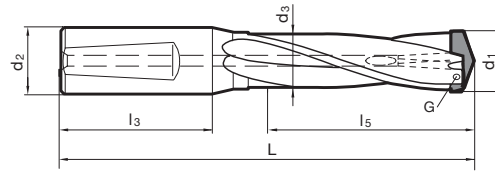
Malzeme

Yüzey

Ni

sap formu

HE



Ürün no 5248

d1	d2	d3	L	l3	l5	G	Code-No.
mm	mm	mm	mm	mm	mm		
16,00-17,00	20,000	15,700	202,000	50,000	126,000	1071 3.006	17,000
16,00-17,00	19,050	15,700	202,000	50,000	126,000	1071 3.006	17,005
17,01-17,99	20,000	16,700	202,000	50,000	126,000	1071 3.006	17,990
17,01-17,99	19,050	16,700	202,000	50,000	126,000	1071 3.006	17,995
18,00-19,00	20,000	17,700	218,000	50,000	140,000	1071 3.000	19,000
18,00-19,00	19,050	17,700	218,000	50,000	140,000	1071 3.000	19,005
19,01-20,00	20,000	18,700	218,000	50,000	140,000	1071 3.000	20,000
19,01-20,00	19,050	18,700	218,000	50,000	140,000	1071 3.000	20,005
20,01-21,00	25,000	19,700	241,000	56,000	154,000	1071 3.000	21,000
20,01-21,00	25,400	19,700	241,000	56,000	154,000	1071 3.000	21,005
21,01-22,50	25,000	20,700	241,000	56,000	154,000	1071 3.000	22,500
21,01-22,50	25,400	21,200	241,000	56,000	154,000	1071 3.000	22,505
22,51-24,00	25,000	22,200	257,000	56,000	168,000	1071 3.500	24,000
22,51-24,00	25,400	22,700	257,000	56,000	168,000	1071 3.500	24,005
24,01-25,50	25,000	23,700	274,000	56,000	182,000	1071 3.500	25,500
24,01-25,50	25,400	24,200	274,000	56,000	182,000	1071 3.500	25,505
25,51-27,50	32,000	25,200	294,000	60,000	196,000	1071 4.000	27,500
25,51-27,50	31,750	26,200	294,000	60,000	196,000	1071 4.000	27,505
27,51-29,50	32,000	27,200	310,000	60,000	210,000	1071 4.000	29,500
27,51-29,50	31,750	28,200	310,000	60,000	210,000	1071 4.000	29,505
29,51-32,00	32,000	29,200	326,000	60,000	224,000	1071 4.500	32,000
29,51-32,00	31,750	30,700	326,000	60,000	224,000	1071 4.500	32,005
32,01-34,50	32,000	31,700	342,000	60,000	238,000	1071 4.500	34,500
32,01-34,50	31,750	33,200	342,000	60,000	238,000	1071 4.500	34,505
34,51-37,50	32,000	34,000	366,000	60,000	266,000	1071 5.000	37,500
34,51-37,50	31,750	36,200	366,000	60,000	266,000	1071 5.000	37,505
37,51-40,50	32,000	37,000	391,000	60,000	280,000	1071 5.000	40,500
37,51-40,50	31,750	39,200	391,000	60,000	280,000	1071 5.000	40,505



## RT 800 Takma uçları

Malzeme **Kom. sert metal**Yüzey **S**

sap formu

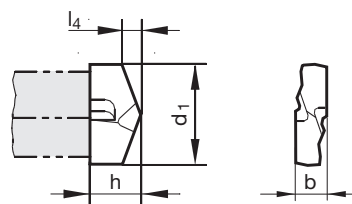
**P** • öz bileme  $\geq \varnothing 16,000$  • koni bileme • ana kesici ağız form konkav  
• sıkma vidaları Ürün no. 1071 dahil

**M** ○**K** •**N** ○**S** ○**H** ○1000 N/mm<sup>2</sup> üzerindeki Çelikler

Takma uçlu delme sistemleri T 800

## GÜHRINGNAVIGATOR

Kesme verileri sayfası 770

Ürün no **1047**

d1		l4	b	h	Code-No.
mm	inch	mm	mm	mm	
16,000		3,000	4,500	8,000	16,000
16,270	41/64	3,000	4,500	8,000	16,270
16,500		3,100	4,500	8,000	16,500
16,670	21/32	3,100	4,500	8,000	16,670
17,000		3,100	4,500	8,000	17,000
17,070	43/64	3,200	4,500	8,000	17,070
17,460	11/16	3,200	4,500	8,000	17,460
17,500		3,200	4,500	8,000	17,500
17,860	45/64	3,300	4,500	8,000	17,860
18,000		3,300	5,000	8,000	18,000
18,260	23/32	3,400	5,000	8,000	18,260
18,500		3,400	5,000	8,000	18,500
18,650	47/64	3,400	5,000	8,000	18,650
19,000		3,500	5,000	8,000	19,000
19,050	3/4	3,500	5,000	8,000	19,050
19,250		3,600	5,000	8,000	19,250
19,450	49/64	3,600	5,000	8,000	19,450
19,500		3,600	5,000	8,000	19,500
19,840	25/32	3,700	5,000	8,000	19,840
20,000		3,700	5,000	8,000	20,000
20,240	51/64	3,700	5,500	8,800	20,240
20,500		3,800	5,500	8,800	20,500
20,640	13/16	3,800	5,500	8,800	20,640
21,000		3,900	5,500	8,800	21,000
21,030	53/64	3,900	5,500	8,800	21,030
21,430	27/32	3,900	5,500	8,800	21,430
21,500		4,000	5,500	8,800	21,500
21,830	55/64	4,000	5,500	8,800	21,830
22,000		4,100	5,500	8,800	22,000
22,220	7/8	4,100	5,500	8,800	22,220
22,500		4,100	5,500	8,800	22,500
22,620	57/64	4,200	6,300	10,000	22,620
23,000		4,200	6,300	10,000	23,000
23,020	29/32	4,200	6,300	10,000	23,020
23,420	59/64	4,300	6,300	10,000	23,420
23,500		4,300	6,300	10,000	23,500
23,810	15/16	4,400	6,300	10,000	23,810
24,000		4,400	6,300	10,000	24,000
24,210	61/64	4,500	6,300	10,000	24,210
24,500		4,500	6,300	10,000	24,500
24,610	31/32	4,500	6,300	10,000	24,610
25,000	63/64	4,600	6,300	10,000	25,000



d1		l4	b	h	Code-No.
mm	inch	mm	mm	mm	
25,400	1	4,700	6,300	10,000	25,400
25,500		4,700	6,300	10,000	25,500
26,000		4,800	7,300	11,600	26,000
26,500		4,900	7,300	11,600	26,500
27,000		5,000	7,300	11,600	27,000
27,500		5,100	7,300	11,600	27,500
28,000		5,100	7,300	11,600	28,000
28,500		5,200	7,300	11,600	28,500
29,000		5,300	7,300	11,600	29,000
29,500		5,400	7,300	11,600	29,500
30,000		5,500	8,500	13,600	30,000
30,500		5,600	8,500	13,600	30,500
31,000		5,700	8,500	13,600	31,000
31,500		5,800	8,500	13,600	31,500
32,000		5,900	8,500	13,600	32,000
32,500		6,000	8,500	13,600	32,500
33,000		6,100	8,500	13,600	33,000
33,500		6,100	8,500	13,600	33,500
34,000		6,200	8,500	13,600	34,000
34,500		6,300	8,500	13,600	34,500
35,000		6,400	10,000	16,000	35,000
36,000		6,600	10,000	16,000	36,000
37,000		6,800	10,000	16,000	37,000
37,500		6,900	10,000	16,000	37,500
38,000		7,000	10,000	16,000	38,000
39,000		7,100	10,000	16,000	39,000
40,000		7,300	10,000	16,000	40,000
40,500		7,400	10,000	16,000	40,500

Takma uçlu delme sistemleri T 800



## RT 800 Takma uçları

Malzeme **Kom. sert metal**Yüzey **F**

sap formu

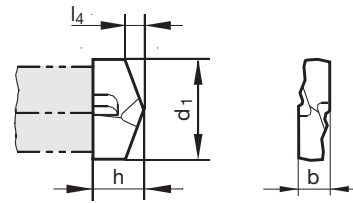
**P** • öz bileme  $\geq \varnothing 16,000$  • koni bileme • ana kesici ağız form konkav  
• sıkma vidaları Ürün no. 1071 dahil

**M** ○**K** •**N** ○**S** ○**H** ○1000 N/mm<sup>2</sup> üzerindeki Çelikler

Takma uçlu delme sistemleri T 800

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 770

Ürün no **2485**

d1		l4	b	h	Code-No.
mm	inch	mm	mm	mm	
16,000		3,000	4,500	8,000	16,000
16,270	41/64	3,000	4,500	8,000	16,270
16,500		3,100	4,500	8,000	16,500
16,670	21/32	3,100	4,500	8,000	16,670
17,000		3,100	4,500	8,000	17,000
17,070	43/64	3,200	4,500	8,000	17,070
17,460	11/16	3,200	4,500	8,000	17,460
17,500		3,200	4,500	8,000	17,500
17,860	45/64	3,300	4,500	8,000	17,860
18,000		3,300	5,000	8,000	18,000
18,260	23/32	3,400	5,000	8,000	18,260
18,500		3,400	5,000	8,000	18,500
18,650	47/64	3,400	5,000	8,000	18,650
19,000		3,500	5,000	8,000	19,000
19,050	3/4	3,500	5,000	8,000	19,050
19,250		3,600	5,000	8,000	19,250
19,450	49/64	3,600	5,000	8,000	19,450
19,500		3,600	5,000	8,000	19,500
19,840	25/32	3,700	5,000	8,000	19,840
20,000		3,700	5,000	8,000	20,000
20,240	51/64	3,700	5,500	8,800	20,240
20,500		3,800	5,500	8,800	20,500
20,640	13/16	3,800	5,500	8,800	20,640
21,000		3,900	5,500	8,800	21,000
21,030	53/64	3,900	5,500	8,800	21,030
21,430	27/32	3,900	5,500	8,800	21,430
21,500		4,000	5,500	8,800	21,500
21,830	55/64	4,000	5,500	8,800	21,830
22,000		4,100	5,500	8,800	22,000
22,220	7/8	4,100	5,500	8,800	22,220
22,500		4,100	5,500	8,800	22,500
22,620	57/64	4,200	6,300	10,000	22,620
23,000		4,200	6,300	10,000	23,000
23,020	29/32	4,200	6,300	10,000	23,020
23,420	59/64	4,300	6,300	10,000	23,420
23,500		4,300	6,300	10,000	23,500
23,810	15/16	4,400	6,300	10,000	23,810
24,000		4,400	6,300	10,000	24,000
24,210	61/64	4,500	6,300	10,000	24,210
24,500		4,500	6,300	10,000	24,500
24,610	31/32	4,500	6,300	10,000	24,610
25,000	63/64	4,600	6,300	10,000	25,000



d1		l4	b	h	Code-No.
mm	inch	mm	mm	mm	
25,400	1	4,700	6,300	10,000	25,400
25,500		4,700	6,300	10,000	25,500
26,000		4,800	7,300	11,600	26,000
26,500		4,900	7,300	11,600	26,500
27,000		5,000	7,300	11,600	27,000
27,500		5,100	7,300	11,600	27,500
28,000		5,100	7,300	11,600	28,000
28,500		5,200	7,300	11,600	28,500
29,000		5,300	7,300	11,600	29,000
29,500		5,400	7,300	11,600	29,500
30,000		5,500	8,500	13,600	30,000
30,500		5,600	8,500	13,600	30,500
31,000		5,700	8,500	13,600	31,000
31,500		5,800	8,500	13,600	31,500
32,000		5,900	8,500	13,600	32,000
32,500		6,000	8,500	13,600	32,500
33,000		6,100	8,500	13,600	33,000
33,500		6,100	8,500	13,600	33,500
34,000		6,200	8,500	13,600	34,000
34,500		6,300	8,500	13,600	34,500
35,000		6,400	10,000	16,000	35,000
36,000		6,600	10,000	16,000	36,000
37,000		6,800	10,000	16,000	37,000
37,500		6,900	10,000	16,000	37,500
38,000		7,000	10,000	16,000	38,000
39,000		7,100	10,000	16,000	39,000
40,000		7,300	10,000	16,000	40,000
40,500		7,400	10,000	16,000	40,500

Takma uçlu delme sistemleri T 800



## RT 800 Takma uçları

Malzeme **Kom. sert metal**

Yüzey ○

sap formu

**P** öz bileme  $\geq \text{Ø } 16,000$  • koni bileme • ana kesici ağız form konkav  
• sıkma vidaları Ürün no. 1071 dahil

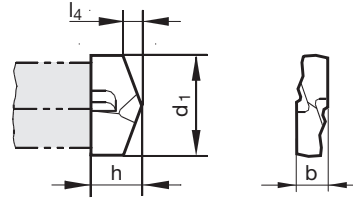
**M****K** ○**N** •**S****H**

döküm ve AlSi-alaşımları

Takma uçlu delme sistemleri T 800

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 770

Ürün no **2747**

d1		l4	b	h	Code-No.
mm	inch	mm	mm	mm	
16,000		3,000	4,500	8,000	16,000
16,500		3,100	4,500	8,000	16,500
17,000		3,100	4,500	8,000	17,000
17,070	43/64	3,200	4,500	8,000	17,070
17,500		3,200	4,500	8,000	17,500
18,000		3,300	5,000	8,000	18,000
18,260	23/32	3,400	5,000	8,000	18,260
18,650	47/64	3,400	5,000	8,000	18,650
19,000		3,500	5,000	8,000	19,000
19,050	3/4	3,500	5,000	8,000	19,050
19,250		3,600	5,000	8,000	19,250
19,450	49/64	3,600	5,000	8,000	19,450
19,500		3,600	5,000	8,000	19,500
19,840	25/32	3,700	5,000	8,000	19,840
20,000		3,700	5,000	8,000	20,000
20,500		3,800	5,500	8,800	20,500
20,640	13/16	3,800	5,500	8,800	20,640
21,000		3,900	5,500	8,800	21,000
21,030	53/64	3,900	5,500	8,800	21,030
21,430	27/32	3,900	5,500	8,800	21,430
21,830	55/64	4,000	5,500	8,800	21,830
22,000		4,100	5,500	8,800	22,000
23,000		4,200	6,300	10,000	23,000
23,420	59/64	4,300	6,300	10,000	23,420
23,500		4,300	6,300	10,000	23,500
24,000		4,400	6,300	10,000	24,000
24,210	61/64	4,500	6,300	10,000	24,210
24,500		4,500	6,300	10,000	24,500
25,000	63/64	4,600	6,300	10,000	25,000
25,500		4,700	6,300	10,000	25,500
26,000		4,800	7,300	11,600	26,000
26,500		4,900	7,300	11,600	26,500
27,000		5,000	7,300	11,600	27,000
27,500		5,100	7,300	11,600	27,500
28,000		5,100	7,300	11,600	28,000
29,500		5,400	7,300	11,600	29,500
30,000		5,500	8,500	13,600	30,000
30,500		5,600	8,500	13,600	30,500
31,000		5,700	8,500	13,600	31,000
31,500		5,800	8,500	13,600	31,500
32,000		5,900	8,500	13,600	32,000
32,500		6,000	8,500	13,600	32,500





d1		l4	b	h	Code-No.
mm	inch	mm	mm	mm	
33,000		6,100	8,500	13,600	33,000
33,500		6,100	8,500	13,600	33,500
34,000		6,200	8,500	13,600	34,000
34,500		6,300	8,500	13,600	34,500
35,000		6,400	10,000	16,000	35,000
36,000		6,600	10,000	16,000	36,000
37,000		6,800	10,000	16,000	37,000
39,000		7,100	10,000	16,000	39,000
40,000		7,300	10,000	16,000	40,000

Takma uçlu delme  
sistemleri T 800



## RT 800 Sıkma vidaları



Ürün no 1071

G	l1	Torx	Code-No.
	mm		
M3 x 0,35	7,000	T6	3,000
M3 x 0,35	6,000	T6	3,006
M3,5 x 0,35	8,000	T7	3,500
M4 x 0,5	9,000	T8	4,000
M4 x 0,5	10,000	T8	4,500
M5 x 0,5	11,000	T10	5,000



## Tork anahtarları



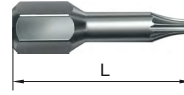
Ürün no

4915

Motor		Nm	Tip	Code-No.
1/4"	alyen	0,4-1	A	1,001
1/4"	alyen	0,8-2	A	2,000
1/4"	alyen	1-5	A	5,001
1/4"	alyen	2-8	A	8,000
1/4"	alyen	12	D	12,000
1/4"	alyen	5-14	D	14,000
3/8"	square	5-50	B	50,000
1/2"	square	20-200	C	200,000



## Torx-Bit uçları



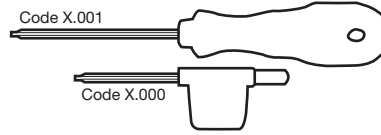
Ürün no

4917

Motor		Torx	L mm	Code-No.
1/4	alyen	T5	25,000	5,000
1/4	alyen	T6	25,000	6,000
1/4	alyen	T7	25,000	7,000
1/4	alyen	T8	25,000	8,000
1/4	alyen	T9	25,000	9,000
1/4	alyen	T10	25,000	10,000
1/4	alyen	T15	25,000	15,000
1/4	alyen	T20	25,000	20,000
1/2	square	T25	25,000	25,000



## Torx tornavida



Ürün no

1612

Torx	Code-No.
T5	5,001
T6	6,000
T6	6,001
T7	7,001
T8	8,000
T8	8,001
T9	9,001
T10	10,001
T15	15,000
T15	15,001
T20	20,001
T25	25,001
T30	30,001

## HT 800 WP

### Guhring HT 800 WP takımları için aşağıdaki uygulamaları ve gözlemleri yapınız:

Her uç değişiminde civatanın değişmesinide öneririz, her tutucu aynı zamanda artikel 4071 civata ve artikel 1612 tork anahtarı ile gelmektedir. Aynı zamanda her değiştirilebilir uç artikel 4071 civata ile gelmektedir. takma ucu değiştirirken lütfen belirtilen sıkma tork değerlerine uyunuz. Bu sayede optimum işleme şartları oluşur.

çap aralığı	11,0 - 12,99	13,0 - 13,99	14,0 - 15,99	16,0 - 17,99	18,0 - 19,99	20,0 - 21,99	22,0 - 29,99	30,0 - 40,00
diş	M2,2	M2,5	M3	M3,5	M4	M4,5	M5	M6
Torx boyu	T7	T8	T9	T10	T15	T15	T20	T25
sıkma torku [Nm]	0,8	1,0	1,7	2,7	4,0	6,0	8,0	14,0

detayları diş kitlemeye uygulayın (Loctite)!

- açık delikler için destek kenarları kalıcı olarak çapla temasta olmalı, çıkışta ilerlemeyi düşürmeyi öneririz
- 5xD delme boyundan sonra pilot delme uygulaması yapılmalıdır. Artikel 4105 ve art. no. 4111 uç ile. Alternatif olarak işlenecek malzemeye göre RT 100 U ve VA tipleride kullanılabilir.
- Merkezlemeden delik delmek için ilerleme hızını düşürmeyi öneririz.
- Deneme yapmadan darbeleri kesimlerde (kanallar, patlayan delikler) delme işlemi yapmayınız. (maks 0,2xD) darbe boşluklarında mümkün olduğunca ilerlemeyi kısın .
- konvensiyonel takma uçlu matkapların aksine HT800 ile katmanlı levha malzemeleri delebilirsiniz.
- Tornada (cansız takım) takımın doğru merkezlendiğinden emin olunmalı
- optimum işleme koşulları için soğutma önemlidir
- Takım MQL kullanımı için limitasyonlara sahiptir. MQL tipi olarak konik shaft kullanılmalı ve Guhring bileşenleri tercih edilmelidir. Detay için Satış ile görüşünüz

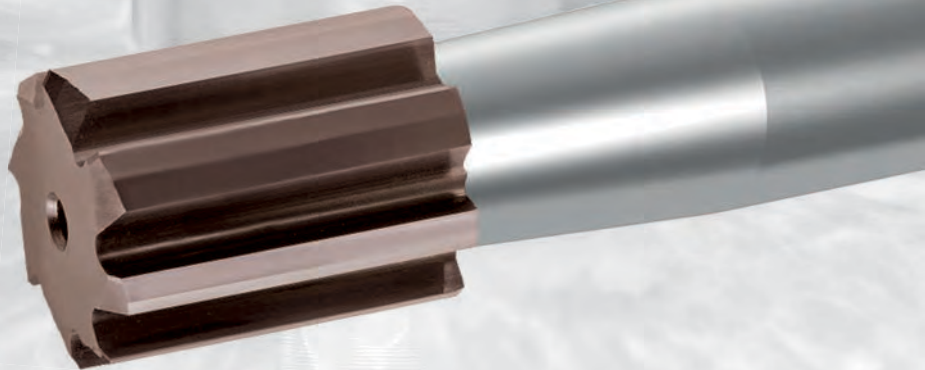
## RT 800 WP

### RT 800 WP takımları için aşağıdaki notlara ve uygulama önerilerine bakınız:

- Açık delikler için destek yatakları çapla temas halinde kalmalı.
- 7xD takım için 140° den büyük açılı ve çapın min. 2/3 boyunda kesme kenarı ile pilotlama uygulaması önerilmektedir.
- Deneme yapmadan darbeleri kesimlerde (kanallar, patlayan delikler) delme işlemi yapmayınız. (maks 0,2xD) darbe boşluklarında mümkün olduğunca ilerlemeyi kısın.
- konvensiyonel takma uçlu matkapların aksine HT800 ile katmanlı levha malzemeleri delebilirsiniz.
- Uçları değiştirirken aynı zamanda civatalarında değişmesini tavsiye ederiz

# HR 500 T

HA Silindirik sap sayesinde komple karbür yüksek performans raybaları çeşitli tutucu seçeneklerine sahiptir.

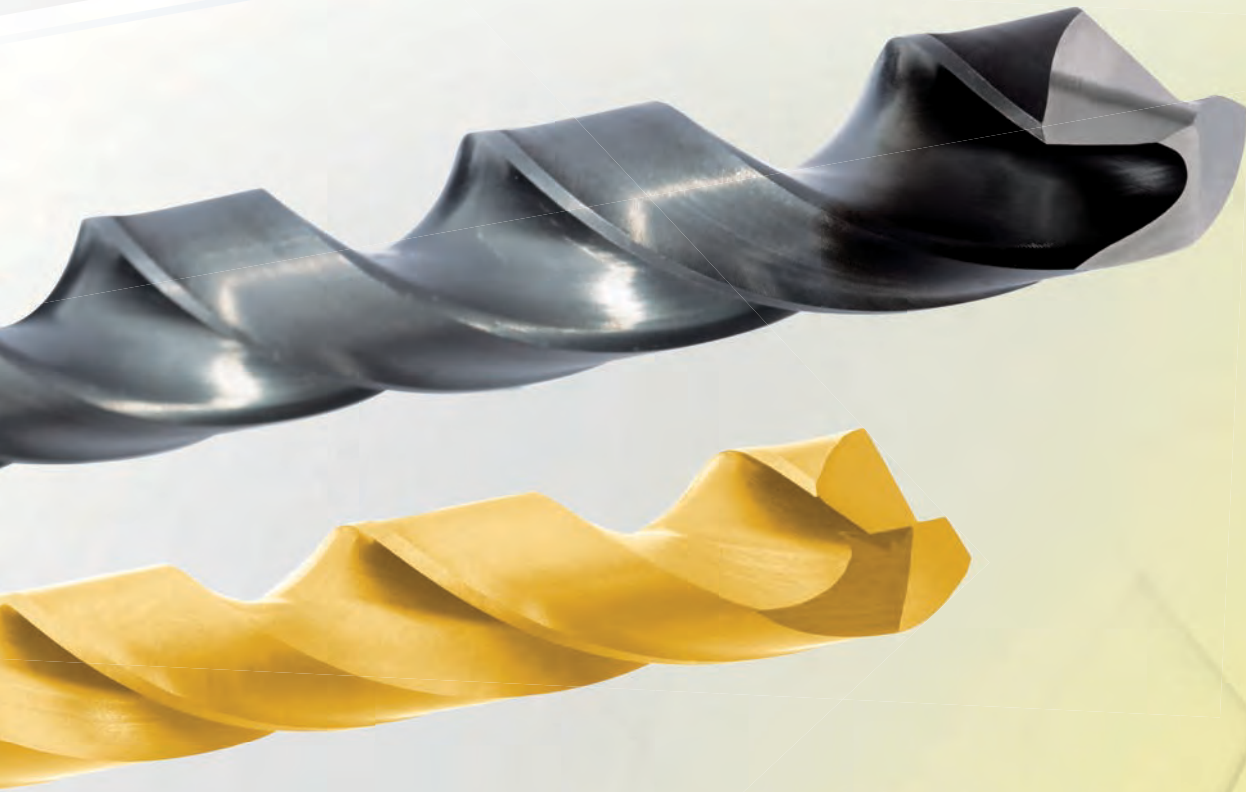


Daha fazla bilgi Rayba kataloğumuzda bulunabilir.





# SILINDİR ŐAFTLI MATKAP UCU





P	M	K	N	S	H	takım görüntüsü	delik derinliği	Standart	Tip	Kesme yönü	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayısı	Sayfa
•	•	•	•	•	•		~3xD	DIN 1897	N	R	HSS		0,350 - 44,000	223	772	192
•	•	•	•	•	•		~3xD	DIN 1897	N	R	HSS		0,500 - 30,160	653	772	196
•	•	•	•	•	•		~3xD	DIN 1897	N	R	HSS		1,000 - 15,000	2460	772	199
•	•	•	•	•	•		~3xD	DIN 1897	N	L	HSS		0,320 - 50,000	226	772	200
•	•	•	•	•	•		~3xD	DIN 1897	N	L	HSS		0,900 - 13,000	672	772	203
•	•	•	•	•	•		~3xD	DIN 1897	H	R	HSS		0,690 - 21,000	224	772	204
•	•	•	•	•	•		~3xD	DIN 1897	H	L	HSS		0,750 - 24,000	227	772	206
•	•	•	•	•	•		~3xD	DIN 1897	W	R	HSS		1,000 - 20,000	225	772	208
•	•	•	•	•	•		~3xD	DIN 1897	W	L	HSS		1,000 - 20,000	228	772	210
•	•	•	•	•	•		~3xD	DIN 1897	GT 80	R	HSS		1,000 - 20,000	552	772	212
•	•	•	•	•	•		~3xD	DIN 1897	GT 80	L	HSS		1,000 - 19,840	553	772	215
•	•	•	•	•	•		~3xD	DIN 1897	GV 120	R	HSCO		0,400 - 48,000	329	772	218
•	•	•	•	•	•		~3xD	DIN 1897	GV 120	R	HSCO		0,500 - 15,500	659	774	222
•	•	•	•	•	•		~3xD	DIN 1897	GV 120	R	HSCO		1,000 - 13,000	2461	774	224
•	•	•	•	•	•		~3xD	DIN 1897	GV 120	L	HSCO		0,450 - 32,000	330	772	225
•	•	•	•	•	•		~3xD	DIN 1897	GT 80	R	HSCO		1,000 - 20,000	1228	774	227
•	•	•	•	•	•		~3xD	DIN 1897	GT 80	R	HSCO		1,000 - 16,000	2498	774	229
•	•	•	•	•	•		~3xD	DIN 1897	VA	R	HSCO		1,000 - 12,000	1261	772	230
•	•	•	•	•	•		~3xD	DIN 1897	VA	R	HSCO		1,000 - 13,000	572	774	231
•	•	•	•	•	•		~3xD	DIN 1897	P2000	R	HSCO		1,000 - 13,000	2048	774	233
•	•	•	•	•	•		~3xD	DIN 1897	N	R	M42		1,000 - 15,870	1259	772	235
•	•	•	•	•	•		~3xD	DIN 1897	GT 500 DZ	R	HSS-E-PM		1,000 - 14,290	515	774	237
•	•	•	•	•	•		3xD	DIN 6539	N	R	VHM		0,500 - 16,000	730	776	239
•	•	•	•	•	•		~3xD	DIN 6539	N	R	VHM		1,000 - 16,000	2463	776	241

SİLİNDİR ŞAFTLI MATKAP UCU



P	M	K	N	S	H	takım görüntüsü	delik derinliği	Standart	Tip	Kesme yönü	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayfası	Sayfa
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## Çok kısa helisel matkap uçları

							~3xD	WN	N	R	VHM	○	0,500 - 6,500	702	776	243
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## Helisel matkap uçları, kısa

•	•	•	•	•	•		~5xD	DIN 338	N	R	HSS	○	0,200 - 20,000	205	778	244
•	•	•	•	•	•		~5xD	DIN 338	N	R	HSS	Ⓢ	0,200 - 19,000	651	780	250
•	•	•	•	•	•		~5xD	DIN 338	N	R	HSS	F	1,000 - 14,500	2456	780	254
•	•	•	•	•	•		~5xD	DIN 338	N	R	HSS	○	2,400 - 5,610	560	778	256
•	•	•	•	•	•		~5xD	DIN 338	N	R	HSS	●	3,000 - 16,000	240	778	257
•	•	•	•	•	•		~5xD	DIN 338	N	L	HSS	○ <sup>&gt;0</sup> <sub>2,36</sub>	0,200 - 20,000	208	778	258
•	•	•	•	•	•		~5xD	DIN 338	N	L	HSS	Ⓢ	0,250 - 14,250	664	780	261
•	•	•	•	•	•		~5xD	DIN 338	H	R	HSS	○	0,200 - 20,000	206	778	263
•	•	•	•	•	•		~5xD	DIN 338	H	L	HSS	○	0,300 - 20,000	209	778	266
•	•	•	•	•	•		~5xD	DIN 338	W	R	HSS	○	0,200 - 20,000	207	778	269
•	•	•	•	•	•		~5xD	DIN 338	W	L	HSS	○	0,250 - 20,000	210	778	272
•	•	•	•	•	•		~5xD	DIN 338	GT 100	R	HSS	○ <sup>&gt;0</sup> <sub>2,36</sub>	0,600 - 16,000	549	778	274
•	•	•	•	•	•		~5xD	DIN 338	GT 100	R	HSS	Ⓢ	1,000 - 15,000	652	780	277
•	•	•	•	•	•		~5xD	DIN 338	GT 100	R	HSS	F	1,000 - 15,000	2457	780	280
•	•	•	•	•	•		~5xD	DIN 338	GT 100	L	HSS	○ <sup>&gt;0</sup> <sub>2,36</sub>	1,000 - 15,500	550	778	281
•	•	•	•	•	•		~5xD	DIN 338	GT 100	L	HSS	Ⓢ	1,300 - 9,800	665	780	283
•	•	•	•	•	•		~5xD	DIN 338	N	R	HSCO	○ <sup>&gt;0</sup> <sub>2,36</sub>	0,200 - 20,000	305	780	284
•	•	•	•	•	•		~5xD	DIN 338	N	R	HSCO	Ⓢ	1,200 - 13,000	2997	782	288
•	•	•	•	•	•		~5xD	DIN 338	N	L	HSCO	○ <sup>&gt;0</sup> <sub>6,00</sub>	0,360 - 18,500	308	780	289
•	•	•	•	•	•		~5xD	DIN 338	GT 100	R	HSCO	○ <sup>&gt;0</sup> <sub>2,36</sub>	1,000 - 16,000	622	780	291
•	•	•	•	•	•		~5xD	DIN 338	GT 100	R	HSCO	Ⓢ	1,000 - 15,000	658	782	294
•	•	•	•	•	•		~5xD	DIN 338	GT 100	R	HSCO	F	1,000 - 14,000	2459	782	296



P	M	K	N	S	H	takım görüntüsü	delik derinliği	Standart	Tip	Kesme yönü	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayısı	Sayfa
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## Helisel matkap uçları, kısa

•	○						~5xD	DIN 338	GT 100	(R)	HSCO	C	3,000 - 11,910	1221	782	298
○	•	○					~5xD	DIN 338	GT 100	(R)	HSCO	A	3,000 - 12,000	1223	782	299
○	•		•				~5xD	DIN 338	Ti	(R)	HSCO	○	0,200 - 19,000	605	780	301
○	•		•				~5xD	DIN 338	Ti	(R)	HSCO	S	0,500 - 14,500	657	782	304
○	•		•				~5xD	DIN 338	Ti	(R)	HSCO	F	0,400 - 15,000	2458	782	306
○	•		•				~5xD	DIN 338	Ti	(L)	HSCO	○	1,300 - 9,500	608	780	308
○	•	○	○				~5xD	DIN 338	VA	(R)	HSCO	○	1,000 - 13,000	1260	780	309
•	○	○	○				~5xD	DIN 338	P2000	(R)	HSCO	•	1,000 - 13,000	2047	784	311
•	•	•	•	○			~5xD	DIN 338	AeroX	(R)	M42	•	1,000 - 13,000	1018	784	313
•	○	○	•	•	○		~5xD	DIN 338	N	(R)	M42	○	0,400 - 16,000	1146	780	315
•	•	•	○	•			~5xD	DIN 338	N	(R)	M42	F	1,000 - 16,000	1199	784	317
○	○	○	•	•			~5xD	WN	N	(R)	VHM	○	1,000 - 12,700	732	784	319
○	○	○	•	○			~5xD	WN	N	(R)	VHM	F	1,000 - 12,700	2464	784	321
○	○		•				~5xD	WN	Duro 150	(R)	HM	○	3,000 - 14,000	710	776	323

## Silindirik saplı uzun matkap uçları

•	•	○					~10xD	DIN 339	N	(R)	HSS	○ <sup>&gt;0</sup> <sub>2,36</sub>	0,800 - 20,000	211	786	325
•	•	○					~10xD	DIN 339	N	(R)	HSS	○	2,400 - 5,000	561	786	327
•	•	•					~10xD	DIN 339	N	(R)	HSS	S	1,000 - 13,000	666	786	328
•	○	•	•	○			~10xD	DIN 339	N	(R)	HSCO	○ <sup>&gt;0</sup> <sub>2,36</sub>	1,100 - 19,000	311	792	330

## Helisel matkap uçları, uzun

•	•	○					~10xD	DIN 340	N	(R)	HSS	○ <sup>&gt;0</sup> <sub>2,36</sub>	0,400 - 36,510	217	786	331
•	•	○					~10xD	DIN 340	N	(R)	HSS	S	0,500 - 22,220	667	786	334
•	•	○					~10xD	DIN 340	N	(L)	HSS	○ <sup>&gt;0</sup> <sub>6,00</sub>	0,450 - 29,000	220	786	336
•	•	○					~10xD	DIN 340	N	(R)	HSS	○	2,950 - 25,250	204	786	338
•	•	•					~10xD	DIN 340	H	(R)	HSS	○	0,500 - 16,000	218	786	339



P	M	K	N	S	H	takım görüntüsü	delik derinliği	Standart	Tip	Kesme yönü	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayısı	Sayfa
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## Helisel matkap uçları, uzun

							~10xD	DIN 340	H	L	HSS	○	0,450 - 15,000	221	786	341
							~10xD	DIN 340	W	R	HSS	○	0,500 - 20,640	219	786	342
							~10xD	DIN 340	GT 100	R	HSS	○	1,000 - 14,000	535	786	344
							~10xD	DIN 340	GT 100	R	HSS	○	1,000 - 14,000	668	786	347
							~10xD	DIN 340	GT 100	R	HSS	○	1,000 - 10,000	2462	786	349
							~10xD	DIN 340	GT 100	L	HSS	○	1,400 - 13,000	506	786	350
							~10xD	DIN 340	GT 50	R	HSS	○	1,000 - 32,600	501	786	351
							~10xD	DIN 340	N	R	HSCO	○	0,500 - 22,000	317	792	353
							~10xD	DIN 340	GT 100	R	HSCO	○	1,000 - 16,000	336	792	355
							~10xD	DIN 340	GT 100	R	HSCO	○	1,000 - 12,000	396	792	357
							~10xD	DIN 340	Ti	R	HSCO	○	1,000 - 15,000	617	792	358
							~10xD	DIN 340	Ti	R	HSCO	○	1,000 - 10,200	669	792	360
							~10xD	WN	N	R	VHM	○	0,500 - 1,450	706	792	362

SİLİNDİR ŞAFTLI MATKAP UCU

## Helisel matkap uçları çok uzun, seri 1

							~15xD	DIN 1869	N	R	HSS	○	1,600 - 13,000	235	788	363
							~15xD	DIN 1869	GT 100	R	HSS	○	1,950 - 13,000	502	790	365
							~15xD	DIN 1869	GT 100	R	HSS	○	2,000 - 12,700	670	790	367
							~15xD	DIN 1869	GT 50	R	HSS	○	2,000 - 12,700	524	788	368
							~15xD	DIN 1869	GT 100	R	HSCO	○	2,700 - 10,000	618	794	370

## Ekstra uzun helisel matkaplar, seri 2

							~20xD	DIN 1869	N	R	HSS	○	2,700 - 13,000	236	788	371
							~20xD	DIN 1869	GT 100	R	HSS	○	2,000 - 13,000	503	790	372
							~20xD	DIN 1869	GT 100	R	HSS	○	2,700 - 8,500	671	790	374
							~20xD	DIN 1869	GT 50	R	HSS	○	3,000 - 13,000	528	788	375
							~20xD	DIN 1869	GT 100	R	HSCO	○	3,000 - 10,000	619	794	376



P	M	K	N	S	H	takım görüntüsü	delik derinliği	Standart	Tip	Kesme yönü	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayısı	Sayfa
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## Ekstra uzun helisel matkaplar, seri 3

•	•	•	•	•	•		~25xD	DIN 1869	N	(R)	HSS	○	3,500 - 13,000	237	788	377
•	•	•	•	•	•		~25xD	DIN 1869	GT 100	(R)	HSS	◐	2,500 - 13,000	504	790	378
○	•	•	•	•	•		~25xD	DIN 1869	GT 50	(R)	HSS	○	2,500 - 10,000	529	788	379
•	•	•	•	•	•		~25xD	DIN 1869	GT 100	(R)	HSCO	◐	2,500 - 13,000	571	794	380

## Helisel matkap uçları, çok uzun

•	•	•	•	•	•		>25xD	WN	GT 100	(R)	HSS	◐	6,000 - 12,000	242	790	381
•	•	•	•	•	•		>25xD	WN	GT 100	(R)	HSS	○	8,000 - 12,000	243	790	382
•	•	•	•	•	•		>25xD	WN	GT 100	(R)	HSS	○	10,000 - 12,000	244	790	383

## Çok uzun silindirik saplı helisel matkap uçları

•	•	•	•	•	•		~3xD	WN	GU 500	(R)	HSCO	Ⓢ	2,000 - 20,000	512	774	384
•	•	•	•	•	•		~5xD	WN	GU 500	(R)	HSCO	Ⓢ	2,000 - 20,000	511	784	386
•	•	•	•	•	•		~5xD	WN	GT 500	(R)	HSS-E-PM	F	2,000 - 12,900	513	784	388
○	•	•	•	•	•		~3xD	DIN 6537 K	H	(R)	VHM	A	2,600 - 14,100	1946	776	389

## Helisel matkap uçları, uzun saplı 6 inç boyunda

•	•	•	•	•	•		NAS 907	N	(R)	HSS	○	1,500 - 8,000	577		390
•	•	•	•	•	•		NAS 907	N	(R)	HSS	◐ <sub>2,36</sub>	1,500 - 8,000	579		391

## Helisel matkap uçları, uzun saplı 12 inç boyunda

•	•	•	•	•	•		NAS 907	N	(R)	HSS	○	1,500 - 8,000	578		392
•	•	•	•	•	•		NAS 907	N	(R)	HSS	◐ <sub>2,36</sub>	1,500 - 8,000	580		393

## Soğutma kanallı matkap uçları

•	•	•	•	•	•		~10xD	WN	N	(R)	HSS	○	3,000 - 13,000	390	788	394
•	•	•	•	•	•		~5xD	WN	GT 80 IK	(R)	HSCO	○	5,000 - 20,000	1131	784	395
•	•	•	•	•	•		~5xD	WN	GT 80 IK	(R)	HSCO	Ⓢ	5,000 - 20,000	1132	784	396

## İçten su vermesiz HSS-E-PM mikro hassas deliciler

•	•	•	•	•	•		~5xD	DIN 1899	N	(R)	HSS-E-PM	○	0,050 - 1,920	301	796	397
•	•	•	•	•	•		~5xD	DIN 1899	N	(R)	HSS-E-PM	Ⓢ	0,160 - 1,900	660	796	400



P	M	K	N	S	H	takım görüntüsü	delik derinliği	Standart	Tip	Kesme yönü	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayısı	Sayfa
•	•	•	•	•	•		~5xD	DIN 1899	N	L	HSS-E-PM	○	0,130 - 1,850	303	796	402
İçten su vermesiz HSS-E-PM mikro hassas deliciler																
•	•	•	•	•	•		~5xD	WN	N	R	VHM	○	0,200 - 1,400	701	796	404
•	•	•	•	•	•			WN	N	R	VHM	⊙	0,100 - 3,000	3899	796	405
İçten su vermesiz solid karbür mikro hassas deliciler																
•	•	•	•	•	•		4xD	WN	N	R	VHM	⊙	0,500 - 3,000	6400	796	407
•	•	•	•	•	•		7xD	WN	N	R	VHM	⊙	0,500 - 3,000	6401	796	408
ExclusiveLine kılcal matkap uçları, soğutma kanalsız																
•	•	•	•	•	•		5xD	WN	N	R	VHM	⊙	1,400 - 3,000	6405	796	409
•	•	•	•	•	•		8xD	WN	N	R	VHM	⊙	1,400 - 3,000	6408	796	410
•	•	•	•	•	•		15xD	WN	N	R	VHM	⊙	1,400 - 3,000	6412	796	411
ExclusiveLine kılcal matkap ucu, soğutma kanallı																
•	•	•	•	•	•			WN	N	R	HSS	●	13,000 - 28,570	268	778	412
Kısa helisel matkap ucu sap-Ø 12,7 mm																
•	•	•	•	•	•			WN	V72	R	HSCO	○	16,000 - 40,000	128	772	413
Kısa helisel matkap ucu sap-Ø 16,0 mm																
•	•	•	•	•	•			WN	V72	R	HSCO	○	25,000 - 40,000	129	772	414
•	•	•	•	•	•			WN	V72	L	HSCO	○	25,000 - 39,000	136	772	415
Kısa helisel matkap ucu sap-Ø25,4 mm																
•	•	•	•	•	•			DIN 1898	N	R	HSS	⊙ <sub>2,36</sub>	2,000 - 12,000	531		416
Pim deliği matkap ucu																
•	•	•	•	•	•		~5xD	DIN 338	N	R	HSS	⊙ <sub>2,36</sub>		201		417
Helisel matkap setleri																



P	M	K	N	S	H	takım görüntüsü	delik derinliği	Standart	Tip	Kesme yönü	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayfası	Sayfa
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## Helisel matkap setleri

Silindirik Şaftlı Matkap ucu

•	•	○					~5xD	DIN 338	N	R	HSS	$\begin{matrix} >0 \\ 2,36 \end{matrix}$		200		418
•	•	○					~5xD	DIN 338	N	R	HSS	S		17		419
•	○	•	○				~5xD	DIN 338	N	R	HSCO	○		16		420
○	•		•				~5xD	DIN 338	Ti	R	HSCO	○		18		421
○	•	○	○				~5xD	DIN 338	VA	R	HSCO	○		195		422
•	○	○	○				~5xD	DIN 338	P2000	R	HSCO	●		2049		423
•	○	○	○				~3xD	DIN 1897	P2000	R	HSCO	M		2050		424
•	•	•	•	○			~5xD	DIN 338	AeroX	R	M42	●		1083		425





P	M	K	N	S	H	takım görüntüsü	delik derinliği	Standart	Tip	Kesme yönü	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayfası	Sayfa
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## Helisel matkap setleri


Silindir Şaftlı Matkap ucu

## Sert metal takma uçlu özel matkap uçları


## FK-Helisel matkap ucu (cam elyaf takviyeli yapay malzeme)

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## Sert metal uçlu matkap ucu

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## Duvar delme matkap ucu

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ÇELİK

~ 3xD  
DIN 1897

~ 5xD  
DIN 338

~ 10xD  
DIN 340

~ 15xD  
DIN 1869  
R1

No 1

Ø 1,00 - 14,00 mm  
Ürün no 2459  
den itibaren 296



No 1

Ø 1,00 - 12,00 mm  
Ürün no 396  
den itibaren 357



No 1

Ø 2,70 - 10,00 mm  
Ürün no 618  
den itibaren 370



Ø 1,00 - 15,00 mm  
Ürün no 2457  
den itibaren 280



Ø 1,00 - 10,00 mm  
Ürün no 2462  
den itibaren 349



Ø 2,00 - 12,70 mm  
Ürün no 670  
den itibaren 367



No 1

Ø 1,00 - 13,00 mm  
Ürün no 2461  
den itibaren 224



Ø 1,00 - 15,00 mm  
Ürün no 2460  
den itibaren 199



Ø 1,00 - 14,50 mm  
Ürün no 2456  
den itibaren 254



Ø 0,50 - 22,22 mm  
Ürün no 667  
den itibaren 334



Ø 1,60 - 13,00 mm  
Ürün no 235  
den itibaren 363



Ø 1,20 - 13,00 mm  
Ürün no 2997  
den itibaren 288



Ø 0,50 - 22,00 mm  
Ürün no 317  
den itibaren 353



No 1

Ø 2,00 - 20,00 mm  
Ürün no 512  
den itibaren 384



No 1

Ø 2,00 - 20,00 mm  
Ürün no 511  
den itibaren 386



Ø 2,00 - 12,90 mm  
Ürün no 513  
den itibaren 388



No 1

Ø 5,00 - 20,00 mm  
Ürün no 1132  
den itibaren 396



SIKARKEN DÜŞÜK  
SIKMA GÜCÜ İHTYACI

İÇTEN SU VERME  
UYGULAMALARI İÇİN

Silindirik Şaftlı Matkap  
ucu

düz silindirik şaft

uniform şaft

içten  
sogutmali



# QUICKFINDER

~20xD  
DIN 1869  
R2

~25xD  
DIN 1869  
R3

>25xD  
fabrika standartı  
ekstra uzun

No 1 ideal  
takım

No 1

Ø 3,00 - 10,00 mm  
Ürün no 619  
den itibaren 376



No 1

Ø 2,50 - 13,00 mm  
Ürün no 571  
den itibaren 380



GT100, HSCO

No 1

Ø 2,70 - 8,50 mm  
Ürün no 671  
den itibaren 374



No 1

Ø 2,50 - 13,00 mm  
Ürün no 504  
den itibaren 378



Ø 6,00 - 12,00 mm  
Ürün no 242  
den itibaren 381



GT100, HSS



GV120, HSCO

Ø 2,70 - 13,00 mm  
Ürün no 236  
den itibaren 371



Ø 3,50 - 13,00 mm  
Ürün no 237  
den itibaren 377



Tip N, HSS



Tip N, HSCO



GU500, HSCO



GT500, HSS-E-PM



GT80IK, HSCO

PASLANMAZ  
ÇELİKLERTİTAN &  
ÖZEL ALAŞIMLAR~ 3xD  
DIN 1897~ 5xD  
DIN 338~ 10xD  
DIN 340~ 15xD  
DIN 1869  
R1

No 1 No 1

Ø 0,40 - 15,00 mm  
Ürün no 2458  
den itibaren 306

F S O

No 1 No 1

Ø 1,00 - 10,2 mm  
Ürün no 669  
den itibaren 360

S O

No 1 No 1

Ø 1,00 - 13,00 mm  
Ürün no 572  
den itibaren 231

S O

Ø 1,00 - 13,00 mm  
Ürün no 1260  
den itibaren 309

O

Ø 1,00 - 14,00 mm  
Ürün no 2459  
den itibaren 296

F S O

Ø 1,00 - 12,00 mm  
Ürün no 396  
den itibaren 357

F O

No 1 No 1

Ø 2,70 - 10,00 mm  
Ürün no 618  
den itibaren 370

O

Ø 1,00 - 13,00 mm  
Ürün no 2461  
den itibaren 224

F S O

Ø 1,00 - 15,87 mm  
Ürün no 1259  
den itibaren 235

O

Ø 1,00 - 16,00 mm  
Ürün no 1199  
den itibaren 317

F O

No 1

Ø 2,00 - 20,00 mm  
Ürün no 512  
den itibaren 384

S

No 1

Ø 2,00 - 20,00 mm  
Ürün no 511  
den itibaren 386

S

Ø 2,00 - 12,900 mm  
Ürün no 513  
den itibaren 388

F

SIKARKEN DÜŞÜK  
SIKMA GÜCÜ İHTİYACI

No 1 No 1

Ø 5,00 - 20,00 mm  
Ürün no 1132  
den itibaren 396

S O

İÇTEN SU VERME  
UYGULAMALARI İÇİN



# QUICKFINDER

~20xD  
DIN 1869  
R2

~25xD  
DIN 1869  
R3

>25xD  
fabrika standardı  
ekstra uzun

**No 1** paslanmaz çelikler için  
ideal takım

**No 1** özel alaşım ve titanyum alaşımları için  
ideal takım



Tip Ti, HSCO



Tip VA, HSCO

**No 1** **No 1**

Ø 3,00 - 10,00 mm  
Ürün no 619  
den itibaren 376



**No 1** **No 1**

Ø 2,50 - 13,00 mm  
Ürün no 571  
den itibaren 380



GT100, HSCO



GV120, HSCO



Tip N, M42



GU500, HSCO



GT500, HSS-E-PM



GT801K, HSCO



# K DÖKME DEMİR

~ 3xD  
DIN 1897

~ 5xD  
DIN 338

~ 10xD  
DIN 340

~ 15xD  
DIN 1869  
R1

No 1

Ø 1,00 - 14,00 mm  
Ürün no 2459  
den itibaren 296



No 1

Ø 1,00 - 12,00 mm  
Ürün no 396  
den itibaren 357



No 1

Ø 2,70 - 10,00 mm  
Ürün no 618  
den itibaren 370



Ø 1,00 - 15,00 mm  
Ürün no 2457  
den itibaren 280



Ø 1,00 - 10,00 mm  
Ürün no 2462  
den itibaren 349



Ø 2,00 - 12,70 mm  
Ürün no 670  
den itibaren 367



No 1

Ø 1,00 - 15,00 mm  
Ürün no 2460  
den itibaren 199



Ø 1,00 - 14,50 mm  
Ürün no 2456  
den itibaren 254



Ø 0,50 - 22,22 mm  
Ürün no 667  
den itibaren 334



Ø 1,60 - 13,00 mm  
Ürün no 235  
den itibaren 363



Ø 1,20 - 13,00 mm  
Ürün no 2997  
den itibaren 288



Ø 0,50 - 22,00 mm  
Ürün no 317  
den itibaren 353



No 1

Ø 2,00 - 20,00 mm  
Ürün no 512  
den itibaren 384



No 1

Ø 2,00 - 20,00 mm  
Ürün no 511  
den itibaren 386



Ø 2,00 - 12,90 mm  
Ürün no 513  
den itibaren 388



SIKARKEN DÜŞÜK  
SIKMA GÜCÜ İHTYACI

No 1

Ø 5,00 - 20,00 mm  
Ürün no 1132  
den itibaren 396



İÇTEN SU VERME  
UYGULAMALARI İÇİN



# QUICKFINDER

~20xD  
DIN 1869  
R2

~25xD  
DIN 1869  
R3

>25xD  
fabrika standartı  
ekstra uzun

**No 1** ideal  
takım

**No 1**

Ø 3,00 - 10,00 mm  
Ürün no 619  
den itibaren 376



**No 1**

Ø 2,50 - 13,00 mm  
Ürün no 571  
den itibaren 380



GT100, HSCO

**No 1**

Ø 2,70 - 8,50 mm  
Ürün no 671  
den itibaren 374



Ø 2,50 - 13,00 mm  
Ürün no 504  
den itibaren 378



**No 1**

Ø 6,00 - 12,00 mm  
Ürün no 242  
den itibaren 381



GT100, HSS

Ø 2,70 - 13,00 mm  
Ürün no 236  
den itibaren 371



Ø 3,50 - 13,00 mm  
Ürün no 237  
den itibaren 377



Tip N, HSS



Tip N, HSCO



GU500, HSCO



GT500, HSS-E-PM



GT80IK, HSCO

**N**

ALUMİNYUM, NE, PLASTİKLER

**~ 3xD**  
**DIN 1897****~ 5xD**  
**DIN 338****~ 10xD**  
**DIN 340****~ 15xD**  
**DIN 1869**  
**R1****No 1**Ø 1,00 - 20,00 mm  
Ürün no 225  
den itibaren 208**No 1**Ø 0,20 - 20,00 mm  
Ürün no 207  
den itibaren 269**No 1**Ø 0,50 - 20,64 mm  
Ürün no 219  
den itibaren 342Yumuşak ,uzun talaş veren  
malzemeler için W tipi**No 1**Ø 0,69 - 21,00 mm  
Ürün no 224  
den itibaren 204**No 1**Ø 0,20 - 20,00 mm  
Ürün no 206  
den itibaren 263**No 1**Ø 0,50 - 16,00 mm  
Ürün no 218  
den itibaren 339Sert, kırılğan malzemeler  
için tip H**No 1**Yumuşak ,uzun talaş veren  
malzemeler için GT50 tipiØ 1,00 - 32,60 mm  
Ürün no 501  
den itibaren 351Ø 2,00 - 12,70 mm  
Ürün no 524  
den itibaren 368Ø 1,00 - 15,50 mm  
Ürün no 550  
den itibaren 281Ø 1,00 - 14,00 mm  
Ürün no 535  
den itibaren 344Ø 1,95 - 13,00 mm  
Ürün no 502  
den itibaren 365Ø 1,00 - 16,00 mm  
Ürün no 622  
den itibaren 291Ø 1,00 - 16,00 mm  
Ürün no 336  
den itibaren 355Ø 2,70 - 10,00 mm  
Ürün no 618  
den itibaren 370**No 1**Ø 2,00 - 20,00 mm  
Ürün no 512  
den itibaren 384**No 1**Ø 2,00 - 20,00 mm  
Ürün no 511  
den itibaren 386SİKARKEN DÜŞÜK  
SİKMA GÜCÜ İHTYACI**No 1**Ø 5,00 - 20,00 mm  
Ürün no 1131  
den itibaren 395İÇTEN SU VERME  
UYGULAMALARI İÇİN





# QUICKFINDER

~20xD  
DIN 1869  
R2

~25xD  
DIN 1869  
R3

>25xD  
fabrika standardı  
ekstra uzun

**No 1** ideal takım



Tip W, HSS



Tip H, HSS

**No 1**

Ø 3,00 - 13,00 mm  
Ürün no 528  
den itibaren 375



**No 1**

Ø 2,50 - 10,00 mm  
Ürün no 529  
den itibaren 379



GT50, HSS

**No 1**

Ø 2,70 - 8,50 mm  
Ürün no 671  
den itibaren 374



Ø 2,50 - 13,00 mm  
Ürün no 504  
den itibaren 378



Ø 6,00 - 12,00 mm  
Ürün no 242  
den itibaren 381



GT100, HSS

Ø 3,00 - 10,00 mm  
Ürün no 619  
den itibaren 376



Ø 2,50 - 13,00 mm  
Ürün no 571  
den itibaren 380



GT100, HSCO



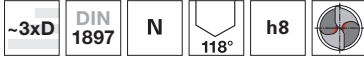
GU500, HSCO



GT80IK, HSCO



## Çok kısa helisel matkap uçları

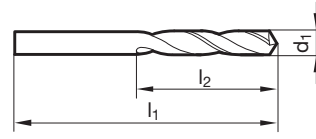
Malzeme **HSS**Yüzey  $\geq 0,2,36$ 

Kesme yönü

**P** • öz bileme  $\geq \varnothing 1,000$  • koni bileme • otomat/revolver torna tezgahları için  
• el matkapları için de

**M****K** •**N** ○ ince cidarlı malzemeler**S****H****GÜHRING** NAVIGATOR

Kesme verileri sayfası 772

SİLİNDİR ŞAFTLI MATKAP  
UCUÜrün no **223**

d1		l1	l2
mm	inch	mm	mm
0,350		19,000	2,000
0,400	1/64	19,000	2,500
0,480		19,000	2,500
0,500		20,000	3,000
0,550		21,000	3,500
0,575		21,000	3,500
0,600		21,000	3,500
0,650		22,000	4,000
0,660		22,000	4,000
0,700		23,000	4,500
0,720		23,000	4,500
0,750		23,000	4,500
0,790	1/32	24,000	5,000
0,800		24,000	5,000
0,820		24,000	5,000
0,850		24,000	5,000
0,890		25,000	5,500
0,900		25,000	5,500
0,930		25,000	5,500
0,950		25,000	5,500
0,980		26,000	6,000
1,000		26,000	6,000
1,020		26,000	6,000
1,030		26,000	6,000
1,040		26,000	6,000
1,050		26,000	6,000
1,070		28,000	7,000
1,090		28,000	7,000
1,100		28,000	7,000
1,110		28,000	7,000
1,120		28,000	7,000
1,150		28,000	7,000
1,180		28,000	7,000
1,190	3/64	30,000	8,000
1,200		30,000	8,000
1,220		30,000	8,000
1,250		30,000	8,000
1,260		30,000	8,000
1,280		30,000	8,000
1,300		30,000	8,000
1,320		30,000	8,000
1,350		32,000	9,000

d1		l1	l2
mm	inch	mm	mm
1,400		32,000	9,000
1,430		32,000	9,000
1,450		32,000	9,000
1,480		32,000	9,000
1,500		32,000	9,000
1,510		34,000	10,000
1,520		34,000	10,000
1,550		34,000	10,000
1,570		34,000	10,000
1,590	1/16	34,000	10,000
1,600		34,000	10,000
1,610		34,000	10,000
1,650		34,000	10,000
1,700		34,000	10,000
1,720		36,000	11,000
1,730		36,000	11,000
1,740		36,000	11,000
1,750		36,000	11,000
1,770		36,000	11,000
1,780		36,000	11,000
1,800		36,000	11,000
1,850		36,000	11,000
1,900		36,000	11,000
1,930		38,000	12,000
1,950		38,000	12,000
1,970		38,000	12,000
1,980	5/64	38,000	12,000
1,990		38,000	12,000
2,000		38,000	12,000
2,020		38,000	12,000
2,050		38,000	12,000
2,060		38,000	12,000
2,080		38,000	12,000
2,100		38,000	12,000
2,120		38,000	12,000
2,150		40,000	13,000
2,180		40,000	13,000
2,200		40,000	13,000
2,220		40,000	13,000
2,250		40,000	13,000
2,260		40,000	13,000
2,300		40,000	13,000



d1		l1	l2
mm	inch	mm	mm
2,350		40,000	13,000
2,370		43,000	14,000
2,380	3/32	43,000	14,000
2,400		43,000	14,000
2,420		43,000	14,000
2,440		43,000	14,000
2,450		43,000	14,000
2,480		43,000	14,000
2,490		43,000	14,000
2,500		43,000	14,000
2,520		43,000	14,000
2,530		43,000	14,000
2,550		43,000	14,000
2,580		43,000	14,000
2,600		43,000	14,000
2,640		43,000	14,000
2,650		43,000	14,000
2,700		46,000	16,000
2,710		46,000	16,000
2,750		46,000	16,000
2,780	7/64	46,000	16,000
2,790		46,000	16,000
2,800		46,000	16,000
2,820		46,000	16,000
2,850		46,000	16,000
2,870		46,000	16,000
2,900		46,000	16,000
2,920		46,000	16,000
2,950		46,000	16,000
2,970		46,000	16,000
3,000		46,000	16,000
3,020		49,000	18,000
3,050		49,000	18,000
3,100		49,000	18,000
3,150		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,220		49,000	18,000
3,250		49,000	18,000
3,260		49,000	18,000
3,300		49,000	18,000
3,350		49,000	18,000
3,400		52,000	20,000
3,450		52,000	20,000
3,500		52,000	20,000
3,550		52,000	20,000
3,570	9/64	52,000	20,000
3,580		52,000	20,000
3,600		52,000	20,000
3,650		52,000	20,000
3,660		52,000	20,000
3,700		52,000	20,000
3,730		52,000	20,000
3,750		52,000	20,000
3,800		55,000	22,000
3,850		55,000	22,000
3,860		55,000	22,000
3,900		55,000	22,000
3,910		55,000	22,000
3,950		55,000	22,000
3,960		55,000	22,000
3,970	5/32	55,000	22,000
3,990		55,000	22,000
4,000		55,000	22,000
4,020		55,000	22,000
4,040		55,000	22,000
4,050		55,000	22,000
4,080		55,000	22,000
4,090		55,000	22,000
4,100		55,000	22,000
4,150		55,000	22,000
4,200		55,000	22,000

d1		l1	l2
mm	inch	mm	mm
4,220		55,000	22,000
4,250		55,000	22,000
4,300		58,000	24,000
4,370	11/64	58,000	24,000
4,380		58,000	24,000
4,390		58,000	24,000
4,400		58,000	24,000
4,450		58,000	24,000
4,500		58,000	24,000
4,550		58,000	24,000
4,570		58,000	24,000
4,600		58,000	24,000
4,620		58,000	24,000
4,650		58,000	24,000
4,700		58,000	24,000
4,750		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,850		62,000	26,000
4,900		62,000	26,000
4,920		62,000	26,000
4,950		62,000	26,000
4,980		62,000	26,000
5,000		62,000	26,000
5,020		62,000	26,000
5,050		62,000	26,000
5,060		62,000	26,000
5,100		62,000	26,000
5,110		62,000	26,000
5,150		62,000	26,000
5,160	13/64	62,000	26,000
5,180		62,000	26,000
5,200		62,000	26,000
5,220		62,000	26,000
5,250		62,000	26,000
5,300		62,000	26,000
5,310		66,000	28,000
5,350		66,000	28,000
5,400		66,000	28,000
5,410		66,000	28,000
5,450		66,000	28,000
5,500		66,000	28,000
5,550		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,610		66,000	28,000
5,700		66,000	28,000
5,750		66,000	28,000
5,790		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
5,940		66,000	28,000
5,950	15/64	66,000	28,000
6,000		66,000	28,000
6,040		70,000	31,000
6,050		70,000	31,000
6,100		70,000	31,000
6,150		70,000	31,000
6,200		70,000	31,000
6,250		70,000	31,000
6,300		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,450		70,000	31,000
6,500		70,000	31,000
6,530		70,000	31,000
6,550		70,000	31,000
6,600		70,000	31,000
6,630		70,000	31,000
6,700		70,000	31,000
6,750	17/64	74,000	34,000
6,760		74,000	34,000



d1		l1	l2
mm	inch	mm	mm
6,800		74,000	34,000
6,850		74,000	34,000
6,900		74,000	34,000
6,950		74,000	34,000
7,000		74,000	34,000
7,030		74,000	34,000
7,050		74,000	34,000
7,100		74,000	34,000
7,140	9/32	74,000	34,000
7,150		74,000	34,000
7,200		74,000	34,000
7,250		74,000	34,000
7,300		74,000	34,000
7,370		74,000	34,000
7,400		74,000	34,000
7,450		74,000	34,000
7,490		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,550		79,000	37,000
7,600		79,000	37,000
7,670		79,000	37,000
7,700		79,000	37,000
7,750		79,000	37,000
7,800		79,000	37,000
7,850		79,000	37,000
7,900		79,000	37,000
7,940	5/16	79,000	37,000
8,000		79,000	37,000
8,030		79,000	37,000
8,050		79,000	37,000
8,100		79,000	37,000
8,150		79,000	37,000
8,200		79,000	37,000
8,250		79,000	37,000
8,300		79,000	37,000
8,330	21/64	79,000	37,000
8,400		79,000	37,000
8,430		79,000	37,000
8,450		79,000	37,000
8,500		79,000	37,000
8,550		84,000	40,000
8,600		84,000	40,000
8,610		84,000	40,000
8,650		84,000	40,000
8,700		84,000	40,000
8,730	11/32	84,000	40,000
8,750		84,000	40,000
8,800		84,000	40,000
8,840		84,000	40,000
8,900		84,000	40,000
8,950		84,000	40,000
9,000		84,000	40,000
9,050		84,000	40,000
9,090		84,000	40,000
9,100		84,000	40,000
9,130	23/64	84,000	40,000
9,150		84,000	40,000
9,200		84,000	40,000
9,250		84,000	40,000
9,270		84,000	40,000
9,300		84,000	40,000
9,340		84,000	40,000
9,350		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,520	3/8	89,000	43,000
9,580		89,000	43,000
9,600		89,000	43,000
9,650		89,000	43,000
9,700		89,000	43,000
9,750		89,000	43,000

d1		l1	l2
mm	inch	mm	mm
9,800		89,000	43,000
9,850		89,000	43,000
9,900		89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,050		89,000	43,000
10,080		89,000	43,000
10,100		89,000	43,000
10,150		89,000	43,000
10,200		89,000	43,000
10,250		89,000	43,000
10,260		89,000	43,000
10,300		89,000	43,000
10,320	13/32	89,000	43,000
10,400		89,000	43,000
10,490		89,000	43,000
10,500		89,000	43,000
10,600		89,000	43,000
10,700		95,000	47,000
10,720	27/64	95,000	47,000
10,750		95,000	47,000
10,800		95,000	47,000
10,900		95,000	47,000
11,000		95,000	47,000
11,100		95,000	47,000
11,110	7/16	95,000	47,000
11,200		95,000	47,000
11,250		95,000	47,000
11,300		95,000	47,000
11,400		95,000	47,000
11,500		95,000	47,000
11,510	29/64	95,000	47,000
11,600		95,000	47,000
11,700		95,000	47,000
11,750		95,000	47,000
11,800		95,000	47,000
11,900		102,000	51,000
11,910	15/32	102,000	51,000
12,000		102,000	51,000
12,050		102,000	51,000
12,100		102,000	51,000
12,150		102,000	51,000
12,200		102,000	51,000
12,250		102,000	51,000
12,300	31/64	102,000	51,000
12,400		102,000	51,000
12,500		102,000	51,000
12,600		102,000	51,000
12,700	1/2	102,000	51,000
12,750		102,000	51,000
12,800		102,000	51,000
12,900		102,000	51,000
13,000		102,000	51,000
13,100	33/64	102,000	51,000
13,200		102,000	51,000
13,250		107,000	54,000
13,300		107,000	54,000
13,400		107,000	54,000
13,490	17/32	107,000	54,000
13,500		107,000	54,000
13,600		107,000	54,000
13,700		107,000	54,000
13,750		107,000	54,000
13,800		107,000	54,000
13,890	35/64	107,000	54,000
14,000		107,000	54,000
14,100		111,000	56,000
14,200		111,000	56,000
14,290	9/16	111,000	56,000
14,300		111,000	56,000
14,400		111,000	56,000
14,500		111,000	56,000

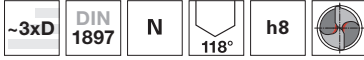


d1		l1	l2
mm	inch	mm	mm
14,600		111,000	56,000
14,680	37/64	111,000	56,000
14,700		111,000	56,000
14,750		111,000	56,000
14,800		111,000	56,000
14,900		111,000	56,000
15,000		111,000	56,000
15,080	19/32	115,000	58,000
15,100		115,000	58,000
15,200		115,000	58,000
15,250		115,000	58,000
15,400		115,000	58,000
15,480	39/64	115,000	58,000
15,500		115,000	58,000
15,600		115,000	58,000
15,700		115,000	58,000
15,750		115,000	58,000
15,800		115,000	58,000
15,870	5/8	115,000	58,000
16,000		115,000	58,000
16,100		119,000	60,000
16,150		119,000	60,000
16,200		119,000	60,000
16,250		119,000	60,000
16,270	41/64	119,000	60,000
16,300		119,000	60,000
16,500		119,000	60,000
16,670	21/32	119,000	60,000
16,750		119,000	60,000
17,000		119,000	60,000
17,070	43/64	123,000	62,000
17,100		123,000	62,000
17,200		123,000	62,000
17,250		123,000	62,000
17,460	11/16	123,000	62,000
17,500		123,000	62,000
17,600		123,000	62,000
17,750		123,000	62,000
17,860	45/64	123,000	62,000
18,000		123,000	62,000
18,100		127,000	64,000
18,200		127,000	64,000
18,250		127,000	64,000
18,260	23/32	127,000	64,000
18,500		127,000	64,000
18,650	47/64	127,000	64,000
18,750		127,000	64,000
19,000		127,000	64,000

d1		l1	l2
mm	inch	mm	mm
19,050	3/4	131,000	66,000
19,100		131,000	66,000
19,250		131,000	66,000
19,500		131,000	66,000
19,840	25/32	131,000	66,000
20,000		131,000	66,000
20,100		136,000	68,000
20,240	51/64	136,000	68,000
20,250		136,000	68,000
20,500		136,000	68,000
20,640	13/16	136,000	68,000
20,750		136,000	68,000
20,800		136,000	68,000
21,000		136,000	68,000
21,030	53/64	136,000	68,000
21,430	27/32	141,000	70,000
21,500		141,000	70,000
21,830	55/64	141,000	70,000
22,000		141,000	70,000
22,220	7/8	141,000	70,000
22,500		146,000	72,000
23,000		146,000	72,000
23,020	29/32	146,000	72,000
23,420	59/64	146,000	72,000
23,500		146,000	72,000
23,810	15/16	151,000	75,000
24,000		151,000	75,000
24,210	61/64	151,000	75,000
24,500		151,000	75,000
24,610	31/32	151,000	75,000
25,000	63/64	151,000	75,000
25,400	1	156,000	78,000
26,000		156,000	78,000
26,500		156,000	78,000
27,000		162,000	81,000
27,500		162,000	81,000
28,000		162,000	81,000
28,570	1 1/8	168,000	84,000
29,000		168,000	84,000
29,370	1 5/32	168,000	84,000
30,000		168,000	84,000
31,000		174,000	87,000
32,000		180,000	90,000
33,000		180,000	90,000
40,000		200,000	100,000
44,000		214,000	108,000



## Çok kısa helisel matkap uçları



**P** • öz bileme  $\geq \varnothing 1,000$  • koni bileme • el matkapları için de • otomat/revolver torna tezgahları için

**M**

**K** •

**N** ○ ince cidarlı malzemeler

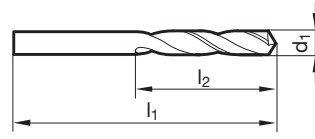
**S**

**H**

Malzeme **HSS**Yüzey **S**Kesme yönü **R****GÜHRING** NAVIGATOR

Kesme verileri sayfası 772

SİLİNDİR ŞAFTLI MATKAP UCU

Ürün no **653**

d1		l1	l2
mm	inch	mm	mm
0,500		20,000	3,000
0,600		21,000	3,500
0,700		23,000	4,500
0,750		23,000	4,500
0,790	1/32	24,000	5,000
0,800		24,000	5,000
0,900		25,000	5,500
1,000		26,000	6,000
1,020		26,000	6,000
1,050		26,000	6,000
1,070		28,000	7,000
1,090		28,000	7,000
1,100		28,000	7,000
1,110		28,000	7,000
1,120		28,000	7,000
1,150		28,000	7,000
1,180		28,000	7,000
1,190	3/64	30,000	8,000
1,200		30,000	8,000
1,250		30,000	8,000
1,300		30,000	8,000
1,320		30,000	8,000
1,350		32,000	9,000
1,400		32,000	9,000
1,450		32,000	9,000
1,500		32,000	9,000
1,510		34,000	10,000
1,550		34,000	10,000
1,590	1/16	34,000	10,000
1,600		34,000	10,000
1,610		34,000	10,000
1,650		34,000	10,000
1,700		34,000	10,000
1,750		36,000	11,000
1,780		36,000	11,000
1,800		36,000	11,000
1,850		36,000	11,000
1,900		36,000	11,000
1,930		38,000	12,000
1,950		38,000	12,000
1,980	5/64	38,000	12,000
1,990		38,000	12,000

d1		l1	l2
mm	inch	mm	mm
2,000		38,000	12,000
2,050		38,000	12,000
2,060		38,000	12,000
2,080		38,000	12,000
2,100		38,000	12,000
2,150		40,000	13,000
2,180		40,000	13,000
2,200		40,000	13,000
2,250		40,000	13,000
2,260		40,000	13,000
2,300		40,000	13,000
2,350		40,000	13,000
2,370		43,000	14,000
2,380	3/32	43,000	14,000
2,400		43,000	14,000
2,440		43,000	14,000
2,450		43,000	14,000
2,500		43,000	14,000
2,530		43,000	14,000
2,550		43,000	14,000
2,580		43,000	14,000
2,600		43,000	14,000
2,640		43,000	14,000
2,650		43,000	14,000
2,700		46,000	16,000
2,710		46,000	16,000
2,750		46,000	16,000
2,780	7/64	46,000	16,000
2,790		46,000	16,000
2,800		46,000	16,000
2,850		46,000	16,000
2,870		46,000	16,000
2,900		46,000	16,000
2,950		46,000	16,000
3,000		46,000	16,000
3,050		49,000	18,000
3,100		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,250		49,000	18,000
3,260		49,000	18,000
3,300		49,000	18,000



d1		l1	l2
mm	inch	mm	mm
3,400		52,000	20,000
3,450		52,000	20,000
3,500		52,000	20,000
3,550		52,000	20,000
3,570	9/64	52,000	20,000
3,600		52,000	20,000
3,650		52,000	20,000
3,660		52,000	20,000
3,700		52,000	20,000
3,730		52,000	20,000
3,750		52,000	20,000
3,800		55,000	22,000
3,860		55,000	22,000
3,900		55,000	22,000
3,970	5/32	55,000	22,000
3,990		55,000	22,000
4,000		55,000	22,000
4,040		55,000	22,000
4,050		55,000	22,000
4,090		55,000	22,000
4,100		55,000	22,000
4,150		55,000	22,000
4,200		55,000	22,000
4,250		55,000	22,000
4,300		58,000	24,000
4,370	11/64	58,000	24,000
4,390		58,000	24,000
4,400		58,000	24,000
4,500		58,000	24,000
4,570		58,000	24,000
4,600		58,000	24,000
4,620		58,000	24,000
4,650		58,000	24,000
4,700		58,000	24,000
4,750		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,850		62,000	26,000
4,900		62,000	26,000
4,920		62,000	26,000
4,950		62,000	26,000
4,980		62,000	26,000
5,000		62,000	26,000
5,050		62,000	26,000
5,060		62,000	26,000
5,100		62,000	26,000
5,110		62,000	26,000
5,160	13/64	62,000	26,000
5,180		62,000	26,000
5,200		62,000	26,000
5,250		62,000	26,000
5,300		62,000	26,000
5,310		66,000	28,000
5,400		66,000	28,000
5,410		66,000	28,000
5,450		66,000	28,000
5,500		66,000	28,000
5,520		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,610		66,000	28,000
5,700		66,000	28,000
5,750		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
5,950	15/64	66,000	28,000
6,000		66,000	28,000
6,040		70,000	31,000
6,050		70,000	31,000
6,100		70,000	31,000
6,150		70,000	31,000
6,200		70,000	31,000

d1		l1	l2
mm	inch	mm	mm
6,250		70,000	31,000
6,300		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,450		70,000	31,000
6,500		70,000	31,000
6,530		70,000	31,000
6,600		70,000	31,000
6,700		70,000	31,000
6,750	17/64	74,000	34,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,100		74,000	34,000
7,140	9/32	74,000	34,000
7,200		74,000	34,000
7,250		74,000	34,000
7,300		74,000	34,000
7,370		74,000	34,000
7,400		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,600		79,000	37,000
7,670		79,000	37,000
7,700		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000
7,940	5/16	79,000	37,000
8,000		79,000	37,000
8,030		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,250		79,000	37,000
8,300		79,000	37,000
8,330	21/64	79,000	37,000
8,400		79,000	37,000
8,430		79,000	37,000
8,500		79,000	37,000
8,550		84,000	40,000
8,600		84,000	40,000
8,610		84,000	40,000
8,700		84,000	40,000
8,730	11/32	84,000	40,000
8,750		84,000	40,000
8,800		84,000	40,000
8,900		84,000	40,000
9,000		84,000	40,000
9,090		84,000	40,000
9,100		84,000	40,000
9,130	23/64	84,000	40,000
9,200		84,000	40,000
9,250		84,000	40,000
9,300		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,520	3/8	89,000	43,000
9,580		89,000	43,000
9,700		89,000	43,000
9,800		89,000	43,000
9,900		89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,100		89,000	43,000
10,200		89,000	43,000
10,300		89,000	43,000
10,320	13/32	89,000	43,000
10,400		89,000	43,000
10,490		89,000	43,000
10,500		89,000	43,000
10,600		89,000	43,000
10,720	27/64	95,000	47,000
10,750		95,000	47,000



Silindir Şaftlı Matkap ucu

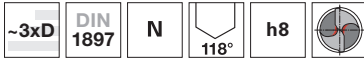
d1		l1	l2
mm	inch	mm	mm
10,800		95,000	47,000
11,000		95,000	47,000
11,110	7/16	95,000	47,000
11,200		95,000	47,000
11,300		95,000	47,000
11,400		95,000	47,000
11,500		95,000	47,000
11,510	29/64	95,000	47,000
11,750		95,000	47,000
11,800		95,000	47,000
11,900		102,000	51,000
11,910	15/32	102,000	51,000
12,000		102,000	51,000
12,100		102,000	51,000
12,200		102,000	51,000
12,300	31/64	102,000	51,000
12,500		102,000	51,000
12,700	1/2	102,000	51,000
12,800		102,000	51,000
13,000		102,000	51,000
13,100	33/64	102,000	51,000
13,490	17/32	107,000	54,000
13,500		107,000	54,000
13,700		107,000	54,000
13,800		107,000	54,000
13,890	35/64	107,000	54,000
14,000		107,000	54,000
14,200		111,000	56,000
14,290	9/16	111,000	56,000
14,500		111,000	56,000
14,800		111,000	56,000
14,900		111,000	56,000
15,000		111,000	56,000
15,080	19/32	115,000	58,000
15,250		115,000	58,000
15,500		115,000	58,000
15,800		115,000	58,000
15,870	5/8	115,000	58,000
16,000		115,000	58,000
16,250		119,000	60,000
16,270	41/64	119,000	60,000
16,500		119,000	60,000

d1		l1	l2
mm	inch	mm	mm
16,670	21/32	119,000	60,000
17,000		119,000	60,000
17,460	11/16	123,000	62,000
17,500		123,000	62,000
17,860	45/64	123,000	62,000
18,000		123,000	62,000
18,250		127,000	64,000
18,260	23/32	127,000	64,000
18,500		127,000	64,000
18,650	47/64	127,000	64,000
19,000		127,000	64,000
19,050	3/4	131,000	66,000
19,500		131,000	66,000
20,000		131,000	66,000
20,500		136,000	68,000
20,640	13/16	136,000	68,000
21,000		136,000	68,000
21,500		141,000	70,000
22,000		141,000	70,000
22,500		146,000	72,000
22,620	57/64	146,000	72,000
23,000		146,000	72,000
23,420	59/64	146,000	72,000
24,000		151,000	75,000
24,500		151,000	75,000
25,000	63/64	151,000	75,000
25,400	1	156,000	78,000
27,500		162,000	81,000
28,500		168,000	84,000
29,370	1 5/32	168,000	84,000
29,500		168,000	84,000
30,000		168,000	84,000
30,160	1 3/16	174,000	87,000





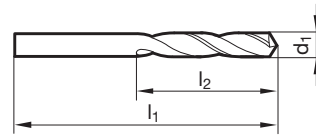
## Çok kısa helisel matkap uçları

Malzeme **HSS**Yüzey **F**Kesme yönü **R**

**P** • öz bileme  $\geq \varnothing 1,000$  • koni bileme • otomat/revolver torna tezgahları için  
• el matkapları için de

**M****K** •**N** • ince cidarlı malzemeler**S****H****GÜHRING** NAVIGATOR

Kesme verileri sayfası 772

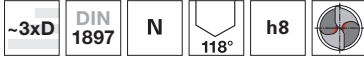
Ürün no **2460**SİLİNDİR ŞAFTLI MATKAP  
UCU

d1		l1	l2
mm	inch	mm	mm
1,000		26,000	6,000
1,100		28,000	7,000
1,200		30,000	8,000
1,300		30,000	8,000
2,000		38,000	12,000
2,200		40,000	13,000
2,500		43,000	14,000
2,600		43,000	14,000
2,700		46,000	16,000
2,800		46,000	16,000
2,900		46,000	16,000
3,000		46,000	16,000
3,100		49,000	18,000
3,300		49,000	18,000
3,400		52,000	20,000
3,600		52,000	20,000
3,700		52,000	20,000
3,900		55,000	22,000
4,000		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,300		58,000	24,000
4,500		58,000	24,000
4,600		58,000	24,000
4,700		58,000	24,000
4,800		62,000	26,000
4,900		62,000	26,000
5,000		62,000	26,000
5,200		62,000	26,000
5,300		62,000	26,000
5,400		66,000	28,000
5,500		66,000	28,000
5,700		66,000	28,000
5,900		66,000	28,000
6,000		66,000	28,000
6,100		70,000	31,000

d1		l1	l2
mm	inch	mm	mm
6,200		70,000	31,000
6,300		70,000	31,000
6,600		70,000	31,000
6,700		70,000	31,000
6,800		74,000	34,000
7,100		74,000	34,000
7,300		74,000	34,000
7,500		74,000	34,000
7,800		79,000	37,000
8,300		79,000	37,000
8,500		79,000	37,000
8,700		84,000	40,000
8,800		84,000	40,000
8,900		84,000	40,000
9,000		84,000	40,000
9,100		84,000	40,000
9,300		84,000	40,000
9,600		89,000	43,000
9,800		89,000	43,000
9,900		89,000	43,000
10,000		89,000	43,000
10,100		89,000	43,000
10,500		89,000	43,000
11,200		95,000	47,000
12,200		102,000	51,000
12,300	31/64	102,000	51,000
12,700	1/2	102,000	51,000
12,800		102,000	51,000
13,500		107,000	54,000
14,500		111,000	56,000
15,000		111,000	56,000



## Çok kısa helisel matkap uçları

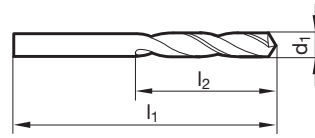
Malzeme **HSS**

Yüzey

Kesme yönü

**P** • öz bileme  $\geq \varnothing 14,050$  • koni bileme • otomat/revolver torna tezgahları için**M****K** •**N** ○ ince cidarlı malzemeler**S****H****GÜHRING** NAVIGATOR

Kesme verileri sayfası 772

SİLİNDİR ŞAFTLI MATKAP  
UCUÜrün no **226**

d1		l1	l2
mm	inch	mm	mm
0,320		19,000	2,000
0,500		20,000	3,000
0,550		21,000	3,500
0,580		21,000	3,500
0,620		22,000	4,000
0,650		22,000	4,000
0,700		23,000	4,500
0,740		23,000	4,500
0,750		23,000	4,500
0,800		24,000	5,000
0,810		24,000	5,000
0,850		24,000	5,000
0,875		25,000	5,500
0,890		25,000	5,500
0,900		25,000	5,500
0,950		25,000	5,500
0,970		26,000	6,000
0,975		26,000	6,000
1,000		26,000	6,000
1,020		26,000	6,000
1,030		26,000	6,000
1,040		26,000	6,000
1,050		26,000	6,000
1,060		26,000	6,000
1,070		28,000	7,000
1,090		28,000	7,000
1,100		28,000	7,000
1,150		28,000	7,000
1,190	3/64	30,000	8,000
1,200		30,000	8,000
1,220		30,000	8,000
1,250		30,000	8,000
1,320		30,000	8,000
1,330		32,000	9,000
1,350		32,000	9,000
1,450		32,000	9,000
1,500		32,000	9,000
1,510		34,000	10,000
1,550		34,000	10,000
1,580		34,000	10,000
1,590	1/16	34,000	10,000
1,600		34,000	10,000

d1		l1	l2
mm	inch	mm	mm
1,610		34,000	10,000
1,650		34,000	10,000
1,670		34,000	10,000
1,700		34,000	10,000
1,720		36,000	11,000
1,750		36,000	11,000
1,780		36,000	11,000
1,800		36,000	11,000
1,810		36,000	11,000
1,850		36,000	11,000
1,900		36,000	11,000
1,930		38,000	12,000
1,940		38,000	12,000
1,950		38,000	12,000
1,980	5/64	38,000	12,000
1,990		38,000	12,000
2,000		38,000	12,000
2,010		38,000	12,000
2,050		38,000	12,000
2,060		38,000	12,000
2,080		38,000	12,000
2,100		38,000	12,000
2,180		40,000	13,000
2,200		40,000	13,000
2,220		40,000	13,000
2,260		40,000	13,000
2,300		40,000	13,000
2,350		40,000	13,000
2,360		40,000	13,000
2,370		43,000	14,000
2,380	3/32	43,000	14,000
2,400		43,000	14,000
2,440		43,000	14,000
2,450		43,000	14,000
2,490		43,000	14,000
2,500		43,000	14,000
2,520		43,000	14,000
2,530		43,000	14,000
2,550		43,000	14,000
2,580		43,000	14,000
2,600		43,000	14,000
2,640		43,000	14,000



d1		l1	l2
mm	inch	mm	mm
2,650		43,000	14,000
2,700		46,000	16,000
2,710		46,000	16,000
2,720		46,000	16,000
2,800		46,000	16,000
2,820		46,000	16,000
2,870		46,000	16,000
2,880		46,000	16,000
2,900		46,000	16,000
3,000		46,000	16,000
3,020		49,000	18,000
3,050		49,000	18,000
3,100		49,000	18,000
3,150		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,230		49,000	18,000
3,250		49,000	18,000
3,300		49,000	18,000
3,330		49,000	18,000
3,400		52,000	20,000
3,420		52,000	20,000
3,450		52,000	20,000
3,480		52,000	20,000
3,500		52,000	20,000
3,530		52,000	20,000
3,700		52,000	20,000
3,710		52,000	20,000
3,720		52,000	20,000
3,730		52,000	20,000
3,750		52,000	20,000
3,770		55,000	22,000
3,800		55,000	22,000
3,840		55,000	22,000
3,850		55,000	22,000
3,860		55,000	22,000
3,910		55,000	22,000
3,950		55,000	22,000
3,970	5/32	55,000	22,000
3,990		55,000	22,000
4,000		55,000	22,000
4,020		55,000	22,000
4,030		55,000	22,000
4,033		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,220		55,000	22,000
4,230		55,000	22,000
4,250		55,000	22,000
4,290		58,000	24,000
4,300		58,000	24,000
4,350		58,000	24,000
4,370	11/64	58,000	24,000
4,400		58,000	24,000
4,450		58,000	24,000
4,500		58,000	24,000
4,520		58,000	24,000
4,560		58,000	24,000
4,570		58,000	24,000
4,600		58,000	24,000
4,620		58,000	24,000
4,700		58,000	24,000
4,750		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,850		62,000	26,000
4,920		62,000	26,000
4,930		62,000	26,000
4,950		62,000	26,000
4,970		62,000	26,000
4,980		62,000	26,000
5,000		62,000	26,000

d1		l1	l2
mm	inch	mm	mm
5,050		62,000	26,000
5,100		62,000	26,000
5,110		62,000	26,000
5,150		62,000	26,000
5,160	13/64	62,000	26,000
5,180		62,000	26,000
5,200		62,000	26,000
5,220		62,000	26,000
5,250		62,000	26,000
5,300		62,000	26,000
5,310		66,000	28,000
5,400		66,000	28,000
5,410		66,000	28,000
5,450		66,000	28,000
5,500		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,610		66,000	28,000
5,620		66,000	28,000
5,700		66,000	28,000
5,750		66,000	28,000
5,790		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
5,940		66,000	28,000
5,950	15/64	66,000	28,000
6,000		66,000	28,000
6,040		70,000	31,000
6,150		70,000	31,000
6,170		70,000	31,000
6,200		70,000	31,000
6,250		70,000	31,000
6,300		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,530		70,000	31,000
6,540		70,000	31,000
6,550		70,000	31,000
6,570		70,000	31,000
6,600		70,000	31,000
6,630		70,000	31,000
6,700		70,000	31,000
6,750	17/64	74,000	34,000
6,800		74,000	34,000
6,900		74,000	34,000
6,920		74,000	34,000
7,000		74,000	34,000
7,030		74,000	34,000
7,100		74,000	34,000
7,140	9/32	74,000	34,000
7,200		74,000	34,000
7,250		74,000	34,000
7,350		74,000	34,000
7,370		74,000	34,000
7,400		74,000	34,000
7,450		74,000	34,000
7,490		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,550		79,000	37,000
7,700		79,000	37,000
7,750		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000
7,940	5/16	79,000	37,000
8,000		79,000	37,000
8,030		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,300		79,000	37,000
8,330	21/64	79,000	37,000

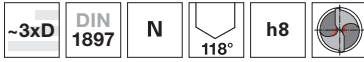


d1		l1	l2
mm	inch	mm	mm
8,500		79,000	37,000
8,600		84,000	40,000
8,700		84,000	40,000
8,730	11/32	84,000	40,000
8,800		84,000	40,000
8,840		84,000	40,000
8,850		84,000	40,000
8,900		84,000	40,000
9,000		84,000	40,000
9,090		84,000	40,000
9,130	23/64	84,000	40,000
9,150		84,000	40,000
9,300		84,000	40,000
9,340		84,000	40,000
9,350		84,000	40,000
9,500		84,000	40,000
9,520	3/8	89,000	43,000
9,580		89,000	43,000
9,700		89,000	43,000
9,750		89,000	43,000
9,900		89,000	43,000
10,000		89,000	43,000
10,050		89,000	43,000
10,080		89,000	43,000
10,100		89,000	43,000
10,200		89,000	43,000
10,300		89,000	43,000
10,320	13/32	89,000	43,000
10,490		89,000	43,000
10,500		89,000	43,000
10,600		89,000	43,000
10,800		95,000	47,000
11,000		95,000	47,000
11,110	7/16	95,000	47,000
11,200		95,000	47,000
11,250		95,000	47,000
11,500		95,000	47,000
11,510	29/64	95,000	47,000
11,750		95,000	47,000
11,800		95,000	47,000
12,000		102,000	51,000
12,200		102,000	51,000
12,450		102,000	51,000
12,500		102,000	51,000
12,700	1/2	102,000	51,000
12,900		102,000	51,000
13,000		102,000	51,000
13,200		102,000	51,000
13,250		107,000	54,000
13,750		107,000	54,000
13,890	35/64	107,000	54,000
14,000		107,000	54,000
14,050		111,000	56,000
14,200		111,000	56,000

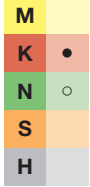
d1		l1	l2
mm	inch	mm	mm
14,250		111,000	56,000
14,290	9/16	111,000	56,000
14,500		111,000	56,000
14,700		111,000	56,000
15,000		111,000	56,000
15,200		115,000	58,000
15,480	39/64	115,000	58,000
15,600		115,000	58,000
15,750		115,000	58,000
15,870	5/8	115,000	58,000
16,000		115,000	58,000
16,200		119,000	60,000
16,500		119,000	60,000
16,670	21/32	119,000	60,000
17,000		119,000	60,000
17,070	43/64	123,000	62,000
17,750		123,000	62,000
18,000		123,000	62,000
18,500		127,000	64,000
19,050	3/4	131,000	66,000
19,840	25/32	131,000	66,000
20,000		131,000	66,000
20,640	13/16	136,000	68,000
21,000		136,000	68,000
21,250		141,000	70,000
21,750		141,000	70,000
21,830	55/64	141,000	70,000
22,000		141,000	70,000
22,400		141,000	70,000
23,000		146,000	72,000
24,000		151,000	75,000
25,500		156,000	78,000
26,190	1 1/32	156,000	78,000
26,590	1 3/64	162,000	81,000
26,990	1 1/16	162,000	81,000
27,380	1 5/64	162,000	81,000
29,000		168,000	84,000
30,960	1 7/32	174,000	87,000
31,500		174,000	87,000
32,150	1 17/64	180,000	90,000
32,940	1 19/64	180,000	90,000
33,000		180,000	90,000
34,500		186,000	93,000
34,920	1 3/8	186,000	93,000
36,000		193,000	96,000
37,000		193,000	96,000
40,000		200,000	100,000
45,000		214,000	108,000
48,000		228,000	116,000
50,000		228,000	116,000



## Çok kısa helisel matkap uçları

Malzeme **HSS**Yüzey **S**Kesme yönü **L**

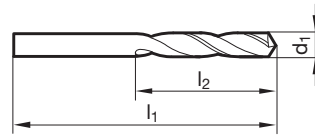
**P** • öz bileme  $\geq \varnothing 2,400$  • koni bileme • otomat/revolver torna tezgahları için



**N** ○ ince cidarlı malzemeler

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 772

Ürün no **672**

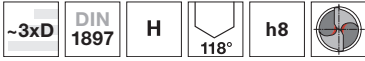
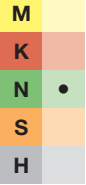
SİLİNDİR ŞAFTLI MATKAP UCU

d1		l1	l2
mm	inch	mm	mm
0,900		25,000	5,500
0,950		25,000	5,500
1,000		26,000	6,000
1,100		28,000	7,000
1,400		32,000	9,000
1,500		32,000	9,000
1,600		34,000	10,000
1,800		36,000	11,000
2,000		38,000	12,000
2,100		38,000	12,000
2,200		40,000	13,000
2,300		40,000	13,000
2,350		40,000	13,000
2,400		43,000	14,000
2,500		43,000	14,000
2,550		43,000	14,000
2,700		46,000	16,000
2,800		46,000	16,000
2,920		46,000	16,000
3,000		46,000	16,000
3,100		49,000	18,000
3,150		49,000	18,000
3,200		49,000	18,000
3,300		49,000	18,000
3,400		52,000	20,000
3,500		52,000	20,000
3,800		55,000	22,000
3,900		55,000	22,000
4,000		55,000	22,000
4,200		55,000	22,000
4,250		55,000	22,000
4,300		58,000	24,000
4,400		58,000	24,000
4,600		58,000	24,000
4,700		58,000	24,000
4,800		62,000	26,000

d1		l1	l2
mm	inch	mm	mm
4,900		62,000	26,000
5,000		62,000	26,000
5,200		62,000	26,000
5,600		66,000	28,000
5,700		66,000	28,000
5,900		66,000	28,000
6,000		66,000	28,000
6,100		70,000	31,000
6,200		70,000	31,000
6,500		70,000	31,000
6,800		74,000	34,000
6,900		74,000	34,000
7,500		74,000	34,000
7,900		79,000	37,000
8,000		79,000	37,000
8,500		79,000	37,000
8,700		84,000	40,000
8,800		84,000	40,000
9,000		84,000	40,000
9,500		84,000	40,000
9,800		89,000	43,000
10,000		89,000	43,000
11,000		95,000	47,000
11,500		95,000	47,000
12,500		102,000	51,000
12,700	1/2	102,000	51,000
13,000		102,000	51,000



## Çok kısa helisel matkap uçları

P öz bileme  $\geq \varnothing 14,500$  • koni bileme

• sert ve kırılğan malzemeler • pirinç, magnezyum alaşımları • bronz, fosforlu bronz • slate, mico, pertinax

Malzeme HSS

Yüzey



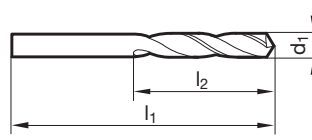
Kesme yönü



## GÜHRING NAVIGATOR

Kesme verileri sayfası 772

SİLİNDİR ŞAFTLI MATKAP UCU



Ürün no

224

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,690		23,000	4,500	3,000		46,000	16,000
0,900		25,000	5,500	3,100		49,000	18,000
0,950		25,000	5,500	3,170	1/8	49,000	18,000
1,000		26,000	6,000	3,200		49,000	18,000
1,100		28,000	7,000	3,250		49,000	18,000
1,190	3/64	30,000	8,000	3,300		49,000	18,000
1,200		30,000	8,000	3,350		49,000	18,000
1,300		30,000	8,000	3,400		52,000	20,000
1,400		32,000	9,000	3,500		52,000	20,000
1,500		32,000	9,000	3,570	9/64	52,000	20,000
1,550		34,000	10,000	3,600		52,000	20,000
1,590	1/16	34,000	10,000	3,650		52,000	20,000
1,600		34,000	10,000	3,700		52,000	20,000
1,620		34,000	10,000	3,800		55,000	22,000
1,700		34,000	10,000	3,850		55,000	22,000
1,780		36,000	11,000	3,900		55,000	22,000
1,800		36,000	11,000	3,970	5/32	55,000	22,000
1,850		36,000	11,000	4,000		55,000	22,000
1,900		36,000	11,000	4,050		55,000	22,000
1,950		38,000	12,000	4,100		55,000	22,000
1,980	5/64	38,000	12,000	4,200		55,000	22,000
2,000		38,000	12,000	4,250		55,000	22,000
2,020		38,000	12,000	4,300		58,000	24,000
2,050		38,000	12,000	4,370	11/64	58,000	24,000
2,100		38,000	12,000	4,400		58,000	24,000
2,200		40,000	13,000	4,450		58,000	24,000
2,250		40,000	13,000	4,500		58,000	24,000
2,300		40,000	13,000	4,600		58,000	24,000
2,350		40,000	13,000	4,700		58,000	24,000
2,370		43,000	14,000	4,760	3/16	62,000	26,000
2,380	3/32	43,000	14,000	4,800		62,000	26,000
2,400		43,000	14,000	4,900		62,000	26,000
2,450		43,000	14,000	5,000		62,000	26,000
2,500		43,000	14,000	5,100		62,000	26,000
2,550		43,000	14,000	5,200		62,000	26,000
2,600		43,000	14,000	5,300		62,000	26,000
2,650		43,000	14,000	5,400		66,000	28,000
2,700		46,000	16,000	5,500		66,000	28,000
2,780	7/64	46,000	16,000	5,560	7/32	66,000	28,000
2,800		46,000	16,000	5,600		66,000	28,000
2,900		46,000	16,000	5,700		66,000	28,000
2,950		46,000	16,000	5,800		66,000	28,000

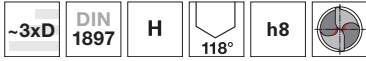


d1		l1	l2
mm	inch	mm	mm
5,900		66,000	28,000
5,950	15/64	66,000	28,000
6,000		66,000	28,000
6,100		70,000	31,000
6,200		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,600		70,000	31,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,140	9/32	74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,750		79,000	37,000
7,940	5/16	79,000	37,000
8,000		79,000	37,000
8,030		79,000	37,000
8,100		79,000	37,000
8,330	21/64	79,000	37,000
8,400		79,000	37,000
8,500		79,000	37,000
9,000		84,000	40,000

d1		l1	l2
mm	inch	mm	mm
9,200		84,000	40,000
9,500		84,000	40,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,320	13/32	89,000	43,000
10,500		89,000	43,000
10,720	27/64	95,000	47,000
11,000		95,000	47,000
11,110	7/16	95,000	47,000
11,500		95,000	47,000
11,910	15/32	102,000	51,000
12,000		102,000	51,000
12,500		102,000	51,000
13,000		102,000	51,000
14,000		107,000	54,000
14,500		111,000	56,000
15,000		111,000	56,000
16,000		115,000	58,000
17,000		119,000	60,000
18,000		123,000	62,000
19,000		127,000	64,000
20,000		131,000	66,000
21,000		136,000	68,000



## Çok kısa helisel matkap uçları

P öz bileme  $\geq \varnothing 15,000$  • koni bileme

• sert ve kırılğan malzemeler • pirinç, magnezyum alaşımları • bronz, fosforlu bronz • slate, mico, pertinax

## GÜHRING NAVIGATOR

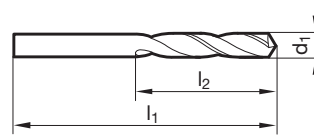
Kesme verileri sayfası 772

Malzeme HSS

Yüzey



Kesme yönü



Ürün no

227

d1		l1	l2
mm	inch	mm	mm
0,750		23,000	4,500
1,040		26,000	6,000
1,150		28,000	7,000
1,190	3/64	30,000	8,000
1,200		30,000	8,000
1,350		32,000	9,000
1,540		34,000	10,000
1,590	1/16	34,000	10,000
1,700		34,000	10,000
1,800		36,000	11,000
1,900		36,000	11,000
1,950		38,000	12,000
1,980	5/64	38,000	12,000
2,100		38,000	12,000
2,150		40,000	13,000
2,200		40,000	13,000
2,370		43,000	14,000
2,380	3/32	43,000	14,000
2,480		43,000	14,000
2,500		43,000	14,000
2,580		43,000	14,000
2,600		43,000	14,000
2,700		46,000	16,000
2,780	7/64	46,000	16,000
2,800		46,000	16,000
2,900		46,000	16,000
3,000		46,000	16,000
3,100		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,350		49,000	18,000
3,400		52,000	20,000
3,500		52,000	20,000
3,570	9/64	52,000	20,000
3,600		52,000	20,000
3,700		52,000	20,000
3,970	5/32	55,000	22,000
4,100		55,000	22,000
4,250		55,000	22,000
4,300		58,000	24,000
4,370	11/64	58,000	24,000
4,600		58,000	24,000

d1		l1	l2
mm	inch	mm	mm
4,700		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,900		62,000	26,000
5,000		62,000	26,000
5,100		62,000	26,000
5,150		62,000	26,000
5,160	13/64	62,000	26,000
5,300		62,000	26,000
5,400		66,000	28,000
5,500		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,700		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
5,950	15/64	66,000	28,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,600		70,000	31,000
6,750	17/64	74,000	34,000
7,000		74,000	34,000
7,140	9/32	74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,750		79,000	37,000
7,900		79,000	37,000
7,940	5/16	79,000	37,000
8,300		79,000	37,000
8,330	21/64	79,000	37,000
8,500		79,000	37,000
8,730	11/32	84,000	40,000
8,800		84,000	40,000
9,130	23/64	84,000	40,000
9,500		84,000	40,000
9,520	3/8	89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,320	13/32	89,000	43,000
10,720	27/64	95,000	47,000



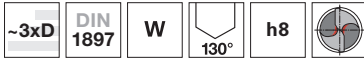


d1		l1	l2
mm	inch	mm	mm
11,000		95,000	47,000
11,110	7/16	95,000	47,000
11,510	29/64	95,000	47,000
11,910	15/32	102,000	51,000
13,500		107,000	54,000
15,000		111,000	56,000

d1		l1	l2
mm	inch	mm	mm
22,200		141,000	70,000
24,000		151,000	75,000



## Çok kısa helisel matkap uçları



P	öz bileme $\geq \varnothing 2,380$ • koni bileme
M	
K	
N	• yumuşak ve uzun talaş veren malzemelerde • Alüminyum/Al-alaşimleri (uzun talaşlı) • çinko, saflaştırılmış bakır, silumin, elektrotlar • yumuşak sentetik malzemeler, ahşap
S	
H	

Malzeme **HSS**

Yüzey

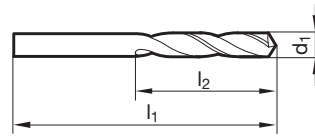


Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 772

SİLİNDİR ŞAFTLI MATKAP UCU



Ürün no

225

d1		l1	l2
mm	inch	mm	mm
1,000		26,000	6,000
1,100		28,000	7,000
1,190	3/64	30,000	8,000
1,200		30,000	8,000
1,300		30,000	8,000
1,400		32,000	9,000
1,500		32,000	9,000
1,590	1/16	34,000	10,000
1,600		34,000	10,000
1,700		34,000	10,000
1,800		36,000	11,000
1,900		36,000	11,000
1,980	5/64	38,000	12,000
2,000		38,000	12,000
2,100		38,000	12,000
2,200		40,000	13,000
2,250		40,000	13,000
2,300		40,000	13,000
2,380	3/32	43,000	14,000
2,400		43,000	14,000
2,500		43,000	14,000
2,550		43,000	14,000
2,600		43,000	14,000
2,700		46,000	16,000
2,710		46,000	16,000
2,750		46,000	16,000
2,780	7/64	46,000	16,000
2,800		46,000	16,000
2,900		46,000	16,000
3,000		46,000	16,000
3,050		49,000	18,000
3,100		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,300		49,000	18,000
3,400		52,000	20,000
3,500		52,000	20,000
3,570	9/64	52,000	20,000
3,700		52,000	20,000
3,800		55,000	22,000
3,900		55,000	22,000
3,970	5/32	55,000	22,000

d1		l1	l2
mm	inch	mm	mm
4,000		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,300		58,000	24,000
4,370	11/64	58,000	24,000
4,400		58,000	24,000
4,500		58,000	24,000
4,600		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,900		62,000	26,000
5,000		62,000	26,000
5,100		62,000	26,000
5,200		62,000	26,000
5,250		62,000	26,000
5,300		62,000	26,000
5,560	7/32	66,000	28,000
5,700		66,000	28,000
5,900		66,000	28,000
5,950	15/64	66,000	28,000
6,000		66,000	28,000
6,100		70,000	31,000
6,200		70,000	31,000
6,300		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,530		70,000	31,000
6,600		70,000	31,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,100		74,000	34,000
7,140	9/32	74,000	34,000
7,300		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,600		79,000	37,000
7,800		79,000	37,000
7,940	5/16	79,000	37,000
8,000		79,000	37,000
8,200		79,000	37,000



d1		l1	l2
mm	inch	mm	mm
8,330	21/64	79,000	37,000
8,400		79,000	37,000
8,430		79,000	37,000
8,500		79,000	37,000
8,600		84,000	40,000
8,700		84,000	40,000
8,730	11/32	84,000	40,000
8,900		84,000	40,000
9,000		84,000	40,000
9,130	23/64	84,000	40,000
9,200		84,000	40,000
9,400		84,000	40,000
9,520	3/8	89,000	43,000
9,800		89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,200		89,000	43,000
10,500		89,000	43,000

d1		l1	l2
mm	inch	mm	mm
10,720	27/64	95,000	47,000
11,000		95,000	47,000
11,110	7/16	95,000	47,000
12,000		102,000	51,000
12,100		102,000	51,000
12,500		102,000	51,000
12,700	1/2	102,000	51,000
12,800		102,000	51,000
13,000		102,000	51,000
14,500		111,000	56,000
15,000		111,000	56,000
16,000		115,000	58,000
17,500		123,000	62,000
18,000		123,000	62,000
19,050	3/4	131,000	66,000
19,750		131,000	66,000
20,000		131,000	66,000



## Çok kısa helisel matkap uçları



P	öz bileme $\geq \varnothing 2,380$ • koni bileme
M	
K	
N	• yumuşak ve uzun talaş veren malzemelerde • Alüminyum/Al-alaşimleri (uzun talaşlı) • çinko, saflaştırılmış bakır, silumin, elektrotlar • yumuşak sentetik malzemeler, ahşap
S	
H	

Malzeme **HSS**

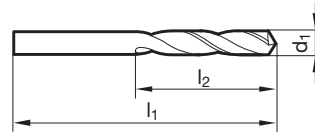
Yüzey

Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 772

SİLİNDİR ŞAFTLI MATKAP UCU

Ürün no **228**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		26,000	6,000	4,200		55,000	22,000
1,100		28,000	7,000	4,300		58,000	24,000
1,150		28,000	7,000	4,370	11/64	58,000	24,000
1,190	3/64	30,000	8,000	4,390		58,000	24,000
1,200		30,000	8,000	4,400		58,000	24,000
1,300		30,000	8,000	4,500		58,000	24,000
1,400		32,000	9,000	4,600		58,000	24,000
1,450		32,000	9,000	4,760	3/16	62,000	26,000
1,500		32,000	9,000	4,800		62,000	26,000
1,590	1/16	34,000	10,000	4,900		62,000	26,000
1,600		34,000	10,000	5,100		62,000	26,000
1,700		34,000	10,000	5,160	13/64	62,000	26,000
1,800		36,000	11,000	5,200		62,000	26,000
1,900		36,000	11,000	5,400		66,000	28,000
1,980	5/64	38,000	12,000	5,600		66,000	28,000
2,000		38,000	12,000	5,700		66,000	28,000
2,100		38,000	12,000	5,800		66,000	28,000
2,200		40,000	13,000	5,900		66,000	28,000
2,300		40,000	13,000	5,950	15/64	66,000	28,000
2,350		40,000	13,000	6,100		70,000	31,000
2,380	3/32	43,000	14,000	6,150		70,000	31,000
2,400		43,000	14,000	6,350	1/4	70,000	31,000
2,420		43,000	14,000	6,500		70,000	31,000
2,500		43,000	14,000	6,700		70,000	31,000
2,570		43,000	14,000	6,750	17/64	74,000	34,000
2,600		43,000	14,000	6,800		74,000	34,000
2,700		46,000	16,000	6,900		74,000	34,000
2,780	7/64	46,000	16,000	7,000		74,000	34,000
2,800		46,000	16,000	7,140	9/32	74,000	34,000
2,900		46,000	16,000	7,400		74,000	34,000
2,920		46,000	16,000	7,500		74,000	34,000
3,100		49,000	18,000	7,540	19/64	79,000	37,000
3,170	1/8	49,000	18,000	7,800		79,000	37,000
3,200		49,000	18,000	7,940	5/16	79,000	37,000
3,570	9/64	52,000	20,000	8,330	21/64	79,000	37,000
3,600		52,000	20,000	8,400		79,000	37,000
3,650		52,000	20,000	8,730	11/32	84,000	40,000
3,700		52,000	20,000	9,000		84,000	40,000
3,800		55,000	22,000	9,130	23/64	84,000	40,000
3,970	5/32	55,000	22,000	9,500		84,000	40,000
4,000		55,000	22,000	9,920	25/64	89,000	43,000
4,100		55,000	22,000	10,320	13/32	89,000	43,000



d1		l1	l2
mm	inch	mm	mm
10,500		89,000	43,000
10,720	27/64	95,000	47,000
11,110	7/16	95,000	47,000
11,500		95,000	47,000
11,910	15/32	102,000	51,000
12,300	31/64	102,000	51,000
12,500		102,000	51,000
12,700	1/2	102,000	51,000
12,800		102,000	51,000
13,000		102,000	51,000
13,500		107,000	54,000
14,000		107,000	54,000

d1		l1	l2
mm	inch	mm	mm
14,500		111,000	56,000
14,700		111,000	56,000
15,000		111,000	56,000
15,500		115,000	58,000
16,500		119,000	60,000
18,000		123,000	62,000
20,000		131,000	66,000



## Çok kısa helisel matkap uçları



**P** • öz bileme  $\geq \varnothing 1,000$  • koni bileme • daha yüksek mukavemetli çelikler için • kaplamasız  $< 2,36$  mm

**M** ○

**K** ○

**N** • otomat çelikleri • paslanmaz çelik/aside dayanıklı •  $800 \text{ N/mm}^2$ 'ye kadar sementasyon ve ıslah çelikleri • kısa/orta talaşlı Al- ve Cu-alaşimleri.

**S** ○

**H** ○

Malzeme **HSS**

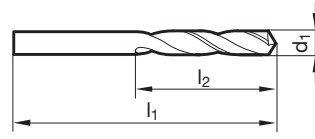
Yüzey

Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 772

SİLİNDİR ŞAFTLI MATKAP UCU

Ürün no **552**

d1		l1	l2
mm	inch	mm	mm
1,000		26,000	6,000
1,020		26,000	6,000
1,040		26,000	6,000
1,050		26,000	6,000
1,070		28,000	7,000
1,090		28,000	7,000
1,100		28,000	7,000
1,150		28,000	7,000
1,180		28,000	7,000
1,190	3/64	30,000	8,000
1,200		30,000	8,000
1,250		30,000	8,000
1,300		30,000	8,000
1,320		30,000	8,000
1,350		32,000	9,000
1,400		32,000	9,000
1,450		32,000	9,000
1,500		32,000	9,000
1,510		34,000	10,000
1,530		34,000	10,000
1,550		34,000	10,000
1,590	1/16	34,000	10,000
1,600		34,000	10,000
1,610		34,000	10,000
1,650		34,000	10,000
1,700		34,000	10,000
1,750		36,000	11,000
1,780		36,000	11,000
1,800		36,000	11,000
1,820		36,000	11,000
1,850		36,000	11,000
1,900		36,000	11,000
1,930		38,000	12,000
1,950		38,000	12,000
1,980	5/64	38,000	12,000
1,990		38,000	12,000
2,000		38,000	12,000
2,050		38,000	12,000
2,060		38,000	12,000
2,080		38,000	12,000
2,100		38,000	12,000
2,130		40,000	13,000

d1		l1	l2
mm	inch	mm	mm
2,150		40,000	13,000
2,180		40,000	13,000
2,200		40,000	13,000
2,250		40,000	13,000
2,260		40,000	13,000
2,300		40,000	13,000
2,320		40,000	13,000
2,350		40,000	13,000
2,370		43,000	14,000
2,380	3/32	43,000	14,000
2,400		43,000	14,000
2,440		43,000	14,000
2,450		43,000	14,000
2,490		43,000	14,000
2,500		43,000	14,000
2,530		43,000	14,000
2,550		43,000	14,000
2,580		43,000	14,000
2,600		43,000	14,000
2,640		43,000	14,000
2,650		43,000	14,000
2,700		46,000	16,000
2,710		46,000	16,000
2,750		46,000	16,000
2,780	7/64	46,000	16,000
2,790		46,000	16,000
2,800		46,000	16,000
2,820		46,000	16,000
2,850		46,000	16,000
2,870		46,000	16,000
2,900		46,000	16,000
2,950		46,000	16,000
3,000		46,000	16,000
3,050		49,000	18,000
3,100		49,000	18,000
3,150		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,250		49,000	18,000
3,260		49,000	18,000
3,300		49,000	18,000
3,350		49,000	18,000



d1		l1	l2
mm	inch	mm	mm
3,400		52,000	20,000
3,450		52,000	20,000
3,500		52,000	20,000
3,550		52,000	20,000
3,570	9/64	52,000	20,000
3,600		52,000	20,000
3,650		52,000	20,000
3,660		52,000	20,000
3,700		52,000	20,000
3,730		52,000	20,000
3,750		52,000	20,000
3,800		55,000	22,000
3,850		55,000	22,000
3,860		55,000	22,000
3,900		55,000	22,000
3,910		55,000	22,000
3,950		55,000	22,000
3,970	5/32	55,000	22,000
3,990		55,000	22,000
4,000		55,000	22,000
4,040		55,000	22,000
4,050		55,000	22,000
4,090		55,000	22,000
4,100		55,000	22,000
4,150		55,000	22,000
4,200		55,000	22,000
4,220		55,000	22,000
4,250		55,000	22,000
4,300		58,000	24,000
4,350		58,000	24,000
4,370	11/64	58,000	24,000
4,390		58,000	24,000
4,400		58,000	24,000
4,450		58,000	24,000
4,500		58,000	24,000
4,550		58,000	24,000
4,570		58,000	24,000
4,600		58,000	24,000
4,620		58,000	24,000
4,650		58,000	24,000
4,700		58,000	24,000
4,750		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,850		62,000	26,000
4,900		62,000	26,000
4,920		62,000	26,000
4,950		62,000	26,000
4,980		62,000	26,000
5,000		62,000	26,000
5,050		62,000	26,000
5,060		62,000	26,000
5,100		62,000	26,000
5,110		62,000	26,000
5,160	13/64	62,000	26,000
5,180		62,000	26,000
5,200		62,000	26,000
5,220		62,000	26,000
5,300		62,000	26,000
5,310		66,000	28,000
5,400		66,000	28,000
5,410		66,000	28,000
5,500		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,610		66,000	28,000
5,700		66,000	28,000
5,790		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
5,940		66,000	28,000
5,950	15/64	66,000	28,000

d1		l1	l2
mm	inch	mm	mm
6,000		66,000	28,000
6,040		70,000	31,000
6,100		70,000	31,000
6,150		70,000	31,000
6,200		70,000	31,000
6,250		70,000	31,000
6,300		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,530		70,000	31,000
6,600		70,000	31,000
6,630		70,000	31,000
6,700		70,000	31,000
6,750	17/64	74,000	34,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,030		74,000	34,000
7,100		74,000	34,000
7,140	9/32	74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,370		74,000	34,000
7,400		74,000	34,000
7,490		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,600		79,000	37,000
7,670		79,000	37,000
7,700		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000
7,940	5/16	79,000	37,000
8,000		79,000	37,000
8,030		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,300		79,000	37,000
8,330	21/64	79,000	37,000
8,400		79,000	37,000
8,430		79,000	37,000
8,500		79,000	37,000
8,600		84,000	40,000
8,610		84,000	40,000
8,700		84,000	40,000
8,730	11/32	84,000	40,000
8,800		84,000	40,000
8,840		84,000	40,000
8,900		84,000	40,000
9,000		84,000	40,000
9,090		84,000	40,000
9,100		84,000	40,000
9,130	23/64	84,000	40,000
9,200		84,000	40,000
9,300		84,000	40,000
9,340		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,520	3/8	89,000	43,000
9,580		89,000	43,000
9,600		89,000	43,000
9,700		89,000	43,000
9,800		89,000	43,000
9,900		89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,080		89,000	43,000
10,200		89,000	43,000
10,260		89,000	43,000
10,320	13/32	89,000	43,000
10,490		89,000	43,000



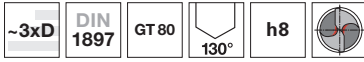
d1		l1	l2
mm	inch	mm	mm
10,500		89,000	43,000
10,600		89,000	43,000
10,720	27/64	95,000	47,000
10,800		95,000	47,000
11,000		95,000	47,000
11,110	7/16	95,000	47,000
11,200		95,000	47,000
11,300		95,000	47,000
11,400		95,000	47,000
11,500		95,000	47,000
11,510	29/64	95,000	47,000
11,800		95,000	47,000
11,910	15/32	102,000	51,000
12,000		102,000	51,000
12,300	31/64	102,000	51,000
12,400		102,000	51,000
12,500		102,000	51,000
12,700	1/2	102,000	51,000
12,900		102,000	51,000
13,000		102,000	51,000
13,100	33/64	102,000	51,000
13,490	17/32	107,000	54,000
13,500		107,000	54,000
13,890	35/64	107,000	54,000

d1		l1	l2
mm	inch	mm	mm
14,000		107,000	54,000
14,290	9/16	111,000	56,000
14,500		111,000	56,000
14,680	37/64	111,000	56,000
15,000		111,000	56,000
15,080	19/32	115,000	58,000
15,480	39/64	115,000	58,000
15,500		115,000	58,000
15,870	5/8	115,000	58,000
16,000		115,000	58,000
16,270	41/64	119,000	60,000
16,500		119,000	60,000
17,000		119,000	60,000
17,070	43/64	123,000	62,000
17,460	11/16	123,000	62,000
17,860	45/64	123,000	62,000
18,000		123,000	62,000
18,260	23/32	127,000	64,000
19,000		127,000	64,000
19,050	3/4	131,000	66,000
19,840	25/32	131,000	66,000
20,000		131,000	66,000





## Çok kısa helisel matkap uçları



**P** • öz bileme  $\geq \varnothing 1,000$  • koni bileme • daha yüksek mukavemetli çelikler için • kaplamasız  $< 2,36$  mm

**M** ○

**K** ○

**N** • otomat çelikleri • paslanmaz çelik/aside dayanıklı •  $800 \text{ N/mm}^2$ 'ye kadar sementasyon ve ıslah çelikleri • kısa/orta talaşlı Al- ve Cu-alaşımları.

**S** ○

**H** ○

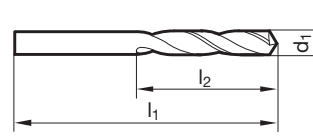
Malzeme **HSS**

Yüzey  $\geq \varnothing 16,0$

Kesme yönü

## GÜHRING NAVIGATOR

Kesme verileri sayfası 772



Ürün no **553**

d1		l1	l2
mm	inch	mm	mm
1,000		26,000	6,000
1,020		26,000	6,000
1,070		28,000	7,000
1,090		28,000	7,000
1,100		28,000	7,000
1,150		28,000	7,000
1,180		28,000	7,000
1,190	3/64	30,000	8,000
1,200		30,000	8,000
1,250		30,000	8,000
1,300		30,000	8,000
1,320		30,000	8,000
1,350		32,000	9,000
1,400		32,000	9,000
1,450		32,000	9,000
1,500		32,000	9,000
1,510		34,000	10,000
1,550		34,000	10,000
1,590	1/16	34,000	10,000
1,600		34,000	10,000
1,610		34,000	10,000
1,650		34,000	10,000
1,700		34,000	10,000
1,750		36,000	11,000
1,780		36,000	11,000
1,800		36,000	11,000
1,850		36,000	11,000
1,900		36,000	11,000
1,930		38,000	12,000
1,950		38,000	12,000
1,980	5/64	38,000	12,000
1,990		38,000	12,000
2,000		38,000	12,000
2,050		38,000	12,000
2,060		38,000	12,000
2,080		38,000	12,000
2,100		38,000	12,000
2,180		40,000	13,000
2,200		40,000	13,000
2,250		40,000	13,000
2,260		40,000	13,000
2,300		40,000	13,000

d1		l1	l2
mm	inch	mm	mm
2,350		40,000	13,000
2,380	3/32	43,000	14,000
2,400		43,000	14,000
2,440		43,000	14,000
2,490		43,000	14,000
2,500		43,000	14,000
2,530		43,000	14,000
2,550		43,000	14,000
2,580		43,000	14,000
2,600		43,000	14,000
2,640		43,000	14,000
2,700		46,000	16,000
2,710		46,000	16,000
2,750		46,000	16,000
2,780	7/64	46,000	16,000
2,790		46,000	16,000
2,800		46,000	16,000
2,820		46,000	16,000
2,850		46,000	16,000
2,870		46,000	16,000
2,900		46,000	16,000
2,950		46,000	16,000
3,000		46,000	16,000
3,050		49,000	18,000
3,100		49,000	18,000
3,150		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,250		49,000	18,000
3,260		49,000	18,000
3,300		49,000	18,000
3,350		49,000	18,000
3,400		52,000	20,000
3,450		52,000	20,000
3,500		52,000	20,000
3,570	9/64	52,000	20,000
3,600		52,000	20,000
3,650		52,000	20,000
3,660		52,000	20,000
3,680		52,000	20,000
3,700		52,000	20,000
3,750		52,000	20,000



d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
3,800		55,000	22,000	7,030		74,000	34,000
3,850		55,000	22,000	7,140	9/32	74,000	34,000
3,860		55,000	22,000	7,300		74,000	34,000
3,900		55,000	22,000	7,370		74,000	34,000
3,910		55,000	22,000	7,400		74,000	34,000
3,950		55,000	22,000	7,490		74,000	34,000
3,970	5/32	55,000	22,000	7,500		74,000	34,000
3,990		55,000	22,000	7,540	19/64	79,000	37,000
4,000		55,000	22,000	7,600		79,000	37,000
4,040		55,000	22,000	7,670		79,000	37,000
4,050		55,000	22,000	7,700		79,000	37,000
4,090		55,000	22,000	7,940	5/16	79,000	37,000
4,100		55,000	22,000	8,000		79,000	37,000
4,150		55,000	22,000	8,200		79,000	37,000
4,200		55,000	22,000	8,330	21/64	79,000	37,000
4,220		55,000	22,000	8,430		79,000	37,000
4,250		55,000	22,000	8,500		79,000	37,000
4,300		58,000	24,000	8,600		84,000	40,000
4,370	11/64	58,000	24,000	8,610		84,000	40,000
4,390		58,000	24,000	8,730	11/32	84,000	40,000
4,400		58,000	24,000	8,840		84,000	40,000
4,450		58,000	24,000	9,000		84,000	40,000
4,500		58,000	24,000	9,090		84,000	40,000
4,550		58,000	24,000	9,130	23/64	84,000	40,000
4,570		58,000	24,000	9,340		84,000	40,000
4,600		58,000	24,000	9,400		84,000	40,000
4,620		58,000	24,000	9,500		84,000	40,000
4,650		58,000	24,000	9,520	3/8	89,000	43,000
4,700		58,000	24,000	9,580		89,000	43,000
4,760	3/16	62,000	26,000	9,600		89,000	43,000
4,800		62,000	26,000	9,700		89,000	43,000
4,850		62,000	26,000	9,800		89,000	43,000
4,900		62,000	26,000	9,900		89,000	43,000
4,920		62,000	26,000	9,920	25/64	89,000	43,000
4,950		62,000	26,000	10,000		89,000	43,000
4,980		62,000	26,000	10,200		89,000	43,000
5,000		62,000	26,000	10,260		89,000	43,000
5,060		62,000	26,000	10,320	13/32	89,000	43,000
5,100		62,000	26,000	10,490		89,000	43,000
5,110		62,000	26,000	10,500		89,000	43,000
5,160	13/64	62,000	26,000	10,700		95,000	47,000
5,180		62,000	26,000	10,720	27/64	95,000	47,000
5,200		62,000	26,000	10,900		95,000	47,000
5,220		62,000	26,000	11,000		95,000	47,000
5,300		62,000	26,000	11,100		95,000	47,000
5,500		66,000	28,000	11,110	7/16	95,000	47,000
5,560	7/32	66,000	28,000	11,500		95,000	47,000
5,600		66,000	28,000	11,510	29/64	95,000	47,000
5,610		66,000	28,000	11,800		95,000	47,000
5,700		66,000	28,000	11,910	15/32	102,000	51,000
5,790		66,000	28,000	12,000		102,000	51,000
5,800		66,000	28,000	12,300	31/64	102,000	51,000
5,900		66,000	28,000	12,500		102,000	51,000
5,940		66,000	28,000	12,700	1/2	102,000	51,000
5,950	15/64	66,000	28,000	12,800		102,000	51,000
6,000		66,000	28,000	13,000		102,000	51,000
6,050		70,000	31,000	13,100	33/64	102,000	51,000
6,100		70,000	31,000	13,490	17/32	107,000	54,000
6,150		70,000	31,000	13,500		107,000	54,000
6,200		70,000	31,000	13,890	35/64	107,000	54,000
6,250		70,000	31,000	14,000		107,000	54,000
6,350	1/4	70,000	31,000	14,250		111,000	56,000
6,400		70,000	31,000	14,290	9/16	111,000	56,000
6,500		70,000	31,000	14,500		111,000	56,000
6,530		70,000	31,000	14,680	37/64	111,000	56,000
6,600		70,000	31,000	15,000		111,000	56,000
6,630		70,000	31,000	15,080	19/32	115,000	58,000
6,700		70,000	31,000	15,480	39/64	115,000	58,000
6,750	17/64	74,000	34,000	15,500		115,000	58,000
6,800		74,000	34,000	15,870	5/8	115,000	58,000
6,900		74,000	34,000	16,000		115,000	58,000
7,000		74,000	34,000	16,270	41/64	119,000	60,000

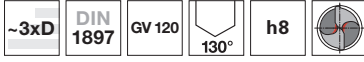


d1		l1	l2
mm	inch	mm	mm
17,070	43/64	123,000	62,000
17,460	11/16	123,000	62,000
17,860	45/64	123,000	62,000
18,000		123,000	62,000
18,260	23/32	127,000	64,000
18,500		127,000	64,000

d1		l1	l2
mm	inch	mm	mm
18,650	47/64	127,000	64,000
19,000		127,000	64,000
19,500		131,000	66,000
19,840	25/32	131,000	66,000



## Çok kısa helisel matkap uçları



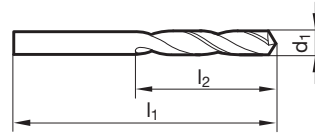
<b>P</b>	•	öz bileme $\geq \varnothing 1,000$ • koni bileme • Co-alaşımlı HSS-çeliği • artırılmış aşınma direnci
<b>M</b>	•	
<b>K</b>	•	
<b>N</b>	○	paslanmaz çelik/aside dayanıklı • yay çelikleri • ostenitik paslanmaz çelikler • Hastelloy, Inconel, Nimonic
<b>S</b>	•	
<b>H</b>	○	

Malzeme	<b>HSCO</b>
Yüzey	
Kesme yönü	

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 772

SİLİNDİR ŞAFTLI MATKAP UCU



Ürün no 329

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,400	1/64	19,000	2,500	1,200		30,000	8,000
0,500		20,000	3,000	1,210		30,000	8,000
0,510		20,000	3,000	1,230		30,000	8,000
0,520		20,000	3,000	1,250		30,000	8,000
0,550		21,000	3,500	1,280		30,000	8,000
0,570		21,000	3,500	1,300		30,000	8,000
0,580		21,000	3,500	1,320		30,000	8,000
0,590		21,000	3,500	1,330		32,000	9,000
0,600		21,000	3,500	1,350		32,000	9,000
0,610		22,000	4,000	1,370		32,000	9,000
0,640		22,000	4,000	1,400		32,000	9,000
0,650		22,000	4,000	1,450		32,000	9,000
0,700		23,000	4,500	1,470		32,000	9,000
0,730		23,000	4,500	1,500		32,000	9,000
0,740		23,000	4,500	1,510		34,000	10,000
0,750		23,000	4,500	1,550		34,000	10,000
0,790	1/32	24,000	5,000	1,570		34,000	10,000
0,800		24,000	5,000	1,590	1/16	34,000	10,000
0,810		24,000	5,000	1,600		34,000	10,000
0,820		24,000	5,000	1,610		34,000	10,000
0,840		24,000	5,000	1,630		34,000	10,000
0,850		24,000	5,000	1,650		34,000	10,000
0,860		25,000	5,500	1,680		34,000	10,000
0,870		25,000	5,500	1,700		34,000	10,000
0,900		25,000	5,500	1,730		36,000	11,000
0,910		25,000	5,500	1,750		36,000	11,000
0,940		25,000	5,500	1,780		36,000	11,000
0,950		25,000	5,500	1,800		36,000	11,000
0,960		26,000	6,000	1,820		36,000	11,000
0,970		26,000	6,000	1,830		36,000	11,000
0,990		26,000	6,000	1,850		36,000	11,000
1,000		26,000	6,000	1,900		36,000	11,000
1,020		26,000	6,000	1,930		38,000	12,000
1,030		26,000	6,000	1,950		38,000	12,000
1,050		26,000	6,000	1,970		38,000	12,000
1,070		28,000	7,000	1,980	5/64	38,000	12,000
1,090		28,000	7,000	1,990		38,000	12,000
1,100		28,000	7,000	2,000		38,000	12,000
1,150		28,000	7,000	2,030		38,000	12,000
1,170		28,000	7,000	2,050		38,000	12,000
1,180		28,000	7,000	2,060		38,000	12,000
1,190	3/64	30,000	8,000	2,080		38,000	12,000



d1		l1	l2
mm	inch	mm	mm
2,100		38,000	12,000
2,150		40,000	13,000
2,180		40,000	13,000
2,200		40,000	13,000
2,250		40,000	13,000
2,260		40,000	13,000
2,300		40,000	13,000
2,320		40,000	13,000
2,350		40,000	13,000
2,360		40,000	13,000
2,370		43,000	14,000
2,380	3/32	43,000	14,000
2,400		43,000	14,000
2,420		43,000	14,000
2,440		43,000	14,000
2,450		43,000	14,000
2,470		43,000	14,000
2,490		43,000	14,000
2,500		43,000	14,000
2,520		43,000	14,000
2,530		43,000	14,000
2,550		43,000	14,000
2,580		43,000	14,000
2,600		43,000	14,000
2,640		43,000	14,000
2,650		43,000	14,000
2,700		46,000	16,000
2,710		46,000	16,000
2,750		46,000	16,000
2,780	7/64	46,000	16,000
2,790		46,000	16,000
2,800		46,000	16,000
2,820		46,000	16,000
2,830		46,000	16,000
2,850		46,000	16,000
2,870		46,000	16,000
2,900		46,000	16,000
2,950		46,000	16,000
3,000		46,000	16,000
3,020		49,000	18,000
3,050		49,000	18,000
3,100		49,000	18,000
3,150		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,250		49,000	18,000
3,260		49,000	18,000
3,300		49,000	18,000
3,350		49,000	18,000
3,400		52,000	20,000
3,450		52,000	20,000
3,500		52,000	20,000
3,520		52,000	20,000
3,550		52,000	20,000
3,570	9/64	52,000	20,000
3,600		52,000	20,000
3,660		52,000	20,000
3,700		52,000	20,000
3,730		52,000	20,000
3,750		52,000	20,000
3,800		55,000	22,000
3,850		55,000	22,000
3,860		55,000	22,000
3,900		55,000	22,000
3,910		55,000	22,000
3,950		55,000	22,000
3,970	5/32	55,000	22,000
3,990		55,000	22,000
4,000		55,000	22,000
4,040		55,000	22,000
4,050		55,000	22,000
4,090		55,000	22,000

d1		l1	l2
mm	inch	mm	mm
4,100		55,000	22,000
4,150		55,000	22,000
4,200		55,000	22,000
4,220		55,000	22,000
4,250		55,000	22,000
4,300		58,000	24,000
4,350		58,000	24,000
4,370	11/64	58,000	24,000
4,390		58,000	24,000
4,400		58,000	24,000
4,450		58,000	24,000
4,500		58,000	24,000
4,550		58,000	24,000
4,570		58,000	24,000
4,600		58,000	24,000
4,620		58,000	24,000
4,650		58,000	24,000
4,700		58,000	24,000
4,750		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,850		62,000	26,000
4,900		62,000	26,000
4,920		62,000	26,000
4,950		62,000	26,000
4,980		62,000	26,000
5,000		62,000	26,000
5,020		62,000	26,000
5,050		62,000	26,000
5,060		62,000	26,000
5,100		62,000	26,000
5,110		62,000	26,000
5,150		62,000	26,000
5,160	13/64	62,000	26,000
5,180		62,000	26,000
5,200		62,000	26,000
5,220		62,000	26,000
5,250		62,000	26,000
5,300		62,000	26,000
5,310		66,000	28,000
5,350		66,000	28,000
5,400		66,000	28,000
5,410		66,000	28,000
5,450		66,000	28,000
5,500		66,000	28,000
5,550		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,610		66,000	28,000
5,700		66,000	28,000
5,750		66,000	28,000
5,790		66,000	28,000
5,800		66,000	28,000
5,850		66,000	28,000
5,900		66,000	28,000
5,940		66,000	28,000
5,950	15/64	66,000	28,000
6,000		66,000	28,000
6,040		70,000	31,000
6,050		70,000	31,000
6,100		70,000	31,000
6,150		70,000	31,000
6,200		70,000	31,000
6,250		70,000	31,000
6,300		70,000	31,000
6,320		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,450		70,000	31,000
6,500		70,000	31,000
6,530		70,000	31,000
6,550		70,000	31,000



d1		l1	l2
mm	inch	mm	mm
6,600		70,000	31,000
6,630		70,000	31,000
6,700		70,000	31,000
6,750	17/64	74,000	34,000
6,800		74,000	34,000
6,850		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,030		74,000	34,000
7,050		74,000	34,000
7,100		74,000	34,000
7,140	9/32	74,000	34,000
7,200		74,000	34,000
7,250		74,000	34,000
7,300		74,000	34,000
7,350		74,000	34,000
7,370		74,000	34,000
7,400		74,000	34,000
7,490		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,550		79,000	37,000
7,600		79,000	37,000
7,670		79,000	37,000
7,700		79,000	37,000
7,750		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000
7,940	5/16	79,000	37,000
8,000		79,000	37,000
8,030		79,000	37,000
8,050		79,000	37,000
8,100		79,000	37,000
8,150		79,000	37,000
8,200		79,000	37,000
8,250		79,000	37,000
8,300		79,000	37,000
8,330	21/64	79,000	37,000
8,400		79,000	37,000
8,430		79,000	37,000
8,500		79,000	37,000
8,520		84,000	40,000
8,550		84,000	40,000
8,600		84,000	40,000
8,610		84,000	40,000
8,700		84,000	40,000
8,730	11/32	84,000	40,000
8,750		84,000	40,000
8,800		84,000	40,000
8,840		84,000	40,000
8,900		84,000	40,000
9,000		84,000	40,000
9,050		84,000	40,000
9,090		84,000	40,000
9,100		84,000	40,000
9,130	23/64	84,000	40,000
9,200		84,000	40,000
9,250		84,000	40,000
9,300		84,000	40,000
9,340		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,520	3/8	89,000	43,000
9,580		89,000	43,000
9,600		89,000	43,000
9,700		89,000	43,000
9,750		89,000	43,000
9,800		89,000	43,000
9,900		89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,050		89,000	43,000

d1		l1	l2
mm	inch	mm	mm
10,080		89,000	43,000
10,100		89,000	43,000
10,200		89,000	43,000
10,300		89,000	43,000
10,320	13/32	89,000	43,000
10,400		89,000	43,000
10,490		89,000	43,000
10,500		89,000	43,000
10,600		89,000	43,000
10,700		95,000	47,000
10,720	27/64	95,000	47,000
10,800		95,000	47,000
10,900		95,000	47,000
11,000		95,000	47,000
11,100		95,000	47,000
11,110	7/16	95,000	47,000
11,200		95,000	47,000
11,250		95,000	47,000
11,300		95,000	47,000
11,400		95,000	47,000
11,500		95,000	47,000
11,510	29/64	95,000	47,000
11,600		95,000	47,000
11,700		95,000	47,000
11,800		95,000	47,000
11,910	15/32	102,000	51,000
12,000		102,000	51,000
12,100		102,000	51,000
12,200		102,000	51,000
12,300	31/64	102,000	51,000
12,500		102,000	51,000
12,600		102,000	51,000
12,700	1/2	102,000	51,000
12,800		102,000	51,000
12,900		102,000	51,000
13,000		102,000	51,000
13,100	33/64	102,000	51,000
13,200		102,000	51,000
13,490	17/32	107,000	54,000
13,500		107,000	54,000
13,600		107,000	54,000
13,750		107,000	54,000
13,800		107,000	54,000
13,890	35/64	107,000	54,000
14,000		107,000	54,000
14,200		111,000	56,000
14,290	9/16	111,000	56,000
14,500		111,000	56,000
14,680	37/64	111,000	56,000
14,750		111,000	56,000
15,000		111,000	56,000
15,080	19/32	115,000	58,000
15,480	39/64	115,000	58,000
15,500		115,000	58,000
15,870	5/8	115,000	58,000
16,000		115,000	58,000
16,200		119,000	60,000
16,270	41/64	119,000	60,000
16,500		119,000	60,000
16,670	21/32	119,000	60,000
17,000		119,000	60,000
17,070	43/64	123,000	62,000
17,460	11/16	123,000	62,000
17,500		123,000	62,000
17,860	45/64	123,000	62,000
18,000		123,000	62,000
18,500		127,000	64,000
18,650	47/64	127,000	64,000
19,000		127,000	64,000
19,050	3/4	131,000	66,000
19,450	49/64	131,000	66,000
19,500		131,000	66,000

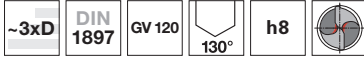


d1		l1	l2
mm	inch	mm	mm
19,840	25/32	131,000	66,000
20,000		131,000	66,000
20,250		136,000	68,000
20,500	13/16	136,000	68,000
20,640		136,000	68,000
21,000		136,000	68,000
22,000		141,000	70,000
22,200	63/64	141,000	70,000
23,000		146,000	72,000
24,000		151,000	75,000
24,500		151,000	75,000
25,000		151,000	75,000

d1		l1	l2
mm	inch	mm	mm
25,400	1	156,000	78,000
25,500		156,000	78,000
26,000		156,000	78,000
28,000		162,000	81,000
48,000		228,000	116,000



## Çok kısa helisel matkap uçları

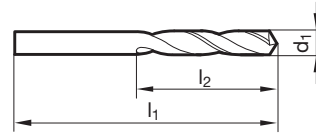


<b>P</b>	•	öz bileme $\geq \varnothing 1,000$ • koni bileme • Co-alaşımlı HSS-çeliği • arttırılmış aşınma direnci
<b>M</b>	•	
<b>K</b>	•	
<b>N</b>	○	paslanmaz çelik/aside dayanıklı • yay çelikleri • ostenitik paslanmaz çelikler • Hastelloy, Inconel, Nimonic
<b>S</b>	•	
<b>H</b>	○	

Malzeme **HSCO**Yüzey **S**Kesme yönü **R****GÜHRING**NAVIGATOR

Kesme verileri sayfası 774

SİLİNDİR ŞAFTLI MATKAP UCU

Ürün no **659**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,500		20,000	3,000	2,000		38,000	12,000
0,600		21,000	3,500	2,050		38,000	12,000
0,650		22,000	4,000	2,080		38,000	12,000
0,700		23,000	4,500	2,100		38,000	12,000
0,740		23,000	4,500	2,180		40,000	13,000
0,750		23,000	4,500	2,200		40,000	13,000
0,780		24,000	5,000	2,250		40,000	13,000
0,790	1/32	24,000	5,000	2,260		40,000	13,000
0,800		24,000	5,000	2,300		40,000	13,000
0,850		24,000	5,000	2,350		40,000	13,000
0,900		25,000	5,500	2,370		43,000	14,000
0,950		25,000	5,500	2,380	3/32	43,000	14,000
1,000		26,000	6,000	2,400		43,000	14,000
1,020		26,000	6,000	2,440		43,000	14,000
1,070		28,000	7,000	2,450		43,000	14,000
1,090		28,000	7,000	2,490		43,000	14,000
1,100		28,000	7,000	2,500		43,000	14,000
1,150		28,000	7,000	2,530		43,000	14,000
1,190	3/64	30,000	8,000	2,550		43,000	14,000
1,200		30,000	8,000	2,580		43,000	14,000
1,250		30,000	8,000	2,600		43,000	14,000
1,300		30,000	8,000	2,640		43,000	14,000
1,320		30,000	8,000	2,700		46,000	16,000
1,400		32,000	9,000	2,710		46,000	16,000
1,450		32,000	9,000	2,780	7/64	46,000	16,000
1,500		32,000	9,000	2,800		46,000	16,000
1,510		34,000	10,000	2,820		46,000	16,000
1,530		34,000	10,000	2,850		46,000	16,000
1,550		34,000	10,000	2,900		46,000	16,000
1,570		34,000	10,000	2,950		46,000	16,000
1,590	1/16	34,000	10,000	3,000		46,000	16,000
1,600		34,000	10,000	3,030		49,000	18,000
1,610		34,000	10,000	3,050		49,000	18,000
1,700		34,000	10,000	3,100		49,000	18,000
1,780		36,000	11,000	3,170	1/8	49,000	18,000
1,800		36,000	11,000	3,200		49,000	18,000
1,850		36,000	11,000	3,250		49,000	18,000
1,900		36,000	11,000	3,260		49,000	18,000
1,930		38,000	12,000	3,300		49,000	18,000
1,970		38,000	12,000	3,350		49,000	18,000
1,980	5/64	38,000	12,000	3,400		52,000	20,000
1,990		38,000	12,000	3,450		52,000	20,000



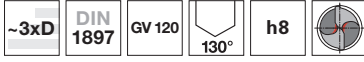


d1		l1	l2
mm	inch	mm	mm
3,500		52,000	20,000
3,570	9/64	52,000	20,000
3,600		52,000	20,000
3,660		52,000	20,000
3,700		52,000	20,000
3,730		52,000	20,000
3,800		55,000	22,000
3,860		55,000	22,000
3,900		55,000	22,000
3,910		55,000	22,000
3,970	5/32	55,000	22,000
3,990		55,000	22,000
4,000		55,000	22,000
4,040		55,000	22,000
4,050		55,000	22,000
4,090		55,000	22,000
4,100		55,000	22,000
4,150		55,000	22,000
4,200		55,000	22,000
4,250		55,000	22,000
4,300		58,000	24,000
4,370	11/64	58,000	24,000
4,390		58,000	24,000
4,400		58,000	24,000
4,500		58,000	24,000
4,600		58,000	24,000
4,620		58,000	24,000
4,700		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,850		62,000	26,000
4,900		62,000	26,000
4,920		62,000	26,000
5,000		62,000	26,000
5,060		62,000	26,000
5,100		62,000	26,000
5,160	13/64	62,000	26,000
5,200		62,000	26,000
5,220		62,000	26,000
5,300		62,000	26,000
5,310		66,000	28,000
5,400		66,000	28,000
5,500		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,610		66,000	28,000
5,700		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
5,940		66,000	28,000
6,000		66,000	28,000
6,040		70,000	31,000
6,050		70,000	31,000
6,100		70,000	31,000
6,150		70,000	31,000
6,200		70,000	31,000
6,300		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,530		70,000	31,000
6,600		70,000	31,000
6,700		70,000	31,000
6,750	17/64	74,000	34,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,100		74,000	34,000
7,140	9/32	74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,370		74,000	34,000

d1		l1	l2
mm	inch	mm	mm
7,400		74,000	34,000
7,490		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,600		79,000	37,000
7,700		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000
7,940	5/16	79,000	37,000
8,000		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,300		79,000	37,000
8,400		79,000	37,000
8,500		79,000	37,000
8,600		84,000	40,000
8,610		84,000	40,000
8,700		84,000	40,000
8,730	11/32	84,000	40,000
8,800		84,000	40,000
8,840		84,000	40,000
9,000		84,000	40,000
9,100		84,000	40,000
9,130	23/64	84,000	40,000
9,200		84,000	40,000
9,300		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,520	3/8	89,000	43,000
9,600		89,000	43,000
9,700		89,000	43,000
9,800		89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,100		89,000	43,000
10,200		89,000	43,000
10,250		89,000	43,000
10,320	13/32	89,000	43,000
10,500		89,000	43,000
10,720	27/64	95,000	47,000
10,800		95,000	47,000
10,900		95,000	47,000
11,000		95,000	47,000
11,110	7/16	95,000	47,000
11,500		95,000	47,000
12,000		102,000	51,000
12,100		102,000	51,000
12,200		102,000	51,000
12,300	31/64	102,000	51,000
12,500		102,000	51,000
12,700	1/2	102,000	51,000
12,800		102,000	51,000
13,000		102,000	51,000
13,300		107,000	54,000
13,490	17/32	107,000	54,000
13,500		107,000	54,000
14,000		107,000	54,000
14,290	9/16	111,000	56,000
14,500		111,000	56,000
15,000		111,000	56,000
15,500		115,000	58,000



## Çok kısa helisel matkap uçları

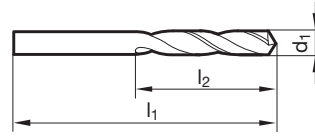


<b>P</b>	•	öz bileme $\geq \varnothing 1,000$ • koni bileme • Co-alaşımlı HSS-çeliği • arttırılmış aşınma direnci
<b>M</b>	•	
<b>K</b>	•	
<b>N</b>	○	paslanmaz çelik/aside dayanıklı • yay çelikleri • ostenitik paslanmaz çelikler • Hastelloy, Inconel, Nimonic
<b>S</b>	•	
<b>H</b>	○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 774

Malzeme	<b>HSCO</b>
Yüzey	<b>F</b>
Kesme yönü	<b>R</b>

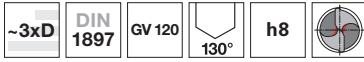


Ürün no 2461

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		26,000	6,000	5,300		62,000	26,000
1,100		28,000	7,000	5,400		66,000	28,000
1,200		30,000	8,000	5,500		66,000	28,000
1,300		30,000	8,000	5,600		66,000	28,000
1,400		32,000	9,000	5,800		66,000	28,000
1,500		32,000	9,000	6,000		66,000	28,000
1,600		34,000	10,000	6,100		70,000	31,000
1,700		34,000	10,000	6,200		70,000	31,000
1,800		36,000	11,000	6,300		70,000	31,000
1,900		36,000	11,000	6,400		70,000	31,000
2,000		38,000	12,000	6,500		70,000	31,000
2,100		38,000	12,000	6,600		70,000	31,000
2,200		40,000	13,000	6,800		74,000	34,000
2,300		40,000	13,000	6,900		74,000	34,000
2,400		43,000	14,000	7,000		74,000	34,000
2,500		43,000	14,000	7,200		74,000	34,000
2,600		43,000	14,000	7,300		74,000	34,000
2,700		46,000	16,000	7,400		74,000	34,000
2,800		46,000	16,000	7,500		74,000	34,000
2,900		46,000	16,000	7,600		79,000	37,000
3,000		46,000	16,000	7,800		79,000	37,000
3,100		49,000	18,000	8,000		79,000	37,000
3,200		49,000	18,000	8,100		79,000	37,000
3,300		49,000	18,000	8,200		79,000	37,000
3,400		52,000	20,000	8,300		79,000	37,000
3,500		52,000	20,000	8,500		79,000	37,000
3,600		52,000	20,000	8,600		84,000	40,000
3,700		52,000	20,000	8,700		84,000	40,000
3,800		55,000	22,000	8,800		84,000	40,000
3,900		55,000	22,000	9,000		84,000	40,000
4,000		55,000	22,000	9,200		84,000	40,000
4,200		55,000	22,000	9,300		84,000	40,000
4,300		58,000	24,000	9,500		84,000	40,000
4,400		58,000	24,000	9,800		89,000	43,000
4,500		58,000	24,000	10,000		89,000	43,000
4,600		58,000	24,000	10,200		89,000	43,000
4,700		58,000	24,000	10,500		89,000	43,000
4,800		62,000	26,000	11,000		95,000	47,000
4,900		62,000	26,000	11,500		95,000	47,000
5,000		62,000	26,000	12,000		102,000	51,000
5,100		62,000	26,000	13,000		102,000	51,000
5,200		62,000	26,000				



## Çok kısa helisel matkap uçları

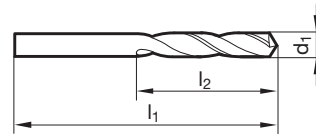


<b>P</b>	•	öz bileme $\geq \varnothing 2,370$ • koni bileme • Co-alaşımlı HSS-çeliği • arttırılmış aşınma direnci
<b>M</b>	•	
<b>K</b>	•	
<b>N</b>	○	paslanmaz çelik/aside dayanıklı • yay çelikleri • ostenitik paslanmaz çelikler • Hastelloy, Inconel, Nimonic
<b>S</b>	•	
<b>H</b>	○	

Malzeme	<b>HSCO</b>
Yüzey	$\text{Ra} \leq 6,00$
Kesme yönü	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 772



Ürün no 330

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,450		19,000	2,500	2,000		38,000	12,000
0,500		20,000	3,000	2,020		38,000	12,000
0,620		22,000	4,000	2,080		38,000	12,000
0,700		23,000	4,500	2,100		38,000	12,000
0,710		23,000	4,500	2,180		40,000	13,000
0,750		23,000	4,500	2,200		40,000	13,000
0,800		24,000	5,000	2,260		40,000	13,000
0,900		25,000	5,500	2,300		40,000	13,000
1,000		26,000	6,000	2,370		43,000	14,000
1,030		26,000	6,000	2,380	3/32	43,000	14,000
1,040		26,000	6,000	2,440		43,000	14,000
1,050		26,000	6,000	2,500		43,000	14,000
1,060		26,000	6,000	2,550		43,000	14,000
1,090		28,000	7,000	2,600		43,000	14,000
1,150		28,000	7,000	2,640		43,000	14,000
1,170		28,000	7,000	2,750		46,000	16,000
1,180		28,000	7,000	2,770		46,000	16,000
1,190	3/64	30,000	8,000	2,780	7/64	46,000	16,000
1,200		30,000	8,000	2,820		46,000	16,000
1,210		30,000	8,000	2,950		46,000	16,000
1,220		30,000	8,000	3,000		46,000	16,000
1,230		30,000	8,000	3,150		49,000	18,000
1,300		30,000	8,000	3,170	1/8	49,000	18,000
1,320		30,000	8,000	3,200		49,000	18,000
1,350		32,000	9,000	3,400		52,000	20,000
1,420		32,000	9,000	3,450		52,000	20,000
1,450		32,000	9,000	3,500		52,000	20,000
1,470		32,000	9,000	3,600		52,000	20,000
1,500		32,000	9,000	3,700		52,000	20,000
1,510		34,000	10,000	3,860		55,000	22,000
1,530		34,000	10,000	3,970	5/32	55,000	22,000
1,550		34,000	10,000	3,990		55,000	22,000
1,590	1/16	34,000	10,000	4,000		55,000	22,000
1,600		34,000	10,000	4,040		55,000	22,000
1,610		34,000	10,000	4,090		55,000	22,000
1,650		34,000	10,000	4,100		55,000	22,000
1,700		34,000	10,000	4,200		55,000	22,000
1,780		36,000	11,000	4,300		58,000	24,000
1,800		36,000	11,000	4,370	11/64	58,000	24,000
1,930		38,000	12,000	4,390		58,000	24,000
1,980	5/64	38,000	12,000	4,400		58,000	24,000
1,990		38,000	12,000	4,500		58,000	24,000

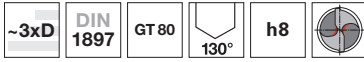


d1		l1	l2
mm	inch	mm	mm
4,570		58,000	24,000
4,620		58,000	24,000
4,760	3/16	62,000	26,000
4,850		62,000	26,000
4,920		62,000	26,000
4,980		62,000	26,000
5,000		62,000	26,000
5,100		62,000	26,000
5,110		62,000	26,000
5,160	13/64	62,000	26,000
5,200		62,000	26,000
5,220		62,000	26,000
5,310		66,000	28,000
5,400		66,000	28,000
5,410		66,000	28,000
5,500		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,610		66,000	28,000
5,700		66,000	28,000
5,750		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
6,000		66,000	28,000
6,040		70,000	31,000
6,300		70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,600		70,000	31,000
6,750	17/64	74,000	34,000
6,800		74,000	34,000
7,000		74,000	34,000
7,030		74,000	34,000
7,050		74,000	34,000
7,100		74,000	34,000
7,140	9/32	74,000	34,000
7,370		74,000	34,000
7,490		74,000	34,000
7,540	19/64	79,000	37,000
7,600		79,000	37,000
7,700		79,000	37,000
7,900		79,000	37,000
8,000		79,000	37,000
8,030		79,000	37,000
8,330	21/64	79,000	37,000
8,430		79,000	37,000
8,500		79,000	37,000
8,610		84,000	40,000

d1		l1	l2
mm	inch	mm	mm
8,700		84,000	40,000
8,730	11/32	84,000	40,000
8,800		84,000	40,000
9,000		84,000	40,000
9,090		84,000	40,000
9,100		84,000	40,000
9,130	23/64	84,000	40,000
9,200		84,000	40,000
9,340		84,000	40,000
9,400		84,000	40,000
9,520	3/8	89,000	43,000
9,580		89,000	43,000
9,700		89,000	43,000
9,900		89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,080		89,000	43,000
10,260		89,000	43,000
10,490		89,000	43,000
10,720	27/64	95,000	47,000
10,900		95,000	47,000
11,000		95,000	47,000
11,100		95,000	47,000
11,200		95,000	47,000
11,300		95,000	47,000
11,510	29/64	95,000	47,000
11,910	15/32	102,000	51,000
12,000		102,000	51,000
12,300	31/64	102,000	51,000
12,400		102,000	51,000
13,000		102,000	51,000
13,500		107,000	54,000
14,000		107,000	54,000
14,700		111,000	56,000
15,100		115,000	58,000
15,500		115,000	58,000
16,000		115,000	58,000
19,500		131,000	66,000
19,750		131,000	66,000
22,500		146,000	72,000
23,500		146,000	72,000
24,000		151,000	75,000
25,000	63/64	151,000	75,000
25,500		156,000	78,000
26,000		156,000	78,000
27,000		162,000	81,000
32,000		180,000	90,000



## Çok kısa helisel matkap uçları

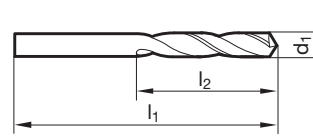


<b>P</b> ●	öz bileme $\geq \varnothing 1,000$ • koni bileme • Co-alaşımlı HSS-çeliği • yüksek aşınma direnci
<b>M</b> ○	
<b>K</b> ○	
<b>N</b> ○	yüksek mukavemetli çelikler için • 1000 N/mm <sup>2</sup> 'ye kadar uzun talaşlı malzemeler • Al- ve Cu-alaşimleri • yumuşak bronzlar • elektrolitik bakır
<b>S</b> ○	• sünek pirinç
<b>H</b> ○	

Malzeme **HSCO**Yüzey **S**Kesme yönü **R**

## GÜHRING NAVIGATOR

Kesme verileri sayfası 774

Ürün no **1228**

SİLİNDİR ŞAFTLI MATKAP UCU

d1		l1	l2
mm	inch	mm	mm
1,000		26,000	6,000
1,100		28,000	7,000
1,190	3/64	30,000	8,000
1,200		30,000	8,000
1,300		30,000	8,000
1,400		32,000	9,000
1,500		32,000	9,000
1,600		34,000	10,000
1,700		34,000	10,000
1,800		36,000	11,000
1,900		36,000	11,000
2,000		38,000	12,000
2,100		38,000	12,000
2,200		40,000	13,000
2,300		40,000	13,000
2,400		43,000	14,000
2,500		43,000	14,000
2,580		43,000	14,000
2,600		43,000	14,000
2,800		46,000	16,000
2,900		46,000	16,000
3,000		46,000	16,000
3,100		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,300		49,000	18,000
3,400		52,000	20,000
3,500		52,000	20,000
3,570	9/64	52,000	20,000
3,600		52,000	20,000
3,700		52,000	20,000
3,800		55,000	22,000
3,900		55,000	22,000
3,970	5/32	55,000	22,000
4,000		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,300		58,000	24,000
4,370	11/64	58,000	24,000
4,400		58,000	24,000
4,500		58,000	24,000
4,600		58,000	24,000

d1		l1	l2
mm	inch	mm	mm
4,700		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,900		62,000	26,000
5,000		62,000	26,000
5,100		62,000	26,000
5,160	13/64	62,000	26,000
5,200		62,000	26,000
5,300		62,000	26,000
5,400		66,000	28,000
5,500		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,700		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
6,000		66,000	28,000
6,100		70,000	31,000
6,200		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,600		70,000	31,000
6,700		70,000	31,000
6,750	17/64	74,000	34,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,140	9/32	74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,400		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,800		79,000	37,000
7,940	5/16	79,000	37,000
8,000		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,300		79,000	37,000
8,330	21/64	79,000	37,000
8,500		79,000	37,000

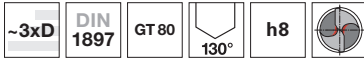


d1		l1	l2
mm	inch	mm	mm
8,600		84,000	40,000
8,700		84,000	40,000
9,000		84,000	40,000
9,100		84,000	40,000
9,130	23/64	84,000	40,000
9,200		84,000	40,000
9,300		84,000	40,000
9,400		84,000	40,000
9,600		89,000	43,000
9,700		89,000	43,000
9,800		89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,200		89,000	43,000
10,320	13/32	89,000	43,000
10,500		89,000	43,000
11,000		95,000	47,000
11,500		95,000	47,000
11,510	29/64	95,000	47,000
11,800		95,000	47,000
12,000		102,000	51,000
12,300	31/64	102,000	51,000
12,500		102,000	51,000
12,700	1/2	102,000	51,000

d1		l1	l2
mm	inch	mm	mm
12,800		102,000	51,000
13,000		102,000	51,000
13,100	33/64	102,000	51,000
13,490	17/32	107,000	54,000
13,500		107,000	54,000
14,000		107,000	54,000
14,500		111,000	56,000
15,000		111,000	56,000
15,500		115,000	58,000
16,000		115,000	58,000
16,500		119,000	60,000
17,000		119,000	60,000
17,500		123,000	62,000
18,000		123,000	62,000
18,500		127,000	64,000
19,000		127,000	64,000
20,000		131,000	66,000



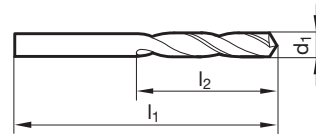
## Çok kısa helisel matkap uçları



<b>P</b> ●	öz bileme $\geq \varnothing 1,000$ • koni bileme • Co-alaşımlı HSS-çeliği • arttırılmış aşınma direnci
<b>M</b> ○	
<b>K</b> ○	
<b>N</b> ○	1000 N/mm <sup>2</sup> 'ye kadar uzun talaşlı malzemeler • Al- ve Cu-alaşimleri
<b>S</b> ○	• yumuşak bronzlar • elektrolitik bakır • sünek pirinç
<b>H</b> ○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 774

Malzeme **HSC0**Yüzey **F**Kesme yönü **R**Ürün no **2498**

d1		l1	l2
mm	inch	mm	mm
1,000		26,000	6,000
1,200		30,000	8,000
1,300		30,000	8,000
1,500		32,000	9,000
1,600		34,000	10,000
1,800		36,000	11,000
2,000		38,000	12,000
2,100		38,000	12,000
2,200		40,000	13,000
2,300		40,000	13,000
2,400		43,000	14,000
2,500		43,000	14,000
2,600		43,000	14,000
2,800		46,000	16,000
2,900		46,000	16,000
3,000		46,000	16,000
3,100		49,000	18,000
3,200		49,000	18,000
3,300		49,000	18,000
3,400		52,000	20,000
3,500		52,000	20,000
3,600		52,000	20,000
3,700		52,000	20,000
4,000		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,300		58,000	24,000
4,400		58,000	24,000
4,500		58,000	24,000
4,600		58,000	24,000
4,700		58,000	24,000
5,000		62,000	26,000
5,100		62,000	26,000
5,200		62,000	26,000
5,300		62,000	26,000
5,500		66,000	28,000

d1		l1	l2
mm	inch	mm	mm
5,600		66,000	28,000
6,000		66,000	28,000
6,200		70,000	31,000
6,500		70,000	31,000
6,600		70,000	31,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,500		74,000	34,000
7,600		79,000	37,000
7,700		79,000	37,000
7,800		79,000	37,000
8,000		79,000	37,000
8,500		79,000	37,000
8,600		84,000	40,000
9,000		84,000	40,000
9,300		84,000	40,000
9,500		84,000	40,000
10,000		89,000	43,000
10,200		89,000	43,000
10,500		89,000	43,000
10,800		95,000	47,000
11,000		95,000	47,000
11,800		95,000	47,000
12,000		102,000	51,000
12,500		102,000	51,000
13,000		102,000	51,000
13,500		107,000	54,000
14,000		107,000	54,000
14,500		111,000	56,000
15,000		111,000	56,000
16,000		115,000	58,000



## Çok kısa helisel matkap uçları



<b>P</b>	○	koni bileme • Co-alaşımlı HSS-çeliği • arttırılmış aşınma direnci
<b>M</b>	●	
<b>K</b>		
<b>N</b>	○	pasas/aside/ısıya dayanıklı ostenitik çelikler (V2A-ve-V4A)
<b>S</b>	○	
<b>H</b>		

## GÜHRING NAVIGATOR

Kesme verileri sayfası 772

Malzeme HSC0

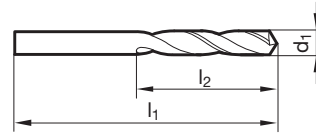
Yüzey



Kesme yönü



SİLİNDİR ŞAFTLI MATKAP UCU



Ürün no

1261

d1		l1	l2
mm	inch	mm	mm
1,000		26,000	6,000
1,100		28,000	7,000
1,200		30,000	8,000
1,300		30,000	8,000
1,500		32,000	9,000
1,590	1/16	34,000	10,000
1,600		34,000	10,000
1,700		34,000	10,000
1,900		36,000	11,000
2,000		38,000	12,000
2,200		40,000	13,000
2,300		40,000	13,000
2,400		43,000	14,000
2,500		43,000	14,000
2,600		43,000	14,000
2,700		46,000	16,000
2,800		46,000	16,000
2,900		46,000	16,000
3,000		46,000	16,000
3,100		49,000	18,000
3,200		49,000	18,000
3,300		49,000	18,000
3,400		52,000	20,000
3,500		52,000	20,000
3,600		52,000	20,000
3,700		52,000	20,000
3,800		55,000	22,000
4,000		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,300		58,000	24,000
4,500		58,000	24,000
4,700		58,000	24,000
4,800		62,000	26,000
5,000		62,000	26,000
5,100		62,000	26,000
5,200		62,000	26,000
5,500		66,000	28,000
5,600		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
6,000		66,000	28,000

d1		l1	l2
mm	inch	mm	mm
6,100		70,000	31,000
6,300		70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,600		70,000	31,000
6,800		74,000	34,000
7,000		74,000	34,000
7,100		74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,400		74,000	34,000
7,500		74,000	34,000
7,700		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000
8,000		79,000	37,000
8,300		79,000	37,000
8,400		79,000	37,000
8,500		79,000	37,000
8,600		84,000	40,000
8,700		84,000	40,000
8,800		84,000	40,000
9,000		84,000	40,000
9,100		84,000	40,000
9,300		84,000	40,000
9,500		84,000	40,000
9,900		89,000	43,000
10,000		89,000	43,000
10,200		89,000	43,000
10,900		95,000	47,000
11,500		95,000	47,000
12,000		102,000	51,000





## Çok kısa helisel matkap uçları



**P** • öz bileme  $\geq \text{Ø } 1,000$  • optimize edilmiş Form B matkaplar • Co-alaşımli HSS-çeliği • arttırılmış aşınma direnci

**M** •

**K** •

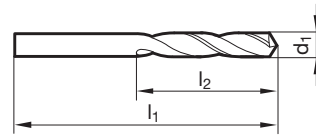
**N** • pasas/aside/ısıya dayanıklı ostenitik çelikler (V2A-ve-V4A) • özel alaşımlar

**S** •

**H**

Malzeme **HSCO**Yüzey **S**Kesme yönü **R****GÜHRING**NAVIGATOR

Kesme verileri sayfası 774

Ürün no **572**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		26,000	6,000	5,100		62,000	26,000
1,100		28,000	7,000	5,200		62,000	26,000
1,200		30,000	8,000	5,300		62,000	26,000
1,300		30,000	8,000	5,400		66,000	28,000
1,400		32,000	9,000	5,500		66,000	28,000
1,500		32,000	9,000	5,550		66,000	28,000
1,600		34,000	10,000	5,600		66,000	28,000
1,700		34,000	10,000	5,700		66,000	28,000
1,800		36,000	11,000	5,800		66,000	28,000
1,900		36,000	11,000	5,900		66,000	28,000
2,000		38,000	12,000	6,000		66,000	28,000
2,100		38,000	12,000	6,100		70,000	31,000
2,200		40,000	13,000	6,200		70,000	31,000
2,300		40,000	13,000	6,300		70,000	31,000
2,400		43,000	14,000	6,400		70,000	31,000
2,500		43,000	14,000	6,500		70,000	31,000
2,600		43,000	14,000	6,600		70,000	31,000
2,700		46,000	16,000	6,700		70,000	31,000
2,800		46,000	16,000	6,800		74,000	34,000
2,900		46,000	16,000	6,900		74,000	34,000
3,000		46,000	16,000	7,000		74,000	34,000
3,100		49,000	18,000	7,100		74,000	34,000
3,200		49,000	18,000	7,200		74,000	34,000
3,300		49,000	18,000	7,300		74,000	34,000
3,400		52,000	20,000	7,400		74,000	34,000
3,500		52,000	20,000	7,450		74,000	34,000
3,600		52,000	20,000	7,500		74,000	34,000
3,700		52,000	20,000	7,600		79,000	37,000
3,800		55,000	22,000	7,700		79,000	37,000
3,900		55,000	22,000	7,800		79,000	37,000
4,000		55,000	22,000	7,900		79,000	37,000
4,100		55,000	22,000	8,000		79,000	37,000
4,200		55,000	22,000	8,100		79,000	37,000
4,300		58,000	24,000	8,200		79,000	37,000
4,400		58,000	24,000	8,300		79,000	37,000
4,500		58,000	24,000	8,400		79,000	37,000
4,600		58,000	24,000	8,500		79,000	37,000
4,650		58,000	24,000	8,600		84,000	40,000
4,700		58,000	24,000	8,700		84,000	40,000
4,800		62,000	26,000	8,800		84,000	40,000
4,900		62,000	26,000	8,900		84,000	40,000
5,000		62,000	26,000	9,000		84,000	40,000

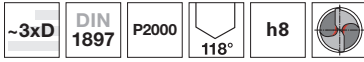


d1		l1	l2
mm	inch	mm	mm
9,100		84,000	40,000
9,200		84,000	40,000
9,250		84,000	40,000
9,300		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,600		89,000	43,000
9,700		89,000	43,000
9,800		89,000	43,000
9,900		89,000	43,000
10,000		89,000	43,000
10,200		89,000	43,000

d1		l1	l2
mm	inch	mm	mm
10,500		89,000	43,000
11,000		95,000	47,000
11,200		95,000	47,000
11,500		95,000	47,000
11,800		95,000	47,000
12,000		102,000	51,000
12,500		102,000	51,000
13,000		102,000	51,000



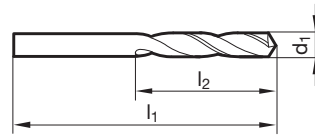
## Çok kısa helisel matkap uçları

Malzeme **HSCO**Yüzey **M**Kesme yönü **R**

**P** • öz bileme  $\geq \varnothing 1,000$  • koni bileme • dalgalı bilemede üniversal uygulama  
• Co-alaşimli HSS-çeliği • arttırılmış aşınma direnci • profesyonel kullanım için • el matkapları için de

**M** ○**K** ○**N** ○**S** ○**H** ○1000 N/mm<sup>2</sup> ye kadar uzun talaşlı çelikler • döküm ve AISi-alaşimleri**GÜHRING**NAVIGATOR

Kesme verileri sayfası 774

Ürün no **2048**

d1		l1	l2
mm	inch	mm	mm
1,000		26,000	6,000
1,100		28,000	7,000
1,200		30,000	8,000
1,300		30,000	8,000
1,400		32,000	9,000
1,500		32,000	9,000
1,600		34,000	10,000
1,700		34,000	10,000
1,800		36,000	11,000
1,900		36,000	11,000
2,000		38,000	12,000
2,100		38,000	12,000
2,200		40,000	13,000
2,300		40,000	13,000
2,400		43,000	14,000
2,700		46,000	16,000
2,800		46,000	16,000
2,900		46,000	16,000
3,000		46,000	16,000
3,100		49,000	18,000
3,300		49,000	18,000
3,400		52,000	20,000
3,500		52,000	20,000
3,600		52,000	20,000
3,700		52,000	20,000
3,800		55,000	22,000
4,000		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,400		58,000	24,000
4,500		58,000	24,000
4,600		58,000	24,000
4,700		58,000	24,000
4,800		62,000	26,000
4,900		62,000	26,000
5,000		62,000	26,000
5,200		62,000	26,000
5,300		62,000	26,000
5,400		66,000	28,000
5,500		66,000	28,000
5,600		66,000	28,000
5,700		66,000	28,000

d1		l1	l2
mm	inch	mm	mm
5,800		66,000	28,000
6,000		66,000	28,000
6,100		70,000	31,000
6,200		70,000	31,000
6,300		70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,600		70,000	31,000
6,700		70,000	31,000
6,900		74,000	34,000
7,000		74,000	34,000
7,100		74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,400		74,000	34,000
7,500		74,000	34,000
7,600		79,000	37,000
7,700		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000
8,000		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,300		79,000	37,000
8,400		79,000	37,000
8,500		79,000	37,000
8,600		84,000	40,000
8,700		84,000	40,000
8,800		84,000	40,000
8,900		84,000	40,000
9,000		84,000	40,000
9,100		84,000	40,000
9,200		84,000	40,000
9,300		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,600		89,000	43,000
9,700		89,000	43,000
9,800		89,000	43,000
9,900		89,000	43,000
10,000		89,000	43,000
10,200		89,000	43,000

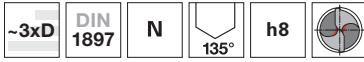


d1		l1	l2
mm	inch	mm	mm
10,500		89,000	43,000
11,500		95,000	47,000
12,000		102,000	51,000
12,500		102,000	51,000
13,000		102,000	51,000

d1		l1	l2
mm	inch	mm	mm



## Çok kısa helisel matkap uçları

Malzeme **M42**

Yüzey

Kesme yönü

**P** • öz bileme  $\geq \varnothing 1,000$  • koni bileme • yüksek Co ve Mo yüzdesi • özellikle yükske aşınma dirençli

**M** ○**K** ○

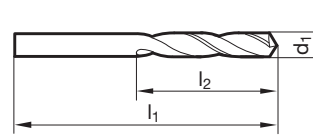
**N** • orta yüksek mukavemetli CR-Ni bazlı alaşımlar • Hastelloy, Inconel, Nimonic • pas/asit/ısıya dayanıklı çelikler • aşınmaya dirençli sac metaller

**S** • 1400 N/mm<sup>2</sup> mukavemetli çelikler/bronzlar

**H** ○

## GÜHRING NAVIGATOR

Kesme verileri sayfası 772

Ürün no **1259**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		26,000	6,000	4,700		58,000	24,000
1,100		28,000	7,000	4,760	3/16	62,000	26,000
1,200		30,000	8,000	4,800		62,000	26,000
1,300		30,000	8,000	4,900		62,000	26,000
1,400		32,000	9,000	5,000		62,000	26,000
1,500		32,000	9,000	5,100		62,000	26,000
1,600		34,000	10,000	5,200		62,000	26,000
1,700		34,000	10,000	5,300		62,000	26,000
1,800		36,000	11,000	5,400		66,000	28,000
1,900		36,000	11,000	5,500		66,000	28,000
2,000		38,000	12,000	5,560	7/32	66,000	28,000
2,100		38,000	12,000	5,600		66,000	28,000
2,200		40,000	13,000	5,700		66,000	28,000
2,300		40,000	13,000	5,800		66,000	28,000
2,380	3/32	43,000	14,000	5,950	15/64	66,000	28,000
2,400		43,000	14,000	6,000		66,000	28,000
2,500		43,000	14,000	6,100		70,000	31,000
2,600		43,000	14,000	6,200		70,000	31,000
2,700		46,000	16,000	6,300		70,000	31,000
2,780	7/64	46,000	16,000	6,350	1/4	70,000	31,000
2,800		46,000	16,000	6,400		70,000	31,000
2,900		46,000	16,000	6,500		70,000	31,000
3,000		46,000	16,000	6,600		70,000	31,000
3,100		49,000	18,000	6,800		74,000	34,000
3,170	1/8	49,000	18,000	7,000		74,000	34,000
3,200		49,000	18,000	7,100		74,000	34,000
3,300		49,000	18,000	7,140	9/32	74,000	34,000
3,400		52,000	20,000	7,200		74,000	34,000
3,500		52,000	20,000	7,300		74,000	34,000
3,600		52,000	20,000	7,400		74,000	34,000
3,700		52,000	20,000	7,500		74,000	34,000
3,800		55,000	22,000	7,540	19/64	79,000	37,000
3,900		55,000	22,000	7,600		79,000	37,000
3,970	5/32	55,000	22,000	7,700		79,000	37,000
4,000		55,000	22,000	7,800		79,000	37,000
4,100		55,000	22,000	7,900		79,000	37,000
4,200		55,000	22,000	7,940	5/16	79,000	37,000
4,300		58,000	24,000	8,000		79,000	37,000
4,370	11/64	58,000	24,000	8,100		79,000	37,000
4,400		58,000	24,000	8,200		79,000	37,000
4,500		58,000	24,000	8,300		79,000	37,000
4,600		58,000	24,000	8,330	21/64	79,000	37,000

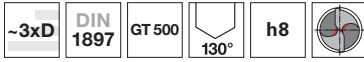


d1		l1	l2
mm	inch	mm	mm
8,500		79,000	37,000
8,600		84,000	40,000
8,700		84,000	40,000
9,000		84,000	40,000
9,300		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,800		89,000	43,000
9,900		89,000	43,000
10,000		89,000	43,000
10,500		89,000	43,000
11,000		95,000	47,000

d1		l1	l2
mm	inch	mm	mm
11,500		95,000	47,000
12,000		102,000	51,000
12,500		102,000	51,000
12,700	1/2	102,000	51,000
13,000		102,000	51,000
14,000		107,000	54,000
15,000		111,000	56,000
15,870	5/8	115,000	58,000



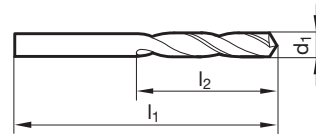
## Çok kısa helisel matkap uçları



<b>P</b> •	öz bileme $\geq \text{Ø } 1,000$ • özel B tipi sivirtme ile kon yüzey geometrisi • Co-alaşım HSS-çeliği • özellikle yüksek stabilite • özellikle yüksek aşınma dirençli
<b>M</b> ○	
<b>K</b> •	
<b>N</b> ○	yüksek çekme mukavemetli malzemeler, yüksek alaşım çelikler • ıslah çelikleri ve sementasyon çelikleri • pik döküm, pirinç, bronz
<b>S</b> ○	
<b>H</b> ○	

Malzeme **HSS-E-PM**Yüzey **F**Kesme yönü **R****GÜHRING**NAVIGATOR

Kesme verileri sayfası 774

Ürün no **515**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		26,000	6,000	2,640		43,000	14,000
1,020		26,000	6,000	2,700		46,000	16,000
1,040		26,000	6,000	2,710		46,000	16,000
1,070		28,000	7,000	2,780	7/64	46,000	16,000
1,090		28,000	7,000	2,790		46,000	16,000
1,100		28,000	7,000	2,800		46,000	16,000
1,180		28,000	7,000	2,820		46,000	16,000
1,190	3/64	30,000	8,000	2,870		46,000	16,000
1,200		30,000	8,000	2,900		46,000	16,000
1,300		30,000	8,000	2,950		46,000	16,000
1,320		30,000	8,000	3,000		46,000	16,000
1,400		32,000	9,000	3,050		49,000	18,000
1,500		32,000	9,000	3,100		49,000	18,000
1,510		34,000	10,000	3,170	1/8	49,000	18,000
1,590	1/16	34,000	10,000	3,200		49,000	18,000
1,600		34,000	10,000	3,260		49,000	18,000
1,610		34,000	10,000	3,300		49,000	18,000
1,700		34,000	10,000	3,400		52,000	20,000
1,780		36,000	11,000	3,450		52,000	20,000
1,800		36,000	11,000	3,500		52,000	20,000
1,850		36,000	11,000	3,570	9/64	52,000	20,000
1,900		36,000	11,000	3,600		52,000	20,000
1,930		38,000	12,000	3,660		52,000	20,000
1,980	5/64	38,000	12,000	3,700		52,000	20,000
1,990		38,000	12,000	3,730		52,000	20,000
2,000		38,000	12,000	3,800		55,000	22,000
2,060		38,000	12,000	3,860		55,000	22,000
2,080		38,000	12,000	3,900		55,000	22,000
2,100		38,000	12,000	3,910		55,000	22,000
2,180		40,000	13,000	3,970	5/32	55,000	22,000
2,200		40,000	13,000	3,990		55,000	22,000
2,260		40,000	13,000	4,000		55,000	22,000
2,300		40,000	13,000	4,040		55,000	22,000
2,370		43,000	14,000	4,090		55,000	22,000
2,380	3/32	43,000	14,000	4,100		55,000	22,000
2,400		43,000	14,000	4,200		55,000	22,000
2,440		43,000	14,000	4,220		55,000	22,000
2,490		43,000	14,000	4,300		58,000	24,000
2,500		43,000	14,000	4,370	11/64	58,000	24,000
2,530		43,000	14,000	4,390		58,000	24,000
2,580		43,000	14,000	4,400		58,000	24,000
2,600		43,000	14,000	4,500		58,000	24,000



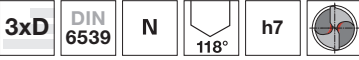
d1		l1	l2
mm	inch	mm	mm
4,570		58,000	24,000
4,600		58,000	24,000
4,620		58,000	24,000
4,650		58,000	24,000
4,700		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,850		62,000	26,000
4,900		62,000	26,000
4,920		62,000	26,000
4,980		62,000	26,000
5,000		62,000	26,000
5,060		62,000	26,000
5,100		62,000	26,000
5,110		62,000	26,000
5,160	13/64	62,000	26,000
5,180		62,000	26,000
5,200		62,000	26,000
5,220		62,000	26,000
5,300		62,000	26,000
5,310		66,000	28,000
5,400		66,000	28,000
5,410		66,000	28,000
5,500		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,610		66,000	28,000
5,700		66,000	28,000
5,790		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
5,940		66,000	28,000
5,950	15/64	66,000	28,000
6,000		66,000	28,000
6,040		70,000	31,000
6,100		70,000	31,000
6,150		70,000	31,000
6,200		70,000	31,000
6,250		70,000	31,000
6,300		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,530		70,000	31,000
6,600		70,000	31,000
6,630		70,000	31,000
6,700		70,000	31,000
6,750	17/64	74,000	34,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,030		74,000	34,000
7,100		74,000	34,000
7,140	9/32	74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,370		74,000	34,000
7,400		74,000	34,000
7,490		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,600		79,000	37,000
7,670		79,000	37,000
7,700		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000

d1		l1	l2
mm	inch	mm	mm
7,940	5/16	79,000	37,000
8,000		79,000	37,000
8,030		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,300		79,000	37,000
8,330	21/64	79,000	37,000
8,400		79,000	37,000
8,430		79,000	37,000
8,500		79,000	37,000
8,600		84,000	40,000
8,610		84,000	40,000
8,730	11/32	84,000	40,000
8,800		84,000	40,000
8,840		84,000	40,000
8,900		84,000	40,000
9,000		84,000	40,000
9,090		84,000	40,000
9,130	23/64	84,000	40,000
9,200		84,000	40,000
9,300		84,000	40,000
9,340		84,000	40,000
9,350		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,520	3/8	89,000	43,000
9,580		89,000	43,000
9,600		89,000	43,000
9,700		89,000	43,000
9,800		89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,080		89,000	43,000
10,200		89,000	43,000
10,260		89,000	43,000
10,320	13/32	89,000	43,000
10,490		89,000	43,000
10,500		89,000	43,000
10,720	27/64	95,000	47,000
11,000		95,000	47,000
11,110	7/16	95,000	47,000
11,500		95,000	47,000
11,510	29/64	95,000	47,000
11,800		95,000	47,000
11,910	15/32	102,000	51,000
12,000		102,000	51,000
12,300	31/64	102,000	51,000
12,500		102,000	51,000
12,700	1/2	102,000	51,000
13,000		102,000	51,000
13,100	33/64	102,000	51,000
13,490	17/32	107,000	54,000
13,500		107,000	54,000
14,000		107,000	54,000
14,290	9/16	111,000	56,000





## Çok kısa helisel matkap uçları



**P** öz bileme  $\geq \text{Ø} 2,060$  • yüzey Bileme • ana kesici ağız düz form

**M**

**K**

**N** yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • pik döküm • bronz / pirinç • Alüminyum ve Al-Alaşımları • Magnezyum ve Mg-alışımları • plastikler ve fiber takviyeli plastikler

**S**

**H**

Malzeme

Kom. sert metal

Yüzey

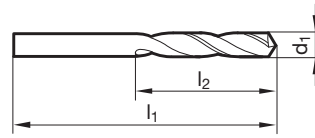


Kesme yönü



## GÜHRING NAVIGATOR

Kesme verileri sayfası 776



Ürün no

730

d1		l1	l2
mm	inch	mm	mm
0,500		20,000	3,000
0,600		21,000	3,500
0,700		23,000	4,500
0,800		24,000	5,000
0,900		25,000	5,500
1,000		26,000	6,000
1,020		26,000	6,000
1,040		26,000	6,000
1,070		28,000	7,000
1,090		28,000	7,000
1,100		28,000	7,000
1,180		28,000	7,000
1,190	3/64	30,000	8,000
1,200		30,000	8,000
1,300		30,000	8,000
1,320		30,000	8,000
1,400		32,000	9,000
1,500		32,000	9,000
1,510		34,000	10,000
1,590	1/16	34,000	10,000
1,600		34,000	10,000
1,610		34,000	10,000
1,700		34,000	10,000
1,780		36,000	11,000
1,800		36,000	11,000
1,850		36,000	11,000
1,900		36,000	11,000
1,930		38,000	12,000
1,980	5/64	38,000	12,000
1,990		38,000	12,000
2,000		38,000	12,000
2,060		38,000	12,000
2,080		38,000	12,000
2,100		38,000	12,000
2,180		40,000	13,000
2,200		40,000	13,000
2,250		40,000	13,000
2,260		40,000	13,000
2,300		40,000	13,000
2,370		43,000	14,000
2,380	3/32	43,000	14,000
2,400		43,000	14,000

d1		l1	l2
mm	inch	mm	mm
2,440		43,000	14,000
2,490		43,000	14,000
2,500		43,000	14,000
2,530		43,000	14,000
2,580		43,000	14,000
2,600		43,000	14,000
2,640		43,000	14,000
2,700		46,000	16,000
2,710		46,000	16,000
2,780	7/64	46,000	16,000
2,790		46,000	16,000
2,800		46,000	16,000
2,820		46,000	16,000
2,870		46,000	16,000
2,900		46,000	16,000
2,950		46,000	16,000
3,000		46,000	16,000
3,050		49,000	18,000
3,100		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,260		49,000	18,000
3,300		49,000	18,000
3,400		52,000	20,000
3,450		52,000	20,000
3,500		52,000	20,000
3,570	9/64	52,000	20,000
3,600		52,000	20,000
3,660		52,000	20,000
3,700		52,000	20,000
3,730		52,000	20,000
3,800		55,000	22,000
3,860		55,000	22,000
3,900		55,000	22,000
3,910		55,000	22,000
3,970	5/32	55,000	22,000
3,990		55,000	22,000
4,000		55,000	22,000
4,040		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,220		55,000	22,000

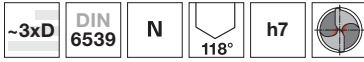


d1		l1	l2
mm	inch	mm	mm
4,300		58,000	24,000
4,370	11/64	58,000	24,000
4,390		58,000	24,000
4,400		58,000	24,000
4,500		58,000	24,000
4,570		58,000	24,000
4,600		58,000	24,000
4,620		58,000	24,000
4,700		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,850		62,000	26,000
4,900		62,000	26,000
4,920		62,000	26,000
4,980		62,000	26,000
5,000		62,000	26,000
5,060		62,000	26,000
5,100		62,000	26,000
5,110		62,000	26,000
5,160	13/64	62,000	26,000
5,180		62,000	26,000
5,200		62,000	26,000
5,220		62,000	26,000
5,300		62,000	26,000
5,310		66,000	28,000
5,400		66,000	28,000
5,410		66,000	28,000
5,500		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,700		66,000	28,000
5,790		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
5,940		66,000	28,000
5,950	15/64	66,000	28,000
6,000		66,000	28,000
6,040		70,000	31,000
6,100		70,000	31,000
6,150		70,000	31,000
6,200		70,000	31,000
6,250		70,000	31,000
6,300		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,530		70,000	31,000
6,600		70,000	31,000
6,630		70,000	31,000
6,700		70,000	31,000
6,750	17/64	74,000	34,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,030		74,000	34,000
7,100		74,000	34,000
7,140	9/32	74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,370		74,000	34,000
7,400		74,000	34,000
7,490		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,600		79,000	37,000
7,670		79,000	37,000

d1		l1	l2
mm	inch	mm	mm
7,700		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000
7,940	5/16	79,000	37,000
8,000		79,000	37,000
8,030		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,300		79,000	37,000
8,330	21/64	79,000	37,000
8,400		79,000	37,000
8,430		79,000	37,000
8,500		79,000	37,000
8,600		84,000	40,000
8,610		84,000	40,000
8,700		84,000	40,000
8,730	11/32	84,000	40,000
8,800		84,000	40,000
8,840		84,000	40,000
8,900		84,000	40,000
9,000		84,000	40,000
9,090		84,000	40,000
9,100		84,000	40,000
9,130	23/64	84,000	40,000
9,200		84,000	40,000
9,300		84,000	40,000
9,340		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,520	3/8	89,000	43,000
9,580		89,000	43,000
9,600		89,000	43,000
9,700		89,000	43,000
9,800		89,000	43,000
9,900		89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,080		89,000	43,000
10,200		89,000	43,000
10,260		89,000	43,000
10,300		89,000	43,000
10,320	13/32	89,000	43,000
10,490		89,000	43,000
10,500		89,000	43,000
10,720	27/64	95,000	47,000
11,000		95,000	47,000
11,110	7/16	95,000	47,000
11,500		95,000	47,000
11,510	29/64	95,000	47,000
11,700		95,000	47,000
11,910	15/32	102,000	51,000
12,000		102,000	51,000
12,300	31/64	102,000	51,000
12,500		102,000	51,000
12,700	1/2	102,000	51,000
13,000		102,000	51,000
13,490	17/32	107,000	54,000
14,000		107,000	54,000
14,290	9/16	111,000	56,000
15,000		111,000	56,000
16,000		115,000	58,000



## Çok kısa helisel matkap uçları



**P** öz bileme  $\geq \varnothing 2,060$  • yüzey Bileme • ana kesici ağız düz form

**M**

**K**

**N** yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • döküm malzemeler • pirinç • Yüksek Si içerikli Al malzemeler • Magnezyum ve Mg-alaşımları • plastikler ve fiber takviyeli plastikler

**S**

**H**

Malzeme

Kom. sert metal

Yüzey

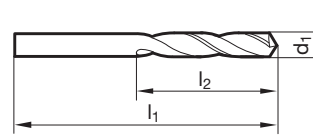
F

Kesme yönü

R

## GÜHRING NAVIGATOR

Kesme verileri sayfası 776



Ürün no

2463

d1		l1	l2
mm	inch	mm	mm
1,000		26,000	6,000
1,020		26,000	6,000
1,040		26,000	6,000
1,070		28,000	7,000
1,090		28,000	7,000
1,100		28,000	7,000
1,180		28,000	7,000
1,190	3/64	30,000	8,000
1,200		30,000	8,000
1,300		30,000	8,000
1,320		30,000	8,000
1,400		32,000	9,000
1,500		32,000	9,000
1,510		34,000	10,000
1,590	1/16	34,000	10,000
1,600		34,000	10,000
1,610		34,000	10,000
1,700		34,000	10,000
1,780		36,000	11,000
1,800		36,000	11,000
1,850		36,000	11,000
1,900		36,000	11,000
1,930		38,000	12,000
1,980	5/64	38,000	12,000
1,990		38,000	12,000
2,000		38,000	12,000
2,060		38,000	12,000
2,080		38,000	12,000
2,100		38,000	12,000
2,180		40,000	13,000
2,200		40,000	13,000
2,250		40,000	13,000
2,260		40,000	13,000
2,300		40,000	13,000
2,370		43,000	14,000
2,380	3/32	43,000	14,000
2,400		43,000	14,000
2,440		43,000	14,000
2,490		43,000	14,000
2,500		43,000	14,000
2,530		43,000	14,000
2,580		43,000	14,000

d1		l1	l2
mm	inch	mm	mm
2,600		43,000	14,000
2,640		43,000	14,000
2,700		46,000	16,000
2,710		46,000	16,000
2,780	7/64	46,000	16,000
2,790		46,000	16,000
2,800		46,000	16,000
2,820		46,000	16,000
2,870		46,000	16,000
2,900		46,000	16,000
2,950		46,000	16,000
3,000		46,000	16,000
3,050		49,000	18,000
3,100		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,260		49,000	18,000
3,300		49,000	18,000
3,400		52,000	20,000
3,450		52,000	20,000
3,500		52,000	20,000
3,570	9/64	52,000	20,000
3,600		52,000	20,000
3,660		52,000	20,000
3,700		52,000	20,000
3,730		52,000	20,000
3,800		55,000	22,000
3,860		55,000	22,000
3,900		55,000	22,000
3,910		55,000	22,000
3,970	5/32	55,000	22,000
3,990		55,000	22,000
4,000		55,000	22,000
4,040		55,000	22,000
4,090		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,220		55,000	22,000
4,300		58,000	24,000
4,370	11/64	58,000	24,000
4,390		58,000	24,000
4,400		58,000	24,000



d1		l1	l2
mm	inch	mm	mm
4,500		58,000	24,000
4,570		58,000	24,000
4,600		58,000	24,000
4,620		58,000	24,000
4,700		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,850		62,000	26,000
4,900		62,000	26,000
4,920		62,000	26,000
4,980		62,000	26,000
5,000		62,000	26,000
5,060		62,000	26,000
5,100		62,000	26,000
5,110		62,000	26,000
5,160	13/64	62,000	26,000
5,180		62,000	26,000
5,200		62,000	26,000
5,220		62,000	26,000
5,300		62,000	26,000
5,310		66,000	28,000
5,400		66,000	28,000
5,410		66,000	28,000
5,500		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,610		66,000	28,000
5,700		66,000	28,000
5,790		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
5,940		66,000	28,000
5,950	15/64	66,000	28,000
6,000		66,000	28,000
6,040		70,000	31,000
6,100		70,000	31,000
6,150		70,000	31,000
6,200		70,000	31,000
6,250		70,000	31,000
6,300		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,530		70,000	31,000
6,600		70,000	31,000
6,630		70,000	31,000
6,700		70,000	31,000
6,750	17/64	74,000	34,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,030		74,000	34,000
7,100		74,000	34,000
7,140	9/32	74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,370		74,000	34,000
7,400		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,600		79,000	37,000
7,670		79,000	37,000
7,700		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000
7,940	5/16	79,000	37,000

d1		l1	l2
mm	inch	mm	mm
8,000		79,000	37,000
8,030		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,300		79,000	37,000
8,330	21/64	79,000	37,000
8,400		79,000	37,000
8,430		79,000	37,000
8,500		79,000	37,000
8,600		84,000	40,000
8,610		84,000	40,000
8,700		84,000	40,000
8,730	11/32	84,000	40,000
8,800		84,000	40,000
8,840		84,000	40,000
8,900		84,000	40,000
9,000		84,000	40,000
9,090		84,000	40,000
9,100		84,000	40,000
9,130	23/64	84,000	40,000
9,200		84,000	40,000
9,300		84,000	40,000
9,340		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,520	3/8	89,000	43,000
9,580		89,000	43,000
9,600		89,000	43,000
9,700		89,000	43,000
9,800		89,000	43,000
9,900		89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,080		89,000	43,000
10,200		89,000	43,000
10,260		89,000	43,000
10,300		89,000	43,000
10,320	13/32	89,000	43,000
10,490		89,000	43,000
10,500		89,000	43,000
10,720	27/64	95,000	47,000
11,000		95,000	47,000
11,110	7/16	95,000	47,000
11,500		95,000	47,000
11,510	29/64	95,000	47,000
11,910	15/32	102,000	51,000
12,000		102,000	51,000
12,300	31/64	102,000	51,000
12,700	1/2	102,000	51,000
13,000		102,000	51,000
13,490	17/32	107,000	54,000
14,000		107,000	54,000
14,290	9/16	111,000	56,000
15,000		111,000	56,000
16,000		115,000	58,000



## Çok kısa helisel matkap uçları



**P** yüzey Bileme • ana kesici ağız düz form

**M**

**K**

**N**

**S**

**H**

cam elyaf takviyeli plastikler • kesme kenarı ve yüzeylerde aşınmaya sebep veren dropletler

Malzeme **Kom. sert metal**

Yüzey

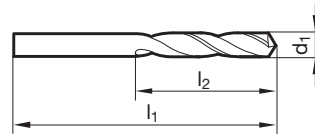


Kesme yönü



## GÜHRING NAVIGATOR

Kesme verileri sayfası 776



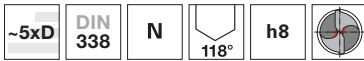
Ürün no **702**

d1		l1	l2
mm	inch	mm	mm
0,500		30,000	6,500
0,550		30,000	6,500
0,600		30,000	6,500
0,650		30,000	6,500
0,700		30,000	6,500
0,750		30,000	8,500
0,800		30,000	8,500
0,900		30,000	9,500
1,000		30,000	11,000
1,050		30,000	11,000
1,100		30,000	11,000
1,200		30,000	13,000
1,350		30,000	13,000
1,400		30,000	13,000
1,450		30,000	13,000
1,500		30,000	13,000
1,600		40,000	17,500
1,650		40,000	17,500
1,700		40,000	17,500
1,800		40,000	17,500
1,850		40,000	17,500
1,900		40,000	17,500
2,000		40,000	17,500
2,010		40,000	17,500
2,050		40,000	17,500
2,100		40,000	17,500
2,200		40,000	17,500
2,260		40,000	17,500
2,300		40,000	17,500
2,400		40,000	17,500
2,490		40,000	17,500
2,500		40,000	17,500
2,530		45,000	20,000
2,600		45,000	20,000
2,700		45,000	20,000
2,800		45,000	20,000

d1		l1	l2
mm	inch	mm	mm
3,000		45,000	20,000
3,050		50,000	22,000
3,100		50,000	22,000
3,200		50,000	22,000
3,260		50,000	22,000
3,300		50,000	22,000
3,400		50,000	22,000
3,450		50,000	22,000
3,500		50,000	22,000
3,570	9/64	50,000	22,000
3,600		50,000	22,000
3,910		50,000	22,000
4,000		50,000	22,000
4,200		50,000	25,000
4,300		50,000	25,000
4,400		50,000	25,000
4,700		50,000	25,000
5,000		50,000	25,000
5,200		50,000	25,000
5,310		50,000	25,000
5,610		50,000	25,000
5,790		50,000	25,000
5,950	15/64	50,000	25,000
6,000		50,000	25,000
6,250		65,000	30,000
6,350	1/4	65,000	30,000
6,500		65,000	30,000



## Helisel matkap uçları, kısa

P • öz bileme  $\geq \varnothing 1,000$  • koni bileme

M

K •

N ○ alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

S

H

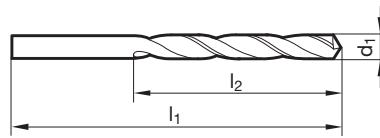
## GÜHRING NAVIGATOR

Kesme verileri sayfası 778

Malzeme HSS

Yüzey  $\geq 0,2,36$ 

Kesme yönü (R)



Ürün no 205

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,200		19,000	2,500	0,620		26,000	8,000
0,210		19,000	2,500	0,630		26,000	8,000
0,220		19,000	2,500	0,640		26,000	8,000
0,230		19,000	2,500	0,650		26,000	8,000
0,240		19,000	2,500	0,660		26,000	8,000
0,250		19,000	3,000	0,670		26,000	8,000
0,260		19,000	3,000	0,680		28,000	9,000
0,270		19,000	3,000	0,690		28,000	9,000
0,280		19,000	3,000	0,700		28,000	9,000
0,290		19,000	3,000	0,710		28,000	9,000
0,300		19,000	3,000	0,720		28,000	9,000
0,310		19,000	4,000	0,730		28,000	9,000
0,320		19,000	4,000	0,740		28,000	9,000
0,330		19,000	4,000	0,750		28,000	9,000
0,340		19,000	4,000	0,760		30,000	10,000
0,350		19,000	4,000	0,770		30,000	10,000
0,360		19,000	4,000	0,780		30,000	10,000
0,370		19,000	4,000	0,790	1/32	30,000	10,000
0,380		19,000	4,000	0,800		30,000	10,000
0,390		20,000	5,000	0,810		30,000	10,000
0,400	1/64	20,000	5,000	0,820		30,000	10,000
0,410		20,000	5,000	0,830		30,000	10,000
0,420		20,000	5,000	0,840		30,000	10,000
0,430		20,000	5,000	0,850		30,000	10,000
0,440		20,000	5,000	0,860		32,000	11,000
0,450		20,000	5,000	0,870		32,000	11,000
0,460		20,000	5,000	0,880		32,000	11,000
0,470		20,000	5,000	0,890		32,000	11,000
0,480		20,000	5,000	0,900		32,000	11,000
0,490		22,000	6,000	0,910		32,000	11,000
0,500		22,000	6,000	0,920		32,000	11,000
0,510		22,000	6,000	0,930		32,000	11,000
0,520		22,000	6,000	0,940		32,000	11,000
0,530		22,000	6,000	0,950		32,000	11,000
0,540		24,000	7,000	0,960		34,000	12,000
0,550		24,000	7,000	0,970		34,000	12,000
0,560		24,000	7,000	0,980		34,000	12,000
0,570		24,000	7,000	0,990		34,000	12,000
0,580		24,000	7,000	1,000		34,000	12,000
0,590		24,000	7,000	1,010		34,000	12,000
0,600		24,000	7,000	1,020		34,000	12,000
0,610		26,000	8,000	1,030		34,000	12,000



d1		l1	l2
mm	inch	mm	mm
1,040		34,000	12,000
1,050		34,000	12,000
1,060		34,000	12,000
1,070		36,000	14,000
1,080		36,000	14,000
1,090		36,000	14,000
1,100		36,000	14,000
1,110		36,000	14,000
1,120		36,000	14,000
1,130		36,000	14,000
1,140		36,000	14,000
1,150		36,000	14,000
1,160		36,000	14,000
1,170		36,000	14,000
1,180		36,000	14,000
1,190	3/64	38,000	16,000
1,200		38,000	16,000
1,210		38,000	16,000
1,220		38,000	16,000
1,230		38,000	16,000
1,240		38,000	16,000
1,250		38,000	16,000
1,260		38,000	16,000
1,270		38,000	16,000
1,280		38,000	16,000
1,290		38,000	16,000
1,300		38,000	16,000
1,310		38,000	16,000
1,320		38,000	16,000
1,330		40,000	18,000
1,340		40,000	18,000
1,350		40,000	18,000
1,360		40,000	18,000
1,370		40,000	18,000
1,380		40,000	18,000
1,390		40,000	18,000
1,400		40,000	18,000
1,410		40,000	18,000
1,420		40,000	18,000
1,430		40,000	18,000
1,440		40,000	18,000
1,450		40,000	18,000
1,460		40,000	18,000
1,470		40,000	18,000
1,480		40,000	18,000
1,490		40,000	18,000
1,500		40,000	18,000
1,510		43,000	20,000
1,520		43,000	20,000
1,530		43,000	20,000
1,540		43,000	20,000
1,550		43,000	20,000
1,560		43,000	20,000
1,570		43,000	20,000
1,580		43,000	20,000
1,590	1/16	43,000	20,000
1,600		43,000	20,000
1,610		43,000	20,000
1,620		43,000	20,000
1,630		43,000	20,000
1,640		43,000	20,000
1,650		43,000	20,000
1,660		43,000	20,000
1,670		43,000	20,000
1,680		43,000	20,000
1,690		43,000	20,000
1,700		43,000	20,000
1,710		46,000	22,000
1,720		46,000	22,000
1,730		46,000	22,000
1,740		46,000	22,000
1,750		46,000	22,000

d1		l1	l2
mm	inch	mm	mm
1,760		46,000	22,000
1,770		46,000	22,000
1,780		46,000	22,000
1,790		46,000	22,000
1,800		46,000	22,000
1,810		46,000	22,000
1,820		46,000	22,000
1,830		46,000	22,000
1,840		46,000	22,000
1,850		46,000	22,000
1,860		46,000	22,000
1,870		46,000	22,000
1,880		46,000	22,000
1,890		46,000	22,000
1,900		46,000	22,000
1,910		49,000	24,000
1,920		49,000	24,000
1,930		49,000	24,000
1,940		49,000	24,000
1,950		49,000	24,000
1,960		49,000	24,000
1,970		49,000	24,000
1,980	5/64	49,000	24,000
1,990		49,000	24,000
2,000		49,000	24,000
2,010		49,000	24,000
2,020		49,000	24,000
2,030		49,000	24,000
2,040		49,000	24,000
2,050		49,000	24,000
2,060		49,000	24,000
2,070		49,000	24,000
2,080		49,000	24,000
2,090		49,000	24,000
2,100		49,000	24,000
2,110		49,000	24,000
2,120		49,000	24,000
2,130		53,000	27,000
2,140		53,000	27,000
2,150		53,000	27,000
2,170		53,000	27,000
2,180		53,000	27,000
2,200		53,000	27,000
2,210		53,000	27,000
2,220		53,000	27,000
2,230		53,000	27,000
2,240		53,000	27,000
2,250		53,000	27,000
2,260		53,000	27,000
2,270		53,000	27,000
2,280		53,000	27,000
2,290		53,000	27,000
2,300		53,000	27,000
2,320		53,000	27,000
2,330		53,000	27,000
2,340		53,000	27,000
2,350		53,000	27,000
2,360		53,000	27,000
2,370		57,000	30,000
2,380	3/32	57,000	30,000
2,390		57,000	30,000
2,400		57,000	30,000
2,420		57,000	30,000
2,430		57,000	30,000
2,440		57,000	30,000
2,450		57,000	30,000
2,460		57,000	30,000
2,470		57,000	30,000
2,480		57,000	30,000
2,490		57,000	30,000
2,500		57,000	30,000
2,510		57,000	30,000



d1		l1	l2
mm	inch	mm	mm
2,520		57,000	30,000
2,530		57,000	30,000
2,540		57,000	30,000
2,550		57,000	30,000
2,570		57,000	30,000
2,580		57,000	30,000
2,600		57,000	30,000
2,610		57,000	30,000
2,620		57,000	30,000
2,630		57,000	30,000
2,640		57,000	30,000
2,650		57,000	30,000
2,660		61,000	33,000
2,670		61,000	33,000
2,680		61,000	33,000
2,700		61,000	33,000
2,710		61,000	33,000
2,720		61,000	33,000
2,730		61,000	33,000
2,750		61,000	33,000
2,760		61,000	33,000
2,780	7/64	61,000	33,000
2,790		61,000	33,000
2,800		61,000	33,000
2,820		61,000	33,000
2,830		61,000	33,000
2,850		61,000	33,000
2,870		61,000	33,000
2,880		61,000	33,000
2,900		61,000	33,000
2,910		61,000	33,000
2,920		61,000	33,000
2,930		61,000	33,000
2,940		61,000	33,000
2,950		61,000	33,000
2,960		61,000	33,000
2,970		61,000	33,000
2,980		61,000	33,000
2,990		61,000	33,000
3,000		61,000	33,000
3,010		65,000	36,000
3,020		65,000	36,000
3,030		65,000	36,000
3,040		65,000	36,000
3,050		65,000	36,000
3,060		65,000	36,000
3,070		65,000	36,000
3,080		65,000	36,000
3,100		65,000	36,000
3,120		65,000	36,000
3,130		65,000	36,000
3,150		65,000	36,000
3,160		65,000	36,000
3,170	1/8	65,000	36,000
3,180		65,000	36,000
3,200		65,000	36,000
3,220		65,000	36,000
3,230		65,000	36,000
3,250		65,000	36,000
3,260		65,000	36,000
3,300		65,000	36,000
3,320		65,000	36,000
3,330		65,000	36,000
3,350		65,000	36,000
3,360		70,000	39,000
3,370		70,000	39,000
3,380		70,000	39,000
3,400		70,000	39,000
3,420		70,000	39,000
3,450		70,000	39,000
3,500		70,000	39,000
3,520		70,000	39,000

d1		l1	l2
mm	inch	mm	mm
3,550		70,000	39,000
3,570	9/64	70,000	39,000
3,600		70,000	39,000
3,610		70,000	39,000
3,620		70,000	39,000
3,650		70,000	39,000
3,660		70,000	39,000
3,680		70,000	39,000
3,700		70,000	39,000
3,725		70,000	39,000
3,730		70,000	39,000
3,750		70,000	39,000
3,800		75,000	43,000
3,820		75,000	43,000
3,830		75,000	43,000
3,850		75,000	43,000
3,860		75,000	43,000
3,870		75,000	43,000
3,900		75,000	43,000
3,910		75,000	43,000
3,920		75,000	43,000
3,930		75,000	43,000
3,940		75,000	43,000
3,950		75,000	43,000
3,970	5/32	75,000	43,000
3,980		75,000	43,000
3,990		75,000	43,000
4,000		75,000	43,000
4,010		75,000	43,000
4,020		75,000	43,000
4,030		75,000	43,000
4,040		75,000	43,000
4,050		75,000	43,000
4,060		75,000	43,000
4,070		75,000	43,000
4,080		75,000	43,000
4,090		75,000	43,000
4,100		75,000	43,000
4,120		75,000	43,000
4,150		75,000	43,000
4,200		75,000	43,000
4,220		75,000	43,000
4,250		75,000	43,000
4,270		80,000	47,000
4,300		80,000	47,000
4,320		80,000	47,000
4,350		80,000	47,000
4,370	11/64	80,000	47,000
4,380		80,000	47,000
4,390		80,000	47,000
4,400		80,000	47,000
4,420		80,000	47,000
4,450		80,000	47,000
4,500		80,000	47,000
4,520		80,000	47,000
4,530		80,000	47,000
4,550		80,000	47,000
4,570		80,000	47,000
4,600		80,000	47,000
4,620		80,000	47,000
4,650		80,000	47,000
4,700		80,000	47,000
4,730		80,000	47,000
4,750		80,000	47,000
4,760	3/16	86,000	52,000
4,770		86,000	52,000
4,800		86,000	52,000
4,830		86,000	52,000
4,850		86,000	52,000
4,860		86,000	52,000
4,900		86,000	52,000
4,920		86,000	52,000





d1		l1	l2
mm	inch	mm	mm
4,930		86,000	52,000
4,950		86,000	52,000
4,970		86,000	52,000
4,980		86,000	52,000
5,000		86,000	52,000
5,020		86,000	52,000
5,025		86,000	52,000
5,030		86,000	52,000
5,050		86,000	52,000
5,060		86,000	52,000
5,080		86,000	52,000
5,100		86,000	52,000
5,110		86,000	52,000
5,120		86,000	52,000
5,150		86,000	52,000
5,160	13/64	86,000	52,000
5,180		86,000	52,000
5,190		86,000	52,000
5,200		86,000	52,000
5,220		86,000	52,000
5,250		86,000	52,000
5,260		86,000	52,000
5,300		86,000	52,000
5,310		93,000	57,000
5,350		93,000	57,000
5,400		93,000	57,000
5,410		93,000	57,000
5,420		93,000	57,000
5,450		93,000	57,000
5,500		93,000	57,000
5,550		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,610		93,000	57,000
5,630		93,000	57,000
5,650		93,000	57,000
5,700		93,000	57,000
5,750		93,000	57,000
5,790		93,000	57,000
5,800		93,000	57,000
5,850		93,000	57,000
5,900		93,000	57,000
5,920		93,000	57,000
5,930		93,000	57,000
5,940		93,000	57,000
5,950	15/64	93,000	57,000
5,960		93,000	57,000
5,970		93,000	57,000
5,980		93,000	57,000
5,990		93,000	57,000
6,000		93,000	57,000
6,030		101,000	63,000
6,040		101,000	63,000
6,050		101,000	63,000
6,100		101,000	63,000
6,150		101,000	63,000
6,170		101,000	63,000
6,200		101,000	63,000
6,210		101,000	63,000
6,220		101,000	63,000
6,250		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,380		101,000	63,000
6,400		101,000	63,000
6,450		101,000	63,000
6,500		101,000	63,000
6,530		101,000	63,000
6,550		101,000	63,000
6,600		101,000	63,000
6,630		101,000	63,000
6,650		101,000	63,000

d1		l1	l2
mm	inch	mm	mm
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,760		109,000	69,000
6,800		109,000	69,000
6,850		109,000	69,000
6,900		109,000	69,000
6,950		109,000	69,000
7,000		109,000	69,000
7,030		109,000	69,000
7,040		109,000	69,000
7,050		109,000	69,000
7,070		109,000	69,000
7,100		109,000	69,000
7,130		109,000	69,000
7,140	9/32	109,000	69,000
7,150		109,000	69,000
7,200		109,000	69,000
7,250		109,000	69,000
7,300		109,000	69,000
7,320		109,000	69,000
7,350		109,000	69,000
7,370		109,000	69,000
7,400		109,000	69,000
7,450		109,000	69,000
7,490		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000
7,550		117,000	75,000
7,600		117,000	75,000
7,650		117,000	75,000
7,670		117,000	75,000
7,700		117,000	75,000
7,750		117,000	75,000
7,800		117,000	75,000
7,850		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
7,950		117,000	75,000
7,980		117,000	75,000
8,000		117,000	75,000
8,030		117,000	75,000
8,050		117,000	75,000
8,100		117,000	75,000
8,130		117,000	75,000
8,150		117,000	75,000
8,200		117,000	75,000
8,250		117,000	75,000
8,300		117,000	75,000
8,330	21/64	117,000	75,000
8,350		117,000	75,000
8,400		117,000	75,000
8,430		117,000	75,000
8,450		117,000	75,000
8,500		117,000	75,000
8,550		125,000	81,000
8,600		125,000	81,000
8,610		125,000	81,000
8,650		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,750		125,000	81,000
8,800		125,000	81,000
8,840		125,000	81,000
8,850		125,000	81,000
8,900		125,000	81,000
8,950		125,000	81,000
9,000		125,000	81,000
9,050		125,000	81,000
9,090		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,150		125,000	81,000



d1		l1	l2
mm	inch	mm	mm
9,200		125,000	81,000
9,250		125,000	81,000
9,300		125,000	81,000
9,340		125,000	81,000
9,350		125,000	81,000
9,400		125,000	81,000
9,450		125,000	81,000
9,500		125,000	81,000
9,510		133,000	87,000
9,520	3/8	133,000	87,000
9,570		133,000	87,000
9,580		133,000	87,000
9,600		133,000	87,000
9,650		133,000	87,000
9,700		133,000	87,000
9,750		133,000	87,000
9,800		133,000	87,000
9,850		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
9,950		133,000	87,000
10,000		133,000	87,000
10,050		133,000	87,000
10,080		133,000	87,000
10,100		133,000	87,000
10,150		133,000	87,000
10,200		133,000	87,000
10,250		133,000	87,000
10,260		133,000	87,000
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,350		133,000	87,000
10,400		133,000	87,000
10,450		133,000	87,000
10,490		133,000	87,000
10,500		133,000	87,000
10,550		133,000	87,000
10,600		133,000	87,000
10,700		142,000	94,000
10,720	27/64	142,000	94,000
10,750		142,000	94,000
10,800		142,000	94,000
10,900		142,000	94,000
11,000		142,000	94,000
11,050		142,000	94,000
11,100		142,000	94,000
11,110	7/16	142,000	94,000
11,150		142,000	94,000
11,200		142,000	94,000
11,250		142,000	94,000
11,300		142,000	94,000
11,350		142,000	94,000
11,400		142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,600		142,000	94,000
11,700		142,000	94,000
11,750		142,000	94,000
11,800		142,000	94,000
11,900		151,000	101,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,050		151,000	101,000
12,100		151,000	101,000
12,200		151,000	101,000
12,250		151,000	101,000
12,300	31/64	151,000	101,000
12,400		151,000	101,000
12,500		151,000	101,000
12,600		151,000	101,000
12,650		151,000	101,000
12,700	1/2	151,000	101,000

d1		l1	l2
mm	inch	mm	mm
12,750		151,000	101,000
12,800		151,000	101,000
12,850		151,000	101,000
12,900		151,000	101,000
13,000		151,000	101,000
13,100	33/64	151,000	101,000
13,200		151,000	101,000
13,250		160,000	108,000
13,300		160,000	108,000
13,400		160,000	108,000
13,490	17/32	160,000	108,000
13,500		160,000	108,000
13,530		160,000	108,000
13,600		160,000	108,000
13,700		160,000	108,000
13,750		160,000	108,000
13,800		160,000	108,000
13,890	35/64	160,000	108,000
13,900		160,000	108,000
14,000		160,000	108,000
14,100		169,000	114,000
14,200		169,000	114,000
14,250		169,000	114,000
14,290	9/16	169,000	114,000
14,300		169,000	114,000
14,400		169,000	114,000
14,450		169,000	114,000
14,500		169,000	114,000
14,600		169,000	114,000
14,680	37/64	169,000	114,000
14,700		169,000	114,000
14,750		169,000	114,000
14,800		169,000	114,000
14,900		169,000	114,000
15,000		169,000	114,000
15,080	19/32	178,000	120,000
15,100		178,000	120,000
15,200		178,000	120,000
15,250		178,000	120,000
15,300		178,000	120,000
15,400		178,000	120,000
15,480	39/64	178,000	120,000
15,500		178,000	120,000
15,600		178,000	120,000
15,700		178,000	120,000
15,750		178,000	120,000
15,800		178,000	120,000
15,870	5/8	178,000	120,000
15,900		178,000	120,000
16,000		178,000	120,000
16,100		184,000	125,000
16,200		184,000	125,000
16,250		184,000	125,000
16,270	41/64	184,000	125,000
16,300		184,000	125,000
16,400		184,000	125,000
16,500		184,000	125,000
16,600		184,000	125,000
16,670	21/32	184,000	125,000
16,700		184,000	125,000
16,750		184,000	125,000
16,800		184,000	125,000
16,900		184,000	125,000
17,000		184,000	125,000
17,070	43/64	191,000	130,000
17,200		191,000	130,000
17,250		191,000	130,000
17,300		191,000	130,000
17,400		191,000	130,000
17,460	11/16	191,000	130,000
17,500		191,000	130,000
17,600		191,000	130,000

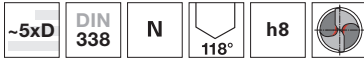


d1		l1	l2
mm	inch	mm	mm
17,700		191,000	130,000
17,750		191,000	130,000
17,800		191,000	130,000
17,860	45/64	191,000	130,000
17,900		191,000	130,000
18,000		191,000	130,000
18,100		198,000	135,000
18,200		198,000	135,000
18,260	23/32	198,000	135,000
18,400		198,000	135,000
18,500		198,000	135,000
18,650	47/64	198,000	135,000

d1		l1	l2
mm	inch	mm	mm
18,750		198,000	135,000
18,800		198,000	135,000
19,000		198,000	135,000
19,050	3/4	205,000	140,000
19,100		205,000	140,000
19,200		205,000	140,000
19,250		205,000	140,000
19,500		205,000	140,000
19,600		205,000	140,000
19,750		205,000	140,000
19,840	25/32	205,000	140,000
20,000		205,000	140,000



## Helisel matkap uçları, kısa

P • öz bileme  $\geq \varnothing 1,000$  • koni bileme

M

K •

N ○ alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

S

H

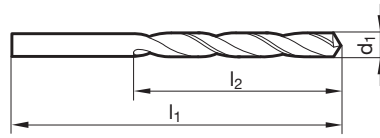
Malzeme HSS

Yüzey S

Kesme yönü R

## GÜHRING NAVIGATOR

Kesme verileri sayfası 780



Ürün no 651

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,200		19,000	2,500	0,720		28,000	9,000
0,250		19,000	3,000	0,740		28,000	9,000
0,280		19,000	3,000	0,750		28,000	9,000
0,300		19,000	3,000	0,770		30,000	10,000
0,310		19,000	4,000	0,780		30,000	10,000
0,320		19,000	4,000	0,790	1/32	30,000	10,000
0,330		19,000	4,000	0,800		30,000	10,000
0,340		19,000	4,000	0,810		30,000	10,000
0,360		19,000	4,000	0,820		30,000	10,000
0,370		19,000	4,000	0,830		30,000	10,000
0,380		19,000	4,000	0,840		30,000	10,000
0,390		20,000	5,000	0,850		30,000	10,000
0,400	1/64	20,000	5,000	0,860		32,000	11,000
0,410		20,000	5,000	0,870		32,000	11,000
0,420		20,000	5,000	0,880		32,000	11,000
0,430		20,000	5,000	0,890		32,000	11,000
0,440		20,000	5,000	0,900		32,000	11,000
0,450		20,000	5,000	0,910		32,000	11,000
0,460		20,000	5,000	0,920		32,000	11,000
0,470		20,000	5,000	0,930		32,000	11,000
0,480		20,000	5,000	0,940		32,000	11,000
0,490		22,000	6,000	0,950		32,000	11,000
0,500		22,000	6,000	0,960		34,000	12,000
0,510		22,000	6,000	0,970		34,000	12,000
0,520		22,000	6,000	0,980		34,000	12,000
0,530		22,000	6,000	0,990		34,000	12,000
0,540		24,000	7,000	1,000		34,000	12,000
0,550		24,000	7,000	1,020		34,000	12,000
0,570		24,000	7,000	1,030		34,000	12,000
0,580		24,000	7,000	1,040		34,000	12,000
0,590		24,000	7,000	1,050		34,000	12,000
0,600		24,000	7,000	1,060		34,000	12,000
0,610		26,000	8,000	1,070		36,000	14,000
0,620		26,000	8,000	1,080		36,000	14,000
0,630		26,000	8,000	1,090		36,000	14,000
0,640		26,000	8,000	1,100		36,000	14,000
0,650		26,000	8,000	1,110		36,000	14,000
0,660		26,000	8,000	1,120		36,000	14,000
0,680		28,000	9,000	1,130		36,000	14,000
0,690		28,000	9,000	1,140		36,000	14,000
0,700		28,000	9,000	1,150		36,000	14,000
0,710		28,000	9,000	1,160		36,000	14,000



d1		l1	l2
mm	inch	mm	mm
1,170		36,000	14,000
1,180		36,000	14,000
1,190	3/64	38,000	16,000
1,200		38,000	16,000
1,210		38,000	16,000
1,220		38,000	16,000
1,240		38,000	16,000
1,250		38,000	16,000
1,260		38,000	16,000
1,270		38,000	16,000
1,280		38,000	16,000
1,300		38,000	16,000
1,320		38,000	16,000
1,330		40,000	18,000
1,340		40,000	18,000
1,350		40,000	18,000
1,400		40,000	18,000
1,420		40,000	18,000
1,430		40,000	18,000
1,450		40,000	18,000
1,460		40,000	18,000
1,470		40,000	18,000
1,480		40,000	18,000
1,490		40,000	18,000
1,500		40,000	18,000
1,510		43,000	20,000
1,520		43,000	20,000
1,530		43,000	20,000
1,540		43,000	20,000
1,550		43,000	20,000
1,560		43,000	20,000
1,570		43,000	20,000
1,590	1/16	43,000	20,000
1,600		43,000	20,000
1,610		43,000	20,000
1,620		43,000	20,000
1,640		43,000	20,000
1,650		43,000	20,000
1,660		43,000	20,000
1,680		43,000	20,000
1,700		43,000	20,000
1,710		46,000	22,000
1,720		46,000	22,000
1,730		46,000	22,000
1,750		46,000	22,000
1,770		46,000	22,000
1,780		46,000	22,000
1,800		46,000	22,000
1,820		46,000	22,000
1,830		46,000	22,000
1,850		46,000	22,000
1,870		46,000	22,000
1,900		46,000	22,000
1,910		49,000	24,000
1,930		49,000	24,000
1,950		49,000	24,000
1,960		49,000	24,000
1,970		49,000	24,000
1,980	5/64	49,000	24,000
1,990		49,000	24,000
2,000		49,000	24,000
2,020		49,000	24,000
2,030		49,000	24,000
2,050		49,000	24,000
2,060		49,000	24,000
2,080		49,000	24,000
2,100		49,000	24,000
2,150		53,000	27,000
2,180		53,000	27,000
2,200		53,000	27,000
2,250		53,000	27,000
2,260		53,000	27,000

d1		l1	l2
mm	inch	mm	mm
2,300		53,000	27,000
2,350		53,000	27,000
2,370		57,000	30,000
2,380	3/32	57,000	30,000
2,400		57,000	30,000
2,440		57,000	30,000
2,450		57,000	30,000
2,490		57,000	30,000
2,500		57,000	30,000
2,520		57,000	30,000
2,530		57,000	30,000
2,550		57,000	30,000
2,580		57,000	30,000
2,600		57,000	30,000
2,640		57,000	30,000
2,650		57,000	30,000
2,700		61,000	33,000
2,710		61,000	33,000
2,720		61,000	33,000
2,750		61,000	33,000
2,780	7/64	61,000	33,000
2,790		61,000	33,000
2,800		61,000	33,000
2,820		61,000	33,000
2,850		61,000	33,000
2,870		61,000	33,000
2,900		61,000	33,000
2,950		61,000	33,000
3,000		61,000	33,000
3,020		65,000	36,000
3,030		65,000	36,000
3,050		65,000	36,000
3,100		65,000	36,000
3,150		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,250		65,000	36,000
3,260		65,000	36,000
3,300		65,000	36,000
3,350		65,000	36,000
3,400		70,000	39,000
3,450		70,000	39,000
3,500		70,000	39,000
3,550		70,000	39,000
3,570	9/64	70,000	39,000
3,600		70,000	39,000
3,650		70,000	39,000
3,660		70,000	39,000
3,700		70,000	39,000
3,730		70,000	39,000
3,750		70,000	39,000
3,800		75,000	43,000
3,850		75,000	43,000
3,860		75,000	43,000
3,900		75,000	43,000
3,910		75,000	43,000
3,950		75,000	43,000
3,970	5/32	75,000	43,000
3,990		75,000	43,000
4,000		75,000	43,000
4,040		75,000	43,000
4,050		75,000	43,000
4,070		75,000	43,000
4,090		75,000	43,000
4,100		75,000	43,000
4,150		75,000	43,000
4,200		75,000	43,000
4,220		75,000	43,000
4,250		75,000	43,000
4,300		80,000	47,000
4,350		80,000	47,000
4,370	11/64	80,000	47,000



d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
4,390		80,000	47,000	7,030		109,000	69,000
4,400		80,000	47,000	7,050		109,000	69,000
4,450		80,000	47,000	7,100		109,000	69,000
4,500		80,000	47,000	7,140	9/32	109,000	69,000
4,550		80,000	47,000	7,200		109,000	69,000
4,570		80,000	47,000	7,250		109,000	69,000
4,600		80,000	47,000	7,300		109,000	69,000
4,620		80,000	47,000	7,370		109,000	69,000
4,650		80,000	47,000	7,400		109,000	69,000
4,700		80,000	47,000	7,450		109,000	69,000
4,750		80,000	47,000	7,490		109,000	69,000
4,760	3/16	86,000	52,000	7,500		109,000	69,000
4,800		86,000	52,000	7,540	19/64	117,000	75,000
4,850		86,000	52,000	7,600		117,000	75,000
4,900		86,000	52,000	7,670		117,000	75,000
4,920		86,000	52,000	7,700		117,000	75,000
4,950		86,000	52,000	7,750		117,000	75,000
4,980		86,000	52,000	7,800		117,000	75,000
5,000		86,000	52,000	7,900		117,000	75,000
5,020		86,000	52,000	7,940	5/16	117,000	75,000
5,050		86,000	52,000	8,000		117,000	75,000
5,060		86,000	52,000	8,030		117,000	75,000
5,100		86,000	52,000	8,050		117,000	75,000
5,110		86,000	52,000	8,100		117,000	75,000
5,150		86,000	52,000	8,150		117,000	75,000
5,160	13/64	86,000	52,000	8,200		117,000	75,000
5,180		86,000	52,000	8,250		117,000	75,000
5,200		86,000	52,000	8,300		117,000	75,000
5,220		86,000	52,000	8,330	21/64	117,000	75,000
5,250		86,000	52,000	8,400		117,000	75,000
5,300		86,000	52,000	8,430		117,000	75,000
5,310		93,000	57,000	8,450		117,000	75,000
5,400		93,000	57,000	8,500		117,000	75,000
5,410		93,000	57,000	8,600		125,000	81,000
5,450		93,000	57,000	8,610		125,000	81,000
5,500		93,000	57,000	8,700		125,000	81,000
5,550		93,000	57,000	8,730	11/32	125,000	81,000
5,560	7/32	93,000	57,000	8,750		125,000	81,000
5,600		93,000	57,000	8,800		125,000	81,000
5,610		93,000	57,000	8,840		125,000	81,000
5,650		93,000	57,000	8,850		125,000	81,000
5,700		93,000	57,000	8,900		125,000	81,000
5,750		93,000	57,000	9,000		125,000	81,000
5,790		93,000	57,000	9,050		125,000	81,000
5,800		93,000	57,000	9,090		125,000	81,000
5,850		93,000	57,000	9,100		125,000	81,000
5,900		93,000	57,000	9,130	23/64	125,000	81,000
5,940		93,000	57,000	9,200		125,000	81,000
5,950	15/64	93,000	57,000	9,250		125,000	81,000
6,000		93,000	57,000	9,300		125,000	81,000
6,040		101,000	63,000	9,340		125,000	81,000
6,050		101,000	63,000	9,350		125,000	81,000
6,100		101,000	63,000	9,400		125,000	81,000
6,150		101,000	63,000	9,500		125,000	81,000
6,200		101,000	63,000	9,520	3/8	133,000	87,000
6,250		101,000	63,000	9,550		133,000	87,000
6,300		101,000	63,000	9,580		133,000	87,000
6,350	1/4	101,000	63,000	9,600		133,000	87,000
6,400		101,000	63,000	9,700		133,000	87,000
6,500		101,000	63,000	9,750		133,000	87,000
6,530		101,000	63,000	9,800		133,000	87,000
6,550		101,000	63,000	9,900		133,000	87,000
6,600		101,000	63,000	9,920	25/64	133,000	87,000
6,630		101,000	63,000	10,000		133,000	87,000
6,650		101,000	63,000	10,060		133,000	87,000
6,700		101,000	63,000	10,080		133,000	87,000
6,750	17/64	109,000	69,000	10,100		133,000	87,000
6,800		109,000	69,000	10,200		133,000	87,000
6,850		109,000	69,000	10,250		133,000	87,000
6,900		109,000	69,000	10,260		133,000	87,000
7,000		109,000	69,000	10,300		133,000	87,000
7,020		109,000	69,000	10,320	13/32	133,000	87,000



d1		l1	l2
mm	inch	mm	mm
10,400		133,000	87,000
10,490		133,000	87,000
10,500		133,000	87,000
10,550		133,000	87,000
10,600		133,000	87,000
10,700		142,000	94,000
10,720	27/64	142,000	94,000
10,750		142,000	94,000
10,800		142,000	94,000
10,900		142,000	94,000
11,000		142,000	94,000
11,100		142,000	94,000
11,110	7/16	142,000	94,000
11,200		142,000	94,000
11,250		142,000	94,000
11,300		142,000	94,000
11,400		142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,600		142,000	94,000
11,650		142,000	94,000
11,700		142,000	94,000
11,750		142,000	94,000
11,800		142,000	94,000
11,900		151,000	101,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,100		151,000	101,000
12,200		151,000	101,000
12,250		151,000	101,000
12,300	31/64	151,000	101,000
12,400		151,000	101,000
12,500		151,000	101,000
12,600		151,000	101,000
12,700	1/2	151,000	101,000
12,800		151,000	101,000
12,900		151,000	101,000
13,000		151,000	101,000
13,100	33/64	151,000	101,000
13,200		151,000	101,000
13,490	17/32	160,000	108,000
13,500		160,000	108,000

d1		l1	l2
mm	inch	mm	mm
13,700		160,000	108,000
13,750		160,000	108,000
13,800		160,000	108,000
13,890	35/64	160,000	108,000
13,900		160,000	108,000
14,000		160,000	108,000
14,100		169,000	114,000
14,200		169,000	114,000
14,250		169,000	114,000
14,290	9/16	169,000	114,000
14,300		169,000	114,000
14,400		169,000	114,000
14,500		169,000	114,000
14,680	37/64	169,000	114,000
15,000		169,000	114,000
15,080	19/32	178,000	120,000
15,250		178,000	120,000
15,480	39/64	178,000	120,000
15,500		178,000	120,000
15,800		178,000	120,000
15,870	5/8	178,000	120,000
16,000		178,000	120,000
16,500		184,000	125,000
16,750		184,000	125,000
17,000		184,000	125,000
17,250		191,000	130,000
17,500		191,000	130,000
18,000		191,000	130,000
18,500		198,000	135,000
18,800		198,000	135,000
19,000		198,000	135,000



## Helisel matkap uçları, kısa

~5xD

DIN  
338

N

118°

h8

P • öz bileme  $\geq \varnothing 1,000$  • koni bileme

M

K •

N •

alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

S

H

Malzeme

HSS

Yüzey

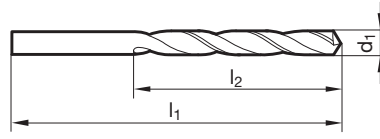
F

Kesme yönü

R

## GÜHRING NAVIGATOR

Kesme verileri sayfası 780

SİLİNDİR ŞAFTLI MATKAP  
UCU

Ürün no

2456

d1		l1	l2
mm	inch	mm	mm
1,000		34,000	12,000
1,100		36,000	14,000
1,200		38,000	16,000
1,300		38,000	16,000
1,400		40,000	18,000
1,500		40,000	18,000
1,600		43,000	20,000
1,700		43,000	20,000
1,800		46,000	22,000
1,900		46,000	22,000
2,000		49,000	24,000
2,100		49,000	24,000
2,200		53,000	27,000
2,300		53,000	27,000
2,400		57,000	30,000
2,500		57,000	30,000
2,600		57,000	30,000
2,700		61,000	33,000
2,800		61,000	33,000
2,900		61,000	33,000
3,000		61,000	33,000
3,100		65,000	36,000
3,200		65,000	36,000
3,300		65,000	36,000
3,400		70,000	39,000
3,500		70,000	39,000
3,600		70,000	39,000
3,700		70,000	39,000
3,800		75,000	43,000
3,900		75,000	43,000
4,000		75,000	43,000
4,100		75,000	43,000
4,200		75,000	43,000
4,300		80,000	47,000
4,400		80,000	47,000
4,500		80,000	47,000
4,600		80,000	47,000
4,800		86,000	52,000
5,000		86,000	52,000
5,100		86,000	52,000
5,200		86,000	52,000
5,500		93,000	57,000

d1		l1	l2
mm	inch	mm	mm
5,600		93,000	57,000
5,700		93,000	57,000
5,800		93,000	57,000
5,900		93,000	57,000
6,000		93,000	57,000
6,100		101,000	63,000
6,200		101,000	63,000
6,300		101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,600		101,000	63,000
6,700		101,000	63,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,200		109,000	69,000
7,300		109,000	69,000
7,400		109,000	69,000
7,500		109,000	69,000
7,600		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,800		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,500		125,000	81,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
10,000		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,300		133,000	87,000



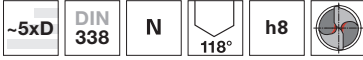


d1		l1	l2
mm	inch	mm	mm
10,400		133,000	87,000
10,700		142,000	94,000
11,000		142,000	94,000
11,100		142,000	94,000
11,400		142,000	94,000
11,700		142,000	94,000

d1		l1	l2
mm	inch	mm	mm
11,900		151,000	101,000
12,700	1/2	151,000	101,000
13,000		151,000	101,000
14,000		160,000	108,000
14,500		169,000	114,000



## Helisel matkap uçları, kısa

P • öz bileme  $\geq \varnothing 2,370$  • koni bileme

M

K •

N ○

S

H

alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

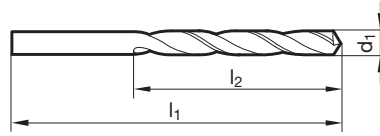
Malzeme **HSS**

Yüzey ○

Kesme yönü (R)

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 778

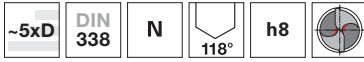
SİLİNDİR ŞAFTLI MATKAP  
UCUÜrün no **560**

d1		l1	l2
mm	inch	mm	mm
2,400		57,000	30,000
2,500		57,000	30,000
2,580		57,000	30,000
2,600		57,000	30,000
2,640		57,000	30,000
2,700		61,000	33,000
2,710		61,000	33,000
2,750		61,000	33,000
2,790		61,000	33,000
2,800		61,000	33,000
2,820		61,000	33,000
2,850		61,000	33,000
2,870		61,000	33,000
2,950		61,000	33,000
3,000		61,000	33,000
3,050		65,000	36,000
3,200		65,000	36,000
3,240		65,000	36,000
3,260		65,000	36,000
3,300		65,000	36,000
3,400		70,000	39,000
3,450		70,000	39,000
3,500		70,000	39,000
3,570	9/64	70,000	39,000
3,600		70,000	39,000
3,650		70,000	39,000
3,660		70,000	39,000
3,700		70,000	39,000
3,730		70,000	39,000
3,800		75,000	43,000

d1		l1	l2
mm	inch	mm	mm
3,860		75,000	43,000
3,900		75,000	43,000
3,950		75,000	43,000
3,970	5/32	75,000	43,000
4,000		75,000	43,000
4,200		75,000	43,000
4,300		80,000	47,000
4,370	11/64	80,000	47,000
4,500		80,000	47,000
4,550		80,000	47,000
4,600		80,000	47,000
4,620		80,000	47,000
4,650		80,000	47,000
4,700		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,850		86,000	52,000
4,900		86,000	52,000
4,920		86,000	52,000
4,950		86,000	52,000
5,000		86,000	52,000
5,100		86,000	52,000
5,200		86,000	52,000
5,300		86,000	52,000
5,610		93,000	57,000



## Helisel matkap uçları, kısa



**P** • öz bileme  $\geq \varnothing 3,000$  • koni bileme • DIN 1809 döndürücü dilli

**M**

**K** •

**N** ○ alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

**S**

**H**

Malzeme **HSS**

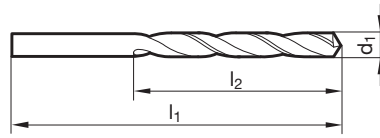
Yüzey



Kesme yönü

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 778



SİLİNDİR ŞAFTLI MATKAP UCU

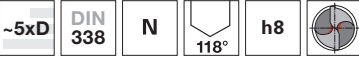
Ürün no **240**

d1		l1	l2
mm	inch	mm	mm
3,000		61,000	33,000
3,100		65,000	36,000
3,200		65,000	36,000
3,300		65,000	36,000
3,400		70,000	39,000
3,500		70,000	39,000
3,600		70,000	39,000
3,700		70,000	39,000
3,800		75,000	43,000
3,900		75,000	43,000
3,970	5/32	75,000	43,000
4,000		75,000	43,000
4,100		75,000	43,000
4,200		75,000	43,000
4,300		80,000	47,000
4,400		80,000	47,000
4,500		80,000	47,000
4,600		80,000	47,000
4,700		80,000	47,000
4,800		86,000	52,000
4,900		86,000	52,000
5,000		86,000	52,000
5,100		86,000	52,000
5,200		86,000	52,000
5,250		86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,500		93,000	57,000
5,600		93,000	57,000
5,700		93,000	57,000
5,800		93,000	57,000
5,850		93,000	57,000
5,900		93,000	57,000
6,000		93,000	57,000
6,050		101,000	63,000
6,100		101,000	63,000
6,200		101,000	63,000
6,300		101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,600		101,000	63,000
6,700		101,000	63,000

d1		l1	l2
mm	inch	mm	mm
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000
7,200		109,000	69,000
7,500		109,000	69,000
7,600		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,400		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,800		125,000	81,000
9,000		125,000	81,000
9,100		125,000	81,000
9,250		125,000	81,000
9,300		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,600		133,000	87,000
9,800		133,000	87,000
10,000		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,500		133,000	87,000
11,000		142,000	94,000
11,500		142,000	94,000
12,000		151,000	101,000
13,000		151,000	101,000
13,490	17/32	160,000	108,000
15,000		169,000	114,000
16,000		178,000	120,000



## Helisel matkap uçları, kısa

P • öz bileme  $\geq \varnothing 14,700$  • koni bileme

M

K •

N ○

S

H

alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

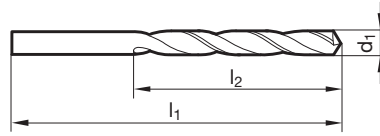
Malzeme **HSS**

Yüzey

Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 778

Ürün no **208**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,200		19,000	2,500	0,750		28,000	9,000
0,240		19,000	2,500	0,770		30,000	10,000
0,290		19,000	3,000	0,775		30,000	10,000
0,300		19,000	3,000	0,780		30,000	10,000
0,340		19,000	4,000	0,790	1/32	30,000	10,000
0,350		19,000	4,000	0,800		30,000	10,000
0,360		19,000	4,000	0,810		30,000	10,000
0,370		19,000	4,000	0,820		30,000	10,000
0,390		20,000	5,000	0,830		30,000	10,000
0,400	1/64	20,000	5,000	0,840		30,000	10,000
0,410		20,000	5,000	0,850		30,000	10,000
0,420		20,000	5,000	0,860		32,000	11,000
0,430		20,000	5,000	0,870		32,000	11,000
0,440		20,000	5,000	0,880		32,000	11,000
0,450		20,000	5,000	0,890		32,000	11,000
0,460		20,000	5,000	0,900		32,000	11,000
0,470		20,000	5,000	0,910		32,000	11,000
0,480		20,000	5,000	0,930		32,000	11,000
0,500		22,000	6,000	0,950		32,000	11,000
0,510		22,000	6,000	0,960		34,000	12,000
0,520		22,000	6,000	0,970		34,000	12,000
0,530		22,000	6,000	0,980		34,000	12,000
0,540		24,000	7,000	0,990		34,000	12,000
0,550		24,000	7,000	1,000		34,000	12,000
0,560		24,000	7,000	1,020		34,000	12,000
0,570		24,000	7,000	1,040		34,000	12,000
0,580		24,000	7,000	1,050		34,000	12,000
0,600		24,000	7,000	1,070		36,000	14,000
0,610		26,000	8,000	1,080		36,000	14,000
0,620		26,000	8,000	1,090		36,000	14,000
0,630		26,000	8,000	1,100		36,000	14,000
0,640		26,000	8,000	1,110		36,000	14,000
0,650		26,000	8,000	1,120		36,000	14,000
0,660		26,000	8,000	1,130		36,000	14,000
0,670		26,000	8,000	1,150		36,000	14,000
0,680		28,000	9,000	1,170		36,000	14,000
0,690		28,000	9,000	1,180		36,000	14,000
0,700		28,000	9,000	1,190	3/64	38,000	16,000
0,710		28,000	9,000	1,200		38,000	16,000
0,720		28,000	9,000	1,210		38,000	16,000
0,730		28,000	9,000	1,220		38,000	16,000
0,740		28,000	9,000	1,250		38,000	16,000



d1		l1	l2
mm	inch	mm	mm
1,270		38,000	16,000
1,290		38,000	16,000
1,300		38,000	16,000
1,310		38,000	16,000
1,320		38,000	16,000
1,350		40,000	18,000
1,380		40,000	18,000
1,390		40,000	18,000
1,400		40,000	18,000
1,420		40,000	18,000
1,430		40,000	18,000
1,450		40,000	18,000
1,465		40,000	18,000
1,470		40,000	18,000
1,490		40,000	18,000
1,500		40,000	18,000
1,510		43,000	20,000
1,550		43,000	20,000
1,590	1/16	43,000	20,000
1,600		43,000	20,000
1,610		43,000	20,000
1,620		43,000	20,000
1,630		43,000	20,000
1,650		43,000	20,000
1,660		43,000	20,000
1,700		43,000	20,000
1,720		46,000	22,000
1,750		46,000	22,000
1,760		46,000	22,000
1,770		46,000	22,000
1,780		46,000	22,000
1,790		46,000	22,000
1,800		46,000	22,000
1,820		46,000	22,000
1,830		46,000	22,000
1,840		46,000	22,000
1,850		46,000	22,000
1,880		46,000	22,000
1,900		46,000	22,000
1,930		49,000	24,000
1,940		49,000	24,000
1,950		49,000	24,000
1,970		49,000	24,000
1,980	5/64	49,000	24,000
2,000		49,000	24,000
2,040		49,000	24,000
2,050		49,000	24,000
2,080		49,000	24,000
2,100		49,000	24,000
2,120		49,000	24,000
2,150		53,000	27,000
2,180		53,000	27,000
2,200		53,000	27,000
2,240		53,000	27,000
2,250		53,000	27,000
2,260		53,000	27,000
2,300		53,000	27,000
2,320		53,000	27,000
2,350		53,000	27,000
2,360		53,000	27,000
2,370		57,000	30,000
2,380	3/32	57,000	30,000
2,400		57,000	30,000
2,420		57,000	30,000
2,440		57,000	30,000
2,450		57,000	30,000
2,490		57,000	30,000
2,500		57,000	30,000
2,530		57,000	30,000
2,550		57,000	30,000
2,570		57,000	30,000
2,580		57,000	30,000

d1		l1	l2
mm	inch	mm	mm
2,600		57,000	30,000
2,640		57,000	30,000
2,650		57,000	30,000
2,660		61,000	33,000
2,670		61,000	33,000
2,700		61,000	33,000
2,710		61,000	33,000
2,730		61,000	33,000
2,750		61,000	33,000
2,780	7/64	61,000	33,000
2,800		61,000	33,000
2,870		61,000	33,000
2,880		61,000	33,000
2,900		61,000	33,000
2,910		61,000	33,000
2,950		61,000	33,000
2,970		61,000	33,000
3,000		61,000	33,000
3,020		65,000	36,000
3,030		65,000	36,000
3,050		65,000	36,000
3,100		65,000	36,000
3,150		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,220		65,000	36,000
3,250		65,000	36,000
3,260		65,000	36,000
3,280		65,000	36,000
3,300		65,000	36,000
3,320		65,000	36,000
3,330		65,000	36,000
3,340		65,000	36,000
3,370		70,000	39,000
3,380		70,000	39,000
3,400		70,000	39,000
3,450		70,000	39,000
3,470		70,000	39,000
3,500		70,000	39,000
3,530		70,000	39,000
3,570	9/64	70,000	39,000
3,600		70,000	39,000
3,650		70,000	39,000
3,700		70,000	39,000
3,750		70,000	39,000
3,800		75,000	43,000
3,850		75,000	43,000
3,870		75,000	43,000
3,900		75,000	43,000
3,910		75,000	43,000
3,950		75,000	43,000
3,970	5/32	75,000	43,000
4,000		75,000	43,000
4,050		75,000	43,000
4,090		75,000	43,000
4,100		75,000	43,000
4,130		75,000	43,000
4,150		75,000	43,000
4,200		75,000	43,000
4,250		75,000	43,000
4,300		80,000	47,000
4,350		80,000	47,000
4,370	11/64	80,000	47,000
4,390		80,000	47,000
4,400		80,000	47,000
4,450		80,000	47,000
4,500		80,000	47,000
4,520		80,000	47,000
4,530		80,000	47,000
4,550		80,000	47,000
4,570		80,000	47,000
4,600		80,000	47,000

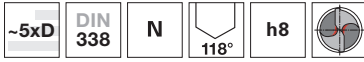


d1		l1	l2
mm	inch	mm	mm
4,680		80,000	47,000
4,750		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,850		86,000	52,000
4,900		86,000	52,000
4,920		86,000	52,000
4,930		86,000	52,000
4,950		86,000	52,000
4,970		86,000	52,000
4,980		86,000	52,000
5,000		86,000	52,000
5,060		86,000	52,000
5,080		86,000	52,000
5,100		86,000	52,000
5,110		86,000	52,000
5,160	13/64	86,000	52,000
5,200		86,000	52,000
5,220		86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,500		93,000	57,000
5,520		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,610		93,000	57,000
5,650		93,000	57,000
5,700		93,000	57,000
5,750		93,000	57,000
5,800		93,000	57,000
5,850		93,000	57,000
5,900		93,000	57,000
5,940		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,100		101,000	63,000
6,200		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,450		101,000	63,000
6,500		101,000	63,000
6,530		101,000	63,000
6,550		101,000	63,000
6,570		101,000	63,000
6,600		101,000	63,000
6,630		101,000	63,000
6,700		101,000	63,000
6,800		109,000	69,000
6,880		109,000	69,000
6,900		109,000	69,000
6,910		109,000	69,000
6,950		109,000	69,000
7,000		109,000	69,000
7,030		109,000	69,000
7,040		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000
7,220		109,000	69,000
7,300		109,000	69,000
7,400		109,000	69,000
7,490		109,000	69,000
7,500		109,000	69,000
7,520		117,000	75,000
7,540	19/64	117,000	75,000
7,550		117,000	75,000
7,600		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000
7,850		117,000	75,000
7,900		117,000	75,000

d1		l1	l2
mm	inch	mm	mm
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,330	21/64	117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,610		125,000	81,000
8,650		125,000	81,000
8,700		125,000	81,000
8,800		125,000	81,000
9,000		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,750		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,080		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,300		133,000	87,000
10,500		133,000	87,000
10,750		142,000	94,000
11,000		142,000	94,000
11,110	7/16	142,000	94,000
11,250		142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,800		142,000	94,000
11,900		151,000	101,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,300	31/64	151,000	101,000
12,500		151,000	101,000
12,600		151,000	101,000
12,700	1/2	151,000	101,000
12,750		151,000	101,000
12,800		151,000	101,000
13,000		160,000	108,000
13,250		160,000	108,000
13,400		160,000	108,000
13,600		160,000	108,000
13,750		160,000	108,000
13,800		160,000	108,000
14,000		160,000	108,000
14,700		169,000	114,000
14,800		169,000	114,000
14,900		169,000	114,000
15,000		169,000	114,000
15,050		178,000	120,000
15,500		178,000	120,000
15,600		178,000	120,000
15,700		178,000	120,000
15,750		178,000	120,000
15,800		178,000	120,000
15,870	5/8	178,000	120,000
16,000		178,000	120,000
17,250		191,000	130,000
17,500		191,000	130,000
19,000		198,000	135,000
19,050	3/4	205,000	140,000
19,500		205,000	140,000
20,000		205,000	140,000



## Helisel matkap uçları, kısa



**P** • öz bileme  $\geq \varnothing 2,380$  • koni bileme

**M**

**K** •

**N** ○ alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

**S**

**H**

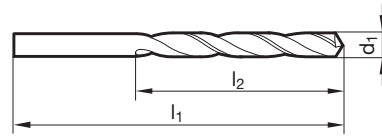
## GÜHRING NAVIGATOR

Kesme verileri sayfası 780

Malzeme **HSS**

Yüzey **S**

Kesme yönü **L**



Ürün no **664**

Silindir Şaftlı Matkap  
ucu

d1		l1	l2
mm	inch	mm	mm
0,250		19,000	3,000
0,420		20,000	5,000
0,430		20,000	5,000
0,450		20,000	5,000
0,500		22,000	6,000
0,550		24,000	7,000
0,575		24,000	7,000
0,600		24,000	7,000
0,670		26,000	8,000
0,680		28,000	9,000
0,770		30,000	10,000
0,800		30,000	10,000
0,900		32,000	11,000
0,950		32,000	11,000
1,000		34,000	12,000
1,040		34,000	12,000
1,050		34,000	12,000
1,070		36,000	14,000
1,090		36,000	14,000
1,100		36,000	14,000
1,150		36,000	14,000
1,180		36,000	14,000
1,190	3/64	38,000	16,000
1,200		38,000	16,000
1,250		38,000	16,000
1,300		38,000	16,000
1,320		38,000	16,000
1,400		40,000	18,000
1,420		40,000	18,000
1,450		40,000	18,000
1,500		40,000	18,000
1,550		43,000	20,000
1,580		43,000	20,000
1,590	1/16	43,000	20,000
1,600		43,000	20,000
1,650		43,000	20,000
1,700		43,000	20,000
1,750		46,000	22,000
1,800		46,000	22,000
1,850		46,000	22,000
1,900		46,000	22,000
2,000		49,000	24,000

d1		l1	l2
mm	inch	mm	mm
2,050		49,000	24,000
2,100		49,000	24,000
2,150		53,000	27,000
2,300		53,000	27,000
2,360		53,000	27,000
2,380	3/32	57,000	30,000
2,400		57,000	30,000
2,450		57,000	30,000
2,500		57,000	30,000
2,580		57,000	30,000
2,600		57,000	30,000
2,650		57,000	30,000
2,700		61,000	33,000
2,710		61,000	33,000
2,750		61,000	33,000
2,780	7/64	61,000	33,000
2,800		61,000	33,000
2,850		61,000	33,000
2,870		61,000	33,000
2,900		61,000	33,000
2,950		61,000	33,000
3,000		61,000	33,000
3,050		65,000	36,000
3,100		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,300		65,000	36,000
3,400		70,000	39,000
3,500		70,000	39,000
3,570	9/64	70,000	39,000
3,700		70,000	39,000
3,750		70,000	39,000
3,800		75,000	43,000
3,970	5/32	75,000	43,000
4,000		75,000	43,000
4,100		75,000	43,000
4,200		75,000	43,000
4,300		80,000	47,000
4,370	11/64	80,000	47,000
4,400		80,000	47,000
4,500		80,000	47,000
4,700		80,000	47,000



Silindir Şaftlı Matkap ucu

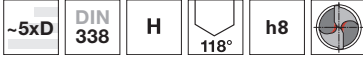
d1		l1	l2	
mm	inch	mm	mm	
4,760	3/16	86,000	52,000	
4,800		86,000	52,000	
4,900		86,000	52,000	
5,000	13/64	86,000	52,000	
5,060		86,000	52,000	
5,100		86,000	52,000	
5,160		86,000	52,000	
5,200		86,000	52,000	
5,300	7/32	86,000	52,000	
5,400		93,000	57,000	
5,410		93,000	57,000	
5,500		93,000	57,000	
5,560		93,000	57,000	
5,700		93,000	57,000	
5,950		93,000	57,000	
6,000	15/64	93,000	57,000	
6,200		101,000	63,000	
6,250		101,000	63,000	
6,350		101,000	63,000	
6,400		101,000	63,000	
6,700		101,000	63,000	
6,800		109,000	69,000	
7,000		109,000	69,000	
7,140		9/32	109,000	69,000
7,200		19/64	109,000	69,000
7,300	109,000		69,000	
7,500	109,000		69,000	
7,540	117,000		75,000	
7,850	117,000		75,000	
7,900	117,000	75,000		

d1		l1	l2	
mm	inch	mm	mm	
8,000	11/32	117,000	75,000	
8,500		117,000	75,000	
8,730		125,000	81,000	
8,800		125,000	81,000	
9,100	23/64	125,000	81,000	
9,130		125,000	81,000	
9,400		125,000	81,000	
9,500		125,000	81,000	
9,600		133,000	87,000	
9,800	25/64	133,000	87,000	
9,920		133,000	87,000	
10,000		133,000	87,000	
10,200		133,000	87,000	
10,320		133,000	87,000	
10,900		142,000	94,000	
11,000	13/32	142,000	94,000	
12,000		151,000	101,000	
12,400		151,000	101,000	
12,500		151,000	101,000	
13,500		160,000	108,000	
14,250		169,000	114,000	





## Helisel matkap uçları, kısa



**P** öz bileme  $\geq \varnothing 14,500$  • koni bileme

**M**

**K**

**N** • sert ve kırılğan malzemeler • pirinç, magnezyum alaşımları • bronz,

**S** fosforlu bronz • slate, mico, pertinax

**H**

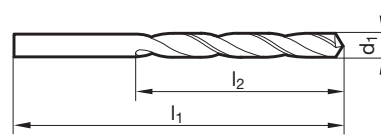
## GÜHRING NAVIGATOR

Kesme verileri sayfası 778

Malzeme **HSS**

Yüzey

Kesme yönü



Ürün no **206**

d1		l1	l2
mm	inch	mm	mm
0,200		19,000	2,500
0,210		19,000	2,500
0,220		19,000	2,500
0,240		19,000	2,500
0,250		19,000	3,000
0,280		19,000	3,000
0,290		19,000	3,000
0,300		19,000	3,000
0,310		19,000	4,000
0,320		19,000	4,000
0,340		19,000	4,000
0,350		19,000	4,000
0,400	1/64	20,000	5,000
0,410		20,000	5,000
0,420		20,000	5,000
0,440		20,000	5,000
0,450		20,000	5,000
0,460		20,000	5,000
0,480		20,000	5,000
0,500		22,000	6,000
0,520		22,000	6,000
0,530		22,000	6,000
0,550		24,000	7,000
0,560		24,000	7,000
0,570		24,000	7,000
0,600		24,000	7,000
0,620		26,000	8,000
0,640		26,000	8,000
0,650		26,000	8,000
0,660		26,000	8,000
0,670		26,000	8,000
0,680		28,000	9,000
0,690		28,000	9,000
0,700		28,000	9,000
0,710		28,000	9,000
0,720		28,000	9,000
0,730		28,000	9,000
0,740		28,000	9,000
0,750		28,000	9,000
0,760		30,000	10,000
0,770		30,000	10,000
0,780		30,000	10,000

d1		l1	l2
mm	inch	mm	mm
0,790	1/32	30,000	10,000
0,800		30,000	10,000
0,810		30,000	10,000
0,820		30,000	10,000
0,830		30,000	10,000
0,840		30,000	10,000
0,850		30,000	10,000
0,860		32,000	11,000
0,870		32,000	11,000
0,880		32,000	11,000
0,890		32,000	11,000
0,900		32,000	11,000
0,910		32,000	11,000
0,930		32,000	11,000
0,950		32,000	11,000
0,960		34,000	12,000
0,970		34,000	12,000
0,980		34,000	12,000
0,990		34,000	12,000
1,000		34,000	12,000
1,020		34,000	12,000
1,030		34,000	12,000
1,040		34,000	12,000
1,050		34,000	12,000
1,060		34,000	12,000
1,070		36,000	14,000
1,080		36,000	14,000
1,100		36,000	14,000
1,120		36,000	14,000
1,130		36,000	14,000
1,140		36,000	14,000
1,150		36,000	14,000
1,160		36,000	14,000
1,180		36,000	14,000
1,190	3/64	38,000	16,000
1,200		38,000	16,000
1,220		38,000	16,000
1,230		38,000	16,000
1,250		38,000	16,000
1,270		38,000	16,000
1,280		38,000	16,000
1,300		38,000	16,000



d1		l1	l2
mm	inch	mm	mm
1,320		38,000	16,000
1,330		40,000	18,000
1,350		40,000	18,000
1,370		40,000	18,000
1,380		40,000	18,000
1,400		40,000	18,000
1,420		40,000	18,000
1,430		40,000	18,000
1,440		40,000	18,000
1,450		40,000	18,000
1,470		40,000	18,000
1,480		40,000	18,000
1,490		40,000	18,000
1,500		40,000	18,000
1,520		43,000	20,000
1,530		43,000	20,000
1,540		43,000	20,000
1,550		43,000	20,000
1,590	1/16	43,000	20,000
1,600		43,000	20,000
1,620		43,000	20,000
1,650		43,000	20,000
1,670		43,000	20,000
1,700		43,000	20,000
1,720		46,000	22,000
1,730		46,000	22,000
1,750		46,000	22,000
1,780		46,000	22,000
1,800		46,000	22,000
1,820		46,000	22,000
1,850		46,000	22,000
1,870		46,000	22,000
1,900		46,000	22,000
1,920		49,000	24,000
1,950		49,000	24,000
1,960		49,000	24,000
1,980	5/64	49,000	24,000
2,000		49,000	24,000
2,010		49,000	24,000
2,020		49,000	24,000
2,030		49,000	24,000
2,040		49,000	24,000
2,050		49,000	24,000
2,060		49,000	24,000
2,070		49,000	24,000
2,080		49,000	24,000
2,100		49,000	24,000
2,120		49,000	24,000
2,150		53,000	27,000
2,180		53,000	27,000
2,200		53,000	27,000
2,220		53,000	27,000
2,230		53,000	27,000
2,250		53,000	27,000
2,270		53,000	27,000
2,300		53,000	27,000
2,320		53,000	27,000
2,350		53,000	27,000
2,380	3/32	57,000	30,000
2,400		57,000	30,000
2,450		57,000	30,000
2,470		57,000	30,000
2,480		57,000	30,000
2,500		57,000	30,000
2,520		57,000	30,000
2,530		57,000	30,000
2,550		57,000	30,000
2,570		57,000	30,000
2,600		57,000	30,000
2,640		57,000	30,000
2,650		57,000	30,000
2,700		61,000	33,000

d1		l1	l2
mm	inch	mm	mm
2,710		61,000	33,000
2,750		61,000	33,000
2,780	7/64	61,000	33,000
2,800		61,000	33,000
2,820		61,000	33,000
2,840		61,000	33,000
2,850		61,000	33,000
2,900		61,000	33,000
2,920		61,000	33,000
2,950		61,000	33,000
2,970		61,000	33,000
3,000		61,000	33,000
3,010		65,000	36,000
3,020		65,000	36,000
3,030		65,000	36,000
3,040		65,000	36,000
3,050		65,000	36,000
3,060		65,000	36,000
3,070		65,000	36,000
3,100		65,000	36,000
3,120		65,000	36,000
3,150		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,220		65,000	36,000
3,250		65,000	36,000
3,260		65,000	36,000
3,300		65,000	36,000
3,350		65,000	36,000
3,400		70,000	39,000
3,410		70,000	39,000
3,450		70,000	39,000
3,470		70,000	39,000
3,500		70,000	39,000
3,520		70,000	39,000
3,550		70,000	39,000
3,570	9/64	70,000	39,000
3,600		70,000	39,000
3,650		70,000	39,000
3,700		70,000	39,000
3,720		70,000	39,000
3,750		70,000	39,000
3,800		75,000	43,000
3,830		75,000	43,000
3,850		75,000	43,000
3,870		75,000	43,000
3,880		75,000	43,000
3,900		75,000	43,000
3,910		75,000	43,000
3,950		75,000	43,000
3,970	5/32	75,000	43,000
4,000		75,000	43,000
4,020		75,000	43,000
4,040		75,000	43,000
4,050		75,000	43,000
4,070		75,000	43,000
4,100		75,000	43,000
4,150		75,000	43,000
4,200		75,000	43,000
4,250		75,000	43,000
4,300		80,000	47,000
4,350		80,000	47,000
4,370	11/64	80,000	47,000
4,400		80,000	47,000
4,420		80,000	47,000
4,450		80,000	47,000
4,500		80,000	47,000
4,600		80,000	47,000
4,650		80,000	47,000
4,700		80,000	47,000
4,750		80,000	47,000
4,760	3/16	86,000	52,000

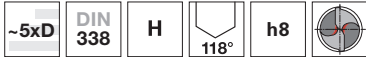
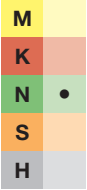


d1		l1	l2
mm	inch	mm	mm
4,800		86,000	52,000
4,850		86,000	52,000
4,900		86,000	52,000
4,950		86,000	52,000
5,000		86,000	52,000
5,050		86,000	52,000
5,100		86,000	52,000
5,150		86,000	52,000
5,160	13/64	86,000	52,000
5,200		86,000	52,000
5,250		86,000	52,000
5,300		86,000	52,000
5,310		93,000	57,000
5,400		93,000	57,000
5,450		93,000	57,000
5,500		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,700		93,000	57,000
5,750		93,000	57,000
5,800		93,000	57,000
5,850		93,000	57,000
5,900		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,050		101,000	63,000
6,100		101,000	63,000
6,150		101,000	63,000
6,200		101,000	63,000
6,250		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,450		101,000	63,000
6,500		101,000	63,000
6,530		101,000	63,000
6,550		101,000	63,000
6,600		101,000	63,000
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,050		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000
7,250		109,000	69,000
7,300		109,000	69,000
7,350		109,000	69,000
7,400		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000
7,600		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000
7,850		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,050		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,250		117,000	75,000
8,300		117,000	75,000
8,330	21/64	117,000	75,000

d1		l1	l2
mm	inch	mm	mm
8,400		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,750		125,000	81,000
8,800		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,250		125,000	81,000
9,300		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,100		133,000	87,000
10,150		133,000	87,000
10,200		133,000	87,000
10,250		133,000	87,000
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,500		133,000	87,000
10,600		133,000	87,000
10,720	27/64	142,000	94,000
10,800		142,000	94,000
10,900		142,000	94,000
11,000		142,000	94,000
11,100		142,000	94,000
11,110	7/16	142,000	94,000
11,200		142,000	94,000
11,400		142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,700		142,000	94,000
11,900		151,000	101,000
12,000		151,000	101,000
12,100		151,000	101,000
12,200		151,000	101,000
12,300	31/64	151,000	101,000
12,500		151,000	101,000
12,700	1/2	151,000	101,000
12,800		151,000	101,000
13,000		151,000	101,000
13,200		151,000	101,000
13,500		160,000	108,000
14,000		160,000	108,000
14,500		169,000	114,000
15,000		169,000	114,000
15,500		178,000	120,000
16,000		178,000	120,000
17,000		184,000	125,000
18,000		191,000	130,000
19,000		198,000	135,000
20,000		205,000	140,000



## Helisel matkap uçları, kısa

P öz bileme  $\geq \varnothing 14,200$  • koni bileme

• sert ve kırılğan malzemeler • pirinç, magnezyum alaşımları • bronz, fosforlu bronz • slate, mico, pertinax

## GÜHRING NAVIGATOR

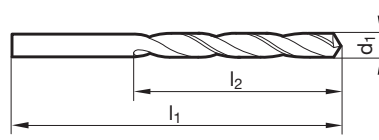
Kesme verileri sayfası 778

Malzeme HSS

Yüzey



Kesme yönü



Ürün no

209

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,300		19,000	3,000	1,130		36,000	14,000
0,400	1/64	20,000	5,000	1,150		36,000	14,000
0,450		20,000	5,000	1,160		36,000	14,000
0,480		20,000	5,000	1,165		36,000	14,000
0,490		22,000	6,000	1,170		36,000	14,000
0,500		22,000	6,000	1,200		38,000	16,000
0,530		22,000	6,000	1,210		38,000	16,000
0,540		24,000	7,000	1,220		38,000	16,000
0,550		24,000	7,000	1,230		38,000	16,000
0,580		24,000	7,000	1,240		38,000	16,000
0,590		24,000	7,000	1,250		38,000	16,000
0,600		24,000	7,000	1,260		38,000	16,000
0,620		26,000	8,000	1,270		38,000	16,000
0,640		26,000	8,000	1,280		38,000	16,000
0,660		26,000	8,000	1,300		38,000	16,000
0,670		26,000	8,000	1,320		38,000	16,000
0,680		28,000	9,000	1,380		40,000	18,000
0,700		28,000	9,000	1,400		40,000	18,000
0,710		28,000	9,000	1,410		40,000	18,000
0,720		28,000	9,000	1,450		40,000	18,000
0,730		28,000	9,000	1,480		40,000	18,000
0,740		28,000	9,000	1,500		40,000	18,000
0,750		28,000	9,000	1,520		43,000	20,000
0,780		30,000	10,000	1,550		43,000	20,000
0,800		30,000	10,000	1,560		43,000	20,000
0,810		30,000	10,000	1,600		43,000	20,000
0,860		32,000	11,000	1,610		43,000	20,000
0,880		32,000	11,000	1,620		43,000	20,000
0,900		32,000	11,000	1,640		43,000	20,000
0,910		32,000	11,000	1,650		43,000	20,000
0,920		32,000	11,000	1,670		43,000	20,000
0,940		32,000	11,000	1,680		43,000	20,000
0,950		32,000	11,000	1,700		43,000	20,000
0,960		34,000	12,000	1,720		46,000	22,000
0,970		34,000	12,000	1,730		46,000	22,000
1,000		34,000	12,000	1,740		46,000	22,000
1,020		34,000	12,000	1,750		46,000	22,000
1,030		34,000	12,000	1,800		46,000	22,000
1,060		34,000	12,000	1,810		46,000	22,000
1,080		36,000	14,000	1,820		46,000	22,000
1,100		36,000	14,000	1,830		46,000	22,000
1,120		36,000	14,000	1,850		46,000	22,000



d1		l1	l2
mm	inch	mm	mm
1,860		46,000	22,000
1,870		46,000	22,000
1,890		46,000	22,000
1,900		46,000	22,000
1,930		49,000	24,000
1,980	5/64	49,000	24,000
2,000		49,000	24,000
2,030		49,000	24,000
2,050		49,000	24,000
2,060		49,000	24,000
2,100		49,000	24,000
2,140		53,000	27,000
2,150		53,000	27,000
2,200		53,000	27,000
2,220		53,000	27,000
2,230		53,000	27,000
2,240		53,000	27,000
2,250		53,000	27,000
2,280		53,000	27,000
2,290		53,000	27,000
2,300		53,000	27,000
2,350		53,000	27,000
2,380	3/32	57,000	30,000
2,390		57,000	30,000
2,400		57,000	30,000
2,420		57,000	30,000
2,450		57,000	30,000
2,470		57,000	30,000
2,500		57,000	30,000
2,520		57,000	30,000
2,530		57,000	30,000
2,550		57,000	30,000
2,570		57,000	30,000
2,600		57,000	30,000
2,650		57,000	30,000
2,700		61,000	33,000
2,750		61,000	33,000
2,800		61,000	33,000
2,820		61,000	33,000
2,830		61,000	33,000
2,850		61,000	33,000
2,900		61,000	33,000
2,930		61,000	33,000
3,000		61,000	33,000
3,030		65,000	36,000
3,050		65,000	36,000
3,070		65,000	36,000
3,080		65,000	36,000
3,100		65,000	36,000
3,150		65,000	36,000
3,160		65,000	36,000
3,170	1/8	65,000	36,000
3,175		65,000	36,000
3,200		65,000	36,000
3,250		65,000	36,000
3,270		65,000	36,000
3,300		65,000	36,000
3,340		65,000	36,000
3,350		65,000	36,000
3,380		70,000	39,000
3,400		70,000	39,000
3,450		70,000	39,000
3,470		70,000	39,000
3,500		70,000	39,000
3,550		70,000	39,000
3,580		70,000	39,000
3,650		70,000	39,000
3,700		70,000	39,000
3,710		70,000	39,000
3,730		70,000	39,000
3,830		75,000	43,000
3,900		75,000	43,000

d1		l1	l2
mm	inch	mm	mm
3,950		75,000	43,000
3,960		75,000	43,000
4,000		75,000	43,000
4,050		75,000	43,000
4,070		75,000	43,000
4,100		75,000	43,000
4,120		75,000	43,000
4,200		75,000	43,000
4,220		75,000	43,000
4,250		75,000	43,000
4,280		80,000	47,000
4,300		80,000	47,000
4,370	11/64	80,000	47,000
4,400		80,000	47,000
4,450		80,000	47,000
4,500		80,000	47,000
4,550		80,000	47,000
4,600		80,000	47,000
4,700		80,000	47,000
4,800		86,000	52,000
4,850		86,000	52,000
4,870		86,000	52,000
4,950		86,000	52,000
5,000		86,000	52,000
5,050		86,000	52,000
5,100		86,000	52,000
5,200		86,000	52,000
5,250		86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,500		93,000	57,000
5,650		93,000	57,000
5,800		93,000	57,000
5,850		93,000	57,000
6,000		93,000	57,000
6,050		101,000	63,000
6,100		101,000	63,000
6,120		101,000	63,000
6,130		101,000	63,000
6,150		101,000	63,000
6,250		101,000	63,000
6,300		101,000	63,000
6,450		101,000	63,000
6,500		101,000	63,000
6,650		101,000	63,000
6,700		101,000	63,000
6,900		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000
7,150		109,000	69,000
7,200		109,000	69,000
7,220		109,000	69,000
7,300		109,000	69,000
7,350		109,000	69,000
7,550		117,000	75,000
7,750		117,000	75,000
7,800		117,000	75,000
8,000		117,000	75,000
8,050		117,000	75,000
8,100		117,000	75,000
8,300		117,000	75,000
8,400		117,000	75,000
8,450		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,800		125,000	81,000
9,000		125,000	81,000
9,100		125,000	81,000
9,250		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,750		133,000	87,000



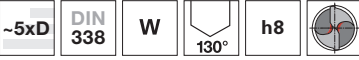
Silindir Şaftlı Matkap ucu

d1		l1	l2
mm	inch	mm	mm
9,800		133,000	87,000
9,850		133,000	87,000
10,000		133,000	87,000
10,500		133,000	87,000
11,100		142,000	94,000
11,400		142,000	94,000
11,500		142,000	94,000
12,050		151,000	101,000
12,100		151,000	101,000
12,150		151,000	101,000
12,200		151,000	101,000
12,300	31/64	151,000	101,000
12,800		151,000	101,000
13,100	33/64	151,000	101,000
13,300		160,000	108,000
13,500		160,000	108,000
13,800		160,000	108,000
14,200		169,000	114,000

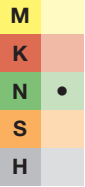
d1		l1	l2
mm	inch	mm	mm
14,300		169,000	114,000
14,400		169,000	114,000
14,500		169,000	114,000
15,100		178,000	120,000
15,300		178,000	120,000
15,500		178,000	120,000
16,000		178,000	120,000
17,000		184,000	125,000
18,000		191,000	130,000
20,000		205,000	140,000



## Helisel matkap uçları, kısa



**P** öz bileme  $\geq \text{Ø } 14,500$  • koni bileme



**N** • yumuşak ve uzun talaş veren malzemelerde • Alüminyum/Al-alaşimleri (uzun talaşlı) • çinko, safaştırılmış bakır, silumin, elektrotlar • plastikler (yumuşak) • odun

## GÜHRING NAVIGATOR

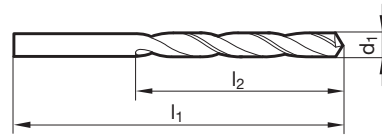
Kesme verileri sayfası 778

Malzeme **HSS**

Yüzey



Kesme yönü



Ürün no

207

SİLİNDİR ŞAFTLI MATKAP UCU

d1		l1	l2
mm	inch	mm	mm
0,200		19,000	2,500
0,250		19,000	3,000
0,300		19,000	3,000
0,340		19,000	4,000
0,350		19,000	4,000
0,400	1/64	20,000	5,000
0,410		20,000	5,000
0,450		20,000	5,000
0,460		20,000	5,000
0,500		22,000	6,000
0,520		22,000	6,000
0,550		24,000	7,000
0,570		24,000	7,000
0,600		24,000	7,000
0,610		26,000	8,000
0,620		26,000	8,000
0,650		26,000	8,000
0,660		26,000	8,000
0,700		28,000	9,000
0,720		28,000	9,000
0,750		28,000	9,000
0,790	1/32	30,000	10,000
0,800		30,000	10,000
0,810		30,000	10,000
0,840		30,000	10,000
0,850		30,000	10,000
0,860		32,000	11,000
0,870		32,000	11,000
0,900		32,000	11,000
0,950		32,000	11,000
0,970		34,000	12,000
0,990		34,000	12,000
1,000		34,000	12,000
1,010		34,000	12,000
1,020		34,000	12,000
1,050		34,000	12,000
1,100		36,000	14,000
1,110		36,000	14,000
1,120		36,000	14,000
1,140		36,000	14,000
1,150		36,000	14,000
1,180		36,000	14,000

d1		l1	l2
mm	inch	mm	mm
1,190	3/64	38,000	16,000
1,200		38,000	16,000
1,220		38,000	16,000
1,250		38,000	16,000
1,270		38,000	16,000
1,280		38,000	16,000
1,300		38,000	16,000
1,330		40,000	18,000
1,350		40,000	18,000
1,380		40,000	18,000
1,400		40,000	18,000
1,420		40,000	18,000
1,430		40,000	18,000
1,450		40,000	18,000
1,500		40,000	18,000
1,510		43,000	20,000
1,520		43,000	20,000
1,530		43,000	20,000
1,550		43,000	20,000
1,570		43,000	20,000
1,580		43,000	20,000
1,590	1/16	43,000	20,000
1,600		43,000	20,000
1,610		43,000	20,000
1,630		43,000	20,000
1,650		43,000	20,000
1,660		43,000	20,000
1,680		43,000	20,000
1,700		43,000	20,000
1,750		46,000	22,000
1,770		46,000	22,000
1,780		46,000	22,000
1,800		46,000	22,000
1,820		46,000	22,000
1,850		46,000	22,000
1,900		46,000	22,000
1,920		49,000	24,000
1,930		49,000	24,000
1,950		49,000	24,000
1,980	5/64	49,000	24,000
2,000		49,000	24,000
2,020		49,000	24,000



d1		l1	l2
mm	inch	mm	mm
2,030		49,000	24,000
2,050		49,000	24,000
2,060		49,000	24,000
2,080		49,000	24,000
2,100		49,000	24,000
2,150		53,000	27,000
2,200		53,000	27,000
2,250		53,000	27,000
2,270		53,000	27,000
2,300		53,000	27,000
2,320		53,000	27,000
2,350		53,000	27,000
2,380	3/32	57,000	30,000
2,400		57,000	30,000
2,450		57,000	30,000
2,500		57,000	30,000
2,530		57,000	30,000
2,550		57,000	30,000
2,600		57,000	30,000
2,650		57,000	30,000
2,700		61,000	33,000
2,730		61,000	33,000
2,750		61,000	33,000
2,780	7/64	61,000	33,000
2,800		61,000	33,000
2,820		61,000	33,000
2,830		61,000	33,000
2,850		61,000	33,000
2,900		61,000	33,000
2,930		61,000	33,000
2,950		61,000	33,000
3,000		61,000	33,000
3,030		65,000	36,000
3,050		65,000	36,000
3,100		65,000	36,000
3,150		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,250		65,000	36,000
3,260		65,000	36,000
3,300		65,000	36,000
3,350		65,000	36,000
3,380		70,000	39,000
3,400		70,000	39,000
3,450		70,000	39,000
3,500		70,000	39,000
3,550		70,000	39,000
3,570	9/64	70,000	39,000
3,600		70,000	39,000
3,650		70,000	39,000
3,700		70,000	39,000
3,730		70,000	39,000
3,750		70,000	39,000
3,800		75,000	43,000
3,850		75,000	43,000
3,900		75,000	43,000
3,950		75,000	43,000
3,970	5/32	75,000	43,000
4,000		75,000	43,000
4,030		75,000	43,000
4,040		75,000	43,000
4,050		75,000	43,000
4,100		75,000	43,000
4,150		75,000	43,000
4,200		75,000	43,000
4,220		75,000	43,000
4,250		75,000	43,000
4,300		80,000	47,000
4,350		80,000	47,000
4,370	11/64	80,000	47,000
4,390		80,000	47,000
4,400		80,000	47,000

d1		l1	l2
mm	inch	mm	mm
4,500		80,000	47,000
4,550		80,000	47,000
4,600		80,000	47,000
4,620		80,000	47,000
4,650		80,000	47,000
4,700		80,000	47,000
4,750		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,850		86,000	52,000
4,900		86,000	52,000
5,000		86,000	52,000
5,030		86,000	52,000
5,050		86,000	52,000
5,100		86,000	52,000
5,160	13/64	86,000	52,000
5,200		86,000	52,000
5,250		86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,450		93,000	57,000
5,500		93,000	57,000
5,550		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,700		93,000	57,000
5,750		93,000	57,000
5,800		93,000	57,000
5,900		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,050		101,000	63,000
6,100		101,000	63,000
6,150		101,000	63,000
6,200		101,000	63,000
6,250		101,000	63,000
6,300	1/4	101,000	63,000
6,350		101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,530		101,000	63,000
6,550		101,000	63,000
6,600		101,000	63,000
6,630		101,000	63,000
6,650		101,000	63,000
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,850		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000
7,250		109,000	69,000
7,300		109,000	69,000
7,400		109,000	69,000
7,490		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000
7,600		117,000	75,000
7,700		117,000	75,000
7,750		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,030		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,400		117,000	75,000



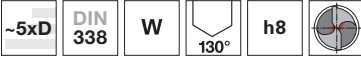


d1		l1	l2
mm	inch	mm	mm
8,450		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,750		125,000	81,000
8,800		125,000	81,000
8,840		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,090		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,250		125,000	81,000
9,300		125,000	81,000
9,340		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,080		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,250		133,000	87,000
10,260		133,000	87,000
10,400		133,000	87,000
10,500		133,000	87,000
10,700		142,000	94,000
10,800		142,000	94,000
10,900		142,000	94,000

d1		l1	l2
mm	inch	mm	mm
11,000		142,000	94,000
11,100		142,000	94,000
11,200		142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,600		142,000	94,000
11,700		142,000	94,000
11,800		142,000	94,000
11,900		151,000	101,000
12,000		151,000	101,000
12,100		151,000	101,000
12,200		151,000	101,000
12,500		151,000	101,000
12,600		151,000	101,000
12,700	1/2	151,000	101,000
12,800		151,000	101,000
12,900		151,000	101,000
13,000		151,000	101,000
13,100	33/64	151,000	101,000
13,200		151,000	101,000
13,500		160,000	108,000
13,800		160,000	108,000
14,000		160,000	108,000
14,500		169,000	114,000
14,700		169,000	114,000
15,000		169,000	114,000
15,600		178,000	120,000
16,000		178,000	120,000
16,500		184,000	125,000
17,000		184,000	125,000
17,500		191,000	130,000
18,000		191,000	130,000
20,000		205,000	140,000



## Helisel matkap uçları, kısa

P öz bileme  $\geq \text{Ø } 14,500$  • koni bileme

• yumuşak ve uzun talaş veren malzemelerde • Alüminyum/Al-alaşimleri (uzun talaşlı) • çinko, saflaştırılmış bakır, silumin, elektrotlar • plastikler (yumuşak) • odun

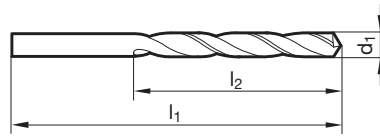
Malzeme **HSS**

Yüzey

Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 778



Ürün no

210

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,250		19,000	3,000	0,980		34,000	12,000
0,270		19,000	3,000	0,990		34,000	12,000
0,280		19,000	3,000	1,000		34,000	12,000
0,320		19,000	4,000	1,020		34,000	12,000
0,330		19,000	4,000	1,050		34,000	12,000
0,340		19,000	4,000	1,070		36,000	14,000
0,360		19,000	4,000	1,100		36,000	14,000
0,390		20,000	5,000	1,120		36,000	14,000
0,400	1/64	20,000	5,000	1,150		36,000	14,000
0,410		20,000	5,000	1,210		38,000	16,000
0,420		20,000	5,000	1,220		38,000	16,000
0,430		20,000	5,000	1,250		38,000	16,000
0,450		20,000	5,000	1,290		38,000	16,000
0,470		20,000	5,000	1,300		38,000	16,000
0,490		22,000	6,000	1,320		38,000	16,000
0,500		22,000	6,000	1,400		40,000	18,000
0,525		22,000	6,000	1,450		40,000	18,000
0,530		22,000	6,000	1,480		40,000	18,000
0,560		24,000	7,000	1,500		40,000	18,000
0,590		24,000	7,000	1,540		43,000	20,000
0,600		24,000	7,000	1,550		43,000	20,000
0,610		26,000	8,000	1,580		43,000	20,000
0,660		26,000	8,000	1,600		43,000	20,000
0,710		28,000	9,000	1,630		43,000	20,000
0,720		28,000	9,000	1,700		43,000	20,000
0,730		28,000	9,000	1,750		46,000	22,000
0,740		28,000	9,000	1,800		46,000	22,000
0,750		28,000	9,000	1,850		46,000	22,000
0,760		30,000	10,000	1,950		49,000	24,000
0,770		30,000	10,000	2,000		49,000	24,000
0,790	1/32	30,000	10,000	2,150		53,000	27,000
0,800		30,000	10,000	2,200		53,000	27,000
0,810		30,000	10,000	2,300		53,000	27,000
0,825		30,000	10,000	2,320		53,000	27,000
0,840		30,000	10,000	2,340		53,000	27,000
0,850		30,000	10,000	2,350		53,000	27,000
0,860		32,000	11,000	2,380	3/32	57,000	30,000
0,880		32,000	11,000	2,450		57,000	30,000
0,890		32,000	11,000	2,500		57,000	30,000
0,900		32,000	11,000	2,530		57,000	30,000
0,950		32,000	11,000	2,550		57,000	30,000
0,970		34,000	12,000	2,570		57,000	30,000

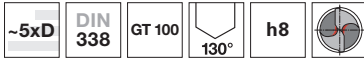


d1		l1	l2
mm	inch	mm	mm
2,600		57,000	30,000
2,650		57,000	30,000
2,700		61,000	33,000
2,750		61,000	33,000
2,800		61,000	33,000
2,900		61,000	33,000
2,950		61,000	33,000
2,970		61,000	33,000
3,000		61,000	33,000
3,130		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,250		65,000	36,000
3,280		65,000	36,000
3,300		65,000	36,000
3,380		70,000	39,000
3,400		70,000	39,000
3,450		70,000	39,000
3,500		70,000	39,000
3,550		70,000	39,000
3,600		70,000	39,000
3,650		70,000	39,000
3,700		70,000	39,000
3,750		70,000	39,000
3,800		75,000	43,000
3,820		75,000	43,000
3,860		75,000	43,000
3,900		75,000	43,000
3,910		75,000	43,000
3,920		75,000	43,000
4,000		75,000	43,000
4,030		75,000	43,000
4,050		75,000	43,000
4,100		75,000	43,000
4,200		75,000	43,000
4,400		80,000	47,000
4,500		80,000	47,000
4,520		80,000	47,000
4,550		80,000	47,000
4,600		80,000	47,000
4,700		80,000	47,000
4,720		80,000	47,000
4,750		80,000	47,000
4,850		86,000	52,000
4,900		86,000	52,000
4,950		86,000	52,000
5,000		86,000	52,000
5,020		86,000	52,000
5,100		86,000	52,000
5,150		86,000	52,000
5,200		86,000	52,000
5,400		93,000	57,000
5,450		93,000	57,000
5,500		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,620		93,000	57,000
5,800		93,000	57,000
5,850		93,000	57,000
5,900		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,030		101,000	63,000
6,050		101,000	63,000
6,080		101,000	63,000
6,100		101,000	63,000

d1		l1	l2
mm	inch	mm	mm
6,150		101,000	63,000
6,200		101,000	63,000
6,400		101,000	63,000
6,450		101,000	63,000
6,600		101,000	63,000
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,900		109,000	69,000
6,950		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000
7,250		109,000	69,000
7,350		109,000	69,000
7,400		109,000	69,000
7,450		109,000	69,000
7,500		109,000	69,000
7,600		117,000	75,000
7,900		117,000	75,000
8,050		117,000	75,000
8,250		117,000	75,000
8,300		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,750		125,000	81,000
9,350		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,650		133,000	87,000
9,700		133,000	87,000
9,750		133,000	87,000
9,800		133,000	87,000
10,000		133,000	87,000
10,200		133,000	87,000
10,500		133,000	87,000
10,700		142,000	94,000
10,750		142,000	94,000
11,100		142,000	94,000
11,500		142,000	94,000
11,750		142,000	94,000
11,800		142,000	94,000
11,950		151,000	101,000
12,100		151,000	101,000
12,200		151,000	101,000
12,250		151,000	101,000
12,500		151,000	101,000
12,800		151,000	101,000
13,200		151,000	101,000
14,500		169,000	114,000
15,000		169,000	114,000
15,500		178,000	120,000
16,000		178,000	120,000
16,200		184,000	125,000
17,000		184,000	125,000
17,300		191,000	130,000
17,500		191,000	130,000
17,600		191,000	130,000
18,000		191,000	130,000
19,000		198,000	135,000
19,500		205,000	140,000
19,800		205,000	140,000
20,000		205,000	140,000



## Helisel matkap uçları, kısa

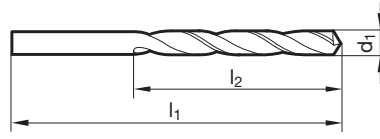
Malzeme **HSS**

Yüzey

Kesme yönü

**P** • öz bileme  $\geq \varnothing 0,970$  • koni bileme • geniş kanallı • özellikle delik derinliği 3xD üstü için**M****K** •**N** • pik döküm • 1000 N/mm<sup>2</sup> üzerindeki Çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.**S****H****GÜHRING**NAVIGATOR

Kesme verileri sayfası 778

SİLİNDİR ŞAFTLI MATKAP  
UCUÜrün no **549**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,600		24,000	7,000	1,620		43,000	20,000
0,700		28,000	9,000	1,650		43,000	20,000
0,710		28,000	9,000	1,660		43,000	20,000
0,790	1/32	30,000	10,000	1,670		43,000	20,000
0,800		30,000	10,000	1,680		43,000	20,000
0,890		32,000	11,000	1,690		43,000	20,000
0,900		32,000	11,000	1,700		43,000	20,000
0,950		32,000	11,000	1,720		46,000	22,000
0,970		34,000	12,000	1,750		46,000	22,000
0,990		34,000	12,000	1,780		46,000	22,000
1,000		34,000	12,000	1,800		46,000	22,000
1,020		34,000	12,000	1,820		46,000	22,000
1,040		34,000	12,000	1,850		46,000	22,000
1,050		34,000	12,000	1,860		46,000	22,000
1,070		36,000	14,000	1,900		46,000	22,000
1,090		36,000	14,000	1,930		49,000	24,000
1,100		36,000	14,000	1,950		49,000	24,000
1,150		36,000	14,000	1,980	5/64	49,000	24,000
1,180		36,000	14,000	1,990		49,000	24,000
1,190	3/64	38,000	16,000	2,000		49,000	24,000
1,200		38,000	16,000	2,020		49,000	24,000
1,220		38,000	16,000	2,050		49,000	24,000
1,230		38,000	16,000	2,060		49,000	24,000
1,240		38,000	16,000	2,080		49,000	24,000
1,250		38,000	16,000	2,100		49,000	24,000
1,300		38,000	16,000	2,150		53,000	27,000
1,305		38,000	16,000	2,180		53,000	27,000
1,320		38,000	16,000	2,200		53,000	27,000
1,350		40,000	18,000	2,250		53,000	27,000
1,400		40,000	18,000	2,260		53,000	27,000
1,450		40,000	18,000	2,300		53,000	27,000
1,500		40,000	18,000	2,330		53,000	27,000
1,510		43,000	20,000	2,350		53,000	27,000
1,520		43,000	20,000	2,370		57,000	30,000
1,530		43,000	20,000	2,380	3/32	57,000	30,000
1,550		43,000	20,000	2,400		57,000	30,000
1,560		43,000	20,000	2,420		57,000	30,000
1,570		43,000	20,000	2,440		57,000	30,000
1,580		43,000	20,000	2,450		57,000	30,000
1,590	1/16	43,000	20,000	2,480		57,000	30,000
1,600		43,000	20,000	2,490		57,000	30,000
1,610		43,000	20,000	2,500		57,000	30,000



d1		l1	l2
mm	inch	mm	mm
2,530		57,000	30,000
2,550		57,000	30,000
2,580		57,000	30,000
2,600		57,000	30,000
2,640		57,000	30,000
2,650		57,000	30,000
2,700		61,000	33,000
2,710		61,000	33,000
2,750		61,000	33,000
2,780	7/64	61,000	33,000
2,790		61,000	33,000
2,800		61,000	33,000
2,820		61,000	33,000
2,850		61,000	33,000
2,870		61,000	33,000
2,900		61,000	33,000
2,950		61,000	33,000
2,980		61,000	33,000
3,000		61,000	33,000
3,030		65,000	36,000
3,050		65,000	36,000
3,080		65,000	36,000
3,100		65,000	36,000
3,150		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,220		65,000	36,000
3,230		65,000	36,000
3,250		65,000	36,000
3,260		65,000	36,000
3,300		65,000	36,000
3,350		65,000	36,000
3,400		70,000	39,000
3,450		70,000	39,000
3,500		70,000	39,000
3,550		70,000	39,000
3,570	9/64	70,000	39,000
3,580		70,000	39,000
3,600		70,000	39,000
3,660		70,000	39,000
3,680		70,000	39,000
3,700		70,000	39,000
3,730		70,000	39,000
3,750		70,000	39,000
3,800		75,000	43,000
3,860		75,000	43,000
3,870		75,000	43,000
3,900		75,000	43,000
3,910		75,000	43,000
3,950		75,000	43,000
3,970	5/32	75,000	43,000
3,990		75,000	43,000
4,000		75,000	43,000
4,040		75,000	43,000
4,050		75,000	43,000
4,090		75,000	43,000
4,100		75,000	43,000
4,150		75,000	43,000
4,200		75,000	43,000
4,210		75,000	43,000
4,220		75,000	43,000
4,250		75,000	43,000
4,300		80,000	47,000
4,370	11/64	80,000	47,000
4,390		80,000	47,000
4,400		80,000	47,000
4,450		80,000	47,000
4,500		80,000	47,000
4,550		80,000	47,000
4,570		80,000	47,000
4,600		80,000	47,000
4,620		80,000	47,000

d1		l1	l2
mm	inch	mm	mm
4,650		80,000	47,000
4,700		80,000	47,000
4,750		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,850		86,000	52,000
4,900		86,000	52,000
4,920		86,000	52,000
4,950		86,000	52,000
4,980		86,000	52,000
5,000		86,000	52,000
5,030		86,000	52,000
5,050		86,000	52,000
5,060		86,000	52,000
5,100		86,000	52,000
5,110		86,000	52,000
5,150		86,000	52,000
5,160	13/64	86,000	52,000
5,180		86,000	52,000
5,200		86,000	52,000
5,220		86,000	52,000
5,250		86,000	52,000
5,300		86,000	52,000
5,310		93,000	57,000
5,350		93,000	57,000
5,400		93,000	57,000
5,410		93,000	57,000
5,450		93,000	57,000
5,500		93,000	57,000
5,550		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,610		93,000	57,000
5,650		93,000	57,000
5,700		93,000	57,000
5,750		93,000	57,000
5,790		93,000	57,000
5,800		93,000	57,000
5,850		93,000	57,000
5,900		93,000	57,000
5,940		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,040		101,000	63,000
6,050		101,000	63,000
6,100		101,000	63,000
6,150		101,000	63,000
6,200		101,000	63,000
6,250		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,530		101,000	63,000
6,550		101,000	63,000
6,600		101,000	63,000
6,630		101,000	63,000
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,830		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,030		109,000	69,000
7,040		109,000	69,000
7,050		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000
7,250		109,000	69,000
7,290		109,000	69,000
7,300		109,000	69,000

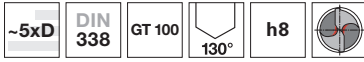


d1		l1	l2
mm	inch	mm	mm
7,370		109,000	69,000
7,400		109,000	69,000
7,490		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000
7,580		117,000	75,000
7,600		117,000	75,000
7,670		117,000	75,000
7,700		117,000	75,000
7,750		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,030		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,250		117,000	75,000
8,300		117,000	75,000
8,330	21/64	117,000	75,000
8,400		117,000	75,000
8,430		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,610		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,750		125,000	81,000
8,800		125,000	81,000
8,840		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,090		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,250		125,000	81,000
9,300		125,000	81,000
9,340		125,000	81,000
9,350		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,580		133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,750		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,080		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,260		133,000	87,000
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,400		133,000	87,000
10,490		133,000	87,000
10,500		133,000	87,000

d1		l1	l2
mm	inch	mm	mm
10,600		133,000	87,000
10,700		142,000	94,000
10,720	27/64	142,000	94,000
10,750		142,000	94,000
10,800		142,000	94,000
10,900		142,000	94,000
11,000		142,000	94,000
11,100		142,000	94,000
11,110	7/16	142,000	94,000
11,200		142,000	94,000
11,300		142,000	94,000
11,400		142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,600		142,000	94,000
11,700		142,000	94,000
11,750		142,000	94,000
11,800		142,000	94,000
11,900		151,000	101,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,100		151,000	101,000
12,150		151,000	101,000
12,200		151,000	101,000
12,250		151,000	101,000
12,300	31/64	151,000	101,000
12,400		151,000	101,000
12,500		151,000	101,000
12,700	1/2	151,000	101,000
12,750		151,000	101,000
12,800		151,000	101,000
12,900		151,000	101,000
13,000		151,000	101,000
13,100	33/64	151,000	101,000
13,200		151,000	101,000
13,490	17/32	160,000	108,000
13,500		160,000	108,000
13,600		160,000	108,000
13,700		160,000	108,000
13,890	35/64	160,000	108,000
14,000		160,000	108,000
14,250		169,000	114,000
14,290	9/16	169,000	114,000
14,500		169,000	114,000
14,680	37/64	169,000	114,000
15,000		169,000	114,000
15,080	19/32	178,000	120,000
15,400		178,000	120,000
15,480	39/64	178,000	120,000
15,500		178,000	120,000
15,750		178,000	120,000
15,870	5/8	178,000	120,000
16,000		178,000	120,000



## Helisel matkap uçları, kısa

Malzeme **HSS**Yüzey **S**Kesme yönü **R**

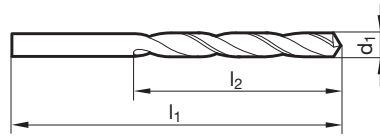
**P** • öz bileme  $\geq \varnothing 1,000$  • koni bileme • geniş kanallı • özellikle delik derinliği 3xD üstü için

**M****K** •

**N** • pik döküm • 1000 N/mm<sup>2</sup> üzerindeki Çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.

**S****H****GÜHRING**NAVIGATOR

Kesme verileri sayfası 780

Ürün no **652**

SİLİNDİR ŞAFTLI MATKAP UCU

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		34,000	12,000	2,250		53,000	27,000
1,020		34,000	12,000	2,260		53,000	27,000
1,040		34,000	12,000	2,300		53,000	27,000
1,070		36,000	14,000	2,350		53,000	27,000
1,090		36,000	14,000	2,370		57,000	30,000
1,100		36,000	14,000	2,380	3/32	57,000	30,000
1,180		36,000	14,000	2,400		57,000	30,000
1,190	3/64	38,000	16,000	2,440		57,000	30,000
1,200		38,000	16,000	2,450		57,000	30,000
1,220		38,000	16,000	2,490		57,000	30,000
1,250		38,000	16,000	2,500		57,000	30,000
1,300		38,000	16,000	2,530		57,000	30,000
1,320		38,000	16,000	2,550		57,000	30,000
1,350		40,000	18,000	2,580		57,000	30,000
1,400		40,000	18,000	2,600		57,000	30,000
1,450		40,000	18,000	2,640		57,000	30,000
1,500		40,000	18,000	2,650		57,000	30,000
1,510		43,000	20,000	2,700		61,000	33,000
1,530		43,000	20,000	2,710		61,000	33,000
1,550		43,000	20,000	2,750		61,000	33,000
1,590	1/16	43,000	20,000	2,780	7/64	61,000	33,000
1,600		43,000	20,000	2,790		61,000	33,000
1,610		43,000	20,000	2,800		61,000	33,000
1,650		43,000	20,000	2,820		61,000	33,000
1,700		43,000	20,000	2,850		61,000	33,000
1,720		46,000	22,000	2,870		61,000	33,000
1,750		46,000	22,000	2,900		61,000	33,000
1,780		46,000	22,000	2,950		61,000	33,000
1,800		46,000	22,000	3,000		61,000	33,000
1,850		46,000	22,000	3,050		65,000	36,000
1,900		46,000	22,000	3,100		65,000	36,000
1,930		49,000	24,000	3,170	1/8	65,000	36,000
1,950		49,000	24,000	3,200		65,000	36,000
1,980	5/64	49,000	24,000	3,250		65,000	36,000
1,990		49,000	24,000	3,260		65,000	36,000
2,000		49,000	24,000	3,300		65,000	36,000
2,060		49,000	24,000	3,350		65,000	36,000
2,080		49,000	24,000	3,400		70,000	39,000
2,100		49,000	24,000	3,450		70,000	39,000
2,150		53,000	27,000	3,500		70,000	39,000
2,180		53,000	27,000	3,570	9/64	70,000	39,000
2,200		53,000	27,000	3,600		70,000	39,000



d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
3,650		70,000	39,000	6,750	17/64	109,000	69,000
3,660		70,000	39,000	6,800		109,000	69,000
3,700		70,000	39,000	6,900		109,000	69,000
3,730		70,000	39,000	7,000		109,000	69,000
3,750		70,000	39,000	7,030		109,000	69,000
3,800		75,000	43,000	7,100		109,000	69,000
3,860		75,000	43,000	7,140	9/32	109,000	69,000
3,900		75,000	43,000	7,200		109,000	69,000
3,910		75,000	43,000	7,300		109,000	69,000
3,970	5/32	75,000	43,000	7,370		109,000	69,000
3,990		75,000	43,000	7,400		109,000	69,000
4,000		75,000	43,000	7,490		109,000	69,000
4,040		75,000	43,000	7,500		109,000	69,000
4,050		75,000	43,000	7,540	19/64	117,000	75,000
4,090		75,000	43,000	7,600		117,000	75,000
4,100		75,000	43,000	7,670		117,000	75,000
4,200		75,000	43,000	7,700		117,000	75,000
4,220		75,000	43,000	7,800		117,000	75,000
4,250		75,000	43,000	7,900		117,000	75,000
4,300		80,000	47,000	7,940	5/16	117,000	75,000
4,370	11/64	80,000	47,000	8,000		117,000	75,000
4,390		80,000	47,000	8,030		117,000	75,000
4,400		80,000	47,000	8,100		117,000	75,000
4,450		80,000	47,000	8,200		117,000	75,000
4,500		80,000	47,000	8,330	21/64	117,000	75,000
4,570		80,000	47,000	8,400		117,000	75,000
4,600		80,000	47,000	8,430		117,000	75,000
4,620		80,000	47,000	8,500		117,000	75,000
4,700		80,000	47,000	8,600		125,000	81,000
4,760	3/16	86,000	52,000	8,610		125,000	81,000
4,800		86,000	52,000	8,730	11/32	125,000	81,000
4,850		86,000	52,000	8,800		125,000	81,000
4,900		86,000	52,000	8,840		125,000	81,000
4,920		86,000	52,000	8,900		125,000	81,000
4,980		86,000	52,000	9,000		125,000	81,000
5,000		86,000	52,000	9,100		125,000	81,000
5,060		86,000	52,000	9,130	23/64	125,000	81,000
5,100		86,000	52,000	9,200		125,000	81,000
5,110		86,000	52,000	9,300		125,000	81,000
5,160	13/64	86,000	52,000	9,340		125,000	81,000
5,180		86,000	52,000	9,400		125,000	81,000
5,200		86,000	52,000	9,500		125,000	81,000
5,220		86,000	52,000	9,520	3/8	133,000	87,000
5,300		86,000	52,000	9,600		133,000	87,000
5,310		93,000	57,000	9,700		133,000	87,000
5,400		93,000	57,000	9,800		133,000	87,000
5,410		93,000	57,000	9,900		133,000	87,000
5,500		93,000	57,000	9,920	25/64	133,000	87,000
5,560	7/32	93,000	57,000	10,000		133,000	87,000
5,600		93,000	57,000	10,200		133,000	87,000
5,610		93,000	57,000	10,300		133,000	87,000
5,700		93,000	57,000	10,320	13/32	133,000	87,000
5,750		93,000	57,000	10,490		133,000	87,000
5,790		93,000	57,000	10,500		133,000	87,000
5,800		93,000	57,000	10,700		142,000	94,000
5,900		93,000	57,000	10,720	27/64	142,000	94,000
5,940		93,000	57,000	11,000		142,000	94,000
5,950	15/64	93,000	57,000	11,110	7/16	142,000	94,000
6,000		93,000	57,000	11,200		142,000	94,000
6,040		101,000	63,000	11,500		142,000	94,000
6,100		101,000	63,000	11,510	29/64	142,000	94,000
6,150		101,000	63,000	11,600		142,000	94,000
6,200		101,000	63,000	11,910	15/32	151,000	101,000
6,250		101,000	63,000	12,000		151,000	101,000
6,300		101,000	63,000	12,300	31/64	151,000	101,000
6,350	1/4	101,000	63,000	12,500		151,000	101,000
6,400		101,000	63,000	12,600		151,000	101,000
6,500		101,000	63,000	12,700	1/2	151,000	101,000
6,530		101,000	63,000	13,000		151,000	101,000
6,600		101,000	63,000	13,100	33/64	151,000	101,000
6,630		101,000	63,000	13,490	17/32	160,000	108,000
6,700		101,000	63,000	13,890	35/64	160,000	108,000





d1		l1	l2
mm	inch	mm	mm
14,000		160,000	108,000
14,290	9/16	169,000	114,000
15,000		169,000	114,000

d1		l1	l2
mm	inch	mm	mm



## Helisel matkap uçları, kısa



**P** • öz bileme  $\geq \varnothing 1,000$  • koni bileme • geniş kanallı • özellikle delik derinliği 3xD üstü için

**M**

**K** •

**N** • pik döküm • 1000 N/mm<sup>2</sup> üzerindeki Çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.

**S**

**H**

Malzeme **HSS**

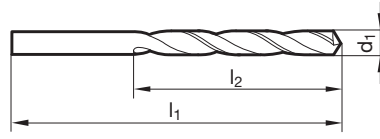
Yüzey **F**

Kesme yönü **R**

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 780

SİLİNDİR ŞAFTLI MATKAP UCU



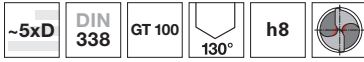
Ürün no **2457**

d1		l1	l2
mm	inch	mm	mm
1,000		34,000	12,000
1,300		38,000	16,000
1,500		40,000	18,000
1,600		43,000	20,000
1,700		43,000	20,000
1,800		46,000	22,000
2,000		49,000	24,000
2,100		49,000	24,000
2,400		57,000	30,000
2,800		61,000	33,000
2,900		61,000	33,000
3,000		61,000	33,000
3,100		65,000	36,000
3,200		65,000	36,000
3,300		65,000	36,000
3,400		70,000	39,000
3,500		70,000	39,000
3,600		70,000	39,000
3,800		75,000	43,000
4,000		75,000	43,000
4,200		75,000	43,000
4,300		80,000	47,000
4,400		80,000	47,000
4,700		80,000	47,000
4,800		86,000	52,000
4,900		86,000	52,000
5,000		86,000	52,000
5,100		86,000	52,000
5,400		93,000	57,000
5,500		93,000	57,000

d1		l1	l2
mm	inch	mm	mm
5,600		93,000	57,000
5,700		93,000	57,000
6,000		93,000	57,000
6,100		101,000	63,000
6,200		101,000	63,000
6,600		101,000	63,000
6,800		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000
7,200		109,000	69,000
7,300		109,000	69,000
7,400		109,000	69,000
7,900		117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,400		117,000	75,000
8,500		117,000	75,000
8,700		125,000	81,000
8,800		125,000	81,000
8,900		125,000	81,000
9,100		125,000	81,000
9,400		125,000	81,000
9,600		133,000	87,000
9,700		133,000	87,000
10,300		133,000	87,000
10,700		142,000	94,000
11,400		142,000	94,000
11,700		142,000	94,000
11,800		142,000	94,000
15,000		169,000	114,000



## Helisel matkap uçları, kısa

Malzeme **HSS**

Yüzey

Kesme yönü

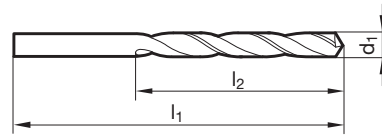
**P** • öz bileme  $\geq \varnothing 1,000$  • koni bileme • geniş kanallı • özellikle delik derinliği 3xD üstü için

**M****K** •

**N** • pik döküm • 1000 N/mm<sup>2</sup> üzerindeki Çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.

**S****H****GÜHRING** NAVIGATOR

Kesme verileri sayfası 778

Ürün no **550**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		34,000	12,000	2,750		61,000	33,000
1,300		38,000	16,000	2,780	7/64	61,000	33,000
1,350		40,000	18,000	2,790		61,000	33,000
1,400		40,000	18,000	2,800		61,000	33,000
1,450		40,000	18,000	2,870		61,000	33,000
1,485		40,000	18,000	2,900		61,000	33,000
1,490		40,000	18,000	2,950		61,000	33,000
1,500		40,000	18,000	3,000		61,000	33,000
1,550		43,000	20,000	3,020		65,000	36,000
1,580		43,000	20,000	3,050		65,000	36,000
1,590	1/16	43,000	20,000	3,100		65,000	36,000
1,600		43,000	20,000	3,150		65,000	36,000
1,650		43,000	20,000	3,170	1/8	65,000	36,000
1,700		43,000	20,000	3,175	1/8	65,000	36,000
1,780		46,000	22,000	3,200		65,000	36,000
1,800		46,000	22,000	3,250		65,000	36,000
1,850		46,000	22,000	3,260		65,000	36,000
1,900		46,000	22,000	3,300		65,000	36,000
1,950		49,000	24,000	3,350		65,000	36,000
1,980	5/64	49,000	24,000	3,400		70,000	39,000
2,000		49,000	24,000	3,450		70,000	39,000
2,030		49,000	24,000	3,500		70,000	39,000
2,050		49,000	24,000	3,550		70,000	39,000
2,080		49,000	24,000	3,570	9/64	70,000	39,000
2,100		49,000	24,000	3,600		70,000	39,000
2,150		53,000	27,000	3,650		70,000	39,000
2,200		53,000	27,000	3,660		70,000	39,000
2,250		53,000	27,000	3,700		70,000	39,000
2,260		53,000	27,000	3,750		70,000	39,000
2,300		53,000	27,000	3,800		75,000	43,000
2,350		53,000	27,000	3,860		75,000	43,000
2,370		57,000	30,000	3,900		75,000	43,000
2,380	3/32	57,000	30,000	3,990		75,000	43,000
2,400		57,000	30,000	4,000		75,000	43,000
2,490		57,000	30,000	4,040		75,000	43,000
2,500		57,000	30,000	4,100		75,000	43,000
2,530		57,000	30,000	4,200		75,000	43,000
2,550		57,000	30,000	4,300		80,000	47,000
2,580		57,000	30,000	4,370	11/64	80,000	47,000
2,600		57,000	30,000	4,450		80,000	47,000
2,670		61,000	33,000	4,500		80,000	47,000
2,700		61,000	33,000	4,600		80,000	47,000



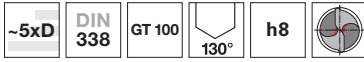
Silindir Şaftlı Matkap ucu

d1		l1	l2
mm	inch	mm	mm
4,620		80,000	47,000
4,760	3/16	86,000	52,000
4,900		86,000	52,000
5,000		86,000	52,000
5,100		86,000	52,000
5,200		86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,500		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,700		93,000	57,000
5,750		93,000	57,000
5,790		93,000	57,000
5,800		93,000	57,000
5,850		93,000	57,000
5,900		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,100		101,000	63,000
6,200		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,600		101,000	63,000
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000
7,300		109,000	69,000
7,400		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000
7,600		117,000	75,000

d1		l1	l2
mm	inch	mm	mm
7,700		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,330	21/64	117,000	75,000
8,400		117,000	75,000
8,500		117,000	75,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,800		125,000	81,000
9,000		125,000	81,000
9,200		125,000	81,000
9,400		125,000	81,000
9,520	3/8	133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
10,000		133,000	87,000
10,200		133,000	87,000
10,300		133,000	87,000
10,600		133,000	87,000
10,800		142,000	94,000
11,100		142,000	94,000
11,110	7/16	142,000	94,000
11,900		151,000	101,000
12,400		151,000	101,000
12,800		151,000	101,000
14,290	9/16	169,000	114,000
15,000		169,000	114,000
15,500		178,000	120,000



## Helisel matkap uçları, kısa

Malzeme **HSS**Yüzey **S**Kesme yönü **L**

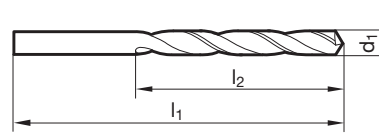
**P** • öz bileme  $\geq \varnothing 1,300$  • koni bileme • geniş kanallı • özellikle delik derinliği 3xD üstü için

**M****K** •

**N** • pik döküm • 1000 N/mm<sup>2</sup> üzerindeki Çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.

**S****H****GÜHRING**NAVIGATOR

Kesme verileri sayfası 780

Ürün no **665**SİLİNDİR ŞAFTLI MATKAP  
UCU

d1		l1	l2
mm	inch	mm	mm
1,300		38,000	16,000
1,400		40,000	18,000
1,500		40,000	18,000
1,550		43,000	20,000
1,590	1/16	43,000	20,000
1,600		43,000	20,000
1,650		43,000	20,000
1,700		43,000	20,000
1,800		46,000	22,000
1,900		46,000	22,000
1,980	5/64	49,000	24,000
2,000		49,000	24,000
2,100		49,000	24,000
2,200		53,000	27,000
2,260		53,000	27,000
2,300		53,000	27,000
2,380	3/32	57,000	30,000
2,400		57,000	30,000
2,500		57,000	30,000
2,530		57,000	30,000
2,580		57,000	30,000
2,600		57,000	30,000
2,700		61,000	33,000
2,780	7/64	61,000	33,000
2,800		61,000	33,000
2,950		61,000	33,000
3,000		61,000	33,000
3,100		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,300		65,000	36,000
3,400		70,000	39,000
3,450		70,000	39,000
3,570	9/64	70,000	39,000
3,700		70,000	39,000
3,800		75,000	43,000

d1		l1	l2
mm	inch	mm	mm
3,900		75,000	43,000
4,000		75,000	43,000
4,300		80,000	47,000
4,400		80,000	47,000
4,500		80,000	47,000
4,700		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,900		86,000	52,000
5,000		86,000	52,000
5,100		86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,500		93,000	57,000
5,700		93,000	57,000
5,800		93,000	57,000
5,900		93,000	57,000
6,000		93,000	57,000
6,500		101,000	63,000
7,000		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,540	19/64	117,000	75,000
7,800		117,000	75,000
7,940	5/16	117,000	75,000
8,600		125,000	81,000
9,130	23/64	125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,800		133,000	87,000



## Helisel matkap uçları, kısa

~5xD

DIN  
338

N

118°

h8



P	•	öz bileme $\geq \varnothing 1,000$ • koni bileme • Co-alaşımlı HSS-çeliği • artırılmış aşınma direnci
M	○	
K	•	
N	○	alaşım/alaşısız çelikler ve çelik dökümlerde • 800 N/mm <sup>2</sup> üzerindeki sert malzemeler • sıcak ve soğuk işlem çelikleri • rulman çeliği • yüksek alaşım çelikleri • ıslah çelikleri ve sementasyon çelikleri
S	○	
H	○	

Malzeme

HSCO

Yüzey

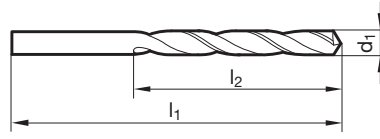
 $\geq 0,236$ 

Kesme yönü

R

## GÜHRING NAVIGATOR

Kesme verileri sayfası 780

SİLİNDİR ŞAFTLI MATKAP  
UCU

Ürün no

305

d1		l1	l2
mm	inch	mm	mm
0,200		19,000	2,500
0,220		19,000	2,500
0,230		19,000	2,500
0,250		19,000	3,000
0,260		19,000	3,000
0,270		19,000	3,000
0,280		19,000	3,000
0,300		19,000	3,000
0,310		19,000	4,000
0,320		19,000	4,000
0,330		19,000	4,000
0,340		19,000	4,000
0,350		19,000	4,000
0,360		19,000	4,000
0,370		19,000	4,000
0,380		19,000	4,000
0,390		20,000	5,000
0,400	1/64	20,000	5,000
0,410		20,000	5,000
0,420		20,000	5,000
0,430		20,000	5,000
0,440		20,000	5,000
0,450		20,000	5,000
0,460		20,000	5,000
0,470		20,000	5,000
0,480		20,000	5,000
0,490		22,000	6,000
0,500		22,000	6,000
0,510		22,000	6,000
0,520		22,000	6,000
0,530		22,000	6,000
0,540		24,000	7,000
0,550		24,000	7,000
0,560		24,000	7,000
0,570		24,000	7,000
0,580		24,000	7,000
0,590		24,000	7,000
0,600		24,000	7,000
0,610		26,000	8,000
0,620		26,000	8,000
0,640		26,000	8,000
0,650		26,000	8,000

d1		l1	l2
mm	inch	mm	mm
0,660		26,000	8,000
0,670		26,000	8,000
0,680		28,000	9,000
0,700		28,000	9,000
0,710		28,000	9,000
0,720		28,000	9,000
0,730		28,000	9,000
0,740		28,000	9,000
0,750		28,000	9,000
0,760		30,000	10,000
0,770		30,000	10,000
0,780		30,000	10,000
0,790	1/32	30,000	10,000
0,800		30,000	10,000
0,810		30,000	10,000
0,820		30,000	10,000
0,830		30,000	10,000
0,840		30,000	10,000
0,850		30,000	10,000
0,860		32,000	11,000
0,870		32,000	11,000
0,880		32,000	11,000
0,890		32,000	11,000
0,900		32,000	11,000
0,910		32,000	11,000
0,920		32,000	11,000
0,930		32,000	11,000
0,940		32,000	11,000
0,950		32,000	11,000
0,960		34,000	12,000
0,970		34,000	12,000
0,980		34,000	12,000
0,990		34,000	12,000
1,000		34,000	12,000
1,010		34,000	12,000
1,020		34,000	12,000
1,030		34,000	12,000
1,040		34,000	12,000
1,050		34,000	12,000
1,070		36,000	14,000
1,080		36,000	14,000
1,090		36,000	14,000



d1		l1	l2
mm	inch	mm	mm
1,100		36,000	14,000
1,120		36,000	14,000
1,130		36,000	14,000
1,140		36,000	14,000
1,150		36,000	14,000
1,160		36,000	14,000
1,170		36,000	14,000
1,180		36,000	14,000
1,190	3/64	38,000	16,000
1,200		38,000	16,000
1,210		38,000	16,000
1,220		38,000	16,000
1,230		38,000	16,000
1,250		38,000	16,000
1,260		38,000	16,000
1,280		38,000	16,000
1,290		38,000	16,000
1,300		38,000	16,000
1,310		38,000	16,000
1,320		38,000	16,000
1,330		40,000	18,000
1,350		40,000	18,000
1,360		40,000	18,000
1,370		40,000	18,000
1,380		40,000	18,000
1,400		40,000	18,000
1,410		40,000	18,000
1,420		40,000	18,000
1,430		40,000	18,000
1,440		40,000	18,000
1,450		40,000	18,000
1,460		40,000	18,000
1,470		40,000	18,000
1,480		40,000	18,000
1,490		40,000	18,000
1,500		40,000	18,000
1,510		43,000	20,000
1,520		43,000	20,000
1,530		43,000	20,000
1,540		43,000	20,000
1,550		43,000	20,000
1,560		43,000	20,000
1,570		43,000	20,000
1,580		43,000	20,000
1,590	1/16	43,000	20,000
1,600		43,000	20,000
1,610		43,000	20,000
1,620		43,000	20,000
1,640		43,000	20,000
1,650		43,000	20,000
1,660		43,000	20,000
1,670		43,000	20,000
1,680		43,000	20,000
1,700		43,000	20,000
1,710		46,000	22,000
1,720		46,000	22,000
1,730		46,000	22,000
1,740		46,000	22,000
1,750		46,000	22,000
1,760		46,000	22,000
1,780		46,000	22,000
1,790		46,000	22,000
1,800		46,000	22,000
1,810		46,000	22,000
1,820		46,000	22,000
1,830		46,000	22,000
1,840		46,000	22,000
1,850		46,000	22,000
1,860		46,000	22,000
1,900		46,000	22,000
1,910		49,000	24,000
1,930		49,000	24,000

d1		l1	l2
mm	inch	mm	mm
1,950		49,000	24,000
1,960		49,000	24,000
1,970		49,000	24,000
1,980	5/64	49,000	24,000
1,990		49,000	24,000
2,000		49,000	24,000
2,010		49,000	24,000
2,020		49,000	24,000
2,030		49,000	24,000
2,040		49,000	24,000
2,050		49,000	24,000
2,060		49,000	24,000
2,070		49,000	24,000
2,080		49,000	24,000
2,100		49,000	24,000
2,120		49,000	24,000
2,150		53,000	27,000
2,180		53,000	27,000
2,200		53,000	27,000
2,230		53,000	27,000
2,250		53,000	27,000
2,260		53,000	27,000
2,300		53,000	27,000
2,320		53,000	27,000
2,350		53,000	27,000
2,370		57,000	30,000
2,380	3/32	57,000	30,000
2,400		57,000	30,000
2,440		57,000	30,000
2,450		57,000	30,000
2,470		57,000	30,000
2,490		57,000	30,000
2,500		57,000	30,000
2,510		57,000	30,000
2,520		57,000	30,000
2,530		57,000	30,000
2,550		57,000	30,000
2,580		57,000	30,000
2,600		57,000	30,000
2,640		57,000	30,000
2,650		57,000	30,000
2,700		61,000	33,000
2,710		61,000	33,000
2,750		61,000	33,000
2,780	7/64	61,000	33,000
2,790		61,000	33,000
2,800		61,000	33,000
2,820		61,000	33,000
2,850		61,000	33,000
2,870		61,000	33,000
2,900		61,000	33,000
2,920		61,000	33,000
2,950		61,000	33,000
3,000		61,000	33,000
3,020		65,000	36,000
3,030		65,000	36,000
3,050		65,000	36,000
3,100		65,000	36,000
3,150		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,250		65,000	36,000
3,260		65,000	36,000
3,300		65,000	36,000
3,330		65,000	36,000
3,350		65,000	36,000
3,400		70,000	39,000
3,450		70,000	39,000
3,500		70,000	39,000
3,550		70,000	39,000
3,570	9/64	70,000	39,000
3,600		70,000	39,000



d1		l1	l2
mm	inch	mm	mm
3,650		70,000	39,000
3,660		70,000	39,000
3,700		70,000	39,000
3,730		70,000	39,000
3,750		70,000	39,000
3,800		75,000	43,000
3,850		75,000	43,000
3,860		75,000	43,000
3,900		75,000	43,000
3,910		75,000	43,000
3,970	5/32	75,000	43,000
3,990		75,000	43,000
4,000		75,000	43,000
4,020		75,000	43,000
4,040		75,000	43,000
4,050		75,000	43,000
4,070		75,000	43,000
4,090		75,000	43,000
4,100		75,000	43,000
4,120		75,000	43,000
4,150		75,000	43,000
4,170		75,000	43,000
4,200		75,000	43,000
4,220		75,000	43,000
4,250		75,000	43,000
4,300		80,000	47,000
4,370	11/64	80,000	47,000
4,390		80,000	47,000
4,400		80,000	47,000
4,450		80,000	47,000
4,500		80,000	47,000
4,550		80,000	47,000
4,570		80,000	47,000
4,600		80,000	47,000
4,620		80,000	47,000
4,650		80,000	47,000
4,700		80,000	47,000
4,750		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,850		86,000	52,000
4,900		86,000	52,000
4,920		86,000	52,000
4,980		86,000	52,000
5,000		86,000	52,000
5,020		86,000	52,000
5,050		86,000	52,000
5,060		86,000	52,000
5,100		86,000	52,000
5,110		86,000	52,000
5,150		86,000	52,000
5,160	13/64	86,000	52,000
5,180		86,000	52,000
5,200		86,000	52,000
5,220		86,000	52,000
5,250		86,000	52,000
5,300		86,000	52,000
5,310		93,000	57,000
5,400		93,000	57,000
5,410		93,000	57,000
5,450		93,000	57,000
5,500		93,000	57,000
5,550		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,610		93,000	57,000
5,650		93,000	57,000
5,700		93,000	57,000
5,750		93,000	57,000
5,790		93,000	57,000
5,800		93,000	57,000
5,850		93,000	57,000

d1		l1	l2
mm	inch	mm	mm
5,900		93,000	57,000
5,940		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,040		101,000	63,000
6,050		101,000	63,000
6,100		101,000	63,000
6,150		101,000	63,000
6,200		101,000	63,000
6,250		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,450		101,000	63,000
6,500		101,000	63,000
6,530		101,000	63,000
6,600		101,000	63,000
6,630		101,000	63,000
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,760		109,000	69,000
6,800		109,000	69,000
6,850		109,000	69,000
6,900		109,000	69,000
6,950		109,000	69,000
7,000		109,000	69,000
7,030		109,000	69,000
7,050		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000
7,250		109,000	69,000
7,300		109,000	69,000
7,370		109,000	69,000
7,400		109,000	69,000
7,490		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000
7,600		117,000	75,000
7,670		117,000	75,000
7,700		117,000	75,000
7,750		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,030		117,000	75,000
8,050		117,000	75,000
8,100		117,000	75,000
8,150		117,000	75,000
8,200		117,000	75,000
8,250		117,000	75,000
8,300		117,000	75,000
8,330	21/64	117,000	75,000
8,400		117,000	75,000
8,430		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,610		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,750		125,000	81,000
8,800		125,000	81,000
8,840		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,090		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,250		125,000	81,000
9,300		125,000	81,000



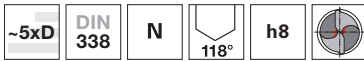


d1		l1	l2
mm	inch	mm	mm
9,340		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,580		133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,750		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,050		133,000	87,000
10,080		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,250		133,000	87,000
10,260		133,000	87,000
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,400		133,000	87,000
10,490		133,000	87,000
10,500		133,000	87,000
10,600		133,000	87,000
10,700		142,000	94,000
10,720	27/64	142,000	94,000
10,750		142,000	94,000
10,800		142,000	94,000
10,900		142,000	94,000
11,000		142,000	94,000
11,100		142,000	94,000
11,110	7/16	142,000	94,000
11,200		142,000	94,000
11,250		142,000	94,000
11,300		142,000	94,000
11,400		142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,600		142,000	94,000
11,700		142,000	94,000
11,750		142,000	94,000
11,800		142,000	94,000
11,900		151,000	101,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,100		151,000	101,000
12,200		151,000	101,000
12,250		151,000	101,000

d1		l1	l2
mm	inch	mm	mm
12,300	31/64	151,000	101,000
12,400		151,000	101,000
12,500		151,000	101,000
12,600		151,000	101,000
12,700	1/2	151,000	101,000
12,750		151,000	101,000
12,800		151,000	101,000
12,900		151,000	101,000
13,000		151,000	101,000
13,100	33/64	151,000	101,000
13,200		151,000	101,000
13,300		160,000	108,000
13,490	17/32	160,000	108,000
13,500		160,000	108,000
13,600		160,000	108,000
13,700		160,000	108,000
13,750		160,000	108,000
13,800		160,000	108,000
13,890	35/64	160,000	108,000
13,900		160,000	108,000
14,000		160,000	108,000
14,100		169,000	114,000
14,200		169,000	114,000
14,290	9/16	169,000	114,000
14,500	37/64	169,000	114,000
14,680		169,000	114,000
15,000		169,000	114,000
15,250		178,000	120,000
15,480	39/64	178,000	120,000
15,500		178,000	120,000
15,750		178,000	120,000
15,870	5/8	178,000	120,000
16,000		178,000	120,000
16,500		184,000	125,000
16,670	21/32	184,000	125,000
17,000		184,000	125,000
17,460	11/16	191,000	130,000
17,500		191,000	130,000
18,000		191,000	130,000
18,500		198,000	135,000
19,000		198,000	135,000
19,500		205,000	140,000
20,000		205,000	140,000



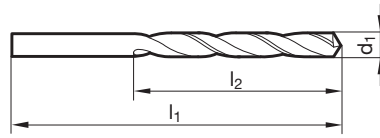
## Helisel matkap uçları, kısa



<b>P</b> ●	öz bileme $\geq \varnothing 1,200$ • koni bileme • Co-alaşımlı HSS-çeliği • yüksek aşınma direnci
<b>M</b> ○	
<b>K</b> ●	
<b>N</b> ○	alaşım ve alaşımsız çelikler • 800 N/mm <sup>2</sup> üstü mukavemetli döküm çeşitleri • sıcak ve soğuk işlem çelikleri • rulman çeliği • yüksek alaşım çelikleri • ıslah çelikleri ve sementasyon çelikleri
<b>S</b> ○	
<b>H</b> ○	

Malzeme **HSCO**Yüzey **S**Kesme yönü **R****GÜHRING**NAVIGATOR

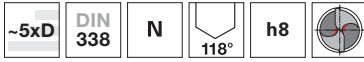
Kesme verileri sayfası 782

Ürün no **2997**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,200		38,000	16,000	6,300		101,000	63,000
1,300		38,000	16,000	6,400		101,000	63,000
1,400		40,000	18,000	6,500		101,000	63,000
1,500		40,000	18,000	6,600		101,000	63,000
1,600		43,000	20,000	6,700		101,000	63,000
1,700		43,000	20,000	6,800		109,000	69,000
1,800		46,000	22,000	6,900		109,000	69,000
1,900		46,000	22,000	7,000		109,000	69,000
2,000		49,000	24,000	7,100		109,000	69,000
2,100		49,000	24,000	7,300		109,000	69,000
2,200		53,000	27,000	7,400		109,000	69,000
2,300		53,000	27,000	7,500		109,000	69,000
2,500		57,000	30,000	7,600		117,000	75,000
2,700		61,000	33,000	7,700		117,000	75,000
2,800		61,000	33,000	7,800		117,000	75,000
2,900		61,000	33,000	7,900		117,000	75,000
3,000		61,000	33,000	8,000		117,000	75,000
3,100		65,000	36,000	8,200		117,000	75,000
3,300		65,000	36,000	8,400		117,000	75,000
3,400		70,000	39,000	8,500		117,000	75,000
3,500		70,000	39,000	8,800		125,000	81,000
3,600		70,000	39,000	8,900		125,000	81,000
3,700		70,000	39,000	9,000		125,000	81,000
3,800		75,000	43,000	9,300		125,000	81,000
3,900		75,000	43,000	9,400		125,000	81,000
4,000		75,000	43,000	9,500		125,000	81,000
4,100		75,000	43,000	9,600		133,000	87,000
4,200		75,000	43,000	9,700		133,000	87,000
4,300		80,000	47,000	9,800		133,000	87,000
4,500		80,000	47,000	9,900		133,000	87,000
4,700		80,000	47,000	10,000		133,000	87,000
4,800		86,000	52,000	10,300		133,000	87,000
4,900		86,000	52,000	10,500		133,000	87,000
5,000		86,000	52,000	10,800		142,000	94,000
5,200		86,000	52,000	11,000		142,000	94,000
5,300		86,000	52,000	11,200		142,000	94,000
5,400		93,000	57,000	11,500		142,000	94,000
5,500		93,000	57,000	12,000		151,000	101,000
5,600		93,000	57,000	12,500		151,000	101,000
5,800		93,000	57,000	12,700	1/2	151,000	101,000
6,000		93,000	57,000	13,000		151,000	101,000
6,100		101,000	63,000				



## Helisel matkap uçları, kısa

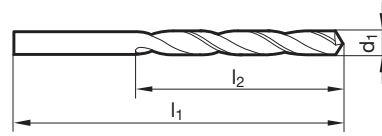


<b>P</b> ●	öz bileme $\geq \varnothing 2,370$ • koni bileme • Co-alaşımlı HSS-çeliği • yüksek aşınma direnci
<b>M</b> ○	
<b>K</b> ●	
<b>N</b> ○	alaşım ve alaşimsız çelikler • 800 N/mm <sup>2</sup> üstü mukavemetli döküm çeşitleri • sıcak ve soğuk işlem çelikleri • rulman çeliği • yüksek alaşım çelikleri • ıslah çelikleri ve sementasyon çelikleri
<b>S</b> ○	
<b>H</b> ○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 780

Malzeme	<b>HSCO</b>
Yüzey	$\text{Ra} > 6,00$
Kesme yönü	



Ürün no 308

SİLİNDİR ŞAFTLI MATKAP UCU

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,360		19,000	4,000	1,600		43,000	20,000
0,390		20,000	5,000	1,610		43,000	20,000
0,500		22,000	6,000	1,620		43,000	20,000
0,560		24,000	7,000	1,700		43,000	20,000
0,590		24,000	7,000	1,720		46,000	22,000
0,600		24,000	7,000	1,750		46,000	22,000
0,620		26,000	8,000	1,780		46,000	22,000
0,630		26,000	8,000	1,800		46,000	22,000
0,650		26,000	8,000	1,830		46,000	22,000
0,750		28,000	9,000	1,850		46,000	22,000
0,780		30,000	10,000	1,900		46,000	22,000
0,800		30,000	10,000	1,930		49,000	24,000
0,820		30,000	10,000	1,950		49,000	24,000
0,900		32,000	11,000	1,980	5/64	49,000	24,000
0,910		32,000	11,000	2,000		49,000	24,000
0,920		32,000	11,000	2,050		49,000	24,000
0,930		32,000	11,000	2,060		49,000	24,000
0,950		32,000	11,000	2,080		49,000	24,000
0,980		34,000	12,000	2,100		49,000	24,000
1,000		34,000	12,000	2,180		53,000	27,000
1,020		34,000	12,000	2,200		53,000	27,000
1,030		34,000	12,000	2,250		53,000	27,000
1,050		34,000	12,000	2,260		53,000	27,000
1,080		36,000	14,000	2,350		53,000	27,000
1,100		36,000	14,000	2,370		57,000	30,000
1,150		36,000	14,000	2,380	3/32	57,000	30,000
1,180		36,000	14,000	2,400		57,000	30,000
1,190	3/64	38,000	16,000	2,500		57,000	30,000
1,200		38,000	16,000	2,520		57,000	30,000
1,210		38,000	16,000	2,530		57,000	30,000
1,230		38,000	16,000	2,600		57,000	30,000
1,320		38,000	16,000	2,640		57,000	30,000
1,330		40,000	18,000	2,750		61,000	33,000
1,350		40,000	18,000	2,780	7/64	61,000	33,000
1,400		40,000	18,000	2,790		61,000	33,000
1,430		40,000	18,000	2,800		61,000	33,000
1,450		40,000	18,000	2,820		61,000	33,000
1,470		40,000	18,000	2,950		61,000	33,000
1,480		40,000	18,000	3,000		61,000	33,000
1,490		40,000	18,000	3,030		65,000	36,000
1,510		43,000	20,000	3,050		65,000	36,000
1,520		43,000	20,000	3,100		65,000	36,000

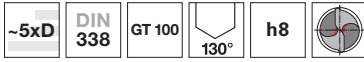


d1		l1	l2
mm	inch	mm	mm
3,150		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,300		65,000	36,000
3,400		70,000	39,000
3,420		70,000	39,000
3,450		70,000	39,000
3,500		70,000	39,000
3,530		70,000	39,000
3,650		70,000	39,000
3,660		70,000	39,000
3,700		70,000	39,000
3,800		75,000	43,000
3,860		75,000	43,000
3,900		75,000	43,000
3,910		75,000	43,000
3,970	5/32	75,000	43,000
3,990		75,000	43,000
4,000		75,000	43,000
4,040		75,000	43,000
4,050		75,000	43,000
4,090		75,000	43,000
4,150		75,000	43,000
4,200		75,000	43,000
4,220		75,000	43,000
4,300		80,000	47,000
4,350		80,000	47,000
4,370	11/64	80,000	47,000
4,390		80,000	47,000
4,400		80,000	47,000
4,500		80,000	47,000
4,620		80,000	47,000
4,650		80,000	47,000
4,700		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,830		86,000	52,000
4,900		86,000	52,000
5,000		86,000	52,000
5,060		86,000	52,000
5,110		86,000	52,000
5,160	13/64	86,000	52,000
5,180		86,000	52,000
5,200		86,000	52,000
5,220		86,000	52,000
5,300		86,000	52,000
5,310		93,000	57,000
5,400		93,000	57,000
5,410		93,000	57,000
5,550		93,000	57,000
5,560	7/32	93,000	57,000
5,570		93,000	57,000
5,610		93,000	57,000
5,700		93,000	57,000
5,800		93,000	57,000
5,900		93,000	57,000
5,940		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,100		101,000	63,000
6,250		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,530		101,000	63,000
6,700		101,000	63,000

d1		l1	l2
mm	inch	mm	mm
6,750	17/64	109,000	69,000
7,040		109,000	69,000
7,370		109,000	69,000
7,400		109,000	69,000
7,490		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000
7,600		117,000	75,000
7,670		117,000	75,000
7,700		117,000	75,000
8,000		117,000	75,000
8,030		117,000	75,000
8,040		117,000	75,000
8,300		117,000	75,000
8,330	21/64	117,000	75,000
8,600		125,000	81,000
8,610		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,800		125,000	81,000
8,840		125,000	81,000
9,000		125,000	81,000
9,090		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,340		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,600		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,080		133,000	87,000
10,260		133,000	87,000
10,320	13/32	133,000	87,000
10,490		133,000	87,000
10,800		142,000	94,000
11,000		142,000	94,000
11,110	7/16	142,000	94,000
11,200		142,000	94,000
11,400		142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,910	15/32	151,000	101,000
12,050		151,000	101,000
12,250		151,000	101,000
12,300	31/64	151,000	101,000
12,500		151,000	101,000
12,700	1/2	151,000	101,000
13,750		160,000	108,000
14,300		169,000	114,000
14,500		169,000	114,000
16,200		184,000	125,000
16,500		184,000	125,000
18,000		191,000	130,000
18,500		198,000	135,000



## Helisel matkap uçları, kısa

Malzeme **HSCO**Yüzey  $\text{Ra} > 0,2,36$ 

Kesme yönü

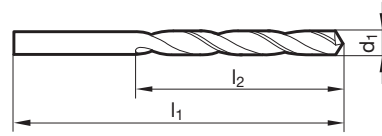
**P** • öz bileme  $\geq \text{Ø} 1,000$  • koni bileme • Co-alaşımlı HSS-çeliği • geniş kanallı  
• arttırılmış aşınma direnci • özellikle delik derinliği 3xD üstü için

**M** ○**K** •

**N** • alaşım ve alaşım dışı çelikler •  $800 \text{ N/mm}^2$  üzerindeki sert malzemeler  
• sıcak ve soğuk işlem çelikleri • rulman çeliği • yüksek alaşım çelikleri  
• ıslah çelikleri ve sementasyon çelikleri

**S****H****GÜHRING** NAVIGATOR

Kesme verileri sayfası 780

Ürün no **622**SİLİNDİR ŞAFTLI MATKAP  
UCU

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		34,000	12,000	2,080		49,000	24,000
1,020		34,000	12,000	2,100		49,000	24,000
1,040		34,000	12,000	2,150		53,000	27,000
1,050		34,000	12,000	2,180		53,000	27,000
1,070		36,000	14,000	2,200		53,000	27,000
1,090		36,000	14,000	2,250		53,000	27,000
1,100		36,000	14,000	2,260		53,000	27,000
1,130		36,000	14,000	2,300		53,000	27,000
1,150		36,000	14,000	2,350		53,000	27,000
1,180		36,000	14,000	2,370		57,000	30,000
1,190	3/64	38,000	16,000	2,380	3/32	57,000	30,000
1,200		38,000	16,000	2,400		57,000	30,000
1,250		38,000	16,000	2,420		57,000	30,000
1,270		38,000	16,000	2,440		57,000	30,000
1,300		38,000	16,000	2,450		57,000	30,000
1,320		38,000	16,000	2,490		57,000	30,000
1,350		40,000	18,000	2,500		57,000	30,000
1,400		40,000	18,000	2,530		57,000	30,000
1,430		40,000	18,000	2,550		57,000	30,000
1,440		40,000	18,000	2,580		57,000	30,000
1,450		40,000	18,000	2,600		57,000	30,000
1,500		40,000	18,000	2,640		57,000	30,000
1,510		43,000	20,000	2,650		57,000	30,000
1,550		43,000	20,000	2,700		61,000	33,000
1,590	1/16	43,000	20,000	2,710		61,000	33,000
1,600		43,000	20,000	2,750		61,000	33,000
1,610		43,000	20,000	2,780	7/64	61,000	33,000
1,650		43,000	20,000	2,790		61,000	33,000
1,700		43,000	20,000	2,800		61,000	33,000
1,780		46,000	22,000	2,820		61,000	33,000
1,800		46,000	22,000	2,850		61,000	33,000
1,850		46,000	22,000	2,870		61,000	33,000
1,900		46,000	22,000	2,900		61,000	33,000
1,920		49,000	24,000	2,950		61,000	33,000
1,930		49,000	24,000	3,000		61,000	33,000
1,950		49,000	24,000	3,050		65,000	36,000
1,960		49,000	24,000	3,100		65,000	36,000
1,980	5/64	49,000	24,000	3,150		65,000	36,000
1,990		49,000	24,000	3,170	1/8	65,000	36,000
2,000		49,000	24,000	3,200		65,000	36,000
2,050		49,000	24,000	3,250		65,000	36,000
2,060		49,000	24,000	3,260		65,000	36,000



d1		l1	l2
mm	inch	mm	mm
3,300		65,000	36,000
3,400		70,000	39,000
3,450		70,000	39,000
3,500		70,000	39,000
3,570	9/64	70,000	39,000
3,600		70,000	39,000
3,650		70,000	39,000
3,660		70,000	39,000
3,700		70,000	39,000
3,730		70,000	39,000
3,800		75,000	43,000
3,860		75,000	43,000
3,900		75,000	43,000
3,910		75,000	43,000
3,970	5/32	75,000	43,000
3,990		75,000	43,000
4,000		75,000	43,000
4,020		75,000	43,000
4,040		75,000	43,000
4,050		75,000	43,000
4,090		75,000	43,000
4,100		75,000	43,000
4,150		75,000	43,000
4,200		75,000	43,000
4,220		75,000	43,000
4,250		75,000	43,000
4,300		80,000	47,000
4,370	11/64	80,000	47,000
4,390		80,000	47,000
4,400		80,000	47,000
4,500		80,000	47,000
4,550		80,000	47,000
4,570		80,000	47,000
4,600		80,000	47,000
4,620		80,000	47,000
4,650		80,000	47,000
4,700		80,000	47,000
4,750		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,850		86,000	52,000
4,900		86,000	52,000
4,920		86,000	52,000
4,980		86,000	52,000
5,000		86,000	52,000
5,060		86,000	52,000
5,100		86,000	52,000
5,110		86,000	52,000
5,160	13/64	86,000	52,000
5,180		86,000	52,000
5,200		86,000	52,000
5,220		86,000	52,000
5,250		86,000	52,000
5,300		86,000	52,000
5,310		93,000	57,000
5,400		93,000	57,000
5,410		93,000	57,000
5,500		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,610		93,000	57,000
5,700		93,000	57,000
5,750		93,000	57,000
5,790		93,000	57,000
5,800		93,000	57,000
5,900		93,000	57,000
5,940		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,040		101,000	63,000
6,050		101,000	63,000
6,100		101,000	63,000

d1		l1	l2
mm	inch	mm	mm
6,150		101,000	63,000
6,200		101,000	63,000
6,250		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,530		101,000	63,000
6,600		101,000	63,000
6,630		101,000	63,000
6,650		101,000	63,000
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,030		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000
7,300		109,000	69,000
7,370		109,000	69,000
7,400		109,000	69,000
7,450		109,000	69,000
7,490		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000
7,600		117,000	75,000
7,670		117,000	75,000
7,700		117,000	75,000
7,750		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,030		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,330	21/64	117,000	75,000
8,400		117,000	75,000
8,430		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,610		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,800		125,000	81,000
8,840		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,090		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,340		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,580		133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,080		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,250		133,000	87,000
10,260		133,000	87,000



d1		l1	l2
mm	inch	mm	mm
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,400		133,000	87,000
10,500		133,000	87,000
10,600		133,000	87,000
10,700		142,000	94,000
10,720	27/64	142,000	94,000
10,800		142,000	94,000
10,900		142,000	94,000
11,000		142,000	94,000
11,100		142,000	94,000
11,110	7/16	142,000	94,000
11,200		142,000	94,000
11,300		142,000	94,000
11,400		142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,600		142,000	94,000

d1		l1	l2
mm	inch	mm	mm
11,700		142,000	94,000
11,800		142,000	94,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,500		151,000	101,000
12,700	1/2	151,000	101,000
12,800		151,000	101,000
13,000		151,000	101,000
13,500		160,000	108,000
13,800		160,000	108,000
14,000		160,000	108,000
16,000		178,000	120,000



## Helisel matkap uçları, kısa



Malzeme HSCO

Yüzey S

Kesme yönü R

**P** • öz bileme  $\geq \varnothing 1,000$  • koni bileme • Co-alaşımlı HSS-çeliği • geniş kanallı  
• arttırılmış aşınma direnci • özellikle delik derinliği 3xD üstü için

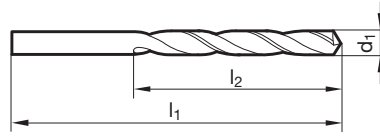
**M** ○**K** •**N** ○**S** ○**H** ○

alaşım ve alaşımsız çelikler • 800 N/mm<sup>2</sup> üzerindeki sert malzemeler  
• sıcak ve soğuk işlem çelikleri • rulman çeliği • yüksek alaşım çelikleri  
• ıslah çelikleri ve sementasyon çelikleri

## GÜHRINGNAVIGATOR

Kesme verileri sayfası 782

SİLİNDİR ŞAFTLI MATKAP UCU



Ürün no 658

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		34,000	12,000	2,300		53,000	27,000
1,020		34,000	12,000	2,350		53,000	27,000
1,050		34,000	12,000	2,370		57,000	30,000
1,070		36,000	14,000	2,380	3/32	57,000	30,000
1,100		36,000	14,000	2,400		57,000	30,000
1,130		36,000	14,000	2,440		57,000	30,000
1,150		36,000	14,000	2,450		57,000	30,000
1,190	3/64	38,000	16,000	2,490		57,000	30,000
1,200		38,000	16,000	2,500		57,000	30,000
1,300		38,000	16,000	2,530		57,000	30,000
1,320		38,000	16,000	2,550		57,000	30,000
1,350		40,000	18,000	2,580		57,000	30,000
1,400		40,000	18,000	2,600		57,000	30,000
1,430		40,000	18,000	2,640		57,000	30,000
1,450		40,000	18,000	2,650		57,000	30,000
1,500		40,000	18,000	2,700		61,000	33,000
1,510		43,000	20,000	2,750		61,000	33,000
1,550		43,000	20,000	2,780	7/64	61,000	33,000
1,590	1/16	43,000	20,000	2,790		61,000	33,000
1,600		43,000	20,000	2,800		61,000	33,000
1,610		43,000	20,000	2,820		61,000	33,000
1,630		43,000	20,000	2,870		61,000	33,000
1,650		43,000	20,000	2,900		61,000	33,000
1,700		43,000	20,000	2,950		61,000	33,000
1,780		46,000	22,000	3,000		61,000	33,000
1,800		46,000	22,000	3,050		65,000	36,000
1,850		46,000	22,000	3,100		65,000	36,000
1,900		46,000	22,000	3,170	1/8	65,000	36,000
1,930		49,000	24,000	3,200		65,000	36,000
1,950		49,000	24,000	3,250		65,000	36,000
1,980	5/64	49,000	24,000	3,260		65,000	36,000
1,990		49,000	24,000	3,300		65,000	36,000
2,000		49,000	24,000	3,400		70,000	39,000
2,050		49,000	24,000	3,450		70,000	39,000
2,060		49,000	24,000	3,500		70,000	39,000
2,080		49,000	24,000	3,570	9/64	70,000	39,000
2,100		49,000	24,000	3,600		70,000	39,000
2,150		53,000	27,000	3,660		70,000	39,000
2,180		53,000	27,000	3,700		70,000	39,000
2,200		53,000	27,000	3,750		70,000	39,000
2,250		53,000	27,000	3,800		75,000	43,000
2,260		53,000	27,000	3,860		75,000	43,000





d1		l1	l2
mm	inch	mm	mm
3,900		75,000	43,000
3,970	5/32	75,000	43,000
4,000		75,000	43,000
4,030		75,000	43,000
4,040		75,000	43,000
4,050		75,000	43,000
4,090		75,000	43,000
4,100		75,000	43,000
4,200		75,000	43,000
4,220		75,000	43,000
4,250		75,000	43,000
4,300		80,000	47,000
4,370	11/64	80,000	47,000
4,400		80,000	47,000
4,500		80,000	47,000
4,570		80,000	47,000
4,600		80,000	47,000
4,620		80,000	47,000
4,700		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,850		86,000	52,000
4,900		86,000	52,000
4,920		86,000	52,000
4,980		86,000	52,000
5,000		86,000	52,000
5,060		86,000	52,000
5,100		86,000	52,000
5,160	13/64	86,000	52,000
5,200		86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,500		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,610		93,000	57,000
5,700		93,000	57,000
5,790		93,000	57,000
5,800		93,000	57,000
5,850		93,000	57,000
5,900		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,100		101,000	63,000
6,150		101,000	63,000
6,200		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,530		101,000	63,000
6,600		101,000	63,000
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000

d1		l1	l2
mm	inch	mm	mm
7,300		109,000	69,000
7,400		109,000	69,000
7,500		109,000	69,000
7,600		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,400		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,750		125,000	81,000
8,800		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,500		133,000	87,000
10,720	27/64	142,000	94,000
10,800		142,000	94,000
11,000		142,000	94,000
11,110	7/16	142,000	94,000
11,200		142,000	94,000
11,500		142,000	94,000
11,700		142,000	94,000
11,800		142,000	94,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,500		151,000	101,000
12,800		151,000	101,000
13,000		151,000	101,000
13,500		160,000	108,000
13,800		160,000	108,000
14,000		160,000	108,000
14,500		169,000	114,000
15,000		169,000	114,000



## Helisel matkap uçları, kısa



**P** • öz bileme  $\geq \text{Ø } 1,000$  • koni bileme • Co-alaşımlı HSS-çeliği • geniş kanallı  
• arttırılmış aşınma direnci • özellikle delik derinliği 3xD üstü için

**M** ○

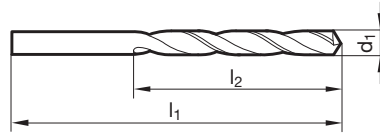
**K** •

**N** • alaşım ve alaşım dışı çelikler •  $800 \text{ N/mm}^2$  üzerindeki sert malzemeler  
**S** • sıcak ve soğuk işlem çelikleri • rulman çeliği • yüksek alaşım çelikleri  
• ıslah çelikleri ve sementasyon çelikleri

**H** ○

Malzeme **HSCO**Yüzey **F**Kesme yönü **R****GÜHRING**NAVIGATOR

Kesme verileri sayfası 782

Ürün no **2459**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		34,000	12,000	5,200		86,000	52,000
1,100		36,000	14,000	5,300		86,000	52,000
1,200		38,000	16,000	5,400		93,000	57,000
1,300		38,000	16,000	5,500		93,000	57,000
1,400		40,000	18,000	5,600		93,000	57,000
1,500		40,000	18,000	5,700		93,000	57,000
1,600		43,000	20,000	5,800		93,000	57,000
1,700		43,000	20,000	5,900		93,000	57,000
1,800		46,000	22,000	6,000		93,000	57,000
1,900		46,000	22,000	6,100		101,000	63,000
2,000		49,000	24,000	6,200		101,000	63,000
2,100		49,000	24,000	6,300		101,000	63,000
2,200		53,000	27,000	6,400		101,000	63,000
2,300		53,000	27,000	6,500		101,000	63,000
2,400		57,000	30,000	6,600		101,000	63,000
2,500		57,000	30,000	6,700		101,000	63,000
2,600		57,000	30,000	6,800		109,000	69,000
2,700		61,000	33,000	6,900		109,000	69,000
2,800		61,000	33,000	7,000		109,000	69,000
2,900		61,000	33,000	7,100		109,000	69,000
3,000		61,000	33,000	7,300		109,000	69,000
3,100		65,000	36,000	7,400		109,000	69,000
3,200		65,000	36,000	7,500		109,000	69,000
3,300		65,000	36,000	7,700		117,000	75,000
3,400		70,000	39,000	7,800		117,000	75,000
3,500		70,000	39,000	7,900		117,000	75,000
3,600		70,000	39,000	8,000		117,000	75,000
3,700		70,000	39,000	8,100		117,000	75,000
3,800		75,000	43,000	8,200		117,000	75,000
3,900		75,000	43,000	8,300		117,000	75,000
4,000		75,000	43,000	8,400		117,000	75,000
4,100		75,000	43,000	8,500		117,000	75,000
4,200		75,000	43,000	8,600		125,000	81,000
4,300		80,000	47,000	8,700		125,000	81,000
4,400		80,000	47,000	8,800		125,000	81,000
4,500		80,000	47,000	9,000		125,000	81,000
4,600		80,000	47,000	9,200		125,000	81,000
4,700		80,000	47,000	9,400		125,000	81,000
4,800		86,000	52,000	9,500		125,000	81,000
4,900		86,000	52,000	9,700		133,000	87,000
5,000		86,000	52,000	9,800		133,000	87,000
5,100		86,000	52,000	9,900		133,000	87,000

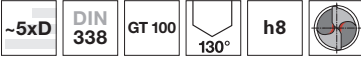


d1		l1	l2
mm	inch	mm	mm
10,000		133,000	87,000
10,200		133,000	87,000
10,300		133,000	87,000
10,400		133,000	87,000
10,500		133,000	87,000
11,000		142,000	94,000

d1		l1	l2
mm	inch	mm	mm
11,500		142,000	94,000
12,000		151,000	101,000
13,000		151,000	101,000
14,000		160,000	108,000



## Helisel matkap uçları, kısa



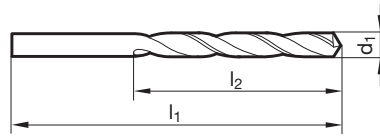
**P** • öz bileme  $\geq \varnothing 3,000$  • koni bileme • Co-alaşımlı HSS-çeliği • geniş kanallı  
• arttırılmış aşınma direnci • özellikle delik derinliği 3xD üstü için

**M****K****N****S****H**

alaşım ve alaşımsız çelikler • 800 N/mm<sup>2</sup> üzerindeki sert malzemeler  
• sıcak ve soğuk işlem çelikleri • rulman çeliği • yüksek alaşım çelikleri  
• ıslah çelikleri ve sementasyon çelikleri

Malzeme **HSC0**Yüzey **G**Kesme yönü **R****GÜHRINGNAVIGATOR**

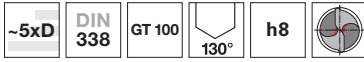
Kesme verileri sayfası 782

Ürün no **1221**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
3,000		61,000	33,000	6,350	1/4	101,000	63,000
3,050		65,000	36,000	6,400		101,000	63,000
3,100		65,000	36,000	6,600		101,000	63,000
3,170	1/8	65,000	36,000	6,700		101,000	63,000
3,200		65,000	36,000	6,800		109,000	69,000
3,300		65,000	36,000	6,900		109,000	69,000
3,400		70,000	39,000	7,000		109,000	69,000
3,450		70,000	39,000	7,100		109,000	69,000
3,500		70,000	39,000	7,400		109,000	69,000
3,570	9/64	70,000	39,000	7,800		117,000	75,000
3,600		70,000	39,000	7,900		117,000	75,000
3,660		70,000	39,000	8,000		117,000	75,000
3,700		70,000	39,000	8,200		117,000	75,000
3,750		70,000	39,000	8,300		117,000	75,000
3,800		75,000	43,000	8,400		117,000	75,000
3,900		75,000	43,000	8,500		117,000	75,000
3,970	5/32	75,000	43,000	8,600		125,000	81,000
4,000		75,000	43,000	8,700		125,000	81,000
4,050		75,000	43,000	8,900		125,000	81,000
4,100		75,000	43,000	9,000		125,000	81,000
4,200		75,000	43,000	9,130	23/64	125,000	81,000
4,300		80,000	47,000	9,500		125,000	81,000
4,370	11/64	80,000	47,000	9,520	3/8	133,000	87,000
4,500		80,000	47,000	9,900		133,000	87,000
4,700		80,000	47,000	9,920	25/64	133,000	87,000
4,760	3/16	86,000	52,000	10,000		133,000	87,000
4,800		86,000	52,000	10,100		133,000	87,000
4,900		86,000	52,000	10,200		133,000	87,000
4,920		86,000	52,000	10,400		133,000	87,000
4,980		86,000	52,000	10,700		142,000	94,000
5,000		86,000	52,000	11,200		142,000	94,000
5,100		86,000	52,000	11,910	15/32	151,000	101,000
5,200		86,000	52,000				
5,400		93,000	57,000				
5,500		93,000	57,000				
5,560	7/32	93,000	57,000				
5,700		93,000	57,000				
5,900		93,000	57,000				
6,000		93,000	57,000				
6,100		101,000	63,000				
6,200		101,000	63,000				
6,300		101,000	63,000				



## Helisel matkap uçları, kısa

Malzeme **HSCO**Yüzey **A**Kesme yönü **R**

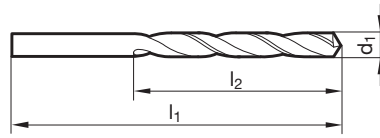
**P** öz bileme  $\geq \varnothing 3,000$  • koni bileme • Co-alaşımlı HSS-çeliği • geniş kanallı  
• arttırılmış aşınma direnci • özellikle delik derinliği 3xD üstü için

**M****K****N****S****H**

**N** alaşım ve alaşım dışı çelikler • 800 N/mm<sup>2</sup> üzerindeki sert malzemeler  
• sıcak ve soğuk işlem çelikleri • rulman çeliği • yüksek alaşım çelikleri  
• ıslah çelikleri ve sementasyon çelikleri

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 782

Ürün no **1223**SİLİNDİR ŞAFTLI MATKAP  
UCU

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
3,000		61,000	33,000	6,300		101,000	63,000
3,050		65,000	36,000	6,350	1/4	101,000	63,000
3,100		65,000	36,000	6,400		101,000	63,000
3,170	1/8	65,000	36,000	6,500		101,000	63,000
3,200		65,000	36,000	6,600		101,000	63,000
3,300		65,000	36,000	6,700		101,000	63,000
3,500		70,000	39,000	6,900		109,000	69,000
3,600		70,000	39,000	7,000		109,000	69,000
3,700		70,000	39,000	7,100		109,000	69,000
3,800		75,000	43,000	7,200		109,000	69,000
3,860		75,000	43,000	7,300		109,000	69,000
3,900		75,000	43,000	7,400		109,000	69,000
3,970	5/32	75,000	43,000	7,500		109,000	69,000
4,000		75,000	43,000	7,600		117,000	75,000
4,040		75,000	43,000	7,700		117,000	75,000
4,100		75,000	43,000	7,800		117,000	75,000
4,200		75,000	43,000	7,900		117,000	75,000
4,300		80,000	47,000	7,940	5/16	117,000	75,000
4,370	11/64	80,000	47,000	8,000		117,000	75,000
4,400		80,000	47,000	8,100		117,000	75,000
4,500		80,000	47,000	8,200		117,000	75,000
4,600		80,000	47,000	8,300		117,000	75,000
4,700		80,000	47,000	8,400		117,000	75,000
4,760	3/16	86,000	52,000	8,500		117,000	75,000
4,800		86,000	52,000	8,600		125,000	81,000
4,900		86,000	52,000	8,700		125,000	81,000
4,920		86,000	52,000	8,730	11/32	125,000	81,000
4,980		86,000	52,000	8,800		125,000	81,000
5,000		86,000	52,000	9,000		125,000	81,000
5,100		86,000	52,000	9,130	23/64	125,000	81,000
5,160	13/64	86,000	52,000	9,200		125,000	81,000
5,200		86,000	52,000	9,500		125,000	81,000
5,300		86,000	52,000	9,520	3/8	133,000	87,000
5,400		93,000	57,000	9,530		133,000	87,000
5,500		93,000	57,000	9,800		133,000	87,000
5,600		93,000	57,000	9,900		133,000	87,000
5,700		93,000	57,000	9,920	25/64	133,000	87,000
5,800		93,000	57,000	10,000		133,000	87,000
5,900		93,000	57,000	10,100		133,000	87,000
5,950	15/64	93,000	57,000	10,200		133,000	87,000
6,000		93,000	57,000	10,300		133,000	87,000
6,100		101,000	63,000	10,400		133,000	87,000

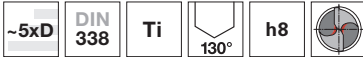


d1		l1	l2
mm	inch	mm	mm
10,500		133,000	87,000
10,700		142,000	94,000
10,720	27/64	142,000	94,000
10,800		142,000	94,000
11,000		142,000	94,000
11,110	7/16	142,000	94,000

d1		l1	l2
mm	inch	mm	mm
11,200		142,000	94,000
11,500		142,000	94,000
11,700		142,000	94,000
12,000		151,000	101,000



## Helisel matkap uçları, kısa



<b>P</b>	o	öz bileme $\geq \varnothing 0,970$ • koni bileme • Co-alaşımlı HSS-çeliği • arttırılmış aşınma direnci
<b>M</b>	•	
<b>K</b>		
<b>N</b>		Titanyum ve Ti alaşımları • pas/aşide/ısıya dayanıklı ostenitik çelikler
<b>S</b>	•	• 900 N/mm <sup>2</sup> üstü yüksek mukavemetli, kısa talaşlı çelikler • Hastelloy, Inconel, Nimonic
<b>H</b>		

## GÜHRING NAVIGATOR

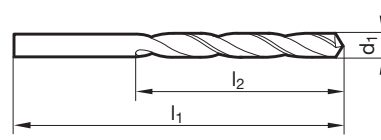
Kesme verileri sayfası 780

Malzeme HSC0

Yüzey



Kesme yönü



Ürün no 605

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,200		19,000	2,500	1,040		34,000	12,000
0,300		19,000	3,000	1,050		34,000	12,000
0,380		19,000	4,000	1,070		36,000	14,000
0,400	1/64	20,000	5,000	1,080		36,000	14,000
0,440		20,000	5,000	1,090		36,000	14,000
0,450		20,000	5,000	1,100		36,000	14,000
0,500		22,000	6,000	1,140		36,000	14,000
0,510		22,000	6,000	1,150		36,000	14,000
0,530		22,000	6,000	1,160		36,000	14,000
0,550		24,000	7,000	1,180		36,000	14,000
0,570		24,000	7,000	1,190	3/64	38,000	16,000
0,580		24,000	7,000	1,200		38,000	16,000
0,600		24,000	7,000	1,210		38,000	16,000
0,610		26,000	8,000	1,220		38,000	16,000
0,640		26,000	8,000	1,230		38,000	16,000
0,650		26,000	8,000	1,250		38,000	16,000
0,700		28,000	9,000	1,290		38,000	16,000
0,710		28,000	9,000	1,300		38,000	16,000
0,720		28,000	9,000	1,320		38,000	16,000
0,750		28,000	9,000	1,350		40,000	18,000
0,760		30,000	10,000	1,400		40,000	18,000
0,790	1/32	30,000	10,000	1,450		40,000	18,000
0,800		30,000	10,000	1,460		40,000	18,000
0,810		30,000	10,000	1,500		40,000	18,000
0,820		30,000	10,000	1,510		43,000	20,000
0,830		30,000	10,000	1,520		43,000	20,000
0,840		30,000	10,000	1,530		43,000	20,000
0,850		30,000	10,000	1,550		43,000	20,000
0,860		32,000	11,000	1,570		43,000	20,000
0,870		32,000	11,000	1,590	1/16	43,000	20,000
0,880		32,000	11,000	1,600		43,000	20,000
0,887		32,000	11,000	1,610		43,000	20,000
0,890		32,000	11,000	1,620		43,000	20,000
0,900		32,000	11,000	1,650		43,000	20,000
0,910		32,000	11,000	1,680		43,000	20,000
0,920		32,000	11,000	1,700		43,000	20,000
0,940		32,000	11,000	1,730		46,000	22,000
0,950		32,000	11,000	1,750		46,000	22,000
0,980		34,000	12,000	1,780		46,000	22,000
0,990		34,000	12,000	1,800		46,000	22,000
1,000		34,000	12,000	1,820		46,000	22,000
1,020		34,000	12,000	1,850		46,000	22,000



d1		l1	l2
mm	inch	mm	mm
1,900		46,000	22,000
1,930		49,000	24,000
1,950		49,000	24,000
1,970		49,000	24,000
1,980	5/64	49,000	24,000
1,990		49,000	24,000
2,000		49,000	24,000
2,020		49,000	24,000
2,030		49,000	24,000
2,050		49,000	24,000
2,080		49,000	24,000
2,100		49,000	24,000
2,120		49,000	24,000
2,150		53,000	27,000
2,180		53,000	27,000
2,200		53,000	27,000
2,250		53,000	27,000
2,260		53,000	27,000
2,300		53,000	27,000
2,320		53,000	27,000
2,350		53,000	27,000
2,370		57,000	30,000
2,380	3/32	57,000	30,000
2,400		57,000	30,000
2,450		57,000	30,000
2,490		57,000	30,000
2,500		57,000	30,000
2,530		57,000	30,000
2,550		57,000	30,000
2,600		57,000	30,000
2,650		57,000	30,000
2,700		61,000	33,000
2,710		61,000	33,000
2,750		61,000	33,000
2,780	7/64	61,000	33,000
2,790		61,000	33,000
2,800		61,000	33,000
2,810		61,000	33,000
2,820		61,000	33,000
2,850		61,000	33,000
2,870		61,000	33,000
2,900		61,000	33,000
2,950		61,000	33,000
3,000		61,000	33,000
3,030		65,000	36,000
3,050		65,000	36,000
3,100		65,000	36,000
3,150		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,250		65,000	36,000
3,260		65,000	36,000
3,300		65,000	36,000
3,350		65,000	36,000
3,400		70,000	39,000
3,450		70,000	39,000
3,500		70,000	39,000
3,550		70,000	39,000
3,570	9/64	70,000	39,000
3,600		70,000	39,000
3,650		70,000	39,000
3,700		70,000	39,000
3,750		70,000	39,000
3,790		75,000	43,000
3,800		75,000	43,000
3,900		75,000	43,000
3,950		75,000	43,000
3,970	5/32	75,000	43,000
3,980		75,000	43,000
4,000		75,000	43,000
4,040		75,000	43,000
4,050		75,000	43,000

d1		l1	l2
mm	inch	mm	mm
4,100		75,000	43,000
4,150		75,000	43,000
4,200		75,000	43,000
4,220		75,000	43,000
4,250		75,000	43,000
4,300		80,000	47,000
4,350		80,000	47,000
4,370	11/64	80,000	47,000
4,400		80,000	47,000
4,450		80,000	47,000
4,500		80,000	47,000
4,570		80,000	47,000
4,600		80,000	47,000
4,650		80,000	47,000
4,700		80,000	47,000
4,750		80,000	47,000
4,760	3/16	86,000	52,000
4,790		86,000	52,000
4,800		86,000	52,000
4,850		86,000	52,000
4,900		86,000	52,000
5,000		86,000	52,000
5,050		86,000	52,000
5,100		86,000	52,000
5,110		86,000	52,000
5,160	13/64	86,000	52,000
5,200		86,000	52,000
5,250		86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,410		93,000	57,000
5,500		93,000	57,000
5,550		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,610		93,000	57,000
5,700		93,000	57,000
5,750		93,000	57,000
5,800		93,000	57,000
5,900		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,050		101,000	63,000
6,080		101,000	63,000
6,100		101,000	63,000
6,200		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,600		101,000	63,000
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000
7,300		109,000	69,000
7,400		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000
7,600		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000



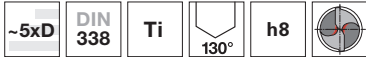


d1		l1	l2
mm	inch	mm	mm
8,330	21/64	117,000	75,000
8,400		117,000	75,000
8,500		117,000	75,000
8,550		125,000	81,000
8,600		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,800		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,400		133,000	87,000
10,500		133,000	87,000
10,600		133,000	87,000
10,700		142,000	94,000
10,720	27/64	142,000	94,000
10,800		142,000	94,000
11,000		142,000	94,000
11,100		142,000	94,000
11,110	7/16	142,000	94,000

d1		l1	l2
mm	inch	mm	mm
11,200		142,000	94,000
11,300		142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,600		142,000	94,000
11,700		142,000	94,000
11,750		142,000	94,000
11,800		142,000	94,000
11,900		151,000	101,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,100		151,000	101,000
12,200		151,000	101,000
12,300	31/64	151,000	101,000
12,500		151,000	101,000
12,700	1/2	151,000	101,000
12,800		151,000	101,000
13,000		151,000	101,000
13,100	33/64	151,000	101,000
13,500		160,000	108,000
13,800		160,000	108,000
13,890	35/64	160,000	108,000
13,970		160,000	108,000
14,000		160,000	108,000
14,290	9/16	169,000	114,000
14,500		169,000	114,000
14,680	37/64	169,000	114,000
15,000		169,000	114,000
15,500		178,000	120,000
16,000		178,000	120,000
16,500		184,000	125,000
17,000		184,000	125,000
17,500		191,000	130,000
18,000		191,000	130,000
19,000		198,000	135,000



## Helisel matkap uçları, kısa



<b>P</b>	○	öz bileme $\geq \varnothing 1,000$ • koni bileme • Co-alaşimli HSS-çeliği • arttırılmış aşınma direnci
<b>M</b>	●	
<b>K</b>	●	
<b>N</b>	●	Titanyum ve Ti alaşımları • pas/aşide/ısıya dayanıklı ostenitik çelikler
<b>S</b>	●	• 900 N/mm <sup>2</sup> üstü yüksek mukavemetli, kısa talaşlı çelikler • Hastelloy, Inconel, Nimonic
<b>H</b>	●	

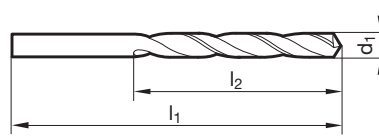
## GÜHRING NAVIGATOR

Kesme verileri sayfası 782

Malzeme HSCO

Yüzey S

Kesme yönü R



Ürün no 657

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,500		22,000	6,000	1,900		46,000	22,000
0,530		22,000	6,000	1,950		49,000	24,000
0,600		24,000	7,000	1,980	5/64	49,000	24,000
0,650		26,000	8,000	2,000		49,000	24,000
0,700		28,000	9,000	2,050		49,000	24,000
0,750		28,000	9,000	2,100		49,000	24,000
0,800		30,000	10,000	2,150		53,000	27,000
0,850		30,000	10,000	2,200		53,000	27,000
0,880		32,000	11,000	2,250		53,000	27,000
0,900		32,000	11,000	2,260		53,000	27,000
0,920		32,000	11,000	2,300		53,000	27,000
0,940		32,000	11,000	2,350		53,000	27,000
0,950		32,000	11,000	2,380	3/32	57,000	30,000
1,000		34,000	12,000	2,400		57,000	30,000
1,050		34,000	12,000	2,440		57,000	30,000
1,100		36,000	14,000	2,500		57,000	30,000
1,150		36,000	14,000	2,530		57,000	30,000
1,180		36,000	14,000	2,550		57,000	30,000
1,190	3/64	38,000	16,000	2,600		57,000	30,000
1,200		38,000	16,000	2,700		61,000	33,000
1,210		38,000	16,000	2,750		61,000	33,000
1,250		38,000	16,000	2,780	7/64	61,000	33,000
1,300		38,000	16,000	2,800		61,000	33,000
1,320		38,000	16,000	2,820		61,000	33,000
1,350		40,000	18,000	2,900		61,000	33,000
1,390		40,000	18,000	2,950		61,000	33,000
1,400		40,000	18,000	3,000		61,000	33,000
1,450		40,000	18,000	3,050		65,000	36,000
1,500		40,000	18,000	3,100		65,000	36,000
1,510		43,000	20,000	3,150		65,000	36,000
1,520		43,000	20,000	3,170	1/8	65,000	36,000
1,550		43,000	20,000	3,200		65,000	36,000
1,590	1/16	43,000	20,000	3,250		65,000	36,000
1,600		43,000	20,000	3,260		65,000	36,000
1,610		43,000	20,000	3,300		65,000	36,000
1,620		43,000	20,000	3,350		65,000	36,000
1,650		43,000	20,000	3,400		70,000	39,000
1,700		43,000	20,000	3,500		70,000	39,000
1,750		46,000	22,000	3,570	9/64	70,000	39,000
1,780		46,000	22,000	3,600		70,000	39,000
1,800		46,000	22,000	3,650		70,000	39,000
1,850		46,000	22,000	3,700		70,000	39,000

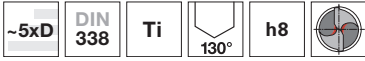


d1		l1	l2
mm	inch	mm	mm
3,750		70,000	39,000
3,800		75,000	43,000
3,900		75,000	43,000
3,970	5/32	75,000	43,000
4,000		75,000	43,000
4,050		75,000	43,000
4,100		75,000	43,000
4,200		75,000	43,000
4,250		75,000	43,000
4,300		80,000	47,000
4,350		80,000	47,000
4,370	11/64	80,000	47,000
4,400		80,000	47,000
4,500		80,000	47,000
4,600		80,000	47,000
4,700		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,900		86,000	52,000
5,000		86,000	52,000
5,050		86,000	52,000
5,100		86,000	52,000
5,110		86,000	52,000
5,160	13/64	86,000	52,000
5,200		86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,500		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,610		93,000	57,000
5,700		93,000	57,000
5,800		93,000	57,000
5,900		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,100		101,000	63,000
6,200		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,600		101,000	63,000
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000
7,300		109,000	69,000
7,400		109,000	69,000
7,500		109,000	69,000

d1		l1	l2
mm	inch	mm	mm
7,540	19/64	117,000	75,000
7,600		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,400		117,000	75,000
8,500		117,000	75,000
8,550		125,000	81,000
8,600		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,800		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,100		125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
10,000		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,400		133,000	87,000
10,500		133,000	87,000
10,800		142,000	94,000
11,000		142,000	94,000
11,110	7/16	142,000	94,000
11,200		142,000	94,000
11,500		142,000	94,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,100		151,000	101,000
12,300	31/64	151,000	101,000
12,500		151,000	101,000
12,700	1/2	151,000	101,000
13,000		151,000	101,000
13,500		160,000	108,000
14,000		160,000	108,000
14,500		169,000	114,000



## Helisel matkap uçları, kısa



**P** ○ öz bileme  $\geq \varnothing 1,000$  • koni bileme • Co-alaşımlı HSS-çeliği • arttırılmış aşınma direnci

**M** ●

**K** ●

**N** ● Titanyum ve Ti alaşımları • pas/aSIDE/ısıya dayanıklı ostenitik çelikler  
**S** ● 900 N/mm<sup>2</sup> üstü yüksek mukavemetli, kısa talaşlı çelikler • Hastelloy, Inconel, Nimonic

**H** ●

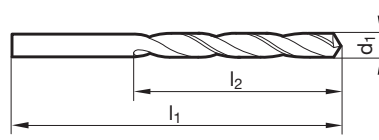
## GÜHRING NAVIGATOR

Kesme verileri sayfası 782

Malzeme HSC0

Yüzey F

Kesme yönü R



Ürün no 2458

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,400	1/64	20,000	5,000	3,800		75,000	43,000
0,810		30,000	10,000	3,900		75,000	43,000
1,000		34,000	12,000	3,970	5/32	75,000	43,000
1,100		36,000	14,000	4,000		75,000	43,000
1,190	3/64	38,000	16,000	4,100		75,000	43,000
1,200		38,000	16,000	4,150		75,000	43,000
1,300		38,000	16,000	4,200		75,000	43,000
1,400		40,000	18,000	4,220		75,000	43,000
1,500		40,000	18,000	4,300		80,000	47,000
1,530		43,000	20,000	4,370	11/64	80,000	47,000
1,590	1/16	43,000	20,000	4,400		80,000	47,000
1,600		43,000	20,000	4,500		80,000	47,000
1,650		43,000	20,000	4,600		80,000	47,000
1,700		43,000	20,000	4,700		80,000	47,000
1,800		46,000	22,000	4,760	3/16	86,000	52,000
1,900		46,000	22,000	4,800		86,000	52,000
1,980	5/64	49,000	24,000	4,900		86,000	52,000
2,000		49,000	24,000	5,000		86,000	52,000
2,050		49,000	24,000	5,050		86,000	52,000
2,100		49,000	24,000	5,100		86,000	52,000
2,200		53,000	27,000	5,160	13/64	86,000	52,000
2,300		53,000	27,000	5,200		86,000	52,000
2,370		57,000	30,000	5,300		86,000	52,000
2,380	3/32	57,000	30,000	5,400		93,000	57,000
2,400		57,000	30,000	5,500		93,000	57,000
2,500		57,000	30,000	5,560	7/32	93,000	57,000
2,600		57,000	30,000	5,600		93,000	57,000
2,700		61,000	33,000	5,700		93,000	57,000
2,750		61,000	33,000	5,800		93,000	57,000
2,780	7/64	61,000	33,000	5,900		93,000	57,000
2,800		61,000	33,000	5,950	15/64	93,000	57,000
2,900		61,000	33,000	6,000		93,000	57,000
3,000		61,000	33,000	6,100		101,000	63,000
3,100		65,000	36,000	6,200		101,000	63,000
3,170	1/8	65,000	36,000	6,300		101,000	63,000
3,200		65,000	36,000	6,350	1/4	101,000	63,000
3,300		65,000	36,000	6,400		101,000	63,000
3,400		70,000	39,000	6,500		101,000	63,000
3,500		70,000	39,000	6,600		101,000	63,000
3,570	9/64	70,000	39,000	6,700		101,000	63,000
3,600		70,000	39,000	6,750	17/64	109,000	69,000
3,700		70,000	39,000	6,800		109,000	69,000

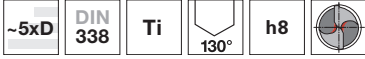


d1		l1	l2
mm	inch	mm	mm
6,900		109,000	69,000
7,000		109,000	69,000
7,140	9/32	109,000	69,000
7,400		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000
7,600		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,330	21/64	117,000	75,000
8,400		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,800		125,000	81,000
9,000		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000

d1		l1	l2
mm	inch	mm	mm
9,800		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,400		133,000	87,000
10,500		133,000	87,000
10,720	27/64	142,000	94,000
11,000		142,000	94,000
11,110	7/16	142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,300	31/64	151,000	101,000
12,500		151,000	101,000
12,700	1/2	151,000	101,000
13,000		151,000	101,000
13,100	33/64	151,000	101,000
13,490	17/32	160,000	108,000
14,000		160,000	108,000
14,290	9/16	169,000	114,000
14,500		169,000	114,000
15,000		169,000	114,000



## Helisel matkap uçları, kısa



**P** ○ öz bileme  $\geq \varnothing 1,000$  • koni bileme • Co-alaşımlı HSS-çeliği • yüksek aşınma direnci

**M** ●

**K** ●

**N** ●

**S** ●

**H** ●

Titanyum ve Ti alaşımları • pas/aşide/ısıya dayanıklı ostenitik çelikler  
•  $900 \text{ N/mm}^2$  üstü yüksek mukavemetli, kısa talaşlı çelikler • Hastelloy, Inconel, Nimonic

Malzeme HSC0

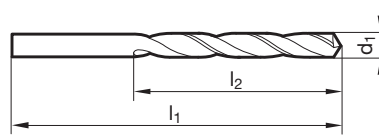
Yüzey ○

Kesme yönü Ⓛ

## GÜHRING NAVIGATOR

Kesme verileri sayfası 780

SİLİNDİR ŞAFTLI MATKAP UCU



Ürün no 608

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,300		38,000	16,000	4,920		86,000	52,000
1,320		38,000	16,000	5,000		86,000	52,000
1,350		40,000	18,000	5,200		86,000	52,000
1,400		40,000	18,000	5,400		93,000	57,000
1,600		43,000	20,000	5,450		93,000	57,000
1,620		43,000	20,000	5,580		93,000	57,000
1,640		43,000	20,000	5,600		93,000	57,000
1,700		43,000	20,000	5,700		93,000	57,000
1,800		46,000	22,000	5,800		93,000	57,000
1,900		46,000	22,000	5,900		93,000	57,000
1,950		49,000	24,000	6,000		93,000	57,000
2,000		49,000	24,000	6,300		101,000	63,000
2,150		53,000	27,000	6,600		101,000	63,000
2,400		57,000	30,000	6,900		109,000	69,000
2,500		57,000	30,000	7,000		109,000	69,000
2,600		57,000	30,000	7,100		109,000	69,000
2,750		61,000	33,000	7,300		109,000	69,000
2,800		61,000	33,000	7,400		109,000	69,000
3,000		61,000	33,000	7,500		109,000	69,000
3,300		65,000	36,000	7,600		117,000	75,000
3,320		65,000	36,000	7,700		117,000	75,000
3,400		70,000	39,000	7,800		117,000	75,000
3,500		70,000	39,000	7,900		117,000	75,000
3,550		70,000	39,000	8,100		117,000	75,000
3,600		70,000	39,000	8,400		117,000	75,000
3,650		70,000	39,000	8,750		125,000	81,000
3,700		70,000	39,000	8,800		125,000	81,000
3,900		75,000	43,000	9,100		125,000	81,000
4,000		75,000	43,000	9,200		125,000	81,000
4,250		75,000	43,000	9,300		125,000	81,000
4,300		80,000	47,000	9,500		125,000	81,000
4,400		80,000	47,000				
4,500		80,000	47,000				
4,700		80,000	47,000				
4,800		86,000	52,000				
4,900		86,000	52,000				



## Helisel matkap uçları, kısa

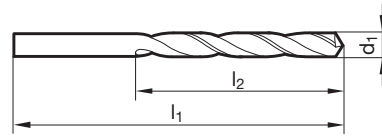


P	○	koni bileme • Co-alışimli HSS-çeliği • arttırılmış aşınma direnci
M	●	
K	●	
N	○	pasas/aside/ısıya dayanıklı ostenitik çelikler (V2A-ve-V4A)
S	○	
H	○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 780

Malzeme	HSCO
Yüzey	○
Kesme yönü	Ⓜ



Ürün no 1260

SİLİNDİR ŞAFTLI MATKAP UCU

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		34,000	12,000	5,100		86,000	52,000
1,100		36,000	14,000	5,200		86,000	52,000
1,200		38,000	16,000	5,300		86,000	52,000
1,300		38,000	16,000	5,400		93,000	57,000
1,400		40,000	18,000	5,500		93,000	57,000
1,500		40,000	18,000	5,600		93,000	57,000
1,600		43,000	20,000	5,700		93,000	57,000
1,700		43,000	20,000	5,800		93,000	57,000
1,800		46,000	22,000	5,900		93,000	57,000
1,900		46,000	22,000	6,000		93,000	57,000
2,000		49,000	24,000	6,100		101,000	63,000
2,100		49,000	24,000	6,200		101,000	63,000
2,200		53,000	27,000	6,300		101,000	63,000
2,300		53,000	27,000	6,400		101,000	63,000
2,400		57,000	30,000	6,500		101,000	63,000
2,500		57,000	30,000	6,600		101,000	63,000
2,600		57,000	30,000	6,700		101,000	63,000
2,700		61,000	33,000	6,800		109,000	69,000
2,800		61,000	33,000	6,900		109,000	69,000
2,900		61,000	33,000	7,000		109,000	69,000
3,000		61,000	33,000	7,100		109,000	69,000
3,100		65,000	36,000	7,200		109,000	69,000
3,200		65,000	36,000	7,300		109,000	69,000
3,300		65,000	36,000	7,400		109,000	69,000
3,400		70,000	39,000	7,500		109,000	69,000
3,500		70,000	39,000	7,700		117,000	75,000
3,570	9/64	70,000	39,000	7,800		117,000	75,000
3,600		70,000	39,000	7,900		117,000	75,000
3,700		70,000	39,000	8,000		117,000	75,000
3,800		75,000	43,000	8,100		117,000	75,000
3,900		75,000	43,000	8,200		117,000	75,000
4,000		75,000	43,000	8,300		117,000	75,000
4,100		75,000	43,000	8,400		117,000	75,000
4,200		75,000	43,000	8,500		117,000	75,000
4,300		80,000	47,000	8,600		125,000	81,000
4,400		80,000	47,000	8,700		125,000	81,000
4,500		80,000	47,000	8,800		125,000	81,000
4,600		80,000	47,000	8,900		125,000	81,000
4,700		80,000	47,000	9,000		125,000	81,000
4,800		86,000	52,000	9,100		125,000	81,000
4,900		86,000	52,000	9,200		125,000	81,000
5,000		86,000	52,000	9,400		125,000	81,000



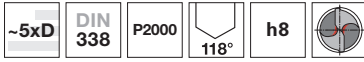
d1		l1	l2
mm	inch	mm	mm
9,500		125,000	81,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,300		133,000	87,000
10,500		133,000	87,000
10,600		133,000	87,000
10,800		142,000	94,000

d1		l1	l2
mm	inch	mm	mm
11,000		142,000	94,000
11,200		142,000	94,000
11,500		142,000	94,000
11,800		142,000	94,000
11,900		151,000	101,000
12,000		151,000	101,000
12,500		151,000	101,000
13,000		151,000	101,000





## Helisel matkap uçları, kısa

Malzeme **HSCO**

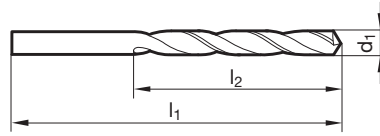
Yüzey

Kesme yönü

**P** • öz bileme  $\geq \varnothing 1,000$  • koni bileme • dalgalı bilemede üniversal uygulama  
• Co-alaşimli HSS-çelığı • artırılmış aşınma direnci

**M** ○**K** ○**N** ○1000 N/mm<sup>2</sup> üzerindeki Çelikler • AISi-alaşimleri**S** ○**H** ○**GÜHRING** NAVIGATOR

Kesme verileri sayfası 784

Ürün no **2047**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		34,000	12,000	5,200		86,000	52,000
1,100		36,000	14,000	5,300		86,000	52,000
1,200		38,000	16,000	5,400		93,000	57,000
1,300		38,000	16,000	5,500		93,000	57,000
1,400		40,000	18,000	5,600		93,000	57,000
1,500		40,000	18,000	5,700		93,000	57,000
1,600		43,000	20,000	5,800		93,000	57,000
1,700		43,000	20,000	5,900		93,000	57,000
1,800		46,000	22,000	6,000		93,000	57,000
1,900		46,000	22,000	6,100		101,000	63,000
2,000		49,000	24,000	6,200		101,000	63,000
2,100		49,000	24,000	6,300		101,000	63,000
2,200		53,000	27,000	6,400		101,000	63,000
2,300		53,000	27,000	6,500		101,000	63,000
2,400		57,000	30,000	6,600		101,000	63,000
2,500		57,000	30,000	6,700		101,000	63,000
2,600		57,000	30,000	6,800		109,000	69,000
2,700		61,000	33,000	6,900		109,000	69,000
2,800		61,000	33,000	7,000		109,000	69,000
2,900		61,000	33,000	7,100		109,000	69,000
3,000		61,000	33,000	7,200		109,000	69,000
3,100		65,000	36,000	7,300		109,000	69,000
3,200		65,000	36,000	7,400		109,000	69,000
3,300		65,000	36,000	7,500		109,000	69,000
3,400		70,000	39,000	7,600		117,000	75,000
3,500		70,000	39,000	7,700		117,000	75,000
3,600		70,000	39,000	7,800		117,000	75,000
3,700		70,000	39,000	7,900		117,000	75,000
3,800		75,000	43,000	8,000		117,000	75,000
3,900		75,000	43,000	8,100		117,000	75,000
4,000		75,000	43,000	8,200		117,000	75,000
4,100		75,000	43,000	8,300		117,000	75,000
4,200		75,000	43,000	8,400		117,000	75,000
4,300		80,000	47,000	8,500		117,000	75,000
4,400		80,000	47,000	8,600		125,000	81,000
4,500		80,000	47,000	8,700		125,000	81,000
4,600		80,000	47,000	8,800		125,000	81,000
4,700		80,000	47,000	8,900		125,000	81,000
4,800		86,000	52,000	9,000		125,000	81,000
4,900		86,000	52,000	9,100		125,000	81,000
5,000		86,000	52,000	9,200		125,000	81,000
5,100		86,000	52,000	9,300		125,000	81,000

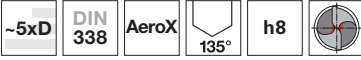


d1		l1	l2
mm	inch	mm	mm
9,400		125,000	81,000
9,500		125,000	81,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
10,000		133,000	87,000
10,200		133,000	87,000
10,500		133,000	87,000
11,000		142,000	94,000
11,500		142,000	94,000
12,000		151,000	101,000

d1		l1	l2
mm	inch	mm	mm
12,500		151,000	101,000
13,000		151,000	101,000



## Aerox Matkaplar



P	•	öz bileme $\geq \varnothing 1,000$ • optimize edilmiş Form B matkaplar • uzun takım ömrü için %8 cobalt alaşımlı HSCO yüksek hız çelikleri ile yüksek ısı dayanımı ve sertlik
M	•	
K	•	
N	•	alaşimsız ve yüksek alaşımlı çelikler • döküm malzemeler • demir dışı metaller • Titanyum ve Ti alaşımları
S	•	
H	○	

Malzeme **M42**

Yüzey

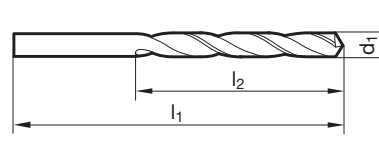
Kesme yönü



SİLİNDİR ŞAFTLI MATKAP UCU

## GÜHRING NAVIGATOR

Kesme verileri sayfası 784

Ürün no **1018**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		34,000	12,000	4,400		80,000	47,000
1,100		36,000	14,000	4,500		80,000	47,000
1,200		38,000	16,000	4,600		80,000	47,000
1,300		38,000	16,000	4,700		80,000	47,000
1,400		40,000	18,000	4,760	3/16	86,000	52,000
1,500		40,000	18,000	4,800		86,000	52,000
1,590	1/16	43,000	20,000	4,900		86,000	52,000
1,600		43,000	20,000	5,000		86,000	52,000
1,700		43,000	20,000	5,100		86,000	52,000
1,800		46,000	22,000	5,160	13/64	86,000	52,000
1,900		46,000	22,000	5,200		86,000	52,000
1,980	5/64	49,000	24,000	5,300		86,000	52,000
2,000		49,000	24,000	5,400		93,000	57,000
2,100		49,000	24,000	5,500		93,000	57,000
2,200		53,000	27,000	5,560	7/32	93,000	57,000
2,300		53,000	27,000	5,600		93,000	57,000
2,380	3/32	57,000	30,000	5,700		93,000	57,000
2,400		57,000	30,000	5,800		93,000	57,000
2,500		57,000	30,000	5,900		93,000	57,000
2,600		57,000	30,000	5,950	15/64	93,000	57,000
2,700		61,000	33,000	6,000		93,000	57,000
2,780	7/64	61,000	33,000	6,100		101,000	63,000
2,800		61,000	33,000	6,200		101,000	63,000
2,900		61,000	33,000	6,300		101,000	63,000
3,000		61,000	33,000	6,350	1/4	101,000	63,000
3,100		65,000	36,000	6,400		101,000	63,000
3,170	1/8	65,000	36,000	6,500		101,000	63,000
3,200		65,000	36,000	6,600		101,000	63,000
3,250		65,000	36,000	6,700		101,000	63,000
3,300		65,000	36,000	6,800		109,000	69,000
3,400		70,000	39,000	6,900		109,000	69,000
3,500		70,000	39,000	7,000		109,000	69,000
3,570	9/64	70,000	39,000	7,100		109,000	69,000
3,600		70,000	39,000	7,140	9/32	109,000	69,000
3,700		70,000	39,000	7,200		109,000	69,000
3,800		75,000	43,000	7,300		109,000	69,000
3,900		75,000	43,000	7,400		109,000	69,000
3,970	5/32	75,000	43,000	7,500		109,000	69,000
4,000		75,000	43,000	7,540	19/64	117,000	75,000
4,100		75,000	43,000	7,600		117,000	75,000
4,200		75,000	43,000	7,700		117,000	75,000
4,300		80,000	47,000	7,800		117,000	75,000

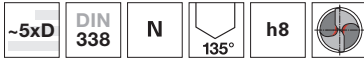


d1		l1	l2
mm	inch	mm	mm
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,330	21/64	117,000	75,000
8,400		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,800		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000

d1		l1	l2
mm	inch	mm	mm
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,500		133,000	87,000
10,720	27/64	142,000	94,000
10,800		142,000	94,000
11,000		142,000	94,000
11,110	7/16	142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,200		151,000	101,000
12,300	31/64	151,000	101,000
12,500		151,000	101,000
12,700	1/2	151,000	101,000
12,800		151,000	101,000
13,000		151,000	101,000



## Helisel matkap uçları, kısa

Malzeme **M42**

Yüzey

Kesme yönü

**P** • öz bileme  $\geq \varnothing 1,000$  • koni bileme • yüksek Co ve Mo yüzdesi • özellikle yüksek aşınma dirençli

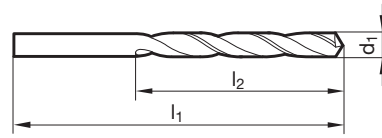
**M** ○**K** ○

**N** • orta yüksek mukavemetli CR-Ni bazlı alaşımlar • Hastelloy, Inconel, Nimonic • pas/asit/ısıya dayanıklı çelikler • aşınmaya dirençli sac metaller

**S** • 1400 N/mm<sup>2</sup> mukavemetli çelikler/bronzlar

**H** ○**GÜHRING** NAVIGATOR

Kesme verileri sayfası 780

Ürün no **1146**

SİLİNDİR ŞAFTLI MATKAP UCU

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,400	1/64	20,000	5,000	4,200		75,000	43,000
0,500		22,000	6,000	4,300		80,000	47,000
0,800		30,000	10,000	4,400		80,000	47,000
0,900		32,000	11,000	4,500		80,000	47,000
1,000		34,000	12,000	4,600		80,000	47,000
1,100		36,000	14,000	4,700		80,000	47,000
1,200		38,000	16,000	4,760	3/16	86,000	52,000
1,300		38,000	16,000	4,800		86,000	52,000
1,400		40,000	18,000	4,900		86,000	52,000
1,500		40,000	18,000	5,000		86,000	52,000
1,590	1/16	43,000	20,000	5,100		86,000	52,000
1,600		43,000	20,000	5,200		86,000	52,000
1,700		43,000	20,000	5,300		86,000	52,000
1,800		46,000	22,000	5,400		93,000	57,000
1,900		46,000	22,000	5,500		93,000	57,000
1,980	5/64	49,000	24,000	5,600		93,000	57,000
2,000		49,000	24,000	5,700		93,000	57,000
2,100		49,000	24,000	5,800		93,000	57,000
2,200		53,000	27,000	5,900		93,000	57,000
2,300		53,000	27,000	5,950	15/64	93,000	57,000
2,380	3/32	57,000	30,000	6,000		93,000	57,000
2,400		57,000	30,000	6,100		101,000	63,000
2,500		57,000	30,000	6,200		101,000	63,000
2,600		57,000	30,000	6,300		101,000	63,000
2,700		61,000	33,000	6,350	1/4	101,000	63,000
2,780	7/64	61,000	33,000	6,400		101,000	63,000
2,800		61,000	33,000	6,500		101,000	63,000
2,900		61,000	33,000	6,600		101,000	63,000
3,000		61,000	33,000	6,700		101,000	63,000
3,100		65,000	36,000	6,750	17/64	109,000	69,000
3,170	1/8	65,000	36,000	6,800		109,000	69,000
3,200		65,000	36,000	6,900		109,000	69,000
3,300		65,000	36,000	7,000		109,000	69,000
3,400		70,000	39,000	7,100		109,000	69,000
3,500		70,000	39,000	7,200		109,000	69,000
3,600		70,000	39,000	7,300		109,000	69,000
3,700		70,000	39,000	7,400		109,000	69,000
3,800		75,000	43,000	7,500		109,000	69,000
3,900		75,000	43,000	7,540	19/64	117,000	75,000
3,970	5/32	75,000	43,000	7,600		117,000	75,000
4,000		75,000	43,000	7,700		117,000	75,000
4,100		75,000	43,000	7,800		117,000	75,000

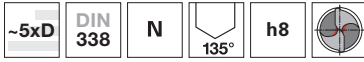


d1		l1	l2
mm	inch	mm	mm
7,900		117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,330	21/64	117,000	75,000
8,400		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,800		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000

d1		l1	l2
mm	inch	mm	mm
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,200		133,000	87,000
10,500		133,000	87,000
11,000		142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,300	31/64	151,000	101,000
12,500		151,000	101,000
13,000		151,000	101,000
13,100	33/64	151,000	101,000
13,500		160,000	108,000
14,000		160,000	108,000
15,000		169,000	114,000
15,870	5/8	178,000	120,000
16,000		178,000	120,000



## Helisel matkap uçları, kısa

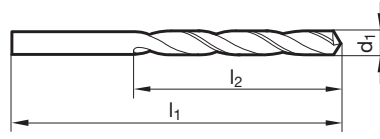


<b>P</b>	•	öz bileme $\geq \varnothing 1,000$ • optimize edilmiş Form B matkaplar • %8 cobalt alaşımli HSCO yüksek hız çeliği • özellikle yüksek aşınma dirençli
<b>M</b>	•	
<b>K</b>	•	
<b>N</b>	○	orta yüksek mukavemetli CR-Ni bazlı alaşımlar • Hastelloy, Inconel, Nimonic • pas/asit/ısıya dayanıklı çelikler • aşınmaya dirençli sac metaller
<b>S</b>	•	• 1400 N/mm <sup>2</sup> mukavemetli çelikler/bronzlar
<b>H</b>		

## GÜHRING NAVIGATOR

Kesme verileri sayfası 784

Malzeme	<b>M42</b>
Yüzey	<b>F</b>
Kesme yönü	<b>R</b>



Ürün no 1199

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		34,000	12,000	4,760	3/16	86,000	52,000
1,100		36,000	14,000	4,800		86,000	52,000
1,200		38,000	16,000	4,900		86,000	52,000
1,300		38,000	16,000	5,000		86,000	52,000
1,400		40,000	18,000	5,100		86,000	52,000
1,500		40,000	18,000	5,160	13/64	86,000	52,000
1,590	1/16	43,000	20,000	5,200		86,000	52,000
1,600		43,000	20,000	5,300		86,000	52,000
1,700		43,000	20,000	5,400		93,000	57,000
1,800		46,000	22,000	5,500		93,000	57,000
1,900		46,000	22,000	5,600		93,000	57,000
2,000		49,000	24,000	5,700		93,000	57,000
2,100		49,000	24,000	5,800		93,000	57,000
2,200		53,000	27,000	5,900		93,000	57,000
2,300		53,000	27,000	5,950	15/64	93,000	57,000
2,380	3/32	57,000	30,000	6,000		93,000	57,000
2,400		57,000	30,000	6,100		101,000	63,000
2,500		57,000	30,000	6,200		101,000	63,000
2,600		57,000	30,000	6,300		101,000	63,000
2,700		61,000	33,000	6,350	1/4	101,000	63,000
2,800		61,000	33,000	6,400		101,000	63,000
2,900		61,000	33,000	6,500		101,000	63,000
3,000		61,000	33,000	6,600		101,000	63,000
3,100		65,000	36,000	6,700		101,000	63,000
3,170	1/8	65,000	36,000	6,750	17/64	109,000	69,000
3,200		65,000	36,000	6,800		109,000	69,000
3,300		65,000	36,000	6,900		109,000	69,000
3,400		70,000	39,000	7,000		109,000	69,000
3,500		70,000	39,000	7,100		109,000	69,000
3,600		70,000	39,000	7,200		109,000	69,000
3,700		70,000	39,000	7,300		109,000	69,000
3,800		75,000	43,000	7,400		109,000	69,000
3,900		75,000	43,000	7,500		109,000	69,000
3,970	5/32	75,000	43,000	7,600		117,000	75,000
4,000		75,000	43,000	7,700		117,000	75,000
4,100		75,000	43,000	7,800		117,000	75,000
4,200		75,000	43,000	7,900		117,000	75,000
4,300		80,000	47,000	8,000		117,000	75,000
4,400		80,000	47,000	8,100		117,000	75,000
4,500		80,000	47,000	8,200		117,000	75,000
4,600		80,000	47,000	8,300		117,000	75,000
4,700		80,000	47,000	8,400		117,000	75,000



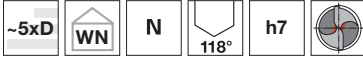
d1		l1	l2
mm	inch	mm	mm
8,500		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,730		125,000	81,000
8,800		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,100		125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000

d1		l1	l2
mm	inch	mm	mm
10,100		133,000	87,000
10,200		133,000	87,000
10,500		133,000	87,000
10,800		142,000	94,000
11,000		142,000	94,000
11,200		142,000	94,000
11,500		142,000	94,000
11,800		142,000	94,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,200		151,000	101,000
12,500		151,000	101,000
13,000		151,000	101,000
14,000		160,000	108,000
15,000		169,000	114,000
16,000		178,000	120,000





## Helisel matkap uçları, kısa



**P** öz bileme  $\geq \text{Ø } 2,060$  • yüzey Bileme • ana kesici ağız düz form

**M**

**K**

**N** • yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • pik

**S** • döküm • bronz / pirinç • Alüminyum ve Al-Alaşımları • Magnezyum ve

**H** • Mg-alaşımları • plastikler ve fiber takviyeli plastikler

Malzeme

Kom. sert metal

Yüzey

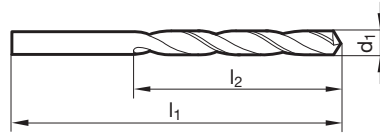


Kesme yönü



## GÜHRING NAVIGATOR

Kesme verileri sayfası 784



Ürün no

732

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		34,000	12,000	2,640		57,000	30,000
1,020		34,000	12,000	2,700		61,000	33,000
1,040		34,000	12,000	2,710		61,000	33,000
1,070		36,000	14,000	2,780	7/64	61,000	33,000
1,090		36,000	14,000	2,790		61,000	33,000
1,100		36,000	14,000	2,800		61,000	33,000
1,180		36,000	14,000	2,820		61,000	33,000
1,190	3/64	38,000	16,000	2,870		61,000	33,000
1,200		38,000	16,000	2,900		61,000	33,000
1,300		38,000	16,000	2,950		61,000	33,000
1,320		38,000	16,000	3,000		61,000	33,000
1,400		40,000	18,000	3,050		65,000	36,000
1,500		40,000	18,000	3,100		65,000	36,000
1,510		43,000	20,000	3,170	1/8	65,000	36,000
1,590	1/16	43,000	20,000	3,200		65,000	36,000
1,600		43,000	20,000	3,260		65,000	36,000
1,610		43,000	20,000	3,300		65,000	36,000
1,700		43,000	20,000	3,400		70,000	39,000
1,780		46,000	22,000	3,450		70,000	39,000
1,800		46,000	22,000	3,500		70,000	39,000
1,850		46,000	22,000	3,570	9/64	70,000	39,000
1,900		46,000	22,000	3,600		70,000	39,000
1,930		49,000	24,000	3,660		70,000	39,000
1,980	5/64	49,000	24,000	3,700		70,000	39,000
1,990		49,000	24,000	3,730		70,000	39,000
2,000		49,000	24,000	3,800		75,000	43,000
2,060		49,000	24,000	3,860		75,000	43,000
2,080		49,000	24,000	3,900		75,000	43,000
2,100		49,000	24,000	3,910		75,000	43,000
2,180		53,000	27,000	3,970	5/32	75,000	43,000
2,200		53,000	27,000	3,990		75,000	43,000
2,260		53,000	27,000	4,000		75,000	43,000
2,300		53,000	27,000	4,040		75,000	43,000
2,370		57,000	30,000	4,090		75,000	43,000
2,380	3/32	57,000	30,000	4,100		75,000	43,000
2,400		57,000	30,000	4,200		75,000	43,000
2,440		57,000	30,000	4,220		75,000	43,000
2,490		57,000	30,000	4,300		80,000	47,000
2,500		57,000	30,000	4,370	11/64	80,000	47,000
2,530		57,000	30,000	4,390		80,000	47,000
2,580		57,000	30,000	4,400		80,000	47,000
2,600		57,000	30,000	4,500		80,000	47,000

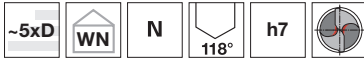


d1		l1	l2
mm	inch	mm	mm
4,570		80,000	47,000
4,600		80,000	47,000
4,620		80,000	47,000
4,700		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,850		86,000	52,000
4,900		86,000	52,000
4,920		86,000	52,000
4,980		86,000	52,000
5,000		86,000	52,000
5,060		86,000	52,000
5,100		86,000	52,000
5,110		86,000	52,000
5,160	13/64	86,000	52,000
5,180		86,000	52,000
5,200		86,000	52,000
5,220		86,000	52,000
5,300		86,000	52,000
5,310		93,000	57,000
5,400		93,000	57,000
5,410		93,000	57,000
5,500		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,610		93,000	57,000
5,700		93,000	57,000
5,790		93,000	57,000
5,800		93,000	57,000
5,900		93,000	57,000
5,940		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,040		101,000	63,000
6,100		101,000	63,000
6,150		101,000	63,000
6,200		101,000	63,000
6,250		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,530		101,000	63,000
6,600		101,000	63,000
6,630		101,000	63,000
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,030		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000
7,300		109,000	69,000
7,370		109,000	69,000
7,400		109,000	69,000
7,490		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000

d1		l1	l2
mm	inch	mm	mm
7,600		117,000	75,000
7,670		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,030		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,330	21/64	117,000	75,000
8,400		117,000	75,000
8,430		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,610		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,800		125,000	81,000
8,840		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,090		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,340		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,580		133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,080		133,000	87,000
10,200		133,000	87,000
10,260		133,000	87,000
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,490		133,000	87,000
10,500		133,000	87,000
10,720	27/64	142,000	94,000
11,000		142,000	94,000
11,110	7/16	142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,300	31/64	151,000	101,000
12,700	1/2	151,000	101,000



## Helisel matkap uçları, kısa



**P** öz bileme  $\geq \varnothing 2,060$  • yüzey Bileme • ana kesici ağız düz form

**M**

**K**

**N** yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • döküm malzemeler • pirinç • Yüksek Si içerikli Al malzemeler • Magnezyum ve Mg-alaşımları • plastikler ve fiber takviyeli plastikler

**S**

**H**

Malzeme

Kom. sert metal

Yüzey

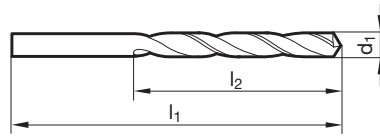
F

Kesme yönü

R

## GÜHRING NAVIGATOR

Kesme verileri sayfası 784



Ürün no

2464

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		34,000	12,000	2,640		57,000	30,000
1,020		34,000	12,000	2,700		61,000	33,000
1,040		34,000	12,000	2,710		61,000	33,000
1,070		36,000	14,000	2,780	7/64	61,000	33,000
1,090		36,000	14,000	2,790		61,000	33,000
1,100		36,000	14,000	2,800		61,000	33,000
1,180		36,000	14,000	2,820		61,000	33,000
1,190	3/64	38,000	16,000	2,870		61,000	33,000
1,200		38,000	16,000	2,900		61,000	33,000
1,300		38,000	16,000	2,950		61,000	33,000
1,320		38,000	16,000	3,000		61,000	33,000
1,400		40,000	18,000	3,050		65,000	36,000
1,500		40,000	18,000	3,100		65,000	36,000
1,510		43,000	20,000	3,170	1/8	65,000	36,000
1,590	1/16	43,000	20,000	3,200		65,000	36,000
1,600		43,000	20,000	3,260		65,000	36,000
1,610		43,000	20,000	3,300		65,000	36,000
1,700		43,000	20,000	3,400		70,000	39,000
1,780		46,000	22,000	3,450		70,000	39,000
1,800		46,000	22,000	3,500		70,000	39,000
1,850		46,000	22,000	3,570	9/64	70,000	39,000
1,900		46,000	22,000	3,600		70,000	39,000
1,930		49,000	24,000	3,660		70,000	39,000
1,980	5/64	49,000	24,000	3,700		70,000	39,000
1,990		49,000	24,000	3,730		70,000	39,000
2,000		49,000	24,000	3,800		75,000	43,000
2,060		49,000	24,000	3,860		75,000	43,000
2,080		49,000	24,000	3,900		75,000	43,000
2,100		49,000	24,000	3,910		75,000	43,000
2,180		53,000	27,000	3,970	5/32	75,000	43,000
2,200		53,000	27,000	3,990		75,000	43,000
2,260		53,000	27,000	4,000		75,000	43,000
2,300		53,000	27,000	4,040		75,000	43,000
2,370		57,000	30,000	4,090		75,000	43,000
2,380	3/32	57,000	30,000	4,100		75,000	43,000
2,400		57,000	30,000	4,200		75,000	43,000
2,440		57,000	30,000	4,220		75,000	43,000
2,490		57,000	30,000	4,300		80,000	47,000
2,500		57,000	30,000	4,370	11/64	80,000	47,000
2,530		57,000	30,000	4,390		80,000	47,000
2,580		57,000	30,000	4,400		80,000	47,000
2,600		57,000	30,000	4,500		80,000	47,000



d1		l1	l2
mm	inch	mm	mm
4,570		80,000	47,000
4,600		80,000	47,000
4,620		80,000	47,000
4,700		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,850		86,000	52,000
4,900		86,000	52,000
4,920		86,000	52,000
4,980		86,000	52,000
5,000		86,000	52,000
5,060		86,000	52,000
5,100		86,000	52,000
5,110		86,000	52,000
5,160	13/64	86,000	52,000
5,180		86,000	52,000
5,200		86,000	52,000
5,220		86,000	52,000
5,300		86,000	52,000
5,310		93,000	57,000
5,400		93,000	57,000
5,410		93,000	57,000
5,500		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,610		93,000	57,000
5,700		93,000	57,000
5,790		93,000	57,000
5,800		93,000	57,000
5,900		93,000	57,000
5,940		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,040		101,000	63,000
6,100		101,000	63,000
6,150		101,000	63,000
6,200		101,000	63,000
6,250		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,530		101,000	63,000
6,600		101,000	63,000
6,630		101,000	63,000
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,030		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000
7,300		109,000	69,000
7,370		109,000	69,000
7,400		109,000	69,000
7,490		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000

d1		l1	l2
mm	inch	mm	mm
7,600		117,000	75,000
7,670		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,030		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,330	21/64	117,000	75,000
8,400		117,000	75,000
8,430		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,610		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,800		125,000	81,000
8,840		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,090		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,340		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,580		133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,080		133,000	87,000
10,200		133,000	87,000
10,260		133,000	87,000
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,490		133,000	87,000
10,500		133,000	87,000
10,720	27/64	142,000	94,000
11,000		142,000	94,000
11,110	7/16	142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,300	31/64	151,000	101,000
12,700	1/2	151,000	101,000



## Helisel matkap uçları, kısa

Malzeme **Sert metal**

Yüzey



Kesme yönü



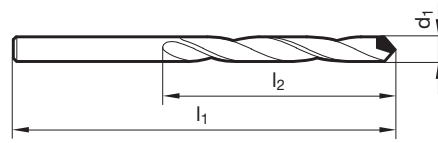
**P** ○ öz bileme  $\geq \varnothing 2,700$  • yüzey Bileme • Özel matkap ucu • HM ucu

**M****K** ○**N**

aşırı aşındırıcı malzemeler • ısıtılmış/görüş/sertleştirilmiş çelik • sert döküm, mangan-çeliği, sert bronzlar

**S****H** •**GÜHRING**NAVIGATOR

Kesme verileri sayfası 776



SİLİNDİR ŞAFTLI MATKAP UCU

Ürün no

**710**

d1		l1	l2
mm	inch	mm	mm
3,000		61,000	33,000
3,100		65,000	36,000
3,300		65,000	36,000
3,400		70,000	39,000
3,500		70,000	39,000
4,000		75,000	43,000
4,200		75,000	43,000
4,500		80,000	47,000
4,700		80,000	47,000
5,000		86,000	52,000
5,100		86,000	52,000
5,500		93,000	57,000
6,000		93,000	57,000
6,300		101,000	63,000
6,500		101,000	63,000
6,800		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000

d1		l1	l2
mm	inch	mm	mm
7,200		109,000	69,000
7,400		109,000	69,000
7,500		109,000	69,000
8,000		117,000	75,000
8,500		117,000	75,000
9,000		125,000	81,000
9,500		125,000	81,000
10,000		133,000	87,000
10,200		133,000	87,000
11,000		142,000	94,000
12,000		151,000	101,000
12,500		151,000	101,000
13,000		151,000	101,000
14,000		160,000	108,000

# HSS uzmanı

Özel işleme özellikleri için özel yüksek hız çeliği (HSS) matkap dizaynları

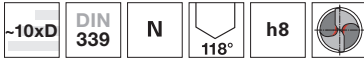
Guhring yüz yılı aşan bilgi birikimi, sanatsal üretim teknolojileri ile yüksek hız çeliği üretiminde, hızlı hss takım üretimi, özel uyulamaya yönelik kaplama belirleme, yüksek fiyat performans ürün üretiminde öncüdür.

Hassas matkap, kademeli ve çok kanallı matkap üretiminde, HSS alanındaki yüksek tecrübe ve birikimize güvenebilirsiniz.





## Silindirik saplı uzun matkap uçları



**P** • öz bileme  $\geq \varnothing 1,000$  • koni bileme • burç kullanarak delme için

**M**

**K** •

**N** ○ alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

**S**

**H**

Malzeme **HSS**

Yüzey  $\geq 2,36$

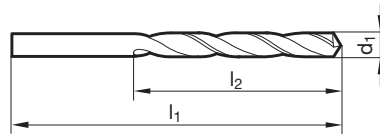
Kesme yönü



Silindirik Şaftlı Matkap Ucu

## GÜHRING NAVIGATOR

Kesme verileri sayfası 786



Ürün no **211**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,800		42,000	22,000	2,350		70,000	44,000
1,000		48,000	26,000	2,360		70,000	44,000
1,050		48,000	26,000	2,400		74,000	47,000
1,080		50,000	28,000	2,450		74,000	47,000
1,100		50,000	28,000	2,470		74,000	47,000
1,110		50,000	28,000	2,500		74,000	47,000
1,150		50,000	28,000	2,550		74,000	47,000
1,200		52,000	30,000	2,600		74,000	47,000
1,230		52,000	30,000	2,620		74,000	47,000
1,250		52,000	30,000	2,650		74,000	47,000
1,300		52,000	30,000	2,680		79,000	51,000
1,350		55,000	33,000	2,700		79,000	51,000
1,380		55,000	33,000	2,730		79,000	51,000
1,400		55,000	33,000	2,800		79,000	51,000
1,430		55,000	33,000	2,900		79,000	51,000
1,450		55,000	33,000	2,950		79,000	51,000
1,460		55,000	33,000	2,960		79,000	51,000
1,480		55,000	33,000	3,000		79,000	51,000
1,500		55,000	33,000	3,050		84,000	55,000
1,520		58,000	35,000	3,070		84,000	55,000
1,580		58,000	35,000	3,100		84,000	55,000
1,600		58,000	35,000	3,150		84,000	55,000
1,620		58,000	35,000	3,170	1/8	84,000	55,000
1,650		58,000	35,000	3,200		84,000	55,000
1,700		58,000	35,000	3,250		84,000	55,000
1,800		62,000	38,000	3,300		84,000	55,000
1,810		62,000	38,000	3,400		91,000	60,000
1,850		62,000	38,000	3,480		91,000	60,000
1,870		62,000	38,000	3,500		91,000	60,000
1,900		62,000	38,000	3,600		91,000	60,000
1,930		66,000	41,000	3,700		91,000	60,000
1,980	5/64	66,000	41,000	3,730		91,000	60,000
1,990		66,000	41,000	3,800		96,000	64,000
2,000		66,000	41,000	3,900		96,000	64,000
2,020		66,000	41,000	3,950		96,000	64,000
2,030		66,000	41,000	4,000		96,000	64,000
2,050		66,000	41,000	4,100		96,000	64,000
2,100		66,000	41,000	4,200		96,000	64,000
2,150		70,000	44,000	4,300		102,000	69,000
2,200		70,000	44,000	4,400		102,000	69,000
2,220		70,000	44,000	4,500		102,000	69,000
2,320		70,000	44,000	4,580		102,000	69,000



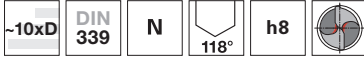
d1		l1	l2
mm	inch	mm	mm
4,600		102,000	69,000
4,700		102,000	69,000
4,750		102,000	69,000
4,800		108,000	74,000
4,900		108,000	74,000
4,950		108,000	74,000
5,000		108,000	74,000
5,100		108,000	74,000
5,200		108,000	74,000
5,300		108,000	74,000
5,330		116,000	80,000
5,350		116,000	80,000
5,400		116,000	80,000
5,500		116,000	80,000
5,550		116,000	80,000
5,600		116,000	80,000
5,700		116,000	80,000
5,800		116,000	80,000
5,900		116,000	80,000
6,000		116,000	80,000
6,100		124,000	86,000
6,150		124,000	86,000
6,200		124,000	86,000
6,350	1/4	124,000	86,000
6,400		124,000	86,000
6,500		124,000	86,000
6,600		124,000	86,000
6,700		124,000	86,000
6,800		133,000	93,000
6,900		133,000	93,000
7,000		133,000	93,000
7,050		133,000	93,000
7,100		133,000	93,000
7,150		133,000	93,000
7,200		133,000	93,000
7,300		133,000	93,000
7,400		133,000	93,000
7,600		142,000	100,000
7,750		142,000	100,000
7,800		142,000	100,000
7,950		142,000	100,000
8,000		142,000	100,000
8,100		142,000	100,000
8,120		142,000	100,000
8,200		142,000	100,000
8,300		142,000	100,000
8,500		142,000	100,000
8,600		151,000	107,000

d1		l1	l2
mm	inch	mm	mm
8,700		151,000	107,000
8,730	11/32	151,000	107,000
8,900		151,000	107,000
9,000		151,000	107,000
9,100		151,000	107,000
9,200		151,000	107,000
9,300		151,000	107,000
9,500		151,000	107,000
9,600		162,000	116,000
9,650		162,000	116,000
9,700		162,000	116,000
9,750		162,000	116,000
9,800		162,000	116,000
10,000		162,000	116,000
10,200		162,000	116,000
10,500		162,000	116,000
10,800		173,000	125,000
10,900		173,000	125,000
11,000		173,000	125,000
11,300		173,000	125,000
11,400		173,000	125,000
11,500		173,000	125,000
11,700		173,000	125,000
11,750		173,000	125,000
12,000		184,000	134,000
12,100		184,000	134,000
12,300	31/64	184,000	134,000
12,500		184,000	134,000
13,000		184,000	134,000
13,200		184,000	134,000
13,500		194,000	142,000
13,800		194,000	142,000
14,200		202,000	147,000
14,500		202,000	147,000
15,000		202,000	147,000
15,500		211,000	153,000
16,500		218,000	159,000
17,000		218,000	159,000
18,000		226,000	165,000
18,250		234,000	171,000
18,500		234,000	171,000
19,000		234,000	171,000
19,500		242,000	177,000
20,000		242,000	177,000





## Silindirik saplı uzun matkap uçları



**P** • öz bileme  $\geq \text{Ø} 2,400$  • koni bileme • burç kullanarak delme için

**M**

**K** •

**N** ○ alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

**S**

**H**

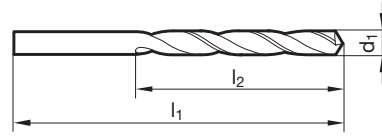
Malzeme **HSS**

Yüzey ○

Kesme yönü **R**

## GÜHRING NAVIGATOR

Kesme verileri sayfası 786



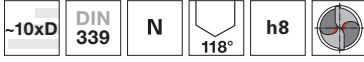
Ürün no **561**

d1		l1	l2
mm	inch	mm	mm
2,400		74,000	47,000
2,500		74,000	47,000
2,600		74,000	47,000
3,000		79,000	51,000
3,100		84,000	55,000
3,120		84,000	55,000
3,200		84,000	55,000
3,300		84,000	55,000
4,000		96,000	64,000
4,250		96,000	64,000
4,400		102,000	69,000
4,800		108,000	74,000

d1		l1	l2
mm	inch	mm	mm
5,000		108,000	74,000



## Silindirik saplı uzun matkap uçları

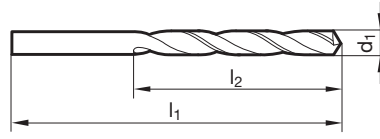


P	•	öz bileme $\geq \varnothing 1,000$ • koni bileme • burç kullanarak delme için
M		
K	•	
N	•	alaşımli/alaşimsız çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit
S		
H		

## GÜHRING NAVIGATOR

Kesme verileri sayfası 786

Malzeme	HSS
Yüzey	S
Kesme yönü	R



Ürün no 666

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		48,000	26,000	4,100		96,000	64,000
1,100		50,000	28,000	4,200		96,000	64,000
1,200		52,000	30,000	4,300		102,000	69,000
1,280		52,000	30,000	4,400		102,000	69,000
1,300		52,000	30,000	4,500		102,000	69,000
1,350		55,000	33,000	4,600		102,000	69,000
1,400		55,000	33,000	4,800		108,000	74,000
1,450		55,000	33,000	5,000		108,000	74,000
1,500		55,000	33,000	5,100		108,000	74,000
1,510		58,000	35,000	5,150		108,000	74,000
1,550		58,000	35,000	5,300		108,000	74,000
1,600		58,000	35,000	5,400		116,000	80,000
1,700		58,000	35,000	5,500		116,000	80,000
1,800		62,000	38,000	5,600		116,000	80,000
1,900		62,000	38,000	5,700		116,000	80,000
1,980	5/64	66,000	41,000	5,800		116,000	80,000
1,990		66,000	41,000	6,000		116,000	80,000
2,000		66,000	41,000	6,100		124,000	86,000
2,020		66,000	41,000	6,200		124,000	86,000
2,100		66,000	41,000	6,350	1/4	124,000	86,000
2,200		70,000	44,000	6,400		124,000	86,000
2,300		70,000	44,000	6,500		124,000	86,000
2,400		74,000	47,000	6,600		124,000	86,000
2,450		74,000	47,000	6,700		124,000	86,000
2,500		74,000	47,000	6,800		133,000	93,000
2,550		74,000	47,000	6,900		133,000	93,000
2,600		74,000	47,000	7,000		133,000	93,000
2,800		79,000	51,000	7,100		133,000	93,000
2,900		79,000	51,000	7,200		133,000	93,000
3,000		79,000	51,000	7,300		133,000	93,000
3,100		84,000	55,000	7,500		133,000	93,000
3,150		84,000	55,000	7,600		142,000	100,000
3,200		84,000	55,000	7,700		142,000	100,000
3,300		84,000	55,000	7,800		142,000	100,000
3,400		91,000	60,000	7,900		142,000	100,000
3,500		91,000	60,000	7,940	5/16	142,000	100,000
3,570	9/64	91,000	60,000	8,000		142,000	100,000
3,600		91,000	60,000	8,200		142,000	100,000
3,700		91,000	60,000	8,500		142,000	100,000
3,800		96,000	64,000	8,600		151,000	107,000
3,900		96,000	64,000	9,000		151,000	107,000
4,000		96,000	64,000	9,600		162,000	116,000

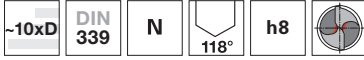


d1		l1	l2
mm	inch	mm	mm
9,800		162,000	116,000
10,000		162,000	116,000
10,200		162,000	116,000
11,000		173,000	125,000
11,500		173,000	125,000
11,910	15/32	184,000	134,000

d1		l1	l2
mm	inch	mm	mm
12,500		184,000	134,000
13,000		184,000	134,000



## Silindirik saplı uzun matkap uçları

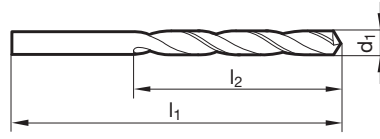


<b>P</b>	•	öz bileme $\geq \text{Ø } 1,100$ • koni bileme • Co-alaşımlı HSS-çeliği • yüksek aşınma direnci • burç kullanarak delme için
<b>M</b>	○	
<b>K</b>	•	
<b>N</b>	•	alaşım/alaşısız çelikler ve döküm , 800 N/mm <sup>2</sup> üzerinde • sıcak ve soğuk işlem çelikleri • rulman çeliği • yüksek alaşım çelikleri • ıslah çelikleri ve sementasyon çelikleri
<b>S</b>	○	
<b>H</b>		

## GÜHRING NAVIGATOR

Kesme verileri sayfası 792

Malzeme	<b>HSCO</b>
Yüzey	$\text{Ra} > 2,36$
Kesme yönü	<b>R</b>



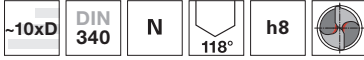
Ürün no 311

d1		l1	l2
mm	inch	mm	mm
1,100		50,000	28,000
1,300		52,000	30,000
1,500		55,000	33,000
1,600		58,000	35,000
1,800		62,000	38,000
1,900		62,000	38,000
1,950		66,000	41,000
2,000		66,000	41,000
2,500		74,000	47,000
3,000		79,000	51,000
3,100		84,000	55,000
3,200		84,000	55,000
4,000		96,000	64,000
4,500		102,000	69,000
5,000		108,000	74,000
5,100		108,000	74,000
6,100		124,000	86,000
6,400		124,000	86,000

d1		l1	l2
mm	inch	mm	mm
6,800		133,000	93,000
7,000		133,000	93,000
8,200		142,000	100,000
8,500		142,000	100,000
10,000		162,000	116,000
10,800		173,000	125,000
17,500		226,000	165,000
19,000		234,000	171,000



## Helisel matkap uçları, uzun

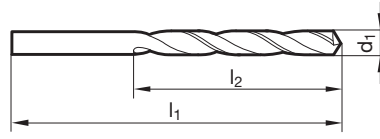


P	•	öz bileme $\geq \varnothing 1,000$ • koni bileme • çok derin deliklerde
M		
K	•	
N	○	alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit
S		
H		

## GÜHRING NAVIGATOR

Kesme verileri sayfası 786

Malzeme	HSS
Yüzey	$\text{Ra} > 2,36$
Kesme yönü	R



Ürün no 217

SİLİNDİR ŞAFTLI MATKAP UCU

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,400	1/64	30,000	10,000	1,500		70,000	45,000
0,440		30,000	10,000	1,510		76,000	50,000
0,450		30,000	10,000	1,550		76,000	50,000
0,470		30,000	10,000	1,590	1/16	76,000	50,000
0,500		32,000	12,000	1,600		76,000	50,000
0,520		32,000	12,000	1,610		76,000	50,000
0,550		35,000	15,000	1,650		76,000	50,000
0,570		35,000	15,000	1,700		76,000	50,000
0,600		35,000	15,000	1,750		80,000	53,000
0,620		38,000	18,000	1,780		80,000	53,000
0,650		38,000	18,000	1,800		80,000	53,000
0,700		42,000	21,000	1,850		80,000	53,000
0,730		42,000	21,000	1,900		80,000	53,000
0,750		42,000	21,000	1,930		85,000	56,000
0,760		46,000	25,000	1,950		85,000	56,000
0,790	1/32	46,000	25,000	1,980	5/64	85,000	56,000
0,800		46,000	25,000	2,000		85,000	56,000
0,820		46,000	25,000	2,030		85,000	56,000
0,850		46,000	25,000	2,050		85,000	56,000
0,900		51,000	29,000	2,060		85,000	56,000
0,910		51,000	29,000	2,080		85,000	56,000
0,920		51,000	29,000	2,100		85,000	56,000
0,950		51,000	29,000	2,150		90,000	59,000
0,970		56,000	33,000	2,200		90,000	59,000
1,000		56,000	33,000	2,250		90,000	59,000
1,040		56,000	33,000	2,260		90,000	59,000
1,050		56,000	33,000	2,300		90,000	59,000
1,080		60,000	37,000	2,350		90,000	59,000
1,090		60,000	37,000	2,370		95,000	62,000
1,100		60,000	37,000	2,380	3/32	95,000	62,000
1,120		60,000	37,000	2,400		95,000	62,000
1,130		60,000	37,000	2,420		95,000	62,000
1,150		60,000	37,000	2,440		95,000	62,000
1,180		60,000	37,000	2,450		95,000	62,000
1,190	3/64	65,000	41,000	2,490		95,000	62,000
1,200		65,000	41,000	2,500		95,000	62,000
1,250		65,000	41,000	2,550		95,000	62,000
1,300		65,000	41,000	2,580		95,000	62,000
1,350		70,000	45,000	2,600		95,000	62,000
1,400		70,000	45,000	2,620		95,000	62,000
1,450		70,000	45,000	2,640		95,000	62,000
1,490		70,000	45,000	2,650		95,000	62,000



d1		l1	l2
mm	inch	mm	mm
2,700		100,000	66,000
2,710		100,000	66,000
2,750		100,000	66,000
2,780	7/64	100,000	66,000
2,790		100,000	66,000
2,800		100,000	66,000
2,820		100,000	66,000
2,850		100,000	66,000
2,870		100,000	66,000
2,900		100,000	66,000
2,950		100,000	66,000
3,000		100,000	66,000
3,030		106,000	69,000
3,050		106,000	69,000
3,100		106,000	69,000
3,150		106,000	69,000
3,170	1/8	106,000	69,000
3,200		106,000	69,000
3,250		106,000	69,000
3,260		106,000	69,000
3,300		106,000	69,000
3,350		106,000	69,000
3,400		112,000	73,000
3,450		112,000	73,000
3,500		112,000	73,000
3,550		112,000	73,000
3,570	9/64	112,000	73,000
3,600		112,000	73,000
3,650		112,000	73,000
3,660		112,000	73,000
3,700		112,000	73,000
3,750		112,000	73,000
3,800		119,000	78,000
3,850		119,000	78,000
3,860		119,000	78,000
3,900		119,000	78,000
3,910		119,000	78,000
3,950		119,000	78,000
3,970	5/32	119,000	78,000
3,990		119,000	78,000
4,000		119,000	78,000
4,030		119,000	78,000
4,040		119,000	78,000
4,050		119,000	78,000
4,090		119,000	78,000
4,100		119,000	78,000
4,150		119,000	78,000
4,200		119,000	78,000
4,220		119,000	78,000
4,250		119,000	78,000
4,300		126,000	82,000
4,350		126,000	82,000
4,370	11/64	126,000	82,000
4,390		126,000	82,000
4,400		126,000	82,000
4,450		126,000	82,000
4,500		126,000	82,000
4,570		126,000	82,000
4,600		126,000	82,000
4,650		126,000	82,000
4,700		126,000	82,000
4,750		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
4,850		132,000	87,000
4,900		132,000	87,000
4,920		132,000	87,000
4,950		132,000	87,000
4,980		132,000	87,000
5,000		132,000	87,000
5,030		132,000	87,000
5,050		132,000	87,000

d1		l1	l2
mm	inch	mm	mm
5,060		132,000	87,000
5,100		132,000	87,000
5,110		132,000	87,000
5,150		132,000	87,000
5,160	13/64	132,000	87,000
5,180		132,000	87,000
5,200		132,000	87,000
5,220		132,000	87,000
5,250		132,000	87,000
5,300		132,000	87,000
5,310		139,000	91,000
5,350		139,000	91,000
5,400		139,000	91,000
5,410		139,000	91,000
5,450		139,000	91,000
5,500		139,000	91,000
5,550		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,650		139,000	91,000
5,700		139,000	91,000
5,750		139,000	91,000
5,790		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,060		148,000	97,000
6,100		148,000	97,000
6,200		148,000	97,000
6,250		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,700		148,000	97,000
6,750	17/64	156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,100		156,000	102,000
7,140	9/32	156,000	102,000
7,200		156,000	102,000
7,250		156,000	102,000
7,300		156,000	102,000
7,400		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,600		165,000	109,000
7,700		165,000	109,000
7,750		165,000	109,000
7,800		165,000	109,000
7,900		165,000	109,000
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,250		165,000	109,000
8,300		165,000	109,000
8,330	21/64	165,000	109,000
8,400		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,700		175,000	115,000
8,730	11/32	175,000	115,000
8,750		175,000	115,000
8,800		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,100		175,000	115,000
9,130	23/64	175,000	115,000

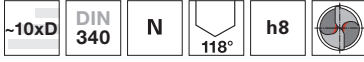


d1		l1	l2
mm	inch	mm	mm
9,200		175,000	115,000
9,300		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,600		184,000	121,000
9,700		184,000	121,000
9,750		184,000	121,000
9,800		184,000	121,000
9,900		184,000	121,000
9,920	25/64	184,000	121,000
10,000		184,000	121,000
10,100		184,000	121,000
10,200		184,000	121,000
10,250		184,000	121,000
10,300		184,000	121,000
10,320	13/32	184,000	121,000
10,400		184,000	121,000
10,500		184,000	121,000
10,700		195,000	128,000
10,720	27/64	195,000	128,000
10,750		195,000	128,000
10,800		195,000	128,000
11,000		195,000	128,000
11,110	7/16	195,000	128,000
11,200		195,000	128,000
11,400		195,000	128,000
11,500		195,000	128,000
11,510	29/64	195,000	128,000
11,600		195,000	128,000
11,700		195,000	128,000
11,750		195,000	128,000
11,800		195,000	128,000
11,910	15/32	205,000	134,000
12,000		205,000	134,000
12,100		205,000	134,000
12,200		205,000	134,000
12,300	31/64	205,000	134,000
12,500		205,000	134,000
12,700	1/2	205,000	134,000
12,800		205,000	134,000
13,000		205,000	134,000
13,200		205,000	134,000
13,490	17/32	214,000	140,000
13,500		214,000	140,000
13,800		214,000	140,000
13,890	35/64	214,000	140,000
14,000		214,000	140,000
14,200		220,000	144,000
14,250		220,000	144,000
14,290	9/16	220,000	144,000
14,490		220,000	144,000
14,500		220,000	144,000
14,900		220,000	144,000

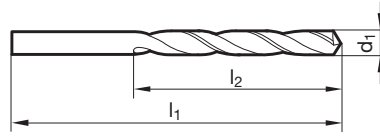
d1		l1	l2
mm	inch	mm	mm
15,000		220,000	144,000
15,080	19/32	227,000	149,000
15,200		227,000	149,000
15,250		227,000	149,000
15,400		227,000	149,000
15,480	39/64	227,000	149,000
15,500		227,000	149,000
15,600		227,000	149,000
15,870	5/8	227,000	149,000
16,000		227,000	149,000
16,270	41/64	235,000	154,000
16,500		235,000	154,000
16,670	21/32	235,000	154,000
17,000		235,000	154,000
17,070	43/64	241,000	158,000
17,460	11/16	241,000	158,000
17,500		241,000	158,000
18,000		241,000	158,000
18,500		247,000	162,000
18,650	47/64	247,000	162,000
19,000		247,000	162,000
19,050	3/4	254,000	166,000
19,500		254,000	166,000
20,000		254,000	166,000
20,500		261,000	171,000
20,640	13/16	261,000	171,000
21,000		261,000	171,000
21,500		268,000	176,000
22,000		268,000	176,000
23,300		275,000	180,000
23,810	15/16	282,000	185,000
24,000		282,000	185,000
25,000	63/64	282,000	185,000
26,190	1 1/32	290,000	190,000
26,500		290,000	190,000
26,990	1 1/16	298,000	195,000
28,570	1 1/8	307,000	201,000
29,000		307,000	201,000
29,370	1 5/32	307,000	201,000
29,500		307,000	201,000
30,160	1 3/16	316,000	207,000
30,960	1 7/32	316,000	207,000
31,000		316,000	207,000
36,510	1 7/16	345,000	225,000



## Helisel matkap uçları, uzun

Malzeme **HSS**Yüzey **S**Kesme yönü **R****P** • öz bileme  $\geq \text{Ø } 1,000$  • koni bileme • çok derin deliklerde • burç kullanarak delme için**M****K** •**N** ○ alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit**S****H****GÜHRING** NAVIGATOR

Kesme verileri sayfası 786

SİLİNDİR ŞAFTLI MATKAP  
UCUÜrün no **667**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,500		32,000	12,000	2,800		100,000	66,000
0,600		35,000	15,000	2,850		100,000	66,000
0,700		42,000	21,000	2,870		100,000	66,000
0,750		42,000	21,000	2,900		100,000	66,000
0,800		46,000	25,000	3,000		100,000	66,000
0,900		51,000	29,000	3,030		106,000	69,000
0,950		51,000	29,000	3,050		106,000	69,000
1,000		56,000	33,000	3,100		106,000	69,000
1,100		60,000	37,000	3,170	1/8	106,000	69,000
1,150		60,000	37,000	3,200		106,000	69,000
1,200		65,000	41,000	3,250		106,000	69,000
1,250		65,000	41,000	3,260		106,000	69,000
1,300		65,000	41,000	3,300		106,000	69,000
1,350		70,000	45,000	3,350		106,000	69,000
1,400		70,000	45,000	3,400		112,000	73,000
1,450		70,000	45,000	3,500		112,000	73,000
1,500		70,000	45,000	3,570	9/64	112,000	73,000
1,550		76,000	50,000	3,600		112,000	73,000
1,590	1/16	76,000	50,000	3,650		112,000	73,000
1,600		76,000	50,000	3,700		112,000	73,000
1,650		76,000	50,000	3,730		112,000	73,000
1,700		76,000	50,000	3,750		112,000	73,000
1,800		80,000	53,000	3,800		119,000	78,000
1,850		80,000	53,000	3,850		119,000	78,000
1,900		80,000	53,000	3,900		119,000	78,000
1,950		85,000	56,000	3,950		119,000	78,000
1,980	5/64	85,000	56,000	3,970	5/32	119,000	78,000
2,000		85,000	56,000	4,000		119,000	78,000
2,100		85,000	56,000	4,050		119,000	78,000
2,200		90,000	59,000	4,100		119,000	78,000
2,300		90,000	59,000	4,200		119,000	78,000
2,350		90,000	59,000	4,250		119,000	78,000
2,370		95,000	62,000	4,300		126,000	82,000
2,380	3/32	95,000	62,000	4,370	11/64	126,000	82,000
2,440		95,000	62,000	4,400		126,000	82,000
2,450		95,000	62,000	4,500		126,000	82,000
2,500		95,000	62,000	4,570		126,000	82,000
2,530		95,000	62,000	4,600		126,000	82,000
2,650		95,000	62,000	4,620		126,000	82,000
2,700		100,000	66,000	4,650		126,000	82,000
2,750		100,000	66,000	4,700		126,000	82,000
2,780	7/64	100,000	66,000	4,750		126,000	82,000



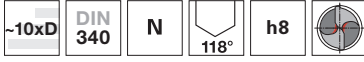


d1		l1	l2
mm	inch	mm	mm
4,760	3/16	132,000	87,000
4,850		132,000	87,000
4,900		132,000	87,000
5,000		132,000	87,000
5,100		132,000	87,000
5,160	13/64	132,000	87,000
5,200		132,000	87,000
5,250		132,000	87,000
5,300		132,000	87,000
5,310		139,000	91,000
5,400		139,000	91,000
5,410		139,000	91,000
5,500		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,610		139,000	91,000
5,700		139,000	91,000
5,790		139,000	91,000
5,900		139,000	91,000
6,000		139,000	91,000
6,100		148,000	97,000
6,200		148,000	97,000
6,250		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,750	17/64	156,000	102,000
6,800		156,000	102,000
7,000		156,000	102,000
7,100		156,000	102,000
7,140	9/32	156,000	102,000
7,200		156,000	102,000
7,250		156,000	102,000
7,300		156,000	102,000
7,370		156,000	102,000
7,400		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,700		165,000	109,000
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,050		165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,250		165,000	109,000
8,300		165,000	109,000
8,400		165,000	109,000
8,500		165,000	109,000
8,700		175,000	115,000
8,730	11/32	175,000	115,000
8,800		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000

d1		l1	l2
mm	inch	mm	mm
9,100		175,000	115,000
9,300		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,700		184,000	121,000
9,900		184,000	121,000
9,920	25/64	184,000	121,000
10,000		184,000	121,000
10,200		184,000	121,000
10,320	13/32	184,000	121,000
10,500		184,000	121,000
10,720	27/64	195,000	128,000
10,800		195,000	128,000
10,900		195,000	128,000
11,000		195,000	128,000
11,110	7/16	195,000	128,000
11,500		195,000	128,000
11,750		195,000	128,000
11,910	15/32	205,000	134,000
12,000		205,000	134,000
12,500		205,000	134,000
12,700	1/2	205,000	134,000
13,000		205,000	134,000
13,490	17/32	214,000	140,000
13,500		214,000	140,000
13,800		214,000	140,000
13,890	35/64	214,000	140,000
14,000		214,000	140,000
14,290	9/16	220,000	144,000
14,500		220,000	144,000
14,750		220,000	144,000
14,800		220,000	144,000
14,900		220,000	144,000
15,000		220,000	144,000
15,080	19/32	227,000	149,000
16,000		227,000	149,000
16,500		235,000	154,000
16,670	21/32	235,000	154,000
16,750		235,000	154,000
17,000		235,000	154,000
17,460	11/16	241,000	158,000
18,000		241,000	158,000
18,250		247,000	162,000
22,220	7/8	268,000	176,000



## Helisel matkap uçları, uzun



P	•	öz bileme $\geq \text{Ø } 14,750$ • koni bileme • çok derin deliklerde • burç kullanarak delme için
M		
K	•	
N	o	alaşımli/alaşimsız çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit
S		
H		

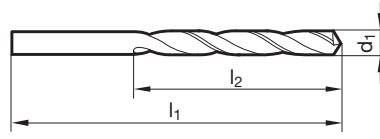
Malzeme **HSS**

Yüzey

Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 786

Ürün no **220**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,450		30,000	10,000	4,500		126,000	82,000
0,470		30,000	10,000	4,600		126,000	82,000
0,900		51,000	29,000	4,780		132,000	87,000
0,950		51,000	29,000	4,800		132,000	87,000
1,100		60,000	37,000	4,950		132,000	87,000
1,150		60,000	37,000	5,000		132,000	87,000
1,200		65,000	41,000	5,100		132,000	87,000
1,250		65,000	41,000	5,200		132,000	87,000
1,400		70,000	45,000	5,600		139,000	91,000
1,450		70,000	45,000	5,700		139,000	91,000
1,500		70,000	45,000	6,000		139,000	91,000
1,600		76,000	50,000	6,050		148,000	97,000
1,630		76,000	50,000	6,100		148,000	97,000
1,660		76,000	50,000	6,400		148,000	97,000
1,730		80,000	53,000	6,500		148,000	97,000
1,800		80,000	53,000	6,600		148,000	97,000
1,850		80,000	53,000	6,800		156,000	102,000
1,900		80,000	53,000	7,200		156,000	102,000
2,000		85,000	56,000	7,500		156,000	102,000
2,300		90,000	59,000	7,800		165,000	109,000
2,500		95,000	62,000	8,000		165,000	109,000
2,700		100,000	66,000	8,100		165,000	109,000
2,750		100,000	66,000	8,250		165,000	109,000
2,900		100,000	66,000	8,400		165,000	109,000
2,950		100,000	66,000	8,800		175,000	115,000
3,000		100,000	66,000	9,000		175,000	115,000
3,050		106,000	69,000	9,520	3/8	184,000	121,000
3,070		106,000	69,000	9,700		184,000	121,000
3,100		106,000	69,000	9,800		184,000	121,000
3,250		106,000	69,000	9,900		184,000	121,000
3,300		106,000	69,000	10,000		184,000	121,000
3,350		106,000	69,000	10,100		184,000	121,000
3,400		112,000	73,000	10,500		184,000	121,000
3,500		112,000	73,000	11,000		195,000	128,000
3,550		112,000	73,000	11,500		195,000	128,000
3,600		112,000	73,000	11,900		205,000	134,000
3,700		112,000	73,000	12,000		205,000	134,000
3,800		119,000	78,000	12,200		205,000	134,000
4,000		119,000	78,000	12,500		205,000	134,000
4,050		119,000	78,000	13,000		205,000	134,000
4,250		119,000	78,000	13,500		214,000	140,000
4,300		126,000	82,000	14,750		220,000	144,000

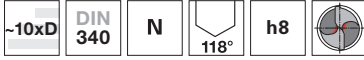


d1		l1	l2
mm	inch	mm	mm
19,000		247,000	162,000
20,000		254,000	166,000
22,000		268,000	176,000
25,000	63/64	282,000	185,000
25,500		290,000	190,000
29,000		307,000	201,000

d1		l1	l2
mm	inch	mm	mm



## Helisel matkap uçları, uzun



<b>P</b>	•	öz bileme $\geq \varnothing 2,950$ • koni bileme • döndürücü dilli
<b>M</b>		
<b>K</b>	•	
<b>N</b>	○	alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit
<b>S</b>		
<b>H</b>		

**GÜHRING**NAVIGATOR

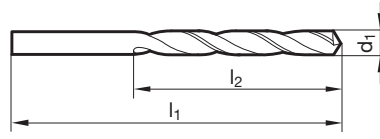
Kesme verileri sayfası 786

Malzeme **HSS**

Yüzey



Kesme yönü



Ürün no

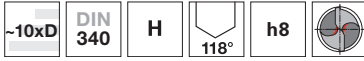
204

d1		l1	l2
mm	inch	mm	mm
2,950		100,000	66,000
3,000		100,000	66,000
3,100		106,000	69,000
3,170	1/8	106,000	69,000
3,200		106,000	69,000
3,300		106,000	69,000
3,400		112,000	73,000
3,500		112,000	73,000
3,600		112,000	73,000
3,800		119,000	78,000
3,900		119,000	78,000
4,000		119,000	78,000
4,050		119,000	78,000
4,100		119,000	78,000
4,200		119,000	78,000
4,250		119,000	78,000
4,300		126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
5,000		132,000	87,000
5,080		132,000	87,000
5,100		132,000	87,000
5,200		132,000	87,000
5,500		139,000	91,000
5,600		139,000	91,000
5,800		139,000	91,000
5,850		139,000	91,000
5,900		139,000	91,000
6,000		139,000	91,000
6,100		148,000	97,000
6,200		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,700		148,000	97,000
6,750	17/64	156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000

d1		l1	l2
mm	inch	mm	mm
7,000		156,000	102,000
7,400		156,000	102,000
7,500		156,000	102,000
7,600		165,000	109,000
7,700		165,000	109,000
7,800		165,000	109,000
8,000		165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,250		165,000	109,000
8,400		165,000	109,000
8,450		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,750		175,000	115,000
8,800		175,000	115,000
9,000		175,000	115,000
9,300		175,000	115,000
9,400		175,000	115,000
9,700		184,000	121,000
9,800		184,000	121,000
9,900		184,000	121,000
10,000		184,000	121,000
10,200		184,000	121,000
10,300		184,000	121,000
10,400		184,000	121,000
10,500		184,000	121,000
10,800		195,000	128,000
11,600		195,000	128,000
12,000		205,000	134,000
13,000		205,000	134,000
25,250		290,000	190,000



## Helisel matkap uçları, uzun

Malzeme **HSS**

Yüzey



Kesme yönü



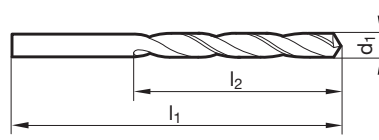
**P** öz bileme  $\geq \varnothing 15,000$  • koni bileme • çok derin deliklerde

**M****K****N****S****H**

• sert ve kırılgan malzemeler • pirinç, magnezyum alaşımları • bronz, fosforlu bronz • slate, mico, pertinax

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 786

Ürün no **218**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,500		32,000	12,000	2,300		90,000	59,000
0,520		32,000	12,000	2,350		90,000	59,000
0,550		35,000	15,000	2,400		95,000	62,000
0,600		35,000	15,000	2,500		95,000	62,000
0,650		38,000	18,000	2,550		95,000	62,000
0,700		42,000	21,000	2,600		95,000	62,000
0,750		42,000	21,000	2,650		95,000	62,000
0,800		46,000	25,000	2,700		100,000	66,000
0,820		46,000	25,000	2,800		100,000	66,000
0,840		46,000	25,000	2,830		100,000	66,000
0,850		46,000	25,000	2,870		100,000	66,000
0,900		51,000	29,000	2,900		100,000	66,000
0,950		51,000	29,000	2,940		100,000	66,000
0,970		56,000	33,000	3,000		100,000	66,000
1,000		56,000	33,000	3,020		106,000	69,000
1,050		56,000	33,000	3,050		106,000	69,000
1,100		60,000	37,000	3,060		106,000	69,000
1,150		60,000	37,000	3,100		106,000	69,000
1,200		65,000	41,000	3,150		106,000	69,000
1,250		65,000	41,000	3,180		106,000	69,000
1,300		65,000	41,000	3,200		106,000	69,000
1,400		70,000	45,000	3,250		106,000	69,000
1,500		70,000	45,000	3,270		106,000	69,000
1,550		76,000	50,000	3,300		106,000	69,000
1,560		76,000	50,000	3,400		112,000	73,000
1,570		76,000	50,000	3,500		112,000	73,000
1,580		76,000	50,000	3,550		112,000	73,000
1,600		76,000	50,000	3,600		112,000	73,000
1,650		76,000	50,000	3,800		119,000	78,000
1,700		76,000	50,000	3,900		119,000	78,000
1,750		80,000	53,000	4,000		119,000	78,000
1,800		80,000	53,000	4,030		119,000	78,000
1,820		80,000	53,000	4,100		119,000	78,000
1,850		80,000	53,000	4,200		119,000	78,000
1,900		80,000	53,000	4,300		126,000	82,000
1,950		85,000	56,000	4,400		126,000	82,000
2,000		85,000	56,000	4,500		126,000	82,000
2,050		85,000	56,000	4,600		126,000	82,000
2,100		85,000	56,000	4,700		126,000	82,000
2,180		90,000	59,000	4,760	3/16	132,000	87,000
2,200		90,000	59,000	4,800		132,000	87,000
2,250		90,000	59,000	4,900		132,000	87,000



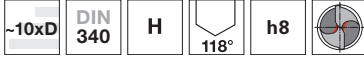
Silindir Şaftlı Matkap ucu

d1		l1	l2
mm	inch	mm	mm
5,000		132,000	87,000
5,100		132,000	87,000
5,200		132,000	87,000
5,300		132,000	87,000
5,400		139,000	91,000
5,450		139,000	91,000
5,500		139,000	91,000
5,600		139,000	91,000
5,900		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,100		148,000	97,000
6,200		148,000	97,000
6,300		148,000	97,000
6,420		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,700		148,000	97,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,200		156,000	102,000
7,350		156,000	102,000
7,500		156,000	102,000

d1		l1	l2
mm	inch	mm	mm
8,000		165,000	109,000
8,200		165,000	109,000
8,300		165,000	109,000
8,700		175,000	115,000
9,000		175,000	115,000
9,500		175,000	115,000
9,700		184,000	121,000
9,900		184,000	121,000
10,000		184,000	121,000
11,250		195,000	128,000
12,100		205,000	134,000
14,000		214,000	140,000
15,000		220,000	144,000
16,000		227,000	149,000



## Helisel matkap uçları, uzun



**P** öz bileme  $\geq \varnothing 15,000$  • koni bileme • çok derin deliklerde

**M****K****N****S****H**

• sert ve kırılğan malzemeler • pirinç, magnezyum alaşımları • bronz, fosforlu bronz • slate, mico, pertinax

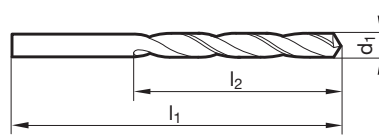
**GÜHRING** NAVIGATOR

Kesme verileri sayfası 786

Malzeme **HSS**

Yüzey

Kesme yönü



Ürün no

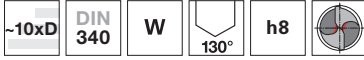
**221**

d1		l1	l2
mm	inch	mm	mm
0,450		30,000	10,000
0,600		35,000	15,000
0,650		38,000	18,000
0,900		51,000	29,000
1,100		60,000	37,000
1,240		65,000	41,000
1,300		65,000	41,000
1,320		65,000	41,000
1,370		70,000	45,000
1,400		70,000	45,000
1,500		70,000	45,000
1,550		76,000	50,000
1,800		80,000	53,000
1,850		80,000	53,000
2,000		85,000	56,000
2,160		90,000	59,000
2,180		90,000	59,000
2,200		90,000	59,000
2,270		90,000	59,000
2,350		90,000	59,000
2,850		100,000	66,000
2,900		100,000	66,000
2,950		100,000	66,000
3,000		100,000	66,000
3,170	1/8	106,000	69,000
3,200		106,000	69,000
3,250		106,000	69,000
3,400		112,000	73,000
3,450		112,000	73,000
3,500		112,000	73,000

d1		l1	l2
mm	inch	mm	mm
3,510		112,000	73,000
3,700		112,000	73,000
4,100		119,000	78,000
4,200		119,000	78,000
4,400		126,000	82,000
4,500		126,000	82,000
4,900		132,000	87,000
5,000		132,000	87,000
5,050		132,000	87,000
5,100		132,000	87,000
5,400		139,000	91,000
5,600		139,000	91,000
5,900		139,000	91,000
6,000		139,000	91,000
6,800		156,000	102,000
8,000		165,000	109,000
9,000		175,000	115,000
12,800		205,000	134,000
15,000		220,000	144,000



## Helisel matkap uçları, uzun

P öz bileme  $\geq \text{Ø } 14,500$  • koni bileme • çok derin deliklerde

N • yumuşak ve uzun talaş veren malzemelerde • Alüminyum/Al-alaşimleri (uzun talaşlı) • çinko, saflaştırılmış bakır, silumin, elektrotlar • yumuşak sentetik malzemeler, ahşap

## GÜHRING NAVIGATOR

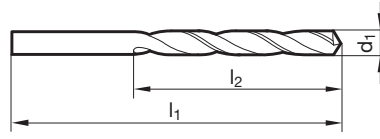
Kesme verileri sayfası 786

Malzeme HSS

Yüzey



Kesme yönü



Ürün no

219

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,500		32,000	12,000	2,100		85,000	56,000
0,600		35,000	15,000	2,150		90,000	59,000
0,650		38,000	18,000	2,200		90,000	59,000
0,700		42,000	21,000	2,250		90,000	59,000
0,740		42,000	21,000	2,300		90,000	59,000
0,750		42,000	21,000	2,350		90,000	59,000
0,800		46,000	25,000	2,380	3/32	95,000	62,000
0,850		46,000	25,000	2,400		95,000	62,000
0,900		51,000	29,000	2,430		95,000	62,000
0,950		51,000	29,000	2,450		95,000	62,000
0,970		56,000	33,000	2,490		95,000	62,000
0,980		56,000	33,000	2,500		95,000	62,000
1,000		56,000	33,000	2,550		95,000	62,000
1,100		60,000	37,000	2,600		95,000	62,000
1,180		60,000	37,000	2,650		95,000	62,000
1,190	3/64	65,000	41,000	2,700		100,000	66,000
1,200		65,000	41,000	2,710		100,000	66,000
1,220		65,000	41,000	2,750		100,000	66,000
1,250		65,000	41,000	2,800		100,000	66,000
1,300		65,000	41,000	2,850		100,000	66,000
1,350		70,000	45,000	2,880		100,000	66,000
1,370		70,000	45,000	2,900		100,000	66,000
1,400		70,000	45,000	2,950		100,000	66,000
1,440		70,000	45,000	3,000		100,000	66,000
1,500		70,000	45,000	3,100		106,000	69,000
1,520		76,000	50,000	3,170	1/8	106,000	69,000
1,600		76,000	50,000	3,180		106,000	69,000
1,610		76,000	50,000	3,200		106,000	69,000
1,650		76,000	50,000	3,250		106,000	69,000
1,700		76,000	50,000	3,260		106,000	69,000
1,750		80,000	53,000	3,300		106,000	69,000
1,760		80,000	53,000	3,350		106,000	69,000
1,770		80,000	53,000	3,400		112,000	73,000
1,780		80,000	53,000	3,500		112,000	73,000
1,800		80,000	53,000	3,550		112,000	73,000
1,850		80,000	53,000	3,600		112,000	73,000
1,900		80,000	53,000	3,650		112,000	73,000
1,950		85,000	56,000	3,700		112,000	73,000
1,970		85,000	56,000	3,750		112,000	73,000
2,000		85,000	56,000	3,800		119,000	78,000
2,050		85,000	56,000	3,830		119,000	78,000
2,070		85,000	56,000	3,900		119,000	78,000



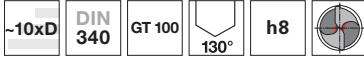


d1		l1	l2
mm	inch	mm	mm
3,920		119,000	78,000
3,990		119,000	78,000
4,000		119,000	78,000
4,100		119,000	78,000
4,150		119,000	78,000
4,200		119,000	78,000
4,250		119,000	78,000
4,300		126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,700		126,000	82,000
4,800		132,000	87,000
4,830		132,000	87,000
4,870		132,000	87,000
4,900		132,000	87,000
4,950		132,000	87,000
5,000		132,000	87,000
5,100		132,000	87,000
5,200		132,000	87,000
5,300		132,000	87,000
5,400		139,000	91,000
5,430		139,000	91,000
5,500		139,000	91,000
5,650		139,000	91,000
5,700		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,980		139,000	91,000
6,000		139,000	91,000
6,100		148,000	97,000
6,250		148,000	97,000
6,300		148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,700		148,000	97,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,100		156,000	102,000
7,300		156,000	102,000
7,400		156,000	102,000
7,450		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,550		165,000	109,000
7,670		165,000	109,000
7,700		165,000	109,000

d1		l1	l2
mm	inch	mm	mm
7,850		165,000	109,000
7,900		165,000	109,000
7,950		165,000	109,000
8,000		165,000	109,000
8,200		165,000	109,000
8,300		165,000	109,000
8,500		165,000	109,000
8,550		175,000	115,000
8,600		175,000	115,000
8,700		175,000	115,000
8,750		175,000	115,000
8,800		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,100		175,000	115,000
9,500		175,000	115,000
9,700		184,000	121,000
9,800		184,000	121,000
9,900		184,000	121,000
10,000		184,000	121,000
10,300		184,000	121,000
10,700		195,000	128,000
10,750		195,000	128,000
11,000		195,000	128,000
11,300		195,000	128,000
11,400		195,000	128,000
12,000		205,000	134,000
13,100	33/64	205,000	134,000
13,500		214,000	140,000
13,750		214,000	140,000
14,000		214,000	140,000
14,500		220,000	144,000
15,000		220,000	144,000
15,500		227,000	149,000
17,000		235,000	154,000
18,000		241,000	158,000
18,250		247,000	162,000
19,000		247,000	162,000
19,840	25/32	254,000	166,000
20,000		254,000	166,000
20,640	13/16	261,000	171,000



## Helisel matkap uçları, uzun

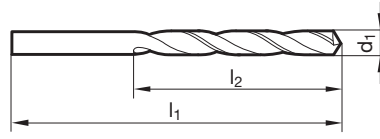


<b>P</b>	•	öz bileme $\geq \varnothing 1,000$ • koni bileme • geniş kanallı • zor talaş atılmasında
<b>M</b>		
<b>K</b>	•	
<b>N</b>	•	1000 N/mm <sup>2</sup> 'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.
<b>S</b>		
<b>H</b>		

## GÜHRING NAVIGATOR

Kesme verileri sayfası 786

Malzeme	<b>HSS</b>
Yüzey	
Kesme yönü	



Ürün no 535

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	2,200		90,000	59,000
1,020		56,000	33,000	2,250		90,000	59,000
1,040		56,000	33,000	2,260		90,000	59,000
1,050		56,000	33,000	2,300		90,000	59,000
1,070		60,000	37,000	2,350		90,000	59,000
1,090		60,000	37,000	2,370		95,000	62,000
1,100		60,000	37,000	2,380	3/32	95,000	62,000
1,150		60,000	37,000	2,400		95,000	62,000
1,180		60,000	37,000	2,440		95,000	62,000
1,190	3/64	65,000	41,000	2,450		95,000	62,000
1,200		65,000	41,000	2,480		95,000	62,000
1,250		65,000	41,000	2,490		95,000	62,000
1,300		65,000	41,000	2,500		95,000	62,000
1,320		65,000	41,000	2,530		95,000	62,000
1,350		70,000	45,000	2,550		95,000	62,000
1,400		70,000	45,000	2,580		95,000	62,000
1,450		70,000	45,000	2,600		95,000	62,000
1,500		70,000	45,000	2,640		95,000	62,000
1,510		76,000	50,000	2,650		95,000	62,000
1,520		76,000	50,000	2,700		100,000	66,000
1,550		76,000	50,000	2,710		100,000	66,000
1,590	1/16	76,000	50,000	2,750		100,000	66,000
1,600		76,000	50,000	2,780	7/64	100,000	66,000
1,650		76,000	50,000	2,790		100,000	66,000
1,670		76,000	50,000	2,800		100,000	66,000
1,700		76,000	50,000	2,820		100,000	66,000
1,750		80,000	53,000	2,830		100,000	66,000
1,780		80,000	53,000	2,850		100,000	66,000
1,800		80,000	53,000	2,870		100,000	66,000
1,850		80,000	53,000	2,900		100,000	66,000
1,900		80,000	53,000	2,940		100,000	66,000
1,930		85,000	56,000	2,950		100,000	66,000
1,950		85,000	56,000	3,000		100,000	66,000
1,980	5/64	85,000	56,000	3,050		106,000	69,000
1,990		85,000	56,000	3,100		106,000	69,000
2,000		85,000	56,000	3,150		106,000	69,000
2,050		85,000	56,000	3,170	1/8	106,000	69,000
2,060		85,000	56,000	3,200		106,000	69,000
2,080		85,000	56,000	3,250		106,000	69,000
2,100		85,000	56,000	3,260		106,000	69,000
2,150		90,000	59,000	3,270		106,000	69,000
2,180		90,000	59,000	3,300		106,000	69,000



d1		l1	l2
mm	inch	mm	mm
3,400		112,000	73,000
3,450		112,000	73,000
3,500		112,000	73,000
3,550		112,000	73,000
3,570	9/64	112,000	73,000
3,600		112,000	73,000
3,660		112,000	73,000
3,700		112,000	73,000
3,730		112,000	73,000
3,750		112,000	73,000
3,800		119,000	78,000
3,860		119,000	78,000
3,900		119,000	78,000
3,910		119,000	78,000
3,970	5/32	119,000	78,000
3,990		119,000	78,000
4,000		119,000	78,000
4,040		119,000	78,000
4,050		119,000	78,000
4,090		119,000	78,000
4,100		119,000	78,000
4,130		119,000	78,000
4,150		119,000	78,000
4,200		119,000	78,000
4,220		119,000	78,000
4,250		119,000	78,000
4,300		126,000	82,000
4,350		126,000	82,000
4,370	11/64	126,000	82,000
4,390		126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,570		126,000	82,000
4,600		126,000	82,000
4,620		126,000	82,000
4,700		126,000	82,000
4,750		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
4,850		132,000	87,000
4,900		132,000	87,000
4,920		132,000	87,000
4,980		132,000	87,000
5,000		132,000	87,000
5,050		132,000	87,000
5,060		132,000	87,000
5,100		132,000	87,000
5,110		132,000	87,000
5,160	13/64	132,000	87,000
5,180		132,000	87,000
5,200		132,000	87,000
5,220		132,000	87,000
5,250		132,000	87,000
5,300		132,000	87,000
5,310		139,000	91,000
5,400		139,000	91,000
5,410		139,000	91,000
5,500		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,610		139,000	91,000
5,700		139,000	91,000
5,750		139,000	91,000
5,790		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,940		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,040		148,000	97,000
6,050		148,000	97,000
6,100		148,000	97,000

d1		l1	l2
mm	inch	mm	mm
6,150		148,000	97,000
6,200		148,000	97,000
6,250		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,530		148,000	97,000
6,600		148,000	97,000
6,630		148,000	97,000
6,700		148,000	97,000
6,750	17/64	156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000
6,910		156,000	102,000
7,000		156,000	102,000
7,030		156,000	102,000
7,040		156,000	102,000
7,100		156,000	102,000
7,140	9/32	156,000	102,000
7,200		156,000	102,000
7,300		156,000	102,000
7,370		156,000	102,000
7,400		156,000	102,000
7,490		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,600		165,000	109,000
7,670		165,000	109,000
7,700		165,000	109,000
7,750		165,000	109,000
7,800		165,000	109,000
7,850		165,000	109,000
7,900		165,000	109,000
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,030		165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,250		165,000	109,000
8,300		165,000	109,000
8,330	21/64	165,000	109,000
8,400		165,000	109,000
8,430		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,610		175,000	115,000
8,700		175,000	115,000
8,730	11/32	175,000	115,000
8,800		175,000	115,000
8,840		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,090		175,000	115,000
9,100		175,000	115,000
9,130	23/64	175,000	115,000
9,200		175,000	115,000
9,300		175,000	115,000
9,340		175,000	115,000
9,350		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,600		184,000	121,000
9,700		184,000	121,000
9,800		184,000	121,000
9,900		184,000	121,000
9,920	25/64	184,000	121,000
10,000		184,000	121,000
10,080		184,000	121,000
10,100		184,000	121,000
10,200		184,000	121,000



d1		l1	l2
mm	inch	mm	mm
10,300		184,000	121,000
10,320	13/32	184,000	121,000
10,400		184,000	121,000
10,490		184,000	121,000
10,500		184,000	121,000
10,600		184,000	121,000
10,720	27/64	195,000	128,000
10,800		195,000	128,000
10,900		195,000	128,000
11,000		195,000	128,000
11,100		195,000	128,000
11,110	7/16	195,000	128,000
11,300		195,000	128,000
11,400		195,000	128,000
11,500		195,000	128,000
11,800		195,000	128,000
11,900		205,000	134,000
11,910	15/32	205,000	134,000

d1		l1	l2
mm	inch	mm	mm
12,000		205,000	134,000
12,150		205,000	134,000
12,300	31/64	205,000	134,000
12,500		205,000	134,000
12,600		205,000	134,000
12,700	1/2	205,000	134,000
13,000		205,000	134,000
13,100	33/64	205,000	134,000
13,490	17/32	214,000	140,000
13,500		214,000	140,000
13,700		214,000	140,000
13,890	35/64	214,000	140,000
13,900		214,000	140,000
14,000		214,000	140,000



## Helisel matkap uçları, uzun

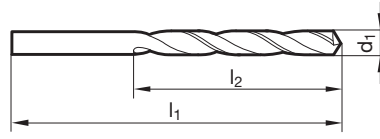


P	•	öz bileme $\geq \varnothing 1,000$ • koni bileme • geniş kanallı • zor talaş atılmasında
M		
K	•	
N	•	1000 N/mm <sup>2</sup> 'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.
S		
H		

## GÜHRING NAVIGATOR

Kesme verileri sayfası 786

Malzeme	HSS
Yüzey	S
Kesme yönü	R



Ürün no 668

SİLİNDİR ŞAFTLI MATKAP UCU

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	2,800		100,000	66,000
1,090		60,000	37,000	2,820		100,000	66,000
1,100		60,000	37,000	2,850		100,000	66,000
1,180		60,000	37,000	2,870		100,000	66,000
1,190	3/64	65,000	41,000	2,900		100,000	66,000
1,200		65,000	41,000	2,950		100,000	66,000
1,300		65,000	41,000	3,000		100,000	66,000
1,320		65,000	41,000	3,050		106,000	69,000
1,400		70,000	45,000	3,100		106,000	69,000
1,500		70,000	45,000	3,170	1/8	106,000	69,000
1,510		76,000	50,000	3,200		106,000	69,000
1,590	1/16	76,000	50,000	3,250		106,000	69,000
1,600		76,000	50,000	3,260		106,000	69,000
1,650		76,000	50,000	3,300		106,000	69,000
1,700		76,000	50,000	3,400		112,000	73,000
1,800		80,000	53,000	3,450		112,000	73,000
1,850		80,000	53,000	3,500		112,000	73,000
1,900		80,000	53,000	3,570	9/64	112,000	73,000
1,930		85,000	56,000	3,600		112,000	73,000
1,950		85,000	56,000	3,700		112,000	73,000
1,980	5/64	85,000	56,000	3,730		112,000	73,000
1,990		85,000	56,000	3,750		112,000	73,000
2,000		85,000	56,000	3,800		119,000	78,000
2,060		85,000	56,000	3,860		119,000	78,000
2,080		85,000	56,000	3,870		119,000	78,000
2,100		85,000	56,000	3,900		119,000	78,000
2,180		90,000	59,000	3,910		119,000	78,000
2,200		90,000	59,000	3,970	5/32	119,000	78,000
2,260		90,000	59,000	4,000		119,000	78,000
2,300		90,000	59,000	4,040		119,000	78,000
2,380	3/32	95,000	62,000	4,090		119,000	78,000
2,400		95,000	62,000	4,100		119,000	78,000
2,490		95,000	62,000	4,200		119,000	78,000
2,500		95,000	62,000	4,220		119,000	78,000
2,530		95,000	62,000	4,300		126,000	82,000
2,550		95,000	62,000	4,370	11/64	126,000	82,000
2,580		95,000	62,000	4,400		126,000	82,000
2,600		95,000	62,000	4,500		126,000	82,000
2,640		95,000	62,000	4,600		126,000	82,000
2,700		100,000	66,000	4,700		126,000	82,000
2,710		100,000	66,000	4,760	3/16	132,000	87,000
2,780	7/64	100,000	66,000	4,800		132,000	87,000

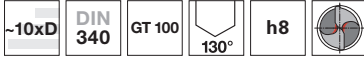


d1		l1	l2
mm	inch	mm	mm
4,850		132,000	87,000
4,900		132,000	87,000
4,910		132,000	87,000
4,920		132,000	87,000
5,000		132,000	87,000
5,060		132,000	87,000
5,100		132,000	87,000
5,160	13/64	132,000	87,000
5,200		132,000	87,000
5,300		132,000	87,000
5,400		139,000	91,000
5,500		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,700		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,040		148,000	97,000
6,100		148,000	97,000
6,150		148,000	97,000
6,200		148,000	97,000
6,250		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,530		148,000	97,000
6,600		148,000	97,000
6,630		148,000	97,000
6,700		148,000	97,000
6,750	17/64	156,000	102,000
6,760		156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,100		156,000	102,000
7,140	9/32	156,000	102,000
7,250		156,000	102,000
7,300		156,000	102,000
7,370		156,000	102,000
7,490		156,000	102,000
7,500		156,000	102,000
7,600		165,000	109,000
7,700		165,000	109,000
7,800		165,000	109,000
7,900		165,000	109,000

d1		l1	l2
mm	inch	mm	mm
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,200		165,000	109,000
8,300		165,000	109,000
8,400		165,000	109,000
8,430		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,610		175,000	115,000
8,700		175,000	115,000
8,730	11/32	175,000	115,000
8,800		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,130	23/64	175,000	115,000
9,200		175,000	115,000
9,340		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,700		184,000	121,000
9,900		184,000	121,000
9,920	25/64	184,000	121,000
10,000		184,000	121,000
10,100		184,000	121,000
10,200		184,000	121,000
10,320	13/32	184,000	121,000
10,500		184,000	121,000
11,000		195,000	128,000
11,110	7/16	195,000	128,000
11,500		195,000	128,000
11,510	29/64	195,000	128,000
11,910	15/32	205,000	134,000
12,000		205,000	134,000
12,300	31/64	205,000	134,000
12,700	1/2	205,000	134,000
13,000		205,000	134,000
14,000		214,000	140,000



## Helisel matkap uçları, uzun

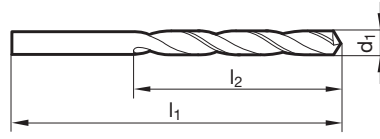


P	•	öz bileme $\geq \varnothing 1,000$ • koni bileme • geniş kanallı • zor talaş atılmasında
M		
K	•	
N	•	1000 N/mm <sup>2</sup> 'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.
S		
H		

## GÜHRING NAVIGATOR

Kesme verileri sayfası 786

Malzeme	HSS
Yüzey	F
Kesme yönü	R



Ürün no 2462

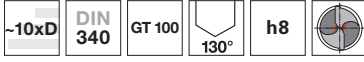
SİLİNDİR ŞAFTLI MATKAP UCU

d1		l1	l2
mm	inch	mm	mm
1,000		56,000	33,000
1,100		60,000	37,000
1,200		65,000	41,000
1,300		65,000	41,000
1,500		70,000	45,000
1,600		76,000	50,000
1,700		76,000	50,000
1,800		80,000	53,000
1,900		80,000	53,000
2,000		85,000	56,000
2,100		85,000	56,000
2,200		90,000	59,000
2,300		90,000	59,000
2,400		95,000	62,000
2,500		95,000	62,000
2,600		95,000	62,000
2,800		100,000	66,000
2,900		100,000	66,000
3,000		100,000	66,000
3,100		106,000	69,000
3,200		106,000	69,000
3,300		106,000	69,000
3,400		112,000	73,000
3,500		112,000	73,000

d1		l1	l2
mm	inch	mm	mm
3,800		119,000	78,000
4,000		119,000	78,000
4,200		119,000	78,000
4,300		126,000	82,000
4,500		126,000	82,000
4,800		132,000	87,000
5,000		132,000	87,000
5,200		132,000	87,000
5,400		139,000	91,000
5,500		139,000	91,000
6,000		139,000	91,000
6,100		148,000	97,000
6,200		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,800		156,000	102,000
7,000		156,000	102,000
7,200		156,000	102,000
7,300		156,000	102,000
7,600		165,000	109,000
8,000		165,000	109,000
9,000		175,000	115,000
10,000		184,000	121,000



## Helisel matkap uçları, uzun



**P** • öz bileme  $\geq \varnothing 1,400$  • koni bileme • geniş kanallı • zor talaş atılmasında

**M****K** •

**N** •  $1000 \text{ N/mm}^2$ 'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.

**S****H**

Malzeme

**HSS**

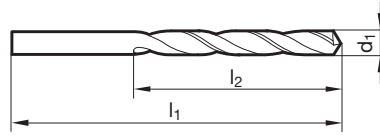
Yüzey

 $\geq 0,2,36$ 

Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 786

SİLİNDİR ŞAFTLI MATKAP  
UCU

Ürün no

**506**

d1		l1	l2
mm	inch	mm	mm
1,400		70,000	45,000
1,500		70,000	45,000
1,600		76,000	50,000
1,680		76,000	50,000
1,800		80,000	53,000
1,850		80,000	53,000
2,000		85,000	56,000
2,200		90,000	59,000
2,300		90,000	59,000
2,350		90,000	59,000
2,500		95,000	62,000
2,800		100,000	66,000
3,000		100,000	66,000
3,050		106,000	69,000
3,200		106,000	69,000
3,300		106,000	69,000
3,400		112,000	73,000
3,500		112,000	73,000
3,550		112,000	73,000
3,800		119,000	78,000
3,950		119,000	78,000
4,000		119,000	78,000
4,400		126,000	82,000
4,500		126,000	82,000

d1		l1	l2
mm	inch	mm	mm
4,600		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
4,950		132,000	87,000
5,160	13/64	132,000	87,000
5,200		132,000	87,000
5,400		139,000	91,000
5,600		139,000	91,000
5,700		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
6,000		139,000	91,000
7,400		156,000	102,000
7,800		165,000	109,000
8,500		165,000	109,000
9,000		175,000	115,000
9,900		184,000	121,000
10,320	13/32	184,000	121,000
11,000		195,000	128,000
11,500		195,000	128,000
11,600		195,000	128,000
12,000		205,000	134,000
12,500		205,000	134,000
13,000		205,000	134,000





## Helisel matkap uçları, uzun



**P** öz bileme  $\geq \varnothing 2,370$  • koni bileme • Özellikle geniş talaş kanalı



**N** yumuşak uzun talaşlı malzemeler  $1200 \text{ N/mm}^2$ 'ye kadar • otomat çelikleri (yumuşak) • Alüminyum/Al-alaşimleri (uzun talaşlı) • çinko, saflaştırılmış bakır, silümin, elektrotlar • zamak, argalyum, yumuşal plastikler, ahşap

## GÜHRING NAVIGATOR

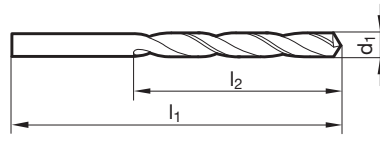
Kesme verileri sayfası 786

Malzeme **HSS**

Yüzey



Kesme yönü

Ürün no **501**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	2,350		90,000	59,000
1,020		56,000	33,000	2,370		95,000	62,000
1,030		56,000	33,000	2,380	3/32	95,000	62,000
1,040		56,000	33,000	2,400		95,000	62,000
1,070		60,000	37,000	2,440		95,000	62,000
1,090		60,000	37,000	2,450		95,000	62,000
1,100		60,000	37,000	2,490		95,000	62,000
1,180		60,000	37,000	2,500		95,000	62,000
1,190	3/64	65,000	41,000	2,520		95,000	62,000
1,200		65,000	41,000	2,530		95,000	62,000
1,250		65,000	41,000	2,550		95,000	62,000
1,300		65,000	41,000	2,580		95,000	62,000
1,320		65,000	41,000	2,600		95,000	62,000
1,400		70,000	45,000	2,640		95,000	62,000
1,450		70,000	45,000	2,650		95,000	62,000
1,480		70,000	45,000	2,700		100,000	66,000
1,500		70,000	45,000	2,710		100,000	66,000
1,510		76,000	50,000	2,750		100,000	66,000
1,550		76,000	50,000	2,780	7/64	100,000	66,000
1,590	1/16	76,000	50,000	2,790		100,000	66,000
1,600		76,000	50,000	2,800		100,000	66,000
1,610		76,000	50,000	2,820		100,000	66,000
1,700		76,000	50,000	2,850		100,000	66,000
1,750		80,000	53,000	2,870		100,000	66,000
1,780		80,000	53,000	2,900		100,000	66,000
1,800		80,000	53,000	2,950		100,000	66,000
1,850		80,000	53,000	3,000		100,000	66,000
1,900		80,000	53,000	3,050		106,000	69,000
1,930		85,000	56,000	3,100		106,000	69,000
1,950		85,000	56,000	3,170	1/8	106,000	69,000
1,980	5/64	85,000	56,000	3,200		106,000	69,000
1,990		85,000	56,000	3,250		106,000	69,000
2,000		85,000	56,000	3,260		106,000	69,000
2,050		85,000	56,000	3,300		106,000	69,000
2,060		85,000	56,000	3,350		106,000	69,000
2,080		85,000	56,000	3,400		112,000	73,000
2,100		85,000	56,000	3,450		112,000	73,000
2,180		90,000	59,000	3,500		112,000	73,000
2,200		90,000	59,000	3,570	9/64	112,000	73,000
2,250		90,000	59,000	3,600		112,000	73,000
2,260		90,000	59,000	3,650		112,000	73,000
2,300		90,000	59,000	3,660		112,000	73,000

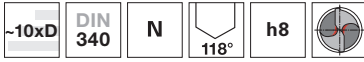


d1		l1	l2
mm	inch	mm	mm
3,700		112,000	73,000
3,800		119,000	78,000
3,860		119,000	78,000
3,900		119,000	78,000
3,910		119,000	78,000
3,970	5/32	119,000	78,000
3,990		119,000	78,000
4,000		119,000	78,000
4,040		119,000	78,000
4,050		119,000	78,000
4,090		119,000	78,000
4,100		119,000	78,000
4,200		119,000	78,000
4,220		119,000	78,000
4,250		119,000	78,000
4,300		126,000	82,000
4,350		126,000	82,000
4,370	11/64	126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,570		126,000	82,000
4,600		126,000	82,000
4,620		126,000	82,000
4,700		126,000	82,000
4,750		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
4,850		132,000	87,000
4,900		132,000	87,000
4,920		132,000	87,000
4,980		132,000	87,000
5,000		132,000	87,000
5,060		132,000	87,000
5,100		132,000	87,000
5,110		132,000	87,000
5,160	13/64	132,000	87,000
5,180		132,000	87,000
5,200		132,000	87,000
5,300		132,000	87,000
5,310		139,000	91,000
5,400		139,000	91,000
5,410		139,000	91,000
5,500		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,610		139,000	91,000
5,650		139,000	91,000
5,700		139,000	91,000
5,790		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,940		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,030		148,000	97,000
6,040		148,000	97,000
6,150		148,000	97,000
6,200		148,000	97,000
6,250		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,530		148,000	97,000
6,600		148,000	97,000
6,630		148,000	97,000
6,700		148,000	97,000
6,750	17/64	156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,040		156,000	102,000

d1		l1	l2
mm	inch	mm	mm
7,100		156,000	102,000
7,140	9/32	156,000	102,000
7,300		156,000	102,000
7,370		156,000	102,000
7,490		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,600		165,000	109,000
7,670		165,000	109,000
7,900		165,000	109,000
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,025		165,000	109,000
8,030		165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,330	21/64	165,000	109,000
8,430		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,610		175,000	115,000
8,700		175,000	115,000
8,730	11/32	175,000	115,000
8,750		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,090		175,000	115,000
9,100		175,000	115,000
9,130	23/64	175,000	115,000
9,300		175,000	115,000
9,340		175,000	115,000
9,350		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,580		184,000	121,000
9,600		184,000	121,000
9,800		184,000	121,000
9,900		184,000	121,000
9,920	25/64	184,000	121,000
10,000		184,000	121,000
10,080		184,000	121,000
10,200		184,000	121,000
10,260		184,000	121,000
10,320	13/32	184,000	121,000
10,500		184,000	121,000
10,600		184,000	121,000
10,700		195,000	128,000
10,720	27/64	195,000	128,000
10,800		195,000	128,000
11,000		195,000	128,000
11,110	7/16	195,000	128,000
11,200		195,000	128,000
11,400		195,000	128,000
11,500		195,000	128,000
11,510	29/64	195,000	128,000
11,750		195,000	128,000
11,800		195,000	128,000
11,900		205,000	134,000
11,910	15/32	205,000	134,000
12,000		205,000	134,000
12,200		205,000	134,000
12,300	31/64	205,000	134,000
12,500		205,000	134,000
12,700	1/2	205,000	134,000
13,000		205,000	134,000
13,100	33/64	205,000	134,000
13,490	17/32	214,000	140,000
14,000		214,000	140,000
32,600		325,000	213,000



## Helisel matkap uçları, uzun

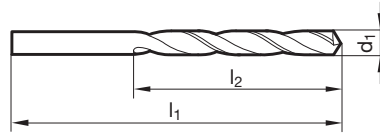


<b>P</b>	•	öz bileme $\geq \varnothing 1,000$ • koni bileme • Co-alaşımlı HSS-çeliği • arttırılmış aşınma direnci
<b>M</b>	○	
<b>K</b>	•	
<b>N</b>	•	alaşım/alaşısız çelikler ve döküm , 800 N/mm <sup>2</sup> üzerinde • sıcak ve soğuk işlem çelikleri • rulman çeliği • yüksek alaşımli çelikleri • ıslah çelikleri ve sementasyon çelikleri
<b>S</b>	○	
<b>H</b>		

## GÜHRING NAVIGATOR

Kesme verileri sayfası 792

Malzeme	<b>HSCO</b>
Yüzey	$\text{Ra} > 2,36$
Kesme yönü	<b>R</b>



Ürün no 317

SİLİNDİR ŞAFTLI MATKAP UCU

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,500		32,000	12,000	2,500		95,000	62,000
0,600		35,000	15,000	2,600		95,000	62,000
0,700		42,000	21,000	2,700		100,000	66,000
0,750		42,000	21,000	2,780	7/64	100,000	66,000
0,800		46,000	25,000	2,800		100,000	66,000
0,850		46,000	25,000	2,900		100,000	66,000
0,900		51,000	29,000	3,000		100,000	66,000
0,950		51,000	29,000	3,050		106,000	69,000
0,960		56,000	33,000	3,100		106,000	69,000
1,000		56,000	33,000	3,170	1/8	106,000	69,000
1,020		56,000	33,000	3,200		106,000	69,000
1,050		56,000	33,000	3,250		106,000	69,000
1,100		60,000	37,000	3,300		106,000	69,000
1,150		60,000	37,000	3,400		112,000	73,000
1,190	3/64	65,000	41,000	3,500		112,000	73,000
1,200		65,000	41,000	3,550		112,000	73,000
1,250		65,000	41,000	3,570	9/64	112,000	73,000
1,300		65,000	41,000	3,600		112,000	73,000
1,350		70,000	45,000	3,700		112,000	73,000
1,400		70,000	45,000	3,800		119,000	78,000
1,450		70,000	45,000	3,900		119,000	78,000
1,500		70,000	45,000	3,970	5/32	119,000	78,000
1,510		76,000	50,000	4,000		119,000	78,000
1,550		76,000	50,000	4,040		119,000	78,000
1,590	1/16	76,000	50,000	4,100		119,000	78,000
1,600		76,000	50,000	4,200		119,000	78,000
1,650		76,000	50,000	4,300		126,000	82,000
1,700		76,000	50,000	4,370	11/64	126,000	82,000
1,780		80,000	53,000	4,400		126,000	82,000
1,800		80,000	53,000	4,500		126,000	82,000
1,850		80,000	53,000	4,600		126,000	82,000
1,900		80,000	53,000	4,700		126,000	82,000
1,950		85,000	56,000	4,760	3/16	132,000	87,000
1,980	5/64	85,000	56,000	4,800		132,000	87,000
2,000		85,000	56,000	4,850		132,000	87,000
2,050		85,000	56,000	4,900		132,000	87,000
2,060		85,000	56,000	5,000		132,000	87,000
2,100		85,000	56,000	5,050		132,000	87,000
2,200		90,000	59,000	5,100		132,000	87,000
2,300		90,000	59,000	5,160	13/64	132,000	87,000
2,380	3/32	95,000	62,000	5,200		132,000	87,000
2,400		95,000	62,000	5,300		132,000	87,000



d1		l1	l2
mm	inch	mm	mm
5,400		139,000	91,000
5,500		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,700		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,100		148,000	97,000
6,200		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,630		148,000	97,000
6,750	17/64	156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,140	9/32	156,000	102,000
7,200		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,600		165,000	109,000
7,700		165,000	109,000
7,800		165,000	109,000
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,200		165,000	109,000
8,330	21/64	165,000	109,000
8,430		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,730	11/32	175,000	115,000
8,800		175,000	115,000
9,000		175,000	115,000
9,130	23/64	175,000	115,000
9,200		175,000	115,000
9,300		175,000	115,000
9,500		175,000	115,000

d1		l1	l2
mm	inch	mm	mm
9,520	3/8	184,000	121,000
9,700		184,000	121,000
9,920	25/64	184,000	121,000
10,000		184,000	121,000
10,100		184,000	121,000
10,200		184,000	121,000
10,320	13/32	184,000	121,000
10,500		184,000	121,000
10,720	27/64	195,000	128,000
10,750		195,000	128,000
10,800		195,000	128,000
11,000		195,000	128,000
11,110	7/16	195,000	128,000
11,200		195,000	128,000
11,500		195,000	128,000
11,510	29/64	195,000	128,000
11,910	15/32	205,000	134,000
12,000		205,000	134,000
12,300	31/64	205,000	134,000
12,500		205,000	134,000
12,700	1/2	205,000	134,000
13,000		205,000	134,000
13,100	33/64	205,000	134,000
13,500		214,000	140,000
13,700		214,000	140,000
13,890	35/64	214,000	140,000
13,900		214,000	140,000
14,000		214,000	140,000
14,290	9/16	220,000	144,000
14,400		220,000	144,000
14,600		220,000	144,000
14,680	37/64	220,000	144,000
14,700		220,000	144,000
14,750		220,000	144,000
14,900		220,000	144,000
15,000		220,000	144,000
15,080	19/32	227,000	149,000
15,480	39/64	227,000	149,000
15,800		227,000	149,000
15,870	5/8	227,000	149,000
16,000		227,000	149,000
22,000		268,000	176,000



## Helisel matkap uçları, uzun

Malzeme **HSC0**

Yüzey

Kesme yönü

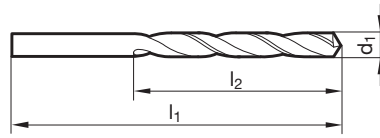
**P** • öz bileme  $\geq \varnothing 1,000$  • koni bileme • Co-alaşımlı HSS-çeliği • geniş kanallı  
• artırılmış aşınma direnci • zor talaş atılmasında

**M** •**K** •

**N** • alaşım/alaşısız çelikler ve döküm,  $800 \text{ N/mm}^2$  üzerinde • sıcak ve  
soğuk işlem çelikleri • rulman çeliği • yüksek alaşım çelikleri • ıslah  
çelikleri ve sementasyon çelikleri

**S** •**H** •**GÜHRING** NAVIGATOR

Kesme verileri sayfası 792

Ürün no **336**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	2,440		95,000	62,000
1,020		56,000	33,000	2,450		95,000	62,000
1,040		56,000	33,000	2,490		95,000	62,000
1,070		60,000	37,000	2,500		95,000	62,000
1,090		60,000	37,000	2,530		95,000	62,000
1,100		60,000	37,000	2,550		95,000	62,000
1,180		60,000	37,000	2,580		95,000	62,000
1,190	3/64	65,000	41,000	2,600		95,000	62,000
1,200		65,000	41,000	2,640		95,000	62,000
1,250		65,000	41,000	2,700		100,000	66,000
1,300		65,000	41,000	2,710		100,000	66,000
1,320		65,000	41,000	2,750		100,000	66,000
1,400		70,000	45,000	2,780	7/64	100,000	66,000
1,500		70,000	45,000	2,790		100,000	66,000
1,510		76,000	50,000	2,800		100,000	66,000
1,550		76,000	50,000	2,820		100,000	66,000
1,590	1/16	76,000	50,000	2,850		100,000	66,000
1,600		76,000	50,000	2,870		100,000	66,000
1,610		76,000	50,000	2,900		100,000	66,000
1,700		76,000	50,000	2,950		100,000	66,000
1,750		80,000	53,000	3,000		100,000	66,000
1,780		80,000	53,000	3,050		106,000	69,000
1,800		80,000	53,000	3,100		106,000	69,000
1,850		80,000	53,000	3,170	1/8	106,000	69,000
1,900		80,000	53,000	3,200		106,000	69,000
1,930		85,000	56,000	3,260		106,000	69,000
1,980	5/64	85,000	56,000	3,300		106,000	69,000
1,990		85,000	56,000	3,400		112,000	73,000
2,000		85,000	56,000	3,440		112,000	73,000
2,050		85,000	56,000	3,450		112,000	73,000
2,060		85,000	56,000	3,500		112,000	73,000
2,080		85,000	56,000	3,570	9/64	112,000	73,000
2,100		85,000	56,000	3,600		112,000	73,000
2,180		90,000	59,000	3,660		112,000	73,000
2,200		90,000	59,000	3,700		112,000	73,000
2,250		90,000	59,000	3,730		112,000	73,000
2,260		90,000	59,000	3,750		112,000	73,000
2,300		90,000	59,000	3,800		119,000	78,000
2,350		90,000	59,000	3,860		119,000	78,000
2,370		95,000	62,000	3,900		119,000	78,000
2,380	3/32	95,000	62,000	3,910		119,000	78,000
2,400		95,000	62,000	3,970	5/32	119,000	78,000

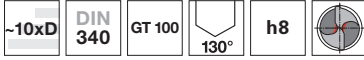


d1		l1	l2
mm	inch	mm	mm
3,990		119,000	78,000
4,000		119,000	78,000
4,040		119,000	78,000
4,090		119,000	78,000
4,100		119,000	78,000
4,200		119,000	78,000
4,220		119,000	78,000
4,300		126,000	82,000
4,370	11/64	126,000	82,000
4,390		126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,570		126,000	82,000
4,600		126,000	82,000
4,620		126,000	82,000
4,700		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
4,850		132,000	87,000
4,900		132,000	87,000
4,920		132,000	87,000
4,980		132,000	87,000
5,000		132,000	87,000
5,060		132,000	87,000
5,100		132,000	87,000
5,110		132,000	87,000
5,160	13/64	132,000	87,000
5,180		132,000	87,000
5,200		132,000	87,000
5,220		132,000	87,000
5,300		132,000	87,000
5,310		139,000	91,000
5,400		139,000	91,000
5,410		139,000	91,000
5,500		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,610		139,000	91,000
5,700		139,000	91,000
5,790		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,940		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,040		148,000	97,000
6,100		148,000	97,000
6,150		148,000	97,000
6,200		148,000	97,000
6,250		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,530		148,000	97,000
6,600		148,000	97,000
6,630		148,000	97,000
6,700		148,000	97,000
6,750	17/64	156,000	102,000
6,800		156,000	102,000

d1		l1	l2
mm	inch	mm	mm
6,900		156,000	102,000
7,000		156,000	102,000
7,030		156,000	102,000
7,100		156,000	102,000
7,140	9/32	156,000	102,000
7,200		156,000	102,000
7,300		156,000	102,000
7,370		156,000	102,000
7,400		156,000	102,000
7,490		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,670		165,000	109,000
7,700		165,000	109,000
7,800		165,000	109,000
7,900		165,000	109,000
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,030		165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,300		165,000	109,000
8,400		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,610		175,000	115,000
8,700		175,000	115,000
8,730	11/32	175,000	115,000
8,800		175,000	115,000
8,840		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,090		175,000	115,000
9,100		175,000	115,000
9,200		175,000	115,000
9,300		175,000	115,000
9,350		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,700		184,000	121,000
9,750		184,000	121,000
9,800		184,000	121,000
9,900		184,000	121,000
10,000		184,000	121,000
10,200		184,000	121,000
10,500		184,000	121,000
10,750		195,000	128,000
10,800		195,000	128,000
10,900		195,000	128,000
11,000		195,000	128,000
11,500		195,000	128,000
11,800		195,000	128,000
12,000		205,000	134,000
12,500		205,000	134,000
13,000		205,000	134,000
15,500		227,000	149,000
16,000		227,000	149,000



## Helisel matkap uçları, uzun

Malzeme **HSCO**Yüzey **F**Kesme yönü **R**

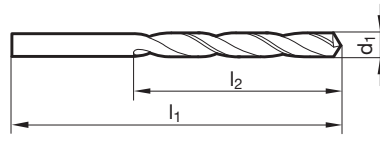
**P** • öz bileme  $\geq \varnothing 1,000$  • koni bileme • Co-alaşımli HSS-çeliği • geniş kanallı  
• özellikle yüksek aşınma dirençli • zor talaş atılmasında

**M** •**K** •

**N** • alaşımli/alaşımli çelikler ve döküm , 800 N/mm<sup>2</sup> üzerinde • sıcak ve soğuk işlem çelikleri • rulman çeliği • yüksek alaşımli çelikleri • ıslah çelikleri ve sementasyon çelikleri

**S** •**H** •**GÜHRING** NAVIGATOR

Kesme verileri sayfası 792

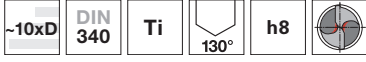
Ürün no **396**

SİLİNDİR ŞAFTLI MATKAP UCU

d1		l1	l2
mm	inch	mm	mm
1,000		56,000	33,000
1,100		60,000	37,000
1,200		65,000	41,000
1,300		65,000	41,000
1,500		70,000	45,000
1,600		76,000	50,000
1,800		80,000	53,000
1,900		80,000	53,000
2,000		85,000	56,000
2,100		85,000	56,000
2,200		90,000	59,000
2,300		90,000	59,000
2,400		95,000	62,000
2,500		95,000	62,000
2,700		100,000	66,000
2,800		100,000	66,000
2,900		100,000	66,000
3,000		100,000	66,000
3,100		106,000	69,000
3,200		106,000	69,000
3,300		106,000	69,000
3,400		112,000	73,000
3,500		112,000	73,000
3,600		112,000	73,000
3,800		119,000	78,000
3,900		119,000	78,000
4,000		119,000	78,000
4,100		119,000	78,000
4,200		119,000	78,000
4,500		126,000	82,000
4,800		132,000	87,000
5,000		132,000	87,000
5,100		132,000	87,000
5,200		132,000	87,000
5,400		139,000	91,000
5,500		139,000	91,000

d1		l1	l2
mm	inch	mm	mm
5,800		139,000	91,000
5,900		139,000	91,000
6,000		139,000	91,000
6,200		148,000	97,000
6,500		148,000	97,000
6,700		148,000	97,000
6,800		156,000	102,000
7,000		156,000	102,000
7,200		156,000	102,000
7,400		156,000	102,000
7,500		156,000	102,000
7,600		165,000	109,000
7,700		165,000	109,000
7,800		165,000	109,000
7,900		165,000	109,000
8,000		165,000	109,000
8,200		165,000	109,000
8,300		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,800		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,100		175,000	115,000
9,200		175,000	115,000
9,300		175,000	115,000
9,500		175,000	115,000
9,600		184,000	121,000
9,700		184,000	121,000
10,000		184,000	121,000
10,200		184,000	121,000
10,500		184,000	121,000
11,000		195,000	128,000
11,500		195,000	128,000
12,000		205,000	134,000

## Helisel matkap uçları, uzun



**P** öz bileme  $\geq \varnothing 1,000$  • koni bileme • Co-alaşımlı HSS-çeliği • arttırılmış aşınma direnci

**M**

**K**

**N** Titanyum ve Ti alaşımları • pas/aşide/ısıya dayanıklı ostenitik çelikler

**S** • 900 N/mm<sup>2</sup> üstü yüksek mukavemetli, kısa talaşlı çelikler • rulman çeliği • Hastelloy, Inconel, Nimonic

**H**

Malzeme

HSCO

Yüzey

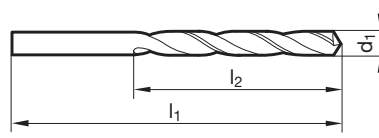


Kesme yönü



## GÜHRING NAVIGATOR

Kesme verileri sayfası 792



Ürün no

617

d1		l1	l2
mm	inch	mm	mm
1,000		56,000	33,000
1,100		60,000	37,000
1,200		65,000	41,000
1,300		65,000	41,000
1,400		70,000	45,000
1,450		70,000	45,000
1,500		70,000	45,000
1,590	1/16	76,000	50,000
1,600		76,000	50,000
1,610		76,000	50,000
1,650		76,000	50,000
1,700		76,000	50,000
1,750		80,000	53,000
1,800		80,000	53,000
1,850		80,000	53,000
1,900		80,000	53,000
1,930		85,000	56,000
1,950		85,000	56,000
1,980	5/64	85,000	56,000
2,000		85,000	56,000
2,050		85,000	56,000
2,100		85,000	56,000
2,150		90,000	59,000
2,200		90,000	59,000
2,260		90,000	59,000
2,300		90,000	59,000
2,380	3/32	95,000	62,000
2,400		95,000	62,000
2,450		95,000	62,000
2,500		95,000	62,000
2,550		95,000	62,000
2,600		95,000	62,000
2,700		100,000	66,000
2,780	7/64	100,000	66,000
2,800		100,000	66,000
2,900		100,000	66,000
3,000		100,000	66,000
3,050		106,000	69,000
3,100		106,000	69,000
3,170	1/8	106,000	69,000
3,200		106,000	69,000
3,250		106,000	69,000

d1		l1	l2
mm	inch	mm	mm
3,300		106,000	69,000
3,400		112,000	73,000
3,450		112,000	73,000
3,500		112,000	73,000
3,570	9/64	112,000	73,000
3,600		112,000	73,000
3,700		112,000	73,000
3,800		119,000	78,000
3,900		119,000	78,000
3,970	5/32	119,000	78,000
4,000		119,000	78,000
4,050		119,000	78,000
4,100		119,000	78,000
4,200		119,000	78,000
4,300		126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,600		126,000	82,000
4,700		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
4,900		132,000	87,000
4,950		132,000	87,000
5,000		132,000	87,000
5,100		132,000	87,000
5,160	13/64	132,000	87,000
5,200		132,000	87,000
5,300		132,000	87,000
5,400		139,000	91,000
5,500		139,000	91,000
5,600		139,000	91,000
5,700		139,000	91,000
5,800		139,000	91,000
6,000		139,000	91,000
6,100		148,000	97,000
6,200		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,700		148,000	97,000

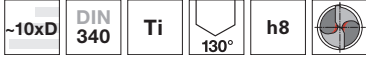




d1		l1	l2
mm	inch	mm	mm
6,750	17/64	156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,100		156,000	102,000
7,140	9/32	156,000	102,000
7,250		156,000	102,000
7,400		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,700		165,000	109,000
7,800		165,000	109,000
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,300		165,000	109,000
8,330	21/64	165,000	109,000
8,400		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,700		175,000	115,000
8,730	11/32	175,000	115,000
8,800		175,000	115,000

d1		l1	l2
mm	inch	mm	mm
9,000		175,000	115,000
9,100		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,800		184,000	121,000
10,000		184,000	121,000
10,200		184,000	121,000
10,500		184,000	121,000
11,000		195,000	128,000
11,110	7/16	195,000	128,000
11,510	29/64	195,000	128,000
12,000		205,000	134,000
12,500		205,000	134,000
13,000		205,000	134,000
15,000		220,000	144,000

## Helisel matkap uçları, uzun



<b>P</b>	○	öz bileme $\geq \varnothing 1,000$ • koni bileme • Co-alaşımlı HSS-çeliği • arttırılmış aşınma direnci
<b>M</b>	●	
<b>K</b>	●	
<b>N</b>	●	Titanyum ve Ti alaşımları • pas/aşide/ısıya dayanıklı ostenitik çelikler
<b>S</b>	●	• 900 N/mm <sup>2</sup> üstü yüksek mukavemetli, kısa talaşlı çelikler • rulman çeliği • Hastelloy, Inconel, Nimonic
<b>H</b>	●	

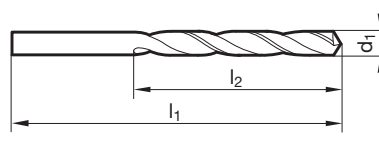
## GÜHRING NAVIGATOR

Kesme verileri sayfası 792

Malzeme HSC0

Yüzey S

Kesme yönü R



Ürün no 669

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	4,300		126,000	82,000
1,200		65,000	41,000	4,370	11/64	126,000	82,000
1,300		65,000	41,000	4,400		126,000	82,000
1,400		70,000	45,000	4,500		126,000	82,000
1,500		70,000	45,000	4,700		126,000	82,000
1,590	1/16	76,000	50,000	4,760	3/16	132,000	87,000
1,600		76,000	50,000	4,800		132,000	87,000
1,700		76,000	50,000	5,000		132,000	87,000
1,800		80,000	53,000	5,100		132,000	87,000
1,900		80,000	53,000	5,160	13/64	132,000	87,000
1,980	5/64	85,000	56,000	5,200		132,000	87,000
2,000		85,000	56,000	5,300		132,000	87,000
2,050		85,000	56,000	5,500		139,000	91,000
2,100		85,000	56,000	5,600		139,000	91,000
2,200		90,000	59,000	5,700		139,000	91,000
2,300		90,000	59,000	5,800		139,000	91,000
2,380	3/32	95,000	62,000	6,000		139,000	91,000
2,400		95,000	62,000	6,100		148,000	97,000
2,500		95,000	62,000	6,200		148,000	97,000
2,600		95,000	62,000	6,300		148,000	97,000
2,700		100,000	66,000	6,350	1/4	148,000	97,000
2,750		100,000	66,000	6,400		148,000	97,000
2,780	7/64	100,000	66,000	6,500		148,000	97,000
2,800		100,000	66,000	6,700		148,000	97,000
2,900		100,000	66,000	6,750	17/64	156,000	102,000
3,000		100,000	66,000	6,800		156,000	102,000
3,100		106,000	69,000	7,000		156,000	102,000
3,170	1/8	106,000	69,000	7,100		156,000	102,000
3,200		106,000	69,000	7,140	9/32	156,000	102,000
3,250		106,000	69,000	7,200		156,000	102,000
3,300		106,000	69,000	7,400		156,000	102,000
3,400		112,000	73,000	7,500		156,000	102,000
3,500		112,000	73,000	7,540	19/64	165,000	109,000
3,570	9/64	112,000	73,000	7,800		165,000	109,000
3,600		112,000	73,000	7,900		165,000	109,000
3,700		112,000	73,000	7,940	5/16	165,000	109,000
3,800		119,000	78,000	8,000		165,000	109,000
3,900		119,000	78,000	8,200		165,000	109,000
3,970	5/32	119,000	78,000	8,500		165,000	109,000
4,000		119,000	78,000	8,730	11/32	175,000	115,000
4,100		119,000	78,000	9,000		175,000	115,000
4,200		119,000	78,000	9,130	23/64	175,000	115,000



d1		l1	l2
mm	inch	mm	mm
9,300		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
10,000		184,000	121,000
10,200		184,000	121,000

d1		l1	l2
mm	inch	mm	mm



## Helisel matkap uçları, uzun



**P** yüzey Bileme • ana kesici ağız düz form

**M**

**K**

**N**

**S**

**H**

cam elyaf takviyeli plastikler • kesme kenarı ve yüzeylerde aşınmaya sebep veren dropletler

Malzeme

Kom. sert metal

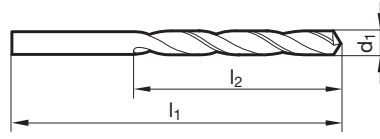
Yüzey



Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 792



Ürün no

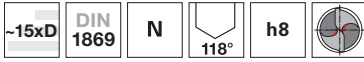
706

d1		l1	l2
mm	inch	mm	mm
0,500		38,000	8,500
0,600		38,000	9,500
0,650		38,000	10,500
0,700		38,000	10,500
0,750		38,000	12,500
0,800		38,000	12,500
0,850		38,000	14,500
0,900		38,000	14,500
1,000		38,000	17,000
1,050		38,000	17,000
1,100		38,000	17,000
1,400		38,000	17,000

d1		l1	l2
mm	inch	mm	mm
1,450		38,000	17,000



## Helisel matkap uçları çok uzun, seri 1



**P** • öz bileme  $\geq \varnothing 2,380$  • koni bileme • çok derin delikler için

**M**

**K** •

**N** ○ alaşım/alaşımız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

**S**

**H**

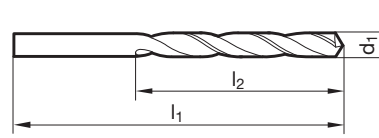
## GÜHRING NAVIGATOR

Kesme verileri sayfası 788

Malzeme **HSS**

Yüzey  $\varnothing_{2,36}^{+0}$

Kesme yönü



Ürün no **235**

Silindir Şaftlı Matkap  
ucu

d1		l1	l2
mm	inch	mm	mm
1,600		115,000	75,000
1,700		115,000	75,000
1,800		120,000	80,000
1,900		120,000	80,000
1,930		125,000	85,000
1,950		125,000	85,000
2,000		125,000	85,000
2,050		125,000	85,000
2,100		125,000	85,000
2,200		135,000	90,000
2,300		135,000	90,000
2,350		135,000	90,000
2,380	3/32	140,000	95,000
2,400		140,000	95,000
2,500		140,000	95,000
2,600		140,000	95,000
2,700		150,000	100,000
2,800		150,000	100,000
2,900		150,000	100,000
3,000		150,000	100,000
3,100		155,000	105,000
3,170	1/8	155,000	105,000
3,200		155,000	105,000
3,250		155,000	105,000
3,300		155,000	105,000
3,400		165,000	115,000
3,500		165,000	115,000
3,570	9/64	165,000	115,000
3,600		165,000	115,000
3,650		165,000	115,000
3,700		165,000	115,000
3,750		165,000	115,000
3,800		175,000	120,000
3,900		175,000	120,000
3,970	5/32	175,000	120,000
4,000		175,000	120,000
4,100		175,000	120,000
4,200		175,000	120,000
4,300		185,000	125,000
4,370	11/64	185,000	125,000
4,400		185,000	125,000
4,500		185,000	125,000

d1		l1	l2
mm	inch	mm	mm
4,600		185,000	125,000
4,700		185,000	125,000
4,760	3/16	195,000	135,000
4,800		195,000	135,000
4,900		195,000	135,000
5,000		195,000	135,000
5,100		195,000	135,000
5,200		195,000	135,000
5,300		195,000	135,000
5,340		205,000	140,000
5,400		205,000	140,000
5,500		205,000	140,000
5,560	7/32	205,000	140,000
5,600		205,000	140,000
5,700		205,000	140,000
5,800		205,000	140,000
5,900		205,000	140,000
6,000		205,000	140,000
6,100		215,000	150,000
6,200		215,000	150,000
6,250		215,000	150,000
6,300	1/4	215,000	150,000
6,350		215,000	150,000
6,400		215,000	150,000
6,500		215,000	150,000
6,600		215,000	150,000
6,700		215,000	150,000
6,750	17/64	225,000	155,000
6,800		225,000	155,000
7,000		225,000	155,000
7,200		225,000	155,000
7,400		225,000	155,000
7,500		225,000	155,000
7,700		240,000	165,000
7,800		240,000	165,000
7,900		240,000	165,000
7,940	5/16	240,000	165,000
8,000		240,000	165,000
8,100		240,000	165,000
8,200		240,000	165,000
8,330	21/64	240,000	165,000
8,400		240,000	165,000

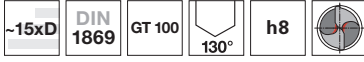


d1		l1	l2
mm	inch	mm	mm
8,500		240,000	165,000
8,700		250,000	175,000
8,730	11/32	250,000	175,000
8,800		250,000	175,000
8,900		250,000	175,000
9,000		250,000	175,000
9,130	23/64	250,000	175,000
9,500		250,000	175,000
9,520	3/8	265,000	185,000
9,600		265,000	185,000
9,700		265,000	185,000
9,800		265,000	185,000
9,900		265,000	185,000
9,920	25/64	265,000	185,000
10,000		265,000	185,000
10,100		265,000	185,000
10,200		265,000	185,000
10,250		265,000	185,000

d1		l1	l2
mm	inch	mm	mm
10,320	13/32	265,000	185,000
10,500		265,000	185,000
11,000		280,000	195,000
11,500		280,000	195,000
11,510	29/64	280,000	195,000
11,800		280,000	195,000
12,000		295,000	205,000
12,100		295,000	205,000
12,250		295,000	205,000
12,300	31/64	295,000	205,000
12,500		295,000	205,000
12,700	1/2	295,000	205,000
13,000		295,000	205,000



## Helisel matkap uçları çok uzun, seri 1

Malzeme **HSS**

Yüzey

Kesme yönü

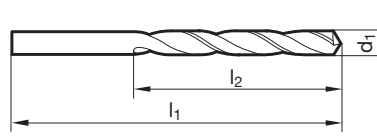
**P** • öz bileme  $\geq \varnothing 1,950$  • koni bileme • geniş kanallı • çok derin delikler için  
• zor talaş atılmasında

**M****K** •**N** •**S****H**

1000 N/mm<sup>2</sup>'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 790

Ürün no **502**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,950		125,000	85,000	4,400		185,000	125,000
2,000		125,000	85,000	4,500		185,000	125,000
2,050		125,000	85,000	4,570		185,000	125,000
2,100		125,000	85,000	4,600		185,000	125,000
2,200		135,000	90,000	4,700		185,000	125,000
2,300		135,000	90,000	4,760	3/16	195,000	135,000
2,370		140,000	95,000	4,800		195,000	135,000
2,380	3/32	140,000	95,000	4,900		195,000	135,000
2,400		140,000	95,000	5,000		195,000	135,000
2,500		140,000	95,000	5,100		195,000	135,000
2,550		140,000	95,000	5,110		195,000	135,000
2,580		140,000	95,000	5,160	13/64	195,000	135,000
2,600		140,000	95,000	5,200		195,000	135,000
2,700		150,000	100,000	5,300		195,000	135,000
2,780	7/64	150,000	100,000	5,400		205,000	140,000
2,800		150,000	100,000	5,500		205,000	140,000
2,850		150,000	100,000	5,560	7/32	205,000	140,000
2,870		150,000	100,000	5,600		205,000	140,000
2,900		150,000	100,000	5,700		205,000	140,000
2,950		150,000	100,000	5,750		205,000	140,000
3,000		150,000	100,000	5,800		205,000	140,000
3,030		155,000	105,000	5,900		205,000	140,000
3,100		155,000	105,000	5,950	15/64	205,000	140,000
3,170	1/8	155,000	105,000	6,000		205,000	140,000
3,200		155,000	105,000	6,100		215,000	150,000
3,250		155,000	105,000	6,200		215,000	150,000
3,300		155,000	105,000	6,250		215,000	150,000
3,400		165,000	115,000	6,300		215,000	150,000
3,500		165,000	115,000	6,350	1/4	215,000	150,000
3,570	9/64	165,000	115,000	6,400		215,000	150,000
3,600		165,000	115,000	6,500		215,000	150,000
3,700		165,000	115,000	6,600		215,000	150,000
3,750		165,000	115,000	6,700		215,000	150,000
3,800		175,000	120,000	6,750	17/64	225,000	155,000
3,860		175,000	120,000	6,800		225,000	155,000
3,900		175,000	120,000	6,900		225,000	155,000
3,970	5/32	175,000	120,000	7,000		225,000	155,000
4,000		175,000	120,000	7,100		225,000	155,000
4,100		175,000	120,000	7,200		225,000	155,000
4,200		175,000	120,000	7,300		225,000	155,000
4,300		185,000	125,000	7,500		225,000	155,000
4,370	11/64	185,000	125,000	7,540	19/64	240,000	165,000



Silindir Şaftlı Matkap ucu

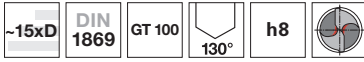
d1		l1	l2
mm	inch	mm	mm
7,700		240,000	165,000
7,750		240,000	165,000
7,800		240,000	165,000
7,900		240,000	165,000
7,940	5/16	240,000	165,000
8,000		240,000	165,000
8,100		240,000	165,000
8,200		240,000	165,000
8,300		240,000	165,000
8,330	21/64	240,000	165,000
8,400		240,000	165,000
8,430		240,000	165,000
8,500		240,000	165,000
8,600		250,000	175,000
8,700		250,000	175,000
8,730	11/32	250,000	175,000
8,800		250,000	175,000
9,000		250,000	175,000
9,200		250,000	175,000
9,300		250,000	175,000
9,400		250,000	175,000
9,500		250,000	175,000
9,520	3/8	265,000	185,000
9,600		265,000	185,000

d1		l1	l2
mm	inch	mm	mm
9,700		265,000	185,000
9,800		265,000	185,000
9,900		265,000	185,000
9,920	25/64	265,000	185,000
10,000		265,000	185,000
10,200		265,000	185,000
10,320	13/32	265,000	185,000
10,500		265,000	185,000
10,720	27/64	280,000	195,000
11,000		280,000	195,000
11,110	7/16	280,000	195,000
11,200		280,000	195,000
11,500		280,000	195,000
11,510	29/64	280,000	195,000
11,750		280,000	195,000
11,800		280,000	195,000
12,000		295,000	205,000
12,500		295,000	205,000
12,700	1/2	295,000	205,000
13,000		295,000	205,000





## Helisel matkap uçları çok uzun, seri 1

Malzeme **HSS**Yüzey **S**Kesme yönü **R**

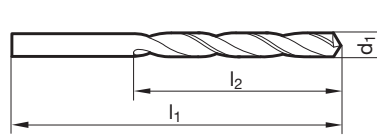
**P** • öz bileme  $\geq \varnothing 1,980$  • koni bileme • geniş kanallı • çok derin delikler için  
• zor talaş atılmasında

**M****K** •

**N** •  $1000 \text{ N/mm}^2$ 'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.

**S** ○**H****GÜHRING**NAVIGATOR

Kesme verileri sayfası 790

Ürün no **670**SİLİNDİR ŞAFTLI MATKAP  
UCU

d1		l1	l2
mm	inch	mm	mm
2,000		125,000	85,000
2,100		125,000	85,000
2,200		135,000	90,000
2,300		135,000	90,000
2,380	3/32	140,000	95,000
2,400		140,000	95,000
2,500		140,000	95,000
2,780	7/64	150,000	100,000
2,800		150,000	100,000
2,950		150,000	100,000
3,000		150,000	100,000
3,100		155,000	105,000
3,170	1/8	155,000	105,000
3,200		155,000	105,000
3,300		155,000	105,000
3,500		165,000	115,000
3,570	9/64	165,000	115,000
3,600		165,000	115,000
3,800		175,000	120,000
3,970	5/32	175,000	120,000
4,000		175,000	120,000
4,200		175,000	120,000
4,370	11/64	185,000	125,000
4,500		185,000	125,000
4,600		185,000	125,000
4,760	3/16	195,000	135,000
4,800		195,000	135,000
5,000		195,000	135,000
5,100		195,000	135,000
5,160	13/64	195,000	135,000
5,200		195,000	135,000
5,500		205,000	140,000
5,560	7/32	205,000	140,000
6,000		205,000	140,000
6,100		215,000	150,000
6,200		215,000	150,000

d1		l1	l2
mm	inch	mm	mm
6,350	1/4	215,000	150,000
6,500		215,000	150,000
6,600		215,000	150,000
6,800		225,000	155,000
7,000		225,000	155,000
7,140	9/32	225,000	155,000
7,500		225,000	155,000
7,540	19/64	240,000	165,000
7,940	5/16	240,000	165,000
8,000		240,000	165,000
8,200		240,000	165,000
8,500		240,000	165,000
8,730	11/32	250,000	175,000
9,000		250,000	175,000
9,520	3/8	265,000	185,000
9,600		265,000	185,000
9,920	25/64	265,000	185,000
10,000		265,000	185,000
10,900		280,000	195,000
11,000		280,000	195,000
11,900		295,000	205,000
11,910	15/32	295,000	205,000
12,000		295,000	205,000
12,500		295,000	205,000
12,700	1/2	295,000	205,000



## Helisel matkap uçları çok uzun, seri 1



**P** öz bileme  $\geq \varnothing 2,380$  • koni bileme • çok derin delikler için

**M**  
**K**  
**N** • yumuşak uzun talaşlı malzemeler  $1200 \text{ N/mm}^2$ 'ye kadar • otomat çelikleri (yumuşak) • Alüminyum/Al-alışımları (uzun talaşlı) • çinko, saflaştırılmış bakır, silümin, elektrotlar • zamak, argalyum, yumuşal plastikler, ahşap  
**S**  
**H**

Malzeme **HSS**

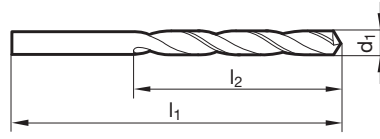
Yüzey



Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 788

Ürün no **524**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
2,000		125,000	85,000	5,200		195,000	135,000
2,100		125,000	85,000	5,400		205,000	140,000
2,200		135,000	90,000	5,600		205,000	140,000
2,300		135,000	90,000	5,700		205,000	140,000
2,350		135,000	90,000	5,800		205,000	140,000
2,380	3/32	140,000	95,000	5,900		205,000	140,000
2,400		140,000	95,000	5,950	15/64	205,000	140,000
2,450		140,000	95,000	6,000		205,000	140,000
2,500		140,000	95,000	6,100		215,000	150,000
2,600		140,000	95,000	6,350	1/4	215,000	150,000
2,780	7/64	150,000	100,000	6,400		215,000	150,000
2,800		150,000	100,000	6,500		215,000	150,000
2,900		150,000	100,000	6,600		215,000	150,000
2,950		150,000	100,000	6,750	17/64	225,000	155,000
3,000		150,000	100,000	6,800		225,000	155,000
3,100		155,000	105,000	7,000		225,000	155,000
3,170	1/8	155,000	105,000	7,100		225,000	155,000
3,200		155,000	105,000	7,140	9/32	225,000	155,000
3,300		155,000	105,000	7,300		225,000	155,000
3,350		155,000	105,000	7,400		225,000	155,000
3,400		165,000	115,000	7,500		225,000	155,000
3,450		165,000	115,000	7,540	19/64	240,000	165,000
3,500		165,000	115,000	7,800		240,000	165,000
3,530		165,000	115,000	7,900		240,000	165,000
3,570	9/64	165,000	115,000	7,940	5/16	240,000	165,000
3,600		165,000	115,000	8,000		240,000	165,000
3,800		175,000	120,000	8,100		240,000	165,000
3,900		175,000	120,000	8,330	21/64	240,000	165,000
3,970	5/32	175,000	120,000	8,600		250,000	175,000
4,000		175,000	120,000	8,730	11/32	250,000	175,000
4,100		175,000	120,000	8,900		250,000	175,000
4,200		175,000	120,000	9,000		250,000	175,000
4,250		175,000	120,000	9,130	23/64	250,000	175,000
4,300		185,000	125,000	9,200		250,000	175,000
4,370	11/64	185,000	125,000	9,500		250,000	175,000
4,400		185,000	125,000	9,520	3/8	265,000	185,000
4,500		185,000	125,000	9,920	25/64	265,000	185,000
4,760	3/16	195,000	135,000	10,000		265,000	185,000
4,900		195,000	135,000	10,320	13/32	265,000	185,000
5,000		195,000	135,000	10,500		265,000	185,000
5,100		195,000	135,000	11,000		280,000	195,000
5,160	13/64	195,000	135,000	11,110	7/16	280,000	195,000

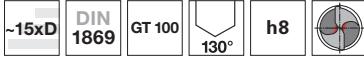


d1		l1	l2
mm	inch	mm	mm
11,500		280,000	195,000
11,910	15/32	295,000	205,000
12,000		295,000	205,000
12,700	1/2	295,000	205,000

d1		l1	l2
mm	inch	mm	mm



## Helisel matkap uçları çok uzun, seri 1



Malzeme HSC0

Yüzey



Kesme yönü



**P** • öz bileme  $\geq \text{Ø} 2,700$  • koni bileme • Co-alaşımlı HSS-çeliği • geniş kanallı  
• arttırılmış aşınma direnci • çok derin delikler için • zor talaş atılmasında

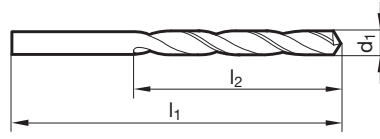
**M** •**K** •

**N** • çelik ve çelik dökümler • pik döküm, temper döküm ve küresel döküm

**S** •**H** ○

## GÜHRING NAVIGATOR

Kesme verileri sayfası 794

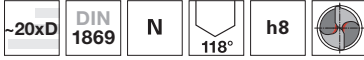
SİLİNDİR ŞAFTLI MATKAP  
UCU

Ürün no 618

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
2,700		150,000	100,000	5,800		205,000	140,000
2,900		150,000	100,000	6,000		205,000	140,000
3,000		150,000	100,000	6,100		215,000	150,000
3,100		155,000	105,000	6,200		215,000	150,000
3,170	1/8	155,000	105,000	6,300		215,000	150,000
3,200		155,000	105,000	6,350	1/4	215,000	150,000
3,300		155,000	105,000	6,400		215,000	150,000
3,400		165,000	115,000	6,500		215,000	150,000
3,500		165,000	115,000	6,600		215,000	150,000
3,570	9/64	165,000	115,000	6,700		215,000	150,000
3,600		165,000	115,000	6,750	17/64	225,000	155,000
3,700		165,000	115,000	6,800		225,000	155,000
3,750		165,000	115,000	7,000		225,000	155,000
3,800		175,000	120,000	7,140	9/32	225,000	155,000
3,970	5/32	175,000	120,000	7,400		225,000	155,000
4,000		175,000	120,000	7,500		225,000	155,000
4,100		175,000	120,000	7,540	19/64	240,000	165,000
4,200		175,000	120,000	7,700		240,000	165,000
4,300		185,000	125,000	7,800		240,000	165,000
4,370	11/64	185,000	125,000	7,940	5/16	240,000	165,000
4,400		185,000	125,000	8,000		240,000	165,000
4,500		185,000	125,000	8,200		240,000	165,000
4,600		185,000	125,000	8,330	21/64	240,000	165,000
4,760	3/16	195,000	135,000	8,500		240,000	165,000
4,800		195,000	135,000	8,700		250,000	175,000
4,850		195,000	135,000	8,730	11/32	250,000	175,000
5,000		195,000	135,000	8,800		250,000	175,000
5,100		195,000	135,000	9,000		250,000	175,000
5,160	13/64	195,000	135,000	9,130	23/64	250,000	175,000
5,200		195,000	135,000	9,400		250,000	175,000
5,300		195,000	135,000	9,500		250,000	175,000
5,400		205,000	140,000	9,520	3/8	265,000	185,000
5,500		205,000	140,000	9,700		265,000	185,000
5,560	7/32	205,000	140,000	10,000		265,000	185,000
5,600		205,000	140,000				
5,700		205,000	140,000				



## Ekstra uzun helisel matkaplar, seri 2



**P** • öz bileme  $\geq \varnothing 2,700$  • koni bileme • çok derin delikler için

**M**

**K** •

**N** ○ alaşım/alaşımız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

**S**

**H**

## GÜHRING NAVIGATOR

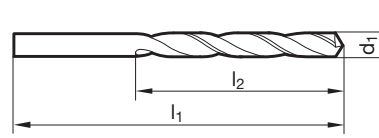
Kesme verileri sayfası 788

Malzeme **HSS**

Yüzey



Kesme yönü



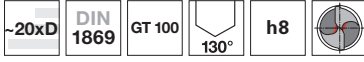
Ürün no **236**

d1		l1	l2
mm	inch	mm	mm
2,700		190,000	130,000
2,800		190,000	130,000
2,900		190,000	130,000
3,000		190,000	130,000
3,100		200,000	135,000
3,170	1/8	200,000	135,000
3,200		200,000	135,000
3,300		200,000	135,000
3,500		210,000	145,000
3,570	9/64	210,000	145,000
3,600		210,000	145,000
3,800		220,000	150,000
3,970	5/32	220,000	150,000
4,000		220,000	150,000
4,100		220,000	150,000
4,200		220,000	150,000
4,500		235,000	160,000
4,760	3/16	245,000	170,000
4,800		245,000	170,000
4,900		245,000	170,000
5,000		245,000	170,000
5,200		245,000	170,000
5,500		260,000	180,000
5,560	7/32	260,000	180,000
5,800		260,000	180,000
5,900		260,000	180,000
5,950	15/64	260,000	180,000
6,000		260,000	180,000
6,200		275,000	190,000
6,350	1/4	275,000	190,000

d1		l1	l2
mm	inch	mm	mm
6,500		275,000	190,000
6,700		275,000	190,000
6,800		290,000	200,000
7,000		290,000	200,000
7,140	9/32	290,000	200,000
7,500		290,000	200,000
7,540	19/64	305,000	210,000
7,800		305,000	210,000
7,940	5/16	305,000	210,000
8,000		305,000	210,000
8,100		305,000	210,000
8,500		305,000	210,000
8,700		320,000	220,000
8,730	11/32	320,000	220,000
8,800		320,000	220,000
8,900		320,000	220,000
9,000		320,000	220,000
9,130	23/64	320,000	220,000
9,500		320,000	220,000
9,800		340,000	235,000
10,000		340,000	235,000
10,200		340,000	235,000
10,500		340,000	235,000
11,000		365,000	250,000
11,110	7/16	365,000	250,000
11,500		365,000	250,000
11,510	29/64	365,000	250,000
11,750		365,000	250,000
12,000		375,000	260,000
13,000		375,000	260,000



## Ekstra uzun helisel matkaplar, seri 2

Malzeme **HSS**

Yüzey

Kesme yönü

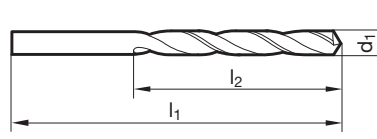
**P** • öz bileme  $\geq \text{Ø} 2,000$  • koni bileme • geniş kanallı • çok derin delikler için  
• zor talaş atılmasında

**M****K** •

**N** •  $1000 \text{ N/mm}^2$ 'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.

**S****H****GÜHRING**NAVIGATOR

Kesme verileri sayfası 790

SİLİNDİR ŞAFTLI MATKAP  
UCUÜrün no **503**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
2,000		160,000	110,000	6,100		275,000	190,000
2,200		170,000	115,000	6,150		275,000	190,000
2,300		170,000	115,000	6,200		275,000	190,000
2,500		180,000	120,000	6,350	1/4	275,000	190,000
2,800		190,000	130,000	6,400		275,000	190,000
3,000		190,000	130,000	6,500		275,000	190,000
3,030		200,000	135,000	6,600		275,000	190,000
3,100		200,000	135,000	6,700		275,000	190,000
3,170	1/8	200,000	135,000	6,750	17/64	290,000	200,000
3,200		200,000	135,000	6,800		290,000	200,000
3,300		200,000	135,000	6,900		290,000	200,000
3,400		210,000	145,000	7,000		290,000	200,000
3,500		210,000	145,000	7,140	9/32	290,000	200,000
3,570	9/64	210,000	145,000	7,500		290,000	200,000
3,600		210,000	145,000	7,540	19/64	305,000	210,000
3,700		210,000	145,000	7,800		305,000	210,000
3,800		220,000	150,000	7,940	5/16	305,000	210,000
3,900		220,000	150,000	8,000		305,000	210,000
3,970	5/32	220,000	150,000	8,200		305,000	210,000
4,000		220,000	150,000	8,330	21/64	305,000	210,000
4,100		220,000	150,000	8,500		305,000	210,000
4,200		220,000	150,000	8,600		320,000	220,000
4,300		235,000	160,000	8,730	11/32	320,000	220,000
4,370	11/64	235,000	160,000	8,800		320,000	220,000
4,400		235,000	160,000	9,000		320,000	220,000
4,500		235,000	160,000	9,100		320,000	220,000
4,760	3/16	245,000	170,000	9,130	23/64	320,000	220,000
4,800		245,000	170,000	9,500		320,000	220,000
4,900		245,000	170,000	9,520	3/8	340,000	235,000
5,000		245,000	170,000	9,700		340,000	235,000
5,100		245,000	170,000	9,800		340,000	235,000
5,160	13/64	245,000	170,000	9,920	25/64	340,000	235,000
5,200		245,000	170,000	10,000		340,000	235,000
5,300		245,000	170,000	10,200		340,000	235,000
5,400		260,000	180,000	10,500		340,000	235,000
5,500		260,000	180,000	10,720	27/64	365,000	250,000
5,560	7/32	260,000	180,000	11,000		365,000	250,000
5,700		260,000	180,000	11,110	7/16	365,000	250,000
5,800		260,000	180,000	11,500		365,000	250,000
5,900		260,000	180,000	11,510	29/64	365,000	250,000
5,950	15/64	260,000	180,000	11,750		365,000	250,000
6,000		260,000	180,000	11,910	15/32	375,000	260,000

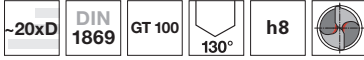


d1		l1	l2
mm	inch	mm	mm
12,000		375,000	260,000
12,300	31/64	375,000	260,000
12,500		375,000	260,000
12,700	1/2	375,000	260,000
13,000		375,000	260,000

d1		l1	l2
mm	inch	mm	mm



## Ekstra uzun helisel matkaplar, seri 2

Malzeme **HSS**Yüzey **S**Kesme yönü **R**

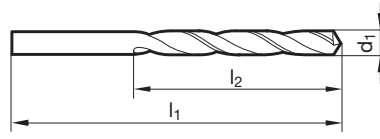
**P** • öz bileme  $\geq \varnothing 2,300$  • koni bileme • geniş kanallı • çok derin delikler için  
• zor talaş atılmasında

**M****K** •

**N** •  $1000 \text{ N/mm}^2$ 'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler,  
VA-çelikleri vb.

**S** ○**H****GÜHRING**NAVIGATOR

Kesme verileri sayfası 790

SİLİNDİR ŞAFTLI MATKAP  
UCUÜrün no **671**

d1		l1	l2
mm	inch	mm	mm
2,700		190,000	130,000
2,800		190,000	130,000
3,000		190,000	130,000
3,100		200,000	135,000
3,170	1/8	200,000	135,000
3,200		200,000	135,000
3,500		210,000	145,000
3,570	9/64	210,000	145,000
3,970	5/32	220,000	150,000
4,000		220,000	150,000
4,090		220,000	150,000
4,370	11/64	235,000	160,000
4,400		235,000	160,000
4,500		235,000	160,000
4,600		235,000	160,000
4,760	3/16	245,000	170,000
4,800		245,000	170,000
5,000		245,000	170,000

d1		l1	l2
mm	inch	mm	mm
5,300		245,000	170,000
5,500		260,000	180,000
5,560	7/32	260,000	180,000
6,000		260,000	180,000
6,350	1/4	275,000	190,000
6,500		275,000	190,000
6,750	17/64	290,000	200,000
6,800		290,000	200,000
7,000		290,000	200,000
7,140	9/32	290,000	200,000
7,500		290,000	200,000
7,940	5/16	305,000	210,000
8,000		305,000	210,000
8,500		305,000	210,000







## Ekstra uzun helisel matkaplar, seri 2

Malzeme **HSCO**

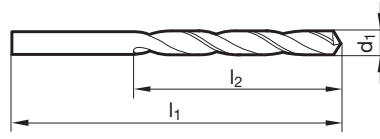
Yüzey

Kesme yönü

<b>P</b>	•	öz bileme $\geq \varnothing 3,000$ • koni bileme • Co-alaşımlı HSS-çeliği • geniş kanallı • arttırılmış aşınma direnci • çok derin delikler için • zor talaş atılmasında
<b>M</b>	•	
<b>K</b>	•	
<b>N</b>	•	çelik ve çelik dökümler • pik döküm, temper döküm ve küresel döküm
<b>S</b>	•	
<b>H</b>	○	

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 794

SİLİNDİR ŞAFTLI MATKAP  
UCU

Ürün no

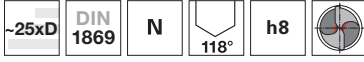
619

d1		l1	l2
mm	inch	mm	mm
3,000		190,000	130,000
3,170	1/8	200,000	135,000
3,200		200,000	135,000
3,300		200,000	135,000
3,500		210,000	145,000
3,570	9/64	210,000	145,000
3,970	5/32	220,000	150,000
4,000		220,000	150,000
4,100		220,000	150,000
4,200		220,000	150,000
4,370	11/64	235,000	160,000
4,500		235,000	160,000
4,760	3/16	245,000	170,000
4,800		245,000	170,000
4,900		245,000	170,000
5,000		245,000	170,000
5,200		245,000	170,000
5,500		260,000	180,000
5,560	7/32	260,000	180,000
5,950	15/64	260,000	180,000
6,000		260,000	180,000
6,100		275,000	190,000
6,200		275,000	190,000
6,350	1/4	275,000	190,000

d1		l1	l2
mm	inch	mm	mm
6,500		275,000	190,000
6,750	17/64	290,000	200,000
6,800		290,000	200,000
7,000		290,000	200,000
7,140	9/32	290,000	200,000
7,400		290,000	200,000
7,500		290,000	200,000
7,540	19/64	305,000	210,000
7,600		305,000	210,000
7,940	5/16	305,000	210,000
8,000		305,000	210,000
8,200		305,000	210,000
8,500		305,000	210,000
8,730	11/32	320,000	220,000
9,000		320,000	220,000
9,130	23/64	320,000	220,000
9,500		320,000	220,000
9,520	3/8	340,000	235,000
9,600		340,000	235,000
9,900		340,000	235,000
10,000		340,000	235,000



## Ekstra uzun helisel matkaplar, seri 3



**P** • öz bileme  $\geq \varnothing 3,500$  • koni bileme • çok derin delikler için

**M**

**K** •

**N** ○ alaşımlı/alaşımsız çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

**S**

**H**

## GÜHRING NAVIGATOR

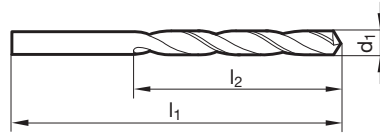
Kesme verileri sayfası 788

Malzeme **HSS**

Yüzey



Kesme yönü



Ürün no

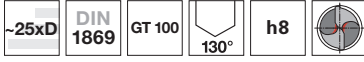
237

d1		l1	l2
mm	inch	mm	mm
3,500		265,000	180,000
3,800		280,000	190,000
4,000		280,000	190,000
4,100		280,000	190,000
4,200		280,000	190,000
4,500		295,000	200,000
5,000		315,000	210,000
5,200		315,000	210,000
5,500		330,000	225,000
5,800		330,000	225,000
5,900		330,000	225,000
6,000		330,000	225,000
6,100		350,000	235,000
6,200		350,000	235,000
6,500		350,000	235,000
6,700		350,000	235,000
6,800		370,000	250,000
7,000		370,000	250,000

d1		l1	l2
mm	inch	mm	mm
7,500		370,000	250,000
7,800		390,000	265,000
8,000		390,000	265,000
8,500		390,000	265,000
9,000		410,000	280,000
9,500		410,000	280,000
9,800		430,000	295,000
10,000		430,000	295,000
10,300		430,000	295,000
10,500		430,000	295,000
11,000		455,000	310,000
11,500		455,000	310,000
11,750		455,000	310,000
12,000		480,000	330,000
12,500		480,000	330,000
13,000		480,000	330,000



## Ekstra uzun helisel matkaplar, seri 3



**P** • öz bileme  $\geq \text{Ø} 2,500$  • koni bileme • geniş kanallı • zor talaş atılmasında  
• çok derin delikler için

**M****K** •

**N** •  $1000 \text{ N/mm}^2$ 'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.

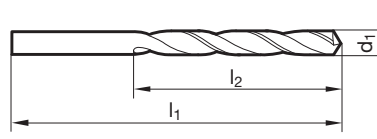
**S****H**Malzeme **HSS**

Yüzey

Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 790

SİLİNDİR ŞAFTLI MATKAP  
UCUÜrün no **504**

d1		l1	l2
mm	inch	mm	mm
2,500		225,000	150,000
3,000		240,000	160,000
3,100		250,000	170,000
3,170	1/8	250,000	170,000
3,200		250,000	170,000
3,300		250,000	170,000
3,400		265,000	180,000
3,500		265,000	180,000
3,570	9/64	265,000	180,000
3,600		265,000	180,000
3,700		265,000	180,000
3,800		280,000	190,000
3,900		280,000	190,000
3,970	5/32	280,000	190,000
4,000		280,000	190,000
4,100		280,000	190,000
4,200		280,000	190,000
4,300		295,000	200,000
4,370	11/64	295,000	200,000
4,400		295,000	200,000
4,500		295,000	200,000
4,600		295,000	200,000
4,760	3/16	315,000	210,000
4,800		315,000	210,000
4,900		315,000	210,000
5,000		315,000	210,000
5,100		315,000	210,000
5,200		315,000	210,000
5,500		330,000	225,000
5,560	7/32	330,000	225,000
5,800		330,000	225,000
5,950	15/64	330,000	225,000
6,000		330,000	225,000
6,100		350,000	235,000
6,200		350,000	235,000
6,300		350,000	235,000
6,350	1/4	350,000	235,000
6,400		350,000	235,000
6,500		350,000	235,000
6,700		350,000	235,000
6,750	17/64	370,000	250,000
6,800		370,000	250,000

d1		l1	l2
mm	inch	mm	mm
7,000		370,000	250,000
7,140	9/32	370,000	250,000
7,200		370,000	250,000
7,500		370,000	250,000
7,540	19/64	390,000	265,000
7,750		390,000	265,000
7,800		390,000	265,000
7,940	5/16	390,000	265,000
8,000		390,000	265,000
8,200		390,000	265,000
8,330	21/64	390,000	265,000
8,500		390,000	265,000
8,600		410,000	280,000
8,730	11/32	410,000	280,000
8,800		410,000	280,000
8,900		410,000	280,000
9,000		410,000	280,000
9,200		410,000	280,000
9,500		410,000	280,000
9,520	3/8	430,000	295,000
9,530		430,000	295,000
9,920	25/64	430,000	295,000
10,000		430,000	295,000
10,320	13/32	430,000	295,000
10,500		430,000	295,000
10,720	27/64	455,000	310,000
11,000		455,000	310,000
11,110	7/16	455,000	310,000
11,500		455,000	310,000
12,000		480,000	330,000
12,200		480,000	330,000
12,500		480,000	330,000
13,000		480,000	330,000



## Ekstra uzun helisel matkaplar, seri 3



**P** öz bileme  $\geq \text{Ø} 2,500$  • koni bileme • çok derin delikler için



**N** yumuşak uzun talaşlı malzemeler  $1200 \text{ N/mm}^2$ 'ye kadar • otomat çelikleri (yumuşak) • Alüminyum/Al-alaşımları (uzun talaşlı) • çinko, saflaştırılmış bakır, silümin, elektrotlar • zamak, argalyum, yumuşal plastikler, ahşap

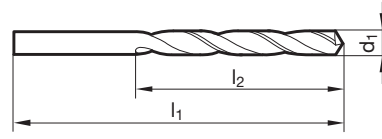
## GÜHRING NAVIGATOR

Kesme verileri sayfası 788

Malzeme **HSS**

Yüzey

Kesme yönü

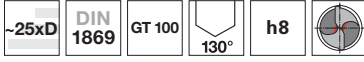
Ürün no **529**

d1		l1	l2
mm	inch	mm	mm
2,500		225,000	150,000
3,000		240,000	160,000
3,500		265,000	180,000
3,800		280,000	190,000
4,000		280,000	190,000
4,500		295,000	200,000
5,000		315,000	210,000
6,000		330,000	225,000
6,500		350,000	235,000
6,700		350,000	235,000
6,800		370,000	250,000
7,500		370,000	250,000

d1		l1	l2
mm	inch	mm	mm
8,000		390,000	265,000
9,500		410,000	280,000
10,000		430,000	295,000



## Ekstra uzun helisel matkaplar, seri 3

Malzeme **HSC0**

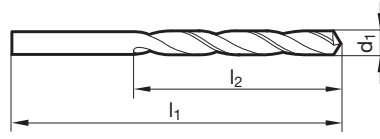
Yüzey

Kesme yönü

<b>P</b>	•	öz bileme $\geq \varnothing 2,500$ • koni bileme • Co-alaşımli HSS-çeliği • geniş kanallı
<b>M</b>	•	• yüksek aşınma direnci • çok derin delikler için • zor talaş atılmasında
<b>K</b>	•	
<b>N</b>	•	çelik ve çelik dökümler • pik döküm, temper döküm ve küresel döküm
<b>S</b>	•	
<b>H</b>	○	

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 794

SİLİNDİR ŞAFTLI MATKAP  
UCU

Ürün no

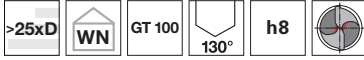
571

d1		l1	l2
mm	inch	mm	mm
2,500		225,000	150,000
3,000		240,000	160,000
3,100		250,000	170,000
3,170	1/8	250,000	170,000
3,200		250,000	170,000
3,300		250,000	170,000
3,400		265,000	180,000
3,500		265,000	180,000
3,700		265,000	180,000
3,800		280,000	190,000
3,900		280,000	190,000
3,970	5/32	280,000	190,000
4,000		280,000	190,000
4,100		280,000	190,000
4,200		280,000	190,000
4,300		295,000	200,000
4,500		295,000	200,000
4,600		295,000	200,000
4,760	3/16	315,000	210,000
4,800		315,000	210,000
4,900		315,000	210,000
5,000		315,000	210,000
5,100		315,000	210,000
5,200		315,000	210,000
5,500		330,000	225,000
5,560	7/32	330,000	225,000
5,800		330,000	225,000
5,950	15/64	330,000	225,000
6,000		330,000	225,000
6,100		350,000	235,000
6,200		350,000	235,000
6,300		350,000	235,000
6,350	1/4	350,000	235,000
6,400		350,000	235,000
6,500		350,000	235,000
6,700		350,000	235,000

d1		l1	l2
mm	inch	mm	mm
6,750	17/64	370,000	250,000
6,800		370,000	250,000
7,000		370,000	250,000
7,140	9/32	370,000	250,000
7,200		370,000	250,000
7,500		370,000	250,000
7,750		390,000	265,000
7,800		390,000	265,000
7,940	5/16	390,000	265,000
8,000		390,000	265,000
8,200		390,000	265,000
8,500		390,000	265,000
8,600		410,000	280,000
8,730	11/32	410,000	280,000
8,800		410,000	280,000
9,000		410,000	280,000
9,500		410,000	280,000
9,520	3/8	430,000	295,000
10,000		430,000	295,000
10,320	13/32	430,000	295,000
10,500		430,000	295,000
10,720	27/64	455,000	310,000
11,000		455,000	310,000
11,110	7/16	455,000	310,000
11,500		455,000	310,000
12,000		480,000	330,000
12,200		480,000	330,000
12,500		480,000	330,000
13,000		480,000	330,000



## Helisel matkap uçları, çok uzun

Malzeme **HSS**

Yüzey

Kesme yönü

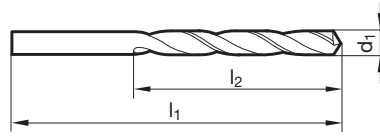
**P** • öz bileme  $\geq \varnothing 6,000$  • koni bileme • geniş kanallı • çok derin delikler için  
• zor talaş atılmasında

**M****K** •

**N** •  $1000 \text{ N/mm}^2$ 'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler,  
VA-çelikleri vb.

**S****H****GÜHRING** NAVIGATOR

Kesme verileri sayfası 790

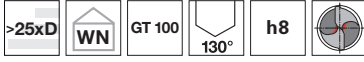
Ürün no **242**

d1		l1	l2
mm	inch	mm	mm
6,000		500,000	400,000
8,000		500,000	400,000
10,000		600,000	500,000
11,000		600,000	500,000
12,000		600,000	500,000

d1		l1	l2
mm	inch	mm	mm



## Helisel matkap uçları, çok uzun



Malzeme **HSS**

Yüzey

Kesme yönü

**P** • öz bileme  $\geq \varnothing 8,000$  • koni bileme • geniş kanallı • çok derin delikler için  
• zor talaş atılmasında

**M**

**K** •

**N** • 1000 N/mm<sup>2</sup>'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.

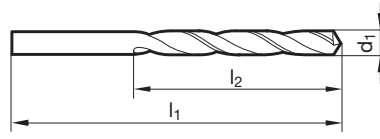
**S**

**H**

## GÜHRING NAVIGATOR

Kesme verileri sayfası 790

Silindirik Şaftlı Matkap ucu



Ürün no **243**

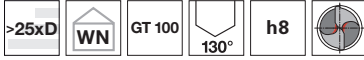
d1		l1	l2
mm	inch	mm	mm
8,000		750,000	650,000
10,000		750,000	650,000
11,000		750,000	650,000
12,000		750,000	650,000

d1		l1	l2
mm	inch	mm	mm





## Helisel matkap uçları, çok uzun



<b>P</b>	•	öz bileme $\geq \varnothing 10,000$ • koni bileme • geniş kanallı • çok derin delikler için • zor talaş atılmasında
<b>M</b>		
<b>K</b>	•	
<b>N</b>	•	1000 N/mm <sup>2</sup> 'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.
<b>S</b>		
<b>H</b>		

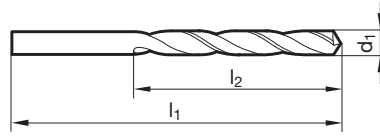
## GÜHRING NAVIGATOR

Kesme verileri sayfası 790

Malzeme **HSS**

Yüzey

Kesme yönü

Ürün no **244**

d1		l1	l2
mm	inch	mm	mm
10,000		1000,000	850,000
11,000		1000,000	850,000
12,000		1000,000	850,000

d1		l1	l2
mm	inch	mm	mm



## Çok uzun silindirik saplı helisel matkap uçları



Malzeme HSC0

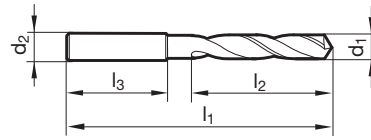
Yüzey S

Kesme yönü R

P	•	öz bileme $\geq \varnothing 2,000$ • yüzey Bileme • Co-alaşım HSS-çeliği • az ilerleme gücü gerektirir • az tork gerektirir • artırılmış aşınma direnci • genel amaçlı
M	•	
K	•	
N	•	alaşım/alaşımız. çelikler $800 \text{ N/mm}^2$ 'ye kadar • soğuk/sıcak işlem çelikleri • paslanmaz çelikler • demir dışı metaller • döküm malzemeler • plastikler
S	•	
H	•	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 774



Ürün no 512

d1	d2 h6	l1	l2	l3	d1	d2 h6	l1	l2	l3
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
2,000	3,000	44,000	12,000	28,000	5,800	6,000	72,000	28,000	36,000
2,100	3,000	44,000	12,000	28,000	5,900	6,000	72,000	28,000	36,000
2,200	3,000	45,000	13,000	28,000	5,950	6,000	72,000	28,000	36,000
2,300	3,000	45,000	13,000	28,000	6,000	6,000	72,000	28,000	36,000
2,400	3,000	46,000	14,000	28,000	6,100	8,000	75,000	31,000	36,000
2,500	3,000	46,000	14,000	28,000	6,200	8,000	75,000	31,000	36,000
2,600	3,000	46,000	14,000	28,000	6,300	8,000	75,000	31,000	36,000
2,700	3,000	48,000	16,000	28,000	6,350	8,000	75,000	31,000	36,000
2,780	3,000	48,000	16,000	28,000	6,400	8,000	75,000	31,000	36,000
2,800	3,000	48,000	16,000	28,000	6,500	8,000	75,000	31,000	36,000
2,900	3,000	48,000	16,000	28,000	6,600	8,000	75,000	31,000	36,000
3,000	3,000	48,000	16,000	28,000	6,750	8,000	78,000	34,000	36,000
3,100	4,000	50,000	18,000	28,000	6,800	8,000	78,000	34,000	36,000
3,170	4,000	50,000	18,000	28,000	6,900	8,000	78,000	34,000	36,000
3,200	4,000	50,000	18,000	28,000	7,000	8,000	78,000	34,000	36,000
3,300	4,000	50,000	18,000	28,000	7,100	8,000	78,000	34,000	36,000
3,400	4,000	52,000	20,000	28,000	7,140	8,000	78,000	34,000	36,000
3,500	4,000	52,000	20,000	28,000	7,200	8,000	78,000	34,000	36,000
3,570	4,000	52,000	20,000	28,000	7,300	8,000	78,000	34,000	36,000
3,600	4,000	52,000	20,000	28,000	7,500	8,000	78,000	34,000	36,000
3,700	4,000	52,000	20,000	28,000	7,600	8,000	81,000	37,000	36,000
3,800	4,000	54,000	22,000	28,000	7,800	8,000	81,000	37,000	36,000
3,900	4,000	54,000	22,000	28,000	7,900	8,000	81,000	37,000	36,000
4,000	4,000	54,000	22,000	28,000	7,940	8,000	81,000	37,000	36,000
4,100	6,000	66,000	22,000	36,000	8,000	8,000	81,000	37,000	36,000
4,200	6,000	66,000	22,000	36,000	8,100	10,000	87,000	37,000	40,000
4,300	6,000	68,000	24,000	36,000	8,200	10,000	87,000	37,000	40,000
4,370	6,000	68,000	24,000	36,000	8,300	10,000	87,000	37,000	40,000
4,400	6,000	68,000	24,000	36,000	8,330	10,000	87,000	37,000	40,000
4,500	6,000	68,000	24,000	36,000	8,500	10,000	87,000	37,000	40,000
4,700	6,000	68,000	24,000	36,000	8,600	10,000	91,000	40,000	40,000
4,760	6,000	70,000	26,000	36,000	8,730	10,000	91,000	40,000	40,000
4,800	6,000	70,000	26,000	36,000	8,800	10,000	91,000	40,000	40,000
4,900	6,000	70,000	26,000	36,000	8,900	10,000	91,000	40,000	40,000
5,000	6,000	70,000	26,000	36,000	9,000	10,000	91,000	40,000	40,000
5,100	6,000	70,000	26,000	36,000	9,100	10,000	91,000	40,000	40,000
5,200	6,000	70,000	26,000	36,000	9,130	10,000	91,000	40,000	40,000
5,300	6,000	70,000	26,000	36,000	9,200	10,000	91,000	40,000	40,000
5,400	6,000	72,000	28,000	36,000	9,300	10,000	91,000	40,000	40,000
5,500	6,000	72,000	28,000	36,000	9,400	10,000	91,000	40,000	40,000
5,560	6,000	72,000	28,000	36,000	9,500	10,000	91,000	40,000	40,000
5,600	6,000	72,000	28,000	36,000	9,520	10,000	93,000	43,000	40,000



d1	d2 h6	l1	l2	l3
mm	mm	mm	mm	mm
9,800	10,000	93,000	43,000	40,000
9,900	10,000	93,000	43,000	40,000
9,920	10,000	93,000	43,000	40,000
10,000	10,000	93,000	43,000	40,000
10,100	12,000	100,000	43,000	45,000
10,200	12,000	100,000	43,000	45,000
10,300	12,000	100,000	43,000	45,000
10,320	12,000	100,000	43,000	45,000
10,500	12,000	100,000	43,000	45,000
10,800	12,000	104,000	47,000	45,000
11,000	12,000	104,000	47,000	45,000
11,100	12,000	104,000	47,000	45,000
11,110	12,000	104,000	47,000	45,000
11,200	12,000	104,000	47,000	45,000
11,300	12,000	104,000	47,000	45,000
11,400	12,000	104,000	47,000	45,000
11,500	12,000	104,000	47,000	45,000
11,510	12,000	104,000	47,000	45,000

d1	d2 h6	l1	l2	l3
mm	mm	mm	mm	mm
11,700	12,000	104,000	47,000	45,000
11,800	12,000	104,000	47,000	45,000
12,000	12,000	108,000	51,000	45,000
12,300	16,000	111,000	51,000	48,000
12,500	16,000	111,000	51,000	48,000
13,000	16,000	111,000	51,000	48,000
13,490	16,000	114,000	54,000	48,000
13,500	16,000	114,000	54,000	48,000
14,000	16,000	114,000	54,000	48,000
15,000	16,000	116,000	56,000	48,000
16,000	16,000	118,000	58,000	48,000
16,500	20,000	126,000	60,000	50,000
16,670	20,000	126,000	60,000	50,000
17,500	20,000	128,000	62,000	50,000
18,000	20,000	128,000	62,000	50,000
18,500	20,000	130,000	64,000	50,000
19,500	20,000	132,000	66,000	50,000
20,000	20,000	132,000	66,000	50,000



## Çok uzun silindirik saplı helisel matkap uçları



Malzeme HSC0

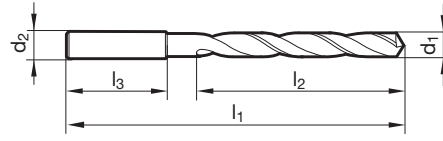
Yüzey S

Kesme yönü R

P	•	öz bileme $\geq \varnothing 2,000$ • yüzey Bileme • Co-alaşimli HSS-çeliği • az ilerleme gücü gerektirir • az tork gerektirir • artırılmış aşınma direnci • genel amaçlı
M	•	
K	•	
N	•	alaşimli/alaşimsız çelikler $800 \text{ N/mm}^2$ 'ye kadar • soğuk/sıcak işlem çelikleri • paslanmaz çelikler • demir dışı metaller • döküm malzemeler • plastikler
S	•	
H	•	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 784



Ürün no 511

d1	d2 h6	l1	l2	l3	d1	d2 h6	l1	l2	l3
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
2,000	3,000	56,000	24,000	28,000	6,300	8,000	107,000	63,000	36,000
2,100	3,000	56,000	24,000	28,000	6,350	8,000	107,000	63,000	36,000
2,300	3,000	59,000	27,000	28,000	6,400	8,000	107,000	63,000	36,000
2,380	3,000	62,000	30,000	28,000	6,500	8,000	107,000	63,000	36,000
2,400	3,000	62,000	30,000	28,000	6,600	8,000	107,000	63,000	36,000
2,500	3,000	62,000	30,000	28,000	6,750	8,000	113,000	69,000	36,000
2,600	3,000	62,000	30,000	28,000	6,800	8,000	113,000	69,000	36,000
2,780	3,000	65,000	33,000	28,000	6,900	8,000	113,000	69,000	36,000
2,800	3,000	65,000	33,000	28,000	7,000	8,000	113,000	69,000	36,000
2,900	3,000	65,000	33,000	28,000	7,100	8,000	113,000	69,000	36,000
3,000	3,000	65,000	33,000	28,000	7,140	8,000	113,000	69,000	36,000
3,100	4,000	68,000	36,000	28,000	7,200	8,000	113,000	69,000	36,000
3,200	4,000	68,000	36,000	28,000	7,300	8,000	113,000	69,000	36,000
3,300	4,000	68,000	36,000	28,000	7,400	8,000	113,000	69,000	36,000
3,400	4,000	71,000	39,000	28,000	7,500	8,000	113,000	69,000	36,000
3,500	4,000	71,000	39,000	28,000	7,540	8,000	119,000	75,000	36,000
3,570	4,000	71,000	39,000	28,000	7,550	8,000	119,000	75,000	36,000
3,900	4,000	75,000	43,000	28,000	7,600	8,000	119,000	75,000	36,000
3,970	4,000	75,000	43,000	28,000	7,700	8,000	119,000	75,000	36,000
4,000	4,000	75,000	43,000	28,000	7,800	8,000	119,000	75,000	36,000
4,200	6,000	87,000	43,000	36,000	7,900	8,000	119,000	75,000	36,000
4,300	6,000	91,000	47,000	36,000	8,000	8,000	119,000	75,000	36,000
4,370	6,000	91,000	47,000	36,000	8,100	10,000	125,000	75,000	40,000
4,400	6,000	91,000	47,000	36,000	8,200	10,000	125,000	75,000	40,000
4,500	6,000	91,000	47,000	36,000	8,300	10,000	125,000	75,000	40,000
4,650	6,000	91,000	47,000	36,000	8,330	10,000	125,000	75,000	40,000
4,700	6,000	91,000	47,000	36,000	8,500	10,000	125,000	75,000	40,000
4,760	6,000	96,000	52,000	36,000	8,600	10,000	131,000	81,000	40,000
4,800	6,000	96,000	52,000	36,000	8,730	10,000	131,000	81,000	40,000
4,900	6,000	96,000	52,000	36,000	8,800	10,000	131,000	81,000	40,000
5,000	6,000	96,000	52,000	36,000	8,900	10,000	131,000	81,000	40,000
5,100	6,000	96,000	52,000	36,000	9,000	10,000	131,000	81,000	40,000
5,160	6,000	96,000	52,000	36,000	9,100	10,000	131,000	81,000	40,000
5,200	6,000	96,000	52,000	36,000	9,130	10,000	131,000	81,000	40,000
5,300	6,000	96,000	52,000	36,000	9,400	10,000	131,000	81,000	40,000
5,400	6,000	101,000	57,000	36,000	9,500	10,000	131,000	81,000	40,000
5,500	6,000	101,000	57,000	36,000	9,520	10,000	137,000	87,000	40,000
5,600	6,000	101,000	57,000	36,000	9,550	10,000	137,000	87,000	40,000
5,800	6,000	101,000	57,000	36,000	9,600	10,000	137,000	87,000	40,000
5,900	6,000	101,000	57,000	36,000	9,900	10,000	137,000	87,000	40,000
6,000	6,000	101,000	57,000	36,000	9,920	10,000	137,000	87,000	40,000
6,100	8,000	107,000	63,000	36,000	10,000	10,000	137,000	87,000	40,000

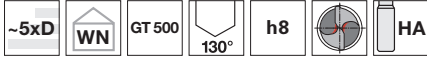


d1	d2 h6	l1	l2	l3
mm	mm	mm	mm	mm
10,100	12,000	144,000	87,000	45,000
10,200	12,000	144,000	87,000	45,000
10,400	12,000	144,000	87,000	45,000
10,500	12,000	144,000	87,000	45,000
10,600	12,000	144,000	87,000	45,000
10,800	12,000	151,000	94,000	45,000
11,000	12,000	151,000	94,000	45,000
11,110	12,000	151,000	94,000	45,000
11,200	12,000	151,000	94,000	45,000
11,300	12,000	151,000	94,000	45,000
11,510	12,000	151,000	94,000	45,000
11,800	12,000	151,000	94,000	45,000
11,910	12,000	158,000	101,000	45,000
12,000	12,000	158,000	101,000	45,000
12,200	16,000	161,000	101,000	48,000
12,500	16,000	161,000	101,000	48,000
12,700	16,000	161,000	101,000	48,000
13,000	16,000	161,000	101,000	48,000

d1	d2 h6	l1	l2	l3
mm	mm	mm	mm	mm
13,500	16,000	166,000	106,000	48,000
13,890	16,000	166,000	106,000	48,000
14,000	16,000	166,000	106,000	48,000
14,500	16,000	169,000	109,000	48,000
15,000	16,000	169,000	109,000	48,000
15,500	16,000	172,000	112,000	48,000
16,000	16,000	172,000	112,000	48,000
16,500	20,000	181,000	115,000	50,000
17,000	20,000	181,000	115,000	50,000
17,460	20,000	184,000	118,000	50,000
17,500	20,000	184,000	118,000	50,000
18,000	20,000	184,000	118,000	50,000
19,000	20,000	188,000	122,000	50,000
19,500	20,000	191,000	125,000	50,000
20,000	20,000	191,000	125,000	50,000



## Çok uzun silindirik saplı helisel matkap uçları



Malzeme HSS-E-PM

Yüzey F

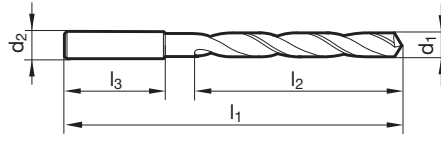
Kesme yönü R

**P** • öz bileme  $\geq \varnothing 2,000$  • özel B tipi sivirtme ile kon yüzey geometrisi • Co-alaşimli HSS-çeliği • özellikle yüksek stabilite • özellikle yüksek aşınma dirençli

**M** ○  
**K** •  
**N** ○ yüksek çekme mukavemetli malzemeler, yüksek alaşimli çelikler • ıslah çelikleri ve sementasyon çelikleri • pik döküm, piring, bronz  
**S** ○  
**H** ○

## GÜHRING NAVIGATOR

Kesme verileri sayfası 784



Ürün no 513

d1	d2 h6	l1	l2	l3	d1	d2 h6	l1	l2	l3
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
2,000	3,000	56,000	24,000	28,000	7,800	8,000	119,000	75,000	36,000
2,100	3,000	56,000	24,000	28,000	7,940	8,000	119,000	75,000	36,000
2,380	3,000	62,000	30,000	28,000	8,000	8,000	119,000	75,000	36,000
2,500	3,000	62,000	30,000	28,000	8,330	10,000	125,000	75,000	40,000
2,780	3,000	65,000	33,000	28,000	8,500	10,000	125,000	75,000	40,000
3,000	3,000	65,000	33,000	28,000	8,730	10,000	131,000	81,000	40,000
3,170	4,000	68,000	36,000	28,000	8,800	10,000	131,000	81,000	40,000
3,300	4,000	68,000	36,000	28,000	9,000	10,000	131,000	81,000	40,000
3,500	4,000	71,000	39,000	28,000	9,130	10,000	131,000	81,000	40,000
3,570	4,000	71,000	39,000	28,000	9,300	10,000	131,000	81,000	40,000
3,970	4,000	75,000	43,000	28,000	9,500	10,000	131,000	81,000	40,000
4,000	4,000	75,000	43,000	28,000	9,520	10,000	137,000	87,000	40,000
4,200	6,000	87,000	43,000	36,000	9,600	10,000	137,000	87,000	40,000
4,370	6,000	91,000	47,000	36,000	9,800	10,000	137,000	87,000	40,000
4,500	6,000	91,000	47,000	36,000	9,920	10,000	137,000	87,000	40,000
4,650	6,000	91,000	47,000	36,000	10,000	10,000	137,000	87,000	40,000
4,760	6,000	96,000	52,000	36,000	10,200	12,000	144,000	87,000	45,000
4,800	6,000	96,000	52,000	36,000	10,500	12,000	144,000	87,000	45,000
5,000	6,000	96,000	52,000	36,000	10,600	12,000	144,000	87,000	45,000
5,100	6,000	96,000	52,000	36,000	10,700	12,000	151,000	94,000	45,000
5,160	6,000	96,000	52,000	36,000	10,900	12,000	151,000	94,000	45,000
5,200	6,000	96,000	52,000	36,000	11,000	12,000	151,000	94,000	45,000
5,300	6,000	96,000	52,000	36,000	11,100	12,000	151,000	94,000	45,000
5,500	6,000	101,000	57,000	36,000	11,300	12,000	151,000	94,000	45,000
5,800	6,000	101,000	57,000	36,000	11,400	12,000	151,000	94,000	45,000
6,000	6,000	101,000	57,000	36,000	11,500	12,000	151,000	94,000	45,000
6,350	8,000	107,000	63,000	36,000	11,900	12,000	158,000	101,000	45,000
6,500	8,000	107,000	63,000	36,000	12,000	12,000	158,000	101,000	45,000
6,600	8,000	107,000	63,000	36,000	12,200	14,000	161,000	101,000	45,000
6,750	8,000	113,000	69,000	36,000	12,300	14,000	161,000	101,000	45,000
6,800	8,000	113,000	69,000	36,000	12,400	14,000	161,000	101,000	45,000
7,000	8,000	113,000	69,000	36,000	12,500	14,000	161,000	101,000	45,000
7,140	8,000	113,000	69,000	36,000	12,600	14,000	161,000	101,000	45,000
7,400	8,000	113,000	69,000	36,000	12,700	14,000	161,000	101,000	45,000
7,500	8,000	113,000	69,000	36,000	12,900	14,000	161,000	101,000	45,000
7,540	8,000	119,000	75,000	36,000					



## Çok uzun silindirik saplı helisel matkap uçları



**P** öz bileme  $\geq \varnothing 2,600$  • yüzey Bileme • ana kesici ağız düz form (düzeltmeden sonra)

**M**

**K**

**N** 62 HRC 'ye kadar sertleştirilmiş çelikler

**S**

**H**

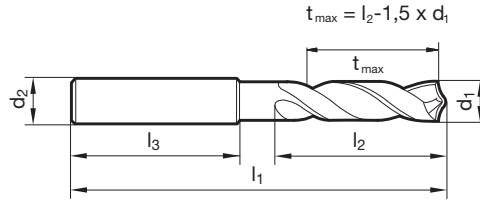
Malzeme **Kom. sert metal**

Yüzey **A**

Kesme yönü **R**

## GÜHRING NAVIGATOR

Kesme verileri sayfası 776



Silindirik Şaftlı Matkap Ucu

Ürün no

1946

d1	d2 h6	l1	l2	l3
mm	mm	mm	mm	mm
2,600	6,000	62,000	20,000	36,000
3,000	6,000	62,000	20,000	36,000
3,400	6,000	62,000	20,000	36,000
4,000	6,000	66,000	24,000	36,000
4,300	6,000	66,000	24,000	36,000
5,000	6,000	66,000	28,000	36,000
5,100	6,000	66,000	28,000	36,000
5,600	6,000	66,000	28,000	36,000
6,000	6,000	66,000	28,000	36,000
6,900	8,000	79,000	34,000	36,000
7,100	8,000	79,000	41,000	36,000
8,000	8,000	79,000	41,000	36,000

d1	d2 h6	l1	l2	l3
mm	mm	mm	mm	mm
8,600	10,000	89,000	47,000	40,000
9,100	10,000	89,000	47,000	40,000
10,000	10,000	89,000	47,000	40,000
10,400	12,000	102,000	55,000	45,000
10,600	12,000	102,000	55,000	45,000
11,100	12,000	102,000	55,000	45,000
12,000	12,000	102,000	55,000	45,000
14,100	16,000	115,000	65,000	48,000



## Helisel matkap uçları, uzun saplı 6 inç boyunda



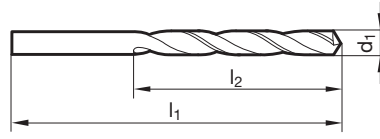
<b>P</b>	•	öz bileme $\geq \varnothing 1,500$ • koni bileme
<b>M</b>		
<b>K</b>	•	
<b>N</b>	•	Alüminyum alaşımlı saçlar • çok katlı levhalar (Sandviç paketleri) • çelik ve döküm
<b>S</b>		
<b>H</b>		

Malzeme **HSS**

Yüzey



Kesme yönü

Ürün no **577**

d1		l1	l2
mm	inch	mm	mm
1,500		153,000	23,000
1,590	1/16	153,000	26,000
1,650		153,000	26,000
1,750		153,000	26,000
1,780		153,000	26,000
1,900		153,000	26,000
1,930		153,000	29,000
1,980	5/64	153,000	29,000
1,990		153,000	29,000
2,000		153,000	29,000
2,100		153,000	29,000
2,300		153,000	32,500
2,380	3/32	153,000	37,000
2,400		153,000	37,000
2,490		153,000	37,000
2,500		153,000	37,000
2,530		153,000	37,000
2,580		153,000	37,000
2,870		153,000	42,000
2,950		153,000	42,000
3,000		153,000	42,000
3,170	1/8	153,000	42,000
3,200		153,000	42,000
3,260		153,000	42,000
3,500		154,000	49,000
3,570	9/64	154,000	49,000
3,800		154,000	55,000
3,860		154,000	55,000
3,910		154,000	55,000
3,970	5/32	154,000	55,000
4,000		154,000	55,000
4,040		154,000	55,000
4,090		154,000	55,000
4,220		154,000	55,000
4,390		154,000	60,000
4,500		154,000	60,000

d1		l1	l2
mm	inch	mm	mm
4,570		154,000	60,000
4,700		154,000	60,000
4,760	3/16	154,000	63,500
4,800		154,000	63,500
4,850		154,000	63,500
4,920		154,000	63,500
4,980		154,000	63,500
5,000		154,000	63,500
5,160	13/64	154,000	63,500
5,500		154,000	68,500
5,560	7/32	154,000	68,500
5,800		154,000	68,500
5,940		154,000	68,500
5,950	15/64	154,000	68,500
6,040		154,000	75,000
6,150		154,000	75,000
6,200		154,000	75,000
6,250		154,000	75,000
6,350	1/4	154,000	75,000
6,530		154,000	75,000
6,800		155,000	80,000
7,000		155,000	80,000
7,700		155,000	90,000
7,940	5/16	155,000	90,000
8,000		155,000	90,000





## Helisel matkap uçları, uzun saplı 6 inç boyunda



**P** • öz bileme  $\geq \varnothing 1,500$  • koni bileme

**M**

**K** •

**N** • Alüminyum alaşımlı saçlar • çok katlı levhalar (Sandviç paketleri) • çelik ve döküm

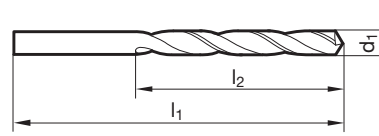
**S**

**H**

Malzeme **HSS**

Yüzey  $\geq 0_{2,36}$

Kesme yönü



Ürün no **579**

d1		l1	l2
mm	inch	mm	mm
1,500		153,000	23,000
1,590	1/16	153,000	26,000
1,780		153,000	26,000
1,980	5/64	153,000	29,000
2,000		153,000	29,000
2,380	3/32	153,000	37,000
2,400		153,000	37,000
2,490		153,000	37,000
2,500		153,000	37,000
2,580		153,000	37,000
2,640		153,000	37,000
2,710		153,000	42,000
2,780	7/64	153,000	42,000
2,790		153,000	42,000
2,820		153,000	42,000
2,870		153,000	42,000
2,950		153,000	42,000
3,000		153,000	42,000
3,050		153,000	42,000
3,170	1/8	153,000	42,000
3,200		153,000	42,000
3,260		153,000	42,000
3,450		154,000	49,000
3,500		154,000	49,000
3,570	9/64	154,000	49,000
3,600		154,000	49,000
3,660		154,000	49,000
3,700		154,000	49,000
3,800		154,000	55,000
3,970	5/32	154,000	55,000

d1		l1	l2
mm	inch	mm	mm
3,990		154,000	55,000
4,000		154,000	55,000
4,040		154,000	55,000
4,090		154,000	55,000
4,370	11/64	154,000	60,000
4,390		154,000	60,000
4,500		154,000	60,000
4,570		154,000	60,000
4,620		154,000	60,000
4,760	3/16	154,000	63,500
4,800		154,000	63,500
4,850		154,000	63,500
4,920		154,000	63,500
4,980		154,000	63,500
5,000		154,000	63,500
5,160	13/64	154,000	63,500
5,560	7/32	154,000	68,500
5,800		154,000	68,500
5,940		154,000	68,500
5,950	15/64	154,000	68,500
6,040		154,000	75,000
6,250		154,000	75,000
6,350	1/4	154,000	75,000
6,450		154,000	75,000
6,530		154,000	75,000
6,750	17/64	155,000	80,000
7,940	5/16	155,000	90,000
8,000		155,000	90,000



## Helisel matkap uçları, uzun saplı 12 inç boyunda

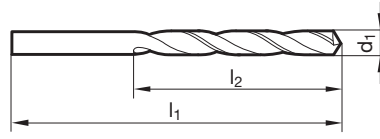


<b>P</b>	•	öz bileme $\geq \varnothing 1,500$ • koni bileme
<b>M</b>		
<b>K</b>	•	
<b>N</b>	•	Aluminyum alaşımlı saçlar • çok katlı levhalar (Sandviç paketleri) • çelik ve döküm
<b>S</b>		
<b>H</b>		

Malzeme **HSS**

Yüzey

Kesme yönü

SİLİNDİR ŞAFTLI MATKAP  
UCUÜrün no **578**

d1		l1	l2
mm	inch	mm	mm
1,500		306,000	23,000
1,590	1/16	306,000	26,000
1,780		306,000	26,000
1,850		306,000	26,000
1,930		306,000	29,000
2,000		306,000	29,000
2,180		306,000	32,500
2,260		306,000	32,500
2,380	3/32	306,000	37,000
2,440		306,000	37,000
2,490		306,000	37,000
2,500		306,000	37,000
2,580		306,000	37,000
2,640		306,000	37,000
2,790		306,000	42,000
2,820		306,000	42,000
3,000		306,000	42,000
3,170	1/8	306,000	42,000
3,200		306,000	42,000
3,260		306,000	42,000
3,500		308,000	49,000
3,570	9/64	308,000	49,000
3,660		308,000	49,000
3,800		308,000	55,000
3,970	5/32	308,000	55,000
4,000		308,000	55,000
4,040		308,000	55,000
4,090		308,000	55,000
4,220		308,000	55,000
4,370	11/64	308,000	60,000

d1		l1	l2
mm	inch	mm	mm
4,390		308,000	60,000
4,500		308,000	60,000
4,570		308,000	60,000
4,620		308,000	60,000
4,700		308,000	60,000
4,760	3/16	308,000	63,500
4,800		308,000	63,500
4,850		308,000	63,500
4,920		308,000	63,500
4,980		308,000	63,500
5,000		308,000	63,500
5,160	13/64	308,000	63,500
5,500		308,000	68,500
5,800		308,000	68,500
5,950	15/64	308,000	68,500
6,000		308,000	68,500
6,040		308,000	75,000
6,350	1/4	308,000	75,000
6,530		308,000	75,000
7,000		310,000	80,000
8,000		310,000	90,000



## Helisel matkap uçları, uzun saplı 12 inç boyunda



**P** • öz bileme  $\geq \varnothing 1,500$  • koni bileme

**M**

**K** •

**N** • Alüminyum alaşımlı saçlar • çok katlı levhalar (Sandviç paketleri) • çelik ve döküm

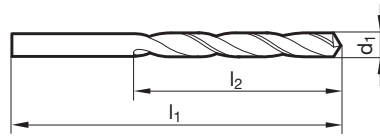
**S**

**H**

Malzeme **HSS**

Yüzey  $\geq 0,2,36$

Kesme yönü



Ürün no **580**

d1		l1	l2
mm	inch	mm	mm
1,500		306,000	23,000
1,590	1/16	306,000	26,000
1,780		306,000	26,000
1,980	5/64	306,000	29,000
2,000		306,000	29,000
2,380	3/32	306,000	37,000
2,490		306,000	37,000
2,500		306,000	37,000
2,580		306,000	37,000
2,640		306,000	37,000
2,710		306,000	42,000
2,780	7/64	306,000	42,000
2,790		306,000	42,000
2,820		306,000	42,000
2,870		306,000	42,000
2,950		306,000	42,000
3,000		306,000	42,000
3,170	1/8	306,000	42,000
3,260		306,000	42,000
3,450		308,000	49,000
3,500		308,000	49,000
3,660		308,000	49,000
3,730		308,000	49,000
3,800		308,000	55,000
3,970	5/32	308,000	55,000
3,990		308,000	55,000
4,000		308,000	55,000
4,040		308,000	55,000
4,300		308,000	60,000
4,370	11/64	308,000	60,000

d1		l1	l2
mm	inch	mm	mm
4,390		308,000	60,000
4,500		308,000	60,000
4,570		308,000	60,000
4,620		308,000	60,000
4,700		308,000	60,000
4,760	3/16	308,000	63,500
4,800		308,000	63,500
4,850		308,000	63,500
4,920		308,000	63,500
4,980		308,000	63,500
5,000		308,000	63,500
5,060		308,000	63,500
5,110		308,000	63,500
5,160	13/64	308,000	63,500
5,560	7/32	308,000	68,500
5,790		308,000	68,500
5,940		308,000	68,500
5,950	15/64	308,000	68,500
6,000		308,000	68,500
6,040		308,000	75,000
6,150		308,000	75,000
6,250		308,000	75,000
6,350	1/4	308,000	75,000
6,530		308,000	75,000
7,940	5/16	310,000	90,000
8,000		310,000	90,000



## Soğutma kanallı matkap uçları



<b>P</b>	•	öz bileme $\geq \varnothing 3,000$ • koni bileme • burç kullanarak delme için • özellikle delik derinliği 5xD üstü için
<b>M</b>	○	
<b>K</b>	•	
<b>N</b>	•	lamine metal sac • çelik ve çelik döküm, yumuşak döküm • 800 N/mm <sup>2</sup> 'ye kadar ostenitli çelikler
<b>S</b>	○	
<b>H</b>		

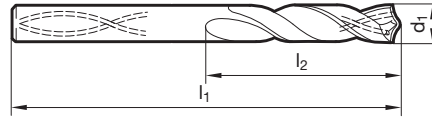
Malzeme **HSS**

Yüzey ○

Kesme yönü (R)

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 788

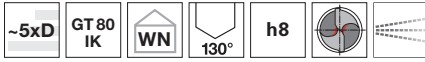
Ürün no **390**

d1	l1	l2
mm	mm	mm
3,000	100,000	66,000
3,300	106,000	69,000
3,500	112,000	73,000
4,000	119,000	78,000
4,200	119,000	78,000
4,500	126,000	82,000
5,000	132,000	87,000
5,500	139,000	91,000
6,000	139,000	91,000
6,500	148,000	97,000
6,800	156,000	102,000
6,900	156,000	102,000
7,000	156,000	102,000
7,500	156,000	102,000
8,000	165,000	109,000
8,500	165,000	109,000
9,000	175,000	115,000
9,500	175,000	115,000

d1	l1	l2
mm	mm	mm
10,000	184,000	121,000
10,200	184,000	121,000
10,500	184,000	121,000
11,000	195,000	128,000
11,500	195,000	128,000
12,000	205,000	134,000
13,000	205,000	134,000



## Soğutma kanallı matkap uçları

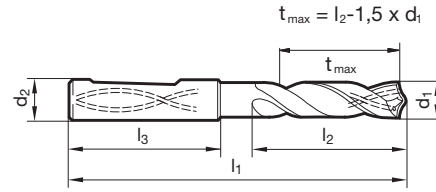


P	•	öz bileme $\geq \varnothing 5,000$ • koni bileme • Co-alaşımlı HSS-çeliği
M	•	
K	•	
N	•	1000 N/mm <sup>2</sup> 'ye kadar uzun talaşlı malzemeler • paslanmaz çelikler • döküm malzemeler • demir dışı metaller
S	•	
H	○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 784

Malzeme	HSCO
Yüzey	○
sap formu	HE



SİLİNDİR ŞAFTLI MATKAP UCU

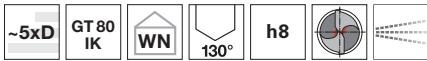
Ürün no 1131

d1		d6 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
5,000		6,000	82,000	44,000	36,000
5,500		6,000	82,000	44,000	36,000
6,000		6,000	82,000	44,000	36,000
6,350	1/4	8,000	91,000	53,000	36,000
6,800		8,000	91,000	53,000	36,000
7,140	9/32	8,000	91,000	53,000	36,000
7,800		8,000	91,000	53,000	36,000
8,000		8,000	91,000	53,000	36,000
9,000		10,000	103,000	61,000	40,000
9,500		10,000	103,000	61,000	40,000
10,000		10,000	103,000	61,000	40,000
10,200		12,000	118,000	71,000	45,000
10,320	13/32	12,000	118,000	71,000	45,000
10,500		12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,500		12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,500		14,000	124,000	77,000	45,000

d1		d6 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,000		14,000	124,000	77,000	45,000
13,500		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,290	9/16	16,000	133,000	83,000	48,000
15,000		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
15,870	5/8	16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,500		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,500		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



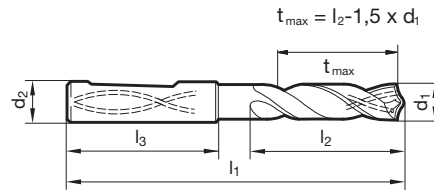
## Soğutma kanallı matkap uçları



<b>P</b>	•	öz bileme $\geq \varnothing 5,000$ • koni bileme • Co-alışimli HSS-çeliği • arttırılmış aşınma direnci
<b>M</b>	•	
<b>K</b>	•	
<b>N</b>	•	1000 N/mm <sup>2</sup> 'ye kadar uzun talaşlı malzemeler • paslanmaz çelikler • döküm malzemeler • demir dışı metaller
<b>S</b>	•	
<b>H</b>	○	

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 784



Ürün no

1132

d1		d6 h6	l1	l2	l3	d1		d6 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
5,000		6,000	82,000	44,000	36,000	12,000		12,000	118,000	71,000	45,000
5,500		6,000	82,000	44,000	36,000	12,500		14,000	124,000	77,000	45,000
6,000		6,000	82,000	44,000	36,000	13,000		14,000	124,000	77,000	45,000
6,500		8,000	91,000	53,000	36,000	13,500		14,000	124,000	77,000	45,000
6,800		8,000	91,000	53,000	36,000	14,000		14,000	124,000	77,000	45,000
7,000		8,000	91,000	53,000	36,000	14,500		16,000	133,000	83,000	48,000
7,500		8,000	91,000	53,000	36,000	15,000		16,000	133,000	83,000	48,000
7,800		8,000	91,000	53,000	36,000	15,500		16,000	133,000	83,000	48,000
8,000		8,000	91,000	53,000	36,000	15,870	5/8	16,000	133,000	83,000	48,000
8,500		10,000	103,000	61,000	40,000	16,000		16,000	133,000	83,000	48,000
9,000		10,000	103,000	61,000	40,000	16,500		18,000	143,000	93,000	48,000
9,500		10,000	103,000	61,000	40,000	17,000		18,000	143,000	93,000	48,000
10,000		10,000	103,000	61,000	40,000	17,500		18,000	143,000	93,000	48,000
10,200		12,000	118,000	71,000	45,000	18,000		18,000	143,000	93,000	48,000
10,320	13/32	12,000	118,000	71,000	45,000	19,000		20,000	153,000	101,000	50,000
10,500		12,000	118,000	71,000	45,000	19,500		20,000	153,000	101,000	50,000
11,000		12,000	118,000	71,000	45,000	20,000		20,000	153,000	101,000	50,000
11,500		12,000	118,000	71,000	45,000						



## İçten su vermesiz HSS-E-PM mikro hassas deliciler



Malzeme HSS-E-PM

Yüzey



Kesme yönü



P • yüzey Bileme • Güçlendirilmiş saplı • &lt;math&gt;\varnothing 0,15\text{ mm}&lt;/math&gt; Co-alaşımlı HSS-çeliği

M •

K •

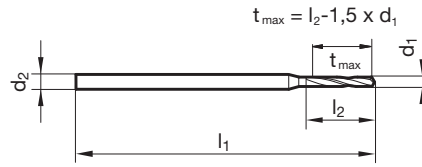
N • yüksek alaşımli çelikleri

S ○

H

## GÜHRING NAVIGATOR

Kesme verileri sayfası 796



Ürün no 301

d1	d2	l1	l2
mm	mm	mm	mm
0,050	1,000	25,000	0,400
0,060	1,000	25,000	0,400
0,070	1,000	25,000	0,500
0,075	1,000	25,000	0,500
0,080	1,000	25,000	0,500
0,090	1,000	25,000	0,500
0,100	1,000	25,000	0,500
0,105	1,000	25,000	0,500
0,110	1,000	25,000	0,500
0,115	1,000	25,000	0,500
0,120	1,000	25,000	0,500
0,121	1,000	25,000	0,800
0,125	1,000	25,000	0,800
0,128	1,000	25,000	0,800
0,130	1,000	25,000	0,800
0,140	1,000	25,000	0,800
0,143	1,000	25,000	0,800
0,145	1,000	25,000	0,800
0,147	1,000	25,000	0,800
0,150	1,000	25,000	0,800
0,155	1,000	25,000	1,100
0,160	1,000	25,000	1,100
0,170	1,000	25,000	1,100
0,175	1,000	25,000	1,100
0,180	1,000	25,000	1,100
0,190	1,000	25,000	1,100
0,195	1,000	25,000	1,500
0,200	1,000	25,000	1,500
0,205	1,000	25,000	1,500
0,210	1,000	25,000	1,500
0,215	1,000	25,000	1,500
0,220	1,000	25,000	1,500
0,225	1,000	25,000	1,500
0,230	1,000	25,000	1,500
0,235	1,000	25,000	1,500
0,240	1,000	25,000	1,500
0,245	1,000	25,000	1,900
0,250	1,000	25,000	1,900
0,255	1,000	25,000	1,900
0,260	1,000	25,000	1,900
0,265	1,000	25,000	1,900
0,270	1,000	25,000	1,900

d1	d2	l1	l2
mm	mm	mm	mm
0,275	1,000	25,000	1,900
0,280	1,000	25,000	1,900
0,285	1,000	25,000	1,900
0,290	1,000	25,000	1,900
0,295	1,000	25,000	1,900
0,300	1,000	25,000	1,900
0,305	1,000	25,000	2,400
0,310	1,000	25,000	2,400
0,315	1,000	25,000	2,400
0,320	1,000	25,000	2,400
0,325	1,000	25,000	2,400
0,330	1,000	25,000	2,400
0,335	1,000	25,000	2,400
0,340	1,000	25,000	2,400
0,345	1,000	25,000	2,400
0,350	1,000	25,000	2,400
0,355	1,000	25,000	2,400
0,360	1,000	25,000	2,400
0,365	1,000	25,000	2,400
0,370	1,000	25,000	2,400
0,375	1,000	25,000	2,400
0,380	1,000	25,000	2,400
0,385	1,000	25,000	3,000
0,390	1,000	25,000	3,000
0,400	1,000	25,000	3,000
0,405	1,000	25,000	3,000
0,410	1,000	25,000	3,000
0,415	1,000	25,000	3,000
0,420	1,000	25,000	3,000
0,425	1,000	25,000	3,000
0,430	1,000	25,000	3,000
0,432	1,000	25,000	3,000
0,435	1,000	25,000	3,000
0,440	1,000	25,000	3,000
0,445	1,000	25,000	3,000
0,450	1,000	25,000	3,000
0,455	1,000	25,000	3,000
0,460	1,000	25,000	3,000
0,470	1,000	25,000	3,000
0,475	1,000	25,000	3,000
0,480	1,000	25,000	3,000
0,485	1,000	25,000	3,400



d1	d2	l1	l2
mm	mm	mm	mm
0,490	1,000	25,000	3,400
0,495	1,000	25,000	3,400
0,500	1,000	25,000	3,400
0,505	1,000	25,000	3,400
0,510	1,000	25,000	3,400
0,515	1,000	25,000	3,400
0,520	1,000	25,000	3,400
0,525	1,000	25,000	3,400
0,530	1,000	25,000	3,400
0,535	1,000	25,000	3,900
0,540	1,000	25,000	3,900
0,545	1,000	25,000	3,900
0,550	1,000	25,000	3,900
0,560	1,000	25,000	3,900
0,570	1,000	25,000	3,900
0,580	1,000	25,000	3,900
0,585	1,000	25,000	3,900
0,590	1,000	25,000	3,900
0,595	1,000	25,000	3,900
0,600	1,000	25,000	3,900
0,605	1,000	25,000	4,200
0,610	1,000	25,000	4,200
0,615	1,000	25,000	4,200
0,620	1,000	25,000	4,200
0,625	1,000	25,000	4,200
0,630	1,000	25,000	4,200
0,632	1,000	25,000	4,200
0,640	1,000	25,000	4,200
0,650	1,000	25,000	4,200
0,655	1,000	25,000	4,200
0,660	1,000	25,000	4,200
0,665	1,000	25,000	4,200
0,670	1,000	25,000	4,200
0,675	1,000	25,000	4,800
0,680	1,000	25,000	4,800
0,690	1,000	25,000	4,800
0,695	1,000	25,000	4,800
0,700	1,000	25,000	4,800
0,705	1,000	25,000	4,800
0,710	1,000	25,000	4,800
0,720	1,000	25,000	4,800
0,725	1,000	25,000	4,800
0,730	1,000	25,000	4,800
0,740	1,000	25,000	4,800
0,750	1,000	25,000	4,800
0,760	1,000	25,000	5,300
0,770	1,000	25,000	5,300
0,780	1,000	25,000	5,300
0,790	1,000	25,000	5,300
0,795	1,500	25,000	5,300
0,800	1,500	25,000	5,300
0,810	1,500	25,000	5,300
0,820	1,500	25,000	5,300
0,825	1,500	25,000	5,300
0,830	1,500	25,000	5,300
0,840	1,500	25,000	5,300
0,845	1,500	25,000	5,300
0,850	1,500	25,000	5,300
0,860	1,500	25,000	6,000
0,870	1,500	25,000	6,000
0,880	1,500	25,000	6,000
0,890	1,500	25,000	6,000
0,900	1,500	25,000	6,000
0,910	1,500	25,000	6,000
0,920	1,500	25,000	6,000
0,925	1,500	25,000	6,000
0,930	1,500	25,000	6,000
0,940	1,500	25,000	6,000
0,950	1,500	25,000	6,000
0,960	1,500	25,000	6,800
0,970	1,500	25,000	6,800
0,980	1,500	25,000	6,800

d1	d2	l1	l2
mm	mm	mm	mm
0,990	1,500	25,000	6,800
1,000	1,500	25,000	6,800
1,010	1,500	25,000	6,800
1,020	1,500	25,000	6,800
1,030	1,500	25,000	6,800
1,040	1,500	25,000	6,800
1,050	1,500	25,000	6,800
1,055	1,500	25,000	6,800
1,060	1,500	25,000	6,800
1,070	1,500	25,000	7,600
1,080	1,500	25,000	7,600
1,090	1,500	25,000	7,600
1,100	1,500	25,000	7,600
1,110	1,500	25,000	7,600
1,120	1,500	25,000	7,600
1,130	1,500	25,000	7,600
1,140	1,500	25,000	7,600
1,150	1,500	25,000	7,600
1,160	1,500	25,000	7,600
1,170	1,500	25,000	7,600
1,180	1,500	25,000	7,600
1,190	1,500	25,000	8,500
1,200	1,500	25,000	8,500
1,210	1,500	25,000	8,500
1,220	1,500	25,000	8,500
1,230	1,500	25,000	8,500
1,240	1,500	25,000	8,500
1,250	1,500	25,000	8,500
1,260	1,500	25,000	8,500
1,265	1,500	25,000	8,500
1,270	1,500	25,000	8,500
1,280	1,500	25,000	8,500
1,290	1,500	25,000	8,500
1,300	1,500	25,000	8,500
1,310	1,500	25,000	8,500
1,320	1,500	25,000	8,500
1,325	1,500	25,000	9,500
1,330	1,500	25,000	9,500
1,340	1,500	25,000	9,500
1,350	1,500	25,000	9,500
1,370	1,500	25,000	9,500
1,380	1,500	25,000	9,500
1,390	1,500	25,000	9,500
1,400	1,500	25,000	9,500
1,410	1,500	25,000	9,500
1,420	1,500	25,000	9,500
1,430	1,500	25,000	9,500
1,440	1,500	25,000	9,500
1,450	1,500	25,000	9,500
1,460	2,000	30,000	9,500
1,470	2,000	30,000	9,500
1,500	2,000	30,000	9,500
1,520	2,000	30,000	10,600
1,530	2,000	30,000	10,600
1,540	2,000	30,000	10,600
1,550	2,000	30,000	10,600
1,590	2,000	30,000	10,600
1,600	2,000	30,000	10,600
1,610	2,000	30,000	10,600
1,630	2,000	30,000	10,600
1,640	2,000	30,000	10,600
1,650	2,000	30,000	10,600
1,660	2,000	30,000	10,600
1,690	2,000	30,000	10,600
1,700	2,000	30,000	10,600
1,710	2,000	30,000	11,800
1,715	2,000	30,000	11,800
1,730	2,000	30,000	11,800
1,745	2,000	30,000	11,800
1,750	2,000	30,000	11,800
1,775	2,000	30,000	11,800
1,800	2,000	30,000	11,800





d1	d2	l1	l2
mm	mm	mm	mm
1,830	2,000	30,000	11,800
1,840	2,000	30,000	11,800
1,850	2,000	30,000	11,800
1,860	2,000	30,000	11,800
1,900	2,000	30,000	11,800
1,920	2,000	30,000	13,200

d1	d2	l1	l2
mm	mm	mm	mm



## İçten su vermesiz HSS-E-PM mikro hassas deliciler

~5xD	DIN 1899	N	118°	0/-0,004
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P	•	yüzey Bileme • Güçlendirilmiş saplı • arttırılmış aşınma direnci
M	•	
K	•	
N	•	yüksek alaşimli çelikleri
S	○	
H		

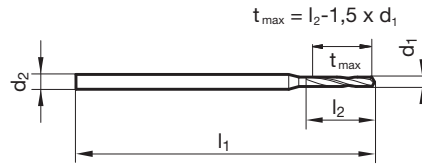
Malzeme HSS-E-PM

Yüzey S

Kesme yönü R

## GÜHRING NAVIGATOR

Kesme verileri sayfası 796



Ürün no 660

d1	d2	l1	l2	d1	d2	l1	l2
mm	mm	mm	mm	mm	mm	mm	mm
0,160	1,000	25,000	1,100	0,530	1,000	25,000	3,400
0,170	1,000	25,000	1,100	0,540	1,000	25,000	3,900
0,180	1,000	25,000	1,100	0,550	1,000	25,000	3,900
0,190	1,000	25,000	1,100	0,560	1,000	25,000	3,900
0,200	1,000	25,000	1,500	0,570	1,000	25,000	3,900
0,210	1,000	25,000	1,500	0,580	1,000	25,000	3,900
0,220	1,000	25,000	1,500	0,590	1,000	25,000	3,900
0,230	1,000	25,000	1,500	0,600	1,000	25,000	3,900
0,240	1,000	25,000	1,500	0,610	1,000	25,000	4,200
0,250	1,000	25,000	1,900	0,620	1,000	25,000	4,200
0,255	1,000	25,000	1,900	0,630	1,000	25,000	4,200
0,260	1,000	25,000	1,900	0,640	1,000	25,000	4,200
0,265	1,000	25,000	1,900	0,650	1,000	25,000	4,200
0,270	1,000	25,000	1,900	0,660	1,000	25,000	4,200
0,280	1,000	25,000	1,900	0,670	1,000	25,000	4,200
0,290	1,000	25,000	1,900	0,680	1,000	25,000	4,800
0,295	1,000	25,000	1,900	0,690	1,000	25,000	4,800
0,300	1,000	25,000	1,900	0,700	1,000	25,000	4,800
0,305	1,000	25,000	2,400	0,710	1,000	25,000	4,800
0,310	1,000	25,000	2,400	0,720	1,000	25,000	4,800
0,320	1,000	25,000	2,400	0,730	1,000	25,000	4,800
0,325	1,000	25,000	2,400	0,740	1,000	25,000	4,800
0,330	1,000	25,000	2,400	0,750	1,000	25,000	4,800
0,340	1,000	25,000	2,400	0,760	1,000	25,000	5,300
0,350	1,000	25,000	2,400	0,770	1,000	25,000	5,300
0,360	1,000	25,000	2,400	0,780	1,000	25,000	5,300
0,370	1,000	25,000	2,400	0,790	1,000	25,000	5,300
0,380	1,000	25,000	2,400	0,800	1,500	25,000	5,300
0,390	1,000	25,000	3,000	0,810	1,500	25,000	5,300
0,400	1,000	25,000	3,000	0,820	1,500	25,000	5,300
0,410	1,000	25,000	3,000	0,830	1,500	25,000	5,300
0,420	1,000	25,000	3,000	0,840	1,500	25,000	5,300
0,430	1,000	25,000	3,000	0,850	1,500	25,000	5,300
0,440	1,000	25,000	3,000	0,860	1,500	25,000	6,000
0,450	1,000	25,000	3,000	0,870	1,500	25,000	6,000
0,460	1,000	25,000	3,000	0,880	1,500	25,000	6,000
0,470	1,000	25,000	3,000	0,900	1,500	25,000	6,000
0,480	1,000	25,000	3,000	0,910	1,500	25,000	6,000
0,490	1,000	25,000	3,400	0,920	1,500	25,000	6,000
0,500	1,000	25,000	3,400	0,940	1,500	25,000	6,000
0,510	1,000	25,000	3,400	0,950	1,500	25,000	6,000
0,520	1,000	25,000	3,400	0,960	1,500	25,000	6,800



d1	d2	l1	l2
mm	mm	mm	mm
0,970	1,500	25,000	6,800
0,980	1,500	25,000	6,800
1,000	1,500	25,000	6,800
1,020	1,500	25,000	6,800
1,040	1,500	25,000	6,800
1,050	1,500	25,000	6,800
1,070	1,500	25,000	7,600
1,080	1,500	25,000	7,600
1,100	1,500	25,000	7,600
1,150	1,500	25,000	7,600
1,180	1,500	25,000	7,600
1,190	1,500	25,000	8,500

d1	d2	l1	l2
mm	mm	mm	mm
1,200	1,500	25,000	8,500
1,220	1,500	25,000	8,500
1,250	1,500	25,000	8,500
1,300	1,500	25,000	8,500
1,350	1,500	25,000	9,500
1,390	1,500	25,000	9,500
1,400	1,500	25,000	9,500
1,420	1,500	25,000	9,500
1,450	1,500	25,000	9,500
1,500	2,000	30,000	9,500
1,800	2,000	30,000	11,800
1,900	2,000	30,000	11,800



## İçten su vermesiz HSS-E-PM mikro hassas deliciler

~5xD	DIN 1899	N	118°	0/-0,004
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Malzeme HSS-E-PM

Yüzey



Kesme yönü



P • yüzey Bileme • Güçlendirilmiş saplı • &lt; Ø 0,15 mm Co-alaşimli HSS-çeliği

M •

K •

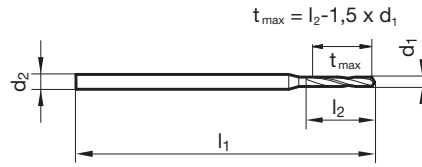
N • yüksek alaşimli çelikleri

S ○

H

## GÜHRING NAVIGATOR

Kesme verileri sayfası 796



Ürün no

303

d1	d2	l1	l2
mm	mm	mm	mm
0,130	1,000	25,000	0,800
0,140	1,000	25,000	0,800
0,150	1,000	25,000	0,800
0,155	1,000	25,000	1,100
0,160	1,000	25,000	1,100
0,170	1,000	25,000	1,100
0,175	1,000	25,000	1,100
0,180	1,000	25,000	1,100
0,185	1,000	25,000	1,100
0,190	1,000	25,000	1,100
0,195	1,000	25,000	1,500
0,200	1,000	25,000	1,500
0,210	1,000	25,000	1,500
0,215	1,000	25,000	1,500
0,220	1,000	25,000	1,500
0,225	1,000	25,000	1,500
0,230	1,000	25,000	1,500
0,235	1,000	25,000	1,500
0,240	1,000	25,000	1,500
0,245	1,000	25,000	1,900
0,250	1,000	25,000	1,900
0,255	1,000	25,000	1,900
0,260	1,000	25,000	1,900
0,265	1,000	25,000	1,900
0,270	1,000	25,000	1,900
0,275	1,000	25,000	1,900
0,280	1,000	25,000	1,900
0,290	1,000	25,000	1,900
0,295	1,000	25,000	1,900
0,300	1,000	25,000	1,900
0,310	1,000	25,000	2,400
0,315	1,000	25,000	2,400
0,330	1,000	25,000	2,400
0,340	1,000	25,000	2,400
0,345	1,000	25,000	2,400
0,350	1,000	25,000	2,400
0,355	1,000	25,000	2,400
0,360	1,000	25,000	2,400
0,370	1,000	25,000	2,400
0,380	1,000	25,000	2,400
0,390	1,000	25,000	3,000
0,400	1,000	25,000	3,000

d1	d2	l1	l2
mm	mm	mm	mm
0,410	1,000	25,000	3,000
0,415	1,000	25,000	3,000
0,420	1,000	25,000	3,000
0,430	1,000	25,000	3,000
0,435	1,000	25,000	3,000
0,440	1,000	25,000	3,000
0,450	1,000	25,000	3,000
0,460	1,000	25,000	3,000
0,465	1,000	25,000	3,000
0,470	1,000	25,000	3,000
0,480	1,000	25,000	3,000
0,485	1,000	25,000	3,400
0,490	1,000	25,000	3,400
0,495	1,000	25,000	3,400
0,500	1,000	25,000	3,400
0,510	1,000	25,000	3,400
0,520	1,000	25,000	3,400
0,525	1,000	25,000	3,400
0,540	1,000	25,000	3,900
0,545	1,000	25,000	3,900
0,550	1,000	25,000	3,900
0,555	1,000	25,000	3,900
0,565	1,000	25,000	3,900
0,570	1,000	25,000	3,900
0,580	1,000	25,000	3,900
0,590	1,000	25,000	3,900
0,600	1,000	25,000	3,900
0,615	1,000	25,000	4,200
0,620	1,000	25,000	4,200
0,630	1,000	25,000	4,200
0,640	1,000	25,000	4,200
0,650	1,000	25,000	4,200
0,660	1,000	25,000	4,200
0,670	1,000	25,000	4,200
0,675	1,000	25,000	4,800
0,680	1,000	25,000	4,800
0,685	1,000	25,000	4,800
0,690	1,000	25,000	4,800
0,695	1,000	25,000	4,800
0,700	1,000	25,000	4,800
0,710	1,000	25,000	4,800
0,720	1,000	25,000	4,800

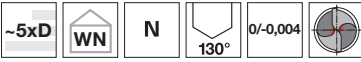


d1	d2	l1	l2
mm	mm	mm	mm
0,740	1,000	25,000	4,800
0,750	1,000	25,000	4,800
0,760	1,000	25,000	5,300
0,770	1,000	25,000	5,300
0,780	1,000	25,000	5,300
0,790	1,000	25,000	5,300
0,800	1,500	25,000	5,300
0,805	1,500	25,000	5,300
0,810	1,500	25,000	5,300
0,820	1,500	25,000	5,300
0,830	1,500	25,000	5,300
0,840	1,500	25,000	5,300
0,850	1,500	25,000	5,300
0,855	1,500	25,000	6,000
0,860	1,500	25,000	6,000
0,870	1,500	25,000	6,000
0,880	1,500	25,000	6,000
0,885	1,500	25,000	6,000
0,890	1,500	25,000	6,000
0,900	1,500	25,000	6,000
0,910	1,500	25,000	6,000
0,915	1,500	25,000	6,000
0,920	1,500	25,000	6,000
0,925	1,500	25,000	6,000
0,935	1,500	25,000	6,000
0,940	1,500	25,000	6,000
0,950	1,500	25,000	6,000
0,960	1,500	25,000	6,800
0,970	1,500	25,000	6,800
0,975	1,500	25,000	6,800
0,980	1,500	25,000	6,800
0,985	1,500	25,000	6,800
0,990	1,500	25,000	6,800
1,000	1,500	25,000	6,800
1,005	1,500	25,000	6,800
1,020	1,500	25,000	6,800

d1	d2	l1	l2
mm	mm	mm	mm
1,030	1,500	25,000	6,800
1,040	1,500	25,000	6,800
1,050	1,500	25,000	6,800
1,060	1,500	25,000	6,800
1,080	1,500	25,000	7,600
1,085	1,500	25,000	7,600
1,090	1,500	25,000	7,600
1,100	1,500	25,000	7,600
1,110	1,500	25,000	7,600
1,120	1,500	25,000	7,600
1,125	1,500	25,000	7,600
1,150	1,500	25,000	7,600
1,160	1,500	25,000	7,600
1,170	1,500	25,000	7,600
1,180	1,500	25,000	7,600
1,200	1,500	25,000	8,500
1,250	1,500	25,000	8,500
1,270	1,500	25,000	8,500
1,280	1,500	25,000	8,500
1,285	1,500	25,000	8,500
1,290	1,500	25,000	8,500
1,310	1,500	25,000	8,500
1,330	1,500	25,000	9,500
1,350	1,500	25,000	9,500
1,360	1,500	25,000	9,500
1,375	1,500	25,000	9,500
1,400	1,500	25,000	9,500
1,405	1,500	25,000	9,500
1,425	1,500	25,000	9,500
1,450	1,500	25,000	9,500
1,460	2,000	30,000	9,500
1,500	2,000	30,000	9,500
1,600	2,000	30,000	10,600
1,615	2,000	30,000	10,600
1,800	2,000	30,000	11,800
1,850	2,000	30,000	11,800



## İçten su vermesiz solid karbür mikro hassas deliciler



**P** • öz bileme  $\geq \varnothing 0,800$  • yüzey Bileme • ana kesici ağız düz form

**M** ○

**K** •

**N** ○

**S** ○

**H** ○

yapı ve sementasyon çelikleri • döküm malzemeler • bronz / pirinç  
• Alüminyum ve Al-Alaşımları • Magnezyum ve Mg-alışımları • plastikler  
ve fiber takviyeli plastikler

Malzeme

Kom. sert metal

Yüzey

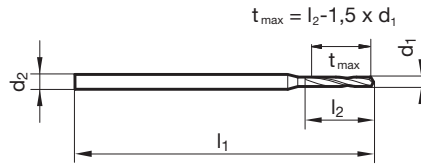


Kesme yönü

SİLİNDİR ŞAFTLI MATKAP  
UCU

## GÜHRING NAVIGATOR

Kesme verileri sayfası 796



Ürün no

701

d1	d2	l1	l2
mm	mm	mm	mm
0,200	1,000	25,000	1,500
0,220	1,000	25,000	1,500
0,250	1,000	25,000	1,900
0,260	1,000	25,000	1,900
0,280	1,000	25,000	1,900
0,300	1,000	25,000	1,900
0,330	1,000	25,000	2,400
0,350	1,000	25,000	2,400
0,400	1,000	25,000	3,000
0,450	1,000	25,000	3,000
0,500	1,000	25,000	3,400
0,600	1,000	25,000	3,900
0,650	1,000	25,000	4,200
0,700	1,000	25,000	4,800
0,750	1,000	25,000	4,800
0,800	1,500	25,000	5,300
0,810	1,500	25,000	5,300
0,830	1,500	25,000	5,300

d1	d2	l1	l2
mm	mm	mm	mm
0,850	1,500	25,000	5,300
0,900	1,500	25,000	6,000
1,000	1,500	25,000	6,800
1,050	1,500	25,000	6,800
1,100	1,500	25,000	7,600
1,150	1,500	25,000	7,600
1,200	1,500	25,000	8,500
1,250	1,500	25,000	8,500
1,300	1,500	25,000	8,500
1,350	1,500	25,000	9,500
1,400	1,500	25,000	9,500



## İçten su vermesiz solid karbür mikro hassas deliciler



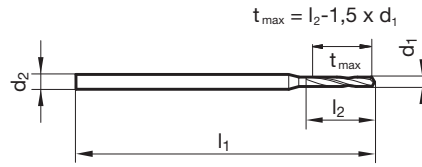
**P** • öz bileme  $\geq \varnothing 0,800$  • yüzey Bileme



**N** yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşimli çelikler 1200 N/mm<sup>2</sup>'ye kadar • döküm malzemeler

Malzeme **Kom. sert metal**Yüzey **A**Kesme yönü **R****GÜHRING**NAVIGATOR

Kesme verileri sayfası 796



Ürün no

3899

d1	d2 h6	l1	l2
mm	mm	mm	mm
0,100	3,000	38,000	1,200
0,150	3,000	38,000	2,000
0,200	3,000	38,000	2,500
0,250	3,000	38,000	3,000
0,260	3,000	38,000	3,000
0,270	3,000	38,000	3,000
0,280	3,000	38,000	3,000
0,300	3,000	38,000	5,000
0,310	3,000	38,000	5,000
0,330	3,000	38,000	5,000
0,350	3,000	38,000	6,000
0,360	3,000	38,000	6,000
0,370	3,000	38,000	6,000
0,380	3,000	38,000	6,000
0,400	3,000	38,000	7,000
0,410	3,000	38,000	7,000
0,430	3,000	38,000	7,000
0,440	3,000	38,000	7,000
0,450	3,000	38,000	7,000
0,480	3,000	38,000	7,000
0,500	3,000	38,000	7,000
0,510	3,000	38,000	7,000
0,530	3,000	38,000	7,000
0,550	3,000	38,000	7,000
0,570	3,000	38,000	7,000
0,600	3,000	38,000	7,000
0,640	3,000	38,000	7,000
0,650	3,000	38,000	7,000
0,660	3,000	38,000	7,000
0,680	3,000	38,000	7,000
0,700	3,000	38,000	8,000
0,710	3,000	38,000	8,000
0,720	3,000	38,000	8,000
0,740	3,000	38,000	8,000
0,750	3,000	38,000	8,000
0,760	3,000	38,000	8,000
0,770	3,000	38,000	8,000
0,780	3,000	38,000	8,000
0,790	3,000	38,000	8,000
0,800	3,000	38,000	10,000
0,810	3,000	38,000	10,000
0,820	3,000	38,000	10,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
0,830	3,000	38,000	10,000
0,840	3,000	38,000	10,000
0,850	3,000	38,000	10,000
0,860	3,000	38,000	10,000
0,870	3,000	38,000	10,000
0,880	3,000	38,000	10,000
0,890	3,000	38,000	10,000
0,900	3,000	38,000	10,000
0,910	3,000	38,000	10,000
0,920	3,000	38,000	10,000
0,930	3,000	38,000	10,000
0,940	3,000	38,000	10,000
0,950	3,000	38,000	10,000
0,960	3,000	38,000	10,000
0,970	3,000	38,000	10,000
0,980	3,000	38,000	10,000
0,990	3,000	38,000	10,000
1,000	3,000	38,000	10,000
1,010	3,000	38,000	10,000
1,020	3,000	38,000	10,000
1,050	3,000	38,000	10,000
1,060	3,000	38,000	10,000
1,070	3,000	38,000	10,000
1,090	3,000	38,000	10,000
1,100	3,000	38,000	10,000
1,110	3,000	38,000	10,000
1,150	3,000	38,000	10,000
1,170	3,000	38,000	10,000
1,190	3,000	38,000	10,000
1,200	3,000	38,000	10,000
1,210	3,000	38,000	10,000
1,220	3,000	38,000	10,000
1,230	3,000	38,000	10,000
1,240	3,000	38,000	10,000
1,260	3,000	38,000	10,000
1,270	3,000	38,000	10,000
1,280	3,000	38,000	10,000
1,300	3,000	38,000	10,000
1,370	3,000	38,000	10,000
1,400	3,000	38,000	10,000
1,420	3,000	38,000	10,000
1,450	3,000	38,000	10,000



Silindir Şaftlı Matkap ucu

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,490	3,000	38,000	10,000
1,500	3,000	38,000	10,000
1,510	3,000	38,000	10,000
1,520	3,000	38,000	10,000
1,550	3,000	38,000	10,000
1,560	3,000	38,000	10,000
1,580	3,000	38,000	10,000
1,590	3,000	38,000	10,000
1,600	3,000	38,000	12,000
1,630	3,000	38,000	12,000
1,650	3,000	38,000	12,000
1,700	3,000	38,000	12,000
1,750	3,000	38,000	12,000
1,800	3,000	38,000	12,000
1,810	3,000	38,000	12,000
1,820	3,000	38,000	12,000
1,830	3,000	38,000	12,000
1,840	3,000	38,000	12,000
1,850	3,000	38,000	12,000
1,860	3,000	38,000	12,000
1,900	3,000	38,000	12,000
1,920	3,000	38,000	12,000
1,950	3,000	38,000	12,000
1,980	3,000	38,000	12,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
2,000	3,000	38,000	12,000
2,050	3,000	38,000	12,000
2,100	3,000	38,000	12,000
2,150	3,000	38,000	12,000
2,200	3,000	38,000	12,000
2,400	3,000	38,000	12,000
2,500	3,000	38,000	12,000
2,550	3,000	38,000	12,000
2,600	3,000	38,000	12,000
2,750	3,000	38,000	12,000
2,800	3,000	38,000	12,000
2,950	3,000	38,000	12,000
3,000	3,000	38,000	12,000





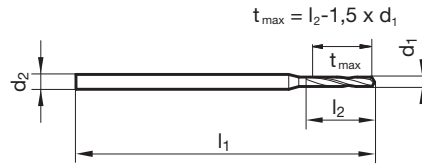
## ExclusiveLine kılcal matkap uçları, soğutma kanalsız



P	•	öz bileme $\geq \varnothing 0,500$ • yüzey Bileme • ana kesici ağız düz form • taşlanmış kesme ağız yuvarlatması
M	•	
K	•	
N	○	yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm <sup>2</sup> 'ye kadar • paslanmaz çelikler • döküm malzemeler
S	○	
H		

## GÜHRING NAVIGATOR

Kesme verileri sayfası 796

Malzeme **Kom. sert metal**Yüzey **A**Kesme yönü **R**

SİLİNDİR ŞAFTLI MATKAP UCU

Ürün no

6400

d1	d2 h6	l1	l2
mm	mm	mm	mm
0,500	3,000	47,000	3,000
0,550	3,000	47,000	3,300
0,600	3,000	47,000	3,600
0,650	3,000	47,000	3,900
0,700	3,000	47,000	4,200
0,750	3,000	47,000	4,500
0,800	3,000	47,000	4,800
0,850	3,000	47,000	5,100
0,900	3,000	47,000	5,400
0,950	3,000	47,000	5,700
1,000	3,000	47,000	6,000
1,050	3,000	47,000	6,300
1,100	3,000	47,000	6,600
1,150	3,000	47,000	6,900
1,200	3,000	47,000	7,200
1,250	3,000	47,000	7,500
1,300	3,000	47,000	7,800
1,350	3,000	47,000	8,100
1,400	3,000	47,000	8,400
1,450	3,000	47,000	8,700
1,500	3,000	47,000	9,000
1,550	3,000	47,000	9,300
1,590	3,000	47,000	9,600
1,600	3,000	47,000	9,600
1,650	3,000	47,000	9,900
1,700	3,000	47,000	10,200
1,750	3,000	47,000	10,500
1,800	3,000	52,000	10,800
1,850	3,000	52,000	11,100
1,900	3,000	52,000	11,400

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,950	3,000	52,000	11,700
1,980	4,000	59,000	12,000
2,000	4,000	59,000	12,000
2,050	4,000	59,000	12,300
2,100	4,000	59,000	12,600
2,150	4,000	59,000	12,900
2,200	4,000	59,000	13,200
2,250	4,000	59,000	13,500
2,300	4,000	59,000	13,800
2,350	4,000	59,000	14,100
2,380	4,000	59,000	14,400
2,400	4,000	59,000	14,400
2,450	4,000	59,000	14,700
2,500	4,000	59,000	15,000
2,550	4,000	59,000	15,300
2,600	4,000	59,000	15,600
2,650	4,000	59,000	15,900
2,700	4,000	59,000	16,200
2,750	4,000	59,000	16,500
2,780	4,000	59,000	16,800
2,800	4,000	59,000	16,800
2,850	4,000	59,000	17,100
2,900	4,000	59,000	17,400
2,950	4,000	59,000	17,700
3,000	4,000	59,000	18,000



## ExclusiveLine kılcal matkap uçları, soğutma kanalsız



P	•	öz bileme $\geq \varnothing 0,500$ • yüzey Bileme • ana kesici ağız düz form • taşlanmış kesme ağız yuvarlatması
M	•	
K	•	
N	○	yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm <sup>2</sup> 'ye kadar • paslanmaz çelikler • döküm malzemeler
S	○	
H		

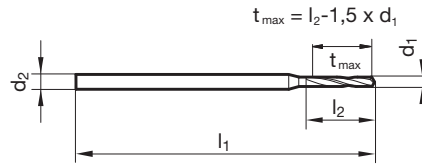
Malzeme Kom. sert metal

Yüzey A

Kesme yönü R

## GÜHRING NAVIGATOR

Kesme verileri sayfası 796



Ürün no 6401

d1	d2 h6	l1	l2
mm	mm	mm	mm
0,500	3,000	47,000	4,000
0,550	3,000	47,000	4,400
0,600	3,000	47,000	4,800
0,650	3,000	47,000	5,200
0,700	3,000	47,000	5,600
0,750	3,000	47,000	6,000
0,800	3,000	47,000	6,400
0,850	3,000	47,000	6,800
0,900	3,000	47,000	7,200
0,950	3,000	47,000	7,600
1,000	3,000	47,000	8,000
1,050	3,000	47,000	8,400
1,100	3,000	47,000	8,800
1,150	3,000	47,000	9,200
1,200	3,000	52,000	10,800
1,250	3,000	52,000	11,300
1,300	3,000	52,000	11,700
1,350	3,000	52,000	12,200
1,400	3,000	52,000	12,600
1,450	3,000	52,000	13,100
1,500	3,000	52,000	13,500
1,550	3,000	52,000	14,000
1,590	3,000	52,000	14,400
1,600	3,000	52,000	14,400
1,650	3,000	52,000	14,900
1,700	3,000	52,000	15,300
1,750	3,000	52,000	15,800
1,800	3,000	52,000	16,200
1,850	3,000	52,000	16,700
1,900	3,000	52,000	17,100

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,950	3,000	52,000	17,600
1,980	4,000	63,000	18,000
2,000	4,000	63,000	18,000
2,050	4,000	63,000	18,500
2,100	4,000	63,000	18,900
2,150	4,000	63,000	19,400
2,200	4,000	63,000	19,800
2,250	4,000	63,000	20,300
2,300	4,000	63,000	20,700
2,350	4,000	63,000	21,200
2,380	4,000	63,000	21,600
2,400	4,000	63,000	21,600
2,450	4,000	63,000	22,100
2,500	4,000	63,000	22,500
2,550	4,000	63,000	23,000
2,600	4,000	67,000	23,400
2,650	4,000	67,000	23,900
2,700	4,000	67,000	24,300
2,750	4,000	67,000	24,800
2,780	4,000	67,000	25,200
2,800	4,000	67,000	25,200
2,850	4,000	67,000	25,700
2,900	4,000	67,000	26,100
2,950	4,000	67,000	26,600
3,000	4,000	67,000	27,000



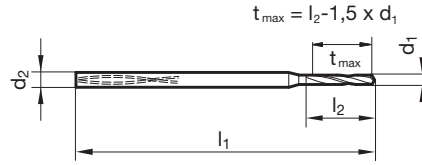
## ExclusiveLine kılcal matkap ucu, soğutma kanallı



P	•	öz bileme $\geq \varnothing 1,400$ • yüzey Bileme • ana kesici ağız düz form
M	•	• taşlanmış kesme ağız yuvarlatması
K	•	
N	○	yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm <sup>2</sup> 'ye kadar • paslanmaz çelikler • döküm malzemeler
S	○	
H		

Malzeme **Kom. sert metal**Yüzey **A**Kesme yönü **R****NEW****GÜHRING**NAVIGATOR

Kesme verileri sayfası 796



SİLİNDİR ŞAFTLI MATKAP UCU

Ürün no **6405**

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,400	4,000	52,000	11,000
1,450	4,000	52,000	12,000
1,500	4,000	52,000	12,000
1,550	4,000	52,000	12,000
1,590	4,000	52,000	13,000
1,600	4,000	52,000	13,000
1,650	4,000	52,000	13,000
1,700	4,000	56,000	14,000
1,750	4,000	56,000	14,000
1,800	4,000	56,000	14,000
1,850	4,000	56,000	15,000
1,900	4,000	56,000	15,000
1,950	4,000	56,000	16,000
1,980	4,000	56,000	16,000
2,000	4,000	56,000	16,000
2,050	4,000	56,000	16,000
2,100	4,000	62,000	17,000
2,150	4,000	62,000	17,000
2,200	4,000	62,000	18,000
2,250	4,000	62,000	18,000
2,300	4,000	62,000	18,000
2,350	4,000	62,000	19,000
2,380	4,000	62,000	19,000
2,400	4,000	62,000	19,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
2,450	4,000	62,000	20,000
2,500	4,000	62,000	20,000
2,550	4,000	62,000	20,000
2,600	4,000	66,000	21,000
2,650	4,000	66,000	21,000
2,700	4,000	66,000	22,000
2,750	4,000	66,000	22,000
2,780	4,000	66,000	22,000
2,800	4,000	66,000	22,000
2,850	4,000	66,000	23,000
2,900	4,000	66,000	23,000
2,950	4,000	66,000	24,000
3,000	4,000	66,000	24,000



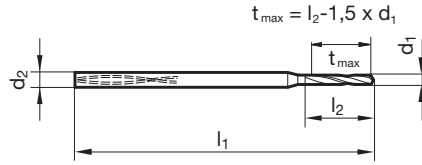
## ExclusiveLine kılcal matkap ucu, soğutma kanallı



P	•	öz bileme $\geq \text{Ø } 1,400$ • yüzey Bileme • ana kesici ağız düz form • taşlanmış kesme ağız yuvarlatması
M	•	
K	•	
N	○	yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm <sup>2</sup> 'ye kadar • paslanmaz çelikler • döküm malzemeler
S	○	
H		

Malzeme **Kom. sert metal**Yüzey **A**Kesme yönü **R****GÜHRING**NAVIGATOR

Kesme verileri sayfası 796

Ürün no **6408**

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,400	4,000	52,000	15,000
1,450	4,000	52,000	16,000
1,500	4,000	52,000	17,000
1,550	4,000	52,000	17,000
1,590	4,000	52,000	18,000
1,600	4,000	52,000	18,000
1,650	4,000	52,000	18,000
1,700	4,000	56,000	19,000
1,750	4,000	56,000	19,000
1,800	4,000	56,000	20,000
1,850	4,000	56,000	20,000
1,900	4,000	56,000	21,000
1,950	4,000	56,000	21,000
1,980	4,000	56,000	22,000
2,000	4,000	56,000	22,000
2,050	4,000	56,000	23,000
2,100	4,000	62,000	23,000
2,150	4,000	62,000	24,000
2,200	4,000	62,000	24,000
2,250	4,000	62,000	25,000
2,300	4,000	62,000	25,000
2,320	4,000	62,000	26,000
2,350	4,000	62,000	26,000
2,380	4,000	62,000	26,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
2,400	4,000	62,000	26,000
2,450	4,000	62,000	27,000
2,500	4,000	62,000	28,000
2,550	4,000	62,000	28,000
2,600	4,000	66,000	29,000
2,650	4,000	66,000	29,000
2,700	4,000	66,000	30,000
2,750	4,000	66,000	30,000
2,780	4,000	66,000	31,000
2,800	4,000	66,000	31,000
2,850	4,000	66,000	31,000
2,900	4,000	66,000	32,000
2,950	4,000	66,000	32,000
3,000	4,000	66,000	33,000



## ExclusiveLine kılcal matkap ucu, soğutma kanallı

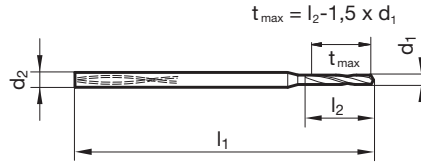


P	•	öz bileme $\geq \varnothing 1,400$ • yüzey Bileme • ana kesici ağız düz form
M	•	• taşlanmış kesme ağız yuvarlatması
K	•	
N	○	yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alışımlı çelikler 1200 N/mm <sup>2</sup> 'ye kadar • paslanmaz çelikler • döküm malzemeler
S	○	
H		

## GÜHRING NAVIGATOR

Kesme verileri sayfası 796

Malzeme	Kom. sert metal
Yüzey	A
Kesme yönü	R



SİLİNDİR ŞAFTLI MATKAP UCU

Ürün no

6412

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,400	4,000	62,000	25,000
1,500	4,000	62,000	27,000
1,590	4,000	62,000	29,000
1,600	4,000	62,000	29,000
1,600	4,000	62,000	29,000
1,600	4,000	62,000	29,000
1,700	4,000	70,000	31,000
1,800	4,000	70,000	32,000
1,900	4,000	70,000	34,000
1,980	4,000	70,000	36,000
2,000	4,000	70,000	36,000
2,100	4,000	78,000	38,000
2,200	4,000	78,000	40,000
2,300	4,000	78,000	42,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
2,380	4,000	78,000	44,000
2,400	4,000	78,000	44,000
2,500	4,000	78,000	45,000
2,600	4,000	87,000	47,000
2,700	4,000	87,000	48,000
2,780	4,000	87,000	50,000
2,800	4,000	87,000	50,000
2,900	4,000	87,000	52,000
3,000	4,000	87,000	54,000



## Kısa helisel matkap ucu sap-Ø 12,7 mm

P • öz bileme  $\geq \text{Ø } 14,290$  • koni bileme • birim şaftı ile

P	•
M	
K	•
N	○
S	
H	

alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

Malzeme **HSS**

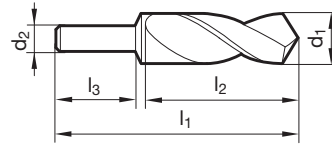
Yüzey



Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 778

Ürün no **268**

d1	d2	l1	l2	l3
mm	mm	mm	mm	mm
13,000	12,700	156,000	82,000	57,000
13,490	12,700	156,000	82,000	57,000
13,500	12,700	156,000	82,000	57,000
14,000	12,700	156,000	82,000	57,000
14,290	12,700	157,000	83,000	57,000
14,500	12,700	157,000	83,000	57,000
15,000	12,700	157,000	83,000	57,000
15,500	12,700	157,000	83,000	57,000
15,870	12,700	157,000	83,000	57,000
16,000	12,700	157,000	83,000	57,000
16,500	12,700	158,000	84,000	57,000
16,670	12,700	158,000	84,000	57,000
17,000	12,700	158,000	84,000	57,000
17,460	12,700	158,000	84,000	57,000
17,500	12,700	158,000	84,000	57,000
18,000	12,700	158,000	84,000	57,000
19,000	12,700	158,000	84,000	57,000
19,050	12,700	159,000	85,000	57,000

d1	d2	l1	l2	l3
mm	mm	mm	mm	mm
19,840	12,700	159,000	85,000	57,000
20,000	12,700	159,000	85,000	57,000
21,000	12,700	159,000	85,000	57,000
21,430	12,700	159,000	85,000	57,000
22,000	12,700	159,000	85,000	57,000
22,220	12,700	159,000	85,000	57,000
23,000	12,700	159,000	85,000	57,000
23,020	12,700	159,000	85,000	57,000
23,810	12,700	160,000	86,000	57,000
24,000	12,700	160,000	86,000	57,000
25,000	12,700	160,000	86,000	57,000
25,400	12,700	160,000	86,000	57,000
28,570	12,700	160,000	86,000	57,000



## Kısa helisel matkap ucu sap-Ø 16,0 mm



<b>P</b>	•	uç bilemesiz • Co-alaşımlı HSS-çeliği • arttırılmış aşınma direnci • birim şaftı ile • Çift taraf puntalı yarı mamül ürün • düzeltme işlemleri
<b>M</b>	•	örneğin: çap düzeltme, kademe bilemesi, ağız bileme gibi
<b>K</b>	○	
<b>N</b>	○	zor işlenebilir malzemeler • paslanmaz çelik/aside dayanıklı • yay çelikleri • ostenitik paslanmaz çelikler
<b>S</b>	○	
<b>H</b>		

Malzeme **HSCO**

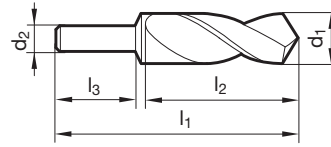
Yüzey



Kesme yönü

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 772

Ürün no **128**

d1	d2	l1	l2	l3
mm	mm	mm	mm	mm
16,000	16,000	130,000	88,000	42,000
16,500	16,000	130,000	88,000	40,000
17,000	16,000	130,000	88,000	40,000
17,500	16,000	130,000	88,000	40,000
18,000	16,000	130,000	88,000	40,000
19,000	16,000	130,000	88,000	40,000
20,000	16,000	130,000	88,000	40,000
20,500	16,000	130,000	88,000	40,000
21,000	16,000	130,000	88,000	40,000
21,500	16,000	130,000	88,000	40,000
22,000	16,000	130,000	88,000	40,000
22,500	16,000	130,000	88,000	40,000
23,000	16,000	130,000	88,000	40,000
23,500	16,000	130,000	88,000	40,000
24,000	16,000	130,000	88,000	40,000
24,500	16,000	130,000	88,000	40,000
25,000	16,000	130,000	88,000	40,000
25,500	16,000	140,000	98,000	40,000

d1	d2	l1	l2	l3
mm	mm	mm	mm	mm
26,000	16,000	140,000	98,000	40,000
27,000	16,000	140,000	98,000	40,000
28,000	16,000	140,000	98,000	40,000
28,500	16,000	140,000	98,000	40,000
30,000	16,000	140,000	98,000	40,000
31,000	16,000	140,000	98,000	40,000
32,000	16,000	140,000	98,000	40,000
35,000	16,000	140,000	98,000	40,000
38,000	16,000	140,000	98,000	40,000
40,000	16,000	140,000	98,000	40,000



## Kısa helisel matkap ucu sap-Ø25,4 mm



<b>P</b>	•	uç bilesmez • Co-alaşımlı HSS-çeliği • arttırılmış aşınma direnci • birim şaftı ile • Çift taraf puntalı yarı mamül ürün • düzeltme işlemleri
<b>M</b>	•	örneğin: çap düzeltme, kademe bilesmesi, ağız bilesme gibi
<b>K</b>	○	
<b>N</b>	○	paslanmaz çelik/aside dayanıklı • zor işlenebilir malzemeler • yay çelikleri • ostenitik paslanmaz çelikler
<b>S</b>	○	
<b>H</b>		

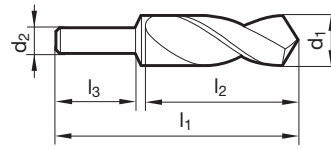
Malzeme **HSCO**

Yüzey ○

Kesme yönü

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 772

Ürün no **129**

d1	d2	l1	l2	l3
mm	mm	mm	mm	mm
25,000	25,400	140,000	93,000	45,000
26,000	25,400	140,000	93,000	45,000
28,000	25,400	140,000	93,000	45,000
29,500	25,400	140,000	93,000	45,000
30,000	25,400	140,000	93,000	45,000
32,000	25,400	140,000	93,000	45,000
33,000	25,400	140,000	93,000	45,000
34,000	25,400	140,000	93,000	45,000
35,000	25,400	140,000	93,000	45,000
36,000	25,400	140,000	93,000	45,000
37,000	25,400	140,000	93,000	45,000
38,000	25,400	140,000	93,000	45,000

d1	d2	l1	l2	l3
mm	mm	mm	mm	mm
40,000	25,400	140,000	93,000	45,000





## Kısa helisel matkap ucu sap-Ø25,4 mm



<b>P</b>	•	uç bilemesiz • Co-alaşımlı HSS-çeliği • yüksek aşınma direnci • birim şaftı ile • Çift taraf puntalı yarı mamül ürün • düzeltme işlemleri
<b>M</b>	•	örneğin:çap düzeltme,kademe bilemesi,ağız bileme gibi
<b>K</b>	○	
<b>N</b>	○	zor işlenebilir malzemeler • paslanmaz / aside dayanıklı çelikler Va-çelikleri • yay çelikleri • ostenitik paslanmaz çelikler
<b>S</b>	○	
<b>H</b>		

Malzeme **HSCO**

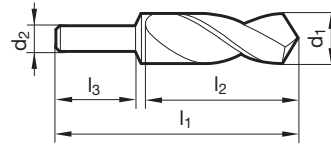
Yüzey



Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 772



Ürün no

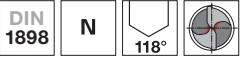
**136**

d1	d2	l1	l2	l3
mm	mm	mm	mm	mm
25,000	25,400	140,000	93,000	45,000
25,500	25,400	140,000	93,000	45,000
26,000	25,400	140,000	93,000	45,000
26,500	25,400	140,000	93,000	45,000
27,500	25,400	140,000	93,000	45,000
29,500	25,400	140,000	93,000	45,000

d1	d2	l1	l2	l3
mm	mm	mm	mm	mm
36,000	25,400	140,000	93,000	45,000
38,000	25,400	140,000	93,000	45,000
39,000	25,400	140,000	93,000	45,000



Pim deliği matkap ucu



Malzeme **HSS**

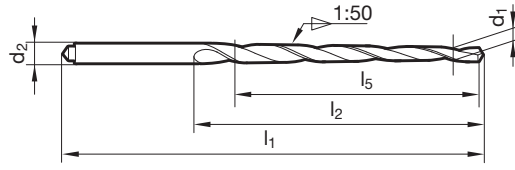
Yüzey  $\geq \frac{0}{2,36}$

Kesme yönü

**P** • öz bileme  $\geq \varnothing 1,000$  • koni bileme • konik deliklerde konik pin leri tutmak için DIN1 • döndürücü dili

<b>P</b>	•
<b>M</b>	○
<b>K</b>	•
<b>N</b>	○
<b>S</b>	○
<b>H</b>	○

Silindir Şaftlı Matkap ucu



Ürün no **531**

d1	d2	l1	l2	l5
mm	mm	mm	mm	mm
2,000	3,150	86,000	52,000	48,000
2,500	3,150	86,000	52,000	48,000
3,000	4,000	100,000	63,000	58,000
3,500	5,000	112,000	74,000	68,000
4,000	5,000	112,000	74,000	68,000
4,500	6,300	122,000	81,000	73,000

d1	d2	l1	l2	l5
mm	mm	mm	mm	mm
5,000	6,300	122,000	81,000	73,000
5,500	8,000	160,000	114,000	105,000
6,000	8,000	160,000	114,000	105,000
8,000	10,000	207,000	157,000	145,000
10,000	12,500	245,000	190,000	175,000
12,000	16,000	290,000	228,000	210,000



## Helisel matkap setleri



**P** • koni bileme • Matkap setleri standart ölçülerde gösterildiği gibi, dizip kullanmak için setler bakalit standlarla desteklenebilir, daha rahat kullanımı için kutu tavsiye edilir, diğer matkap set opsiyonları talep üzerindedir

Malzeme **HSS**Yüzey  $\geq 0,2,36$ 

Kesme yönü

SİLİNDİR ŞAFTLI MATKAP  
UCUÜrün no **201**

d1	um artarak	adet/set	Code-No.
mm	mm		
1,0-5,0	0,1	41	0,011
5,1-10,0	0,1	50	0,012
1,0-10,0	0,5	19	0,013
1,0-13,0	0,5	25	0,014
1,0-5,9	0,1	50	0,015
6,0-10,0	0,1	41	0,016
1,0-10,5	0,5	24	0,018
1,0-10,5	0,5	32	0,019
1/16 - 1/2	1/64	29	0,021
1,02-5,79	1/64	60	0,026



## Helisel Matkap Setleri, çözüük



**P** • koni bileme • Matkap setleri standart ölçülerde gösterildiği gibi, dizip kullanmak için setler bakalit standlarla desteklenebilir, daha rahat kullanımı için kutu tavsiye edilir, diğer matkap set opsiyonları talep üzerinedir



Malzeme **HSS**

Yüzey

Kesme yönü

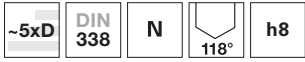


Ürün no **200**

d1	um artarak	adet/set	Code-No.
mm	mm		
1,0-5,0	0,1	41	0,011
5,1-10,0	0,1	50	0,012
1,0-10,0	0,5	19	0,013
1,0-13,0	0,5	25	0,014
1,0-5,9	0,1	50	0,015
6,0-10,0	0,1	41	0,016
1,0-10,5	0,5	24	0,018



## Helisel matkap setleri



**P** • koni bileme • Matkap setleri standart ölçülerde gösterildiği gibi, dizip kullanmak için setler bakalit standlarla desteklenebilir, daha rahat kullanımı için kutu tavsiye edilir, diğer matkap set opsiyonları talep üzerindedir

Malzeme **HSS**Yüzey **S**Kesme yönü **R**

SİLİNDİR ŞAFTLI MATKAP UCU

Ürün no 17

d1 mm	um artarak mm	adet/set	Code-No.
1,0-10,0	0,5	19	6,013
1,0-13,0	0,5	25	6,014
1,0-5,9	0,1	50	6,015
6,0-10,0	0,1	41	6,016
1/16 - 1/2	1/64	29	6,021



## Helisel matkap setleri



**P** • koni bileme • Matkap setleri standart ölçülerde gösterildiği gibi, dizip kullanmak için setler bakalit standlarla desteklenebilir, daha rahat kullanımı için kutu tavsiye edilir, diğer matkap set opsiyonları talep üzerindedir

<b>M</b>	○
<b>K</b>	•
<b>N</b>	○
<b>S</b>	○
<b>H</b>	○

Malzeme **HSCO**

Yüzey



Kesme yönü



Ürün no

16

d1	um artarak	adet/set	Code-No.
mm	mm		
1,0-10,0	0,5	19	3,013
1,0-13,0	0,5	25	3,014
1,0-5,9	0,1	50	3,015
6,0-10,0	0,1	41	3,016
1/16 - 1/2	1/64	29	3,021



## Helisel matkap setleri



**P** ○ koni bileme • Matkap setleri standart ölçülerde gösterildiği gibi, dizip kullanmak için setler bakalit standlarla desteklenebilir, daha rahat kullanımı için kutu tavsiye edilir, diğer matkap set opsiyonları talep üzerindedir

Malzeme **HSCO**

Yüzey ○

Kesme yönü **(R)**SİLİNDİR ŞAFTLI MATKAP  
UCUÜrün no **18**

d1 mm	um artarak mm	adet/set	Code-No.
1,0-10,0	0,5	19	8,013
1,0-13,0	0,5	25	8,014
1,0-5,9	0,1	50	8,015
6,0-10,0	0,1	41	8,016
1,0-10,5	0,5	24	8,018



## Helisel matkap setleri



**P** ○ koni bileme • Matkap setleri standart ölçülerde gösterildiği gibi, dizip kullanmak için setler bakalit standlarla desteklenebilir, daha rahat kullanımı için kutu tavsiye edilir, diğer matkap set opsiyonları talep üzerindedir



Malzeme **HSCO**

Yüzey ○

Kesme yönü (R)



Ürün no **195**

d1	um artarak	adet/set	Code-No.
mm	mm		
1,0-13,0	0,5	25	8,014
1,0-10,5	0,5	24	8,018





## Helisel matkap setleri



**P** • koni bileme • Matkap setleri standart ölçülerde gösterildiği gibi, dizip kullanmak için setler bakalit standlarla desteklenebilir, daha rahat kullanımı için kutu tavsiye edilir, diğer matkap set opsiyonları talep üzerindedir

Malzeme **HSC0**

Yüzey



Kesme yönü



SİLİNDİR ŞAFTLI MATKAP UCU

Ürün no

2049

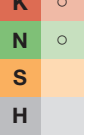
d1 mm	um artarak mm	adet/set	Code-No.
1,0-13,0	0,5	25	0,014
1,0-10,0	0,5	19	0,013
1,0-10,5	0,5	24	0,018
1,0-5,0	0,1	41	0,011
5,1-10,0	0,1	50	0,012



## Helisel matkap setleri



**P** • koni bileme • Matkap setleri standart ölçülerde gösterildiği gibi, dizip kullanmak için setler bakalit standlarla desteklenebilir, daha rahat kullanımı için kutu tavsiye edilir, diğer matkap set opsiyonları talep üzerindedir



Malzeme **HSCO**

Yüzey **M**

Kesme yönü **R**



Ürün no **2050**

d1	um artarak	adet/set	Code-No.
mm	mm		
1,0-10,0	0,5	19	0,013
5,1-10,0	0,1	50	0,012



## Aerox Matkap setleri



P	•	optimize edilmiş Form B matkaplar • %8 cobalt alaşımlı HSCO yüksek hız çeliği • Matkap setleri standart ölçülerde gösterildiği gibi, dizip kullanmak için setler bakalit standlarla desteklenebilir, daha rahat kullanımı için kutu tavsiye edilir, diğer matkap set opsiyonları talep üzerinedir
M	•	
K	•	
N	•	alaşimsız ve yüksek alaşımlı çelikler • döküm malzemeler • demir dışı metaller • Titanyum ve Ti alaşımları
S	•	
H	○	

Malzeme **M42**

Yüzey

Kesme yönü

**NEW**SİLİNDİR ŞAFTLI MATKAP  
UCUÜrün no **1083**

d1	um artarak	adet/set	Code-No.
mm	mm		
1,0-13,0	0,5	25	0,014
1,0-10,0	0,5	19	0,013



## Helisel matkap setleri



Boş kasetler, çelik

Silindir Şaftlı Matkap  
ucu



Ürün no 36

d1 mm	um artarak mm	adet/set	Code-No.
1,0-13,0			0,214
1,0-10,0			0,213
1,0-5,9			0,215
6,0-10,0			0,216
1,0-10,5			0,218



## Helisel matkap setleri



Boş kasetler, çelik

SİLİNDİR ŞAFTLI MATKAP  
UCU

Ürün no

73

d1 mm	um artarak mm	adet/set	Code-No.
1,0-13,0			0,614



## Helisel matkap setleri



bakalit stand

Silindir Şaftlı Matkap  
ucu



Ürün no

11

d1 mm	um artarak mm	adet/set	Code-No.
1,0-13,0			0,114
5,1-10,0			0,112
1,0-5,0			0,111
1,0-5,9			0,115
1,0-10,0			0,113
1/16 - 1/2			0,121
1/16 - 1/2			0,122



## Sert metal takma uçlu özel matkap uçları

Malzeme **Sert metal**

Yüzey



Kesme yönü



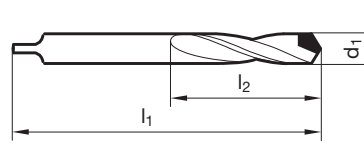
**P** öz bileme  $\geq \text{Ø } 1,700$  • yüzey Bileme • HM uçlu

**M****K****N**

yaprak yay çeliği • sert döküm 300 HB' nin üstünde • saf Molibden • sert bronzlar

**S****H****GÜHRING**NAVIGATOR

Kesme verileri sayfası 776

Ürün no **703**

d1	l1	l2
mm	mm	mm
1,700	45,000	18,000
2,600	50,000	20,000
2,700	50,000	20,000
2,900	50,000	20,000
3,000	50,000	20,000
3,100	56,000	25,000
3,200	56,000	25,000
3,250	56,000	25,000
3,300	56,000	25,000
3,500	56,000	25,000
3,700	56,000	25,000
3,800	56,000	25,000
3,900	56,000	25,000
4,000	56,000	25,000
4,100	63,000	28,000
4,200	63,000	28,000
4,300	63,000	28,000
4,500	63,000	28,000
4,800	63,000	28,000
4,900	63,000	28,000
5,000	63,000	28,000
5,100	71,000	32,000
5,200	71,000	32,000
5,300	71,000	32,000
5,400	71,000	32,000
5,500	71,000	32,000
5,800	71,000	32,000
6,000	71,000	32,000
6,200	71,000	32,000
6,300	71,000	32,000
6,350	71,000	32,000
6,400	71,000	32,000
6,500	71,000	32,000
6,700	80,000	40,000
6,800	80,000	40,000
7,000	80,000	40,000

d1	l1	l2
mm	mm	mm
7,200	80,000	40,000
7,500	80,000	40,000
7,800	80,000	40,000
8,000	80,000	40,000
8,200	90,000	50,000
8,400	90,000	50,000
8,500	90,000	50,000
9,000	90,000	50,000
9,500	90,000	50,000
9,800	100,000	56,000
10,000	100,000	56,000
10,200	100,000	56,000
10,400	100,000	56,000
10,500	100,000	56,000
11,000	100,000	56,000
11,500	112,000	63,000
12,000	112,000	63,000
12,500	112,000	63,000
12,700	112,000	63,000
13,000	112,000	63,000
13,500	125,000	71,000
14,000	125,000	71,000
14,500	125,000	71,000
15,000	125,000	71,000
15,500	140,000	80,000
16,000	140,000	80,000
16,500	140,000	80,000
17,000	140,000	80,000
17,500	160,000	90,000
18,000	160,000	90,000
19,000	160,000	90,000
19,500	160,000	90,000
20,000	160,000	90,000
21,000	160,000	90,000
22,000	160,000	90,000
24,000	170,000	100,000



## Sert metal takma uçlu özel matkap uçları



**P** öz bileme  $\geq \text{Ø } 1,500$  • yüzey Bileme • HM uçlu



**N** cam elyaf takviyeli plastikler • kesme kenarı ve yüzeylerde aşınmaya sebep veren dropletler

Malzeme **Sert metal**

Yüzey



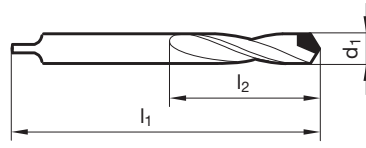
Kesme yönü



Silindir Şaftlı Matkap  
ucu

## GÜHRING NAVIGATOR

Kesme verileri sayfası 776



Ürün no

704

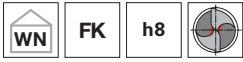
d1	l1	l2
mm	mm	mm
1,900	45,000	18,000
2,200	45,000	18,000
3,100	56,000	25,000
3,200	56,000	25,000
3,500	56,000	25,000
4,200	63,000	28,000

d1	l1	l2
mm	mm	mm
5,000	63,000	28,000
6,000	71,000	32,000
8,000	80,000	40,000
24,000	170,000	100,000





## FK-Helisel matkap ucu (cam elyaf takviyeli yapay malzeme)



P	öz bileme $\geq \text{Ø} 2,380$ • özel ağız bilemeli
M	
K	
N	elyaf takviyeli plastikler
S	
H	

Malzeme **Kom. sert metal**

Yüzey

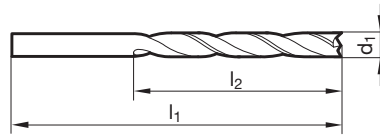


Kesme yönü



## GÜHRING NAVIGATOR

Kesme verileri sayfası 776



Ürün no

1149

d1		l1	l2
mm	inch	mm	mm
2,500		43,000	14,000
3,200		49,000	18,000
3,570	9/64	52,000	20,000
4,000		55,000	22,000
4,760	3/16	62,000	26,000
5,000		62,000	26,000

d1		l1	l2
mm	inch	mm	mm
6,000		66,000	28,000
8,000		79,000	37,000
10,000		89,000	43,000



## Sert metal uçlu matkap ucu



**P** öz bileme  $\geq \text{Ø } 3,000$  • yüzey Bileme • Özel matkap ucu • zor şartlarda uygulama

**M**

**K**

**N** sert dökme demir • sert Çelik

**S**

**H**

Malzeme **Sert metal**

Yüzey



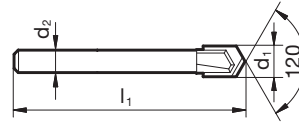
Kesme yönü



## GÜHRING NAVIGATOR

Kesme verileri sayfası 776

Silindirik Şaftlı Matkap ucu



Ürün no

707

d1	l1	l2
mm	mm	mm
3,000	50,000	
5,000	63,000	
5,500	70,000	
6,000	70,000	
8,000	80,000	
9,000	90,000	

d1	l1	l2
mm	mm	mm
12,000	112,000	



## Duvar delme matkap ucu



**P** yüzey Bileme • HM uçlu • Matkap ve darbeli matkap makineleri için  
• darbesiz fayans delme

**M****K****N**

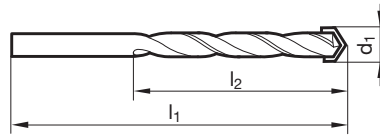
tuğla ,beton,seramikler

**S****H**Malzeme **Sert metal**

Yüzey



Kesme yönü



Ürün no

716

d1	l1	l2
mm	mm	mm
4,000	75,000	40,000
5,000	85,000	50,000
6,000	100,000	60,000
8,000	120,000	80,000
10,000	120,000	80,000
12,000	150,000	90,000

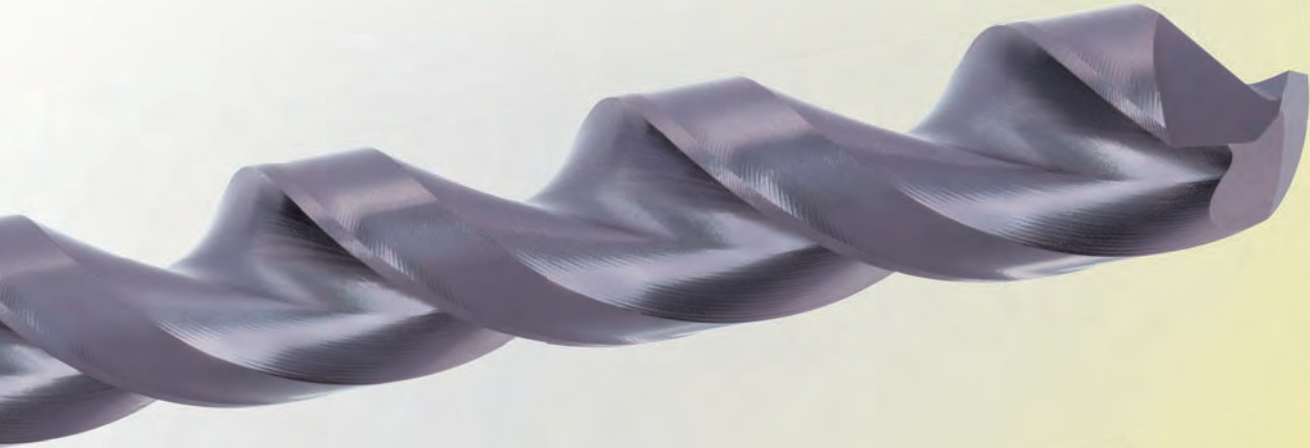
d1	l1	l2
mm	mm	mm

SİLİNDİR ŞAFTLI MATKAP  
UCU



# MORS KONİK ŞAFTLI MATKAP UCU

Mors konik şaftlı  
matkap ucu





P	M	K	N	S	H	takım görüntüsü	delik derinliği	Standart	Tip	Kesme yönü	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayısı	Sayfa
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## Helisel matkap uçları, kısa

•	•	•	•	•	•		~3xD	WN	GV 120	R	HSCO	○	8,100 - 38,000	363	772	448
•	•	•	•	•	•		~3xD	WN	GV 120	R	HSCO	Ⓢ	10,500 - 31,000	663	774	449

## Helisel matkap uçları

•	•	•	•	•	•		~5xD	DIN 345	N	R	HSS	○	2,380 - 96,000	245	778	450
•	•	•	•	•	•		~5xD	DIN 345	N	R	HSS	○	10,000 - 28,000	592	778	454
•	•	•	•	•	•		~5xD	DIN 345	N	R	HSS	Ⓢ	3,000 - 31,000	654	780	455
•	•	•	•	•	•		~5xD	DIN 345	N	L	HSS	○	6,000 - 60,000	248	778	457
•	•	•	•	•	•		~5xD	DIN 345	N	R	HSS	○	8,500 - 59,000	229	778	458
•	•	•	•	•	•		~5xD	DIN 345	H	R	HSS	○	6,700 - 25,250	246	778	459
•	•	•	•	•	•		~5xD	DIN 345	W	R	HSS	○	3,200 - 32,000	247	778	460
•	•	•	•	•	•		~5xD	DIN 345	GT 100	R	HSS	○	7,940 - 31,750	558	778	461
•	•	•	•	•	•		~5xD	DIN 345	GT 100	R	HSS	Ⓢ	7,940 - 31,500	606	780	462
•	•	•	•	•	•		~5xD	DIN 345	N	R	HSCO	○	4,000 - 50,000	345	780	463
•	•	•	•	•	•		~5xD	DIN 345	N	R	HSCO	Ⓢ	8,000 - 30,000	661	782	465
•	•	•	•	•	•		~5xD	DIN 345	GT 100	R	HSCO	○	10,000 - 39,000	645	780	466
•	•	•	•	•	•		~5xD	DIN 345	GT 100	R	HSCO	Ⓢ	10,000 - 23,810	662	782	467
•	•	•	•	•	•		~5xD	DIN 345	GT 100	R	HSCO	Ⓒ	10,000 - 30,160	1222	782	468
•	•	•	•	•	•		~5xD	DIN 345	GT 100	R	HSCO	Ⓐ	10,400 - 30,160	1224	782	469
•	•	•	•	•	•		~5xD	DIN 345	VA	R	HSCO	○	10,000 - 34,000	1262	780	470
•	•	•	•	•	•		~5xD	DIN 346	N	R	HSS	○	10,000 - 73,000	251	778	471
•	•	•	•	•	•		~5xD	DIN 346	N	R	HSCO	○	12,000 - 31,500	351	780	472

## Silindirik saplı uzun matkap uçları

•	•	•	•	•	•		~10xD	DIN 341	N	R	HSS	○	2,900 - 50,000	257	786	473
•	•	•	•	•	•		~10xD	DIN 341	N	R	HSS	Ⓢ	5,500 - 22,000	655	786	475
•	•	•	•	•	•		~10xD	DIN 341	GT 100	R	HSS	○	5,500 - 32,000	551	786	476



P	M	K	N	S	H	takım görüntüsü	delik derinliği	Standart	Tip	Kesme yönü	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayfası	Sayfa
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### Silindirik saplı uzun matkap uçları

•	•	•					~10xD	DIN 341	GT 100	(R)	HSS	Ⓢ	7,000 - 23,000	656	786	478
○		•					~10xD	DIN 341	GT 50	(R)	HSS	○	5,500 - 29,500	505	786	479
•	○	•	•	○			~10xD	DIN 341	N	(R)	HSCO	●	4,750 - 40,000	357	792	480
•	•	•	•	○			~10xD	DIN 341	GT 100	(R)	HSCO	● <sub>16.0</sub>	10,000 - 26,000	623	792	481
•	•	○					~10xD	WN	N	(R)	HSS	●	10,000 - 29,000	523	786	482

### Helisel matkap uçları çok uzun, seri 1

•	•	○					~15xD	DIN 1870	N	(R)	HSS	●	8,000 - 50,000	266	788	483
•	•	•					~15xD	DIN 1870	GT 100	(R)	HSS	● <sub>16.0</sub>	8,000 - 30,000	526	790	484
○		•					~15xD	DIN 1870	GT 50	(R)	HSS	○	8,500 - 33,000	525	788	485
•	•	•	•	○			~15xD	DIN 1870	GT 100	(R)	HSCO	● <sub>16.0</sub>	9,520 - 30,000	620	794	486

### Ekstra uzun helisel matkaplar, seri 2

•	•	○					~20xD	DIN 1870	N	(R)	HSS	●	8,000 - 45,000	267	788	487
•	•	•					~20xD	DIN 1870	GT 100	(R)	HSS	● <sub>16.0</sub>	8,000 - 30,000	527	790	488
○		•					~20xD	DIN 1870	GT 50	(R)	HSS	○	8,500 - 31,000	542	788	489
•	•	•	•	○			~20xD	DIN 1870	GT 100	(R)	HSCO	● <sub>16.0</sub>	9,520 - 23,420	621	794	490

### Helisel matkap uçları, çok uzun

•	•	•					>20xD	WN	GT 100	(R)	HSS	●	6,000 - 7,500	563	790	491
•	•	•					>20xD	WN	GT 100	(R)	HSS	●	6,000 - 10,000	564	790	492
•	•	•					>20xD	WN	GT 100	(R)	HSS	● <sub>16.0</sub>	6,000 - 17,000	565	790	493
•	•	•					>20xD	WN	GT 100	(R)	HSS	● <sub>16.0</sub>	8,000 - 40,000	566	790	494
•	•	•					>20xD	WN	GT 100	(R)	HSS	● <sub>16.0</sub>	14,000 - 40,000	293	790	495
•	•	•					>20xD	WN	GT 100	(R)	HSS	○	14,000 - 18,000	298	790	496
•	•	•					>20xD	WN	GT 100	(R)	HSS	○	14,000 - 18,000	299	790	497

### Soğutma kanallı matkap ucu, kısa

•	○	•	•				~7xD	WN	N	(R)	HSS	●	9,920 - 23,020	269	788	498
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P	M	K	N	S	H	takım görüntüsü	delik derinliği	Standart	Tip	Kesme yönü	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayfası	Sayfa
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## Soğutma kanallı matkap uçları, Kanal boyu fabrika norm.a göre

•	○	•	•	•			WN	N	R	HSS	●	8,000 - 50,000	254	788	499
•	○	•	•	•			WN	N	R	HSS	●	8,000 - 42,000	255	788	500

## Soğutma kanallı matkap uçları, Kanal boyu DIN 341

•	○	•	•	•			~10xD	WN	N	R	HSS	●	10,000 - 32,000	1101	788	501
•	○	•	•	•			~10xD	WN	N	R	HSS	●	10,000 - 40,000	270	788	502
•	○	•	•	•			~10xD	WN	N	R	HSS	●	10,000 - 44,450	271	788	503
•	○	•	•	•			~10xD	WN	N	R	HSS	●	10,000 - 44,450	272	788	504
•	•	•	•	•	○		~10xD	WN	GT 100	R	HSCO	●	11,000 - 34,920	370	794	505
•	•	•	•	•	○		~10xD	WN	GT 100	R	HSCO	●	11,000 - 34,920	371	794	506
•	•	•	•	•	○		~10xD	WN	GT 100	R	HSCO	●	12,500 - 34,000	372	794	507

## Soğutma kanallı matkap uçları, Kanal boyu DIN 1870

•	•	•	•	•	○		~15xD	WN	GT 100	R	HSCO	●	11,000 - 34,000	374	794	508
•	•	•	•	•	○		~15xD	WN	GT 100	R	HSCO	●	11,000 - 34,000	375	794	509
•	•	•	•	•	○		~15xD	WN	GT 100	R	HSCO	●	11,000 - 29,000	376	794	510

## Pim deliği matkap ucu

•	○	•	•	•			DIN 1898	N	R	HSS	●	5,000 - 25,000	532		511
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## Sert metal takma uçlu özel matkap uçları

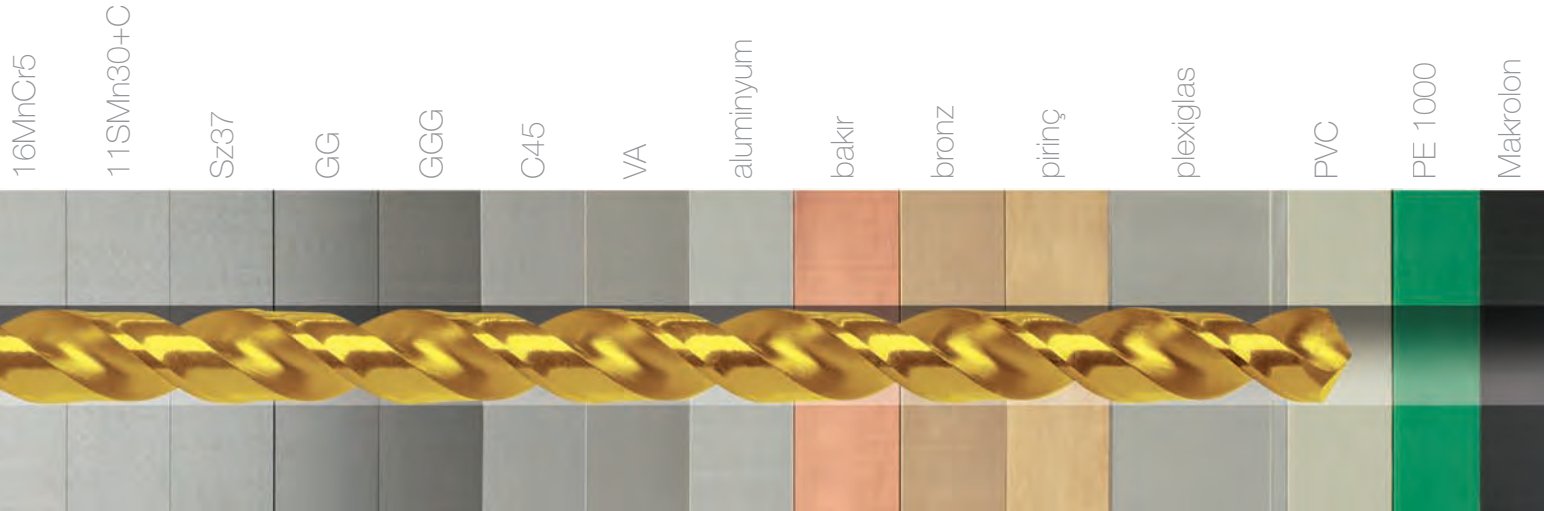
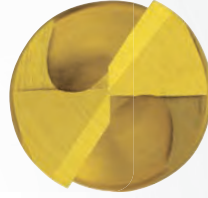
○	○	○	○	○			DIN 8041	N	R	HM	○	8,000 - 40,000	705	776	512
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# GU 500

## Universal HSCO matkaplar

- Bir çok malzemedede universal uygulama
- çap olarak hassas deliklerde 4 yüzey bileme sayesinde mükemmel merkezleme
- keskin bileme geometrisi sayesinde düşük ilerleme gücü ve tork gücü
- kepçeli kanal yapısı ile optimum talaş tahliyesi



## GU 500 - Bir çok malzemedede universal uygulama

Yapı çelikleri ve karbon çelikleri · 850 N/mm<sup>2</sup> ye kadar yüksek alaşımlı çelikler · paslanmaz çelikler · döküm malzemeler  
demir dışı metaller · alüminyum · magnezyum alaşımları · plastikler



ÇELİK

~ 3xD  
fabrika standartı

~ 5xD  
DIN 345

~ 10xD  
DIN 341

~ 15xD  
DIN 1870  
R1

No 1

Ø 3,00 - 31,00 mm  
Ürün no 654  
den itibaren 455



No 1

Ø 5,50 - 22,00 mm  
Ürün no 655  
den itibaren 475



Ø 8,00 - 50,00 mm  
Ürün no 266  
den itibaren 483



Ø 8,00 - 30,00 mm  
Ürün no 661  
den itibaren 465



Ø 4,75 - 40,00 mm  
Ürün no 357  
den itibaren 480



Ø 7,94 - 31,50 mm  
Ürün no 606  
den itibaren 462



Ø 7,00 - 23,00 mm  
Ürün no 656  
den itibaren 478



Ø 8,00 - 30,00 mm  
Ürün no 526  
den itibaren 484



Ø 10,00 - 23,81 mm  
Ürün no 662  
den itibaren 467



Ø 10,00 - 26,00 mm  
Ürün no 623  
den itibaren 481



Ø 9,52 - 30,00 mm  
Ürün no 620  
den itibaren 486



No 1

Ø 10,50 - 31,00 mm  
Ürün no 663  
den itibaren 449



~ 10xD  
kanal boyu  
DIN 341

~ 15xD  
kanal boyu  
DIN 1870 R1

No 1

Ø 10,00 - 32,00 mm  
Ürün no 1101  
den itibaren 501



Ø 11,00 - 34,92 mm  
Ürün no 370  
den itibaren 505



No 1

Ø 11,00 - 34,00 mm  
Ürün no 374  
den itibaren 508



Mors Konik Şaftlı  
Matkap Ucu

içten su vermesiz

içten soğutmalı



# QUICKFINDER

~20xD  
DIN 1870  
R2

>20xD  
fabrika standartı  
ekstra uzun

No 1 ideal  
takım

Ø 8,00 - 45,00 mm  
Ürün no 267  
den itibaren 487



Tip N, HSS



Tip N, HSCO

Ø 8,00 - 30,00 mm  
Ürün no 527  
den itibaren 488



No 1

Ø 8,00 - 40,00 mm  
Ürün no 566  
den itibaren 494



GT100, HSS

No 1

Ø 9,52 - 23,42 mm  
Ürün no 621  
den itibaren 490



GT100, HSCO



GV120, HSCO



Tip N, HSS



GT100, HSCO



PASLANMAZ  
ÇELİKLER



TITAN &  
ÖZEL ALAŞIMLAR

~ 3xD  
fabrika standartı

~ 5xD  
DIN 345

~ 10xD  
DIN 341

~ 15xD  
DIN 1870  
R1

No 1 No 1

Ø 10,00 - 34,00 mm  
Ürün no 1262  
den itibaren 470



No 1 No 1

Ø 10,00 - 26,00 mm  
Ürün no 623  
den itibaren 481



No 1 No 1

Ø 9,52 - 30,00 mm  
Ürün no 620  
den itibaren 486



No 1 No 1

Ø 10,50 - 31,00 mm  
Ürün no 663  
den itibaren 449



Ø 8,00 - 30,00 mm  
Ürün no 661  
den itibaren 465



Ø 4,75 - 40,00 mm  
Ürün no 357  
den itibaren 480



~ 10xD  
kanal boyu  
DIN 341

~ 15xD  
kanal boyu  
DIN 1870 R1

No 1 No 1

Ø 11,00 - 34,92 mm  
Ürün no 370  
den itibaren 505



No 1 No 1

Ø 11,00 - 34,00 mm  
Ürün no 374  
den itibaren 508



Mors Konik Şaftlı  
Matkap Ucu

içten su vermesiz

içten soğutmalı



# QUICKFINDER


~20xD  
DIN 1870  
R2

>20xD  
fabrika standartı  
ekstra uzun

**No 1** paslanmaz çelikler için  
ideal takım

**No 1** özel ve titanyum alaşımlar için  
ideal takım

**No 1** **No 1**

Ø 9,52 - 23,42 mm  
Ürün no 621  
den itibaren 490  




Tip VA, HSCO



GT100, HSCO



GV120, HSCO



Tip N, HSCO



GT100, HSCO



# K DÖKME DEMİR

~ 3xD  
fabrika standartı

~ 5xD  
DIN 345

~ 10xD  
DIN 341

~ 15xD  
DIN 1870  
R1

**No 1**

Ø 3,00 - 31,00 mm  
Ürün no 654  
den itibaren 455



**No 1**

Ø 5,50 - 22,00 mm  
Ürün no 655  
den itibaren 475



Ø 8,00 - 50,00 mm  
Ürün no 266  
den itibaren 483



Ø 8,00 - 30,00 mm  
Ürün no 661  
den itibaren 465



Ø 4,75 - 40,00 mm  
Ürün no 357  
den itibaren 480



Ø 7,94 - 31,50 mm  
Ürün no 606  
den itibaren 462



Ø 7,00 - 23,00 mm  
Ürün no 656  
den itibaren 478



Ø 8,00 - 30,00 mm  
Ürün no 526  
den itibaren 484



Ø 10,00 - 23,81 mm  
Ürün no 662  
den itibaren 467



Ø 10,00 - 26,00 mm  
Ürün no 623  
den itibaren 481



Ø 9,52 - 30,00 mm  
Ürün no 620  
den itibaren 486



**No 1**

Ø 10,50 - 31,00 mm  
Ürün no 663  
den itibaren 449



~ 10xD  
kanal boyu  
DIN 341

~ 15xD  
kanal boyu  
DIN 1870 R1

**No 1**

Ø 10,00 - 32,00 mm  
Ürün no 1101  
den itibaren 501



Ø 11,00 - 34,92 mm  
Ürün no 370  
den itibaren 505



Ø 11,00 - 34,00 mm  
Ürün no 374  
den itibaren 508



**No 1**

içten su vermesiz

içten soğutmalı

Mors Konik Şaftlı  
Matkap Ucu



# QUICKFINDER

~20xD  
DIN 1870  
R2

>20xD  
fabrika standarti  
ekstra uzun

**No 1** ideal  
takım

Ø 8,00 - 45,00 mm  
Ürün no 267  
den itibaren 487



Tip N, HSS



Tip N, HSCO

Ø 8,00 - 30,00 mm  
Ürün no 527  
den itibaren 488



**No 1**

Ø 8,00 - 40,00 mm  
Ürün no 566  
den itibaren 494



GT100, HSS

**No 1**

Ø 9,52 - 23,42 mm  
Ürün no 621  
den itibaren 490



GT100, HSCO



GV120, HSCO



Tip N, HSS



GT100, HSCO



**N** ALUMINYUM, NE, PLASTİKLER

~ 3xD  
fabrika standartı

~ 5xD  
DIN 345

~ 10xD  
DIN 341

~ 15xD  
DIN 1870  
R1

**No 1**

Ø 3,20 - 32,00 mm  
Ürün no 247  
den itibaren 460

yumuşak, uzun talaş veren  
malzemeler için W tipi

**No 1**

Ø 6,70 - 25,25 mm  
Ürün no 246  
den itibaren 459

sert, kırılğan malzemeler  
için tip H

**No 1**

Ø 5,50 - 29,50 mm  
Ürün no 505  
den itibaren 479

yumuşak, uzun talaş veren  
malzemeler için GT50 tipi

**No 1**

Ø 8,50 - 33,00 mm  
Ürün no 525  
den itibaren 485

Ø 7,94 - 31,75 mm  
Ürün no 558  
den itibaren 461

Ø 5,50 - 32,00 mm  
Ürün no 551  
den itibaren 476

Ø 8,00 - 30,00 mm  
Ürün no 526  
den itibaren 484

Ø 10,00 - 39,00 mm  
Ürün no 645  
den itibaren 466

Ø 10,00 - 26,00 mm  
Ürün no 623  
den itibaren 481

Ø 9,52 - 30,00 mm  
Ürün no 620  
den itibaren 486

~ 10xD  
kanal boyu  
DIN 341

~ 15xD  
kanal boyu  
DIN 1870 R1

**No 1**

Ø 10,00 - 32,00 mm  
Ürün no 1101  
den itibaren 501

Ø 11,00 - 34,92 mm  
Ürün no 370  
den itibaren 505

**No 1**

Ø 11,00 - 34,00 mm  
Ürün no 374  
den itibaren 508





# QUICKFINDER

~20xD  
DIN 1870  
R2

>20xD  
fabrika standartı  
ekstra uzun

No 1 ideal  
takım



Tip W, HSS



Tip H, HSS

No 1

Ø 8,50 - 31,00 mm  
Ürün no 542  
den itibaren 489



GT50, HSS

No 1

Ø 8,00 - 30,00 mm  
Ürün no 527  
den itibaren 488



Ø 8,00 - 40,00 mm  
Ürün no 566  
den itibaren 494



GT100, HSS

Ø 9,52 - 23,42 mm  
Ürün no 621  
den itibaren 490



GT100, HSCO



Tip N, HSS



GT100, HSCO



## Helisel matkap uçları, kısa



**P** • öz bileme  $\geq \varnothing 7,000$  • koni bileme • Co-alaşımlı HSS-çeliği • artırılmış aşınma direnci

**M** •

**K** •

**N** ○ zor işlenebilir malzemeler • paslanmaz çelik/aside dayanıklı • yay çelikleri, ostenitli çelikler

**S** •

**H** ○

Malzeme **HSCO**

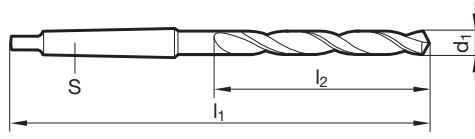
Yüzey



Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 772

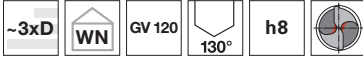
Ürün no **363**

d1		S	l1	l2
mm	inch		mm	mm
8,100		MK-1	130,000	49,000
8,200		MK-1	130,000	49,000
8,300		MK-1	130,000	49,000
8,500		MK-1	130,000	49,000
8,600		MK-1	134,000	53,000
8,730	11/32	MK-1	134,000	53,000
9,000		MK-1	134,000	53,000
9,520	3/8	MK-1	138,000	57,000
9,920	25/64	MK-1	138,000	57,000
10,000		MK-1	138,000	57,000
10,100		MK-1	138,000	57,000
10,200		MK-1	138,000	57,000
10,500		MK-1	138,000	57,000
11,000		MK-1	142,000	61,000
11,750		MK-1	142,000	61,000
12,000		MK-1	147,000	66,000
12,500		MK-1	147,000	66,000
12,700	1/2	MK-1	147,000	66,000
13,000		MK-1	147,000	66,000
13,490	17/32	MK-2	168,000	70,000
13,500		MK-2	168,000	70,000
14,000		MK-2	168,000	70,000
14,500		MK-2	172,000	74,000
15,000		MK-2	172,000	74,000
15,500		MK-2	176,000	78,000
16,000		MK-2	176,000	78,000
16,500		MK-2	179,000	81,000
17,000		MK-2	179,000	81,000
17,500		MK-2	183,000	85,000
18,000		MK-2	183,000	85,000

d1		S	l1	l2
mm	inch		mm	mm
18,500		MK-2	186,000	88,000
19,000		MK-2	186,000	88,000
19,450	49/64	MK-3	212,000	91,000
20,000		MK-3	212,000	91,000
20,500		MK-3	216,000	95,000
20,900		MK-3	216,000	95,000
21,000		MK-3	216,000	95,000
21,500		MK-3	219,000	98,000
22,000		MK-3	219,000	98,000
22,220	7/8	MK-3	219,000	98,000
23,000		MK-3	222,000	101,000
23,020	29/32	MK-3	222,000	101,000
24,000		MK-3	225,000	104,000
24,500		MK-3	225,000	104,000
25,000	63/64	MK-3	225,000	104,000
26,000		MK-4	256,000	107,000
26,500		MK-4	256,000	107,000
27,000		MK-4	259,000	110,000
27,500		MK-4	259,000	110,000
28,000		MK-4	259,000	110,000
29,000		MK-4	263,000	114,000
29,370	1 5/32	MK-4	263,000	114,000
30,000		MK-4	263,000	114,000
32,000		MK-4	269,000	120,000
33,000		MK-4	269,000	120,000
37,000		MK-4	276,000	127,000
38,000		MK-5	317,000	130,000



## Helisel matkap uçları, kısa



P	•	öz bileme $\geq \varnothing 9,000$ • koni bileme • Co-alaşımlı HSS-çeliği • yüksek aşınma direnci
M	•	
K	•	
N	○	zor işlenebilir malzemeler • paslanmaz / aside dayanıklı çelikler Va-çelikleri • yay çelikleri, ostenitli çelikler
S	•	
H	○	

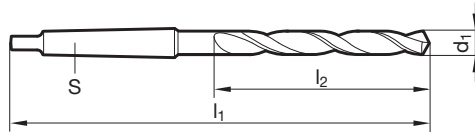
## GÜHRING NAVIGATOR

Kesme verileri sayfası 774

Malzeme HSC0

Yüzey S

Kesme yönü R



Ürün no 663

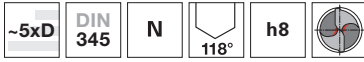
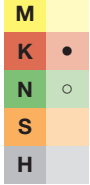
Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2
mm	inch		mm	mm
10,500		MK-1	138,000	57,000
10,750		MK-1	142,000	61,000
11,500		MK-1	142,000	61,000
12,500		MK-1	147,000	66,000
13,500		MK-2	168,000	70,000
14,000		MK-2	168,000	70,000
14,250		MK-2	172,000	74,000
15,000		MK-2	172,000	74,000
16,000		MK-2	176,000	78,000
16,500		MK-2	179,000	81,000
17,000		MK-2	179,000	81,000
17,500		MK-2	183,000	85,000

d1		S	l1	l2
mm	inch		mm	mm
18,000		MK-2	183,000	85,000
19,000		MK-2	186,000	88,000
20,000		MK-3	212,000	91,000
21,000		MK-3	216,000	95,000
22,000		MK-3	219,000	98,000
23,000		MK-3	222,000	101,000
25,000	63/64	MK-3	225,000	104,000
27,000		MK-4	259,000	110,000
29,000		MK-4	263,000	114,000
30,000		MK-4	263,000	114,000
31,000		MK-4	266,000	117,000



## Helisel matkap uçları

P • öz bileme  $\geq \varnothing 14,050$  • koni bileme

N ○ alaşımli/alaşımısız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

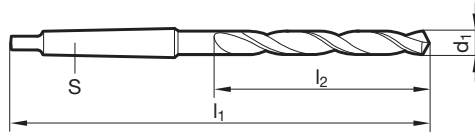
Malzeme **HSS**

Yüzey

Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 778

Ürün no **245**

d1		S	l1	l2	d1		S	l1	l2
mm	inch		mm	mm	mm	inch		mm	mm
2,380	3/32	MK-1	111,000	30,000	5,950	15/64	MK-1	138,000	57,000
2,400		MK-1	111,000	30,000	6,000		MK-1	138,000	57,000
2,450		MK-1	111,000	30,000	6,050		MK-1	144,000	63,000
2,500		MK-1	111,000	30,000	6,100		MK-1	144,000	63,000
2,650		MK-1	111,000	30,000	6,200		MK-1	144,000	63,000
2,780	7/64	MK-1	114,000	33,000	6,300		MK-1	144,000	63,000
2,900		MK-1	114,000	33,000	6,350	1/4	MK-1	144,000	63,000
3,000		MK-1	114,000	33,000	6,400		MK-1	144,000	63,000
3,050		MK-1	117,000	36,000	6,500		MK-1	144,000	63,000
3,170	1/8	MK-1	117,000	36,000	6,600		MK-1	144,000	63,000
3,200		MK-1	117,000	36,000	6,700		MK-1	144,000	63,000
3,250		MK-1	117,000	36,000	6,750	17/64	MK-1	150,000	69,000
3,300		MK-1	117,000	36,000	6,800		MK-1	150,000	69,000
3,450		MK-1	120,000	39,000	6,900		MK-1	150,000	69,000
3,500		MK-1	120,000	39,000	7,000		MK-1	150,000	69,000
3,570	9/64	MK-1	120,000	39,000	7,140	9/32	MK-1	150,000	69,000
3,600		MK-1	120,000	39,000	7,200		MK-1	150,000	69,000
3,970	5/32	MK-1	124,000	43,000	7,250		MK-1	150,000	69,000
4,000		MK-1	124,000	43,000	7,300		MK-1	150,000	69,000
4,200		MK-1	124,000	43,000	7,400		MK-1	150,000	69,000
4,250		MK-1	124,000	43,000	7,500		MK-1	150,000	69,000
4,300		MK-1	128,000	47,000	7,540	19/64	MK-1	156,000	75,000
4,370	11/64	MK-1	128,000	47,000	7,600		MK-1	156,000	75,000
4,400		MK-1	128,000	47,000	7,700		MK-1	156,000	75,000
4,500		MK-1	128,000	47,000	7,750		MK-1	156,000	75,000
4,600		MK-1	128,000	47,000	7,800		MK-1	156,000	75,000
4,750		MK-1	128,000	47,000	7,900		MK-1	156,000	75,000
4,760	3/16	MK-1	133,000	52,000	7,940	5/16	MK-1	156,000	75,000
4,800		MK-1	133,000	52,000	8,000		MK-1	156,000	75,000
5,000		MK-1	133,000	52,000	8,050		MK-1	156,000	75,000
5,100		MK-1	133,000	52,000	8,100		MK-1	156,000	75,000
5,160	13/64	MK-1	133,000	52,000	8,200		MK-1	156,000	75,000
5,200		MK-1	133,000	52,000	8,250		MK-1	156,000	75,000
5,250		MK-1	133,000	52,000	8,300		MK-1	156,000	75,000
5,300		MK-1	133,000	52,000	8,330	21/64	MK-1	156,000	75,000
5,500		MK-1	138,000	57,000	8,400		MK-1	156,000	75,000
5,560	7/32	MK-1	138,000	57,000	8,500		MK-1	156,000	75,000
5,600		MK-1	138,000	57,000	8,600		MK-1	162,000	81,000
5,700		MK-1	138,000	57,000	8,700		MK-1	162,000	81,000
5,750		MK-1	138,000	57,000	8,730	11/32	MK-1	162,000	81,000
5,800		MK-1	138,000	57,000	8,750		MK-1	162,000	81,000
5,900		MK-1	138,000	57,000	8,800		MK-1	162,000	81,000



d1		S	l1	l2
mm	inch		mm	mm
8,900		MK-1	162,000	81,000
9,000		MK-1	162,000	81,000
9,050		MK-1	162,000	81,000
9,100		MK-1	162,000	81,000
9,130	23/64	MK-1	162,000	81,000
9,200		MK-1	162,000	81,000
9,250		MK-1	162,000	81,000
9,300		MK-1	162,000	81,000
9,500		MK-1	162,000	81,000
9,520	3/8	MK-1	168,000	87,000
9,750		MK-1	168,000	87,000
9,800		MK-1	168,000	87,000
9,900		MK-1	168,000	87,000
9,920	25/64	MK-1	168,000	87,000
10,000		MK-1	168,000	87,000
10,100		MK-1	168,000	87,000
10,200		MK-1	168,000	87,000
10,250		MK-1	168,000	87,000
10,300		MK-1	168,000	87,000
10,320	13/32	MK-1	168,000	87,000
10,400		MK-1	168,000	87,000
10,500		MK-1	168,000	87,000
10,520		MK-1	168,000	87,000
10,600		MK-1	168,000	87,000
10,700		MK-1	175,000	94,000
10,720	27/64	MK-1	175,000	94,000
10,750		MK-1	175,000	94,000
10,800		MK-1	175,000	94,000
10,900		MK-1	175,000	94,000
11,000		MK-1	175,000	94,000
11,100		MK-1	175,000	94,000
11,110	7/16	MK-1	175,000	94,000
11,200		MK-1	175,000	94,000
11,250		MK-1	175,000	94,000
11,300		MK-1	175,000	94,000
11,500		MK-1	175,000	94,000
11,600		MK-1	175,000	94,000
11,700		MK-1	175,000	94,000
11,750		MK-1	175,000	94,000
11,800		MK-1	175,000	94,000
11,900		MK-1	182,000	101,000
11,910	15/32	MK-1	182,000	101,000
12,000		MK-1	182,000	101,000
12,100		MK-1	182,000	101,000
12,200		MK-1	182,000	101,000
12,250		MK-1	182,000	101,000
12,300	31/64	MK-1	182,000	101,000
12,500		MK-1	182,000	101,000
12,550		MK-1	182,000	101,000
12,600		MK-1	182,000	101,000
12,700	1/2	MK-1	182,000	101,000
12,750		MK-1	182,000	101,000
12,800		MK-1	182,000	101,000
12,900		MK-1	182,000	101,000
13,000		MK-1	182,000	101,000
13,100	33/64	MK-1	182,000	101,000
13,200		MK-1	182,000	101,000
13,250		MK-1	189,000	108,000
13,300		MK-1	189,000	108,000
13,490	17/32	MK-1	189,000	108,000
13,500		MK-1	189,000	108,000
13,600		MK-1	189,000	108,000
13,700		MK-1	189,000	108,000
13,750		MK-1	189,000	108,000
13,800		MK-1	189,000	108,000
13,890	35/64	MK-1	189,000	108,000
14,000		MK-1	189,000	108,000
14,050		MK-2	212,000	114,000
14,100		MK-2	212,000	114,000
14,200		MK-2	212,000	114,000
14,250		MK-2	212,000	114,000
14,290	9/16	MK-2	212,000	114,000

d1		S	l1	l2
mm	inch		mm	mm
14,300		MK-2	212,000	114,000
14,400		MK-2	212,000	114,000
14,500		MK-2	212,000	114,000
14,600		MK-2	212,000	114,000
14,680	37/64	MK-2	212,000	114,000
14,700		MK-2	212,000	114,000
14,750		MK-2	212,000	114,000
14,800		MK-2	212,000	114,000
14,900		MK-2	212,000	114,000
15,000		MK-2	212,000	114,000
15,080	19/32	MK-2	218,000	120,000
15,100		MK-2	218,000	120,000
15,200		MK-2	218,000	120,000
15,250		MK-2	218,000	120,000
15,300		MK-2	218,000	120,000
15,400		MK-2	218,000	120,000
15,500		MK-2	218,000	120,000
15,600		MK-2	218,000	120,000
15,700		MK-2	218,000	120,000
15,750		MK-2	218,000	120,000
15,800		MK-2	218,000	120,000
15,870	5/8	MK-2	218,000	120,000
15,900		MK-2	218,000	120,000
16,000		MK-2	218,000	120,000
16,100		MK-2	223,000	125,000
16,200		MK-2	223,000	125,000
16,250		MK-2	223,000	125,000
16,270	41/64	MK-2	223,000	125,000
16,300		MK-2	223,000	125,000
16,400		MK-2	223,000	125,000
16,500		MK-2	223,000	125,000
16,670	21/32	MK-2	223,000	125,000
16,700		MK-2	223,000	125,000
16,750		MK-2	223,000	125,000
16,800		MK-2	223,000	125,000
17,000		MK-2	223,000	125,000
17,070	43/64	MK-2	228,000	130,000
17,100		MK-2	228,000	130,000
17,250		MK-2	228,000	130,000
17,300		MK-2	228,000	130,000
17,400		MK-2	228,000	130,000
17,460	11/16	MK-2	228,000	130,000
17,500		MK-2	228,000	130,000
17,600		MK-2	228,000	130,000
17,700		MK-2	228,000	130,000
17,750		MK-2	228,000	130,000
17,800		MK-2	228,000	130,000
17,860	45/64	MK-2	228,000	130,000
17,900		MK-2	228,000	130,000
18,000		MK-2	228,000	130,000
18,100		MK-2	233,000	135,000
18,200		MK-2	233,000	135,000
18,250		MK-2	233,000	135,000
18,260	23/32	MK-2	233,000	135,000
18,300		MK-2	233,000	135,000
18,500		MK-2	233,000	135,000
18,650	47/64	MK-2	233,000	135,000
18,750		MK-2	233,000	135,000
18,800		MK-2	233,000	135,000
18,900		MK-2	233,000	135,000
19,000		MK-2	233,000	135,000
19,050	3/4	MK-2	238,000	140,000
19,100		MK-2	238,000	140,000
19,200		MK-2	238,000	140,000
19,250		MK-2	238,000	140,000
19,450	49/64	MK-2	238,000	140,000
19,500		MK-2	238,000	140,000
19,700		MK-2	238,000	140,000
19,750		MK-2	238,000	140,000
19,800		MK-2	238,000	140,000
19,840	25/32	MK-2	238,000	140,000
20,000		MK-2	238,000	140,000



d1		S	l1	l2
mm	inch		mm	mm
20,100		MK-2	243,000	145,000
20,200		MK-2	243,000	145,000
20,250		MK-2	243,000	145,000
20,300		MK-2	243,000	145,000
20,400		MK-2	243,000	145,000
20,500		MK-2	243,000	145,000
20,640	13/16	MK-2	243,000	145,000
20,750		MK-2	243,000	145,000
21,000		MK-2	243,000	145,000
21,030	53/64	MK-2	243,000	145,000
21,100		MK-2	243,000	145,000
21,200		MK-2	243,000	145,000
21,250		MK-2	248,000	150,000
21,430	27/32	MK-2	248,000	150,000
21,500		MK-2	248,000	150,000
21,750		MK-2	248,000	150,000
21,830	55/64	MK-2	248,000	150,000
22,000		MK-2	248,000	150,000
22,100		MK-2	248,000	150,000
22,200		MK-2	248,000	150,000
22,220	7/8	MK-2	248,000	150,000
22,250		MK-2	248,000	150,000
22,400		MK-2	248,000	150,000
22,500		MK-2	253,000	155,000
22,620	57/64	MK-2	253,000	155,000
22,750		MK-2	253,000	155,000
23,000		MK-2	253,000	155,000
23,020	29/32	MK-2	253,000	155,000
23,250		MK-3	276,000	155,000
23,420	59/64	MK-3	276,000	155,000
23,500		MK-3	276,000	155,000
23,750		MK-3	281,000	160,000
23,810	15/16	MK-3	281,000	160,000
23,900		MK-3	281,000	160,000
24,000		MK-3	281,000	160,000
24,100		MK-3	281,000	160,000
24,210	61/64	MK-3	281,000	160,000
24,250		MK-3	281,000	160,000
24,500		MK-3	281,000	160,000
24,610	31/32	MK-3	281,000	160,000
24,750		MK-3	281,000	160,000
25,000	63/64	MK-3	281,000	160,000
25,100		MK-3	286,000	165,000
25,200		MK-3	286,000	165,000
25,250		MK-3	286,000	165,000
25,400	1	MK-3	286,000	165,000
25,500		MK-3	286,000	165,000
25,750		MK-3	286,000	165,000
25,800	1 1/64	MK-3	286,000	165,000
26,000		MK-3	286,000	165,000
26,190	1 1/32	MK-3	286,000	165,000
26,250		MK-3	286,000	165,000
26,500		MK-3	286,000	165,000
26,590	1 3/64	MK-3	291,000	170,000
26,750		MK-3	291,000	170,000
26,990	1 1/16	MK-3	291,000	170,000
27,000		MK-3	291,000	170,000
27,500		MK-3	291,000	170,000
27,750		MK-3	291,000	170,000
27,780	1 3/32	MK-3	291,000	170,000
28,000		MK-3	291,000	170,000
28,250		MK-3	296,000	175,000
28,500		MK-3	296,000	175,000
28,570	1 1/8	MK-3	296,000	175,000
28,750		MK-3	296,000	175,000
29,000		MK-3	296,000	175,000
29,250		MK-3	296,000	175,000
29,500		MK-3	296,000	175,000
29,750		MK-3	296,000	175,000
30,000		MK-3	296,000	175,000
30,100		MK-3	301,000	180,000
30,160	1 3/16	MK-3	301,000	180,000

d1		S	l1	l2
mm	inch		mm	mm
30,250		MK-3	301,000	180,000
30,500		MK-3	301,000	180,000
30,560	1 13/64	MK-3	301,000	180,000
30,750		MK-3	301,000	180,000
31,000		MK-3	301,000	180,000
31,250		MK-3	301,000	180,000
31,500		MK-3	301,000	180,000
31,750	1 1/4	MK-3	306,000	185,000
32,000		MK-4	334,000	185,000
32,150	1 17/64	MK-4	334,000	185,000
32,250		MK-4	334,000	185,000
32,500		MK-4	334,000	185,000
32,750		MK-4	334,000	185,000
33,000		MK-4	334,000	185,000
33,340	1 5/16	MK-4	334,000	185,000
33,500		MK-4	334,000	185,000
34,000		MK-4	339,000	190,000
34,500		MK-4	339,000	190,000
34,750		MK-4	339,000	190,000
34,920	1 3/8	MK-4	339,000	190,000
35,000		MK-4	339,000	190,000
35,500		MK-4	339,000	190,000
36,000		MK-4	344,000	195,000
36,500		MK-4	344,000	195,000
36,750		MK-4	344,000	195,000
37,000		MK-4	344,000	195,000
37,310	1 15/32	MK-4	344,000	195,000
37,500		MK-4	344,000	195,000
37,700	1 31/64	MK-4	349,000	200,000
38,000		MK-4	349,000	200,000
38,100	1 1/2	MK-4	349,000	200,000
38,500	1 33/64	MK-4	349,000	200,000
39,000		MK-4	349,000	200,000
39,500		MK-4	349,000	200,000
39,690	1 9/16	MK-4	349,000	200,000
40,000		MK-4	349,000	200,000
40,500		MK-4	354,000	205,000
40,750		MK-4	354,000	205,000
40,800		MK-4	354,000	205,000
41,000		MK-4	354,000	205,000
41,270	1 5/8	MK-4	354,000	205,000
41,500		MK-4	354,000	205,000
42,000		MK-4	354,000	205,000
42,500		MK-4	354,000	205,000
43,000		MK-4	359,000	210,000
43,500		MK-4	359,000	210,000
44,000		MK-4	359,000	210,000
44,450	1 3/4	MK-4	359,000	210,000
44,500		MK-4	359,000	210,000
45,000		MK-4	359,000	210,000
45,500		MK-4	364,000	215,000
46,000		MK-4	364,000	215,000
46,430	1 53/64	MK-4	364,000	215,000
46,500		MK-4	364,000	215,000
47,000		MK-4	364,000	215,000
47,230	1 55/64	MK-4	364,000	215,000
47,500		MK-4	364,000	215,000
47,620	1 7/8	MK-4	369,000	220,000
48,000		MK-4	369,000	220,000
48,020	1 57/64	MK-4	369,000	220,000
48,500		MK-4	369,000	220,000
48,820	1 59/64	MK-4	369,000	220,000
49,000		MK-4	369,000	220,000
49,500		MK-4	369,000	220,000
49,610	1 61/64	MK-4	369,000	220,000
50,000		MK-4	369,000	220,000
50,500		MK-4	374,000	225,000
50,800	2	MK-4	374,000	225,000
51,000		MK-5	412,000	225,000
52,000		MK-5	412,000	225,000
53,000		MK-5	412,000	225,000
53,390		MK-5	417,000	230,000

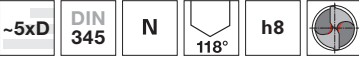


d1		S	l1	l2
mm	inch		mm	mm
53,400		MK-5	417,000	230,000
54,000		MK-5	417,000	230,000
55,000		MK-5	417,000	230,000
56,000		MK-5	417,000	230,000
57,000		MK-5	422,000	235,000
58,000		MK-5	422,000	235,000
59,000		MK-5	422,000	235,000
60,000		MK-5	422,000	235,000
61,000		MK-5	427,000	240,000
62,000		MK-5	427,000	240,000
63,000		MK-5	427,000	240,000
63,500	2 1/2	MK-5	432,000	245,000
65,000		MK-5	432,000	245,000
66,670	2 5/8	MK-5	432,000	245,000
67,500		MK-5	437,000	250,000
68,000		MK-5	437,000	250,000
69,850	2 3/4	MK-5	437,000	250,000
70,000		MK-5	437,000	250,000

d1		S	l1	l2
mm	inch		mm	mm
71,500		MK-5	442,000	255,000
72,000		MK-5	442,000	255,000
75,000		MK-5	442,000	255,000
76,990	3 1/32	MK-6	514,000	260,000
77,000		MK-6	514,000	260,000
77,790	3 1/16	MK-6	514,000	260,000
78,580	3 3/32	MK-6	514,000	260,000
79,500		MK-6	514,000	260,000
87,310	3 7/16	MK-6	524,000	270,000
89,000		MK-6	524,000	270,000
92,500		MK-6	529,000	275,000
93,000		MK-6	529,000	275,000
94,000		MK-6	529,000	275,000
94,500		MK-6	529,000	275,000
95,250	3 3/4	MK-6	534,000	280,000
95,500		MK-6	534,000	280,000
96,000		MK-6	534,000	280,000



## Helisel matkap uçları



**P** • öz bileme  $\geq \varnothing 10,000$  • koni bileme • çelik endüstrisindeki ağır hizmet uygulamaları için

**M****K** •

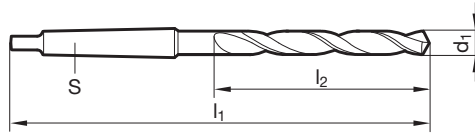
**N** ○ alaşımli/alaşimsız çelikler ve çelik dökümlerde

**S****H**Malzeme **HSS**Yüzey  $\geq \frac{0}{16,0}$ 

Kesme yönü

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 778

Ürün no **592**

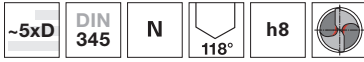
d1		S	l1	l2
mm	inch		mm	mm
10,000		MK-1	168,000	87,000
10,320	13/32	MK-1	168,000	87,000
11,000		MK-1	175,000	94,000
11,110	7/16	MK-1	175,000	94,000
11,500		MK-1	175,000	94,000
11,910	15/32	MK-1	182,000	101,000
12,000		MK-1	182,000	101,000
12,700	1/2	MK-1	182,000	101,000
13,000		MK-1	182,000	101,000
13,490	17/32	MK-1	189,000	108,000
13,500		MK-1	189,000	108,000
14,000		MK-1	189,000	108,000

d1		S	l1	l2
mm	inch		mm	mm
14,290	9/16	MK-2	212,000	114,000
15,080	19/32	MK-2	218,000	120,000
17,000		MK-2	223,000	125,000
18,000		MK-2	228,000	130,000
19,050	3/4	MK-2	238,000	140,000
19,840	25/32	MK-2	238,000	140,000
20,000		MK-2	238,000	140,000
21,430	27/32	MK-2	248,000	150,000
22,000		MK-2	248,000	150,000
23,000		MK-2	253,000	155,000
28,000		MK-3	291,000	170,000





## Helisel matkap uçları



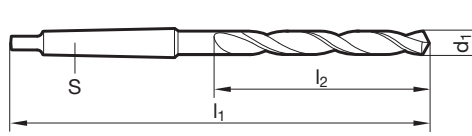
**P** • öz bileme  $\geq \varnothing 3,000$  • koni bileme



**N** ○ alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

Malzeme **HSS**Yüzey **S**Kesme yönü **R****GÜHRING**NAVIGATOR

Kesme verileri sayfası 780

Ürün no **654**Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2	d1		S	l1	l2
mm	inch		mm	mm	mm	inch		mm	mm
3,000		MK-1	114,000	33,000	11,110	7/16	MK-1	175,000	94,000
3,170	1/8	MK-1	117,000	36,000	11,200		MK-1	175,000	94,000
3,500		MK-1	120,000	39,000	11,250		MK-1	175,000	94,000
3,970	5/32	MK-1	124,000	43,000	11,500		MK-1	175,000	94,000
4,000		MK-1	124,000	43,000	11,510	29/64	MK-1	175,000	94,000
4,100		MK-1	124,000	43,000	11,750		MK-1	175,000	94,000
4,370	11/64	MK-1	128,000	47,000	11,910	15/32	MK-1	182,000	101,000
4,500		MK-1	128,000	47,000	12,000		MK-1	182,000	101,000
4,760	3/16	MK-1	133,000	52,000	12,200		MK-1	182,000	101,000
5,000		MK-1	133,000	52,000	12,400		MK-1	182,000	101,000
5,160	13/64	MK-1	133,000	52,000	12,500		MK-1	182,000	101,000
5,560	7/32	MK-1	138,000	57,000	12,700	1/2	MK-1	182,000	101,000
6,000		MK-1	138,000	57,000	12,750		MK-1	182,000	101,000
6,500		MK-1	144,000	63,000	13,000		MK-1	182,000	101,000
6,750	17/64	MK-1	150,000	69,000	13,250		MK-1	189,000	108,000
6,800		MK-1	150,000	69,000	13,490	17/32	MK-1	189,000	108,000
7,000		MK-1	150,000	69,000	13,500		MK-1	189,000	108,000
7,100		MK-1	150,000	69,000	13,890	35/64	MK-1	189,000	108,000
7,140	9/32	MK-1	150,000	69,000	14,000		MK-1	189,000	108,000
7,400		MK-1	150,000	69,000	14,200		MK-2	212,000	114,000
7,700		MK-1	156,000	75,000	14,250		MK-2	212,000	114,000
8,000		MK-1	156,000	75,000	14,290	9/16	MK-2	212,000	114,000
8,500		MK-1	156,000	75,000	14,500		MK-2	212,000	114,000
8,730	11/32	MK-1	162,000	81,000	14,680	37/64	MK-2	212,000	114,000
8,800		MK-1	162,000	81,000	14,750		MK-2	212,000	114,000
9,000		MK-1	162,000	81,000	14,900		MK-2	212,000	114,000
9,400		MK-1	162,000	81,000	15,000		MK-2	212,000	114,000
9,520	3/8	MK-1	168,000	87,000	15,250		MK-2	218,000	120,000
9,600		MK-1	168,000	87,000	15,500		MK-2	218,000	120,000
9,750		MK-1	168,000	87,000	15,750		MK-2	218,000	120,000
9,800		MK-1	168,000	87,000	15,870	5/8	MK-2	218,000	120,000
10,000		MK-1	168,000	87,000	16,000		MK-2	218,000	120,000
10,200		MK-1	168,000	87,000	16,200		MK-2	223,000	125,000
10,250		MK-1	168,000	87,000	16,500		MK-2	223,000	125,000
10,300		MK-1	168,000	87,000	17,000		MK-2	223,000	125,000
10,320	13/32	MK-1	168,000	87,000	17,070	43/64	MK-2	228,000	130,000
10,400		MK-1	168,000	87,000	17,250		MK-2	228,000	130,000
10,500		MK-1	168,000	87,000	17,500		MK-2	228,000	130,000
10,720	27/64	MK-1	175,000	94,000	17,750		MK-2	228,000	130,000
10,750		MK-1	175,000	94,000	18,000		MK-2	228,000	130,000
10,800		MK-1	175,000	94,000	18,250		MK-2	233,000	135,000
11,000		MK-1	175,000	94,000	18,260	23/32	MK-2	233,000	135,000

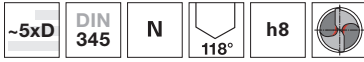


d1		S	l1	l2
mm	inch		mm	mm
18,500		MK-2	233,000	135,000
18,650	47/64	MK-2	233,000	135,000
19,000		MK-2	233,000	135,000
19,050	3/4	MK-2	238,000	140,000
19,450	49/64	MK-2	238,000	140,000
19,500		MK-2	238,000	140,000
19,750		MK-2	238,000	140,000
19,840	25/32	MK-2	238,000	140,000
20,000		MK-2	238,000	140,000
20,250		MK-2	243,000	145,000
20,500		MK-2	243,000	145,000
20,640	13/16	MK-2	243,000	145,000
20,750		MK-2	243,000	145,000
21,000		MK-2	243,000	145,000
21,250		MK-2	248,000	150,000
21,500		MK-2	248,000	150,000
21,750		MK-2	248,000	150,000
21,830	55/64	MK-2	248,000	150,000
22,000		MK-2	248,000	150,000
22,220	7/8	MK-2	248,000	150,000
22,500		MK-2	253,000	155,000
23,000		MK-2	253,000	155,000
23,500		MK-3	276,000	155,000
23,750		MK-3	281,000	160,000

d1		S	l1	l2
mm	inch		mm	mm
24,000		MK-3	281,000	160,000
24,500		MK-3	281,000	160,000
24,750		MK-3	281,000	160,000
25,000	63/64	MK-3	281,000	160,000
25,400	1	MK-3	286,000	165,000
25,500		MK-3	286,000	165,000
26,000		MK-3	286,000	165,000
26,500		MK-3	286,000	165,000
26,990	1 1/16	MK-3	291,000	170,000
27,000		MK-3	291,000	170,000
27,380	1 5/64	MK-3	291,000	170,000
28,000		MK-3	291,000	170,000
28,500		MK-3	296,000	175,000
28,570	1 1/8	MK-3	296,000	175,000
29,000		MK-3	296,000	175,000
29,500		MK-3	296,000	175,000
29,750		MK-3	296,000	175,000
30,000		MK-3	296,000	175,000
30,500		MK-3	301,000	180,000
31,000		MK-3	301,000	180,000



## Helisel matkap uçları



**P** • öz bileme  $\geq \varnothing 14,750$  • koni bileme

**M**

**K** •

**N** ○

**S**

**H**

alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

Malzeme **HSS**

Yüzey

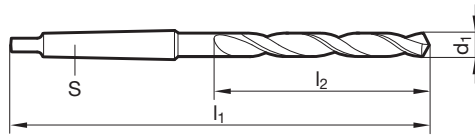


Kesme yönü



## GÜHRING NAVIGATOR

Kesme verileri sayfası 778



Ürün no **248**

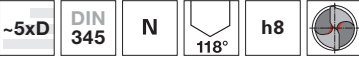
Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2
mm	inch		mm	mm
6,000		MK-1	138,000	57,000
8,000		MK-1	156,000	75,000
8,100		MK-1	156,000	75,000
8,400		MK-1	156,000	75,000
8,500		MK-1	156,000	75,000
9,000		MK-1	162,000	81,000
10,500		MK-1	168,000	87,000
11,000		MK-1	175,000	94,000
11,500		MK-1	175,000	94,000
13,000		MK-1	182,000	101,000
14,000		MK-1	189,000	108,000
15,000		MK-2	212,000	114,000
17,200		MK-2	228,000	130,000
18,000		MK-2	228,000	130,000
20,000		MK-2	238,000	140,000
20,500		MK-2	243,000	145,000
25,500		MK-3	286,000	165,000
28,000		MK-3	291,000	170,000

d1		S	l1	l2
mm	inch		mm	mm
29,000		MK-3	296,000	175,000
30,500		MK-3	301,000	180,000
32,500		MK-4	334,000	185,000
33,000		MK-4	334,000	185,000
34,000		MK-4	339,000	190,000
38,000		MK-4	349,000	200,000
40,000		MK-4	349,000	200,000
60,000		MK-5	422,000	235,000



## Helisel matkap uçları



**P** • öz bileme  $\geq \text{Ø } 8,500$  • koni bileme • Daha iyi bir talaş kırılması  
• genellikle transfer tezahları için uygun

**M**

**K** •

**N** ○ uzun talaşlı malzemeler

**S**

**H**

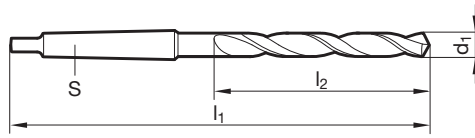
Malzeme **HSS**

Yüzey

Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 778



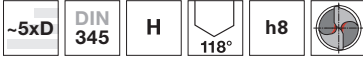
Ürün no **229**

d1		S	l1	l2
mm	inch		mm	mm
8,500		MK-1	156,000	75,000
8,730	11/32	MK-1	162,000	81,000
9,000		MK-1	162,000	81,000
9,500		MK-1	162,000	81,000
9,520	3/8	MK-1	168,000	87,000
11,000		MK-1	175,000	94,000
11,910	15/32	MK-1	182,000	101,000
12,250		MK-1	182,000	101,000
12,500		MK-1	182,000	101,000
13,000		MK-1	182,000	101,000
13,250		MK-1	189,000	108,000
13,490	17/32	MK-1	189,000	108,000
14,000		MK-1	189,000	108,000
14,290	9/16	MK-2	212,000	114,000
14,500		MK-2	212,000	114,000
15,000		MK-2	212,000	114,000
15,080	19/32	MK-2	218,000	120,000
16,000		MK-2	218,000	120,000
18,000		MK-2	228,000	130,000
18,250		MK-2	233,000	135,000
19,500		MK-2	238,000	140,000
19,840	25/32	MK-2	238,000	140,000
20,000		MK-2	238,000	140,000
20,640	13/16	MK-2	243,000	145,000

d1		S	l1	l2
mm	inch		mm	mm
21,000		MK-2	243,000	145,000
22,000		MK-2	248,000	150,000
22,220	7/8	MK-2	248,000	150,000
23,810	15/16	MK-3	281,000	160,000
25,000	63/64	MK-3	281,000	160,000
25,400	1	MK-3	286,000	165,000
26,000		MK-3	286,000	165,000
26,190	1 1/32	MK-3	286,000	165,000
26,500		MK-3	286,000	165,000
35,000		MK-4	339,000	190,000
39,500		MK-4	349,000	200,000
42,500		MK-4	354,000	205,000
43,500		MK-4	359,000	210,000
46,040	1 13/16	MK-4	364,000	215,000
46,500		MK-4	364,000	215,000
47,500		MK-4	364,000	215,000
56,000		MK-5	417,000	230,000
57,000		MK-5	422,000	235,000
58,000		MK-5	422,000	235,000
59,000		MK-5	422,000	235,000



## Helisel matkap uçları



**P** öz bileme  $\geq \text{Ø } 14,500$  • koni bileme



**N** • sert ve kırılğan malzemeler • piriç, magnezyum alaşımları • bronz, fosforlu bBronz • slate, mico, pertinax

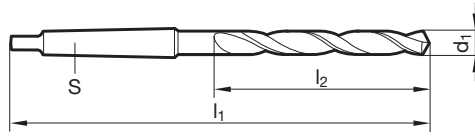
## GÜHRING NAVIGATOR

Kesme verileri sayfası 778

Malzeme **HSS**

Yüzey

Kesme yönü



Ürün no **246**

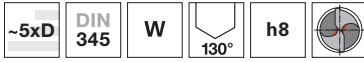
Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2
mm	inch		mm	mm
6,700		MK-1	144,000	63,000
8,200		MK-1	156,000	75,000
11,000		MK-1	175,000	94,000
11,750		MK-1	175,000	94,000
12,600		MK-1	182,000	101,000
12,800		MK-1	182,000	101,000
13,750		MK-1	189,000	108,000
14,500		MK-2	212,000	114,000
15,000		MK-2	212,000	114,000
15,500		MK-2	218,000	120,000
16,000		MK-2	218,000	120,000
16,500		MK-2	223,000	125,000

d1		S	l1	l2
mm	inch		mm	mm
17,000		MK-2	223,000	125,000
20,500		MK-2	243,000	145,000
22,000		MK-2	248,000	150,000
22,250		MK-2	248,000	150,000
23,000		MK-2	253,000	155,000
25,000	63/64	MK-3	281,000	160,000
25,250		MK-3	286,000	165,000



## Helisel matkap uçları

P öz bileme  $\geq \text{Ø } 14,100$  • koni bileme

• yumuşak ve uzun talaş veren malzemelerde • Alüminyum/Al-alaşımaları (uzun talaşlı) • çinko, saflaştırılmış bakır, silumin, elektrotlar

## GÜHRING NAVIGATOR

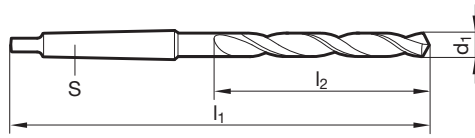
Kesme verileri sayfası 778

Malzeme HSS

Yüzey



Kesme yönü



Ürün no

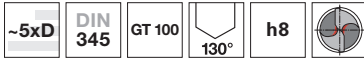
247

d1		S	l1	l2
mm	inch		mm	mm
3,200		MK-1	117,000	36,000
3,300		MK-1	117,000	36,000
3,800		MK-1	124,000	43,000
4,000		MK-1	124,000	43,000
5,000		MK-1	133,000	52,000
5,400		MK-1	138,000	57,000
5,500		MK-1	138,000	57,000
6,000		MK-1	138,000	57,000
6,300		MK-1	144,000	63,000
6,500		MK-1	144,000	63,000
6,600		MK-1	144,000	63,000
6,750	17/64	MK-1	150,000	69,000
6,800		MK-1	150,000	69,000
7,000		MK-1	150,000	69,000
7,500		MK-1	150,000	69,000
7,750		MK-1	156,000	75,000
8,000		MK-1	156,000	75,000
9,200		MK-1	162,000	81,000
9,500		MK-1	162,000	81,000
9,750		MK-1	168,000	87,000
9,800		MK-1	168,000	87,000
12,000		MK-1	182,000	101,000
12,500		MK-1	182,000	101,000
13,000		MK-1	182,000	101,000

d1		S	l1	l2
mm	inch		mm	mm
13,200		MK-1	182,000	101,000
14,000		MK-1	189,000	108,000
16,000		MK-2	218,000	120,000
17,000		MK-2	223,000	125,000
18,000		MK-2	228,000	130,000
18,500		MK-2	233,000	135,000
19,000		MK-2	233,000	135,000
20,000		MK-2	238,000	140,000
21,000		MK-2	243,000	145,000
22,000		MK-2	248,000	150,000
23,000		MK-2	253,000	155,000
27,000		MK-3	291,000	170,000
27,200		MK-3	291,000	170,000
27,250		MK-3	291,000	170,000
27,500		MK-3	291,000	170,000
28,000		MK-3	291,000	170,000
28,500		MK-3	296,000	175,000
30,300		MK-3	301,000	180,000
30,500		MK-3	301,000	180,000
31,000		MK-3	301,000	180,000
31,500		MK-3	301,000	180,000
32,000		MK-4	334,000	185,000



## Helisel matkap uçları

Malzeme **HSS**Yüzey  $\sqrt{16,0}$ Kesme yönü **R**

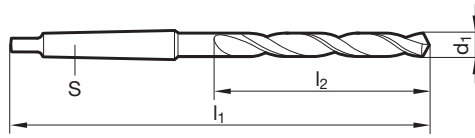
**P** • öz bileme  $\geq \varnothing 7,940$  • koni bileme • geniş kanallı • özellikle delik derinliği 3xD üstü için

**M****K** •

**N** • 1000 N/mm<sup>2</sup>'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.

**S****H****GÜHRING**NAVIGATOR

Kesme verileri sayfası 778

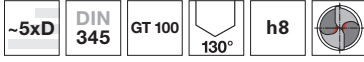
Ürün no **558**Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2
mm	inch		mm	mm
7,940	5/16	MK-1	156,000	75,000
8,000		MK-1	156,000	75,000
8,250		MK-1	156,000	75,000
9,500		MK-1	162,000	81,000
10,000		MK-1	168,000	87,000
10,250		MK-1	168,000	87,000
11,000		MK-1	175,000	94,000
11,110	7/16	MK-1	175,000	94,000
12,700	1/2	MK-1	182,000	101,000
12,750		MK-1	182,000	101,000
13,000		MK-1	182,000	101,000
13,250		MK-1	189,000	108,000
14,000		MK-1	189,000	108,000
14,290	9/16	MK-2	212,000	114,000
14,500		MK-2	212,000	114,000
17,500		MK-2	228,000	130,000
18,000		MK-2	228,000	130,000
19,500		MK-2	238,000	140,000

d1		S	l1	l2
mm	inch		mm	mm
20,000		MK-2	238,000	140,000
20,500		MK-2	243,000	145,000
21,000		MK-2	243,000	145,000
21,250		MK-2	248,000	150,000
27,500		MK-3	291,000	170,000
28,500		MK-3	296,000	175,000
28,570	1 1/8	MK-3	296,000	175,000
29,500		MK-3	296,000	175,000
30,160	1 3/16	MK-3	301,000	180,000
30,500		MK-3	301,000	180,000
31,500		MK-3	301,000	180,000
31,750	1 1/4	MK-3	306,000	185,000



## Helisel matkap uçları

Malzeme **HSS**Yüzey **S**Kesme yönü **R**

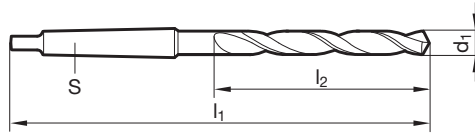
**P** • öz bileme  $\geq \varnothing 7,940$  • koni bileme • geniş kanallı • özellikle delik derinliği 3xD üstü için

**M****K** •

**N** • 1000 N/mm<sup>2</sup>'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.

**S****H****GÜHRING** NAVIGATOR

Kesme verileri sayfası 780

Ürün no **606**

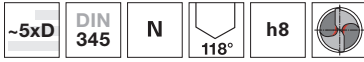
d1		S	l1	l2
mm	inch		mm	mm
7,940	5/16	MK-1	156,000	75,000
8,750		MK-1	162,000	81,000
9,000		MK-1	162,000	81,000
9,520	3/8	MK-1	168,000	87,000
10,000		MK-1	168,000	87,000
11,110	7/16	MK-1	175,000	94,000
12,250		MK-1	182,000	101,000
12,500		MK-1	182,000	101,000
12,750		MK-1	182,000	101,000
14,000		MK-1	189,000	108,000
14,500		MK-2	212,000	114,000
15,750		MK-2	218,000	120,000

d1		S	l1	l2
mm	inch		mm	mm
15,870	5/8	MK-2	218,000	120,000
17,500		MK-2	228,000	130,000
23,500		MK-3	276,000	155,000
23,810	15/16	MK-3	281,000	160,000
25,400	1	MK-3	286,000	165,000
26,990	1 1/16	MK-3	291,000	170,000
28,500		MK-3	296,000	175,000
28,570	1 1/8	MK-3	296,000	175,000
29,000		MK-3	296,000	175,000
31,500		MK-3	301,000	180,000





## Helisel matkap uçları



P	•	öz bileme $\geq \varnothing 3,000$ • koni bileme • Co-alaşımlı HSS-çeliği • artırılmış aşınma direnci
M	○	
K	•	
N	○	alaşım/alaşısız çelikler ve pik döküm çeşitleri 800 N/mm <sup>2</sup> 'ye kadar
S	○	• sıcak ve soğuk işlem çelikleri • rulman çeliği • yüksek alaşım çelikleri • ıslah çelikleri ve sementasyon çelikleri
H		

## GÜHRING NAVIGATOR

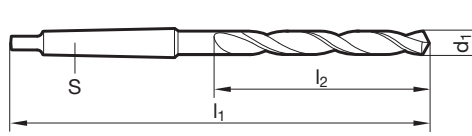
Kesme verileri sayfası 780

Malzeme HSC0

Yüzey



Kesme yönü



Ürün no 345

Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2	d1		S	l1	l2
mm	inch		mm	mm	mm	inch		mm	mm
4,000		MK-1	124,000	43,000	12,700	1/2	MK-1	182,000	101,000
5,000		MK-1	133,000	52,000	12,750		MK-1	182,000	101,000
5,200		MK-1	133,000	52,000	13,000		MK-1	182,000	101,000
5,500		MK-1	138,000	57,000	13,100	33/64	MK-1	182,000	101,000
6,000		MK-1	138,000	57,000	13,200		MK-1	182,000	101,000
6,500		MK-1	144,000	63,000	13,250		MK-1	189,000	108,000
6,700		MK-1	144,000	63,000	13,490	17/32	MK-1	189,000	108,000
6,750	17/64	MK-1	150,000	69,000	13,500		MK-1	189,000	108,000
6,800		MK-1	150,000	69,000	13,700		MK-1	189,000	108,000
7,000		MK-1	150,000	69,000	13,750		MK-1	189,000	108,000
7,500		MK-1	150,000	69,000	13,800		MK-1	189,000	108,000
8,000		MK-1	156,000	75,000	13,900		MK-1	189,000	108,000
8,200		MK-1	156,000	75,000	14,000		MK-1	189,000	108,000
8,500		MK-1	156,000	75,000	14,100		MK-2	212,000	114,000
8,700		MK-1	162,000	81,000	14,200		MK-2	212,000	114,000
9,000		MK-1	162,000	81,000	14,250		MK-2	212,000	114,000
9,500		MK-1	162,000	81,000	14,290	9/16	MK-2	212,000	114,000
9,520	3/8	MK-1	168,000	87,000	14,500		MK-2	212,000	114,000
10,000		MK-1	168,000	87,000	14,750		MK-2	212,000	114,000
10,100		MK-1	168,000	87,000	15,000		MK-2	212,000	114,000
10,150		MK-1	168,000	87,000	15,080	19/32	MK-2	218,000	120,000
10,200		MK-1	168,000	87,000	15,250		MK-2	218,000	120,000
10,250		MK-1	168,000	87,000	15,500		MK-2	218,000	120,000
10,320	13/32	MK-1	168,000	87,000	15,750		MK-2	218,000	120,000
10,500		MK-1	168,000	87,000	15,870	5/8	MK-2	218,000	120,000
10,700		MK-1	175,000	94,000	16,000		MK-2	218,000	120,000
10,720	27/64	MK-1	175,000	94,000	16,100		MK-2	223,000	125,000
10,750		MK-1	175,000	94,000	16,250		MK-2	223,000	125,000
10,800		MK-1	175,000	94,000	16,270	41/64	MK-2	223,000	125,000
11,000		MK-1	175,000	94,000	16,500		MK-2	223,000	125,000
11,110	7/16	MK-1	175,000	94,000	16,670	21/32	MK-2	223,000	125,000
11,200		MK-1	175,000	94,000	16,750		MK-2	223,000	125,000
11,500		MK-1	175,000	94,000	17,000		MK-2	223,000	125,000
11,600		MK-1	175,000	94,000	17,460	11/16	MK-2	228,000	130,000
11,750		MK-1	175,000	94,000	17,500		MK-2	228,000	130,000
11,800		MK-1	175,000	94,000	17,750		MK-2	228,000	130,000
11,900		MK-1	182,000	101,000	17,860	45/64	MK-2	228,000	130,000
12,000		MK-1	182,000	101,000	18,000		MK-2	228,000	130,000
12,100		MK-1	182,000	101,000	18,200		MK-2	233,000	135,000
12,200		MK-1	182,000	101,000	18,250		MK-2	233,000	135,000
12,250		MK-1	182,000	101,000	18,260	23/32	MK-2	233,000	135,000
12,500		MK-1	182,000	101,000	18,500		MK-2	233,000	135,000

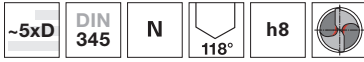


d1		S	l1	l2
mm	inch		mm	mm
18,650	47/64	MK-2	233,000	135,000
18,750		MK-2	233,000	135,000
19,000		MK-2	233,000	135,000
19,050	3/4	MK-2	238,000	140,000
19,250		MK-2	238,000	140,000
19,500		MK-2	238,000	140,000
19,750		MK-2	238,000	140,000
19,840	25/32	MK-2	238,000	140,000
20,000		MK-2	238,000	140,000
20,250		MK-2	243,000	145,000
20,500		MK-2	243,000	145,000
20,640	13/16	MK-2	243,000	145,000
20,750		MK-2	243,000	145,000
21,000		MK-2	243,000	145,000
21,250		MK-2	248,000	150,000
21,500		MK-2	248,000	150,000
22,000		MK-2	248,000	150,000
22,220	7/8	MK-2	248,000	150,000
22,250		MK-2	248,000	150,000
22,500		MK-2	253,000	155,000
22,620	57/64	MK-2	253,000	155,000
23,000		MK-2	253,000	155,000
23,020	29/32	MK-2	253,000	155,000
23,500		MK-3	276,000	155,000
24,000		MK-3	281,000	160,000
24,210	61/64	MK-3	281,000	160,000
24,500		MK-3	281,000	160,000
25,000	63/64	MK-3	281,000	160,000
25,250		MK-3	286,000	165,000
25,400	1	MK-3	286,000	165,000

d1		S	l1	l2
mm	inch		mm	mm
25,500		MK-3	286,000	165,000
26,000		MK-3	286,000	165,000
26,500		MK-3	286,000	165,000
27,000		MK-3	291,000	170,000
27,500		MK-3	291,000	170,000
28,000		MK-3	291,000	170,000
28,500		MK-3	296,000	175,000
28,570	1 1/8	MK-3	296,000	175,000
29,000		MK-3	296,000	175,000
29,500		MK-3	296,000	175,000
30,000		MK-3	296,000	175,000
30,500		MK-3	301,000	180,000
31,000		MK-3	301,000	180,000
31,500		MK-3	301,000	180,000
31,750	1 1/4	MK-3	306,000	185,000
32,000		MK-4	334,000	185,000
32,500		MK-4	334,000	185,000
33,000		MK-4	334,000	185,000
34,000		MK-4	339,000	190,000
35,000		MK-4	339,000	190,000
36,000		MK-4	344,000	195,000
37,000		MK-4	344,000	195,000
38,000		MK-4	349,000	200,000
39,000		MK-4	349,000	200,000
40,000		MK-4	349,000	200,000
42,000		MK-4	354,000	205,000
42,070	1 21/32	MK-4	354,000	205,000
43,000		MK-4	359,000	210,000
45,000		MK-4	359,000	210,000
50,000		MK-4	369,000	220,000



## Helisel matkap uçları



**P** • öz bileme  $\geq \varnothing 7,940$  • koni bileme • Co-alaşımlı HSS-çeliği • yüksek aşınma direnci

**M** ○

**K** •

**N** ○

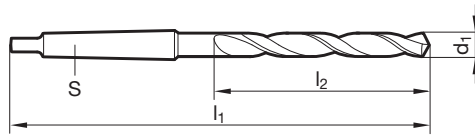
**S** ○

**H** ○

alaşım/alaşısız çelikler ve pik döküm çeşitleri 800 N/mm<sup>2</sup>'ye kadar  
• sıcak ve soğuk işlem çelikleri • rulman çeliği • yüksek alaşım çelikleri  
• ıslah çelikleri ve sementasyon çelikleri

Malzeme **HSCO**Yüzey **S**Kesme yönü **R****GÜHRING** NAVIGATOR

Kesme verileri sayfası 782

Ürün no **661**Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2
mm	inch		mm	mm
8,000		MK-1	156,000	75,000
8,500		MK-1	156,000	75,000
9,000		MK-1	162,000	81,000
9,500		MK-1	162,000	81,000
9,520	3/8	MK-1	168,000	87,000
10,000		MK-1	168,000	87,000
11,000		MK-1	175,000	94,000
12,000		MK-1	182,000	101,000
12,500		MK-1	182,000	101,000
12,700	1/2	MK-1	182,000	101,000
13,000		MK-1	182,000	101,000
13,500		MK-1	189,000	108,000
14,000		MK-1	189,000	108,000
14,500		MK-2	212,000	114,000
15,000		MK-2	212,000	114,000
16,000		MK-2	218,000	120,000
17,000		MK-2	223,000	125,000
17,070	43/64	MK-2	228,000	130,000

d1		S	l1	l2
mm	inch		mm	mm
17,460	11/16	MK-2	228,000	130,000
17,500		MK-2	228,000	130,000
18,000		MK-2	228,000	130,000
19,000		MK-2	233,000	135,000
19,500		MK-2	238,000	140,000
20,000		MK-2	238,000	140,000
21,000		MK-2	243,000	145,000
22,000		MK-2	248,000	150,000
23,000		MK-2	253,000	155,000
23,810	15/16	MK-3	281,000	160,000
25,000	63/64	MK-3	281,000	160,000
26,000		MK-3	286,000	165,000
26,500		MK-3	286,000	165,000
26,990	1 1/16	MK-3	291,000	170,000
29,000		MK-3	296,000	175,000
30,000		MK-3	296,000	175,000



## Helisel matkap uçları

Malzeme **HSCO**

Yüzey

Kesme yönü

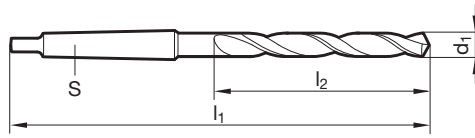
**P** • öz bileme  $\geq \varnothing 9,520$  • koni bileme • Co-alaşımlı HSS-çeliği • geniş kanallı  
• yüksek aşınma direnci • özellikle delik derinliği 3xD üstü için

**M** ○**K** •**N** ○**S** ○**H** ○

**N** ○ alaşım/alaşısız çelikler ve pik döküm çeşitleri 1000 N/mm<sup>2</sup>'ye kadar  
• sıcak ve soğuk işlem çelikleri • rulman çeliği • yüksek alaşım çelikleri  
• ıslah çelikleri ve sementasyon çelikleri

**GÜHRINGNAVIGATOR**

Kesme verileri sayfası 780

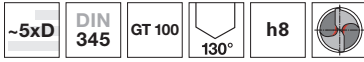
Ürün no **645**

d1	S	l1	l2	
mm	inch	mm	mm	
10,000		MK-1	168,000	87,000
10,100		MK-1	168,000	87,000
10,200		MK-1	168,000	87,000
10,500		MK-1	168,000	87,000
10,720	27/64	MK-1	175,000	94,000
10,800		MK-1	175,000	94,000
11,000		MK-1	175,000	94,000
11,500		MK-1	175,000	94,000
11,510	29/64	MK-1	175,000	94,000
12,000		MK-1	182,000	101,000
12,500		MK-1	182,000	101,000
13,000		MK-1	182,000	101,000
13,300		MK-1	189,000	108,000
13,500		MK-1	189,000	108,000
14,000		MK-1	189,000	108,000
14,250		MK-2	212,000	114,000
14,290	9/16	MK-2	212,000	114,000
14,500		MK-2	212,000	114,000
15,000		MK-2	212,000	114,000
15,250		MK-2	218,000	120,000
15,500		MK-2	218,000	120,000
15,750		MK-2	218,000	120,000
16,000		MK-2	218,000	120,000
16,500		MK-2	223,000	125,000
16,670	21/32	MK-2	223,000	125,000
17,000		MK-2	223,000	125,000
17,250		MK-2	228,000	130,000
17,460	11/16	MK-2	228,000	130,000
17,500		MK-2	228,000	130,000
18,000		MK-2	228,000	130,000

d1	S	l1	l2	
mm	inch	mm	mm	
18,250		MK-2	233,000	135,000
18,500		MK-2	233,000	135,000
19,000		MK-2	233,000	135,000
20,000		MK-2	238,000	140,000
20,500		MK-2	243,000	145,000
21,000		MK-2	243,000	145,000
22,000		MK-2	248,000	150,000
22,220	7/8	MK-2	248,000	150,000
22,620	57/64	MK-2	253,000	155,000
23,000		MK-2	253,000	155,000
24,000		MK-3	281,000	160,000
24,210	61/64	MK-3	281,000	160,000
24,610	31/32	MK-3	281,000	160,000
25,000	63/64	MK-3	281,000	160,000
26,000		MK-3	286,000	165,000
26,500		MK-3	286,000	165,000
27,780	1 3/32	MK-3	291,000	170,000
28,570	1 1/8	MK-3	296,000	175,000
30,000		MK-3	296,000	175,000
31,000		MK-3	301,000	180,000
33,000		MK-4	334,000	185,000
35,000		MK-4	339,000	190,000
37,000		MK-4	344,000	195,000
38,000		MK-4	349,000	200,000
39,000		MK-4	349,000	200,000



## Helisel matkap uçları



**P** • öz bileme  $\geq \varnothing 10,000$  • koni bileme • Co-alaşimli HSS-çeliği • geniş kanallı • yüksek aşınma direnci • özellikle delik derinliği 3xD üstü için

**M** ○

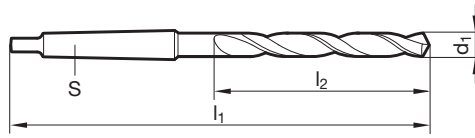
**K** •

**N** ○ alaşimli/alaşimsız çelikler ve pik döküm çeşitleri 1000 N/mm<sup>2</sup>'ye kadar  
**S** • sıcak ve soğuk işlem çelikleri • rulman çeliği • yüksek alaşimli çelikleri  
 • ıslah çelikleri ve sementasyon çelikleri

**H**

Malzeme **HSCO**Yüzey **S**Kesme yönü **R****GÜHRING**NAVIGATOR

Kesme verileri sayfası 782

Ürün no **662**Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2
mm	inch		mm	mm
10,000		MK-1	168,000	87,000
10,200		MK-1	168,000	87,000
11,000		MK-1	175,000	94,000
11,110	7/16	MK-1	175,000	94,000
11,400		MK-1	175,000	94,000
12,200		MK-1	182,000	101,000
12,300	31/64	MK-1	182,000	101,000
12,500		MK-1	182,000	101,000
13,000		MK-1	182,000	101,000
14,000		MK-1	189,000	108,000
14,290	9/16	MK-2	212,000	114,000
15,000		MK-2	212,000	114,000

d1		S	l1	l2
mm	inch		mm	mm
16,000		MK-2	218,000	120,000
17,460	11/16	MK-2	228,000	130,000
17,500		MK-2	228,000	130,000
18,000		MK-2	228,000	130,000
20,000		MK-2	238,000	140,000
20,500		MK-2	243,000	145,000
21,000		MK-2	243,000	145,000
22,000		MK-2	248,000	150,000
23,000		MK-2	253,000	155,000
23,500		MK-3	276,000	155,000
23,810	15/16	MK-3	281,000	160,000



## Helisel matkap uçları



**P** • öz bileme  $\geq \varnothing 10,000$  • koni bileme • Co-alaşım HSS-çeliği • geniş kanallı • yüksek aşınma direnci • özellikle delik derinliği 3xD üstü için

**M**

**K** ○

**N** alaşım/alaşımız. çelikler ve pik döküm çeşitleri 1000 N/mm<sup>2</sup>'ye kadar  
**S** • sıcak ve soğuk işlem çelikleri • rulman çeliği • yüksek alaşım çelikleri  
 • ıslah çelikleri ve sementasyon çelikleri

**H**

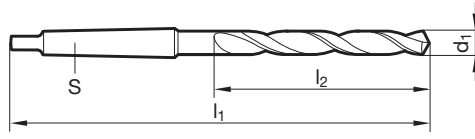
## GÜHRING NAVIGATOR

Kesme verileri sayfası 782

Malzeme **HSCO**

Yüzey **G**

Kesme yönü **R**



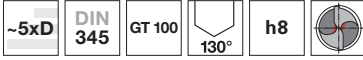
Ürün no **1222**

d1		S	l1	l2
mm	inch		mm	mm
10,000		MK-1	168,000	87,000
10,200		MK-1	168,000	87,000
11,000		MK-1	175,000	94,000
11,110	7/16	MK-1	175,000	94,000
12,500		MK-1	182,000	101,000
12,700	1/2	MK-1	182,000	101,000
14,200		MK-2	212,000	114,000
15,870	5/8	MK-2	218,000	120,000
16,500		MK-2	223,000	125,000
16,670	21/32	MK-2	223,000	125,000
17,460	11/16	MK-2	228,000	130,000
19,500		MK-2	238,000	140,000

d1		S	l1	l2
mm	inch		mm	mm
23,500		MK-3	276,000	155,000
23,810	15/16	MK-3	281,000	160,000
25,500		MK-3	286,000	165,000
26,990	1 1/16	MK-3	291,000	170,000
27,500		MK-3	291,000	170,000
29,500		MK-3	296,000	175,000
30,160	1 3/16	MK-3	301,000	180,000



## Helisel matkap uçları



**P** öz bileme  $\geq \text{Ø } 10,400$  • koni bileme • Co-alaşımlı HSS-çeliği • geniş kanallı • yüksek aşınma direnci • özellikle delik derinliği 3xD üstü için

**M**

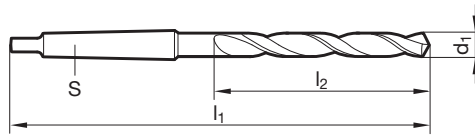
**K**

**N** alaşım/alaşısız çelikler ve pik döküm çeşitleri  $1000 \text{ N/mm}^2$ 'ye kadar  
**S** sıcak ve soğuk işlem çelikleri • rulman çeliği • yüksek alaşım çelikleri  
 • ıslah çelikleri ve sementasyon çelikleri

**H**

Malzeme **HSCO**Yüzey **A**Kesme yönü **R****GÜHRING**NAVIGATOR

Kesme verileri sayfası 782

Ürün no **1224**Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2
mm	inch		mm	mm
10,400		MK-1	168,000	87,000
11,110	7/16	MK-1	175,000	94,000
12,300	31/64	MK-1	182,000	101,000
12,700	1/2	MK-1	182,000	101,000
14,200		MK-2	212,000	114,000
14,290	9/16	MK-2	212,000	114,000
15,870	5/8	MK-2	218,000	120,000
16,000		MK-2	218,000	120,000
16,500		MK-2	223,000	125,000
19,000		MK-2	233,000	135,000
19,500		MK-2	238,000	140,000
23,810	15/16	MK-3	281,000	160,000

d1		S	l1	l2
mm	inch		mm	mm
25,500		MK-3	286,000	165,000
26,990	1 1/16	MK-3	291,000	170,000
27,000		MK-3	291,000	170,000
28,000		MK-3	291,000	170,000
28,500		MK-3	296,000	175,000
29,000		MK-3	296,000	175,000
29,500		MK-3	296,000	175,000
30,160	1 3/16	MK-3	301,000	180,000



## Helisel matkap uçları



P ○ koni bileme • Co-alaşımlı HSS-çeliği • arttırılmış aşınma direnci

M •

K

N ○ pasas/aside/ısıya dayanıklı ostenitik çelikler (V2A-ve-V4A)

S ○

H

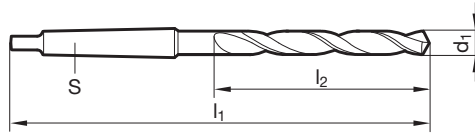
Malzeme HSCÖ

Yüzey ○

Kesme yönü (R)

## GÜHRING NAVIGATOR

Kesme verileri sayfası 780



Ürün no 1262

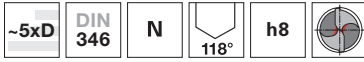
d1		S	l1	l2
mm	inch		mm	mm
10,000		MK-1	168,000	87,000
10,200		MK-1	168,000	87,000
10,500		MK-1	168,000	87,000
10,800		MK-1	175,000	94,000
11,000		MK-1	175,000	94,000
11,200		MK-1	175,000	94,000
11,800		MK-1	175,000	94,000
12,000		MK-1	182,000	101,000
12,300	31/64	MK-1	182,000	101,000
12,500		MK-1	182,000	101,000
13,000		MK-1	182,000	101,000
13,490	17/32	MK-1	189,000	108,000
13,500		MK-1	189,000	108,000
13,800		MK-1	189,000	108,000
14,000		MK-1	189,000	108,000
14,250		MK-2	212,000	114,000
14,500		MK-2	212,000	114,000
14,750		MK-2	212,000	114,000
15,000		MK-2	212,000	114,000
15,250		MK-2	218,000	120,000
15,480	39/64	MK-2	218,000	120,000
15,500		MK-2	218,000	120,000
16,000		MK-2	218,000	120,000
16,250		MK-2	223,000	125,000
16,500		MK-2	223,000	125,000
17,000		MK-2	223,000	125,000
17,500		MK-2	228,000	130,000
18,000		MK-2	228,000	130,000
18,500		MK-2	233,000	135,000
19,000		MK-2	233,000	135,000

d1		S	l1	l2
mm	inch		mm	mm
19,500		MK-2	238,000	140,000
20,000		MK-2	238,000	140,000
20,500		MK-2	243,000	145,000
21,000		MK-2	243,000	145,000
21,500		MK-2	248,000	150,000
21,750		MK-2	248,000	150,000
22,000		MK-2	248,000	150,000
22,500		MK-2	253,000	155,000
23,000		MK-2	253,000	155,000
23,420	59/64	MK-3	276,000	155,000
24,000		MK-3	281,000	160,000
24,500		MK-3	281,000	160,000
25,000	63/64	MK-3	281,000	160,000
25,500		MK-3	286,000	165,000
26,000		MK-3	286,000	165,000
26,500		MK-3	286,000	165,000
27,000		MK-3	291,000	170,000
27,500		MK-3	291,000	170,000
28,000		MK-3	291,000	170,000
28,500		MK-3	296,000	175,000
29,000		MK-3	296,000	175,000
30,000		MK-3	296,000	175,000
32,000		MK-4	334,000	185,000
34,000		MK-4	339,000	190,000





## Helisel matkap uçları



**P** • öz bileme  $\geq \varnothing 14,200$  • koni bileme • daha büyük mors konikli

**M**

**K** •

**N** ○

**S**

**H**

alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

Malzeme **HSS**

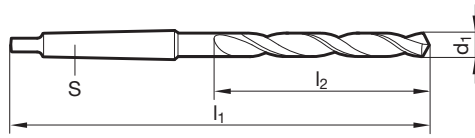
Yüzey



Kesme yönü

**GÜHRING**NAVIGATOR

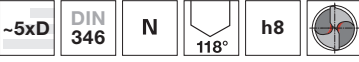
Kesme verileri sayfası 778

Ürün no **251**Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2	d1		S	l1	l2
mm	inch		mm	mm	mm	inch		mm	mm
10,000		MK-2	185,000	87,000	21,430	27/32	MK-3	271,000	150,000
10,500		MK-2	185,000	87,000	21,500		MK-3	271,000	150,000
11,000		MK-2	192,000	94,000	22,000		MK-3	271,000	150,000
11,910	15/32	MK-2	199,000	101,000	22,220	7/8	MK-3	271,000	150,000
12,000		MK-2	199,000	101,000	23,000		MK-3	276,000	155,000
12,250		MK-2	199,000	101,000	23,020	29/32	MK-3	276,000	155,000
12,500		MK-2	199,000	101,000	27,500		MK-4	319,000	170,000
13,000		MK-2	199,000	101,000	27,750		MK-4	319,000	170,000
13,100	33/64	MK-2	199,000	101,000	27,780	1 3/32	MK-4	319,000	170,000
13,250		MK-2	206,000	108,000	28,000		MK-4	319,000	170,000
13,490	17/32	MK-2	206,000	108,000	28,180	1 7/64	MK-4	324,000	175,000
13,500		MK-2	206,000	108,000	28,500		MK-4	324,000	175,000
13,890	35/64	MK-2	206,000	108,000	28,570	1 1/8	MK-4	324,000	175,000
14,000		MK-2	206,000	108,000	28,970	1 9/64	MK-4	324,000	175,000
16,700		MK-3	246,000	125,000	29,770	1 11/64	MK-4	324,000	175,000
17,000		MK-3	246,000	125,000	31,500		MK-4	329,000	180,000
17,250		MK-3	251,000	130,000	32,000		MK-5	372,000	185,000
18,250		MK-3	256,000	135,000	36,000		MK-5	382,000	195,000
18,260	23/32	MK-3	256,000	135,000	40,080	1 37/64	MK-5	392,000	205,000
18,650	47/64	MK-3	256,000	135,000	41,000		MK-5	392,000	205,000
18,750		MK-3	256,000	135,000	41,500		MK-5	392,000	205,000
19,000		MK-3	256,000	135,000	42,070	1 21/32	MK-5	392,000	205,000
19,050	3/4	MK-3	261,000	140,000	44,050	1 47/64	MK-5	397,000	210,000
19,450	49/64	MK-3	261,000	140,000	45,000		MK-5	397,000	210,000
19,840	25/32	MK-3	261,000	140,000	46,040	1 13/16	MK-5	402,000	215,000
20,000		MK-3	261,000	140,000	47,000		MK-5	402,000	215,000
20,250		MK-3	266,000	145,000	49,000		MK-5	407,000	220,000
20,640	13/16	MK-3	266,000	145,000	49,500		MK-5	407,000	220,000
21,000		MK-3	266,000	145,000	73,000		MK-6	509,000	255,000
21,030	53/64	MK-3	266,000	145,000					



## Helisel matkap uçları



**P** • öz bileme  $\geq \varnothing 10,000$  • koni bileme • Co-alaşimli HSS-çeliği • yüksek aşınma direnci • daha büyük mors konikli

**M** ○

**K** •

**N** • alaşimli/alaşimsız, çelikler ve pik döküm çeşitleri  $800 \text{ N/mm}^2$ 'ye kadar  
**S** • sıcak ve soğuk işlem çelikleri • rulman çeliği • yüksek alaşimli çelikleri  
• ıslah çelikleri ve sementasyon çelikleri

**H**

## GÜHRING NAVIGATOR

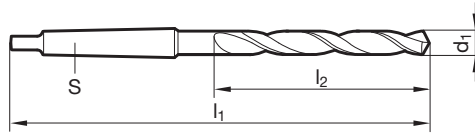
Kesme verileri sayfası 780

Malzeme **HSCO**

Yüzey



Kesme yönü



Ürün no

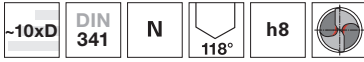
351

d1		S	l1	l2
mm	inch		mm	mm
12,000		MK-2	199,000	101,000
13,000		MK-2	199,000	101,000
14,000		MK-2	206,000	108,000
17,500		MK-3	251,000	130,000
18,500		MK-3	256,000	135,000
20,000		MK-3	261,000	140,000
21,000		MK-3	266,000	145,000
21,500		MK-3	271,000	150,000
22,750		MK-3	276,000	155,000
23,000		MK-3	276,000	155,000
29,000		MK-4	324,000	175,000
30,000		MK-4	324,000	175,000

d1		S	l1	l2
mm	inch		mm	mm
31,000		MK-4	329,000	180,000
31,500		MK-4	329,000	180,000



## Silindirik saplı uzun matkap uçları



**P** • öz bileme  $\geq \text{Ø} 14,100$  • koni bileme • burç kullanarak delme için

**M**

**K** •

**N** ○ alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

**S**

**H**

Malzeme **HSS**

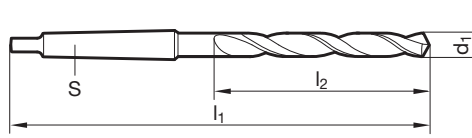
Yüzey



Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 786

Ürün no **257**Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2	d1		S	l1	l2
mm	inch		mm	mm	mm	inch		mm	mm
2,900		MK-1	132,000	51,000	9,900		MK-1	197,000	116,000
3,900		MK-1	145,000	64,000	10,000		MK-1	197,000	116,000
4,000		MK-1	145,000	64,000	10,050		MK-1	197,000	116,000
4,100		MK-1	145,000	64,000	10,100		MK-1	197,000	116,000
4,200		MK-1	145,000	64,000	10,200		MK-1	197,000	116,000
4,500		MK-1	150,000	69,000	10,250		MK-1	197,000	116,000
4,700		MK-1	150,000	69,000	10,300		MK-1	197,000	116,000
5,000		MK-1	155,000	74,000	10,400		MK-1	197,000	116,000
5,100		MK-1	155,000	74,000	10,500		MK-1	197,000	116,000
5,200		MK-1	155,000	74,000	10,600		MK-1	197,000	116,000
5,250		MK-1	155,000	74,000	10,700		MK-1	206,000	125,000
5,500		MK-1	161,000	80,000	10,750		MK-1	206,000	125,000
5,800		MK-1	161,000	80,000	10,800		MK-1	206,000	125,000
6,000		MK-1	161,000	80,000	10,900		MK-1	206,000	125,000
6,500		MK-1	167,000	86,000	11,000		MK-1	206,000	125,000
6,700		MK-1	167,000	86,000	11,250		MK-1	206,000	125,000
6,800		MK-1	174,000	93,000	11,400		MK-1	206,000	125,000
7,000		MK-1	174,000	93,000	11,500		MK-1	206,000	125,000
7,100		MK-1	174,000	93,000	11,750		MK-1	206,000	125,000
7,200		MK-1	174,000	93,000	11,800		MK-1	206,000	125,000
7,300		MK-1	174,000	93,000	12,000		MK-1	215,000	134,000
7,400		MK-1	174,000	93,000	12,100		MK-1	215,000	134,000
7,500		MK-1	174,000	93,000	12,200		MK-1	215,000	134,000
7,600		MK-1	181,000	100,000	12,250		MK-1	215,000	134,000
7,800		MK-1	181,000	100,000	12,300	31/64	MK-1	215,000	134,000
8,000		MK-1	181,000	100,000	12,400		MK-1	215,000	134,000
8,050		MK-1	181,000	100,000	12,500		MK-1	215,000	134,000
8,200		MK-1	181,000	100,000	12,600		MK-1	215,000	134,000
8,250		MK-1	181,000	100,000	13,000		MK-1	215,000	134,000
8,500		MK-1	181,000	100,000	13,100	33/64	MK-1	215,000	134,000
8,600		MK-1	188,000	107,000	13,200		MK-1	215,000	134,000
8,750		MK-1	188,000	107,000	13,490	17/32	MK-1	223,000	142,000
8,800		MK-1	188,000	107,000	13,500		MK-1	223,000	142,000
8,900		MK-1	188,000	107,000	13,750		MK-1	223,000	142,000
9,000		MK-1	188,000	107,000	13,900		MK-1	223,000	142,000
9,100		MK-1	188,000	107,000	14,000		MK-1	223,000	142,000
9,300		MK-1	188,000	107,000	14,100		MK-2	245,000	147,000
9,400		MK-1	188,000	107,000	14,250		MK-2	245,000	147,000
9,500		MK-1	188,000	107,000	14,290	9/16	MK-2	245,000	147,000
9,600		MK-1	197,000	116,000	14,300		MK-2	245,000	147,000
9,700		MK-1	197,000	116,000	14,400		MK-2	245,000	147,000
9,800		MK-1	197,000	116,000	14,500		MK-2	245,000	147,000

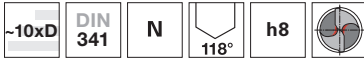


d1		S	l1	l2
mm	inch		mm	mm
14,750		MK-2	245,000	147,000
14,900		MK-2	245,000	147,000
15,000		MK-2	245,000	147,000
15,200		MK-2	251,000	153,000
15,250		MK-2	251,000	153,000
15,500		MK-2	251,000	153,000
15,600		MK-2	251,000	153,000
15,750		MK-2	251,000	153,000
16,000		MK-2	251,000	153,000
16,100		MK-2	257,000	159,000
16,200		MK-2	257,000	159,000
16,250		MK-2	257,000	159,000
16,500		MK-2	257,000	159,000
16,670	21/32	MK-2	257,000	159,000
16,750		MK-2	257,000	159,000
17,000		MK-2	257,000	159,000
17,250		MK-2	263,000	165,000
17,460	11/16	MK-2	263,000	165,000
17,500		MK-2	263,000	165,000
17,750		MK-2	263,000	165,000
18,000		MK-2	263,000	165,000
18,250		MK-2	269,000	171,000
18,500		MK-2	269,000	171,000
18,750		MK-2	269,000	171,000
19,000		MK-2	269,000	171,000
19,500		MK-2	275,000	177,000
19,750		MK-2	275,000	177,000
19,840	25/32	MK-2	275,000	177,000
20,000		MK-2	275,000	177,000
20,250		MK-2	282,000	184,000
20,500		MK-2	282,000	184,000
20,640	13/16	MK-2	282,000	184,000
21,000		MK-2	282,000	184,000
21,500		MK-2	289,000	191,000
21,750		MK-2	289,000	191,000
21,830	55/64	MK-2	289,000	191,000
22,000		MK-2	289,000	191,000
22,220	7/8	MK-2	289,000	191,000
22,250		MK-2	289,000	191,000
22,500		MK-2	296,000	198,000
23,000		MK-2	296,000	198,000
23,500		MK-3	319,000	198,000
23,750		MK-3	327,000	206,000
23,810	15/16	MK-3	327,000	206,000
24,000		MK-3	327,000	206,000
24,250		MK-3	327,000	206,000
24,500		MK-3	327,000	206,000
25,000	63/64	MK-3	327,000	206,000

d1		S	l1	l2
mm	inch		mm	mm
25,250		MK-3	335,000	214,000
25,500		MK-3	335,000	214,000
26,000		MK-3	335,000	214,000
26,500		MK-3	335,000	214,000
26,590	1 3/64	MK-3	343,000	222,000
26,990	1 1/16	MK-3	343,000	222,000
27,000		MK-3	343,000	222,000
27,380	1 5/64	MK-3	343,000	222,000
27,500		MK-3	343,000	222,000
28,000		MK-3	343,000	222,000
28,500		MK-3	351,000	230,000
29,000		MK-3	351,000	230,000
29,500		MK-3	351,000	230,000
30,000		MK-3	351,000	230,000
30,500		MK-3	360,000	239,000
31,000		MK-3	360,000	239,000
32,000		MK-4	397,000	248,000
33,000		MK-4	397,000	248,000
33,500		MK-4	397,000	248,000
34,000		MK-4	406,000	257,000
35,000		MK-4	406,000	257,000
36,000		MK-4	416,000	267,000
36,120	1 27/64	MK-4	416,000	267,000
36,910	1 29/64	MK-4	416,000	267,000
37,000		MK-4	416,000	267,000
37,500		MK-4	416,000	267,000
38,000		MK-4	426,000	277,000
39,000		MK-4	426,000	277,000
39,500		MK-4	426,000	277,000
40,000		MK-4	426,000	277,000
40,080	1 37/64	MK-4	436,000	287,000
40,880	1 39/64	MK-4	436,000	287,000
41,000		MK-4	436,000	287,000
41,670	1 41/64	MK-4	436,000	287,000
42,000		MK-4	436,000	287,000
43,000		MK-4	447,000	298,000
43,660	1 23/32	MK-4	447,000	298,000
44,000		MK-4	447,000	298,000
45,000		MK-4	447,000	298,000
46,830	1 27/32	MK-4	459,000	310,000
48,000		MK-4	470,000	321,000
49,000		MK-4	470,000	321,000
50,000		MK-4	470,000	321,000



## Helisel matkap uçları, kısa



**P** • öz bileme  $\geq \varnothing 4,000$  • koni bileme • burç kullanarak delme için

**M**

**K** •

**N** ○ alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

**S**

**H**

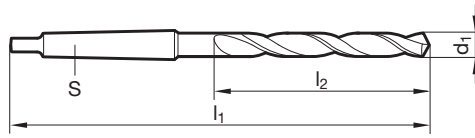
Malzeme **HSS**

Yüzey **S**

Kesme yönü **R**

## GÜHRING NAVIGATOR

Kesme verileri sayfası 786



Ürün no **655**

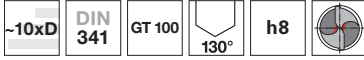
Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2
mm	inch		mm	mm
5,500		MK-1	161,000	80,000
6,000		MK-1	161,000	80,000
6,800		MK-1	174,000	93,000
7,000		MK-1	174,000	93,000
7,300		MK-1	174,000	93,000
8,000		MK-1	181,000	100,000
8,200		MK-1	181,000	100,000
8,400		MK-1	181,000	100,000
8,500		MK-1	181,000	100,000
8,600		MK-1	188,000	107,000
8,700		MK-1	188,000	107,000
8,800		MK-1	188,000	107,000
9,000		MK-1	188,000	107,000
9,500		MK-1	188,000	107,000
10,000		MK-1	197,000	116,000
10,050		MK-1	197,000	116,000
10,100		MK-1	197,000	116,000
10,200		MK-1	197,000	116,000
10,400		MK-1	197,000	116,000
10,500		MK-1	197,000	116,000
11,000		MK-1	206,000	125,000
11,400		MK-1	206,000	125,000
11,500		MK-1	206,000	125,000
11,750		MK-1	206,000	125,000

d1		S	l1	l2
mm	inch		mm	mm
12,000		MK-1	215,000	134,000
12,500		MK-1	215,000	134,000
13,000		MK-1	215,000	134,000
13,500		MK-1	223,000	142,000
14,000		MK-1	223,000	142,000
14,250		MK-2	245,000	147,000
14,500		MK-2	245,000	147,000
14,750		MK-2	245,000	147,000
15,000		MK-2	245,000	147,000
15,250		MK-2	251,000	153,000
15,870	5/8	MK-2	251,000	153,000
17,000		MK-2	257,000	159,000
17,500		MK-2	263,000	165,000
18,000		MK-2	263,000	165,000
21,000		MK-2	282,000	184,000
22,000		MK-2	289,000	191,000

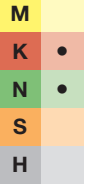


## Silindirik saplı uzun matkap uçları

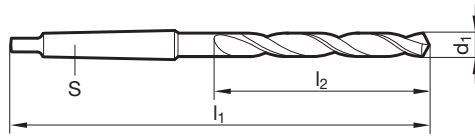
Malzeme **HSS**

Yüzey

Kesme yönü

**P** • öz bileme  $\geq \varnothing 5,500$  • koni bileme • geniş kanallı • zor talaş atılmasında**N** • 1000 N/mm<sup>2</sup>'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.**GÜHRING**NAVIGATOR

Kesme verileri sayfası 786

Ürün no **551**

d1		S	l1	l2	d1		S	l1	l2
mm	inch		mm	mm	mm	inch		mm	mm
5,500		MK-1	161,000	80,000	13,100	33/64	MK-1	215,000	134,000
5,550		MK-1	161,000	80,000	13,490	17/32	MK-1	223,000	142,000
6,350	1/4	MK-1	167,000	86,000	13,500		MK-1	223,000	142,000
6,500		MK-1	167,000	86,000	13,800		MK-1	223,000	142,000
6,750	17/64	MK-1	174,000	93,000	13,890	35/64	MK-1	223,000	142,000
6,800		MK-1	174,000	93,000	14,000		MK-1	223,000	142,000
7,000		MK-1	174,000	93,000	14,200		MK-2	245,000	147,000
7,500		MK-1	174,000	93,000	14,250		MK-2	245,000	147,000
7,940	5/16	MK-1	181,000	100,000	14,290	9/16	MK-2	245,000	147,000
8,000		MK-1	181,000	100,000	14,500		MK-2	245,000	147,000
8,100		MK-1	181,000	100,000	14,750		MK-2	245,000	147,000
8,200		MK-1	181,000	100,000	15,000		MK-2	245,000	147,000
8,300		MK-1	181,000	100,000	15,250		MK-2	251,000	153,000
8,330	21/64	MK-1	181,000	100,000	15,480	39/64	MK-2	251,000	153,000
8,500		MK-1	181,000	100,000	15,750		MK-2	251,000	153,000
8,600		MK-1	188,000	107,000	16,000		MK-2	251,000	153,000
8,700		MK-1	188,000	107,000	16,500		MK-2	257,000	159,000
8,750		MK-1	188,000	107,000	16,670	21/32	MK-2	257,000	159,000
9,000		MK-1	188,000	107,000	17,000		MK-2	257,000	159,000
9,500		MK-1	188,000	107,000	17,460	11/16	MK-2	263,000	165,000
9,520	3/8	MK-1	197,000	116,000	17,500		MK-2	263,000	165,000
9,800		MK-1	197,000	116,000	18,000		MK-2	263,000	165,000
9,900		MK-1	197,000	116,000	18,260	23/32	MK-2	269,000	171,000
9,920	25/64	MK-1	197,000	116,000	19,000		MK-2	269,000	171,000
10,000		MK-1	197,000	116,000	19,500		MK-2	275,000	177,000
10,200		MK-1	197,000	116,000	19,840	25/32	MK-2	275,000	177,000
10,250		MK-1	197,000	116,000	20,000		MK-2	275,000	177,000
10,320	13/32	MK-1	197,000	116,000	21,000		MK-2	282,000	184,000
10,500		MK-1	197,000	116,000	22,000		MK-2	289,000	191,000
10,750		MK-1	206,000	125,000	23,000		MK-2	296,000	198,000
11,000		MK-1	206,000	125,000	23,020	29/32	MK-2	296,000	198,000
11,110	7/16	MK-1	206,000	125,000	23,500		MK-3	319,000	198,000
11,500		MK-1	206,000	125,000	24,000		MK-3	327,000	206,000
11,510	29/64	MK-1	206,000	125,000	25,000	63/64	MK-3	327,000	206,000
11,750		MK-1	206,000	125,000	26,000		MK-3	335,000	214,000
11,800		MK-1	206,000	125,000	26,590	1 3/64	MK-3	343,000	222,000
12,000		MK-1	215,000	134,000	28,570	1 1/8	MK-3	351,000	230,000
12,300	31/64	MK-1	215,000	134,000	28,900		MK-3	351,000	230,000
12,500		MK-1	215,000	134,000	28,970	1 9/64	MK-3	351,000	230,000
12,700	1/2	MK-1	215,000	134,000	29,000		MK-3	351,000	230,000
12,800		MK-1	215,000	134,000	30,000		MK-3	351,000	230,000
13,000		MK-1	215,000	134,000	30,500		MK-3	360,000	239,000

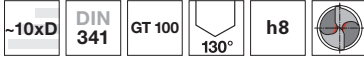


d1		S	l1	l2
mm	inch		mm	mm
30,560	1 13/64	MK-3	360,000	239,000
30,960	1 7/32	MK-3	360,000	239,000
31,000		MK-3	360,000	239,000
31,500		MK-3	360,000	239,000
32,000		MK-4	397,000	248,000

d1		S	l1	l2
mm	inch		mm	mm



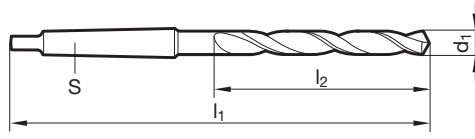
## Silindirik saplı uzun matkap uçları



P	•	öz bileme $\geq \varnothing 5,600$ • koni bileme • geniş kanallı • zor talaş atılmasında
M		
K	•	
N	•	1000 N/mm <sup>2</sup> 'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.
S		
H		

## GÜHRING NAVIGATOR

Kesme verileri sayfası 786

Malzeme **HSS**Yüzey **S**Kesme yönü **R**Ürün no **656**

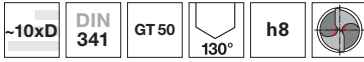
d1		S	l1	l2
mm	inch		mm	mm
7,000		MK-1	174,000	93,000
9,000		MK-1	188,000	107,000
9,500		MK-1	188,000	107,000
9,920	25/64	MK-1	197,000	116,000
10,000		MK-1	197,000	116,000
10,200		MK-1	197,000	116,000
10,320	13/32	MK-1	197,000	116,000
10,500		MK-1	197,000	116,000
11,000		MK-1	206,000	125,000
11,110	7/16	MK-1	206,000	125,000
11,500		MK-1	206,000	125,000
12,000		MK-1	215,000	134,000
12,500		MK-1	215,000	134,000
13,000		MK-1	215,000	134,000
13,800		MK-1	223,000	142,000
14,000		MK-1	223,000	142,000
14,500		MK-2	245,000	147,000
15,000		MK-2	245,000	147,000

d1		S	l1	l2
mm	inch		mm	mm
16,000		MK-2	251,000	153,000
16,670	21/32	MK-2	257,000	159,000
17,460	11/16	MK-2	263,000	165,000
17,500		MK-2	263,000	165,000
18,000		MK-2	263,000	165,000
19,050	3/4	MK-2	275,000	177,000
20,500		MK-2	282,000	184,000
20,640	13/16	MK-2	282,000	184,000
21,500		MK-2	289,000	191,000
23,000		MK-2	296,000	198,000





## Silindirik saplı uzun matkap uçları



**P** öz bileme  $\geq \varnothing 4,200$  • koni bileme • Özellikle geniş talaş kanalı

**M**

**K**

**N** • yumuşak uzun talaşlı malzemeler  $1200 \text{ N/mm}^2$ 'ye kadar • otomat çelikleri (yumuşak) • Alüminyum/Al-alaşımları (uzun talaşlı) • çinko, saflaştırılmış bakır, silümin, elektrotlar • zamak, argalyum, yumuşal plastikler, ahşap

**S**

**H**

Malzeme **HSS**

Yüzey

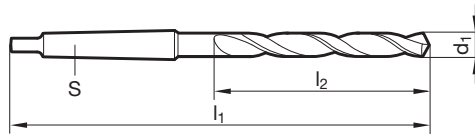


Kesme yönü



## GÜHRING NAVIGATOR

Kesme verileri sayfası 786



Ürün no **505**

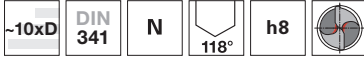
Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2
mm	inch		mm	mm
5,500		MK-1	161,000	80,000
5,600		MK-1	161,000	80,000
5,800		MK-1	161,000	80,000
6,000		MK-1	161,000	80,000
6,100		MK-1	167,000	86,000
6,300		MK-1	167,000	86,000
6,500		MK-1	167,000	86,000
6,700		MK-1	167,000	86,000
6,800		MK-1	174,000	93,000
7,000		MK-1	174,000	93,000
7,200		MK-1	174,000	93,000
7,300		MK-1	174,000	93,000
7,500		MK-1	174,000	93,000
7,700		MK-1	181,000	100,000
7,950		MK-1	181,000	100,000
8,000		MK-1	181,000	100,000
8,200		MK-1	181,000	100,000
8,300		MK-1	181,000	100,000
8,400		MK-1	181,000	100,000
8,500		MK-1	181,000	100,000
8,600		MK-1	188,000	107,000
9,050		MK-1	188,000	107,000
9,300		MK-1	188,000	107,000
9,500		MK-1	188,000	107,000
9,600		MK-1	197,000	116,000
9,700		MK-1	197,000	116,000
9,800		MK-1	197,000	116,000
10,000		MK-1	197,000	116,000
10,200		MK-1	197,000	116,000
10,250		MK-1	197,000	116,000

d1		S	l1	l2
mm	inch		mm	mm
10,700		MK-1	206,000	125,000
10,750		MK-1	206,000	125,000
10,800		MK-1	206,000	125,000
11,200		MK-1	206,000	125,000
11,500		MK-1	206,000	125,000
11,800		MK-1	206,000	125,000
12,000		MK-1	215,000	134,000
12,200		MK-1	215,000	134,000
12,500		MK-1	215,000	134,000
12,700	1/2	MK-1	215,000	134,000
12,800		MK-1	215,000	134,000
13,250		MK-1	223,000	142,000
13,750		MK-1	223,000	142,000
13,800		MK-1	223,000	142,000
14,200		MK-2	245,000	147,000
14,250		MK-2	245,000	147,000
14,300		MK-2	245,000	147,000
14,500		MK-2	245,000	147,000
15,000		MK-2	245,000	147,000
16,000		MK-2	251,000	153,000
16,500		MK-2	257,000	159,000
16,800		MK-2	257,000	159,000
18,500		MK-2	269,000	171,000
19,250		MK-2	275,000	177,000
21,000		MK-2	282,000	184,000
23,500		MK-3	319,000	198,000
24,000		MK-3	327,000	206,000
29,000		MK-3	351,000	230,000
29,500		MK-3	351,000	230,000



## Silindirik saplı uzun matkap uçları



<b>P</b>	•	öz bileme $\geq \varnothing 4,750$ • koni bileme • Co-alaşımlı HSS-çeliği • artırılmış aşınma direnci • burç kullanarak delme için
<b>M</b>	○	
<b>K</b>	•	
<b>N</b>	•	alaşım/alaşısız çelikler ve pik döküm çeşitleri 800 N/mm <sup>2</sup> 'ye kadar
<b>S</b>	○	• sıcak ve soğuk işlem çelikleri • rulman çeliği • yüksek alaşım çelikleri • ıslah çelikleri ve sementasyon çelikleri
<b>H</b>		

## GÜHRING NAVIGATOR

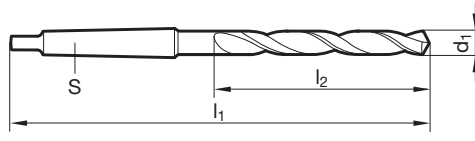
Kesme verileri sayfası 792

Malzeme HSC0

Yüzey



Kesme yönü



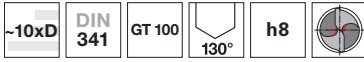
Ürün no 357

d1		S	l1	l2
mm	inch		mm	mm
4,750		MK-1	150,000	69,000
5,000		MK-1	155,000	74,000
5,400		MK-1	161,000	80,000
6,000		MK-1	161,000	80,000
6,750	17/64	MK-1	174,000	93,000
6,800		MK-1	174,000	93,000
7,000		MK-1	174,000	93,000
8,000		MK-1	181,000	100,000
8,200		MK-1	181,000	100,000
8,500		MK-1	181,000	100,000
8,800		MK-1	188,000	107,000
9,000		MK-1	188,000	107,000
9,500		MK-1	188,000	107,000
9,800		MK-1	197,000	116,000
10,000		MK-1	197,000	116,000
10,200		MK-1	197,000	116,000
10,250		MK-1	197,000	116,000
10,500		MK-1	197,000	116,000
11,000		MK-1	206,000	125,000
11,500		MK-1	206,000	125,000
12,000		MK-1	215,000	134,000
12,250		MK-1	215,000	134,000
12,500		MK-1	215,000	134,000
13,000		MK-1	215,000	134,000

d1		S	l1	l2
mm	inch		mm	mm
13,500		MK-1	223,000	142,000
14,000		MK-1	223,000	142,000
14,500		MK-2	245,000	147,000
14,750		MK-2	245,000	147,000
15,000		MK-2	245,000	147,000
15,500		MK-2	251,000	153,000
16,000		MK-2	251,000	153,000
16,750		MK-2	257,000	159,000
17,000		MK-2	257,000	159,000
17,500		MK-2	263,000	165,000
18,000		MK-2	263,000	165,000
20,000		MK-2	275,000	177,000
21,000		MK-2	282,000	184,000
22,000		MK-2	289,000	191,000
23,000		MK-2	296,000	198,000
24,000		MK-3	327,000	206,000
25,000	63/64	MK-3	327,000	206,000
26,000		MK-3	335,000	214,000
26,500		MK-3	335,000	214,000
27,000		MK-3	343,000	222,000
28,000		MK-3	343,000	222,000
30,000		MK-3	351,000	230,000
33,000		MK-4	397,000	248,000
40,000		MK-4	426,000	277,000



## Silindirik saplı uzun matkap uçları



**P** • öz bileme  $\geq \varnothing 10,000$  • koni bileme • Co-alaşimli HSS-çeliği • geniş kanallı • artırılmış aşınma direnci • zor talaş atılmasında

**M** •

**K** •

**N** • alaşım/alaşımzsız. çelikler ve pik döküm çeşitleri  $800 \text{ N/mm}^2$ 'ye kadar  
**S** • sıcak ve soğuk işlem çelikleri • rulman çeliği • yüksek alaşım çelikleri  
 • ıslah çelikleri ve sementasyon çelikleri

**H** ○

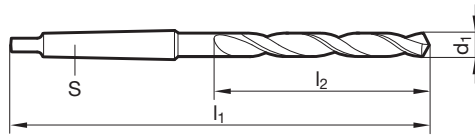
Malzeme **HSCO**

Yüzey  $\geq \frac{\varnothing}{16,0}$

Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 792



Ürün no **623**

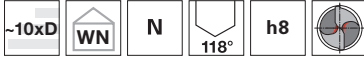
Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2
mm	inch		mm	mm
10,000		MK-1	197,000	116,000
10,200		MK-1	197,000	116,000
10,320	13/32	MK-1	197,000	116,000
10,500		MK-1	197,000	116,000
10,800		MK-1	206,000	125,000
11,000		MK-1	206,000	125,000
11,200		MK-1	206,000	125,000
11,500		MK-1	206,000	125,000
11,510	29/64	MK-1	206,000	125,000
11,800		MK-1	206,000	125,000
12,000		MK-1	215,000	134,000
12,200		MK-1	215,000	134,000
12,400		MK-1	215,000	134,000
12,500		MK-1	215,000	134,000
13,000		MK-1	215,000	134,000
13,490	17/32	MK-1	223,000	142,000
13,500		MK-1	223,000	142,000
13,890	35/64	MK-1	223,000	142,000
14,000		MK-1	223,000	142,000
14,200		MK-2	245,000	147,000
14,290	9/16	MK-2	245,000	147,000
14,500		MK-2	245,000	147,000
14,680	37/64	MK-2	245,000	147,000
15,000		MK-2	245,000	147,000

d1		S	l1	l2
mm	inch		mm	mm
15,500		MK-2	251,000	153,000
16,000		MK-2	251,000	153,000
16,500		MK-2	257,000	159,000
17,000		MK-2	257,000	159,000
17,460	11/16	MK-2	263,000	165,000
17,500		MK-2	263,000	165,000
18,000		MK-2	263,000	165,000
18,500		MK-2	269,000	171,000
19,000		MK-2	269,000	171,000
19,500		MK-2	275,000	177,000
20,000		MK-2	275,000	177,000
20,500		MK-2	282,000	184,000
21,000		MK-2	282,000	184,000
22,000		MK-2	289,000	191,000
22,500		MK-2	296,000	198,000
24,000		MK-3	327,000	206,000
25,000	63/64	MK-3	327,000	206,000
26,000		MK-3	335,000	214,000



## Silindirik saplı uzun matkap uçları



**P** • öz bileme  $\geq \text{Ø } 16,500$  • koni bileme • daha büyük mors konikli • burç kullanarak delme için

**M**

**K** •

**N** ○ alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

**S**

**H**

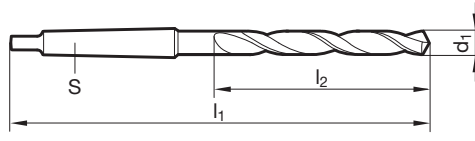
## GÜHRING NAVIGATOR

Kesme verileri sayfası 786

Malzeme **HSS**

Yüzey

Kesme yönü



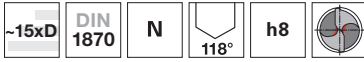
Ürün no **523**

d1		S	l1	l2
mm	inch		mm	mm
10,000		MK-2	214,000	116,000
11,000		MK-2	223,000	125,000
12,300	31/64	MK-2	232,000	134,000
12,500		MK-2	232,000	134,000
14,000		MK-2	240,000	142,000
21,000		MK-3	305,000	184,000

d1		S	l1	l2
mm	inch		mm	mm
23,000		MK-3	319,000	198,000
29,000		MK-4	379,000	230,000



## Helisel matkap uçları çok uzun, seri 1



**P** • öz bileme  $\geq \varnothing 7,800$  • koni bileme • çok derin delikler için

**M**

**K** •

**N** ○

**S**

**H**

alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

Malzeme **HSS**

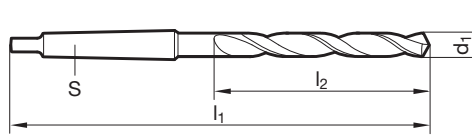
Yüzey



Kesme yönü

**GÜHRING**NAVIGATOR

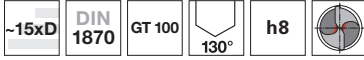
Kesme verileri sayfası 788

Ürün no **266**Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2	d1		S	l1	l2
mm	inch		mm	mm	mm	inch		mm	mm
8,000		MK-1	265,000	165,000	20,500		MK-2	385,000	260,000
8,500		MK-1	265,000	165,000	20,640	13/16	MK-2	385,000	260,000
9,000		MK-1	275,000	175,000	21,000		MK-2	385,000	260,000
9,500		MK-1	275,000	175,000	21,430	27/32	MK-2	405,000	270,000
10,000		MK-1	285,000	185,000	21,500		MK-2	405,000	270,000
10,200		MK-1	285,000	185,000	22,000		MK-2	405,000	270,000
10,250		MK-1	285,000	185,000	22,500		MK-2	405,000	270,000
10,500		MK-1	285,000	185,000	23,000		MK-2	405,000	270,000
11,000		MK-1	300,000	195,000	23,020	29/32	MK-2	405,000	270,000
11,400		MK-1	300,000	195,000	23,500		MK-3	425,000	270,000
11,500		MK-1	300,000	195,000	24,000		MK-3	440,000	290,000
11,750		MK-1	300,000	195,000	24,500		MK-3	440,000	290,000
11,800		MK-1	300,000	195,000	25,000	63/64	MK-3	440,000	290,000
12,000		MK-1	310,000	205,000	26,000		MK-3	440,000	290,000
12,200		MK-1	310,000	205,000	26,500		MK-3	440,000	290,000
12,500		MK-1	310,000	205,000	27,000		MK-3	460,000	305,000
12,700	1/2	MK-1	310,000	205,000	28,000		MK-3	460,000	305,000
13,000		MK-1	310,000	205,000	30,000		MK-3	460,000	305,000
13,500		MK-1	325,000	220,000	30,500		MK-3	480,000	320,000
13,750		MK-1	325,000	220,000	31,000		MK-3	480,000	320,000
14,000		MK-1	325,000	220,000	32,000		MK-4	505,000	320,000
14,290	9/16	MK-2	340,000	220,000	33,000		MK-4	505,000	320,000
14,500		MK-2	340,000	220,000	34,000		MK-4	530,000	340,000
15,000		MK-2	340,000	220,000	35,000		MK-4	530,000	340,000
15,250		MK-2	355,000	230,000	36,000		MK-4	530,000	340,000
15,500		MK-2	355,000	230,000	38,000		MK-4	555,000	360,000
15,750		MK-2	355,000	230,000	39,000		MK-4	555,000	360,000
15,800		MK-2	355,000	230,000	40,000		MK-4	555,000	360,000
16,000		MK-2	355,000	230,000	42,000		MK-4	555,000	360,000
16,250		MK-2	355,000	230,000	45,000		MK-4	585,000	385,000
16,500		MK-2	355,000	230,000	45,240	1 25/32	MK-4	585,000	385,000
16,670	21/32	MK-2	355,000	230,000	48,000		MK-4	605,000	405,000
17,000		MK-2	355,000	230,000	50,000		MK-4	605,000	405,000
17,500		MK-2	370,000	245,000					
17,750		MK-2	370,000	245,000					
18,000		MK-2	370,000	245,000					
18,500		MK-2	370,000	245,000					
18,650	47/64	MK-2	370,000	245,000					
19,000		MK-2	370,000	245,000					
19,500		MK-2	385,000	260,000					
19,750		MK-2	385,000	260,000					
20,000		MK-2	385,000	260,000					



## Helisel matkap uçları çok uzun, seri 1

Malzeme **HSS**

Yüzey

Kesme yönü

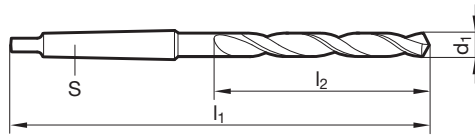
**P** • öz bileme  $\geq \varnothing 5,800$  • koni bileme • geniş kanallı • çok derin delikler için  
• zor talaş atılmasında

**M****K** •

**N** •  $1000 \text{ N/mm}^2$ 'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.

**S****H****GÜHRING**NAVIGATOR

Kesme verileri sayfası 790

Ürün no **526**

d1		S	l1	l2
mm	inch		mm	mm
8,000		MK-1	265,000	165,000
8,500		MK-1	265,000	165,000
8,600		MK-1	275,000	175,000
8,700		MK-1	275,000	175,000
9,000		MK-1	275,000	175,000
9,500		MK-1	275,000	175,000
9,520	3/8	MK-1	285,000	185,000
9,800		MK-1	285,000	185,000
10,000		MK-1	285,000	185,000
10,200		MK-1	285,000	185,000
10,500		MK-1	285,000	185,000
10,720	27/64	MK-1	300,000	195,000
11,000		MK-1	300,000	195,000
11,110	7/16	MK-1	300,000	195,000
11,500		MK-1	300,000	195,000
11,510	29/64	MK-1	300,000	195,000
11,750		MK-1	300,000	195,000
12,000		MK-1	310,000	205,000
12,500		MK-1	310,000	205,000
12,700	1/2	MK-1	310,000	205,000
12,800		MK-1	310,000	205,000
13,000		MK-1	310,000	205,000
13,490	17/32	MK-1	325,000	220,000
13,500		MK-1	325,000	220,000
14,000		MK-1	325,000	220,000
14,200		MK-2	340,000	220,000
14,290	9/16	MK-2	340,000	220,000
14,500		MK-2	340,000	220,000
15,000		MK-2	340,000	220,000
15,500		MK-2	355,000	230,000

d1		S	l1	l2
mm	inch		mm	mm
15,870	5/8	MK-2	355,000	230,000
16,000		MK-2	355,000	230,000
16,500		MK-2	355,000	230,000
17,000		MK-2	355,000	230,000
17,460	11/16	MK-2	370,000	245,000
17,500		MK-2	370,000	245,000
18,000		MK-2	370,000	245,000
18,500		MK-2	370,000	245,000
19,000		MK-2	370,000	245,000
19,500		MK-2	385,000	260,000
20,000		MK-2	385,000	260,000
20,500		MK-2	385,000	260,000
21,000		MK-2	385,000	260,000
21,500		MK-2	405,000	270,000
22,000		MK-2	405,000	270,000
23,000		MK-2	405,000	270,000
24,000		MK-3	440,000	290,000
25,000	63/64	MK-3	440,000	290,000
26,000		MK-3	440,000	290,000
26,500		MK-3	440,000	290,000
28,000		MK-3	460,000	305,000
28,500		MK-3	460,000	305,000
29,000		MK-3	460,000	305,000
30,000		MK-3	460,000	305,000



## Helisel matkap uçları çok uzun, seri 1

Malzeme **HSS**

Yüzey

Kesme yönü

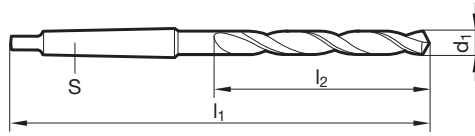
**P** öz bileme  $\geq \varnothing 7,900$  • koni bileme • çok derin delikler için • yumuşak uzun çapaklı malzemeler

**M****K****N** •**S****H**

yumuşak uzun talaşlı malzemeler  $1200 \text{ N/mm}^2$ 'ye kadar • otomat çelikleri (yumuşak) • Alüminyum/Al-alaşımları (uzun talaşlı) • çinko, saflaştırılmış bakır, silümin, elektrotlar • zamak, argalyum, yumuşal plastikler, ahşap

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 788

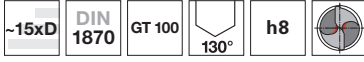
Ürün no **525**Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2
mm	inch		mm	mm
8,500		MK-1	265,000	165,000
8,700		MK-1	275,000	175,000
9,000		MK-1	275,000	175,000
9,500		MK-1	275,000	175,000
10,000		MK-1	285,000	185,000
10,500		MK-1	285,000	185,000
11,000		MK-1	300,000	195,000
12,000		MK-1	310,000	205,000
12,500		MK-1	310,000	205,000
13,000		MK-1	310,000	205,000
13,500		MK-1	325,000	220,000
14,000		MK-1	325,000	220,000
15,000		MK-2	340,000	220,000
15,500		MK-2	355,000	230,000
16,000		MK-2	355,000	230,000
18,000		MK-2	370,000	245,000
19,500		MK-2	385,000	260,000
21,000		MK-2	385,000	260,000

d1		S	l1	l2
mm	inch		mm	mm
23,000		MK-2	405,000	270,000
24,000		MK-3	440,000	290,000
24,300		MK-3	440,000	290,000
24,380		MK-3	440,000	290,000
24,500		MK-3	440,000	290,000
25,500		MK-3	440,000	290,000
26,500		MK-3	440,000	290,000
27,500		MK-3	460,000	305,000
28,000		MK-3	460,000	305,000
29,000		MK-3	460,000	305,000
31,000		MK-3	480,000	320,000
33,000		MK-4	505,000	320,000



## Helisel matkap uçları çok uzun, seri 1

Malzeme **HSCO**

Yüzey

Kesme yönü

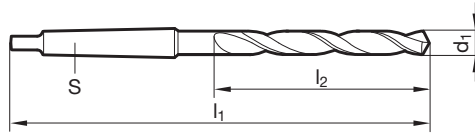
**P** • öz bileme  $\geq \varnothing 9,520$  • koni bileme • Co-alaşımlı HSS-çeliği • geniş kanallı  
• arttırılmış aşınma direnci • çok derin delikler için • zor talaş atılmasında

**M** •**K** •

**N** • çelik ve çelik dökümler • pik döküm, temper döküm ve küresel döküm

**S** •**H** ○**GÜHRING** NAVIGATOR

Kesme verileri sayfası 794

Ürün no **620**

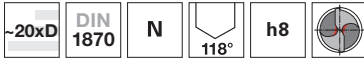
d1		S	l1	l2
mm	inch		mm	mm
9,520	3/8	MK-1	285,000	185,000
10,000		MK-1	285,000	185,000
10,200		MK-1	285,000	185,000
10,320	13/32	MK-1	285,000	185,000
10,500		MK-1	285,000	185,000
11,000		MK-1	300,000	195,000
11,110	7/16	MK-1	300,000	195,000
11,500		MK-1	300,000	195,000
11,510	29/64	MK-1	300,000	195,000
12,000		MK-1	310,000	205,000
12,300	31/64	MK-1	310,000	205,000
12,500		MK-1	310,000	205,000
12,700	1/2	MK-1	310,000	205,000
13,000		MK-1	310,000	205,000
13,500		MK-1	325,000	220,000
14,000		MK-1	325,000	220,000
14,290	9/16	MK-2	340,000	220,000
14,500		MK-2	340,000	220,000
15,000		MK-2	340,000	220,000
15,080	19/32	MK-2	355,000	230,000
15,500		MK-2	355,000	230,000
16,000		MK-2	355,000	230,000
16,500		MK-2	355,000	230,000
17,000		MK-2	355,000	230,000

d1		S	l1	l2
mm	inch		mm	mm
17,500		MK-2	370,000	245,000
18,000		MK-2	370,000	245,000
18,500		MK-2	370,000	245,000
19,000		MK-2	370,000	245,000
20,000		MK-2	385,000	260,000
21,000		MK-2	385,000	260,000
21,830		MK-2	405,000	270,000
22,000		MK-2	405,000	270,000
22,620		MK-2	405,000	270,000
23,000		MK-2	405,000	270,000
25,500		MK-3	440,000	290,000
26,000		MK-3	440,000	290,000
27,180		MK-3	460,000	305,000
29,370	1 5/32	MK-3	460,000	305,000
30,000		MK-3	460,000	305,000





## Ekstra uzun helisel matkaplar, seri 2



**P** • öz bileme  $\geq \varnothing 7,700$  • koni bileme • çok derin delikler için

**M**

**K** •

**N** ○

**S**

**H**

alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

Malzeme **HSS**

Yüzey

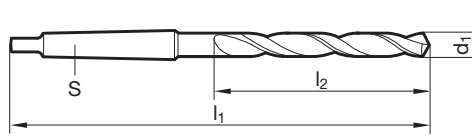


Kesme yönü



## GÜHRING NAVIGATOR

Kesme verileri sayfası 788



Ürün no **267**

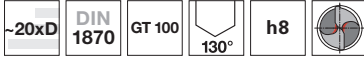
Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2
mm	inch		mm	mm
8,000		MK-1	330,000	210,000
8,500		MK-1	330,000	210,000
9,000		MK-1	345,000	220,000
10,000		MK-1	360,000	235,000
10,200		MK-1	360,000	235,000
10,500		MK-1	360,000	235,000
11,000		MK-1	375,000	250,000
11,500		MK-1	375,000	250,000
11,750		MK-1	375,000	250,000
11,800		MK-1	375,000	250,000
12,000		MK-1	395,000	260,000
13,000		MK-1	395,000	260,000
13,490	17/32	MK-1	410,000	275,000
13,500		MK-1	410,000	275,000
14,000		MK-1	410,000	275,000
14,500		MK-2	425,000	275,000
15,000		MK-2	425,000	275,000
15,480	39/64	MK-2	445,000	295,000
15,500		MK-2	445,000	295,000
16,000		MK-2	445,000	295,000
16,500		MK-2	445,000	295,000
17,000		MK-2	445,000	295,000
17,070	43/64	MK-2	465,000	310,000
17,500		MK-2	465,000	310,000
18,000		MK-2	465,000	310,000
18,500		MK-2	465,000	310,000
19,000		MK-2	465,000	310,000
19,050	3/4	MK-2	490,000	325,000
19,500		MK-2	490,000	325,000
20,000		MK-2	490,000	325,000

d1		S	l1	l2
mm	inch		mm	mm
20,640	13/16	MK-2	490,000	325,000
21,000		MK-2	490,000	325,000
21,430	27/32	MK-2	515,000	345,000
21,500		MK-2	515,000	345,000
21,830	55/64	MK-2	515,000	345,000
22,000		MK-2	515,000	345,000
22,800		MK-2	515,000	345,000
23,000		MK-2	515,000	345,000
23,020	29/32	MK-2	515,000	345,000
23,750		MK-3	555,000	365,000
23,810	15/16	MK-3	555,000	365,000
24,000		MK-3	555,000	365,000
24,500		MK-3	555,000	365,000
25,000	63/64	MK-3	555,000	365,000
26,000		MK-3	555,000	365,000
28,000		MK-3	580,000	385,000
29,500		MK-3	580,000	385,000
30,000		MK-3	580,000	385,000
31,000		MK-3	610,000	410,000
32,000		MK-4	635,000	410,000
34,000		MK-4	665,000	430,000
40,000		MK-4	695,000	460,000
45,000		MK-4	735,000	490,000



## Ekstra uzun helisel matkaplar, seri 2

Malzeme **HSS**

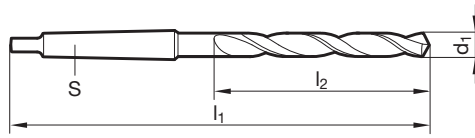
Yüzey

Kesme yönü

**P** • öz bileme  $\geq \varnothing 7,800$  • koni bileme • geniş kanallı • zor talaş atılmasında  
• çok derin delikler için

**M****K****N** • 1000 N/mm<sup>2</sup>'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler,  
VA-çelikleri vb.**S****H****GÜHRING**NAVIGATOR

Kesme verileri sayfası 790

Ürün no **527**

d1		S	l1	l2
mm	inch		mm	mm
8,000		MK-1	330,000	210,000
8,400		MK-1	330,000	210,000
8,500		MK-1	330,000	210,000
9,000		MK-1	345,000	220,000
9,500		MK-1	345,000	220,000
10,000		MK-1	360,000	235,000
10,500		MK-1	360,000	235,000
11,000		MK-1	375,000	250,000
11,110	7/16	MK-1	375,000	250,000
11,500		MK-1	375,000	250,000
11,510	29/64	MK-1	375,000	250,000
11,800		MK-1	375,000	250,000
11,910	15/32	MK-1	395,000	260,000
12,000		MK-1	395,000	260,000
12,500		MK-1	395,000	260,000
12,700	1/2	MK-1	395,000	260,000
13,000		MK-1	395,000	260,000
13,500		MK-1	410,000	275,000
13,700		MK-1	410,000	275,000
13,800		MK-1	410,000	275,000
13,890	35/64	MK-1	410,000	275,000
14,000		MK-1	410,000	275,000
14,290	9/16	MK-2	425,000	275,000
14,500		MK-2	425,000	275,000
15,000		MK-2	425,000	275,000
15,500		MK-2	445,000	295,000
16,000		MK-2	445,000	295,000
16,500		MK-2	445,000	295,000
17,000		MK-2	445,000	295,000
17,070	43/64	MK-2	465,000	310,000

d1		S	l1	l2
mm	inch		mm	mm
17,500		MK-2	465,000	310,000
17,800		MK-2	465,000	310,000
18,000		MK-2	465,000	310,000
18,500		MK-2	465,000	310,000
19,000		MK-2	465,000	310,000
19,450	49/64	MK-2	490,000	325,000
19,500		MK-2	490,000	325,000
20,000		MK-2	490,000	325,000
20,500		MK-2	490,000	325,000
21,000		MK-2	490,000	325,000
21,030	53/64	MK-2	490,000	325,000
21,430	27/32	MK-2	515,000	345,000
22,000		MK-2	515,000	345,000
23,000		MK-2	515,000	345,000
23,020	29/32	MK-2	515,000	345,000
23,810	15/16	MK-3	555,000	365,000
24,000		MK-3	555,000	365,000
24,210	61/64	MK-3	555,000	365,000
25,000	63/64	MK-3	555,000	365,000
26,000		MK-3	555,000	365,000
26,190	1 1/32	MK-3	555,000	365,000
26,500		MK-3	555,000	365,000
27,000		MK-3	580,000	385,000
28,000		MK-3	580,000	385,000
28,750		MK-3	580,000	385,000
29,000		MK-3	580,000	385,000
29,500		MK-3	580,000	385,000
30,000		MK-3	580,000	385,000



## Ekstra uzun helisel matkaplar, seri 2

Malzeme **HSS**

Yüzey

Kesme yönü

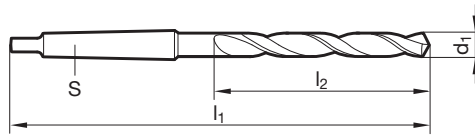
**P** öz bileme  $\geq \text{Ø} 8,000$  • koni bileme • çok derin delikler için

**M** **K** **N** **S** **H**

yumuşak uzun talaşlı malzemeler  $1200 \text{ N/mm}^2$ 'ye kadar • otomat çelikleri (yumuşak) • Alüminyum/Al-alaşımları (uzun talaşlı) • çinko, saflaştırılmış bakır, silümin, elektrotlar • zamak, argalyum, yumuşal plastikler, ahşap

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 788

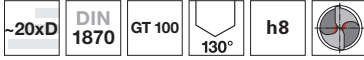
Ürün no **542**Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2
mm	inch		mm	mm
8,500		MK-1	330,000	210,000
8,600		MK-1	345,000	220,000
8,800		MK-1	345,000	220,000
9,000		MK-1	345,000	220,000
9,500		MK-1	345,000	220,000
10,500		MK-1	360,000	235,000
10,700		MK-1	375,000	250,000
11,000		MK-1	375,000	250,000
11,500		MK-1	375,000	250,000
12,000		MK-1	395,000	260,000
12,500		MK-1	395,000	260,000
13,000		MK-1	395,000	260,000
13,500		MK-1	410,000	275,000
14,500		MK-2	425,000	275,000
15,000		MK-2	425,000	275,000
17,000		MK-2	445,000	295,000
17,500		MK-2	465,000	310,000
20,500		MK-2	490,000	325,000

d1		S	l1	l2
mm	inch		mm	mm
21,000		MK-2	490,000	325,000
21,500		MK-2	515,000	345,000
22,000		MK-2	515,000	345,000
23,000		MK-2	515,000	345,000
24,000		MK-3	555,000	365,000
24,500		MK-3	555,000	365,000
25,500		MK-3	555,000	365,000
26,000		MK-3	555,000	365,000
26,500		MK-3	555,000	365,000
27,500		MK-3	580,000	385,000
28,000		MK-3	580,000	385,000
29,000		MK-3	580,000	385,000
29,500		MK-3	580,000	385,000
30,000		MK-3	580,000	385,000
31,000		MK-3	610,000	410,000



## Ekstra uzun helisel matkaplar, seri 2

Malzeme **HSCO**

Yüzey

Kesme yönü

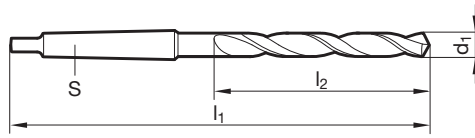
**P** • öz bileme  $\geq \varnothing 9,520$  • koni bileme • Co-alaşımlı HSS-çeliği • geniş kanallı  
• yüksek aşınma direnci • zor talaş atılmasında • çok derin delikler için

**M** •**K** •

**N** • çelik ve çelik dökümler • pik döküm, temper döküm ve küresel döküm

**S** •**H** ○**GÜHRING** NAVIGATOR

Kesme verileri sayfası 794

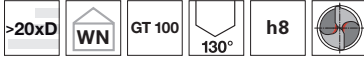
Ürün no **621**

d1		S	l1	l2
mm	inch		mm	mm
9,520	3/8	MK-1	360,000	235,000
10,000		MK-1	360,000	235,000
10,500		MK-1	360,000	235,000
10,720	27/64	MK-1	375,000	250,000
11,000		MK-1	375,000	250,000
11,500		MK-1	375,000	250,000
11,510	29/64	MK-1	375,000	250,000
12,000		MK-1	395,000	260,000
12,500		MK-1	395,000	260,000
12,700	1/2	MK-1	395,000	260,000
13,000		MK-1	395,000	260,000
13,500		MK-1	410,000	275,000

d1		S	l1	l2
mm	inch		mm	mm
14,000		MK-1	410,000	275,000
14,500		MK-2	425,000	275,000
15,000		MK-2	425,000	275,000
16,000		MK-2	445,000	295,000
16,270		MK-2	445,000	295,000
18,000		MK-2	465,000	310,000
18,500		MK-2	465,000	310,000
19,000		MK-2	465,000	310,000
20,000		MK-2	490,000	325,000
21,430	27/32	MK-2	515,000	345,000
23,420	59/64	MK-3	535,000	345,000



## Helisel matkap uçları, çok uzun



- P** • öz bileme  $\geq \text{Ø} 6,000$  • koni bileme • geniş kanallı • zor talaş atılmasında  
• çok derin delikler için



- N** •  $1000 \text{ N/mm}^2$ 'ye kadar pıkk döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.

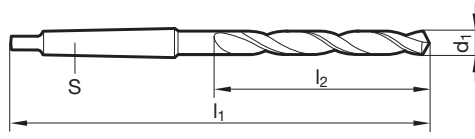
Malzeme **HSS**

Yüzey

Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 790

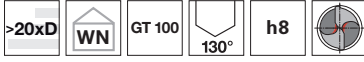
Ürün no **563**Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2
mm	inch		mm	mm
6,000		MK-1	200,000	120,000
6,500		MK-1	200,000	120,000
7,000		MK-1	200,000	120,000
7,500		MK-1	200,000	120,000

d1		S	l1	l2
mm	inch		mm	mm



## Helisel matkap uçları, çok uzun



**P** • öz bileme  $\geq \text{Ø} 6,000$  • koni bileme • geniş kanallı • zor talaş atılmasında  
• çok derin delikler için

**M**

**K** •

**N** •  $1000 \text{ N/mm}^2$ 'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler,  
VA-çelikleri vb.

**S**

**H**

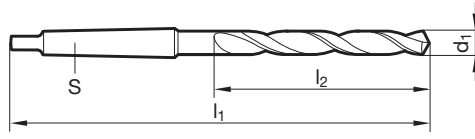
## GÜHRING NAVIGATOR

Kesme verileri sayfası 790

Malzeme **HSS**

Yüzey

Kesme yönü



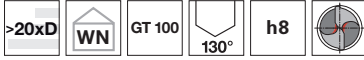
Ürün no **564**

d1	S	l1	l2
mm	inch	mm	mm
6,000	MK-1	300,000	220,000
6,500	MK-1	300,000	220,000
7,000	MK-1	300,000	220,000
8,000	MK-1	350,000	270,000
8,500	MK-1	350,000	270,000
9,000	MK-1	350,000	270,000

d1	S	l1	l2
mm	inch	mm	mm
10,000	MK-1	350,000	270,000



## Helisel matkap uçları, çok uzun



- P** • öz bileme  $\geq \text{Ø} 6,000$  • koni bileme • geniş kanallı • zor talaş atılmasında  
• çok derin delikler için

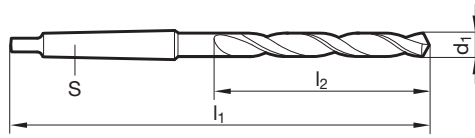


- N** •  $1000 \text{ N/mm}^2$ 'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.

## GÜHRING NAVIGATOR

Kesme verileri sayfası 790

Malzeme	<b>HSS</b>
Yüzey	$\text{Ra} > 0,16,0$
Kesme yönü	<b>R</b>



Ürün no 565

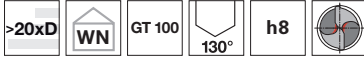
Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2
mm	inch		mm	mm
6,000		MK-1	425,000	345,000
6,500		MK-1	425,000	345,000
7,000		MK-1	425,000	345,000
7,500		MK-1	425,000	345,000
8,000		MK-1	425,000	345,000
8,500		MK-1	425,000	345,000
9,000		MK-1	425,000	345,000
10,000		MK-1	425,000	345,000
11,000		MK-1	425,000	345,000
12,000		MK-1	425,000	345,000
13,000		MK-1	425,000	345,000
14,000		MK-1	425,000	345,000

d1		S	l1	l2
mm	inch		mm	mm
15,000		MK-2	425,000	325,000
16,000		MK-2	425,000	325,000
17,000		MK-2	425,000	325,000



## Helisel matkap uçları, çok uzun



**P** • öz bileme  $\geq \varnothing 8,000$  • koni bileme • geniş kanallı • zor talaş atılmasında  
• çok derin delikler için

**M**

**K** •

**N** • 1000 N/mm<sup>2</sup>'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler,  
VA-çelikleri vb.

**S**

**H**

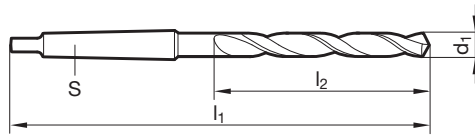
## GÜHRING NAVIGATOR

Kesme verileri sayfası 790

Malzeme **HSS**

Yüzey  $\geq \frac{0}{16,0}$

Kesme yönü



Ürün no **566**

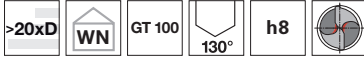
d1		S	l1	l2
mm	inch		mm	mm
8,000		MK-1	500,000	420,000
8,500		MK-1	500,000	420,000
9,000		MK-1	500,000	420,000
9,500		MK-1	500,000	420,000
10,000		MK-1	500,000	420,000
11,000		MK-1	500,000	420,000
12,000		MK-1	500,000	420,000
13,000		MK-1	500,000	420,000
14,000		MK-1	500,000	420,000
15,000		MK-2	500,000	400,000
16,000		MK-2	500,000	400,000
17,000		MK-2	500,000	400,000

d1		S	l1	l2
mm	inch		mm	mm
18,000		MK-2	500,000	400,000
19,000		MK-2	500,000	400,000
20,000		MK-2	500,000	400,000
21,000		MK-2	500,000	400,000
22,000		MK-2	500,000	400,000
35,000		MK-4	500,000	350,000
40,000		MK-4	500,000	350,000





## Helisel matkap uçları, çok uzun

Malzeme **HSS**Yüzey  $\geq \frac{0}{16,0}$ 

Kesme yönü

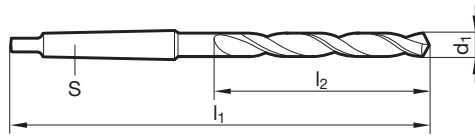
**P** • öz bileme  $\geq \text{Ø } 14,000$  • koni bileme • geniş kanallı • zor talaş atılmasında  
• çok derin delikler için

**M****K** •

**N** •  $1000 \text{ N/mm}^2$ 'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler,  
VA-çelikleri vb.

**S****H****GÜHRING**NAVIGATOR

Kesme verileri sayfası 790

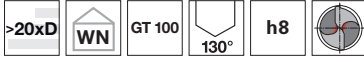
Ürün no **293**Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2
mm	inch		mm	mm
14,000		MK-1	600,000	500,000
15,000		MK-2	600,000	500,000
16,000		MK-2	600,000	500,000
17,000		MK-2	600,000	500,000
18,000		MK-2	600,000	500,000
19,000		MK-2	600,000	500,000
20,000		MK-2	600,000	500,000
21,000		MK-2	600,000	500,000
22,000		MK-2	600,000	500,000
23,000		MK-2	600,000	500,000
24,000		MK-3	600,000	475,000
25,000	63/64	MK-3	600,000	475,000

d1		S	l1	l2
mm	inch		mm	mm
26,000		MK-3	600,000	475,000
28,000		MK-3	600,000	475,000
30,000		MK-3	600,000	475,000
32,000		MK-4	600,000	450,000
35,000		MK-4	600,000	450,000
38,000		MK-4	600,000	450,000
40,000		MK-4	600,000	450,000



## Helisel matkap uçları, çok uzun



Malzeme **HSS**

Yüzey

Kesme yönü

**P** • öz bileme  $\geq \text{Ø } 14,000$  • koni bileme • geniş kanallı • zor talaş atılmasında  
• çok derin delikler için

**M**

**K** •

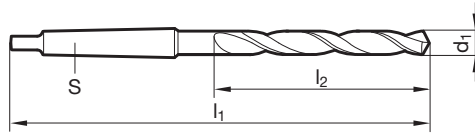
**N** •  $1000 \text{ N/mm}^2$ 'ye kadar pıkköküm ve çelikler • İstisnalar: CrNi-çelikler,  
VA-çelikleri vb.

**S**

**H**

## GÜHRING NAVIGATOR

Kesme verileri sayfası 790



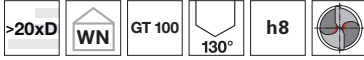
Ürün no **298**

d1		S	l1	l2
mm	inch		mm	mm
14,000		MK-1	750,000	650,000
15,000		MK-2	750,000	650,000
16,000		MK-2	750,000	650,000
18,000		MK-2	750,000	650,000

d1		S	l1	l2
mm	inch		mm	mm



## Helisel matkap uçları, çok uzun

Malzeme **HSS**

Yüzey

Kesme yönü

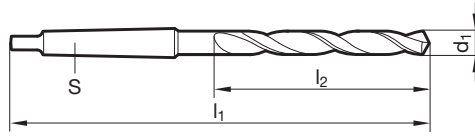
**P** • öz bileme  $\geq \text{Ø } 14,000$  • koni bileme • geniş kanallı • zor talaş atılmasında  
• çok derin delikler için

**M****K** •

**N** •  $1000 \text{ N/mm}^2$ 'ye kadar pıkköküm ve çelikler • İstisnalar: CrNi-çelikler,  
VA-çelikleri vb.

**S****H****GÜHRING**NAVIGATOR

Kesme verileri sayfası 790

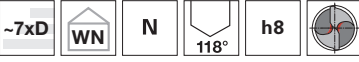
Ürün no **299**Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2
mm	inch		mm	mm
14,000		MK-1	1000,000	850,000
15,000		MK-2	1000,000	850,000
16,000		MK-2	1000,000	850,000
18,000		MK-2	1000,000	850,000

d1		S	l1	l2
mm	inch		mm	mm



## Soğutma kanallı matkap ucu, kısa



<b>P</b>	•	öz bileme $\geq \varnothing 9,520$ • koni bileme • burç kullanarak delme için
<b>M</b>	○	
<b>K</b>	•	
<b>N</b>	•	lamine metal sac • çelik ve çelik döküm, yumuşak döküm • 800 N/mm <sup>2</sup> 'ye kadar ostenitli çelikler
<b>S</b>	•	
<b>H</b>	•	

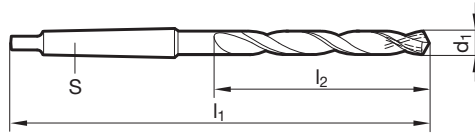
## GÜHRING NAVIGATOR

Kesme verileri sayfası 788

Malzeme **HSS**

Yüzey

Kesme yönü

Ürün no **269**

d1		S	l1	l2
mm	inch		mm	mm
9,920	25/64	MK-1	197,000	101,000
10,320	13/32	MK-1	197,000	101,000
10,500		MK-1	197,000	101,000
11,000		MK-1	206,000	110,000
11,110	7/16	MK-1	206,000	110,000
11,500		MK-1	206,000	110,000
12,500		MK-1	215,000	119,000
12,700	1/2	MK-1	215,000	119,000
12,800		MK-1	215,000	119,000
13,000		MK-1	215,000	119,000
13,200		MK-1	215,000	119,000
13,490	17/32	MK-1	223,000	127,000
13,500		MK-1	223,000	127,000
13,800		MK-1	223,000	127,000
14,000		MK-1	223,000	127,000
14,250		MK-2	245,000	133,000
14,290	9/16	MK-2	245,000	133,000
14,500		MK-2	245,000	133,000
15,000		MK-2	245,000	133,000
15,080	19/32	MK-2	251,000	139,000
15,150		MK-2	251,000	139,000
15,180		MK-2	251,000	139,000
15,250		MK-2	251,000	139,000
15,870	5/8	MK-2	251,000	139,000
16,000		MK-2	251,000	139,000
16,500		MK-2	257,000	145,000
16,670	21/32	MK-2	257,000	145,000
16,750		MK-2	257,000	145,000
17,000		MK-2	257,000	145,000
17,100		MK-2	263,000	151,000

d1		S	l1	l2
mm	inch		mm	mm
17,460	11/16	MK-2	263,000	151,000
17,500		MK-2	263,000	151,000
17,750		MK-2	263,000	151,000
18,000		MK-2	263,000	151,000
18,260	23/32	MK-2	269,000	157,000
18,500		MK-2	269,000	157,000
19,000		MK-2	269,000	157,000
19,050	3/4	MK-2	275,000	163,000
19,200		MK-2	275,000	163,000
19,250		MK-2	275,000	163,000
19,500		MK-2	275,000	163,000
19,750		MK-2	275,000	163,000
19,840	25/32	MK-2	275,000	163,000
20,250		MK-2	282,000	170,000
20,640	13/16	MK-2	282,000	170,000
20,750		MK-2	282,000	170,000
21,000		MK-2	282,000	170,000
21,430	27/32	MK-2	289,000	177,000
21,500		MK-2	289,000	177,000
22,220	7/8	MK-2	289,000	177,000
23,020	29/32	MK-2	296,000	184,000



## Soğutma kanallı matkap uçları, Kanal boyu fabrika norm.a göre



**P** • öz bileme  $\geq \text{Ø } 8,000$  • koni bileme • Mors konik şafttan aksiyel ve radyal soğutma desteği (DIN 228'e benzer form BK) • cıvata ile gerekli olan soğutma deliğini açıp veya kapatmak mümkündür

**K** •  
**N** • konstrüksiyon çeliklerinin işlenmesi için optimize edilmiştir. • lamine metal sac • çelik ve çelik döküm, yumuşak döküm •  $800 \text{ N/mm}^2$ 'ye kadar ostenitli çelikler  
**S**  
**H**

Malzeme **HSS**

Yüzey



Kesme yönü

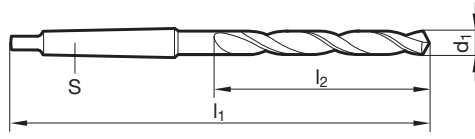


NEW



## GÜHRING NAVIGATOR

Kesme verileri sayfası 788



Ürün no 254

Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2
mm	inch		mm	mm
8,000		MK-2	268,000	116,000
9,000		MK-2	268,000	116,000
10,000		MK-3	268,000	116,000
10,500		MK-3	268,000	116,000
11,000		MK-3	278,000	125,000
12,000		MK-3	287,000	134,000
13,000		MK-3	287,000	134,000
13,500		MK-3	285,000	142,000
14,000		MK-3	285,000	142,000
15,000		MK-3	300,000	147,000
16,000		MK-3	306,000	153,000
17,000		MK-3	311,000	159,000
17,500		MK-3	318,000	165,000
18,000		MK-3	318,000	165,000
19,000		MK-3	324,000	171,000
20,000		MK-3	330,000	177,000
21,000		MK-3	343,000	184,000
22,000		MK-3	350,000	191,000
23,000		MK-3	357,000	198,000
24,000		MK-3	365,000	206,000
25,000	63/64	MK-3	365,000	206,000
26,000		MK-3	373,000	214,000
27,000		MK-4	407,000	222,000
28,000		MK-4	407,000	222,000

d1		S	l1	l2
mm	inch		mm	mm
29,000		MK-4	410,000	225,000
30,000		MK-4	410,000	225,000
31,000		MK-4	410,000	225,000
32,000		MK-4	410,000	225,000
33,000		MK-4	410,000	225,000
34,000		MK-4	410,000	225,000
35,000		MK-4	410,000	225,000
36,000		MK-4	410,000	225,000
37,000		MK-4	410,000	225,000
38,000		MK-4	410,000	225,000
39,000		MK-4	410,000	225,000
40,000		MK-4	410,000	225,000
41,000		MK-4	410,000	225,000
42,000		MK-4	410,000	225,000
43,000		MK-4	410,000	225,000
44,000		MK-4	410,000	225,000
45,000		MK-4	410,000	225,000
46,000		MK-4	410,000	225,000
47,000		MK-4	410,000	225,000
48,000		MK-4	410,000	225,000
49,000		MK-4	410,000	225,000
50,000		MK-4	410,000	225,000



## Soğutma kanallı matkap uçları, Kanal boyu fabrika norm.a göre



P	•	öz bileme $\geq \varnothing 8,000$ • koni bileme • special point geometry with 170° özel uç açısı geometrisi ve 90° punta • çok iyi kendini merkezleme
M	○	• Mors konik şafttan aksiyel ve radyal soğutma desteği (DIN 228'e benzer form BK) • cıvata ile gerekli olan soğuma deliğini açıp veya kapatmak mümkündür
K	•	
N	•	konstrüksiyon çeliklerinin işlenmesi için optimize edilmiştir. • çelik ve çelik döküm, yumuşak döküm • 800 N/mm <sup>2</sup> 'ye kadar ostenitli çelikler
S		
H		

Malzeme HSS

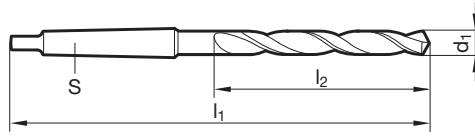
Yüzey

Kesme yönü



## GÜHRING NAVIGATOR

Kesme verileri sayfası 788



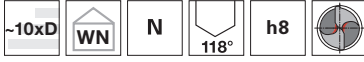
Ürün no 255

d1		S	l1	l2
mm	inch		mm	mm
8,000		MK-2	268,000	116,000
9,000		MK-2	268,000	116,000
10,000		MK-3	268,000	116,000
10,500		MK-3	268,000	116,000
11,000		MK-3	278,000	125,000
12,000		MK-3	287,000	134,000
13,000		MK-3	287,000	134,000
13,500		MK-3	285,000	142,000
14,000		MK-3	285,000	142,000
15,000		MK-3	300,000	147,000
16,000		MK-3	306,000	153,000
17,000		MK-3	311,000	159,000
17,500		MK-3	318,000	165,000
18,000		MK-3	318,000	165,000
19,000		MK-3	324,000	171,000
20,000		MK-3	330,000	177,000
21,000		MK-3	343,000	184,000
22,000		MK-3	350,000	191,000
23,000		MK-3	357,000	198,000
24,000		MK-3	365,000	206,000
25,000	63/64	MK-3	365,000	206,000
26,000		MK-3	373,000	214,000
27,000		MK-4	375,000	193,000
28,000		MK-4	375,000	193,000

d1		S	l1	l2
mm	inch		mm	mm
29,000		MK-4	375,000	193,000
30,000		MK-4	375,000	193,000
31,000		MK-4	375,000	193,000
32,000		MK-4	375,000	193,000
33,000		MK-4	375,000	193,000
34,000		MK-4	375,000	193,000
35,000		MK-4	375,000	193,000
36,000		MK-4	375,000	193,000
37,000		MK-4	375,000	193,000
38,000		MK-4	375,000	193,000
39,000		MK-4	375,000	193,000
40,000		MK-4	375,000	193,000
41,000		MK-4	375,000	193,000
42,000		MK-4	375,000	193,000



## Soğutma kanallı matkap uçları, Kanal boyu DIN 341



**P** • öz bileme  $\geq \text{Ø } 10,000$  • koni bileme • Burç vasıtasıyla delik delme.  
Soğutma desteği DIN 228 BK ya göre.

**M** ○

**K** •

**N** • lamine metal sac • çelik ve çelik döküm, yumuşak döküm • 800 N/  
mm<sup>2</sup>'ye kadar ostenitli çelikler

**S**

**H**

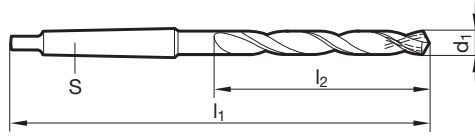
Malzeme **HSS**

Yüzey

Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 788



Ürün no **1101**

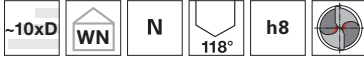
Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2
mm	inch		mm	mm
10,000		MK-2	223,000	116,000
10,500		MK-2	223,000	116,000
11,000		MK-2	232,000	125,000
11,500		MK-2	232,000	125,000
12,000		MK-2	241,000	134,000
12,500		MK-2	241,000	134,000
13,000		MK-2	241,000	134,000
13,500		MK-2	249,000	142,000
14,000		MK-2	249,000	142,000
14,750		MK-2	254,000	147,000
15,000		MK-2	254,000	147,000
16,000		MK-2	260,000	153,000
16,250		MK-2	266,000	159,000
17,000		MK-2	266,000	159,000
17,500		MK-2	272,000	165,000
18,000		MK-2	272,000	165,000
19,000		MK-2	278,000	171,000
20,000		MK-2	284,000	177,000

d1		S	l1	l2
mm	inch		mm	mm
21,000		MK-2	291,000	184,000
22,000		MK-2	298,000	191,000
24,000		MK-3	332,000	206,000
25,000	63/64	MK-3	332,000	206,000
26,000		MK-3	340,000	214,000
28,000		MK-3	348,000	222,000
29,000		MK-3	356,000	230,000
30,000		MK-3	356,000	230,000
32,000		MK-4	409,000	248,000



## Soğutma kanallı matkap uçları, Kanal boyu DIN 341



**P** • öz bileme  $\geq \varnothing 10,000$  • koni bileme • burç kullanarak delme için • mors konik kısımdan axial soğutma

**M** ○

**K** •

**N** • lamine metal sac • çelik ve çelik döküm, yumuşak döküm • 800 N/mm<sup>2</sup>'ye kadar ostenitli çelikler

**S**

**H**

Malzeme **HSS**

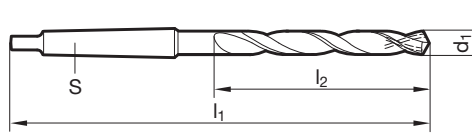
Yüzey



Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 788

Ürün no **270**

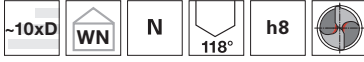
d1		S	l1	l2
mm	inch		mm	mm
10,000		MK-2	233,000	116,000
11,000		MK-2	242,000	125,000
12,000		MK-2	251,000	134,000
13,000		MK-2	251,000	134,000
13,200		MK-2	251,000	134,000
13,500		MK-2	259,000	142,000
14,000		MK-2	259,000	142,000
14,290	9/16	MK-2	264,000	147,000
15,000		MK-2	264,000	147,000
15,500		MK-2	270,000	153,000
16,000		MK-2	270,000	153,000
16,500		MK-2	276,000	159,000
17,000		MK-2	276,000	159,000
17,460	11/16	MK-2	282,000	165,000
17,500		MK-2	282,000	165,000
18,000		MK-2	282,000	165,000
18,500		MK-3	307,000	171,000
19,000		MK-3	307,000	171,000
19,500		MK-3	313,000	177,000
20,000		MK-3	313,000	177,000
20,500		MK-3	320,000	184,000
21,000		MK-3	320,000	184,000
22,000		MK-3	327,000	191,000
23,000		MK-3	334,000	198,000

d1		S	l1	l2
mm	inch		mm	mm
23,020	29/32	MK-3	334,000	198,000
24,000		MK-3	342,000	206,000
25,000	63/64	MK-3	342,000	206,000
26,000		MK-3	350,000	214,000
26,500		MK-3	350,000	214,000
27,000		MK-4	385,000	222,000
28,000		MK-4	385,000	222,000
29,000		MK-4	393,000	230,000
29,500		MK-4	393,000	230,000
30,000		MK-4	393,000	230,000
32,000		MK-4	421,000	248,000
33,000		MK-4	421,000	248,000
34,000		MK-4	430,000	257,000
35,000		MK-4	430,000	257,000
40,000		MK-4	450,000	277,000





## Soğutma kanallı matkap uçları, Kanal boyu DIN 341



**P** • öz bileme  $\geq \varnothing 10,000$  • koni bileme • burç kullanarak delme için

**M** ○

**K** •

**N** • lamine metal sac • çelik ve çelik döküm, yumuşak döküm • 800 N/mm<sup>2</sup>'ye kadar ostenitli çelikler

**S**

**H**

Malzeme **HSS**

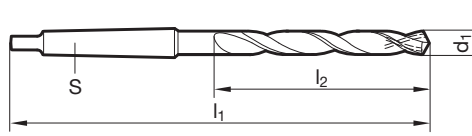
Yüzey



Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 788



Ürün no **271**

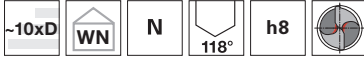
Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2
mm	inch		mm	mm
10,000		MK-2	233,000	116,000
10,500		MK-2	233,000	116,000
10,720	27/64	MK-2	242,000	125,000
11,000		MK-2	242,000	125,000
11,510	29/64	MK-2	242,000	125,000
11,910	15/32	MK-2	251,000	134,000
12,300	31/64	MK-2	251,000	134,000
13,000		MK-2	251,000	134,000
13,800		MK-2	259,000	142,000
14,000		MK-2	259,000	142,000
14,250		MK-2	264,000	147,000
14,290	9/16	MK-2	264,000	147,000
14,500		MK-2	264,000	147,000
15,000		MK-2	264,000	147,000
15,080	19/32	MK-2	270,000	153,000
15,500		MK-2	270,000	153,000
16,000		MK-2	270,000	153,000
16,500		MK-2	276,000	159,000
17,000		MK-2	276,000	159,000
17,250		MK-2	282,000	165,000
17,500		MK-2	282,000	165,000
18,250		MK-3	307,000	171,000
18,500		MK-3	307,000	171,000
19,050	3/4	MK-3	313,000	177,000

d1		S	l1	l2
mm	inch		mm	mm
19,500		MK-3	313,000	177,000
19,840	25/32	MK-3	313,000	177,000
20,000		MK-3	313,000	177,000
20,250		MK-3	320,000	184,000
22,500		MK-3	334,000	198,000
23,000		MK-3	334,000	198,000
23,750		MK-3	342,000	206,000
24,250		MK-3	342,000	206,000
24,610	31/32	MK-3	342,000	206,000
25,400	1	MK-3	350,000	214,000
26,000		MK-3	350,000	214,000
26,990	1 1/16	MK-4	385,000	222,000
27,780	1 3/32	MK-4	385,000	222,000
28,570	1 1/8	MK-4	393,000	230,000
28,750		MK-4	393,000	230,000
29,000		MK-4	393,000	230,000
29,500		MK-4	393,000	230,000
30,000		MK-4	393,000	230,000
30,500		MK-4	402,000	239,000
34,000		MK-4	430,000	257,000
44,450		MK-4	471,000	298,000



## Soğutma kanallı matkap uçları, Kanal boyu DIN 341



**P** • öz bileme  $\geq \varnothing 10,000$  • koni bileme • burç kullanarak delme için • mors konikte radyal soğutma desteği

**M** ○

**K** •

**N** • lamine metal sac • çelik ve çelik döküm, yumuşak döküm • 800 N/mm<sup>2</sup>'ye kadar ostenitli çelikler

**S**

**H**

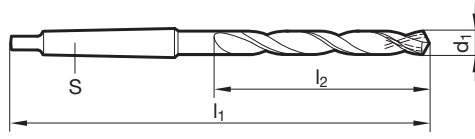
Malzeme **HSS**

Yüzey

Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 788

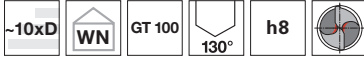
Ürün no **272**

d1		S	l1	l2
mm	inch		mm	mm
10,000		MK-2	233,000	116,000
12,500		MK-2	251,000	134,000
13,200		MK-2	251,000	134,000
13,500		MK-2	259,000	142,000
14,750		MK-2	264,000	147,000
15,500		MK-2	270,000	153,000
15,870	5/8	MK-2	270,000	153,000
16,500		MK-2	276,000	159,000
16,670	21/32	MK-2	276,000	159,000
17,000		MK-2	276,000	159,000
18,000		MK-2	282,000	165,000
18,500		MK-3	307,000	171,000

d1		S	l1	l2
mm	inch		mm	mm
20,000		MK-3	313,000	177,000
22,000		MK-3	327,000	191,000
22,500		MK-3	334,000	198,000
24,000		MK-3	342,000	206,000
26,000		MK-3	350,000	214,000
26,990	1 1/16	MK-4	385,000	222,000
29,500		MK-4	393,000	230,000
32,000		MK-4	421,000	248,000
44,450	1 3/4	MK-4	471,000	298,000



## Soğutma kanallı matkap uçları, Kanal boyu DIN 341



<b>P</b>	•	öz bileme $\geq \text{Ø } 11,000$ • koni bileme • mors konik kısımdan axial soğutma
<b>M</b>	•	• Co-alaşımli HSS-çeliği • arttırılmış aşınma direnci • burç kullanarak delme için
<b>K</b>	•	
<b>N</b>	•	mukavemetli ve yüksek mukavemetli çelikleri • çelik döküm, pik döküm
<b>S</b>	•	• pas/asit/ısıya dayanıklı çelikler • 1300 N/mm <sup>2</sup> ye kadar çekme mukavemeti
<b>H</b>	○	

## GÜHRING NAVIGATOR

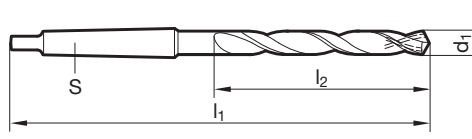
Kesme verileri sayfası 794

Malzeme **HSCO**

Yüzey



Kesme yönü

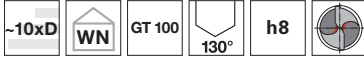
Ürün no **370**Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2
mm	inch		mm	mm
11,000		MK-2	242,000	125,000
12,000		MK-2	251,000	134,000
12,500		MK-2	251,000	134,000
13,000		MK-2	251,000	134,000
13,500		MK-2	259,000	142,000
14,000		MK-2	259,000	142,000
15,000		MK-2	264,000	147,000
15,080	19/32	MK-2	270,000	153,000
16,000		MK-2	270,000	153,000
17,000		MK-2	276,000	159,000
17,500		MK-2	282,000	165,000
18,000		MK-2	282,000	165,000
18,500		MK-3	307,000	171,000
19,000		MK-3	307,000	171,000
20,000		MK-3	313,000	177,000
21,000		MK-3	320,000	184,000
21,500		MK-3	327,000	191,000
22,000		MK-3	327,000	191,000

d1		S	l1	l2
mm	inch		mm	mm
24,000		MK-3	342,000	206,000
24,610	31/32	MK-3	342,000	206,000
29,370	1 5/32	MK-4	393,000	230,000
29,500		MK-4	393,000	230,000
30,000		MK-4	393,000	230,000
30,960	1 7/32	MK-4	402,000	239,000
31,000		MK-4	402,000	239,000
32,000		MK-4	421,000	248,000
32,250		MK-4	421,000	248,000
32,500		MK-4	421,000	248,000
32,540	1 9/32	MK-4	421,000	248,000
33,000		MK-4	421,000	248,000
34,130	1 11/32	MK-4	430,000	257,000
34,920	1 3/8	MK-4	430,000	257,000



## Soğutma kanallı matkap uçları, Kanal boyu DIN 341



<b>P</b>	•	öz bileme $\geq \varnothing 11,000$ • koni bileme
<b>M</b>	•	• Co-alaşım HSS-çeliği • yüksek aşınma direnci
<b>K</b>	•	• burç kullanarak delme için
<b>N</b>	•	mukavemetli ve yüksek mukavemetli çelikleri • çelik döküm, pik döküm
<b>S</b>	•	• pas/asit/ısıya dayanıklı çelikler • 1300 N/mm <sup>2</sup> ye kadar çekme mukavemeti
<b>H</b>	○	

## GÜHRING NAVIGATOR

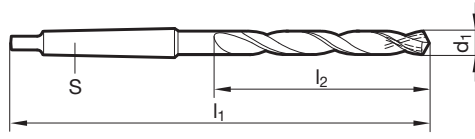
Kesme verileri sayfası 794

Malzeme **HSCO**

Yüzey



Kesme yönü

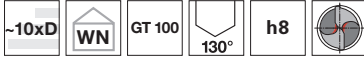
Ürün no **371**

d1		S	l1	l2
mm	inch		mm	mm
11,000		MK-2	242,000	125,000
11,110	7/16	MK-2	242,000	125,000
11,500		MK-2	242,000	125,000
12,300	31/64	MK-2	251,000	134,000
12,500		MK-2	251,000	134,000
12,800		MK-2	251,000	134,000
13,000		MK-2	251,000	134,000
13,490	17/32	MK-2	259,000	142,000
13,500		MK-2	259,000	142,000
14,000		MK-2	259,000	142,000
14,290	9/16	MK-2	264,000	147,000
14,500		MK-2	264,000	147,000
15,000		MK-2	264,000	147,000
16,000		MK-2	270,000	153,000
16,500		MK-2	276,000	159,000
16,670	21/32	MK-2	276,000	159,000
17,000		MK-2	276,000	159,000
17,460	11/16	MK-2	282,000	165,000
18,260	23/32	MK-3	307,000	171,000
19,500		MK-3	313,000	177,000
19,840	25/32	MK-3	313,000	177,000
20,500		MK-3	320,000	184,000
20,640	13/16	MK-3	320,000	184,000
21,000		MK-3	320,000	184,000

d1		S	l1	l2
mm	inch		mm	mm
21,500		MK-3	327,000	191,000
22,220	7/8	MK-3	327,000	191,000
22,500		MK-3	334,000	198,000
23,020	29/32	MK-3	334,000	198,000
23,810	15/16	MK-3	342,000	206,000
28,570	1 1/8	MK-4	393,000	230,000
29,000		MK-4	393,000	230,000
30,000		MK-4	393,000	230,000
30,960	1 7/32	MK-4	402,000	239,000
31,750	1 1/4	MK-4	411,000	248,000
32,000		MK-4	421,000	248,000
32,540	1 9/32	MK-4	421,000	248,000
33,340	1 5/16	MK-4	421,000	248,000
34,000		MK-4	430,000	257,000
34,920	1 3/8	MK-4	430,000	257,000



## Soğutma kanallı matkap uçları, Kanal boyu DIN 341



<b>P</b>	•	öz bileme $\geq \text{Ø } 11,500$ • koni bileme • mors konikte radyal soğutma desteği • Co-alaşımlı HSS-çeliği • yüksek aşınma direnci • burç kullanarak delme için
<b>M</b>	•	
<b>K</b>	•	
<b>N</b>	•	mukavemetli ve yüksek mukavemetli çelikleri • çelik döküm, pik döküm
<b>S</b>	•	pas/asit/ısıya dayanıklı çelikler • 1300 N/mm <sup>2</sup> ye kadar çekme mukavemeti
<b>H</b>	○	

## GÜHRING NAVIGATOR

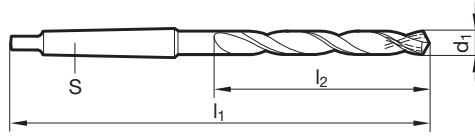
Kesme verileri sayfası 794

Malzeme **HSCO**

Yüzey



Kesme yönü



Ürün no

372

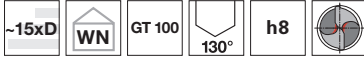
Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2
mm	inch		mm	mm
12,500		MK-2	251,000	134,000
12,700	1/2	MK-2	251,000	134,000
14,000		MK-2	259,000	142,000
16,000		MK-2	270,000	153,000
17,000		MK-2	276,000	159,000
18,500		MK-3	307,000	171,000

d1		S	l1	l2
mm	inch		mm	mm
21,500		MK-3	327,000	191,000
23,810	15/16	MK-3	342,000	206,000
27,000		MK-4	385,000	222,000
30,000		MK-4	393,000	230,000
34,000		MK-4	430,000	257,000



## Soğutma kanallı matkap uçları, Kanal boyu DIN 1870



Malzeme HSC0

Yüzey

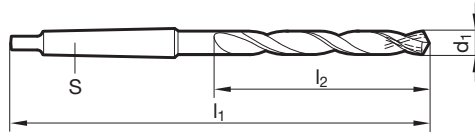
Kesme yönü



P	•	öz bileme $\geq \text{Ø } 11,000$ • koni bileme • mors konik kısımdan axial soğutma
M	•	• Co-alaşımli HSS-çeliği • arttırılmış aşınma direnci • burç kullanarak delme için
K	•	
N	•	mukavemetli ve yüksek mukavemetli çelikleri • çelik döküm, pik döküm
S	•	• pas/asit/ısıya dayanıklı çelikler • 1300 N/mm <sup>2</sup> ye kadar çekme mukavemeti
H	○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 794



Ürün no

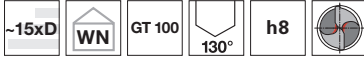
374

d1		S	l1	l2
mm	inch		mm	mm
11,000		MK-2	312,000	195,000
12,000		MK-2	322,000	205,000
12,300	31/64	MK-2	322,000	205,000
12,500		MK-2	322,000	205,000
13,000		MK-2	322,000	205,000
14,000		MK-2	337,000	220,000
15,000		MK-2	337,000	220,000
16,000		MK-2	347,000	230,000
16,500		MK-2	347,000	230,000
17,500		MK-2	362,000	245,000
18,000		MK-2	362,000	245,000
18,500		MK-3	381,000	245,000
19,840	25/32	MK-3	396,000	260,000
20,000		MK-3	396,000	260,000
21,000		MK-3	396,000	260,000
21,430	27/32	MK-3	406,000	270,000
21,500		MK-3	406,000	270,000
24,610	31/32	MK-3	426,000	290,000

d1		S	l1	l2
mm	inch		mm	mm
28,570	1 1/8	MK-4	468,000	305,000
28,750		MK-4	468,000	305,000
29,370	1 5/32	MK-4	468,000	305,000
30,960	1 7/32	MK-4	483,000	320,000
32,250		MK-4	493,000	320,000
32,540	1 9/32	MK-4	493,000	320,000
34,000		MK-4	513,000	340,000



## Soğutma kanallı matkap uçları, Kanal boyu DIN 1870



<b>P</b>	•	öz bileme $\geq \varnothing 11,000$ • koni bileme
<b>M</b>	•	• Co-alaşimli HSS-çeliği • yüksek aşınma direnci
<b>K</b>	•	• burç kullanarak delme için
<b>N</b>	•	mukavemetli ve yüksek mukavemetli çelikleri • çelik döküm, pik döküm
<b>S</b>	•	• pas/asit/ısıya dayanıklı çelikler • 1300 N/mm <sup>2</sup> ye kadar çekme mukavemeti
<b>H</b>	○	

## GÜHRING NAVIGATOR

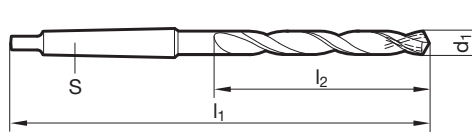
Kesme verileri sayfası 794

Malzeme **HSCO**

Yüzey



Kesme yönü



Ürün no

375

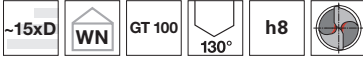
Mors Konik Şaftlı  
Matkap Ucu

d1		S	l1	l2
mm	inch		mm	mm
11,000		MK-2	312,000	195,000
11,110	7/16	MK-2	312,000	195,000
11,510	29/64	MK-2	312,000	195,000
12,800		MK-2	322,000	205,000
13,500		MK-2	337,000	220,000
18,260	23/32	MK-3	381,000	245,000
19,000		MK-3	381,000	245,000
21,000		MK-3	396,000	260,000
21,430	27/32	MK-3	406,000	270,000
24,500		MK-3	426,000	290,000
25,000	63/64	MK-3	426,000	290,000
25,400	1	MK-3	426,000	290,000

d1		S	l1	l2
mm	inch		mm	mm
26,500		MK-3	426,000	290,000
28,570	1 1/8	MK-4	468,000	305,000
30,960	1 7/32	MK-4	483,000	320,000
32,540	1 9/32	MK-4	493,000	320,000
33,340	1 5/16	MK-4	493,000	320,000
34,000		MK-4	513,000	340,000



## Soğutma kanallı matkap uçları, Kanal boyu DIN 1870



<b>P</b>	•	öz bileme $\geq \text{Ø } 11,000$ • koni bileme • mors konikte radyal soğutma desteği • Co-alaşımlı HSS-çeliği • yüksek aşınma direnci • burç kullanarak delme için
<b>M</b>	•	
<b>K</b>	•	
<b>N</b>	•	mukavemetli ve yüksek mukavemetli çelikleri • çelik döküm, pik döküm
<b>S</b>	•	• pas/asit/ısıya dayanıklı çelikler • 1300 N/mm <sup>2</sup> ye kadar çekme mulavemeti
<b>H</b>	○	

## GÜHRING NAVIGATOR

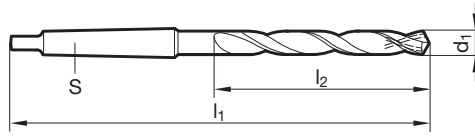
Kesme verileri sayfası 794

Malzeme HSCO

Yüzey



Kesme yönü



Ürün no

376

d1		S	l1	l2
mm	inch		mm	mm
11,000		MK-2	312,000	195,000
13,000		MK-2	322,000	205,000
14,000		MK-2	337,000	220,000
16,500		MK-2	347,000	230,000
18,000		MK-2	362,000	245,000
19,840	25/32	MK-3	396,000	260,000

d1		S	l1	l2
mm	inch		mm	mm
21,500		MK-3	406,000	270,000
27,780	1 3/32	MK-4	468,000	305,000
29,000		MK-4	468,000	305,000





## Pim deliği matkap ucu

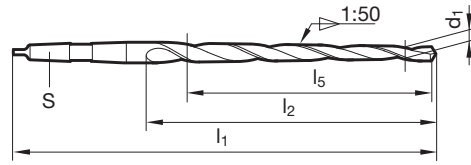
Malzeme **HSS**

Yüzey

Kesme yönü

**P** • öz bileme  $\geq \varnothing 5,000$  • koni bileme • For tapered holes to suit taper pins to DIN 1 (new: DIN EN 22 339), DIN 7978 (new: DIN EN 28 736), DIN 7977 (new: DIN EN 28737) and DIN 258

<b>P</b>	•
<b>M</b>	○
<b>K</b>	•
<b>N</b>	○
<b>S</b>	
<b>H</b>	

Ürün no **532**Mors Konik Şaftlı  
Matkap Ucu

d1	S	l1	l2	l5
mm		mm	mm	mm
5,000	MK-1	155,000	81,000	73,000
6,000	MK-1	187,000	108,000	105,000
8,000	MK-1	227,000	149,000	145,000
10,000	MK-1	257,000	180,000	175,000
12,000	MK-2	315,000	219,000	210,000
13,000	MK-2	325,000	229,000	220,000

d1	S	l1	l2	l5
mm		mm	mm	mm
14,000	MK-2	325,000	229,000	220,000
16,000	MK-2	335,000	239,000	230,000
20,000	MK-3	377,000	263,000	250,000
25,000	MK-3	427,000	311,000	300,000



## Sert metal takma uçlu özel matkap uçları

P öz bileme  $\geq \varnothing 8,000$  • yüzey Bileme • HM uçlu

yaprak yay çeliği • sert döküm 300 HB' nin üstünde • saf Molibden • sert bronzlar

Malzeme Sert metal

Yüzey

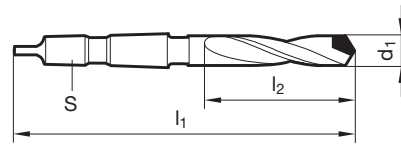


Kesme yönü



## GÜHRING NAVIGATOR

Kesme verileri sayfası 776



Ürün no 705

d1		S	l1	l2
mm	inch		mm	mm
8,000		MK-1	130,000	40,000
8,500		MK-1	135,000	45,000
10,000		MK-1	140,000	50,000
10,200		MK-1	140,000	50,000
10,500		MK-1	140,000	50,000
11,000		MK-1	140,000	50,000
11,500		MK-1	146,000	56,000
12,000		MK-1	146,000	56,000
13,000		MK-1	146,000	56,000
13,500		MK-2	168,000	63,000
14,000		MK-2	168,000	63,000
14,500		MK-2	168,000	63,000
15,000		MK-2	168,000	63,000
15,500		MK-2	175,000	70,000
16,000		MK-2	175,000	70,000
16,500		MK-2	175,000	70,000
17,000		MK-2	175,000	70,000
17,500		MK-2	185,000	80,000
18,000		MK-2	185,000	80,000
19,000		MK-2	185,000	80,000
19,500		MK-3	215,000	90,000
20,000		MK-3	215,000	90,000
21,000		MK-3	215,000	90,000
21,500		MK-3	215,000	90,000

d1		S	l1	l2
mm	inch		mm	mm
22,000		MK-3	215,000	90,000
23,000		MK-3	225,000	100,000
24,000		MK-3	225,000	100,000
24,500		MK-3	225,000	100,000
25,000	63/64	MK-3	225,000	100,000
26,000		MK-4	260,000	110,000
26,500		MK-4	260,000	110,000
27,000		MK-4	260,000	110,000
28,000		MK-4	260,000	110,000
30,000		MK-4	275,000	125,000
32,000		MK-4	275,000	125,000
33,000		MK-4	290,000	140,000
38,000		MK-4	310,000	160,000
40,000		MK-4	310,000	160,000

# HSK-A mors konik tutucular

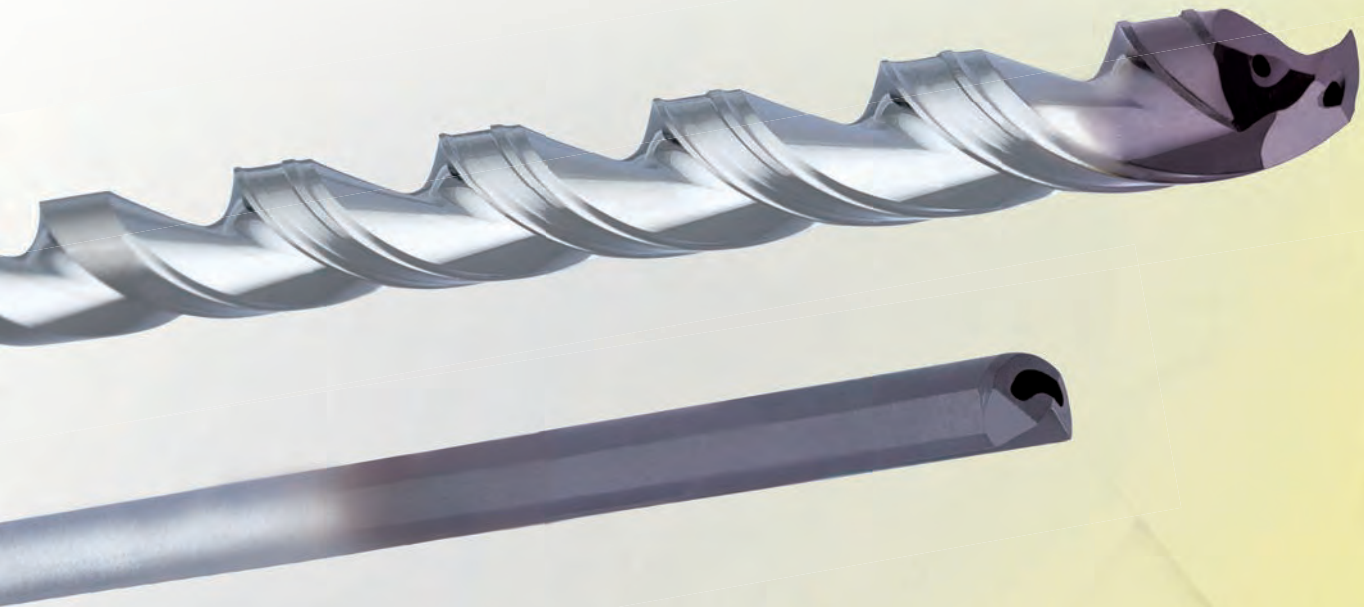
Mors konik sapları tutabilmek için



Daha fazla bilgi GM300 kataloglarında bulunabilir.



# DERIN DELIK MATKAP UCU





KARBÜR HELİSEL  
DERİN DELİK MATKAPLARI



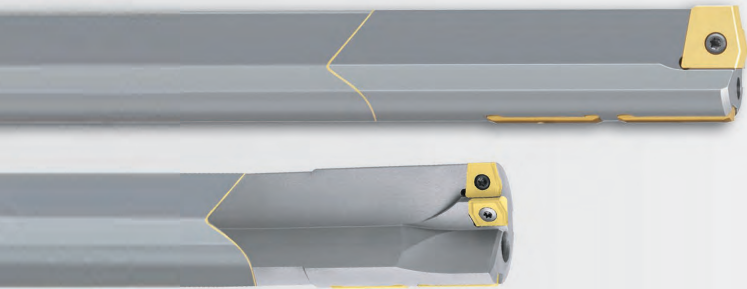
TEK AĞIZLI KARBÜR  
DERİN DELİK MATKAPLARI  
EB 100



İKİ AĞIZLI KAYNAKLI  
DERİN DELİK MATKAPLARI  
EB 80



İKİ AĞIZLI KAYNAKLI  
DERİN DELİK MATKAPLARI  
ZB 80



MODÜLER TEK AĞIZLI  
DERİN DELİK MATKAPLARI  
EB 800



HSS/HSCO HELİSEL  
DERİN DELİK MATKAPLARI



- en yüksek kesme ve ilerleme hızları için helisel karbür derin delik matkapları
- 15xD den itibaren delme derinlikleri
- nominal çap 3.00 – 14.00 mm
- optimum takım stabilizasyonu ve soğutma
- uzun takım ömrü ve azaltılmış işleme zamanları
- bir çok malzeme için uygundur

sayfadan itibaren 523

- ekstra dar toleranslar için tek ağızlı derin delik matkapları
- 0.9 mm nominal çaptan itibaren üretilir
- 16.00 mm nominal çap
- 500.00 mm kanal boyu; maks. 100xD
- 80xD ye kadar tek takım ile
- bir çok malzeme için uygun

sayfadan itibaren 529

- karbür kaynaklı tek ağızlı derin delik matkapları
- 3000.00 mm ye kadar toplam uzunluk
- 2.00 den 40.00 mm ye kadar nominal çap
- geniş opsiyon, küre uçlu veya kademeli matkap gibi
- bir çok malzeme için uygun

sayfadan itibaren 540

- karbür kaynaklı 2 ağızlı derin delik matkapları
- 6.00 dan 30.00 mm ye kadar nominal çap
- GG25, GGG40, GGV işleme için mükemmel
- çok geniş soğutma kanalları
- optimize edilmiş ağız geometrisi

sayfadan itibaren 551

- tek ağızlı değiştirilebilir uçlu derin delik matkapları
- 12 den 52 mm ye kadar nominal çap
- temel gövde için 0,5mm değiştirilebilir
- her türlü karbür kalite ve kaplama kombinasyonu mümkün
- neredeyse tüm malzemeler için uygun

sayfadan itibaren 553

- HSS/HSCO helisel derin delik matkapları, stabil işleme şartları için
- 0.40 – 50.00 mm ye kadar çap aralığı
- 850 mm ye kadar kanal uzunluğu
- düz veya mors konik şaf olarak mevcut
- bir çok malzeme için uygun

sayfadan itibaren 580



P	M	K	N	S	H	takım görüntüsü	delik derinliği	Standart	Tip	Kesme yönü	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayfası	Sayfa
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## İçten soğutma kanallı rasyo matkap

•	•	•	•	•	•		15xD	WN	RT 100 T	R	VHM	A	3,000 - 14,000	6509	760	523
•	•	•	•	•	•		20xD	WN	RT 100 T	R	VHM	A	3,000 - 14,000	6511	760	524
•	•	•	•	•	•		25xD	WN	RT 100 T	R	VHM	A	3,000 - 12,000	6512	760	525
•	•	•	•	•	•		30xD	WN	RT 100 T	R	VHM	A	3,000 - 10,000	6513	760	526
•	•	•	•	•	•		40xD	WN	RT 100 T	R	VHM	A	3,000 - 8,000	6514	760	527

## Tek ağızlı derin delik matkap ucu EB100

•	•	•	•	•	•		25xD	WN	EB 100	R	VHM	a	2,380 - 12,000	5646	808	529
•	•	•	•	•	•		50xD	WN	EB 100	R	VHM	a	2,380 - 8,000	5647	808	530
•	•	•	•	•	•		75xD	WN	EB 100	R	VHM	a	2,380 - 6,000	5648	808	531
•	•	•	•	•	•		45,00	WN	EB 100	R	VHM	○	1,200 - 3,200	5024	808	532
•	•	•	•	•	•		45,00	WN	EB 100	R	VHM	A	1,200 - 3,200	5632	808	533
•	•	•	•	•	•		80,00	WN	EB 100	R	VHM	○	1,200 - 5,000	5020	808	534
•	•	•	•	•	•		80,00	WN	EB 100	R	VHM	A	1,200 - 5,000	5633	808	535
•	•	•	•	•	•		120,00	WN	EB 100	R	VHM	○	1,500 - 5,000	5026	808	536
•	•	•	•	•	•		120,00	WN	EB 100	R	VHM	A	1,500 - 5,000	5637	808	537
•	•	•	•	•	•		160,00	WN	EB 100	R	VHM	○	1,500 - 8,000	5021	808	538
•	•	•	•	•	•		160,00	WN	EB 100	R	VHM	A	1,500 - 8,000	5638	808	539

## Tek ağızlı derin delik matkap ucu EB 80

•	•	•	•	•	•		20xD	WN	EB 80	R	HM	S	4,000 - 12,000	5018	808	540
•	•	•	•	•	•		20xD	WN	EB 80	R	HM	C	3,970 - 12,700	5639	808	541
•	•	•	•	•	•		30xD	WN	EB 80	R	HM	S	4,000 - 12,000	5460	808	542
•	•	•	•	•	•		30xD	WN	EB 80	R	HM	C	3,970 - 12,700	5640	808	543
•	•	•	•	•	•		40xD	WN	EB 80	R	HM	○	4,000 - 12,000	5689	808	544
•	•	•	•	•	•		40xD	WN	EB 80	R	HM	S	4,000 - 12,000	5022	808	545
•	•	•	•	•	•		40xD	WN	EB 80	R	HM	C	3,970 - 12,700	5641	808	546





P	M	K	N	S	H	takım görüntüsü	delik derinliği	Standart	Tip	Kesme yönü	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayfası	Sayfa
Tek ağızlı derin delik matkap ucu EB 80																
•	○	•	○	○	○		80xD	WN	EB 80	R	HM	○	3,970 - 11,950	5690	808	547
•	○	•	○	○	○		80xD	WN	EB 80	R	HM	Ⓢ	4,950 - 11,950	5023	808	548
○	•	○	•	○	○		80xD	WN	EB 80	R	HM	Ⓢ	4,950 - 12,650	5642	808	549
•	○	•	•	○	○		1100,00	WN	EB 80	R	HM	Ⓢ	6,000 - 22,000	5164	808	550
Çift ağızlı derin delik matkap ucu ZB 80																
•	○	•	○	○	○		30xD	WN	ZB 80	R	HM	○	8,000 - 12,000	5019	808	551
•	○	•	○	○	○		30xD	WN	ZB 80	R	HM	○	8,000 - 12,000	5643	808	552
Tek ağızlı derin delik matkap ucu EB 800																
•	○	•	○	○	○		30xD	WN	EB 800	R	HM	Ⓢ	12,000 - 24,000	5644	808	555
Torx tornavida																
•	○	•	○	○	○			WN						1612		558
Tork anahtarları																
•	○	•	○	○	○			WN						4915		559
Torx-Bit uçları																
•	○	•	○	○	○			WN						4917		560
Sıkma vidaları																
•	○	•	○	○	○			WN						4071		561
Delik delme kovanı																
•	○	•	○	○	○			WN			VHM			5748		565
•	○	•	○	○	○			WN			HSS			5747		566
Tek ağızlı derin delik matkabı için sızdırmazlık contaları																
•	○	•	○	○	○			WN						5752		569
Tek ağızlı matkap ucu için yataklama burcu																
•	○	•	○	○	○			WN						5750		571
Tek ve iki ağızlı derin delik matkapları için lünet burçları																
•	○	•	○	○	○			WN						5749		573



P	M	K	N	S	H	takım görüntüsü	delik derinliği	Standart	Tip	Kesme yönü	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayfası	Sayfa
														5753		575
														5751		576
														5754		577
														5755		578
Helisel matkap uçları, uzun																
•	•	•	•	•	•		~10xD	DIN 340	N	(R)	HSS		0,400 - 36,510	217	786	580
•	•	•	•	•	•		~10xD	DIN 340	N	(R)	HSS		0,500 - 22,220	667	786	583
•	•	•	•	•	•		~10xD	DIN 340	N	(L)	HSS		0,450 - 29,000	220	786	585
•	•	•	•	•	•		~10xD	DIN 340	N	(R)	HSS		2,950 - 25,250	204	786	587
•	•	•	•	•	•		~10xD	DIN 340	H	(R)	HSS		0,500 - 16,000	218	786	588
•	•	•	•	•	•		~10xD	DIN 340	H	(L)	HSS		0,450 - 15,000	221	786	590
•	•	•	•	•	•		~10xD	DIN 340	W	(R)	HSS		0,500 - 20,640	219	786	591
•	•	•	•	•	•		~10xD	DIN 340	GT 100	(R)	HSS		1,000 - 14,000	535	786	593
•	•	•	•	•	•		~10xD	DIN 340	GT 100	(R)	HSS		1,000 - 14,000	668	786	596
•	•	•	•	•	•		~10xD	DIN 340	GT 100	(R)	HSS		1,000 - 10,000	2462	786	598
•	•	•	•	•	•		~10xD	DIN 340	GT 100	(L)	HSS		1,400 - 13,000	506	786	599
•	•	•	•	•	•		~10xD	DIN 340	GT 50	(R)	HSS		1,000 - 32,600	501	786	600
•	•	•	•	•	•		~10xD	DIN 340	N	(R)	HSCO		0,500 - 22,000	317	792	602
•	•	•	•	•	•		~10xD	DIN 340	GT 100	(R)	HSCO		1,000 - 16,000	336	792	604
•	•	•	•	•	•		~10xD	DIN 340	GT 100	(R)	HSCO		1,000 - 12,000	396	792	606
•	•	•	•	•	•		~10xD	DIN 340	Ti	(R)	HSCO		1,000 - 15,000	617	792	607
•	•	•	•	•	•		~10xD	DIN 340	Ti	(R)	HSCO		1,000 - 10,200	669	792	609
•	•	•	•	•	•		~10xD	WN	N	(R)	VHM		0,500 - 1,450	706	792	611



P	M	K	N	S	H	takım görüntüsü	delik derinliği	Standart	Tip	Kesme yönü	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayfası	Sayfa
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## Helisel matkap uçları çok uzun, seri 1

•	•	•	•	•	•		~15xD	DIN 1869	N	(R)	HSS		1,600 - 13,000	235	788	612
•	•	•	•	•	•		~15xD	DIN 1869	GT 100	(R)	HSS		1,950 - 13,000	502	790	614
•	•	•	•	•	•		~15xD	DIN 1869	GT 100	(R)	HSS		2,000 - 12,700	670	790	616
•	•	•	•	•	•		~15xD	DIN 1869	GT 50	(R)	HSS		2,000 - 12,700	524	788	617
•	•	•	•	•	•		~15xD	DIN 1869	GT 100	(R)	HSCO		2,700 - 10,000	618	794	619

## Ekstra uzun helisel matkaplar, seri 2

•	•	•	•	•	•		~20xD	DIN 1869	N	(R)	HSS		2,700 - 13,000	236	788	620
•	•	•	•	•	•		~20xD	DIN 1869	GT 100	(R)	HSS		2,000 - 13,000	503	790	621
•	•	•	•	•	•		~20xD	DIN 1869	GT 100	(R)	HSS		2,700 - 8,500	671	790	623
•	•	•	•	•	•		~20xD	DIN 1869	GT 50	(R)	HSS		3,000 - 13,000	528	788	624
•	•	•	•	•	•		~20xD	DIN 1869	GT 100	(R)	HSCO		3,000 - 10,000	619	794	625

## Ekstra uzun helisel matkaplar, seri 3

•	•	•	•	•	•		~25xD	DIN 1869	N	(R)	HSS		3,500 - 13,000	237	788	626
•	•	•	•	•	•		~25xD	DIN 1869	GT 100	(R)	HSS		2,500 - 13,000	504	790	627
•	•	•	•	•	•		~25xD	DIN 1869	GT 50	(R)	HSS		2,500 - 10,000	529	788	628
•	•	•	•	•	•		~25xD	DIN 1869	GT 100	(R)	HSCO		2,500 - 13,000	571	794	629

## Helisel matkap uçları, çok uzun

•	•	•	•	•	•		>25xD	WN	GT 100	(R)	HSS		6,000 - 12,000	242	790	630
•	•	•	•	•	•		>25xD	WN	GT 100	(R)	HSS		8,000 - 12,000	243	790	631
•	•	•	•	•	•		>25xD	WN	GT 100	(R)	HSS		10,000 - 12,000	244	790	632

## Helisel matkap uçları çok uzun, seri 1

•	•	•	•	•	•		~15xD	DIN 1870	N	(R)	HSS		8,000 - 50,000	266	788	633
•	•	•	•	•	•		~15xD	DIN 1870	GT 100	(R)	HSS		8,000 - 30,000	526	790	634
•	•	•	•	•	•		~15xD	DIN 1870	GT 50	(R)	HSS		8,500 - 33,000	525	788	635
•	•	•	•	•	•		~15xD	DIN 1870	GT 100	(R)	HSCO		9,520 - 30,000	620	794	636



P	M	K	N	S	H	takım görüntüsü	delik derinliği	Standart	Tip	Kesme yönü	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayfası	Sayfa
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## Ekstra uzun helisel matkaplar, seri 2

•	•	•	•	•	•		~20xD	DIN 1870	N	(R)	HSS	○	8,000 - 45,000	267	788	637
•	•	•	•	•	•		~20xD	DIN 1870	GT 100	(R)	HSS	○ -0.0 16.0	8,000 - 30,000	527	790	638
○	•	•	•	•	•		~20xD	DIN 1870	GT 50	(R)	HSS	○	8,500 - 31,000	542	788	639
•	•	•	•	•	•		~20xD	DIN 1870	GT 100	(R)	HSCO	○ -0.0 16.0	9,520 - 23,420	621	794	640

## Soğutma kanallı matkap uçları, Kanal boyu DIN 1870

•	•	•	•	•	•		~15xD	WN	GT 100	(R)	HSCO	○	11,000 - 34,000	374	794	641
•	•	•	•	•	•		~15xD	WN	GT 100	(R)	HSCO	○	11,000 - 34,000	375	794	642
•	•	•	•	•	•		~15xD	WN	GT 100	(R)	HSCO	○	11,000 - 29,000	376	794	643



## İçten soğutma kanallı rasyo matkap



Malzeme

Kom. sert metal

Yüze

A

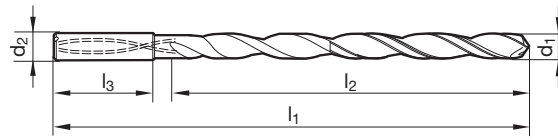
sap formu

HA

P	•	öz bileme $\geq \varnothing 3,000$ • koni bileme • ana kesici ağız form konkav • optimize edilmiş kanal kesit alanı • maksimal soğutma kanal delikleri alanı • yağ basıncına dikkat edin
M	•	
K	•	
N	○	yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşimli çelikler 1200 N/mm <sup>2</sup> 'ye kadar • paslanmaz çelikler • döküm malzemeler
S	○	
H	○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 760



Ürün no

6509

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		6,000	95,000	55,000	36,000
3,170	1/8	6,000	106,000	67,000	36,000
3,500		6,000	116,000	76,000	36,000
3,570	9/64	6,000	116,000	76,000	36,000
3,970	5/32	6,000	116,000	76,000	36,000
4,000		6,000	116,000	76,000	36,000
4,370	11/64	6,000	133,000	93,000	36,000
4,500		6,000	133,000	93,000	36,000
4,760	3/16	6,000	133,000	93,000	36,000
5,000		6,000	133,000	93,000	36,000
5,100		6,000	150,000	110,000	36,000
5,160	13/64	6,000	150,000	110,000	36,000
5,410		6,000	150,000	110,000	36,000
5,500		6,000	150,000	110,000	36,000
5,560	7/32	6,000	150,000	110,000	36,000
5,950	15/64	6,000	150,000	110,000	36,000
6,000		6,000	150,000	110,000	36,000
6,350	1/4	8,000	167,000	127,000	36,000
6,500		8,000	167,000	127,000	36,000
6,750	17/64	8,000	167,000	127,000	36,000
7,000		8,000	167,000	127,000	36,000
7,140	9/32	8,000	183,000	143,000	36,000
7,500		8,000	183,000	143,000	36,000
7,540	19/64	8,000	183,000	143,000	36,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
7,940	5/16	8,000	183,000	143,000	36,000
8,000		8,000	183,000	143,000	36,000
8,330	21/64	10,000	204,000	160,000	40,000
8,500		10,000	204,000	160,000	40,000
8,730	11/32	10,000	204,000	160,000	40,000
9,000		10,000	204,000	160,000	40,000
9,130	23/64	10,000	221,000	177,000	40,000
9,520	3/8	10,000	221,000	177,000	40,000
9,920	25/64	10,000	221,000	177,000	40,000
10,000		10,000	221,000	177,000	40,000
10,320	13/32	12,000	247,000	198,000	45,000
10,720	27/64	12,000	247,000	198,000	45,000
11,000		12,000	247,000	198,000	45,000
11,110	7/16	12,000	263,000	214,000	45,000
11,510	29/64	12,000	263,000	214,000	45,000
11,910	15/32	12,000	263,000	214,000	45,000
12,000		12,000	263,000	214,000	45,000
12,300	31/64	14,000	297,000	248,000	45,000
12,700	1/2	14,000	297,000	248,000	45,000
13,100	33/64	14,000	297,000	248,000	45,000
13,490	17/32	14,000	297,000	248,000	45,000
13,890	35/64	14,000	297,000	248,000	45,000
14,000		14,000	297,000	248,000	45,000

Derin Delik Matkap Ucu



## İçten soğutma kanallı rasyo matkap



<b>P</b>	•	öz bileme $\geq \varnothing 3,000$ • koni bileme • ana kesici ağız form konkav • optimize edilmiş kanal kesit alanı • maksimal soğutma kanal delikleri alanı • yağ basıncına dikkat edin
<b>M</b>	•	
<b>K</b>	•	
<b>N</b>	○	yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm <sup>2</sup> 'ye kadar • paslanmaz çelikler • döküm malzemeler
<b>S</b>	○	
<b>H</b>	○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 760

Malzeme

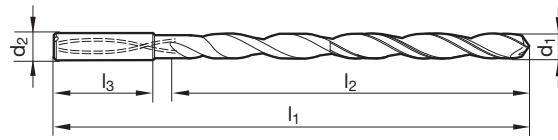
Kom. sert metal

Yüzey

A

sap formu

HA



Ürün no

6511

Derin Delik Matkap Ucu

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	110,000	70,000	36,000	8,730	11/32	10,000	249,000	205,000	40,000
3,100		6,000	123,000	83,000	36,000	9,000		10,000	249,000	205,000	40,000
3,170	1/8	6,000	123,000	83,000	36,000	9,130	23/64	10,000	271,000	227,000	40,000
3,500		6,000	136,000	96,000	36,000	9,520	3/8	10,000	271,000	227,000	40,000
3,570	9/64	6,000	136,000	96,000	36,000	9,920	25/64	10,000	271,000	227,000	40,000
3,970	5/32	6,000	136,000	96,000	36,000	10,000		10,000	271,000	227,000	40,000
4,000		6,000	136,000	96,000	36,000	10,320	13/32	12,000	302,000	253,000	45,000
4,200		6,000	158,000	118,000	36,000	10,720	27/64	12,000	302,000	253,000	45,000
4,370	11/64	6,000	158,000	118,000	36,000	11,000		12,000	302,000	253,000	45,000
4,500		6,000	158,000	118,000	36,000	11,110	7/16	12,000	323,000	274,000	45,000
4,760	3/16	6,000	158,000	118,000	36,000	11,510	29/64	12,000	323,000	274,000	45,000
5,000		6,000	158,000	118,000	36,000	11,910	15/32	12,000	323,000	274,000	45,000
5,100		6,000	180,000	140,000	36,000	12,000		12,000	323,000	274,000	45,000
5,160	13/64	6,000	180,000	140,000	36,000	12,300	31/64	14,000	367,000	318,000	45,000
5,410		6,000	180,000	140,000	36,000	12,700	1/2	14,000	367,000	318,000	45,000
5,500		6,000	180,000	140,000	36,000	13,100	33/64	14,000	367,000	318,000	45,000
5,560	7/32	6,000	180,000	140,000	36,000	13,490	17/32	14,000	367,000	318,000	45,000
5,950	15/64	6,000	180,000	140,000	36,000	13,890	35/64	14,000	367,000	318,000	45,000
6,000		6,000	180,000	140,000	36,000	14,000		14,000	367,000	318,000	45,000
6,350	1/4	8,000	202,000	162,000	36,000						
6,500		8,000	202,000	162,000	36,000						
6,750	17/64	8,000	202,000	162,000	36,000						
7,000		8,000	202,000	162,000	36,000						
7,140	9/32	8,000	223,000	183,000	36,000						
7,500		8,000	223,000	183,000	36,000						
7,540	19/64	8,000	223,000	183,000	36,000						
7,940	5/16	8,000	223,000	183,000	36,000						
8,000		8,000	223,000	183,000	36,000						
8,330	21/64	10,000	249,000	205,000	40,000						
8,500		10,000	249,000	205,000	40,000						



## İçten soğutma kanallı rasyo matkap



Malzeme

Kom. sert metal

Yüzey

A

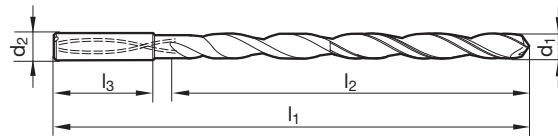
sap formu

HA

P	•	öz bileme $\geq \varnothing 3,000$ • koni bileme • ana kesici ağız form konkav • optimize edilmiş kanal kesit alanı • maksimal soğutma kanal delikleri alanı • yağ basıncına dikkat edin
M	•	
K	•	
N	○	yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm <sup>2</sup> 'ye kadar • paslanmaz çelikler • döküm malzemeler
S	○	
H	○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 760



Ürün no

6512

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	125,000	85,000	36,000	7,000		8,000	237,000	197,000	36,000
3,100		6,000	141,000	101,000	36,000	7,140	9/32	8,000	263,000	223,000	36,000
3,170	1/8	6,000	141,000	101,000	36,000	7,500		8,000	263,000	223,000	36,000
3,500		6,000	156,000	116,000	36,000	7,540	19/64	8,000	263,000	223,000	36,000
3,570	9/64	6,000	156,000	116,000	36,000	7,940	5/16	8,000	263,000	223,000	36,000
3,800		6,000	156,000	116,000	36,000	8,000		8,000	263,000	223,000	36,000
3,970	5/32	6,000	156,000	116,000	36,000	8,330	21/64	10,000	294,000	250,000	40,000
4,000		6,000	156,000	116,000	36,000	8,500		10,000	294,000	250,000	40,000
4,200		6,000	183,000	143,000	36,000	8,730	11/32	10,000	294,000	250,000	40,000
4,370	11/64	6,000	183,000	143,000	36,000	8,800		10,000	294,000	250,000	40,000
4,500		6,000	183,000	143,000	36,000	9,000		10,000	294,000	250,000	40,000
4,760	3/16	6,000	183,000	143,000	36,000	9,130	23/64	10,000	321,000	277,000	40,000
5,000		6,000	183,000	143,000	36,000	9,520	3/8	10,000	321,000	277,000	40,000
5,100		6,000	210,000	170,000	36,000	9,920	25/64	10,000	321,000	277,000	40,000
5,160	13/64	6,000	210,000	170,000	36,000	10,000		10,000	321,000	277,000	40,000
5,410		6,000	210,000	170,000	36,000	10,320	13/32	12,000	359,000	310,000	45,000
5,500		6,000	210,000	170,000	36,000	10,720	27/64	12,000	359,000	310,000	45,000
5,560	7/32	6,000	210,000	170,000	36,000	11,000		12,000	359,000	310,000	45,000
5,950	15/64	6,000	210,000	170,000	36,000	11,110	7/16	12,000	386,000	337,000	45,000
6,000		6,000	210,000	170,000	36,000	11,510	29/64	12,000	386,000	337,000	45,000
6,300		8,000	237,000	197,000	36,000	11,910	15/32	12,000	386,000	337,000	45,000
6,350	1/4	8,000	237,000	197,000	36,000	12,000		12,000	386,000	337,000	45,000
6,500		8,000	237,000	197,000	36,000						
6,750	17/64	8,000	237,000	197,000	36,000						

Derin Delik Matkap Ucu



## İçten soğutma kanallı rasyo matkap

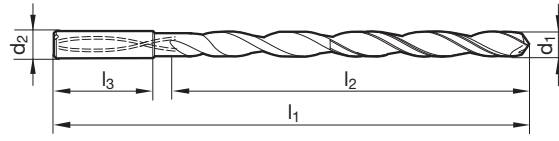


<b>P</b>	•	öz bileme $\geq \varnothing 3,000$ • koni bileme • ana kesici ağız form konkav • optimize edilmiş kanal kesit alanı • maksimal soğutma kanal delikleri alanı • yağ basıncına dikkat edin
<b>M</b>	•	
<b>K</b>	•	
<b>N</b>	○	yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm <sup>2</sup> 'ye kadar • paslanmaz çelikler • döküm malzemeler
<b>S</b>	○	
<b>H</b>	○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 760

Malzeme	<b>Kom. sert metal</b>
Yüzey	<b>A</b>
sap formu	HA



Ürün no 6513

Derin Delik Matkap Ucu

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	140,000	100,000	36,000	7,000		8,000	272,000	232,000	36,000
3,100		6,000	158,000	118,000	36,000	7,140	9/32	8,000	303,000	263,000	36,000
3,170	1/8	6,000	158,000	118,000	36,000	7,500		8,000	303,000	263,000	36,000
3,500		6,000	176,000	136,000	36,000	7,540	19/64	8,000	303,000	263,000	36,000
3,570	9/64	6,000	176,000	136,000	36,000	7,940	5/16	8,000	303,000	263,000	36,000
3,800		6,000	176,000	136,000	36,000	8,000		8,000	303,000	263,000	36,000
3,970	5/32	6,000	176,000	136,000	36,000	8,330	21/64	10,000	339,000	295,000	40,000
4,000		6,000	176,000	136,000	36,000	8,500		10,000	339,000	295,000	40,000
4,200		6,000	208,000	168,000	36,000	8,730	11/32	10,000	339,000	295,000	40,000
4,370	11/64	6,000	208,000	168,000	36,000	8,800		10,000	339,000	295,000	40,000
4,500		6,000	208,000	168,000	36,000	9,000		10,000	339,000	295,000	40,000
4,760	3/16	6,000	208,000	168,000	36,000	9,130	23/64	10,000	371,000	327,000	40,000
5,000		6,000	208,000	168,000	36,000	9,520	3/8	10,000	371,000	327,000	40,000
5,100		6,000	240,000	200,000	36,000	9,920	25/64	10,000	371,000	327,000	40,000
5,160	13/64	6,000	240,000	200,000	36,000	10,000		10,000	371,000	327,000	40,000
5,410		6,000	240,000	200,000	36,000						
5,500		6,000	240,000	200,000	36,000						
5,560	7/32	6,000	240,000	200,000	36,000						
5,950	15/64	6,000	240,000	200,000	36,000						
6,000		6,000	240,000	200,000	36,000						
6,300		8,000	272,000	232,000	36,000						
6,350	1/4	8,000	272,000	232,000	36,000						
6,500		8,000	272,000	232,000	36,000						
6,750	17/64	8,000	272,000	232,000	36,000						





## İçten soğutma kanallı rasyo matkap

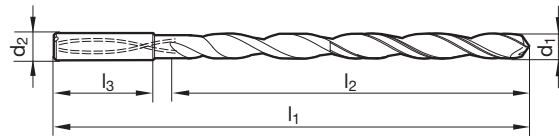
Malzeme **Kom. sert metal**Yüzey **A**

sap formu HA

<b>P</b>	•	öz bileme $\geq \varnothing 3,000$ • koni bileme • ana kesici ağız form konkav • optimize edilmiş kanal kesit alanı • maksimal soğutma kanal delikleri alanı • yağ basıncına dikkat edin
<b>M</b>	•	
<b>K</b>	•	
<b>N</b>	o	yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm <sup>2</sup> 'ye kadar • paslanmaz çelikler • döküm malzemeler
<b>S</b>	o	
<b>H</b>	o	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 760

Ürün no **6514**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	170,000	130,000	36,000	5,950	15/64	6,000	300,000	260,000	36,000
3,100		6,000	193,000	153,000	36,000	6,000		6,000	300,000	260,000	36,000
3,170	1/8	6,000	193,000	153,000	36,000	6,300		8,000	322,000	282,000	36,000
3,500		6,000	193,000	153,000	36,000	6,350	1/4	8,000	322,000	282,000	36,000
3,570	9/64	6,000	216,000	176,000	36,000	6,500		8,000	322,000	282,000	36,000
3,800		6,000	216,000	176,000	36,000	6,750	17/64	8,000	342,000	302,000	36,000
3,970	5/32	6,000	216,000	176,000	36,000	7,000		8,000	342,000	302,000	36,000
4,000		6,000	216,000	176,000	36,000	7,140	9/32	8,000	363,000	323,000	36,000
4,200		6,000	238,000	198,000	36,000	7,500		8,000	363,000	323,000	36,000
4,370	11/64	6,000	238,000	198,000	36,000	7,540	19/64	8,000	383,000	343,000	36,000
4,500		6,000	238,000	198,000	36,000	7,940	5/16	8,000	383,000	343,000	36,000
4,760	3/16	6,000	258,000	218,000	36,000	8,000		8,000	383,000	343,000	36,000
5,000		6,000	258,000	218,000	36,000						
5,100		6,000	280,000	240,000	36,000						
5,160	13/64	6,000	280,000	240,000	36,000						
5,410		6,000	280,000	240,000	36,000						
5,500		6,000	280,000	240,000	36,000						
5,560	7/32	6,000	300,000	260,000	36,000						

Derin Delik Matkap Ucu



## Süper hızlı derin delik matkap servisi

Bir kaç iş günü içerisinde takımlarınız hazırlanır.  
Gühring'in süper hızlı derin delik matkap teklifi sayesinde

### EB 100

Dizayn opsiyonları:

- kanal uzunluğu:

45 mm Ø 1,2 / 1,5 / 1,59 / 1,6 / 1,98 / 2,0 / 2,5 / 2,7 / 3,0 / 3,2

80 mm Ø 1,5 / 1,59 / 1,6 / 1,98 / 2,0 / 2,5 / 2,7 / 3,0 / 3,2 / 3,5 / 4,0 / 4,2 / 4,5 / 5,0

120 mm Ø 1,5 / 1,59 / 1,6 / 1,98 / 2,0 / 2,5 / 2,7 / 3,0 / 3,2 / 3,5 / 4,0 / 4,2 / 4,5 / 5,0

160 mm Ø 1,5 / 1,59 / 1,6 / 1,98 / 2,0 / 2,5 / 2,7 / 3,0 / 3,2 / 3,5 / 4,0 / 4,2 / 4,5 / 5,0 /  
6,0 / 8,0

- özel çözümler: nominal çap 0.9 – 16.0 mm, maks. kanal uzunluğu 500 mm
- karbür kalitesi: K30/K40
- kafa formu: G
- kaplamasız veya kaplamalı
- standart sürücü kombinasyonları ile  
15 iş gününde özel takımlar!

### EB 80

Dizayn opsiyonları:

- nominal çap 2.0 – 13.9 mm, 0.1 mm aralık ile
- nominal çap 14.0 – 22.0 mm, 0.5 mm aralık ile
- 1,200 mm ye kadar toplam uzunluk, min. kanal uzunluğu 20xD
- kafa form G
- standard sürücüler
- karbür kalitesi K15
- döküm ve alüminyum için kaplamasız standart ağız bilemesi
- S-kaplama (TiN), uzun talaş veren malzemeler için talaş kırma yarığı
- standart sürücü kombinasyonları ile  
10 iş günü içerisinde özel takımlar!



## Tek ağızlı derin delik matkap ucu EB100



Malzeme

Kom. sert metal

Yüzey

⊕

sap formu

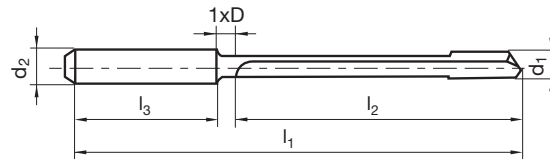
HA

**P** ● sırt formu G • d1'den = 3 mm aynı şekilde d2= 6 mm'den itibaren konik  
MMS sap sonu ile komple Karbür sap

<b>P</b>	●
<b>M</b>	●
<b>K</b>	○
<b>N</b>	○
<b>S</b>	○
<b>H</b>	○

## GÜHRING NAVIGATOR

Kesme verileri sayfası 808



Ürün no

5646

d1 h5		d2 h6	l1	l2	l3	Code-No.
mm	inch	mm	mm	mm	mm	
2,380	3/32	4,000	100,000	70,000	28,000	2,380
2,500		4,000	115,000	85,000	28,000	2,500
2,780	7/64	4,000	115,000	85,000	28,000	2,780
3,000		6,000	145,000	105,000	36,000	3,000
3,170	1/8	6,000	145,000	105,000	36,000	3,170
3,500		6,000	145,000	105,000	36,000	3,500
3,570	9/64	6,000	160,000	120,000	36,000	3,570
3,970	5/32	6,000	160,000	120,000	36,000	3,970
4,000		6,000	160,000	120,000	36,000	4,000
4,370	11/64	6,000	220,000	180,000	36,000	4,370
4,760	3/16	6,000	220,000	180,000	36,000	4,760
5,000		6,000	220,000	180,000	36,000	5,000
5,160	13/64	6,000	220,000	180,000	36,000	5,160
5,560	7/32	6,000	220,000	180,000	36,000	5,560
5,950	15/64	6,000	220,000	180,000	36,000	5,950
6,000		6,000	220,000	180,000	36,000	6,000
6,350	1/4	8,000	260,000	210,000	36,000	6,350
6,750	17/64	8,000	260,000	210,000	36,000	6,750
7,000		8,000	260,000	210,000	36,000	7,000
7,140	9/32	8,000	285,000	240,000	36,000	7,140
7,540	19/64	8,000	285,000	240,000	36,000	7,540
7,940	5/16	8,000	285,000	240,000	36,000	7,940
8,000		8,000	285,000	240,000	36,000	8,000
9,000		10,000	350,000	300,000	40,000	9,000
10,000		10,000	350,000	300,000	40,000	10,000
11,000		12,000	420,000	360,000	45,000	11,000
12,000		12,000	420,000	360,000	45,000	12,000

Derin Delik Matkap Ucu



## Tek ağızlı derin delik matkap ucu EB100



Malzeme

Kom. sert metal

Yüzey

⊕

sap formu

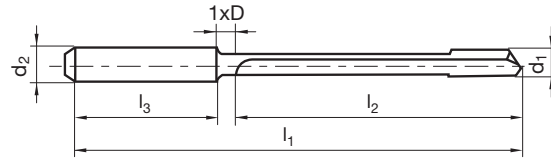
HA

**P** ● sırt formu G • d1'den = 3 mm aynı şekilde d2= 6 mm'den itibaren konik  
MMS sap sonu ile komple Karbür sap

<b>P</b>	●
<b>M</b>	●
<b>K</b>	○
<b>N</b>	○
<b>S</b>	○
<b>H</b>	○

## GÜHRING NAVIGATOR

Kesme verileri sayfası 808



Ürün no

5647

d1 h5		d2 h6	l1	l2	l3	Code-No.
mm	inch	mm	mm	mm	mm	
2,380	3/32	4,000	160,000	130,000	28,000	2,380
2,500		4,000	185,000	155,000	28,000	2,500
2,780	7/64	4,000	185,000	155,000	28,000	2,780
3,000		6,000	230,000	190,000	36,000	3,000
3,170	1/8	6,000	230,000	190,000	36,000	3,170
3,500		6,000	230,000	190,000	36,000	3,500
3,570	9/64	6,000	260,000	220,000	36,000	3,570
3,970	5/32	6,000	260,000	220,000	36,000	3,970
4,000		6,000	260,000	220,000	36,000	4,000
4,370	11/64	6,000	370,000	330,000	36,000	4,370
4,760	3/16	6,000	370,000	330,000	36,000	4,760
5,000		6,000	370,000	330,000	36,000	5,000
5,160	13/64	6,000	370,000	330,000	36,000	5,160
5,560	7/32	6,000	370,000	330,000	36,000	5,560
5,950	15/64	6,000	370,000	330,000	36,000	5,950
6,000		6,000	370,000	330,000	36,000	6,000
6,350	1/4	8,000	430,000	385,000	36,000	6,350
6,750	17/64	8,000	430,000	385,000	36,000	6,750
7,000		8,000	430,000	385,000	36,000	7,000
7,140	9/32	8,000	485,000	440,000	36,000	7,140
7,540	19/64	8,000	485,000	440,000	36,000	7,540
7,940	5/16	8,000	485,000	440,000	36,000	7,940
8,000		8,000	485,000	440,000	36,000	8,000



## Tek ağızlı derin delik matkap ucu EB100

Malzeme **Kom. sert metal**Yüzey **⊕**

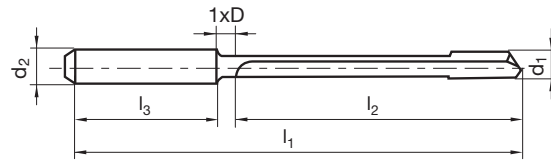
sap formu HA

**P** • sırt formu G • d1'den = 3 mm aynı şekilde d2= 6 mm'den itibaren konik  
MMS sap sonu ile komple Karbür sap

<b>P</b>	•
<b>M</b>	•
<b>K</b>	○
<b>N</b>	
<b>S</b>	○
<b>H</b>	○

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 808

Ürün no **5648**

d1 h5		d2 h6	l1	l2	l3	Code-No.
mm	inch	mm	mm	mm	mm	
2,380	3/32	4,000	220,000	190,000	28,000	2,380
2,500		4,000	255,000	220,000	28,000	2,500
2,780	7/64	4,000	255,000	220,000	28,000	2,780
3,000		6,000	320,000	280,000	36,000	3,000
3,170	1/8	6,000	320,000	280,000	36,000	3,170
3,500		6,000	320,000	280,000	36,000	3,500
3,570	9/64	6,000	360,000	320,000	36,000	3,570
3,970	5/32	6,000	360,000	320,000	36,000	3,970
4,000		6,000	360,000	320,000	36,000	4,000
4,370	11/64	6,000	525,000	485,000	36,000	4,370
4,760	3/16	6,000	525,000	485,000	36,000	4,760
5,000		6,000	525,000	485,000	36,000	5,000
5,160	13/64	6,000	525,000	485,000	36,000	5,160
5,560	7/32	6,000	525,000	485,000	36,000	5,560
5,950	15/64	6,000	525,000	485,000	36,000	5,950
6,000		6,000	525,000	485,000	36,000	6,000

Derin Delik Matkap Ucu



## Tek ağızlı derin delik matkap ucu EB100



P	○	kanal boyu 45 mm • sırt formu G
M	○	
K	○	
N	●	
S	●	
H	○	

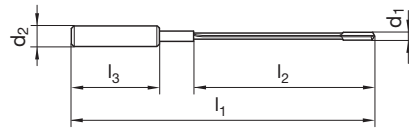
## GÜHRING NAVIGATOR

Kesme verileri sayfası 808

Malzeme **Kom. sert metal**

Yüzey ○

sap formu HA

Ürün no **5024**

d1 h5		d2 h6	l1	l2	l3	Code-No.
mm	inch	mm	mm	mm	mm	
1,200		4,000	90,000	45,000	28,000	1,200
1,500		4,000	90,000	45,000	28,000	1,500
1,590	1/16	4,000	90,000	45,000	28,000	1,590
1,600		4,000	90,000	45,000	28,000	1,600
1,980	5/64	4,000	90,000	45,000	28,000	1,980
2,000		4,000	90,000	45,000	28,000	2,000
2,500		10,000	100,000	45,000	40,000	2,500
2,700		10,000	100,000	45,000	40,000	2,700
3,000		10,000	100,000	45,000	40,000	3,000
3,200		10,000	100,000	45,000	40,000	3,200



## Tek ağızlı derin delik matkap ucu EB100



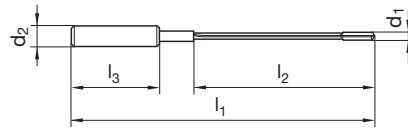
P	•	kanal boyu 45 mm • sırt formu G
M	○	
K	•	
N	○	
S	○	
H	○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 808

Malzeme **Kom. sert metal**Yüzey **A**

sap formu HA

Ürün no **5632**

d1 h5		d2 h6	l1	l2	l3	Code-No.
mm	inch	mm	mm	mm	mm	
1,200		4,000	90,000	45,000	28,000	1,200
1,500		4,000	90,000	45,000	28,000	1,500
1,590	1/16	4,000	90,000	45,000	28,000	1,590
1,600		4,000	90,000	45,000	28,000	1,600
1,980	5/64	4,000	90,000	45,000	28,000	1,980
2,000		4,000	90,000	45,000	28,000	2,000
2,500		10,000	100,000	45,000	40,000	2,500
2,700		10,000	100,000	45,000	40,000	2,700
3,000		10,000	100,000	45,000	40,000	3,000
3,200		10,000	100,000	45,000	40,000	3,200

Derin Delik Matkap Ucu



## Tek ağızlı derin delik matkap ucu EB100



P	○	kanal boyu 80 mm • sırt formu G
M	○	
K	○	
N	●	
S	●	
H	○	

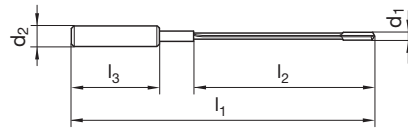
## GÜHRING NAVIGATOR

Kesme verileri sayfası 808

Malzeme **Kom. sert metal**

Yüzey ○

sap formu HA

Ürün no **5020**

Derin Delik Matkap Ucu

d1 h5		d2 h6	l1	l2	l3	Code-No.
mm	inch	mm	mm	mm	mm	
1,200		4,000	125,000	80,000	28,000	1,200
1,500		4,000	125,000	80,000	28,000	1,500
1,590	1/16	4,000	125,000	80,000	28,000	1,590
1,600		4,000	125,000	80,000	28,000	1,600
1,980	5/64	4,000	125,000	80,000	28,000	1,980
2,000		4,000	125,000	80,000	28,000	2,000
2,500		10,000	135,000	80,000	40,000	2,500
2,700		10,000	135,000	80,000	40,000	2,700
3,000		10,000	135,000	80,000	40,000	3,000
3,200		10,000	135,000	80,000	40,000	3,200
3,500		10,000	135,000	80,000	40,000	3,500
4,000		10,000	135,000	80,000	40,000	4,000
4,200		10,000	135,000	80,000	40,000	4,200
4,500		10,000	135,000	80,000	40,000	4,500
5,000		10,000	135,000	80,000	40,000	5,000





## Tek ağızlı derin delik matkap ucu EB100



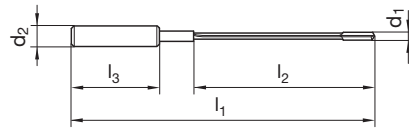
P	•	kanal boyu 80 mm • sırt formu G
M	○	
K	•	
N	○	
S	○	
H	○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 808

Malzeme **Kom. sert metal**Yüzey **A**

sap formu HA

Ürün no **5633**

d1 h5		d2 h6	l1	l2	l3	Code-No.
mm	inch	mm	mm	mm	mm	
1,200		4,000	125,000	80,000	28,000	1,200
1,500		4,000	125,000	80,000	28,000	1,500
1,590	1/16	4,000	125,000	80,000	28,000	1,590
1,600		4,000	125,000	80,000	28,000	1,600
1,980	5/64	4,000	125,000	80,000	28,000	1,980
2,000		4,000	125,000	80,000	28,000	2,000
2,500		10,000	135,000	80,000	40,000	2,500
2,700		10,000	135,000	80,000	40,000	2,700
3,000		10,000	135,000	80,000	40,000	3,000
3,200		10,000	135,000	80,000	40,000	3,200
3,500		10,000	135,000	80,000	40,000	3,500
4,000		10,000	135,000	80,000	40,000	4,000
4,200		10,000	135,000	80,000	40,000	4,200
4,500		10,000	135,000	80,000	40,000	4,500
5,000		10,000	135,000	80,000	40,000	5,000

Derin Delik Matkap Ucu



## Tek ağızlı derin delik matkap ucu EB100

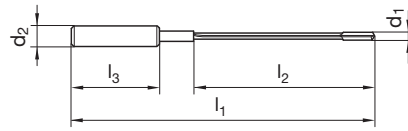


P	○	kanal boyu 120 mm • sırt formu G
M	○	
K	○	
N	●	
S	●	
H	○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 808

Malzeme	Kom. sert metal
Yüzey	○
sap formu	HA



Ürün no 5026

d1 h5		d2 h6	l1	l2	l3	Code-No.
mm	inch	mm	mm	mm	mm	
1,500		4,000	165,000	120,000	28,000	1,500
1,590	1/16	4,000	165,000	120,000	28,000	1,590
1,600		4,000	165,000	120,000	28,000	1,600
1,980	5/64	4,000	165,000	120,000	28,000	1,980
2,000		4,000	165,000	120,000	28,000	2,000
2,500		10,000	175,000	120,000	40,000	2,500
2,700		10,000	175,000	120,000	40,000	2,700
3,000		10,000	175,000	120,000	40,000	3,000
3,200		10,000	175,000	120,000	40,000	3,200
3,500		10,000	175,000	120,000	40,000	3,500
4,000		10,000	175,000	120,000	40,000	4,000
4,200		10,000	175,000	120,000	40,000	4,200
4,500		10,000	175,000	120,000	40,000	4,500
5,000		10,000	175,000	120,000	40,000	5,000



## Tek ağızlı derin delik matkap ucu EB100

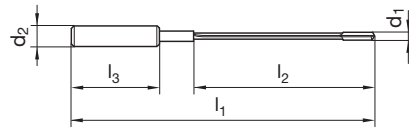
Malzeme **Kom. sert metal**Yüzey **A**

sap formu HA

P	•	kanal boyu 120 mm • sırt formu G
M	○	
K	•	
N	○	
S	○	
H	○	

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 808

Ürün no **5637**

d1 h5		d2 h6	l1	l2	l3	Code-No.
mm	inch	mm	mm	mm	mm	
1,500		4,000	165,000	120,000	28,000	1,500
1,590	1/16	4,000	165,000	120,000	28,000	1,590
1,600		4,000	165,000	120,000	28,000	1,600
1,980	5/64	4,000	165,000	120,000	28,000	1,980
2,000		4,000	165,000	120,000	28,000	2,000
2,500		10,000	175,000	120,000	40,000	2,500
2,700		10,000	175,000	120,000	40,000	2,700
3,000		10,000	175,000	120,000	40,000	3,000
3,200		10,000	175,000	120,000	40,000	3,200
3,500		10,000	175,000	120,000	40,000	3,500
4,000		10,000	175,000	120,000	40,000	4,000
4,200		10,000	175,000	120,000	40,000	4,200
4,500		10,000	175,000	120,000	40,000	4,500
5,000		10,000	175,000	120,000	40,000	5,000

Derin Delik Matkap  
Ucu



## Tek ağızlı derin delik matkap ucu EB100

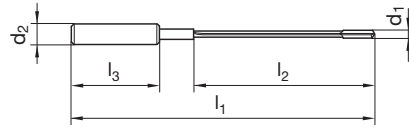


P	○	kanal boyu 160 mm • sırt formu G
M	○	
K	○	
N	●	
S	●	
H	○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 808

Malzeme	Kom. sert metal
Yüzey	○
sap formu	HA



Ürün no 5021

Derin Delik Matkap Ucu

d1 h5		d2 h6	l1	l2	l3	Code-No.
mm	inch	mm	mm	mm	mm	
1,500		4,000	205,000	160,000	28,000	1,500
1,590	1/16	4,000	205,000	160,000	28,000	1,590
1,600		4,000	205,000	160,000	28,000	1,600
1,980	5/64	4,000	205,000	160,000	28,000	1,980
2,000		4,000	205,000	160,000	28,000	2,000
2,500		10,000	215,000	160,000	40,000	2,500
2,700		10,000	215,000	160,000	40,000	2,700
3,000		10,000	215,000	160,000	40,000	3,000
3,200		10,000	215,000	160,000	40,000	3,200
3,500		10,000	215,000	160,000	40,000	3,500
4,000		10,000	215,000	160,000	40,000	4,000
4,200		10,000	215,000	160,000	40,000	4,200
4,500		10,000	215,000	160,000	40,000	4,500
5,000		10,000	215,000	160,000	40,000	5,000
6,000		16,000	225,000	160,000	48,000	6,000
8,000		16,000	225,000	160,000	48,000	8,000



## Tek ağızlı derin delik matkap ucu EB100

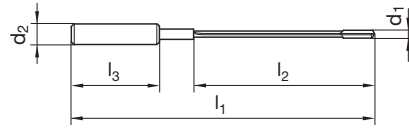
Malzeme **Kom. sert metal**Yüzey **A**

sap formu HA

P	•	kanal boyu 160 mm • sırt formu G
M	○	
K	•	
N	○	
S	○	
H	○	

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 808

Ürün no **5638**

d1 h5		d2 h6	l1	l2	l3	Code-No.
mm	inch	mm	mm	mm	mm	
1,500		4,000	205,000	160,000	28,000	1,500
1,590	1/16	4,000	205,000	160,000	28,000	1,590
1,600		4,000	205,000	160,000	28,000	1,600
1,980	5/64	4,000	205,000	160,000	28,000	1,980
2,000		4,000	205,000	160,000	28,000	2,000
2,500		10,000	215,000	160,000	40,000	2,500
2,700		10,000	215,000	160,000	40,000	2,700
3,000		10,000	215,000	160,000	40,000	3,000
3,200		10,000	215,000	160,000	40,000	3,200
3,500		10,000	215,000	160,000	40,000	3,500
4,000		10,000	215,000	160,000	40,000	4,000
4,200		10,000	215,000	160,000	40,000	4,200
4,500		10,000	215,000	160,000	40,000	4,500
5,000		10,000	215,000	160,000	40,000	5,000
6,000		16,000	225,000	160,000	48,000	6,000
8,000		16,000	225,000	160,000	48,000	8,000

Derin Delik Matkap Ucu



## Tek ağızlı derin delik matkap ucu EB 80

Malzeme **Sert metal**Yüzey **S**

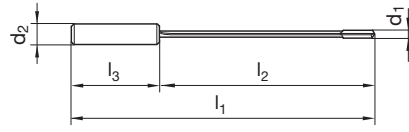
sap formu HA

**P** • genişletilmiş yağ kanalı ile • sırt formu G • uzun talaş dağıtıcısı ile

<b>P</b>	•
<b>M</b>	○
<b>K</b>	•
<b>N</b>	○
<b>S</b>	○
<b>H</b>	○

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 808

Ürün no **5018**

Derin Delik Matkap Ucu

d1 h5		d2 h6	l1	l2	l3	Code-No.
mm	inch	mm	mm	mm	mm	
4,000		12,000	150,000	100,000	45,000	4,000
4,200		12,000	160,000	110,000	45,000	4,200
4,500		12,000	170,000	120,000	45,000	4,500
5,000		16,000	180,000	130,000	48,000	5,000
5,500		16,000	190,000	140,000	48,000	5,500
6,000		16,000	210,000	160,000	48,000	6,000
6,500		16,000	220,000	170,000	48,000	6,500
7,000		16,000	235,000	185,000	48,000	7,000
8,000		16,000	260,000	210,000	48,000	8,000
9,000		16,000	280,000	230,000	48,000	9,000
10,000		20,000	320,000	260,000	50,000	10,000
12,000		20,000	370,000	310,000	50,000	12,000



## Tek ağızlı derin delik matkap ucu EB 80



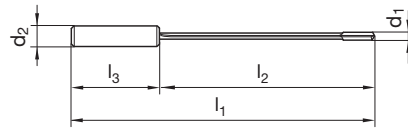
P	○	sırt formu G
M	●	
K	○	
N	○	
S	●	
H	○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 808

Malzeme **Sert metal**Yüzey **⊖**

sap formu HA

Ürün no **5639**

d1 h5		d2 h6	l1	l2	l3	Code-No.
mm	inch	mm	mm	mm	mm	
3,970	5/32	10,000	150,000	100,000	40,000	3,970
4,000		12,000	150,000	100,000	45,000	4,000
5,000		16,000	180,000	130,000	48,000	5,000
5,156	13/64	16,000	180,000	130,000	48,000	5,156
6,000		16,000	210,000	160,000	48,000	6,000
6,350	1/4	16,000	220,000	170,000	48,000	6,350
7,000		16,000	235,000	185,000	48,000	7,000
7,938	5/16	16,000	260,000	210,000	48,000	7,938
8,000		16,000	260,000	210,000	48,000	8,000
9,000		16,000	280,000	230,000	48,000	9,000
9,525	3/8	16,000	290,000	240,000	48,000	9,525
10,000		20,000	320,000	260,000	50,000	10,000
11,000		20,000	340,000	290,000	50,000	11,000
11,113	7/16	20,000	340,000	290,000	50,000	11,113
12,000		20,000	370,000	310,000	50,000	12,000
12,700	1/2	20,000	385,000	330,000	50,000	12,700

Derin Delik Matkap Ucu



## Tek ağızlı derin delik matkap ucu EB 80

Malzeme **Sert metal**Yüzey **S**

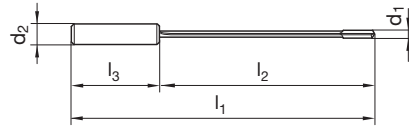
sap formu HA

**P** • genişletilmiş yağ kanalı ile • sırt formu G • uzun talaş dağıtıcısı ile

<b>M</b>	○
<b>K</b>	•
<b>N</b>	○
<b>S</b>	○
<b>H</b>	○

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 808

Ürün no **5460**

Derin Delik Matkap Ucu

d1 h5		d2 h6	l1	l2	l3	Code-No.
mm	inch	mm	mm	mm	mm	
4,000		12,000	200,000	155,000	45,000	4,000
4,200		12,000	210,000	165,000	45,000	4,200
4,500		12,000	220,000	175,000	45,000	4,500
5,000		16,000	230,000	182,000	48,000	5,000
5,500		16,000	245,000	197,000	48,000	5,500
6,000		16,000	260,000	212,000	48,000	6,000
6,500		16,000	275,000	227,000	48,000	6,500
7,000		16,000	290,000	242,000	48,000	7,000
8,000		16,000	320,000	272,000	48,000	8,000
9,000		16,000	350,000	302,000	48,000	9,000
10,000		20,000	400,000	350,000	50,000	10,000
12,000		20,000	450,000	400,000	50,000	12,000





## Tek ağızlı derin delik matkap ucu EB 80



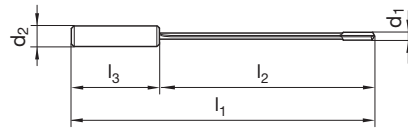
P	○	sırt formu G
M	●	
K	○	
N	○	
S	●	
H	○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 808

Malzeme **Sert metal**Yüzey **Ⓢ**

sap formu HA

Ürün no **5640**

d1 h5		d2 h6	l1	l2	l3	Code-No.
mm	inch	mm	mm	mm	mm	
3,970	5/32	10,000	200,000	155,000	40,000	3,970
4,000		12,000	200,000	155,000	45,000	4,000
5,000		16,000	230,000	182,000	48,000	5,000
5,156	13/64	16,000	230,000	182,000	48,000	5,156
6,000		16,000	260,000	212,000	48,000	6,000
6,350	1/4	16,000	275,000	227,000	48,000	6,350
7,000		16,000	290,000	242,000	48,000	7,000
7,938	5/16	16,000	320,000	272,000	48,000	7,938
8,000		16,000	320,000	272,000	48,000	8,000
9,000		16,000	350,000	302,000	48,000	9,000
9,525	3/8	16,000	380,000	330,000	48,000	9,525
10,000		20,000	400,000	350,000	50,000	10,000
11,000		20,000	430,000	380,000	50,000	11,000
11,113	7/16	20,000	430,000	380,000	50,000	11,113
12,000		20,000	450,000	400,000	50,000	12,000
12,700	1/2	20,000	500,000	450,000	50,000	12,700

Derin Delik Matkap Ucu



## Tek ağızlı derin delik matkap ucu EB 80



P	•	genişletilmiş yağ kanalı ile • sırt formu G • uzun talaş dağıtıcısı ile
M	○	
K	•	
N	○	
S	○	
H	○	

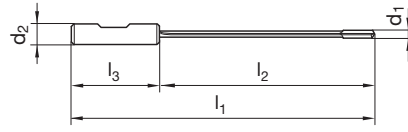
## GÜHRING NAVIGATOR

Kesme verileri sayfası 808

Malzeme **Sert metal**

Yüzey ○

sap formu HB

Ürün no **5689**

d1 h5		d2 h6	l1	l2	l3	Code-No.
mm	inch	mm	mm	mm	mm	
4,000		12,000	230,000	185,000	45,000	4,000
5,000		16,000	280,000	232,000	48,000	5,000
6,000		16,000	320,000	272,000	48,000	6,000
8,000		16,000	420,000	372,000	48,000	8,000
10,000		20,000	510,000	460,000	50,000	10,000
12,000		20,000	600,000	550,000	50,000	12,000



## Tek ağızlı derin delik matkap ucu EB 80

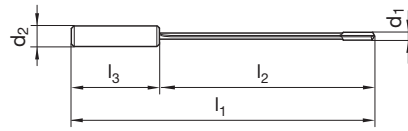
Malzeme **Sert metal**Yüzey **S**

sap formu HA

<b>P</b>	•	genişletilmiş yağ kanalı ile • sırt formu G • uzun talaş dağıtıcısı ile
<b>M</b>	○	
<b>K</b>	•	
<b>N</b>	○	
<b>S</b>	○	
<b>H</b>	○	

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 808

Ürün no **5022**

d1 h5		d2 h6	l1	l2	l3	Code-No.
mm	inch	mm	mm	mm	mm	
4,000		12,000	230,000	185,000	45,000	4,000
4,200		12,000	240,000	195,000	45,000	4,200
4,500		12,000	250,000	205,000	45,000	4,500
5,000		16,000	280,000	232,000	48,000	5,000
5,500		16,000	300,000	252,000	48,000	5,500
6,000		16,000	320,000	272,000	48,000	6,000
6,500		16,000	340,000	292,000	48,000	6,500
7,000		16,000	370,000	322,000	48,000	7,000
8,000		16,000	420,000	372,000	48,000	8,000
9,000		16,000	450,000	402,000	48,000	9,000
10,000		20,000	510,000	460,000	50,000	10,000
12,000		20,000	600,000	550,000	50,000	12,000

Derin Delik Matkap Ucu



## Tek ağızlı derin delik matkap ucu EB 80



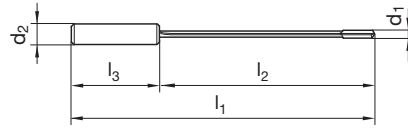
P	○	sırt formu G
M	●	
K	○	
N	○	
S	●	
H	○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 808

Malzeme **Sert metal**Yüzey **C**

sap formu HA

Ürün no **5641**

Derin Delik Matkap Ucu

d1 h5		d2 h6	l1	l2	l3	Code-No.
mm	inch	mm	mm	mm	mm	
3,970	5/32	10,000	230,000	185,000	40,000	3,970
4,000		12,000	230,000	185,000	45,000	4,000
5,000		16,000	280,000	232,000	48,000	5,000
5,156	13/64	16,000	280,000	232,000	48,000	5,156
6,000		16,000	320,000	272,000	48,000	6,000
6,350	1/4	16,000	340,000	292,000	48,000	6,350
7,000		16,000	370,000	322,000	48,000	7,000
7,938	5/16	16,000	420,000	372,000	48,000	7,938
8,000		16,000	420,000	372,000	48,000	8,000
9,000		16,000	450,000	402,000	48,000	9,000
9,525	3/8	16,000	480,000	432,000	48,000	9,525
10,000		20,000	510,000	460,000	50,000	10,000
11,000		20,000	550,000	500,000	50,000	11,000
11,113	7/16	20,000	550,000	500,000	50,000	11,113
12,000		20,000	600,000	550,000	50,000	12,000
12,700	1/2	20,000	635,000	585,000	50,000	12,700



## Tek ağızlı derin delik matkap ucu EB 80



P	•	genişletilmiş yağ kanalı ile • sırt formu G • uzun talaş dağıtıcısı ile
M	○	
K	•	
N	○	maksimum kanal uzunluğu 40XD, daha fazla delme derinliği olan takımlar için ilk takım olarak artikel 5641 uygulayın
S	○	
H	○	

## GÜHRING NAVIGATOR

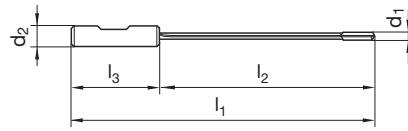
Kesme verileri sayfası 808

Malzeme **Sert metal**

Yüzey ○

sap formu HB

NEW

Ürün no **5690**

d1 h5		d2 h6	l1	l2	l3	Code-No.
mm	inch	mm	mm	mm	mm	
3,970	5/32	10,000	390,000	350,000	40,000	3,970
4,950		16,000	480,000	432,000	48,000	4,950
5,950	15/64	16,000	560,000	512,000	48,000	5,950
7,950		16,000	740,000	692,000	48,000	7,950
9,950		20,000	910,000	860,000	50,000	9,950
11,950		20,000	1080,000	1030,000	50,000	11,950

Derin Delik Matkap Ucu



## Tek ağızlı derin delik matkap ucu EB 80

Malzeme **Sert metal**Yüzey **S**

sap formu HA

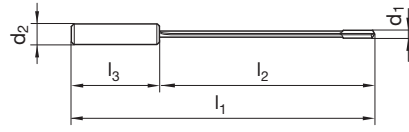
**P** • genişletilmiş yağ kanalı ile • sırt formu G • uzun talaş dağıtıcısı ile

<b>P</b>	•
<b>M</b>	○
<b>K</b>	•
<b>N</b>	○
<b>S</b>	○
<b>H</b>	○

beher takım için maksimal. kanal boyu 40 x D, daha büyük delik derinliklerinde 2 takım kullanınız.(örneğin: Ø 10 x 450 und Ø 9,95 x 850 mm)

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 808

Ürün no **5023**

d1 h5		d2 h6	l1	l2	l3	Code-No.
mm	inch	mm	mm	mm	mm	
4,950		16,000	480,000	432,000	48,000	4,950
5,950	15/64	16,000	560,000	512,000	48,000	5,950
7,950		16,000	740,000	692,000	48,000	7,950
9,950		20,000	910,000	860,000	50,000	9,950
11,950		20,000	1080,000	1030,000	50,000	11,950



## Tek ağızlı derin delik matkap ucu EB 80



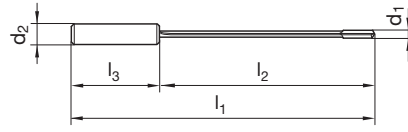
P	○	sırt formu G
M	●	
K	○	
N	○	maksimum kanal uzunluğu 40XD, daha fazla delme derinliği olan takımlar için ilk takım olarak artikel 5641 uygulayın
S	●	
H	○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 808

Malzeme **Sert metal**Yüzey **Ⓢ**

sap formu HA

Ürün no **5642**

d1 h5		d2 h6	l1	l2	l3	Code-No.
mm	inch	mm	mm	mm	mm	
4,950		16,000	480,000	432,000	48,000	4,950
5,106		16,000	480,000	432,000	48,000	5,106
5,950	15/64	16,000	560,000	512,000	48,000	5,950
6,300		16,000	590,000	542,000	48,000	6,300
6,950		16,000	650,000	602,000	48,000	6,950
7,888		16,000	740,000	692,000	48,000	7,888
7,950		16,000	740,000	692,000	48,000	7,950
8,950		16,000	820,000	772,000	48,000	8,950
9,475		16,000	870,000	822,000	48,000	9,475
9,950		20,000	910,000	860,000	50,000	9,950
10,950		20,000	995,000	945,000	50,000	10,950
11,063		20,000	995,000	945,000	50,000	11,063
11,950		20,000	1080,000	1030,000	50,000	11,950
12,650		20,000	1140,000	1090,000	50,000	12,650

Derin Delik Matkap Ucu



## Tek ağızlı derin delik matkap ucu EB 80

Malzeme **Sert metal**Yüzey **S**

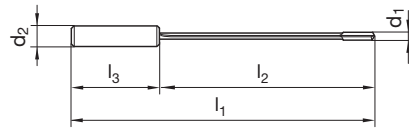
sap formu cyl.

**P** • toplam uzunluk = 1100,00 mm • sırt formu G • derin delik delme makinaları için sürücü (T3.1)

<b>M</b>	○
<b>K</b>	•
<b>N</b>	•
<b>S</b>	○
<b>H</b>	○

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 808

Ürün no **5164**

Derin Delik Matkap Ucu

d1 h5		d2 h6	l1	l2	l3	Code-No.
mm	inch	mm	mm	mm	mm	
6,000		25,000	1100,000	1010,000	70,000	6,000
7,000		25,000	1100,000	1010,000	70,000	7,000
8,000		25,000	1100,000	1010,000	70,000	8,000
10,000		25,000	1100,000	1010,000	70,000	10,000
12,000		25,000	1100,000	1010,000	70,000	12,000
16,000		25,000	1100,000	1010,000	70,000	16,000
20,000		25,000	1100,000	1010,000	70,000	20,000
22,000		25,000	1100,000	1000,000	70,000	22,000





## Çift ağızlı derin delik matkap ucu ZB 80

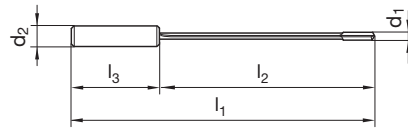


P	4 zırlı derin delik matkabı • alüminyum için
M	
K	
N	•
S	
H	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 808

Malzeme	Sert metal
Yüzey	○
sap formu	HA



Ürün no 5019

d1 h5	d2	l1	l2	l3	Code-No.
mm	mm	mm	mm	mm	
8,000	16,000	330,000	280,000	48,000	8,000
10,000	20,000	390,000	340,000	50,000	10,000
12,000	20,000	450,000	400,000	50,000	12,000

Derin Delik Matkap Ucu



## Çift ağızlı derin delik matkap ucu ZB 80



P	4 zırlı derin delik matkabı • pik döküm için
M	
K	•
N	
S	
H	

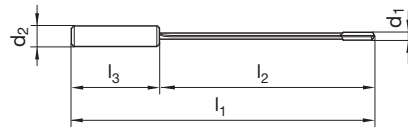
## GÜHRING NAVIGATOR

Kesme verileri sayfası 808

Malzeme **Sert metal**

Yüzey ○

sap formu HA

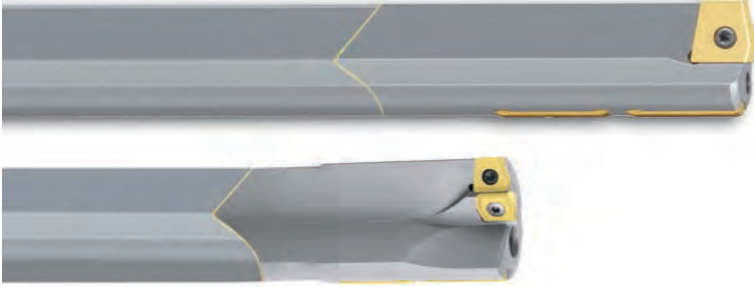
Ürün no **5643**

d1 h5	d2	l1	l2	l3	Code-No.
mm	mm	mm	mm	mm	
8,000	16,000	330,000	280,000	48,000	8,000
10,000	20,000	390,000	340,000	50,000	10,000
12,000	20,000	450,000	400,000	50,000	12,000



## EB 800

- Artık özel bir seçenek olarak Ø52 ve üzeri çaplar mevcut
- Ek sabit ücretler ile standart olarak uçlar ve yataklar 1/10 çaplarında, özel takım olarak 1/100 çaplarında



Takma uçlu ve değiştirilebilir kılavuzlama parçalı tek ağızlı derin delik matkabını müşteriye özel takım olarak üretmekteyiz. Bu ürün 16,0-40,0 çap aralığında, maksimal 3000 mm toplam boya kadardır ve muhtelif malzemeleri işlemeye uygundur.

### Avantajlarınız:

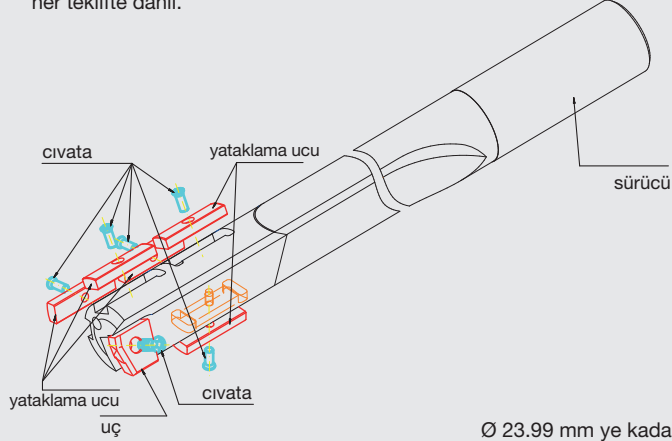
- Uç ve kılavuzlama parçalarının değiştirilebilir olmaları sayesinde her türlü sert metal çeşidi ve kaplama tipinin kombinasyonu mümkündür.
- Hassas takma uçlar ve kılavuzlama parçaları sayesinde karmaşık bir ayara gerek yoktur.
- Hassas kılavuzlama parçalarını derin delik uygulamalarınıza özel olarak sert metalden üretiyoruz. Dış yüzeye çift taraflı olarak monte edilebildiğinden, takım ömrü iki kat artar. Ayrıca tüm Gühring kaplama çeşitleri uygulanabilir.
- Hassas oturma yüzeyleri ve değiştirilebilir takma uçlar kullanılarak sağlam bir takım formu oluşturulmuştur.
- Aşınan parçaların makine üstünde iken değiştirilebilmeleri mümkün olduğundan yüksek maliyetli üretim aksamaları oluşmaz.
- Takma uç tekniği sayesinde zahmetli tekrar bileme işlemlerine gerek kalmaz.
- İşe uygun seçilen takma uç problemleri iş malzemelerinde bile daima ideal talaş kaldırmayı sağlar.
- Derin delik işlemlerinize uygun takma uçlar sert metalden üretilmiştir ve tüm Gühring kaplama çeşitleriyle kaplanabilir.
- Değişebilir parçalar sayesinde verilen çap aralıklarında istenilen çap ölçüsü uygulanabilir.
- Bağlama sapını islah çeliğinden;
  - DIN 6535 HA
  - DIN 6535 HE
  - DIN 6535 HB
  - DIN 1835 E
 normlarına uygun üretiyoruz

Derin delik makinelerine uygun sap formları da mümkündür.



**Dikkat:** - en kısa kanal uzunluğu 15xD  
- IT9/IT10 toleranslarında mümkün

çizim, tüm Gühring kodları ve özellikleri  
her teklifte dahil.



Ø 23.99 mm ye kadar 4 yataklama ucu  
Ø 24.00 mm ye kadar 5 yataklama ucu

### sıkma torku- kılavuz değerleri

dış uç

ebatlar	Ø aralığı (mm)	ISO metrik diş	Torx-ebatlar	sıkma torku Nm cinsinden
0.	12,00 – 15,99	M2,5 x 5,2	T8	1,00
1.	16,00 – 19,99	M3,0 x 6,4	T9	1,40
2.	20,00 – 25,99	M4,0 x 7,7	T15	2,50
3.	26,00 – 29,99	M4,0 x 10,6	T15	2,50
4.	30,00 – 33,99	M4,0 x 10,6	T15	2,50
5.	34,00 – 37,99	M5,0 x 14,2	T20	5,00
6.	38,00 – 40,00	M5,0 x 14,2	T20	5,00
7.	40,01 – 43,99	M3,0 x 6,4	T9	1,40
8.	44,00 – 47,99	M4,0 x 7,7	T15	2,50
9.	48,00 – 52,00	M4,0 x 10,6	T15	2,50

iç uç

ebatlar	Ø aralığı (mm)	ISO metrik diş	Torx-ebatlar	sıkma torku Nm cinsinden
7. – 9.	40,01 – 52,00	M4,5 x 11,8	T15	3,00

yataklama uçları

ebatlar	Ø aralığı (mm)	ISO metrik diş	Torx-ebatlar	sıkma torku Nm cinsinden
0.	12,00 – 15,99	M1,6 x 4,4	T5	0,40
1.	16,00 – 17,99	M2,2 x 4,6	T7	0,60
1.	18,00 – 19,99	M2,2 x 5,6	T7	0,60
2.	20,00 – 22,49	M2,5 x 5,2	T8	1,00
2.	22,50 – 25,99	M2,5 x 6,4	T8	1,00
3.	26,00 – 29,99	M2,5 x 6,4	T8	1,00
4. – 9.	30,00 – 52,00	M3,0 x 8,0	T9	1,40



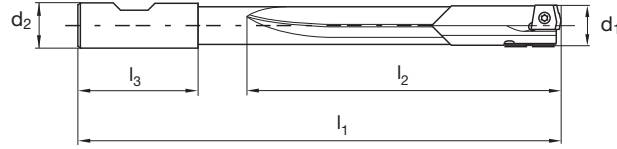
## Tek ağızlı derin delik matkap ucu EB 800

Malzeme **Sert metal**Yüzey **S**sap formu **HB**

P	•	Takma uçlu • değiştirilebilir yataklama • tornavida ile • vidalar ile • genel amaçlı • tork anahtarı art. No. 4915 ayrıca sipariş ediniz
M	○	
K	○	
N	•	
S	○	
H		

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 808







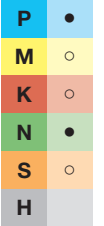
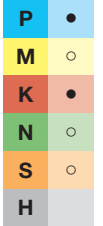

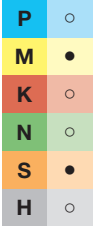




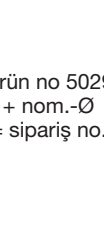
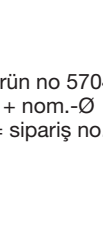
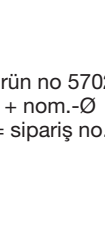
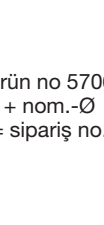
















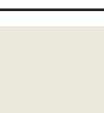
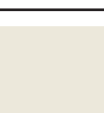
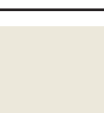
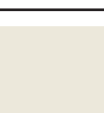
Ürün no **5644**

d1 h8		d2	l1	l2	l3	Code-No.
mm	inch	mm	mm	mm	mm	
12,000		20,000	446,000	384,000	50,000	12,000
12,700	1/2	20,000	468,000	406,000	50,000	12,700
14,000		20,000	510,000	448,000	50,000	14,000
15,000		25,000	548,000	480,000	56,000	15,000
16,000		25,000	580,000	512,000	56,000	16,000
18,000		25,000	644,000	576,000	56,000	18,000
20,000		32,000	712,000	640,000	60,000	20,000
24,000		32,000	840,000	768,000	60,000	24,000










Derin Delik Matkap Ucu



Ø 12.0 den 52.0 mm ye kadar özel çözümler, 3000 mm toplam uzunluk

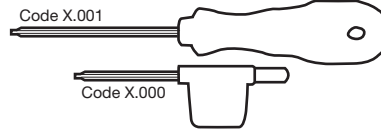
tutucu ölçüsü	çap aralığı tutucu	gövde/tutucu	uçlar (dış)				uç		
									
			TiN- kaplama	FIRE- kaplama	Signum- kaplama	TiAlN nanoA- kaplama			
0.	Ø12.00 - Ø12.49	Gövde/ tutucu, müşteri ihtiyaçlarına göre. 10xD ve toplam uzunluk 3000mm Alternatif: Standar ürün artikel 5644 çap 12mm den 24mm ye kadar, tecih edilen çaplar TiN kaplama uç ve yataklama uçları ile					Ürün no 4071 2.502 T8 M2.5x 5.2	Ürün no 1612 8.001	
	Ø12.50 - Ø12.99								
	Ø13.00 - Ø13.49								
	Ø13.50 - Ø13.99								
	Ø14.00 - Ø14.49								
	Ø14.50 - Ø14.99								
	Ø15.00 - Ø15.49								
	Ø15.50 - Ø15.99								
	Ø16.00 - Ø16.49								
	Ø16.50 - Ø16.99								
1.	Ø16.50 - Ø16.99	Gövde/ tutucu, müşteri ihtiyaçlarına göre. 10xD ve toplam uzunluk 3000mm Alternatif: Standar ürün artikel 5644 çap 12mm den 24mm ye kadar, tecih edilen çaplar TiN kaplama uç ve yataklama uçları ile					Ürün no 4071 3.002 T9 M3x6.4	Ürün no 1612 9.001	
	Ø17.00 - Ø17.49								
	Ø17.50 - Ø17.99								
	Ø18.00 - Ø18.49								
	Ø18.50 - Ø18.99								
	Ø19.00 - Ø19.49								
	Ø19.50 - Ø19.99								
	Ø20.00 - Ø20.49								
	Ø20.50 - Ø20.99								
	Ø21.00 - Ø21.49								
2.	Ø21.50 - Ø21.99	Gövde/ tutucu, müşteri ihtiyaçlarına göre. 10xD ve toplam uzunluk 3000mm Alternatif: Standar ürün artikel 5644 çap 12mm den 24mm ye kadar, tecih edilen çaplar TiN kaplama uç ve yataklama uçları ile					Ürün no 4071 4.001 T15 M4x7.7	Ürün no 1612 15.001	
	Ø22.00 - Ø22.49								
	Ø22.50 - Ø22.99								
	Ø23.00 - Ø23.49								
	Ø23.50 - Ø23.99								
	Ø24.00 - Ø24.49								
	Ø24.50 - Ø24.99								
	Ø25.00 - Ø25.49								
	Ø25.50 - Ø25.99								
	Ø26.00 - Ø26.49								
3.	Ø26.50 - Ø26.99	Gövde/ tutucu, müşteri ihtiyaçlarına göre. 10xD ve toplam uzunluk 3000mm Alternatif: Standar ürün artikel 5644 çap 12mm den 24mm ye kadar, tecih edilen çaplar TiN kaplama uç ve yataklama uçları ile					Ürün no 4071 4.002 T15 M4x10.6	Ürün no 1612 15.001	
	Ø27.00 - Ø27.49								
	Ø27.50 - Ø27.99								
	Ø28.00 - Ø28.49								
	Ø28.50 - Ø28.99								
	Ø29.00 - Ø29.49								
	Ø29.50 - Ø29.99								
	Ø30.00 - Ø30.49								
	Ø30.50 - Ø30.99								
	Ø31.00 - Ø31.49								
4.	Ø31.50 - Ø31.99	Gövde/ tutucu, müşteri ihtiyaçlarına göre. 10xD ve toplam uzunluk 3000mm Alternatif: Standar ürün artikel 5644 çap 12mm den 24mm ye kadar, tecih edilen çaplar TiN kaplama uç ve yataklama uçları ile					Ürün no 4071 5.002 T20 M5x14.2	Ürün no 1612 20.001	
	Ø32.00 - Ø32.49								
	Ø32.50 - Ø32.99								
	Ø33.00 - Ø33.49								
	Ø33.50 - Ø33.99								
	Ø34.00 - Ø34.49								
	Ø34.50 - Ø34.99								
	Ø35.00 - Ø35.49								
	Ø35.50 - Ø35.99								
	Ø36.00 - Ø36.49								
5.	Ø36.50 - Ø36.99	Gövde/ tutucu, müşteri ihtiyaçlarına göre. 10xD ve toplam uzunluk 3000mm Alternatif: Standar ürün artikel 5644 çap 12mm den 24mm ye kadar, tecih edilen çaplar TiN kaplama uç ve yataklama uçları ile					Ürün no 4071 3.002 TX9 M3x6.4	Ürün no 1612 9.001	
	Ø37.00 - Ø37.49								
	Ø37.50 - Ø37.99								
	Ø38.00 - Ø38.49								
	Ø38.50 - Ø38.99								
	Ø39.00 - Ø39.49								
	Ø39.50 - Ø40.00								
	Ø40.01 - Ø40.49								
	Ø40.50 - Ø40.99								
	Ø41.00 - Ø41.49								
6.	Ø41.50 - Ø41.99	Gövde/ tutucu, müşteri ihtiyaçlarına göre. 10xD ve toplam uzunluk 3000mm Alternatif: Standar ürün artikel 5644 çap 12mm den 24mm ye kadar, tecih edilen çaplar TiN kaplama uç ve yataklama uçları ile					Ürün no 4071 4.001 TX15 M4x7.7	Ürün no 1612 15.001	
	Ø42.00 - Ø42.49								
	Ø42.50 - Ø42.99								
	Ø43.00 - Ø43.49								
	Ø43.50 - Ø43.99								
	Ø44.00 - Ø44.49								
	Ø44.50 - Ø44.99								
	Ø45.00 - Ø45.49								
	Ø45.50 - Ø45.99								
	Ø46.00 - Ø46.49								
7.	Ø46.50 - Ø46.99	Gövde/ tutucu, müşteri ihtiyaçlarına göre. 10xD ve toplam uzunluk 3000mm Alternatif: Standar ürün artikel 5644 çap 12mm den 24mm ye kadar, tecih edilen çaplar TiN kaplama uç ve yataklama uçları ile					Ürün no 4071 4.002 TX15 M4x10.6	Ürün no 1612 15.001	
	Ø47.00 - Ø47.49								
	Ø47.50 - Ø47.99								
	Ø48.00 - Ø48.49								
	Ø48.50 - Ø48.99								
	Ø49.00 - Ø49.49								
	Ø49.50 - Ø49.99								
	Ø50.00 - Ø50.49								
	Ø50.50 - Ø50.99								
	Ø51.00 - Ø51.49								
Ø51.50 - Ø52.00									



uçlar (iç)	civatalar	civata sürücüsü	yataklama ucu				civatalar	civata sürücüsü																																																
			TiN- kaplama	FIRE- kaplama	Signum- kaplama	TiAIN nanoA- kaplama																																																		
																																																								
			<table border="1"> <tr><td>P</td><td>•</td></tr> <tr><td>M</td><td>○</td></tr> <tr><td>K</td><td>○</td></tr> <tr><td>N</td><td>•</td></tr> <tr><td>S</td><td>○</td></tr> <tr><td>H</td><td>○</td></tr> </table>	P	•	M	○	K	○	N	•	S	○	H	○	<table border="1"> <tr><td>P</td><td>•</td></tr> <tr><td>M</td><td>○</td></tr> <tr><td>K</td><td>•</td></tr> <tr><td>N</td><td>○</td></tr> <tr><td>S</td><td>○</td></tr> <tr><td>H</td><td>○</td></tr> </table>	P	•	M	○	K	•	N	○	S	○	H	○	<table border="1"> <tr><td>P</td><td>•</td></tr> <tr><td>M</td><td>•</td></tr> <tr><td>K</td><td>•</td></tr> <tr><td>N</td><td>○</td></tr> <tr><td>S</td><td>•</td></tr> <tr><td>H</td><td>○</td></tr> </table>	P	•	M	•	K	•	N	○	S	•	H	○	<table border="1"> <tr><td>P</td><td>○</td></tr> <tr><td>M</td><td>•</td></tr> <tr><td>K</td><td>○</td></tr> <tr><td>N</td><td>○</td></tr> <tr><td>S</td><td>•</td></tr> <tr><td>H</td><td>○</td></tr> </table>	P	○	M	•	K	○	N	○	S	•	H	○	<p>Ürün no 4071 1.601 T5 M1.6x4.4</p>	<p>Ürün no 1612 5.001</p>
P	•																																																							
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H	○																																																							
							<p>Ürün no 4071 2.203 T7 / M2.2x 4.6</p>	<p>Ürün no 1612 7.001</p>																																																
							<p>Ürün no 4071 2.202 T7 / M2.2x5.6</p>																																																	
			<p>Ürün no 5030 + nom.-Ø = sipariş no.</p>	<p>Ürün no 5705 + nom.-Ø = sipariş no.</p>	<p>Ürün no 5703 + nom.-Ø = sipariş no.</p>	<p>Ürün no 5707 + nom.-Ø = sipariş no.</p>	<p>Ürün no 4071 2.502 T8 M2.5x 5.2</p>	<p>Ürün no 1612 8.001</p>																																																
							<p>Ürün no 4071 2.501 T8 M2.5x6.4</p>																																																	
<p><b>kaplamasız</b> özel matkaplar</p> <p><b>TiN</b> özel matkaplar</p> <p><b>FIRE</b> özel matkaplar</p>	<p>Ürün no 4071 4.501 T15 M4.5x11.8</p>	<p>Ürün no 1612 15.001</p>	özel matkaplar	özel matkaplar	özel matkaplar	özel matkaplar	<p>Ürün no 4071 3.003 T9 M3x8</p>	<p>Ürün no 1612 9.001</p>																																																



Torx tornavida



Ürün no

1612

Ölçüler	Code-No.
T5	5,001
T7	7,001
T8	8,001
T9	9,001
T15	15,001
T20	20,001





## Tork anahtarları



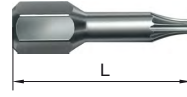
Ürün no

4915

Motor		Nm	Tip	Code-No.
1/4"	alyen	0,4-1	A	1,001
1/4"	alyen	1-5	A	5,001



Torx-Bit uçları



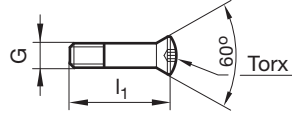
Ürün no

4917

Motor		Torx	L	Code-No.
			mm	
1/4	alyen	T5	25,000	5,000
1/4	alyen	T7	25,000	7,000
1/4	alyen	T8	25,000	8,000
1/4	alyen	T9	25,000	9,000
1/4	alyen	T15	25,000	15,000
1/4	alyen	T20	25,000	20,000



## Sıkma vidaları



Ürün no

4071

G	l1 mm	Torx	Code-No.
M1,6	4,400	T5	1,601
M2,2	5,600	T7	2,202
M2,2	4,600	T7	2,203
M2,5	6,400	T8	2,501
M2,5	5,200	T8	2,502
M3	6,400	T9	3,002
M3	8,000	T9	3,003
M4	7,700	T15	4,001
M4	10,600	T15	4,002
M5	14,200	T20	5,002

Derin Delik Matkap  
Ucu



## DERİN DELİK MATKAP İÇİN AKSESUAR

Derin Delik Matkap  
Ucu

### Tek ağızlı derin delik matkap bileme makinası TBM 116

TBM 116 bir universal elle bileme makinasıdır. Gerekli tüm aksesuarlar üzerinde mevcuttur. Gühring tek ağızlı matkap bileme tertibatı ve Gühring çiftli bileme taşı birlikte mükemmel bir uyum oluşturmaktadır. Bu makine az ve orta sayıdaki bilemeler ve değişik çap ve boyda olan takımların bilenmesi için uygundur. Ayrıca bu özelliklerinin yanı sıra tek ağızlı derin delik matkaplarında enine talaş kırıcı yapılmasını da mümkün kılar.

#### Sipariş içeriği:

Bir bileme makinesi ve iki adet makine lambası ve iki adet priz 220 V (bileme tertibatı ve bileme taşı ekstra sipariş edilmelidir )

#### Makine verileri:

Çalışma gerilimi 380 V/50 Hz, bileme taşı-devir sayısı maksimal 2850 dev./dak, Bileme taşı çapı 150 mm

Ürün no: 600 127 170





## Tek ağızlı derin delik matkap bileme makinası TBV 116, Ø 3 - 30 mm için

Bileme tertibatı, çap aralığı 3 mm'den 30 mm'ye kadar olan tek ağızlı derin delik matkaplarının bilenmesi için tasarlanmıştır. Standart ve özel bileme yapabilmektedir. Kısa puntası sayesinde kanal boyu sınırlamasına gerek kalmamaktadır. Uzun takımları alttan desteklemek için bir dayama çubuğu da sipariş paketinde yer almaktadır. Bu özellikleriyle TBV 116 universal olup her yerde bulunabilen normal el bileme tezgahları üzerinde kullanılabilir. **TBV 116 için çiftli bileme Taşı DSS 125'in kullanılmasını tavsiye ediyoruz.**

### Dikkat:

Tek ağızlı derin delik matkaplarda kanal boşluk açısı 120°'dir ve bu yüzden tutucu bir pensle indeks tablaya bağlanamaz. Pensle bağlandığında takım zarar görebilir.

**Ürün no:** 600 127 171



## Tek ağızlı derin delik matkabı bileme makinası TBV 216, Ø 1 - 6 mm için

Yeni bir universal bileme teçhizatı olan TBV 216, çap aralığı 1,0 - 6,0 mm ve azami boyu 350 mm olan derin delik matkaplarının bilenmesi için uygun olup, bileme elle ve sadece dört iş adımıyla yapılmaktadır. Bileme işlemi 3 ayrı ekseninde dönebilen bir tertibat yardımıyla farklı bileme açıları verilerek uygulanır. Tüm açılar birbirinden bağımsız olarak ayarlanabilir ve gerektiğinde tekrar düzeltilebilir.

**Bu teçhizat için tekli bileme taşı ESS 125 ,i tavsiye ediyoruz. Sipariş içeriği**

### Sipariş içeriği:

Kılavuz burç takımı çapları: 1,0 / 1,5 / 2,0 / 2,5 / 3,0 / 3,5 mm  
-Çeşitli ara parçalar:merkezeleme mikroskobu, kumlama ve skalalı mercek

**Ürün no:** 600 132 346





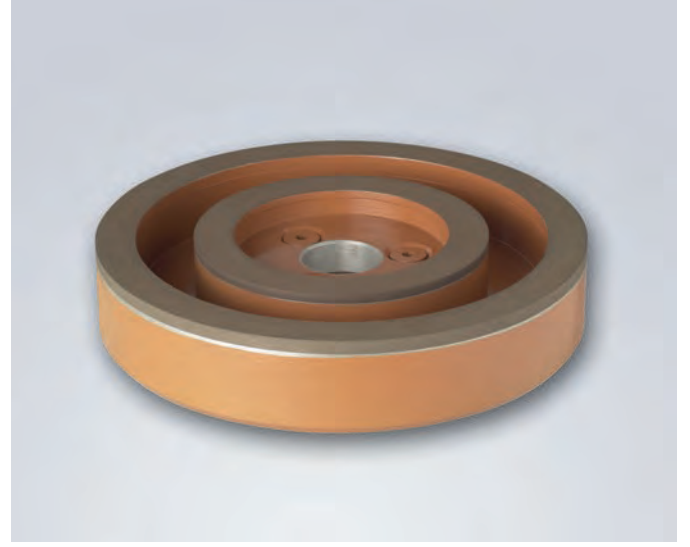
### Çiftli bileme taşı DSS 125

Çift bileme taşı DSS 125 birbirine vidalanarak sabitlenen iki taştan oluşan ve birlikte bilenen bir taş takımıdır. Söz konusu takım aşındırmanın büyük bölümünü yapan bir adet iri taneli dışta duran elmas taş ve kesici ağızların finiş taşlamasını yapan içte duran bir elmas taştan oluşmaktadır. Belli aralıklarla bir temizleme taşı ile taşın üzerinde biriken bileme artığı tozların süpürülmesi gereklidir, aksi takdirde muhtemelen oluşacak aşırı sıcaklık sert metal ağızlara zarar verecektir.

#### DSS 125 aşağıdakilerden oluşur:

Dış taş Ø 125 mm, elmas genişliği 10 mm, elmas et kalınlığı 3 mm, delik Ø 20 mm, tane iriliği D 126 İç taş Ø 75 mm, elmas genişliği 10 mm, elmas et kalınlığı 2 mm, delik Ø 20 mm, tane iriliği D 46

Ürün no: 400 110 098



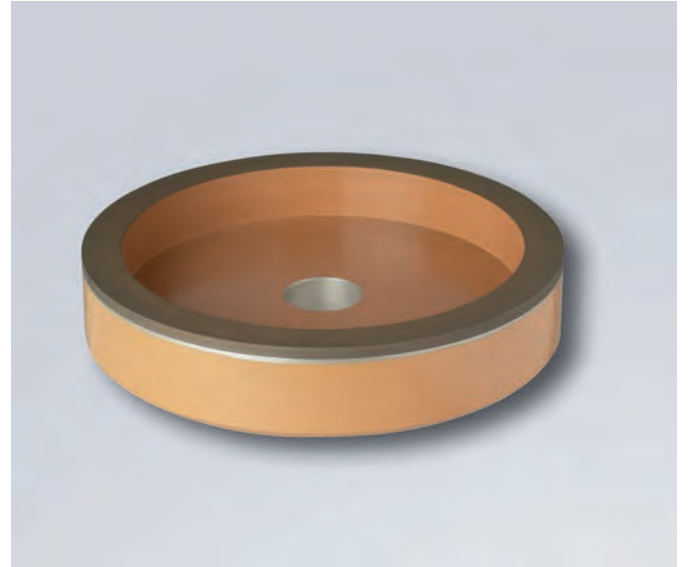
### Tekli bileme taşı ESS 125

ESS bileme taşı ince taneli bir elmas taştır. Bu taşla takım kesme ağızlarında iyi bir yüzey finish elde edilir. Zaman zaman bir temizleme taşı ile taş üzerindeki bileme tozlarının temizlenmesi faydalı olur. Aksi takdirde oluşan aşırı ısı karbür kesici ağızlara zarar verebilir.

#### ESS 125 aşağıdaki gibidir:

- Ø 125 mm çap, taş genişliği 10 mm,  
elmas kalınlığı 3 mm, iç çap Ø 20 mm, tane iriliği D 25

Ürün no: 400 119 203



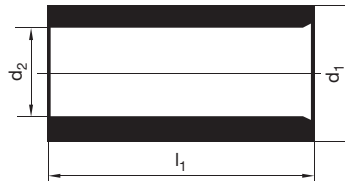


## Delik delme kovani



Malzeme

Kom. sert metal



Ürün no

5748

d2	d1	l1	Code-No.
mm	mm	mm	
0,900	3,000	9,000	0,900
1,590	4,000	9,000	1,590
1,600	4,000	9,000	1,600
1,605	4,000	9,000	1,605
2,000	5,000	9,000	2,000
2,030	5,000	9,000	2,030
2,040	5,000	9,000	2,040
2,500	5,000	9,000	2,500
3,000	6,000	12,000	3,000
3,500	7,000	12,000	3,500
3,750	7,000	12,000	3,750
4,000	7,000	12,000	4,000
4,500	8,000	12,000	4,500
5,000	8,000	12,000	5,000
5,200	10,000	16,000	5,200
5,500	10,000	16,000	5,500
5,515	10,000	16,000	5,515
5,525	10,000	16,000	5,525
6,000	10,000	16,000	6,000
6,100	12,000	16,000	6,100
6,900	12,000	16,000	6,900
7,100	12,000	16,000	7,100
8,000	12,000	16,000	8,000
8,015	12,000	16,000	8,015
8,510	15,000	20,000	8,510
10,000	15,000	20,000	10,000
10,920	18,000	20,000	10,920
11,000	18,000	20,000	11,000
12,000	18,000	20,000	12,000
12,030	18,000	20,000	12,030

d2	d1	l1	Code-No.
mm	mm	mm	
12,600	22,000	28,000	12,600
14,000	22,000	28,000	14,000
14,030	22,000	28,000	14,030
14,400	22,000	28,000	14,400
16,000	26,000	28,000	16,000
16,030	26,000	28,000	16,030
16,200	26,000	28,000	16,200
18,000	26,000	28,000	18,000
18,030	26,000	28,000	18,030
18,050	26,000	28,000	18,050
20,000	30,000	36,000	20,000
20,030	30,000	36,000	20,030
22,000	30,000	36,000	22,000
22,030	30,000	36,000	22,030
22,120	35,000	36,000	22,120
23,500	35,000	36,000	23,500
24,000	35,000	36,000	24,000
24,030	35,000	36,000	24,030
25,000	35,000	36,000	25,000
26,000	35,000	36,000	26,000
30,000	42,000	45,000	30,000
34,000	48,000	45,000	34,000
40,000	55,000	55,000	40,000

Derin Delik Matkap  
Ucu

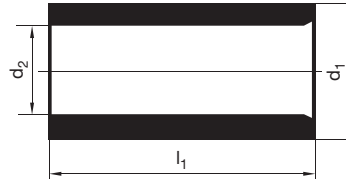


## Delik delme kovani



Malzeme

HSS



Ürün no

5747

Derin Delik Matkap  
Ucu

d2	d1	l1	Code-No.	d2	d1	l1	Code-No.
mm	mm	mm		mm	mm	mm	
0,900	3,000	9,000	0,900	6,800	12,000	16,000	6,800
1,600	4,000	9,000	1,600	7,000	12,000	16,000	7,000
2,000	5,000	9,000	2,000	7,100	12,000	16,000	7,100
2,200	5,000	9,000	2,200	7,400	12,000	16,000	7,400
2,340	5,000	9,000	2,340	7,500	12,000	16,000	7,500
2,700	6,000	12,000	2,700	7,600	12,000	16,000	7,600
3,000	6,000	12,000	3,000	7,800	12,000	16,000	7,800
3,100	6,000	12,000	3,100	7,830	12,000	16,000	7,830
3,255	6,000	12,000	3,255	7,938	12,000	16,000	7,938
3,300	6,000	12,000	3,300	8,000	12,000	16,000	8,000
3,400	7,000	12,000	3,400	8,020	12,000	16,000	8,020
3,500	7,000	12,000	3,500	8,050	12,000	16,000	8,050
3,650	7,000	12,000	3,650	8,100	15,000	20,000	8,100
3,700	7,000	12,000	3,700	8,500	15,000	20,000	8,500
3,800	7,000	12,000	3,800	8,530	15,000	20,000	8,530
4,000	7,000	12,000	4,000	8,800	15,000	20,000	8,800
4,100	8,000	12,000	4,100	9,000	15,000	20,000	9,000
4,300	8,000	12,000	4,300	9,100	15,000	20,000	9,100
4,500	8,000	12,000	4,500	9,200	15,000	20,000	9,200
4,600	8,000	12,000	4,600	9,300	15,000	20,000	9,300
4,760	8,000	12,000	4,760	9,500	15,000	20,000	9,500
4,763	8,000	12,000	4,763	9,525	15,000	20,000	9,525
4,800	8,000	12,000	4,800	9,530	15,000	20,000	9,530
5,000	8,000	12,000	5,000	9,570	15,000	20,000	9,570
5,020	8,000	12,000	5,020	9,652	15,000	20,000	9,652
5,100	10,000	16,000	5,100	9,800	15,000	20,000	9,800
5,200	10,000	16,000	5,200	10,000	15,000	20,000	10,000
5,300	10,000	16,000	5,300	10,100	18,000	20,000	10,100
5,500	10,000	16,000	5,500	10,600	18,000	20,000	10,600
5,600	10,000	16,000	5,600	11,080	18,000	20,000	11,080
5,800	10,000	16,000	5,800	11,100	18,000	20,000	11,100
6,000	10,000	16,000	6,000	11,113	18,000	20,000	11,113
6,050	10,000	16,000	6,050	11,500	18,000	20,000	11,500
6,100	12,000	16,000	6,100	11,600	18,000	20,000	11,600
6,300	12,000	16,000	6,300	12,000	18,000	20,000	12,000
6,350	12,000	16,000	6,350	12,020	18,000	20,000	12,020
6,370	12,000	16,000	6,370	12,100	22,000	28,000	12,100
6,502	12,000	16,000	6,502	12,530	22,000	28,000	12,530
6,600	12,000	16,000	6,600	12,600	22,000	28,000	12,600
6,730	12,000	16,000	6,730	12,700	22,000	28,000	12,700
6,731	12,000	16,000	6,731	12,800	22,000	28,000	12,800
6,750	12,000	16,000	6,750	12,954	22,000	28,000	12,954





d2	d1	l1	Code-No.
mm	mm	mm	
13,000	22,000	28,000	13,000
13,400	22,000	28,000	13,400
13,500	22,000	28,000	13,500
13,700	22,000	28,000	13,700
13,800	22,000	28,000	13,800
14,000	22,000	28,000	14,000
14,310	22,000	28,000	14,310
14,620	22,000	28,000	14,620
14,770	22,000	28,000	14,770
15,000	22,000	28,000	15,000
15,875	26,000	28,000	15,875
16,000	26,000	28,000	16,000
16,330	26,000	28,000	16,330
17,040	26,000	28,000	17,040
17,080	26,000	28,000	17,080
18,000	26,000	28,000	18,000
18,255	30,000	36,000	18,255
18,450	30,000	36,000	18,450
19,000	30,000	36,000	19,000
19,050	30,000	36,000	19,050
19,300	30,000	36,000	19,300
19,700	30,000	36,000	19,700
20,000	30,000	36,000	20,000
21,050	30,000	36,000	21,050

d2	d1	l1	Code-No.
mm	mm	mm	
22,000	30,000	36,000	22,000
22,100	35,000	36,000	22,100
22,120	35,000	36,000	22,120
22,225	35,000	36,000	22,225
23,500	35,000	36,000	23,500
24,000	35,000	36,000	24,000
24,500	35,000	36,000	24,500
25,000	35,000	36,000	25,000
25,250	35,000	36,000	25,250
25,400	35,000	36,000	25,400
26,000	35,000	36,000	26,000
28,000	42,000	45,000	28,000
28,169	42,000	45,000	28,169
30,000	42,000	45,000	30,000
30,100	48,000	45,000	30,100
34,000	48,000	45,000	34,000
38,100	55,000	55,000	38,100
40,000	55,000	55,000	40,000



## Derin delik delme makinaları için aksesuarlar

Konvensiyonel makinaların aksine, gerekli aksesuarlar, delme burçları, kapatma diskleri vb derin delik delme makinalarının standart parçalarıdır. Takip eden sayfalarda bu ürünlerin seçimini bulacaksınız.



Gösterim orjinalden farklı olabilir

### Aksesuarlar

Kapatma diskleri ,destek burçları. 5749, 5750, 5751, 5752 and 5753 her zaman kullanılacak derin delik matkabının kodunu içerir. Sipariş ederken, lütfen art. no. + tablodaki kodlardan seçiniz!

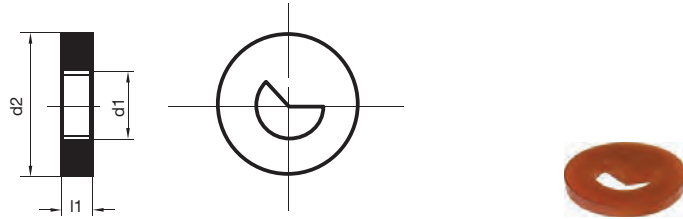
### Karar verme tablosu kod no. / aksesuarlar için derin delik delme matkap çapı

Kod no	Derin delik matkapları için Nominal çap d1	
	mm den	mm ye
1,900	2,000	2,099
2,000	2,100	2,199
2,100	2,200	2,299
2,200	2,300	2,399
2,300	2,400	2,499
2,400	2,500	2,599
2,500	2,600	2,699
2,600	2,700	2,799
2,700	2,800	2,899
2,800	2,900	3,099
3,000	3,100	3,359
3,200	3,360	3,459
3,300	3,460	3,559
3,400	3,560	3,799
3,600	3,800	3,959
3,700	3,960	4,259
4,000	4,260	4,499
4,200	4,500	4,749
4,500	4,750	4,999
4,700	5,000	5,249
5,000	5,250	5,499
5,200	5,500	5,749
5,500	5,750	5,999
5,700	6,000	6,249
6,000	6,250	6,449
6,200	6,450	6,749
6,500	6,750	6,999
6,700	7,000	7,299
7,000	7,300	7,599
7,300	7,600	7,799
7,500	7,800	7,999
7,700	8,000	8,299
8,000	8,300	8,699
8,400	8,700	8,999
8,700	9,000	9,299
9,000	9,300	9,699

Kod no	Derin delik matkapları için Nominal çap d1	
	mm den	mm ye
9,400	9,700	9,999
9,700	10,000	10,299
10,000	10,300	10,799
10,500	10,800	11,299
11,000	11,300	11,799
11,500	11,800	12,399
12,000	12,400	12,899
12,500	12,900	13,399
13,000	13,400	13,899
13,500	13,900	14,399
14,000	14,400	14,899
14,500	14,900	15,399
15,000	15,400	15,899
15,500	15,900	16,399
16,000	16,400	16,899
16,500	16,900	17,399
17,000	17,400	17,899
17,500	17,900	18,399
18,000	18,400	19,509
19,000	19,510	20,509
20,000	20,510	21,509
21,000	21,510	22,609
22,000	22,610	23,609
23,000	23,610	24,609
24,000	24,610	25,609
25,000	25,610	26,609
26,000	26,610	27,609
27,000	27,610	28,609
28,000	28,610	29,609
29,000	29,610	30,609
30,000	30,610	32,609
32,000	32,610	34,699
34,000	34,700	36,699
36,000	36,700	38,699
38,000	38,700	40,000



## Tek ağızlı derin delik matkabı için sızdırmazlık contaları



Ürün no 5752

d1	Ø-Aralığı	d2	l1	Code-No.
mm		mm	mm	
2,100	2,200-2,299	20,000	4,000	2,100
2,200	2,300-2,399	20,000	4,000	2,200
2,600	2,700-2,799	20,000	4,000	2,600
2,800	2,900-3,099	20,000	4,000	2,800
3,000	3,100-3,359	20,000	4,000	3,000
3,300	3,460-3,559	20,000	4,000	3,300
3,400	3,560-3,799	20,000	4,000	3,400
3,600	3,800-3,959	20,000	4,000	3,600
3,700	3,960-4,259	20,000	4,000	3,700
4,000	4,260-4,499	20,000	4,000	4,000
4,200	4,500-4,749	20,000	4,000	4,200
4,500	4,750-4,999	20,000	4,000	4,500
4,700	5,000-5,249	20,000	4,000	4,700
5,000	5,250-5,499	32,000	4,000	5,000
5,200	5,500-5,749	32,000	4,000	5,200
5,500	5,750-5,999	32,000	4,000	5,500
5,700	6,000-6,249	32,000	4,000	5,700
6,000	6,250-6,449	32,000	4,000	6,000
6,200	6,450-6,749	32,000	4,000	6,200
6,500	6,750-6,999	32,000	4,000	6,500
6,700	7,000-7,299	32,000	4,000	6,700
7,000	7,300-7,599	32,000	4,000	7,000
7,300	7,600-7,799	32,000	4,000	7,300
7,500	7,800-7,999	32,000	4,000	7,500
7,700	8,000-8,299	32,000	4,000	7,700
8,000	8,300-8,699	32,000	4,000	8,000
8,400	8,700-8,999	32,000	4,000	8,400
8,700	9,000-9,299	32,000	4,000	8,700
9,000	9,300-9,699	32,000	4,000	9,000
9,400	9,700-9,999	32,000	4,000	9,400
9,700	10,000-10,299	32,000	4,000	9,700
10,000	11,300-11,799	32,000	4,000	10,000
10,500	10,800-11,299	32,000	4,000	10,500
11,000	11,300-11,799	32,000	4,000	11,000
11,500	11,800-12,399	32,000	4,000	11,500
12,000	12,400-12,899	32,000	4,000	12,000
12,500	12,900-13,399	32,000	4,000	12,500
13,500	13,900-14,399	32,000	4,000	13,500
14,000	14,400-14,899	32,000	4,000	14,000
14,500	14,900-15,399	32,000	4,000	14,500
15,000	15,400-15,899	32,000	4,000	15,000
15,500	15,900-16,399	40,000	4,000	15,500
16,500	16,900-17,399	40,000	4,000	16,500
17,000	17,400-17,899	40,000	4,000	17,000
17,500	17,900-18,399	40,000	4,000	17,500
18,000	18,400-19,509	40,000	4,000	18,000
19,000	19,510-20,509	40,000	4,000	19,000
20,000	20,510-21,509	40,000	4,000	20,000

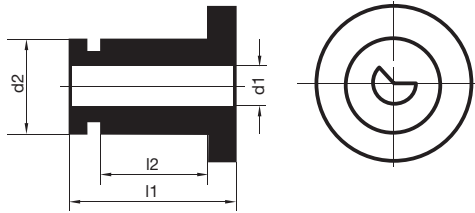
Derin Delik Matkap  
Ucu



d1	Ø-Aralığı	d2	l1	Code-No.
mm		mm	mm	
21,000	21,510-22,609	40,000	4,000	21,000
22,000	22,610-23,609	40,000	4,000	22,000
23,000	23,610-24,609	40,000	4,000	23,000
24,000	24,610-25,609	40,000	4,000	24,000
25,000	25,610-26,609	40,000	4,000	25,000
27,000	27,610-28,609	90,000	4,000	27,000
29,000	29,610-30,609	90,000	4,000	29,000
30,000	30,610-32,609	90,000	4,000	30,000
32,000	32,610-34,699	90,000	4,000	32,000
36,000	36,700-38,699	90,000	4,000	36,000
38,000	38,700-40,000	90,000	4,000	38,000



## Tek ağızlı matkap ucu için yataklama burcu



Ürün no

5750

d1	Ø-Aralığı	d2	l1	l2	Code-No.
mm		mm	mm	mm	
2,100	2,200-2,299	20,000	20,000	12,000	202,100
2,600	2,700-2,799	20,000	20,000	12,000	202,600
2,800	2,900-3,099	20,000	20,000	12,000	202,800
3,000	3,100-3,359	20,000	20,000	12,000	203,000
3,300	3,460-3,559	20,000	20,000	12,000	203,300
3,700	3,960-4,259	20,000	20,000	12,000	203,700
4,700	5,000-5,249	20,000	20,000	12,000	204,700
5,700	6,000-6,249	20,000	20,000	12,000	205,700
6,700	7,000-7,299	20,000	20,000	12,000	206,700
7,700	8,000-8,299	20,000	20,000	12,000	207,700
8,000	8,300-8,699	20,000	20,000	12,000	208,000
8,700	9,000-9,299	20,000	20,000	12,000	208,700
9,700	10,000-10,299	20,000	20,000	12,000	209,700
11,500	11,800-12,399	20,000	20,000	12,000	211,500
3,700	3,960-4,259	30,000	26,000	13,000	303,700
4,000	4,260-4,499	30,000	26,000	13,000	304,000
4,200	4,500-4,749	30,000	26,000	13,000	304,200
4,500	4,750-4,999	30,000	26,000	13,000	304,500
4,700	5,000-5,249	30,000	26,000	13,000	304,700
5,000	5,250-5,499	30,000	26,000	13,000	305,000
5,200	5,500-5,749	30,000	26,000	13,000	305,200
5,500	5,750-5,999	30,000	26,000	13,000	305,500
5,700	6,000-6,249	30,000	26,000	13,000	305,700
6,000	6,250-6,449	30,000	26,000	13,000	306,000
6,200	6,450-6,749	30,000	26,000	13,000	306,200
6,500	6,750-6,999	30,000	26,000	13,000	306,500
6,700	7,000-7,299	30,000	26,000	13,000	306,700
7,000	7,300-7,599	30,000	26,000	13,000	307,000
7,300	7,600-7,799	30,000	26,000	13,000	307,300
7,500	7,800-7,999	30,000	26,000	13,000	307,500
7,700	8,000-8,299	30,000	26,000	13,000	307,700
8,000	8,300-8,699	30,000	26,000	13,000	308,000
8,400	8,700-8,999	30,000	26,000	13,000	308,400
8,700	9,000-9,299	30,000	26,000	13,000	308,700
9,000	9,300-9,699	30,000	26,000	13,000	309,000
9,400	9,700-9,999	30,000	26,000	13,000	309,400
9,700	10,000-10,299	30,000	26,000	13,000	309,700
10,000	10,300-10,799	30,000	26,000	13,000	310,000
10,500	10,800-11,299	30,000	26,000	13,000	310,500
11,000	11,300-11,799	30,000	26,000	13,000	311,000
11,500	11,800-12,399	30,000	26,000	13,000	311,500
12,000	12,400-12,899	30,000	26,000	13,000	312,000
12,500	12,900-13,399	30,000	26,000	13,000	312,500
13,500	13,900-14,399	30,000	26,000	13,000	313,500
14,000	14,400-14,899	30,000	26,000	13,000	314,000
14,500	14,900-15,399	30,000	26,000	13,000	314,500
15,000	15,400-15,899	30,000	26,000	13,000	315,000
15,500	15,900-16,399	30,000	26,000	13,000	315,500

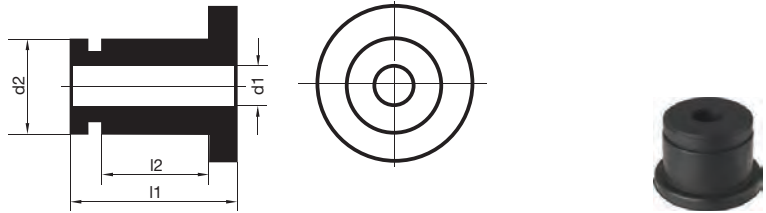
Derin Delik Matkap Ucu



d1	Ø-Aralığı	d2	l1	l2	Code-No.
mm		mm	mm	mm	
16,500	16,900-17,399	30,000	26,000	13,000	316,500
17,000	17,400-17,899	30,000	26,000	13,000	317,000
17,500	17,900-18,399	30,000	26,000	13,000	317,500
18,000	18,400-19,509	30,000	26,000	13,000	318,000
19,000	19,510-20,509	30,000	26,000	13,000	319,000
21,000	21,510-22,609	30,000	26,000	13,000	321,000
20,000	20,510-21,509	45,000	26,000	16,000	420,000
21,000	21,510-22,609	45,000	26,000	16,000	421,000
22,000	22,610-23,609	45,000	26,000	16,000	422,000
23,000	23,610-24,609	45,000	26,000	16,000	423,000
24,000	24,610-25,609	45,000	26,000	16,000	424,000
25,000	25,610-26,609	45,000	26,000	16,000	425,000
27,000	27,610-28,609	45,000	26,000	16,000	427,000
28,000	28,610-29,609	45,000	26,000	16,000	428,000
29,000	29,610-30,609	45,000	26,000	16,000	429,000
30,000	30,610-32,609	45,000	26,000	16,000	430,000
32,000	32,610-34,699	45,000	26,000	16,000	432,000
34,000	34,700-36,699	45,000	26,000	16,000	434,000



## Tek ve iki ağızlı derin delik matkapları için lünet burçları



Ürün no 5749

d1	Ø-Aralığı	d2	l1	l2	Code-No.
mm		mm	mm	mm	
3,000	3,100-3,359	20,000	22,000	12,000	203,000
3,700	3,960-4,259	20,000	22,000	12,000	203,700
4,500	4,750-4,999	20,000	22,000	12,000	204,500
4,700	5,000-5,249	20,000	22,000	12,000	204,700
5,700	6,000-6,249	20,000	22,000	12,000	205,700
8,000	8,300-8,699	20,000	22,000	12,000	208,000
9,700	10,000-10,299	20,000	22,000	12,000	209,700
2,200	2,300-2,399	30,000	26,000	13,000	302,200
3,000	3,100-3,359	30,000	26,000	13,000	303,000
3,300	3,460-3,559	30,000	26,000	13,000	303,300
3,400	3,560-3,799	30,000	26,000	13,000	303,400
3,600	3,800-3,959	30,000	26,000	13,000	303,600
3,700	3,960-4,259	30,000	26,000	13,000	303,700
4,000	4,260-4,499	30,000	26,000	13,000	304,000
4,200	4,500-4,749	30,000	26,000	13,000	304,200
4,500	4,750-4,999	30,000	26,000	13,000	304,500
4,700	5,000-5,249	30,000	26,000	13,000	304,700
5,000	5,250-5,499	30,000	26,000	13,000	305,000
5,200	5,500-5,749	30,000	26,000	13,000	305,200
5,500	5,750-5,999	30,000	26,000	13,000	305,500
5,700	6,000-6,249	30,000	26,000	13,000	305,700
6,000	6,250-6,449	30,000	26,000	13,000	306,000
6,200	6,450-6,749	30,000	26,000	13,000	306,200
6,700	7,000-7,299	30,000	26,000	13,000	306,700
7,500	7,800-7,999	30,000	26,000	13,000	307,500
7,700	8,000-8,299	30,000	26,000	13,000	307,700
8,700	9,000-9,299	30,000	26,000	13,000	308,700
9,000	9,300-9,699	30,000	26,000	13,000	309,000
9,700	10,000-10,299	30,000	26,000	13,000	309,700
10,000	10,300-10,799	30,000	26,000	13,000	310,000
10,500	10,800-11,299	30,000	26,000	13,000	310,500
11,000	11,300-11,799	30,000	26,000	13,000	311,000
11,500	11,800-12,399	30,000	26,000	13,000	311,500
12,000	12,400-12,899	30,000	26,000	13,000	312,000
12,500	12,900-13,399	30,000	26,000	13,000	312,500
13,500	13,900-14,399	30,000	26,000	13,000	313,500
14,000	14,400-14,899	30,000	26,000	13,000	314,000
14,500	14,900-15,399	30,000	26,000	13,000	314,500
15,000	15,400-15,899	30,000	26,000	13,000	315,000
15,500	15,900-16,399	30,000	26,000	13,000	315,500
16,600	17,900-18,399	30,000	26,000	13,000	316,600
17,000	17,400-17,899	30,000	26,000	13,000	317,000
17,500	17,900-18,399	30,000	26,000	13,000	317,500
18,000	18,400-19,509	30,000	26,000	13,000	318,000
19,000	19,510-20,509	30,000	26,000	13,000	319,000
20,000	20,510-21,509	30,000	26,000	13,000	320,000
21,000	21,510-22,609	30,000	26,000	13,000	321,000
22,000	22,610-23,609	30,000	26,000	13,000	322,000

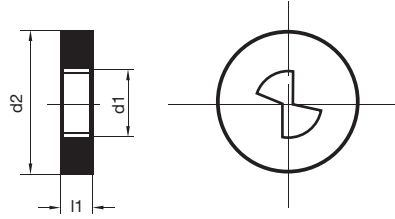


d1	Ø-Aralığı	d2	l1	l2	Code-No.
mm		mm	mm	mm	
23,000	23,610-24,609	30,000	26,000	13,000	323,000
24,000	24,610-25,609	30,000	26,000	13,000	324,000
4,700	5,000-5,249	45,000	26,000	16,000	404,700
6,200	6,450-6,749	45,000	26,000	16,000	406,200
7,500	7,800-7,999	45,000	26,000	16,000	407,500
7,700	8,000-8,299	45,000	26,000	16,000	407,700
9,000	9,300-9,699	45,000	26,000	16,000	409,000
9,400	9,700-9,999	45,000	26,000	16,000	409,400
9,700	10,000-10,299	45,000	26,000	16,000	409,700
11,500	11,800-12,399	45,000	26,000	16,000	411,500
14,000	14,400-14,899	45,000	26,000	16,000	414,000
15,000	15,400-15,899	45,000	26,000	16,000	415,000
15,500	15,900-16,399	45,000	26,000	16,000	415,500
17,500	17,900-18,399	45,000	26,000	16,000	417,500
18,000	18,400-19,509	45,000	26,000	16,000	418,000
19,000	19,510-20,509	45,000	26,000	16,000	419,000
21,000	21,510-22,609	45,000	26,000	16,000	421,000
24,000	24,610-25,609	45,000	26,000	16,000	424,000
25,000	25,610-26,609	45,000	26,000	16,000	425,000
26,000	26,610-27,609	45,000	26,000	16,000	426,000
27,000	27,610-28,609	45,000	26,000	16,000	427,000
29,000	29,610-30,609	45,000	26,000	16,000	429,000
32,000	32,610-34,699	45,000	26,000	16,000	432,000





## Çift ağızlı derin delik matkabı için sızdırmazlık contaları



Ürün no

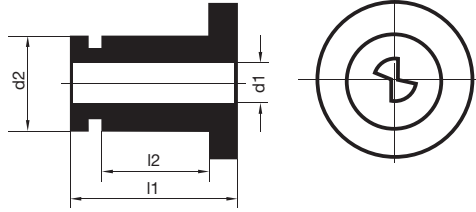
5753

d1 mm	Ø-Aralığı	d2 mm	l1 mm	Code-No.
5,700	6,000-6,249	32,000	4,000	5,700
7,700	8,000-8,299	32,000	4,000	7,700
8,700	9,000-9,299	32,000	4,000	8,700
9,000	9,300-9,699	32,000	4,000	9,000
9,700	10,000-10,299	32,000	4,000	9,700
11,500	11,800-12,399	32,000	4,000	11,500
13,500	13,900-14,399	32,000	4,000	13,500
15,500	15,900-16,399	40,000	4,000	15,500
19,000	19,510-20,509	40,000	4,000	19,000
23,000	23,610-24,609	40,000	4,000	23,000
25,000	25,610-26,609	40,000	4,000	25,000

Derin Delik Matkap  
Ucu



## Çift ağızlı derin delik matkap ucu için yataklama burcu



Ürün no

5751

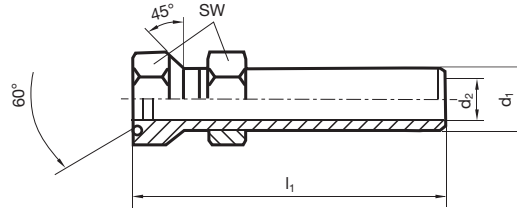
d1	Ø-Aralığı	d2	l1	l2	Code-No.
mm		mm	mm	mm	
5,700	6,000-6,249	20,000	20,000	12,000	205,700
9,700	10,000-10,299	20,000	20,000	12,000	209,700
6,500	6,750-6,999	30,000	26,000	13,000	306,500
6,700	7,000-7,299	30,000	26,000	13,000	306,700
7,700	8,000-8,299	30,000	26,000	13,000	307,700
9,400	9,700-9,999	30,000	26,000	13,000	309,400
9,700	10,000-10,299	30,000	26,000	13,000	309,700
11,500	11,800-12,399	30,000	26,000	13,000	311,500
15,000	15,400-15,899	30,000	26,000	13,000	315,000
15,500	15,900-16,399	30,000	26,000	13,000	315,500
16,600	17,900-18,399	30,000	26,000	13,000	316,600
17,000	17,400-17,899	30,000	26,000	13,000	317,000
17,500	17,900-18,399	30,000	26,000	13,000	317,500
8,700	9,000-9,299	45,000	26,000	16,000	408,700
13,500	13,900-14,399	45,000	26,000	16,000	413,500
19,000	19,510-20,509	45,000	26,000	16,000	419,000
23,000	23,610-24,609	45,000	26,000	16,000	423,000
24,000	24,610-25,609	45,000	26,000	16,000	424,000
25,000	25,610-26,609	45,000	26,000	16,000	425,000
26,000	26,610-27,609	45,000	26,000	16,000	426,000
27,000	27,610-28,609	45,000	26,000	16,000	427,000



## Ayar civatası



Contasız ayar vidaları



Ürün no

5754

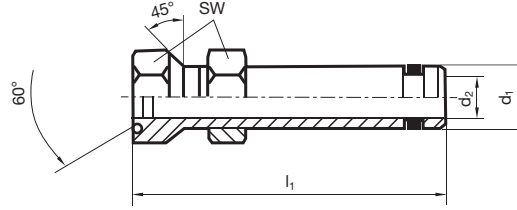
d1	d2	l1	SW	Code-No.
	mm	mm	mm	
M6 x 0,5	3,500	26,000	9,000	6,000
M10 x 1	6,000	38,000	13,000	10,000
M16 x 1,5	10,000	57,000	22,000	16,000



Ayar civatası



Kapama elementi ile ayar vidaları

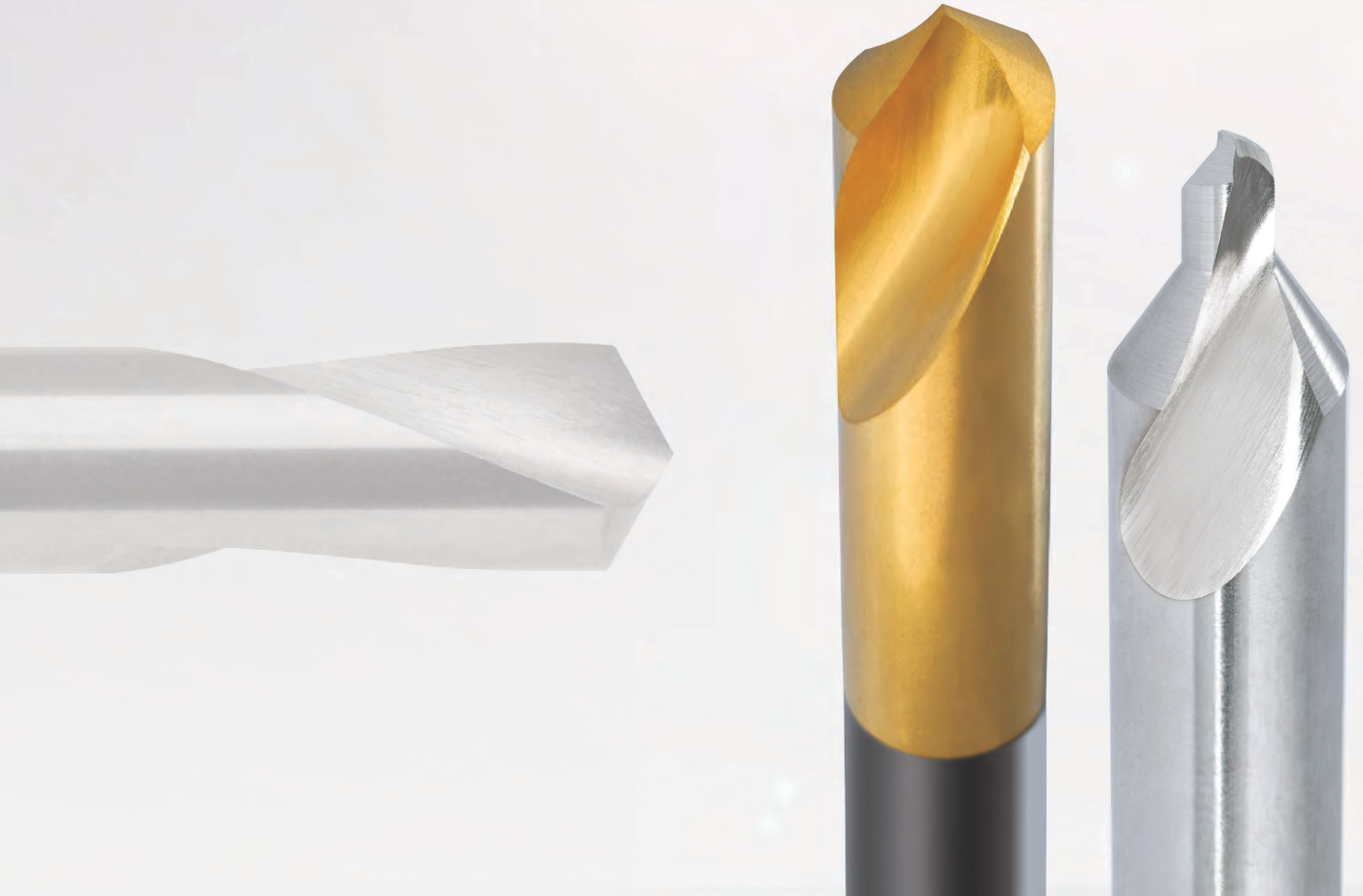


Ürün no 5755

d1	d2	l1	SW	Code-No.
	mm	mm	mm	
M6 x 0,5	3,500	45,000	9,000	6,000
M10 x 1	6,000	50,000	13,000	10,000
M16 x 1,5	10,000	65,000	22,000	16,000
M24X1,5	16,000	90,000	30,000	24,000

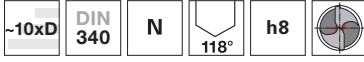
# NC punta ve merkez delik matkapları

Uzun matkap uygulamalarında punta öneririz. NC punta matkaplarımız bu uygulama için özelleştirilmiştir. Formlu deliklerin üretiminde kendi matkaplarımızı öneririz.





## Helisel matkap uçları, uzun

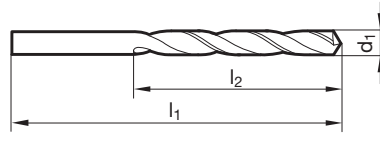


<b>P</b> •	öz bileme $\geq \varnothing 1,000$ • koni bileme • çok derin deliklerde
<b>M</b>	
<b>K</b> •	
<b>N</b> ○	alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit
<b>S</b>	
<b>H</b>	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 786

Malzeme	<b>HSS</b>
Yüzey	$\text{Ra} > 0,2,36$
Kesme yönü	



Ürün no 217

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,400	1/64	30,000	10,000	1,500		70,000	45,000
0,440		30,000	10,000	1,510		76,000	50,000
0,450		30,000	10,000	1,550		76,000	50,000
0,470		30,000	10,000	1,590	1/16	76,000	50,000
0,500		32,000	12,000	1,600		76,000	50,000
0,520		32,000	12,000	1,610		76,000	50,000
0,550		35,000	15,000	1,650		76,000	50,000
0,570		35,000	15,000	1,700		76,000	50,000
0,600		35,000	15,000	1,750		80,000	53,000
0,620		38,000	18,000	1,780		80,000	53,000
0,650		38,000	18,000	1,800		80,000	53,000
0,700		42,000	21,000	1,850		80,000	53,000
0,730		42,000	21,000	1,900		80,000	53,000
0,750		42,000	21,000	1,930		85,000	56,000
0,760		46,000	25,000	1,950		85,000	56,000
0,790	1/32	46,000	25,000	1,980	5/64	85,000	56,000
0,800		46,000	25,000	2,000		85,000	56,000
0,820		46,000	25,000	2,030		85,000	56,000
0,850		46,000	25,000	2,050		85,000	56,000
0,900		51,000	29,000	2,060		85,000	56,000
0,910		51,000	29,000	2,080		85,000	56,000
0,920		51,000	29,000	2,100		85,000	56,000
0,950		51,000	29,000	2,150		90,000	59,000
0,970		56,000	33,000	2,200		90,000	59,000
1,000		56,000	33,000	2,250		90,000	59,000
1,040		56,000	33,000	2,260		90,000	59,000
1,050		56,000	33,000	2,300		90,000	59,000
1,080		60,000	37,000	2,350		90,000	59,000
1,090		60,000	37,000	2,370		95,000	62,000
1,100		60,000	37,000	2,380	3/32	95,000	62,000
1,120		60,000	37,000	2,400		95,000	62,000
1,130		60,000	37,000	2,420		95,000	62,000
1,150		60,000	37,000	2,440		95,000	62,000
1,180		60,000	37,000	2,450		95,000	62,000
1,190	3/64	65,000	41,000	2,490		95,000	62,000
1,200		65,000	41,000	2,500		95,000	62,000
1,250		65,000	41,000	2,550		95,000	62,000
1,300		65,000	41,000	2,580		95,000	62,000
1,350		70,000	45,000	2,600		95,000	62,000
1,400		70,000	45,000	2,620		95,000	62,000
1,450		70,000	45,000	2,640		95,000	62,000
1,490		70,000	45,000	2,650		95,000	62,000



d1		l1	l2
mm	inch	mm	mm
2,700		100,000	66,000
2,710		100,000	66,000
2,750		100,000	66,000
2,780	7/64	100,000	66,000
2,790		100,000	66,000
2,800		100,000	66,000
2,820		100,000	66,000
2,850		100,000	66,000
2,870		100,000	66,000
2,900		100,000	66,000
2,950		100,000	66,000
3,000		100,000	66,000
3,030		106,000	69,000
3,050		106,000	69,000
3,100		106,000	69,000
3,150		106,000	69,000
3,170	1/8	106,000	69,000
3,200		106,000	69,000
3,250		106,000	69,000
3,260		106,000	69,000
3,300		106,000	69,000
3,350		106,000	69,000
3,400		112,000	73,000
3,450		112,000	73,000
3,500		112,000	73,000
3,550		112,000	73,000
3,570	9/64	112,000	73,000
3,600		112,000	73,000
3,650		112,000	73,000
3,660		112,000	73,000
3,700		112,000	73,000
3,750		112,000	73,000
3,800		119,000	78,000
3,850		119,000	78,000
3,860		119,000	78,000
3,900		119,000	78,000
3,910		119,000	78,000
3,950		119,000	78,000
3,970	5/32	119,000	78,000
3,990		119,000	78,000
4,000		119,000	78,000
4,030		119,000	78,000
4,040		119,000	78,000
4,050		119,000	78,000
4,090		119,000	78,000
4,100		119,000	78,000
4,150		119,000	78,000
4,200		119,000	78,000
4,220		119,000	78,000
4,250		119,000	78,000
4,300		126,000	82,000
4,350		126,000	82,000
4,370	11/64	126,000	82,000
4,390		126,000	82,000
4,400		126,000	82,000
4,450		126,000	82,000
4,500		126,000	82,000
4,570		126,000	82,000
4,600		126,000	82,000
4,650		126,000	82,000
4,700		126,000	82,000
4,750		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
4,850		132,000	87,000
4,900		132,000	87,000
4,920		132,000	87,000
4,950		132,000	87,000
4,980		132,000	87,000
5,000		132,000	87,000
5,030		132,000	87,000
5,050		132,000	87,000

d1		l1	l2
mm	inch	mm	mm
5,060		132,000	87,000
5,100		132,000	87,000
5,110		132,000	87,000
5,150		132,000	87,000
5,160	13/64	132,000	87,000
5,180		132,000	87,000
5,200		132,000	87,000
5,220		132,000	87,000
5,250		132,000	87,000
5,300		132,000	87,000
5,310		139,000	91,000
5,350		139,000	91,000
5,400		139,000	91,000
5,410		139,000	91,000
5,450		139,000	91,000
5,500		139,000	91,000
5,550		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,650		139,000	91,000
5,700		139,000	91,000
5,750		139,000	91,000
5,790		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,060		148,000	97,000
6,100		148,000	97,000
6,200		148,000	97,000
6,250		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,700		148,000	97,000
6,750	17/64	156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,100		156,000	102,000
7,140	9/32	156,000	102,000
7,200		156,000	102,000
7,250		156,000	102,000
7,300		156,000	102,000
7,400		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,600		165,000	109,000
7,700		165,000	109,000
7,750		165,000	109,000
7,800		165,000	109,000
7,900		165,000	109,000
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,250		165,000	109,000
8,300		165,000	109,000
8,330	21/64	165,000	109,000
8,400		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,700		175,000	115,000
8,730	11/32	175,000	115,000
8,750		175,000	115,000
8,800		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,100		175,000	115,000
9,130	23/64	175,000	115,000

Derin Delik Matkap Ucu



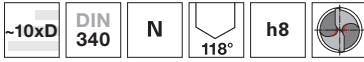
d1		l1	l2
mm	inch	mm	mm
9,200		175,000	115,000
9,300		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,600		184,000	121,000
9,700		184,000	121,000
9,750		184,000	121,000
9,800		184,000	121,000
9,900		184,000	121,000
9,920	25/64	184,000	121,000
10,000		184,000	121,000
10,100		184,000	121,000
10,200		184,000	121,000
10,250		184,000	121,000
10,300		184,000	121,000
10,320	13/32	184,000	121,000
10,400		184,000	121,000
10,500		184,000	121,000
10,700		195,000	128,000
10,720	27/64	195,000	128,000
10,750		195,000	128,000
10,800		195,000	128,000
11,000		195,000	128,000
11,110	7/16	195,000	128,000
11,200		195,000	128,000
11,400		195,000	128,000
11,500		195,000	128,000
11,510	29/64	195,000	128,000
11,600		195,000	128,000
11,700		195,000	128,000
11,750		195,000	128,000
11,800		195,000	128,000
11,910	15/32	205,000	134,000
12,000		205,000	134,000
12,100		205,000	134,000
12,200		205,000	134,000
12,300	31/64	205,000	134,000
12,500		205,000	134,000
12,700	1/2	205,000	134,000
12,800		205,000	134,000
13,000		205,000	134,000
13,200		205,000	134,000
13,490	17/32	214,000	140,000
13,500		214,000	140,000
13,800		214,000	140,000
13,890	35/64	214,000	140,000
14,000		214,000	140,000
14,200		220,000	144,000
14,250		220,000	144,000
14,290	9/16	220,000	144,000
14,490		220,000	144,000
14,500		220,000	144,000
14,900		220,000	144,000

d1		l1	l2
mm	inch	mm	mm
15,000		220,000	144,000
15,080	19/32	227,000	149,000
15,200		227,000	149,000
15,250		227,000	149,000
15,400		227,000	149,000
15,480	39/64	227,000	149,000
15,500		227,000	149,000
15,600		227,000	149,000
15,870	5/8	227,000	149,000
16,000		227,000	149,000
16,270	41/64	235,000	154,000
16,500		235,000	154,000
16,670	21/32	235,000	154,000
17,000		235,000	154,000
17,070	43/64	241,000	158,000
17,460	11/16	241,000	158,000
17,500		241,000	158,000
18,000		241,000	158,000
18,500		247,000	162,000
18,650	47/64	247,000	162,000
19,000		247,000	162,000
19,050	3/4	254,000	166,000
19,500		254,000	166,000
20,000		254,000	166,000
20,500		261,000	171,000
20,640	13/16	261,000	171,000
21,000		261,000	171,000
21,500		268,000	176,000
22,000		268,000	176,000
23,300		275,000	180,000
23,810	15/16	282,000	185,000
24,000		282,000	185,000
25,000	63/64	282,000	185,000
26,190	1 1/32	290,000	190,000
26,500		290,000	190,000
26,990	1 1/16	298,000	195,000
28,570	1 1/8	307,000	201,000
29,000		307,000	201,000
29,370	1 5/32	307,000	201,000
29,500		307,000	201,000
30,160	1 3/16	316,000	207,000
30,960	1 7/32	316,000	207,000
31,000		316,000	207,000
36,510	1 7/16	345,000	225,000





## Helisel matkap uçları, uzun

Malzeme **HSS**Yüzey **S**Kesme yönü **R**

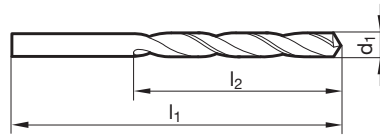
**P** • öz bileme  $\geq \varnothing 1,000$  • koni bileme • çok derin deliklerde • burç kullanarak delme için

**M****K** •

**N** ○ alaşımli/alaşimsız çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

**S****H****GÜHRING**NAVIGATOR

Kesme verileri sayfası 786

Ürün no **667**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,500		32,000	12,000	2,800		100,000	66,000
0,600		35,000	15,000	2,850		100,000	66,000
0,700		42,000	21,000	2,870		100,000	66,000
0,750		42,000	21,000	2,900		100,000	66,000
0,800		46,000	25,000	3,000		100,000	66,000
0,900		51,000	29,000	3,030		106,000	69,000
0,950		51,000	29,000	3,050		106,000	69,000
1,000		56,000	33,000	3,100		106,000	69,000
1,100		60,000	37,000	3,170	1/8	106,000	69,000
1,150		60,000	37,000	3,200		106,000	69,000
1,200		65,000	41,000	3,250		106,000	69,000
1,250		65,000	41,000	3,260		106,000	69,000
1,300		65,000	41,000	3,300		106,000	69,000
1,350		70,000	45,000	3,350		106,000	69,000
1,400		70,000	45,000	3,400		112,000	73,000
1,450		70,000	45,000	3,500		112,000	73,000
1,500		70,000	45,000	3,570	9/64	112,000	73,000
1,550		76,000	50,000	3,600		112,000	73,000
1,590	1/16	76,000	50,000	3,650		112,000	73,000
1,600		76,000	50,000	3,700		112,000	73,000
1,650		76,000	50,000	3,730		112,000	73,000
1,700		76,000	50,000	3,750		112,000	73,000
1,800		80,000	53,000	3,800		119,000	78,000
1,850		80,000	53,000	3,850		119,000	78,000
1,900		80,000	53,000	3,900		119,000	78,000
1,950		85,000	56,000	3,950		119,000	78,000
1,980	5/64	85,000	56,000	3,970	5/32	119,000	78,000
2,000		85,000	56,000	4,000		119,000	78,000
2,100		85,000	56,000	4,050		119,000	78,000
2,200		90,000	59,000	4,100		119,000	78,000
2,300		90,000	59,000	4,200		119,000	78,000
2,350		90,000	59,000	4,250		119,000	78,000
2,370		95,000	62,000	4,300		126,000	82,000
2,380	3/32	95,000	62,000	4,370	11/64	126,000	82,000
2,440		95,000	62,000	4,400		126,000	82,000
2,450		95,000	62,000	4,500		126,000	82,000
2,500		95,000	62,000	4,570		126,000	82,000
2,530		95,000	62,000	4,600		126,000	82,000
2,650		95,000	62,000	4,620		126,000	82,000
2,700		100,000	66,000	4,650		126,000	82,000
2,750		100,000	66,000	4,700		126,000	82,000
2,780	7/64	100,000	66,000	4,750		126,000	82,000

Derin Delik Matkap Ucu

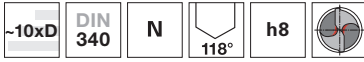


d1		l1	l2	
mm	inch	mm	mm	
4,760	3/16	132,000	87,000	
4,850		132,000	87,000	
4,900		132,000	87,000	
5,000	13/64	132,000	87,000	
5,100		132,000	87,000	
5,160		132,000	87,000	
5,200		132,000	87,000	
5,250		132,000	87,000	
5,300	7/32	132,000	87,000	
5,310		139,000	91,000	
5,400		139,000	91,000	
5,410		139,000	91,000	
5,500		139,000	91,000	
5,560		139,000	91,000	
5,600		139,000	91,000	
5,610	1/4	139,000	91,000	
5,700		139,000	91,000	
5,790		139,000	91,000	
5,900		139,000	91,000	
6,000		139,000	91,000	
6,100		148,000	97,000	
6,200		148,000	97,000	
6,250		148,000	97,000	
6,350		148,000	97,000	
6,400		17/64	148,000	97,000
6,500	148,000		97,000	
6,600	148,000		97,000	
6,750	156,000		102,000	
6,800	156,000		102,000	
7,000	156,000		102,000	
7,100	9/32		156,000	102,000
7,140			156,000	102,000
7,200			156,000	102,000
7,250			156,000	102,000
7,300	19/64		156,000	102,000
7,370			156,000	102,000
7,400		156,000	102,000	
7,500		156,000	102,000	
7,540		165,000	109,000	
7,700		165,000	109,000	
7,940		5/16	165,000	109,000
8,000			165,000	109,000
8,050			165,000	109,000
8,100			165,000	109,000
8,200	11/32	165,000	109,000	
8,250		165,000	109,000	
8,300		165,000	109,000	
8,400		165,000	109,000	
8,500		165,000	109,000	
8,700		175,000	115,000	
8,730		175,000	115,000	
8,800		175,000	115,000	
8,900		175,000	115,000	
9,000		175,000	115,000	

d1		l1	l2
mm	inch	mm	mm
9,100		175,000	115,000
9,300		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,700		184,000	121,000
9,900	25/64	184,000	121,000
9,920		184,000	121,000
10,000		184,000	121,000
10,200		184,000	121,000
10,320	13/32	184,000	121,000
10,500		184,000	121,000
10,720	27/64	195,000	128,000
10,800		195,000	128,000
10,900		195,000	128,000
11,000		195,000	128,000
11,110	7/16	195,000	128,000
11,500		195,000	128,000
11,750		195,000	128,000
11,910	15/32	205,000	134,000
12,000		205,000	134,000
12,500	1/2	205,000	134,000
12,700		205,000	134,000
13,000		205,000	134,000
13,490		205,000	134,000
13,500	17/32	214,000	140,000
13,800		214,000	140,000
13,890	35/64	214,000	140,000
14,000		214,000	140,000
14,290	9/16	220,000	144,000
14,500		220,000	144,000
14,750		220,000	144,000
14,800		220,000	144,000
14,900		220,000	144,000
15,000		220,000	144,000
15,080	19/32	227,000	149,000
16,000		227,000	149,000
16,500	21/32	235,000	154,000
16,670		235,000	154,000
16,750		235,000	154,000
17,000		235,000	154,000
17,460	11/16	241,000	158,000
18,000		241,000	158,000
18,250	7/8	247,000	162,000
22,220		268,000	176,000



## Helisel matkap uçları, uzun

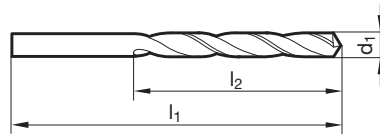


P	•	öz bileme $\geq \varnothing 14,750$ • koni bileme • çok derin deliklerde • burç kullanarak delme için
M		
K	•	
N	o	alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit
S		
H		

## GÜHRING NAVIGATOR

Kesme verileri sayfası 786

Malzeme	HSS
Yüzey	$\text{Ra} > 6,00$
Kesme yönü	



Ürün no 220

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,450		30,000	10,000	4,500		126,000	82,000
0,470		30,000	10,000	4,600		126,000	82,000
0,900		51,000	29,000	4,780		132,000	87,000
0,950		51,000	29,000	4,800		132,000	87,000
1,100		60,000	37,000	4,950		132,000	87,000
1,150		60,000	37,000	5,000		132,000	87,000
1,200		65,000	41,000	5,100		132,000	87,000
1,250		65,000	41,000	5,200		132,000	87,000
1,400		70,000	45,000	5,600		139,000	91,000
1,450		70,000	45,000	5,700		139,000	91,000
1,500		70,000	45,000	6,000		139,000	91,000
1,600		76,000	50,000	6,050		148,000	97,000
1,630		76,000	50,000	6,100		148,000	97,000
1,660		76,000	50,000	6,400		148,000	97,000
1,730		80,000	53,000	6,500		148,000	97,000
1,800		80,000	53,000	6,600		148,000	97,000
1,850		80,000	53,000	6,800		156,000	102,000
1,900		80,000	53,000	7,200		156,000	102,000
2,000		85,000	56,000	7,500		156,000	102,000
2,300		90,000	59,000	7,800		165,000	109,000
2,500		95,000	62,000	8,000		165,000	109,000
2,700		100,000	66,000	8,100		165,000	109,000
2,750		100,000	66,000	8,250		165,000	109,000
2,900		100,000	66,000	8,400		165,000	109,000
2,950		100,000	66,000	8,800		175,000	115,000
3,000		100,000	66,000	9,000		175,000	115,000
3,050		106,000	69,000	9,520	3/8	184,000	121,000
3,070		106,000	69,000	9,700		184,000	121,000
3,100		106,000	69,000	9,800		184,000	121,000
3,250		106,000	69,000	9,900		184,000	121,000
3,300		106,000	69,000	10,000		184,000	121,000
3,350		106,000	69,000	10,100		184,000	121,000
3,400		112,000	73,000	10,500		184,000	121,000
3,500		112,000	73,000	11,000		195,000	128,000
3,550		112,000	73,000	11,500		195,000	128,000
3,600		112,000	73,000	11,900		205,000	134,000
3,700		112,000	73,000	12,000		205,000	134,000
3,800		119,000	78,000	12,200		205,000	134,000
4,000		119,000	78,000	12,500		205,000	134,000
4,050		119,000	78,000	13,000		205,000	134,000
4,250		119,000	78,000	13,500		214,000	140,000
4,300		126,000	82,000	14,750		220,000	144,000

Derin Delik Matkap Ucu

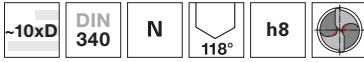


d1		l1	l2
mm	inch	mm	mm
19,000		247,000	162,000
20,000		254,000	166,000
22,000		268,000	176,000
25,000	63/64	282,000	185,000
25,500		290,000	190,000
29,000		307,000	201,000

d1		l1	l2
mm	inch	mm	mm



## Helisel matkap uçları, uzun



P	•	öz bileme $\geq \varnothing 2,950$ • koni bileme • döndürücü dilli
M		
K	•	
N	o	alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit
S		
H		

## GÜHRING NAVIGATOR

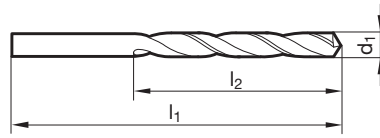
Kesme verileri sayfası 786

Malzeme **HSS**

Yüzey



Kesme yönü

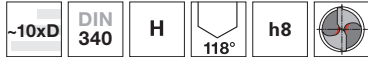
Ürün no **204**

d1		l1	l2
mm	inch	mm	mm
2,950		100,000	66,000
3,000		100,000	66,000
3,100		106,000	69,000
3,170	1/8	106,000	69,000
3,200		106,000	69,000
3,300		106,000	69,000
3,400		112,000	73,000
3,500		112,000	73,000
3,600		112,000	73,000
3,800		119,000	78,000
3,900		119,000	78,000
4,000		119,000	78,000
4,050		119,000	78,000
4,100		119,000	78,000
4,200		119,000	78,000
4,250		119,000	78,000
4,300		126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
5,000		132,000	87,000
5,080		132,000	87,000
5,100		132,000	87,000
5,200		132,000	87,000
5,500		139,000	91,000
5,600		139,000	91,000
5,800		139,000	91,000
5,850		139,000	91,000
5,900		139,000	91,000
6,000		139,000	91,000
6,100		148,000	97,000
6,200		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,700		148,000	97,000
6,750	17/64	156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000

d1		l1	l2
mm	inch	mm	mm
7,000		156,000	102,000
7,400		156,000	102,000
7,500		156,000	102,000
7,600		165,000	109,000
7,700		165,000	109,000
7,800		165,000	109,000
8,000		165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,250		165,000	109,000
8,400		165,000	109,000
8,450		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,750		175,000	115,000
8,800		175,000	115,000
9,000		175,000	115,000
9,300		175,000	115,000
9,400		175,000	115,000
9,700		184,000	121,000
9,800		184,000	121,000
9,900		184,000	121,000
10,000		184,000	121,000
10,200		184,000	121,000
10,300		184,000	121,000
10,400		184,000	121,000
10,500		184,000	121,000
10,800		195,000	128,000
11,600		195,000	128,000
12,000		205,000	134,000
13,000		205,000	134,000
25,250		290,000	190,000



## Helisel matkap uçları, uzun

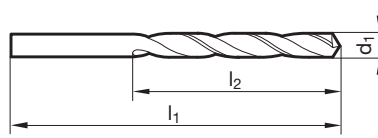
Malzeme **HSS**

Yüzey

Kesme yönü

**P** öz bileme  $\geq \varnothing 15,000$  • koni bileme • çok derin deliklerde**M****K****N** • sert ve kırılğan malzemeler • pirinç, magnezyum alaşımları • bronz,**S** fosforlu bronz • slate, mico, pertinax**H****GÜHRING** NAVIGATOR

Kesme verileri sayfası 786



Ürün no

218

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,500		32,000	12,000	2,300		90,000	59,000
0,520		32,000	12,000	2,350		90,000	59,000
0,550		35,000	15,000	2,400		95,000	62,000
0,600		35,000	15,000	2,500		95,000	62,000
0,650		38,000	18,000	2,550		95,000	62,000
0,700		42,000	21,000	2,600		95,000	62,000
0,750		42,000	21,000	2,650		95,000	62,000
0,800		46,000	25,000	2,700		100,000	66,000
0,820		46,000	25,000	2,800		100,000	66,000
0,840		46,000	25,000	2,830		100,000	66,000
0,850		46,000	25,000	2,870		100,000	66,000
0,900		51,000	29,000	2,900		100,000	66,000
0,950		51,000	29,000	2,940		100,000	66,000
0,970		56,000	33,000	3,000		100,000	66,000
1,000		56,000	33,000	3,020		106,000	69,000
1,050		56,000	33,000	3,050		106,000	69,000
1,100		60,000	37,000	3,060		106,000	69,000
1,150		60,000	37,000	3,100		106,000	69,000
1,200		65,000	41,000	3,150		106,000	69,000
1,250		65,000	41,000	3,180		106,000	69,000
1,300		65,000	41,000	3,200		106,000	69,000
1,400		70,000	45,000	3,250		106,000	69,000
1,500		70,000	45,000	3,270		106,000	69,000
1,550		76,000	50,000	3,300		106,000	69,000
1,560		76,000	50,000	3,400		112,000	73,000
1,570		76,000	50,000	3,500		112,000	73,000
1,580		76,000	50,000	3,550		112,000	73,000
1,600		76,000	50,000	3,600		112,000	73,000
1,650		76,000	50,000	3,800		119,000	78,000
1,700		76,000	50,000	3,900		119,000	78,000
1,750		80,000	53,000	4,000		119,000	78,000
1,800		80,000	53,000	4,030		119,000	78,000
1,820		80,000	53,000	4,100		119,000	78,000
1,850		80,000	53,000	4,200		119,000	78,000
1,900		80,000	53,000	4,300		126,000	82,000
1,950		85,000	56,000	4,400		126,000	82,000
2,000		85,000	56,000	4,500		126,000	82,000
2,050		85,000	56,000	4,600		126,000	82,000
2,100		85,000	56,000	4,700		126,000	82,000
2,180		90,000	59,000	4,760	3/16	132,000	87,000
2,200		90,000	59,000	4,800		132,000	87,000
2,250		90,000	59,000	4,900		132,000	87,000

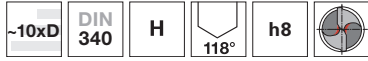


d1		l1	l2
mm	inch	mm	mm
5,000		132,000	87,000
5,100		132,000	87,000
5,200		132,000	87,000
5,300		132,000	87,000
5,400		139,000	91,000
5,450		139,000	91,000
5,500		139,000	91,000
5,600		139,000	91,000
5,900		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,100		148,000	97,000
6,200		148,000	97,000
6,300		148,000	97,000
6,420		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,700		148,000	97,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,200		156,000	102,000
7,350		156,000	102,000
7,500		156,000	102,000

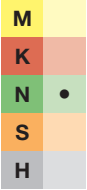
d1		l1	l2
mm	inch	mm	mm
8,000		165,000	109,000
8,200		165,000	109,000
8,300		165,000	109,000
8,700		175,000	115,000
9,000		175,000	115,000
9,500		175,000	115,000
9,700		184,000	121,000
9,900		184,000	121,000
10,000		184,000	121,000
11,250		195,000	128,000
12,100		205,000	134,000
14,000		214,000	140,000
15,000		220,000	144,000
16,000		227,000	149,000



## Helisel matkap uçları, uzun



**P** öz bileme  $\geq \varnothing 15,000$  • koni bileme • çok derin deliklerde



**N** • sert ve kırılğan malzemeler • pirinç, magnezyum alaşımları • bronz, fosforlu bronz • slate, mico, pertinax

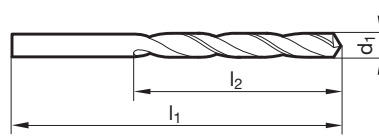
**GÜHRING** NAVIGATOR

Kesme verileri sayfası 786

Malzeme **HSS**

Yüzey

Kesme yönü



Ürün no

**221**

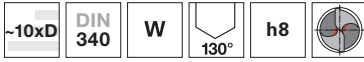
d1		l1	l2
mm	inch	mm	mm
0,450		30,000	10,000
0,600		35,000	15,000
0,650		38,000	18,000
0,900		51,000	29,000
1,100		60,000	37,000
1,240		65,000	41,000
1,300		65,000	41,000
1,320		65,000	41,000
1,370		70,000	45,000
1,400		70,000	45,000
1,500		70,000	45,000
1,550		76,000	50,000
1,800		80,000	53,000
1,850		80,000	53,000
2,000		85,000	56,000
2,160		90,000	59,000
2,180		90,000	59,000
2,200		90,000	59,000
2,270		90,000	59,000
2,350		90,000	59,000
2,850		100,000	66,000
2,900		100,000	66,000
2,950		100,000	66,000
3,000		100,000	66,000
3,170	1/8	106,000	69,000
3,200		106,000	69,000
3,250		106,000	69,000
3,400		112,000	73,000
3,450		112,000	73,000
3,500		112,000	73,000

d1		l1	l2
mm	inch	mm	mm
3,510		112,000	73,000
3,700		112,000	73,000
4,100		119,000	78,000
4,200		119,000	78,000
4,400		126,000	82,000
4,500		126,000	82,000
4,900		132,000	87,000
5,000		132,000	87,000
5,050		132,000	87,000
5,100		132,000	87,000
5,400		139,000	91,000
5,600		139,000	91,000
5,900		139,000	91,000
6,000		139,000	91,000
6,800		156,000	102,000
8,000		165,000	109,000
9,000		175,000	115,000
12,800		205,000	134,000
15,000		220,000	144,000





## Helisel matkap uçları, uzun



**P** öz bileme  $\geq \text{Ø } 14,500$  • koni bileme • çok derin deliklerde



**N** • yumuşak ve uzun talaş veren malzemelerde • Alüminyum/Al-alaşimleri (uzun talaşlı) • çinko, saflaştırılmış bakır, silumin, elektrotlar • yumuşak sentetik malzemeler, ahşap

## GÜHRING NAVIGATOR

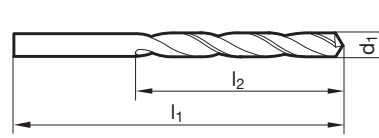
Kesme verileri sayfası 786

Malzeme **HSS**

Yüzey



Kesme yönü

Ürün no **219**

d1		l1	l2
mm	inch	mm	mm
0,500		32,000	12,000
0,600		35,000	15,000
0,650		38,000	18,000
0,700		42,000	21,000
0,740		42,000	21,000
0,750		42,000	21,000
0,800		46,000	25,000
0,850		46,000	25,000
0,900		51,000	29,000
0,950		51,000	29,000
0,970		56,000	33,000
0,980		56,000	33,000
1,000		56,000	33,000
1,100		60,000	37,000
1,180		60,000	37,000
1,190	3/64	65,000	41,000
1,200		65,000	41,000
1,220		65,000	41,000
1,250		65,000	41,000
1,300		65,000	41,000
1,350		70,000	45,000
1,370		70,000	45,000
1,400		70,000	45,000
1,440		70,000	45,000
1,500		70,000	45,000
1,520		76,000	50,000
1,600		76,000	50,000
1,610		76,000	50,000
1,650		76,000	50,000
1,700		76,000	50,000
1,750		80,000	53,000
1,760		80,000	53,000
1,770		80,000	53,000
1,780		80,000	53,000
1,800		80,000	53,000
1,850		80,000	53,000
1,900		80,000	53,000
1,950		85,000	56,000
1,970		85,000	56,000
2,000		85,000	56,000
2,050		85,000	56,000
2,070		85,000	56,000

d1		l1	l2
mm	inch	mm	mm
2,100		85,000	56,000
2,150		90,000	59,000
2,200		90,000	59,000
2,250		90,000	59,000
2,300		90,000	59,000
2,350		90,000	59,000
2,380	3/32	95,000	62,000
2,400		95,000	62,000
2,430		95,000	62,000
2,450		95,000	62,000
2,490		95,000	62,000
2,500		95,000	62,000
2,550		95,000	62,000
2,600		95,000	62,000
2,650		95,000	62,000
2,700		100,000	66,000
2,710		100,000	66,000
2,750		100,000	66,000
2,800		100,000	66,000
2,850		100,000	66,000
2,880		100,000	66,000
2,900		100,000	66,000
2,950		100,000	66,000
3,000		100,000	66,000
3,100		106,000	69,000
3,170	1/8	106,000	69,000
3,180		106,000	69,000
3,200		106,000	69,000
3,250		106,000	69,000
3,260		106,000	69,000
3,300		106,000	69,000
3,350		106,000	69,000
3,400		112,000	73,000
3,500		112,000	73,000
3,550		112,000	73,000
3,600		112,000	73,000
3,650		112,000	73,000
3,700		112,000	73,000
3,750		112,000	73,000
3,800		119,000	78,000
3,830		119,000	78,000
3,900		119,000	78,000



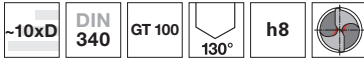
Derin Delik Matkap Ucu

d1		l1	l2
mm	inch	mm	mm
3,920		119,000	78,000
3,990		119,000	78,000
4,000		119,000	78,000
4,100		119,000	78,000
4,150		119,000	78,000
4,200		119,000	78,000
4,250		119,000	78,000
4,300		126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,700		126,000	82,000
4,800		132,000	87,000
4,830		132,000	87,000
4,870		132,000	87,000
4,900		132,000	87,000
4,950		132,000	87,000
5,000		132,000	87,000
5,100		132,000	87,000
5,200		132,000	87,000
5,300		132,000	87,000
5,400		139,000	91,000
5,430		139,000	91,000
5,500		139,000	91,000
5,650		139,000	91,000
5,700		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,980		139,000	91,000
6,000		139,000	91,000
6,100		148,000	97,000
6,250		148,000	97,000
6,300		148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,700		148,000	97,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,100		156,000	102,000
7,300		156,000	102,000
7,400		156,000	102,000
7,450		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,550		165,000	109,000
7,670		165,000	109,000
7,700		165,000	109,000

d1		l1	l2
mm	inch	mm	mm
7,850		165,000	109,000
7,900		165,000	109,000
7,950		165,000	109,000
8,000		165,000	109,000
8,200		165,000	109,000
8,300		165,000	109,000
8,500		165,000	109,000
8,550		175,000	115,000
8,600		175,000	115,000
8,700		175,000	115,000
8,750		175,000	115,000
8,800		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,100		175,000	115,000
9,500		175,000	115,000
9,700		184,000	121,000
9,800		184,000	121,000
9,900		184,000	121,000
10,000		184,000	121,000
10,300		184,000	121,000
10,700		195,000	128,000
10,750		195,000	128,000
11,000		195,000	128,000
11,300		195,000	128,000
11,400		195,000	128,000
12,000		205,000	134,000
13,100	33/64	205,000	134,000
13,500		214,000	140,000
13,750		214,000	140,000
14,000		214,000	140,000
14,500		220,000	144,000
15,000		220,000	144,000
15,500		227,000	149,000
17,000		235,000	154,000
18,000		241,000	158,000
18,250		247,000	162,000
19,000		247,000	162,000
19,840	25/32	254,000	166,000
20,000		254,000	166,000
20,640	13/16	261,000	171,000



## Helisel matkap uçları, uzun

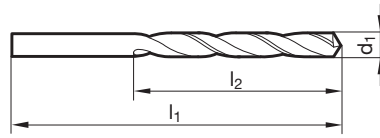
Malzeme **HSS**Yüzey  $\text{Ra} > 0,2,36$ 

Kesme yönü

**P** • öz bileme  $\geq \text{Ø} 1,000$  • koni bileme • geniş kanallı • zor talaş atılmasında

**M****K** •**N** • 1000 N/mm<sup>2</sup>'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.**S****H****GÜHRING**NAVIGATOR

Kesme verileri sayfası 786

Ürün no **535**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	2,200		90,000	59,000
1,020		56,000	33,000	2,250		90,000	59,000
1,040		56,000	33,000	2,260		90,000	59,000
1,050		56,000	33,000	2,300		90,000	59,000
1,070		60,000	37,000	2,350		90,000	59,000
1,090		60,000	37,000	2,370		95,000	62,000
1,100		60,000	37,000	2,380	3/32	95,000	62,000
1,150		60,000	37,000	2,400		95,000	62,000
1,180		60,000	37,000	2,440		95,000	62,000
1,190	3/64	65,000	41,000	2,450		95,000	62,000
1,200		65,000	41,000	2,480		95,000	62,000
1,250		65,000	41,000	2,490		95,000	62,000
1,300		65,000	41,000	2,500		95,000	62,000
1,320		65,000	41,000	2,530		95,000	62,000
1,350		70,000	45,000	2,550		95,000	62,000
1,400		70,000	45,000	2,580		95,000	62,000
1,450		70,000	45,000	2,600		95,000	62,000
1,500		70,000	45,000	2,640		95,000	62,000
1,510		76,000	50,000	2,650		95,000	62,000
1,520		76,000	50,000	2,700		100,000	66,000
1,550		76,000	50,000	2,710		100,000	66,000
1,590	1/16	76,000	50,000	2,750		100,000	66,000
1,600		76,000	50,000	2,780	7/64	100,000	66,000
1,650		76,000	50,000	2,790		100,000	66,000
1,670		76,000	50,000	2,800		100,000	66,000
1,700		76,000	50,000	2,820		100,000	66,000
1,750		80,000	53,000	2,830		100,000	66,000
1,780		80,000	53,000	2,850		100,000	66,000
1,800		80,000	53,000	2,870		100,000	66,000
1,850		80,000	53,000	2,900		100,000	66,000
1,900		80,000	53,000	2,940		100,000	66,000
1,930		85,000	56,000	2,950		100,000	66,000
1,950		85,000	56,000	3,000		100,000	66,000
1,980	5/64	85,000	56,000	3,050		106,000	69,000
1,990		85,000	56,000	3,100		106,000	69,000
2,000		85,000	56,000	3,150		106,000	69,000
2,050		85,000	56,000	3,170	1/8	106,000	69,000
2,060		85,000	56,000	3,200		106,000	69,000
2,080		85,000	56,000	3,250		106,000	69,000
2,100		85,000	56,000	3,260		106,000	69,000
2,150		90,000	59,000	3,270		106,000	69,000
2,180		90,000	59,000	3,300		106,000	69,000



d1		l1	l2
mm	inch	mm	mm
3,400		112,000	73,000
3,450		112,000	73,000
3,500		112,000	73,000
3,550		112,000	73,000
3,570	9/64	112,000	73,000
3,600		112,000	73,000
3,660		112,000	73,000
3,700		112,000	73,000
3,730		112,000	73,000
3,750		112,000	73,000
3,800		119,000	78,000
3,860		119,000	78,000
3,900		119,000	78,000
3,910		119,000	78,000
3,970	5/32	119,000	78,000
3,990		119,000	78,000
4,000		119,000	78,000
4,040		119,000	78,000
4,050		119,000	78,000
4,090		119,000	78,000
4,100		119,000	78,000
4,130		119,000	78,000
4,150		119,000	78,000
4,200		119,000	78,000
4,220		119,000	78,000
4,250		119,000	78,000
4,300		126,000	82,000
4,350		126,000	82,000
4,370	11/64	126,000	82,000
4,390		126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,570		126,000	82,000
4,600		126,000	82,000
4,620		126,000	82,000
4,700		126,000	82,000
4,750		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
4,850		132,000	87,000
4,900		132,000	87,000
4,920		132,000	87,000
4,980		132,000	87,000
5,000		132,000	87,000
5,050		132,000	87,000
5,060		132,000	87,000
5,100		132,000	87,000
5,110		132,000	87,000
5,160	13/64	132,000	87,000
5,180		132,000	87,000
5,200		132,000	87,000
5,220		132,000	87,000
5,250		132,000	87,000
5,300		132,000	87,000
5,310		139,000	91,000
5,400		139,000	91,000
5,410		139,000	91,000
5,500		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,610		139,000	91,000
5,700		139,000	91,000
5,750		139,000	91,000
5,790		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,940		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,040		148,000	97,000
6,050		148,000	97,000
6,100		148,000	97,000

d1		l1	l2
mm	inch	mm	mm
6,150		148,000	97,000
6,200		148,000	97,000
6,250		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,530		148,000	97,000
6,600		148,000	97,000
6,630		148,000	97,000
6,700		148,000	97,000
6,750	17/64	156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000
6,910		156,000	102,000
7,000		156,000	102,000
7,030		156,000	102,000
7,040		156,000	102,000
7,100		156,000	102,000
7,140	9/32	156,000	102,000
7,200		156,000	102,000
7,300		156,000	102,000
7,370		156,000	102,000
7,400		156,000	102,000
7,490		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,600		165,000	109,000
7,670		165,000	109,000
7,700		165,000	109,000
7,750		165,000	109,000
7,800		165,000	109,000
7,850		165,000	109,000
7,900		165,000	109,000
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,030		165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,250		165,000	109,000
8,300		165,000	109,000
8,330	21/64	165,000	109,000
8,400		165,000	109,000
8,430		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,610		175,000	115,000
8,700		175,000	115,000
8,730	11/32	175,000	115,000
8,800		175,000	115,000
8,840		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,090		175,000	115,000
9,100		175,000	115,000
9,130	23/64	175,000	115,000
9,200		175,000	115,000
9,300		175,000	115,000
9,340		175,000	115,000
9,350		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,600		184,000	121,000
9,700		184,000	121,000
9,800		184,000	121,000
9,900		184,000	121,000
9,920	25/64	184,000	121,000
10,000		184,000	121,000
10,080		184,000	121,000
10,100		184,000	121,000
10,200		184,000	121,000

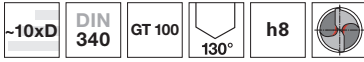


d1		l1	l2
mm	inch	mm	mm
10,300		184,000	121,000
10,320	13/32	184,000	121,000
10,400		184,000	121,000
10,490		184,000	121,000
10,500		184,000	121,000
10,600		184,000	121,000
10,720	27/64	195,000	128,000
10,800		195,000	128,000
10,900		195,000	128,000
11,000		195,000	128,000
11,100		195,000	128,000
11,110	7/16	195,000	128,000
11,300		195,000	128,000
11,400		195,000	128,000
11,500		195,000	128,000
11,800		195,000	128,000
11,900		205,000	134,000
11,910	15/32	205,000	134,000

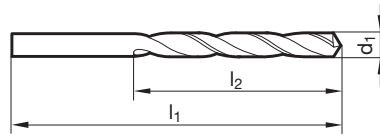
d1		l1	l2
mm	inch	mm	mm
12,000		205,000	134,000
12,150		205,000	134,000
12,300	31/64	205,000	134,000
12,500		205,000	134,000
12,600		205,000	134,000
12,700	1/2	205,000	134,000
13,000		205,000	134,000
13,100	33/64	205,000	134,000
13,490	17/32	214,000	140,000
13,500		214,000	140,000
13,700		214,000	140,000
13,890	35/64	214,000	140,000
13,900		214,000	140,000
14,000		214,000	140,000



## Helisel matkap uçları, uzun

Malzeme **HSS**Yüzey **S**Kesme yönü **R****P** • öz bileme  $\geq \varnothing 1,000$  • koni bileme • geniş kanallı • zor talaş atılmasında**M****K** •**N** • 1000 N/mm<sup>2</sup>'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.**S****H****GÜHRING**NAVIGATOR

Kesme verileri sayfası 786

Ürün no **668**

Derin Delik Matkap Ucu

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	2,800		100,000	66,000
1,090		60,000	37,000	2,820		100,000	66,000
1,100		60,000	37,000	2,850		100,000	66,000
1,180		60,000	37,000	2,870		100,000	66,000
1,190	3/64	65,000	41,000	2,900		100,000	66,000
1,200		65,000	41,000	2,950		100,000	66,000
1,300		65,000	41,000	3,000		100,000	66,000
1,320		65,000	41,000	3,050		106,000	69,000
1,400		70,000	45,000	3,100		106,000	69,000
1,500		70,000	45,000	3,170	1/8	106,000	69,000
1,510		76,000	50,000	3,200		106,000	69,000
1,590	1/16	76,000	50,000	3,250		106,000	69,000
1,600		76,000	50,000	3,260		106,000	69,000
1,650		76,000	50,000	3,300		106,000	69,000
1,700		76,000	50,000	3,400		112,000	73,000
1,800		80,000	53,000	3,450		112,000	73,000
1,850		80,000	53,000	3,500		112,000	73,000
1,900		80,000	53,000	3,570	9/64	112,000	73,000
1,930		85,000	56,000	3,600		112,000	73,000
1,950		85,000	56,000	3,700		112,000	73,000
1,980	5/64	85,000	56,000	3,730		112,000	73,000
1,990		85,000	56,000	3,750		112,000	73,000
2,000		85,000	56,000	3,800		119,000	78,000
2,060		85,000	56,000	3,860		119,000	78,000
2,080		85,000	56,000	3,870		119,000	78,000
2,100		85,000	56,000	3,900		119,000	78,000
2,180		90,000	59,000	3,910		119,000	78,000
2,200		90,000	59,000	3,970	5/32	119,000	78,000
2,260		90,000	59,000	4,000		119,000	78,000
2,300		90,000	59,000	4,040		119,000	78,000
2,380	3/32	95,000	62,000	4,090		119,000	78,000
2,400		95,000	62,000	4,100		119,000	78,000
2,490		95,000	62,000	4,200		119,000	78,000
2,500		95,000	62,000	4,220		119,000	78,000
2,530		95,000	62,000	4,300		126,000	82,000
2,550		95,000	62,000	4,370	11/64	126,000	82,000
2,580		95,000	62,000	4,400		126,000	82,000
2,600		95,000	62,000	4,500		126,000	82,000
2,640		95,000	62,000	4,600		126,000	82,000
2,700		100,000	66,000	4,700		126,000	82,000
2,710		100,000	66,000	4,760	3/16	132,000	87,000
2,780	7/64	100,000	66,000	4,800		132,000	87,000



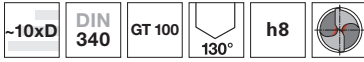
d1		l1	l2
mm	inch	mm	mm
4,850		132,000	87,000
4,900		132,000	87,000
4,910		132,000	87,000
4,920		132,000	87,000
5,000		132,000	87,000
5,060		132,000	87,000
5,100		132,000	87,000
5,160	13/64	132,000	87,000
5,200		132,000	87,000
5,300		132,000	87,000
5,400		139,000	91,000
5,500		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,700		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,040		148,000	97,000
6,100		148,000	97,000
6,150		148,000	97,000
6,200		148,000	97,000
6,250		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,530		148,000	97,000
6,600		148,000	97,000
6,630		148,000	97,000
6,700		148,000	97,000
6,750	17/64	156,000	102,000
6,760		156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,100		156,000	102,000
7,140	9/32	156,000	102,000
7,250		156,000	102,000
7,300		156,000	102,000
7,370		156,000	102,000
7,490		156,000	102,000
7,500		156,000	102,000
7,600		165,000	109,000
7,700		165,000	109,000
7,800		165,000	109,000
7,900		165,000	109,000

d1		l1	l2
mm	inch	mm	mm
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,200		165,000	109,000
8,300		165,000	109,000
8,400		165,000	109,000
8,430		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,610		175,000	115,000
8,700		175,000	115,000
8,730	11/32	175,000	115,000
8,800		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,130	23/64	175,000	115,000
9,200		175,000	115,000
9,340		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,700		184,000	121,000
9,900		184,000	121,000
9,920	25/64	184,000	121,000
10,000		184,000	121,000
10,100		184,000	121,000
10,200		184,000	121,000
10,320	13/32	184,000	121,000
10,500		184,000	121,000
11,000		195,000	128,000
11,110	7/16	195,000	128,000
11,500		195,000	128,000
11,510	29/64	195,000	128,000
11,910	15/32	205,000	134,000
12,000		205,000	134,000
12,300	31/64	205,000	134,000
12,700	1/2	205,000	134,000
13,000		205,000	134,000
14,000		214,000	140,000

Derin Delik Matkap  
Ucu



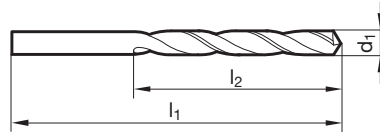
## Helisel matkap uçları, uzun



P	•	öz bileme $\geq \varnothing 1,000$ • koni bileme • geniş kanallı • zor talaş atılmasında
M		
K	•	
N	•	1000 N/mm <sup>2</sup> 'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.
S		
H		

## GÜHRING NAVIGATOR

Kesme verileri sayfası 786

Malzeme **HSS**Yüzey **F**Kesme yönü **R**Ürün no **2462**

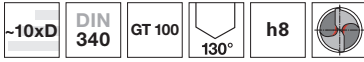
Derin Delik Matkap Ucu

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	3,800		119,000	78,000
1,100		60,000	37,000	4,000		119,000	78,000
1,200		65,000	41,000	4,200		119,000	78,000
1,300		65,000	41,000	4,300		126,000	82,000
1,500		70,000	45,000	4,500		126,000	82,000
1,600		76,000	50,000	4,800		132,000	87,000
1,700		76,000	50,000	5,000		132,000	87,000
1,800		80,000	53,000	5,200		132,000	87,000
1,900		80,000	53,000	5,400		139,000	91,000
2,000		85,000	56,000	5,500		139,000	91,000
2,100		85,000	56,000	6,000		139,000	91,000
2,200		90,000	59,000	6,100		148,000	97,000
2,300		90,000	59,000	6,200		148,000	97,000
2,400		95,000	62,000	6,500		148,000	97,000
2,500		95,000	62,000	6,600		148,000	97,000
2,600		95,000	62,000	6,800		156,000	102,000
2,800		100,000	66,000	7,000		156,000	102,000
2,900		100,000	66,000	7,200		156,000	102,000
3,000		100,000	66,000	7,300		156,000	102,000
3,100		106,000	69,000	7,600		165,000	109,000
3,200		106,000	69,000	8,000		165,000	109,000
3,300		106,000	69,000	9,000		175,000	115,000
3,400		112,000	73,000	10,000		184,000	121,000
3,500		112,000	73,000				





## Helisel matkap uçları, uzun

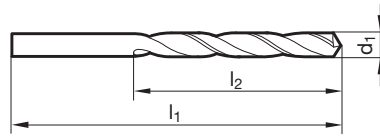


P	•	öz bileme $\geq \varnothing 1,400$ • koni bileme • geniş kanallı • zor talaş atılmasında
M		
K	•	
N	•	1000 N/mm <sup>2</sup> 'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.
S		
H		

## GÜHRING NAVIGATOR

Kesme verileri sayfası 786

Malzeme	HSS
Yüzey	$\geq 0,2,36$
Kesme yönü	



Ürün no 506

d1		l1	l2
mm	inch	mm	mm
1,400		70,000	45,000
1,500		70,000	45,000
1,600		76,000	50,000
1,680		76,000	50,000
1,800		80,000	53,000
1,850		80,000	53,000
2,000		85,000	56,000
2,200		90,000	59,000
2,300		90,000	59,000
2,350		90,000	59,000
2,500		95,000	62,000
2,800		100,000	66,000
3,000		100,000	66,000
3,050		106,000	69,000
3,200		106,000	69,000
3,300		106,000	69,000
3,400		112,000	73,000
3,500		112,000	73,000
3,550		112,000	73,000
3,800		119,000	78,000
3,950		119,000	78,000
4,000		119,000	78,000
4,400		126,000	82,000
4,500		126,000	82,000

d1		l1	l2
mm	inch	mm	mm
4,600		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
4,950		132,000	87,000
5,160	13/64	132,000	87,000
5,200		132,000	87,000
5,400		139,000	91,000
5,600		139,000	91,000
5,700		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
6,000		139,000	91,000
7,400		156,000	102,000
7,800		165,000	109,000
8,500		165,000	109,000
9,000		175,000	115,000
9,900		184,000	121,000
10,320	13/32	184,000	121,000
11,000		195,000	128,000
11,500		195,000	128,000
11,600		195,000	128,000
12,000		205,000	134,000
12,500		205,000	134,000
13,000		205,000	134,000

Derin Delik Matkap Ucu



## Helisel matkap uçları, uzun

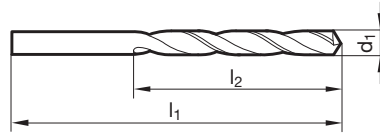
Malzeme **HSS**

Yüzey

Kesme yönü

**P** öz bileme  $\geq \varnothing 2,370$  • koni bileme • Özellikle geniş talaş kanalı**M** **K** **N** yumuşak uzun talaşlı malzemeler  $1200 \text{ N/mm}^2$ 'ye kadar • otomat çelikleri (yumuşak) • Alüminyum/Al-alaşimleri (uzun talaşlı) • çinko, saflaştırılmış bakır, silümin, elektrotlar • zamak, argalyum, yumuşal plastikler, ahşap**S** **H** **GÜHRING**NAVIGATOR

Kesme verileri sayfası 786

Ürün no **501**

Derin Delik Matkap Ucu

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	2,350		90,000	59,000
1,020		56,000	33,000	2,370		95,000	62,000
1,030		56,000	33,000	2,380	3/32	95,000	62,000
1,040		56,000	33,000	2,400		95,000	62,000
1,070		60,000	37,000	2,440		95,000	62,000
1,090		60,000	37,000	2,450		95,000	62,000
1,100		60,000	37,000	2,490		95,000	62,000
1,180		60,000	37,000	2,500		95,000	62,000
1,190	3/64	65,000	41,000	2,520		95,000	62,000
1,200		65,000	41,000	2,530		95,000	62,000
1,250		65,000	41,000	2,550		95,000	62,000
1,300		65,000	41,000	2,580		95,000	62,000
1,320		65,000	41,000	2,600		95,000	62,000
1,400		70,000	45,000	2,640		95,000	62,000
1,450		70,000	45,000	2,650		95,000	62,000
1,480		70,000	45,000	2,700		100,000	66,000
1,500		70,000	45,000	2,710		100,000	66,000
1,510		76,000	50,000	2,750		100,000	66,000
1,550		76,000	50,000	2,780	7/64	100,000	66,000
1,590	1/16	76,000	50,000	2,790		100,000	66,000
1,600		76,000	50,000	2,800		100,000	66,000
1,610		76,000	50,000	2,820		100,000	66,000
1,700		76,000	50,000	2,850		100,000	66,000
1,750		80,000	53,000	2,870		100,000	66,000
1,780		80,000	53,000	2,900		100,000	66,000
1,800		80,000	53,000	2,950		100,000	66,000
1,850		80,000	53,000	3,000		100,000	66,000
1,900		80,000	53,000	3,050		106,000	69,000
1,930		85,000	56,000	3,100		106,000	69,000
1,950		85,000	56,000	3,170	1/8	106,000	69,000
1,980	5/64	85,000	56,000	3,200		106,000	69,000
1,990		85,000	56,000	3,250		106,000	69,000
2,000		85,000	56,000	3,260		106,000	69,000
2,050		85,000	56,000	3,300		106,000	69,000
2,060		85,000	56,000	3,350		106,000	69,000
2,080		85,000	56,000	3,400		112,000	73,000
2,100		85,000	56,000	3,450		112,000	73,000
2,180		90,000	59,000	3,500		112,000	73,000
2,200		90,000	59,000	3,570	9/64	112,000	73,000
2,250		90,000	59,000	3,600		112,000	73,000
2,260		90,000	59,000	3,650		112,000	73,000
2,300		90,000	59,000	3,660		112,000	73,000

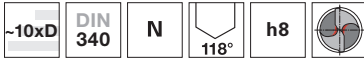


d1		l1	l2
mm	inch	mm	mm
3,700		112,000	73,000
3,800		119,000	78,000
3,860		119,000	78,000
3,900		119,000	78,000
3,910		119,000	78,000
3,970	5/32	119,000	78,000
3,990		119,000	78,000
4,000		119,000	78,000
4,040		119,000	78,000
4,050		119,000	78,000
4,090		119,000	78,000
4,100		119,000	78,000
4,200		119,000	78,000
4,220		119,000	78,000
4,250		119,000	78,000
4,300		126,000	82,000
4,350		126,000	82,000
4,370	11/64	126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,570		126,000	82,000
4,600		126,000	82,000
4,620		126,000	82,000
4,700		126,000	82,000
4,750		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
4,850		132,000	87,000
4,900		132,000	87,000
4,920		132,000	87,000
4,980		132,000	87,000
5,000		132,000	87,000
5,060		132,000	87,000
5,100		132,000	87,000
5,110		132,000	87,000
5,160	13/64	132,000	87,000
5,180		132,000	87,000
5,200		132,000	87,000
5,300		132,000	87,000
5,310		139,000	91,000
5,400		139,000	91,000
5,410		139,000	91,000
5,500		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,610		139,000	91,000
5,650		139,000	91,000
5,700		139,000	91,000
5,790		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,940		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,030		148,000	97,000
6,040		148,000	97,000
6,150		148,000	97,000
6,200		148,000	97,000
6,250		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,530		148,000	97,000
6,600		148,000	97,000
6,630		148,000	97,000
6,700		148,000	97,000
6,750	17/64	156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,040		156,000	102,000

d1		l1	l2
mm	inch	mm	mm
7,100		156,000	102,000
7,140	9/32	156,000	102,000
7,300		156,000	102,000
7,370		156,000	102,000
7,490		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,600		165,000	109,000
7,670		165,000	109,000
7,900		165,000	109,000
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,025		165,000	109,000
8,030		165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,330	21/64	165,000	109,000
8,430		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,610		175,000	115,000
8,700		175,000	115,000
8,730	11/32	175,000	115,000
8,750		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,090		175,000	115,000
9,100		175,000	115,000
9,130	23/64	175,000	115,000
9,300		175,000	115,000
9,340		175,000	115,000
9,350		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,580		184,000	121,000
9,600		184,000	121,000
9,800		184,000	121,000
9,900		184,000	121,000
9,920	25/64	184,000	121,000
10,000		184,000	121,000
10,080		184,000	121,000
10,200		184,000	121,000
10,260		184,000	121,000
10,320	13/32	184,000	121,000
10,500		184,000	121,000
10,600		184,000	121,000
10,700		195,000	128,000
10,720	27/64	195,000	128,000
10,800		195,000	128,000
11,000		195,000	128,000
11,110	7/16	195,000	128,000
11,200		195,000	128,000
11,400		195,000	128,000
11,500		195,000	128,000
11,510	29/64	195,000	128,000
11,750		195,000	128,000
11,800		195,000	128,000
11,900		205,000	134,000
11,910	15/32	205,000	134,000
12,000		205,000	134,000
12,200		205,000	134,000
12,300	31/64	205,000	134,000
12,500		205,000	134,000
12,700	1/2	205,000	134,000
13,000		205,000	134,000
13,100	33/64	205,000	134,000
13,490	17/32	214,000	140,000
14,000		214,000	140,000
32,600		325,000	213,000



## Helisel matkap uçları, uzun

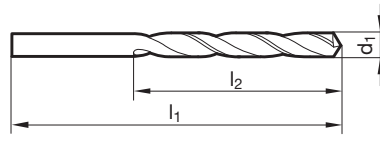


<b>P</b> ●	öz bileme $\geq \varnothing 1,000$ • koni bileme • Co-alaşımlı HSS-çeliği • artırılmış aşınma direnci
<b>M</b> ○	
<b>K</b> ●	
<b>N</b> ●	alaşım/alaşısız çelikler ve döküm, 800 N/mm <sup>2</sup> üzerinde • sıcak ve soğuk işlem çelikleri • rulman çeliği • yüksek alaşımli çelikleri • işlah çelikleri ve sementasyon çelikleri
<b>S</b> ○	
<b>H</b> ○	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 792

Malzeme	<b>HSCO</b>
Yüzey	$\text{Ra} > 0,2,36$
Kesme yönü	



Ürün no 317

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,500		32,000	12,000	2,500		95,000	62,000
0,600		35,000	15,000	2,600		95,000	62,000
0,700		42,000	21,000	2,700		100,000	66,000
0,750		42,000	21,000	2,780	7/64	100,000	66,000
0,800		46,000	25,000	2,800		100,000	66,000
0,850		46,000	25,000	2,900		100,000	66,000
0,900		51,000	29,000	3,000		100,000	66,000
0,950		51,000	29,000	3,050		106,000	69,000
0,960		56,000	33,000	3,100		106,000	69,000
1,000		56,000	33,000	3,170	1/8	106,000	69,000
1,020		56,000	33,000	3,200		106,000	69,000
1,050		56,000	33,000	3,250		106,000	69,000
1,100		60,000	37,000	3,300		106,000	69,000
1,150		60,000	37,000	3,400		112,000	73,000
1,190	3/64	65,000	41,000	3,500		112,000	73,000
1,200		65,000	41,000	3,550		112,000	73,000
1,250		65,000	41,000	3,570	9/64	112,000	73,000
1,300		65,000	41,000	3,600		112,000	73,000
1,350		70,000	45,000	3,700		112,000	73,000
1,400		70,000	45,000	3,800		119,000	78,000
1,450		70,000	45,000	3,900		119,000	78,000
1,500		70,000	45,000	3,970	5/32	119,000	78,000
1,510		76,000	50,000	4,000		119,000	78,000
1,550		76,000	50,000	4,040		119,000	78,000
1,590	1/16	76,000	50,000	4,100		119,000	78,000
1,600		76,000	50,000	4,200		119,000	78,000
1,650		76,000	50,000	4,300		126,000	82,000
1,700		76,000	50,000	4,370	11/64	126,000	82,000
1,780		80,000	53,000	4,400		126,000	82,000
1,800		80,000	53,000	4,500		126,000	82,000
1,850		80,000	53,000	4,600		126,000	82,000
1,900		80,000	53,000	4,700		126,000	82,000
1,950		85,000	56,000	4,760	3/16	132,000	87,000
1,980	5/64	85,000	56,000	4,800		132,000	87,000
2,000		85,000	56,000	4,850		132,000	87,000
2,050		85,000	56,000	4,900		132,000	87,000
2,060		85,000	56,000	5,000		132,000	87,000
2,100		85,000	56,000	5,050		132,000	87,000
2,200		90,000	59,000	5,100		132,000	87,000
2,300		90,000	59,000	5,160	13/64	132,000	87,000
2,380	3/32	95,000	62,000	5,200		132,000	87,000
2,400		95,000	62,000	5,300		132,000	87,000

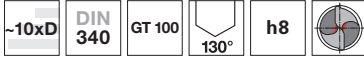


d1		l1	l2
mm	inch	mm	mm
5,400		139,000	91,000
5,500		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,700		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,100		148,000	97,000
6,200		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,630		148,000	97,000
6,750	17/64	156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,140	9/32	156,000	102,000
7,200		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,600		165,000	109,000
7,700		165,000	109,000
7,800		165,000	109,000
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,200		165,000	109,000
8,330	21/64	165,000	109,000
8,430		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,730	11/32	175,000	115,000
8,800		175,000	115,000
9,000		175,000	115,000
9,130	23/64	175,000	115,000
9,200		175,000	115,000
9,300		175,000	115,000
9,500		175,000	115,000

d1		l1	l2
mm	inch	mm	mm
9,520	3/8	184,000	121,000
9,700		184,000	121,000
9,920	25/64	184,000	121,000
10,000		184,000	121,000
10,100		184,000	121,000
10,200		184,000	121,000
10,320	13/32	184,000	121,000
10,500		184,000	121,000
10,720	27/64	195,000	128,000
10,750		195,000	128,000
10,800		195,000	128,000
11,000		195,000	128,000
11,110	7/16	195,000	128,000
11,200		195,000	128,000
11,500		195,000	128,000
11,510	29/64	195,000	128,000
11,910	15/32	205,000	134,000
12,000		205,000	134,000
12,300	31/64	205,000	134,000
12,500		205,000	134,000
12,700	1/2	205,000	134,000
13,000		205,000	134,000
13,100	33/64	205,000	134,000
13,500		214,000	140,000
13,700		214,000	140,000
13,890	35/64	214,000	140,000
13,900		214,000	140,000
14,000		214,000	140,000
14,290	9/16	220,000	144,000
14,400		220,000	144,000
14,600		220,000	144,000
14,680	37/64	220,000	144,000
14,700		220,000	144,000
14,750		220,000	144,000
14,900		220,000	144,000
15,000		220,000	144,000
15,080	19/32	227,000	149,000
15,480	39/64	227,000	149,000
15,800		227,000	149,000
15,870	5/8	227,000	149,000
16,000		227,000	149,000
22,000		268,000	176,000



## Helisel matkap uçları, uzun

Malzeme **HSCO**

Yüzey

Kesme yönü

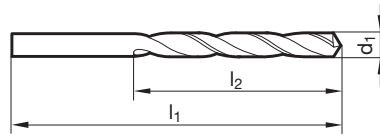
**P** • öz bileme  $\geq \varnothing 1,000$  • koni bileme • Co-alaşımli HSS-çeliği • geniş kanallı  
• arttırılmış aşınma direnci • zor talaş atılmasında

**M** •**K** •

**N** • alaşımli/alaşımız çelikler ve döküm , 800 N/mm<sup>2</sup> üzerinde • sıcak ve  
soğuk işlem çelikleri • rulman çeliği • yüksek alaşımli çelikleri • ıslah  
çelikleri ve sementasyon çelikleri

**S** •**H** •**GÜHRING**NAVIGATOR

Kesme verileri sayfası 792

Ürün no **336**

Derin Delik Matkap Ucu

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	2,440		95,000	62,000
1,020		56,000	33,000	2,450		95,000	62,000
1,040		56,000	33,000	2,490		95,000	62,000
1,070		60,000	37,000	2,500		95,000	62,000
1,090		60,000	37,000	2,530		95,000	62,000
1,100		60,000	37,000	2,550		95,000	62,000
1,180		60,000	37,000	2,580		95,000	62,000
1,190	3/64	65,000	41,000	2,600		95,000	62,000
1,200		65,000	41,000	2,640		95,000	62,000
1,250		65,000	41,000	2,700		100,000	66,000
1,300		65,000	41,000	2,710		100,000	66,000
1,320		65,000	41,000	2,750		100,000	66,000
1,400		70,000	45,000	2,780	7/64	100,000	66,000
1,500		70,000	45,000	2,790		100,000	66,000
1,510		76,000	50,000	2,800		100,000	66,000
1,550		76,000	50,000	2,820		100,000	66,000
1,590	1/16	76,000	50,000	2,850		100,000	66,000
1,600		76,000	50,000	2,870		100,000	66,000
1,610		76,000	50,000	2,900		100,000	66,000
1,700		76,000	50,000	2,950		100,000	66,000
1,750		80,000	53,000	3,000		100,000	66,000
1,780		80,000	53,000	3,050		106,000	69,000
1,800		80,000	53,000	3,100		106,000	69,000
1,850		80,000	53,000	3,170	1/8	106,000	69,000
1,900		80,000	53,000	3,200		106,000	69,000
1,930		85,000	56,000	3,260		106,000	69,000
1,980	5/64	85,000	56,000	3,300		106,000	69,000
1,990		85,000	56,000	3,400		112,000	73,000
2,000		85,000	56,000	3,440		112,000	73,000
2,050		85,000	56,000	3,450		112,000	73,000
2,060		85,000	56,000	3,500		112,000	73,000
2,080		85,000	56,000	3,570	9/64	112,000	73,000
2,100		85,000	56,000	3,600		112,000	73,000
2,180		90,000	59,000	3,660		112,000	73,000
2,200		90,000	59,000	3,700		112,000	73,000
2,250		90,000	59,000	3,730		112,000	73,000
2,260		90,000	59,000	3,750		112,000	73,000
2,300		90,000	59,000	3,800		119,000	78,000
2,350		90,000	59,000	3,860		119,000	78,000
2,370		95,000	62,000	3,900		119,000	78,000
2,380	3/32	95,000	62,000	3,910		119,000	78,000
2,400		95,000	62,000	3,970	5/32	119,000	78,000



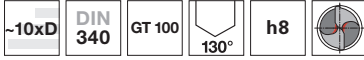
d1		l1	l2
mm	inch	mm	mm
3,990		119,000	78,000
4,000		119,000	78,000
4,040		119,000	78,000
4,090		119,000	78,000
4,100		119,000	78,000
4,200		119,000	78,000
4,220		119,000	78,000
4,300		126,000	82,000
4,370	11/64	126,000	82,000
4,390		126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,570		126,000	82,000
4,600		126,000	82,000
4,620		126,000	82,000
4,700		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
4,850		132,000	87,000
4,900		132,000	87,000
4,920		132,000	87,000
4,980		132,000	87,000
5,000		132,000	87,000
5,060		132,000	87,000
5,100		132,000	87,000
5,110		132,000	87,000
5,160	13/64	132,000	87,000
5,180		132,000	87,000
5,200		132,000	87,000
5,220		132,000	87,000
5,300		132,000	87,000
5,310		139,000	91,000
5,400		139,000	91,000
5,410		139,000	91,000
5,500		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,610		139,000	91,000
5,700		139,000	91,000
5,790		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,940		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,040		148,000	97,000
6,100		148,000	97,000
6,150		148,000	97,000
6,200		148,000	97,000
6,250		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,530		148,000	97,000
6,600		148,000	97,000
6,630		148,000	97,000
6,700		148,000	97,000
6,750	17/64	156,000	102,000
6,800		156,000	102,000

d1		l1	l2
mm	inch	mm	mm
6,900		156,000	102,000
7,000		156,000	102,000
7,030		156,000	102,000
7,100		156,000	102,000
7,140	9/32	156,000	102,000
7,200		156,000	102,000
7,300		156,000	102,000
7,370		156,000	102,000
7,400		156,000	102,000
7,490		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,670		165,000	109,000
7,700		165,000	109,000
7,800		165,000	109,000
7,900		165,000	109,000
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,030		165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,300		165,000	109,000
8,400		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,610		175,000	115,000
8,700		175,000	115,000
8,730	11/32	175,000	115,000
8,800		175,000	115,000
8,840		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,090		175,000	115,000
9,100		175,000	115,000
9,200		175,000	115,000
9,300		175,000	115,000
9,350		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,700		184,000	121,000
9,750		184,000	121,000
9,800		184,000	121,000
9,900		184,000	121,000
10,000		184,000	121,000
10,200		184,000	121,000
10,500		184,000	121,000
10,750		195,000	128,000
10,800		195,000	128,000
10,900		195,000	128,000
11,000		195,000	128,000
11,500		195,000	128,000
11,800		195,000	128,000
12,000		205,000	134,000
12,500		205,000	134,000
13,000		205,000	134,000
15,500		227,000	149,000
16,000		227,000	149,000

Derin Delik Matkap  
Ucu



## Helisel matkap uçları, uzun

Malzeme **HSCO**Yüzey **F**Kesme yönü **R**

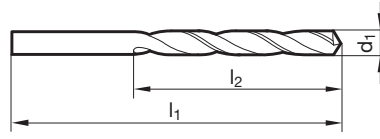
**P** • öz bileme  $\geq \varnothing 1,000$  • koni bileme • Co-alaşımli HSS-çeliği • geniş kanallı  
• özellikle yüksek aşınma dirençli • zor talaş atılmasında

**M** •**K** •

**N** • alaşımli/alaşimsız çelikler ve döküm , 800 N/mm<sup>2</sup> üzerinde • sıcak ve soğuk işlem çelikleri • rulman çeliği • yüksek alaşımli çelikleri • ıslah çelikleri ve sementasyon çelikleri

**S** •**H** •**GÜHRING**NAVIGATOR

Kesme verileri sayfası 792

Ürün no **396**

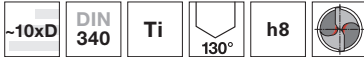
Derin Delik Matkap Ucu

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	5,800		139,000	91,000
1,100		60,000	37,000	5,900		139,000	91,000
1,200		65,000	41,000	6,000		139,000	91,000
1,300		65,000	41,000	6,200		148,000	97,000
1,500		70,000	45,000	6,500		148,000	97,000
1,600		76,000	50,000	6,700		148,000	97,000
1,800		80,000	53,000	6,800		156,000	102,000
1,900		80,000	53,000	7,000		156,000	102,000
2,000		85,000	56,000	7,200		156,000	102,000
2,100		85,000	56,000	7,400		156,000	102,000
2,200		90,000	59,000	7,500		156,000	102,000
2,300		90,000	59,000	7,600		165,000	109,000
2,400		95,000	62,000	7,700		165,000	109,000
2,500		95,000	62,000	7,800		165,000	109,000
2,700		100,000	66,000	7,900		165,000	109,000
2,800		100,000	66,000	8,000		165,000	109,000
2,900		100,000	66,000	8,200		165,000	109,000
3,000		100,000	66,000	8,300		165,000	109,000
3,100		106,000	69,000	8,500		165,000	109,000
3,200		106,000	69,000	8,600		175,000	115,000
3,300		106,000	69,000	8,800		175,000	115,000
3,400		112,000	73,000	8,900		175,000	115,000
3,500		112,000	73,000	9,000		175,000	115,000
3,600		112,000	73,000	9,100		175,000	115,000
3,800		119,000	78,000	9,200		175,000	115,000
3,900		119,000	78,000	9,300		175,000	115,000
4,000		119,000	78,000	9,500		175,000	115,000
4,100		119,000	78,000	9,600		184,000	121,000
4,200		119,000	78,000	9,700		184,000	121,000
4,500		126,000	82,000	10,000		184,000	121,000
4,800		132,000	87,000	10,200		184,000	121,000
5,000		132,000	87,000	10,500		184,000	121,000
5,100		132,000	87,000	11,000		195,000	128,000
5,200		132,000	87,000	11,500		195,000	128,000
5,400		139,000	91,000	12,000		205,000	134,000
5,500		139,000	91,000				





## Helisel matkap uçları, uzun



<b>P</b>	○	öz bileme $\geq \varnothing 1,000$ • koni bileme • Co-alaşimli HSS-çeliği • arttırılmış aşınma direnci
<b>M</b>	●	
<b>K</b>	●	
<b>N</b>	●	Titanyum ve Ti alaşımları • pas/aşide/ısıya dayanıklı ostenitik çelikler
<b>S</b>	●	• 900 N/mm <sup>2</sup> üstü yüksek mukavemetli, kısa talaşlı çelikler • rulman çeliği • Hastelloy, Inconel, Nimonic
<b>H</b>	●	

## GÜHRING NAVIGATOR

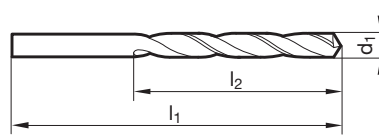
Kesme verileri sayfası 792

Malzeme **HSCO**

Yüzey



Kesme yönü

Ürün no **617**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	3,300		106,000	69,000
1,100		60,000	37,000	3,400		112,000	73,000
1,200		65,000	41,000	3,450		112,000	73,000
1,300		65,000	41,000	3,500		112,000	73,000
1,400		70,000	45,000	3,570	9/64	112,000	73,000
1,450		70,000	45,000	3,600		112,000	73,000
1,500		70,000	45,000	3,700		112,000	73,000
1,590	1/16	76,000	50,000	3,800		119,000	78,000
1,600		76,000	50,000	3,900		119,000	78,000
1,610		76,000	50,000	3,970	5/32	119,000	78,000
1,650		76,000	50,000	4,000		119,000	78,000
1,700		76,000	50,000	4,050		119,000	78,000
1,750		80,000	53,000	4,100		119,000	78,000
1,800		80,000	53,000	4,200		119,000	78,000
1,850		80,000	53,000	4,300		126,000	82,000
1,900		80,000	53,000	4,400		126,000	82,000
1,930		85,000	56,000	4,500		126,000	82,000
1,950		85,000	56,000	4,600		126,000	82,000
1,980	5/64	85,000	56,000	4,700		126,000	82,000
2,000		85,000	56,000	4,760	3/16	132,000	87,000
2,050		85,000	56,000	4,800		132,000	87,000
2,100		85,000	56,000	4,900		132,000	87,000
2,150		90,000	59,000	4,950		132,000	87,000
2,200		90,000	59,000	5,000		132,000	87,000
2,260		90,000	59,000	5,100		132,000	87,000
2,300		90,000	59,000	5,160	13/64	132,000	87,000
2,380	3/32	95,000	62,000	5,200		132,000	87,000
2,400		95,000	62,000	5,300		132,000	87,000
2,450		95,000	62,000	5,400		139,000	91,000
2,500		95,000	62,000	5,500		139,000	91,000
2,550		95,000	62,000	5,600		139,000	91,000
2,600		95,000	62,000	5,700		139,000	91,000
2,700		100,000	66,000	5,800		139,000	91,000
2,780	7/64	100,000	66,000	6,000		139,000	91,000
2,800		100,000	66,000	6,100		148,000	97,000
2,900		100,000	66,000	6,200		148,000	97,000
3,000		100,000	66,000	6,300		148,000	97,000
3,050		106,000	69,000	6,350	1/4	148,000	97,000
3,100		106,000	69,000	6,400		148,000	97,000
3,170	1/8	106,000	69,000	6,500		148,000	97,000
3,200		106,000	69,000	6,600		148,000	97,000
3,250		106,000	69,000	6,700		148,000	97,000

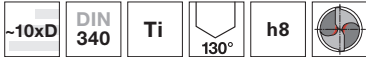


d1		l1	l2
mm	inch	mm	mm
6,750	17/64	156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000	9/32	156,000	102,000
7,100		156,000	102,000
7,140		156,000	102,000
7,250		156,000	102,000
7,400		156,000	102,000
7,500	19/64	156,000	102,000
7,540		165,000	109,000
7,700		165,000	109,000
7,800		165,000	109,000
7,940		165,000	109,000
8,000	5/16	165,000	109,000
8,100		165,000	109,000
8,200	21/64	165,000	109,000
8,300		165,000	109,000
8,330		165,000	109,000
8,400		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,700		11/32	175,000
8,730	175,000		115,000
8,800	175,000		115,000

d1		l1	l2
mm	inch	mm	mm
9,000		175,000	115,000
9,100		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,800		184,000	121,000
10,000		184,000	121,000
10,200		184,000	121,000
10,500	7/16	184,000	121,000
11,000		195,000	128,000
11,110		195,000	128,000
11,510		195,000	128,000
12,000		205,000	134,000
12,500	29/64	205,000	134,000
13,000		205,000	134,000
15,000		220,000	144,000



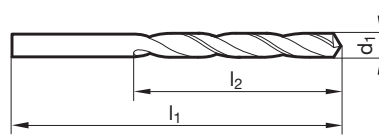
## Helisel matkap uçları, uzun



<b>P</b>	o	öz bileme $\geq \varnothing 1,000$ • koni bileme • Co-alaşimli HSS-çeliği • arttırılmış aşınma direnci
<b>M</b>	•	
<b>K</b>		
<b>N</b>		Titanyum ve Ti alaşımları • pas/aşide/ısıya dayanıklı ostenitik çelikler
<b>S</b>	•	• 900 N/mm <sup>2</sup> üstü yüksek mukavemetli, kısa talaşlı çelikler • rulman çeliği • Hastelloy, Inconel, Nimonic
<b>H</b>		

## GÜHRING NAVIGATOR

Kesme verileri sayfası 792

Malzeme **HSCO**Yüzey **S**Kesme yönü **R**Ürün no **669**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	4,300		126,000	82,000
1,200		65,000	41,000	4,370	11/64	126,000	82,000
1,300		65,000	41,000	4,400		126,000	82,000
1,400		70,000	45,000	4,500		126,000	82,000
1,500		70,000	45,000	4,700		126,000	82,000
1,590	1/16	76,000	50,000	4,760	3/16	132,000	87,000
1,600		76,000	50,000	4,800		132,000	87,000
1,700		76,000	50,000	5,000		132,000	87,000
1,800		80,000	53,000	5,100		132,000	87,000
1,900		80,000	53,000	5,160	13/64	132,000	87,000
1,980	5/64	85,000	56,000	5,200		132,000	87,000
2,000		85,000	56,000	5,300		132,000	87,000
2,050		85,000	56,000	5,500		139,000	91,000
2,100		85,000	56,000	5,600		139,000	91,000
2,200		90,000	59,000	5,700		139,000	91,000
2,300		90,000	59,000	5,800		139,000	91,000
2,380	3/32	95,000	62,000	6,000		139,000	91,000
2,400		95,000	62,000	6,100		148,000	97,000
2,500		95,000	62,000	6,200		148,000	97,000
2,600		95,000	62,000	6,300		148,000	97,000
2,700		100,000	66,000	6,350	1/4	148,000	97,000
2,750		100,000	66,000	6,400		148,000	97,000
2,780	7/64	100,000	66,000	6,500		148,000	97,000
2,800		100,000	66,000	6,700		148,000	97,000
2,900		100,000	66,000	6,750	17/64	156,000	102,000
3,000		100,000	66,000	6,800		156,000	102,000
3,100		106,000	69,000	7,000		156,000	102,000
3,170	1/8	106,000	69,000	7,100		156,000	102,000
3,200		106,000	69,000	7,140	9/32	156,000	102,000
3,250		106,000	69,000	7,200		156,000	102,000
3,300		106,000	69,000	7,400		156,000	102,000
3,400		112,000	73,000	7,500		156,000	102,000
3,500		112,000	73,000	7,540	19/64	165,000	109,000
3,570	9/64	112,000	73,000	7,800		165,000	109,000
3,600		112,000	73,000	7,900		165,000	109,000
3,700		112,000	73,000	7,940	5/16	165,000	109,000
3,800		119,000	78,000	8,000		165,000	109,000
3,900		119,000	78,000	8,200		165,000	109,000
3,970	5/32	119,000	78,000	8,500		165,000	109,000
4,000		119,000	78,000	8,730	11/32	175,000	115,000
4,100		119,000	78,000	9,000		175,000	115,000
4,200		119,000	78,000	9,130	23/64	175,000	115,000

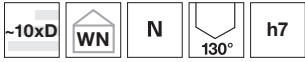


d1		l1	l2
mm	inch	mm	mm
9,300		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
10,000		184,000	121,000
10,200		184,000	121,000

d1		l1	l2
mm	inch	mm	mm



## Helisel matkap uçları, uzun



**P** yüzey Bileme • ana kesici ağız düz form

**M**

**K**

**N**

**S**

**H**

cam elyaf takviyeli plastikler • kesme kenarı ve yüzeylerde aşınmaya sebep veren dropletler

Malzeme **Kom. sert metal**

Yüzey

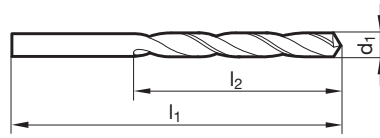


Kesme yönü



## GÜHRING NAVIGATOR

Kesme verileri sayfası 792



Ürün no

706

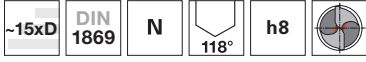
d1		l1	l2
mm	inch	mm	mm
0,500		38,000	8,500
0,600		38,000	9,500
0,650		38,000	10,500
0,700		38,000	10,500
0,750		38,000	12,500
0,800		38,000	12,500
0,850		38,000	14,500
0,900		38,000	14,500
1,000		38,000	17,000
1,050		38,000	17,000
1,100		38,000	17,000
1,400		38,000	17,000

d1		l1	l2
mm	inch	mm	mm
1,450		38,000	17,000

Derin Delik Matkap Ucu



## Helisel matkap uçları çok uzun, seri 1



**P** • öz bileme  $\geq \varnothing 2,380$  • koni bileme • çok derin delikler için

**M****K** •

**N** ○ alaşımli/alaşimsız çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

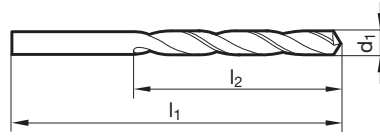
**S****H**Malzeme **HSS**

Yüzey

Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 788

Ürün no **235**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,600		115,000	75,000	4,600		185,000	125,000
1,700		115,000	75,000	4,700		185,000	125,000
1,800		120,000	80,000	4,760	3/16	195,000	135,000
1,900		120,000	80,000	4,800		195,000	135,000
1,930		125,000	85,000	4,900		195,000	135,000
1,950		125,000	85,000	5,000		195,000	135,000
2,000		125,000	85,000	5,100		195,000	135,000
2,050		125,000	85,000	5,200		195,000	135,000
2,100		125,000	85,000	5,300		195,000	135,000
2,200		135,000	90,000	5,340		205,000	140,000
2,300		135,000	90,000	5,400		205,000	140,000
2,350		135,000	90,000	5,500		205,000	140,000
2,380	3/32	140,000	95,000	5,560	7/32	205,000	140,000
2,400		140,000	95,000	5,600		205,000	140,000
2,500		140,000	95,000	5,700		205,000	140,000
2,600		140,000	95,000	5,800		205,000	140,000
2,700		150,000	100,000	5,900		205,000	140,000
2,800		150,000	100,000	6,000		205,000	140,000
2,900		150,000	100,000	6,100		215,000	150,000
3,000		150,000	100,000	6,200		215,000	150,000
3,100		155,000	105,000	6,250		215,000	150,000
3,170	1/8	155,000	105,000	6,300		215,000	150,000
3,200		155,000	105,000	6,350	1/4	215,000	150,000
3,250		155,000	105,000	6,400		215,000	150,000
3,300		155,000	105,000	6,500		215,000	150,000
3,400		165,000	115,000	6,600		215,000	150,000
3,500		165,000	115,000	6,700		215,000	150,000
3,570	9/64	165,000	115,000	6,750	17/64	225,000	155,000
3,600		165,000	115,000	6,800		225,000	155,000
3,650		165,000	115,000	7,000		225,000	155,000
3,700		165,000	115,000	7,200		225,000	155,000
3,750		165,000	115,000	7,400		225,000	155,000
3,800		175,000	120,000	7,500		225,000	155,000
3,900		175,000	120,000	7,700		240,000	165,000
3,970	5/32	175,000	120,000	7,800		240,000	165,000
4,000		175,000	120,000	7,900		240,000	165,000
4,100		175,000	120,000	7,940	5/16	240,000	165,000
4,200		175,000	120,000	8,000		240,000	165,000
4,300		185,000	125,000	8,100		240,000	165,000
4,370	11/64	185,000	125,000	8,200		240,000	165,000
4,400		185,000	125,000	8,330	21/64	240,000	165,000
4,500		185,000	125,000	8,400		240,000	165,000

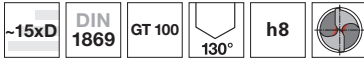


d1		l1	l2
mm	inch	mm	mm
8,500		240,000	165,000
8,700		250,000	175,000
8,730	11/32	250,000	175,000
8,800		250,000	175,000
8,900		250,000	175,000
9,000		250,000	175,000
9,130	23/64	250,000	175,000
9,500		250,000	175,000
9,520	3/8	265,000	185,000
9,600		265,000	185,000
9,700		265,000	185,000
9,800		265,000	185,000
9,900		265,000	185,000
9,920	25/64	265,000	185,000
10,000		265,000	185,000
10,100		265,000	185,000
10,200		265,000	185,000
10,250		265,000	185,000

d1		l1	l2
mm	inch	mm	mm
10,320	13/32	265,000	185,000
10,500		265,000	185,000
11,000		280,000	195,000
11,500		280,000	195,000
11,510	29/64	280,000	195,000
11,800		280,000	195,000
12,000		295,000	205,000
12,100		295,000	205,000
12,250		295,000	205,000
12,300	31/64	295,000	205,000
12,500		295,000	205,000
12,700	1/2	295,000	205,000
13,000		295,000	205,000



## Helisel matkap uçları çok uzun, seri 1

Malzeme **HSS**

Yüzey

Kesme yönü

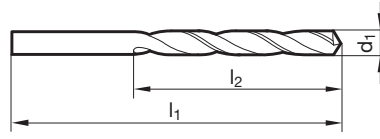
**P** • öz bileme  $\geq \varnothing 1,950$  • koni bileme • geniş kanallı • çok derin delikler için  
• zor talaş atılmasında

**M****K** •

**N** • 1000 N/mm<sup>2</sup>'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.

**S****H****GÜHRING**NAVIGATOR

Kesme verileri sayfası 790

Ürün no **502**

Derin Delik Matkap Ucu

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,950		125,000	85,000	4,400		185,000	125,000
2,000		125,000	85,000	4,500		185,000	125,000
2,050		125,000	85,000	4,570		185,000	125,000
2,100		125,000	85,000	4,600		185,000	125,000
2,200		135,000	90,000	4,700		185,000	125,000
2,300		135,000	90,000	4,760	3/16	195,000	135,000
2,370		140,000	95,000	4,800		195,000	135,000
2,380	3/32	140,000	95,000	4,900		195,000	135,000
2,400		140,000	95,000	5,000		195,000	135,000
2,500		140,000	95,000	5,100		195,000	135,000
2,550		140,000	95,000	5,110		195,000	135,000
2,580		140,000	95,000	5,160	13/64	195,000	135,000
2,600		140,000	95,000	5,200		195,000	135,000
2,700		150,000	100,000	5,300		195,000	135,000
2,780	7/64	150,000	100,000	5,400		205,000	140,000
2,800		150,000	100,000	5,500		205,000	140,000
2,850		150,000	100,000	5,560	7/32	205,000	140,000
2,870		150,000	100,000	5,600		205,000	140,000
2,900		150,000	100,000	5,700		205,000	140,000
2,950		150,000	100,000	5,750		205,000	140,000
3,000		150,000	100,000	5,800		205,000	140,000
3,030		155,000	105,000	5,900		205,000	140,000
3,100		155,000	105,000	5,950	15/64	205,000	140,000
3,170	1/8	155,000	105,000	6,000		205,000	140,000
3,200		155,000	105,000	6,100		215,000	150,000
3,250		155,000	105,000	6,200		215,000	150,000
3,300		155,000	105,000	6,250		215,000	150,000
3,400		165,000	115,000	6,300		215,000	150,000
3,500		165,000	115,000	6,350	1/4	215,000	150,000
3,570	9/64	165,000	115,000	6,400		215,000	150,000
3,600		165,000	115,000	6,500		215,000	150,000
3,700		165,000	115,000	6,600		215,000	150,000
3,750		165,000	115,000	6,700		215,000	150,000
3,800		175,000	120,000	6,750	17/64	225,000	155,000
3,860		175,000	120,000	6,800		225,000	155,000
3,900		175,000	120,000	6,900		225,000	155,000
3,970	5/32	175,000	120,000	7,000		225,000	155,000
4,000		175,000	120,000	7,100		225,000	155,000
4,100		175,000	120,000	7,200		225,000	155,000
4,200		175,000	120,000	7,300		225,000	155,000
4,300		185,000	125,000	7,500		225,000	155,000
4,370	11/64	185,000	125,000	7,540	19/64	240,000	165,000



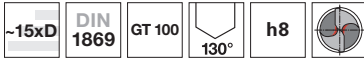


d1		l1	l2
mm	inch	mm	mm
7,700		240,000	165,000
7,750		240,000	165,000
7,800		240,000	165,000
7,900		240,000	165,000
7,940	5/16	240,000	165,000
8,000		240,000	165,000
8,100		240,000	165,000
8,200		240,000	165,000
8,300		240,000	165,000
8,330	21/64	240,000	165,000
8,400		240,000	165,000
8,430		240,000	165,000
8,500		240,000	165,000
8,600		250,000	175,000
8,700		250,000	175,000
8,730	11/32	250,000	175,000
8,800		250,000	175,000
9,000		250,000	175,000
9,200		250,000	175,000
9,300		250,000	175,000
9,400		250,000	175,000
9,500		250,000	175,000
9,520	3/8	265,000	185,000
9,600		265,000	185,000

d1		l1	l2
mm	inch	mm	mm
9,700		265,000	185,000
9,800		265,000	185,000
9,900		265,000	185,000
9,920	25/64	265,000	185,000
10,000		265,000	185,000
10,200		265,000	185,000
10,320	13/32	265,000	185,000
10,500		265,000	185,000
10,720	27/64	280,000	195,000
11,000		280,000	195,000
11,110	7/16	280,000	195,000
11,200		280,000	195,000
11,500		280,000	195,000
11,510	29/64	280,000	195,000
11,750		280,000	195,000
11,800		280,000	195,000
12,000		295,000	205,000
12,500		295,000	205,000
12,700	1/2	295,000	205,000
13,000		295,000	205,000



## Helisel matkap uçları çok uzun, seri 1

Malzeme **HSS**Yüzey **S**Kesme yönü **R**

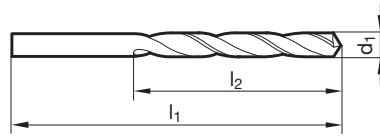
**P** • öz bileme  $\geq \varnothing 1,980$  • koni bileme • geniş kanallı • çok derin delikler için  
• zor talaş atılmasında

**M****K** •

**N** •  $1000 \text{ N/mm}^2$ 'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.

**S** ○**H****GÜHRING**NAVIGATOR

Kesme verileri sayfası 790

Ürün no **670**

Derin Delik Matkap Ucu

d1		l1	l2
mm	inch	mm	mm
2,000		125,000	85,000
2,100		125,000	85,000
2,200		135,000	90,000
2,300		135,000	90,000
2,380	3/32	140,000	95,000
2,400		140,000	95,000
2,500		140,000	95,000
2,780	7/64	150,000	100,000
2,800		150,000	100,000
2,950		150,000	100,000
3,000		150,000	100,000
3,100		155,000	105,000
3,170	1/8	155,000	105,000
3,200		155,000	105,000
3,300		155,000	105,000
3,500		165,000	115,000
3,570	9/64	165,000	115,000
3,600		165,000	115,000
3,800		175,000	120,000
3,970	5/32	175,000	120,000
4,000		175,000	120,000
4,200		175,000	120,000
4,370	11/64	185,000	125,000
4,500		185,000	125,000
4,600		185,000	125,000
4,760	3/16	195,000	135,000
4,800		195,000	135,000
5,000		195,000	135,000
5,100		195,000	135,000
5,160	13/64	195,000	135,000
5,200		195,000	135,000
5,500		205,000	140,000
5,560	7/32	205,000	140,000
6,000		205,000	140,000
6,100		215,000	150,000
6,200		215,000	150,000

d1		l1	l2
mm	inch	mm	mm
6,350	1/4	215,000	150,000
6,500		215,000	150,000
6,600		215,000	150,000
6,800		225,000	155,000
7,000		225,000	155,000
7,140	9/32	225,000	155,000
7,500		225,000	155,000
7,540	19/64	240,000	165,000
7,940	5/16	240,000	165,000
8,000		240,000	165,000
8,200		240,000	165,000
8,500		240,000	165,000
8,730	11/32	250,000	175,000
9,000		250,000	175,000
9,520	3/8	265,000	185,000
9,600		265,000	185,000
9,920	25/64	265,000	185,000
10,000		265,000	185,000
10,900		280,000	195,000
11,000		280,000	195,000
11,900		295,000	205,000
11,910	15/32	295,000	205,000
12,000		295,000	205,000
12,500		295,000	205,000
12,700	1/2	295,000	205,000



## Helisel matkap uçları çok uzun, seri 1



**P** öz bileme  $\geq \varnothing 2,380$  • koni bileme • çok derin delikler için



**N** yumuşak uzun talaşlı malzemeler  $1200 \text{ N/mm}^2$ 'ye kadar • otomat çelikleri (yumuşak) • Alüminyum/Al-alışımları (uzun talaşlı) • çinko, saflaştırılmış bakır, silümin, elektrotlar • zamak, argalyum, yumuşal plastikler, ahşap

## GÜHRING NAVIGATOR

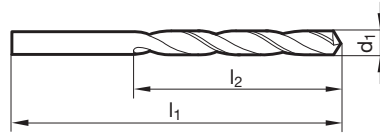
Kesme verileri sayfası 788

Malzeme **HSS**

Yüzey



Kesme yönü

Ürün no **524**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
2,000		125,000	85,000	5,200		195,000	135,000
2,100		125,000	85,000	5,400		205,000	140,000
2,200		135,000	90,000	5,600		205,000	140,000
2,300		135,000	90,000	5,700		205,000	140,000
2,350		135,000	90,000	5,800		205,000	140,000
2,380	3/32	140,000	95,000	5,900		205,000	140,000
2,400		140,000	95,000	5,950	15/64	205,000	140,000
2,450		140,000	95,000	6,000		205,000	140,000
2,500		140,000	95,000	6,100		215,000	150,000
2,600		140,000	95,000	6,350	1/4	215,000	150,000
2,780	7/64	150,000	100,000	6,400		215,000	150,000
2,800		150,000	100,000	6,500		215,000	150,000
2,900		150,000	100,000	6,600		215,000	150,000
2,950		150,000	100,000	6,750	17/64	225,000	155,000
3,000		150,000	100,000	6,800		225,000	155,000
3,100		155,000	105,000	7,000		225,000	155,000
3,170	1/8	155,000	105,000	7,100		225,000	155,000
3,200		155,000	105,000	7,140	9/32	225,000	155,000
3,300		155,000	105,000	7,300		225,000	155,000
3,350		155,000	105,000	7,400		225,000	155,000
3,400		165,000	115,000	7,500		225,000	155,000
3,450		165,000	115,000	7,540	19/64	240,000	165,000
3,500		165,000	115,000	7,800		240,000	165,000
3,530		165,000	115,000	7,900		240,000	165,000
3,570	9/64	165,000	115,000	7,940	5/16	240,000	165,000
3,600		165,000	115,000	8,000		240,000	165,000
3,800		175,000	120,000	8,100		240,000	165,000
3,900		175,000	120,000	8,330	21/64	240,000	165,000
3,970	5/32	175,000	120,000	8,600		250,000	175,000
4,000		175,000	120,000	8,730	11/32	250,000	175,000
4,100		175,000	120,000	8,900		250,000	175,000
4,200		175,000	120,000	9,000		250,000	175,000
4,250		175,000	120,000	9,130	23/64	250,000	175,000
4,300		185,000	125,000	9,200		250,000	175,000
4,370	11/64	185,000	125,000	9,500		250,000	175,000
4,400		185,000	125,000	9,520	3/8	265,000	185,000
4,500		185,000	125,000	9,920	25/64	265,000	185,000
4,760	3/16	195,000	135,000	10,000		265,000	185,000
4,900		195,000	135,000	10,320	13/32	265,000	185,000
5,000		195,000	135,000	10,500		265,000	185,000
5,100		195,000	135,000	11,000		280,000	195,000
5,160	13/64	195,000	135,000	11,110	7/16	280,000	195,000

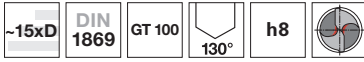


d1		l1	l2
mm	inch	mm	mm
11,500		280,000	195,000
11,910	15/32	295,000	205,000
12,000		295,000	205,000
12,700	1/2	295,000	205,000

d1		l1	l2
mm	inch	mm	mm



## Helisel matkap uçları çok uzun, seri 1

Malzeme **HSCO**

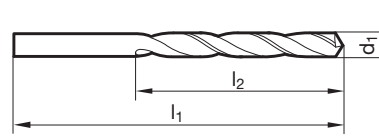
Yüzey

Kesme yönü

- P** • öz bileme  $\geq \text{Ø} 2,700$  • koni bileme • Co-alaşımlı HSS-çeliği • geniş kanallı  
• arttırılmış aşınma direnci • çok derin delikler için • zor talaş atılmasında
- M** •
- K** •
- N** • çelik ve çelik dökümler • pik döküm, temper döküm ve küresel döküm
- S** •
- H** •

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 794

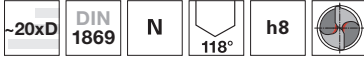
Ürün no **618**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
2,700		150,000	100,000	5,800		205,000	140,000
2,900		150,000	100,000	6,000		205,000	140,000
3,000		150,000	100,000	6,100		215,000	150,000
3,100		155,000	105,000	6,200		215,000	150,000
3,170	1/8	155,000	105,000	6,300		215,000	150,000
3,200		155,000	105,000	6,350	1/4	215,000	150,000
3,300		155,000	105,000	6,400		215,000	150,000
3,400		165,000	115,000	6,500		215,000	150,000
3,500		165,000	115,000	6,600		215,000	150,000
3,570	9/64	165,000	115,000	6,700		215,000	150,000
3,600		165,000	115,000	6,750	17/64	225,000	155,000
3,700		165,000	115,000	6,800		225,000	155,000
3,750		165,000	115,000	7,000		225,000	155,000
3,800		175,000	120,000	7,140	9/32	225,000	155,000
3,970	5/32	175,000	120,000	7,400		225,000	155,000
4,000		175,000	120,000	7,500		225,000	155,000
4,100		175,000	120,000	7,540	19/64	240,000	165,000
4,200		175,000	120,000	7,700		240,000	165,000
4,300		185,000	125,000	7,800		240,000	165,000
4,370	11/64	185,000	125,000	7,940	5/16	240,000	165,000
4,400		185,000	125,000	8,000		240,000	165,000
4,500		185,000	125,000	8,200		240,000	165,000
4,600		185,000	125,000	8,330	21/64	240,000	165,000
4,760	3/16	195,000	135,000	8,500		240,000	165,000
4,800		195,000	135,000	8,700		250,000	175,000
4,850		195,000	135,000	8,730	11/32	250,000	175,000
5,000		195,000	135,000	8,800		250,000	175,000
5,100		195,000	135,000	9,000		250,000	175,000
5,160	13/64	195,000	135,000	9,130	23/64	250,000	175,000
5,200		195,000	135,000	9,400		250,000	175,000
5,300		195,000	135,000	9,500		250,000	175,000
5,400		205,000	140,000	9,520	3/8	265,000	185,000
5,500		205,000	140,000	9,700		265,000	185,000
5,560	7/32	205,000	140,000	10,000		265,000	185,000
5,600		205,000	140,000				
5,700		205,000	140,000				

Derin Delik Matkap Ucu



## Ekstra uzun helisel matkaplar, seri 2



<b>P</b> •	öz bileme $\geq \varnothing 2,700$ • koni bileme • çok derin delikler için
<b>M</b>	
<b>K</b> •	
<b>N</b> ○	alaşımli/alaşimsız çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit
<b>S</b>	
<b>H</b>	

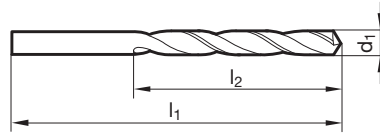
## GÜHRING NAVIGATOR

Kesme verileri sayfası 788

Malzeme **HSS**

Yüzey

Kesme yönü

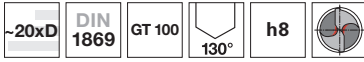
Ürün no **236**

d1		l1	l2
mm	inch	mm	mm
2,700		190,000	130,000
2,800		190,000	130,000
2,900		190,000	130,000
3,000		190,000	130,000
3,100		200,000	135,000
3,170	1/8	200,000	135,000
3,200		200,000	135,000
3,300		200,000	135,000
3,500		210,000	145,000
3,570	9/64	210,000	145,000
3,600		210,000	145,000
3,800		220,000	150,000
3,970	5/32	220,000	150,000
4,000		220,000	150,000
4,100		220,000	150,000
4,200		220,000	150,000
4,500		235,000	160,000
4,760	3/16	245,000	170,000
4,800		245,000	170,000
4,900		245,000	170,000
5,000		245,000	170,000
5,200		245,000	170,000
5,500		260,000	180,000
5,560	7/32	260,000	180,000
5,800		260,000	180,000
5,900		260,000	180,000
5,950	15/64	260,000	180,000
6,000		260,000	180,000
6,200		275,000	190,000
6,350	1/4	275,000	190,000

d1		l1	l2
mm	inch	mm	mm
6,500		275,000	190,000
6,700		275,000	190,000
6,800		290,000	200,000
7,000		290,000	200,000
7,140	9/32	290,000	200,000
7,500		290,000	200,000
7,540	19/64	305,000	210,000
7,800		305,000	210,000
7,940	5/16	305,000	210,000
8,000		305,000	210,000
8,100		305,000	210,000
8,500		305,000	210,000
8,700		320,000	220,000
8,730	11/32	320,000	220,000
8,800		320,000	220,000
8,900		320,000	220,000
9,000		320,000	220,000
9,130	23/64	320,000	220,000
9,500		320,000	220,000
9,800		340,000	235,000
10,000		340,000	235,000
10,200		340,000	235,000
10,500		340,000	235,000
11,000		365,000	250,000
11,110	7/16	365,000	250,000
11,500		365,000	250,000
11,510	29/64	365,000	250,000
11,750		365,000	250,000
12,000		375,000	260,000
13,000		375,000	260,000



## Ekstra uzun helisel matkaplar, seri 2

Malzeme **HSS**

Yüzey

Kesme yönü

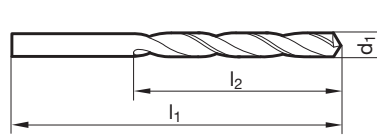
**P** • öz bileme  $\geq \varnothing 2,000$  • koni bileme • geniş kanallı • çok derin delikler için  
• zor talaş atılmasında

**M****K** •

**N** • 1000 N/mm<sup>2</sup>'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler,  
VA-çelikleri vb.

**S****H****GÜHRING**NAVIGATOR

Kesme verileri sayfası 790

Ürün no **503**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
2,000		160,000	110,000	6,100		275,000	190,000
2,200		170,000	115,000	6,150		275,000	190,000
2,300		170,000	115,000	6,200		275,000	190,000
2,500		180,000	120,000	6,350	1/4	275,000	190,000
2,800		190,000	130,000	6,400		275,000	190,000
3,000		190,000	130,000	6,500		275,000	190,000
3,030		200,000	135,000	6,600		275,000	190,000
3,100		200,000	135,000	6,700		275,000	190,000
3,170	1/8	200,000	135,000	6,750	17/64	290,000	200,000
3,200		200,000	135,000	6,800		290,000	200,000
3,300		200,000	135,000	6,900		290,000	200,000
3,400		210,000	145,000	7,000		290,000	200,000
3,500		210,000	145,000	7,140	9/32	290,000	200,000
3,570	9/64	210,000	145,000	7,500		290,000	200,000
3,600		210,000	145,000	7,540	19/64	305,000	210,000
3,700		210,000	145,000	7,800		305,000	210,000
3,800		220,000	150,000	7,940	5/16	305,000	210,000
3,900		220,000	150,000	8,000		305,000	210,000
3,970	5/32	220,000	150,000	8,200		305,000	210,000
4,000		220,000	150,000	8,330	21/64	305,000	210,000
4,100		220,000	150,000	8,500		305,000	210,000
4,200		220,000	150,000	8,600		320,000	220,000
4,300		235,000	160,000	8,730	11/32	320,000	220,000
4,370	11/64	235,000	160,000	8,800		320,000	220,000
4,400		235,000	160,000	9,000		320,000	220,000
4,500		235,000	160,000	9,100		320,000	220,000
4,760	3/16	245,000	170,000	9,130	23/64	320,000	220,000
4,800		245,000	170,000	9,500		320,000	220,000
4,900		245,000	170,000	9,520	3/8	340,000	235,000
5,000		245,000	170,000	9,700		340,000	235,000
5,100		245,000	170,000	9,800		340,000	235,000
5,160	13/64	245,000	170,000	9,920	25/64	340,000	235,000
5,200		245,000	170,000	10,000		340,000	235,000
5,300		245,000	170,000	10,200		340,000	235,000
5,400		260,000	180,000	10,500		340,000	235,000
5,500		260,000	180,000	10,720	27/64	365,000	250,000
5,560	7/32	260,000	180,000	11,000		365,000	250,000
5,700		260,000	180,000	11,110	7/16	365,000	250,000
5,800		260,000	180,000	11,500		365,000	250,000
5,900		260,000	180,000	11,510	29/64	365,000	250,000
5,950	15/64	260,000	180,000	11,750		365,000	250,000
6,000		260,000	180,000	11,910	15/32	375,000	260,000



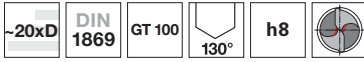
d1		l1	l2
mm	inch	mm	mm
12,000		375,000	260,000
12,300	31/64	375,000	260,000
12,500		375,000	260,000
12,700	1/2	375,000	260,000
13,000		375,000	260,000

d1		l1	l2
mm	inch	mm	mm





## Ekstra uzun helisel matkaplar, seri 2

Malzeme **HSS**Yüzey **S**Kesme yönü **R**

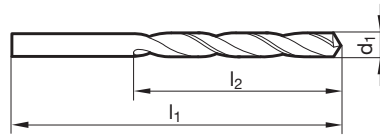
**P** • öz bileme  $\geq \varnothing 2,300$  • koni bileme • geniş kanallı • çok derin delikler için  
• zor talaş atılmasında

**M****K** •

**N** •  $1000 \text{ N/mm}^2$ 'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler,  
VA-çelikleri vb.

**S** ○**H****GÜHRING**NAVIGATOR

Kesme verileri sayfası 790

Ürün no **671**

d1		l1	l2
mm	inch	mm	mm
2,700		190,000	130,000
2,800		190,000	130,000
3,000		190,000	130,000
3,100		200,000	135,000
3,170	1/8	200,000	135,000
3,200		200,000	135,000
3,500		210,000	145,000
3,570	9/64	210,000	145,000
3,970	5/32	220,000	150,000
4,000		220,000	150,000
4,090		220,000	150,000
4,370	11/64	235,000	160,000
4,400		235,000	160,000
4,500		235,000	160,000
4,600		235,000	160,000
4,760	3/16	245,000	170,000
4,800		245,000	170,000
5,000		245,000	170,000

d1		l1	l2
mm	inch	mm	mm
5,300		245,000	170,000
5,500		260,000	180,000
5,560	7/32	260,000	180,000
6,000		260,000	180,000
6,350	1/4	275,000	190,000
6,500		275,000	190,000
6,750	17/64	290,000	200,000
6,800		290,000	200,000
7,000		290,000	200,000
7,140	9/32	290,000	200,000
7,500		290,000	200,000
7,940	5/16	305,000	210,000
8,000		305,000	210,000
8,500		305,000	210,000

Derin Delik Matkap  
Ucu



## Ekstra uzun helisel matkaplar, seri 2



Malzeme **HSS**

Yüzey



Kesme yönü



**P** öz bileme  $\geq \varnothing 2,800$  • koni bileme • çok derin delikler için

**M**

**K**

**N**

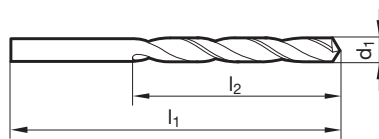
**S**

**H**

yumuşak uzun talaşlı malzemeler  $1200 \text{ N/mm}^2$ 'ye kadar • otomat çelikleri (yumuşak) • Alüminyum/Al-alaşimleri (uzun talaşlı) • çinko, saflaştırılmış bakır, silümin, elektrotlar • zamak, argalyum, yumuşal plastikler, ahşap

## GÜHRING NAVIGATOR

Kesme verileri sayfası 788



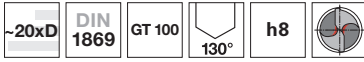
Ürün no **528**

Derin Delik Matkap Ucu

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
3,000		190,000	130,000	7,500		290,000	200,000
3,030		200,000	135,000	8,000		305,000	210,000
3,100		200,000	135,000	8,500		305,000	210,000
3,170	1/8	200,000	135,000	9,000		320,000	220,000
3,500		210,000	145,000	10,000		340,000	235,000
3,650		210,000	145,000	10,500		340,000	235,000
3,800		220,000	150,000	11,500		365,000	250,000
4,000		220,000	150,000	13,000		375,000	260,000
4,200		220,000	150,000				
4,500		235,000	160,000				
4,760	3/16	245,000	170,000				
4,800		245,000	170,000				
5,000		245,000	170,000				
5,110		245,000	170,000				
5,500		260,000	180,000				
5,800		260,000	180,000				
6,000		260,000	180,000				
7,000		290,000	200,000				



## Ekstra uzun helisel matkaplar, seri 2

Malzeme **HSCO**

Yüzey

Kesme yönü

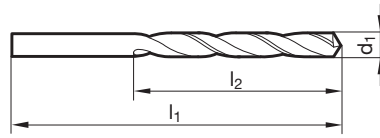
**P** • öz bileme  $\geq \text{Ø } 3,000$  • koni bileme • Co-alaşımlı HSS-çeliği • geniş kanallı  
• arttırılmış aşınma direnci • çok derin delikler için • zor talaş atılmasında

**M** •**K** •

**N** • çelik ve çelik dökümler • pik döküm, temper döküm ve küresel döküm

**S** •**H** ○**GÜHRING** NAVIGATOR

Kesme verileri sayfası 794

Ürün no **619**

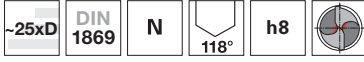
d1		l1	l2
mm	inch	mm	mm
3,000		190,000	130,000
3,170	1/8	200,000	135,000
3,200		200,000	135,000
3,300		200,000	135,000
3,500		210,000	145,000
3,570	9/64	210,000	145,000
3,970	5/32	220,000	150,000
4,000		220,000	150,000
4,100		220,000	150,000
4,200		220,000	150,000
4,370	11/64	235,000	160,000
4,500		235,000	160,000
4,760	3/16	245,000	170,000
4,800		245,000	170,000
4,900		245,000	170,000
5,000		245,000	170,000
5,200		245,000	170,000
5,500		260,000	180,000
5,560	7/32	260,000	180,000
5,950	15/64	260,000	180,000
6,000		260,000	180,000
6,100		275,000	190,000
6,200		275,000	190,000
6,350	1/4	275,000	190,000

d1		l1	l2
mm	inch	mm	mm
6,500		275,000	190,000
6,750	17/64	290,000	200,000
6,800		290,000	200,000
7,000		290,000	200,000
7,140	9/32	290,000	200,000
7,400		290,000	200,000
7,500		290,000	200,000
7,540	19/64	305,000	210,000
7,600		305,000	210,000
7,940	5/16	305,000	210,000
8,000		305,000	210,000
8,200		305,000	210,000
8,500		305,000	210,000
8,730	11/32	320,000	220,000
9,000		320,000	220,000
9,130	23/64	320,000	220,000
9,500		320,000	220,000
9,520	3/8	340,000	235,000
9,600		340,000	235,000
9,900		340,000	235,000
10,000		340,000	235,000

Derin Delik Matkap Ucu



## Ekstra uzun helisel matkaplar, seri 3



P	•	öz bileme $\geq \varnothing 3,500$ • koni bileme • çok derin delikler için
M		
K	•	
N	○	alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit
S		
H		

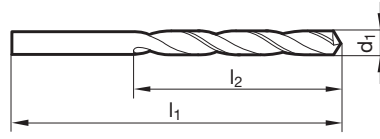
## GÜHRING NAVIGATOR

Kesme verileri sayfası 788

Malzeme **HSS**

Yüzey

Kesme yönü

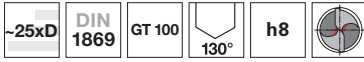
Ürün no **237**

d1		l1	l2
mm	inch	mm	mm
3,500		265,000	180,000
3,800		280,000	190,000
4,000		280,000	190,000
4,100		280,000	190,000
4,200		280,000	190,000
4,500		295,000	200,000
5,000		315,000	210,000
5,200		315,000	210,000
5,500		330,000	225,000
5,800		330,000	225,000
5,900		330,000	225,000
6,000		330,000	225,000
6,100		350,000	235,000
6,200		350,000	235,000
6,500		350,000	235,000
6,700		350,000	235,000
6,800		370,000	250,000
7,000		370,000	250,000

d1		l1	l2
mm	inch	mm	mm
7,500		370,000	250,000
7,800		390,000	265,000
8,000		390,000	265,000
8,500		390,000	265,000
9,000		410,000	280,000
9,500		410,000	280,000
9,800		430,000	295,000
10,000		430,000	295,000
10,300		430,000	295,000
10,500		430,000	295,000
11,000		455,000	310,000
11,500		455,000	310,000
11,750		455,000	310,000
12,000		480,000	330,000
12,500		480,000	330,000
13,000		480,000	330,000



## Ekstra uzun helisel matkaplar, seri 3



<b>P</b>	•	öz bileme $\geq \varnothing 2,500$ • koni bileme • geniş kanallı • zor talaş atılmasında
<b>M</b>		• çok derin delikler için
<b>K</b>	•	
<b>N</b>	•	1000 N/mm <sup>2</sup> 'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.
<b>S</b>		
<b>H</b>		

Malzeme **HSS**

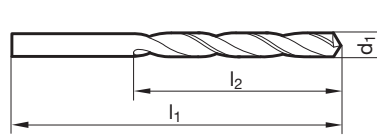
Yüzey



Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 790

Ürün no **504**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
2,500		225,000	150,000	7,000		370,000	250,000
3,000		240,000	160,000	7,140	9/32	370,000	250,000
3,100		250,000	170,000	7,200		370,000	250,000
3,170	1/8	250,000	170,000	7,500		370,000	250,000
3,200		250,000	170,000	7,540	19/64	390,000	265,000
3,300		250,000	170,000	7,750		390,000	265,000
3,400		265,000	180,000	7,800		390,000	265,000
3,500		265,000	180,000	7,940	5/16	390,000	265,000
3,570	9/64	265,000	180,000	8,000		390,000	265,000
3,600		265,000	180,000	8,200		390,000	265,000
3,700		265,000	180,000	8,330	21/64	390,000	265,000
3,800		280,000	190,000	8,500		390,000	265,000
3,900		280,000	190,000	8,600		410,000	280,000
3,970	5/32	280,000	190,000	8,730	11/32	410,000	280,000
4,000		280,000	190,000	8,800		410,000	280,000
4,100		280,000	190,000	8,900		410,000	280,000
4,200		280,000	190,000	9,000		410,000	280,000
4,300		295,000	200,000	9,200		410,000	280,000
4,370	11/64	295,000	200,000	9,500		410,000	280,000
4,400		295,000	200,000	9,520	3/8	430,000	295,000
4,500		295,000	200,000	9,530		430,000	295,000
4,600		295,000	200,000	9,920	25/64	430,000	295,000
4,760	3/16	315,000	210,000	10,000		430,000	295,000
4,800		315,000	210,000	10,320	13/32	430,000	295,000
4,900		315,000	210,000	10,500		430,000	295,000
5,000		315,000	210,000	10,720	27/64	455,000	310,000
5,100		315,000	210,000	11,000		455,000	310,000
5,200		315,000	210,000	11,110	7/16	455,000	310,000
5,500		330,000	225,000	11,500		455,000	310,000
5,560	7/32	330,000	225,000	12,000		480,000	330,000
5,800		330,000	225,000	12,200		480,000	330,000
5,950	15/64	330,000	225,000	12,500		480,000	330,000
6,000		330,000	225,000	13,000		480,000	330,000
6,100		350,000	235,000				
6,200		350,000	235,000				
6,300		350,000	235,000				
6,350	1/4	350,000	235,000				
6,400		350,000	235,000				
6,500		350,000	235,000				
6,700		350,000	235,000				
6,750	17/64	370,000	250,000				
6,800		370,000	250,000				



## Ekstra uzun helisel matkaplar, seri 3



**P** öz bileme  $\geq \text{Ø} 2,500$  • koni bileme • çok derin delikler için



**N** yumuşak uzun talaşlı malzemeler  $1200 \text{ N/mm}^2$ 'ye kadar • otomat çelikleri (yumuşak) • Alüminyum/Al-alaşımları (uzun talaşlı) • çinko, saflaştırılmış bakır, silümin, elektrotlar • zamak, argalyum, yumuşal plastikler, ahşap

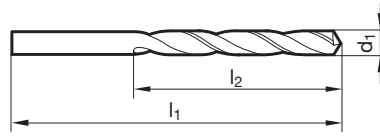
**GÜHRING**NAVIGATOR

Kesme verileri sayfası 788

Malzeme **HSS**

Yüzey

Kesme yönü

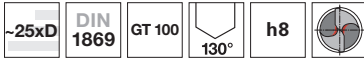
Ürün no **529**

d1		l1	l2
mm	inch	mm	mm
2,500		225,000	150,000
3,000		240,000	160,000
3,500		265,000	180,000
3,800		280,000	190,000
4,000		280,000	190,000
4,500		295,000	200,000
5,000		315,000	210,000
6,000		330,000	225,000
6,500		350,000	235,000
6,700		350,000	235,000
6,800		370,000	250,000
7,500		370,000	250,000

d1		l1	l2
mm	inch	mm	mm
8,000		390,000	265,000
9,500		410,000	280,000
10,000		430,000	295,000



## Ekstra uzun helisel matkaplar, seri 3

Malzeme **HSCO**

Yüzey

Kesme yönü

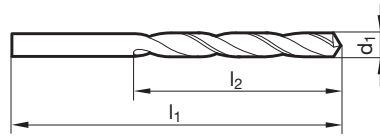
**P** • öz bileme  $\geq \varnothing 2,500$  • koni bileme • Co-alaşımlı HSS-çeliği • geniş kanallı  
• yüksek aşınma direnci • çok derin delikler için • zor talaş atılmasında

**M** •**K** •

**N** • çelik ve çelik dökümler • pik döküm, temper döküm ve küresel döküm

**S** •**H** ○**GÜHRING**NAVIGATOR

Kesme verileri sayfası 794

Ürün no **571**

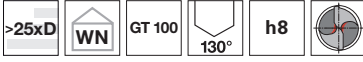
d1		l1	l2
mm	inch	mm	mm
2,500		225,000	150,000
3,000		240,000	160,000
3,100		250,000	170,000
3,170	1/8	250,000	170,000
3,200		250,000	170,000
3,300		250,000	170,000
3,400		265,000	180,000
3,500		265,000	180,000
3,700		265,000	180,000
3,800		280,000	190,000
3,900		280,000	190,000
3,970	5/32	280,000	190,000
4,000		280,000	190,000
4,100		280,000	190,000
4,200		280,000	190,000
4,300		295,000	200,000
4,500		295,000	200,000
4,600		295,000	200,000
4,760	3/16	315,000	210,000
4,800		315,000	210,000
4,900		315,000	210,000
5,000		315,000	210,000
5,100		315,000	210,000
5,200		315,000	210,000
5,500		330,000	225,000
5,560	7/32	330,000	225,000
5,800		330,000	225,000
5,950	15/64	330,000	225,000
6,000		330,000	225,000
6,100		350,000	235,000
6,200		350,000	235,000
6,300		350,000	235,000
6,350	1/4	350,000	235,000
6,400		350,000	235,000
6,500		350,000	235,000
6,700		350,000	235,000

d1		l1	l2
mm	inch	mm	mm
6,750	17/64	370,000	250,000
6,800		370,000	250,000
7,000		370,000	250,000
7,140	9/32	370,000	250,000
7,200		370,000	250,000
7,500		370,000	250,000
7,750		390,000	265,000
7,800		390,000	265,000
7,940	5/16	390,000	265,000
8,000		390,000	265,000
8,200		390,000	265,000
8,500		390,000	265,000
8,600		410,000	280,000
8,730	11/32	410,000	280,000
8,800		410,000	280,000
9,000		410,000	280,000
9,500		410,000	280,000
9,520	3/8	430,000	295,000
10,000		430,000	295,000
10,320	13/32	430,000	295,000
10,500		430,000	295,000
10,720	27/64	455,000	310,000
11,000		455,000	310,000
11,110	7/16	455,000	310,000
11,500		455,000	310,000
12,000		480,000	330,000
12,200		480,000	330,000
12,500		480,000	330,000
13,000		480,000	330,000

Derin Delik Matkap  
Ucu



## Helisel matkap uçları, çok uzun



Malzeme **HSS**

Yüzey

Kesme yönü

**P** • öz bileme  $\geq \varnothing 6,000$  • koni bileme • geniş kanallı • çok derin delikler için  
• zor talaş atılmasında

**M**

**K** •

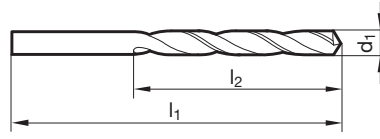
**N** • 1000 N/mm<sup>2</sup>'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler,  
VA-çelikleri vb.

**S**

**H**

## GÜHRING NAVIGATOR

Kesme verileri sayfası 790



Ürün no **242**

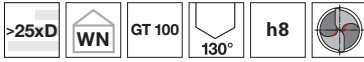
d1		l1	l2
mm	inch	mm	mm
6,000		500,000	400,000
8,000		500,000	400,000
10,000		600,000	500,000
11,000		600,000	500,000
12,000		600,000	500,000

d1		l1	l2
mm	inch	mm	mm





## Helisel matkap uçları, çok uzun

Malzeme **HSS**

Yüzey

Kesme yönü

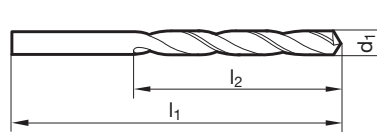
**P** • öz bileme  $\geq \varnothing 8,000$  • koni bileme • geniş kanallı • çok derin delikler için  
• zor talaş atılmasında

**M****K** •

**N** •  $1000 \text{ N/mm}^2$ 'ye kadar pıkk döküm ve çelikler • İstisnalar: CrNi-çelikler,  
VA-çelikleri vb.

**S****H****GÜHRING** NAVIGATOR

Kesme verileri sayfası 790

Ürün no **243**

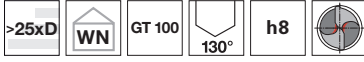
d1		l1	l2
mm	inch	mm	mm
8,000		750,000	650,000
10,000		750,000	650,000
11,000		750,000	650,000
12,000		750,000	650,000

d1		l1	l2
mm	inch	mm	mm

Derin Delik Matkap Ucu



## Helisel matkap uçları, çok uzun

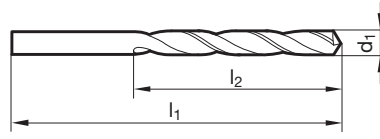


<b>P</b>	•	öz bileme $\geq \varnothing 10,000$ • koni bileme • geniş kanallı • çok derin delikler için • zor talaş atılmasında
<b>M</b>		
<b>K</b>	•	
<b>N</b>	•	1000 N/mm <sup>2</sup> 'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.
<b>S</b>		
<b>H</b>		

## GÜHRING NAVIGATOR

Kesme verileri sayfası 790

Malzeme	<b>HSS</b>
Yüzey	○
Kesme yönü	Ⓜ



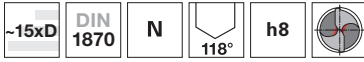
Ürün no 244

d1		l1	l2
mm	inch	mm	mm
10,000		1000,000	850,000
11,000		1000,000	850,000
12,000		1000,000	850,000

d1		l1	l2
mm	inch	mm	mm



## Helisel matkap uçları çok uzun, seri 1

Malzeme **HSS**

Yüzey



Kesme yönü



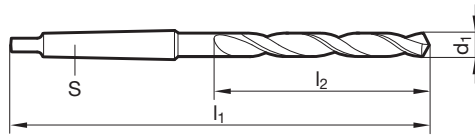
**P** • öz bileme  $\geq \varnothing 7,800$  • koni bileme • çok derin delikler için

**M****K** •**N** ○**S****H**

alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

**GÜHRING**NAVIGATOR

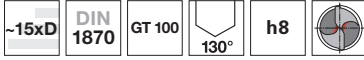
Kesme verileri sayfası 788

Ürün no **266**

d1		S	l1	l2	d1		S	l1	l2
mm	inch		mm	mm	mm	inch		mm	mm
8,000		MK-1	265,000	165,000	20,500		MK-2	385,000	260,000
8,500		MK-1	265,000	165,000	20,640	13/16	MK-2	385,000	260,000
9,000		MK-1	275,000	175,000	21,000		MK-2	385,000	260,000
9,500		MK-1	275,000	175,000	21,430	27/32	MK-2	405,000	270,000
10,000		MK-1	285,000	185,000	21,500		MK-2	405,000	270,000
10,200		MK-1	285,000	185,000	22,000		MK-2	405,000	270,000
10,250		MK-1	285,000	185,000	22,500		MK-2	405,000	270,000
10,500		MK-1	285,000	185,000	23,000		MK-2	405,000	270,000
11,000		MK-1	300,000	195,000	23,020	29/32	MK-2	405,000	270,000
11,400		MK-1	300,000	195,000	23,500		MK-3	425,000	270,000
11,500		MK-1	300,000	195,000	24,000		MK-3	440,000	290,000
11,750		MK-1	300,000	195,000	24,500		MK-3	440,000	290,000
11,800		MK-1	300,000	195,000	25,000	63/64	MK-3	440,000	290,000
12,000		MK-1	310,000	205,000	26,000		MK-3	440,000	290,000
12,200		MK-1	310,000	205,000	26,500		MK-3	440,000	290,000
12,500		MK-1	310,000	205,000	27,000		MK-3	460,000	305,000
12,700	1/2	MK-1	310,000	205,000	28,000		MK-3	460,000	305,000
13,000		MK-1	310,000	205,000	30,000		MK-3	460,000	305,000
13,500		MK-1	325,000	220,000	30,500		MK-3	480,000	320,000
13,750		MK-1	325,000	220,000	31,000		MK-3	480,000	320,000
14,000		MK-1	325,000	220,000	32,000		MK-4	505,000	320,000
14,290	9/16	MK-2	340,000	220,000	33,000		MK-4	505,000	320,000
14,500		MK-2	340,000	220,000	34,000		MK-4	530,000	340,000
15,000		MK-2	340,000	220,000	35,000		MK-4	530,000	340,000
15,250		MK-2	355,000	230,000	36,000		MK-4	530,000	340,000
15,500		MK-2	355,000	230,000	38,000		MK-4	555,000	360,000
15,750		MK-2	355,000	230,000	39,000		MK-4	555,000	360,000
15,800		MK-2	355,000	230,000	40,000		MK-4	555,000	360,000
16,000		MK-2	355,000	230,000	42,000		MK-4	555,000	360,000
16,250		MK-2	355,000	230,000	45,000		MK-4	585,000	385,000
16,500		MK-2	355,000	230,000	45,240	1 25/32	MK-4	585,000	385,000
16,670	21/32	MK-2	355,000	230,000	48,000		MK-4	605,000	405,000
17,000		MK-2	355,000	230,000	50,000		MK-4	605,000	405,000
17,500		MK-2	370,000	245,000					
17,750		MK-2	370,000	245,000					
18,000		MK-2	370,000	245,000					
18,500		MK-2	370,000	245,000					
18,650	47/64	MK-2	370,000	245,000					
19,000		MK-2	370,000	245,000					
19,500		MK-2	385,000	260,000					
19,750		MK-2	385,000	260,000					
20,000		MK-2	385,000	260,000					



## Helisel matkap uçları çok uzun, seri 1

Malzeme **HSS**

Yüzey

Kesme yönü

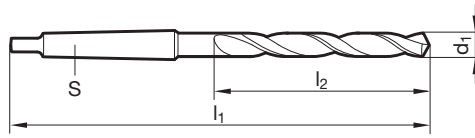
**P** • öz bileme  $\geq \varnothing 5,800$  • koni bileme • geniş kanallı • çok derin delikler için  
• zor talaş atılmasında

**M****K****N****S****H**

• 1000 N/mm<sup>2</sup>'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler, VA-çelikleri vb.

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 790

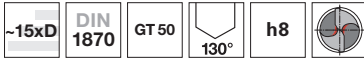
Ürün no **526**

Derin Delik Matkap Ucu

d1		S	l1	l2	d1		S	l1	l2
mm	inch		mm	mm	mm	inch		mm	mm
8,000		MK-1	265,000	165,000	15,870	5/8	MK-2	355,000	230,000
8,500		MK-1	265,000	165,000	16,000		MK-2	355,000	230,000
8,600		MK-1	275,000	175,000	16,500		MK-2	355,000	230,000
8,700		MK-1	275,000	175,000	17,000		MK-2	355,000	230,000
9,000		MK-1	275,000	175,000	17,460	11/16	MK-2	370,000	245,000
9,500		MK-1	275,000	175,000	17,500		MK-2	370,000	245,000
9,520	3/8	MK-1	285,000	185,000	18,000		MK-2	370,000	245,000
9,800		MK-1	285,000	185,000	18,500		MK-2	370,000	245,000
10,000		MK-1	285,000	185,000	19,000		MK-2	370,000	245,000
10,200		MK-1	285,000	185,000	19,500		MK-2	385,000	260,000
10,500		MK-1	285,000	185,000	20,000		MK-2	385,000	260,000
10,720	27/64	MK-1	300,000	195,000	20,500		MK-2	385,000	260,000
11,000		MK-1	300,000	195,000	21,000		MK-2	385,000	260,000
11,110	7/16	MK-1	300,000	195,000	21,500		MK-2	405,000	270,000
11,500		MK-1	300,000	195,000	22,000		MK-2	405,000	270,000
11,510	29/64	MK-1	300,000	195,000	23,000		MK-2	405,000	270,000
11,750		MK-1	300,000	195,000	24,000		MK-3	440,000	290,000
12,000		MK-1	310,000	205,000	25,000	63/64	MK-3	440,000	290,000
12,500		MK-1	310,000	205,000	26,000		MK-3	440,000	290,000
12,700	1/2	MK-1	310,000	205,000	26,500		MK-3	440,000	290,000
12,800		MK-1	310,000	205,000	28,000		MK-3	460,000	305,000
13,000		MK-1	310,000	205,000	28,500		MK-3	460,000	305,000
13,490	17/32	MK-1	325,000	220,000	29,000		MK-3	460,000	305,000
13,500		MK-1	325,000	220,000	30,000		MK-3	460,000	305,000
14,000		MK-1	325,000	220,000					
14,200		MK-2	340,000	220,000					
14,290	9/16	MK-2	340,000	220,000					
14,500		MK-2	340,000	220,000					
15,000		MK-2	340,000	220,000					
15,500		MK-2	355,000	230,000					



## Helisel matkap uçları çok uzun, seri 1

Malzeme **HSS**

Yüzey

Kesme yönü

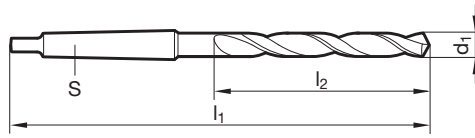
**P** öz bileme  $\geq \varnothing 7,900$  • koni bileme • çok derin delikler için • yumuşak uzun çapaklı malzemeler

**M****K**

**N** yumuşak uzun talaşlı malzemeler  $1200 \text{ N/mm}^2$ 'ye kadar • otomat çelikleri (yumuşak) • Alüminyum/Al-alaşımları (uzun talaşlı) • çinko, saflaştırılmış bakır, silümin, elektrotlar • zamak, argalyum, yumuşal plastikler, ahşap

**S****H****GÜHRING** NAVIGATOR

Kesme verileri sayfası 788

Ürün no **525**

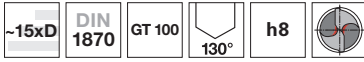
d1		S	l1	l2
mm	inch		mm	mm
8,500		MK-1	265,000	165,000
8,700		MK-1	275,000	175,000
9,000		MK-1	275,000	175,000
9,500		MK-1	275,000	175,000
10,000		MK-1	285,000	185,000
10,500		MK-1	285,000	185,000
11,000		MK-1	300,000	195,000
12,000		MK-1	310,000	205,000
12,500		MK-1	310,000	205,000
13,000		MK-1	310,000	205,000
13,500		MK-1	325,000	220,000
14,000		MK-1	325,000	220,000
15,000		MK-2	340,000	220,000
15,500		MK-2	355,000	230,000
16,000		MK-2	355,000	230,000
18,000		MK-2	370,000	245,000
19,500		MK-2	385,000	260,000
21,000		MK-2	385,000	260,000

d1		S	l1	l2
mm	inch		mm	mm
23,000		MK-2	405,000	270,000
24,000		MK-3	440,000	290,000
24,300		MK-3	440,000	290,000
24,380		MK-3	440,000	290,000
24,500		MK-3	440,000	290,000
25,500		MK-3	440,000	290,000
26,500		MK-3	440,000	290,000
27,500		MK-3	460,000	305,000
28,000		MK-3	460,000	305,000
29,000		MK-3	460,000	305,000
31,000		MK-3	480,000	320,000
33,000		MK-4	505,000	320,000

Derin Delik Matkap Ucu



## Helisel matkap uçları çok uzun, seri 1

Malzeme **HSCO**

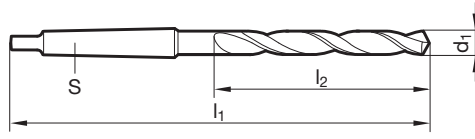
Yüzey

Kesme yönü

<b>P</b>	•	öz bileme $\geq \varnothing 9,520$ • koni bileme • Co-alaşımlı HSS-çeliği • geniş kanallı • arttırılmış aşınma direnci • çok derin delikler için • zor talaş atılmasında
<b>M</b>	•	
<b>K</b>	•	
<b>N</b>	•	çelik ve çelik dökümler • pik döküm, temper döküm ve küresel döküm
<b>S</b>	•	
<b>H</b>	○	

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 794

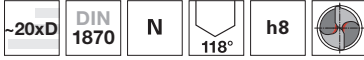
Ürün no **620**

Derin Delik Matkap Ucu

d1		S	l1	l2	d1		S	l1	l2
mm	inch		mm	mm	mm	inch		mm	mm
9,520	3/8	MK-1	285,000	185,000	17,500		MK-2	370,000	245,000
10,000		MK-1	285,000	185,000	18,000		MK-2	370,000	245,000
10,200		MK-1	285,000	185,000	18,500		MK-2	370,000	245,000
10,320	13/32	MK-1	285,000	185,000	19,000		MK-2	370,000	245,000
10,500		MK-1	285,000	185,000	20,000		MK-2	385,000	260,000
11,000		MK-1	300,000	195,000	21,000		MK-2	385,000	260,000
11,110	7/16	MK-1	300,000	195,000	21,830		MK-2	405,000	270,000
11,500		MK-1	300,000	195,000	22,000		MK-2	405,000	270,000
11,510	29/64	MK-1	300,000	195,000	22,620		MK-2	405,000	270,000
12,000		MK-1	310,000	205,000	23,000		MK-2	405,000	270,000
12,300	31/64	MK-1	310,000	205,000	25,500		MK-3	440,000	290,000
12,500		MK-1	310,000	205,000	26,000		MK-3	440,000	290,000
12,700	1/2	MK-1	310,000	205,000	27,180		MK-3	460,000	305,000
13,000		MK-1	310,000	205,000	29,370	1 5/32	MK-3	460,000	305,000
13,500		MK-1	325,000	220,000	30,000		MK-3	460,000	305,000
14,000		MK-1	325,000	220,000					
14,290	9/16	MK-2	340,000	220,000					
14,500		MK-2	340,000	220,000					
15,000		MK-2	340,000	220,000					
15,080	19/32	MK-2	355,000	230,000					
15,500		MK-2	355,000	230,000					
16,000		MK-2	355,000	230,000					
16,500		MK-2	355,000	230,000					
17,000		MK-2	355,000	230,000					



## Ekstra uzun helisel matkaplar, seri 2



**P** • öz bileme  $\geq \varnothing 7,700$  • koni bileme • çok derin delikler için

**M**

**K** •

**N** ○ alaşımli/alaşimsız. çelikler ve çelik dökümlerde • pik döküm, temper döküm ve küresel döküm • toz metal, nikel çeliği ve grafit

**S**

**H**

Malzeme **HSS**

Yüzey

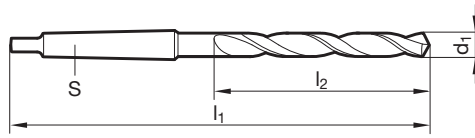


Kesme yönü



## GÜHRING NAVIGATOR

Kesme verileri sayfası 788



Ürün no **267**

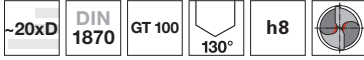
d1		S	l1	l2
mm	inch		mm	mm
8,000		MK-1	330,000	210,000
8,500		MK-1	330,000	210,000
9,000		MK-1	345,000	220,000
10,000		MK-1	360,000	235,000
10,200		MK-1	360,000	235,000
10,500		MK-1	360,000	235,000
11,000		MK-1	375,000	250,000
11,500		MK-1	375,000	250,000
11,750		MK-1	375,000	250,000
11,800		MK-1	375,000	250,000
12,000		MK-1	395,000	260,000
13,000		MK-1	395,000	260,000
13,490	17/32	MK-1	410,000	275,000
13,500		MK-1	410,000	275,000
14,000		MK-1	410,000	275,000
14,500		MK-2	425,000	275,000
15,000		MK-2	425,000	275,000
15,480	39/64	MK-2	445,000	295,000
15,500		MK-2	445,000	295,000
16,000		MK-2	445,000	295,000
16,500		MK-2	445,000	295,000
17,000		MK-2	445,000	295,000
17,070	43/64	MK-2	465,000	310,000
17,500		MK-2	465,000	310,000
18,000		MK-2	465,000	310,000
18,500		MK-2	465,000	310,000
19,000		MK-2	465,000	310,000
19,050	3/4	MK-2	490,000	325,000
19,500		MK-2	490,000	325,000
20,000		MK-2	490,000	325,000

d1		S	l1	l2
mm	inch		mm	mm
20,640	13/16	MK-2	490,000	325,000
21,000		MK-2	490,000	325,000
21,430	27/32	MK-2	515,000	345,000
21,500		MK-2	515,000	345,000
21,830	55/64	MK-2	515,000	345,000
22,000		MK-2	515,000	345,000
22,800		MK-2	515,000	345,000
23,000		MK-2	515,000	345,000
23,020	29/32	MK-2	515,000	345,000
23,750		MK-3	555,000	365,000
23,810	15/16	MK-3	555,000	365,000
24,000		MK-3	555,000	365,000
24,500		MK-3	555,000	365,000
25,000	63/64	MK-3	555,000	365,000
26,000		MK-3	555,000	365,000
28,000		MK-3	580,000	385,000
29,500		MK-3	580,000	385,000
30,000		MK-3	580,000	385,000
31,000		MK-3	610,000	410,000
32,000		MK-4	635,000	410,000
34,000		MK-4	665,000	430,000
40,000		MK-4	695,000	460,000
45,000		MK-4	735,000	490,000

Derin Delik Matkap Ucu



## Ekstra uzun helisel matkaplar, seri 2

Malzeme **HSS**

Yüzey

Kesme yönü

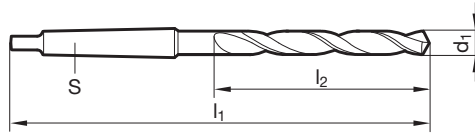
**P** • öz bileme  $\geq \varnothing 7,800$  • koni bileme • geniş kanallı • zor talaş atılmasında  
• çok derin delikler için

**M****K** •

**N** • 1000 N/mm<sup>2</sup>'ye kadar pik döküm ve çelikler • İstisnalar: CrNi-çelikler,  
VA-çelikleri vb.

**S****H****GÜHRING**NAVIGATOR

Kesme verileri sayfası 790

Ürün no **527**

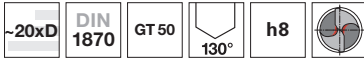
Derin Delik Matkap Ucu

d1		S	l1	l2	d1		S	l1	l2
mm	inch		mm	mm	mm	inch		mm	mm
8,000		MK-1	330,000	210,000	17,500		MK-2	465,000	310,000
8,400		MK-1	330,000	210,000	17,800		MK-2	465,000	310,000
8,500		MK-1	330,000	210,000	18,000		MK-2	465,000	310,000
9,000		MK-1	345,000	220,000	18,500		MK-2	465,000	310,000
9,500		MK-1	345,000	220,000	19,000		MK-2	465,000	310,000
10,000		MK-1	360,000	235,000	19,450	49/64	MK-2	490,000	325,000
10,500		MK-1	360,000	235,000	19,500		MK-2	490,000	325,000
11,000		MK-1	375,000	250,000	20,000		MK-2	490,000	325,000
11,110	7/16	MK-1	375,000	250,000	20,500		MK-2	490,000	325,000
11,500		MK-1	375,000	250,000	21,000		MK-2	490,000	325,000
11,510	29/64	MK-1	375,000	250,000	21,030	53/64	MK-2	490,000	325,000
11,800		MK-1	375,000	250,000	21,430	27/32	MK-2	515,000	345,000
11,910	15/32	MK-1	395,000	260,000	22,000		MK-2	515,000	345,000
12,000		MK-1	395,000	260,000	23,000		MK-2	515,000	345,000
12,500		MK-1	395,000	260,000	23,020	29/32	MK-2	515,000	345,000
12,700	1/2	MK-1	395,000	260,000	23,810	15/16	MK-3	555,000	365,000
13,000		MK-1	395,000	260,000	24,000		MK-3	555,000	365,000
13,500		MK-1	410,000	275,000	24,210	61/64	MK-3	555,000	365,000
13,700		MK-1	410,000	275,000	25,000	63/64	MK-3	555,000	365,000
13,800		MK-1	410,000	275,000	26,000		MK-3	555,000	365,000
13,890	35/64	MK-1	410,000	275,000	26,190	1 1/32	MK-3	555,000	365,000
14,000		MK-1	410,000	275,000	26,500		MK-3	555,000	365,000
14,290	9/16	MK-2	425,000	275,000	27,000		MK-3	580,000	385,000
14,500		MK-2	425,000	275,000	28,000		MK-3	580,000	385,000
15,000		MK-2	425,000	275,000	28,750		MK-3	580,000	385,000
15,500		MK-2	445,000	295,000	29,000		MK-3	580,000	385,000
16,000		MK-2	445,000	295,000	29,500		MK-3	580,000	385,000
16,500		MK-2	445,000	295,000	30,000		MK-3	580,000	385,000
17,000		MK-2	445,000	295,000					
17,070	43/64	MK-2	465,000	310,000					





## Ekstra uzun helisel matkaplar, seri 2

Malzeme **HSS**

Yüzey

Kesme yönü

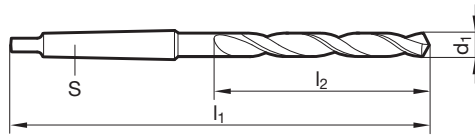
**P** öz bileme  $\geq \varnothing 8,000$  • koni bileme • çok derin delikler için

**M** **K** **N** **S** **H**

yumuşak uzun talaşlı malzemeler  $1200 \text{ N/mm}^2$ 'ye kadar • otomat çelikleri (yumuşak) • Alüminyum/Al-alaşımları (uzun talaşlı) • çinko, saflaştırılmış bakır, silümin, elektrotlar • zamak, argalyum, yumuşal plastikler, ahşap

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 788

Ürün no **542**

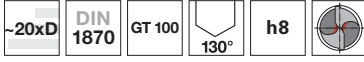
d1		S	l1	l2
mm	inch		mm	mm
8,500		MK-1	330,000	210,000
8,600		MK-1	345,000	220,000
8,800		MK-1	345,000	220,000
9,000		MK-1	345,000	220,000
9,500		MK-1	345,000	220,000
10,500		MK-1	360,000	235,000
10,700		MK-1	375,000	250,000
11,000		MK-1	375,000	250,000
11,500		MK-1	375,000	250,000
12,000		MK-1	395,000	260,000
12,500		MK-1	395,000	260,000
13,000		MK-1	395,000	260,000
13,500		MK-1	410,000	275,000
14,500		MK-2	425,000	275,000
15,000		MK-2	425,000	275,000
17,000		MK-2	445,000	295,000
17,500		MK-2	465,000	310,000
20,500		MK-2	490,000	325,000

d1		S	l1	l2
mm	inch		mm	mm
21,000		MK-2	490,000	325,000
21,500		MK-2	515,000	345,000
22,000		MK-2	515,000	345,000
23,000		MK-2	515,000	345,000
24,000		MK-3	555,000	365,000
24,500		MK-3	555,000	365,000
25,500		MK-3	555,000	365,000
26,000		MK-3	555,000	365,000
26,500		MK-3	555,000	365,000
27,500		MK-3	580,000	385,000
28,000		MK-3	580,000	385,000
29,000		MK-3	580,000	385,000
29,500		MK-3	580,000	385,000
30,000		MK-3	580,000	385,000
31,000		MK-3	610,000	410,000

Derin Delik Matkap Ucu



## Ekstra uzun helisel matkaplar, seri 2

Malzeme **HSCO**

Yüzey

Kesme yönü

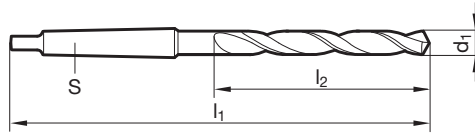
**P** • öz bileme  $\geq \varnothing 9,520$  • koni bileme • Co-alaşımlı HSS-çeliği • geniş kanallı  
• yüksek aşınma direnci • zor talaş atılmasında • çok derin delikler için

**M** •**K** •

**N** • çelik ve çelik dökümler • pik döküm, temper döküm ve küresel döküm

**S** •**H** ○**GÜHRING** NAVIGATOR

Kesme verileri sayfası 794

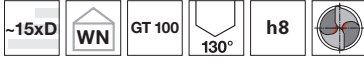
Ürün no **621**

d1		S	l1	l2
mm	inch		mm	mm
9,520	3/8	MK-1	360,000	235,000
10,000		MK-1	360,000	235,000
10,500		MK-1	360,000	235,000
10,720	27/64	MK-1	375,000	250,000
11,000		MK-1	375,000	250,000
11,500		MK-1	375,000	250,000
11,510	29/64	MK-1	375,000	250,000
12,000		MK-1	395,000	260,000
12,500		MK-1	395,000	260,000
12,700	1/2	MK-1	395,000	260,000
13,000		MK-1	395,000	260,000
13,500		MK-1	410,000	275,000

d1		S	l1	l2
mm	inch		mm	mm
14,000		MK-1	410,000	275,000
14,500		MK-2	425,000	275,000
15,000		MK-2	425,000	275,000
16,000		MK-2	445,000	295,000
16,270		MK-2	445,000	295,000
18,000		MK-2	465,000	310,000
18,500		MK-2	465,000	310,000
19,000		MK-2	465,000	310,000
20,000		MK-2	490,000	325,000
21,430	27/32	MK-2	515,000	345,000
23,420	59/64	MK-3	535,000	345,000



## Soğutma kanallı matkap uçları, Kanal boyu DIN 1870



<b>P</b>	•	öz bileme $\geq \text{Ø } 11,000$ • koni bileme • mors konik kısımdan axial soğutma
<b>M</b>	•	• Co-alaşım HSS-çeliği • arttırılmış aşınma direnci • burç kullanarak delme için
<b>K</b>	•	
<b>N</b>	•	mukavemetli ve yüksek mukavemetli çelikleri • çelik döküm, pik döküm
<b>S</b>	•	• pas/asit/ısıya dayanıklı çelikler • 1300 N/mm <sup>2</sup> ye kadar çekme mukavemeti
<b>H</b>	○	

## GÜHRING NAVIGATOR

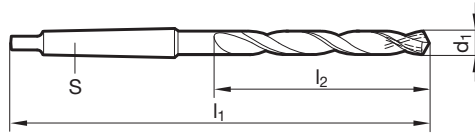
Kesme verileri sayfası 794

Malzeme **HSCO**

Yüzey



Kesme yönü



Ürün no

374

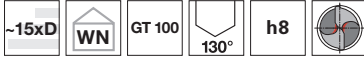
d1		S	l1	l2
mm	inch		mm	mm
11,000		MK-2	312,000	195,000
12,000		MK-2	322,000	205,000
12,300	31/64	MK-2	322,000	205,000
12,500		MK-2	322,000	205,000
13,000		MK-2	322,000	205,000
14,000		MK-2	337,000	220,000
15,000		MK-2	337,000	220,000
16,000		MK-2	347,000	230,000
16,500		MK-2	347,000	230,000
17,500		MK-2	362,000	245,000
18,000		MK-2	362,000	245,000
18,500		MK-3	381,000	245,000
19,840	25/32	MK-3	396,000	260,000
20,000		MK-3	396,000	260,000
21,000		MK-3	396,000	260,000
21,430	27/32	MK-3	406,000	270,000
21,500		MK-3	406,000	270,000
24,610	31/32	MK-3	426,000	290,000

d1		S	l1	l2
mm	inch		mm	mm
28,570	1 1/8	MK-4	468,000	305,000
28,750		MK-4	468,000	305,000
29,370	1 5/32	MK-4	468,000	305,000
30,960	1 7/32	MK-4	483,000	320,000
32,250		MK-4	493,000	320,000
32,540	1 9/32	MK-4	493,000	320,000
34,000		MK-4	513,000	340,000

Derin Delik Matkap Ucu



## Soğutma kanallı matkap uçları, Kanal boyu DIN 1870



<b>P</b>	•	öz bileme $\geq \text{Ø } 11,000$ • koni bileme
<b>M</b>	•	• Co-alaşimli HSS-çeliği • yüksek aşınma direnci
<b>K</b>	•	• burç kullanarak delme için
<b>N</b>	•	mukavemetli ve yüksek mukavemetli çelikleri • çelik döküm, pik döküm
<b>S</b>	•	• pas/asit/ısıya dayanıklı çelikler • 1300 N/mm <sup>2</sup> ye kadar çekme mukavemeti
<b>H</b>	○	

**GÜHRING** NAVIGATOR

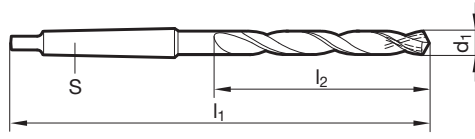
Kesme verileri sayfası 794

Malzeme **HSCO**

Yüzey



Kesme yönü

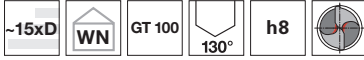
Ürün no **375**

d1		S	l1	l2
mm	inch		mm	mm
11,000		MK-2	312,000	195,000
11,110	7/16	MK-2	312,000	195,000
11,510	29/64	MK-2	312,000	195,000
12,800		MK-2	322,000	205,000
13,500		MK-2	337,000	220,000
18,260	23/32	MK-3	381,000	245,000
19,000		MK-3	381,000	245,000
21,000		MK-3	396,000	260,000
21,430	27/32	MK-3	406,000	270,000
24,500		MK-3	426,000	290,000
25,000	63/64	MK-3	426,000	290,000
25,400	1	MK-3	426,000	290,000

d1		S	l1	l2
mm	inch		mm	mm
26,500		MK-3	426,000	290,000
28,570	1 1/8	MK-4	468,000	305,000
30,960	1 7/32	MK-4	483,000	320,000
32,540	1 9/32	MK-4	493,000	320,000
33,340	1 5/16	MK-4	493,000	320,000
34,000		MK-4	513,000	340,000



## Soğutma kanallı matkap uçları, Kanal boyu DIN 1870



<b>P</b>	•	öz bileme $\geq \text{Ø } 11,000$ • koni bileme • mors konikte radyal soğutma desteği • Co-alaşımlı HSS-çeliği • yüksek aşınma direnci • burç kullanarak delme için
<b>M</b>	•	
<b>K</b>	•	
<b>N</b>	•	mukavemetli ve yüksek mukavemetli çelikleri • çelik döküm, pik döküm
<b>S</b>	•	pas/asit/ısıya dayanıklı çelikler • 1300 N/mm <sup>2</sup> ye kadar çekme mukavemeti
<b>H</b>	○	

## GÜHRING NAVIGATOR

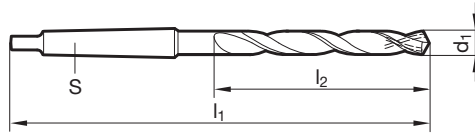
Kesme verileri sayfası 794

Malzeme **HSCO**

Yüzey



Kesme yönü



Ürün no

376

d1		S	l1	l2
mm	inch		mm	mm
11,000		MK-2	312,000	195,000
13,000		MK-2	322,000	205,000
14,000		MK-2	337,000	220,000
16,500		MK-2	347,000	230,000
18,000		MK-2	362,000	245,000
19,840	25/32	MK-3	396,000	260,000

d1		S	l1	l2
mm	inch		mm	mm
21,500		MK-3	406,000	270,000
27,780	1 3/32	MK-4	468,000	305,000
29,000		MK-4	468,000	305,000

Derin Delik Matkap Ucu



# MIKRO MATKAPLAR



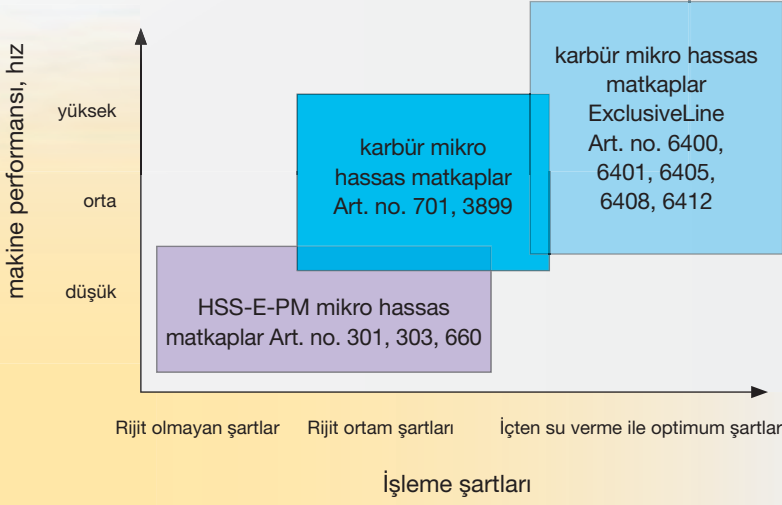


## Mikro hassas markap tipleri

### AVANTAJLAR VE UYGULAMA ALANLARI

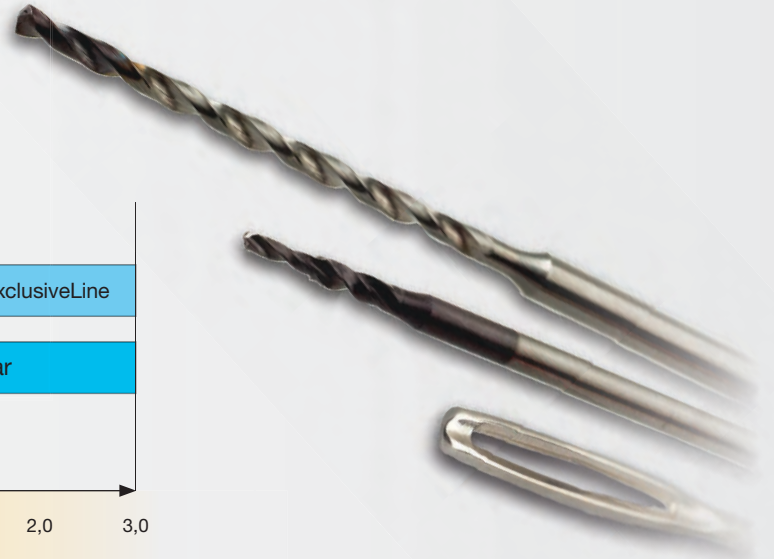
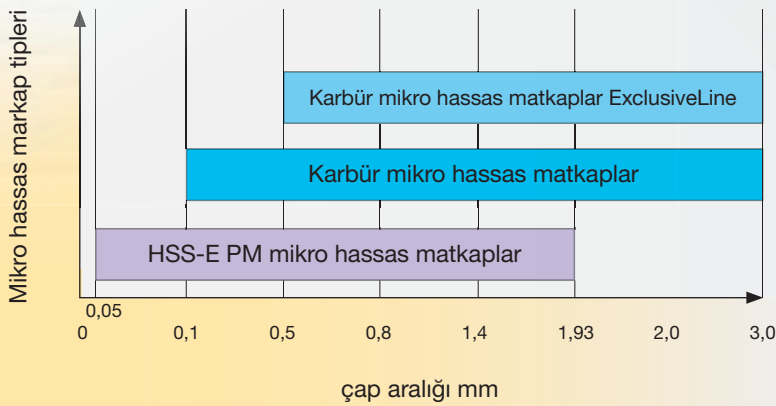
Yüksek adetli üretim ve içten su vermeli tezgah şartları için ve aynı zamanda küçük üretim adetlerinde limitli tezgah

kabiliyetleri için ve zor işleme şartları için Guhring optimum çözümü sunar.



### PROGRAM YELPAZESİ

Guhring karbür ve HSS-E-PM, 0.05 mm den 3.00 mm ye kadar matkap aralığını sunar



Guhring mikro matkapları karbür ve HSS-E PM olarak en küçük deliklerin optimum şekilde işlenmesi için uygundur.

Yüksek hassasiyetli küçük çaplı delik işleme en çok hassasiyetin olması gerektiği işlemlerdir. Bu operasyonlar ve her kullanıcı için Guhring standart ürün gamında mikro hassas matkplar bulunmaktadır.





## HSS-E-PM MIKRO HASSAS MATKAPLAR

Guhring HSS-E PM mikro matkapları yüksek aşınma direnci, yüksek tokluğu ve kesici ağız stabilitesi özellikle zor işlemler ve düşük rijitlik şartlarında optimum çözümü sunar. Toz metalurjisi yöntemiyle üretilen HSS-E çelikler homojen yapısı ile matkap performansına pozitif etki ederler.

HSS-E PM mikro matkaplar örnek olarak, çok spindle li kesme hızı limitasyonu olan tezgahlarda veya düşük üretim adetlerindeki uygulamalar için uygundur. Bu alanlarda optimum fiyat performans oranı sağlarlar.



Daha yüksek takım ömrü ihtiyacında Guhring aynı zamanda TiN kaplamalı HSS E PM matkaplar sunar. Özel uygulaması olan sol kesme yönlü matkaplarda bile Guhring standart çözümler sunmaktadır.

## SOLID KARBÜR MIKRO HASSAS MATKAPLAR

Guhring karbür mikro matkapları içten su vermesiz olarak 0,1 mm den 0,3mm ye kadar mevcuttur. İşleme şartlarının daha iyi olduğu koşullarda karbür mikro matkaplar HSS-E-PM matkaplara göre daha uzun takım ömrü sağlarlar. Bunun nedeni ultra ince , yüksek ısı ve aşınma dirençli karbür yapısına sahip olması, bu mikro karbür matkapların üstün özellikleridir.



## KARBÜR MIKRO HASSAS TAKIMLAR EXCLUSIVELINE AYNI ZAMANDA İÇTEN SU VERME İLE

İçten su vermeli ve içten soğutmasız ExclusiveLine mikro matkaplar bir çok malzemenin yüksek performanslı işlenmesine olanak sağlar.

Mikro matkaplar yüksek adetli , rijit makina tezgah şartlarının sağlandığı seri işlemlerde performans potansiyelini ortaya çıkarmaktadır.2 yüzey bileme yapısı ve kesici ağız köreltmesi ile yüksek kesme değerleri ve talaş kırmayı sağlar. Özel kanal profili sayesinde talaşlar güvenli şekilde tahliye edilmektedir.

4xD den 7xD ye kadar skarbür mikro matkaplar 0,5–3.0 mm aralığında mevcuttur.



Özellikle paslanmaz ve özel alaşım işleminde, derin deliklerde 5xD,8xD ve 15xD içten soğutmalı karbür mikro matkaplar performanslarını kanıtlamaktadır. 15xD ye kadar olan bolarda optimize edilmiş geometrisi ile Guhring mikro matkapları gagalama yapmaya ihtiyaç duymaz. 15xD mikro matkaplar için pilot olarak 4xD içten su vermesiz veya 5xD içten su vermeli mikro matkaplar uygundur.

Mikro matkaplar

## MÜŞTERİ İHTİYAÇLARINA GÖRE ÖZEL ÇÖZÜMLER

Bahsedilen standart mikro matkaplara ilaveten Guhring özel çözümlerde sunar. Bunlar:

- Orta ölçüler standartlara göre
- kademeli ve havşalı delikler için kademeli takımlar
- 30xD delme derinliğine kadar özel boylar
- farklı shaft varyasyonları
- alternatif kaplamalar





P	M	K	N	S	H	takım görüntüsü	delik derinliği	Standart	Tip	Kesme yönü	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayfası	Sayfa
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### İçten su vermesiz HSS-E-PM mikro hassas deliciler

• • • • • ○		~5xD	DIN 1899	N	R	HSS-E-PM	○	0,050 - 1,920	<b>301</b>	796	649
• • • • • ○		~5xD	DIN 1899	N	R	HSS-E-PM	Ⓢ	0,160 - 1,900	<b>660</b>	796	652
• • • • • ○		~5xD	DIN 1899	N	L	HSS-E-PM	○	0,130 - 1,850	<b>303</b>	796	654

### İçten su vermesiz solid karbür mikro hassas deliciler

• ○ ○ ○ ○ ○		~5xD	WN	N	R	VHM	○	0,200 - 1,400	<b>701</b>	796	656
• •			WN	N	R	VHM	Ⓐ	0,100 - 3,000	<b>3899</b>	796	657

### ExclusiveLine kılcal matkap uçları, soğutma kanalsız

• • • • • ○		4xD	WN	N	R	VHM	Ⓐ	0,500 - 3,000	<b>6400</b>	796	659
• • • • • ○		7xD	WN	N	R	VHM	Ⓐ	0,500 - 3,000	<b>6401</b>	796	660

### ExclusiveLine kılcal matkap ucu, soğutma kanallı

• • • • • ○		5xD	WN	N	R	VHM	Ⓐ	1,400 - 3,000	<b>6405</b>	796	661
• • • • • ○		8xD	WN	N	R	VHM	Ⓐ	1,400 - 3,000	<b>6408</b>	796	662
• • • • • ○		15xD	WN	N	R	VHM	Ⓐ	1,400 - 3,000	<b>6412</b>	796	663



## İçten su vermesiz HSS-E-PM mikro hassas deliciler



Malzeme HSS-E-PM

Yüzey



Kesme yönü



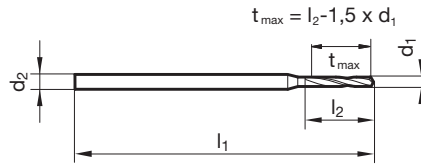
P • yüzey Bileme • Güçlendirilmiş saplı • &lt;math&gt;\varnothing 0,15\text{ mm}&lt;/math&gt; Co-alaşimli HSS-çeliği



N • yüksek alaşimli çelikleri

## GÜHRING NAVIGATOR

Kesme verileri sayfası 796



Ürün no 301

d1	d2	l1	l2	d1	d2	l1	l2
mm	mm	mm	mm	mm	mm	mm	mm
0,050	1,000	25,000	0,400	0,275	1,000	25,000	1,900
0,060	1,000	25,000	0,400	0,280	1,000	25,000	1,900
0,070	1,000	25,000	0,500	0,285	1,000	25,000	1,900
0,075	1,000	25,000	0,500	0,290	1,000	25,000	1,900
0,080	1,000	25,000	0,500	0,295	1,000	25,000	1,900
0,090	1,000	25,000	0,500	0,300	1,000	25,000	1,900
0,100	1,000	25,000	0,500	0,305	1,000	25,000	2,400
0,105	1,000	25,000	0,500	0,310	1,000	25,000	2,400
0,110	1,000	25,000	0,500	0,315	1,000	25,000	2,400
0,115	1,000	25,000	0,500	0,320	1,000	25,000	2,400
0,120	1,000	25,000	0,500	0,325	1,000	25,000	2,400
0,121	1,000	25,000	0,800	0,330	1,000	25,000	2,400
0,125	1,000	25,000	0,800	0,335	1,000	25,000	2,400
0,128	1,000	25,000	0,800	0,340	1,000	25,000	2,400
0,130	1,000	25,000	0,800	0,345	1,000	25,000	2,400
0,140	1,000	25,000	0,800	0,350	1,000	25,000	2,400
0,143	1,000	25,000	0,800	0,355	1,000	25,000	2,400
0,145	1,000	25,000	0,800	0,360	1,000	25,000	2,400
0,147	1,000	25,000	0,800	0,365	1,000	25,000	2,400
0,150	1,000	25,000	0,800	0,370	1,000	25,000	2,400
0,155	1,000	25,000	1,100	0,375	1,000	25,000	2,400
0,160	1,000	25,000	1,100	0,380	1,000	25,000	2,400
0,170	1,000	25,000	1,100	0,385	1,000	25,000	3,000
0,175	1,000	25,000	1,100	0,390	1,000	25,000	3,000
0,180	1,000	25,000	1,100	0,400	1,000	25,000	3,000
0,190	1,000	25,000	1,100	0,405	1,000	25,000	3,000
0,195	1,000	25,000	1,500	0,410	1,000	25,000	3,000
0,200	1,000	25,000	1,500	0,415	1,000	25,000	3,000
0,205	1,000	25,000	1,500	0,420	1,000	25,000	3,000
0,210	1,000	25,000	1,500	0,425	1,000	25,000	3,000
0,215	1,000	25,000	1,500	0,430	1,000	25,000	3,000
0,220	1,000	25,000	1,500	0,432	1,000	25,000	3,000
0,225	1,000	25,000	1,500	0,435	1,000	25,000	3,000
0,230	1,000	25,000	1,500	0,440	1,000	25,000	3,000
0,235	1,000	25,000	1,500	0,445	1,000	25,000	3,000
0,240	1,000	25,000	1,500	0,450	1,000	25,000	3,000
0,245	1,000	25,000	1,900	0,455	1,000	25,000	3,000
0,250	1,000	25,000	1,900	0,460	1,000	25,000	3,000
0,255	1,000	25,000	1,900	0,470	1,000	25,000	3,000
0,260	1,000	25,000	1,900	0,475	1,000	25,000	3,000
0,265	1,000	25,000	1,900	0,480	1,000	25,000	3,000
0,270	1,000	25,000	1,900	0,485	1,000	25,000	3,400

Mikro matkaplar



d1	d2	l1	l2
mm	mm	mm	mm
0,490	1,000	25,000	3,400
0,495	1,000	25,000	3,400
0,500	1,000	25,000	3,400
0,505	1,000	25,000	3,400
0,510	1,000	25,000	3,400
0,515	1,000	25,000	3,400
0,520	1,000	25,000	3,400
0,525	1,000	25,000	3,400
0,530	1,000	25,000	3,400
0,535	1,000	25,000	3,900
0,540	1,000	25,000	3,900
0,545	1,000	25,000	3,900
0,550	1,000	25,000	3,900
0,560	1,000	25,000	3,900
0,570	1,000	25,000	3,900
0,580	1,000	25,000	3,900
0,585	1,000	25,000	3,900
0,590	1,000	25,000	3,900
0,595	1,000	25,000	3,900
0,600	1,000	25,000	3,900
0,605	1,000	25,000	4,200
0,610	1,000	25,000	4,200
0,615	1,000	25,000	4,200
0,620	1,000	25,000	4,200
0,625	1,000	25,000	4,200
0,630	1,000	25,000	4,200
0,632	1,000	25,000	4,200
0,640	1,000	25,000	4,200
0,650	1,000	25,000	4,200
0,655	1,000	25,000	4,200
0,660	1,000	25,000	4,200
0,665	1,000	25,000	4,200
0,670	1,000	25,000	4,200
0,675	1,000	25,000	4,800
0,680	1,000	25,000	4,800
0,690	1,000	25,000	4,800
0,695	1,000	25,000	4,800
0,700	1,000	25,000	4,800
0,705	1,000	25,000	4,800
0,710	1,000	25,000	4,800
0,720	1,000	25,000	4,800
0,725	1,000	25,000	4,800
0,730	1,000	25,000	4,800
0,740	1,000	25,000	4,800
0,750	1,000	25,000	4,800
0,760	1,000	25,000	5,300
0,770	1,000	25,000	5,300
0,780	1,000	25,000	5,300
0,790	1,000	25,000	5,300
0,795	1,500	25,000	5,300
0,800	1,500	25,000	5,300
0,810	1,500	25,000	5,300
0,820	1,500	25,000	5,300
0,825	1,500	25,000	5,300
0,830	1,500	25,000	5,300
0,840	1,500	25,000	5,300
0,845	1,500	25,000	5,300
0,850	1,500	25,000	5,300
0,860	1,500	25,000	6,000
0,870	1,500	25,000	6,000
0,880	1,500	25,000	6,000
0,890	1,500	25,000	6,000
0,900	1,500	25,000	6,000
0,910	1,500	25,000	6,000
0,920	1,500	25,000	6,000
0,925	1,500	25,000	6,000
0,930	1,500	25,000	6,000
0,940	1,500	25,000	6,000
0,950	1,500	25,000	6,000
0,960	1,500	25,000	6,800
0,970	1,500	25,000	6,800
0,980	1,500	25,000	6,800

d1	d2	l1	l2
mm	mm	mm	mm
0,990	1,500	25,000	6,800
1,000	1,500	25,000	6,800
1,010	1,500	25,000	6,800
1,020	1,500	25,000	6,800
1,030	1,500	25,000	6,800
1,040	1,500	25,000	6,800
1,050	1,500	25,000	6,800
1,055	1,500	25,000	6,800
1,060	1,500	25,000	6,800
1,070	1,500	25,000	7,600
1,080	1,500	25,000	7,600
1,090	1,500	25,000	7,600
1,100	1,500	25,000	7,600
1,110	1,500	25,000	7,600
1,120	1,500	25,000	7,600
1,130	1,500	25,000	7,600
1,140	1,500	25,000	7,600
1,150	1,500	25,000	7,600
1,160	1,500	25,000	7,600
1,170	1,500	25,000	7,600
1,180	1,500	25,000	7,600
1,190	1,500	25,000	8,500
1,200	1,500	25,000	8,500
1,210	1,500	25,000	8,500
1,220	1,500	25,000	8,500
1,230	1,500	25,000	8,500
1,240	1,500	25,000	8,500
1,250	1,500	25,000	8,500
1,260	1,500	25,000	8,500
1,265	1,500	25,000	8,500
1,270	1,500	25,000	8,500
1,280	1,500	25,000	8,500
1,290	1,500	25,000	8,500
1,300	1,500	25,000	8,500
1,310	1,500	25,000	8,500
1,320	1,500	25,000	8,500
1,325	1,500	25,000	9,500
1,330	1,500	25,000	9,500
1,340	1,500	25,000	9,500
1,350	1,500	25,000	9,500
1,370	1,500	25,000	9,500
1,380	1,500	25,000	9,500
1,390	1,500	25,000	9,500
1,400	1,500	25,000	9,500
1,410	1,500	25,000	9,500
1,420	1,500	25,000	9,500
1,430	1,500	25,000	9,500
1,440	1,500	25,000	9,500
1,450	1,500	25,000	9,500
1,460	2,000	30,000	9,500
1,470	2,000	30,000	9,500
1,500	2,000	30,000	9,500
1,520	2,000	30,000	10,600
1,530	2,000	30,000	10,600
1,540	2,000	30,000	10,600
1,550	2,000	30,000	10,600
1,590	2,000	30,000	10,600
1,600	2,000	30,000	10,600
1,610	2,000	30,000	10,600
1,630	2,000	30,000	10,600
1,640	2,000	30,000	10,600
1,650	2,000	30,000	10,600
1,660	2,000	30,000	10,600
1,690	2,000	30,000	10,600
1,700	2,000	30,000	10,600
1,710	2,000	30,000	11,800
1,715	2,000	30,000	11,800
1,730	2,000	30,000	11,800
1,745	2,000	30,000	11,800
1,750	2,000	30,000	11,800
1,775	2,000	30,000	11,800
1,800	2,000	30,000	11,800



d1	d2	l1	l2
mm	mm	mm	mm
1,830	2,000	30,000	11,800
1,840	2,000	30,000	11,800
1,850	2,000	30,000	11,800
1,860	2,000	30,000	11,800
1,900	2,000	30,000	11,800
1,920	2,000	30,000	13,200

d1	d2	l1	l2
mm	mm	mm	mm



## İçten su vermesiz HSS-E-PM mikro hassas deliciler

~5xD	DIN 1899	N	118°	0/-0,004
------	-------------	---	------	----------

Malzeme HSS-E-PM

Yüzey S

Kesme yönü R

P • yüzey Bileme • Güçlendirilmiş saplı • artırılmış aşınma direnci

M •

K •

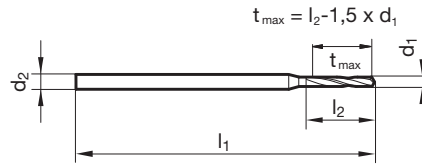
N • yüksek alaşımlı çelikleri

S ○

H

## GÜHRING NAVIGATOR

Kesme verileri sayfası 796



Ürün no 660

d1	d2	l1	l2
mm	mm	mm	mm
0,160	1,000	25,000	1,100
0,170	1,000	25,000	1,100
0,180	1,000	25,000	1,100
0,190	1,000	25,000	1,100
0,200	1,000	25,000	1,500
0,210	1,000	25,000	1,500
0,220	1,000	25,000	1,500
0,230	1,000	25,000	1,500
0,240	1,000	25,000	1,500
0,250	1,000	25,000	1,900
0,255	1,000	25,000	1,900
0,260	1,000	25,000	1,900
0,265	1,000	25,000	1,900
0,270	1,000	25,000	1,900
0,280	1,000	25,000	1,900
0,290	1,000	25,000	1,900
0,295	1,000	25,000	1,900
0,300	1,000	25,000	1,900
0,305	1,000	25,000	2,400
0,310	1,000	25,000	2,400
0,320	1,000	25,000	2,400
0,325	1,000	25,000	2,400
0,330	1,000	25,000	2,400
0,340	1,000	25,000	2,400
0,350	1,000	25,000	2,400
0,360	1,000	25,000	2,400
0,370	1,000	25,000	2,400
0,380	1,000	25,000	2,400
0,390	1,000	25,000	3,000
0,400	1,000	25,000	3,000
0,410	1,000	25,000	3,000
0,420	1,000	25,000	3,000
0,430	1,000	25,000	3,000
0,440	1,000	25,000	3,000
0,450	1,000	25,000	3,000
0,460	1,000	25,000	3,000
0,470	1,000	25,000	3,000
0,480	1,000	25,000	3,000
0,490	1,000	25,000	3,400
0,500	1,000	25,000	3,400
0,510	1,000	25,000	3,400
0,520	1,000	25,000	3,400

d1	d2	l1	l2
mm	mm	mm	mm
0,530	1,000	25,000	3,400
0,540	1,000	25,000	3,900
0,550	1,000	25,000	3,900
0,560	1,000	25,000	3,900
0,570	1,000	25,000	3,900
0,580	1,000	25,000	3,900
0,590	1,000	25,000	3,900
0,600	1,000	25,000	3,900
0,610	1,000	25,000	4,200
0,620	1,000	25,000	4,200
0,630	1,000	25,000	4,200
0,640	1,000	25,000	4,200
0,650	1,000	25,000	4,200
0,660	1,000	25,000	4,200
0,670	1,000	25,000	4,200
0,680	1,000	25,000	4,800
0,690	1,000	25,000	4,800
0,700	1,000	25,000	4,800
0,710	1,000	25,000	4,800
0,720	1,000	25,000	4,800
0,730	1,000	25,000	4,800
0,740	1,000	25,000	4,800
0,750	1,000	25,000	4,800
0,760	1,000	25,000	5,300
0,770	1,000	25,000	5,300
0,780	1,000	25,000	5,300
0,790	1,000	25,000	5,300
0,800	1,500	25,000	5,300
0,810	1,500	25,000	5,300
0,820	1,500	25,000	5,300
0,830	1,500	25,000	5,300
0,840	1,500	25,000	5,300
0,850	1,500	25,000	5,300
0,860	1,500	25,000	6,000
0,870	1,500	25,000	6,000
0,880	1,500	25,000	6,000
0,900	1,500	25,000	6,000
0,910	1,500	25,000	6,000
0,920	1,500	25,000	6,000
0,940	1,500	25,000	6,000
0,950	1,500	25,000	6,000
0,960	1,500	25,000	6,800

Mikro matkaplar



d1	d2	l1	l2
mm	mm	mm	mm
0,970	1,500	25,000	6,800
0,980	1,500	25,000	6,800
1,000	1,500	25,000	6,800
1,020	1,500	25,000	6,800
1,040	1,500	25,000	6,800
1,050	1,500	25,000	6,800
1,070	1,500	25,000	7,600
1,080	1,500	25,000	7,600
1,100	1,500	25,000	7,600
1,150	1,500	25,000	7,600
1,180	1,500	25,000	7,600
1,190	1,500	25,000	8,500

d1	d2	l1	l2
mm	mm	mm	mm
1,200	1,500	25,000	8,500
1,220	1,500	25,000	8,500
1,250	1,500	25,000	8,500
1,300	1,500	25,000	8,500
1,350	1,500	25,000	9,500
1,390	1,500	25,000	9,500
1,400	1,500	25,000	9,500
1,420	1,500	25,000	9,500
1,450	1,500	25,000	9,500
1,500	2,000	30,000	9,500
1,800	2,000	30,000	11,800
1,900	2,000	30,000	11,800



## İçten su vermesiz HSS-E-PM mikro hassas deliciler



Malzeme HSS-E-PM

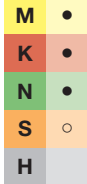
Yüzey



Kesme yönü



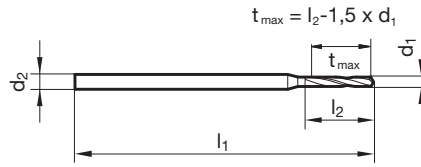
P • yüzey Bileme • Güçlendirilmiş saplı • &lt;math&gt;\varnothing 0,15\text{ mm}&lt;/math&gt; Co-alaşimli HSS-çeliği



N • yüksek alaşimli çelikleri

## GÜHRING NAVIGATOR

Kesme verileri sayfası 796



Ürün no

303

d1	d2	l1	l2
mm	mm	mm	mm
0,130	1,000	25,000	0,800
0,140	1,000	25,000	0,800
0,150	1,000	25,000	0,800
0,155	1,000	25,000	1,100
0,160	1,000	25,000	1,100
0,170	1,000	25,000	1,100
0,175	1,000	25,000	1,100
0,180	1,000	25,000	1,100
0,185	1,000	25,000	1,100
0,190	1,000	25,000	1,100
0,195	1,000	25,000	1,500
0,200	1,000	25,000	1,500
0,210	1,000	25,000	1,500
0,215	1,000	25,000	1,500
0,220	1,000	25,000	1,500
0,225	1,000	25,000	1,500
0,230	1,000	25,000	1,500
0,235	1,000	25,000	1,500
0,240	1,000	25,000	1,500
0,245	1,000	25,000	1,900
0,250	1,000	25,000	1,900
0,255	1,000	25,000	1,900
0,260	1,000	25,000	1,900
0,265	1,000	25,000	1,900
0,270	1,000	25,000	1,900
0,275	1,000	25,000	1,900
0,280	1,000	25,000	1,900
0,290	1,000	25,000	1,900
0,295	1,000	25,000	1,900
0,300	1,000	25,000	1,900
0,310	1,000	25,000	2,400
0,315	1,000	25,000	2,400
0,330	1,000	25,000	2,400
0,340	1,000	25,000	2,400
0,345	1,000	25,000	2,400
0,350	1,000	25,000	2,400
0,355	1,000	25,000	2,400
0,360	1,000	25,000	2,400
0,370	1,000	25,000	2,400
0,380	1,000	25,000	2,400
0,390	1,000	25,000	3,000
0,400	1,000	25,000	3,000

d1	d2	l1	l2
mm	mm	mm	mm
0,410	1,000	25,000	3,000
0,415	1,000	25,000	3,000
0,420	1,000	25,000	3,000
0,430	1,000	25,000	3,000
0,435	1,000	25,000	3,000
0,440	1,000	25,000	3,000
0,450	1,000	25,000	3,000
0,460	1,000	25,000	3,000
0,465	1,000	25,000	3,000
0,470	1,000	25,000	3,000
0,480	1,000	25,000	3,000
0,485	1,000	25,000	3,400
0,490	1,000	25,000	3,400
0,495	1,000	25,000	3,400
0,500	1,000	25,000	3,400
0,510	1,000	25,000	3,400
0,520	1,000	25,000	3,400
0,525	1,000	25,000	3,400
0,540	1,000	25,000	3,900
0,545	1,000	25,000	3,900
0,550	1,000	25,000	3,900
0,555	1,000	25,000	3,900
0,565	1,000	25,000	3,900
0,570	1,000	25,000	3,900
0,580	1,000	25,000	3,900
0,590	1,000	25,000	3,900
0,600	1,000	25,000	3,900
0,615	1,000	25,000	4,200
0,620	1,000	25,000	4,200
0,630	1,000	25,000	4,200
0,640	1,000	25,000	4,200
0,650	1,000	25,000	4,200
0,660	1,000	25,000	4,200
0,670	1,000	25,000	4,200
0,675	1,000	25,000	4,800
0,680	1,000	25,000	4,800
0,685	1,000	25,000	4,800
0,690	1,000	25,000	4,800
0,695	1,000	25,000	4,800
0,700	1,000	25,000	4,800
0,710	1,000	25,000	4,800
0,720	1,000	25,000	4,800

Mikro matkaplar



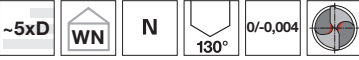


d1	d2	l1	l2
mm	mm	mm	mm
0,740	1,000	25,000	4,800
0,750	1,000	25,000	4,800
0,760	1,000	25,000	5,300
0,770	1,000	25,000	5,300
0,780	1,000	25,000	5,300
0,790	1,000	25,000	5,300
0,800	1,500	25,000	5,300
0,805	1,500	25,000	5,300
0,810	1,500	25,000	5,300
0,820	1,500	25,000	5,300
0,830	1,500	25,000	5,300
0,840	1,500	25,000	5,300
0,850	1,500	25,000	5,300
0,855	1,500	25,000	6,000
0,860	1,500	25,000	6,000
0,870	1,500	25,000	6,000
0,880	1,500	25,000	6,000
0,885	1,500	25,000	6,000
0,890	1,500	25,000	6,000
0,900	1,500	25,000	6,000
0,910	1,500	25,000	6,000
0,915	1,500	25,000	6,000
0,920	1,500	25,000	6,000
0,925	1,500	25,000	6,000
0,935	1,500	25,000	6,000
0,940	1,500	25,000	6,000
0,950	1,500	25,000	6,000
0,960	1,500	25,000	6,800
0,970	1,500	25,000	6,800
0,975	1,500	25,000	6,800
0,980	1,500	25,000	6,800
0,985	1,500	25,000	6,800
0,990	1,500	25,000	6,800
1,000	1,500	25,000	6,800
1,005	1,500	25,000	6,800
1,020	1,500	25,000	6,800

d1	d2	l1	l2
mm	mm	mm	mm
1,030	1,500	25,000	6,800
1,040	1,500	25,000	6,800
1,050	1,500	25,000	6,800
1,060	1,500	25,000	6,800
1,080	1,500	25,000	7,600
1,085	1,500	25,000	7,600
1,090	1,500	25,000	7,600
1,100	1,500	25,000	7,600
1,110	1,500	25,000	7,600
1,120	1,500	25,000	7,600
1,125	1,500	25,000	7,600
1,150	1,500	25,000	7,600
1,160	1,500	25,000	7,600
1,170	1,500	25,000	7,600
1,180	1,500	25,000	7,600
1,200	1,500	25,000	8,500
1,250	1,500	25,000	8,500
1,270	1,500	25,000	8,500
1,280	1,500	25,000	8,500
1,285	1,500	25,000	8,500
1,290	1,500	25,000	8,500
1,310	1,500	25,000	8,500
1,330	1,500	25,000	9,500
1,350	1,500	25,000	9,500
1,360	1,500	25,000	9,500
1,375	1,500	25,000	9,500
1,400	1,500	25,000	9,500
1,405	1,500	25,000	9,500
1,425	1,500	25,000	9,500
1,450	1,500	25,000	9,500
1,460	2,000	30,000	9,500
1,500	2,000	30,000	9,500
1,600	2,000	30,000	10,600
1,615	2,000	30,000	10,600
1,800	2,000	30,000	11,800
1,850	2,000	30,000	11,800



## İçten su vermesiz solid karbür mikro hassas deliciler



**P** • öz bileme  $\geq \varnothing 0,800$  • yüzey Bileme • ana kesici ağız düz form

**M** ○

**K** •

**N** ○ yapı ve sementasyon çelikleri • döküm malzemeler • bronz / pirinç  
• Alüminyum ve Al-Alaşımları • Magnezyum ve Mg-alışımları • plastikler ve fiber takviyeli plastikler

**S** ○

**H** ○

Malzeme

Kom. sert metal

Yüzey

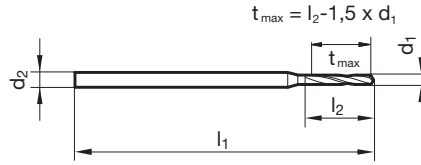


Kesme yönü



## GÜHRING NAVIGATOR

Kesme verileri sayfası 796



Ürün no

701

d1	d2	l1	l2
mm	mm	mm	mm
0,200	1,000	25,000	1,500
0,220	1,000	25,000	1,500
0,250	1,000	25,000	1,900
0,260	1,000	25,000	1,900
0,280	1,000	25,000	1,900
0,300	1,000	25,000	1,900
0,330	1,000	25,000	2,400
0,350	1,000	25,000	2,400
0,400	1,000	25,000	3,000
0,450	1,000	25,000	3,000
0,500	1,000	25,000	3,400
0,600	1,000	25,000	3,900
0,650	1,000	25,000	4,200
0,700	1,000	25,000	4,800
0,750	1,000	25,000	4,800
0,800	1,500	25,000	5,300
0,810	1,500	25,000	5,300
0,830	1,500	25,000	5,300

d1	d2	l1	l2
mm	mm	mm	mm
0,850	1,500	25,000	5,300
0,900	1,500	25,000	6,000
1,000	1,500	25,000	6,800
1,050	1,500	25,000	6,800
1,100	1,500	25,000	7,600
1,150	1,500	25,000	7,600
1,200	1,500	25,000	8,500
1,250	1,500	25,000	8,500
1,300	1,500	25,000	8,500
1,350	1,500	25,000	9,500
1,400	1,500	25,000	9,500



## İçten su vermesiz solid karbür mikro hassas deliciler



**P** • öz bileme ≥ Ø 0,800 • yüzey Bileme

**M**

**K** •

**N**

**S**

**H**

yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşimli çelikler 1200 N/mm<sup>2</sup>'ye kadar • döküm malzemeler

Malzeme

Kom. sert metal

Yüzey

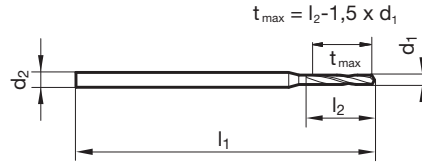
A

Kesme yönü

R

## GÜHRING NAVIGATOR

Kesme verileri sayfası 796



Ürün no

3899

d1	d2 h6	l1	l2
mm	mm	mm	mm
0,100	3,000	38,000	1,200
0,150	3,000	38,000	2,000
0,200	3,000	38,000	2,500
0,250	3,000	38,000	3,000
0,260	3,000	38,000	3,000
0,270	3,000	38,000	3,000
0,280	3,000	38,000	3,000
0,300	3,000	38,000	5,000
0,310	3,000	38,000	5,000
0,330	3,000	38,000	5,000
0,350	3,000	38,000	6,000
0,360	3,000	38,000	6,000
0,370	3,000	38,000	6,000
0,380	3,000	38,000	6,000
0,400	3,000	38,000	7,000
0,410	3,000	38,000	7,000
0,430	3,000	38,000	7,000
0,440	3,000	38,000	7,000
0,450	3,000	38,000	7,000
0,480	3,000	38,000	7,000
0,500	3,000	38,000	7,000
0,510	3,000	38,000	7,000
0,530	3,000	38,000	7,000
0,550	3,000	38,000	7,000
0,570	3,000	38,000	7,000
0,600	3,000	38,000	7,000
0,640	3,000	38,000	7,000
0,650	3,000	38,000	7,000
0,660	3,000	38,000	7,000
0,680	3,000	38,000	7,000
0,700	3,000	38,000	8,000
0,710	3,000	38,000	8,000
0,720	3,000	38,000	8,000
0,740	3,000	38,000	8,000
0,750	3,000	38,000	8,000
0,760	3,000	38,000	8,000
0,770	3,000	38,000	8,000
0,780	3,000	38,000	8,000
0,790	3,000	38,000	8,000
0,800	3,000	38,000	10,000
0,810	3,000	38,000	10,000
0,820	3,000	38,000	10,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
0,830	3,000	38,000	10,000
0,840	3,000	38,000	10,000
0,850	3,000	38,000	10,000
0,860	3,000	38,000	10,000
0,870	3,000	38,000	10,000
0,880	3,000	38,000	10,000
0,890	3,000	38,000	10,000
0,900	3,000	38,000	10,000
0,910	3,000	38,000	10,000
0,920	3,000	38,000	10,000
0,930	3,000	38,000	10,000
0,940	3,000	38,000	10,000
0,950	3,000	38,000	10,000
0,960	3,000	38,000	10,000
0,970	3,000	38,000	10,000
0,980	3,000	38,000	10,000
0,990	3,000	38,000	10,000
1,000	3,000	38,000	10,000
1,010	3,000	38,000	10,000
1,020	3,000	38,000	10,000
1,050	3,000	38,000	10,000
1,060	3,000	38,000	10,000
1,070	3,000	38,000	10,000
1,090	3,000	38,000	10,000
1,100	3,000	38,000	10,000
1,110	3,000	38,000	10,000
1,150	3,000	38,000	10,000
1,170	3,000	38,000	10,000
1,190	3,000	38,000	10,000
1,200	3,000	38,000	10,000
1,210	3,000	38,000	10,000
1,220	3,000	38,000	10,000
1,230	3,000	38,000	10,000
1,240	3,000	38,000	10,000
1,260	3,000	38,000	10,000
1,270	3,000	38,000	10,000
1,280	3,000	38,000	10,000
1,300	3,000	38,000	10,000
1,370	3,000	38,000	10,000
1,400	3,000	38,000	10,000
1,420	3,000	38,000	10,000
1,450	3,000	38,000	10,000

Mikro matkaplar



d1	d2 h6	l1	l2
mm	mm	mm	mm
1,490	3,000	38,000	10,000
1,500	3,000	38,000	10,000
1,510	3,000	38,000	10,000
1,520	3,000	38,000	10,000
1,550	3,000	38,000	10,000
1,560	3,000	38,000	10,000
1,580	3,000	38,000	10,000
1,590	3,000	38,000	10,000
1,600	3,000	38,000	12,000
1,630	3,000	38,000	12,000
1,650	3,000	38,000	12,000
1,700	3,000	38,000	12,000
1,750	3,000	38,000	12,000
1,800	3,000	38,000	12,000
1,810	3,000	38,000	12,000
1,820	3,000	38,000	12,000
1,830	3,000	38,000	12,000
1,840	3,000	38,000	12,000
1,850	3,000	38,000	12,000
1,860	3,000	38,000	12,000
1,900	3,000	38,000	12,000
1,920	3,000	38,000	12,000
1,950	3,000	38,000	12,000
1,980	3,000	38,000	12,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
2,000	3,000	38,000	12,000
2,050	3,000	38,000	12,000
2,100	3,000	38,000	12,000
2,150	3,000	38,000	12,000
2,200	3,000	38,000	12,000
2,400	3,000	38,000	12,000
2,500	3,000	38,000	12,000
2,550	3,000	38,000	12,000
2,600	3,000	38,000	12,000
2,750	3,000	38,000	12,000
2,800	3,000	38,000	12,000
2,950	3,000	38,000	12,000
3,000	3,000	38,000	12,000

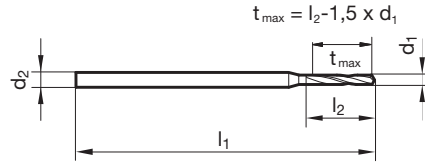
Mikro matkaplar


**ExclusiveLine kılcal matkap uçları, soğutma kanalsız**


<b>P</b>	•	öz bileme $\geq \varnothing 0,500$ • yüzey Bileme • ana kesici ağız düz form • taşlanmış kesme ağız yuvarlatması
<b>M</b>	•	
<b>K</b>	•	
<b>N</b>	○	yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm <sup>2</sup> 'ye kadar • paslanmaz çelikler • döküm malzemeler
<b>S</b>	○	
<b>H</b>		

Malzeme **Kom. sert metal**Yüzey **A**Kesme yönü **R**
**GÜHRING NAVIGATOR**

Kesme verileri sayfası 796



Ürün no

6400

d1	d2 h6	l1	l2
mm	mm	mm	mm
0,500	3,000	47,000	3,000
0,550	3,000	47,000	3,300
0,600	3,000	47,000	3,600
0,650	3,000	47,000	3,900
0,700	3,000	47,000	4,200
0,750	3,000	47,000	4,500
0,800	3,000	47,000	4,800
0,850	3,000	47,000	5,100
0,900	3,000	47,000	5,400
0,950	3,000	47,000	5,700
1,000	3,000	47,000	6,000
1,050	3,000	47,000	6,300
1,100	3,000	47,000	6,600
1,150	3,000	47,000	6,900
1,200	3,000	47,000	7,200
1,250	3,000	47,000	7,500
1,300	3,000	47,000	7,800
1,350	3,000	47,000	8,100
1,400	3,000	47,000	8,400
1,450	3,000	47,000	8,700
1,500	3,000	47,000	9,000
1,550	3,000	47,000	9,300
1,590	3,000	47,000	9,600
1,600	3,000	47,000	9,600
1,650	3,000	47,000	9,900
1,700	3,000	47,000	10,200
1,750	3,000	47,000	10,500
1,800	3,000	52,000	10,800
1,850	3,000	52,000	11,100
1,900	3,000	52,000	11,400

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,950	3,000	52,000	11,700
1,980	4,000	59,000	12,000
2,000	4,000	59,000	12,000
2,050	4,000	59,000	12,300
2,100	4,000	59,000	12,600
2,150	4,000	59,000	12,900
2,200	4,000	59,000	13,200
2,250	4,000	59,000	13,500
2,300	4,000	59,000	13,800
2,350	4,000	59,000	14,100
2,380	4,000	59,000	14,400
2,400	4,000	59,000	14,400
2,450	4,000	59,000	14,700
2,500	4,000	59,000	15,000
2,550	4,000	59,000	15,300
2,600	4,000	59,000	15,600
2,650	4,000	59,000	15,900
2,700	4,000	59,000	16,200
2,750	4,000	59,000	16,500
2,780	4,000	59,000	16,800
2,800	4,000	59,000	16,800
2,850	4,000	59,000	17,100
2,900	4,000	59,000	17,400
2,950	4,000	59,000	17,700
3,000	4,000	59,000	18,000

Mikro matkaplar



## ExclusiveLine kılcal matkap uçları, soğutma kanalsız



P	•	öz bileme $\geq \varnothing 0,500$ • yüzey Bileme • ana kesici ağız düz form • taşlanmış kesme ağız yuvarlatması
M	•	
K	•	
N	○	yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşimli çelikler 1200 N/mm <sup>2</sup> 'ye kadar • paslanmaz çelikler • döküm malzemeler
S	○	
H		

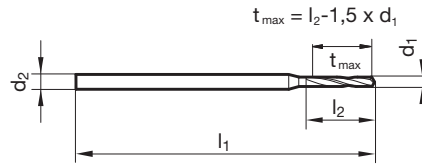
Malzeme Kom. sert metal

Yüzey A

Kesme yönü R

## GÜHRING NAVIGATOR

Kesme verileri sayfası 796



Ürün no 6401

d1	d2 h6	l1	l2
mm	mm	mm	mm
0,500	3,000	47,000	4,000
0,550	3,000	47,000	4,400
0,600	3,000	47,000	4,800
0,650	3,000	47,000	5,200
0,700	3,000	47,000	5,600
0,750	3,000	47,000	6,000
0,800	3,000	47,000	6,400
0,850	3,000	47,000	6,800
0,900	3,000	47,000	7,200
0,950	3,000	47,000	7,600
1,000	3,000	47,000	8,000
1,050	3,000	47,000	8,400
1,100	3,000	47,000	8,800
1,150	3,000	47,000	9,200
1,200	3,000	52,000	10,800
1,250	3,000	52,000	11,300
1,300	3,000	52,000	11,700
1,350	3,000	52,000	12,200
1,400	3,000	52,000	12,600
1,450	3,000	52,000	13,100
1,500	3,000	52,000	13,500
1,550	3,000	52,000	14,000
1,590	3,000	52,000	14,400
1,600	3,000	52,000	14,400
1,650	3,000	52,000	14,900
1,700	3,000	52,000	15,300
1,750	3,000	52,000	15,800
1,800	3,000	52,000	16,200
1,850	3,000	52,000	16,700
1,900	3,000	52,000	17,100

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,950	3,000	52,000	17,600
1,980	4,000	63,000	18,000
2,000	4,000	63,000	18,000
2,050	4,000	63,000	18,500
2,100	4,000	63,000	18,900
2,150	4,000	63,000	19,400
2,200	4,000	63,000	19,800
2,250	4,000	63,000	20,300
2,300	4,000	63,000	20,700
2,350	4,000	63,000	21,200
2,380	4,000	63,000	21,600
2,400	4,000	63,000	21,600
2,450	4,000	63,000	22,100
2,500	4,000	63,000	22,500
2,550	4,000	63,000	23,000
2,600	4,000	67,000	23,400
2,650	4,000	67,000	23,900
2,700	4,000	67,000	24,300
2,750	4,000	67,000	24,800
2,780	4,000	67,000	25,200
2,800	4,000	67,000	25,200
2,850	4,000	67,000	25,700
2,900	4,000	67,000	26,100
2,950	4,000	67,000	26,600
3,000	4,000	67,000	27,000



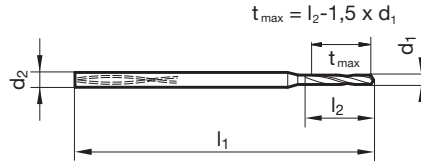
## ExclusiveLine kılcal matkap ucu, soğutma kanallı



P	•	öz bileme $\geq \varnothing 1,400$ • yüzey Bileme • ana kesici ağız düz form
M	•	• taşlanmış kesme ağız yuvarlatması
K	•	
N	○	yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alaşımli çelikler 1200 N/mm <sup>2</sup> 'ye kadar • paslanmaz çelikler • döküm malzemeler
S	○	
H		

Malzeme **Kom. sert metal**Yüzey **A**Kesme yönü **R****NEW****GÜHRING NAVIGATOR**

Kesme verileri sayfası 796

Ürün no **6405**

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,400	4,000	52,000	11,000
1,450	4,000	52,000	12,000
1,500	4,000	52,000	12,000
1,550	4,000	52,000	12,000
1,590	4,000	52,000	13,000
1,600	4,000	52,000	13,000
1,650	4,000	52,000	13,000
1,700	4,000	56,000	14,000
1,750	4,000	56,000	14,000
1,800	4,000	56,000	14,000
1,850	4,000	56,000	15,000
1,900	4,000	56,000	15,000
1,950	4,000	56,000	16,000
1,980	4,000	56,000	16,000
2,000	4,000	56,000	16,000
2,050	4,000	56,000	16,000
2,100	4,000	62,000	17,000
2,150	4,000	62,000	17,000
2,200	4,000	62,000	18,000
2,250	4,000	62,000	18,000
2,300	4,000	62,000	18,000
2,350	4,000	62,000	19,000
2,380	4,000	62,000	19,000
2,400	4,000	62,000	19,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
2,450	4,000	62,000	20,000
2,500	4,000	62,000	20,000
2,550	4,000	62,000	20,000
2,600	4,000	66,000	21,000
2,650	4,000	66,000	21,000
2,700	4,000	66,000	22,000
2,750	4,000	66,000	22,000
2,780	4,000	66,000	22,000
2,800	4,000	66,000	22,000
2,850	4,000	66,000	23,000
2,900	4,000	66,000	23,000
2,950	4,000	66,000	24,000
3,000	4,000	66,000	24,000

Mikro matkaplar



## ExclusiveLine kılcal matkap ucu, soğutma kanallı

8xD

N



h7



P	•	öz bileme $\geq \varnothing 1,400$ • yüzey Bileme • ana kesici ağız düz form
M	•	• taşlanmış kesme ağız yuvarlatması
K	•	
N	○	yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alışımlı çelikler 1200 N/mm <sup>2</sup> 'ye kadar • paslanmaz çelikler • döküm malzemeler
S	○	
H		

Malzeme

Kom. sert metal

Yüzey

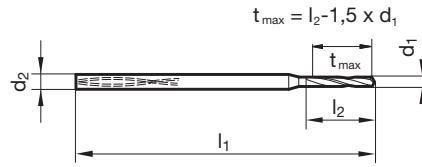
A

Kesme yönü

R

## GÜHRING NAVIGATOR

Kesme verileri sayfası 796



Ürün no

6408

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,400	4,000	52,000	15,000
1,450	4,000	52,000	16,000
1,500	4,000	52,000	17,000
1,550	4,000	52,000	17,000
1,590	4,000	52,000	18,000
1,600	4,000	52,000	18,000
1,650	4,000	52,000	18,000
1,700	4,000	56,000	19,000
1,750	4,000	56,000	19,000
1,800	4,000	56,000	20,000
1,850	4,000	56,000	20,000
1,900	4,000	56,000	21,000
1,950	4,000	56,000	21,000
1,980	4,000	56,000	22,000
2,000	4,000	56,000	22,000
2,050	4,000	56,000	23,000
2,100	4,000	62,000	23,000
2,150	4,000	62,000	24,000
2,200	4,000	62,000	24,000
2,250	4,000	62,000	25,000
2,300	4,000	62,000	25,000
2,320	4,000	62,000	26,000
2,350	4,000	62,000	26,000
2,380	4,000	62,000	26,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
2,400	4,000	62,000	26,000
2,450	4,000	62,000	27,000
2,500	4,000	62,000	28,000
2,550	4,000	62,000	28,000
2,600	4,000	66,000	29,000
2,650	4,000	66,000	29,000
2,700	4,000	66,000	30,000
2,750	4,000	66,000	30,000
2,780	4,000	66,000	31,000
2,800	4,000	66,000	31,000
2,850	4,000	66,000	31,000
2,900	4,000	66,000	32,000
2,950	4,000	66,000	32,000
3,000	4,000	66,000	33,000

Mikro matkaplar




**ExclusiveLine kılcal matkap ucu, soğutma kanallı**

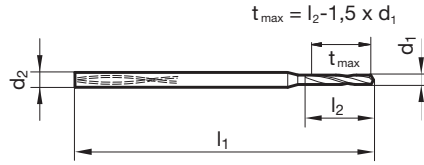

P	•	öz bileme $\geq \text{Ø } 1,400$ • yüzey Bileme • ana kesici ağız düz form
M	•	• taşlanmış kesme ağız yuvarlatması
K	•	
N	○	yapı ve sementasyon çelikleri • otomat çelikleri, ıslah çelikleri • alışımlı çelikler 1200 N/mm <sup>2</sup> 'ye kadar • paslanmaz çelikler • döküm malzemeler
S	○	
H		

**GÜHRING NAVIGATOR**

Kesme verileri sayfası 796

 Malzeme **Kom. sert metal**

 Yüzey **A**

 Kesme yönü **R**


Ürün no

**6412**

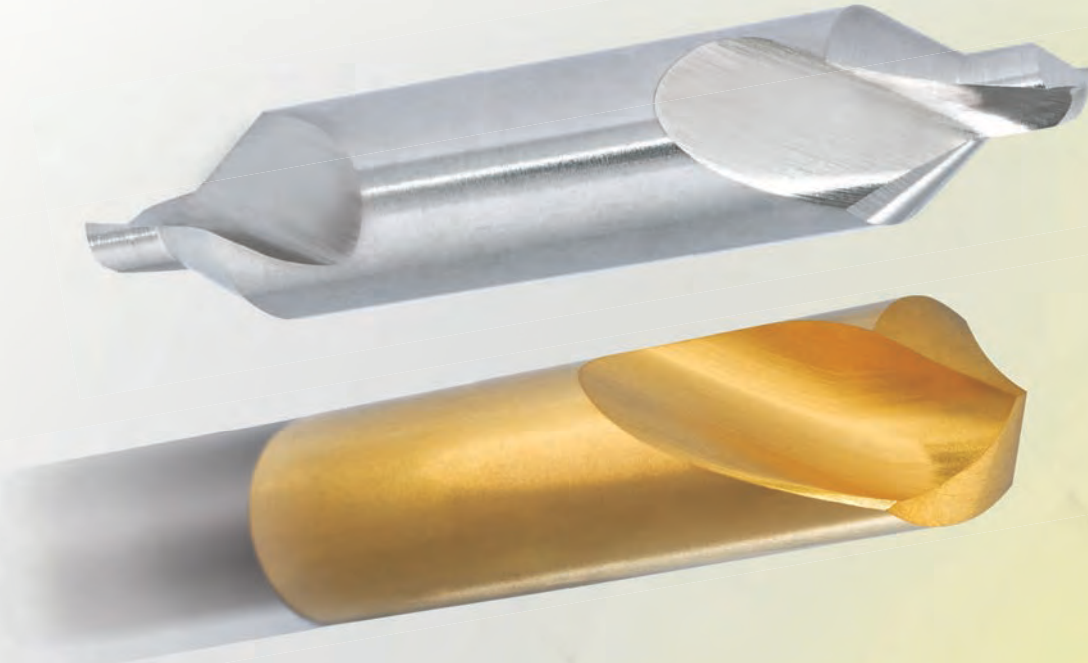
d1	d2 h6	l1	l2
mm	mm	mm	mm
1,400	4,000	62,000	25,000
1,500	4,000	62,000	27,000
1,590	4,000	62,000	29,000
1,600	4,000	62,000	29,000
1,600	4,000	62,000	29,000
1,700	4,000	70,000	31,000
1,800	4,000	70,000	32,000
1,900	4,000	70,000	34,000
1,980	4,000	70,000	36,000
2,000	4,000	70,000	36,000
2,100	4,000	78,000	38,000
2,200	4,000	78,000	40,000
2,300	4,000	78,000	42,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
2,380	4,000	78,000	44,000
2,400	4,000	78,000	44,000
2,500	4,000	78,000	45,000
2,600	4,000	87,000	47,000
2,700	4,000	87,000	48,000
2,780	4,000	87,000	50,000
2,800	4,000	87,000	50,000
2,900	4,000	87,000	52,000
3,000	4,000	87,000	54,000

Mikro matkaplar



# MERKEZ DELICILER / NC SPOR DELICILER





P	M	K	N	S	H	takım görüntüsü	sap formu	Standart	Form	Kesme yönü	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayfası	Sayfa
•	○	•	•	○			Cyl	DIN 333	A	R	HSS	○	0,500 - 12,500	581	802	668
•	○	•	•	○			Cyl	DIN 333	A	R	HSS	Ⓢ	0,500 - 8,000	613	802	669
•	○	•	•	○			Cyl	DIN 333	A	L	HSS	○	0,500 - 12,500	582		670
•	○	•	•	○			Cyl	DIN 333	A	R	HSS	○	1,000 - 12,500	590		671
•	○	•	•	○			Cyl	DIN 333	R	R	HSS	○	0,500 - 12,500	583	802	672
•	○	•	•	○			Cyl	DIN 333	R	R	HSS	Ⓢ	0,800 - 8,000	614	802	673
•	○	•	•	○			Cyl	DIN 333	R	L	HSS	○	0,800 - 5,000	584		674
•	○	•	•	○			Cyl	DIN 333	B	R	HSS	○	1,000 - 10,000	585	802	675
•	○	•	•	○			Cyl	DIN 333	B	L	HSS	○	1,000 - 10,000	586		676
•	○	•	•	○			Cyl	DIN 333	B	R	HSS	○	1,000 - 6,300	591		677
•	○	•	•	○			Cyl	ASME B94.11 M	A	R	HSS	○	1,190 - 7,940	594		678
•	○	•	•	○			Cyl	ASME B94.11 M	B	R	HSS	○	1,190 - 6,350	595		679
•	○	•	•	○			Cyl	BS 328	A	R	HSS	○	1,190 - 7,940	292	802	680
•	○	•	•	○			Cyl	BS 328	A	L	HSS	○	1,190 - 7,940	294		681
•	•	•	•	○			Cyl	DIN 333	A	R	HSCO	○	1,000 - 4,000	381	802	682
○	○	○	○	○	○		Cyl	WN	A	R	VHM	○	0,500 - 6,300	736		683
•	○	•	•	○			Cyl	WN	A	R	HSS	○	0,500 - 10,000	281		684
•	○	•	•	○			Cyl	WN	A	L	HSS	○	0,800 - 5,000	282		685
•	○	•	•	○			Cyl	WN	R	R	HSS	○	0,500 - 10,000	283		686
•	○	•	•	○			Cyl	WN	R	L	HSS	○	1,600 - 4,000	284		687
•	○	•	•	○			Cyl	WN	B	R	HSS	○	1,000 - 6,300	285		688
•	○	•	•	○			Cyl	WN	A	R	HSS	○	1,000 - 3,150	280	802	689
•	○	•	•	○			Cyl	DIN 333	A	R	HSS	○	1,600 - 10,000	587	802	690

## Punta matkap uçları, düz sıkma yüzeyli

•	○	•	•	○			Cyl	DIN 333	A	R	HSS	○	1,600 - 10,000	587	802	690
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P	M	K	N	S	H	takım görüntüsü	sap formu	Standart	Form	Kesme yönü	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayfası	Sayfa
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## Punta matkap uçları, düz sıkma yüzeyli

•	○	•	•	○			Cyl	DIN 333	R	R	HSS	○	1,000 - 10,000	588	802	691
•	○	•	•	○			Cyl	DIN 333	B	R	HSS	○	1,600 - 8,000	589		692
•	○	•	•	○			Cyl	DIN 333	A	R	HSS	○	1,600 - 10,000	287		693
•	○	•	•	○			Cyl	DIN 333	R	R	HSS	○	2,000 - 8,000	288		694
•	○	•	•	○			Cyl	WN	B	R	HSS	○	1,600 - 5,000	289		695

## NC-Punta matkap uçları 90°

•	○	•	•	○			Cyl	WN		R	HSS	○	3,000 - 25,400	557	798	696
•	○	•	•	○			Cyl	WN		R	HSS	S	3,000 - 25,400	568	798	697
•	•	•	•	○			B	WN		R	HSCO	○	3,000 - 20,000	1136	798	698
•	•	•	•	○			B	WN		R	HSCO	F	3,000 - 20,000	1133	798	699
•	○	•	•	○			Cyl	WN		R	HSS	○	6,350 - 25,400	559	798	700
○	○	○	○	○	○		Cyl	WN		R	VHM	○	4,000 - 20,000	723		701

## NC-Punta matkap uçları 120°

•	○	•	•	○			Cyl	WN		R	HSS	○	3,000 - 25,400	556	798	702
•	○	•	•	○			Cyl	WN		R	HSS	S	3,000 - 25,000	567	798	703
•	•	•	•	○			B	WN		R	HSCO	○	3,000 - 20,000	1134	798	704
•	•	•	•	○			B	WN		R	HSCO	F	3,000 - 20,000	1135	798	705
○	○	○	○	○	○		HA	WN		R	VHM	○	5,000 - 20,000	724		706

## NC-Punta matkap uçları 142°

○	○	○	○	○	○		HB	WN		R	VHM	○	4,000 - 20,000	546		707
---	---	---	---	---	---	--	----	----	--	---	-----	---	----------------	-----	--	-----

## Çift taraflı, karoseri matkap ucu

•	○	•	•	○			Cyl	WN		R	HSS	○	1,500 - 10,000	554		708
---	---	---	---	---	--	--	-----	----	--	---	-----	---	----------------	-----	--	-----



## Punta matkap uçları, silindirik saplı

Malzeme **HSS**

Yüzey

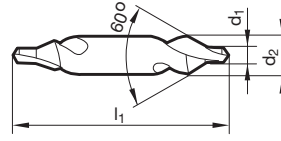
Kesme yönü

**P** • öz bileme  $\geq \text{Ø } 2,000$  • koni bileme • koruma havşasız • DIN 332, sayfa 1,  
form A'e göre •  $d1 < 0,8$  mm tek taraflı punta uçlu

<b>M</b>	○
<b>K</b>	•
<b>N</b>	•
<b>S</b>	○
<b>H</b>	

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 802

Ürün no **581**

d1	d2	l1
mm	mm	mm
0,500	3,150	25,000
0,800	3,150	25,000
1,000	3,150	31,500
1,250	3,150	31,500
1,600	4,000	35,500
2,000	5,000	40,000
2,500	6,300	45,000
3,150	8,000	50,000
4,000	10,000	56,000
5,000	12,500	63,000
6,300	16,000	71,000
8,000	20,000	80,000

d1	d2	l1
mm	mm	mm
10,000	25,000	100,000
12,500	31,500	125,000



## Punta matkap uçları, silindirik saplı

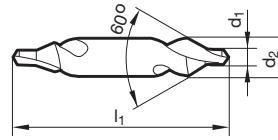


**P** • öz bileme  $\geq \varnothing 2,000$  • koni bileme • koruma havşasız • DIN 332, sayfa 1, form A'e göre •  $d1 < 0,8$  mm tek taraflı punta uçlu • arttırılmış aşınma direnci

<b>M</b>	○
<b>K</b>	•
<b>N</b>	•
<b>S</b>	○
<b>H</b>	•

Malzeme **HSS**Yüzey **S**Kesme yönü **R****GÜHRING** NAVIGATOR

Kesme verileri sayfası 802

Ürün no **613**

d1	d2	l1
mm	mm	mm
0,500	3,150	25,000
0,800	3,150	25,000
1,000	3,150	31,500
1,250	3,150	31,500
1,600	4,000	35,500
2,000	5,000	40,000

d1	d2	l1
mm	mm	mm
2,500	6,300	45,000
3,150	8,000	50,000
4,000	10,000	56,000
5,000	12,500	63,000
6,300	16,000	71,000
8,000	20,000	80,000



## Punta matkap uçları, silindir saplı

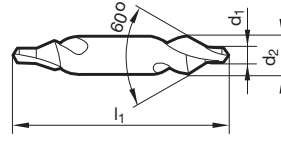
Malzeme **HSS**

Yüzey

Kesme yönü

**P** • öz bileme  $\geq \text{Ø} 2,000$  • koni bileme • koruma havşasız • DIN 332, sayfa 1,  
form A'e göre •  $d1 < 0,8$  mm tek taraflı punta uçlu

<b>M</b>	○
<b>K</b>	•
<b>N</b>	•
<b>S</b>	○
<b>H</b>	•

Ürün no **582**

d1	d2	l1
mm	mm	mm
0,500	3,150	25,000
0,800	3,150	25,000
1,000	3,150	31,500
1,250	3,150	31,500
1,600	4,000	35,500
2,000	5,000	40,000
2,500	6,300	45,000
3,150	8,000	50,000
4,000	10,000	56,000
5,000	12,500	63,000
6,300	16,000	71,000
8,000	20,000	80,000

d1	d2	l1
mm	mm	mm
10,000	25,000	100,000
12,500	31,500	125,000





## Punta matkap uçları, silindirik saplı

DIN  
333

A

N



Malzeme

HSS

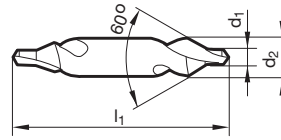
Yüzey



Kesme yönü



**P** • öz bileme  $\geq \text{Ø } 2,000$  • koni bileme • güçlendirilmiş boyun kısmı • yüksek kırılma direnci sağlar • koruma havşasız • ek yağlama için havşa ile delik arası girinti • DIN 332, sayfa 1, form A'e göre

**M** ○**K** •**N** •**S** ○**H** ○

Ürün no

590

d1	d2	l1
mm	mm	mm
1,000	3,150	31,500
1,250	3,150	31,500
1,600	4,000	35,500
2,000	5,000	40,000
2,500	6,300	45,000
3,150	8,000	50,000

d1	d2	l1
mm	mm	mm
4,000	10,000	56,000
5,000	12,500	63,000
6,300	16,000	71,000
8,000	20,000	80,000
10,000	25,000	100,000
12,500	31,500	125,000



## Punta matkap uçları, silindirik saplı



**P** • öz bileme  $\geq \text{Ø} 2,000$  • koni bileme • iki punta ucu arasında doğru konumlandırma • merkez delikler için DIN 332 bölüm 1, form R •  $d1 < 0,8$  mm tek taraflı punta uçu

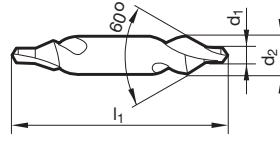
Malzeme **HSS**

Yüzey

Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 802

Ürün no **583**

d1	d2	l1
mm	mm	mm
0,500	3,150	25,000
0,800	3,150	25,000
1,000	3,150	31,500
1,250	3,150	31,500
1,600	4,000	35,500
2,000	5,000	40,000
2,500	6,300	45,000
3,150	8,000	50,000
4,000	10,000	56,000
5,000	12,500	63,000
6,300	16,000	71,000
8,000	20,000	80,000

d1	d2	l1
mm	mm	mm
10,000	25,000	100,000
12,500	31,500	125,000



## Punta matkap uçları, silindirik saplı

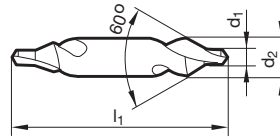


**P** • öz bileme  $\geq \text{Ø} 2,000$  • koni bileme • arttırılmış aşınma direnci • iki punta ucu arasında doğru konumlandırma • merkez delikler için DIN 332 bölüm 1, form R •  $d1 < 0,8$  mm tek taraflı punta uçlu

<b>K</b>	•
<b>N</b>	•
<b>S</b>	○
<b>H</b>	

Malzeme **HSS**Yüzey **S**Kesme yönü **R****GÜHRING**NAVIGATOR

Kesme verileri sayfası 802

Ürün no **614**

d1	d2	l1
mm	mm	mm
0,800	3,150	25,000
1,000	3,150	31,500
1,250	3,150	31,500
1,600	4,000	35,500
2,000	5,000	40,000
2,500	6,300	45,000

d1	d2	l1
mm	mm	mm
3,150	8,000	50,000
4,000	10,000	56,000
5,000	12,500	63,000
6,300	16,000	71,000
8,000	20,000	80,000



## Punta matkap uçları, silindirik saplı

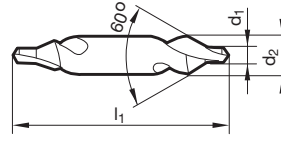
Malzeme **HSS**

Yüzey

Kesme yönü

**P** • öz bileme  $\geq \text{Ø} 2,000$  • koni bileme • iki punta ucu arasında doğru konumlandırma • merkez delikler için DIN 332 bölüm 1, form R •  $d1 < 0,8$  mm tek taraflı punta uçlu

<b>M</b>	○
<b>K</b>	•
<b>N</b>	•
<b>S</b>	○
<b>H</b>	•

Ürün no **584**

d1	d2	l1
mm	mm	mm
0,800	3,150	25,000
1,000	3,150	31,500
1,250	3,150	31,500
1,600	4,000	35,500
2,000	5,000	40,000
2,500	6,300	45,000

d1	d2	l1
mm	mm	mm
3,150	8,000	50,000
4,000	10,000	56,000
5,000	12,500	63,000



## Punta matkap uçları, silindirik saplı

DIN  
333

B

N



Malzeme

HSS

Yüzey



Kesme yönü

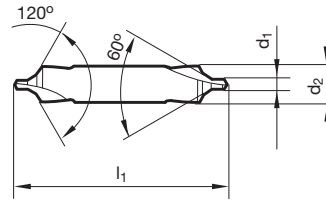


**P** • öz bileme  $\geq \varnothing 2,000$  • koni bileme • DIN 332,Sayfa 1,Form B2'ye göre  
• 120° koruma havşalı

**M** ○**K** •**N** •**S** ○**H** ○

## GÜHRING NAVIGATOR

Kesme verileri sayfası 802



Ürün no

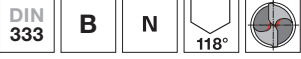
585

d1	d2	l1
mm	mm	mm
1,000	4,000	35,500
1,250	5,000	40,000
1,600	6,300	45,000
2,000	8,000	50,000
2,500	10,000	56,000
3,150	11,200	60,000

d1	d2	l1
mm	mm	mm
4,000	14,000	67,000
5,000	18,000	75,000
6,300	20,000	80,000
8,000	25,000	100,000
10,000	31,500	125,000



## Punta matkap uçları, silindir saplı

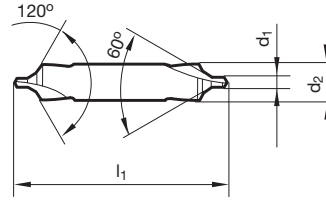
Malzeme **HSS**

Yüzey

Kesme yönü

**P** • öz bileme  $\geq \text{Ø } 2,000$  • koni bileme • DIN 332, Sayfa 1, Form B2'ye göre  
• 120° koruma havşalı

<b>M</b>	○
<b>K</b>	•
<b>N</b>	•
<b>S</b>	○
<b>H</b>	

Ürün no **586**

d1	d2	l1
mm	mm	mm
1,000	4,000	35,500
1,250	5,000	40,000
1,600	6,300	45,000
2,000	8,000	50,000
2,500	10,000	56,000
3,150	11,200	60,000

d1	d2	l1
mm	mm	mm
4,000	14,000	67,000
5,000	18,000	75,000
6,300	20,000	80,000
8,000	25,000	100,000
10,000	31,500	125,000

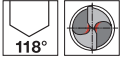


## Punta matkap uçları, silindir saplı

DIN  
333

B

N



Malzeme

HSS

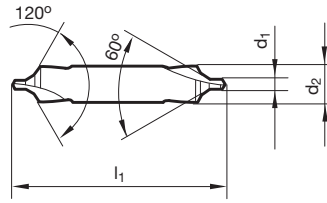
Yüzey



Kesme yönü



**P** • öz bileme  $\geq \varnothing 2,000$  • koni bileme • güçlendirilmiş boyun kısmı • yüksek kırılma direnci sağlar • ek yağlama için havşa ile delik arası girinti • DIN 332,Sayfa 1,Form B2'ye göre •  $120^\circ$  koruma havşalı

**M** ○**K** •**N** •**S** ○**H** ○

Ürün no

591

d1	d2	l1
mm	mm	mm
1,000	4,000	35,500
1,600	6,300	45,000
2,000	8,000	50,000
2,500	10,000	56,000
3,150	11,200	60,000
4,000	14,000	67,000

d1	d2	l1
mm	mm	mm
5,000	18,000	75,000
6,300	20,000	80,000



## Punta matkap uçları, silindirik saplı

ASME  
B94.11  
M

A

N

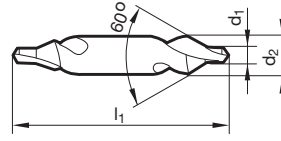
P • öz bileme  $\geq \text{Ø } 1,980$  • koni bileme • Amerikan standartına göre form A

P	•
M	○
K	•
N	•
S	○
H	•

Malzeme **HSS**

Yüzey ○

Kesme yönü (R)



Ürün no 594

Ölçüler	d1		d2	l1	Code-No.
	mm	inch			
1	1,190	3/64	3,170	32,000	1,190
2	1,980	5/64	4,760	48,000	1,980
3	2,780	7/64	6,350	51,000	2,780
4	3,170	1/8	7,940	54,000	3,170
5	4,760	3/16	11,110	70,000	4,760
6	5,560	7/32	12,700	76,000	5,560

Ölçüler	d1		d2	l1	Code-No.
	mm	inch			
7	6,350	1/4	15,870	83,000	6,350
8	7,940	5/16	19,050	89,000	7,940



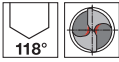


## Punta matkap uçları, silindir saplı

ASME  
B94.11  
M

B

N



Malzeme

HSS

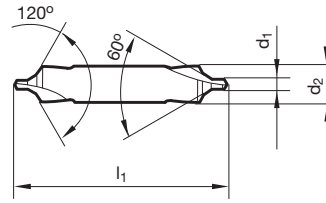
Yüzey



Kesme yönü

P • öz bileme  $\geq \text{Ø } 2,380$  • koni bileme • Amerikan standartına göre form B

P	•
M	○
K	•
N	•
S	○
H	•



Ürün no

595

Ölçüler	d1		d2	l1	Code-No.
	mm	inch			
11	1,190	3/64	3,170	32,000	1,190
12	1,590	1/16	4,760	48,000	1,590
13	2,380	3/32	6,350	51,000	2,380
14	2,780	7/64	7,940	54,000	2,780
15	3,970	5/32	11,110	70,000	3,970
16	4,760	3/16	12,700	76,000	4,760

Ölçüler	d1		d2	l1	Code-No.
	mm	inch			
17	5,560	7/32	15,870	83,000	5,560
18	6,350	1/4	19,050	89,000	6,350



## Punta matkap uçları, silindirik saplı



P • öz bileme  $\geq \text{Ø } 1,190$  • koni bileme • İngiliz standartına göre form A

P	•
M	○
K	•
N	•
S	○
H	•

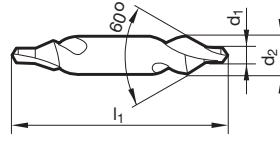
Malzeme **HSS**

Yüzey ○

Kesme yönü

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 802

Ürün no **292**

Ölçüler	d1		d2	l1	Code-No.
	mm	inch			
1	1,190	3/64	3,170	38,000	1,190
2	1,590	1/16	4,760	44,000	1,590
3	2,380	3/32	6,350	51,000	2,380
4	3,170	1/8	7,940	57,000	3,170
5	4,760	3/16	11,110	63,000	4,760
6	6,350	1/4	15,870	76,000	6,350

Ölçüler	d1		d2	l1	Code-No.
	mm	inch			
7	7,940	5/16	19,050	89,000	7,940



## Punta matkap uçları, silindirik saplı

Malzeme **HSS**

Yüzey

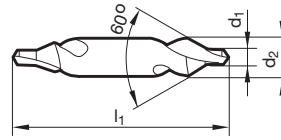


Kesme yönü



**P** • öz bileme  $\geq \text{Ø } 1,190$  • koni bileme • İngiliz standartına göre form A

<b>P</b>	•
<b>M</b>	○
<b>K</b>	•
<b>N</b>	•
<b>S</b>	○
<b>H</b>	



Ürün no

294

Ölçüler	d1		d2	l1	Code-No.
	mm	inch			
1	1,190	3/64	3,170	38,000	1,190
2	1,590	1/16	4,760	44,000	1,590
3	2,380	3/32	6,350	51,000	2,380
4	3,170	1/8	7,940	57,000	3,170
5	4,760	3/16	11,110	63,000	4,760
6	6,350	1/4	15,870	76,000	6,350

Ölçüler	d1		d2	l1	Code-No.
	mm	inch			
7	7,940	5/16	19,050	89,000	7,940



## Punta matkap uçları, silindirik saplı

Malzeme **HSCO**

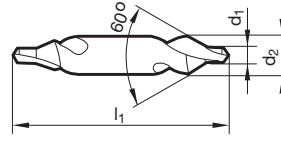
Yüzey

Kesme yönü

<b>P</b>	•	öz bileme $\geq \text{Ø } 2,000$ • koni bileme • koruma havşasız • arttırılmış aşınma direnci • DIN 332, sayfa 1, form A'e göre
<b>M</b>	•	
<b>K</b>	•	
<b>N</b>	•	800 N/mm <sup>2</sup> üzerindeki mazlemeler • pasas/aside/ısıya dayanıklı CrNi-çelikler
<b>S</b>	○	
<b>H</b>		

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 802

Ürün no **381**

d1	d2	l1
mm	mm	mm
1,000	3,150	31,500
1,250	3,150	31,500
1,600	4,000	35,500
2,000	5,000	40,000
2,500	6,300	45,000
3,150	8,000	50,000

d1	d2	l1
mm	mm	mm
4,000	10,000	56,000



## Punta matkap uçları, silindirik saplı

Malzeme **Kom. sert metal**

Yüzey



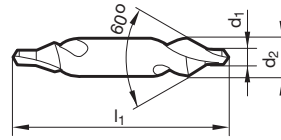
Kesme yönü



**P** öz bileme  $\geq \varnothing 2,000$  • koni bileme • koruma havşasız • DIN 332, sayfa 1,  
form A'e göre •  $d1 < 0,8$  mm tek taraflı punta uçlu

**M****K****N**

evrensel malzeme uygunluğu

**S****H**

Ürün no

736

d1	d2	l1
mm	mm	mm
0,500	3,150	25,000
0,800	3,150	25,000
1,000	3,150	31,500
1,250	3,150	31,500
1,600	4,000	35,500
2,000	5,000	40,000

d1	d2	l1
mm	mm	mm
2,500	6,300	45,000
3,150	8,000	50,000
4,000	10,000	56,000
5,000	12,500	63,000
6,300	16,000	71,000



## Punta matkap uçları, silindirik saplı

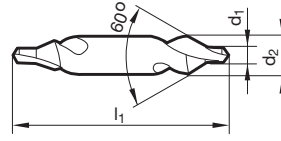
Malzeme **HSS**

Yüzey

Kesme yönü

**P** • öz bileme  $\geq \varnothing 2,000$  • koni bileme • koruma havşasız • merkez delikler için DIN 332 sayfa 1 (konu 09.1960x), Form A •  $d1 < 0,8$  mm tek taraflı punta uçlu

<b>M</b>	○
<b>K</b>	•
<b>N</b>	•
<b>S</b>	○
<b>H</b>	

Ürün no **281**

d1	d2	l1
mm	mm	mm
0,500	3,150	25,000
1,000	3,150	31,500
1,250	4,000	35,500
1,600	5,000	40,000
2,000	6,300	45,000
2,500	8,000	50,000

d1	d2	l1
mm	mm	mm
3,150	10,000	56,000
4,000	12,500	63,000
5,000	16,000	71,000
6,300	20,000	80,000
8,000	25,000	100,000
10,000	31,500	125,000



## Punta matkap uçları, silindirik saplı

Malzeme **HSS**

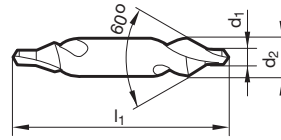
Yüzey



Kesme yönü



**P** • öz bileme  $\geq \text{Ø} 2,000$  • koni bileme • koruma havşasız • merkez delikler için DIN 332 sayfa 1 (konu 09.1960x), Form A •  $d1 < 0,8$  mm tek taraflı punta uçlu

**M** ○**K** •**N** •**S** ○**H** ○

Ürün no

282

d1	d2	l1
mm	mm	mm
0,800	3,150	25,000
1,250	4,000	35,500
1,600	5,000	40,000
2,000	6,300	45,000
2,500	8,000	50,000
3,150	10,000	56,000

d1	d2	l1
mm	mm	mm
4,000	12,500	63,000
5,000	16,000	71,000



## Punta matkap uçları, silindir saplı



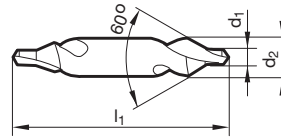
- P** • öz bileme  $\geq \varnothing 2,000$  • koni bileme • iki punta ucu arasında doğru konumlandırma • DIN 332, sayfa 1, form R'e göre •  $d1 < 0,8$  mm tek taraflı punta uçlu

<b>M</b>	○
<b>K</b>	•
<b>N</b>	•
<b>S</b>	○
<b>H</b>	•

Malzeme **HSS**

Yüzey ○

Kesme yönü

Ürün no **283**

d1	d2	l1
mm	mm	mm
0,500	3,150	25,000
0,800	3,150	25,000
1,000	3,150	31,500
1,250	4,000	35,500
1,600	5,000	40,000
2,000	6,300	45,000
2,500	8,000	50,000
3,150	10,000	56,000
4,000	12,500	63,000
5,000	16,000	71,000
6,300	20,000	80,000
8,000	25,000	100,000

d1	d2	l1
mm	mm	mm
10,000	31,500	125,000





## Punta matkap uçları, silindir saplı



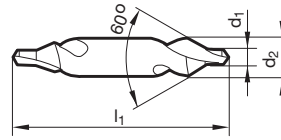
**P** • öz bileme  $\geq \text{Ø} 2,000$  • koni bileme • iki punta ucu arasında doğru konumlandırma • DIN 332, sayfa 1, form R'e göre

<b>M</b>	○
<b>K</b>	•
<b>N</b>	•
<b>S</b>	○
<b>H</b>	•

Malzeme **HSS**

Yüzey ○

Kesme yönü

Ürün no **284**

d1	d2	l1
mm	mm	mm
1,600	5,000	40,000
2,000	6,300	45,000
2,500	8,000	50,000
3,150	10,000	56,000
4,000	12,500	63,000

d1	d2	l1
mm	mm	mm



## Punta matkap uçları, silindir saplı

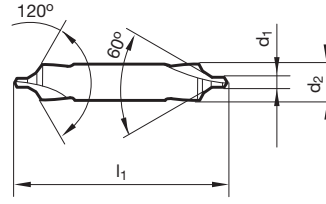
Malzeme **HSS**

Yüzey

Kesme yönü

**P** • öz bileme  $\geq \varnothing 2,000$  • koni bileme • merkez delikler için DIN 332 sayfa 1  
(konu 09.1960x), Form B •  $120^\circ$  koruma havşalı

<b>M</b>	○
<b>K</b>	•
<b>N</b>	•
<b>S</b>	○
<b>H</b>	•

Ürün no **285**

d1	d2	l1
mm	mm	mm
1,000	6,300	40,000
1,600	8,000	50,000
2,000	10,000	56,000
2,500	11,200	63,000
3,150	14,000	71,000
4,000	16,000	80,000

d1	d2	l1
mm	mm	mm
5,000	20,000	90,000
6,300	25,000	100,000



## Punta matkap uçları, silindir saplı

Malzeme **HSS**

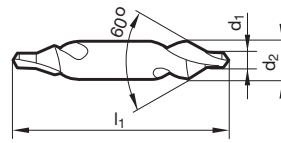
Yüzey

Kesme yönü

- P** • öz bileme  $\geq \text{Ø} 2,000$  • koni bileme • ekstra uzun merkez deliciler  
**M** ○ • koruma havşasız • DIN 332 ye göre merkez delikler, sayfa 1, form A  
**K** •  
**N** •  
**S** ○  
**H**

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 802

Ürün no **280**

d1	d2	l1
mm	mm	mm
1,000	4,000	120,000
1,600	5,000	120,000
2,000	6,000	120,000
2,500	8,000	120,000
3,150	10,000	120,000

d1	d2	l1
mm	mm	mm



## Punta matkap uçları, düz sıkma yüzeyli



**P** • öz bileme  $\geq \varnothing 2,000$  • koni bileme • DIN 332, sayfa 1, form A'e göre  
• koruma havşasız

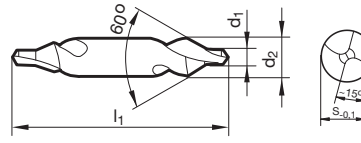
<b>M</b>	○
<b>K</b>	•
<b>N</b>	•
<b>S</b>	○
<b>H</b>	•

Malzeme **HSS**

Yüzey ○

Kesme yönü **(R)****GÜHRING**NAVIGATOR

Kesme verileri sayfası 802

Ürün no **587**

d1	d2	l1	S
mm	mm	mm	mm
1,600	4,000	35,500	3,250
2,000	5,000	40,000	4,200
2,500	6,300	45,000	5,350
3,150	8,000	50,000	6,950
4,000	10,000	56,000	8,400
5,000	12,500	63,000	10,950

d1	d2	l1	S
mm	mm	mm	mm
6,300	16,000	71,000	14,000
8,000	20,000	80,000	17,900
10,000	25,000	100,000	22,500



## Punta matkap uçları, düz sıkma yüzeyli



**P** • öz bileme  $\geq \text{Ø} 2,000$  • koni bileme • iki punta ucu arasında doğru konumlandırma • merkez delikler için DIN 332 bölüm 1, form R

<b>M</b>	○
<b>K</b>	•
<b>N</b>	•
<b>S</b>	○
<b>H</b>	

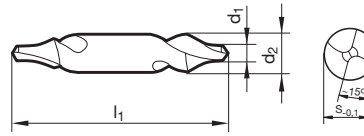
Malzeme **HSS**

Yüzey ○

Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 802

Ürün no **588**

d1	d2	l1	S
mm	mm	mm	mm
1,000	3,150	31,500	2,350
2,000	5,000	40,000	4,200
2,500	6,300	45,000	5,350
3,150	8,000	50,000	6,950
4,000	10,000	56,000	8,400
5,000	12,500	63,000	10,950

d1	d2	l1	S
mm	mm	mm	mm
6,300	16,000	71,000	14,000
8,000	20,000	80,000	17,900
10,000	25,000	100,000	22,500



## Punta matkap uçları, düz sıkma yüzeyli



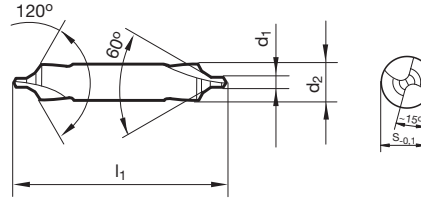
**P** • öz bileme  $\geq \varnothing 2,000$  • koni bileme • DIN 332, Sayfa 1, Form B2'ye göre  
• 120° koruma havşalı

<b>P</b>	•
<b>M</b>	○
<b>K</b>	•
<b>N</b>	•
<b>S</b>	○
<b>H</b>	•

Malzeme **HSS**

Yüzey ○

Kesme yönü

Ürün no **589**

d1	d2	l1	S
mm	mm	mm	mm
1,600	6,300	45,000	5,350
2,000	8,000	50,000	6,950
2,500	10,000	56,000	8,400
3,150	11,200	60,000	10,000
4,000	14,000	67,000	12,650
5,000	18,000	75,000	16,400

d1	d2	l1	S
mm	mm	mm	mm
6,300	20,000	80,000	17,900
8,000	25,000	100,000	22,500



## Punta matkap uçları, düz sıkma yüzeyli

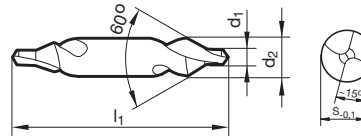
Malzeme **HSS**

Yüzey

Kesme yönü

**P** • öz bileme  $\geq \text{Ø} 2,000$  • koni bileme • koruma havşasız • merkez delikler için DIN 332 sayfa 1 (konu 09.1960x), Form A

<b>P</b>	•
<b>M</b>	○
<b>K</b>	•
<b>N</b>	•
<b>S</b>	○
<b>H</b>	

Ürün no **287**

d1	d2	l1	S
mm	mm	mm	mm
1,600	5,000	40,000	4,200
2,000	6,300	45,000	5,350
2,500	8,000	50,000	6,850
3,150	10,000	56,000	8,400
4,000	12,500	63,000	10,650
5,000	16,000	71,000	13,650

d1	d2	l1	S
mm	mm	mm	mm
6,300	20,000	80,000	17,400
8,000	25,000	100,000	21,900
10,000	31,500	125,000	27,100



## Punta matkap uçları, düz sıkma yüzeyli

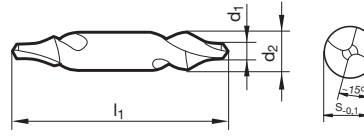


**P** • öz bileme  $\geq \text{Ø} 2,000$  • koni bileme • iki punta ucu arasında doğru konumlandırma • DIN 332, sayfa 1, form R'e göre

<b>M</b>	○
<b>K</b>	•
<b>N</b>	•
<b>S</b>	○
<b>H</b>	•

Malzeme **HSS**

Yüzey ○

Kesme yönü **(R)**Ürün no **288**

d1	d2	l1	S
mm	mm	mm	mm
2,000	6,300	45,000	5,350
2,500	8,000	50,000	6,850
3,150	10,000	56,000	8,400
4,000	12,500	63,000	10,650
5,000	16,000	71,000	13,650
6,300	20,000	80,000	17,400

d1	d2	l1	S
mm	mm	mm	mm
8,000	25,000	100,000	21,900





## Punta matkap uçları, düz sıkma yüzeyli

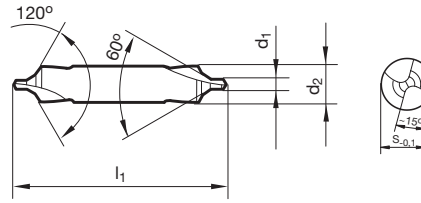
Malzeme **HSS**

Yüzey ○

Kesme yönü (R)

**P** • öz bileme  $\geq \varnothing 2,000$  • koni bileme • merkez delikler için DIN 332 sayfa 1 (konu 09.1960x), Form B • 120° koruma havşalı

<b>P</b>	•
<b>M</b>	○
<b>K</b>	•
<b>N</b>	•
<b>S</b>	○
<b>H</b>	•

Ürün no **289**

d1	d2	l1	S
mm	mm	mm	mm
1,600	8,000	50,000	6,500
2,000	10,000	56,000	7,950
2,500	11,200	63,000	9,500
3,150	14,000	71,000	12,000
4,000	16,000	80,000	14,400
5,000	20,000	90,000	18,400

d1	d2	l1	S
mm	mm	mm	mm



## NC-Punta matkap uçları 90°



P • koni bileme • yalnızca puntalama için uygundur

P	•
M	○
K	•
N	•
S	○
H	•

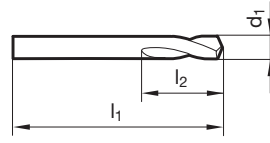
Malzeme **HSS**

Yüzey ○

Kesme yönü (R)

## GÜHRING NAVIGATOR

Kesme verileri sayfası 798

Ürün no **557**

d1		l1	l2
mm	inch	mm	mm
3,000		46,000	12,000
4,000		55,000	12,000
5,000		62,000	14,000
6,000		66,000	16,000
6,350	1/4	70,000	17,000
8,000		79,000	21,000
9,000		84,000	22,000
9,520	3/8	89,000	25,000
10,000		89,000	25,000
12,000		102,000	30,000
12,700	1/2	102,000	30,000
13,000		102,000	30,000

d1		l1	l2
mm	inch	mm	mm
14,000		107,000	33,500
15,870	5/8	115,000	37,500
16,000		115,000	37,500
19,050	3/4	131,000	45,000
20,000		131,000	45,000
25,000	63/64	151,000	53,000
25,400	1	156,000	53,000



## NC-Punta matkap uçları 90°

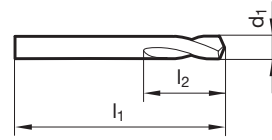


P • koni bileme • yalnızca puntalama için uygundur

P	•
M	○
K	•
N	•
S	○
H	

Malzeme **HSS**Yüzey **S**Kesme yönü **R****GÜHRING** NAVIGATOR

Kesme verileri sayfası 798

Ürün no **568**

d1		l1	l2
mm	inch	mm	mm
3,000		46,000	12,000
4,000		55,000	12,000
5,000		62,000	14,000
6,000		66,000	16,000
6,350	1/4	70,000	17,000
8,000		79,000	21,000
9,520	3/8	89,000	25,000
10,000		89,000	25,000
12,000		102,000	30,000
12,700	1/2	102,000	30,000
15,870	5/8	115,000	37,500
16,000		115,000	37,500

d1		l1	l2
mm	inch	mm	mm
19,050	3/4	131,000	45,000
20,000		131,000	45,000
25,000	63/64	151,000	53,000
25,400	1	156,000	53,000



## NC-Punta matkap uçları 90°



Malzeme HSC0

Yüzey



Kesme yönü



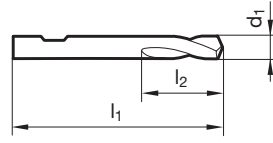
P • koni bileme • yalnızca puntalama için uygundur •  $\geq \varnothing 6,0$  mm DIN 1835-  
B • Co-alaşımlı HSS-çeliği • artırılmış aşınma direnci

P	•
M	•
K	•
N	•
S	○
H	



## GÜHRING NAVIGATOR

Kesme verileri sayfası 798



Ürün no 1136

d1		l1	l2
mm	inch	mm	mm
3,000		46,000	12,000
4,000		55,000	12,000
5,000		62,000	14,000
6,000		66,000	16,000
8,000		79,000	21,000
10,000		89,000	25,000

d1		l1	l2
mm	inch	mm	mm
12,000		102,000	30,000
16,000		115,000	37,500
20,000		131,000	45,000



## NC-Punta matkap uçları 90°

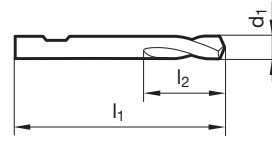
Malzeme **HSCO**Yüzey **F**Kesme yönü **R****NEW**

**P** • koni bileme • yalnızca puntalama için uygundur •  $\geq \varnothing 6,0$  mm DIN 1835-  
**B** • Co-alaşımlı HSS-çeliği • artırılmış aşınma direnci

<b>P</b>	•
<b>M</b>	•
<b>K</b>	•
<b>N</b>	•
<b>S</b>	○
<b>H</b>	

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 798

Ürün no **1133**

d1		l1	l2
mm	inch	mm	mm
3,000		46,000	12,000
4,000		55,000	12,000
5,000		62,000	14,000
6,000		66,000	16,000
8,000		79,000	21,000
10,000		89,000	25,000

d1		l1	l2
mm	inch	mm	mm
12,000		102,000	30,000
16,000		115,000	37,500
20,000		131,000	45,000



## NC-Punta matkap uçları 90°



P • koni bileme • yalnızca puntalama için uygundur

P	•
M	○
K	•
N	•
S	○
H	

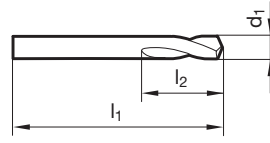
## GÜHRING NAVIGATOR

Kesme verileri sayfası 798

Malzeme **HSS**

Yüzey ○

Kesme yönü (R)



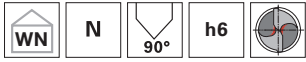
Ürün no **559**

d1		l1	l2
mm	inch	mm	mm
6,350	1/4	105,000	17,000
8,000		118,000	21,000
9,520	3/8	132,000	25,000
12,700	1/2	159,000	30,000
15,870	5/8	186,000	37,500
19,050	3/4	213,000	45,000

d1		l1	l2
mm	inch	mm	mm
25,400	1	216,000	53,000



## NC-Punta matkap uçları 90°

Malzeme **Kom. sert metal**

Yüzey



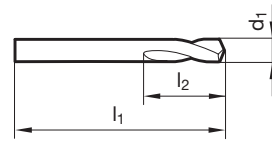
Kesme yönü



**P** öz bileme  $\geq \text{Ø} 6,000$  • yüzey Bileme • yalnızca puntalama için uygundur

**M****K****N**

evrensel malzeme uygunluğu

**S****H**

Ürün no

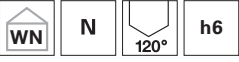
723

d1		l1	l2
mm	inch	mm	mm
4,000		55,000	12,000
5,000		62,000	14,000
6,000		66,000	16,000
6,350	1/4	70,000	17,000
8,000		79,000	21,000
9,520	3/8	89,000	25,000
10,000		89,000	25,000
12,000		102,000	30,000
12,700	1/2	102,000	30,000
15,870	5/8	115,000	37,500
16,000		115,000	37,500
19,050	3/4	131,000	45,000

d1		l1	l2
mm	inch	mm	mm
20,000		131,000	45,000



## NC-Punta matkap uçları 120°



P • koni bileme • yalnızca puntalama için uygundur

P	•
M	○
K	•
N	•
S	○
H	•

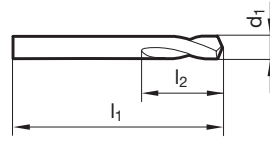
Malzeme **HSS**

Yüzey ○

Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 798

Ürün no **556**

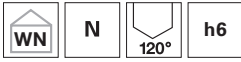
d1		l1	l2
mm	inch	mm	mm
3,000		46,000	12,000
4,000		55,000	12,000
5,000		62,000	14,000
5,600		66,000	16,000
6,000		66,000	16,000
6,350	1/4	70,000	17,000
6,500		70,000	17,000
7,000		74,000	19,000
8,000		79,000	21,000
9,520	3/8	89,000	25,000
10,000		89,000	25,000
11,550		95,000	28,000

d1		l1	l2
mm	inch	mm	mm
12,000		102,000	30,000
12,700	1/2	102,000	30,000
14,000		107,000	33,500
15,000		111,000	33,500
15,870	5/8	115,000	37,500
16,000		115,000	37,500
19,000		127,000	40,000
19,050	3/4	131,000	45,000
20,000		131,000	45,000
25,000	63/64	151,000	53,000
25,400	1	156,000	53,000





## NC-Punta matkap uçları 120°



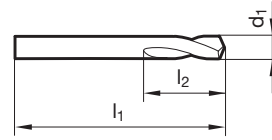
P • koni bileme • yalnızca puntalama için uygundur

P	•
M	○
K	•
N	•
S	○
H	

Malzeme **HSS**Yüzey **S**Kesme yönü **R**

## GÜHRING NAVIGATOR

Kesme verileri sayfası 798

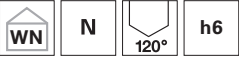
Ürün no **567**

d1		l1	l2
mm	inch	mm	mm
3,000		46,000	12,000
4,000		55,000	12,000
5,000		62,000	14,000
6,000		66,000	16,000
6,350	1/4	70,000	17,000
8,000		79,000	21,000
9,520	3/8	89,000	25,000
10,000		89,000	25,000
12,000		102,000	30,000
12,700	1/2	102,000	30,000
15,870	5/8	115,000	37,500
16,000		115,000	37,500

d1		l1	l2
mm	inch	mm	mm
19,050	3/4	131,000	45,000
20,000		131,000	45,000
25,000	63/64	151,000	53,000



## NC-Punta matkap uçları 120°



Malzeme HSC0

Yüzey



Kesme yönü

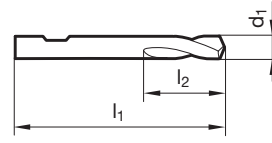


P • koni bileme • yalnızca puntalama için uygundur •  $\geq \varnothing 6,0$  mm DIN 1835-  
B • Co-alaşımlı HSS-çeliği • artırılmış aşınma direnci



## GÜHRING NAVIGATOR

Kesme verileri sayfası 798



Ürün no

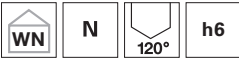
1134

d1		l1	l2
mm	inch	mm	mm
3,000		46,000	12,000
4,000		55,000	12,000
5,000		62,000	14,000
6,000		66,000	16,000
8,000		79,000	21,000
10,000		89,000	25,000

d1		l1	l2
mm	inch	mm	mm
12,000		102,000	30,000
16,000		115,000	37,500
20,000		131,000	45,000



## NC-Punta matkap uçları 120°

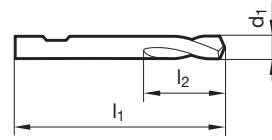
Malzeme **HSCO**Yüzey **F**Kesme yönü **R****NEW**

**P** • koni bileme • yalnızca puntalama için uygundur •  $\geq \varnothing 6,0$  mm DIN 1835-  
B • Co-alaşımlı HSS-çeliği • artırılmış aşınma direnci

<b>P</b>	•
<b>M</b>	•
<b>K</b>	•
<b>N</b>	•
<b>S</b>	○
<b>H</b>	

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 798

Ürün no **1135**

d1		l1	l2
mm	inch	mm	mm
3,000		46,000	12,000
4,000		55,000	12,000
5,000		62,000	14,000
6,000		66,000	16,000
8,000		79,000	21,000
10,000		89,000	25,000

d1		l1	l2
mm	inch	mm	mm
12,000		102,000	30,000
16,000		115,000	37,500
20,000		131,000	45,000



## NC-Punta matkap uçları 120°

Malzeme **Kom. sert metal**

Yüzey



Kesme yönü



**P** öz bileme  $\geq \text{Ø } 13,500$  • yüzey Bileme • yalnızca puntalama için uygundur

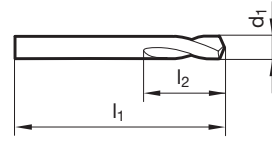
**M**

**K**

**N** evrensel malzeme uygunluğu

**S**

**H**



Ürün no

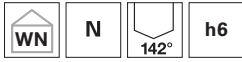
724

d1		l1	l2
mm	inch	mm	mm
5,000		62,000	14,000
6,000		66,000	16,000
6,350	1/4	70,000	17,000
8,000		79,000	21,000
9,520	3/8	89,000	25,000
10,000		89,000	25,000

d1		l1	l2
mm	inch	mm	mm
12,000		102,000	30,000
12,700	1/2	102,000	30,000
15,870	5/8	115,000	37,500
16,000		115,000	37,500
19,050	3/4	131,000	45,000
20,000		131,000	45,000

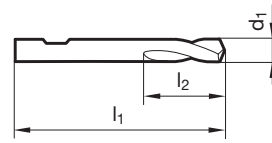


## NC-Punta matkap uçları 142°



<b>P</b>	○	yüzey Bileme • yalnızca puntalama için uygundur • $\geq \text{Ø } 6.0 \text{ mm HB}$ bağlama formu ile
<b>M</b>	○	
<b>K</b>	○	
<b>N</b>	○	evrensel malzeme uygunluğu
<b>S</b>	○	
<b>H</b>	○	

Malzeme	<b>Kom. sert metal</b>
Yüzey	○
Kesme yönü	Ⓜ



Ürün no 546

d1		l1	l2
mm	inch	mm	mm
4,000		55,000	12,000
5,000		62,000	14,000
6,000		66,000	16,000
8,000		79,000	21,000
10,000		89,000	25,000
12,000		102,000	30,000

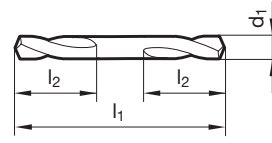
d1		l1	l2
mm	inch	mm	mm
16,000		115,000	37,500
20,000		131,000	45,000



## Çift taraflı, karoseri matkap ucu

Malzeme **HSS**Yüzey   $\geq 0,2,36$ Kesme yönü 

**P** • öz bileme  $\geq \text{Ø } 1,450$  • koni bileme • Çift taraflı kullanım için • Karoseri imalatı için el matkaplarında

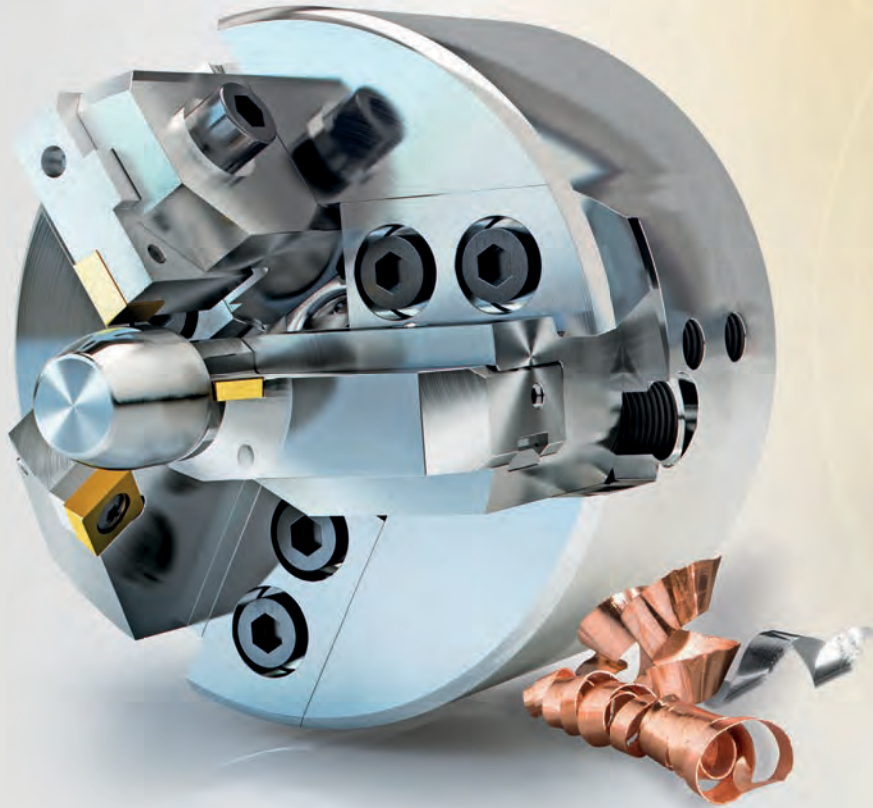
**M** ○**K** •**N** • ince cidarlı malzemeler**S** ○**H**Ürün no **554**

d1	l1	l2
mm	mm	mm
1,500	32,000	6,000
1,900	36,000	7,100
2,000	38,000	7,500
2,100	38,000	7,500
2,200	40,000	8,500
2,300	40,000	8,500
2,400	43,000	9,500
2,450	43,000	9,500
2,500	43,000	9,500
2,600	43,000	9,500
2,700	46,000	10,600
2,780	46,000	10,600
2,800	46,000	10,600
2,900	46,000	10,600
3,000	46,000	10,600
3,050	49,000	11,200
3,100	49,000	11,200
3,170	49,000	11,200
3,200	49,000	11,200
3,260	49,000	11,200
3,300	49,000	11,200
3,500	52,000	12,500
3,570	52,000	12,500
3,600	52,000	12,500
3,650	52,000	12,500
3,700	52,000	12,500
3,800	55,000	14,000
3,970	55,000	14,000
4,000	55,000	14,000
4,100	55,000	14,000
4,200	55,000	14,000
4,300	58,000	15,500
4,500	58,000	15,500
4,600	58,000	15,500
4,760	62,000	17,000
4,800	62,000	17,000

d1	l1	l2
mm	mm	mm
4,900	62,000	17,000
5,000	62,000	17,000
5,100	62,000	17,000
5,200	62,000	17,000
5,300	62,000	17,000
5,400	66,000	19,000
5,500	66,000	19,000
5,560	66,000	19,000
5,600	66,000	19,000
5,800	66,000	19,000
5,900	66,000	19,000
5,950	66,000	19,000
6,000	66,000	19,000
6,100	70,000	21,200
6,350	70,000	21,200
6,500	70,000	21,200
6,800	74,000	23,600
7,000	74,000	23,600
7,100	74,000	23,600
7,500	74,000	23,600
7,940	79,000	25,000
8,000	79,000	25,000
8,500	79,000	25,000
8,600	84,000	25,000
9,000	84,000	25,000
9,500	84,000	25,000
9,520	89,000	25,000
10,000	89,000	25,000

# GE 100

Finiş işlemleri için çoklu takım sistemleri.  
Bir takım ile 5 operasyona kadar tek adımda.



İki veya dört ayarlanabilir kartuş ve merkezde tek veya çok kademeli matkaplar ile işleme zamanlarında saniyelere düşüş.



Daha fazla bilgi GE 100 kataloglarında bulunabilir.





# KADEMELI MATKAP UCU / GENIŞLETİCİ





P	M	K	N	S	H	takım görüntüsü	Standart	Form	Tip	Kesme yönü	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayfası	Sayfa
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## Kademeli punta matkap uçları DIN 332

•	○	•	•	○			WN	D	N	R	HSS	○	8,000 - 40,000	274	804	714
•	○	•	•	○			WN	DR	N	R	HSS	○	8,000 - 40,000	574	804	715
•	○	•	•	○			WN	D	N	R	HSS	○	8,000 - 20,000	575	804	716
•	○	•	•	○			WN	D	N	R	HSS	○	14,000 - 40,000	576	804	717

## Silindirik saplı kademeli matkap uçları, kısa

•	○	•	•	○			WN		N	R	HSS	○	6,000 - 19,000	378	804	718
•	○	•	•	○			WN		N	R	HSS	○	6,600 - 21,500	1147	804	719
•	○	•	•	○			WN		N	R	HSS	○	6,000 - 18,000	379	804	720
•	○	•	•	○			WN		N	R	HSS	○	3,400 - 13,500	380	804	721

## Silindirik saplı, çift fasetlı, kademeli helisel matkap uçları

•	○	•	•	○			DIN 8374	A	N	R	HSS	○	6,000 - 15,000	536	806	722
•	○	•	•	○			DIN 8374	B	N	R	HSS	○	7,500 - 19,000	569	806	723
•	○	•	•	○			WN		N	R	HSS	○	6,600 - 17,200	636	806	724
•	○	•	•	○			WN		N	R	HSS	○	6,000 - 8,000	638	806	725
•	○	•	•	○			DIN 8376		N	R	HSS	○	6,000 - 18,000	538	806	726
○	○	○	○	○	○		WN		N	R	VHM	○	6,000 - 15,000	738		727
•	○	•	•	○			WN		N	R	HSS	○	5,900 - 17,500	514	806	728
•	○	•	•	○			DIN 8378		N	R	HSS	○	3,400 - 13,500	540	806	729
○	○	○	○	○	○		WN		N	R	VHM	○	4,500 - 11,000	739		730

## Mors konik saplı, çift fasetlı, kademeli helisel matkap uçları

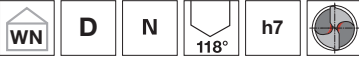
•	○	•	•	○			WN		N	R	HSS	○	11,500 - 23,000	637	806	731
•	○	•	•	○			WN		N	R	HSS	○	11,000 - 29,000	537	806	732
•	○	•	•	○			WN		N	R	HSS	○	18,000 - 26,000	639	806	733
•	○	•	•	○			DIN 8377		N	R	HSS	○	10,000 - 33,000	539	806	734
•	○	•	•	○			WN		N	R	HSS	○	9,400 - 33,000	520	806	735



P	M	K	N	S	H	takım görüntüsü	Standart	Form	Tip	Kesme yönü	Malzeme	Yüzey	d1/mm	ürün no	Kesme verileri sayfası	Sayfa
•	○	•	○				DIN 8379	N	R	HSS	●	9,000 - 22,000	541	806	736	
Mors konik saplı, çift fasetalı, kademeli helisel matkap uçları																
•	○	•	○				DIN 344	N	R	HSS	●	3,800 - 20,000	533	800	737	
○	○	○	○	○	○		WN	N	R	HM	○	3,800 - 15,000	750		739	
Silindirik saplı, genişletici																
•	○	•	○				DIN 343	N	R	HSS	●	7,800 - 50,000	534	800	740	
•	○	•	•	○			DIN 343	N	R	HSCO	●	8,500 - 26,000	634	800	742	
•	○	•	○				DIN 1864	N	R	HSS	●	5,000 - 30,000	555	800	743	
•	○	•	•	○			DIN 1864	N	R	HSCO	●	8,000 - 15,000	635	800	744	
○	○	○	○	○	○		WN	N	R	HM	○	28,700 - 39,600	729		745	
Mors konik saplı genişletici																
•	○	•	○				DIN 1898	N	R	HSS	● <sub>2,36</sub>	2,000 - 12,000	531		746	
•	○	•	○				DIN 1898	N	R	HSS	●	5,000 - 25,000	532		747	
Pim deliği matkap ucu																



## Kademeli punta matkap uçları DIN 332

Malzeme **HSS**

Yüzey



Kesme yönü

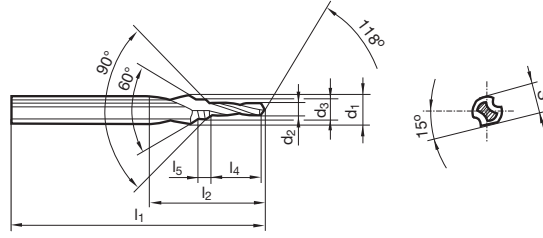


- P** • öz bileme  $\geq \varnothing 8,000$  • siviltme değerleri nom.- $\varnothing d1$  ile ilgili • koni bileme • düz şaft •  $60^\circ$  havşa açısı • form DR sayfa 2, DIN 332'ye göre  
**M** ○ • Puntalama /Boy kesme makinalarında kullanım

- K** •  
**N** •  
**S** ○  
**H** ○

## GÜHRING NAVIGATOR

Kesme verileri sayfası 804



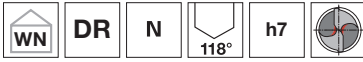
Ürün no

274

d1 h7	d2 h8	d3	l1	l2	l4	l5	S	vida dişleri için
mm	mm	mm	mm	mm	mm	mm	mm	
8,000	3,300	4,300	63,000	23,000	11,000	1,600	6,750	M 4
10,000	4,200	5,300	67,000	27,000	13,000	2,150	8,450	M 5
12,500	5,000	6,400	71,000	33,000	16,000	2,900	10,450	M 6
14,000	6,800	8,400	88,000	41,000	19,500	3,500	12,500	M 8
16,000	8,500	10,500	94,000	47,000	23,000	4,700	14,850	M10
20,000	10,200	13,000	105,000	59,000	28,000	6,500	18,450	M12
25,000	14,000	17,000	132,000	67,000	33,000	8,300	23,400	M16
31,500	17,500	21,000	145,000	76,500	38,000	10,350	29,350	M20
40,000	21,000	25,000	160,000	90,000	45,000	12,000	36,500	M24



## Kademeli punta matkap uçları DIN 332

Malzeme **HSS**

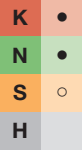
Yüzey



Kesme yönü

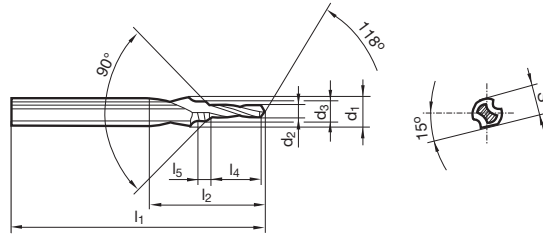


- P** • öz bileme  $\geq \varnothing 8,000$  • sivilme değerleri nom.- $\varnothing d1$  ile ilgili • koni bileme  
**M** ○ • düz shaft •  $60^\circ$  havşa açısı • Form DR Sayfa 2, DIN 332' ye göre  
**K** • • Puntalama /Boy kesme makinalarında kullanım



## GÜHRING NAVIGATOR

Kesme verileri sayfası 804



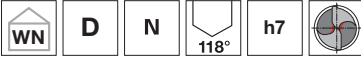
Ürün no

574

d1 h7	d2 h8	d3	l1	l2	l4	l5	S	vida dişleri için
mm	mm	mm	mm	mm	mm	mm	mm	
8,000	3,300	4,300	63,000	23,000	11,000	1,600	6,750	M 4
10,000	4,200	5,300	67,000	27,000	13,000	2,150	8,450	M 5
12,500	5,000	6,400	71,000	33,000	16,000	2,900	10,450	M 6
14,000	6,800	8,400	88,000	41,000	19,500	3,500	12,500	M 8
16,000	8,500	10,500	94,000	47,000	23,000	4,700	14,850	M10
20,000	10,200	13,000	105,000	59,000	28,000	6,500	18,450	M12
25,000	14,000	17,000	132,000	67,000	33,000	8,300	23,400	M16
31,500	17,500	21,000	145,000	76,500	38,000	10,350	29,350	M20
40,000	21,000	25,000	160,000	90,000	45,000	12,000	36,500	M24



## Kademeli punta matkap uçları DIN 332

Malzeme **HSS**

Yüzey



Kesme yönü

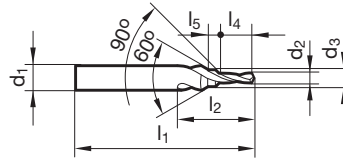


**P** • öz bileme  $\geq \varnothing 8,000$  • sivilme değerleri nom.- $\varnothing d1$  ile ilgili • koni bileme  
• 60° havşa açısı • form DR sayfa 2, DIN 332'ye göre

<b>M</b>	○
<b>K</b>	•
<b>N</b>	•
<b>S</b>	○
<b>H</b>	

## GÜHRING NAVIGATOR

Kesme verileri sayfası 804



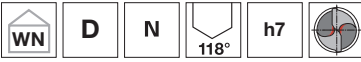
Ürün no

575

d1 h7	d2 h8	d3	l1	l2	l4	l5	vida dişleri için
mm	mm	mm	mm	mm	mm	mm	
8,000	3,300	4,300	63,000	23,000	11,000	1,600	M 4
10,000	4,200	5,300	67,000	27,000	13,000	2,150	M 5
12,500	5,000	6,400	71,000	33,000	16,000	2,900	M 6
14,000	6,800	8,400	88,000	41,000	19,500	3,500	M 8
16,000	8,500	10,500	94,000	47,000	23,000	4,700	M10
20,000	10,200	13,000	105,000	59,000	28,000	6,500	M12



## Kademeli punta matkap uçları DIN 332

Malzeme **HSS**

Yüzey



Kesme yönü

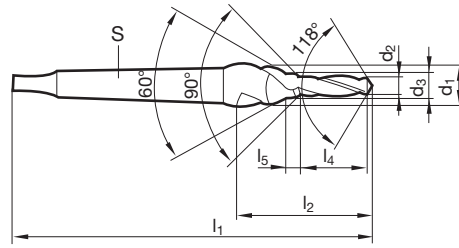


**P** • öz bileme  $\geq \varnothing 14,000$  • siviltme değerleri nom.- $\varnothing d1$  ile ilgili • koni bileme  
•  $60^\circ$  havşa açısı • form DR sayfa 2, DIN 332'ye göre

<b>M</b>	○
<b>K</b>	•
<b>N</b>	•
<b>S</b>	○
<b>H</b>	○

## GÜHRING NAVIGATOR

Kesme verileri sayfası 804



Ürün no

576

d1 h7	d2 h8	d3	l1	l2	l4	l5	vida dişleri için
mm	mm	mm	mm	mm	mm	mm	
14,000	6,800	8,400	110,000	41,000	19,500	3,500	M 8
16,000	8,500	10,500	131,000	47,000	23,000	4,700	M10
20,000	10,200	13,000	145,000	59,000	28,000	6,500	M12
25,000	14,000	17,000	172,000	67,000	33,000	8,300	M16
31,500	17,500	21,000	184,000	76,500	38,000	10,350	M20
40,000	21,000	25,000	222,000	90,000	45,000	12,000	M24



## Silindirik saplı kademeli matkap uçları, kısa



**P** • öz bileme  $\geq \text{Ø} 6,000$  • sivilme değerleri nom.- $\text{Ø} d1$  ile ilgili • koni bileme  
• burulmaya çok dayanıklı • CNC ve NC makineler için • DIN EN 20273 e  
**M** ○ göre açık delikler için, fine seri •  $90^\circ$  vida başı havşası için DIN 74, form  
**K** • A • f küçük çap'a göre kendisini ayarlar. • büyük çap ölçüsüne göre vc  
uyarlıyor

**N** •  
**S** ○  
**H**

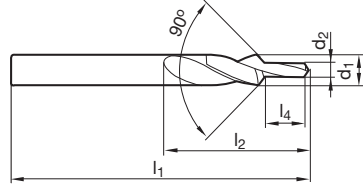
Malzeme **HSS**

Yüzey ○

Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 804

Ürün no **378**

d1	d2 h6	l1	l2	l4	vida dişleri için
mm	mm	mm	mm	mm	
6,000	3,200	66,000	28,000	9,000	M 3
8,000	4,300	79,000	37,000	11,000	M 4
10,000	5,300	89,000	43,000	13,000	M 5
11,500	6,400	95,000	47,000	15,000	M 6
15,000	8,400	111,000	56,000	19,000	M 8
19,000	10,500	127,000	64,000	23,000	M 10





## Silindirik saplı kademeli matkap uçları, kısa



**P** • öz bileme  $\geq \varnothing 6,600$  • sivilme değerleri nom.- $\varnothing d1$  ile ilgili • koni bileme  
• burulmaya çok dayanıklı • CNC ve NC makineler için • DIN EN 20273  
**M** ○ e göre açık delikler için, medium seri • 90° vida başı havşası için DIN 74,  
form A • f küçük çap'a göre kendisini ayarlar. • büyük çap ölçüsüne göre  
vc uyarlıyor

**N** •  
**S** ○  
**H**

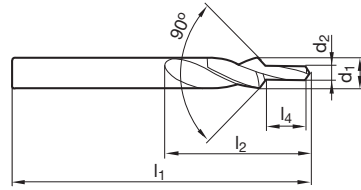
Malzeme **HSS**

Yüzey ○

Kesme yönü

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 804

Ürün no **1147**

d1	d2 h6	l1	l2	l4	vida dişleri için
mm	mm	mm	mm	mm	
6,600	3,400	70,000	31,000	9,000	M 3
9,000	4,500	84,000	40,000	11,000	M 4
11,000	5,500	95,000	47,000	13,000	M 5
13,000	6,600	102,000	51,000	15,000	M 6
17,200	9,000	123,000	62,000	19,000	M 8
21,500	11,000	141,000	70,000	23,000	M 10



## Silindirik saplı kademeli matkap uçları, kısa



P	•	öz bileme $\geq \varnothing 6,000$ • sivilme değerleri nom.- $\varnothing d1$ ile ilgili • koni bileme • burulmaya çok dayanıklı • CNC ve NC makineler için • DIN EN 20273 e göre açık delikler için, medium seri • 180° vida başı havşaları için DIN974-1 e göre • DIN 6912, 7984, 34821, DIN EN ISO 1207, 4762, 14579,
M	○	14580 normuna göre • f küçük çap'a göre kendisini ayarlar. • büyük çap ölçüsüne göre vc uyarlıyor
K	•	
N	•	
S	○	
H		

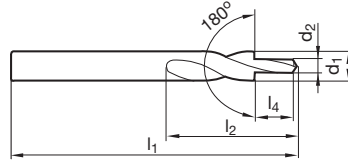
Malzeme **HSS**

Yüzey ○

Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 804

Ürün no **379**

d1	d2 h6	l1	l2	l4	vida dişleri için
mm	mm	mm	mm	mm	
6,000	3,400	66,000	28,000	9,000	M 3
8,000	4,500	79,000	37,000	11,000	M 4
10,000	5,500	89,000	43,000	13,000	M 5
11,000	6,600	95,000	47,000	15,000	M 6
15,000	9,000	111,000	56,000	19,000	M 8
18,000	11,000	123,000	62,000	23,000	M 10



## Silindirik saplı kademeli matkap uçları, kısa



**P** • öz bileme  $\geq \text{Ø } 3,400$  • sivilme değerleri nom.- $\text{Ø } d1$  ile ilgili • koni bileme  
 • burulmaya çok dayanıklı • CNC ve NC makineler için • DIN 336 ya  
 göre kılavuz deliği • DIN EN 20273 e göre açık deliklerde  $90^\circ$  havşalar  
 için • f küçük çap'a göre kendisini ayarlar. • büyük çap ölçüsüne göre vc  
 uyarlıyor

**N** •  
**S** ○  
**H**

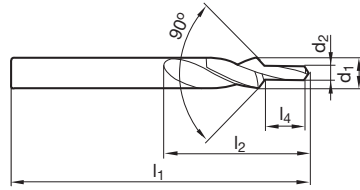
Malzeme **HSS**

Yüzey ○

Kesme yönü

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 804



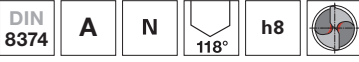
Ürün no

**380**

d1	d2 h6	l1	l2	l4	vida dişleri için
mm	mm	mm	mm	mm	
3,400	2,500	52,000	20,000	8,800	M 3
4,500	3,300	58,000	24,000	11,400	M 4
5,500	4,200	66,000	28,000	13,600	M 5
6,600	5,000	70,000	31,000	16,500	M 6
9,000	6,800	84,000	40,000	21,000	M 8
11,000	8,500	95,000	47,000	25,500	M 10
13,500	10,200	107,000	54,000	30,000	M 12



## Silindirik saplı, çift fasetalı, kademeli helisel matkap uçları



**P** • öz bileme  $\geq \varnothing 6,000$  • sivilme değerleri nom.- $\varnothing d1$  ile ilgili • koni bileme  
• DIN EN 20273 e göre açık delikler için, fine seri •  $90^\circ$  vida başı havşaları  
için • f küçük çap'a göre kendisini ayarlar. • büyük çap ölçüsüne göre vc uyarlıyor

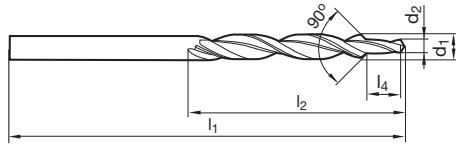
Malzeme **HSS**

Yüzey

Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 806



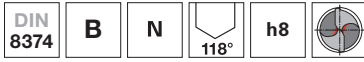
Ürün no

536

d1 h8	d2 h9	l1	l2	l4	vida dişleri için
mm	mm	mm	mm	mm	
6,000	3,200	93,000	57,000	9,000	M 3
8,000	4,300	117,000	75,000	11,000	M 4
10,000	5,300	133,000	87,000	13,000	M 5
11,500	6,400	142,000	94,000	15,000	M 6
15,000	8,400	169,000	114,000	19,000	M 8



## Silindirik saplı, çift fasetalı, kademeli helisel matkap uçları



- P** • öz bileme  $\geq \text{Ø } 7,500$  • sivilme değerleri nom.-Ø d1 ile ilgili • koni bileme  
 • DIN EN 20273 e göre açık delikler için, medium seri • 90° havşa için  
**M** ○ vida başları DIN 74, Form A ve F • f küçük çap'a göre kendisini ayarlar.  
 • büyük çap ölçüsüne göre vc uyarlıyor

Malzeme **HSS**

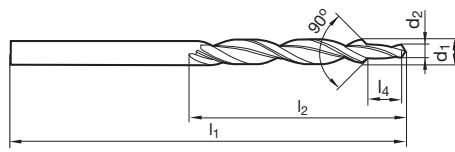
Yüzey



Kesme yönü

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 806



Ürün no

569

d1 h8	d2 h9	l1	l2	l4	vida dişleri için
mm	mm	mm	mm	mm	
7,500	3,400	109,000	69,000	9,000	M 3
9,700	4,500	133,000	87,000	11,000	M 4
12,000	5,500	151,000	101,000	13,000	M 5
14,500	6,600	169,000	114,000	15,000	M 6
19,000	9,000	198,000	135,000	19,000	M 8



## Silindirik saplı, çift fasetalı, kademeli helisel matkap uçları



- P** • öz bileme  $\geq \varnothing 6,600$  • sivilme değerleri nom.- $\varnothing d1$  ile ilgili • koni bileme  
• DIN EN 20273 e göre açık delikler için, medium seri •  $90^\circ$  havşa için  
**M** ○ vida başları DIN 74 part 1 (konu 12.1980), Form A ve B, medium seri  
**K** • f küçük çap'a göre kendisini ayarlar. • büyük çap ölçüsüne göre vc uyarlıyor



## GÜHRING NAVIGATOR

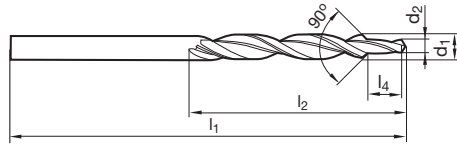
Kesme verileri sayfası 806

Malzeme **HSS**

Yüzey



Kesme yönü



Ürün no

636

d1 h8	d2 h9	l1	l2	l4	vida dişleri için
mm	mm	mm	mm	mm	
6,600	3,400	101,000	63,000	9,000	M 3
9,000	4,500	125,000	81,000	11,000	M 4
11,000	5,500	142,000	94,000	13,000	M 5
13,000	6,600	151,000	101,000	15,000	M 6
17,200	9,000	191,000	130,000	19,000	M 8



## Silindirik saplı, çift fasetalı, kademeli helisel matkap uçları



- P** • öz bileme  $\geq \emptyset 6,000$  • sivilme değerleri nom.- $\emptyset d1$  ile ilgili • koni bileme • DIN EN 20273 e göre açık delikler için, fine seri • 180° vida başı havşaları için DIN974-1 e göre • vidalar için DIN 6912, 7513, 7984
- M** ○
- K** • f küçük çap'a göre kendisini ayarlar. • büyük çap ölçüsüne göre vc uyarlıyor
- N** ○
- S** ○
- H** ○

## GÜHRING NAVIGATOR

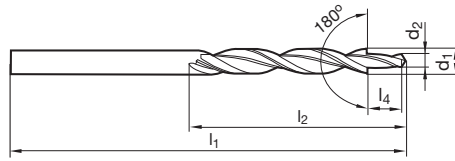
Kesme verileri sayfası 806

Malzeme **HSS**

Yüzey



Kesme yönü



Ürün no

638

d1 h8 mm	d2 h9 mm	l1 mm	l2 mm	l4 mm	vida dişleri için
6,000	3,200	93,000	57,000	9,000	M 3
8,000	4,300	117,000	75,000	11,000	M 4



## Silindirik saplı, çift fasetalı, kademeli helisel matkap uçları



- P** • öz bileme  $\geq \varnothing 6,000$  • sivilme değerleri nom.- $\varnothing d1$  ile ilgili • koni bileme  
• DIN EN 20273 e göre açık delikler için, medium seri • 180° vida başı  
**M** ○ havşaları için DIN974-1 e göre • DIN 6912, 7984, 34821, DIN EN ISO  
1207, 4762, 14579, 14580 ve DIN 7513, 7516, 7500-1 • f küçük çap'a  
**K** • göre kendisini ayarlar. • büyük çap ölçüsüne göre vc uyarlıyor

- N** ○  
**S** ○  
**H** ○

## GÜHRING NAVIGATOR

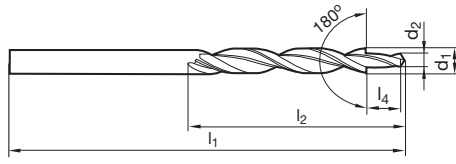
Kesme verileri sayfası 806

Malzeme **HSS**

Yüzey



Kesme yönü



Ürün no

538

d1 h8	d2 h9	l1	l2	l4	vida dişleri için
mm	mm	mm	mm	mm	
6,000	3,400	93,000	57,000	9,000	M 3
8,000	4,500	117,000	75,000	11,000	M 4
10,000	5,500	133,000	87,000	13,000	M 5
11,000	6,600	142,000	94,000	15,000	M 6
15,000	9,000	169,000	114,000	19,000	M 8
18,000	11,000	191,000	130,000	23,000	M 10





## Silindirik saplı, çift fasetalı, kademeli helisel matkap uçları

Malzeme **Kom. sert metal**

Yüzey



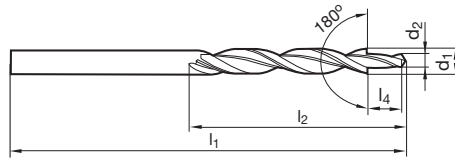
Kesme yönü



**P** öz bileme  $\geq \varnothing 6,000$  • koni bileme • DIN EN 20273 e göre açık delikler için, medium seri • 180° vida başı havşaları için DIN974-1 e göre • vidalar için DIN 6912, 7513, 7984 • f küçük çap'a göre kendisini ayarlar. • büyük çap ölçüsüne göre vc uyarlıyor

**M****K****N****S****H**

evrensel malzeme uygunluğu



Ürün no

738

d1 h8 mm	d2 h9 mm	l1 mm	l2 mm	l4 mm	vida dişleri için
6,000	3,400	93,000	57,000	9,000	M 3
8,000	4,500	117,000	75,000	11,000	M 4
10,000	5,500	133,000	87,000	13,000	M 5
11,000	6,600	142,000	94,000	15,000	M 6
15,000	9,000	169,000	114,000	19,000	M 8



## Silindirik saplı, çift fasetlı, kademeli helisel matkap uçları



**P** • öz bileme  $\geq \text{Ø } 5,900$  • sivilme değerleri nom.-Ø d1 ile ilgili • koni bileme  
 • for through holes with old countersinks Form H, J, K to DIN 75 part 2  
 (issue 04.1968 retracted), design medium and fine • vidalar için DIN 84,  
 912, 6712 normuna göre • f küçük çap'a göre kendisini ayarlar. • büyük  
 çap ölçüsüne göre vc uyarlıyor

Malzeme **HSS**

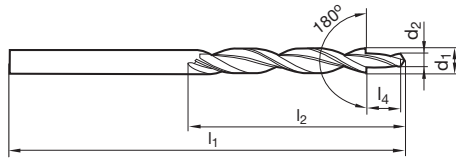
Yüzey



Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 806



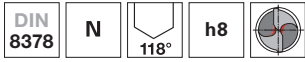
Ürün no

514

d1 h8	d2 h9	l1	l2	l4	vida dişleri için
mm	mm	mm	mm	mm	
5,900	3,200	93,000	57,000	11,000	M 3
7,400	4,300	109,000	69,000	13,000	M 4
8,000	4,800	117,000	75,000	13,000	M 4
9,400	5,300	125,000	81,000	16,000	M 5
10,000	5,800	133,000	87,000	16,000	M 5
10,400	6,400	133,000	87,000	19,000	M 6
11,000	7,000	142,000	94,000	19,000	M 6
13,500	8,400	160,000	108,000	22,000	M 8
16,500	10,500	184,000	125,000	25,000	M 10
17,500	11,500	191,000	130,000	25,000	M 10



## Silindirik saplı, çift fasetlı, kademeli helisel matkap uçları



- P** • öz bileme  $\geq \varnothing 3,400$  • sivilme değerleri nom.- $\varnothing d1$  ile ilgili • koni bileme  
 • DIN 336 ya göre kılavuz deliği • DIN EN 20273 e göre açık deliklerde  
**M** ○  $90^\circ$  havşalar için • f küçük çap'a göre kendisini ayarlar. • büyük çap ölçüsüne göre vc uyarlıyor  
**K** •  
**N** ○  
**S**  
**H**

Malzeme **HSS**

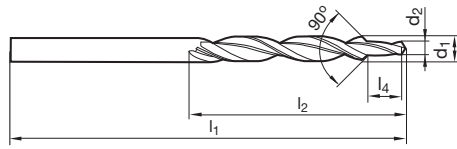
Yüzey



Kesme yönü

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 806

Ürün no **540**

d1 h8	d2 h9	l1	l2	l4	vida dişleri için
mm	mm	mm	mm	mm	
3,400	2,500	70,000	39,000	8,800	M 3
4,500	3,300	80,000	47,000	11,400	M 4
5,500	4,200	93,000	57,000	13,600	M 5
6,600	5,000	101,000	63,000	16,500	M 6
9,000	6,800	125,000	81,000	21,000	M 8
11,000	8,500	142,000	94,000	25,500	M 10
13,500	10,200	160,000	108,000	30,000	M 12



## Silindirik saplı, çift fasetalı, kademeli helisel matkap uçları



**P** öz bileme  $\geq \text{Ø } 4,500$  • koni bileme • DIN 336 ya göre kılavuz deliği • DIN EN 20273 e göre açık deliklerde  $90^\circ$  havşalar için • f küçük çap'a göre kendisini ayarlar. • büyük çap ölçüsüne göre vc uyarlıyor

**K**

**N**

**S** evrensel malzeme uygunluğu

**H**

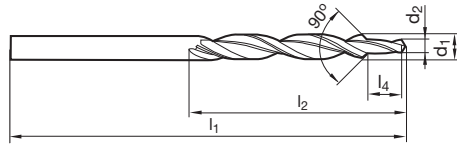
Malzeme

Kom. sert metal

Yüzey



Kesme yönü



Ürün no

739

d1 h8	d2 h9	l1	l2	l4	vida dişleri için
mm	mm	mm	mm	mm	
4,500	3,300	80,000	47,000	11,400	M 4
5,500	4,200	93,000	57,000	13,600	M 5
6,600	5,000	101,000	63,000	16,500	M 6
9,000	6,800	125,000	81,000	21,000	M 8
11,000	8,500	142,000	94,000	25,500	M 10



## Mors konik saplı, çift fasetalı, kademeli helisel matkap uçları

Malzeme **HSS**

Yüzey



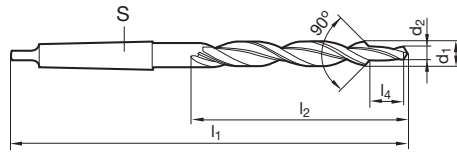
Kesme yönü



- P** • öz bileme  $\geq \text{Ø } 11,500$  • siviltme değerleri nom.- $\text{Ø } d1$  ile ilgili • koni bileme  
 • DIN EN 20273 e göre açık delikler için, fine seri •  $90^\circ$  havşa için vida  
**M** ○ başları DIN 74 part 1 (konu 12.1980), Form A, hassas dizayn • f küçük  
 çap'a göre kendisini ayarlar. • büyük çap ölçüsüne göre vc uyarlıyor  
**K** •  
**N** ○  
**S** ○  
**H** ○

## GÜHRING NAVIGATOR

Kesme verileri sayfası 806



Ürün no

637

d1 h8	d2 h9	S	l1	l2	l4	vida dişleri için
mm	mm		mm	mm	mm	
11,500	6,400	MK-1	175,000	94,000	15,000	M 6
15,000	8,400	MK-2	212,000	114,000	19,000	M 8
19,000	10,500	MK-2	233,000	135,000	23,000	M 10
23,000	13,000	MK-2	253,000	155,000	27,000	M 12



## Mors konik saplı, çift fasetlı, kademeli helisel matkap uçları

Malzeme **HSS**

Yüzey



Kesme yönü

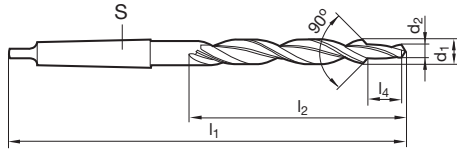


- P** • öz bileme  $\geq \varnothing 11,000$  • siviltme değerleri nom.- $\varnothing d1$  ile ilgili • koni bileme  
• DIN EN 20273 e göre açık delikler için, medium seri •  $90^\circ$  havşa için  
**M** ○ vida başları DIN 74 part 1 (konu 12.1980), Form A ve B, medium seri  
**K** • f küçük çap'a göre kendisini ayarlar. • büyük çap ölçüsüne göre vc uyarlıyor

- N** ○  
**S** ○  
**H** ○

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 806

Ürün no **537**

d1 h8	d2 h9	S	l1	l2	l4	vida dişleri için
mm	mm		mm	mm	mm	
11,000	5,500	MK-1	175,000	94,000	13,000	M 5
17,200	9,000	MK-2	228,000	130,000	19,000	M 8
21,500	11,000	MK-2	248,000	150,000	23,000	M 10
26,000	14,000	MK-3	286,000	165,000	27,000	M 12
29,000	16,000	MK-3	296,000	175,000	31,000	M 14



## Mors konik saplı, çift fasetalı, kademeli helisel matkap uçları



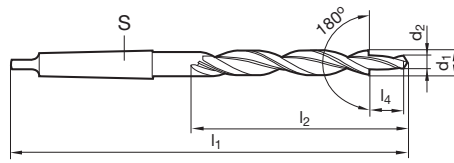
**P** • öz bileme  $\geq \text{Ø } 10,000$  • siviltme değerleri nom.- $\text{Ø } d1$  ile ilgili • koni bileme • DIN EN 20273 e göre açık delikler için, fine seri •  $180^\circ$  vida başı havşaları için DIN974-1 e göre • DIN 6912, 7984, 34821, DIN EN ISO 1207, 4762, 14579, 14580 normuna göre • f küçük çap'a göre kendisini ayarlar. • büyük çap ölçüsüne göre vc uyarlıyor



## GÜHRING NAVIGATOR

Kesme verileri sayfası 806

Malzeme	<b>HSS</b>
Yüzey	●
Kesme yönü	Ⓜ



Ürün no 639

d1 h8	d2 h9	S	l1	l2	l4	vida dişleri için
mm	mm		mm	mm	mm	
18,000	10,500	MK-2	228,000	130,000	23,000	M 10
20,000	13,000	MK-2	238,000	140,000	27,000	M 12
26,000	17,000	MK-3	286,000	165,000	35,000	M 16



## Mors konik saplı, çift fasettalı, kademeli helisel matkap uçları



- P** • öz bileme  $\geq \varnothing 10,000$  • siviltme değerleri nom.- $\varnothing d1$  ile ilgili • koni bileme  
• DIN EN 20273 e göre açık delikler için, medium seri • 180° vida başı  
**M** ○ havşaları için DIN974-1 e göre • DIN 6912, 7984, 34821, DIN EN ISO  
1207, 4762, 14579, 14580 ve DIN 7513, 7516, 7500-1 • f küçük çap'a  
göre kendisini ayarlar. • büyük çap ölçüsüne göre vc uyarlıyor  
**K** •  
**N** ○  
**S** ○  
**H** ○

## GÜHRING NAVIGATOR

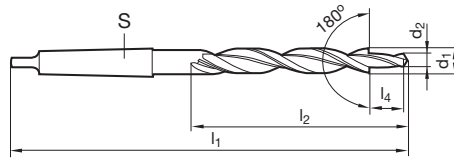
Kesme verileri sayfası 806

Malzeme **HSS**

Yüzey



Kesme yönü



Ürün no

539

d1 h8	d2 h9	S	l1	l2	l4	vida dişleri için
mm	mm		mm	mm	mm	
10,000	5,500	MK-1	168,000	87,000	13,000	M 5
11,000	6,600	MK-1	175,000	94,000	15,000	M 6
15,000	9,000	MK-2	212,000	114,000	19,000	M 8
18,000	11,000	MK-2	228,000	130,000	23,000	M 10
20,000	13,500	MK-2	238,000	140,000	27,000	M 12
26,000	17,500	MK-3	286,000	165,000	35,000	M 16
30,000	20,000	MK-3	296,000	175,000	39,000	M 18
33,000	22,000	MK-4	334,000	185,000	43,000	M 20





## Mors konik saplı, çift fasettalı, kademeli helisel matkap uçları



**P** • öz bileme  $\geq \varnothing 9,400$  • sivilme değerleri nom.- $\varnothing d1$  ile ilgili • koni bileme  
**M** ○ • açık delikler için H, J, K, formlu eski tip havşalı • vidalar için DIN 84,  
 912, 6712 normuna göre • f küçük çap'a göre kendisini ayarlar. • büyük  
**K** • çap ölçüsüne göre vc uyarlıyor  
**N** ○  
**S**  
**H**

Malzeme **HSS**

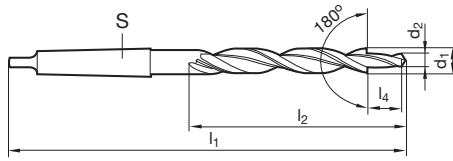
Yüzey



Kesme yönü

**GÜHRING**NAVIGATOR

Kesme verileri sayfası 806



Ürün no

520

d1 h8	d2 h9	S	l1	l2	l4	vida dişleri için
mm	mm		mm	mm	mm	
9,400	5,300	MK-1	162,000	81,000	16,000	M 5
10,000	5,800	MK-1	168,000	87,000	16,000	M 5
11,000	7,000	MK-1	175,000	94,000	19,000	M 6
13,500	8,400	MK-1	189,000	108,000	22,000	M 8
16,500	10,500	MK-2	223,000	125,000	25,000	M 10
17,500	11,500	MK-2	228,000	130,000	25,000	M 10
19,000	13,000	MK-2	233,000	135,000	28,000	M 12
20,000	14,000	MK-2	238,000	140,000	28,000	M 12
23,000	15,000	MK-2	253,000	155,000	30,000	M 14
24,000	16,000	MK-3	281,000	160,000	30,000	M 14
25,000	17,000	MK-3	281,000	160,000	33,000	M 16
26,000	18,000	MK-3	286,000	165,000	33,000	M 16
28,000	19,000	MK-3	291,000	170,000	36,000	M 18
29,000	20,000	MK-3	296,000	175,000	36,000	M 18
31,000	21,000	MK-3	301,000	180,000	39,000	M 20
33,000	23,000	MK-4	334,000	185,000	39,000	M 20



## Mors konik saplı, çift fasettalı, kademeli helisel matkap uçları



**P** • öz bileme  $\geq \text{Ø} 9,000$  • sivilme değerleri nom.- $\text{Ø} d1$  ile ilgili • koni bileme  
• DIN 336 ya göre kılavuz deliği • DIN EN 20273 e göre açık deliklerde  
**M** ○  $90^\circ$  havşalar için • f küçük çap'a göre kendisini ayarlar. • büyük çap ölçüsüne göre vc uyarlıyor  
**K** •  
**N** ○  
**S** ○  
**H** ○

## GÜHRING NAVIGATOR

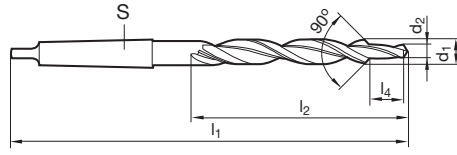
Kesme verileri sayfası 806

Malzeme **HSS**

Yüzey



Kesme yönü



Ürün no

541

d1 h8	d2 h9	S	l1	l2	l4	vida dişleri için
mm	mm		mm	mm	mm	
9,000	6,800	MK-1	162,000	81,000	21,000	M 8
11,000	8,500	MK-1	175,000	94,000	25,500	M 10
13,500	10,200	MK-1	189,000	108,000	30,000	M 12
15,500	12,000	MK-2	218,000	120,000	34,500	M 14
17,500	14,000	MK-2	228,000	130,000	38,500	M 16
20,000	15,500	MK-2	238,000	140,000	43,500	M 18
22,000	17,500	MK-2	248,000	150,000	47,500	M 20



## Silindirik saplı, genişletici

DIN 344	N	120°	h8
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- P** • koni bileme • özellikle yüksek stabilite • önceden delinmiş, dökülmüş, zımbalanmış delikler için • DIN 1809 döndürücü dilli • merkez
- M** ○ kaçıklığı düzeltilmiş • salgısı düzeltilmiş • delik yüzey finışı iyileştirilmiş
- K** • ağızlama-Ø < genişletilecek delik • „en küçük ø ön deliği" dikkate alın
- N** ○ deliği genişlettikten sonra raybalayın

<b>S</b>	○
<b>H</b>	

Malzeme **HSS**

Yüzey

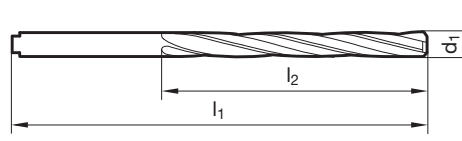


Kesme yönü



## GÜHRING NAVIGATOR

Kesme verileri sayfası 800



Ürün no

533

d1	l1	l2	d0 ≥	d1	l1	l2	d0 ≥
mm	mm	mm	mm	mm	mm	mm	mm
3,800	96,000	64,000	2,80	8,200	142,000	100,000	5,60
4,000	96,000	64,000	2,80	8,250	142,000	100,000	5,60
4,100	96,000	64,000	2,80	8,300	142,000	100,000	5,60
4,400	102,000	69,000	3,20	8,400	142,000	100,000	5,60
4,500	102,000	69,000	3,20	8,500	142,000	100,000	5,60
4,600	102,000	69,000	3,20	8,600	151,000	107,000	6,30
4,750	102,000	69,000	3,20	8,700	151,000	107,000	6,30
4,800	108,000	74,000	3,50	8,800	151,000	107,000	6,30
4,900	108,000	74,000	3,50	8,850	151,000	107,000	6,30
5,000	108,000	74,000	3,50	9,000	151,000	107,000	6,30
5,050	108,000	74,000	3,50	9,100	151,000	107,000	6,30
5,100	108,000	74,000	3,50	9,200	151,000	107,000	6,30
5,300	108,000	74,000	3,50	9,300	151,000	107,000	6,30
5,400	116,000	80,000	4,20	9,400	151,000	107,000	6,30
5,500	116,000	80,000	4,20	9,500	151,000	107,000	6,30
5,550	116,000	80,000	4,20	9,650	162,000	116,000	7,00
5,750	116,000	80,000	4,20	9,800	162,000	116,000	7,00
5,800	116,000	80,000	4,20	10,000	162,000	116,000	7,00
5,850	116,000	80,000	4,20	10,100	162,000	116,000	7,00
5,900	116,000	80,000	4,20	10,200	162,000	116,000	7,00
6,000	116,000	80,000	4,20	10,300	162,000	116,000	7,00
6,100	124,000	86,000	4,20	10,500	162,000	116,000	7,00
6,200	124,000	86,000	4,20	10,600	162,000	116,000	7,00
6,250	124,000	86,000	4,20	10,700	173,000	125,000	7,70
6,300	124,000	86,000	4,20	10,750	173,000	125,000	7,70
6,400	124,000	86,000	4,20	11,000	173,000	125,000	7,70
6,500	124,000	86,000	4,20	11,250	173,000	125,000	7,70
6,700	124,000	86,000	4,20	11,300	173,000	125,000	7,70
6,800	133,000	93,000	4,90	11,750	184,000	134,000	8,40
7,000	133,000	93,000	4,90	11,800	184,000	134,000	8,40
7,150	133,000	93,000	4,90	12,000	184,000	134,000	8,40
7,200	133,000	93,000	4,90	12,200	184,000	134,000	8,40
7,250	133,000	93,000	4,90	12,500	184,000	134,000	8,40
7,500	133,000	93,000	4,90	12,750	184,000	134,000	9,10
7,600	142,000	100,000	5,60	13,000	184,000	134,000	9,10
7,700	142,000	100,000	5,60	13,500	194,000	142,000	9,80
7,750	142,000	100,000	5,60	13,750	194,000	142,000	9,80
7,800	142,000	100,000	5,60	14,000	194,000	142,000	9,80
7,950	142,000	100,000	5,60	15,000	202,000	147,000	10,50
8,000	142,000	100,000	5,60	15,750	211,000	153,000	11,20
8,050	142,000	100,000	5,60	16,000	211,000	153,000	11,20
8,100	142,000	100,000	5,60	17,000	218,000	159,000	11,90

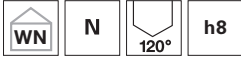


d1	l1	l2	d0 ≥
mm	mm	mm	mm
18,000	226,000	165,000	12,60
20,000	242,000	177,000	14,00

d1	l1	l2	d0 ≥
mm	mm	mm	mm



## Silindirik saplı, genişletici

Malzeme **Sert metal**

Yüzey



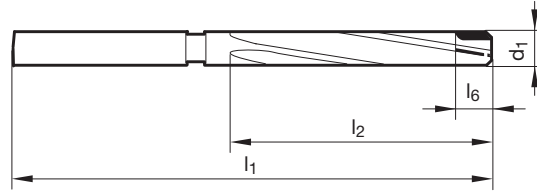
Kesme yönü



**P** ○ koni bileme • HM uçlu • önceden delinmiş, dökülmüş, zımbalanmış delikler için • merkez kaçıklığı düzeltilmiş • salgısı düzeltilmiş • delik yüzey finışı iyileştirilmiş • ağızlama-Ø < genişletilecek delik • „en küçük ön deliği" dikkate alın

**K** ○**N** ○**S** ○

evrensel malzeme uygunluğu

**H** ○

Ürün no

750

d1	l1	l2	l6	d0 ≥
mm	mm	mm	mm	mm
3,800	96,000	64,000		2,800
4,800	108,000	74,000		3,500
5,000	108,000	74,000		3,500
5,800	116,000	80,000		4,200
6,000	116,000	80,000		4,200
7,000	133,000	93,000		4,900

d1	l1	l2	l6	d0 ≥
mm	mm	mm	mm	mm
7,800	142,000	100,000		5,600
8,000	142,000	100,000		5,600
14,000	194,000	142,000	19,000	9,800
15,000	202,000	147,000	19,000	10,500



## Mors konik saplı genişletici

DIN 343	N	120°	h8
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**P** • koni bileme • özellikle yüksek stabilite • önceden delinmiş, dökülmüş  
**M** ○ zımbalanmış delikler için • merkez kaçıklığı düzeltilmiş • salgısı  
düzeltilmiş • delik yüzey finışı iyileştirilmiş • ağızlama-Ø < genişletilecek  
**K** • delik • „en küçük ø ön deliği“ dikkate alın • deliği genişlettikten sonra  
raybalayın

N	○
S	
H	

Malzeme **HSS**

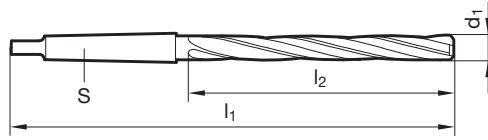
Yüzey



Kesme yönü

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 800

Ürün no **534**

d1	S	l1	l2	d0 ≥	d1	S	l1	l2	d0 ≥
mm		mm	mm	mm	mm		mm	mm	mm
7,800	MK-1	156,000	75,000	5,60	16,200	MK-2	223,000	125,000	11,90
8,000	MK-1	156,000	75,000	5,60	16,250	MK-2	223,000	125,000	11,90
8,100	MK-1	156,000	75,000	5,60	16,500	MK-2	223,000	125,000	11,90
8,800	MK-1	162,000	81,000	6,30	16,750	MK-2	223,000	125,000	11,90
9,000	MK-1	162,000	81,000	6,30	17,000	MK-2	223,000	125,000	11,90
9,200	MK-1	162,000	81,000	6,30	17,500	MK-2	228,000	130,000	12,60
9,700	MK-1	168,000	87,000	7,00	17,750	MK-2	228,000	130,000	12,60
9,800	MK-1	168,000	87,000	7,00	18,000	MK-2	228,000	130,000	12,60
9,900	MK-1	168,000	87,000	7,00	18,100	MK-2	233,000	135,000	13,30
10,000	MK-1	168,000	87,000	7,00	18,250	MK-2	233,000	135,000	13,30
10,100	MK-1	168,000	87,000	7,00	18,500	MK-2	233,000	135,000	13,30
10,200	MK-1	168,000	87,000	7,00	18,700	MK-2	233,000	135,000	13,30
10,750	MK-1	175,000	94,000	7,70	18,750	MK-2	233,000	135,000	13,30
11,000	MK-1	175,000	94,000	7,70	18,800	MK-2	233,000	135,000	13,30
11,100	MK-1	175,000	94,000	7,70	19,000	MK-2	233,000	135,000	13,30
11,250	MK-1	175,000	94,000	7,70	19,250	MK-2	238,000	140,000	14,00
11,500	MK-1	175,000	94,000	7,70	19,500	MK-2	238,000	140,000	14,00
11,750	MK-1	182,000	101,000	8,40	19,700	MK-2	238,000	140,000	14,00
11,800	MK-1	182,000	101,000	8,40	19,750	MK-2	238,000	140,000	14,00
12,000	MK-1	182,000	101,000	8,40	20,000	MK-2	238,000	140,000	14,00
12,200	MK-1	182,000	101,000	8,40	20,200	MK-2	243,000	145,000	14,60
12,300	MK-1	182,000	101,000	8,40	20,250	MK-2	243,000	145,000	14,60
12,500	MK-1	182,000	101,000	8,40	20,500	MK-2	243,000	145,000	14,60
12,700	MK-1	182,000	101,000	9,10	20,700	MK-2	243,000	145,000	14,60
12,750	MK-1	182,000	101,000	9,10	21,000	MK-2	243,000	145,000	14,60
13,000	MK-1	182,000	101,000	9,10	21,500	MK-2	248,000	150,000	15,30
13,250	MK-1	189,000	108,000	9,80	21,700	MK-2	248,000	150,000	15,30
13,500	MK-1	189,000	108,000	9,80	21,750	MK-2	248,000	150,000	15,30
13,750	MK-1	189,000	108,000	9,80	22,000	MK-2	248,000	150,000	15,30
13,800	MK-1	189,000	108,000	9,80	22,250	MK-2	248,000	150,000	15,30
14,000	MK-1	189,000	108,000	9,80	22,400	MK-2	248,000	150,000	15,30
14,100	MK-2	212,000	114,000	10,50	22,500	MK-2	253,000	155,000	16,00
14,200	MK-2	212,000	114,000	10,50	22,700	MK-2	253,000	155,000	16,00
14,450	MK-2	212,000	114,000	10,50	23,000	MK-2	253,000	155,000	16,00
14,500	MK-2	212,000	114,000	10,50	23,500	MK-2	253,000	155,000	16,00
14,750	MK-2	212,000	114,000	10,50	23,700	MK-3	281,000	160,000	16,60
15,000	MK-2	212,000	114,000	10,50	24,000	MK-3	281,000	160,000	16,60
15,250	MK-2	218,000	120,000	11,20	24,200	MK-3	281,000	160,000	16,60
15,500	MK-2	218,000	120,000	11,20	24,500	MK-3	281,000	160,000	17,30
15,750	MK-2	218,000	120,000	11,20	24,700	MK-3	281,000	160,000	17,30
16,000	MK-2	218,000	120,000	11,20	24,750	MK-3	281,000	160,000	17,30
16,150	MK-2	223,000	125,000	11,90	25,000	MK-3	281,000	160,000	17,30



d1	S	l1	l2	d0 ≥
mm		mm	mm	mm
25,250	MK-3	286,000	165,000	18,00
25,500	MK-3	286,000	165,000	18,00
25,600	MK-3	286,000	165,000	18,00
25,700	MK-3	286,000	165,000	18,00
26,000	MK-3	286,000	165,000	18,00
26,500	MK-3	286,000	165,000	18,00
26,700	MK-3	291,000	170,000	18,60
27,000	MK-3	291,000	170,000	18,60
27,500	MK-3	291,000	170,000	18,60
27,700	MK-3	291,000	170,000	19,30
28,000	MK-3	291,000	170,000	19,30
28,700	MK-3	296,000	175,000	20,00
29,000	MK-3	296,000	175,000	20,00
29,500	MK-3	296,000	175,000	20,50
29,700	MK-3	296,000	175,000	20,50
29,750	MK-3	296,000	175,000	20,50
30,000	MK-3	296,000	175,000	20,50
30,500	MK-3	301,000	180,000	21,00
30,600	MK-3	301,000	180,000	21,00
31,000	MK-3	301,000	180,000	21,00
31,600	MK-4	334,000	185,000	22,00
32,000	MK-4	334,000	185,000	22,00
32,600	MK-4	334,000	185,000	23,00
33,000	MK-4	334,000	185,000	23,00

d1	S	l1	l2	d0 ≥
mm		mm	mm	mm
33,600	MK-4	339,000	190,000	24,00
34,000	MK-4	339,000	190,000	24,00
34,600	MK-4	339,000	190,000	25,00
35,000	MK-4	339,000	190,000	25,00
35,600	MK-4	344,000	195,000	25,50
36,000	MK-4	344,000	195,000	25,50
36,600	MK-4	344,000	195,000	26,00
37,600	MK-4	349,000	200,000	26,50
38,000	MK-4	349,000	200,000	26,50
39,000	MK-4	349,000	200,000	27,00
39,600	MK-4	349,000	200,000	28,00
40,000	MK-4	349,000	200,000	28,00
44,000	MK-4	359,000	210,000	30,50
44,600	MK-4	359,000	210,000	31,00
45,000	MK-4	359,000	210,000	31,00
50,000	MK-4	369,000	220,000	34,50



## Mors konik saplı genişletici

DIN 343	N	120°	h8
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**P** • koni bileme • özellikle yüksek stabilite • önceden delinmiş, dökülmüş, zımbalanmış delikler için • merkez kaçıklığı düzeltilmiş • salgısı düzeltilmiş • delik yüzey finışı iyileştirilmiş • ağızlama-Ø < genişletilecek delik • „en küçük ø ön deliği“ dikkate alın • deliği genişlettikten sonra raybalayın

<b>N</b> •
<b>S</b> ○
<b>H</b>

Malzeme **HSCO**

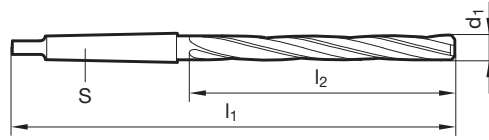
Yüzey



Kesme yönü

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 800



Ürün no

634

d1	S	l1	l2	d0 ≥
mm		mm	mm	mm
8,500	MK-1	156,000	75,000	5,60
9,000	MK-1	162,000	81,000	6,30
9,800	MK-1	168,000	87,000	7,00
10,750	MK-1	175,000	94,000	7,70
11,750	MK-1	182,000	101,000	8,40
12,000	MK-1	182,000	101,000	8,40
12,500	MK-1	182,000	101,000	8,40
12,750	MK-1	182,000	101,000	9,10
13,000	MK-1	182,000	101,000	9,10
14,000	MK-1	189,000	108,000	9,80
14,750	MK-2	212,000	114,000	10,50
15,750	MK-2	218,000	120,000	11,20

d1	S	l1	l2	d0 ≥
mm		mm	mm	mm
16,000	MK-2	218,000	120,000	11,20
16,500	MK-2	223,000	125,000	11,90
17,000	MK-2	223,000	125,000	11,90
18,000	MK-2	228,000	130,000	12,60
19,700	MK-2	238,000	140,000	14,00
20,000	MK-2	238,000	140,000	14,00
21,000	MK-2	243,000	145,000	14,60
22,000	MK-2	248,000	150,000	15,30
23,000	MK-2	253,000	155,000	16,00
24,000	MK-3	281,000	160,000	16,60
25,000	MK-3	281,000	160,000	17,30
26,000	MK-3	286,000	165,000	18,00





## Mors konik saplı genişletici

DIN 1864	N	120°	h8
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**P** • koni bileme • özellikle yüksek stabilite • önceden delinmiş, dökülmüş, zımbalanmış delikler için • merkez kaçıklığı düzeltilmiş • salgısı düzeltilmiş • delik yüzey finışı iyileştirilmiş • ağızlama-Ø < genişletilecek delik • „en küçük ø ön deliği“ dikkate alın • deliği genişlettikten sonra raybalayın

<b>M</b> ○	
<b>K</b> •	
<b>N</b> ○	
<b>S</b> ○	
<b>H</b> ○	

Malzeme **HSS**

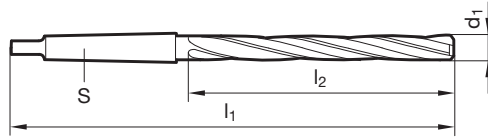
Yüzey



Kesme yönü

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 800

Ürün no **555**

d1	S	l1	l2	d0 ≥
mm		mm	mm	mm
5,000	MK-1	155,000	74,000	3,50
8,000	MK-1	181,000	100,000	5,60
8,800	MK-1	188,000	107,000	6,30
9,000	MK-1	188,000	107,000	6,30
9,700	MK-1	197,000	116,000	7,00
9,800	MK-1	197,000	116,000	7,00
10,000	MK-1	197,000	116,000	7,00
10,100	MK-1	197,000	116,000	7,00
10,500	MK-1	197,000	116,000	7,00
11,100	MK-1	206,000	125,000	7,70
11,750	MK-1	215,000	134,000	8,40
12,000	MK-1	215,000	134,000	8,40
12,750	MK-1	215,000	134,000	9,10
13,000	MK-1	215,000	134,000	9,10
13,750	MK-1	223,000	142,000	9,80
14,000	MK-1	223,000	142,000	9,80
15,000	MK-2	245,000	147,000	10,50
15,750	MK-2	251,000	153,000	11,20

d1	S	l1	l2	d0 ≥
mm		mm	mm	mm
16,000	MK-2	251,000	153,000	11,20
17,750	MK-2	263,000	165,000	12,60
19,000	MK-2	269,000	171,000	13,30
19,700	MK-2	275,000	177,000	14,00
20,000	MK-2	275,000	177,000	14,00
20,700	MK-2	282,000	184,000	14,60
21,000	MK-2	282,000	184,000	14,60
21,700	MK-2	289,000	191,000	15,30
22,000	MK-2	289,000	191,000	15,30
22,700	MK-2	296,000	198,000	16,00
23,000	MK-2	296,000	198,000	16,00
24,000	MK-3	327,000	206,000	16,60
25,000	MK-3	327,000	206,000	17,30
25,700	MK-3	335,000	214,000	18,00
30,000	MK-3	351,000	230,000	20,50



## Mors konik saplı genişletici

DIN 1864	N	120°	h8
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**P** • koni bileme • özellikle yüksek stabilite • önceden delinmiş, dökülmüş  
**M** ○ zımbalanmış delikler için • merkez kaçıklığı düzeltilmiş • salgısı  
düzeltilmiş • delik yüzey finışı iyileştirilmiş • ağızlama-Ø < genişletilecek  
delik • „en küçük ø ön deliği“ dikkate alın • deliği genişlettikten sonra  
raybalayın

<b>N</b> •
<b>S</b> ○
<b>H</b>

Malzeme **HSCO**

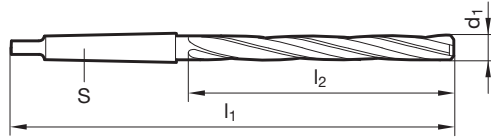
Yüzey



Kesme yönü

**GÜHRING** NAVIGATOR

Kesme verileri sayfası 800



Ürün no

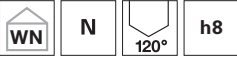
635

d1	S	l1	l2	d0 ≥
mm		mm	mm	mm
8,000	MK-1	181,000	100,000	5,60
10,000	MK-1	197,000	116,000	7,00
14,000	MK-1	223,000	142,000	9,80
15,000	MK-2	245,000	147,000	10,50

d1	S	l1	l2	d0 ≥
mm		mm	mm	mm



## Mors konik saplı genişletici



**P** ○ koni bileme • HM uçlu • önceden delinmiş, dökülmüş, zımbalanmış delikler için • merkez kaçıklığı düzeltilmiş • salgısı düzeltilmiş • delik yüzey finışı iyileştirilmiş • ağızlama-Ø < genişletilecek delik • „en küçük ön deliği" dikkate alın

**K** ○

**N** ○

**S** ○ evrensel malzeme uygunluğu

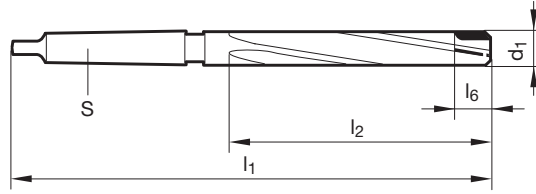
**H** ○

Malzeme **Sert metal**

Yüzey ○

Kesme yönü **R****GÜHRING** NAVIGATOR

Kesme verileri sayfası 800



Ürün no

729

d1	S	l1	l2	l6	d0 ≥
mm		mm	mm	mm	mm
28,700	MK-3	296,000	175,000	25,000	21,0
29,700	MK-3	296,000	175,000	25,000	22,0
30,600	MK-3	301,000	180,000	25,000	23,0
31,600	MK-4	334,000	185,000	25,000	24,0
33,000	MK-4	334,000	185,000	25,000	25,0
33,600	MK-4	339,000	190,000	25,000	26,0

d1	S	l1	l2	l6	d0 ≥
mm		mm	mm	mm	mm
34,000	MK-4	339,000	190,000	25,000	26,0
36,000	MK-4	344,000	195,000	25,000	28,0
37,600	MK-4	349,000	200,000	25,000	30,0
38,600	MK-4	349,000	200,000	25,000	31,0
39,000	MK-4	349,000	200,000	25,000	31,0
39,600	MK-4	349,000	200,000	25,000	32,0



## Pim deliği matkap ucu

DIN  
1898

N

118°



Malzeme

HSS

Yüzey

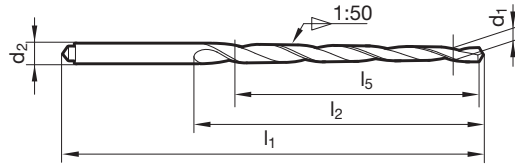
 $\geq 0,2,36$ 

Kesme yönü

R

**P** • öz bileme  $\geq \varnothing 1,000$  • koni bileme • konik deliklerde konik pin leri tutmak için DIN1 • döndürücü dili

<b>M</b>	○
<b>K</b>	•
<b>N</b>	○
<b>S</b>	○
<b>H</b>	○



Ürün no

531

d1	d2	l1	l2	l5
mm	mm	mm	mm	mm
2,000	3,150	86,000	52,000	48,000
2,500	3,150	86,000	52,000	48,000
3,000	4,000	100,000	63,000	58,000
3,500	5,000	112,000	74,000	68,000
4,000	5,000	112,000	74,000	68,000
4,500	6,300	122,000	81,000	73,000

d1	d2	l1	l2	l5
mm	mm	mm	mm	mm
5,000	6,300	122,000	81,000	73,000
5,500	8,000	160,000	114,000	105,000
6,000	8,000	160,000	114,000	105,000
8,000	10,000	207,000	157,000	145,000
10,000	12,500	245,000	190,000	175,000
12,000	16,000	290,000	228,000	210,000



## Pim deliđi matkap ucu

DIN  
1898

N

118°



Malzeme

HSS

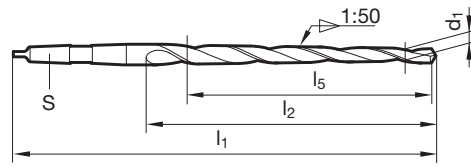
Yüzey



Kesme yönü



**P** • öz bileme  $\geq \varnothing 5,000$  • koni bileme • For tapered holes to suit taper pins to DIN 1 (new: DIN EN 22 339), DIN 7978 (new: DIN EN 28 736), DIN 7977 (new: DIN EN 28737) and DIN 258

**M** ○**K** •**N** ○**S** ○**H** ○

Ürün no

532

d1	d2	l1	l2	l5
mm	mm	mm	mm	mm
5,000		155,000	81,000	73,000
6,000		187,000	108,000	105,000
8,000		227,000	149,000	145,000
10,000		257,000	180,000	175,000
12,000		315,000	219,000	210,000
13,000		325,000	229,000	220,000

d1	d2	l1	l2	l5
mm	mm	mm	mm	mm
14,000		325,000	229,000	220,000
16,000		335,000	239,000	230,000
20,000		377,000	263,000	250,000
25,000		427,000	311,000	300,000

GUANZHU

NANMIO

BRING

**GÜHRING** NAVIGATOR

GATOR

**GÜHRING**NAVIGATOR

Kalın harf baskılı ilerleme kod no.lı olan takımları tercih ediniz.

ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No.

Standart/DIN

Kesici tak. malz.

HM Uygul. grubu

Tip

Kaplama tipi

Soğutma

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/dev)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	2,000	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

kesme yönü

Ⓜ sağ kesmeli

Ⓜ sol kesmeli

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnB30 (9SMnB28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
nitrasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		○
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtü ostenitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤900 ≤1100		●
paslanmaz çelikler, kükürtü martenzitli	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		○
Alüminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> % 10 Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn1Pb	≤500		○
pirinç, kısa talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
uzun talaşlı	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
bronz, kısa talaşlı	2.1090 CuSn7Zn1Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
uzun talaşlı	2.0790 CuNi18Zn19Pb	≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○





## ≤3xD Delik derinliği

1171
6538K
Sert metal
P
RT 80 U
<b>S</b>
aksiyel
55

1660	1180	1181
6537K	6537K	6537K
KSM	KSM	KSM
K/P	K/P	K/P
RT 100 F	RT 100 F	RT 100 U
<b>S</b>	<b>S</b>	<b>S</b>
aksiyel	aksiyel	aksiyel
53	54	43

2468	2477	2469
6537K	6537K	6537K
KSM	KSM	KSM
K/P	K/P	K/P
RT 100 F	RT 100 U	RT 100 U
<b>F</b>	<b>F</b>	<b>F</b>
aksiyel	aksiyel	aksiyel
52	39	41

8510	8610
6537K	6537K
KSM	KSM
K/P	K/P
RT 100 VA	
<b>a</b>	<b>a</b>
aksiyel	aksiyel
48	50

8520	8620
6537K	6537K
KSM	KSM
K/P	K/P
RT 100 HF	
<b>Y</b>	<b>Y</b>
aksiyel	aksiyel
44	46



V <sub>c</sub> m/min	İlerleme hız-kodları
95	6
80	5
95	7
75	6
80	6
75	6
70	6
75	6
60	5
90	7
75	6
60	5
75	6
60	5
45	5
35	5
40	4
40	2
35	2
35	2
150	7
110	7
110	7
90	6
200	8
200	8
170	8
140	7
240	8
240	8
200	8
170	8
230	7
95	6
250	7
170	6
95	6
80	5
70	5
60	5

V <sub>c</sub> m/min	İlerleme hız-kodları	İlerleme hız-kodları	İlerleme hız-kodları
110	6	6	6
90	5	5	5
130	7	7	7
110	7	7	7
100	7	7	7
95	6	6	6
90	6	6	6
90	6	6	6
80	6	6	6
110	7	7	7
90	6	6	6
65	4	4	4
85	6	6	6
80	4	4	5
60	5	5	5
50	4	4	4
45	3	3	3
45	2	2	2
40	2	2	2
20	1	1	1
45	4	4	4
40	2	2	2
35	4	4	4
160	8	8	8
120	8	8	8
100	8	8	8
95	7	7	7
30	2	2	2
25	3	3	3
35	3	3	3
30	2	2	2
240	8	8	8
240	8	8	8
200	8	8	8
170	8	8	8
230	7	7	7
95	6	6	6
250	7	7	7
170	6	6	6
95	6	6	6
80	5	5	5
70	5	5	5
60	5	5	5

V <sub>c</sub> m/min	İlerleme hız-kodları	İlerleme hız-kodları	İlerleme hız-kodları
145	7	7	7
120	6	6	6
170	8	8	8
145	8	8	8
130	8	8	8
125	7	7	7
120	7	7	7
120	7	7	7
105	7	7	7
145	8	8	8
120	7	7	7
85	5	5	5
110	7	7	7
105	5	5	5
80	6	6	6
65	5	5	5
60	4	4	4
60	3	3	3
55	3	3	3
35	2	2	2
60	5	5	5
55	2	2	2
45	5	5	5
210	9	9	9
160	9	9	9
140	9	9	9
130	8	8	8
40	3	3	3
35	4	4	4
45	4	4	4
40	3	3	3
310	9	9	9
310	9	9	9
260	9	9	9
220	9	9	9
280	8	8	8
125	7	7	7
325	8	8	8
220	7	7	7
125	7	7	7
105	6	6	6
90	6	6	6
80	6	6	6

V <sub>c</sub> m/min	İlerleme hız-kodları	İlerleme hız-kodları
80	5	5
60	2-3	2-3
80	5	5
30	4	4
45	4	4
40	3	3

V <sub>c</sub> m/min	İlerleme hız-kodları	İlerleme hız-kodları	İlerleme hız-kodları
145	7	7	7
120	6	6	6
170	8	8	8
145	8	8	8
130	8	8	8
125	7	7	7
120	7	7	7
120	7	7	7
105	7	7	7
145	8	8	8
120	7	7	7
85	5	5	5
110	7	7	7
105	5	5	5
80	6	6	6
65	5	5	5
60	4	4	4
60	3	3	3
55	3	3	3
35	2	2	2
35	4	4	4
45	4	4	4
40	3	3	3

**GÜHRING**NAVIGATOR

Kalın harf baskılı ilerleme kod no.lı olan takımları tercih ediniz.

ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No.

Standart/DIN

Kesici tak. malz.

HM Uygul. grubu

Tip

Kaplama tipi

Soğutma

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/dev)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Al

Alüminyum işlemek için öncelikli

G

döküm işlemek için öncelikli

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

kesme yönü

Ⓜ sağ kesmeli

Ⓛ sol kesmeli

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
nitrasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		○
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtü ostenitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤900 ≤1100		●
paslanmaz çelikler, martenzitli	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		○
Alüminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> % 10 Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn1Pb	≤500		○
pirinç, kısa talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
uzun talaşlı	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
bronz, kısa talaşlı	2.1090 CuSn7Zn1Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
uzun talaşlı	2.0790 CuNi18Zn19Pb	≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○



≤3xD Delik derinliği

1702	1184	1242
6539	6537K	6539
KSM	KSM	KSM
K/P	K/P	K/P
RT 100 F	RT 100 U	RT 100 U
<b>S</b>	<b>S</b>	<b>S</b>
28	21	23

2475	2480	2472	2473
6537K	6537K	6537K	6539
KSM	KSM	KSM	KSM
K/P	K/P	K/P	K/P
RT 100 F	RT 100 U	RT 100 U	RT 100 U
<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>
27	16	18	20

8524
6537K
KSM
K/P
RT 100 HF
<b>Y</b>
25

≤4xD

768	6068
WN	WN
KSM	KSM
K	K
RT 150 GG	RT 150 GG
○	○
aksiyel	aksiyel
56	58
<b>Al</b>	<b>G</b>



Vc m/min	İlerleme hız- kodları		
100	6	6	6
85	5	5	5
110	7	7	7
85	6	6	6
90	6	6	6
85	6	6	6
80	6	6	6
80	6	6	6
75	5	5	5
100	7	7	7
90	6	6	6
65	4	4	4
75	5	5	5
70	4	4	4
50	5	5	5
40	4	4	4
40	3		
35	2	2	2
35	1	1	1
20	1	1	1
40	2	2	2
15	2	1	1
35	2	2	2
160	7	7	7
120	7	7	7
120	7	6	6
95	7	6	6
25	2	2	2
20	3	3	3
15	1	1	1
15	1	1	1
200	8	8	8
200	8	8	8
170	8	8	8
140	7	7	7
200	7	7	7
80	6	6	6
210	7	7	7
140	6	6	6
80	5	5	5
65	5	5	5
60	4	4	4
45	4	4	4

Vc m/min	İlerleme hız- kodları			
130	7	7	7	7
110	6	6	6	6
145	8	8	8	8
110	7	7	7	7
120	7	7	7	7
110	7	7	7	7
105	7	7	7	7
105	7	7	7	7
100	6	6	6	6
130	8	8	8	8
120	7	7	7	7
85	5	5	5	5
100	6	6	6	6
90	5	5	5	5
65	6	6	6	6
55	5	5	5	5
55	4			
45	3	3	3	3
40	1	1	1	1
20	1	1	1	1
40	2	2	2	2
15	1	1	1	1
35	2	2	2	2
210	8	8	8	8
155	8	8	8	8
155	8	7	7	7
125	8	7	7	7
35	3	3	3	3
25	4	4	4	4
15	1	1	1	1
15	1	1	1	1
260	9	9	9	9
260	9	9	9	9
220	9	8	8	8
180	8	8	8	8
260	8	8	8	8
105	7	7	7	7
270	8	8	8	8
180	7	7	7	7
105	6	6	6	6
85	6	6	6	6
80	5	5	5	5
60	5	5	5	5

Vc m/min	İlerleme hız- kodları
130	7
110	6
145	8
110	7
120	7
110	7
105	7
105	7
100	6
130	8
120	7
85	5
100	6
90	5
65	6
55	5
55	4
45	3
40	1
20	1
40	2
15	1
35	2
25	4
15	1
15	1

Vc m/min	İlerleme hız- kodları	
120	7	7
100	7	7
90	7	7
80	7	7
40	2	2
410	9	7
410	9	7
380	9	7
330	9	7
280	9	9
110	6	6
80	5	5

Navigator

**GÜHRING**NAVIGATOR

Kalın harf baskılı ilerleme kod no.lı olan takımları tercih ediniz.

ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No.

Standart/DIN

Kesici tak. malz.

HM Uygul. grubu

Tip

Kaplama tipi

Soğutma

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/dev)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	2,000	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

kesme yönü

Ⓜ sağ kesmeli

Ⓛ sol kesmeli

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
nitasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		○
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtlü ostenitli martenzitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤900 ≤1100 ≤1500		●
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		○
Aluminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> % 10 Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn1Pb	≤500		○
pirinç, kısa talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
uzun talaşlı	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
bronz, kısa talaşlı	2.1090 CuSn7Zn1Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
uzun talaşlı	2.0790 CuNi18Zn19Pb	≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○



≤5xD Delik derinliği

1172	6501	1662	1182	1663	1183	2478	2470	2479	2471	5759
6538M	6537L	6537L	6537L	6537L	6537L	6537L	6537L	6537L	6537L	6537L
HM	KSM	KSM	KSM	KSM	KSM	KSM	KSM	KSM	KSM	KSM
P	K/P	K/P	K/P	K/P	K/P	K/P	K/P	K/P	K/P	K/P
RT 80 U	RT 100 R	RT 100 F	RT 100 F	RT 100 U	RT 100 U	RT 100 F	RT 100 F	RT 100 U	RT 100 U	RT 100 S
<b>S</b>	<b>F</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>
aksiyel	aksiyel	aksiyel	aksiyel	aksiyel	aksiyel	aksiyel	aksiyel	aksiyel	aksiyel	aksiyel
84	82	78	80	65	66	76	77	61	63	59



Vc m/min	VR- kodları	Vc m/min	VR- kodları	Vc m/min	İlerleme hız- kodları				Vc m/min	İlerleme hız- kodları				Vc m/min	VR- kodları
95	5			110	6	6	6	6	145	7	7	7	7	145-230	8
80	4			90	5	5	5	5	120	6	6	6	6	120-220	7
95	6			130	7	7	7	7	170	8	8	8	8	170-260	8
75	5			110	7	7	7	7	145	8	8	8	8	145-230	8
80	5			100	7	7	7	7	130	8	8	8	8	130-220	8
75	5			95	6	6	6	6	125	7	7	7	7	125-210	7
75	5			90	6	6	6	6	120	7	7	7	7	120-200	7
75	5			90	6	6	6	6	120	7	7	7	7	120-210	7
55	4			80	6	6	6	6	105	7	7	7	7	105-200	7
90	6			110	7	7	7	7	145	8	8	8	8	145-230	8
75	5			90	6	6	6	6	120	7	7	7	7	120-210	7
55	4			80	6	6	6	6	105	7	7	7	7	105-200	7
70	5			65	4	4	4	4	85	5	5	5	5	105-200	6
55	4			85	6	6	6	6	105	7	7	7	7	110-150	7
40	4			80	4	4	5	5	100	5	5	5	5	100-150	5
35	4			60	5	5	5	5	70	6	6	6	6	70-120	6
40	4			50	4	4	4	4	55	5	5	5	5	55-100	5
40	3			45	3	3	4	4	60	4	4	5	5	60-100	5
				45	2	2	2	2	60	3	3	3	3	60-100	5
				40	2	2	2	2	55	3	3	3	3		
				25	1	1	1	1	35	2	2	2	2		
40	2			45	4	4	4	4	60	5	5	5	5		
35	2			40	2	2	2	2	55	2	2	2	2		
35	2			35	4	4	4	4	50	5	5	5	5		
150	6	210	9	160	8	8	8	8	195	9	9	9	9		
110	6	160	9	120	8	8	8	8	160	9	9	9	9		
110	6	160	9	100	8	8	8	8	140	9	9	9	9		
90	5	130	8	95	7	7	7	7	130	8	8	8	8		
				30	2	2	2	2	40	3	3	3	3		
		130	8												
		100	8												
		80	8												
		60	8												
				25	3	3	3	3	35	4	4	4	4		
				35	3	3	3	3	45	4	4	4	4		
				30	2	2	2	2	40	3	3	3	3		
				240	8	8	8	8	310	9	9	9	9		
				240	8	8	8	8	310	9	9	9	9		
				200	8	8	8	8	260	9	9	9	9		
				170	8	8	8	8	220	9	9	9	9		
				230	7	7	7	7	280	8	8	8	8		
				95	6	6	6	6	125	7	7	7	7		
				250	7	7	7	7	325	8	8	8	8		
				170	6	6	6	6	220	7	7	7	7		
				95	6	6	6	6	125	7	7	7	7		
				80	5	5	5	5	105	6	6	6	6		
				70	5	5	5	5	90	6	6	6	6		
				60	5	5	5	5	80	6	6	6	6		
200	7														
200	7														
170	7														
140	6														

Navigator

**GÜHRING**NAVIGATOR

Kalın harf baskılı ilerleme kod no.lı olan takımları tercih ediniz.

ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No.

Standart/DIN

Kesici tak. malz.

HM Uygul. grubu

Tip

Kaplama tipi

Soğutma

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/dev)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	2,000	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

kesme yönü

Ⓜ sağ kesmeli

Ⓛ sol kesmeli

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
nitrasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		○
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtlü ostenitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤900 ≤1100		●
paslanmaz çelikler, kükürtlü martenzitli	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		○
Alüminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> % 10 Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		○
pirinç, kısa talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
uzun talaşlı	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
bronz, kısa talaşlı	2.1090 CuSn7Zn19Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
uzun talaşlı	2.0790 CuNi18Zn19Pb	≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○



## ≤5xD Delik derinliği

8511	8611
6537L	6537L
<b>KSM</b>	<b>KSM</b>
K/P	K/P
RT 100 VA	RT 100 VA
<b>a</b>	<b>a</b>
aksiyel	aksiyel
72	74

8521	8621
6537L	6537L
<b>KSM</b>	<b>KSM</b>
K/P	K/P
RT 100 HF	RT 100 HF
<b>Y</b>	<b>Y</b>
aksiyel	aksiyel
68	70

1243	2717
WN	6537L
<b>KSM</b>	<b>KSM</b>
K/P	K/P
RT 100 U	RT 100 U
<b>S</b>	<b>S</b>
36	35

2712	2474	2996	2719
6537L	WN	6537L	6537L
<b>KSM</b>	<b>KSM</b>	<b>KSM</b>	<b>KSM</b>
K/P	K/P	K/P	K/P
RT 100 F	RT 100 U	RT 100 U	RT 100 U
<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>
38	34	30	32



V <sub>c</sub> m/min	İlerleme hız- kodları		V <sub>c</sub> m/min	İlerleme hız- kodları		V <sub>c</sub> m/min	İlerleme hız- kodları		V <sub>c</sub> m/min	İlerleme hız- kodları			
			145	7	7	100	6	6	130	7	7	7	7
			120	6	6	85	5	5	110	6	6	6	6
			170	8	8	110	7	7	145	8	8	8	8
			145	8	8	85	6	6	110	7	7	7	7
			130	8	8	90	6	6	120	7	7	7	7
			125	7	7	85	6	6	110	7	7	7	7
			120	7	7	80	6	6	105	7	7	7	7
			120	7	7	80	6	6	105	7	7	7	7
			105	7	7	75	5	5	100	6	6	6	6
			145	8	8	100	7	7	130	8	8	8	8
			120	7	7	90	6	6	120	7	7	7	7
			85	5	5	65	4	4	85	5	5	5	5
			110	7	7	75	5	5	100	6	6	6	6
			105	5	5	70	4	4	90	5	5	5	5
			80	6	6	50	5	5	65	6	6	6	6
			65	5	5	40	4	4	55	5	5	5	5
			60	4	4				55	4			
			60	3	3	35	2	2	45	3	3	3	3
			55	3	3	35	1	1	35	1	1	1	1
			35	2	2	20	1	1	20	1	1	1	1
80	5	5				40	2	2	45	2	2	2	2
60	2-3	2-3				15	1	1	15	1	1	1	1
80	5	5				35	2	2	35	2	1	2	2
						160	7	7	210	8	8	8	8
						120	7	7	155	8	8	8	8
						120	6	6	145	8	7	7	7
						95	6	6	125	8	7	7	7
						25	2	2	35	3	3	3	3
30	4	4	35	4	4	20	3	3	25	4	4	4	4
45	4	4	45	4	4	15	1	1	15	1	1	1	1
40	3	3	40	3	3	15	1	1	15	1	1	1	1
						200	8	8	260	9	9	9	9
						200	8	8	260	9	9	9	9
						170	8	8	235	9	9	9	9
						140	7	7	170	8	8	8	8
						200	7	7	260	8	8	8	8
						80	6	6	105	7	7	7	7
						210	7	7	270	8	8	8	8
						140	6	6	180	7	7	7	7
						80	5	5	105	6	6	6	6
						65	5	5	85	6	6	6	6
						60	4	4	80	5	5	5	5
						45	4	4	60	5	5	5	5



## GÜHRING NAVIGATOR

Kalın harf baskılı ilerleme kod no.lı olan takımları tercih ediniz.

**ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.**

7 x D üstündeki delik derinliklerinde prensip olarak pilot delik delinmelidir.

1. Pilot delik kısa ve rijit bir matkap ucu ile delinir. Bu matkap ucunun çapı rasyo matkap ucu çapından 0,01 - 0,02 mm daha büyük olmalıdır. Pilot delik derinliği  $\geq 1xD$  olmalıdır.

2. Alternatif olarak pilot delik rasyo matkap ucu ile delinebilir. Ancak ilerleme hızı % 30-40 düşürülecektir.

3. Yağ basıncının en az 40 bar olması tavsiye edilir.

Emniyet nedenlerinden dolayı hiç bir matkap ucu destek olmaksızın 6000 dev/dak. hızla döndürülmemelidir. Aksi taktirde yüksek santrifuj kuvvetlerinden dolayı uzun takımlar daha delmeye başlamadan kırılabilir.

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/dev)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	2,000	2,000

Al

Aluminyum işlemek için öncelikli

G

döküm işlemek için öncelikli

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

kesme yönü

Ⓜ sağ kesmeli

Ⓛ sol kesmeli

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
nitasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		●
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtü ostenitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤900 ≤1100		●
paslanmaz çelikler, martenzitli	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		●
Aluminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> % 10 Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		○
pirinç, kısa talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
uzun talaşlı	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
bronz, kısa talaşlı	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
uzun talaşlı	2.0790 CuNi18Zn19Pb	≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○





≤7xD Delik derinliği

≤8xD

≤10xD

≤12xD

1173
6538L
S. met.
P
RT80U
<b>S</b>
aksiyel
95

769	6069
WN	WN
KSM	
K	K
RT 150 GG	
○	○
aksiyel	aksiyel
93	94
Al	G

2711
WN
KSM
K/P
RT100U
<b>S</b>
aksiyel
89

4044	4045
WN	WN
KSM	
K/P	K/P
RT 100 U	
<b>F</b>	<b>F</b>
aksiyel	aksiyel
85	87

6502
WN
KSM
K/P
RT100R
<b>F</b>
aksiyel
91

8522
WN
KSM
K/P
RT100HF
<b>Y</b>
aksiyel
90

5760
6537L
KSM
K/P
RT100S
<b>F</b>
aksiyel
96

770	6070
WN	WN
KSM	
K	K
RT 150 GG	
○	○
aksiyel	aksiyel
98	99
Al	G

5525
WN
KSM
K/P
RT100U
<b>F</b>
aksiyel
100



V <sub>c</sub> m/min	VR- kodları	V <sub>c</sub> m/min	VR- kodları	V <sub>c</sub> m/min	VR- kodları	V <sub>c</sub> m/min	VR- kodları	V <sub>c</sub> m/min	VR- kodları	V <sub>c</sub> m/min	VR- Code	V <sub>c</sub> m/min	VR- kodları	V <sub>c</sub> m/min	VR- kodları
95	4			110	5	145	6 6			145	6	145-230	7		
75	3			90	4	120	5 5			120	5	120-220	6		
90	5			130	6	170	7 7			170	7	170-260	7		
75	4			110	6	145	7 7			145	7	145-230	7		
80	4			100	6	130	7 7			130	7	130-220	7		
75	4			95	5	125	6 6			125	6	125-210	6		
60	4			90	5	120	6 6			120	6	120-200	6		
75	4			90	5	120	6 6			120	6	120-210	6		
60	3			80	5	105	6 6			105	6	105-200	6		
90	5			110	6	145	7 7			145	7	145-230	7		
75	4			90	5	120	6 6			120	6	120-210	6		
55	3			65	3	85	4 4			85	4	105-200	5		
75	4			80	5	110	6 6			110	6	110-150	6		
55	3			75	4	105	4 4			105	4	100-150	4		
40	3			55	4	80	5 5			80	5	70-120	5		
35	3			40	3	65	4 4			65	4	65-100	4		
40	2			45	2	60	4 4			60	3	60-100	4		
				45	1	60	2 2			60	2	60-100	4		
				40	1	55	2 2			55	2				
				25	1	35	1 1			35	1				
35	1			45	3	60	4 4							60	4
33	1			40	2	55	2 2							55	2
25	1			35	3	45	4 4							45	4
150	5	120	6 7	150	7	195	8 8	210	8				120	6 6	120 8
110	5	100	6 7	120	7	160	8 8	160	8				100	6 6	120 8
110	5	90	6 7	100	7	140	8 8	160	8				90	6 6	100 8
90	4	80	6 7	95	6	130	7 7	130	7				80	6 6	90 7
		40	2 2	30	1	40	2 2						40	1 2	
								130	7						
								100	7						
								80	7						
								60	7						
				25	2	35	3 3			35	3				
				35	1	40	3 3			45	3				
				30	1	40	2 2			40	4				
180	6	410	8 7	240	7	310	8 8						410	8 6	150 8
180	6	410	8 7	240	7	310	8 8						410	8 6	150 8
160	6	380	8 8	200	7	260	8 8						380	8 6	150 8
130	5	330	8 8	170	7	220	8 8						330	8 6	120 8
				230	6	280	7 7								150 7
				95	6	125	6 6								80 6
				250	7	325	7 7						280	7 7	120 7
				170	6	220	6 6								120 6
		110	6 6	95	6	125	6 6						110	6 6	40 6
		80	5 5	80	5	105	5 5						80	5 5	
				70	5	90	5 5								
				60	5	80	5 5								40 5

**GÜHRING**NAVIGATOR

Kalın harf baskılı ilerleme kod no.lı olan takımları tercih ediniz.

ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No.

Standart/DIN

Kesici tak. malz.

HM Uygul. grubu

Tip

Kaplama tipi

Soğutma

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/dev)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	2,000	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

kesme yönü

Ⓜ sağ kesmeli

Ⓛ sol kesmeli

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
nitrasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		○
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtlü ostenitli martenzitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤900 ≤1100 ≤1500		●
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		○
Alüminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si > % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn1Pb	≤500		○
pirinç, kısa talaşlı uzun talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		○
bronz, kısa talaşlı	2.1090 CuSn7Zn1Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 ≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik termoplastik	Bakelit, Resopal, Pertinax, Moltopren Plexiglas, Hostalen, Novodur, Makralon	≤150 ≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○



≤15xD

773
WN
KSM
K
RT 150 GN
○
aksiyel
103

≤15xD

6509
WN
KSM
K/P
RT 100 T
ⓐ
40 bar MQL
102

≤20xD

6511
WN
KSM
K/P
RT 100 T
ⓐ
40 bar MQL
104

≤25xD

6512
WN
KSM
K/P
RT 100 T
ⓐ
40 bar MQL
105

≤30xD

6513
WN
KSM
K/P
RT 100 T
ⓐ
40 bar MQL
106

≤40xD

6514
WN
KSM
K/P
RT 100 T
ⓐ
40 bar
107



V <sub>c</sub> m/min	VR- kodları	V <sub>c</sub> m/min	VR- kodları	V <sub>c</sub> m/min	VR- kodları	V <sub>c</sub> m/min	VR- kodları	V <sub>c</sub> m/min	VR- kodları	V <sub>c</sub> m/min	VR- kodları	V <sub>c</sub> m/min	VR- kodları	V <sub>c</sub> m/min	VR- kodları
		110	8			110	8			100	8			80	7
		110	8			110	8			100	8			80	7
		120	8			120	8			120	8			100	8
		120	8			120	8			100	8			100	8
		110	6			110	6			110	6			110	6
		110	8			110	8			100	8			80	7
		100	7			100	7			100	7			80	7
		110	7	80	7	110	7	80	7	100	7	70	7	80	7
		110	6	80	7	110	6	80	7	100	6	70	7	80	6
		110	8			110	8			100	8			80	7
		110	7	80	6-7	110	7	80	6-7	100	7	70	6-7	80	6
		110	6	80	6-7	110	6	80	6-7	100	6	70	6-7	80	6
		100	5			100	5			80	5			80	5
		80	5			80	5			60	5			60	5
		100	6-7			100	6			90	6			80	6-7
		80	5			80	5			70	4			70	4
		50	5			50	5			50	4			50	4
		50	5			50	5			50	4			50	4
		50	4			50	4			50	4			50	4
		100	5			100	5			100	5			80	5
		70	2-3			60	3			60	3			70	2-3
		100	5			100	5			100	5			80	5
120	5	140	8			140	8			130	8			120	8
100	5	100	8			100	8			90	8			80	8
90	5	140	8			140	8			130	8			120	8
80	5	100	8			100	8			90	8			80	8
40	1														
		100	6			100	6			90	6			80	6
		100	6			100	6			90	6			80	6
		90	8	90	8	90	8	90	8	80	8	80	8	70	8
		30	2			30	2			30	2			30	2
410	6														
410	6														
380	7														
330	7														
		120	1			120	1			120	1			120	1
280	6	120	8			120	8			110	8			100	8
110	5														
80	4														

**GÜHRING**NAVIGATOR

Kalın harf baskılı ilerleme kod no.lı olan takımları tercih ediniz.

ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No.

Standart/DIN

Kesici tak. malz.

HM Uygul. grubu

Tip

Kaplama tipi

Soğutma

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/dev)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

kesme yönü

Ⓜ sağ kesmeli

Ⓛ sol kesmeli

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
nitasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		○
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtlü ostenitli martenzitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤900 ≤1100 ≤1500		●
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		●
Alüminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si > % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn1Pb	≤500		○
pirinç, kısa talaşlı uzun talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		○
bronz, kısa talaşlı	2.1090 CuSn7Zn1Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 ≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik termoplastik	Bakelit, Resopal, Pertinax, Moltopren Plexiglas, Hostalen, Novodur, Makralon	≤150 ≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○



**GÜHRING NAVIGATOR**

Tüm kesme değerleri tavsiye olarak verilmiştir. İlerleme ve kesme değerleri işleme şartlarına göve değişebilir. Delikle ilgili deneme çalışması yapmanızı öneririz.

İdeal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No.

Standart/DIN

Kesici tak. malz.

HM Uygul. grubu

Delik derinliği

Kaplama tipi

Kullanıldığı yerler

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/dev)								
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
nitasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		●
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		●
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtlü ostenitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤900 ≤1100		●
paslanmaz çelikler, kükürtlü martenzitli	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		●
Alüminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> % 10 Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn1Pb	≤500		○
pirinç, kısa talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
uzun talaşlı	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
bronz, kısa talaşlı	2.1090 CuSn7Zn1Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
uzun talaşlı	2.0790 CuNi18Zn19Pb	≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○

HT 800 WP  $\leq 1,5 \times D$ 

4112
WN
KSM
K/P
1,5xD
F
çelikler
139

4115
WN
KSM
K/P
1,5xD
a
pasl. çelik.
145

4113
WN
KSM
K/P
1,5xD
F
döküm
142

4114
WN
KSM
K/P
1,5xD
○
Al/Al alaşı.
148

 $\leq 3 \times D$ 

4112
WN
KSM
K/P
3xD
F
çelikler
139

4115
WN
KSM
K/P
3xD
a
pasl. çelik.
145

4113
WN
KSM
K/P
3xD
F
döküm
142

4114
WN
KSM
K/P
3xD
○
Al/Al alaşı.
148



V <sub>c</sub> m/min	VR kodları	V <sub>c</sub> m/min	VR kodları	V <sub>c</sub> m/min	VR kodları	V <sub>c</sub> m/min	VR kodları	V <sub>c</sub> m/min	VR kodları	V <sub>c</sub> m/min	VR kodları	V <sub>c</sub> m/min	VR kodları
130	6							130	6				
110	5							110	5				
130	7							130	7				
110	6							110	6				
130	6							130	6				
125	6							125	6				
110	5							110	5				
110	6							110	6				
90	5							90	5				
130	7							130	7				
110	6							110	6				
70	4							70	4				
105	5							105	5				
70	4							70	4				
60	5							60	5				
55	4							55	4				
55	3							55	3				
50	2							50	2				
		25	2							25	2		
		55	3							55	3		
		40	3							40	3		
		35	3							35	3		
				100	6					100	6		
				90	6					90	6		
				120	7					120	7		
				100	6					100	6		
		90	6							90	6		
				80	5					80	5		
				80	5					80	5		
				80	5					80	5		
				80	5					80	5		
		25	2							25	2		
		40	3							40	3		
		35	2							35	2		
						200	7					200	7
						180	7					180	7
						150	7					150	7
						120	7					120	7
						180	7					180	7
						70	6					70	6
						180	7					180	7
						120	6					120	6
						70	6					70	6
						50	6					50	6
						45	6					45	6
						35	5					35	5

**GÜHRING NAVIGATOR**

Tüm kesme değerleri tavsiye olarak verilmiştir. İlerleme ve kesme değerleri işleme şartlarına göve değişebilir. Delikle ilgili deneme çalışması yapmanızı öneririz.

İdeal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No.

Standart/DIN

Kesici tak. malz.

HM Uygul. grubu

Delik derinliği

Kaplama tipi

Kullanıldığı yerler

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/dev)								
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
nitasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		●
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		●
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtlü ostenitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤900 ≤1100		●
paslanmaz çelikler, kükürtlü martenzitli	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		●
Alüminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> % 10 Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn1Pb	≤500		○
pirinç, kısa talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
uzun talaşlı	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
bronz, kısa talaşlı	2.1090 CuSn7Zn1Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 ≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○



HT 800 WP  $\leq 5 \times D$ 

4112
WN
KSM
K/P
5xD
F
çelikler
139

4115
WN
KSM
K/P
5xD
a
pasl. çelik.
145

4113
WN
KSM
K/P
5xD
F
döküm
142

4114
WN
KSM
K/P
5xD
○
Al/Al alaşı.
148

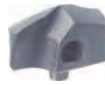
 $\leq 7 \times D$ 

4112
WN
KSM
K/P
7xD
F
çelikler
139

4115
WN
KSM
K/P
7xD
a
pasl. çelik.
145

4113
WN
KSM
K/P
7xD
F
döküm
142

4114
WN
KSM
K/P
7xD
○
Al/Al alaşı.
148



V <sub>c</sub> m/min	VR kodları	V <sub>c</sub> m/min	VR kodları	V <sub>c</sub> m/min	VR kodları	V <sub>c</sub> m/min	VR kodları	V <sub>c</sub> m/min	VR kodları	V <sub>c</sub> m/min	VR kodları	V <sub>c</sub> m/min	VR kodları
125	6							120	5				
105	5							105	4				
125	7							120	6				
105	6							105	5				
125	6							120	5				
120	6							110	5				
105	5							100	4				
105	6							100	5				
85	5							85	4				
125	7							120	6				
105	6							100	5				
70	4							70	4				
105	5							105	4				
70	4							70	3				
55	5							55	4				
50	4							50	3				
55	3							55	2				
50	2							50	2				
		25	2							25	1		
		55	3							55	2		
		40	3							40	2		
		35	3							35	2		
				100	6							80	6
				90	6							70	6
				120	7							100	7
				100	6							80	6
		90	6							70	6		
				80	5							60	5
				80	5							60	5
				80	5							60	5
				80	5							60	5
		25	2							25	1		
		40	3							40	2		
		35	2							35	1		
						180	7					180	6
						180	7					180	6
						140	7					140	6
						110	7					110	6
						180	7					180	6
						70	6					70	5
						180	7					180	6
						120	6					120	5
						70	6					70	5
						50	6					50	5
						45	6					45	5
						35	5					35	4

**GÜHRING NAVIGATOR**

Tüm kesme değerleri tavsiye olarak verilmiştir. İlerleme ve kesme değerleri işleme şartlarına göve değişebilir. Delikle ilgili deneme çalışması yapmanızı öneririz.

İdeal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No.

Standart/DIN

Kesici tak. malz.

HM Uygul. grubu

Delik derinliği

Kaplama tipi

Kullanıldığı yerler

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/dev)								
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
nitrosasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		●
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		●
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtlü ostenitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤900 ≤1100		●
paslanmaz çelikler, kükürtlü martenzitli	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		●
Alüminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> % 10 Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn1Pb	≤500		○
pirinç, kısa talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
uzun talaşlı	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
bronz, kısa talaşlı	2.1090 CuSn7Zn1Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600 ≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○

HT 800 WP  $\leq 10 \times D$ 

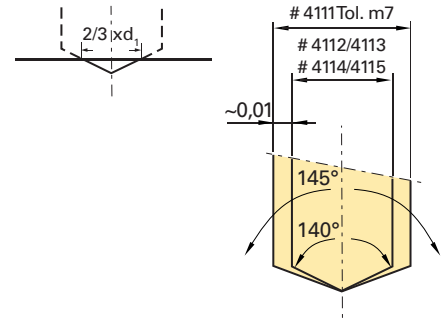
4112
WN
KSM
K/P
10xD
F
çelikler
139

4115
WN
KSM
K/P
10xD
a
paslı. çelik.
145

4113
WN
KSM
K/P
10xD
F
döküm
142

4114
WN
KSM
K/P
10xD
○
Al/Al alaşı.
148

4111
WN
KSM
K/P
1xD
a
pil./senk.
151

 $\leq 1 \times D$  Pilot delik/havşalama

- Açık deliklerde zırhın sürekli temas halinde kalmasına dikkat edin. Ayrıca açık delikten çıkarken ilerlemeyi düşürün.
- 2.  $5 \times D$ 'den derin deliklerde genelde 4105 ürün no. li tutucu ve 4111 ürün no. li pilot delik plakası ile merkezlemeyi veya pilot delik delmeyi öneriyoruz. Alternatif olarak işlenecek malzemeye göre RT 100 U veya RT 100 VA rasyo matkap ucuda kullanılabilir.
- 3. Merkezleme işlemi yapmadan delik direk delininceye delige girişte ilerleme azaltılmalıdır.
- 4. Takımı deneme çalışması yapmadan kesikli yüzeylerde (kanal, enine delikler vs) kullanmayın. Kesikli yüzeylerde (maks.  $0,2 \times D$ ) ilerlemeyi mümkün olduğu kadar düşürün.
- 5. HT 800 normal plaketti takımların aksine saç paketlerini delmek için uygundur.
- 6. Torna tezgahlarında (de liçi takım sabit) takımın tam merkezde durmasına dikkat edin.
- 7. İdeal bir talaş kaldırma için kesici yağ veya emülsiyon miktarının yeterli olması şarttır.
- 8. Takım kuru işleme veya MMS yağlama sistemi için ancak şartlara göre uygundur MMS kullanmak isterseniz konik MMS sap sonu ve Gühring MMS parçalarını kullanın. Gühring size yardımcı olacaktır



Vc m/min	VR kodları	Vc m/min	VR kodları	Vc m/min	VR kodları	Vc m/min	VR kodları	Vc m/min	VR kodları
100	5							130	6
95	4							110	5
100	6							130	7
95	5							110	6
100	5							130	6
95	5							125	6
90	4							110	5
90	5							110	6
85	4							90	5
100	6							130	7
90	5							110	6
70	4							70	4
95	4							105	5
70	3							70	4
55	4							60	5
50	3							55	4
55	2							55	3
50	2							50	2
		25	1					25	2
		55	2					55	3
		40	2					40	3
		35	2					35	3
				80	6			100	6
				70	6			90	6
				100	7			120	7
				80	6			100	6
		70	6					90	6
				60	5			80	5
				60	5			80	5
				60	5			80	5
				60	5			80	5
		25	1					25	2
		40	2					40	3
		35	1					35	2
						150	6	200	7
						150	6	180	7
						130	6	150	7
						105	6	120	7
						150	6	180	7
						70	5	70	6
						150	6	180	7
						110	5	120	6
						70	5	70	6
						50	5	50	6
						45	5	45	6
						35	4	35	5

**GÜHRING NAVIGATOR**

Tüm kesme değerleri tavsiye olarak verilmiştir. İlerleme ve kesme değerleri işleme şartlarına göve değişebilir. Delikle ilgili deneme çalışması yapmanızı öneririz.

İdeal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No.

Standart/DIN

Kesici tak. malz.

HM Uygul. grubu

Delik derinliği

Kaplama tipi

Kullanıldığı yerler

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/dev)								
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
nitrasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		●
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtlü ostenitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤900 ≤1100		●
paslanmaz çelikler, kükürtlü martenzitli	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		○
Alüminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> % 10 Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn1Pb	≤500		○
pirinç, kısa talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
uzun talaşlı	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
bronz, kısa talaşlı	2.1090 CuSn7Zn1Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 ≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○





## GÜHRING NAVIGATOR

Kalın harf baskılı ilerleme kod no.lı olan takımları tercih ediniz.

ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No. ®

Ürün-No. ™

Standart/DIN

Kesici tak. malz.

Kaplama tipi

Tip

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/U)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	2,000	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

kesme yönü

Ⓜ sağ kesmeli

Ⓜ sol kesmeli

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPB30 (9SMnPB28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
nitasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		●
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtlü ostenitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤900 ≤1100		●
paslanmaz çelikler, kükürtlü martenzitli	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		●
Alüminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> % 10 Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn1Pb	≤500		○
pirinç, kısa talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
uzun talaşlı	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
bronz, kısa talaşlı	2.1090 CuSn7Zn1Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
uzun talaşlı	2.0790 CuNi18Zn19Pb	≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○



≤3xD Delik derinliği

223	224	225	552
226	227	228	553
1897	1897	1897	1897
<b>HSS</b>	<b>HSS</b>	<b>HSS</b>	<b>HSS</b>
N	H	W	GT 80
192/200	204/206	208/210	212/215

653
672
1897
<b>HSS</b>
N
196/203

2460
1897
<b>HSS</b>
N
199

329	363	1261	129	1259
330			136	
1897	WN	1897	WN	1897
<b>HSCO</b>	<b>HSCO</b>	<b>HSCO</b>	<b>HSCO</b>	<b>M42</b>
GV 120	GV 120	VA	N	N
218/225	448	230	414/415	235

128
WN
<b>HSCO</b>
N
413



Vc m/min	İlerleme hız- kodları				Vc m/min	İlerleme hız-kodları	Vc m/min	İlerleme hız-kodları	Vc m/min	İlerleme hız- kodları				Vc m/min	İlerleme hız- kodları
27	6			6	30	6	32	7	35	5	5	5	5		
22	5			5	24	5	26	6	30	5	5	5	5		
30	6			6	33	6	36	7	40	5	5	5	5		
30	5			5	33	5	36	6	40	5	5	5	5	5	5
25	5			5	28	5	31	6	40	5	5	5	5	5	5
25	5			5	28	5	31	6	40	5	5	5	5	5	5
					25	4	28	5	35	4	4		4	4	4
					22	4	24	5	20	4	4		4	4	4
									16	3	3		3	3	3
30	6			6	33	6	36	7	36	6	6	6	6	6	6
					20	4	22	5	20	4	4		4	3	3
									15	3	3		3	3	3
					14	4	16	5	16	4	4		4	3	3
									12	3	3		3	3	3
16	4			4	18	4	20	5	12	3	3		3	3	3
									15	4	4		4	3	3
									12	3	3		3	3	3
									15	3	3		3	3	3
									8	2	2		2	2	2
									4	1	1		1	1	1
									18	1	1	4	4	3	3
									14	3	3	3	3	3	3
									16	3	3	3	3	3	3
30	6			6	33	6	36	7	35	6	6		6	5	5
30	6			6	33	6	36	7	30	6	6		6	5	5
25	6			6	28	6	31	7	30	6	6		6	5	5
20	6			6	22	6	24	7	25	6	6		6	5	5
									10	3	3		3	3	3
									8	1	1		1	1	1
									10	2	2		2	2	2
									6	2	2		2	2	2
									90				7	7	7
70			7	7			85	8	90				7	7	7
70			7	7			85	8	90				7	7	7
50	7		7	7			60	8	80				7	7	7
50	6		6	6			60	7	70				6	6	6
70	6		6	6	80	6	90	6	70				6	6	6
60	5		5	5	65	5	70	6	40				5	5	5
70			6	6	75	5	80	6	60				5	5	5
40	5		5	5	45	5	50	6	40				5	5	5
30	4	4		4	33	4	36	5	35	4	4	4	4	4	4
25	4			4	27	4	30	5	30	4	4	4	4	4	4
15	4			4	16	4	18	5	20	4	4	4	4	4	4
					15	4	18	5	15	4	4	4	4	4	4
18	4	4		4	22	4	29	5	20	4	4		4	4	4
28	5	5	5	5	36	5	47	6	30			4	4	4	4



## GÜHRING NAVIGATOR

Kalın harf baskılı ilerleme kod no.lı olan takımları tercih ediniz.

ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No.

Standart/DIN

Kesici tak. malz.

Kaplama tipi

Tip

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/U)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

kesme yönü

Ⓜ sağ kesmeli

Ⓜ sol kesmeli

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPB30 (9SMnPB28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
nitasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		●
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtü ostenitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤900 ≤1100		●
martenzitli	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		●
Alüminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> % 10 Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn1Pb	≤500		○
pirinç, kısa talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
uzun talaşlı	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
bronz, kısa talaşlı	2.1090 CuSn7Zn1Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
uzun talaşlı	2.0790 CuNi18Zn19Pb	≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○





≤3xD Delik derinliği

572 1897 HSCO S VA 231	2048 1897 HSCO M P2000 233	1228 1897 HSCO S GT 80 227	2498 1897 HSCO F GT 80 229	659 1897 HSCO S GV 120 222	663 WN HSCO S GV 120 449	2461 1897 HSCO F GV 120 224	512 WN HSCO S GU 500 384	515 1897 HSS-E-PM F GT 500 237
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V <sub>c</sub> m/min	İlerleme hız- kodları	V <sub>c</sub> m/min	İlerleme hız- kodları	V <sub>c</sub> m/min	İlerleme hız- kodları	V <sub>c</sub> m/min	İlerleme hız- kodları	V <sub>c</sub> m/min	İlerleme hız- kodları	V <sub>c</sub> m/min	İlerleme hız- kodları	V <sub>c</sub> m/min	İlerleme hız- kodları	V <sub>c</sub> m/min	İlerleme hız- kodları	
38	6	35	6	38	6	42	6	38	5	5	42	6	45	6	42	6
33	5	30	5	33	5	36	5	33	4	4	36	5	35	5	37	5
44	6	40	6	44	6	48	7	44	5	5	48	6	50	6	47	7
42	5	40	5	38	5	42	6	38	5	5	42	6	40	6	44	6
44	5	40	5	44	6	48	6	44	5	5	48	6	44	6	47	6
44	5	40	5	44	5	48	6	44	5	5	48	6	44	6	47	6
		35	4	38	4	42	5	38	4	4	42	5	40	5	44	5
		25	4	27	4	30	5	27	4	4	30	5	27	4	30	4
		20	3	22	3	24	4	22	3	3	24	4	22	3	25	3
40	6	40	6	44	4	48	4	44	4	4	48	5	44	6	47	4
		20	4	22	4	24	5	22	4	4	24	5	22	4	25	5
		15	3	18	3	20	4	18	3	3	20	4	18	3	20	4
		20	4	22	4	24	5	22	4	4	24	5	22	4	25	5
		15	3	18	3	20	4	18	3	3	20	4	16	3	18	4
		18	4	19	4	21	5	19	4	4	21	5	20	4	22	5
		12	3	14	3	16	4	14	3	3	16	4	15	3	17	4
		12	3	14	3	17	4	14	3	3	17	4	13	3	17	4
		8	2	9	2	11	3	9	2	2	11	3	9	2	12	2
								4	1	1	5	2				
20	4	14	4	15	4	17	4	20	4	4	22	5	20	4	22	4
15	3	10	3	10	3	12	3	15	3	3	17	4	16	4	18	3
18	3	12	3	12	3	14	3	18	3	3	20	4	18	4	20	3
30	6	38	6	45	6	50	7	40	6	6	45	7	45	6	50	7
30	6	30	6	40	6	45	7	35	6	6	40	7	40	6	44	7
		30	6	33	6	36	7	33	6	6	36	7	40	6	45	7
		25	6	27	6	29	7	27	6	6	29	7	30	6	33	7
		10	3	8	3	10	4	12	3	3	14	4			16	4
8	1	5	2					6	2	2	7	2			6	2
12	2							11	2	2	12	3				
8	2							7	2	2	8	3				
90	7	90	7										70	7		
90	7	90	7										70	7		
80	7	80	7										85	7		
70	6	70	6										70	6		
70	6	85	6										80	6		
70	5	80	5	88	5	96	6						80	5	80	5
60	5	70	5	77	5	84	6						77	5		
40	5	40	5	44	5	48	6						44	5	60	5
35	4	40	4	45	5	50	5	45	5	5	50	6	50	4	50	5
33	4	30	4	40	4	45	5	40	4	4	45	5	40	4	44	5
20	4	25	4	22	4	25	5	23	4	4	26	5	32	4	33	5
15	4	15	4	17	4	20	5	17	4	4	20	5	28	4	28	5
		20	4	22	4	24	5						25	4	25	5
30	4	25	5	27	5	30	5						27	4		



## GÜHRING NAVIGATOR

Kalın harf baskılı ilerleme kod no.lı olan takımları tercih ediniz.

ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No.

Standart/DIN

Kesici tak. malz.

HM Uygul. grubu

Kaplama tipi

Tip

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/U)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

kesme yönü

Ⓜ sağ kesmeli

Ⓜ sol kesmeli

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPB30 (9SMnPB28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
nitasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		●
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtlü ostenitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤900 ≤1100		●
paslanmaz çelikler, kükürtlü martenzitli	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		●
Alüminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> % 10 Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn1Pb	≤500		○
pirinç, kısa talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
uzun talaşlı	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
bronz, kısa talaşlı	2.1090 CuSn7Zn1Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
uzun talaşlı	2.0790 CuNi18Zn19Pb	≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○



## ≤3xD Delik derinliği

730	702	1149	710	703	705	704	707
6539	WN	WN	WN	8037	8041	8038	WN
KSM	KSM	KSM	sert metal	sert metal	sert metal	sert metal	sert metal
K10/K20							
○	○	○	○	○	○	○	○
N	N	N	Duro 150	N	N	N	H
239	243	431	323	429	512	430	432

2463	1946
6539	6537K
KSM	KSM
K/P	K/P
F	A
N	H
241	389



V <sub>c</sub> m/min	İlerleme hız- kodları							V <sub>c</sub> m/min	VR- kodları	V <sub>c</sub> m/min	VR- kodları
80	4							104	5		
70	4							91	5		
80	5							104	6		
70	4		4	4	4			91	5		
80	4							104	5		
70	4							91	5		
60	4							78	5		
60	4							78	5		
80	5							104	6	80	6
60	4							78	5		
50	4							65	5	65	4
50	3							65	4	80	4
25	2		2	2	2		2	32	3		
20	2		3	3	3			26	4	40	2
10			2	2	2					30	1
25	2							32	2		
15	1							20	1		
25	2							32	2		
90	4		4	4	4			117	5	90	8
80	4		4	4	4			104	5	80	8
80	4		4	4	4			91	5	80	8
70	4		4	4	4			104	5	70	7
10			1	1	1		1			30	2
15	2							20	2		
15	1							15	1		
15	1							15	1		
200	7							260	8		
200	7							260	8		
150	6							195	7		
120	6							156	7		
180	6							234	6		
80	5							104	6		
180	5		5	5	5			234	6		
180	5		5	5	5			234	6		
120	5							156	6		
120	5							156	6		
70	4							91	5		
50	3							65	4		
50	4	4						65	5		
40	3	3					3	52	4		
150			1								
80	3	3					2	104	4		



## GÜHRING NAVIGATOR

Kalın harf baskılı ilerleme kod no.lı olan takımrları tercih ediniz.

ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No. ®

Ürün-No. ™

Standart/DIN

Kesici tak. malz.

Kaplama tipi

Tip

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/U)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	2,000	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

kesme yönü

Ⓜ sağ kesmeli

Ⓛ sol kesmeli

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPB30 (9SMnPB28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
nitasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		●
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtlü ostenitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤900 ≤1100		●
paslanmaz çelikler, kükürtlü martenzitli	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		●
Alüminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> % 10 Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn1Pb	≤500		○
pirinç, kısa talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
uzun talaşlı	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
bronz, kısa talaşlı	2.1090 CuSn7Zn1Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
uzun talaşlı	2.0790 CuNi18Zn19Pb	≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○



≤5xD Delik derinliği

560	205	240	268	229	245	592	251	206	246	207	247	549	558
	208			248				209		210		550	
338	338	338	WN	345	345	345	346	338	345	338	345	338	345
HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
N	N	N	N	N	N	N	N	H	H	W	W	GT 100	GT 100
256	244/258	257	412	458/457	450	454	471	263/266	459	269/272	460	274/281	461



Vc m/min	İlerleme hız- kodları												
27	6	6	6	6	6	6	6	6				6	6
22	5	5	5	5	5	5	5	5				5	5
30	6	6	6	6	6	6	6	6				6	6
30	5	5	5	5	5	5	5	5				5	5
25	5	5	5	5	5	5	5	5				5	5
25	5	5	5	5	5	5	5	5				5	5
30	6	6	6	6	6	6	6	6				6	6
16		4	4	4	4	4	4	4				4	4
30	6	6	6	6	6	6	6	6				6	6
30	6	6	6	6	6	6	6	6				6	6
25	6	6	6	6	6	6	6	6				6	6
25	6	6	6	6	6	6	6	6				6	6
80											7	7	
80											7	7	
70	7	7	7	7	7	7	7	7			7	7	7
70	6	6	6	6	6	6	6	6				6	6
50	6	6	6	6	6	6	6	6	6	6		6	6
50	5	5	5	5	5	5	5	5			5	5	5
70									6	6			
40	5	5	5	5	5	5	5	5				5	5
30	4	4	4	4	4	4	4	4	4	4			
25	4	4	4	4	4	4	4	4					
15	4	4	4	4	4	4	4	4				4	4
18	4	4	4	4	4	4	4	4	4	4		4	4
28	5	5	5	5	5	5	5	5	5	5	5	5	5



## GÜHRING NAVIGATOR

Kalın harf baskılı ilerleme kod no.lı olan takım ları tercih ediniz.

ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No. ®

Ürün-No. ™

Standart/DIN

Kesici tak. malz.

Kaplama tipi

Tip

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/U)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	2,000	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

kesme yönü

Ⓜ sağ kesmeli

Ⓜ sol kesmeli

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPB30 (9SMnPB28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
nitasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		○
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtlü ostenitli martenzitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤900 ≤1100 ≤1500		●
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		●
Alüminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> % 10 Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn1Pb	≤500		○
pirinç, kısa talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
uzun talaşlı	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
bronz, kısa talaşlı	2.1090 CuSn7Zn1Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
uzun talaşlı	2.0790 CuNi18Zn19Pb	≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○



≤5xD Delik derinliği

651	654	652	606
664		665	
338	345	338	345
<b>HSS</b>	<b>HSS</b>	<b>HSS</b>	<b>HSS</b>
<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>
N	N	GT 100	GT 100
250/261	455	277/283	462

2456	2457
338	338
<b>HSS</b>	<b>HSS</b>
<b>F</b>	<b>F</b>
N	GT 100
254	280

305	345	351	622	645	605	1260	1262	1146
308					608			
338	345	346	338	345	338	338	345	338
<b>HSCO</b>	<b>HSCO</b>	<b>HSCO</b>	<b>HSCO</b>	<b>HSCO</b>	<b>HSCO</b>	<b>HSCO</b>	<b>HSCO</b>	<b>M42</b>
N	N	N	GT 100	GT 100	Ti	VA	VA	N
284/289	463	472	291	466	301/308	309	470	315



Vc m/min	İlerleme hız- kodları			
30	6	6	6	6
24	5	5	5	5
33	6	6	6	6
33	5	5	5	5
28	5	5	5	5
28	5	5	5	5
25	4	4	4	4
22	4	4	4	4
33	6	6	6	6
20	4	4	4	4
14	4	4	4	4
18	4	4	4	4
33	6	6	6	6
33	6	6	6	6
28	6	6	6	6
22	6	6	6	6
80	6	6		
65	5	5	5	5
75	5	5	5	5
45	5	5	5	5
33	4	4		
27	4	4		
16	4	4	4	4
15	4	4	4	4
22	4	4	4	4
36	5	5		

Vc m/min	İlerleme hız- kodları	
32	7	7
26	6	6
36	7	7
36	6	6
31	6	6
31	6	6
28	5	5
24	5	5
36	7	7
22	5	5
16	5	5
20	5	5
36	7	7
36	7	7
31	7	7
24	7	7
85	8	8
85	8	8
60	8	8
60	8	7
90	7	7
70	6	6
80	6	6
50	6	6
36	5	
33	5	
18	5	5
18	5	5
29	5	5

Vc m/min	İlerleme hız- kodları									
35	5	5	5	5	5		5	5	5	
30	5	5	5	5	5		5	5	5	
40	5	5	5	5	5		5	5	5	
40	5	5	5	5	5		5	5	5	
40	5	5	5	5	5		5	5	5	
35	4	4	4	4	4					5
20	4	4	4	4	4					4
16	3	3	3	3	3		3			3
36	6	6	6	6	6		6	6	6	
20	4	4	4	4	4					3
15	3	3	3	3	3		3			3
16	4	4	4	4	4					3
12	3	3	3	3	3		3			3
15	4	4	4	4	4					3
12	3	3	3	3	3		3			3
15	3	3	3	3	3		3			3
8	2	2	2	2	2		2			2
4										1
18	4	4	4	4	4		4	4	4	3
14	3	3	3	2	2		3	3	3	
16	3	3	3	3	3		3	3	3	3
35	6	6	6	6	6					5
30	6	6	6	6	6					5
30	6	6	6	6	6					5
28	6	6	6	6	6					5
10	3	3	3	3	3		3			3
8										1
10							2	2	2	2
6							2	2	2	2
90							7	7	7	7
90							7	7	7	7
80				7	7		7	7	7	7
70				6	6		6	6	6	6
70							6	6	6	6
40	5	5	5	5	5		5	5	5	5
60							5	5	5	5
40	5	5	5	4	4		5	5	5	5
35	4	4	4				4	4	4	4
33	4	4	4				4	4	4	4
20	4	4	4	4	4		4	4	4	4
15	4	4	4	4	4		1	1	1	4
20	4	4	4	4	4					

Navigator



## GÜHRING NAVIGATOR

Kalın harf baskılı ilerleme kod no.lı olan takımları tercih ediniz.

ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No.

Standart/DIN

Kesici tak. malz.

Kaplama tipi

Tip

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/U)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

kesme yönü

Ⓜ sağ kesmeli

Ⓛ sol kesmeli

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPB30 (9SMnPB28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
nitrasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		○
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtlü ostenitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤900 ≤1100		●
paslanmaz çelikler, kükürtlü martenzitli	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		●
Alüminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> % 10 Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn1Pb	≤500		○
pirinç, kısa talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
uzun talaşlı	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
bronz, kısa talaşlı	2.1090 CuSn7Zn1Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
uzun talaşlı	2.0790 CuNi18Zn19Pb	≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○





≤5xD Delik derinliği

2997	661	658	662	657
338	345	338	345	338
HSCO	HSCO	HSCO	HSCO	HSCO
S	S	S	S	S
N	N	GT 100	GT 100	Ti
288	465	294	467	304

2459	2458
338	338
HSCO	HSCO
F	F
GT 100	Ti
296	306

1223	1224	1221	1222
338	345	338	345
HSCO	HSCO	HSCO	HSCO
A	A	C	C
GT 100	GT 100	GT 100	GT 100
299	469	298	468



V <sub>c</sub> m/min	İlerleme hız-kodları				
38	6	6	6	6	
33	5	5	5	5	
44	5	5	5	5	
38	5	5	5	5	
44	5	5	5	5	
38	4	4	4	4	
27	4	4	4	4	
22	3	3	3	3	3
44	4	4	4	4	
22	4	4	4	4	
18	3	3	3	3	
22	4	4	4	4	
18	3	3	3	3	
19	4	4	4	4	
14	3	3	3	3	
14	3	3	3	3	3
9	2	2			2
20	4	4	4	4	4
15	3	3			3
18			3	3	3
40	6	6	6	6	
35	6	6	6	6	
33	6	6	6	6	
27	6	6	6	6	
12					3
6					2
11					2
7					2
88	5	5	5	5	
40	4	4			
22	4	4	4	4	
17	4	4	4	4	4
22	4	4	4	4	

V <sub>c</sub> m/min	İlerleme hız-kodları	
42	6	
36	5	
48	6	
42	6	
48	6	
42	5	
30	5	
34	4	4
48	6	
24	5	
20	4	
24	5	
20	4	
21	5	
16	4	
17	4	4
11	3	2
6	1	
22	5	5
17	4	3
20	4	4
45	7	
40	7	
36	7	
29	7	
14	4	3
7		2
12		2
8		2
85	8	
72	7	
96	6	
40		
25	5	
20	5	4
24	5	

V <sub>c</sub> m/min	İlerleme hız-kodları			
42			6	6
36			6	6
48			6	6
42	5	5	6	6
42			5	5
30			5	5
34			4	4
48			7	7
24			5	5
20			4	4
20			5	5
15			4	4
21			5	5
16			4	4
17			4	4
11			3	3
22			5	5
18			4	4
45	7	7		
40	7	7		
36	7	7		
29	7	7		
85	7	7		
96	6	6		
25	5	5		
20	5	5		
24	5	5		



## GÜHRING NAVIGATOR

Kalın harf baskılı ilerleme kod no.lı olan takımları tercih ediniz.

ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No.

Standart/DIN

Kesici tak. malz.

Kaplama tipi

Tip

Soğutma

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/U)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	2,000	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

kesme yönü

Ⓜ sağ kesmeli

Ⓜ sol kesmeli

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPB30 (9SMnPB28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
nitrasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		●
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtü ostenitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤900 ≤1100		●
paslanmaz çelikler, kükürtü martenzitli	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		●
Alüminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> % 10 Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn1Pb	≤500		○
pirinç, kısa talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
uzun talaşlı	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
bronz, kısa talaşlı	2.1090 CuSn7Zn1Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
uzun talaşlı	2.0790 CuNi18Zn19Pb	≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○



≤5xD Delik derinliği

1199
338
M42
F nano
N
olmadan
317

1018
338
M42
AeroX
olmadan
313

2047
338
HSCO
P2000
olmadan
311

511
WN
HSCO
S
GU 500
olmadan
386

513
WN
HSS-E-PM
F
GT 500
olmadan
388

1131
WN
HSCO
GT 80 IK
ile
395

1132
WN
HSCO
S
GT 80 IK
ile
396

732
WN
KSM
N
olmadan
319

2464
WN
KSM
F
N
olmadan
321



V <sub>c</sub> m/min	ilerleme hız-kodları	V <sub>c</sub> m/min	ilerleme hız-kodları	V <sub>c</sub> m/min	ilerleme hız-kodları	V <sub>c</sub> m/min	ilerleme hız-kodları	V <sub>c</sub> m/min	ilerleme hız-kod.	V <sub>c</sub> m/min	ilerleme hız-kod.	V <sub>c</sub> m/min	ilerleme hız-kod.	V <sub>c</sub> m/min	ilerleme hız-kod.
42	6	35	6	35	6	45	6	42	6	48	7	60	7	80	4
36	5	30	5	30	5	35	5	37	5	38	6	48	6	70	4
48	6	40	6	40	6	50	6	47	6	48	7	60	7	80	5
42	5	40	5	40	5	40	5	44	6	38	6	48	6	70	4
44	6	40	5	40	5	44	6	47	6	48	6	60	6	80	4
44	5	40	5	40	5	44	6	47	6	48	6	60	6	70	4
42	5	35	4	35	4	40	5	44	5	38	5	50	5	60	4
30	4	20	4	25	4	27	4	30	4	28	5	33	5	60	4
25	3	16	3	20	3	22	3	25	3	26	4	31	4		
40	6	36	6	40	6	44	6	47	3	43	7	55	7	80	5
25	3	20	3	20	4	22	4	25	4	25	5	31	5	60	4
20	3	15	3	15	3	18	3	20	3	24	4	31	4		
20	3	16	4	20	4	22	4	25	4	25	5	30	5	50	4
18	3	12	3	15	3	16	3	18	4	20	4	24	4		65
21	4	15	3	18	4	20	4	22	5	24	5	30	5	50	3
16	3	12	3	12	3	15	3	17	4	16	4	20	4		65
17	3	15	3	12	3	13	3	14	4	14	4	18	4		
11	2	8	2	8	2	9	2	12	2	12	3	15	3	25	2
6	1	4	1							4	3	5	3	20	2
20	4	18	3	14	4	20	4	22	4	20	5	25	5	25	2
15	3	14	3	10	3	16	4	18	3	14	4	18	4	15	1
18	3	16	3	12	3	18	4	20	3	16	4	20	4	25	2
45	6	35	6	38	6	45	6	50	7	48	7	60	7	90	4
40	6	30	6	30	6	40	6	40	7	38	7	48	7	80	4
36	6	30	6	30	6	40	6	44	7	42	7	52	7	70	4
29	6	28	6	25	6	30	6	33	7	32	7	40	7	80	4
14	3	10	3	10	3			16	4	12	4	15	4		
9	1	8	1	5	2										
12	2	10	2					6	2	10	2	12	2	15	2
8	2	6	2							14	3	18	3	15	1
		90	7	90	7	70	7			10	3	12	3	15	1
		90	7	90	7	70	7							200	7
80	7	80	7	80	7	85	7							200	7
70	6	70	6	70	6	70	6			95	7	120	7	150	6
80	6	70	6	85	6	80	6			75	8	95	8	120	6
70	5	70	5	80	5	80	5	50	5					180	5
60	5	60	5	70	5	77	5			90	6	100	6	80	5
40	5	40	5	40	5	44	5	60	5	45	6	55	6	180	5
35	4	35	4	40	4	50	4	50	5					180	5
33	4	33	4	30	4	40	4	44	5	48	5	60	5	120	5
20	4	20	4	25	4	32	4	33	5	45	5	55	5	120	5
15	4	15	4	15	4	28	4	28	5	38	5	45	5	70	4
		20	4	20	4	25	4	25	4					50	3
		30	5	25	5	27	4			38	6	48	6	50	4
														40	3
														80	3
														100	4



## GÜHRING NAVIGATOR

Kalın harf baskılı ilerleme kod no.lı olan takımları tercih ediniz.

ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No. ®

Ürün-No. ™

Standart/DIN

Kesici tak. malz.

Kaplama tipi

Tip

Soğutma

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/U)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	2,000	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

kesme yönü

Ⓜ sağ kesmeli

Ⓛ sol kesmeli

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPB30 (9SMnPB28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
nitrasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		●
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtlü ostenitli martenzitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤900 ≤1100 ≤1500		●
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		●
Alüminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si > % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn1Pb	≤500		○
pirinç, kısa talaşlı uzun talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		○
bronz, kısa talaşlı	2.1090 CuSn7Zn1Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 ≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik termoplastik	Bakelit, Resopal, Pertinax, Moltopren Plexiglas, Hostalen, Novodur, Makralon	≤150 ≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○



≤10xD Delik derinliği

561	211	204	217	257	523
			220		
339	339	340	340	341	WN
HSS	HSS	HSS	HSS	HSS	HSS
N	N	N	N	N	N
olmad.	olmad.	olmad.	olmad.	olmad.	olmad.
327	325	338	331/336	473	482

218	219	501	505	535	551
221				506	
340	340	340	341	340	341
HSS	HSS	HSS	HSS	HSS	HSS
H	W	GT50	GT50	GT100	GT100
olmad.	olmad.	olmad.	olmad.	olmad.	olmad.
339/341	342	351	479	344/350	476

666	667	655	668	656
339	340	341	340	341
HSS	HSS	HSS	HSS	HSS
N	N	N	GT100	GT100
olmad.	olmad.	olmad.	olmad.	olmad.
328	334	475	347	478

2462
340
HSS
GT100
olmad.
349



V <sub>c</sub> m/min	İlerleme hız-kodları					
24	6	6	6	6	6	6
20	5	5	5	5	5	5
27	6	6	6	6	6	6
27	5	5	5	5	5	5
22	5	5	5	5	5	5
22	5	5	5	5	5	5
27	6	6	6	6	6	6
14	4	4	4	4	4	4
27	6	6	6	6	6	6
27	6	6	6	6	6	6
22	6	6	6	6	6	6
18	6	6	6	6	6	6
65	7	7	7	7	7	7
65	7	7	7	7	7	7
45	7	7	7	7	7	7
45	6	6	6	6	6	6
63	6	6	6	6	6	6
54	5	5	5	5	5	5
36	5	5	5	5	5	5
28	4	4	4	4	4	4
22	4	4	4	4	4	4
22	4	4	4	4	4	4
14	4	4	4	4	4	4
22	5	5	5	5	5	5

V <sub>c</sub> m/min	İlerleme hız-kodları					
24					6	6
20					5	5
27					6	6
27					5	5
22					5	5
22					5	5
27					6	6
14					4	4
27					6	6
27					6	6
22					6	6
18					6	6
65	7	7	7			
65	7	7	7			
45	7				6	6
45					6	6
63	6		6	6		
54		5			5	5
63	6					
36					5	5
28	4					
22					4	4
22					4	4
14	4				4	4
22	5	5	5	5		

V <sub>c</sub> m/min	İlerleme hız-kodları						VR-kodları	
28	6	6	6	6	6	6	30	7
22	5	5	5	5	5	5	24	6
30	6	6	6	6	6	6	33	7
30	5	5	5	5	5	5	33	6
25	5	5	5	5	5	5	28	6
25	5	5	5	5	5	5	28	6
22	4	4	4	4	4	4	24	5
18	4	4	4	4	4	4	23	5
30	6	6	6	6	6	6	33	7
14	4	4	4	4	4	4	18	5
12	4	4	4	4	4	4	15	5
16	4	4	4	4	4	4	19	5
10	3	3	3	3	3	3	13	4
30	6	6	6	6	6	6	33	7
30	6	6	6	6	6	6	33	7
24	6	6	6	6	6	6	26	7
20	6	6	6	6	6	6	22	7
50	7	7	7	7	7	7	55	8
50	6	6	6	6	6	6	55	7
70	6	6	6	6	6	6	70	
60	5	5	5	5	5	5	65	6
40	5	5	5	5	5	5	44	6
30	4	4	4	4	4	4	30	
25	4	4	4	4	4	4	25	
14	4	4	4	4	4	4	16	5
12	4	4	4	4	4	4	14	5
18	4	4	4	4	4	4	23	5
32	5	5	5	5	5	5	32	



## GÜHRING NAVIGATOR

Kalın harf baskılı ilerleme kod no.lı olan takım ları tercih ediniz.

ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No.

Standart/DIN

Kesici tak. malz.

Kaplama tipi

Tip

Soğutma

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/U)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	2,000	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

kesme yönü

Ⓜ sağ kesmeli

Ⓜ sol kesmeli

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPB30 (9SMnPB28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
nitasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		●
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtü ostenitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤900 ≤1100		●
paslanmaz çelikler, kükürtü martenzitli	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		●
Alüminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> % 10 Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn1Pb	≤500		○
pirinç, kısa talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
uzun talaşlı	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
bronz, kısa talaşlı	2.1090 CuSn7Zn1Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
uzun talaşlı	2.0790 CuNi18Zn19Pb	≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○





## GÜHRING NAVIGATOR

Kalın harf baskılı ilerleme kod no.lı olan takım ları tercih ediniz.

ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No.

Standart/DIN

Kesici tak. malz.

Kaplama tipi

Tip

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/U)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

kesme yönü

Ⓜ sağ kesmeli

Ⓜ sol kesmeli

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPB30 (9SMnPB28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
nitrasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		○
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtlü ostenitli martenzitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤900 ≤1100 ≤1500		●
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		○
Alüminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si > % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn1Pb	≤500		○
pirinç, kısa talaşlı uzun talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		○
bronz, kısa talaşlı	2.1090 CuSn7Zn1Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 ≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik termoplastik	Bakelit, Resopal, Pertinax, Moltopren Plexiglas, Hostalen, Novodur, Makralon	≤150 ≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○





>10xD Delik derinliği

502	503	504	242	243	244	526	527	563	564	565	566	293	298	299
1869 R1	1869 R2	1869 R3	WN	WN	WN	1870 R1	1870 R2	WN	WN	WN	WN	WN	WN	WN
HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
GT 100	GT 100	GT 100	GT 100	GT 100	GT 100	GT 100	GT 100	GT 100	GT 100	GT 100	GT 100	GT 100	GT 100	GT 100
365	372	378	381	382	383	484	488	491	492	493	494	495	496	497

670	671
1869 R1	1869 R2
HSS	HSS
GT 100	GT 100
367	374



Vc m/min	İlerleme hız- kodları													
22	5	5	5	5	5	5	5	5	5	5	5	5	5	5
18	4	4	4	4	4	4	4	4	4	4	4	4	4	4
22	5	5	5	5	5	5	5	5	5	5	5	5	5	5
18	4	4	4	4	4	4	4	4	4	4	4	4	4	4
22	4	4	4	4	4	4	4	4	4	4	4	4	4	4
18	4	4	4	4	4	4	4	4	4	4	4	4	4	4
22	5	5	5	5	5	5	5	5	5	5	5	5	5	5
18	4	4	4	4	4	4	4	4	4	4	4	4	4	4
12	3	3	3	3	3	3	3	3	3	3	3	3	3	3
6	2	2	2	2	2	2	2	2	2	2	2	2	2	2
22	5	5	5	5	5	5	5	5	5	5	5	5	5	5
18	5	5	5	5	5	5	5	5	5	5	5	5	5	5
20	5	5	5	5	5	5	5	5	5	5	5	5	5	5
14	5	5	5	5	5	5	5	5	5	5	5	5	5	5
28	4	4	4	4	4	4	4	4	4	4	4	4	4	4
22	3	3	3	3	3	3	3	3	3	3	3	3	3	3
20	3	3	3	3	3	3	3	3	3	3	3	3	3	3
18	3	3	3	3	3	3	3	3	3	3	3	3	3	3
12	3	3	3	3	3	3	3	3	3	3	3	3	3	3
18	4	4	4	4	4	4	4	4	4	4	4	4	4	4

Vc m/min	İlerleme hız- kodları	
28	5	5
22	4	4
28	5	5
22	4	4
28	4	4
22	4	4
16	3	3
28	5	5
12	3	3
8	2	2
28	5	5
22	5	5
25	5	5
18	5	5
6	1	1
70	6	6
70	6	6
55	6	6
45	5	5
70	5	5
28	4	4
36	4	4
28	3	3
25	3	3
22	3	3
18	3	3
15	3	3
22	4	4

**GÜHRING**NAVIGATOR

Kalın harf baskılı ilerleme kod no.lı olan takımrları tercih ediniz.

ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No.

Standart/DIN

Kesici tak. malz.

HM Uygul. grubu

Kaplama tipi

Tip

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/U)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	2,000	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

kesme yönü

Ⓜ sağ kesmeli

Ⓜ sol kesmeli

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	<b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2) <b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	<b>1.0718</b> 11SMnPB30 (9SMnPB28), <b>1.0736</b> 11SMn37 (9SMn36) <b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30) <b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45) <b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4 <b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6 <b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1000 ≤1400		●
nitasyon çelikleri	<b>1.8504</b> 34CrAl6 <b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1000 ≤1400		○
takım çelikleri	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9 <b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		●
yay çelikleri	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtlü ostenitli martenzitli	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9 <b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A) <b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤900 ≤1100 ≤1500		●
demir döküm	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20) <b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35) <b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35) <b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000) <b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	<b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2 <b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		●
Alüminyum ve Al alaşımları	<b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		○
Al-dövme alaşımları	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		○
> % 10 Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnezyum alaşımları	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5Zn1Pb	≤500		○
pirinç, kısa talaşlı	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		○
uzun talaşlı	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5	≤600		○
bronz, kısa talaşlı	<b>2.1090</b> CuSn7Zn1Pb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn <b>2.0790</b> CuNi18Zn19Pb	≤600 ≤850		○
bronz, uzun talaşlı	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10 <b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤850 ≤1000		○
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○



≤10xD Delik derinliği

311	317	357	336	623	617
339	340	341	340	341	340
HSCO	HSCO	HSCO	HSCO	HSCO	HSCO

N	N	N	GT 100	GT 100	Ti
330	353	480	355	481	358

669
340
HSCO

Ti
360

396
340
HSCO

GT 100
357

706
WN
KSM
K10/K20

N
362



V <sub>c</sub> m/min	İlerleme hız-kodları						V <sub>c</sub> m/min	İlerleme hız-kodları	V <sub>c</sub> m/min	İlerleme hız-kodları	V <sub>c</sub> m/min	İlerleme hız-kodları	
33	5	5	5	5	5	5			36	5			
27	5	5	5	5	5	5			30	4			
36	5	5	5	5	5	5			40	5			
32	5	5	5	5	5	5			36	5			
36	5	5	5	5	5	5			40	5			
36	5	5	5	5	5	5			40	5			
22	4	4	4	4	4	4			26	4			
18	4	4	4	4	4	4			18	4			
14	3	3	3	3	3	3	3		15	3			
32	5	5	5	5	5	5		15	3				
18	4	4	4	4	4	4			20	4			
13	3	3	3	3	3	3		13	3				
14	4	4	4	4	4	4			18	4			
10	3	3	3	3	3	3		10	3				
13	4	4	4	4	4	4			15	4			
10	3	3	3	3	3	3		10	3				
12	3	3	3	3	3	3		10	3				
6	2	2	2	2	2	2		8	2				
4				1	1	1			5	1			
12	4	4	4	4	4	4	4	15	4	14	4		
8	3	3	3	2	2	2	3	10	3	10	3		
10	3	3	3	3	3	3	3	13	3	12	3		
32	6	6	6	6	6	6			35	6			
27	6	6	6	6	6	6			30	6			
26	6	6	6	6	6	6			30	6			
24	6	6	6	6	6	6			26	6			
6	3	3	3	3	3	3	3	6	3	12	3		
5	1	1	1				1	6	1				
8							2	10	2				
5							2	6	2				
70				7	7					77	7		
60				6	6					66	6		
60							5						
36	5	5	5	5	5					40	6		
54				5	5								
36	5	5	5	5	5					40	6		
30	4	4	4	4	5	5							
24	4	4	4	4	5	5							
18	4	4	4	4	4	4				21	5		
13	4	4	4	4	4	4	4	25	4	15	5		
16	4	4	4	4	4	4				30	5	50	4
26							4					40	3
												80	3



## GÜHRING NAVIGATOR

Kalın harf baskılı ilerleme kod no.lı olan takım ları tercih ediniz.

ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No.

Standart/DIN

Kesici tak. malz.

Kaplama tipi

Tip

Soğutma

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/U)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

kesme yönü





Ⓜ sağ kesmeli


Ⓛ sol kesmeli




malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
nitasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		●
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtlü ostenitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤900 ≤1100		●
paslanmaz çelikler, kükürtlü martenzitli	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		●
Alüminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> % 10 Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn1Pb	≤500		○
pirinç, kısa talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
uzun talaşlı	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
bronz, kısa talaşlı	2.1090 CuSn7Zn1Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
uzun talaşlı	2.0790 CuNi18Zn19Pb	≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○






>10xD Delik derinliği

618	619	620	621
1869 R1	1869 R2	1870 R1	1870 R2
HSCO	HSCO	HSCO	HSCO
			
GT 100	GT 100	GT 100	GT 100
olmadan	olmadan	olmadan	olmadan
370	376	486	490

571
1869 R3
HSCO

GT 100
olmadan
380

370	371	372
WN	WN	WN
HSCO	HSCO	HSCO
		
GT 100	GT 100	GT 100
ile	ile	ile
505	506	507

374	375	376
WN	WN	WN
HSCO	HSCO	HSCO
		
GT 100	GT 100	GT 100
ile	ile	ile
508	509	510



Vc m/min	İlerleme hız- kodları			
30	4	4	4	4
25	4	4	4	4
33	4	4	4	4
30	4	4	4	4
33	4	4	4	4
33	4	4	4	4
20	3	3	3	3
14	3	3	3	3
10	2	2	2	2
29	4	4	4	4
14	3	3	3	3
10	2	2	2	2
10	3	3	3	3
8	2	2	2	2
11	3	3	3	3
8	2	2	2	2
8	2	2	2	2
5	1	1	1	1
3	1	1	1	1
10	3	3	3	3
8	2	2	2	2
10	2	2	2	2
20	5	5	5	5
16	5	5	5	5
5	2	2	2	2
5	1	1	1	1
6	1	1	1	1
5	1	1	1	1
50	6	6	6	6
40	5	5	5	5
30	4	4	4	4
45	4	4	4	4
30	4	4	4	4
25	4	4	4	4
20	4	4	4	4
16	3	3	3	3
10	3	3	3	3
14	3	3	3	3
20	3	3	3	3

Vc m/min	İlerleme hız-kodları
30	4
25	4
33	4
30	4
33	4
33	4
20	3
14	3
10	2
29	4
14	3
10	2
10	3
8	2
11	3
8	2
8	2
5	1
3	1
10	3
8	2
10	2
20	5
16	5
5	2
5	1
6	1
5	1
50	6
40	5
30	4
45	4
30	4
25	4
20	4
16	3
10	3
14	3
20	3

Vc m/min	İlerleme hız- kodları		
35	6	6	6
30	5	5	5
30	6	6	6
30	5	5	5
35	5	5	5
29	5	5	5
22	4	4	4
18	4	4	4
14	3	3	3
35	6	6	6
18	4	4	4
14	3	3	3
14	4	4	4
12	3	3	3
15	4	4	4
11	3	3	3
11	3	3	3
8	2	2	2
4	2	2	2
14	4	4	4
10	3	3	3
12	3	3	3
30	6	6	6
24	6	6	6
24	6	6	6
20	6	6	6
8	3	3	3
8	1	1	1
10	2	2	2
8	2	2	2
60	7	7	7
50	6	6	6
38	5	5	5
55	5	5	5
36	5	5	5
24	4	4	4
20	4	4	4
14	4	4	4
25	5	5	5

Vc m/min	İlerleme hız- kodları		
30	5	5	5
25	4	4	4
30	5	5	5
25	4	4	4
30	4	4	4
25	4	4	4
18	3	3	3
16	3	3	3
12	2	2	2
30	5	5	5
16	3	3	3
12	2	2	2
12	3	3	3
10	2	2	2
13	3	3	3
9	2	2	2
9	2	2	2
6	2	2	2
4	1	1	1
12	3	3	3
8	2	2	2
12	2	2	2
28	5	5	5
22	5	5	5
22	5	5	5
18	5	5	5
6	2	2	2
6	1	1	1
8	2	2	2
6	2	2	2
55	6	6	6
44	5	5	5
35	4	4	4
50	4	4	4
33	4	4	4
22	4	4	4
18	4	4	4
12	4	4	4
25	4	4	4

**GÜHRING NAVIGATOR**

Kalın harf baskılı ilerleme kod no.lı olan takımları tercih ediniz.

ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No.

Ürün-No.

Standart/DIN

Kesici tak. malz.

HM Uygul. grubu

Kaplama tipi

Tip

Soğutma

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/dev)								
0,10	0,002	0,003	0,003	0,004	0,006	0,007	0,010	0,013	0,016
0,16	0,002	0,003	0,004	0,005	0,007	0,009	0,012	0,016	0,022
0,25	0,003	0,004	0,005	0,007	0,009	0,011	0,014	0,019	0,024
0,30	0,004	0,005	0,007	0,009	0,011	0,015	0,019	0,025	0,033
0,50	0,005	0,007	0,008	0,011	0,014	0,019	0,024	0,031	0,041
0,63	0,007	0,009	0,012	0,015	0,020	0,026	0,034	0,044	0,057
0,80	0,010	0,013	0,016	0,020	0,024	0,031	0,038	0,048	0,060
1,00	0,020	0,024	0,029	0,035	0,041	0,050	0,060	0,072	0,086
1,50	0,030	0,035	0,040	0,046	0,052	0,060	0,069	0,080	0,092
2,00	0,040	0,046	0,053	0,061	0,070	0,080	0,093	0,106	0,122

matkap-Ø mm	ilerleme hız kodları ürün-No. 6400/6401/6408/6412												
	56	57	58	59	60	61	62	63	64	65	66	67	68
	f (mm/dev)												
0,50	0,006	0,012	0,018	0,022	0,030	0,035	0,040	0,045	0,050	0,050	0,055	0,060	0,060
0,80	0,008	0,016	0,024	0,032	0,040	0,050	0,060	0,070	0,080	0,080	0,080	0,090	0,090
1,00	0,012	0,022	0,032	0,042	0,060	0,070	0,080	0,090	0,100	0,100	0,110	0,110	0,120
1,50	0,021	0,036	0,051	0,066	0,090	0,100	0,120	0,130	0,150	0,150	0,160	0,170	0,180
2,00	0,032	0,052	0,072	0,092	0,120	0,140	0,160	0,180	0,200	0,210	0,220	0,230	0,240
2,50	0,045	0,070	0,095	0,120	0,150	0,170	0,200	0,220	0,250	0,260	0,270	0,280	0,300
3,00	0,060	0,090	0,120	0,150	0,180	0,210	0,240	0,270	0,300	0,310	0,330	0,340	0,360

malzemeye uyumlu soğutma sıvısı:

● emülsiyon

● yağ

● hava

kesme yönü

sağ kesmeli

sol kesmeli

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	<b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2) <b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤500 ≤1000		●
otomat çelikleri	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36) <b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤850 ≤1000		●
alaşimsız ıslah çelikleri	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30) <b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45) <b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤700 ≤850 ≤1000		●
alaşimli ıslah çelikleri	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4 <b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1000 ≤1400		●
alaşimsız sementasyon çelikleri	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		●
alaşimli sementasyon çelikleri	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6 <b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1000 ≤1400		●
nitasyon çelikleri	<b>1.8504</b> 34CrAl6 <b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1000 ≤1400		●
takım çelikleri	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9 <b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤850 ≤1400		●
yüksek hız çelikleri	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		●
yay çelikleri	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtü ostenitli	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9 <b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤900 ≤1100		●
paslanmaz çelikler, kükürtü martenzitli	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		●
demir döküm	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20) <b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤240 HB ≤350 HB	●
sfero ve temper döküm	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35) <b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	●
sert döküm demir	-		≤350 HB	●
GGV yeni döküm malzemesi	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35) <b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤220 HB ≤300 HB	●
ADI yeni döküm malzemesi	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000) <b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1000 ≤1400		●
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	<b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2 <b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		●
Alüminyum ve Al alaşımları	<b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		●
Al-dövme alaşımları	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5	≤650		●
Al-döküm alaşımları < % 10 Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		●
> % 10 Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		●
Magnezyum alaşımları	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		●
bakır, düşük alaşimli	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5Zn1Pb	≤500		●
pirinç, kısa talaşlı	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		●
uzun talaşlı	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5	≤600		●
bronz, kısa talaşlı	<b>2.1090</b> CuSn7Zn1Pb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn <b>2.0790</b> CuNi18Zn19Pb	≤600 ≤850		●
bronz, uzun talaşlı	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10 <b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤850 ≤1000		●
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		●
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		●
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		●
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		●



≤4xD ≤7xD

≤5xD ≤8xD ≤15xD

301
303
1899
HSS-E-PM
○
N
-siz
649/654

660
1899
HSS-E-PM
Ⓢ
N
-siz
652

701
WN
KSM
K10/K20
○
N
-siz
656

3899
WN
KSM
K/P
Ⓐ
N
-siz
657

6400	6401
WN	WN
KSM	KSM
K/P	K/P
Ⓐ	Ⓐ
N	N
-siz	-siz
108/659	109/660

6405	6408	6412
WN	WN	WN
KSM	KSM	KSM
K/P	K/P	K/P
Ⓐ	Ⓐ	Ⓐ
N	N	N
ile	ile	ile
110/661	111/662	112/663



Vc m/min	İlerleme hız- kodları	Vc m/min	İlerleme hız- kodları	Vc m/min	İlerleme hız- kodları	Vc m/min	İlerleme hız- kodları	Vc m/min	İlerleme hız- kodları	Vc m/min	İlerleme hız- kodları			
21	106	27	106	50	105	100	62	100	64	62	105	62	58	58
18	105	23	105	35	104	100	62	100	64	62	100	62	58	58
18	106	23	106	50	105	100	62	100	64	62	105	62	59	59
16	105	21	105	45	104	90	61	90	63	61	90	61	59	59
20	105	26	105	45	104	90	62	90	64	62	95	62	58	58
18	105	23	105	35	104	90	62	90	64	62	95	62	58	58
14	104	18	104	30	103	90	61	90	63	61	90	61	58	58
14	104	18	104	30	103	90	61	90	63	61	90	61	58	58
12	103	16	103	70	60	70	60	70	62	60	70	60	58	58
18	106	23	106	50	103	100	61	100	63	61	100	61	57	57
14	104	18	104	40	103	85	61	85	63	61	85	61	58	58
12	103	16	103	70	60	70	60	70	62	60	70	60	58	58
14	104	18	104	25	103	70	60	70	62	60	70	60	57	57
12	103	16	103	60	60	60	60	60	62	60	60	60	57	57
16	104	20	104	25	103	50	60	50	62	60	50	60	58	58
14	103	18	103	60	60	60	60	60	62	60	50	60	58	58
14	103	18	103					60	57	57	50	57	57	57
8	102	10	102	20	102			60	57	57	50	57	57	57
				15	104									
18	104	20	104	25	103			30	57	57	70	57	57	57
14	103	16	103	25	102			15	56	56	60	56	56	56
16	103	18	103	25	102			30	57	57	70	57	57	57
26	106	33	106	80	105	130	66	130	68	66	150	60	60	60
22	106	28	106	60	105	130	66	130	68	66	140	60	60	60
18	106	23	106	60	105	130	66	130	68	66	140	60	60	60
22	106	28	106	50	105	120	65	120	67	65	130	60	60	60
				15	103			10	56	56	25	56	56	56
				45	104			15	56	56	35	56	56	56
				25	104			15	56	56	35	56	56	56
				160	107			70	68	68	70	68	68	68
				150	106			70	68	68	70	68	68	68
26	107			100	106			135	59	59	135	59	59	59
18	106			60	106			135	59	59	135	59	59	59
75	106	80	106	150	105									
42	105	53	105	50	105									
				67	106									
22	105	28	105	44	104									
22	104	28	104	68	103									
18	104	23	104	49	103									
13	104	16	104	53	103									
		14	104	36	103									
16	104	20	104	50	103									
18	104	23	104	36	103									
				60	104									

Navigator

**GÜHRING NAVIGATOR NC spor deliciler**

Kalın harf baskılı ilerleme kod no.lı olan takımları tercih ediniz.

ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No.

Standart/DIN

Kesici tak. malz.

Kaplama tipi

Tip

uç açısı °

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/U)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

kesme yönü

Ⓜ sağ kesmeli

Ⓛ sol kesmeli

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm²	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		○
nitasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		○
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		○
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	○
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	○
paslanmaz çelikler, kükürtlü ostenitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤900 ≤1100		○
paslanmaz çelikler, kükürtlü martenzitli	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		○
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		○
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		○
Aluminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> % 10 Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		○
pirinç, kısa talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
uzun talaşlı	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
bronz, kısa talaşlı	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
uzun talaşlı	2.0790 CuNi18Zn19Pb	≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○





557	556	559
WN		
HSS		
○	○	○
N	N	N
90	120	90
696	702	700

568	567
WN	
HSS	
Ⓢ	Ⓢ
N	N
90	120
697	703

1136	1134
WN	
HSCO	
○	○
N	N
90	120
698	704

1133	1135
WN	
HSCO	
Ⓢ	Ⓢ
N	N
90	120
699	705



V <sub>c</sub> m/min	İlerleme hız-kodları		
30	6	6	6
25	5	5	5
32	6	6	6
30	5	5	5
25	5	5	5
25	5	5	5
20	4	4	4
15	4	4	4
12	3	3	3
30	6	6	6
15	4	4	4
8	3	3	3
16	4	4	4
10	3	3	3
6	3	3	3
8	3	3	3
30	6	6	6
30	6	6	6
25	6	6	6
20	6	6	6
70	7	7	7
70	7	7	7
50	7	7	7
50	6	6	6
70	6	6	6
60	5	5	5
60	5	5	5
40	5	5	5
30	4	4	4
25	4	4	4
15	4	4	4
12	4	4	4
18	4	4	4
28	5	5	5

V <sub>c</sub> m/min	İlerleme hız-kodları	
32	6	6
26	5	5
35	6	6
33	5	5
28	5	5
28	5	5
25	4	4
22	4	4
17	3	3
33	6	6
20	4	4
12	3	3
14	4	4
18	4	4
12	3	3
8	3	3
10	3	3
8	3	3
10	3	3
33	6	6
33	6	6
28	6	6
22	6	6
60	6	6
80	6	6
65	5	5
70	5	5
45	5	5
33	4	4
27	4	4
16	4	4
15	4	4
22	4	4
36	5	5

V <sub>c</sub> m/min	İlerleme hız-kodları	
35	6	6
30	5	5
40	5	5
40	5	5
35	5	5
35	5	5
30	4	4
22	4	4
17	3	3
33	6	6
20	4	4
15	3	3
14	4	4
12	3	3
18	4	4
12	3	3
8	3	3
8	2	2
12	3	3
10	3	3
10	3	3
33	6	6
33	6	6
30	6	6
25	6	6
6	1	1
8	2	2
6	2	2
80	7	7
80	7	7
60	7	7
60	6	6
70	6	6
65	5	5
70	5	5
45	5	5
35	4	4
33	4	4
20	4	4
15	4	4
22	4	4
36	5	5

V <sub>c</sub> m/min	İlerleme hız-kodları	
42	6	6
36	5	5
48	6	6
42	6	6
44	6	6
44	6	6
40	5	5
27	4	4
22	3	3
37	6	6
22	4	4
18	3	3
19	4	4
15	3	3
21	4	4
16	3	3
12	3	3
10	2	2
18	3	3
15	3	3
12	3	3
38	6	6
35	6	6
33	6	6
28	6	6
7	1	1
10	2	2
8	2	2
85	7	7
65	7	7
65	6	6
80	6	6
70	5	5
75	5	5
50	5	5
45	5	5
40	4	4
25	4	4
20	4	4
25	4	4
40	4	4

Navigator

**GÜHRING NAVIGATOR Geniştirletici**

Kalın harf baskılı ilerleme kod no.lı olan takımları tercih ediniz.

ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No. (R)

Standart/DIN

Kesici tak. malz.

Kaplama tipi

Tip

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/U)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

kesme yönü

Ⓜ sağ kesmeli

Ⓜ sol kesmeli

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPB30 (9SMnPB28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
nitasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		○
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtlü ostenitli martenzitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤900 ≤1100 ≤1500		●
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		○
Alüminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> % 10 Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPB	≤500		○
pirinç, kısa talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
uzun talaşlı	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
bronz, kısa talaşlı	2.1090 CuSn7ZnPB, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
uzun talaşlı	2.0790 CuNi18Zn19Pb	≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○



533	534	555
DIN 344	DIN 343	DIN 1864
HSS		
N	N	N
737	740	743

634	635
DIN 343	DIN 1864
HSCO	
N	N
742	744



V <sub>c</sub> m/min	İlerleme hız- kodları		
27	4	4	4
20	4	4	4
28	4	4	4
25	4	4	4
22	4	4	4
20	4	4	4
18	3	3	3
15	4	4	4
8	3	3	3
23	5	5	5
15	4	4	4
8	3	3	3
10	4	4	4
8	3	3	3
10	3	3	3
6	3	3	3
6	3	3	3
5	2	2	2
8	2	2	2
6	2	2	2
5	2	2	2
20	6	6	6
20	5	5	5
18	6	6	6
16	5	5	5
3	1	1	1
5	2	2	2
4	2	2	2
60	7	7	7
60	7	7	7
36	6	6	6
36	6	6	6
40	6	6	6
50	5	5	5
50	5	5	5
30	5	5	5
30	4	4	4
25	4	4	4
15	4	4	4
15	4	4	4
15	4	4	4
25	5	5	5

V <sub>c</sub> m/min	İlerleme hız- kodları	
30	4	4
25	4	4
32	4	4
30	4	4
25	4	4
22	4	4
20	3	3
17	4	4
10	3	3
25	5	5
17	4	4
10	3	3
13	4	4
10	3	3
13	3	3
8	3	3
8	3	3
6	2	2
10	2	2
8	2	2
6	2	2
25	6	6
25	5	5
20	6	6
18	5	5
4	1	1
6	2	2
5	2	2
70	7	7
70	7	7
40	6	6
40	6	6
50	6	6
55	5	5
55	5	5
35	5	5
35	4	4
30	4	4
20	4	4
18	4	4
20	4	4
30	5	5

**GÜHRING** NAVIGATOR Punta matkab ucu

Kalın harf baskılı ilerleme kod no.lı olan takımları tercih ediniz.

ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No.

Standart/DIN

Kesici tak. malz.

Kaplama tipi

Tip

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/U)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

kesme yönü

Ⓜ sağ kesmeli

Ⓜ sol kesmeli

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	<b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2) <b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36) <b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30) <b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45) <b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4 <b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6 <b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1000 ≤1400		●
nitrasyon çelikleri	<b>1.8504</b> 34CrAl6 <b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1000 ≤1400		○
takım çelikleri	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9 <b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		●
yay çelikleri	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtlü ostenitli martenzitli	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9 <b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A) <b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤900 ≤1100 ≤1500		●
demir döküm	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20) <b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35) <b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35) <b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000) <b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	<b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2 <b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		○
Aluminyum ve Al alaşımları	<b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		○
Al-dövme alaşımları	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		○
> % 10 Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnezyum alaşımları	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5Zn1Pb	≤500		○
pirinç, kısa talaşlı	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		○
uzun talaşlı	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5	≤600		○
bronz, kısa talaşlı	<b>2.1090</b> CuSn7Zn1Pb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn	≤600		○
uzun talaşlı	<b>2.0790</b> CuNi18Zn19Pb	≤850		○
bronz, uzun talaşlı	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10 <b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤850 ≤1000		○
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○



581	583	585	280	292	587	588
DIN 333			WN	BS 328	DIN 333	
HSS						
○	○	○	○	○	○	○
A	R	B	B	A	A	R
668	672	675	689	680	690	691

613	614
DIN 333	
HSS	
Ⓢ	Ⓢ
A	R
669	673

381
DIN 333
HSCO
○
A
682



V <sub>c</sub> m/min	İlerleme hız-kodları						
30	4	4	4	4	4	4	4
25	4	4	4	4	4	4	4
30	4	4	4	4	4	4	4
30	4	4	4	4	4	4	4
25	4	4	4	4	4	4	4
20	4	4	4	4	4	4	4
20	3	3	3	3	3	3	3
15	4	4	4	4	4	4	4
8	3	3	3	3	3	3	3
25	5	5	5	5	5	5	5
15	4	4	4	4	4	4	4
8	3	3	3	3	3	3	3
10	4	4	4	4	4	4	4
8	3	3	3	3	3	3	3
10	3	3	3	3	3	3	3
6	3	3	3	3	3	3	3
6	3	3	3	3	3	3	3
5	2	2	2	2	2	2	2
10	3	3	3	3	3	3	3
8	3	3	3	3	3	3	3
6	3	3	3	3	3	3	3
20	6	6	6	6	6	6	6
20	5	5	5	5	5	5	5
25	6	6	6	6	6	6	6
20	5	5	5	5	5	5	5
3	1	1	1	1	1	1	1
5	2	2	2	2	2	2	2
4	2	2	2	2	2	2	2
70	7	7	7	7	7	7	7
70	7	7	7	7	7	7	7
40	6	6	6	6	6	6	6
40	6	6	6	6	6	6	6
60	6	6	6	6	6	6	6
50	5	5	5	5	5	5	5
60	5	5	5	5	5	5	5
40	5	5	5	5	5	5	5
30	4	4	4	4	4	4	4
25	4	4	4	4	4	4	4
15	4	4	4	4	4	4	4
15	4	4	4	4	4	4	4
15	4	4	4	4	4	4	4
25	5	5	5	5	5	5	5

V <sub>c</sub> m/min	İlerleme hız-kodları		V <sub>c</sub> m/min	İlerleme hız-kodları
35	4	4	35	4
30	4	4	30	4
35	4	4	35	4
35	4	4	35	4
30	4	4	30	4
25	4	4	25	4
22	3	3	22	3
17	4	4	17	4
10	3	3	10	3
30	5	5	30	5
18	4	4	18	4
10	3	3	10	3
13	4	4	13	4
10	3	3	10	3
13	3	3	13	3
8	3	3	8	3
8	3	3	8	3
8	2	2	8	2
15	3	3	15	3
10	3	3	10	3
8	3	3	8	3
25	6	6	25	6
25	5	5	25	5
30	6	6	30	6
25	5	5	25	5
6	1	1	6	1
6	2	2	6	2
5	2	2	5	2
50	6	6	50	6
70	6	6	70	6
60	5	5	60	5
70	5	5	70	5
45	5	5	45	5
35	4	4	35	4
30	4	4	30	4
20	4	4	20	4
18	4	4	18	4
20	4	4	20	4
30	5	5	30	5

Navigator

**GÜHRING NAVIGATOR Kademeli matkap ucu/Silindirik saplı kademeli matkap uçları, kısa**

Kalın harf baskılı ilerleme kod no.lu olan takımları tercih ediniz.

ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-No. (R)

Standart/DIN

Kesici tak. malz.

Kaplama tipi

Tip

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/U)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	2,000	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

kesme yönü

Ⓜ sağ kesmeli

Ⓛ sol kesmeli

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm²	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPB30 (9SMnPB28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
nitasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		○
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	●
paslanmaz çelikler, kükürtlü ostenitli martenzitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤900 ≤1100 ≤1500		●
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		○
Alüminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> % 10 Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		○
pirinç, kısa talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
uzun talaşlı	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
bronz, kısa talaşlı	2.1090 CuSn7Zn19Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
uzun talaşlı	2.0790 CuNi18Zn19Pb	≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○



274	574	575	576
WN			
HSS			
●	●	●	●
N	N	N	N
714	715	716	717

378	1147	379	380
WN			
HSS			
○	○	○	○
N	N	N	N
718	719	720	721



V <sub>c</sub> m/min	İlerleme hız- kodları			
30	4	4	4	4
25	4	4	4	4
30	4	4	4	4
30	4	4	4	4
25	4	4	4	4
20	4	4	4	4
20	3	3	3	3
15	4	4	4	4
8	3	3	3	3
25	5	5	5	5
15	4	4	4	4
8	3	3	3	3
10	4	4	4	4
8	3	3	3	3
10	3	3	3	3
6	3	3	3	3
6	3	3	3	3
5	2	2	2	2
8	2	2	2	2
6	2	2	2	2
5	2	2	2	2
20	6	6	6	6
20	5	5	5	5
25	6	6	6	6
20	5	5	5	5
3	1	1	1	1
5	2	2	2	2
4	2	2	2	2
60	7	7	7	7
60	7	7	7	7
40	6	6	6	6
40	6	6	6	6
40	6	6	6	6
50	5	5	5	5
60	5	5	5	5
40	5	5	5	5
30	4	4	4	4
25	4	4	4	4
15	4	4	4	4
15	4	4	4	4
15	4	4	4	4
25	5	5	5	5

V <sub>c</sub> m/min	İlerleme hız- kodları			
30	4	4	4	4
25	4	4	4	4
30	4	4	4	4
30	4	4	4	4
25	4	4	4	4
20	4	4	4	4
20	3	3	3	3
15	4	4	4	4
8	3	3	3	3
25	5	5	5	5
15	4	4	4	4
8	3	3	3	3
10	4	4	4	4
8	3	3	3	3
10	3	3	3	3
6	3	3	3	3
6	3	3	3	3
5	2	2	2	2
8	2	2	2	2
6	2	2	2	2
5	2	2	2	2
20	6	6	6	6
20	5	5	5	5
25	6	6	6	6
20	5	5	5	5
3	1	1	1	1
5	2	2	2	2
4	2	2	2	2
60	7	7	7	7
60	7	7	7	7
40	6	6	6	6
40	6	6	6	6
40	6	6	6	6
50	5	5	5	5
60	5	5	5	5
40	5	5	5	5
30	4	4	4	4
25	4	4	4	4
15	4	4	4	4
15	4	4	4	4
15	4	4	4	4
25	5	5	5	5

**GÜHRING NAVIGATOR Çift fasetli, kademeli helisel matkap uçları**

Kalın harf baskılı ilerleme kod no.lu olan takımları tercih ediniz.

ideal takım seçimi ve kesme değerleri tavsiyemiz için [www.guehring.de](http://www.guehring.de) adresinde Gühring Navigator'un elektronik versiyonu bulunmaktadır.

Ürün-NO. (R)

Standart/DIN

Kesici tak. malz.

Kaplama tipi

Tip

Program sayfası

matkap-Ø mm	ilerleme hız kodları								
	1	2	3	4	5	6	7	8	9
	f (mm/U)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	2,000	2,000

malzemeye uyumlu soğutma sıvısı:

○ emülsiyon

● yağ

● hava

kesme yönü

Ⓜ sağ kesmeli

Ⓛ sol kesmeli

malzeme grupları	malzeme örnekleri DIN.EN.'ye göre kalın basılı rakamlar=malzeme-no.	çekme mukavemeti N/mm <sup>2</sup>	sertlik	soğut. sıvısı
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
otomat çelikleri	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
alaşimli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
alaşimli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		○
nitasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		○
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		○
yay çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	○
sertleştirilmiş çelikler	-		≤48 HRC ≤66 HRC	○
paslanmaz çelikler, kükürtlü ostenitli	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤900 ≤1100		○
paslanmaz çelikler, kükürtlü martenzitli	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		○
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
sert döküm demir	-		≤350 HB	○
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000		○
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		○
Alüminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al-dövme alaşımları	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al-döküm alaşımları < % 10 Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> % 10 Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
bakır, düşük alaşimli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		○
pirinç, kısa talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
uzun talaşlı	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
bronz, kısa talaşlı	2.1090 CuSn7Zn19Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
uzun talaşlı	2.0790 CuNi18Zn19Pb	≤850		○
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
plastikler, duroplastik	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplastik	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
plastikler, aramit elyaf takviyeli	Kevlar	≤1000		○
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000		○





536	569	636	638	538	514	540	637	537	639	539	520	541	
DIN 8374		WN		DIN 8376		WN		DIN 8378		WN		DIN 8377	
HSS													
●	●	●	●	●	●	●	●	●	●	●	●	●	
N	N	N	N	N	N	N	N	N	N	N	N	N	
722	723	724	725	726	728	729	731	732	733	734	735	736	



V <sub>c</sub> m/min	İlerleme hız- kodları												
30	4	4	4	4	4	4	4	4	4	4	4	4	4
25	4	4	4	4	4	4	4	4	4	4	4	4	4
30	4	4	4	4	4	4	4	4	4	4	4	4	4
30	4	4	4	4	4	4	4	4	4	4	4	4	4
25	4	4	4	4	4	4	4	4	4	4	4	4	4
20	4	4	4	4	4	4	4	4	4	4	4	4	4
20	3	3	3	3	3	3	3	3	3	3	3	3	3
15	4	4	4	4	4	4	4	4	4	4	4	4	4
8	3	3	3	3	3	3	3	3	3	3	3	3	3
25	5	5	5	5	5	5	5	5	5	5	5	5	5
15	4	4	4	4	4	4	4	4	4	4	4	4	4
8	3	3	3	3	3	3	3	3	3	3	3	3	3
10	4	4	4	4	4	4	4	4	4	4	4	4	4
8	3	3	3	3	3	3	3	3	3	3	3	3	3
10	3	3	3	3	3	3	3	3	3	3	3	3	3
6	3	3	3	3	3	3	3	3	3	3	3	3	3
6	3	3	3	3	3	3	3	3	3	3	3	3	3
5	2	2	2	2	2	2	2	2	2	2	2	2	2
8	2	2	2	2	2	2	2	2	2	2	2	2	2
6	2	2	2	2	2	2	2	2	2	2	2	2	2
5	2	2	2	2	2	2	2	2	2	2	2	2	2
20	6	6	6	6	6	6	6	6	6	6	6	6	6
20	5	5	5	5	5	5	5	5	5	5	5	5	5
25	6	6	6	6	6	6	6	6	6	6	6	6	6
20	5	5	5	5	5	5	5	5	5	5	5	5	5
3	1	1	1	1	1	1	1	1	1	1	1	1	1
5	2	2	2	2	2	2	2	2	2	2	2	2	2
4	2	2	2	2	2	2	2	2	2	2	2	2	2
60	7	7	7	7	7	7	7	7	7	7	7	7	7
60	7	7	7	7	7	7	7	7	7	7	7	7	7
40	6	6	6	6	6	6	6	6	6	6	6	6	6
40	6	6	6	6	6	6	6	6	6	6	6	6	6
40	6	6	6	6	6	6	6	6	6	6	6	6	6
50	5	5	5	5	5	5	5	5	5	5	5	5	5
60	5	5	5	5	5	5	5	5	5	5	5	5	5
40	5	5	5	5	5	5	5	5	5	5	5	5	5
30	4	4	4	4	4	4	4	4	4	4	4	4	4
25	4	4	4	4	4	4	4	4	4	4	4	4	4
15	4	4	4	4	4	4	4	4	4	4	4	4	4
15	4	4	4	4	4	4	4	4	4	4	4	4	4
15	4	4	4	4	4	4	4	4	4	4	4	4	4
25	5	5	5	5	5	5	5	5	5	5	5	5	5

Matkap-Ø mm	ilerleme hız kodu							
	11	12	13	14	15	16	17	18
	f (mm/dev.)							
1,50	0,002	0,004	0,006	0,008	0,012	0,020	0,032	0,045
2,00	0,003	0,005	0,007	0,010	0,016	0,028	0,046	0,055
2,50	0,004	0,006	0,008	0,012	0,018	0,030	0,054	0,070
4,00	0,005	0,007	0,010	0,016	0,025	0,043	0,065	0,085
6,00	0,007	0,009	0,013	0,024	0,035	0,061	0,085	0,120
8,00	0,010	0,014	0,022	0,032	0,045	0,068	0,100	0,150
10,00	0,012	0,016	0,028	0,040	0,055	0,075	0,120	0,160
14,00	0,020	0,025	0,035	0,050	0,065	0,085	0,130	0,180
18,00	0,025	0,030	0,040	0,055	0,070	0,095	0,145	0,200
20,00	0,026	0,035	0,045	0,060	0,080	0,110	0,180	0,250
24,00	0,027	0,036	0,047	0,065	0,085	0,130	0,185	0,300
28,00	0,028	0,038	0,049	0,068	0,090	0,140	0,195	0,350
30,00	0,030	0,040	0,050	0,070	0,100	0,150	0,200	0,400
35,00	0,035	0,045	0,055	0,075	0,120	0,180	0,250	0,450
40,00	0,040	0,050	0,060	0,080	0,150	0,200	0,300	0,500

\*ilerleme hızları takıma ve tavsiye edilen kaplama durumuna göre. Bazı durumlarda kaplamasız takım randimansız olabilir.



Tüm derin delik matkapları kılavuz burçlarla kullanılır. derin delik matkapları asla tam devir sayısıyla döndürülmemelidir. Tezgah içinde salınlı olarak hareket etmemelidir.

#### Tavsiyeler ve kısa yollar

- delik derinliği 40 x D üzerindeki durumlarda 2 veya daha fazla derin delik matkabı kullanmayı tavsiye ediyoruz örneğin: Ø 10 x 400 mm. ve 9,95 x 800 mm. z.B. Ø 10 x 400 mm und Ø 9,95 x 800mm.
- 40 x D üzerindeki delik derinliklerinde ön deliğe sol dönüşle girilmesi gerekmektedir.
- 40 x D' nin üstündeki takımların değişiminde takım yüksek basınçlı içten soğutma ile yaklaşık 1 saniye soğutulabilir.
- uzun talaşlı malzemelerin işlenmesinde kanalları polisajlı derin delik matkabının sipariş edilmesini tavsiye ederiz.
- Genel olarak emülsiyondaki yağ yüzdesi en az %10 olmalıdır.
- uzun talaşlı alüminyumun işlenmesinde kullanılacak tek ağızlı derin delik matkapları 180° bilemeli ve yağ kanallı olarak sipariş edilmelidir.
- Si-yüzdesi %1 den az olan alüminyum deliklerde tavsiye edilen kesme hızı  $V_c > 160$  m/dak ile çalışmak istenirse bu hıza bir kaç kademe çıkmanızı öneririz. Bunun dışında yaklaşık 3xD pilot delik delinmelidir.

#### Derin Delik delme işleminde uygulanacak adımlar

- Pilot deliğin delinmesi  
( $L = 1,5 \times D / \text{Alu } L \approx 3 \times D$ , Tolerans G9)
- Pilot delik içine girinceye kadar yaklaşık devir 200 dev./dak. İlerleme hızı ise 500 mm/dak. olmalıdır.
- Soğutma Sıvı basıncını ve Devir sayısını ayarlama
- Talaş boşaltma yapmadan kesintisiz ilerleme.  
Derin delik matkap ucu kullanımında boy-çap oranı çok büyük ise 25 mm derinliğe kadar olan deliklerde düşük kesme değerleri ile çalışmanızı tavsiye ederiz.  
(takribi optimal değerlerin % 75' kadar.)
- Delik derinliğine ulaşıncaya kesme yağını kapatın.
- İş mili durma konumunda takım hızla geri çekilir.

#### malzemeye uyumlu soğutma sıvısı

- emülsiyon
- yağ
- hava

## EB100

Tek ağızlı derin delik matkap ucu  
komple sert metal

0,9 ... 12,0



≤35xD

>35xD

malzeme grupları	Malzeme örnekleri DIN,EN,'ye göre kalın basılı rakamlar=malzeme-no.	çekme muka- sertlik vemeti N/mm <sup>2</sup>	soğut. sıvısı	önerilen kaplama tipi	≤35xD		>35xD	
					V <sub>c</sub> m/min	ilerleme kod no	V <sub>c</sub> m/min	ilerleme kod no
genel yapı çelikleri	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937	≤500 ≤1000	○		100 85	15 15	100 85	15 15
otomat çelikleri	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb2	≤850 ≤1000	○		90 80	15 15	90 80	15 15
alaşimsız ıslah çelikleri	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000	○		80 75 75	14 14 14	80 75 75	14 14 14
alaşımli ıslah çelikleri	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400	○	A	75 65	14 14	75 65	14 14
alaşimsız sementasyon çelikleri	1.0301 (C10), 1.1121 C10E (Ck10)	≤850	○	A	80	15	80	15
alaşımli sementasyon çelikleri	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400	○		75 65	14 14	75 65	14 14
nitasyon çelikleri	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400	○	A	75 65	14 14	75 65	14 14
takım çelikleri	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6	≤850 ≤1400	○	A	75 65	13 13	75 65	13 13
yüksek hız çelikleri	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400	○	A	55	12	55	12
yağ çelikleri	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)	≤350 HB	○	A	65	13	65	13
sertleştirilmiş çelikler	-	≤48 HRC ≤66 HRC	○		30 25	13 10	30 25	13 14
paslanmaz çelikler, kükürtlü ostenitli martenziti	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10 1.4057 X20CrNi172 (X17CrNi16-2), 1.4122	≤900 ≤1100 ≤1500	○	A	40 35 35	14 14 14	40 35 35	14 14 14
demir döküm	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)	≤240 HB ≤350 HB	○		85 80	16 16	85 85	16 16
Sfero ve temper döküm	0.7050 EN-GJS-500-7 (GGG50), 0.8035 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2	≤240 HB ≤350 HB	○		80 70	15 15	80 70	15 15
sert döküm demir	-	≤350 HB	○		55	14	55	14
GGV yeni döküm malzemesi	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6	≤220 HB ≤300 HB	○					
ADI yeni döküm malzemesi	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400	○					
özel alaşımlar	Nimonic, Inconel, Monel, Hastelloy	≤2000	○					
titanyum ve titanyum alaşımları	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5	≤2000 ≤1400	○	A	20 35 30	12 12 12	20 35 30	12 12 12
Alüminyum ve Al alaşımları	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1 3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si	≤400 ≤650	○		150 120	17 19	150 120	17 19
Al-dövme alaşımları	3.2131 G-AISI5Cu1, 3.2153 G-AISI7Cu3, 3.2573 G-AISI9	≤600	○		120	20	120	20
Al-döküm alaşımları < % 10 Si > % 10 Si	3.2581 G-AISI12, 3.2583 G-AISI12Cu, - G-AISI12CuNiMg	≤600	○		130	18	130	18
Magnezyum alaşımları	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05	≤400	○		110	17	110	17
bakır, düşük alaşımli	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500	○	A	75	15	75	15
pirinç, kısa talaşlı	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410	≤600	○		120	18	120	18
uzun talaşlı	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600	○		90	18	90	18
bronz, kısa talaşlı	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 2.0790 CuNi18Zn19Pb	≤600 ≤850	○		95 75	17 17	95 75	17 17
bronz, uzun talaşlı	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl1Ni, 2.1247 CuBe2	≤850 ≤1000	○		70 60	17 17	70 60	17 17
plastikler, duroplastik termoplastik	Bakelit, Resopal, Pertinax, Moltopren Plexiglas, Hostalen, Novodur, Makralon	≤150 ≤100	○		75 70	15 15	75 70	15 15
Plastikler, aramit elyaf takviyeli	Kevlar	≤1000	○		60	14	60	14
cam-/karbon elyaf takviyeli	GFK/CFK	≤1000	○		50	14	50	14

**Yöntem**

Radyüslü ve tam düz olmayan yüzeylerde derin delik delme işlemlerinde iyi bir sonuç almak için aşağıdaki yöntemi uygulayın:

1. Ör RF 100 U Gühring rasyo freze ile yüzeyi frezeleyin. Yüzey işlenecek delik eksenine dik olmalıdır.
2. En az 1xD derinlikte (Tolerans G9) silindirik pilot delik delin. Bu işlem için 140° uç açılı ve m7 çap toleranslı RT 100 U veya RT 100 F rasyo matkap ucunu öneririz.
3. Pilot delik içine girinceye kadar yaklaşık devir 300 dev./dak. İlerleme hızı ise 500 mm/dak. olmalıdır.
4. Kesme yağ basıncını ve devir sayısını ayarlayın.
5. Talaş boşaltma yapmadan kesintisiz ilerleme.
6. 90° çıkışlı açık deliklerde ilerleme hızını delik sonuna 1 mm kalınca %50 düşürün.
7. Eğik çıkışlı açık deliklerde  $v_f$  ilerleme hızını delik sonuna 1 mm kalınca %40 düşürün.
8. Delik derinliğine ulaşınca kesme yağını ve devir sayısını kapatın.

**Rasyo freze RF 100 U, ürün no. 3736**

FIRE kaplı Gühring rasyo freze, farklı helis hatveleri, hızlı ilerleme ve uzun ömrü sayesinde çelik, pik döküm, Ti ve Ni alaşımlarında kaba ve hassas işlemlere çok uygundur.

**Rasyo matkap ucu RT 100 U, ürün no. 2477****Rasyo matkap ucu RT 100 F, ürün no. 1660**

Gühring rasyo matkap uçları, özel kesme ağız geometrisi, mükemmel merkezleme ve eşmerkez delik delme özellikleri ile öne çıkar. U tipi genellikle genel çelikler ve AlSi alaşımları için uygundur. F tipi ise yüksek alaşımlı, paslanmaz, aside ve ısıya dayanıklı çelikler, Al ve Al alaşımları, Mg ve Mg alaşımları, Ti ve Ti alaşımları için uygundur.

**EB80**

Tek ağızlı derin delik matkap ucu

**lehimli uç**

2,0 ... 40,0

**ZB80**

Çift ağızlı derin delik matkap ucu

**lehimli uç**

6,0 ... 27,0

**EB800**

Tek ağızlı derin delik matkap ucu

**takma uçlu**

12,0 ... 40,0



önerilen kaplama tipi	≤35xD		>35xD		önerilen kaplama tipi	≤35xD		>35xD		önerilen kaplama tipi	≤35xD		>35xD	
	V <sub>c</sub> m/min	ilerleme kod no	V <sub>c</sub> m/min	ilerleme kod no		V <sub>c</sub> m/min	ilerleme kod no	V <sub>c</sub> m/min	ilerleme kod no		V <sub>c</sub> m/min	ilerleme kod no	V <sub>c</sub> m/min	ilerleme kod no
T	100	14	95	13						T	90	15	85	15
T	85	14	80	13						T	80	15	75	15
T	90	14	85	13						T	85	16	80	16
T	80	14	75	13						T	75	16	70	16
T	90	13	85	12						T	85	15	80	15
T	80	13	75	12						T	80	15	75	15
T	75	13	70	12						T	75	15	70	15
T	75	13	70	12						T	75	15	70	15
T	65	13	60	12						T	75	15	70	15
T	80	14	75	13						T	65	15	60	15
T	75	13	70	12						T	80	15	75	15
T	65	13	60	12						T	75	15	70	15
C	75	13	70	12						T	70	15	65	15
C	65	13	60	12						T	70	15	65	15
C	75	12	70	11						T	60	15	55	15
C	65	12	60	11						T	65	14	60	14
C	65	12	60	11						T	60	14	55	14
C	55	11	50	11						T	65	14	60	14
C	65	12	60	12						T	65	15	60	15
C	30	12	25	11						T	30	13	25	13
C	25	11	20	11						T	25	12	20	12
C	55	13	50	12						T	50	14	45	14
C	45	13	40	12						F	45	14	40	14
C	35	13	35	12						F	40	14	35	14
C	85	15	80	14		85	18	80	17		85	16	80	16
C	80	15	75	14		80	18	75	17		80	16	75	16
C	80	14	75	13		75	17	70	16		75	16	70	16
C	70	14	65	13		70	17	65	16		70	16	65	16
C	55	13	50	12		65	16	60	15		55	15	50	15
C														
C														
C														
C	20	11	20	11						F	25	13	20	13
C	35	11	30	11						F	35	13	30	13
C	30	11	25	11						F	30	12	25	12
C	150	16	140	15		120	18	115	17		140	16	135	16
C	120	15	115	14		110	18	105	17		125	16	120	16
C	150	16	140	15		135	18	130	17		170	17	165	17
C	130	16	120	15		120	17	115	16		140	17	135	17
C	110	16	100	15							115	16	110	16
C	75	14	70	13							75	15	70	15
C	120	17	115	16							120	17	115	17
C	90	17	85	16		130	18	125	17		90	17	85	17
C	95	16	90	15		120	18	115	17		95	17	90	17
C	75	16	70	15		110	17	105	16		75	17	70	17
C	70	16	65	15		110	17	105	16		70	17	65	17
C	60	16	55	15		95	17	90	16		70	17	65	17
C	75	14	70	13		95	17	90	16		60	17	55	17
C	70	14	65	13							75	16	70	16
C	60	13	55	12							70	16	65	16
C	50	13	45	12							60	15	55	15
											50	15	45	15



# TEKNİK BÖLÜM



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## RT 100 TRIGON®

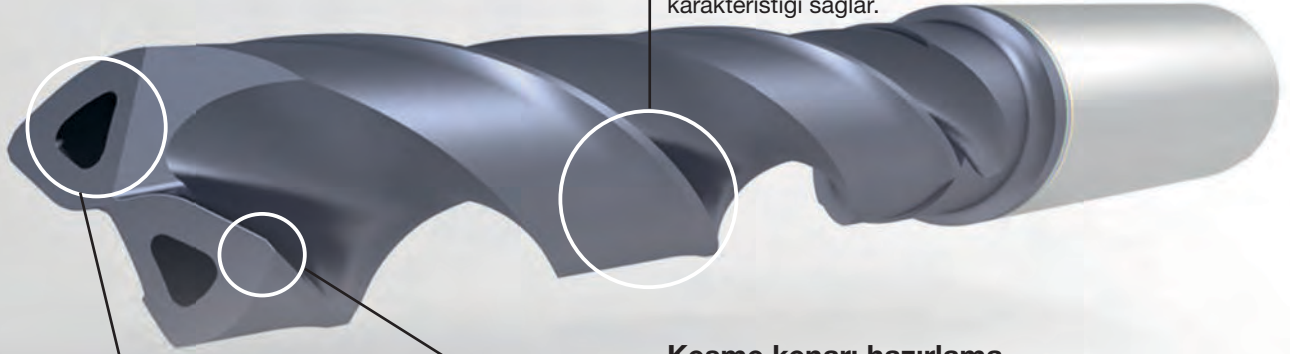
### Daha efektif soğutma için yenilikçi dizayn

Paslanmaz çelik uygulamalarında yüksek krom ve nikel oranı yüksek mukavemetli çeliklerde korozyon direnci sağlar. Sonuç olarak, malzemenin işlenebilirliği düşmekte ve proses sıcaklığı artmaktadır.

Buna rağmen, RT 100 TRIGON® yenilikçi soğutma deliği geometrisi sayesinde yüksek kesme ve ilerleme hızlarında kullanıma imkan verir.

#### Kanal formu

Özel olarak geliştirilmiş en yüksek yüzey pürüzlülüğü hassasiyetine sahip kanallar ve aynı zamanda 4- yüzey bileme ağız geometrisi optimum talaş oluşumu ve kesme karakteristiği sağlar.



#### Kesme kenarı hazırlama

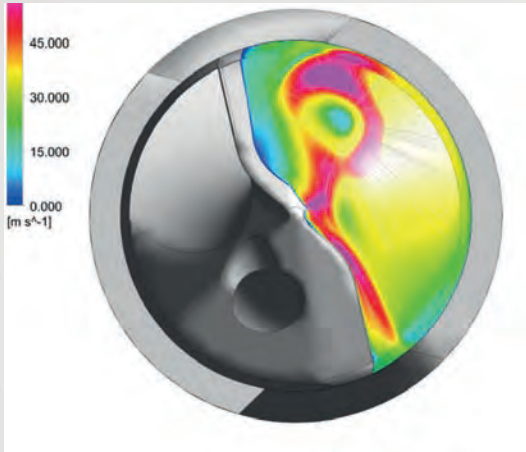
TiAln bazlı kaplama ve özel köşe geometrisi sayesinde kesme esnasında oluşan aşırı gerilimi azaltır ve yüksek aşınma direnci sağlar.



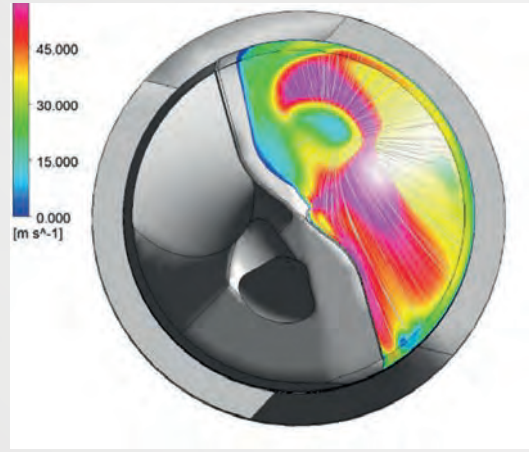
Yeni delik dizaynı soğutma hacmini, soğutma akış oranını ve yönünü optimize eder, çok yüksek proses sıcaklıkları optimum şekilde dağıtılır, düşürülür. Konvansiyonel soğutma

deliklerine nazaran TRIGON® geometrisindeki yönlendirilmiş soğutma sayesinde soğutma sıvısı en çok ihtiyaç duyulan ana kesici ağıza ve matkabın köşesine gider.

Konvansiyonel Soğutma Delikleri



TRIGON® soğutma deliği dizaynı



Soğutma sıvısı akış karakteristikleri kıyaslaması



## RT 100 C

Uzun talaş veren malzemelerin delinmesi için

### Kesme kenarı geometrisi

Konkav forma sahip ana kesici ağız sayesinde, uzun talaş veren çeliklerin işlenmesinde mükemmel delme ve kesme karakteristiği, düşürülmüş kesme gücü ve operasyon sıcaklığı.

### Kanal formu

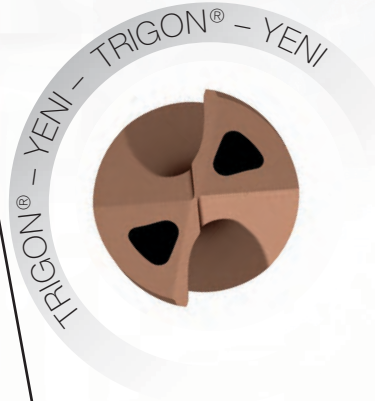
Dar geometrilik kanal formu, özellikle uzun talaş veren çelikler için dizayn edilmiştir. Bu sayede düşük kesme hızlarında bile optimum talaş oluşumu.

Yüksek yüzey kalitesi ve mükemmel kaplama ile optimum talaş tahliyesi, Yüksek sıcaklıkların gücel şekilde elimine edilmesi.

- Özel çözüm
- Ø 3-20 mm
- 7xD ye varan delme derinliği
- Ø 6.0 mm den itibaren yeni TRIGON® soğutma deliği

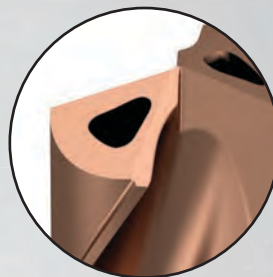
### Yeni soğutma Dizaynı

Konvansiyonel soğutma deliklerine nazaran Trigon geometrisindeki yönlendirilmiş soğutma sayesinde ,soğutma sıvısı en çok ihtiyaç duyulan kesici ağıza ve matkabın kesme köşesine gider



### Kesme ucu hazırlama

RT 100 tip C özel köşe koruma geometrisi ve yüzey kalitesinin birleşimine sahiptir. Gözle görülür ömür artışının yanı sıra, oluşabilecek mikro çatlakların ve sıvıların önne geçilir.







## RT 100 AL

Gühring den Alüminyum malzemeleri işlemek için yeni karbür matkap

Alüminyum malzemelerin işlenmesinde talaş oluşumu ve talaş tahliyesi çok önemli rol oynar.

RT 100 AL geometrisinde kesme kenarında optimum talaş oluşumu tüm al malzeme gruplarında – dövme alüminyumdan yüksek Si oranlı döküm alüminyumlarına kadar.

### Sivrilme, ön yüzey ve boşluk açılarında çok yüksek yüzey kalitesi

- Proses sıcaklığında düşüş
- Sivama oluşumunun engellenmesi

### Açık alın geometrisi ve kesici kenar formu:

- Optimum talaş oluşumu formu

### Keskin, mikro işlem görmüş kesme kenarı

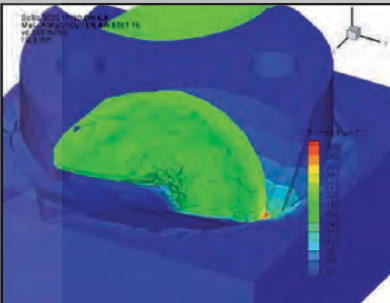
- Isıl işlem görmüş ALSi alaşımlarında mükemmel kesme davranışı
- Dövme alüminyumlarda kısa talaş oluşumu

### Kanal geometrisi

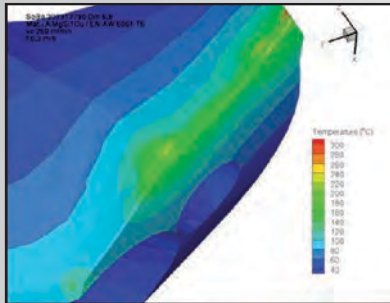
- Optimum talaş tahliyesi için polisajlı kanallar
- Minimize edilmiş sürtünme
- Malzeme yapışmasının engellenmesi

RT 100 AL, sivrilme, ön yüzey ve boşluk açılarındaki ideal yüzey kalitesi sayesinde kendisini diğer matkaplardan ayırır. Mikro işlem görmüş kesici ağız ve köşe sayesinde mükemmel kesme davranışı gösterir, alüminyum işlemede düşük operasyon sıcaklıkları sayesinde sivamanın da önüne geçilmiş olur.

Talaş oluşumu



Kesme köşesindeki sıcaklık dağılımı



Takım dizaynları kaplamasız olup, yüksek mukavemetli, aşındırıcı alüminyum işlemlerinde ömür artışı için kafa kaplaması yapmak mümkündür. Özel ölçüler ve kademeli matkaplar talep üzerine üretilebilir.



## Fiber kompozit plastikler (FCP'ler)

Modern fiber kompozit plastikler (FCP) etkinliğin, hafifliğin, dayanımın ve dinamiğin gerektiği her türlü endüstriyel uygulamalarda kendine yer bulmaktadır. Spesifik kendine özel karakteristikleri ile titanyum ve alüminyum gibi hafif yapı malzemeleri grubuna dahil olurlar. FCP ler veya çok katmanlı-malzemeli sistemler, fcp ve metalik malzemeler artık sadece havacılık, motor sporları ve diğer yüksek teknolojik kullanım alanlarına özgü olmaktan çıkmaktadır.

Özellikle yüksek hafiflik istenen otomotiv, rüzgar enerjisi ve genel makina mühendisliği uygulamalarında FCP kullanımı büyümektedir. FCP ler dayanımın, hafifliğin, enerji tasarrufunun ön plana çıktığı uygulamalarda görülebilirler.

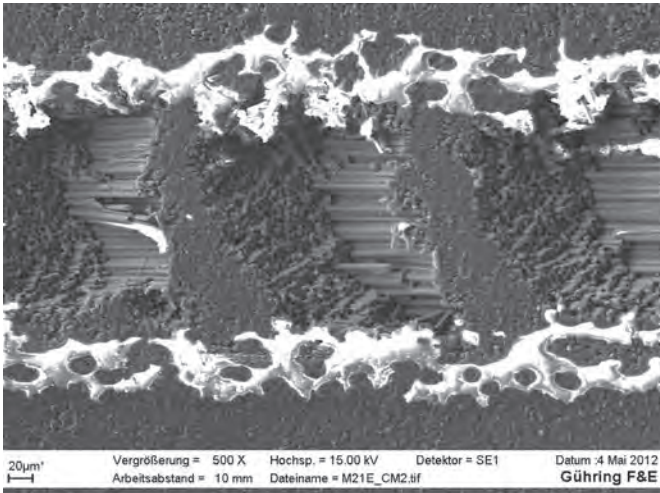
1980 lerin ortalarından beri Guhring FCP'lerin işlenmesi için standart ve özel olarak takım çözümleri sunmaktadır. Bu uzun süreli tecrübe sonucunda geniş bir kullanım alanında yüksek performansa odaklanmış, farklı manuel delik delme, tezgahlı ve robotik makina ve konvensiyonel makina sistemlerine uygun takım çözümleri ortaya çıkmıştır.

Guhring in FCP işleme takımları modern hafif yapı malzemelerinin işlenmesi için gerekli özellikleri sağlamaktadır.

- lif projeksiyonlar olmayan bileşenler
- İpliksiz malzeme yüzey yapısı
- Delik giriş ve çıkışlarında malzemeye zarar vermeden
- Delik çıkışlarında fiberlerin malzemeden ayrılmasının önlenmesi
- Minimum çapak oluşumu
- Termal ısı hasarının önlenmesi

FCP işlemede malzemeye zarar vermeden işemenin temel prensibi takımın kesici ağız köşesini kalitesi ve takımın aşınma direncinin çok yüksek olmasıdır Proses güvenliğini sağlamak

için fiber oranı %55 den fazla olan aşındırıcı malzemelerde keskin kesici ağız kullanılmalıdır.



### CFRP kesme kenarı görüntüsü, 500 kat büyütme

Tarama elektron mikroskobu ile işleme sonrası fiber yapısının oluşumu ve yönlmesi görülmektedir. Fiberler ne matriks içine girmekte ne de kompozit dışına taşmaktadır.



## GFRP / CFRP

Cam fiber güçlendirilmiş plastikler (GFRP) genellikle rüzgar enerjisi sektörü, taşıma ve yapı sektöründe endüstriyel olarak uygulanmaktadır. GFRP genellikle yük mukavemetinin gerektiği, geniş kovan malzemelerinde kullanılır. Daha düşük çekme mukavemetine ihtiyaç duyulan uygulamalarda ise GFRP yerine daha ucuz üretim maliyeti ve işleme kolaylığı sunan CFRP'ler (karbon fiber güçlendirilmiş plastikler) kullanılır.

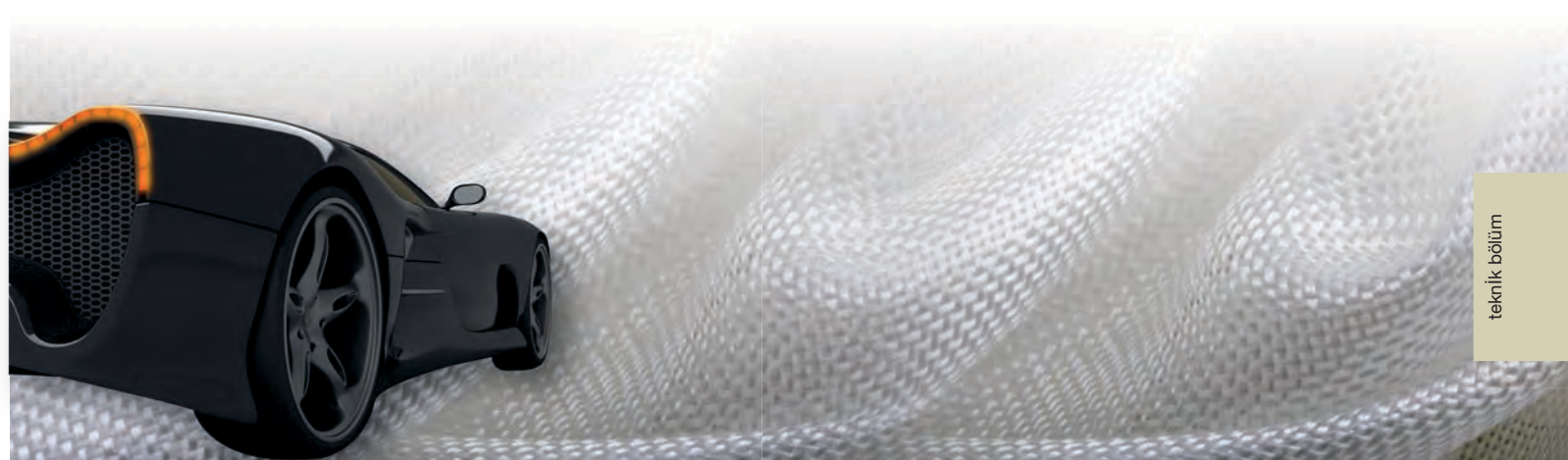
Karbon fiber plastikler (CFRP) kıyasla daha yüksek mukavemete sahiptir. Üretim yöntemine bağlı olarak saf karbon fiberler çelik malzemelere göre daha yüksek mukavemet- ağırlık oranı sağlarlar. Bu nedenle CFRP ler geniş oranda taşıma mukavemetinin gerekli olduğu yapı komponentlerinde kullanılırlar.

CFRP ve GFRP içerisindeki fiberleri korumak için matris içine gömülüdürler. Matris içindeki fiber oranı karakteristiği belirler ve yüksek mukavemetli CFRP lerde bu oran %65 i bulur. Finiş işleme için fiber yapısı ve yönlmesi gözlemlenmelidir. CFRP içerisindeki fiber yapılanması işleme sonrası yüzeyi belirler. Bununla birlikte yönlendirilmemiş fiber yapısındaki iplikleri ,genellikle delik çıkışları, sorunsuz bi şekilde temizleyebilmek için takım geometrisi iyi belirlenmelidir.



CFRP ve GFRP malzemeler yüksek aşındırıcılık özellikleri ile spesifik takım çözümlerine ihtiyaç duyarlar. Tipik FCP component hasarlarını önlemek için Guhring uygulamaya özel takımlar sunar.

Bunun sonucunda kesme güçlerinin kontrol altında tutulduğu deliminsayonsuz yüzeyler ortaya çıkar.

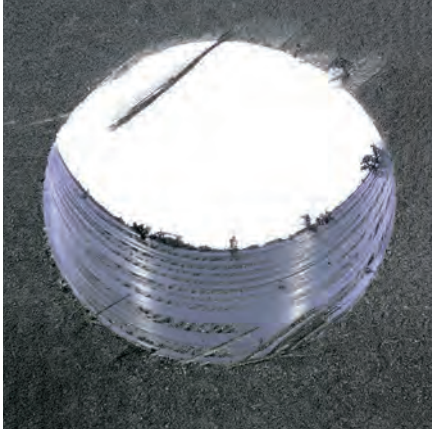




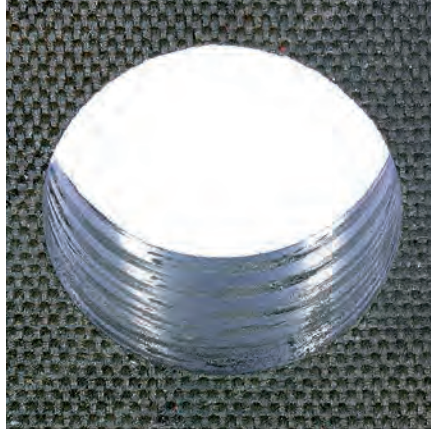
## FCP delme operasyonları

Delme operasyonları için . Özel takım dizaynları sayesinde kumaşlarda olduğu gibi yönsüz fiber yüzeyleri oluşturulabilir

(deliminasyon yok). Delik giriş ve çıkışlarında ve yüzeyinde oluşan deliminasyonun önüne geçilir.



**Delik Çapı D = 6,35 mm**  
Kaplama ve deliminasyon,  
fibe projeksiyon ile



**Delik Çapı D = 6,35 mm**  
CFRP kumaş katmanları,  
optimum işleme kalitesi



**Delik Çapı D = 6,35 mm**  
Yönlenmemiş CFRP  
optimum işleme kalitesi

## Katmanlı Malzemeler

Farklı özellikler gösteren en az iki malzemenin birleşiminden oluşan yeni yapıya katmanlı malzeme denir. Çoğunlukla hafif yapı malzemelerini oluşturan kombinasyon CFRP/titanium ve CFRP/aluminyumdur. Aynı zamanda CFRP, titanium, paslanmaz çelik ve aluminyum kombinasyonlarında mümkündür. Birleşim elementlerinin oluşturulabilmesi için farklı fiziksel özellikleri ve işleme stratejileri olan bu malzemeler birlikte işlenmelidir. CFRP/ titanium işleminde aşındırıcı özellikte CFRP takım kesici ağzını çabuk köreltirken. Titanium ise buna karşın düşük termal iletkenliği ve tokluğu sayesinde yüksek proses sıcaklığı oluşturur. İşleme sırasında yüksek kesme kuvvetleri ve sıcaklık sebebiyle CFRP malzemeler kolaylıkla hasar görebilir. Katmanlı malzemeleri işlerken isabetli işleme şartları uzun takım ömrü için önemlidir.

Bu malzeme grupları için Guhring, karbür, kaplamalı karbür ve PCD takım çözümleri sunmaktadır. Takımlar malzemelerin yapısal özelliklerine ve optimum talaş tahliyesine, tüm malzemelerde uniform delik kalitesini oluşturacak, bu koşullara adapte olacak şekilde dizayn edilmektedir





## Lazer yapısal boşluk

### Soğutma sıvısının hedef yerlere ulaşması sayesinde takım ömrü optimizasyonu

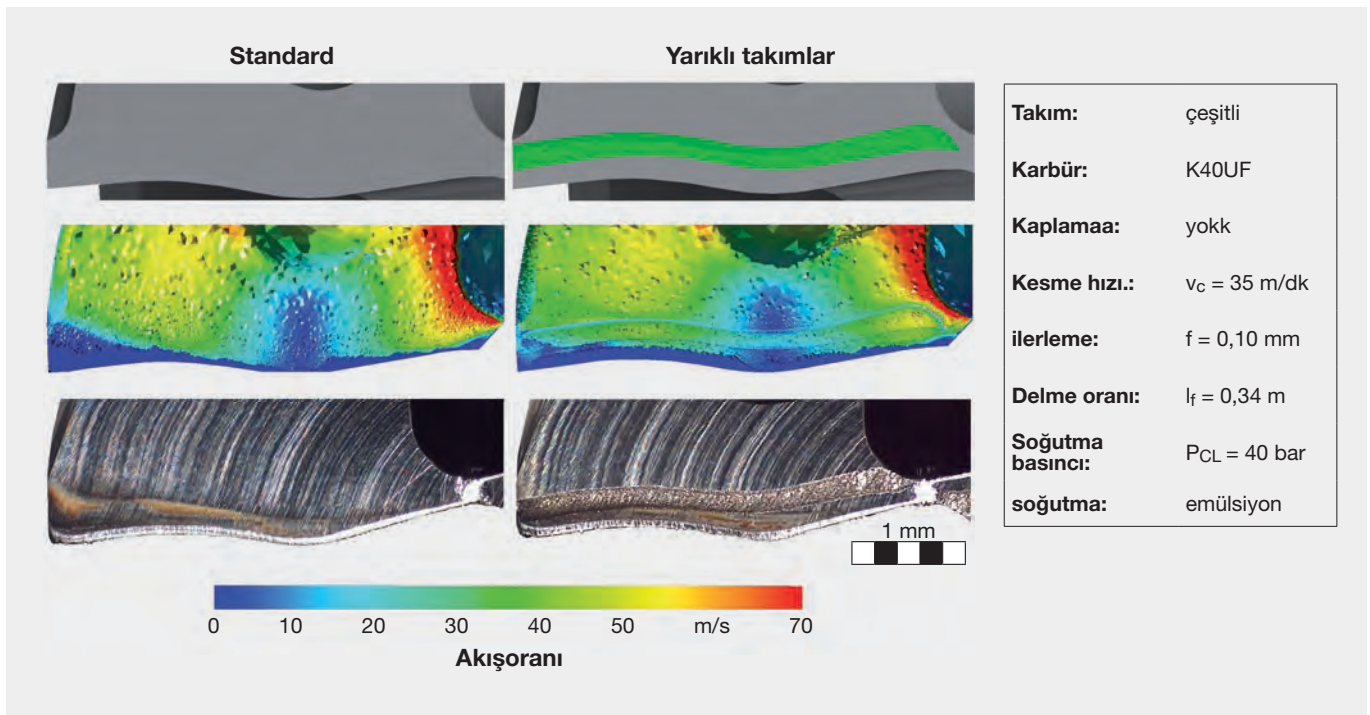
Delik delme operasyonlarında yüksek hacimde soğutma sıvısı istenen bölgeye ulaşmadığı durumlarda istenen sonucu vermez. Lazerle şekil verme ile delik delme takımlarında yenilikçi geliştirilmiş tasarımlar sağlanabilir. Soğutma kanallarının kesiti ve pozisyonu delik delme esnasında soğutma sıvısının etki etmesi açısından oldukça önemlidir. Ayrıca, yapı içindeki boşluk sayesinde, yan yüzeylerinde yağlanmasında ve soğutmasında akış şeklini etkileyebilir. Bu yapılar lazer işleme ortaya çıkarılmıştır.

Amaç soğutma sıvısının, en fazla termal stresli alanlarda konusun rehberlik etmektir. Bu bölgeler kesme ağızı ve dış köşelerin olduğu bölgelerdir. Azaltılmış termal stress, takım aşınmalarını azaltır ve takım ömrünü uzatır. Tüm delik delme esnasında takımın nerelerde termal stress altında kaldığının uygulamalarıdır. Geliştirilmiş soğutma sayesinde, delik kalitesi iyileştirilmiş ve sıcaklıklar azaltılmıştır.

### Akış Analizi Simülasyonu (CFD)

Soğutma sıvısı akışı, oluşturulan yapıların yanı sıra soğutucu kanal çapı etkisi akış analizi simülasyonu uygulaması ile daha ayrıntılı olarak analiz edilebilir. The influence of the coolant duct diameter as well as of the generated structures on CL flow can be analysed in more detail by the application of CFD simulation. İlk incelemede, standart tip basit soğutma kanalı birinci etapta yaklaşık 150µm mesafede kesme kenarında takip edildi. Kanalın derinliği yaklaşık 50 µm. Akış analizi simülasyonları yüksek termal etkisinin olduğu alanlarda geliştirilmiş soğutma kanallarının etkisini göstermektedir. Dış köşedeki geniş alanlar önceden neredeyse soğutma kanallarının tasarımı nedeni soğutma sıvısı ulaşamazken şu an artırılmış soğutma boşluğu sayesinde o bölgelere soğutmanın ulaştığı gözlemlenmektedir.

Inconel 718 nikel bazlı malzemenin işlenmesinde kırmızı alanlar artırılmış soğutma kalitesini göstermektedir. Lazer yapıli boşluklu soğutma kanalı ile normal soğutma kanalı arasında farkı yanlış alanlardaki farklarla görülebilir. Inconel 718 de artırılmış soğutma sıvısı ve geliştirilmiş soğutma kanalları sayesinde delik kalitesi de artırılmıştır.

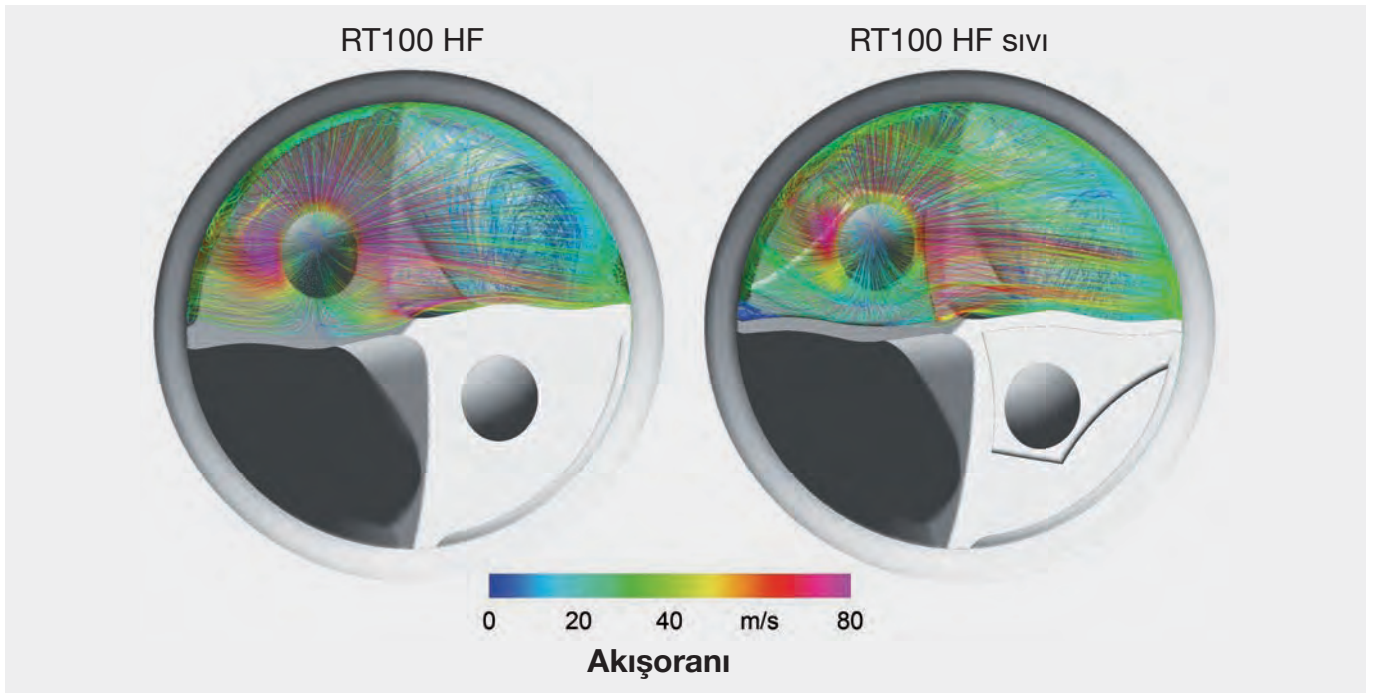




## Kompleks yapılara bakış

Basit yapı sonuçlarına dayanarak, soğutma sıvısının daha iyi nüfus etmesi için ileri seviye ve daha karmaşık formlar geliştirilmiştir. Lazer ile işleme sayesinde takımların ileri seviyede tasarım özgürlüğü ortaya çıkmış olup, önemli ölçüde daha fazla ayrıntı oluşturan başka üretim yöntemleri oluşturulamayacak formlar ortaya çıkmıştır. Lazer ile form verme uygun pozisyon ve optimum soğutma sağlamayı artırmıştır. Akış analizi simülasyonun görüldüğü üzere oluşan girdap gelişimine bağlı olarak, soğutma sıvısının etkisi artmış olup akış analizinde uygulaması görülmüştür.

FLUID olarak adlandırılan hedef bölgeye soğutma sıvısını ulaştırma amacıyla yapılan tasarım delme esnasında aşınmaya dayalı olan direnci artırmıştır. Aynı zamanda yapısal şeklin geliştirilmesi kenar kırılmalarında ve aşınmalarda yüksek piklerde değişkenliklerin engellemesini sağlamıştır. Şu anki lazer ile işleme teknolojisi yüzey kalitesini  $R_z < 5 \mu m$  sağlayarak yüzeyde ve kesme kenarında hasarın oluşmamasını sağlamaktadır. Ayrıca ek olarak lazer işleminin temiz yüzeyi sayesinde, takım kaplamasında herhangi bir negatif etkisi bulunmamaktadır.



## Uygulama alanları

Modifiye edilmiş bu matkap geometrisi özellikle yüksek sıcaklık stresi altında yapılan işlemlerde kullanılabilir. Örnek olarak paslanmaz çelikler, titanium ve titanium alaşımlı malzemeler ve nikel alaşımlı malzemeler. Güncel gelişmelerle Inconel 718

malzemesi de işlenebilecektir. Bu malzeme de aşırı uçta termo mekanik gerilmeler olduğundan takım ömrü limitli olacağı gibi verimlilikte sınırlıdır. Bu tip tasarım ile takım soğutması optimizasyonu potansiyel faydalar sunmaktadır.



## Yeni eklenmiş özellik ile süreç optimizasyonu

Yeni malzemelerin işlenmesi özellikle yapısı tokluk içeren Titanyum, bakır alaşımları kırılğan seramik karbon fiber gibi malzemelerde genel soğutma tasarımı takımlar aşırı aşınma ve

talaş problem eğilimi gösterirler. Yeni yaklaşımlar ile ilerleme yönünde geliştirilmiş talaş formları sayesinde daha yüksek kaliteli yüzeyler ve başarılı takım ömürleri ortaya çıkmaktadır..

### Temel Düşünceler

Sürekli ilerleme esnasında, uygulama şekline göre değişiklik gösteren aksel yönde hareketler esnasında değişik frekanslarda birkaç Hertzden binlerce Hertz kadar frekanslar oluşur. Buna ek olarak, efektif yön açısının tanımlanmış modifikasyonu ve takım kesme kenarı hız artışı yapılır. Uygulama ve takım tipine bağlı olarak, vibrasyon destekli işleme çeşitli etkiler ortaya çıkarır

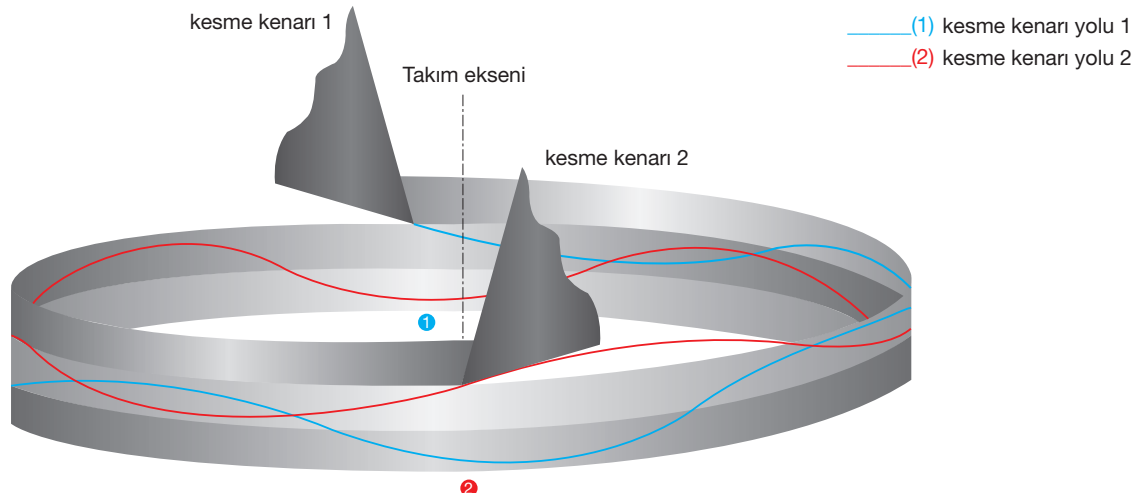
- Daha uygun formda talaş oluşumu ve kırılmış talaş oluşumu
- Geliştirilmiş talaş akışı
- Önceden belirlenmiş kırılma noktaları oluşturuluyor
- Azaltılmış talaş yapışması
- Uzatılmış takım ömrü
- Azaltılmış kesme kuvvetleri
- Azaltılmış sıcaklıklar

Hareket ekleyerek işleme süper alaşımlı, elyaf takviyeli plastik ve uzun talaşlı alaşımlar gibi işlenmesi zor malzemelerin işlenmesinde uygulanır. Örneğin; kurşun-bakır alaşımları Vibrasyon eklemesi ile, düşük frekanslı ve yüksek frekanslı titreşimleri ayırt eder.

### 1.) Düşük frekanslı darbe

Düşük frekanslı darbe olarak 1 kHz den uygulama aralığı en fazla 0.5 mm ye kadar uygulanır. Bu kategori aynı zamanda programlanmış gagalama hareketi veya kesintili ilerleme hareketini kapsar. Geleneksel işleme merkezi makinalarda, bu süreksiz ilerleme, aksel hareket limitlerinden dolayı sınırsız bir şekilde artırılarak yapılamaz. Eklenen hareketli frekanslarla çoklu spindle işleme merkezlerinde başarmak için özel mekanik şanzımanlar uygulanır.

Bu şanzımanlar direkt olarak makinaya takılabilir veya dişli kutusu olarak spindle entegre edilebilir. Darbe, mekanik olarak dişli oranında üretilir veya cam şaft vasıtası hareketi ile iletilir. Delme esnasındaki sabit ilerleme hızında, Spiral şekilli kesme yolundan sapma ile sabit talaş kalınlığı, ek olarak aksel hareket eklenmesi ile değişken talaş kalınlığı elde edilir.



Düşük frekanslı takım hareketi ile talaşı sünek ve yumuşak malzemelerde kontrol edilebilir talaş vermesini sağlar. Katma aksel hareket talaş kalınlığı kontrolünü sağlar. Titreşimlerle,

talaş kontrolü gagalama sayesinde kontrol altında tutulur ve talaş formu, bu nedenle kırılmış olarak ortaya çıkar. Dönme hızı frekansına bağlı olarak , gagalama sayısı belirlenebilir.

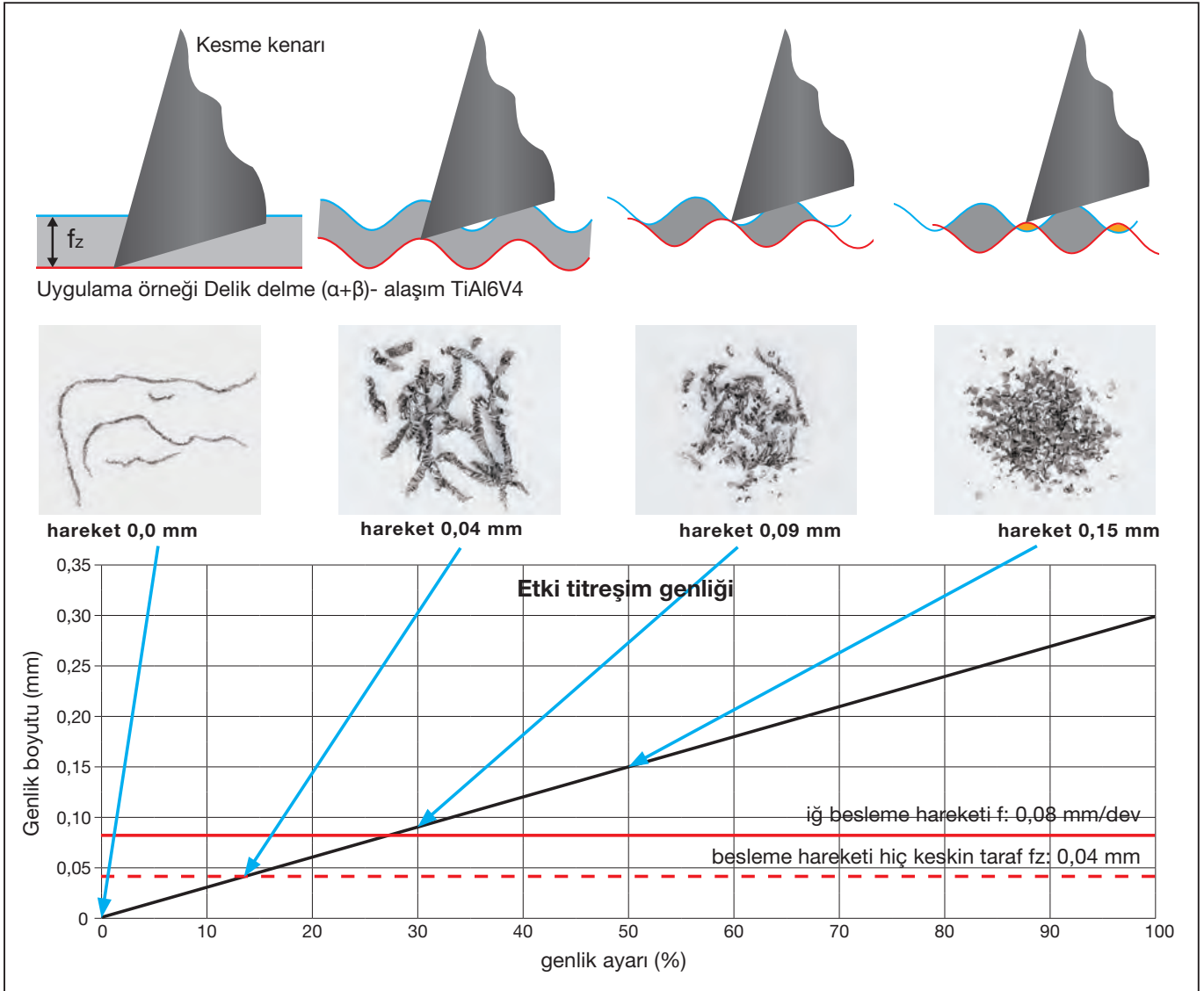
### Talaş oluşumunda titreşimin etkisi

Testte, standart titanium alaşımlı malzemede çeşitli titreşim seviyelerinde delikler delinmiştir (TiAl6V4). Tüm testler  $d = 6.35$  mm çapındaki takım ile kuru kesim yapılarak tamamlanmıştır. Kesme hızı  $V_c=30$ m/dk. ve ilerleme tur başı  $f=0,08$  mm / dev olarak ayarlanmıştır.

Talaşların oluşum şekillerinden titreşimin talaşa olan etkisi açıkça görünmektedir. Görüldüğü üzere titreşimler talaşın kırılmasını kolaylaştırmıştır ve talaş kalınlığı yüksekliği azalmıştır. Çok kısa talaşlar elde etmek için, dökme demir malzemelerin dışında, titreşim Kesici kenarın üzerinde daha yüksek ilerleme oranı ile kullanılmalıdır.

Bu nedenle, sandviç ya da birbirine kaynaklı üst üste olan malzeme yapılarında ya da hibrit malzeme tiplerinde kesme kenarı tamamıyla iş parçası yüzeyinden uygulanan titreşimlerle, işleme esnasında kolaylıkla talaş kontrolü yüzeyden kaldırılır ve işleme sağlanır.

Burada, elyaf kompozit tabakalar halinde kopmalar engellenir ve güvenli talaş kaldırma sayesinde sıcaklıklar aşağı çekilmiş olur.



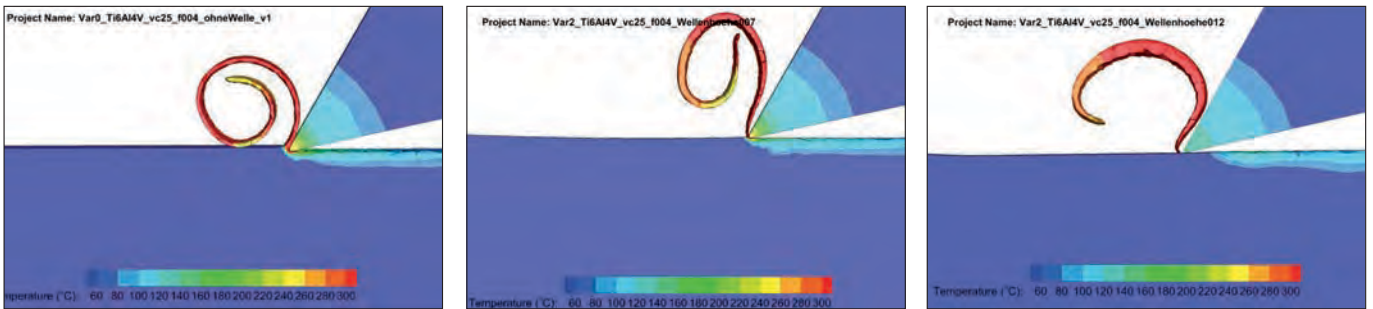




### İşleme sıcaklığındaki uygulanan titreşim etkisi)

Sonlu elemanlar analiz yöntemi ile (FEM) değişik uygulama koşullarında kesme kenarındaki talaş oluşumları simülasyon yapılmıştır. FEM simülasyonun ortaya çıkan talaş formları aşağıdaki resimlerde gösterilmiştir. Resimlerde de gösterilen

simülasyon sonuçlarında talaş kalınlığının artması kısıtlı titreşimin etkisi ile ortaya çıkarılmıştır. Ayrıca, sürekli kesmede kesme kenarında daha yüksek sıcaklık ortaya çıktığı gösterilmiştir.

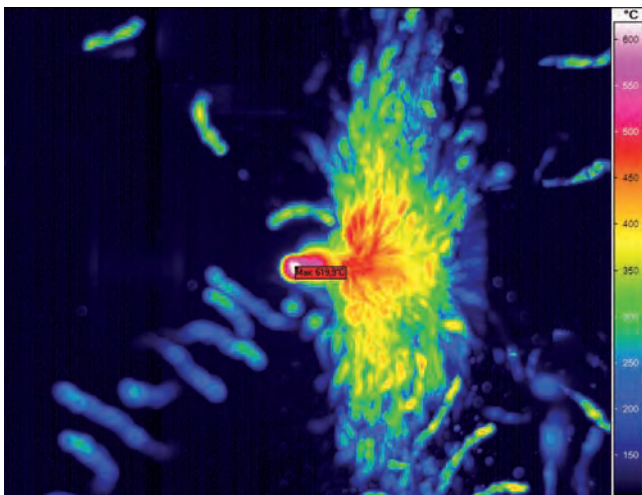


CFRP/titanium malzeme kombinasyonlarını işlerken özellikle ortaya çıkan işleme sıcaklıkları karşılaştırılmıştır. Aynı özellikte ve çaptaki matkaplar  $d = 6.35$  mm kuru kesim yapılarak test yapılmıştır. Test değerleri  $V_c = 30$  m/dk ve ilerleme  $f = 0.07$  mm/dev.

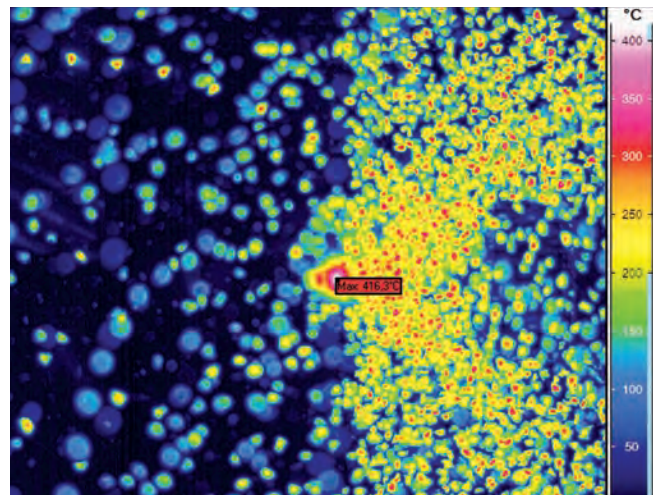
CFRP/titanium malzemeleri işlenirken ortaya çıkan sıcaklık gerçek zamanlı kamera ile kaydedilmiştir. Test panosu toplam kalınlığı 20 mm, 6 mm CFRP ve 14 mm titanium (TiAl6V4) ölçülerindedir. Geriye kalan duvar 1.5 mm panelden yüzeye olan mesafedir ve delik delinmiştir. Standart işleme metoduna göre yeni yöntem titreşimli işleme metodu deliğin çıkışında kesme kenarının ve talaşın oluşumu ve şekli karşılaştırılmak

üzere ölçülmüştür. Titreşimsiz ölçüm metodunda maksimum sıcaklık kesme kenarında  $600^\circ\text{C}$  olarak ölçülmüştür. Titreşimli işleme metodunda ise aynı koşullar altında  $450^\circ\text{C}$  olarak düştüğü ölçülmüştür. Ayrıca, mükemmel talaş kırma sayesinde ve talaş kontrolü sayesinde geliştirilmiş delik yüzey kalitesi, artırılmış takım ömrü ortaya çıkarılmıştır.

### İşleme esnasında kamera kayır resimleri CFRP / ( $\alpha+\beta$ )- alaşım TiAl6V4



Geleneksel kuru kesim  
 $\vartheta_{\text{max}}$ :  $619^\circ\text{C}$



Titreşim destekli kuru kesim  
 $\vartheta_{\text{max}}$ :  $416^\circ\text{C}$

## 2.) Yüksek Frekanslı Darbe (ultra ses destekli)

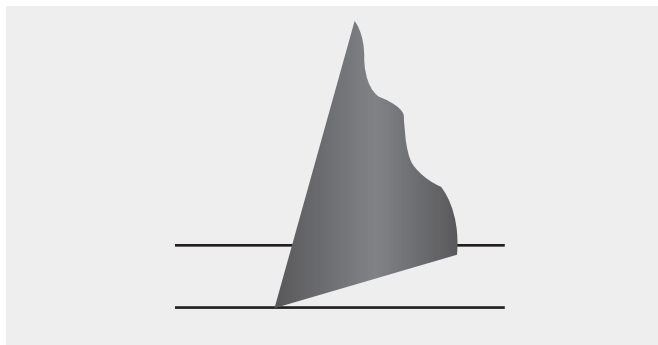
Yüksek frekanslı darbe ile metal kesme işleminde – adı ultra sound supported- aksenal doğrultuda bir salınım hareketi ile geleneksel kesme yöntemi 16.55 kHz frekansında daha yüksek bir frekansta işlem gerçekleştirilir. Çoğunlukla, 2...30 µm arasında takımın kesme noktasında oluşan titreşim ve güç frekansında, takımın kesmesinde darbe nedeni büyük ölçüde etkide bulunur

Darbeler aktüatör üzerinden gerçekleşir. Bir jeneratör, bir çevirici güçlendirici ve takım ile tutucu kombinasyonu olarak adlandırılan Sonotrade kombinasyonu oluşmaktadır. Jeneratör, elektrik enerjisini yüksek frekanslı sinus salınımı ile elektrik enerjisine dönüştürür. Yükseltici, dönüştürücüden alınan titreşimi ileterek piezo aktüatör vasıtası ile mekanik enerjiye dönüştürür sonotrade enerjisi büyütülür.

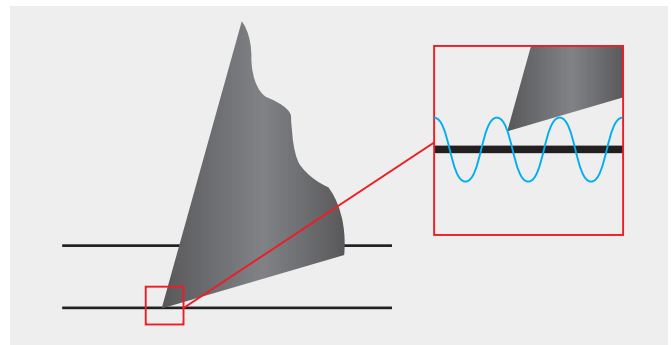
Salınımlı doğrusal hareket ve ilerleme hareketi kombinasyonu sayesinde, seramik, kompozit yüksek kopma mukavemetli malzemelerin işlenmesinde ekonomiklik ve kolaylık sağlar. Daha önceden, ultra ses destekli işlemi cam seramik ve karbür

malzemelerin işlenmesinde kullanılmıştı. Yüksek frekanslı titreşimle işleme kesme kenarı uygunlaştırılarak plastic karbonfiber kompozit malzemeler sandviç yapı malzemelerin delinmesinde ve frezelenmesinde artarak uygulanmaktadır. Tanımlanmış bir kesme kenarı ile mikro kırılmanın önüne geçerek gözle görülür bir etki ile malzemelerin yüzeyleri daha düşük kesme gücünde işlemeyi sağlar.

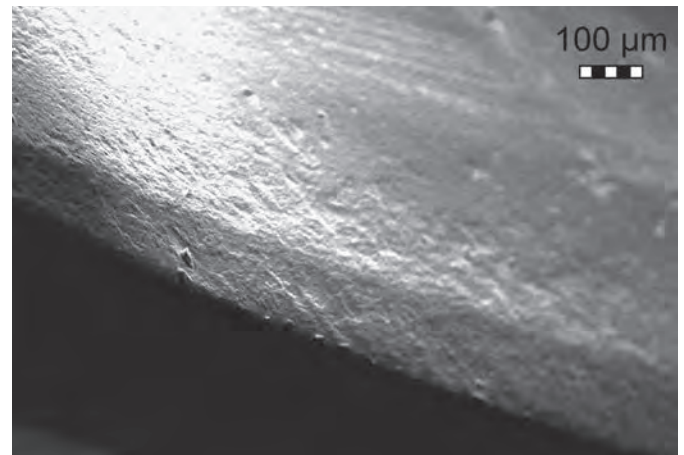
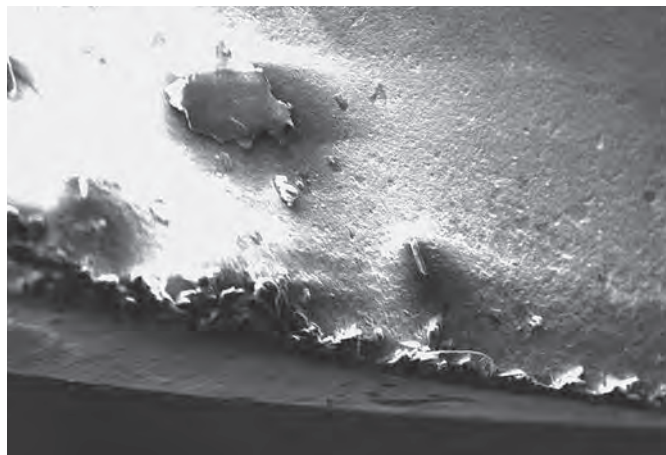
Ayrıca pozitif etki olarak çelik malzemelerin işlenmesinde ve nikel alaşım malzemelerin işlenmesinde built-up (talaş yığılması) ve aşınmanın azalmasını sağlar.



aşırı ses desteği olmadan



aşırı ses destekli



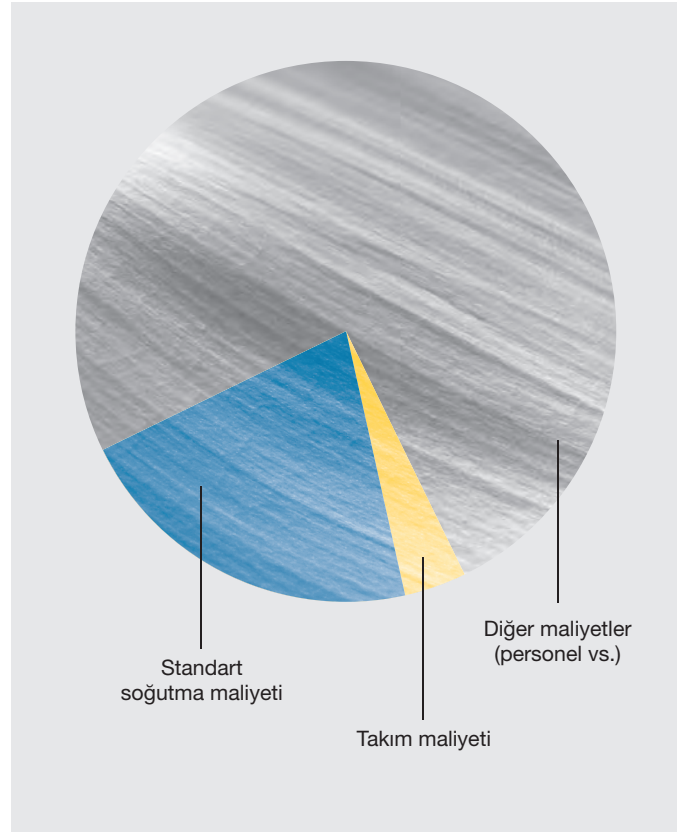


## MQL teknolojisi

### Temelleri

Makine ve kullanılan aletlerin yanısıra soğutma için kullanılan sıvı ve gazlar, işleme süreci maliyetinde dikkate değer bir paya sahiptir. Bu nedenle, soğutma amaçlı yapılan yağlamanın azaltılması maliyetin düşmesini sağlayacaktır.

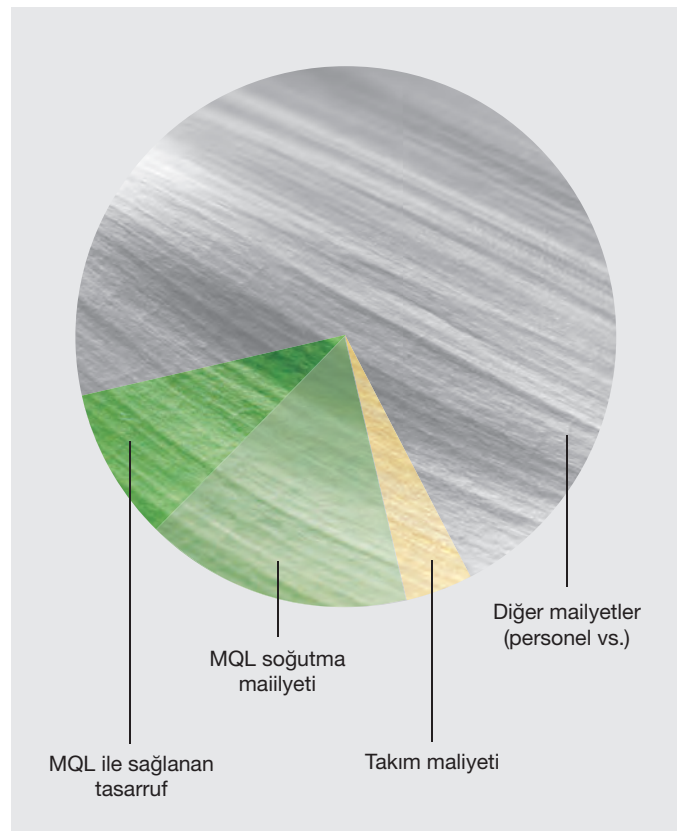
Soğutma yağı kullanımının azaltılması tasarruf edilmesini sağlamanın yanısıra çevrenin ve sağlığın korunmasını da sağlar. Gühring 1990larda başlayan MQL araştırmalarının ve gelişmelerinin öncülerinden biridir.



### MQL sistemin amaçları

MQL soğutma yağlaması sisteminin uygulanması bilinen sıradan yağlama yöntemine göre daha az maliyetlidir.

- Takım uç kısmındaki ısıl gerilimde azalma
- Aşınma oranının azalması
- Derin deliklerde talaş uzaklaştırmada etkinliğin artması
- Soğutma sıvısı kullanımında azalma
- Özellikle derin deliklerde yüksek soğutma ve yağlama etkisi
- Aşağıdaki maliyetlerin azalması:
  - Parça temizleme maliyeti
  - Soğutma yağını çıkartma maliyeti
  - Talaş çıkartma maliyeti
- Çevrenin ve sağlığın korunması



## Günümüz de MQL sisteminin gelişimi

MQL sistemi arařtırmaları sayesinde Gühring, pratik MQL sistemi için ön kořullar oluřturdu. MQL sistem gelistirme çalıřmaları ařamasında tutucu araçlardan aletlerin kesme ucuna kadar bütün parçalar entegre edildi.

### Özellikler:

- modüler kurulmuş ve standartlaştırılmış sistem
- MQL ve geleneksel sıkma seti aynı bir iş mili eğrisi sayesinde serbestçe değiştirilebilir.
- Hidrolik, Shrink ve synchro tutucuların hepsi MQL sıkma sistemi seti için dizayn edilir.



## Gühring'de MQL sistem

2007'de Gühring'in MQL sisteminin MQL uzunluk ayarlı vidaları kapsamıyla, hasar ve kusurlar ortadan kaldırdı. Böylece, günümüzdeki üretim süreci ihtiyaçları en iyi şekilde karşılayan MQL sistemi müşteriler için hazır hale geldi.

### İlk Gühring MQL sistemini özellikleri:

- Yağlamada geçikmenin önlenmesi
- Özel MQL soğutucu birimi
- MQL'e uygun takım şaft bağlantısı
- Konik uçlu vida takımı

Böylece, kullanıcı standardlaşmış bir sistemden yararlanacak ve birbiriyle uyumlu aletlerden dolayı daha az stok tutabilecek.





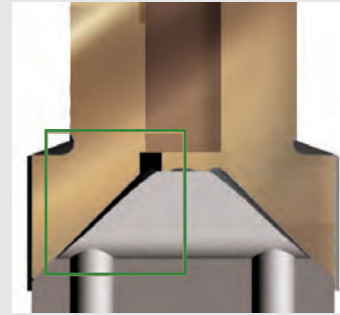
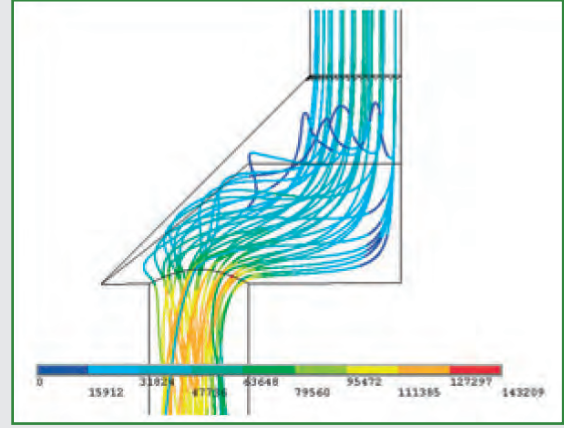
### İyi bir MQL dağıtımı için optimum şaft tasarımı

İlgili bölgeye oldukça düşük miktarda yağutucu salınımı en önemli konudur. Bundan dolayı takımın şaft geometrisinin dizaynı önemli rol oynar. Gühring MQL koşullarını en iyi şekilde sağlayan konik şaft tasarımı geliştirildi.

#### Konik şaftın avantajları:

- Yağlama geçikmesinin önlenmesi
- Minimum ulaşılamayan bölge
- Basit operasyon
- Uygun maliyetli üretim

Düşük girdap oluşturulması ile akış modeli

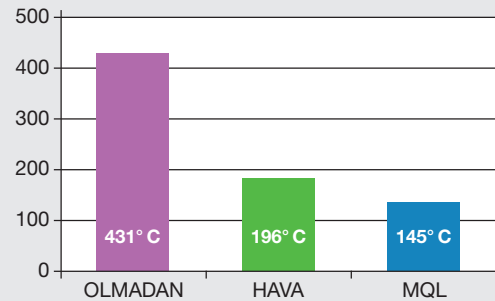
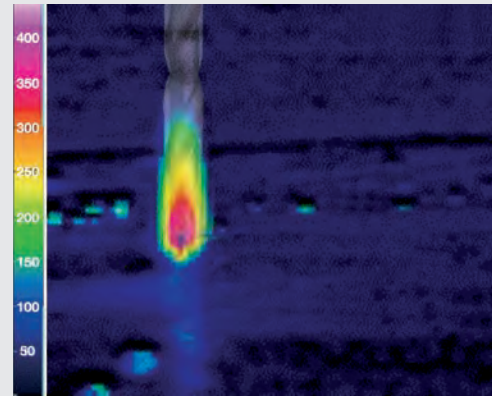


akış koşulları konik geçiş noktasının soğutma kanalı bağlantı yuvasında

### Soğutma noktasını koruma

Kuru işleme ile karşılaştırıldığında, MQL işleme süreci, sıcaklığı dikkate değer ölçüde azaltabilir, sürecin güvenilirliğinin artmasını ve aletlerin daha uzun ömürlü kullanılmasını sağlayabilir.

Gühring de termografik inceleme:  
Takım ısılarını karşılaştırma





## MQL için en iyi form

En uygun takım geometrisi RT 100 T sayesinde en etkili MQL sistemine ulaşılır.



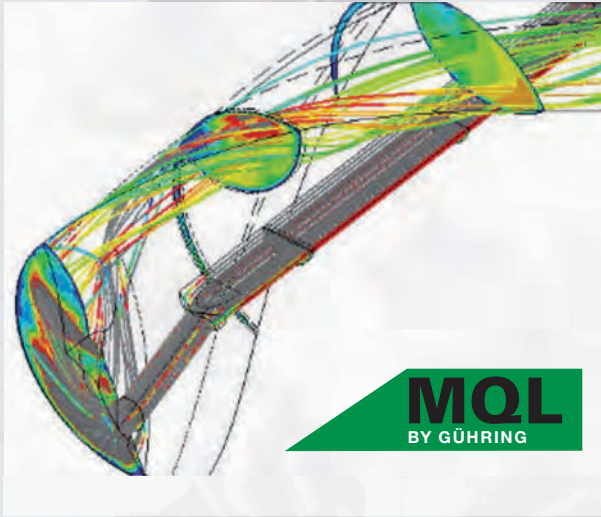
### 1. Enine Kanal Kesiti:

Gühring MQL takımlarının kanal geometrisi küçük talaşların derin deliklerden en iyi şekilde çıkarılmasını sağlar.

### 2. Masimum soğutma kanalı boyunca kesit:

Maksimum soğutma kanalı sayesinde talaş tahliyesinin yanısıra soğutma yağının da en iyi şekilde iletimini de sağlıyor.

## Akış hızı kıyaslanması



0 11 22 33 44 55 66 77 88 m/s

### Akışkan hızı

MQL ile akışkan hızı 30.4 m/s.

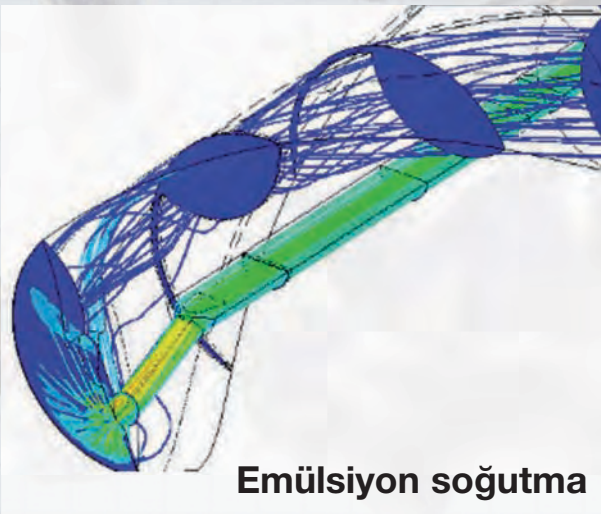
### MQL ile taşınan akışkan

hacmi 6.960 l/h (std.litres hava/h).

Çap  $\varnothing$  = 11.7 mm

Pompa basıncı = 6 bar

Takım üzerindeki basınç = 4 bar



### Emülsiyon ile akışkan

hızı 3.5 m/s.

### Emülsiyon ile taşınan

hacim 600 l/h (std.litres hava/h).

Çap  $\varnothing$  = 11.7 mm

Pompa basıncı = 60 bar

Takım basıncı = 31 bar



## MLK sistem çeşitleri

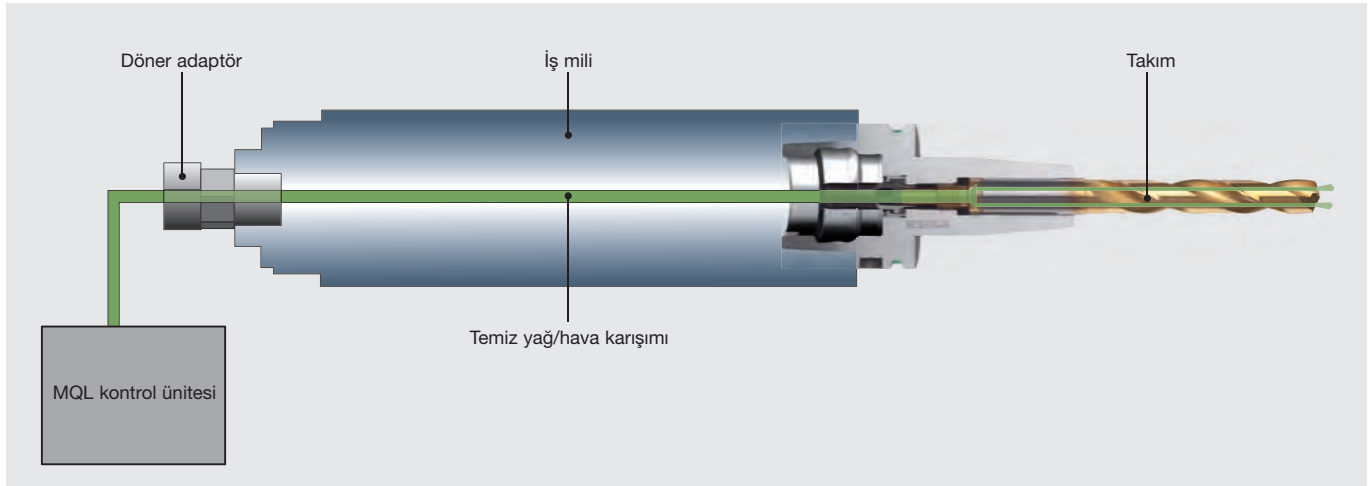
MLK araçlarının, takımlarının kullanılması iki şekilde olabilir: gaz karışımı makine dışında hazırlanır ve işlem lokasyonuna gönderilir.(1-kanal sistemi) veya basınçlı hava ve MLK bileşenleri karıştırılmaları için ayrı ayrı karıştırma odalarına gönderilir

(2-kanal sistemi) uygun minimum miktarda yağlama adaptor kullanımı, mil, tutucu sistem ve takım ile aerosol işleme bölgesini besler. Önlenemeyen kesit değişimleri mümkün olduğunca aerodinamik olmalıdır.

### 1-Kanal MLK sistem

1-kanal lı MLK sitemi ile, yağlama aerosolü makineye eklenmiş ayrı bir MLK birimi içinde oluşturulur. Basınçlı kap içerisindeki özel başlık sistemi düzenli sıkıştırılmış hava beslemesi aracılığıyla

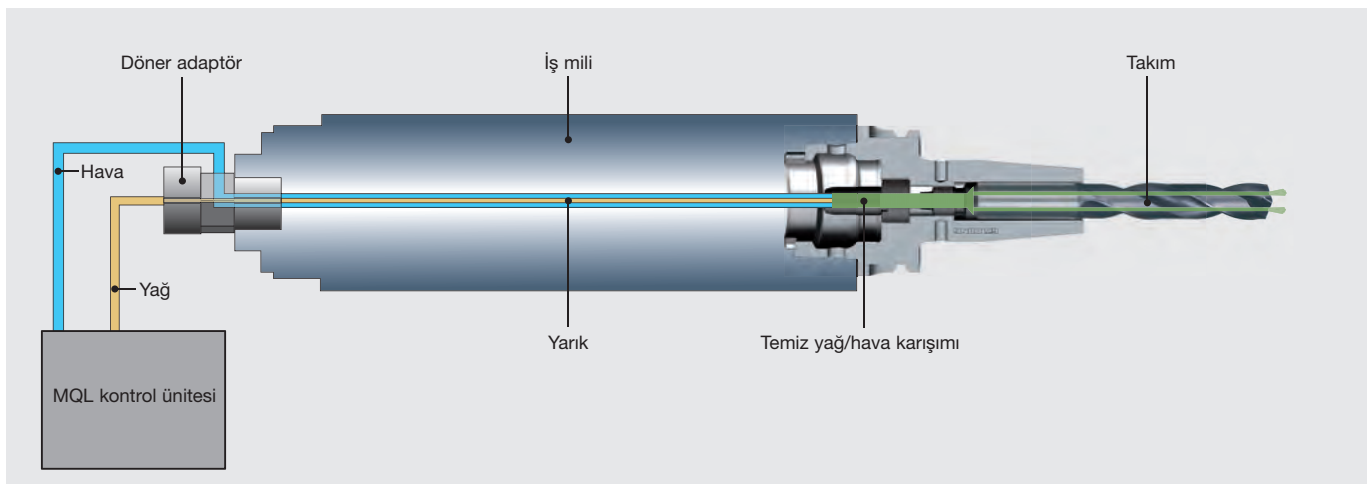
yağlayıcı aerosol oluşturur, yağ içeriği ayarlanabilir ve sonra MLK kontrolünün fiziki sınırları içinde devamlılığı sağlanabilir.



### 2-Kanallı MLK sistem

2 kanallı seistemde yağ bir hat ile üniteden çıkar ve döner adaptör ve diğer engelleri aşmak gönderilir. Sisteme yağ debisini düzenleyecek hızlı bir vana dahil edilir. Temiz yağ kanal bağlantı elemanları ile tutucu içine taşınır. 2. Kanal ise sisteme gerekli olan havayı sağlamak için kullanılır. Temiz yağ ve hava bu noktada karışır.

Karışımı başarılı bir şekilde oluşturmak için tutucuda uygun ve kısa bir karışım borusu bulunmaktadır. Bu sistem ile hava ile daha az miktarda yağ karıştırabiliriz. Karışım uygulama noktasına daha yakın ve daha hızlı ulaşabileceği bir alanda oluştuğu için daha homojen ve daha etkin bir karışım elde edilir.





## Kaplamasız Yüzey



Özellikle yüksek silicon içerikli dövülmüş ve dökme alüminyum alaşımlı malzeme işlemlerinde iyi bir işleme performansı sergiler. Takım kenarında birikmeyi ortadan kaldırmak amacıyla bu takımlar uç, helis kanal boşluğu ve boşluk açısının özel bir kombinasyonu ile bu uygulama alanına uygun hale getirilmiştir.

## Buhar menevişli- temperlenmiş yüzey/ Nitrürlenmiş yüzey



Buhar menevişli bir yüzey bitirme takımı yüzey alanına uygulanan oksidasyon işlemi sayesinde takımın tribolojik özelliklerinin iyileştirilmesinin yanı sıra korozyon korumasını da artırır. ( Yaklaşık olarak (3 to 10 µm). Aşındırıcı uygulamalarda alan nitrürlenme önerilir. Yüzeyin sertliğini artırır bu sayede takımın aşınma direnci geliştirilmiş olur. Sert ham madde kullanımı veya yumuşak malzeme ile kaplanmış takım kullanımı daha iyi sonuçlar elde edilmesini sağlar. Bu tip yüzey işlemleri giderek önemini kaybetmektedir.

## TİN kaplama



Maks. Uygulama sıcaklığı: <600° C  
Renk: Altın Sarısı  
Yapı: Tek Tabaka  
Sertlik: 2300 HV0.05

1980li yılların başlangıcında gühring tarafından tanıtılan tın kaplama, HSS ve Carbür delme takımlarının düşük maliyetli genel amaçlı kaplanmasında kullanılır.

## FIRE/nano FIRE kaplama



Maks. Uygulama sıcaklığı: <800° C  
Renk: Mor  
Yapı: Çoklu Tabaka  
Sertlik: 3300 HV0.05

Fire and nano fire kaplamalar alüminyum titanium ve nitrojen içerir. 1990ların sonlarına doğru tanıtılan bu kaplamalar Tın kaplamanın geliştirilmiş bir versiyonudur. BU tarz kaplamalar Arttırılan sertlik ve iyi termokimyasal direnç sayesinde rakiplerine karşı avantaj sağlamıştır. Bunlar HSS ve karbürler için kullanışlıdır.





### Raptor-kaplama



Maks. Uygulama sıcaklığı: <800° C  
Renk: Beyaz altın  
Yapı: Çoklu Tabaka  
Sertlik: 3300 HV0.05

Raptorun TiN/ TiALN çok katmanlı yapısı çelik işlemede iyi performans için anahtar bileşendir. En üst kaplamadaki zirkonyum temelli ekstra sürtünme azaltıcı yapısı sayesinde, işleme performansı işleme esnasındaki yapışma eğilimli çelikler için geliştirilmiştir.

### TiAlN-kaplama



Maks. Uygulama sıcaklığı: <800° C  
Renk: Mor  
Yapı: Tek katman  
Sertlik: 3300 HV0.05

TiALN kaplama fire and nano fire kaplamanın karakteristiklerine benzerlik gösterir ve onun tek katmanlı yapısı ile mikrohassasiyetli delik delme alanlarında kullanılır.

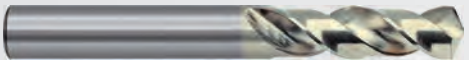
### nanoA-kaplama



Maks. Uygulama sıcaklığı: <900° C  
Renk: Mavi Menekşe  
Yapı: Çoklu Katman , Nano-yapı  
Sertlik: 3300 HV0.05

TiALN temelli nano A paslanmaz çelik işlemlerinde kendini ispatlamıştır. Dökme demir nikel temelli alaşımlar ve cobalt crom alaşımlarındaki delik delme işlemlerinde uygundur. Nano tabakalı yapısı sayesinde kırılma oluşumu ertelenmiş olur. Dahası, Örneğin TiAlN e göre uyarlanmış kompozisyonu sayesinde daha yüksek bir termokimyasal bir direnç ortaya koyar.

### Sirius-kaplama



Maks. Uygulama sıcaklığı: <900° C  
Renk: Beyaz altın  
Yapı: Çoklu Katman , Nano-yapı  
Sertlik: 3400 HV0.05

AlTiN tabanlı sirius kaplama özellikle paslanmaz çelik işlemlerinde elverişlidir. Nano yapısal tasarımı sayesinde iyi sertlik ve tokluk özelliği sergiler. Zirkon içerikli üst tabaka kaplaması malzeme ile kimyasal reaksiyonu engeller bu yüzden talaş tahliyesini kolaylaştırır.



## Signum-kaplama



Maks. Uygulama sıcaklığı: <800° C  
Renk: Bronz  
Yapı: Çoklu Katman , Nano-bileşem  
Sertlik: 5500 HV0.05

Signum kaplama nano kompozitler gurubuna aittir. Mikro yapı yüksek sıcaklık dirençli silikon nitrür matrise sabitlenmiş aşırı derecede ince tialn nano Kristal özelliği sergiler. Bu, sertleştirilmiş çelikler ve dökme demirlerde signum kaplamayı ilk tercih haline getirmiştir

## Endurum-kaplama



Maks. Uygulama sıcaklığı: <800° C  
Renk: Bakır  
Yapı: Çoklu Katman , Nano-bileşem  
Sertlik: 4000 HV0.05

Nano kompozit ailesinin diğer bir üyesi olan Endurum kaplama carbon, otomat ve mangan alaşımlı çelikler için tasarlanmıştır.

## Zenit-kaplama



Maks. Uygulama sıcaklığı: <700° C  
Renk: Beyaz altın  
Yapı: Çoklu Katman , Nano-bileşem  
Sertlik: 2500 HV0.05

Nano yapıllı zenith kaplama titanium alaşımlarının işlenmesi için optimize edilmiştir. Kompozisyonunun yanı sıra özel yapısı tribokimyasal aşınmaların dikkate değer bir biçimde azaltılmasına katkı sağlar ve bu yüzden bu konuda iyi bir çözümdür. Buna paralel olarak modifiye edilmiş silikon içerikli alüminyum döküm alaşımlarında delme işlemlerinde iyi sonuçlar elde eder.

## Ice-kaplama



Maks. Uygulama sıcaklığı: <1000° C  
Renk: Metalik gri  
Yapı: Çoklu Katman  
Sertlik: 3500 HV0.05

Titanyum alüminyum ve krom temelli ice kaplama bakır alaşımları bronz ve prinç gibi demir dışı metallerin işlenmesinde öne çıkar.



### Carbo-kaplama

Maks. Uygulama sıcaklığı: <math><500^{\circ}\text{C}</math>  
Renk : Gri-siyah  
Yapı: Tek Katman  
Sertlik: 5000 HV0.05



Karbon kaplama DLC-kaplama grubunun bir parçasıdır. (DLC= Karbon benzeri elmas). Bu karbon kaplamalar elmas benzeri karakteristikler sergiler. Karbon kaplama %100 karbon ve ta-c yapısının kompozisyonu sayesinde çok yüksek bir sertlik gösterir. Bu durum onun dovme ve dökme alüminyum alaşımları (<math><12\text{ Si}</math>), bakır, pirinç ve bronz gibi malzemelerin delme işlemlerindeki üstün performansını açıklar. Bunlara ek olarak plastikler ve ahşap malzemeler için elverişlidir.

### Cristall-kaplama

Maks. Uygulama sıcaklığı: <math><500^{\circ}\text{C}</math>  
Renk: Gri-siyah  
Yapı: Tek Katman  
Sertlik: 8000 HV0.05



Kristal kaplama saf elmasın hiç bir şekilde gerisinde kalmayan bir saf kristal elmas kaplamadır. Birçok ilgi çekiçi özelliğiyle birlikte, bu kaplama türü eşsiz sertlik özelliğiyle öne çıkar. Bu yüzden mikrokristalli kristal kaplama yüksek aşındırıcılık özelliğine sahip elyaf katkılı plastik, seramik, grafit ve yüksek silikon içerikli dökme alüminyum alaşımlarının işlenmesine olağan üstü uygundur. Bu kaplama teknik prosedür gereği özel karbür sınıflarına uygulanır



	Delme		
	Sert metal		HSS
	geleneksel	MQL	
<b>C-Çelikler</b>	Endurum	Endurum	Fire
<b>Otomat çelikleri</b>	Raptor	Raptor	-
<b>Mn çelikleri</b>	Fire	Fire	-
<b>Düşük alaşımlı çelik</b>	Fire	Fire	Fire
	Endurum	Endurum	TiN
<b>Alaşımlı çelik</b>	Raptor	Raptor	
	Fire	Fire	Fire
	Signum nanoA	Signum nanoA	TiN
<b>Sertleştirilmiş çelikler &lt;55 HRC</b>	Signum	Signum	-
	Fire	Fire	-
	TiAIN	TiAIN	-
<b>Sertleştirilmiş çelikler 55-65 HRC</b>	Signum	Signum	-
	Fire	Fire	-
	TiAIN	TiAIN	-
<b>paslanmaz ve asitik çelikler</b>	nanoA	nanoA	Sirius
	Sirius	Sirius	Fire
	Endurum	Endurum	TiN
<b>çelik döküm</b>	Signum	Signum	Fire
	Fire	Fire	-
	nanoA	nanoA	-
<b>Alüminyum döküm alaşımları</b>	kaplamasız	kaplamasız	kaplamasız
	Carbo	Carbo	Carbo
	Cristall	Cristall	-
<b>Dökme Alüminyum Alaşım (&lt;12% Silisyum)</b>	kaplamasız	kaplamasız	kaplamasız
	Zenit	Zenit	Zenit
	Carbo	Carbo	Carbo
<b>Dökme Alüminyum Alaşım (≥ 12% Silisyum)</b>	Cristall	Cristall	-
	-	-	-
	-	-	-
<b>Nickel alaşımları</b>	nanoA	nanoA	Fire
	Signum	Signum	-
	Fire	Fire	-
<b>Titanyum / Ti alaşımları</b>	Zenit	Zenit	Fire
	nanoA	nanoA	-
<b>Bakır / Bronz / Pirinç</b>	ICE	ICE	TiN
	Carbo	Carbo	-
<b>Kobalt Krom alaşımları</b>	nanoA	nanoA	-
	Signum	Signum	-
	Fire	Fire	-
<b>değerli metaller</b>	nanoA	nanoA	-
<b>Seramik</b>	Cristall	Cristall	-
<b>takviyesiz plastikler</b>	Carbo	-	-
<b>takviyeli plastikler</b>	Cristall	Cristall	-
	Signum	Signum	-

**uyarı:**

Gühring Kaplamaların önerileri gösterilmektedir. Önem derecesi yukarıdan aşağı işlenmektedir.

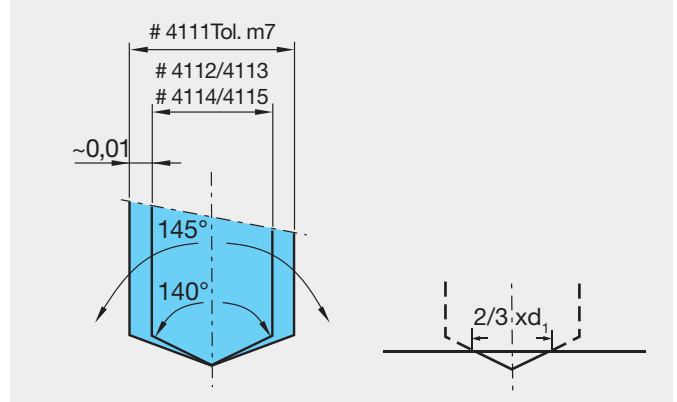


## Merkezeleme ve pilot deliği

### HT 800 için merkleme ve pilot deliği

Genellikle 5xD üzerinde olan HT 800 uygulamaları için pilot delik öneririz.

Merkezelemede delme çapımız da delik çapının 2/3'den büyük olmalıdır. Pilot uygulamalarında 1xD derinlik öneriyoruz. Buna ek olarak uç acımız ve pilot çapımız, matkap açısından ve çapından daha büyük olmalıdır. Bunu sağlamak için, Art no 4111 uç ile kısa bir pilotlama öneriyoruz. Art 4111'in uç açısı 145 derece ve m7 toleransa sahip. Kısa ve rijit tutucusu ise Art 4105'dir.

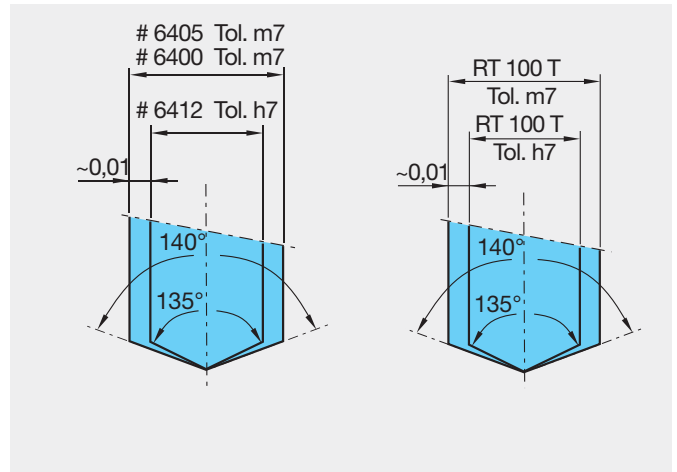


### Karbür takımlar için merkezeleme ve pilot deliği

Karbür matkaplarda 7xD'den 12xD'ye kadar olan uygulamalar için 1xD veya 2xD boylarında pilotlama tavsiye ediyoruz. 12xD üzerinde olan uygulamalarda ise 1xD veya 2xD pilotlama zorunludur.

15xD Excluseive Line mikro matkaplar için (Art 6412) pilot uygulamasında optimum uç açısına ve çap tolerasına sahip olan 4xD su vermesiz (Art 6400) matkap ya da 5xD içten su vermeli (Art 6405) matkap öneriyoruz.

Örneğin RT 100 T'nin kullanıldığı derin delik uygulamalarında 3xD RT 100 U Ratio matkapların kullanılması uygundur. (Örneğin Art 2477). Bu matkaplar uygun uç açısı ve toleransa sahiptirler.



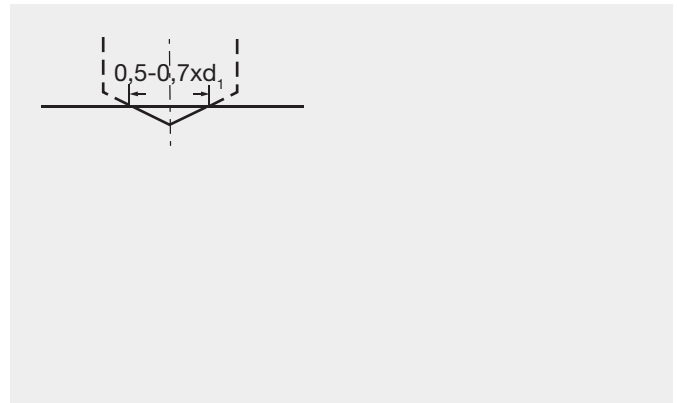
### HSS için merkezeleme ve pilot deliği

#### DIN 340 uzunluğuna sahip matkaplar için merkezeleme

Uzun seri HSS/HSCO matkaplar kullanıldığı zaman (DIN 340) 0,5 ile 0,7xD arasında bir merkezeleme çapı kullanılır. HSS NC Matkaplar bu işlem için uygundur. NC punta matkapları ile ilgili detaylı bilgiler NC Matkaplar bölümünde bulunmaktadır.

#### DIN 1869'a sahip matkaplar için pilot deliği

DIN 1869'a sahip ekstra uzun matkapların kullanımında ise 1xD ile 2xD arasında pilot deliği uygulanmasını tavsiye ediyoruz. DIN 1897'e sahip GV 120 Tip matkaplar bu operasyonlar için uygundur.





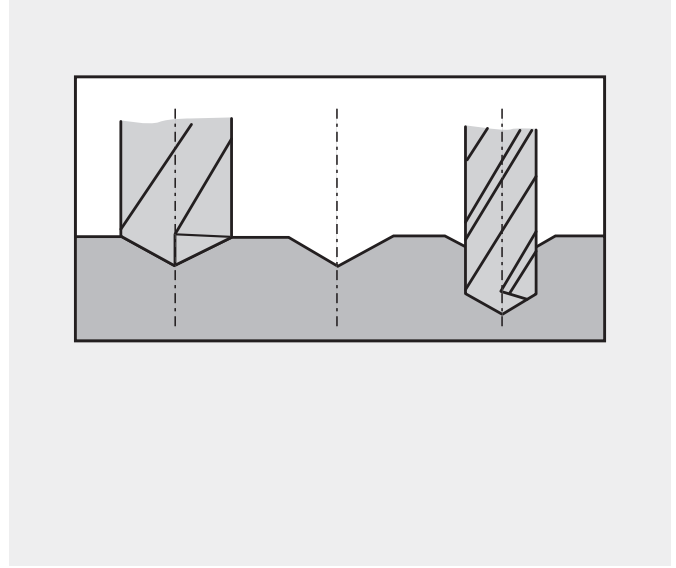
## NC punta matkabı

### NC punta matkabı

Genellikle işlenmesi zor şekilli parçaların (yuvarlak, sert vs.) ile yakın çap toleransları istenen delikler, derin delikler doğrusalık istenilen delikler işlenirken NC punta matkaplarının kullanılması tavsiye edilir.

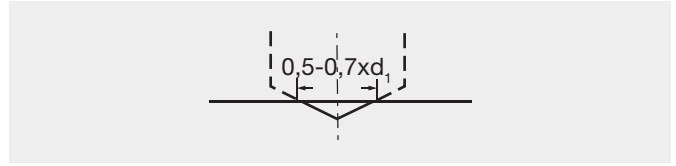
NC matkaplar daha delik çapından daha büyük seçilmesi halinde pah ve havşa oluşturmada kullanılabilirler.

NC Matkaplar çok rijit bir konumlandırma yahip olmaları gerektiği için sert ve kısa kanallı bir tasarıma sahiptirler. Maksimum rijitlikle üretilen bu matkaplar nokta tespiti için işlem sırasında istenilen geometric uzunluğa uygun seçilmelidir.



### NC punta matkabı seçimi

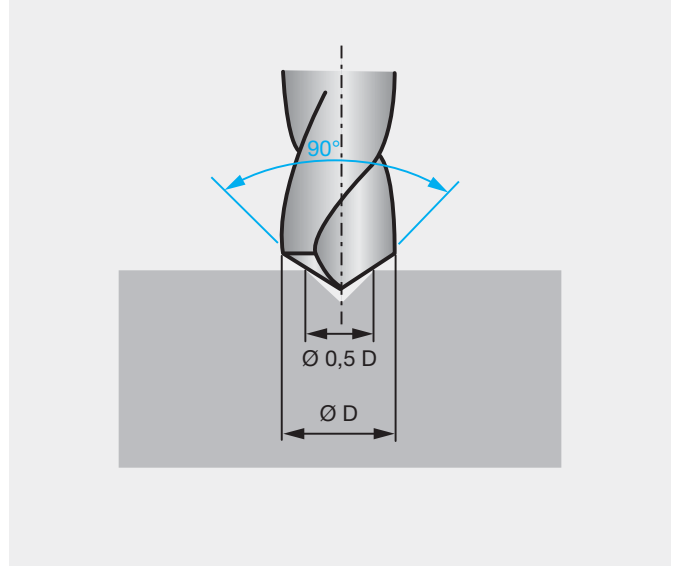
İdeal olarak çapın 0,5 ile 0,7 aralığında seçilmelidir.



### 90° NC punta deliği

90° NC matkaplar la açılmış deliklerin ardından gelen daha geliş açılı matkallarda ilk olarak kesme ağız temas eder ve kesme en kararlı olan kesme ağız tarafından yönlendirilir.

90° NC matkapla delik çapından daha büyük bir delik açılmışsa Tek operasyonla hem merkezleme deliği açılır hemde 90°'lik bir havşa oluşturmuş oluruz.

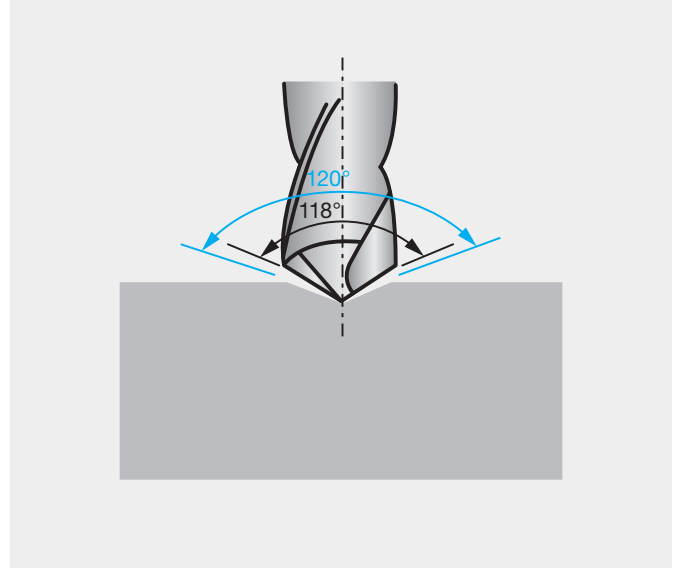




## NC punta matkapları

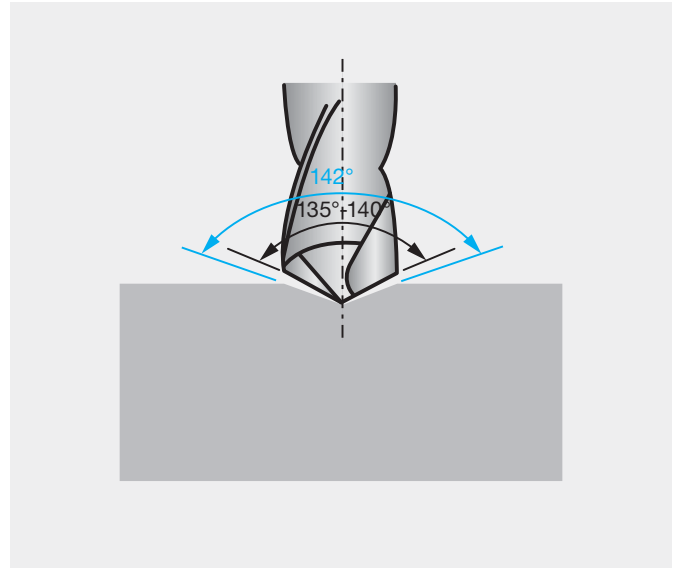
### 120° NC-punta matkapları

NC punta matkapları 120 derecelik uç açısına sahip olup özellikle 118 derecelik HSS/HSCO matkaplarla açılacak asil deliklerin öncesindeki operasyonlarda kullanılır. Bu işlem akabinde HSS/HSCO matkaplarıyla açılacak deliklerin güvenliğini sağlamaktadır.






### 142° NC-punta matkapları

NC punta matkapları 142 derecelik uç açısına sahip olup özellikle 135° - 140° derecelik karbür matkaplarla açılacak asil deliklerin öncesindeki operasyonlarda kullanılır. Bu işlem akabinde karbür matkaplarıyla açılacak deliklerin güvenliğini sağlamaktadır. Eğer karbürün kesme kenarları matkap ucundan önce kesmeye başlarsa takımın kenarlarında aşınma olur bu yüzden punta matkabı kullanımı önemlidir.



### NC punta matkapları

90°	120°	142°
		



## Kesme yağ basıncı ve debisi Rasyo matkap ucu

Şekillerde görülen ideal, normal ve minimal olarak belirtilen kesme yağ debileri yalnızca rasyo matkap ucu RT 100 U için geçerlidir. Her makinada farklı soğutma sistemi kullanıldığından basınç kayıpları da (resim 1) farklıdır ve dolayısıyla basınçlar tezgaha bağlıdır. Belirtilen basınçlar kolaylık olsun diye bilgi amaçlı verilmiştir.

Merkezi içten soğutma kanallı rasyo matkap ucu tip RT 80 için diğer ölçükleri kullanınız. (resim 2)

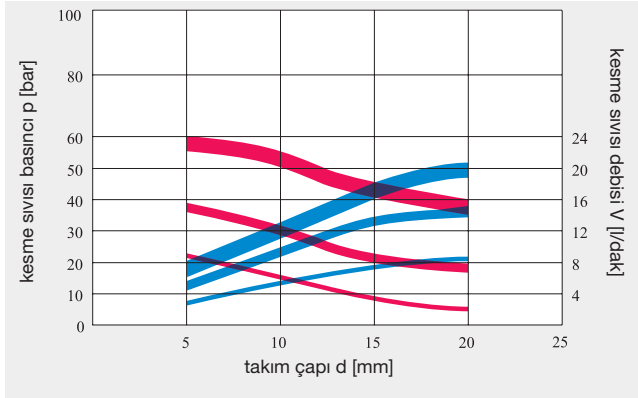
Şekiller rasyo matkaplarla çelik işlemede en önemli uygulamalara ait deneyleri göstermektedir. Belirtilen değerler tavsiye amaçlıdır, ancak diğer malzemeler için de kullanılabilir. Çünkü çelik için yüksek basınçlar gereklidir. Soğutma her ne kadar malzemeye bağlı bir olgu ise de soğutma konusunda özellikle en hassas takım olan düz kanallı RT 150 referans alınmıştır. Örnek olarak düşük basınçtan kaynaklanan ömür kaybı pik döküm işlemede AISi-alaşımına göre daha fazladır.

Bu durum AISi-alaşımını kısa talaşlı olduğu için geçerlidir. Bu nedenle pik döküm için gereken basınç AISi-alaşımına oranla daha yüksek olmalıdır. (resim 3 ve 4)

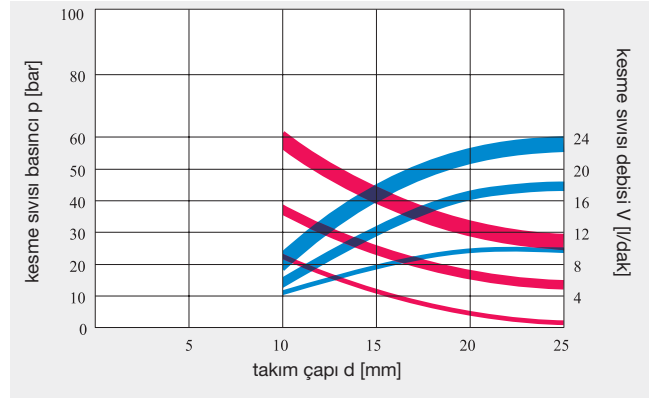
Tavsiye edilen değerler yalnızca 5 X D delik derinliğine kadar geçerlidir. Daha derin delikler için içten soğutmalı takımlar özellikle de RT 150 GN kullanılmalıdır. Aksi taktirde işleme (malzemeye bağlıdır) ekonomik olmaz

gerekli kesme sıvısı basıncı  
ideal basınç  
normal basınç  
minimal basınç

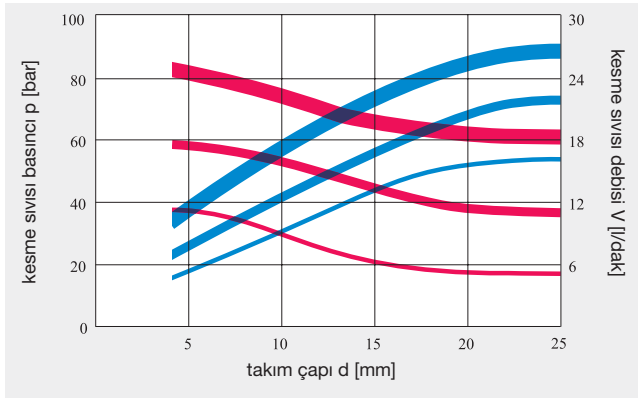
gerekli kesme sıvısı debisi  
ideal debi  
normal debi  
minimal debi



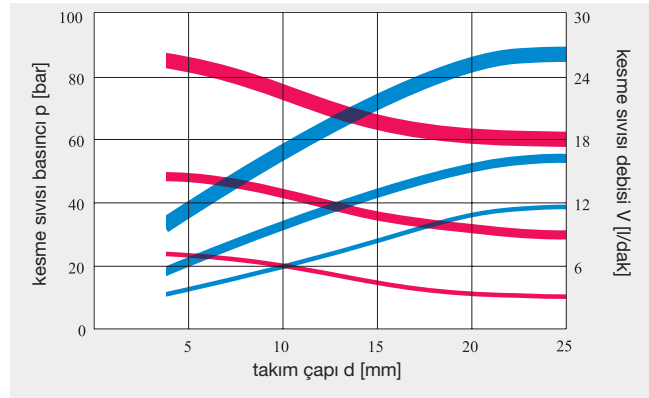
resim 1:  
gerekli kesme sıvısı basıncı ve debisi  
helisel içten soğutma kanallı rasyo matkap ucu tip RT 100



resim 2:  
gerekli kesme sıvısı basıncı ve debisi  
merkezi içten soğutma kanallı Rasyo matkap ucu tip RT 80



resim 3:  
Düz kanallı rasyo matkap ucu RT 150 GG ile GG25 malzeme işlemede  
gerekli kesme yağ basıncı ve debileri



resim 4:  
Düz kanallı rasyo matkap ucu RT 150 GG ile AISi7 malzeme işlemede  
gerekli kesme yağ basıncı ve debileri



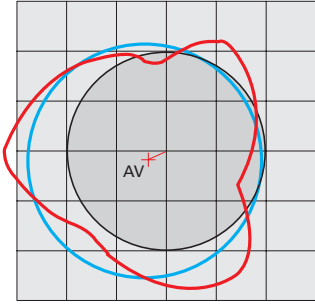


## Tipik delik kalite örnekleri

### 1. 42CrMo4V, Ø 14,5 mm

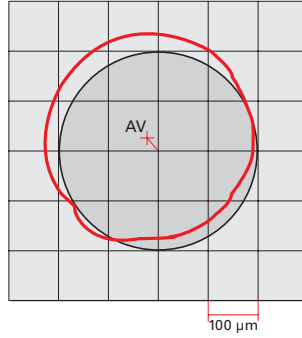
#### HSS-mtkap ucu, tip N ürün no 651 S

vc = 25 m/dak.  
f = 0,25 mm/dev.  
+Rmax = 131,8 µm  
-Rmax = -49,1 µm  
aktuel-D = 14,566 mm  
dRmax = 103,5 µm  
AV = 49,2 µm  
Ra = 2,6 µm, Rz = 6,8 µm **IT12**



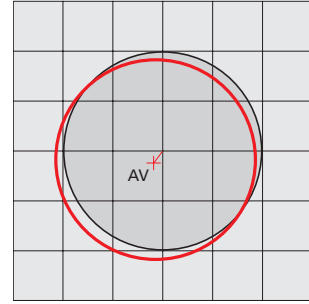
#### rasyo matkap ucu, tip RT 80 ürün no. 1171 S

vc = 70 m/dak  
f = 0,25 mm/dev.  
+Rmax = 42,7 µm  
-Rmax = -29,6 µm  
aktuel-D = 14,515 mm  
dRmax = 12,9 µm  
AV = 35,3 µm  
Ra = 1,4 µm, Rz = 4,31 µm **IT9**



#### rasyo matkap ucu, tip RT 100 ürün no 1181 S

vc = 70 m/dak  
f = 0,25 mm/dev.  
+Rmax = 26,7 µm  
-Rmax = -17,2 µm  
aktuel-D = 14,509 mm  
dRmax = 5,2 µm  
AV = 22,8 µm  
Ra = 1,04 µm, Rz = 3,2 µm **IT8**



Maksimal salgı (dRmax) üretilen delik daresi ile hesaplanan ortalama daire arasındaki en büyük pozitif ve negatif sapmanın mutlak değerleri toplamıdır. (AV) Eksen kaçıklığı matkap ucunun gerçek delik merkezinden kaç mikron kaçık olduğunun ölçüsü-dür. En hatalı ölçü takım çapına göre deliğin IT-kalite sınıfını tayin eder.

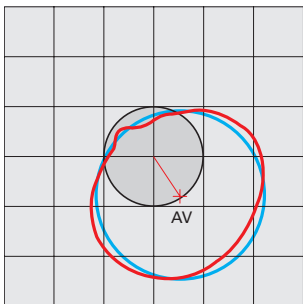
Siyah daire olması gerekli deliği göstermektedir ve takım idealde bu deliği imal etmelidir. Kırmızı daire delinen gerçek

deliği göstermektedir. Mavi daire delinen deliğin aritmetik ortalaması alınmış şeklidir, yani ortalama çapı göstermektedir. Rasyo matkaplarla üretilen daire ile olması gereken dairenin pratik olarak birbiriyle çakıştığı görülmektedir.

### 2. GGG40, Ø 10,0 mm

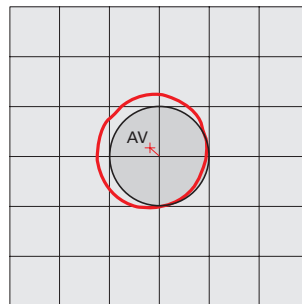
#### HSS-mtkap ucu, tip N ürün no 651 S

vc = 30 m/dak  
f = 0,2 mm/dev.  
aktuel-D = 10,077 mm  
+Rmax = 106 µm  
-Rmax = -28 µm  
dRmax = 42 µm  
AV = 68,5 µm  
Ra = 3,7 µm, Rz = 17,2 µm **IT12**



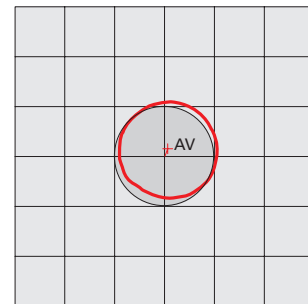
#### rasyo matkap ucu, tip RT 100 ürün no 1181 S

vc = 90 m/dak  
f = 0,3 mm/dev.  
aktuel-D = 10,027 mm  
+Rmax = 34 µm  
-Rmax = -9,2 µm  
dRmax = 6,5 µm  
AV = 22,5 µm  
Ra = 2,2 µm, Rz = 11,5 µm **IT9**



#### rasyo matkap ucu, tip RT 150 GG ürün no. 768 O

vc = 130 m/dak  
f = 0,2 mm/dev.  
aktuel-D = 9,994 mm  
+Rmax = 11,5 µm  
-Rmax = -18 µm  
dRmax = 5 µm  
AV = 14 µm  
Ra = 1,99 µm, Rz = 11,2 µm **IT8**





## Derin delik matkapları konusuna kısa bakış

Talaş kaldırma tekniğinde  $15xD$  delik derinliğinden sonra derin delik delicilerden bahsedilir. Tabii ki derin delik deliciler aynı zamanda kısa delikleri de delebilir, böylelikle bu yöntemin olumlu avantajlarından düzgün yüzey finiş, asgari merkez kaçıklığı ve delik doğrusalılığı gibi özelliklerden de faydalanmış olunur.

### Yüksek basınçlı soğutma - artık tabii bir yöntem.

Son yıllarda tüm matkap ucu takımlarda içten soğutma sistemi kendini kabul ettirmiştir. Kesme yağı bu kanallardan matkap ucunda en gerekli yere ulaştırılır. Bu sayede helisel matkap uçlarında ve makine kılavuzlarında kırımlar azalır, ömürler önemli ölçüde uzar. Konvansiyonel takım tezgahları bugün artık yüksek basınçlı pompalarla donatılmaktadır ve derin delik matkap işlemleri için uygundur. İşlem merkezlerinde, torna makinalarında derin delik delme işlemlerinin kullanımı gittikçe artmaktadır. Böylelikle derin delik işlem tekniği gittikçe daha popüler hale gelmektedir.

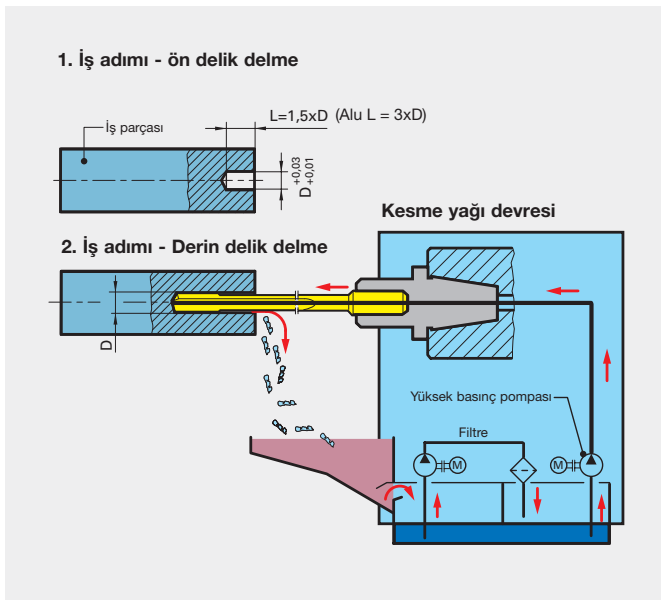


**Tüm derin delik matkaplarına pilot deliği desteği yapılmalıdır. Derin delik matkapları makine atölyelerinde destek olmadan tam hızda çalıştırılmamalıdır.**

### Dikkat!

Çelik saplı derin delik delme matkapları ağırlıklı olarak shrink bağlama için uygundur!  
(istisna T16 sonraki sayfaya bakınız)

### Konvansiyonel takım tezgahlarında derin delik delme



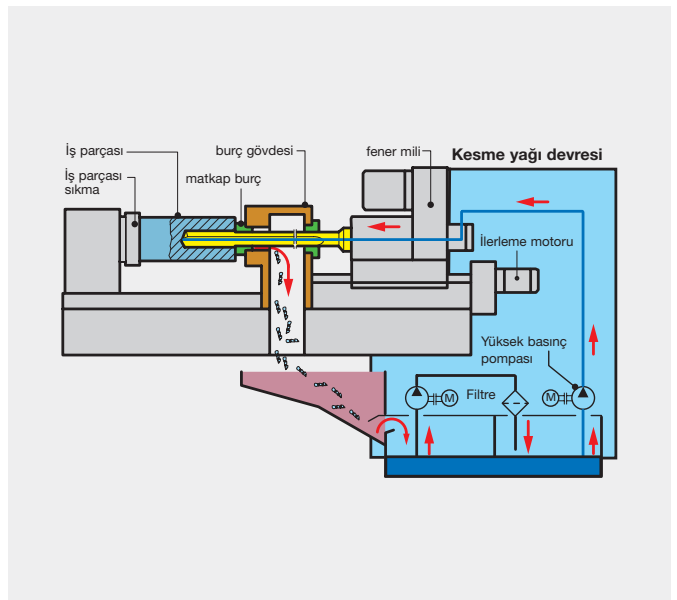
### Konvansiyonel takım tezgahlarındaki yöntemler

- Ön deliği delin. (H8 toleransında);
- Devir sayısı: yaklaşık 200 dev./dak., İlerleme: yaklaşık 500 mm./dak. olmalıdır.  $40xD$ ' den büyük takımlarda yanaşmada sola dönün.
- Soğutma yağ basınç ve devir sayısı ayarını yapın
- Parçayı sökmeden derin deliği kesintisiz olarak delin. Boy çap oranı büyük ise (örneğin: EB 100 kanal uzunluğu 160 mm'den itibaren) delik derinliği yaklaşık 25 mm. ye kadar azaltılmış kesme değerleriyle (ideal kesme hızının yaklaşık %75'i ile) delmeyi tavsiye ederiz.
- Delik derinliğine ulaşıncaya soğutma yağını kapatın
- Fener mili durunca hızlı ilerleme ile takımı geri çekin

### Tavsiyeler

- Delik derinliğinin  $40xD$  üzerindeki durumlarda 2 veya daha fazla derin delik matkabı kullanmayı tavsiye ediyoruz. Örneğin:  $\varnothing 10 \times 400$  mm. ve  $9,95 \times 800$  mm.
- $40xD$ ' den büyük takımlarda yanaşmada sola dönün.
- $40xD$  üzerindeki delik derinliklerinde ön deliğe sol dönüşle girilmesi gerekmektedir.
- Uzun talaşlı malzemelerin işlenmesinde kanalları polisajlı derin delik matkabının sipariş edilmesini tavsiye ederiz
- Uzun talaşlı alüminyumun işlenmesinde kullanılacak tek ağızlı derin delik matkapları  $180^\circ$  bilemeli ve yağ kanallı olarak sipariş edilmelidir.
- Si-yüzdesi %1 den az olan Alüminyum deliklerde tavsiye edilen kesme hızı  $vc > 160$  m/dak ile çalışmak istenirse bu hıza bir kaç kademede çıkmanızı öneririz. Bunun dışında  $3xD$  pilot delik delinmelidir.

### Derin delik matkapları makine





Aşağıdaki burç çeşitlerini ambarlarımızda bulunduruyoruz ancak burada sadece bazı seçenekler sunulmaktadır. Ancak müşteri talebine göre en hassas şekilde burç tasarımı yapıyoruz.

Dikkat! EB 100 burçlarında ayar mili gereklidir. Talep üzerine bilgi verilecektir.

Derin delik makineleri için sıkma burcu				
<b>1</b>		<b>5</b>		
Tanıtım sayısı	d <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>
1.1	10	40	24	-
1.2	10	40	24	45
1.3	10	40	24	55
1.4	16	45	31,2	-
1.5	25	70	34	-
1.6	25	70	34	78
<b>2</b>		<b>6</b>		
Tanıtım sayısı	d <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>
2.1	16	50	47	-
2.2	16	50	47	55
2.3	16	50	47	70
<b>3</b>		<b>7</b>		
Tanıtım sayısı	d <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>
3.1	25	70	34	100
<b>4</b>		<b>8</b>		
Tanıtım sayısı	d <sub>1</sub>	l <sub>1</sub>		
4.1	19,05	70		
4.2	12,70	70		
4.3	25,40	70		
4.4	31,75	70		
4.5	36,10	70		

DIN 1835 sıkma burcu		
<b>9</b>		
Tanıtım sayısı	d <sub>1</sub>	l <sub>1</sub>
9.1	8	36
9.2	10	40
9.3	12	45
9.4	16	48
9.5	20	50
9.6	25	56
9.7	32	60
9.8	31,75	70
9.9	38,1	70
9.10	40	70

DIN 6535 sıkma burcu		
<b>10</b>		
Tanıtım sayısı	d <sub>1</sub>	l <sub>1</sub>
10.1	8	36
10.2	10	40
10.3	12	45
10.4	16	48
10.5	20	50
10.6	25	56
10.7	32	60
10.8	25	70
10.9	40	70

VDI-Tasarımına göre sıkma burcu		
<b>12</b>		
Tanıtım sayısı	d <sub>1</sub>	l <sub>1</sub>
12.1	10	68
12.2	16	90
12.3	25	112

Ayrıca derin delik delme için kullanılabilir.

Speed-Bit-Sistemine göre sıkma burcu			
<b>13</b>			
Tanıtım sayısı	d <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>
13.1	16	40	16
13.2	25	50	25
13.2	35,6	60	

Ayrıca derin delik delme için kullanılabilir.

formu HB		
<b>8</b>		
Tanıtım sayısı	d <sub>1</sub>	l <sub>1</sub>
8.1	8	36
8.2	10	40
8.3	12	45
8.4	16	48
8.5	20	50
8.6	25	56
8.7	32	60
8.8	40	70

formu HE		
<b>11</b>		
Tanıtım sayısı	d <sub>1</sub>	l <sub>1</sub>
11.1	8	36
11.2	10	40
11.3	12	45
11.4	16	48
11.5	20	50
11.6	25,4	70
11.7	25	56
11.8	32	60
11.9	40	70

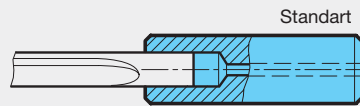
HA formuna benzer şekilde (Shrinklenebilir)		
<b>16</b>		
Tanıtım sayısı	d <sub>1</sub>	l <sub>1</sub>
16.1	10	50
16.2	16	64
16.3	20	70
16.4	25	81
16.5	32	92

HE formuna benzer şekilde		
<b>17</b>		
Tanıtım sayısı	d <sub>1</sub>	l <sub>1</sub>
17.1	19,05	70
17.2	25,40	70
17.3	31,75	70
17.4	38,1	70

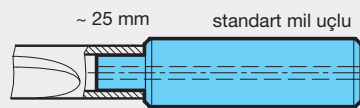
Ayrıca derin delik delme için kullanılabilir.

### Boru saplı derin delik matkaplarında üretim seçenekleri

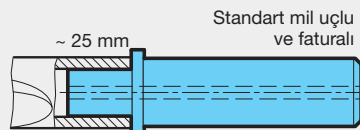
Nominal-Ø < burç-Ø için yöntem:  
(Fark yaklaşık 6 mm olmalıdır)  
boru sapın içine geçirilir.



Nominal-Ø ≠ burç-Ø  
(maks. eşit-kadar)  
boru milin içine geçirilir.



Nominal-Ø > burç-Ø için yöntem;  
boru milin içine geçirilir ve faturaya dayanır.

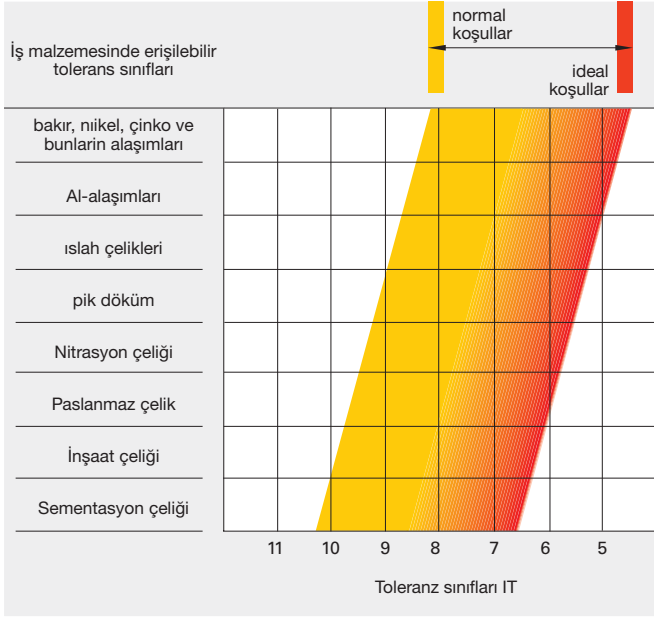




## Tek ağızlı derin delik matkaplarında hassasiyet

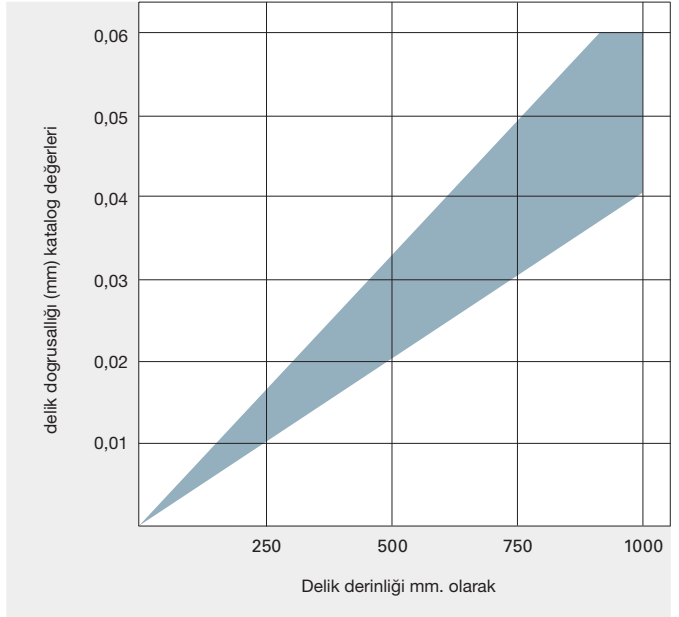
### Toleranslar\*

Tek ağızlı derin delik matkapları ile hassas çap toleransları elde edilebilir. Bunun nedeni kesme kuvvetlerinin mevcut dayama çubukları tarafından karşılanmasıdır. Bu durum helisel matkaplarda böyle değildir. Örneğin bu matkaplarda kesme ağızları arasındaki en ufak bir kaçıklık deliğin daha büyük çıkmasına neden olur.



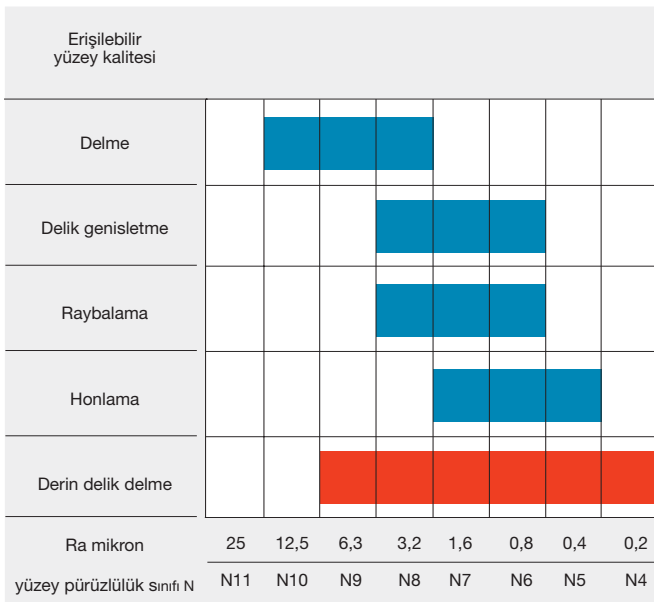
### Delik doğrusalığı\*

Lehimli derin delik matkaplarında, sert metal kesici uç daima esnek bir boruya lehimlendiğinden takım olası mevcut salğıdan etkilenmeden daha doğrusal bir delik deler. Malzemenin aşırı derecede homojen olmaması ve diğer etken faktörler delik doğrusalığını etkileyip, bozacaktır.



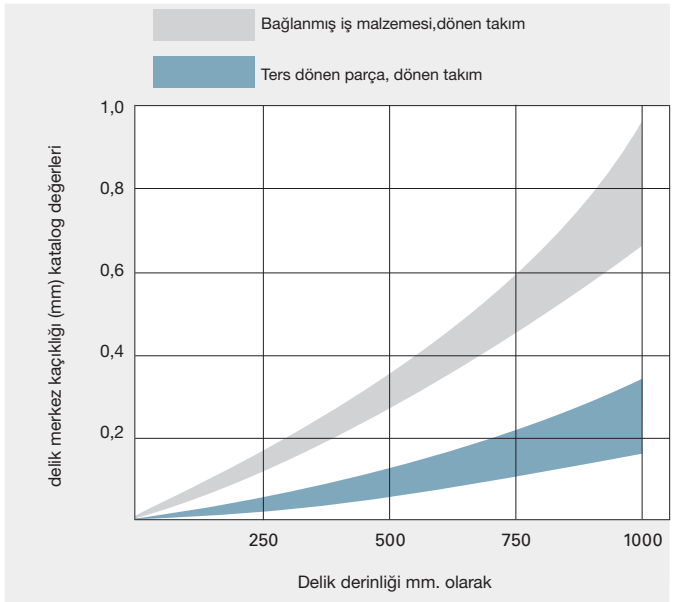
### Yüzey pürüzlülüğü\*

Kesme kuvvetleri kesme ağızında dayama çubukları tarafından karşılanır. Bu çubuklar yüzeydeki kayganlığı da sağlarlar. Dayama çubukları ile delik yüzeyi arasındaki yağ filmi bu açıdan çok önemlidir. Soğutma yağı ne kadar iyi olursa yüzey kalitesi de o kadar iyi olacaktır.



### Delik merkez kaçıklığı\*

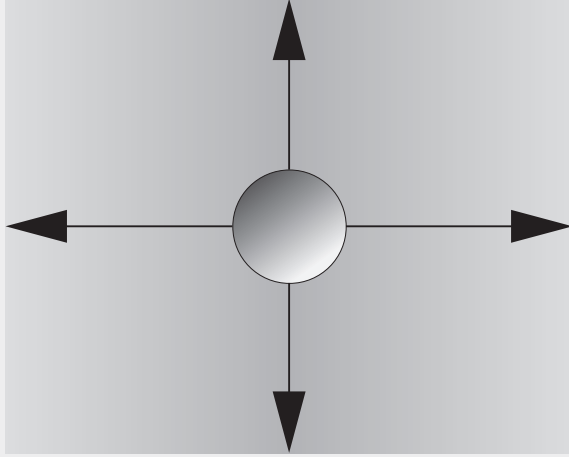
Normal bir helisel matkapla delik delindiğinde ağız bileme kalitesi delik merkez kaçıklığını etkiler. Ağızlarda balansızlıktan kaynaklanan kuvvetler oluşur. Tek ağızlı derin delik matkaplarında kesme kuvvetlerini dayama çubukları karşılayıp, dengelediğinden delik merkez kaçıklığı oluşmaz.



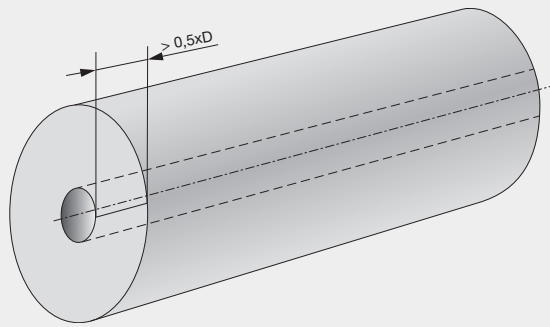
\*İki kesme ağızlı derin delik matkapları - düzkanallının yanı sıra spiral kanallı - yaklaşık belirtilen değerleri iki defa elde eder



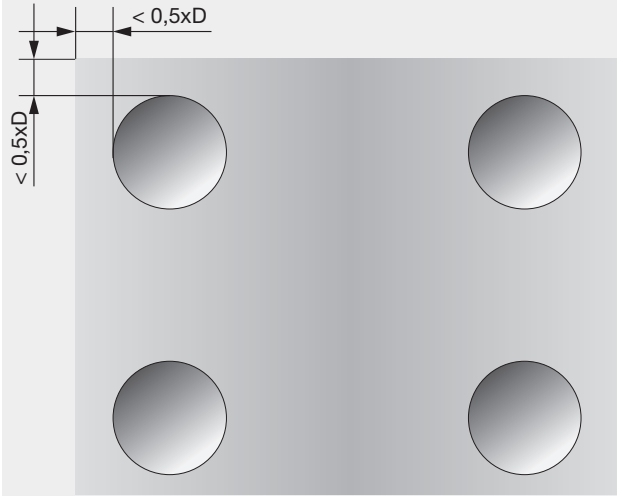
## Delik düzgünlüğü/görüntü bozukluğu



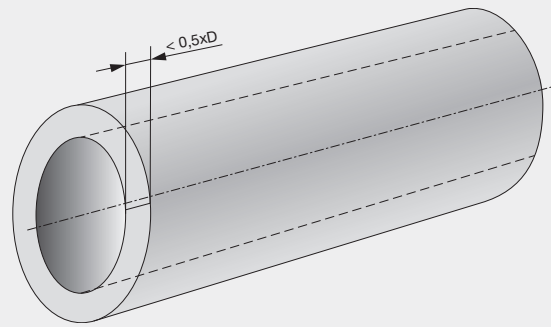
Kenara kadar olan delik mesafesi  $> 0,5xD$



Yeterli duvar mesafesi  
( $> 0,5xD$ ) → optimal



Kenara kadar olan delik mesafesi  $< 0,5xD$



Minimum mesafe ( $0,5xD$ )  
Kısa kalırs → delik düzgünlüğünde  
kayba yol açabilir



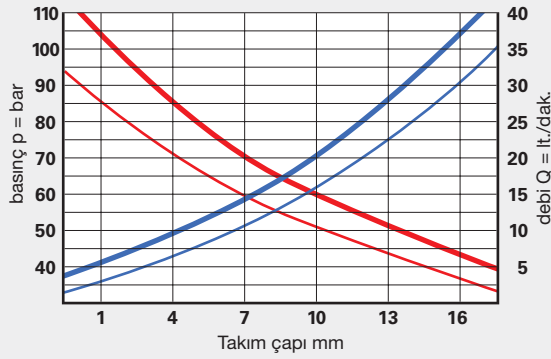
## Kesme yağ basıncı ve debisi

### Lütfen dikkat ediniz:

- Hava, su veya kesme yağ kullanımı farketmeden tüm derin delik matkapları mutlaka içten soğutmalı olarak kullanılmalıdır. Aksi takdirde talaşların atılması mümkün olmaz.
- Tüm derin delik matkaplarda kesme yağı kullanılabilir. Ancak aynı debiyi elde etmek için % 30 daha fazla basınç gerekir.
- Derin delik matkabı MMS sistemle kullanılacak ise küçük çaplarda basınç artırılmalıdır.
- Soğutma değerleri yetersiz kalırsa kesme değerleri düşürülmelidir. Ayrıca basınç artırma sistemi de kullanılabilir.
- Derin delik matkabının boyunun artması ile bir basınç artışının soğutma kanalları boyunca gereken soğutma sıvısının hacmini taşınması beklenir.

### Kesme yağ basıncı ve debisi EB 100

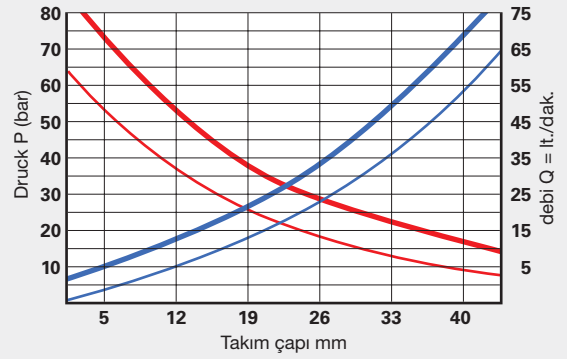
(Emülsiyon için katalog değerleri)



— maks.kesme yağ basıncı — maks. kesme yağ debisi  
— min. kesme yağ basıncı — min. Kühlmittelmenge

### Kesme yağ basıncı ve debisi EB 80

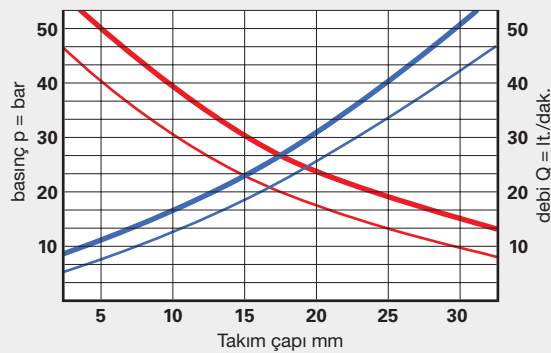
(Emülsiyon için katalog değerleri)



— maks.kesme yağ basıncı — maks. kesme yağ debisi  
— min. kesme yağ basıncı — min. Kühlmittelmenge

### Kesme yağ basıncı ve debisi ZB 80

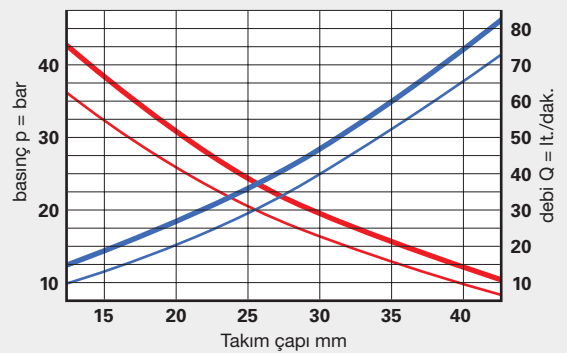
(Emülsiyon için katalog değerleri)



— maks.kesme yağ basıncı — maks. kesme yağ debisi  
— min. kesme yağ basıncı — min. Kühlmittelmenge

### Kesme yağ basıncı ve debisi EB 800

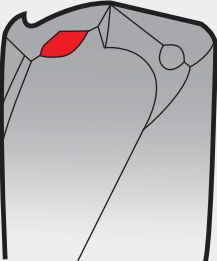
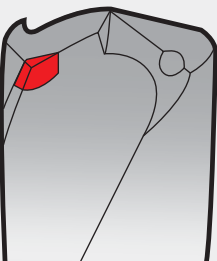
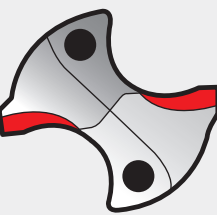
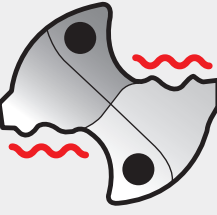
(Emülsiyon için katalog değerleri)



— maks.kesme yağ basıncı — maks. kesme yağ debisi  
— min. kesme yağ basıncı — min. Kühlmittelmenge

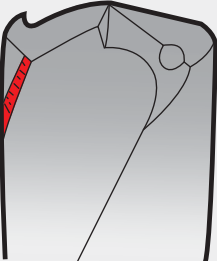

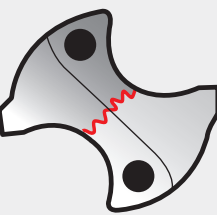
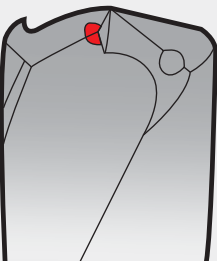


## Uygulama/Çözüm

Problem	sorun	çözüm
<b>1. Kesme ağız birikmesi</b> 	<ul style="list-style-type: none"> <li>■ düşük kesme hızı</li> <li>■ Aşırı bilenmiş kesme ağızı</li> <li>■ Kaplamasız takım ağızı</li> </ul>	<ul style="list-style-type: none"> <li>■ kesme hızını arttırın</li> <li>■ kesme ağızını körleyin</li> <li>■ takımı kaplattırın</li> </ul>
<b>2. Kenarların çitlaması sabit olmaması</b> 	<ul style="list-style-type: none"> <li>■ rijit olmayan durumlar takımın yeterince</li> <li>■ Merkezden sapmaların buyumesi</li> <li>■ pürüzlü kesim</li> </ul>	<ul style="list-style-type: none"> <li>■ Takımı daha rijit bağlayın</li> <li>■ mümkünse merkezeleme kontrol edip doğrulanmalı</li> <li>■ ilerlemeyi düşürün</li> </ul>
<b>3. Kenarlarda aşınma</b> 	<ul style="list-style-type: none"> <li>■ çok yüksek kesme hızı</li> <li>■ İlerleme çok az</li> <li>■ Boşluk açısı çok az</li> </ul>	<ul style="list-style-type: none"> <li>■ kesme hızını azaltın</li> <li>■ ilerlemeyi arttırın</li> <li>■ Boşluk açısını arttırın</li> </ul>
<b>4. Kesme ağızında aşınma</b> 	<ul style="list-style-type: none"> <li>■ Takım bağlanması rijit değil</li> <li>■ Pürüzlü kesme</li> <li>■ max. aşınma değerleri aşılmış</li> <li>■ yanlış takım tipi</li> </ul>	<ul style="list-style-type: none"> <li>■ Takımı daha rijit bağlayın</li> <li>■ ilerlemeyi düşürün</li> <li>■ Takımı daha kısa sürede değiştirin</li> <li>■ uygun olan tipi kullanın</li> </ul>



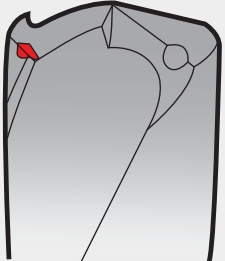
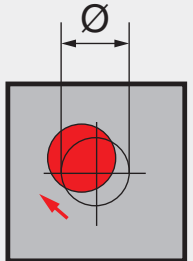
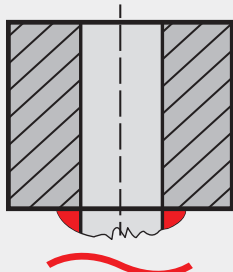
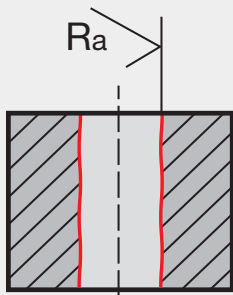
## Uygulama/Çözüm

Problem	sorun	çözüm
<b>5. Yanak asinmasi</b> 	<ul style="list-style-type: none"><li>rijit olmayan sartlar, is parcasinin yeterince sikilmamasi</li><li>Merkezden sapmalarin buyumesi</li><li>Arka konikligin cok kucuk olmasi</li><li>Yanlis sogutucu kullanimi (yag), sogutucunun cok zayif olmasi</li></ul>	<ul style="list-style-type: none"><li>Is parcasinin rijit sekilde baglanmasi</li><li>merkezelemeyi kontrol edip dogrulamak</li><li>takim geometrisini control etmek</li><li>sogutucu sivinin basincini arttirmek veya ilave olarak yag kullanmak.</li></ul>
<b>6. Takim govdesinde centik gorulmesi</b> 	<ul style="list-style-type: none"><li>rijit olmayan sartlar, is parcasinin yeterince sikilmamasi</li><li>Merkezden sapmalarin buyumesi</li><li>puruzlu kesim</li><li>Is parcasinin asindirici olmasi</li></ul>	<ul style="list-style-type: none"><li>Is parcasinin rijit sekilde baglanmasi</li><li>mumkunse merkezeleme kontrol edip dogrulanmeli</li><li>arka konikligin arttirilmesi</li><li>sogutucu sivinin basincini arttirmek veya ilave olarak Yag kullanmak.</li></ul>
<b>7. keskin kosede asir asinim</b> 	<ul style="list-style-type: none"><li>kesme hizi cok dusuk</li><li>ilerleme cok yuksek</li><li>Kesme agzinin faza taslanmasi</li></ul>	<ul style="list-style-type: none"><li>kesme hizi arttirilmali</li><li>ilerleme dusurulmeli</li><li>kesme agzindeki taslama azaltilmali</li></ul>
<b>8. Kesici agizda uflanma veya incelme hatasi</b> 	<ul style="list-style-type: none"><li>Dusuk bosluk acisi</li><li>Kesme agzinin faza taslanmasi</li><li>yanlis takim secimi</li></ul>	<ul style="list-style-type: none"><li>bosluk acisi arttirilmali</li><li>ilerleme dusurulmeli</li><li>uygun takim kullanimi)</li></ul>





## Uygulama/Çözüm

Problem	sorun	çözüm
<b>9. Dış kosedede plastik deformasyon görülmesi</b> 	<ul style="list-style-type: none"> <li>■ kesme hizi çok düşük</li> <li>■ soğutma sıvı yetersizliği</li> <li>■ kosenin yanlış veya hiç taşlanmaması</li> </ul>	<ul style="list-style-type: none"> <li>■ kesme hızı artırılmalı</li> <li>■ soğutma sıvısını miktarı ve basıncı artırılmalı</li> <li>■ doğru taşlanmalı</li> </ul>
<b>10. Merkezden kacıklık</b> 	<ul style="list-style-type: none"> <li>■ rijit olmayan şartlar, iş parçasının yeterince sıkılmaması</li> <li>■ merkezlemenin yanlış olması</li> <li>■ puntalanan alanına hatalı olması</li> <li>■ keskin kosenin büyük olması</li> </ul>	<ul style="list-style-type: none"> <li>■ İş parçasının rigid şekilde bağlanması</li> <li>■ mümkünse merkezleme kontrol edilmeli ve doğrulanmalı</li> <li>■ punta işlemi için 2 ağızlı freze kullanılmalı</li> <li>■ kesici kosenin alanı düşürülmeli</li> </ul>
<b>11. Takım çıkarken Aşırı talaş birikmesi</b> 	<ul style="list-style-type: none"> <li>■ İlerleme çok yüksek</li> <li>■ Yüksek aşınmalar görülmesi</li> <li>■ Kesme ağzının fazla taşlanması</li> </ul>	<ul style="list-style-type: none"> <li>■ ilerlemeyi düşürün</li> <li>■ reduce tool change intervals</li> <li>■ kesme ağzına yapılan taşlama azaltılmalı</li> </ul>
<b>12. Düşük yüzey kalitesi</b> 	<ul style="list-style-type: none"> <li>■ rijit olmayan şartlar, iş parçasının</li> <li>■ merkezdeki sapma çok yüksek</li> <li>■ soğutucu sıvı miktarının düşük olması</li> </ul>	<ul style="list-style-type: none"> <li>■ Takımın rijit olarak bağlanması</li> <li>■ merkezi kontrol edin ve mümkünse düzeltin</li> <li>■ soğutucu sıvının miktarını ve basıncını artırın</li> </ul>



## Yüksek hız çelikleri

yüksek hız çelik takımlarını aşağıda belirtilen çelik çeşitlerinden üretmekteyiz. Alaşım oranlarına göre takımlar kendine has kullanım özellikleri kazanırlar.

Wolfram, Molibden: tavlama özelliğini ve aşınma mukavemetini yükseltir.

Vanadyum: finiş takımlarda aşınma mukavemetini yükseltir

Kobalt: aşınmaya karşı direnci yükseltir, yüksek sıcaklıkta sertliği korur.

Gühring-tanımlaması	Typ	Uygulama alanı ve özellikler
<b>HSS</b>	Geleneksel yüksek hız çeliği	universal kullanım için standart takım malzemesidir
<b>HSCO / HSS-E</b>	Kobalt alaşımlı yüksek hız çeliği	Yüksek işleme sıcaklıkları veya olumsuz soğutma için özellikle elverişli, artan talepler için de yüksek termal sertlikte takım malzemesidir.
<b>M42</b>	8% kobalt alaşımlı yüksek hız çeliği	Isıl direnci ve sertliği artırılmış takım malzemeleri, işlemesi zor malzemeler için uygundur.
<b>HSS-E</b>		
<b>HSS-E-PM</b>	Toz metalurjisi kobalt alaşımlı yüksek hız çeliği üretti.	Çok yoğun ve homojen yapıli takım malzemesidir. Yüksek sertlik ve ısıl direnci, yüksek aşınma dayanımı ve kesme kenarı stabilitesi.



## Gühring takımları için en önemlisi karbür kaliteleridir

Genel uygulamaları için Gühring'in ekstra stoklarından en önemlisi karbürler aşağıdaki listededir. Karbür sınıfları talep üzerine mevcuttur ve detaylı bilgiyi [www.guehring-carbide.de](http://www.guehring-carbide.de)

Gühring'in bilinen uygulamalarının %80'nden fazlasında, özellikle uyarlanmış kaplamalarında DK460UF kalitesindeki karbür takımların sonuçları, kaplanmış takımlarda dahil olmak üzere diğer karbür kaliteleri tarafından aşılamamıştır. Bu ve diğer ekstra stokta materyallerinin takım seçimini büyük oranda basitleştirmektedir. Diğer karbür kalitelerinin uygulamaları ile alakalı daha fazla bilgi için lütfen teknik mühendislerimizle irtibata geçiniz.

çeşit	Co-oranı [M-%]	WC-tane iriliği [µm]	sertlik [HV]	ISO-sınıflandırması [ISO 513]	özellikler
DK460UF K40UF	10	0,6	1620	K20-K40	Genelde kaplamalı olarak çok geniş kullanım alanına sahip bir çeşittir. Çelik, yumuşak alüminyum alaşımları, pik döküm ve aynı zamanda süper alaşım 718 işlemede kullanılır.
DK500UF K44UF	12	0,5	1690	K20-K30	Bu çeşit özellikle sert işlemler için geliştirilmiştir. DK 460 UF 'e göre daha sert ve daha elastiktir yüksek Co-oranı sayesinde kaplamalı olarak kullanım tavsiye edilir.
DK255F	8	0,7	1720	K20	Bu çeşitler, sert işlemler, yüksek mukavemetli pik döküm çeşitleri ve sert AISI- alaşımları için tavsiye edilir. Kuru işleme mümkündür. Kaplamalı kullanım amaçlanmalıdır.
DK120	6	1,3	1620	K15-K20	bu çeşit özellikle elmas kaplı olarak kullanıma uygundur.
DK120UF	7	0,7	1850	K05-K10	Yüksek aşınma dirençli ultra ince tane yapılı çeşitler çok stabil tezgahlar için uygundur, raybalar için tercih edilirler
K55SF	9	0,2-0,4	1920	K05-K10	Aşınmaya karşı yüksek dirençli malzemeler, paslanmaz çelik, Kevlar ve GFK gibi kompozit malzemeler için uygundur. Yüksek hızlı ve kuru işleme de uygundur
DK400N	10	0,7	1580	K20-K40	yüksek sıcaklığa dayanıklı metallerin işlenmesi için yüksek tokluk
DK256EH	10	0,6	1750	K20	Bu grup nikel alaşımlı çelikler için uygundur.
K6UF	6	0,6	1870	K05-K10	Ultra tane yapısındadır ve yüksek aşınmaya karşı dayanıklılık özelliğine sahiptir. Özellikle çok aşındırıcı malzemeler, kompozit malzemeler ve CFK için uygundur.
K5UF	5	0,5	2010	K05-K10	Yeni tasarlanmış ve yüksek sertliğe sahiptir. Kullanım alanı matkap ve rayba takımları içindir. Uygulama alanı kompozit malzeme işleminde önerilmektedir.



## Süper sert malzemeler

Bu yalnız süper sert takım malzemelerinin ekstrem sertliği değildir. Fakat ayrıca onların yüksekisi direnci yüksek kesim oranına ve arttırılmış verimliliğe olanak sağlar.PCD(Polikristal Elmas), maksimum aşınma direncine dayanır. PCD'nin asıl uygulama alanı alüminyum ve lifli kompozit malzemelerin

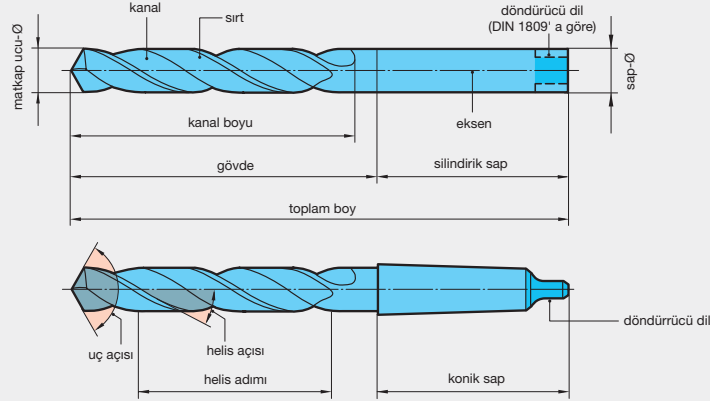
işlenmesidir. PcBN (Çok kristalli kübik bor nitrür) demir içeren malzemelerin uygulamalarında bulunur. Bu takım malzemelerinin en üst potansiyeline ulaşması için sert işleme takımlarının çoğunlukta olduğu uygulama tavsiye edilir.

Gühring-tanımlaması	sınıflandırma	Uygulama alanı özellikler	ortalama tane iriliği	Elmas içerik
<b>PKD</b>	ince tane	Alüminyum ve Al-Si alaşımları <% 10 Si, magnezyum alaşımları, pirinç, bakır, bronz, mükemmel kesme kenarı kalitesi, yüksek aşınma direnci, mükemmel yüzey kalitesi.	2-4 µm	> 90% PKD
	orta taneli	Evrensel Kalite (genel son işleme uygulamalarında) AISI alaşımlar <% 14 Si, bakır alaşımları, grafit ve grafit kompozit malzemeler, elyaf kompozit plastik, sinterlenmemiş seramik ve karbür (<% 15 bağlayıcı metal içeriği) mükemmel direnç, iyi yüzey kaliteleri.	5-10 µm	yaklaşık 92% PKD
	kaba taneli	Kaba işleme uygulamaları AISI alaşımlar>% 14 Si ve diğer aşındırıcı işleme uygulamaları, MMC, kabul edilebilir yüzey kalitesi ile sinterlenmiş seramik ve karbür <% 15 bağlayıcı metal içeriği, aşırı aşınma direnci, yüksek şok direnci, uzun takım ömrü.	>25 µm	yaklaşık 94% PKD
	karışık taneli	Aşındırma işlemi uygulamaları (yani :>% 14 AISi-alaşımlar, MMC, fiber kompozit plastik) En yüksek aşınma dayanımı, mükemmel darbe dayanımı, iyi yüzey kalitesi ile iyi kenar sertliği, uzun alet ömrü ile aşırı aşınma direnci.	4 µm+ 25 µm	yaklaşık 95% PKD
<b>PcBN 10..</b>	düşük CBN-içerikli HM-altlık ile	Sertleştirilmiş malzemelerin, sertleştirilmiş ısı işlem, takım çeliklerinin ve kesme derinliğinin 0.3 mm'den küçük, darbeli kesmelerin son işlemesi için uygundur. Yüksek aşınma direnci, darbe direnci, ısı direnci, tokluk.	<1-4 µm	40-65% CBN
<b>PcBN 20..</b>	yüksek CBN-içerikli HM-altlık ile	Perlitik gri dökme demir (> 45 HRC), PM-çelikler, soğuk döküm demir işleme için. Kesme derinliği 0.5-1.5 mm arası sürekli darbeli kesmelerde uygulama Yüksek aşınma direnci, direnç etkisi.	2-3 µm	70-90% CBN
<b>PcBN 30..</b>	yüksek CBN-içerikli HM-altlık ile	PcBN takım malzemesi kaba takım işlemleri için uygundur. Perlitik gri dökme demir, sert döküm, sertleştirilmiş çelikler. Uygulama için, sıkı malı tutucular, delme ve delik genişletme takımları, freze kafaları tutucularında Yüksek aşınma direnci, direnç etkisi.	2-20 µm	70-87% CBN

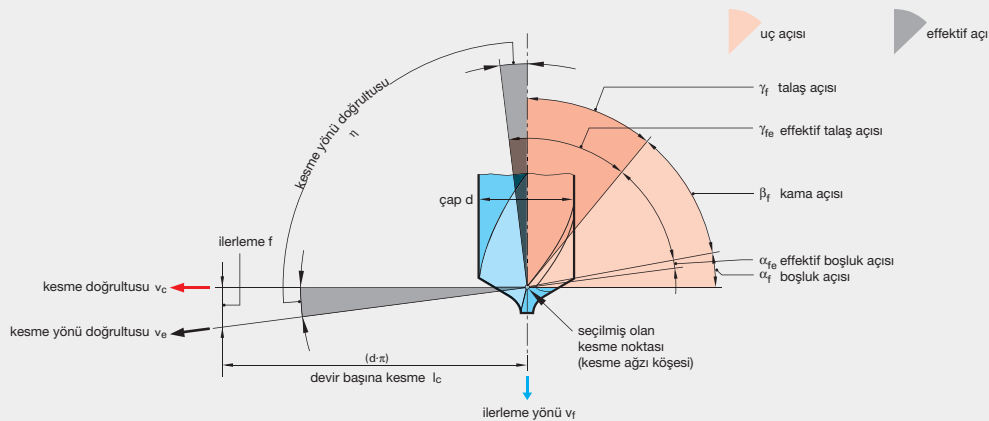
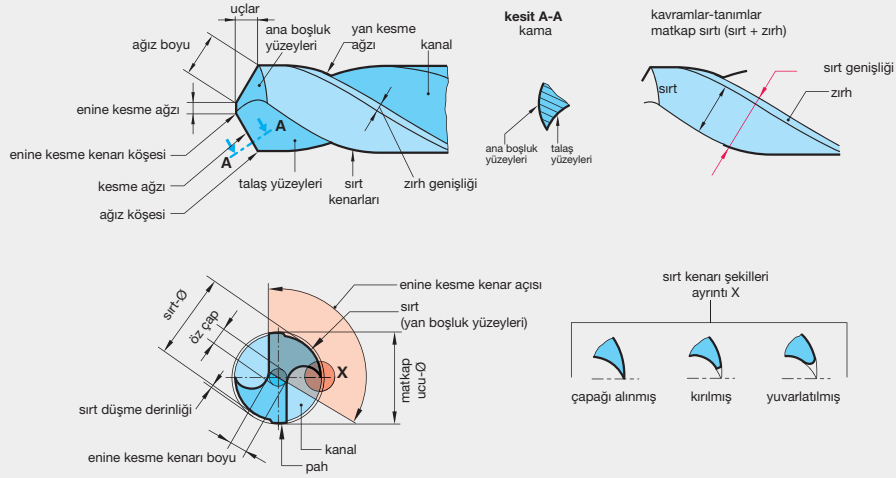


# Tanımlar, ölçüler ve açılar DIN ISO 5419 (alıntı baskı 06/98)

## helisel matkap ucu silindirik saplı/ konik saplı



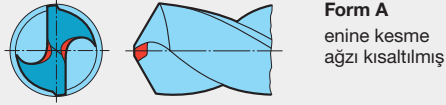
## kesici bölüm



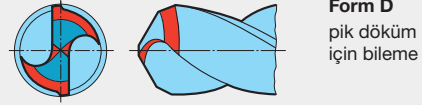


## Öz bileme formları ve imalat toleransları

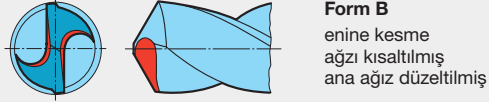
### öz bileme DIN 1412 (alıntı; baskı 03/01)



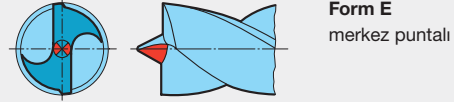
**Form A**  
enine kesme  
ağız kısaltılmış



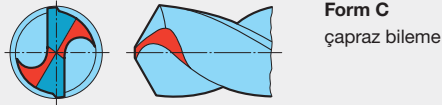
**Form D**  
pik döküm  
için bileme



**Form B**  
enine kesme  
ağız kısaltılmış  
ana ağız düzeltilmiş



**Form E**  
merkez puntalı



**Form C**  
çapraz bileme

### DIN ISO 286,bölüm 2'ye göre Helisel matkap ucu - üretim toleransları

çap (nominal ölçü) mm'ye kadar dahil	ölçüler $\mu\text{m}$	
	h8	h7
0,38 ... 0,60	10	7
0,95	12	8
3,00	14	10
6,00	18	12
10,00	22	15
18,00	27	18
30,00	33	21
50,00	39	25
80,00	46	30
120,00	54	35

### diğer ilgili standartlar

DIN 228 sayfa 1 takım koniği; mors koniği ve metrik konik, konik saplar

DIN 1414-1 yüksek hız çeliği helisel matkap uçları için teknik şartlar

DIN 6580 talaş kaldırma tekniği kavramları; kesme geometrisi

DIN 6581 talaş kaldırma tekniği kavramları; referans sistemleri ve takım ağız açıları

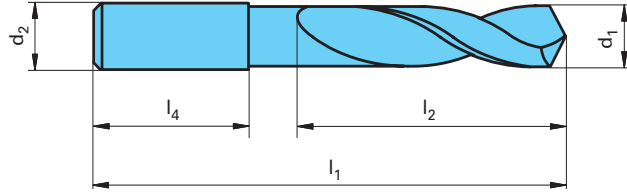
Standartla ilgili sayfalar Alman Norm Enstitüsünün izniyle basılmıştır. Normların A4 boyutundaki yeni baskılarını Beuth-Verlag GmbH, 10787 Berlin, basımevinden temin edebilirsiniz.

\* normal ISO h8 toleransı ile yetinmiyorsanız, lütfen bize bildirin Dar toleranslarla ilgili fiyat listesini matkap ucu bölümünün sonunda bulacaksınız

## Sert metal helisel matkap ucu (rasyo matkap ucu)

### sert metal-helisel matkap (rasyo matkap ucu) DIN 6537

2 veya 3 ağızlı, DIN 6535' e göre kademeli saplı sert metal helisel matkaplar için geçerlidir

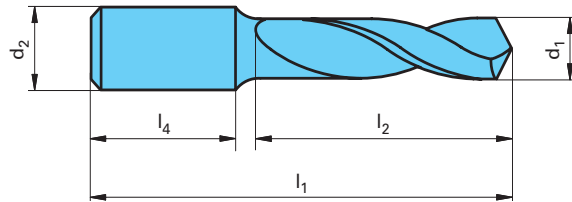


Ölçüler mm dir

Nominal-Ø d1m7	sap-Ø d2h6	Rasyo matkap ucu 3 x D için		Rasyo matkap ucu 5 x D için		sap- boyu l4
		toplam boy l1	kanal boyu maksimal l2	toplam boy l1	kanal boyu maksimal l2	
2,9...3,75	6	62	20	66	28	36
4,75	6	66	24	74	36	36
6,00	6	66	28	82	44	36
7,00	8	79	34	91	53	36
8,00	8	79	41	91	53	36
10,00	10	89	47	103	61	40
12,00	12	102	55	118	71	45
14,00	14	107	60	124	77	45
16,00	16	115	65	133	83	48
18,00	18	123	73	143	93	48
20,00	20	131	79	153	101	50

### sert metal helisel matkap ucu (rasyo matkap) DIN 6538

DIN 6535'e göre kuvvetlendirilmiş silindirik saplı ve sert metal lehim uçlu helisel matkaplar için geçerlidir. Lehimlenen uç kesicinin bir kısmı veya tamamı olabilir.



Ölçüler mm dir

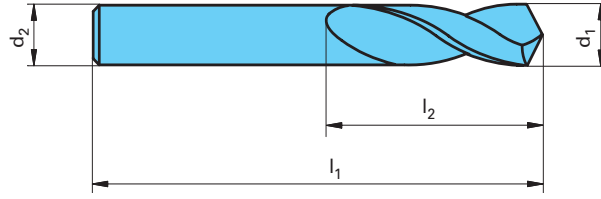
Nominal-Ø d1h7	sap-Ø d2h6	Rasyo matkap ucu 3 x D için		Rasyo matkap ucu 5 x D için		Rasyo matkap ucu 7 x D için		sap- boyu l4
		toplam boy l1	kanal boyu maksimal l2	toplam boy l1	kanal boyu maksimal l2	toplam boy l1	kanal boyu maksimal l2	
9,5...12,0	16	103	51	127	75	151	99	48
14,0	16	111	59	139	87	167	115	48
16,0	20	122	68	154	100	186	132	50
18,0	20	130	76	166	112	202	148	50
20,0	25	144	84	184	124	224	164	56
22,0	25	153	93	197	137	241	181	56
24,0	25	161	101	209	149	257	197	56
26,0	32	174	110	226	162	278	214	60
28,0	32	182	118	238	174	294	230	60
30,0	32	190	126	250	186	310	246	60



## Sert metal helisel matkap ucu (rasyo matkap ucu)

### sert metal-helisel matkap (Rasyo matkap ucu) DIN 6539

sap ve ağız aynı çaplı  
sert metal silindirik saplı  
matkap ucu için geçerlidir



Ölçüler mm dir

nominal-Ø-aralığı (= sap-Ø d2) d1	toplam boy l1	kanal boyu l2
1,90...2,12	38	12
2,36	40	13
2,65	43	14
3,00	46	16
3,35	49	18
3,75	52	20
4,25	55	22
4,75	58	24
5,30	62	26
6,00	66	28
6,70	70	31
7,50	74	34
8,00	79	37
8,50	79	37
9,50	84	40

nominal-Ø-aralığı (= sap-Ø d2) d1	toplam boy l1	kanal boyu l2
10,00	89	43
10,60	89	43
11,80	95	47
12,00	102	51
13,20	102	51
14,00	107	54
15,00	111	56
16,00	115	58
17,00	119	60
18,00	123	62
19,00	127	64
20,00	131	66





## Silindirik saplı helisel matkap uçları

çap mm	DIN 338		DIN 339		DIN 340		DIN 1897		DIN 1869 çok uzun helisel matkap ucu					
	toplam boy mm	kanal boyu	toplam boy mm	kanal boyu	toplam boy mm	kanal boyu	toplam boy mm	kanal boyu	sıra 1		sıra 2		sıra 3	
									toplam boy mm	kanal boyu	toplam boy mm	kanal boyu	toplam boy mm	kanal boyu
≤ 0,24	19	2,5					19	1,5						
0,30	19	3					19	1,5						
0,38	19	4					19	2						
0,48	20	5			30*	10*	19	2,5						
0,53	22	6			32*	12*	20	3						
0,60	24	7	32*	15*	35*	15*	21	3,5						
0,67	26	8	36*	18*	38*	18*	22	4						
0,75	28	9	39*	20*	42*	21*	23	4,5						
0,85	30	10	42*	22*	46*	25*	24	5						
0,95	32	11	45*	24*	51*	29*	25	5,5						
1,06	34	12	48	26	56	33	26	6						
1,18	36	14	50	28	60	37	28	7						
1,32	38	16	52	30	65	41	30	8						
1,50	40	18	55	33	70	45	32	9						
1,70	43	20	58	35	76	50	34	10	115*	75*				
1,90	46	22	62	38	80	53	36	11	120*	80*				
2,12	49	24	66	41	85	56	38	12	125	85	160*	110*	205*	135*
2,36	53	27	70	44	90	59	40	13	135	90	170*	115*	215*	145*
2,65	57	30	74	47	95	62	43	14	140	95	180*	120*	225*	150*
3,00	61	33	79	51	100	66	46	16	150	100	190	130	240*	160*
3,35	65	36	84	55	106	69	49	18	155	105	200	135	250*	170*
3,75	70	39	91	60	112	73	52	20	165	115	210	145	265	180
4,25	75	43	96	64	119	78	55	22	175	120	220	150	280	190
4,75	80	47	102	69	126	82	58	24	185	125	235	160	295	200
5,30	86	52	108	74	132	87	62	26	195	135	245	170	315	210
6,00	93	57	116	80	139	91	66	28	205	140	260	180	330	225
6,70	101	63	124	86	148	97	70	31	215	150	275	190	350	235
7,50	109	69	133	93	156	102	74	34	225	155	290	200	370	250
8,50	117	75	142	100	165	109	79	37	240	165	305	210	390	265
9,50	125	81	151	107	175	115	84	40	250	175	320	220	410	280
10,60	133	87	162	116	184	121	89	43	265	185	340	235	430	295
11,80	142	94	173	125	195	128	95	47	280*	195*	365*	250*	455*	310*
13,20	151	101	184	134	205	134	102	51	295*	205*	375*	260*	480*	330*
14,00	160	108	194	142	214	140	107	54						
15,00	169	114	202	147	220	144	111	56						
16,00	178	120	211	153	227	149	115	58						
17,00	184	125	218	159	235	154	119	60						
18,00	191	130	226	165	241	158	123	62						
19,00	198	135	234	171	247	162	127	64						
20,00	205	140	242	177	254	166	131	66						
21,20					261	171	136	68						
22,40					268	176	141	70						
23,60					275	180	146	72						
25,00					282	185	151	75						
26,50					290	190	156	78						
28,00					298	195	162	81						
30,00					307	201	168	84						
31,50					316	207	174	87						
33,50							180	90						
35,50							186	93						
37,50							193	96						
40,00							200	100						
42,50							207	104						
45,00							214	108						
47,50							221	112						
50,00							228	116						

\* fabrika standartı

Gühring fabrika standartlarına uygun olarak toplam 1000 mm boya kadar helisel matkap ucu üretmektedir.  
Ürün no: 242, 243, 244

teknik bölüm



## Mors konik helisel matkap uçları

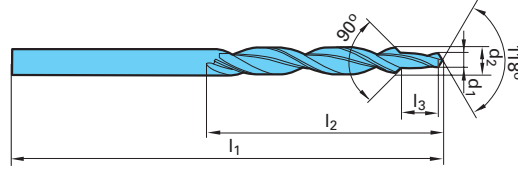
çap mm	DIN 345			DIN 346			DIN 341			delik burç matkabı büyük mors konikli*			GV/VA-matkap ucu* zor işlenebilir malzemeler			DIN 1870 uzun helisel matkap ucu					
	toplam boy mm	kanal boyu mm	mors konik	toplam boy mm	kanal boyu mm	mors konik	toplam boy mm	kanal boyu mm	mors konik	toplam boy mm	kanal boyu mm	mors konik	toplam boy mm	kanal boyu mm	mors konik	sıra 1			sıra 2		
2,65	111*	30*	1*																		
3,00	114	33	1																		
3,35	117	36	1																		
3,75	120	39	1																		
4,25	124	43	1				145*	64*	1*												
4,75	128	47	1				150*	69*	1*												
5,30	133	52	1				155	74	1												
6,00	138	57	1				161	80	1												
6,70	144	63	1				167	86	1												
7,50	150	69	1				174	93	1												
8,50	156	75	1				181	100	1				130	49	1	265	165	1	330	210	1
9,50	162	81	1				188	107	1				134	53	1	275	175	1	345	220	1
10,60	168	87	1	185*	87*	2*	197	116	1	214	116	2	138	57	1	285	185	1	360	235	1
11,80	175	94	1	192*	94*	2*	206	125	1	223	125	2	142	61	1	300	195	1	375	250	1
13,20	182	101	1	199	101	2	215	134	1	232	134	2	147	66	1	310	205	1	395	260	1
14,00	189	108	1	206	108	2	223	142	1	240	142	2	168	70	2	325	220	1	410	275	1
15,00	212	114	2	235*	114*	3*	245	147	2	268	147	3	172	74	2	340	220	2	425	275	2
16,00	218	120	2	241*	120*	3*	251	153	2	274	153	3	176	78	2	355	230	2	445	295	2
17,00	223	125	2	246*	125*	3*	257	159	2	280	159	3	179	81	2	355	230	2	445	295	2
18,00	228	130	2	251*	130*	3*	263	165	2	286	165	3	183	85	2	370	245	2	465	310	2
19,00	233	135	2	256	135	3	269	171	2	292	171	3	186	88	2	370	245	2	465	310	2
20,00	238	140	2	261	140	3	275	177	2	298	177	3	212	91	3	385	260	2	490	325	2
21,20	243	145	2	266	145	3	282	184	2	305	184	3	216	95	3	385	260	3	490	325	3
22,40	248	150	2	271	150	3	289	191	2	312	191	3	219	98	3	405	270	3	515	345	3
23,02	253	155	2	276	155	3	296	198	2	319	198	3	222	101	3	405	270	3	515	345	3
23,60	276	155	3	304*	155*	4*	319	198	3	347	198	4	222	101	3	425	270	3	535	345	3
25,00	281	160	3	309*	160*	4*	327	206	3	355	206	4	225	104	3	440	290	3	555	365	3
26,50	286	165	3	314*	165*	4*	335	214	3	363	214	4	256	107	4	440	290	3	555	365	3
28,00	291	170	3	319	170	4	343	222	3	371	222	4	259	110	4	460	305	3	580	385	3
30,00	296	175	3	324	175	4	351	230	3	379	230	4	263	114	4	460	305	3	580	385	3
31,50	301	180	3	329	180	4	360	239	3	388	239	4	266	117	4	480	320	3	610	410	3
31,75	306	185	3	334	185	4	369	248	3	397	248	4	269	120	4	480	320	3	610	410	3
33,50	334	185	4	372*	185*	5*	397	248	4	435	248	5	269	120	4	505	320	4	635	410	4
35,50	339	190	4	377*	190*	5*	406	257	4				272	123	4	530	340	4	665	430	4
37,50	344	195	4	382*	195*	5*	416	267	4				276	127	4	530	340	4	665	430	4
40,00	349	200	4	387*	200*	5*	426	277	4				317	130	5	555	360	4	695	460	4
42,50	354	205	4	392	205	5	436	287	4				320	133	5	555	360	4	695	460	4
45,00	359	210	4	397	210	5	447	298	4				323	136	5	585	385	4	735	490	4
47,50	364	215	4	402	215	5	459	310	4							585	385	4	735	490	4
50,00	369	220	4	407	220	5	470	321	4							605	405	4	765	510	4
50,80	374	225	4	412	225	5	475*	326*	4*												
53,00	412	225	5	479*	225*	6*	513*	326*	5*												
56,00	417	230	5	484*	230*	6*	518*	331*	5*												
60,00	422	235	5	489*	235*	6*	523*	336*	5*												
63,00	427	240	5	494*	240*	6*															
67,00	432	245	5	499	245	6															
71,00	437	250	5	504	250	6															
75,00	442	255	5	509	255	6															
76,50	447	260	5	514	260	6															
80,00	514	260	6																		
85,00	519	265	6																		
90,00	524	270	6																		
95,00	529	275	6																		
100,00	534	280	6																		
106,00	539*	285*	6*																		

\* fabrika standartı

Gühring fabrika standartlarına uygun olarak toplam 1000 mm boya kadar helisel matkap ucu üretmektedir. Ürün no: 293, 298, 299, 563, 564, 565, 566



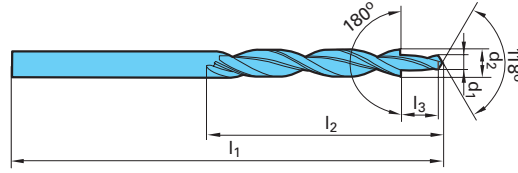
## Silindirik saplı kademeli matkap ucu, havşa açısı 90°



havşa takım-Ø d2 h8 mm	Kademe-Ø* d1 h9 mm	toplam boy l1 mm	kanal boyu l2 mm	kademe boyu l3 mm	vida dişi	kullanım alanı
			<b>HSS</b> DIN 8378/	<b>HM</b>	fabrika standartı	
3,4	2,5	70	39	8,8	M 3	kılavuz ön delik için DIN 336 ve açık deliklere bağlı serbest havşalar için DIN ISO 273 (eski) ve DIN EN 20273 sıra: »orta«.
4,5	3,3	80	47	11,4	M 4	
5,5	4,2	93	57	13,6	M 5	
6,6	5,0	101	63	16,5	M 6	
9,0	6,8	125	81	21,0	M 8	
11,0	8,5	142	94	25,5	M10	
13,5	10,2	160	108	30,0	M12	
DIN 8374 havşa takımı için hassas						
6,0	3,2	93	57	9,0	M 3	açık delikler için DIN ISO 273 (eski), DIN EN 20273 sıra: »hassas«, vida başı havşaları Form A und B DIN 74 bölüm 1 (eski) sıra: »hassas« ve vida başı havşaları DIN 74 Form F. vidalar için DIN 963 (eski) ve DIN 964.
8,0	4,3	117	75	11,0	M 4	
10,0	5,3	133	87	13,0	M 5	
11,5	6,4	142	94	15,0	M 6	
15,0	8,4	169	114	19,0	M 8	
19,0	10,5	198	135	23,0	M10	
havşa takımı için fabrika standartı, orta						
6,6	3,4	101	63	9,0	M 3	açık delikler için DIN ISO 273 (eski) ve vida başı havşaları Form A und B DIN 74 bölüm 1 (eski) sıra: »orta«, vidalar için DIN 963 (eski) ve DIN 964 (eski).
9,0	4,5	125	81	11,0	M 4	
11,0	5,5	142	94	13,0	M 5	
13,0	6,6	151	101	15,0	M 6	
17,2	9,0	191	130	19,0	M 8	
DIN 8374 havşa takımı için, orta						
7,5	3,4	109	69	9,0	M 3	açık delikler için DIN ISO 273 (eski) ve vida başı havşaları Form A und B DIN 74 bölüm 1 (eski) sıra: »orta«, vidalar için DIN 963 (eski) ve DIN 964 (eski).
9,7	4,5	133	87	11,0	M 4	
12,0	5,5	151	101	13,0	M 5	
14,5	6,6	169	114	15,0	M 6	
19,9	9,0	198	135	19,0	M 8	



## Silindirik saplı kademeli matkap ucu, havşa açısı 180°

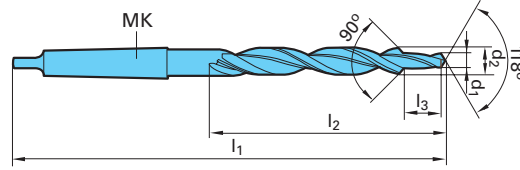


havşa takım-Ø d2 h8 mm	Kademe-Ø* d1 h9 mm	toplam boy l1 mm	kanal boyu l2 mm	kademe boyu l3 mm	için vida dişi	kullanım alanı
			<b>HSS</b> DIN 8376/	<b>HM</b>	fabrika standartı	
6,0**	3,4	93**	57**	9,0	M 3	açık delikler için DIN-ISO 273 (eski), DIN EN 20 273 sıra: »orta«, vida başı havşaları DIN 974-1 ve vida başı havşaları Form H, J ve K DIN 74 bölüm 2 (eski):sıra »orta«. vidalar için DIN 84 (eski), 912 (eski), 6912, 7513 ve DIN 7984.
6,5	3,4	101	63	9,0	M 3	
8,0	4,5	117	75	11,0	M 4	
10,0	5,5	133	87	13,0	M 5	
11,0	6,6	142	94	15,0	M 6	
15,0	9,0	169	114	19,0	M 8	
18,0	11,0	191	130	23,0	M10	
fabrika standartı						
6,0	3,2	93	57	9,0	M 3	açık delikler için DIN-ISO 273 (eski) ve vida başı havşaları Form H, J ve K DIN 74 bölüm 2 (eski) sıra: »hassas«.
8,0	4,3	117	75	11,0	M 4	
havşa takımları fabrika standartı, sıra hassas (eski*)						
5,9	3,2	93	57	11,0	M 3	vidalar için DIN 84 (eski), DIN 912 (eski) DIN 6912. eski havşalar için Form H, J K DIN 75 bölüm 2 sıra: »hassas«.
7,4	4,3	109	69	13,0	M 4	
9,4	5,3	125	81	16,0	M 5	
10,4	6,4	133	87	19,0	M 6	
13,5	8,4	160	108	22,0	M 8	
16,5	10,5	184	125	25,0	M10	
havşa takımı için fabrika standartı, sıra orta (eski*)						
8,0	4,8	117	75	13,0	M 3	vidalar için DIN 84 (eski), DIN 912 (eski) ve DIN 6912.
10,0	5,8	133	87	16,0	M 4	
11,0	7,0	142	94	19,0	M 5	
14,5	9,5	169	114	22,0	M 6	
17,5	11,5	191	130	25,0	M 8	

\* DIN 75, bölüm 2; \*\* fabrika standartı



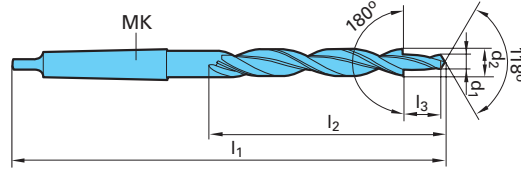
## Mors konik kademeli matkap ucu, havşa açısı 90°



havşa takım-Ø d2 h8 mm	Kademe-Ø* d1 h9 mm	toplam boy l1 mm	kanal boyu l2 mm	mors- konik MK	kademe boyu l3 mm	için vida dişi	kullanım alanı
fabrika standartı							
11,0	5,5	175	94	1	13,0	M 5	açık delikler için DIN-ISO 273 (eski), DIN EN 20273 sıra: »orta«, vida başı havşaları için DIN 74 Form F ve vida başı havşaları için Form A und B DIN 74 bölüm 1 (eski) dizayn: »orta«. vidalar için DIN 963 (eski) ve DIN 964 (eski).
13,0	6,6	182	101	1	15,0	M 6	
17,2	9,0	228	130	2	19,0	M 8	
21,5	11,0	248	150	2	23,0	M10	
26,0	14,0	286	165	3	27,0	M12	
29,0	16,0	296	175	3	31,0	M14	
DIN 8375							
12,0	5,5	182	101	1	13,0	M 5	açık delikler için DIN-ISO 273 (eski), DIN EN 20273 sıra: »orta«, vida başı havşaları için DIN 74 Form F ve vida başı havşaları için Form A und B DIN 74 bölüm 1 (eski) dizayn: »orta«. vidalar için DIN 963 (eski) ve DIN 964 (eski).
14,5	6,6	---	108	1	15,0	M 6	
19,0	9,0	253	135	2	19,0	M 8	
23,0	11,0	248	155	2	23,0	M10	
fabrika standartı							
11,5	6,4	175	94	1	15,0	M 6	açık delikler için DIN-ISO 273 (eski) ve vida başı havşaları Form A ve B DIN 74 bölüm 1 (eski) dizayn: »hassas. vidalar için DIN 963 (eski) ve DIN 964 (eski).
15,0	8,4	212	114	2	19,0	M 8	
19,0	10,5	233	135	2	23,0	M10	
23,0	13,0	253	155	2	27,0	M12	
26,0	15,0	286	165	3	31,0	M14	
30,0	17,0	296	175	3	35,0	M16	
DIN 8379							
9,0	6,8	162	81	1	21,0	M 8	kılavuz ön delik için DIN 336, DIN EN 20273 sıra: »orta« ve açık deliğe bağlı serbest havşalar için DIN ISO 273 (eski).
11,0	8,5	175	94	1	25,5	M10	
13,5	10,2	189	108	1	30,0	M12	
15,5	12,0	218	120	2	34,5	M14	
17,5	14,0	228	130	2	38,5	M16	
20,0	15,5	238	140	2	43,5	M18	
22,0	17,5	248	150	2	47,5	M20	



## mors konik kademeli matkap ucu, havşa açısı 180°



havşa takım-Ø d2 h8 mm	Kademe-Ø* d1 h9 mm	toplam boy l1 mm	kanal boyu l2 mm	mors- konik MK	kademe boyu l3 mm	için vida dişi	kullanım alanı					
<b>HSS</b> DIN 8377/				<b>HM</b> fabrika standartı								
10,0	5,5	168	87	1	13,0	M 5	Açık delikler için DIN-ISO 273 (eski), DIN EN 20273 sıra: »orta«, vida başı havşaları DIN 974-1 ve vida başı havşaları Form H, J ve K DIN 74 bölüm 2 (eski) dizayn: »orta«. vidalar için DIN 84 (eski), 912 (eski), 6912, 7513 ve DIN 7984.					
11,0	6,6	175	94	1	15,0	M 6						
15,0	9,0	212	114	2	19,0	M 8						
18,0	11,0	228	130	2	23,0	M10						
20,0	13,5	238	140	2	27,0	M12						
24,0	15,5	281	160	3	31,0	M14						
26,0	17,5	286	165	3	35,0	M16						
30,0	20,0	296	175	3	39,0	M18						
33,0	22,0	334	185	4	43,0	M20						
fabrika standartı												
10,0	5,3	168	87	1	13,0	M 5	Açık delikler için DIN-ISO 273 (eski) ve vida başı havşaları Form H, J ve K DIN 74 bölüm 2 (eski) dizayn: »hassas«. vidalar için DIN 84 (eski), 912 (eski), 6912, 7513 ve DIN 7984.					
11,0	6,4	175	94	1	15,0	M 6						
15,0	8,4	212	114	2	19,0	M 8						
18,0	10,5	228	130	2	23,0	M10						
20,0	13,0	238	140	2	27,0	M12						
24,0	15,0	281	160	3	31,0	M14						
26,0	17,0	286	165	3	35,0	M16						
havşa takımları fabrika standartı, sıra hassas (eski*)												
9,4	5,3	162	81	1	16,0	M 5	vidalar için DIN 84 (eski), DIN 912 (alt) ve DIN 6912. eski havşalar için Form H, J ve K DIN 75 bölüm 2 dizayn: »hassas«.					
10,4	6,4	168	87	1	19,0	M 6						
13,5	8,4	189	108	1	22,0	M 8						
16,5	10,5	223	125	2	25,0	M10						
19,0	13,0	233	135	2	28,0	M12						
23,0	15,0	253	155	2	30,0	M14						
25,0	17,0	281	160	3	33,0	M16						
28,0	19,0	291	170	3	36,0	M18						
31,0	21,0	301	180	3	39,0	M 20						
havşa takımı için fabrika standartı, sıra orta (eski*)												
10,0	5,8	168	87	1	16,0	M 5	vidalar için DIN 84 (eski), DIN 6912. eski havşalar için Form H, J ve K DIN 75 bölüm 2 dizayn: »orta«.					
11,0	7,0	175	94	1	19,0	M 6						
14,5	9,5	212	114	2	22,0	M 8						
17,5	11,5	228	130	2	25,0	M10						
20,0	14,0	238	140	2	28,0	M12						
24,0	16,0	281	160	3	30,0	M14						
26,0	18,0	286	165	3	33,0	M16						
29,0	20,0	296	175	3	36,0	M18						
33,0	23,0	334	185	4	39,0	M20						
inç	mm	inç	mm	inç	mm	inç	mm	MK	inç	mm	vida dişleri için	kullanım alanı
İngiliz standartı												
19/32	15,08	25/64	9,92	8 5/8	219	4 3/4	121	2	3/4	19,05	3/8 inç	İngiliz standartına göre düz başlı vida
21/32	16,67	29/64	11,51	8 3/4	222	4 7/8	124	2	7/8	22,22	7/16 inç	
25/32	19,84	33/64	13,10	9 3/8	238	5 1/2	140	2	1	25,40	1/2 inç	

\* DIN 75, bölüm 2

**silindirik saplı delik genişletici**

**takma kafalı-delik genişletici**

çap mm	DIN 344					DIN 222		
	toplam- boyu mm	kanal- boyu mm	çap mm	toplam- boy mm	kanal- boyu mm	nominal-Ø mm	toplam- boy mm	delik- nominal-Ø mm
4,25	96*	64*	11,70	173	125	35,5	45	13
4,75	102*	69*	13,20	184	134	45,0	50	16
5,30	108	74	14,00	194	142	53,0	56	19
6,00	116	80	15,00	202	147	63,0	63	22
6,70	124	86	16,00	211	153	75,0	71	27
7,50	133	93	17,00	218	159	90,0	80	32
8,50	142	100	18,00	226	165	101,6	90	40
9,50	151	107	19,00	234	171			
10,60	162	116	20,00	242	177			

**mors konik genişletici**

çap mm	DIN 343			DIN 1864		
	toplam- boy mm	kanal- boy mm	mors- konik	toplam- boy mm	kanal- boy mm	mors- konik
7,50	150*	69*	1*	174*	93*	1*
8,50	156*	75*	1*	181*	100*	1*
9,50	162	81	1	188	107	1
10,60	168	87	1	197	116	1
11,70	175	94	1	206	125	1
13,20	182	101	1	215	134	1
14,00	189	108	1	223	142	1
15,00	212	114	2	245	147	2
16,00	218	120	2	251	153	2
17,00	223	125	2	257	159	2
18,00	228	130	2	263	165	2
19,00	233	135	2	269	171	2
20,00	238	140	2	275	177	2
21,20	243	145	2	282	184	2
22,40	248	150	2	289	191	2
23,60	253	155	2	296	198	2
25,00	281	160	3	327	206	3
26,50	286	165	3	335	214	3
28,00	291	170	3	343	222	3
30,00	296	175	3	351	230	3
31,50	301	180	3	360	239	3
33,50	334	185	4			
35,50	339	190	4			
37,50	344	195	4			
40,00	349	200	4			
42,50	354	205	4			
45,00	359	210	4			
47,50	364	215	4			
50,00	369	220	4			

\*fabrika standartı

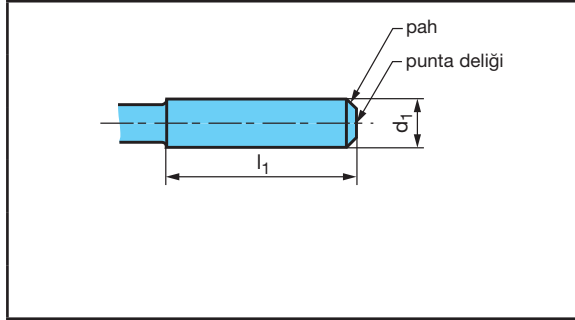
**kılcal matkap (toplam boy 25 mm)**

DIN 1899					
çap mm	sap-Ø mm	kanal- boyu mm	çap mm	sap-Ø mm	kanal- boyu mm
0,1 . . . 0,12 den	1,0	0,5	0,67	1,0	4,2
0,15	1,0	0,8	0,75	1,0	4,8
0,19	1,0	1,1	0,79	1,0	5,3
0,24	1,0	1,5	0,85	1,5	5,3
0,30	1,0	1,9	0,95	1,5	6,0
0,38	1,0	2,4	1,06	1,5	6,8
0,48	1,0	3,0	1,18	1,5	7,6
0,53	1,0	3,4	1,32	1,5	8,5
0,60	1,0	3,9	1,45	1,5	9,5

# HSS takımlar için sap ölçüleri, DIN 1835-1 (alıntı)

## Form A, düz

ölçüler mm dir



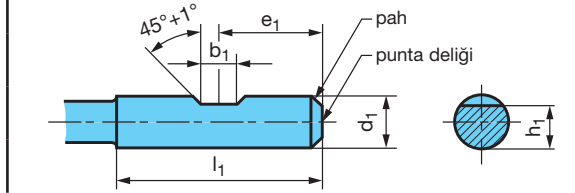
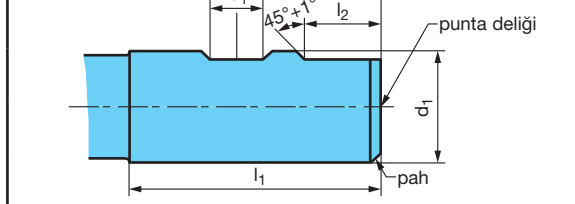
d <sub>1</sub>	h <sub>1</sub>
h8	+2 0
3	28
4	28
5	28
6	36
8	36
10	40

d <sub>1</sub>	h <sub>1</sub>
h8	+2 0
12	45
16	48
20	50
25	56
32	60
40	70

d <sub>1</sub>	h <sub>1</sub>
h8	+2 0
50	80
63	90

## Form B, sıkma yüzeyli

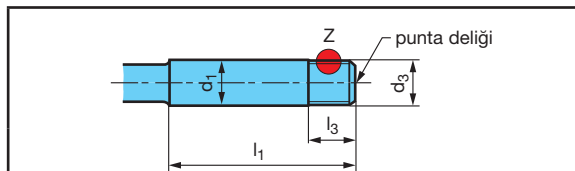
ölçüler mm dir

 tek sıkma yüzeyli  
d<sub>1</sub> = 6 ... 20 mm

 iki sıkma yüzeyli  
d<sub>1</sub> = 25 ... 63 mm için


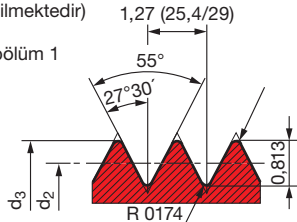
d <sub>1</sub>	b <sub>1</sub>	e <sub>1</sub>	h <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>	punta deliği Form R DIN 332 bölüm 1
h6	+0,05 0	0 -1	h13	+2 0	+1 0	
6	4,2	18	4,8	36	-	1,6x2,5
8	5,5	18	6,6	36	-	1,6x3,35
10	7	20	8,4	40	-	1,6x3,35
12	8	22,5	10,4	45	-	1,6x3,35
16	10	24	14,2	48	-	2,0x4,25
20	11	25	18,2	50	-	2,5x5,3
25	12	32	23	56	17	2,5x5,3
32	14	36	30	60	19	3,15x6,7
40	14	40	38	70	19	3,15x6,7
50	18	45	47,8	80	23	3,15x6,7
63	18	50	60,8	90	23	3,15x6,7

## Form D, çektirmeli

ölçüler mm dir



### ayrıntı Z

 (kesitte gösterilmektedir)  
diş profili  
DIN ISO 228 bölüm 1


d <sub>1</sub>	d <sub>3</sub>	alt üst tolerans.	d <sub>2</sub>	alt üst tolerans.	l <sub>1</sub>	l <sub>3</sub>	punta deliği Form R DIN 332 bölüm 1
h8					+2 0	+2 0	
6	5,9	0 -0,1	5,087	0 -0,1	36	10	1,6 x 2,5
10	9,9	0 -0,1	9,087	0 -0,1	40	10	1,6 x 3,35
12	11,9	0 -0,1	11,087	0 -0,1	45	10	1,6 x 3,35
16	15,9	0 -0,1	15,087	0 -0,1	48	10	2,0 x 4,25
20	19,9	0 -0,15	19,087	0 -0,15	50	15	2,5 x 5,3
25	24,9	0 -0,15	24,087	0 -0,15	56	15	2,5 x 5,3
32	31,9	0 -0,15	31,087	0 -0,15	60	15	3,15 x 6,7

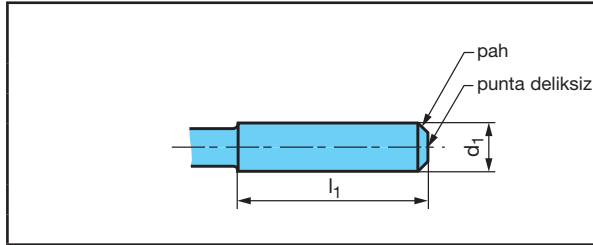




# Helisel matkap uçları ve sert metal parmak freze DIN 6535 için sap ölçüleri

## Form HA, düz

ölçüler mm dir



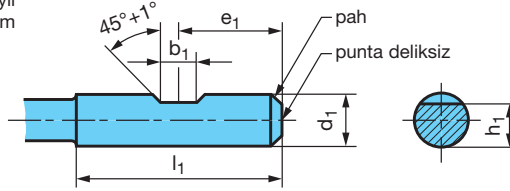
d <sub>1</sub>	l <sub>1</sub>
h6	+2 0
2	28
3	28
4	28
5	28
6	36
8	36
10	40
12	45

d <sub>1</sub>	l <sub>1</sub>
h6	+2 0
14	45
16	48
18	48
20	50
25	56
32	60

## Form HB, düz sıkma yüzeyli

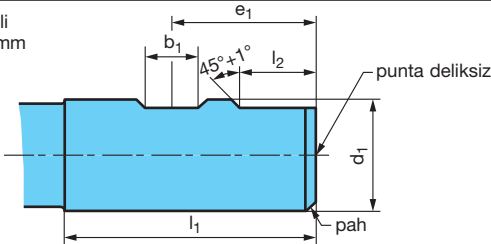
ölçüler mm dir

tek sıkma yüzeyli  
d<sub>1</sub> = 6 ve 20 mm



d <sub>1</sub>	b <sub>1</sub>	e <sub>1</sub>	h <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>
h6	+0,05 0	0 -1	h11	+2 0	+1 0
6	4,2	18	5,1	36	-
8	5,5	18	6,9	36	-
10	7	20	8,5	40	-
12	8	22,5	10,4	45	-
14	8	22,5	12,7	45	-
16	10	24	14,2	48	-
18	10	24	16,2	48	-
20	11	25	18,2	50	-

iki sıkma yüzeyli  
d<sub>1</sub> = 25 ve 32 mm



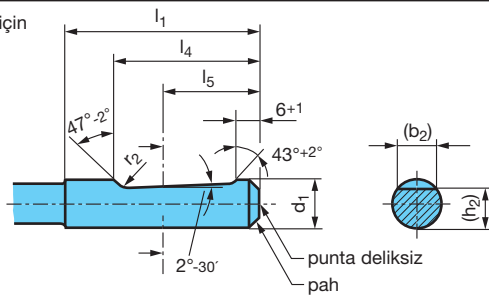
25	12	32	23	56	17
32	14	36	30	60	19

## Form HE, eğik sıkma yüzeyli, soğutma kanalsız\*

\* imalat DIN 6535'e uygun silindirik saplar, soğutma kanallı veya soğutma kanalsız olarak üretilirler. Değişik formlar, ölçüler ve soğutma kanal konumları için ilgili standartlara bakınız.

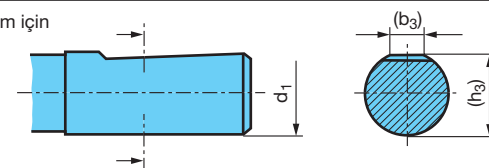
ölçüler mm dir

d<sub>1</sub> = 6 - 20 mm için



d <sub>1</sub>	(b <sub>2</sub> )	(b <sub>3</sub> )	h <sub>2</sub>	(h <sub>3</sub> )	l <sub>1</sub>	l <sub>4</sub>	l <sub>5</sub>	r <sub>2</sub>
h6	≈	(b <sub>3</sub> )	h11	(h <sub>3</sub> )	+2 0	0 -1	nominal ölçü	min.
6	4,3	-	5,1	-	36	25	18	1,2
8	5,5	-	6,9	-	36	25	18	1,2
10	7,1	-	8,5	-	40	28	20	1,2
12	8,2	-	10,4	-	45	33	22,5	1,2
14	8,1	-	12,7	-	45	33	22,5	1,2
16	10,1	-	14,2	-	48	36	24	1,6
18	10,8	-	16,2	-	48	36	24	1,6
20	11,4	-	18,2	-	50	38	25	1,6

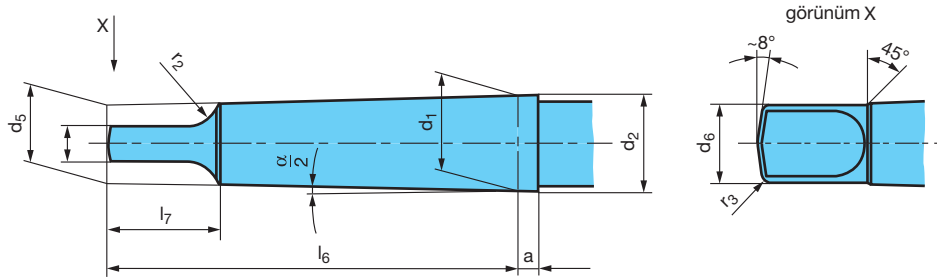
d<sub>1</sub> = 25 ve 32 mm için



25	13,6	9,3	23,0	24,1	56	44	32	1,6
32	15,5	9,9	30,0	31,2	60	48	35	1,6

## Mors konik DIN 228 bölüm 1 (alıntı)

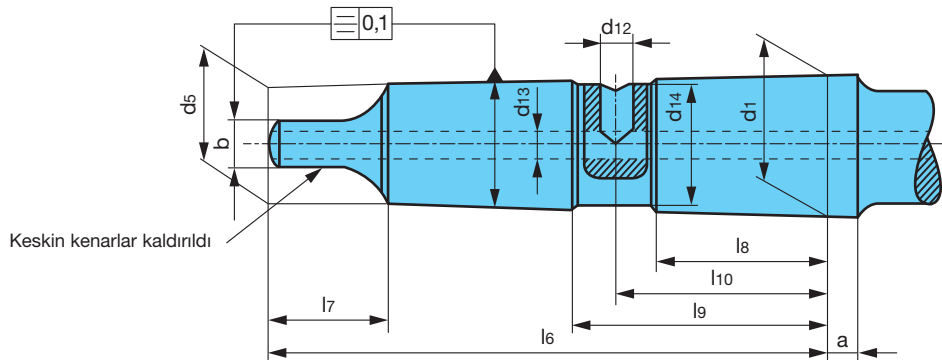
### Form B, mors konik döndürücü dilli



ölçüler mm dir

sap DIN 228'e göre Form B ölçüler	a	ölçüleri	b	d <sub>1</sub>	d <sub>2</sub> ≈	d <sub>5</sub> ≈	d <sub>6</sub> maks.	l <sub>6</sub> -1	l <sub>7</sub> maks.	r <sub>2</sub> maks.	r <sub>3</sub> ≈	$\frac{\alpha}{2}$
<b>MK 1</b>	3,5	+1,4 0	5,2	12,065	12,2	9,0	8,7	62	13,5	5	1,2	1°25'43"
<b>MK 2</b>	5,0	+1,4 0	6,3	17,780	18,0	14,0	13,5	75	16	6	1,6	1°25'50"
<b>MK 3</b>	5,0	+1,7 0	7,9	23,825	24,1	19,1	18,5	94	20	7	2	1°26'16"
<b>MK 4</b>	6,5	+1,9 0	11,9	31,267	31,6	25,2	24,5	117,5	24	8	2,5	1°29'15"
<b>MK 5</b>	6,5	+1,9 0	15,9	44,399	44,7	36,5	35,7	149,5	29	10	3	1°30'26"

### Form BK, Mors konik saplı ve soğutma yağı ulaşımı



ölçüler mm dir

sap DIN228'e göre Form BK ölçüler	a	ölçüleri	b	d <sub>1</sub>	d <sub>5</sub> ≈	d <sub>12</sub>	d <sub>13</sub>	d <sub>14</sub> 0 -0,01	l <sub>6</sub> 0 -1	l <sub>7</sub> maks.	l <sub>8</sub>	l <sub>9</sub>	l <sub>10</sub>
<b>MK 1</b>	3,5	+1,4 0	5,2	12,065	9,0	-	-	-	62	13,5	-	-	-
<b>MK 2</b>	5	+1,4 0	6,3	17,780	14,0	4,2	4,2	15,0	75	16	20	34	27
<b>MK 3</b>	5	+1,7 0	7,9	23,825	19,1	5,0	5,0	21,0	94	20	29	43	36
<b>MK 4</b>	6,5	+1,9 0	11,9	31,267	25,2	6,8	6,8	28,0	117,5	24	39	55	47
<b>MK 5</b>	6,5	+1,9 0	15,9	44,399	36,5	8,5	8,5	40,0	149,5	29	51	69	60



## Toleranslar punta matkabı

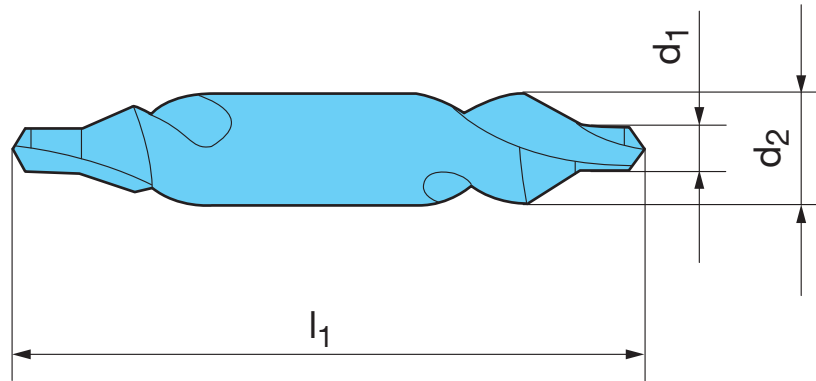
DIN 333	
Ø-aralığı d1 mm	alt ve üst toleranslar d1 mm
0,50 – 2,50	0 +0,14
3,15 – 5,00	0 +0,18
6,30 – 10,00	0 +0,22
12,50	0 +0,27

ürün no 285/286 için	
Ø-aralığı d1 mm	alt ve üst toleranslar d1 mm
1,00 – 1,25	0 +0,10
1,60 – 3,15	0 +0,15
3,15 – 10,00	0 +0,20

B.S. 328' e göre	
Ø-aralığı d1 mm	alt ve üst toleranslar d1 mm
1,19 – 1,59	0 ±0,05
2,38 – 3,17	0 ±0,07
4,76	0 ±0,07
6,35 – 7,94	0 ±0,12

B.S. 328' e göre	
Sap-Ø-aralığı d1 mm	alt ve üst toleranslar d1 mm
3,17 – 4,76	-0,020
6,35	-0,025
7,94 – 11,11	-0,050
15,87 – 19,05	-0,050

ASA' ya göre	
Ø-aralığı d1 mm	alt ve üst toleranslar d1 mm
tümü	0 + 0,07 mm





## Kılavuz için ön delik çapları

metrik ISO-diş DIN 13					metrik ISO-ince diş DIN 13					UNC-vida dışı ASME B1.1									
nom. Ø	hatve P	ön delik Ø DIN 336	delik ön çapı somun dışı 6H*		nom. Ø	x hatve P	ön delik Ø DIN 336	delik ön çapı somun dışı 6H		nom. Ø	x hatve P	ön delik Ø DIN 336	delik ön çapı somun dışı 6H		nom. Ø	adımı	ön delik Ø DIN 336	delik ön çapı somun dışı 2B	
mm	mm	mm	min.	maks.	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	inç başına	mm	min.	maks.
M 1	0,25	<b>0,75</b>	0,729	0,785	M 2,5 x	0,35	<b>2,15</b>	2,121	2,221	M 22 x	1,00	<b>21,00</b>	20,917	21,153	Nr. 1 -	64	<b>1,55</b>	1,425	1,580
M 1,1	0,25	<b>0,85</b>	0,829	0,885	M 3,0 x	0,35	<b>2,65</b>	2,621	2,721	M 22 x	1,50	<b>20,50</b>	20,376	20,676	Nr. 2 -	56	<b>1,85</b>	1,694	1,872
M 1,2	0,25	<b>0,95</b>	0,929	0,985	M 3,5 x	0,35	<b>3,15</b>	3,121	3,221	M 22 x	2,00	<b>20,00</b>	19,835	20,210	Nr. 3 -	48	<b>2,10</b>	1,941	2,146
M 1,4	0,30	<b>1,10</b>	1,075	1,142	M 4,0 x	0,50	<b>3,50</b>	3,459	3,599	M 24 x	1,00	<b>23,00</b>	22,917	23,153	Nr. 4 -	40	<b>2,35</b>	2,157	2,385
M 1,6	0,35	<b>1,25</b>	1,221	1,321	M 4,5 x	0,50	<b>4,00</b>	3,959	4,099	M 24 x	1,50	<b>22,50</b>	22,376	22,676	Nr. 5 -	40	<b>2,65</b>	2,487	2,698
M 1,8	0,35	<b>1,45</b>	1,421	1,521	M 5,0 x	0,50	<b>4,50</b>	4,459	4,599	M 24 x	2,00	<b>22,00</b>	21,835	22,210	Nr. 6 -	32	<b>2,85</b>	2,642	2,896
M 2	0,40	<b>1,60</b>	1,567	1,679	M 5,5 x	0,50	<b>5,00</b>	4,959	5,099	M 25 x	1,00	<b>24,00</b>	23,917	24,153	Nr. 8 -	32	<b>3,50</b>	3,302	3,531
M 2,2	0,45	<b>1,75</b>	1,713	1,838	M 6,0 x	0,75	<b>5,20</b>	5,188	5,378	M 25 x	1,50	<b>23,50</b>	23,376	23,676	Nr. 10 -	24	<b>3,90</b>	3,683	3,937
M 2,5	0,45	<b>2,05</b>	2,013	2,138	M 7,0 x	0,75	<b>6,20</b>	6,188	6,378	M 25 x	2,00	<b>23,00</b>	22,835	23,210	Nr. 12 -	24	<b>4,50</b>	4,343	4,597
M 3	0,50	<b>2,50</b>	2,459	2,599	M 8,0 x	0,50	<b>7,50</b>	7,459	7,599	M 27 x	1,00	<b>26,00</b>	25,917	26,153	1/4 -	20	<b>5,10</b>	4,978	5,258
M 3,5	0,60	<b>2,90</b>	2,850	3,010	M 8,0 x	0,75	<b>7,20</b>	7,188	7,378	M 27 x	1,50	<b>25,50</b>	25,376	25,676	5/16 -	18	<b>6,60</b>	6,401	6,731
M 4	0,70	<b>3,30</b>	3,242	3,422	M 8,0 x	1,00	<b>7,00</b>	6,917	7,153	M 27 x	2,00	<b>25,00</b>	24,835	25,210	3/8 -	16	<b>8,00</b>	7,798	8,153
M 4,5	0,75	<b>3,70</b>	3,688	3,878	M 9,0 x	0,75	<b>8,20</b>	8,188	8,378	M 28 x	1,00	<b>27,00</b>	26,917	27,153	7/16 -	14	<b>9,40</b>	9,144	9,550
M 5	0,80	<b>4,20</b>	4,134	4,334	M 9,0 x	1,00	<b>8,00</b>	7,917	8,153	M 28 x	1,50	<b>26,50</b>	26,376	26,676	1/2 -	13	<b>10,80</b>	10,592	11,024
M 6	1,00	<b>5,00</b>	4,917	5,153	M 10 x	0,75	<b>9,20</b>	9,188	9,378	M 28 x	2,00	<b>26,00</b>	25,835	26,210	9/16 -	12	<b>12,20</b>	11,989	12,446
M 7	1,00	<b>6,00</b>	5,917	6,153	M 10 x	1,00	<b>9,00</b>	8,917	9,153	M 30 x	1,00	<b>29,00</b>	28,917	29,153	5/8 -	11	<b>13,50</b>	13,386	13,868
M 8	1,25	<b>6,80</b>	6,647	6,912	M 10 x	1,25	<b>8,80</b>	8,647	8,912	M 30 x	1,50	<b>28,50</b>	28,376	28,676	3/4 -	10	<b>16,50</b>	16,307	16,840
M 9	1,25	<b>7,80</b>	7,647	7,912	M 11 x	0,75	<b>10,20</b>	10,188	10,378	M 30 x	2,00	<b>28,00</b>	27,835	28,210	7/8 -	9	<b>19,50</b>	19,177	19,761
M 10	1,50	<b>8,50</b>	8,376	8,676	M 11 x	1,00	<b>10,00</b>	9,917	10,153	M 30 x	3,00	<b>27,00</b>	26,752	27,252	1 -	8	<b>22,25</b>	21,971	22,606
M 11	1,50	<b>9,50</b>	9,376	9,676	M 12 x	1,00	<b>11,00</b>	10,917	11,153	M 32 x	1,50	<b>30,50</b>	30,376	30,676	1 1/8 -	7	<b>25,00</b>	24,638	25,349
M 12	1,75	<b>10,20</b>	10,106	10,441	M 12 x	1,25	<b>10,80</b>	10,647	10,912	M 32 x	2,00	<b>30,00</b>	29,835	30,210	1 1/4 -	7	<b>28,00</b>	27,813	28,524
M 14	2,00	<b>12,00</b>	11,835	12,210	M 12 x	1,50	<b>10,50</b>	10,376	10,676	M 33 x	1,50	<b>31,50</b>	31,376	31,676	1 3/8 -	6	<b>30,75</b>	30,353	31,115
M 16	2,00	<b>14,00</b>	13,835	14,210	M 14 x	1,00	<b>13,00</b>	12,917	13,153	M 33 x	2,00	<b>31,00</b>	30,835	31,210	1 1/2 -	6	<b>34,00</b>	33,528	34,290
M 18	2,50	<b>15,50</b>	15,294	15,744	M 14 x	1,25	<b>12,80</b>	12,647	12,912	M 33 x	3,00	<b>30,00</b>	29,752	30,252	1 3/4 -	5	<b>39,50</b>	38,938	39,802
M 20	2,50	<b>17,50</b>	17,294	17,744	M 14 x	1,50	<b>12,50</b>	12,376	12,676	M 35 x	1,50	<b>33,50</b>	33,376	33,676	2 -	4,5	<b>45,00</b>	44,679	45,593
M 22	2,50	<b>19,50</b>	19,294	19,744	M 15 x	1,00	<b>14,00</b>	13,917	14,153	M 36 x	1,50	<b>34,50</b>	34,376	34,676					
M 24	3,00	<b>21,00</b>	20,752	21,252	M 15 x	1,50	<b>13,50</b>	13,376	13,676										
M 27	3,00	<b>24,00</b>	23,752	24,252	M 16 x	1,00	<b>15,00</b>	14,917	15,153										
M 30	3,50	<b>26,50</b>	26,211	26,771	M 16 x	1,25	<b>14,80</b>	14,647	14,912										
M 33	3,50	<b>29,50</b>	29,211	29,771	M 16 x	1,50	<b>14,50</b>	14,376	14,676										
M 36	4,00	<b>32,00</b>	31,670	32,270	M 17 x	1,00	<b>16,00</b>	15,917	16,153										
M 39	4,00	<b>35,00</b>	34,670	35,270	M 17 x	1,50	<b>15,50</b>	15,376	15,676										
M 42	4,50	<b>37,50</b>	37,129	37,799	M 18 x	1,00	<b>17,00</b>	16,917	17,153										
M 45	4,50	<b>40,50</b>	40,129	40,799	M 18 x	1,50	<b>16,50</b>	16,376	16,676										
M 48	5,00	<b>43,00</b>	42,587	43,297	M 20 x	1,00	<b>19,00</b>	18,917	19,153										
M 52	5,00	<b>47,00</b>	46,587	47,297	M 20 x	1,50	<b>18,50</b>	18,376	18,676										
M 56	5,50	<b>50,50</b>	50,046	50,796	M 20 x	2,00	<b>18,00</b>	17,835	18,210										

\* M 1,1 - M 1,4 ön delik Ø somun dışı 5H

MJ-vida dışı DIN ISO 5855					UNJC-vida dışı ISO 3161					UNJF-vida dışı ISO 3161				
nom. Ø	x hatve P	ön delik Ø DIN 336	delik ön çapı somun dışı 5H*		nom. Ø	adımı	ön delik Ø DIN 336	delik ön çapı somun dışı 3B		nom. Ø	adımı	ön delik Ø DIN 336	delik ön çapı somun dışı 3B	
mm	mm	mm	min.	maks.		inç başına	mm	min.	maks.		inç başına	mm	min.	maks.
MJ 3	x 0,50	<b>2,60</b>	2,513	2,653	Nr. 6 -	32	<b>2,85</b>	2,733	2,939	Nr. 6 -	40	<b>3,00</b>	2,888	3,053
MJ 4	x 0,70	<b>3,40</b>	3,318	3,498	Nr. 8 -	32	<b>3,55</b>	3,393	3,599	Nr. 8 -	36	<b>3,60</b>	3,480	3,663
MJ 5	x 0,80	<b>4,30</b>	4,221	4,421	Nr. 10 -	24	<b>4,00</b>	3,795	4,064	Nr. 10 -	32	<b>4,20</b>	4,054	4,255
MJ 6	x 0,50	<b>5,55</b>	5,513	5,625	Nr. 12 -	24	<b>4,60</b>	4,455	4,704	Nr. 12 -	28	<b>4,75</b>	4,602	4,816
MJ 6	x 0,75	<b>5,35</b>	5,269	5,419	1/4 -	20	<b>5,30</b>	5,113	5,387	1/4 -	28	<b>5,60</b>	5,466	5,662
MJ 6	x 1,00	<b>5,10</b>	5,026	5,216	5/16 -	18	<b>6,75</b>	6,563	6,833	5/16 -	24	<b>7,00</b>	6,906	7,109
MJ 8	x 0,50	<b>7,55</b>	7,513	7,625	3/8 -	16	<b>8,20</b>	7,978	8,255	3/8 -	24	<b>8,60</b>	8,494	8,679
MJ 8	x 0,75	<b>7,35</b>	7,269	7,419	7/16 -	14	<b>9,60</b>	9,346	9,639	7/16 -	20	<b>10,00</b>	9,876	10,084
MJ 8	x 1,00	<b>7,10</b>	7,026	7,216	1/2 -	13	<b>11,00</b>	10,798	11,095	1/2 -	20	<b>11,60</b>	11,463	11,661
MJ 8	x 1,25	<b>6,90</b>	6,782	6,994	9/16 -	12	<b>12,40</b>	12,228	12,482	9/16 -	18	<b>13,00</b>	12,913	13,122
MJ 10	x 1,00	<b>9,10</b>	9,026	9,216	5/8 -	11	<b>13,80</b>	13,627	13,904	5/8 -	18	<b>14,60</b>	14,501	14,702
MJ 10	x 1,25	<b>8,90</b>	8,782	8,994										
MJ 10	x 1,50	<b>8,60</b>	8,539	8,775										
MJ 12	x 1,75	<b>10,40</b>	10,295	10,560										
MJ 16	x 2,00	<b>14,20</b>	14,051	14,351										

\* MJ 3 x 0,50 - MJ 5 x 0,80 ön delik Ø somun dışı 6H



UNF-vida dişi ASME B1.1					BSW-(Whitworth)-vida dişi BS84					(Whitworth) boru dişi (DIN-ISO 228-1)					çelik panzer vida dişi DIN 40430 a göre				
nom. Ø	adımlı Ø	ön delik Ø DIN 336	delik ön çapı somun dişi 2B		nom. Ø	adımlı Ø	ön delik Ø DIN 336	delik ön çapı somun dişi 2B		nom. Ø	adımlı Ø	ön delik Ø DIN 336	delik ön çapı somun dişi		nom. Ø	adımlı Ø	ön delik Ø DIN 336	delik ön çapı somun dişi	
			min.	maks.				min.	maks.				min.	maks.				min.	maks.
		inç başına	mm	mm			inç başına	mm	mm			inç başına	mm	mm			inç başına	mm	mm
Nr. 1 - 72		1,55	1,473	1,610	W 1/16	60	1,20	1,045	1,230	G 1/16	28	6,80	6,561	6,843	Pg 7	20	11,40	11,280	11,430
Nr. 2 - 64		1,85	1,755	1,910	W 3/32	48	1,80	1,704	1,912	G 1/8	28	8,80	8,566	8,848	Pg 9	18	14,00	13,860	14,010
Nr. 3 - 56		2,15	2,024	2,197	W 1/8	40	2,50	2,362	2,591	G 1/4	19	11,80	11,445	11,890	Pg 11	18	17,30	17,260	17,410
Nr. 4 - 48		2,40	2,271	2,459	W 5/32	32	3,20	2,952	3,214	G 3/8	19	15,25	14,950	15,395	Pg 13,5	18	19,00	19,060	19,210
Nr. 5 - 44		2,70	2,550	2,741	W 3/16	24	3,60	3,407	3,745	G 1/2	14	19,00	18,631	19,172	Pg 16	18	21,30	21,160	21,310
Nr. 6 - 40		2,95	2,819	3,023	W 7/32	24	4,50	4,201	4,539	G 5/8	14	21,00	20,587	21,128	Pg 21	16	26,90	26,780	27,030
Nr. 8 - 36		3,50	3,404	3,607	W 1/4	20	5,10	4,724	5,156	G 3/4	14	24,50	24,117	24,658	Pg 29	16	35,50	35,480	35,730
Nr. 10 - 32		4,10	3,962	4,166	W 5/16	18	6,50	6,130	6,590	G 7/8	14	28,25	27,877	28,418	Pg 36	16	45,50	45,480	45,730
Nr. 12 - 28		4,60	4,496	4,724	W 3/8	16	7,90	7,492	7,987	G 1	11	30,75	30,291	30,931	Pg 42	16	52,50	52,480	52,730
1/4 - 28		5,50	5,359	5,588	W 7/16	14	9,20	8,789	9,330	G 1 1/8	11	35,50	34,939	35,579	Pg 48	16	57,80	57,780	58,030
5/16 - 24		6,90	6,782	7,036	W 1/2	12	10,50	9,989	10,591	G 1 1/4	11	39,50	38,952	39,592					
3/8 - 24		8,50	8,382	8,636	W 9/16	12	12,00	11,577	12,179	G 1 1/2	11	45,25	44,845	45,485					
7/16 - 20		9,90	9,728	10,033	W 5/8	11	13,50	12,918	13,558	G 1 3/4	11	51,00	50,788	51,428					
1/2 - 20		11,50	11,328	11,608	W 3/4	10	16,25	15,797	16,483	G 2	11	57,00	56,656	57,296					
9/16 - 18		12,90	12,751	13,081	W 7/8	9	19,25	18,611	19,353										
5/8 - 18		14,50	14,351	14,681	W 1	8	22,00	21,334	22,147										
3/4 - 16		17,50	17,323	17,678	W 1 1/8	7	24,50	23,928	24,832										
7/8 - 14		20,40	20,269	20,650	W 1 1/4	7	27,75	27,103	28,007										
1 - 12		23,25	23,114	23,571	W 1 3/8	6	30,50	29,504	30,528										
1 1/8 - 12		26,50	26,289	26,746	W 1 1/2	6	33,50	32,679	33,703										
1 1/4 - 12		29,50	29,464	29,921	W 1 5/8	5	35,50	34,769	35,963										
1 3/8 - 12		32,75	32,639	33,096	W 1 3/4	5	39,00	37,944	39,138										
1 1/2 - 12		36,00	35,814	36,271	W 2	4,5	44,50	43,571	44,877										

NPT ANSI B 2.1  
Amerikan konik boru dişi 1:16

dizayn A (mümkün olduğunca kaçının)		dizayn B		nom. Ø	adımlı inç başına	ön delik-Ø silindirik (A) d <sub>1</sub>	ön delik-Ø konik (B) D <sub>1</sub>	kesme derinliği ET mm	delik derinliği BT (min) mm
				1/16 - 27		6,15	6,39	9,29	10,7
				1/8 - 27		8,40	8,74	9,32	10,8
				1/4 - 18		11,10	11,36	13,52	15,6
				3/8 - 18		14,30	14,80	13,83	16,0
				1/2 - 14		17,90	18,32	18,07	20,8
				3/4 - 14		23,30	23,67	18,55	21,3
				1 - 11,5		29,00	29,69	22,29	25,6
				1 1/4 - 11,5		37,70	38,45	22,80	26,1
				1 1/2 - 11,5		43,70	44,52	22,80	26,1
				2 - 11,5		55,60	56,56	23,20	26,5
				2 1/2 - 8		66,30	67,62	31,75	36,3
				3 - 8		82,30	83,52	33,74	38,5

EG-vida dişi metrik/metrik ince dişi (EG M 14x1,25)  
Telerezasyon teli için DIN 8140

nom. Ø	x hatve P	ön delik Ø DIN 336	delik ön çapı somun dişi	
			min. mm	maks. mm
EG M 4 x 0,70		4,20	4,152	4,292
EG M 5 x 0,80		5,25	5,174	5,334
EG M 6 x 1,00		6,30	6,217	6,407
EG M 8 x 1,25		8,40	8,271	8,483
EG M10 x 1,50		10,50	10,324	10,560
EG M12 x 1,75		12,50	12,379	12,644
EG M14 x 1,25		14,40	14,271	14,483
EG M16 x 2,00		16,50	16,433	16,733

EG UNC (UNC-STI) vida dişi  
Telerezasyon teli için ASME B18.29.1

nom. Ø	adımlı Ø	ön delik Ø	delik ön çapı somun dişi	
			min. mm	maks. mm
EG Nr. 6 - 32		3,80	3,678	3,879
EG Nr. 8 - 32		4,40	4,338	4,524
EG Nr. 10 - 24		5,20	5,055	5,283
EG Nr. 12 - 24		5,80	5,715	5,944
EG 1/4 - 20		6,70	6,624	6,868
EG 5/16 - 18		8,40	8,242	8,489
EG 3/8 - 16		10,00	9,868	10,127
EG 7/16 - 14		11,60	11,506	11,783
EG 1/2 - 13		13,30	13,122	13,393
EG 9/16 - 12		14,90	14,747	15,032
EG 5/8 - 11		16,50	16,375	16,673

EG UNF (UNF-STI) vida dişi  
Telerezasyon teli için ASME B18.29.1

nom. Ø	adımlı Ø	ön delik Ø	delik ön çapı somun dişi	
			min. mm	maks. mm
EG Nr. 6 - 40		3,70	3,644	3,818
EG Nr. 8 - 36		4,40	4,321	4,498
EG Nr. 10 - 32		5,10	4,999	5,184
EG Nr. 12 - 28		5,70	5,682	5,809
EG 1/4 - 28		6,60	6,546	6,721
EG 5/16 - 24		8,25	8,166	8,352
EG 3/8 - 24		9,80	9,754	9,931
EG 7/16 - 20		11,50	11,389	11,585
EG 1/2 - 20		13,10	12,974	13,172
EG 9/16 - 18		14,70	14,592	14,798
EG 5/8 - 18		16,25	16,180	16,386



## Vida Dişleri için tavsiye edilen Delik Çapları

metrik ISO-diş DIN 13					
nom. Ø	hatve P	delik- Ø	delik-Ø		ön delik-Ø somun dişi 7H*
mm	mm	mm	min. mm	maks. mm	min. mm
M 2	0,40	<b>1,85</b>	1,84	1,88	1,567
M 2,2	0,45	<b>2,00</b>	2,01	2,05	1,713
M 2,5	0,45	<b>2,30</b>	2,28	2,32	2,013
M 3	0,50	<b>2,80</b>	2,78	2,85	2,459
M 3,5	0,60	<b>3,25</b>	3,23	3,30	2,850
M 4	0,70	<b>3,70</b>	3,68	3,76	3,242
M 4,5	0,75	<b>4,20</b>			
M 5	0,80	<b>4,65</b>	4,62	4,71	4,134
M 6	1,00	<b>5,55</b>	5,52	5,62	4,917
M 7	1,00	<b>6,55</b>	6,52	6,62	5,917
M 8	1,25	<b>7,40</b>	7,36	7,47	6,647
M 9	1,25	<b>8,40</b>	8,36	8,47	7,647
M 10	1,50	<b>9,30</b>	9,26	9,38	8,376
M 11	1,50	<b>10,30</b>	10,26	10,38	9,376
M 12	1,75	<b>11,20</b>	11,15	11,29	10,106
M 14	2,00	<b>13,10</b>	13,05	13,20	11,835
M 16	2,00	<b>15,10</b>	15,05	15,20	13,835
M 18	2,50	<b>16,90</b>	16,83	17,02	15,294
M 20	2,50	<b>18,90</b>	18,83	19,02	17,294
M 22	2,50	<b>20,90</b>	20,83	21,02	19,294
M 24	3,00	<b>22,70</b>	22,62	22,80	20,752
M 27	3,00	<b>25,70</b>	25,62	25,80	23,752
M 30	3,50	<b>28,50</b>	28,40	28,60	26,211
M 33	3,50	<b>31,50</b>	31,40	31,60	29,211
M 36	4,00	<b>34,30</b>	34,17	34,40	31,670
M 39	4,00	<b>37,30</b>	37,17	37,40	34,670
M 42	4,50	<b>40,10</b>	39,95	40,20	37,129

\* M 2 için M 2,5 ön delik-Ø 6H

metrik ISO-ince diş DIN 13					
nom. Ø	x hatve P	delik- Ø	delik-Ø		ön delik-Ø somun dişi 7H*
mm	mm	mm	min. mm	maks. mm	min. mm
M 2,5 x 0,35	<b>2,35</b>	2,35	2,38	2,121	2,221
M 3 x 0,35	<b>2,85</b>	2,85	2,88	2,621	2,721
M 4 x 0,35	<b>3,85</b>	3,85	3,88	3,621	3,721
M 4 x 0,50	<b>3,80</b>	3,78	3,83	3,459	3,639
M 5 x 0,50	<b>4,80</b>	4,78	4,83	4,459	4,639
M 5,5 x 0,50	<b>5,30</b>	5,28	5,33	4,959	5,139
M 6 x 0,75	<b>5,65</b>	5,62	5,70	5,188	5,424
M 7 x 0,75	<b>6,65</b>	6,62	6,70	6,188	6,424
M 8 x 0,75	<b>7,65</b>	7,62	7,70	7,188	7,424
M 8 x 1,00	<b>7,55</b>	7,52	7,62	6,917	7,217
M 9 x 0,75	<b>8,65</b>	8,62	8,70	8,188	8,424
M 9 x 1,00	<b>8,55</b>	8,52	8,62	7,917	8,217
M 10 x 0,75	<b>9,65</b>	9,62	9,70	9,188	9,424
M 10 x 1,00	<b>9,55</b>	9,52	9,62	8,917	9,217
M 10 x 1,25	<b>9,40</b>	9,36	9,47	8,647	8,982
M 11 x 0,75	<b>10,65</b>	10,62	10,70	10,188	10,424
M 11 x 1,00	<b>10,55</b>	10,52	10,62	9,917	10,217
M 12 x 1,00	<b>11,55</b>	11,52	11,62	10,917	11,217
M 12 x 1,25	<b>11,40</b>	11,36	11,47	10,647	10,982
M 12 x 1,50	<b>11,30</b>	11,26	11,38	10,376	10,751
M 14 x 1,00	<b>13,55</b>	13,52	13,62	12,917	13,217
M 14 x 1,25	<b>13,40</b>	13,36	13,47	12,647	12,982
M 14 x 1,50	<b>13,30</b>	13,26	13,38	12,376	12,751
M 15 x 1,00	<b>14,55</b>	14,52	14,62	13,917	14,217
M 15 x 1,50	<b>14,30</b>	14,26	14,38	13,376	13,751
M 16 x 1,00	<b>15,55</b>	15,52	15,62	14,917	15,217
M 16 x 1,50	<b>15,30</b>	15,26	15,38	14,376	14,751
M 17 x 1,00	<b>16,55</b>	16,52	16,62	15,917	16,217
M 17 x 1,50	<b>16,30</b>	16,26	16,38	15,376	15,751
M 18 x 1,00	<b>17,55</b>	17,52	17,62	16,917	17,217
M 18 x 1,50	<b>17,30</b>	17,26	17,38	16,376	16,751
M 18 x 2,00	<b>17,10</b>	17,05	17,20	15,835	16,310
M 20 x 1,00	<b>19,55</b>	19,52	19,62	18,917	19,217
M 20 x 1,50	<b>19,30</b>	19,26	19,38	18,376	19,751
M 24 x 1,00	<b>23,55</b>	23,52	23,62	22,917	23,217
M 24 x 1,50	<b>23,30</b>	23,26	23,38	22,376	22,751
M 24 x 2,00	<b>23,10</b>	23,05	23,20	21,835	22,310
M 27 x 1,50	<b>26,30</b>	26,26	26,38	25,376	25,751
M 30 x 1,50	<b>29,30</b>	29,26	29,38	28,376	28,751
M 33 x 1,50	<b>32,30</b>	32,26	32,38	31,376	31,751
M 36 x 1,50	<b>35,30</b>	35,26	35,38	34,376	34,751
M 39 x 1,50	<b>38,30</b>	38,26	38,38	37,376	37,751
M 42 x 1,50	<b>41,30</b>	41,26	41,38	40,376	40,751

\* M 2,5 x 0,35 için M 4 x 0,35 ön delik-Ø 6H

## delik ön çapı-toleransı ovalama kılavuzlarında (DIN 13, bölüm 50'ye göre)

Mukavemet açısından kılavuz ön delik toleransının 6H olması gerekli değildir. Somun ve vida diş profillerinin çakışma ölçüsü 0,32 x P nin altına düşmediği için 7 H toleransı yeterlidir. Ayrıca ovalanan dişler, lif çizgilerinin devamlılığı ve malzemenin soğuk şekillenmesi nedeniyle kesilerek üretilen dişlere oranla daha mukavemettir.

UNC-vida dişi ASME B1.1					
nom. Ø	basına hatve	delik- Ø	delik-Ø		ön delik-Ø somun dişi 2B
inç	inç	mm	min. mm	maks. mm	min. mm
Nr. 1 - 64		<b>1,68</b>	1,67	1,70	1,425
Nr. 2 - 56		<b>1,98</b>	1,97	2,01	1,694
Nr. 3 - 48		<b>2,28</b>	2,27	2,32	1,941
Nr. 4 - 40		<b>2,55</b>	2,54	2,59	2,157
Nr. 5 - 40		<b>2,90</b>	2,89	2,94	2,487
Nr. 6 - 32		<b>3,15</b>	3,14	3,19	2,642
Nr. 8 - 32		<b>3,80</b>	3,78	3,82	3,302
Nr. 10 - 24		<b>4,35</b>	4,33	4,39	3,683
Nr. 12 - 24		<b>5,00</b>	4,97	5,03	4,343
1/4 - 20		<b>5,75</b>	5,72	5,80	4,978
5/16 - 18		<b>7,30</b>	7,26	7,37	6,401
3/8 - 16		<b>8,80</b>	8,77	8,88	7,798
7/16 - 14		<b>10,30</b>	10,27	10,37	9,144
1/2 - 13		<b>11,80</b>	11,77	11,88	10,592
9/16 - 12		<b>13,30</b>	13,28	13,39	11,989
5/8 - 11		<b>14,80</b>	14,78	14,90	13,386
3/4 - 10		<b>17,90</b>	17,85	17,97	16,307
7/8 - 9		<b>21,00</b>	20,95	21,10	19,177
1 - 8		<b>24,00</b>	23,95	24,12	21,971

UNF-vida dişi ASME B1.1					
nom. Ø	basına hatve	delik- Ø	delik-Ø		ön delik-Ø somun dişi 2B
inç	inç	mm	min. mm	maks. mm	min. mm
Nr. 1 - 72		<b>1,70</b>	1,69	1,72	1,473
Nr. 2 - 64		<b>2,00</b>	1,99	2,03	1,755
Nr. 3 - 56		<b>2,30</b>	2,29	2,34	2,024
Nr. 4 - 48		<b>2,60</b>	2,59	2,63	2,271
Nr. 5 - 44		<b>2,90</b>	2,89	2,93	2,550
Nr. 6 - 40		<b>3,20</b>	3,19	3,24	2,819
Nr. 8 - 36		<b>3,85</b>	3,83	3,88	3,404
Nr. 10 - 32		<b>4,45</b>	4,43	4,49	3,962
Nr. 12 - 28		<b>5,10</b>	5,07	5,13	4,496
1/4 - 28		<b>5,95</b>	5,92	5,99	5,359
5/16 - 24		<b>7,45</b>	7,42	7,50	6,782
3/8 - 24		<b>9,05</b>	9,02	9,10	8,838
7/16 - 20		<b>10,55</b>	10,48	10,58	9,728
1/2 - 20		<b>12,10</b>	12,08	12,18	11,328
9/16 - 18		<b>13,65</b>	13,61	13,72	12,751
5/8 - 18		<b>15,25</b>	15,21	15,32	14,351
3/4 - 16		<b>18,35</b>	18,30	18,41	17,323
7/8 - 14		<b>21,40</b>	21,35	21,49	20,269
1 - 12		<b>24,45</b>	24,40	24,54	23,114

(Whitworth-) boru dişi (DIN-ISO 228-1 ,e göre)					
nom. Ø	basına hatve	delik- Ø	delik-Ø		ön delik-Ø somun dişi 2B
inç	inç	mm	min. mm	maks. mm	min. mm
G 1/16	28	<b>7,30</b>	7,28	7,35	6,561
G 1/8	28	<b>9,30</b>	9,28	9,35	8,566
G 1/4	19	<b>12,50</b>	12,48	12,55	11,445
G 3/8	19	<b>16,00</b>	15,98	16,05	14,950
G 1/2	14	<b>20,00</b>	19,98	20,12	18,631
G 5/8	14	<b>22,00</b>	21,98	22,12	20,587
G 3/4	14	<b>25,50</b>	25,48	25,62	24,177
G 7/8	14	<b>29,25</b>	29,23	29,37	27,817
G 1	11	<b>32,00</b>	31,98	32,15	30,291
G 1 1/4	11	<b>40,75</b>	40,70	40,85	38,952



# 1/64' ten 11 63/64' e kadar

ölçüler (inç)	mm	inç ölçüsü (ondalık)	ölçüler (inç)	mm	inç ölçüsü (ondalık)	ölçüler (inç)	mm	inç ölçüsü (ondalık)	ölçüler (inç)	mm	inç ölçüsü (ondalık)
-	0,10	0,0039	51	1,70	0,0670	4	5,31	0,2090	-	14,00	0,5512
97	0,15	0,0059		1,75	0,0689	3	5,41	0,213	9/16	14,29	0,5625
96	0,16	0,0063	50	1,78	0,0700		5,50	0,2165		14,50	0,5709
95	0,17	0,0067		1,80	0,0709	7/32	5,56	0,2188	37/64	14,68	0,5781
94	0,18	0,0071	49	1,85	0,0730	2	5,61	0,221	-	15,00	0,5906
93	0,19	0,0075		1,90	0,0748	1	5,79	0,228	19/32	15,08	0,5938
92	0,20	0,0079	48	1,93	0,0760	A	5,94	0,234	39/64	15,48	0,6094
91	0,21	0,0083		1,95	0,0768	15/64	5,95	0,2344		15,50	0,6102
90	0,22	0,0087	5/64	1,98	0,0781	-	6,00	0,2362	5/8	15,88	0,625
89	0,23	0,0091	47	1,99	0,0785	B	6,05	0,238	-	16,00	0,6299
88	0,24	0,0095	-	2,00	0,0787	C	6,15	0,242	41/64	16,27	0,6406
-	0,25	0,0098		2,05	0,0807	D	6,25	0,246		16,50	0,6496
87	0,25	0,0100	46	2,06	0,0810	1/4	6,35	0,25	21/32	16,67	0,6562
	0,26	0,0102	45	2,08	0,0820	E	6,35	0,25	-	17,00	0,6693
86	0,27	0,0105		2,15	0,0846		6,50	0,2559	43/64	17,07	0,6719
	0,27	0,0106	44	2,18	0,0860	F	6,53	0,257	11/16	17,46	0,6875
85	0,28	0,0110	43	2,26	0,0890	G	6,63	0,261		17,50	0,689
	0,29	0,0114	42	2,37	0,0935	17/64	6,75	0,2656	45/64	17,86	0,7031
84	0,29	0,0115	3/32	2,38	0,0938		6,75	0,2657	-	18,00	0,7087
-	0,30	0,0118	41	2,44	0,0960	H	6,76	0,266	23/32	18,26	0,7188
83	0,30	0,0120	40	2,50	0,0980	I	6,91	0,272		18,50	0,7283
82	0,32	0,0125	39	2,53	0,0995	-	7,00	0,2756	47/64	18,65	0,7344
	0,32	0,0126	38	2,58	0,1015	J	7,04	0,2772	-	19,00	0,748
81	0,33	0,0130	37	2,64	0,1040	K	7,14	0,281	3/4	19,05	0,75
80	0,34	0,0135	36	2,71	0,1065	9/32	7,14	0,2812	49/64	19,45	0,7656
79	0,37	0,0145	7/64	2,78	0,1094	L	7,37	0,29		19,50	0,7677
1/64	0,40	0,0156	35	2,79	0,11	M	7,49	0,2949	25/32	19,84	0,7812
78	0,41	0,0160	34	2,82	0,111		7,50	0,2953	-	20,00	0,7874
77	0,46	0,0180	33	2,87	0,113	19/64	7,54	0,2969	51/64	20,24	0,7969
-	0,50	0,0197		2,90	0,1142	N	7,67	0,3020		20,50	0,8071
76	0,51	0,0200	32	2,95	0,116		7,75	0,3051	13/16	20,64	0,8125
75	0,53	0,0210	-	3,00	0,1181	5/16	7,94	0,3125	-	21,00	0,8268
74	0,57	0,0225	31	3,05	0,12	-	8,00	0,315	53/64	21,03	0,8281
-	0,60	0,0236	1/8	3,18	0,125	O	8,03	0,316	27/32	21,43	0,8438
73	0,61	0,0240	30	3,26	0,1285	P	8,20	0,323		21,50	0,8465
72	0,64	0,0250		3,30	0,1299	21/64	8,33	0,3281	55/64	21,84	0,8594
71	0,66	0,0260	29	3,45	0,136	Q	8,43	0,332	-	22,00	0,8661
-	0,70	0,0276		3,50	0,1378		8,50	0,3346	7/8	22,23	0,875
70	0,71	0,0280	28	3,57	0,1405	R	8,61	0,339		22,50	0,8858
69	0,74	0,0292	9/64	3,57	0,1406	11/32	8,73	0,3438	57/64	22,62	0,8906
-	0,75	0,0295	27	3,66	0,144		8,75	0,3445	-	23,00	0,9055
68	0,79	0,0310	26	3,73	0,147	S	8,84	0,348	29/32	23,02	0,9062
1/32	0,79	0,0313		3,75	0,1476	-	9,00	0,3543	59/64	23,42	0,9219
-	0,80	0,0315	25	3,80	0,1495	T	9,09	0,358		23,50	0,9252
67	0,81	0,0320	24	3,86	0,152	23/64	9,13	0,3594	15/16	23,81	0,9375
66	0,84	0,0330	23	3,91	0,154	U	9,35	0,368	-	24,00	0,9449
65	0,89	0,0350	5/32	3,97	0,1562		9,50	0,374	61/64	24,21	0,9531
-	0,90	0,0354	22	3,99	0,157	3/8	9,53	0,375		24,50	0,9646
64	0,91	0,0360	-	4,00	0,1575	V	9,56	0,377	31/32	24,61	0,9688
63	0,94	0,0370	21	4,04	0,159	W	9,80	0,386	-	25,00	0,9843
62	0,97	0,0380	20	4,09	0,161	25/64	9,92	0,3906	63/64	25,00	0,9844
61	0,99	0,0390		4,20	0,1654	-	10,00	0,3937	1	25,40	1,00
-	1,00	0,0394	19	4,22	0,166	X	10,08	0,397			
60	1,02	0,0400	18	4,31	0,1695	Y	10,26	0,4040			
59	1,04	0,0410	11/64	4,37	0,1719	13/32	10,32	0,4062			
58	1,07	0,0420	17	4,39	0,173	Z	10,49	0,413			
57	1,09	0,0430	16	4,50	0,177		10,50	0,4134			
56	1,18	0,0465	15	4,57	0,18	27/64	10,72	0,4219			
3/64	1,19	0,0469	14	4,62	0,182	-	11,00	0,4331			
	1,20	0,0472	13	4,70	0,185	7/16	11,11	0,4375			
	1,25	0,0492	3/16	4,76	0,1875		11,50	0,4528			
	1,30	0,0512	12	4,80	0,189	29/64	11,51	0,4531			
55	1,32	0,0520	11	4,85	0,191	15/32	11,91	0,4688			
54	1,40	0,0550	10	4,91	0,1935	-	12,00	0,4724			
	1,45	0,0571	9	4,98	0,196	31/64	12,30	0,4844			
	1,50	0,0591	-	5,00	0,1968		12,50	0,4921			
53	1,51	0,0595	8	5,05	0,199	1/2	12,70	0,50			
	1,55	0,0610	7	5,11	0,2010	-	13,00	0,5118			
1/16	1,59	0,0625	13/64	5,16	0,2031	33/64	13,10	0,5156			
	1,60	0,0630	6	5,18	0,2040	17/32	13,49	0,5312			
52	1,61	0,0635	5	5,22	0,2055		13,50	0,5315			
	1,65	0,0650		5,25	0,2067	35/64	13,89	0,5469			

1 inç = 25,400 0 mm, bakınız DIN 4890 (baskı 2/75)



## Yeni malzemeler- kısa tanım (özet)

Malzeme no.	Kısa adı eski	Kısa adı yeni	Malzeme no.	Kısa adı eski	Kısa adı yeni	Malzeme no.	Kısa adı eski	Kısa adı yeni	Malzeme no.	Kısa adı eski	Kısa adı yeni
0.6010	GG10	EN-GJL-100	1.0728	60 S 20	-	1.4436	X5CrNiMo17 133	X3CrNiMo17-13-3	1.7043	-	38Cr4
0.6020	GG20	EN-GJL-200	1.0736	9 SMn 36	11SMn37	1.4438	X2CrNiMo18 164	X2CrNiMo18-15-4	1.7147	20 MnCr 5	20MnCr5
0.6025	GG25	EN-GJL-250	1.0737	9 SMnPb 36	11SMnPb37	1.4460	X4CrNiMo27 52	X3CrNiMoN27-5-2	1.7149	20 MnCrS 5	20MnCrS5
0.6035	GG35	EN-GJL-350	1.0756	35 SPb 20	35SPb20	1.4462	X2CrNiMoN22 53	X2CrNiMoN22-5-3	1.7176	55 Cr 3	55Cr3
0.7050	GGG50	EN-GJS-500-7	1.0757	45 SPb 20	46SPb20	1.4509	X6CrTiNb 18	X2CrTiNb18	1.7182	27 MnCrB 5 2	27MnCrB5-2
0.7070	GGG70	EN-GJS-700-2	1.0760	-	38SMn26	1.4510	X6CrTi 17	X3CrTi17	1.7185	33 MnCrB 5 2	33MnCrB5-2
0.8035	GTW35	EN-GJMW-350-4	1.0761	-	38SMnPb26	1.4511	X6CrNb 17	X3CrNb17	1.7189	39 MnCrB 6 2	39MnCrB6-2
0.8155	GTS55	EN-GJMB-550-4	1.0762	-	44SMn28	1.4512	X6CrTi 12	X2CrTi12	1.7213	25 CrMoS 4	25CrMoS4
0.8170	GTS70	EN-GJMB-700-2	1.0763	-	44SMnPb28	1.4520	X1CrTi 15	X2CrTi17	1.7218	25 CrMo 4	25CrMo4
1.0022	St 01Z	-	1.0873	-	DC06 [Fe P06]	1.4521	X2CrMoTi 18 2	X2CrMoTi18-2	1.7219	-	26CrMo4-2
1.0035	St 33	S185	1.1103	ESTe 255	S255NL1	1.4522	X2CrMoNb 18 2	X2CrMoNb18-2	1.7220	34 CrMo 4	34CrMo4
1.0039	St 37 -2	S235JRH	1.1105	ESTe 315	S315NL1	1.4532	X7CrNiMoAl 15 7	X8CrNiMoAl15-7-2	1.7225	42 CrMo 4	42CrMo4
1.0044	St 44 -2	S275JR	1.1121	Ck 10	C10E	1.4541	X6CrNiTi18 10	X6CrNiTi18-10	1.7226	34 CrMoS 4	34CrMoS4
1.0050	St 50 -2	E295	1.1141	Ck15	C15E	1.4542	X5CrNiCuNb 17 4	X5CrNiCuNb16-4	1.7227	42 CrMoS 4	42CrMoS4
1.0060	St 60 -2	E335	1.1151	Ck 22	C22E	1.4550	X6CrNiNb 18 10	X6CrNiNb18-10	1.7228	50 CrMo 4	50CrMo4
1.0070	St 70 -2	E360	1.1158	Ck 25	C25E	1.4558	X2NiCrAlTi 32 20	X2NiCrAlTi32-20	1.7264	20 CrMo 5	20CrMo5
1.0114	St 37 -3U	S235J0	1.1170	28 Mn 6	28Mn6	1.4567	X3CrNiCu 18 9 X	X3CrNiCu18-9-4	1.7261	20 CrMo 4	20CrMo4
1.0226	St 02Z	DX51D	1.1178	Ck 30	C30E	1.4568	X7CrNiAl 17 7	X7CrNiAl17-7	1.7323	20 MoCrS 4	20MoCrS4
1.0242	StE 250 -Z2	S250GD	1.1181	Ck 35	C35E	1.4571	-	X6CrNiMoTi17-12-2	1.7333	22 CrMoS 3 5	22CrMoS3-5
1.0244	StE 280 -Z2	S280GD	1.1186	Ck 40	C40E	1.4577	X3CrNiMoTi 25 25	X3CrNiMoTi25-25	1.7335	13 CrMo 4 4	13CrMo4-5
1.0250	StE 320 -Z3	S320GD	1.1191	Ck 45	C45E	1.4592	X1CrMoTi 29 4	X2CrMoTi29-4	1.7362	12 CrMo 19 5	12CrMo19-5
1.0301	C 10	-	1.1203	Ck 55	C55E	1.4713	X10CrAl 7	X10CrAlSi7	1.7380	10 CrMo 9 10	10CrMo9-10
1.0302	C 10 Pb	-	1.1206	Ck 50	C50E	1.4724	X10CrAl 13	X10CrAlSi13	1.7383	-	11CrMo9-10
1.0306	St 06 Z	DX54D	1.1221	Ck 60	C60E	1.4742	X10CrAl 18	X10CrAlSi18	1.7779	-	20CrMoV13-5-5
1.0312	St 15	DC05 [Fe P05]	1.1241	Cm 50	C50R	1.4762	X10CrAl 24	X10CrAlSi25	1.8159	50 CrV 4	51CrV4
1.0319	RRStE 210.7	L210GA	1.1750	C 75 W	C75W	1.4821	X12CrNiSi 25 4	X20CrNiSi25-4	1.8504	34 CrAl 6	34CrAl6
1.0322	-	DX56D	1.2067	102 Cr 6	102Cr6	1.4828	X15CrNiSi 20 12	X15CrNiSi20-12	1.8519	31 CrMoV 9	31CrMoV9
1.0330	St 12 [St 2]	DC01 [Fe P01]	1.2080	-	X210Cr12	1.4833	X7CrNi 23 14	X7CrNi23-12	1.8550	34 CrAlNi 7	34CrAlNi7
1.0333	USt 13	-	1.2083	-	X42Cr13	1.4841	X15CrNiSi 25 20	X15CrNiSi25-21	1.8807	13 MnNiMoV 5 4	13MnNiMoV5-4
1.0338	St 14 [St 4]	DC04 [Fe P04]	1.2419	-	105WCr6	1.4845	X12CrNi 25 21	X12CrNi25-21	1.8812	18 MnMoV 5 2	18MnMoV5-2
1.0345	H I	P235GH	1.2767	-	X45NiCrMo4	1.4864	X12NiCrSi 36 16	X12NiCrSi35-16	1.8815	18 MnMoV 6 3	18MnMoV6-3
1.0347	RRSt 13 [RRSt 3]	DC03 [Fe P03]	1.3243	S6-5-2-5	S 6-5-2-5	1.4878	X12CrNiTi18 9	X10CrNiTi18-10	1.8821	StE 355 TM	P355M
1.0348	UH I	P195GH	1.3343	S6-5-2	S 6-5-2	1.4903	-	X10CrMoVNb9-1	1.8824	StE 420 TM	P420M
1.0350	St 03Z	DX52D	1.3344	S6-5-3	S 6-5-3	1.5026	55 Si 7	55Si7	1.8826	StE 460 TM	P460M
1.0355	St 05Z	DX53D	1.4000	X6Cr 13	X6Cr13	1.5131	50 MnSi 4	50MnSi4	1.8828	ESTe 420 TM	P420ML2
1.0356	TtSt 35 N	P215NL	1.4002	X6CrAl 13	X6CrAl13	1.5415	15 Mo 3	16Mo3	1.8831	ESTe 460 TM	P460ML2
1.0358	St 05 Z	-	1.4003	X2Cr 11	X2CrNi12	1.5530	21 MnB 5	20MnB5	1.8832	TStE 355 TM	P355ML1
1.0401	C 15	-	1.4005	-	X12CrS13	1.5531	30 MnB 5	30MnB5	1.8835	TStE 420 TM	P420ML1
1.0402	C 22	C22	1.4006	X10Cr 13	X12Cr13	1.5532	38 MnB 5	38MnB5	1.8837	ESTe 460 TM	P460ML1
1.0403	C 15 Pb	-	1.4016	X6Cr 17	X6Cr17	1.5637	10 Ni 14	12Ni14	1.8879	StE ...	P690Q
1.0406	C 25	C25	1.4021	X20Cr 13	X20Cr13	1.5662	-	X11CrMo5+I	1.8880	WStE ...	P690QH
1.0419	St 52.0	L355	1.4028	X30Cr 13	X30Cr13	1.5680	-	X12Ni5	1.8881	TStE ...	P690QL1
1.0424	St 45.8 (ersetzt)	P265	1.4031	X38Cr 13	X38Cr13	1.5710	36 NiCr 6	36NiCr6	1.8882	10 MnTi 3	10MnTi3
1.0424	St 42.8 (ersetzt)	P265	1.4034	X46Cr 13	X46Cr13	1.5715	-	16NiCrS4	1.8888	ESTe ...	P690QL2
1.0425	H2	P265GH	1.4037	X65Cr13	X65Cr13	1.5752	14 NiCr 14	15NiCr13	1.8900	StE 380	S380N
1.0429	StE 290.7 TM	L290MB	1.4057	X20CrNi 17 2	X17CrNi16-2	1.6210	15 MnNi 6 3	15MnNi6-3	1.8901	StE 460	S460N
1.0457	StE 240.7	L245NB	1.4104	X12CrMoS 17	X14CrMoS17	1.6211	16 MnNi 6 3	16MnNi6-3	1.8902	StE 420	S420N
1.0459	RRStE 240.7	L245GA	1.4105	X4CrMoS 18	X6CrMoS17	1.6310	20 MnMoNi 5 5	20MnMoNi5-5	1.8903	TStE 460	S460NL
1.0461	StE 255	S255N	1.4109	X65CrMo 14	X70CrMo15	1.6311	20 MnMoNi 4 5	20MnMoNi4-5	1.8905	StE 460	P460N
1.0473	19 Mn 6	P355GH	1.4110	X55CrMo 14	X55CrMo14	1.6341	11 NiMoV 5 3	11NiMoV5-3	1.8907	StE 500	S500N
1.0481	17 Mn 4	P295GH	1.4112	X90CrMoV 18	X90CrMoV18	1.6368	15 NiCuMoNb 5	15NiCuMoNb5	1.8910	TStE 380	S380NL
1.0484	StE 290.7	L290NB	1.4113	X6CrMo 17 1	X6CrMo17-1	1.6511	36 CrNiMo 4	36CrNiMo4	1.8911	ESTe 380	S380NL1
1.0486	StE 285	P275N	1.4116	X45CrMoV 15	X50CrMoV15	1.6523	21 NiCrMo 2	21NiCrMo2-2	1.8912	TStE 420	S420NL
1.0501	C 35	C35	1.4120	X20CrMo 13	X20CrMo13	1.6526	21 NiCrMoS 2	21NiCrMoS2-2	1.8913	ESTe 420	S420NL1
1.0503	C 45	C45	1.4122	X35CrMo 17	X39CrMo17-1	1.6580	30 CrNiMo 8	30CrNiMo8	1.8915	TStE 460	P460NL1
1.0505	StE 315	P315N	1.4125	X105CrMo 17	X105CrMo17	1.6582	34 CrNiMo 6	34CrNiMo6	1.8917	WStE 500	S500NL
1.0511	C 40	C40	1.4301	X5CrNi 18 10	X5CrNi18-10	1.6587	17 CrNiMo 6	18CrNiMo7-6	1.8918	ESTe 460	P460NL2
1.0528	C 30	C30	1.4303	X5CrNi 18 12	X4CrNi18-12	1.7003	38 Cr 2	38Cr2	1.8919	ESTe 500	S500NL1
1.0529	StE 350 -Z3	S350GD	1.4305	X10CrNiS 18 9	X8CrNiS18-9	1.7006	46 Cr 2	46Cr2	1.8930	WStE 380	P380NH
1.0535	C 55	C55	1.4306	X2CrNi 19 11	X2CrNi19-11	1.7016	17 Cr 3	17Cr3	1.8932	WStE 420	P420NH
1.0539	StE 355N	S355NH	1.4310	X12CrNi 17 7	X10CrNi18-8	1.7023	38 CrS 2	38CrS2	1.8935	WStE 460	P460NH
1.0540	C 50	C50	1.4311	X2CrNiN 18 10	X2CrNiN18-10	1.7025	46 CrS 2	46CrS2	1.8937	TStE 500	P500NH
1.0547	St 52 -3U	S355J0H	1.4313	X4CrNi 13 4	X3CrNiMo13-4	1.7030	28 Cr 4	28Cr4	1.8972	StE 415.7	L415NB
1.0582	StE 360.7	L360NB	1.4318	X2CrNiN 18 7	X2CrNiN18-7	1.7033	34 Cr 4	34Cr4	1.8973	StE 415.7 TM	L415MB
1.0601	C 60	C60	1.4335	X1CrNi 25 21	X1CrNi25-21	1.7034	37 Cr 4	37Cr4	1.8975	StE 445.7 TM	L450MB
1.0710	15 S 10	-	1.4361	X1CrNiSi 18 15	X1CrNiSi18-15-4	1.7035	41 Cr 4	41Cr4	1.8977	StE 480.7 TM	L485MB
1.0715	9 SMn 28	11SMn30	1.4362	X2CrNiN 23 4	X2CrNiN23-4	1.7036	28 CrS 4	28CrS4	1.8978	StE 550.7 TM	L555MB
1.0718	9 SMnPb 28	11SMnPb30	1.4401	X5CrNiMo17 122	X5CrNiMo17-12-2	1.7037	34 CrS 4	34CrS4			
1.0721	10 S 20	10S20	1.4404	X2CrNiMo17 132	X2CrNiMo17-12-2	1.7038	37 CrS 4	37CrS4			
1.0722	10 S Pb 20	10SPb20	1.4410	X10CrNiMo 18 9	X2CrNiMoN25-7-4	1.7039	41 CrS 4	41CrS4			
1.0726	35 S 20	35S20	1.4418	X4CrNiMo 16 5	X4CrNiMo16-5-1	1.7131	16 MnCr 5	16MnCr5			
1.0727	45 S 20	46S20	1.4435	X2CrNiMo18 143	X2CrNiMo18-14-3	1.7139	16 MnCrS 5	16MnCrS5			



# ÜRÜN NUMARA LİSTESİ

BRINCE GÜJH



# ÜRÜN NUMARA LİSTESİ

Ürün no	Sayfa	Delik derinliği	Standart	Tanımlar	Malzeme	Tip	Form
11	428		fabrika standardı	Helisel matkap setleri			
16	420	~5xD	DIN 338	Helisel matkap setleri	HSCO	N	
17	419	~5xD	DIN 338	Helisel matkap setleri	HSS	N	
18	421	~5xD	DIN 338	Helisel matkap setleri	HSCO	Ti	
36	426		fabrika standardı	Helisel matkap setleri			
73	427		fabrika standardı	Helisel matkap setleri			
128	413		fabrika standardı	Kısa helisel matkap ucu sap-Ø 16,0 mm	HSCO	V72	
129	414		fabrika standardı	Kısa helisel matkap ucu sap-Ø25,4 mm	HSCO	V72	
136	415		fabrika standardı	Kısa helisel matkap ucu sap-Ø25,4 mm	HSCO	V72	
195	422	~5xD	DIN 338	Helisel matkap setleri	HSCO	VA	
200	418	~5xD	DIN 338	Helisel Matkap Setleri, çözüük	HSS	N	
201	417	~5xD	DIN 338	Helisel matkap setleri	HSS	N	
204	338, 587	~10xD	DIN 340	Helisel matkap uçları, uzun	HSS	N	
205	244	~5xD	DIN 338	Helisel matkap uçları, kısa	HSS	N	
206	263	~5xD	DIN 338	Helisel matkap uçları, kısa	HSS	H	
207	269	~5xD	DIN 338	Helisel matkap uçları, kısa	HSS	W	
208	258	~5xD	DIN 338	Helisel matkap uçları, kısa	HSS	N	
209	266	~5xD	DIN 338	Helisel matkap uçları, kısa	HSS	H	
210	272	~5xD	DIN 338	Helisel matkap uçları, kısa	HSS	W	
211	325	~10xD	DIN 339	Silindirik saplı uzun matkap uçları	HSS	N	
217	331, 580	~10xD	DIN 340	Helisel matkap uçları, uzun	HSS	N	
218	339, 588	~10xD	DIN 340	Helisel matkap uçları, uzun	HSS	H	
219	342, 591	~10xD	DIN 340	Helisel matkap uçları, uzun	HSS	W	
220	336, 585	~10xD	DIN 340	Helisel matkap uçları, uzun	HSS	N	
221	341, 590	~10xD	DIN 340	Helisel matkap uçları, uzun	HSS	H	
223	192	~3xD	DIN 1897	Çok kısa helisel matkap uçları	HSS	N	
224	204	~3xD	DIN 1897	Çok kısa helisel matkap uçları	HSS	H	
225	208	~3xD	DIN 1897	Çok kısa helisel matkap uçları	HSS	W	
226	200	~3xD	DIN 1897	Çok kısa helisel matkap uçları	HSS	N	
227	206	~3xD	DIN 1897	Çok kısa helisel matkap uçları	HSS	H	
228	210	~3xD	DIN 1897	Çok kısa helisel matkap uçları	HSS	W	
229	458	~5xD	DIN 345	Helisel matkap uçları	HSS	N	
235	363, 612	~15xD	DIN 1869	Helisel matkap uçları çok uzun, seri 1	HSS	N	
236	371, 620	~20xD	DIN 1869	Ekstra uzun helisel matkaplar, seri 2	HSS	N	
237	377, 626	~25xD	DIN 1869	Ekstra uzun helisel matkaplar, seri 3	HSS	N	
240	257	~5xD	DIN 338	Helisel matkap uçları, kısa	HSS	N	
242	381, 630	>25xD	fabrika standardı	Helisel matkap uçları, çok uzun	HSS	GT 100	
243	382, 631	>25xD	fabrika standardı	Helisel matkap uçları, çok uzun	HSS	GT 100	
244	383, 632	>25xD	fabrika standardı	Helisel matkap uçları, çok uzun	HSS	GT 100	
245	450	~5xD	DIN 345	Helisel matkap uçları	HSS	N	
246	459	~5xD	DIN 345	Helisel matkap uçları	HSS	H	
247	460	~5xD	DIN 345	Helisel matkap uçları	HSS	W	
248	457	~5xD	DIN 345	Helisel matkap uçları	HSS	N	
251	471	~5xD	DIN 346	Helisel matkap uçları	HSS	N	
254	499		fabrika standardı	Soğutma kanallı matkap uçları, Kanal boyu fabrika norm.a göre	HSS	N	
255	500		fabrika standardı	Soğutma kanallı matkap uçları, Kanal boyu fabrika norm.a göre	HSS	N	
257	473	~10xD	DIN 341	Silindirik saplı uzun matkap uçları	HSS	N	
266	483, 633	~15xD	DIN 1870	Helisel matkap uçları çok uzun, seri 1	HSS	N	
267	487, 637	~20xD	DIN 1870	Ekstra uzun helisel matkaplar, seri 2	HSS	N	
268	412		fabrika standardı	Kısa helisel matkap ucu sap-Ø 12,7 mm	HSS	N	
269	498	~7xD	fabrika standardı	Soğutma kanallı matkap ucu, kısa	HSS	N	
270	502	~10xD	fabrika standardı	Soğutma kanallı matkap uçları, Kanal boyu DIN 341	HSS	N	
271	503	~10xD	fabrika standardı	Soğutma kanallı matkap uçları, Kanal boyu DIN 341	HSS	N	
272	504	~10xD	fabrika standardı	Soğutma kanallı matkap uçları, Kanal boyu DIN 341	HSS	N	
274	714		fabrika standardı	Kademeli punta matkap uçları DIN 332	HSS	N	D
280	689		fabrika standardı	Punta matkap uçları, silindir saplı	HSS	N	A
281	684		fabrika standardı	Punta matkap uçları, silindir saplı	HSS	N	A
282	685		fabrika standardı	Punta matkap uçları, silindir saplı	HSS	N	A
283	686		fabrika standardı	Punta matkap uçları, silindir saplı	HSS	N	R
284	687		fabrika standardı	Punta matkap uçları, silindir saplı	HSS	N	R
285	688		fabrika standardı	Punta matkap uçları, silindir saplı	HSS	N	B
287	693		DIN 333	Punta matkap uçları, düz sıkma yüzeyli	HSS	N	A
288	694		DIN 333	Punta matkap uçları, düz sıkma yüzeyli	HSS	N	R
289	695		fabrika standardı	Punta matkap uçları, düz sıkma yüzeyli	HSS	N	B
292	680		BS 328	Punta matkap uçları, silindir saplı	HSS	N	A
293	495	>20xD	fabrika standardı	Helisel matkap uçları, çok uzun	HSS	GT 100	
294	681		BS 328	Punta matkap uçları, silindir saplı	HSS	N	A
298	496	>20xD	fabrika standardı	Helisel matkap uçları, çok uzun	HSS	GT 100	
299	497	>20xD	fabrika standardı	Helisel matkap uçları, çok uzun	HSS	GT 100	
301	397, 649	~5xD	DIN 1899	İçten su vermesiz HSS-E-PM mikro hassas deliciler	HSS-E-PM	N	
303	402, 654	~5xD	DIN 1899	İçten su vermesiz HSS-E-PM mikro hassas deliciler	HSS-E-PM	N	
305	284	~5xD	DIN 338	Helisel matkap uçları, kısa	HSCO	N	



Ürün no	Sayfa	Delik derinliği	Standart	Tanımlar	Malzeme	Tip	Form
308	289	~5xD	DIN 338	Helisel matkap uçları, kısa	HSCO	N	
311	330	~10xD	DIN 339	Silindirik saplı uzun matkap uçları	HSCO	N	
317	353, 602	~10xD	DIN 340	Helisel matkap uçları, uzun	HSCO	N	
329	218	~3xD	DIN 1897	Çok kısa helisel matkap uçları	HSCO	GV 120	
330	225	~3xD	DIN 1897	Çok kısa helisel matkap uçları	HSCO	GV 120	
336	355, 604	~10xD	DIN 340	Helisel matkap uçları, uzun	HSCO	GT 100	
345	463	~5xD	DIN 345	Helisel matkap uçları	HSCO	N	
351	472	~5xD	DIN 346	Helisel matkap uçları	HSCO	N	
357	480	~10xD	DIN 341	Silindirik saplı uzun matkap uçları	HSCO	N	
363	448	~3xD	fabrika standardı	Helisel matkap uçları, kısa	HSCO	GV 120	
370	505	~10xD	fabrika standardı	Soğutma kanallı matkap uçları, Kanal boyu DIN 341	HSCO	GT 100	
371	506	~10xD	fabrika standardı	Soğutma kanallı matkap uçları, Kanal boyu DIN 341	HSCO	GT 100	
372	507	~10xD	fabrika standardı	Soğutma kanallı matkap uçları, Kanal boyu DIN 341	HSCO	GT 100	
374	508, 641	~15xD	fabrika standardı	Soğutma kanallı matkap uçları, Kanal boyu DIN 1870	HSCO	GT 100	
375	509, 642	~15xD	fabrika standardı	Soğutma kanallı matkap uçları, Kanal boyu DIN 1870	HSCO	GT 100	
376	510, 643	~15xD	fabrika standardı	Soğutma kanallı matkap uçları, Kanal boyu DIN 1870	HSCO	GT 100	
378	718		fabrika standardı	Silindirik saplı kademeli matkap uçları, kısa	HSS	N	
379	720		fabrika standardı	Silindirik saplı kademeli matkap uçları, kısa	HSS	N	
380	721		fabrika standardı	Silindirik saplı kademeli matkap uçları, kısa	HSS	N	
381	682		DIN 333	Punta matkap uçları, silindir saplı	HSCO	N	A
390	394	~10xD	fabrika standardı	Soğutma kanallı matkap uçları	HSS	N	
396	357, 606	~10xD	DIN 340	Helisel matkap uçları, uzun	HSCO	GT 100	
501	351, 600	~10xD	DIN 340	Helisel matkap uçları, uzun	HSS	GT 50	
502	365, 614	~15xD	DIN 1869	Helisel matkap uçları çok uzun, seri 1	HSS	GT 100	
503	372, 621	~20xD	DIN 1869	Ekstra uzun helisel matkaplar, seri 2	HSS	GT 100	
504	378, 627	~25xD	DIN 1869	Ekstra uzun helisel matkaplar, seri 3	HSS	GT 100	
505	479	~10xD	DIN 341	Silindirik saplı uzun matkap uçları	HSS	GT 50	
506	350, 599	~10xD	DIN 340	Helisel matkap uçları, uzun	HSS	GT 100	
511	386	~5xD	fabrika standardı	Çok uzun silindirik saplı helisel matkap uçları	HSCO	GU 500	
512	384	~3xD	fabrika standardı	Çok uzun silindirik saplı helisel matkap uçları	HSCO	GU 500	
513	388	~5xD	fabrika standardı	Çok uzun silindirik saplı helisel matkap uçları	HSS-E-PM	GT 500	
514	728		fabrika standardı	Silindirik saplı, çift fasetalı, kademeli helisel matkap uçları	HSS	N	
515	237	~3xD	DIN 1897	Çok kısa helisel matkap uçları	HSS-E-PM	GT 500	
520	735		fabrika standardı	Mors konik saplı, çift fasetalı, kademeli helisel matkap uçları	HSS	N	
523	482	~10xD	fabrika standardı	Silindirik saplı uzun matkap uçları	HSS	N	
524	368, 617	~15xD	DIN 1869	Helisel matkap uçları çok uzun, seri 1	HSS	GT 50	
525	485, 635	~15xD	DIN 1870	Helisel matkap uçları çok uzun, seri 1	HSS	GT 50	
526	484, 634	~15xD	DIN 1870	Helisel matkap uçları çok uzun, seri 1	HSS	GT 100	
527	488, 638	~20xD	DIN 1870	Ekstra uzun helisel matkaplar, seri 2	HSS	GT 100	
528	375, 624	~20xD	DIN 1869	Ekstra uzun helisel matkaplar, seri 2	HSS	GT 50	
529	379, 628	~25xD	DIN 1869	Ekstra uzun helisel matkaplar, seri 3	HSS	GT 50	
531	416, 746		DIN 1898	Pim deliği matkap ucu	HSS	N	
532	511, 747		DIN 1898	Pim deliği matkap ucu	HSS	N	
533	737		DIN 344	Silindirik saplı, genişletici	HSS	N	
534	740		DIN 343	Mors konik saplı genişletici	HSS	N	
535	344, 593	~10xD	DIN 340	Helisel matkap uçları, uzun	HSS	GT 100	
536	722		DIN 8374	Silindirik saplı, çift fasetalı, kademeli helisel matkap uçları	HSS	N	A
537	732		fabrika standardı	Mors konik saplı, çift fasetalı, kademeli helisel matkap uçları	HSS	N	
538	726		DIN 8376	Silindirik saplı, çift fasetalı, kademeli helisel matkap uçları	HSS	N	
539	734		DIN 8377	Mors konik saplı, çift fasetalı, kademeli helisel matkap uçları	HSS	N	
540	729		DIN 8378	Silindirik saplı, çift fasetalı, kademeli helisel matkap uçları	HSS	N	
541	736		DIN 8379	Mors konik saplı, çift fasetalı, kademeli helisel matkap uçları	HSS	N	
542	489, 639	~20xD	DIN 1870	Ekstra uzun helisel matkaplar, seri 2	HSS	GT 50	
546	707		fabrika standardı	NC-Punta matkap uçları 142°	Kom. sert metal	N	
549	274	~5xD	DIN 338	Helisel matkap uçları, kısa	HSS	GT 100	
550	281	~5xD	DIN 338	Helisel matkap uçları, kısa	HSS	GT 100	
551	476	~10xD	DIN 341	Silindirik saplı uzun matkap uçları	HSS	GT 100	
552	212	~3xD	DIN 1897	Çok kısa helisel matkap uçları	HSS	GT 80	
553	215	~3xD	DIN 1897	Çok kısa helisel matkap uçları	HSS	GT 80	
554	708		fabrika standardı	Çift taraflı, karoseri matkap ucu	HSS	DK 77	
555	743		DIN 1864	Mors konik saplı genişletici	HSS	N	
556	702		fabrika standardı	NC-Punta matkap uçları 120°	HSS	N	
557	696		fabrika standardı	NC-Punta matkap uçları 90°	HSS	N	
558	461	~5xD	DIN 345	Helisel matkap uçları	HSS	GT 100	
559	700		fabrika standardı	NC-Punta matkap uçları 90°	HSS	N	
560	256	~5xD	DIN 338	Helisel matkap uçları, kısa	HSS	N	
561	327	~10xD	DIN 339	Silindirik saplı uzun matkap uçları	HSS	N	
563	491	>20xD	fabrika standardı	Helisel matkap uçları, çok uzun	HSS	GT 100	
564	492	>20xD	fabrika standardı	Helisel matkap uçları, çok uzun	HSS	GT 100	
565	493	>20xD	fabrika standardı	Helisel matkap uçları, çok uzun	HSS	GT 100	
566	494	>20xD	fabrika standardı	Helisel matkap uçları, çok uzun	HSS	GT 100	
567	703		fabrika standardı	NC-Punta matkap uçları 120°	HSS	N	



# ÜRÜN NUMARA LİSTESİ

Ürün no	Sayfa	Delik derinliği	Standart	Tanımlar	Malzeme	Tip	Form
568	697		fabrika standartı	NC-Punta matkap uçları 90°	HSS	N	
569	723		DIN 8374	Silindirik saplı, çift fasetalı, kademeli helisel matkap uçları	HSS	N	B
571	380, 629	~25xD	DIN 1869	Ekstra uzun helisel matkaplar, seri 3	HSCO	GT 100	
572	231	~3xD	DIN 1897	Çok kısa helisel matkap uçları	HSCO	VA	
574	715		fabrika standartı	Kademeli punta matkap uçları DIN 332	HSS	N	DR
575	716		fabrika standartı	Kademeli punta matkap uçları DIN 332	HSS	N	D
576	717		fabrika standartı	Kademeli punta matkap uçları DIN 332	HSS	N	D
577	390		NAS 907	Helisel matkap uçları, uzun saplı 6 inç boyunda	HSS	N	
578	392		NAS 907	Helisel matkap uçları, uzun saplı 12 inç boyunda	HSS	N	
579	391		NAS 907	Helisel matkap uçları, uzun saplı 6 inç boyunda	HSS	N	
580	393		NAS 907	Helisel matkap uçları, uzun saplı 12 inç boyunda	HSS	N	
581	668		DIN 333	Punta matkap uçları, silindir saplı	HSS	N	A
582	670		DIN 333	Punta matkap uçları, silindir saplı	HSS	N	A
583	672		DIN 333	Punta matkap uçları, silindir saplı	HSS	N	R
584	674		DIN 333	Punta matkap uçları, silindir saplı	HSS	N	R
585	675		DIN 333	Punta matkap uçları, silindir saplı	HSS	N	B
586	676		DIN 333	Punta matkap uçları, silindir saplı	HSS	N	B
587	690		DIN 333	Punta matkap uçları, düz sıkma yüzeyli	HSS	N	A
588	691		DIN 333	Punta matkap uçları, düz sıkma yüzeyli	HSS	N	R
589	692		DIN 333	Punta matkap uçları, düz sıkma yüzeyli	HSS	N	B
590	671		DIN 333	Punta matkap uçları, silindir saplı	HSS	N	A
591	677		DIN 333	Punta matkap uçları, silindir saplı	HSS	N	B
592	454	~5xD	DIN 345	Helisel matkap uçları	HSS	N	
594	678		ASME B94.11 M	Punta matkap uçları, silindir saplı	HSS	N	A
596	679		ASME B94.11 M	Punta matkap uçları, silindir saplı	HSS	N	B
605	301	~5xD	DIN 338	Helisel matkap uçları, kısa	HSCO	Ti	
606	462	~5xD	DIN 345	Helisel matkap uçları	HSS	GT 100	
608	308	~5xD	DIN 338	Helisel matkap uçları, kısa	HSCO	Ti	
611	114	5xD	DIN 6539	3 ağızlı rasyo matkap	Kom. sert metal	GS 200 U	
613	669		DIN 333	Punta matkap uçları, silindir saplı	HSS	N	A
614	673		DIN 333	Punta matkap uçları, silindir saplı	HSS	N	R
617	358, 607	~10xD	DIN 340	Helisel matkap uçları, uzun	HSCO	Ti	
618	370, 619	~15xD	DIN 1869	Helisel matkap uçları çok uzun, seri 1	HSCO	GT 100	
619	376, 625	~20xD	DIN 1869	Ekstra uzun helisel matkaplar, seri 2	HSCO	GT 100	
620	486, 636	~15xD	DIN 1870	Helisel matkap uçları çok uzun, seri 1	HSCO	GT 100	
621	490, 640	~20xD	DIN 1870	Ekstra uzun helisel matkaplar, seri 2	HSCO	GT 100	
622	291	~5xD	DIN 338	Helisel matkap uçları, kısa	HSCO	GT 100	
623	481	~10xD	DIN 341	Silindirik saplı uzun matkap uçları	HSCO	GT 100	
634	742		DIN 343	Mors konik saplı genişletici	HSCO	N	
635	744		DIN 1864	Mors konik saplı genişletici	HSCO	N	
636	724		fabrika standartı	Silindirik saplı, çift fasetalı, kademeli helisel matkap uçları	HSS	N	
637	731		fabrika standartı	Mors konik saplı, çift fasetalı, kademeli helisel matkap uçları	HSS	N	
638	725		fabrika standartı	Silindirik saplı, çift fasetalı, kademeli helisel matkap uçları	HSS	N	
639	733		fabrika standartı	Mors konik saplı, çift fasetalı, kademeli helisel matkap uçları	HSS	N	
645	466	~5xD	DIN 345	Helisel matkap uçları	HSCO	GT 100	
651	250	~5xD	DIN 338	Helisel matkap uçları, kısa	HSS	N	
652	277	~5xD	DIN 338	Helisel matkap uçları, kısa	HSS	GT 100	
653	196	~3xD	DIN 1897	Çok kısa helisel matkap uçları	HSS	N	
654	455	~5xD	DIN 345	Helisel matkap uçları	HSS	N	
655	475	~10xD	DIN 341	Helisel matkap uçları, kısa	HSS	N	
656	478	~10xD	DIN 341	Silindirik saplı uzun matkap uçları	HSS	GT 100	
657	304	~5xD	DIN 338	Helisel matkap uçları, kısa	HSCO	Ti	
658	294	~5xD	DIN 338	Helisel matkap uçları, kısa	HSCO	GT 100	
659	222	~3xD	DIN 1897	Çok kısa helisel matkap uçları	HSCO	GV 120	
660	400, 652	~5xD	DIN 1899	İçten su vermesiz HSS-E-PM mikro hassas deliciler	HSS-E-PM	N	
661	465	~5xD	DIN 345	Helisel matkap uçları	HSCO	N	
662	467	~5xD	DIN 345	Helisel matkap uçları	HSCO	GT 100	
663	449	~3xD	fabrika standartı	Helisel matkap uçları, kısa	HSCO	GV 120	
664	261	~5xD	DIN 338	Helisel matkap uçları, kısa	HSS	N	
665	283	~5xD	DIN 338	Helisel matkap uçları, kısa	HSS	GT 100	
666	328	~10xD	DIN 339	Silindirik saplı uzun matkap uçları	HSS	N	
667	334, 583	~10xD	DIN 340	Helisel matkap uçları, uzun	HSS	N	
668	347, 596	~10xD	DIN 340	Helisel matkap uçları, uzun	HSS	GT 100	
669	360, 609	~10xD	DIN 340	Helisel matkap uçları, uzun	HSCO	Ti	
670	367, 616	~15xD	DIN 1869	Helisel matkap uçları çok uzun, seri 1	HSS	GT 100	
671	374, 623	~20xD	DIN 1869	Ekstra uzun helisel matkaplar, seri 2	HSS	GT 100	
672	203	~3xD	DIN 1897	Çok kısa helisel matkap uçları	HSS	N	
701	404, 656	~5xD	fabrika standartı	İçten su vermesiz solid karbür mikro hassas deliciler	Kom. sert metal	N	
702	243	~3xD	fabrika standartı	Çok kısa helisel matkap uçları	Kom. sert metal	N	
703	429		DIN 8037	Sert metal takma uçlu özel matkap uçları	Sert metal	N	
704	430		DIN 8038	Sert metal takma uçlu özel matkap uçları	Sert metal	N	
705	512		DIN 8041	Sert metal takma uçlu özel matkap uçları	Sert metal	N	



Ürün no	Sayfa	Delik derinliği	Standart	Tanımlar	Malzeme	Tip	Form
706	362, 611	~10xD	fabrika standardı	Helisel matkap uçları, uzun	Kom. sert metal	N	
707	432		fabrika standardı	Sert metal uçlu matkap ucu	Sert metal	H	
710	323	~5xD	fabrika standardı	Helisel matkap uçları, kısa	Sert metal	Duro 150	
716	433		fabrika standardı	Duvar delme matkap ucu	Sert metal	N	
723	701		fabrika standardı	NC-Punta matkap uçları 90°	Kom. sert metal	N	
724	706		fabrika standardı	NC-Punta matkap uçları 120°	Kom. sert metal	N	
729	745		fabrika standardı	Mors konik saplı genişletici	Sert metal	N	
730	239	3xD	DIN 6539	Çok kısa helisel matkap uçları	Kom. sert metal	N	
731	115	5xD	DIN 6539	3 ağızlı rasyo matkap	Kom. sert metal	GS 200 U	
732	319	~5xD	fabrika standardı	Helisel matkap uçları, kısa	Kom. sert metal	N	
736	683		fabrika standardı	Punta matkap uçları, silindirik saplı	Kom. sert metal	N	A
738	727		fabrika standardı	Silindirik saplı, çift fasetalı, kademeli helisel matkap uçları	Kom. sert metal	N	
739	730		fabrika standardı	Silindirik saplı, çift fasetalı, kademeli helisel matkap uçları	Kom. sert metal	N	
745	116	5xD	DIN 6539	3 ağızlı rasyo matkap	Kom. sert metal	GS 200 G	
750	739		fabrika standardı	Silindirik saplı, genişletici	Sert metal	N	
768	56	4xD	fabrika standardı	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 150 GG	
769	93	7xD	fabrika standardı	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 150 GG	
770	98	10xD	fabrika standardı	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 150 GG	
773	103	15xD	fabrika standardı	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 150 GN	
1018	313	~5xD	DIN 338	AeroX Matkaplar	M42	AeroX	
1025	117	5xD	DIN 6539	3 ağızlı rasyo matkap	Kom. sert metal	GS 200 G	
1027	119	5xD	DIN 6539	3 ağızlı rasyo matkap	Kom. sert metal	GS 200 F	
1032	120	3xD	fabrika standardı	3 ağızlı kademeli rasyo matkap ucu	Kom. sert metal	GS 200 G	
1047	162		fabrika standardı	RT 800 Takma uçları	Kom. sert metal	RT 800 WP	
1071	168		fabrika standardı	RT 800 Sıkma vidaları			
1083	425	~5xD	DIN 338	AeroX Matkap setleri	M42	AeroX	
1101	501	~10xD	fabrika standardı	Soğutma kanallı matkap uçları, Kanal boyu DIN 341	HSS	N	
1131	395	~5xD	fabrika standardı	Soğutma kanallı matkap uçları	HSCO	GT 80 IK	
1132	396	~5xD	fabrika standardı	Soğutma kanallı matkap uçları	HSCO	GT 80 IK	
1133	699		fabrika standardı	NC-Punta matkap uçları 90°	HSCO	N	
1134	704		fabrika standardı	NC-Punta matkap uçları 120°	HSCO	N	
1135	705		fabrika standardı	NC-Punta matkap uçları 120°	HSCO	N	
1136	698		fabrika standardı	NC-Punta matkap uçları 90°	HSCO	N	
1146	315	~5xD	DIN 338	Helisel matkap uçları, kısa	M42	N	
1147	719		fabrika standardı	Silindirik saplı kademeli matkap uçları, kısa	HSS	N	
1149	431		fabrika standardı	FK-Helisel matkap ucu (cam elyaf takviyeli yapay malzeme)	Kom. sert metal	FK	
1171	55	3xD	DIN 6538K	İçten soğutma kanallı rasyo matkap	Sert metal	RT 80 U	
1172	84	5xD	DIN 6538M	İçten soğutma kanallı rasyo matkap	Sert metal	RT 80 U	
1173	95	7xD	DIN 6538L	İçten soğutma kanallı rasyo matkap	Sert metal	RT 80 U	
1180	54	3xD	DIN 6537K	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 F	
1181	43	3xD	DIN 6537K	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 U	
1182	80	5xD	DIN 6537L	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 F	
1183	66	5xD	DIN 6537L	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 U	
1184	21	3xD	DIN 6537K	Rasyo matkap uçları, soğutma kanalsız	Kom. sert metal	RT 100 U	
1199	317	~5xD	DIN 338	Helisel matkap uçları, kısa	M42	N	
1221	298	~5xD	DIN 338	Helisel matkap uçları, kısa	HSCO	GT 100	
1222	468	~5xD	DIN 345	Helisel matkap uçları	HSCO	GT 100	
1223	299	~5xD	DIN 338	Helisel matkap uçları, kısa	HSCO	GT 100	
1224	469	~5xD	DIN 345	Helisel matkap uçları	HSCO	GT 100	
1228	227	~3xD	DIN 1897	Çok kısa helisel matkap uçları	HSCO	GT 80	
1242	23	3xD	DIN 6539	Rasyo matkap uçları, soğutma kanalsız	Kom. sert metal	RT 100 U	
1243	36	5xD	fabrika standardı	Rasyo matkap uçları, soğutma kanalsız	Kom. sert metal	RT 100 U	
1259	235	~3xD	DIN 1897	Çok kısa helisel matkap uçları	M42	N	
1260	309	~5xD	DIN 338	Helisel matkap uçları, kısa	HSCO	VA	
1261	230	~3xD	DIN 1897	Çok kısa helisel matkap uçları	HSCO	VA	
1262	470	~5xD	DIN 345	Helisel matkap uçları	HSCO	VA	
1612	171, 558		fabrika standardı	Torx tornavida			
1660	53	3xD	DIN 6537K	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 F	
1662	78	5xD	DIN 6537L	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 F	
1663	65	5xD	DIN 6537L	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 U	
1702	28	3xD	DIN 6539	Rasyo matkap uçları, soğutma kanalsız	Kom. sert metal	RT 100 F	
1946	389	~3xD	DIN 6537K	Çok uzun silindirik saplı helisel matkap uçları	Kom. sert metal	H	
2047	311	~5xD	DIN 338	Helisel matkap uçları, kısa	HSCO	P2000	
2048	233	~3xD	DIN 1897	Çok kısa helisel matkap uçları	HSCO	P2000	
2049	423	~5xD	DIN 338	Helisel matkap setleri	HSCO	P2000	
2050	424	~3xD	DIN 1897	Helisel matkap setleri	HSCO	P2000	
2456	254	~5xD	DIN 338	Helisel matkap uçları, kısa	HSS	N	
2457	280	~5xD	DIN 338	Helisel matkap uçları, kısa	HSS	GT 100	
2458	306	~5xD	DIN 338	Helisel matkap uçları, kısa	HSCO	Ti	
2459	296	~5xD	DIN 338	Helisel matkap uçları, kısa	HSCO	GT 100	
2460	199	~3xD	DIN 1897	Çok kısa helisel matkap uçları	HSS	N	
2461	224	~3xD	DIN 1897	Çok kısa helisel matkap uçları	HSCO	GV 120	



# ÜRÜN NUMARA LİSTESİ

Ürün no	Sayfa	Delik derinliği	Standart	Tanımlar	Malzeme	Tip	Form
2462	349, 598	~10xD	DIN 340	Helisel matkap uçları, uzun	HSS	GT 100	
2463	241	~3xD	DIN 6539	Çok kısa helisel matkap uçları	Kom. sert metal	N	
2464	321	~5xD	fabrika standardı	Helisel matkap uçları, kısa	Kom. sert metal	N	
2468	52	3xD	DIN 6537K	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 F	
2469	41	3xD	DIN 6537K	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 U	
2470	77	5xD	DIN 6537L	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 F	
2471	63	5xD	DIN 6537L	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 U	
2472	18	3xD	DIN 6537K	Rasyo matkap uçları, soğutma kanalsız	Kom. sert metal	RT 100 U	
2473	20	3xD	DIN 6539	Rasyo matkap uçları, soğutma kanalsız	Kom. sert metal	RT 100 U	
2474	34	5xD	fabrika standardı	Rasyo matkap uçları, soğutma kanalsız	Kom. sert metal	RT 100 U	
2475	27	3xD	DIN 6537K	Rasyo matkap uçları, soğutma kanalsız	Kom. sert metal	RT 100 F	
2477	39	3xD	DIN 6537K	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 U	
2478	76	5xD	DIN 6537L	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 F	
2479	61	5xD	DIN 6537L	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 U	
2480	16	3xD	DIN 6537K	Rasyo matkap uçları, soğutma kanalsız	Kom. sert metal	RT 100 U	
2485	164		fabrika standardı	RT 800 Takma uçları	Kom. sert metal	RT 800 WP	
2498	229	~3xD	DIN 1897	Çok kısa helisel matkap uçları	HSCO	GT 80	
2711	89	7xD	fabrika standardı	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 U	
2712	38	5xD	DIN 6537L	Rasyo matkap uçları, soğutma kanalsız	Kom. sert metal	RT 100 F	
2713	113	5xD	DIN 6537L	3 ağızlı rasyo matkap	Kom. sert metal	FT 200 G	
2717	35	5xD	DIN 6537L	Rasyo matkap uçları, soğutma kanalsız	Kom. sert metal	RT 100 U	
2719	32	5xD	DIN 6537L	Rasyo matkap uçları, soğutma kanalsız	Kom. sert metal	RT 100 U	
2747	166		fabrika standardı	RT 800 Takma uçları	Kom. sert metal	RT 800 WP	
2996	30	5xD	DIN 6537L	Rasyo matkap uçları, soğutma kanalsız	Kom. sert metal	RT 100 U	
2997	288	~5xD	DIN 338	Helisel matkap uçları, kısa	HSCO	N	
3899	405, 657		fabrika standardı	İçten su vermesiz solid karbür mikro hassas deliciler	Kom. sert metal	N	
4044	85	7xD	fabrika standardı	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 U	
4045	87	7xD	fabrika standardı	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 U	
4071	158, 561		fabrika standardı	Sıkma vidaları			
4105	138	1xD	fabrika standardı	Takma uç gövdesi HT800		HT 800 WP	
4106	128	1,5xD	fabrika standardı	Takma uç gövdesi HT800		HT 800 WP	
4107	130	3xD	fabrika standardı	Takma uç gövdesi HT800		HT 800 WP	
4108	132	5xD	fabrika standardı	Takma uç gövdesi HT800		HT 800 WP	
4109	134	7xD	fabrika standardı	Takma uç gövdesi HT800		HT 800 WP	
4110	136	10xD	fabrika standardı	Takma uç gövdesi HT800		HT 800 WP	
4111	151		fabrika standardı	HT 800 Takma uçlar	Kom. sert metal	HT 800 WP	
4112	139		fabrika standardı	HT 800 Takma uçlar	Kom. sert metal	HT 800 WP	
4113	142		fabrika standardı	HT 800 Takma uçlar	Kom. sert metal	HT 800 WP	
4114	148		fabrika standardı	HT 800 Takma uçlar	Kom. sert metal	HT 800 WP	
4115	145		fabrika standardı	HT 800 Takma uçlar	Kom. sert metal	HT 800 WP	
4915	169, 559		fabrika standardı	Tork anahtarları			
4917	170, 560		fabrika standardı	Torx-Bit uçları			
5018	540	20xD	fabrika standardı	Tek ağızlı derin delik matkap ucu EB 80	Sert metal	EB 80	
5019	551	30xD	fabrika standardı	Çift ağızlı derin delik matkap ucu ZB 80	Sert metal	ZB 80	
5020	534	80.000	fabrika standardı	Tek ağızlı derin delik matkap ucu EB100	Kom. sert metal	EB 100	
5021	538	160.000	fabrika standardı	Tek ağızlı derin delik matkap ucu EB100	Kom. sert metal	EB 100	
5022	545	40xD	fabrika standardı	Tek ağızlı derin delik matkap ucu EB 80	Sert metal	EB 80	
5023	548	80xD	fabrika standardı	Tek ağızlı derin delik matkap ucu EB 80	Sert metal	EB 80	
5024	532	45.000	fabrika standardı	Tek ağızlı derin delik matkap ucu EB100	Kom. sert metal	EB 100	
5026	536	120.000	fabrika standardı	Tek ağızlı derin delik matkap ucu EB100	Kom. sert metal	EB 100	
5164	550	1100.000	fabrika standardı	Tek ağızlı derin delik matkap ucu EB 80	Sert metal	EB 80	
5242	159	3xD	fabrika standardı	Takma uç gövdesi RT800		RT 800 WP	
5243	160	5xD	fabrika standardı	Takma uç gövdesi RT800		RT 800 WP	
5248	161	7xD	fabrika standardı	Takma uç gövdesi RT800		RT 800 WP	
5460	542	30xD	fabrika standardı	Tek ağızlı derin delik matkap ucu EB 80	Sert metal	EB 80	
5525	100	12xD	fabrika standardı	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 U	
5632	533	45.000	fabrika standardı	Tek ağızlı derin delik matkap ucu EB100	Kom. sert metal	EB 100	
5633	535	80.000	fabrika standardı	Tek ağızlı derin delik matkap ucu EB100	Kom. sert metal	EB 100	
5637	537	120.000	fabrika standardı	Tek ağızlı derin delik matkap ucu EB100	Kom. sert metal	EB 100	
5638	539	160.000	fabrika standardı	Tek ağızlı derin delik matkap ucu EB100	Kom. sert metal	EB 100	
5639	541	20xD	fabrika standardı	Tek ağızlı derin delik matkap ucu EB 80	Sert metal	EB 80	
5640	543	30xD	fabrika standardı	Tek ağızlı derin delik matkap ucu EB 80	Sert metal	EB 80	
5641	546	40xD	fabrika standardı	Tek ağızlı derin delik matkap ucu EB 80	Sert metal	EB 80	
5642	549	80xD	fabrika standardı	Tek ağızlı derin delik matkap ucu EB 80	Sert metal	EB 80	
5643	552	30xD	fabrika standardı	Çift ağızlı derin delik matkap ucu ZB 80	Sert metal	ZB 80	
5644	555	30xD	fabrika standardı	Tek ağızlı derin delik matkap ucu EB 800	Sert metal	EB 800	
5646	529	25xD	fabrika standardı	Tek ağızlı derin delik matkap ucu EB100	Kom. sert metal	EB 100	
5647	530	50xD	fabrika standardı	Tek ağızlı derin delik matkap ucu EB100	Kom. sert metal	EB 100	
5648	531	75xD	fabrika standardı	Tek ağızlı derin delik matkap ucu EB100	Kom. sert metal	EB 100	
5689	544	40xD	fabrika standardı	Tek ağızlı derin delik matkap ucu EB 80	Sert metal	EB 80	
5690	547	80xD	fabrika standardı	Tek ağızlı derin delik matkap ucu EB 80	Sert metal	EB 80	
5747	566		fabrika standardı	Delik delme kovani	HSS		



Ürün no	Sayfa	Delik derinliği	Standart	Tanımlar	Malzeme	Tip	Form
5748	565		fabrika standardı	Delik delme kovani	Kom. sert metal		
5749	573		fabrika standardı	Tek ve iki ağızlı derin delik matkaplar için lünet burçları			
5750	571		fabrika standardı	Tek ağızlı matkap ucu için yataklama burcu			
5751	576		fabrika standardı	Çift ağızlı derin delik matkap ucu için yataklama burcu			
5752	569		fabrika standardı	Tek ağızlı derin delik matkabı için sızdırmazlık contaları			
5753	575		fabrika standardı	Çift ağızlı derin delik matkabı için sızdırmazlık contaları			
5754	577		fabrika standardı	Ayar civatası			
5755	578		fabrika standardı	Ayar civatası			
5759	59	5xD	DIN 6537L	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 S	
5760	96	8xD	fabrika standardı	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 S	
6068	58	4xD	fabrika standardı	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 150 GG	
6069	94	7xD	fabrika standardı	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 150 GG	
6070	99	10xD	fabrika standardı	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 150 GG	
6128	157		fabrika standardı	Sıkma vidaları			
6400	108, 407, 659	4xD	fabrika standardı	ExclusiveLine kılcal matkap uçları, soğutma kanalsız	Kom. sert metal	N	
6401	109, 408, 660	7xD	fabrika standardı	ExclusiveLine kılcal matkap uçları, soğutma kanalsız	Kom. sert metal	N	
6405	110, 409, 661	5xD	fabrika standardı	ExclusiveLine kılcal matkap ucu, soğutma kanallı	Kom. sert metal	N	
6408	111, 410, 662	8xD	fabrika standardı	ExclusiveLine kılcal matkap ucu, soğutma kanallı	Kom. sert metal	N	
6412	112, 411, 663	15xD	fabrika standardı	ExclusiveLine kılcal matkap ucu, soğutma kanallı	Kom. sert metal	N	
6501	82	5xD	DIN 6537L	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 R	
6502	91	7xD	fabrika standardı	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 R	
6509	102, 523	15xD	fabrika standardı	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 T	
6511	104, 524	20xD	fabrika standardı	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 T	
6512	105, 525	25xD	fabrika standardı	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 T	
6513	106, 526	30xD	fabrika standardı	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 T	
6514	107, 527	40xD	fabrika standardı	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 T	
7632	155		fabrika standardı	HT 800 Takma uçlar	Kom. sert metal		
7635	156		fabrika standardı	HT 800 Takma uçlar	Kom. sert metal		
7645	154		fabrika standardı	HT 800 Takma uçlar	Kom. sert metal		
8510	48	3xD	DIN 6537K	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 VA	
8511	72	5xD	DIN 6537L	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 VA	
8520	44	3xD	DIN 6537K	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 HF	
8521	68	5xD	DIN 6537L	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 HF	
8522	90	7xD	fabrika standardı	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 HF	
8524	25	3xD	DIN 6537K	Rasyo matkap uçları, soğutma kanalsız	Kom. sert metal	RT 100 HF	
8610	50	3xD	DIN 6537K	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 VA	
8611	74	5xD	DIN 6537L	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 VA	
8620	46	3xD	DIN 6537K	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 HF	
8621	70	5xD	DIN 6537L	İçten soğutma kanallı rasyo matkap	Kom. sert metal	RT 100 HF	



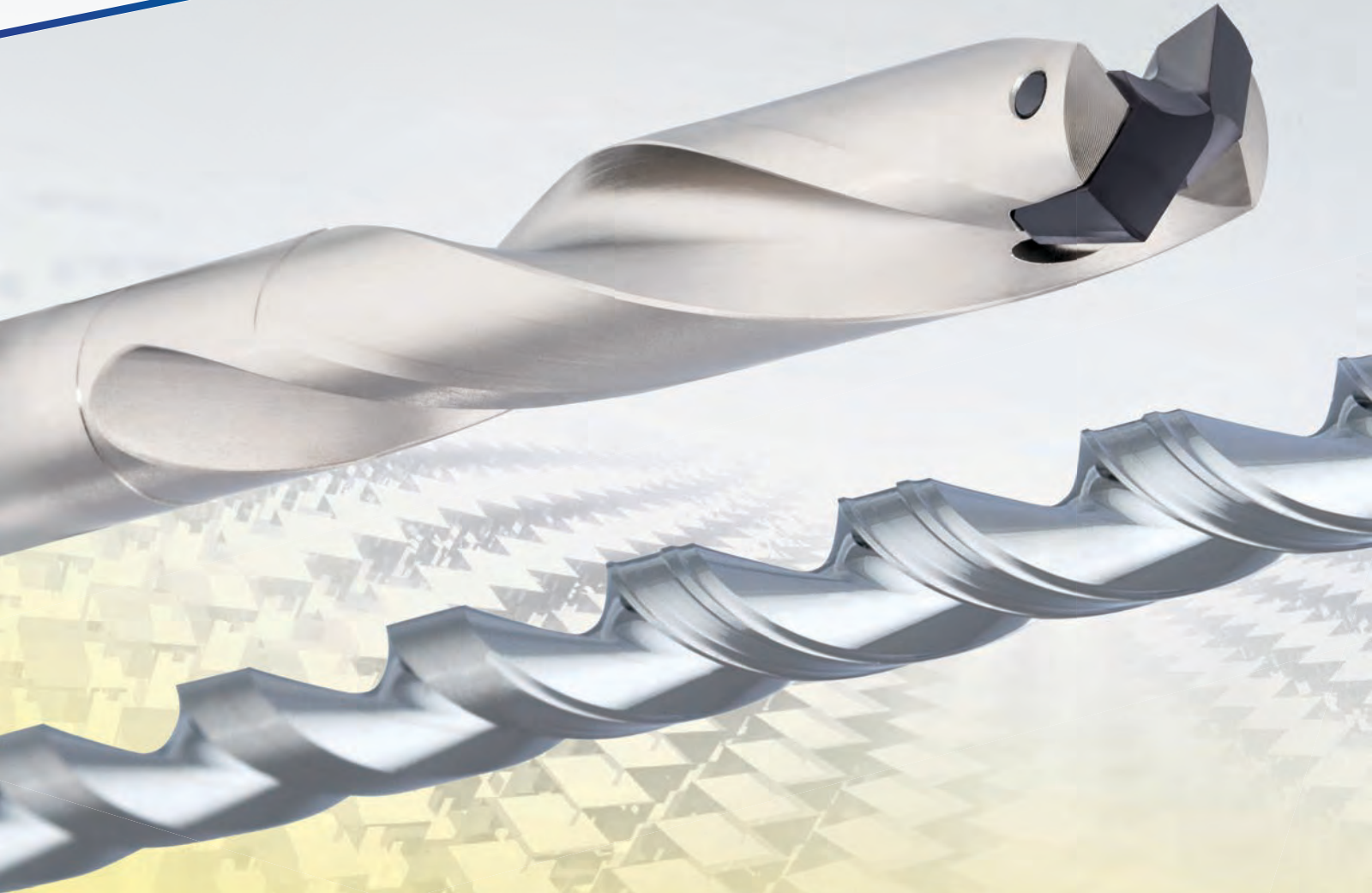








# Delme operasyonlarında mükemmellik





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