

A close-up photograph of a Gühring circular milling cutter. The cutter is a long, cylindrical metal tool with a polished, reflective surface. It has a multi-fluted design at the bottom, with several sharp, pointed cutting edges. The cutter is positioned vertically, with its tip just above a large, circular metal workpiece. The workpiece has a smooth, machined surface and a visible circular groove. The background is blurred, showing industrial machinery. The overall lighting is bright, highlighting the metallic textures and the precision of the tool.

GÜHRING

Circular milling cutter

Rotating grooving cutters for slot milling

Efficiency without compromise

Solid carbide circular milling cutters for smooth-running grooving and recessing operations

x Strong as standard

The circular milling cutters are available as standard in the most common designs and dimensions, perform well in almost all materials and can be used for both high and low cutting values. For maximum flexibility and fast delivery times. The dimensions are application-oriented. The undersize diameters (e.g. d1 = 7.8 mm for 8 mm bore) allows internal radii and contours to be effectively machined close to the bore size.

x Efficient machining in record time

The innovative uneven distribution, combined with positive rake and helix angles and generous chip spaces, ensure smooth running and low cutting forces. This allows the cutting parameters to be increased and machining times to be reduced.

x Maximum performance without chip control problems

Thanks to the short, controlled chip generation, the circular milling cutter ensures perfect chip removal which guarantees a secure process during the milling of internal contours, and as an alternative to parting off when turning. The high number of flutes ensure high cutting data values and longer tool life.

x Also available in special designs

The circular milling cutters are also available customised to your workpiece or process requirements available as special tools with corresponding contours and dimensions.



Application example

Component: Connecting flange, X5CrNi18-10 (1.4301)

Tool: #6950, Ø 7.8 mm

Customer goal: Cycle time saving

Difficulty: Long machining time due to 3 passes per component

Schnittdaten:	Gühring	competition
v_c	95 m/min	80 m/min
f_z	0.03 mm	0.02 mm
S	3878 min-1	3266 min-1
F	465 mm/min	261 mm/min

x Feed rate increased by 78 %



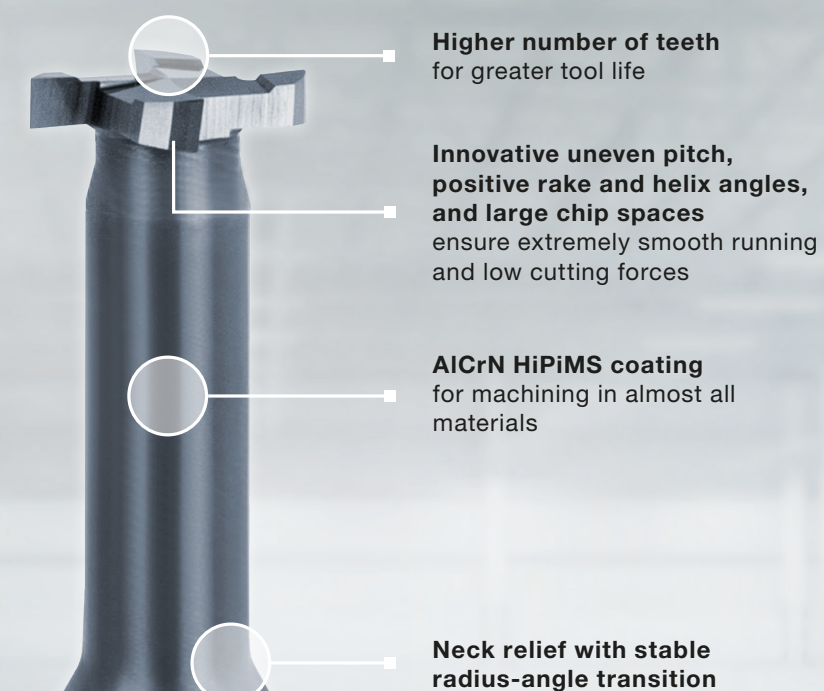
Circular milling cutter

Smooth running high, cutting forces low

The all-rounder for economical
grooving and recessing operations

Gühring is expanding its range of grooving tools
as standard: The high-performance solid carbide
circular milling cutters enable reliable and smooth-
running grooving and recessing operations on
machining centres or lathes.

Thanks to its innovative geometry, the solid carbide
circular milling cutter guarantees excellent surface finishes,
a long tool life and significantly smoother running
compared to its competitors. For maximum efficiency
when milling slots and internal contours.



Materials:



Machining strategy:



Cutting edge shapes:



Application-oriented undersize



The circular milling cutters application orientated
undersize diameters (e.g. $d_1 = 7.8 \text{ mm}$ for 8 mm bore)
allows internal radii and contours to be effectively
machined close to the bore size.

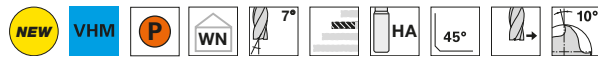


Circular milling cutters, corner chamfer

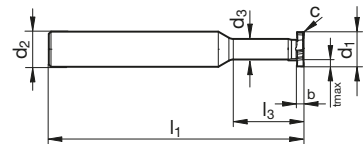
Article no. 6949



You can find cutting data in our online navigator at <https://webnavigator.guehring.de>.



for circular groove and contour milling • high running smoothness due to positive rake and helix angle with unequal pitch • neck clearance • without centre cutting



Article no.

6949

d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l3 mm	b mm	tmax. mm	c mm	Z
3.80	6.00	2.280	54.0	9.000	0.500	0.560	0.050	3
3.80	6.00	2.280	54.0	9.000	1.000	0.560	0.050	3
5.80	6.00	3.480	54.0	12.000	1.000	0.960	0.050	3
5.80	6.00	3.480	54.0	12.000	1.500	0.960	0.050	3
7.80	8.00	4.680	58.0	16.000	1.000	1.360	0.050	4
7.80	8.00	4.680	58.0	16.000	1.500	1.360	0.050	4
9.80	10.00	5.880	66.0	20.000	1.000	1.760	0.050	4
9.80	10.00	5.880	66.0	20.000	1.500	1.760	0.050	4
11.80	12.00	7.080	83.0	24.000	1.500	2.160	0.050	6
11.80	12.00	7.080	83.0	24.000	2.000	2.160	0.050	6
11.80	12.00	7.080	83.0	24.000	2.500	2.160	0.050	6
11.80	12.00	7.080	83.0	24.000	3.000	2.160	0.050	6

Order no.

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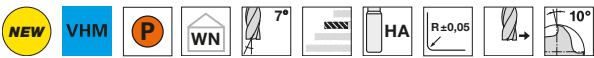


Circular milling cutters, corner radius

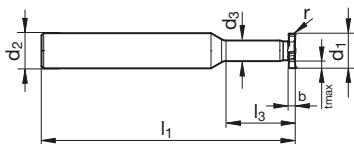
Article no. 6950



You can find cutting data in our online navigator at <https://webnavigator.guehring.de>.



for circular groove and contour milling • high running smoothness due to positive rake and helix angle with unequal pitch • neck clearance • without centre cutting



Article no.

6950

d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l3 mm	b mm	tmax. mm	r mm	Z
7.80	8.00	4.680	58.0	16.000	1.500	1.360	0.150	4
7.80	8.00	4.680	58.0	16.000	2.000	1.360	0.150	4
9.80	10.00	5.880	66.0	20.000	1.500	1.760	0.150	4
9.80	10.00	5.880	66.0	20.000	2.000	1.760	0.150	4
9.80	10.00	5.880	66.0	20.000	2.500	1.760	0.150	4
9.80	10.00	5.880	66.0	20.000	3.000	1.760	0.150	4
11.80	12.00	7.080	83.0	24.000	1.500	2.160	0.150	6
11.80	12.00	7.080	83.0	24.000	2.000	2.160	0.150	6
11.80	12.00	7.080	83.0	24.000	2.500	2.160	0.150	6
11.80	12.00	7.080	83.0	24.000	3.000	2.160	0.150	6
11.80	12.00	7.080	83.0	24.000	4.000	2.160	0.150	6

Order no.

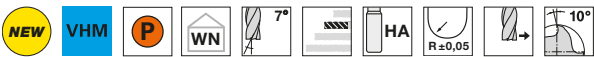
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Circular milling cutters, full radius

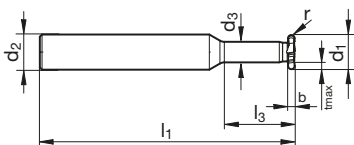
Article no. 6951



You can find cutting data in our online navigator at <https://webnavigator.guehring.de>.



for circular groove and contour milling • high running smoothness due to positive rake and helix angle with unequal pitch • neck clearance • without centre cutting



Article no.

6951

d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l3 mm	b mm	tmax. mm	r mm	Z
3.80	6.00	2.280	54.0	9.000	1.000	0.560	0.500	3
5.80	6.00	3.480	54.0	12.000	1.000	0.960	0.500	3
5.80	6.00	3.480	54.0	12.000	1.500	0.960	0.750	3
7.80	8.00	4.680	58.0	16.000	1.000	1.360	0.500	4
7.80	8.00	4.680	58.0	16.000	1.500	1.360	0.750	4
7.80	8.00	4.680	58.0	16.000	2.000	1.360	1.000	4
9.80	10.00	5.880	66.0	20.000	1.000	1.760	0.500	4
9.80	10.00	5.880	66.0	20.000	1.500	1.760	0.750	4
9.80	10.00	5.880	66.0	20.000	2.000	1.760	1.000	4
9.80	10.00	5.880	66.0	20.000	2.500	1.760	1.250	4
9.80	10.00	5.880	66.0	20.000	3.000	1.760	1.500	4
11.80	12.00	7.080	83.0	24.000	2.000	2.160	1.000	4
11.80	12.00	7.080	83.0	24.000	3.000	2.160	1.500	4

Order no.

6951 3.801
6951 5.801
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Circular milling cutters

Milling conditions:

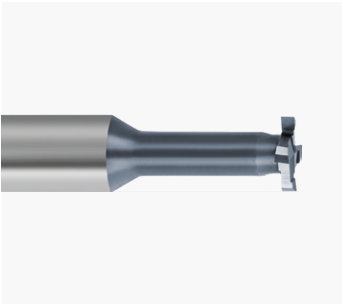
HPC

stable machining conditions
high drive power

M7C

unstable machining conditions
low drive power

long tools



Machining group	Application	v _c (m/min)	a _p max.	a _e max.	f _z (mm) with nom. Ø				
					3.8	5.8	7.8	9.8	11.8
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	Circular slotting	140	b	tmax	0.0150	0.0200	0.0300	0.0400	0.0500
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	Circular slotting	120	b	tmax	0.0150	0.0200	0.0300	0.0400	0.0500
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	Circular slotting	110	b	tmax	0.0150	0.0200	0.0250	0.0350	0.0450
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	Circular slotting	130	b	tmax	0.0150	0.0200	0.0250	0.0350	0.0450
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	Circular slotting	95	b	tmax	0.0100	0.0150	0.0250	0.0350	0.0400
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	Circular slotting	95	b	tmax	0.0100	0.0150	0.0250	0.0350	0.0400
M2.2.1 Duplex steel, high-strength stainless steels	Circular slotting	70	b	tmax	0.0100	0.0150	0.0200	0.0300	0.0350
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	Circular slotting	120	b	tmax	0.0150	0.0200	0.0300	0.0400	0.0500
K1.3.1 Malleable cast iron, ferritic, 130 HB K1.3.2 Malleable cast iron, pearlitic, 230 HB	Circular slotting	100	b	tmax	0.0100	0.0200	0.0250	0.0350	0.0400
K2.1.1 Vermicular graphite cast iron (GJV) K2.2.1 Austenitic-ferritic spheroidal graphite cast iron (ADI)	Circular slotting	85	b	tmax	0.0100	0.0150	0.0250	0.0350	0.0400
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB N1.1.2 Wrought aluminium alloys, hardened, 100 HB	Circular slotting	350	b	tmax	0.0250	0.0350	0.0450	0.0650	0.0800
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	Circular slotting	250	b	tmax	0.0200	0.0300	0.0400	0.0550	0.0700
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	Circular slotting	200	b	tmax	0.0200	0.0300	0.0400	0.0550	0.0700



Machining group	Application	v _c (m/min)	a _p max.	a _e max.	f _z (mm) with nom. Ø				
					3.8	5.8	7.8	9.8	11.8
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 % N3.1.2 Copper and copper alloys: CuZn, CuSnZn	Circular slotting	185	b	tmax	0.0150	0.0250	0.0300	0.0450	0.0550
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	Circular slotting	145	b	tmax	0.0150	0.0200	0.0300	0.0400	0.0500
N4.1.1 Non-metallic materials: Duroplastics, fibre-reinforced plastics									
N4.1.2 Non-metallic materials: Hard rubber, wood, etc.									
N4.1.3 Non-metallic materials: Graphite									
S1.1.1 Heat-resistant alloys, Fe-based, annealed, 200 HB	Circular slotting	30	b	tmax	0.0100	0.0150	0.0200	0.0300	0.0350
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	Circular slotting	25	b	tmax	0.0100	0.0150	0.0200	0.0300	0.0350
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	Circular slotting	15	b	tmax	0.0100	0.0150	0.0200	0.0250	0.0300
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	Circular slotting	15	b	tmax	0.0100	0.0100	0.0150	0.0250	0.0300
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	Circular slotting	15	b	tmax	0.0100	0.0150	0.0200	0.0250	0.0300
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	Circular slotting	50	b	tmax	0.0100	0.0200	0.0250	0.0350	0.0400
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	Circular slotting	45	b	tmax	0.0100	0.0150	0.0200	0.0300	0.0400
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC									
H1.1.2 Hardened steel, hardened and tempered, < 60 HRC									
H1.1.3 Hardened steel, hardened and tempered, > 60 HRC									
H2.1.1 Chilled cast iron, 400 HB									
H2.1.2 Chilled cast iron, hardened and tempered, < 55 HRC									

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Circular milling cutter

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