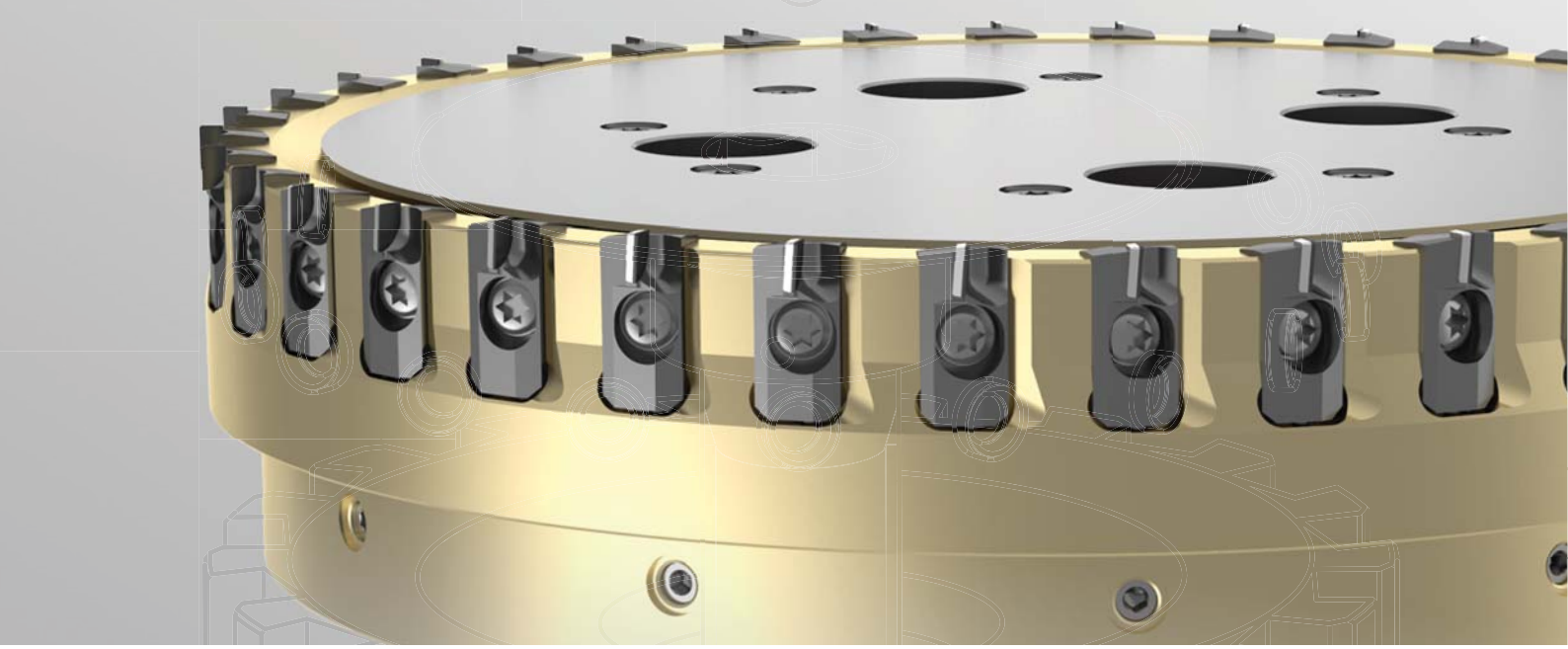
PCD-PCBN

Perfection in machining

GUHRING



PF 3000 Face Milling Cutter

GUHRING – YOUR WORLD-WIDE PARTNER

ADVANTAGES

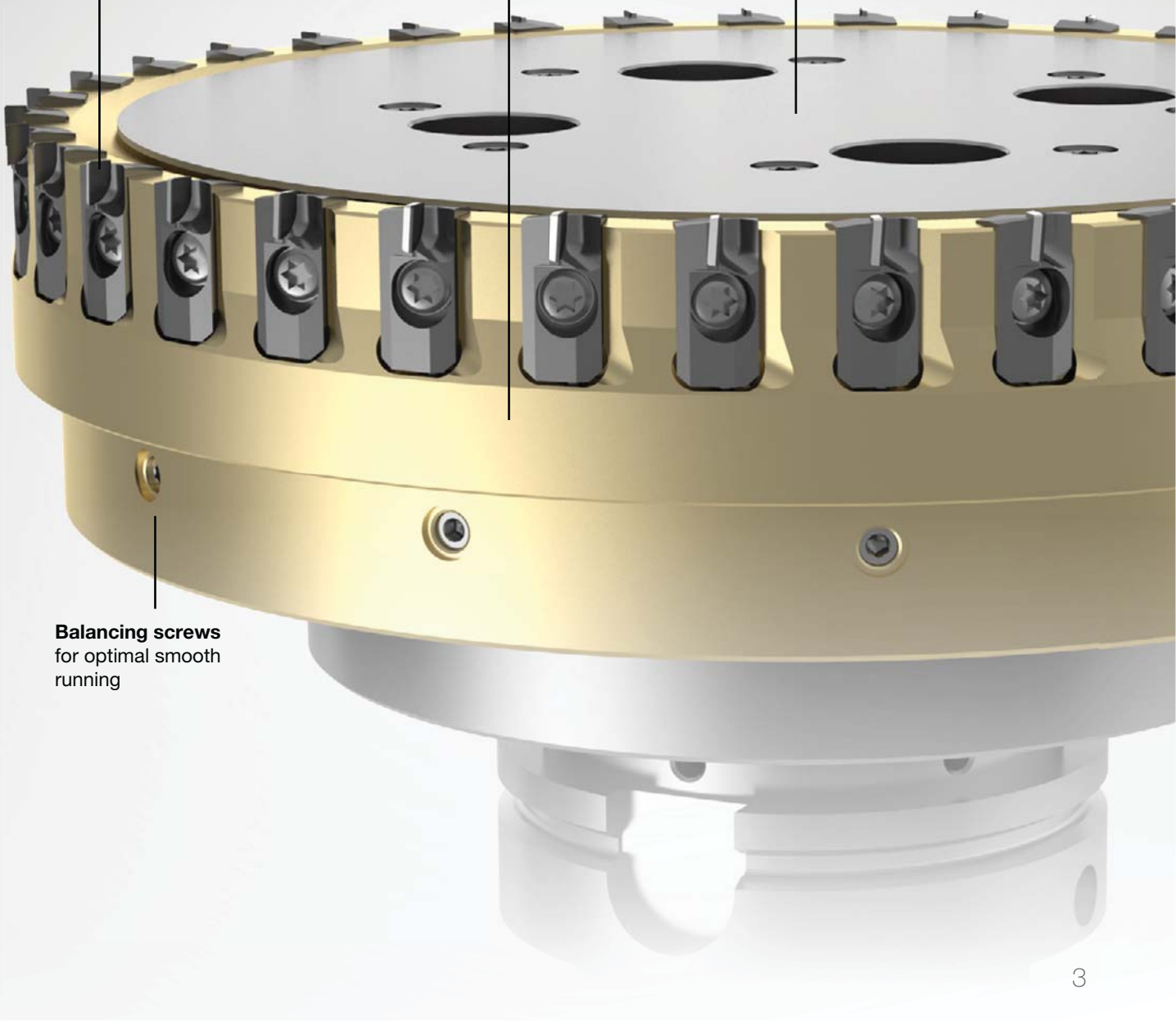
- axially adjustable inserts
- standard tool Ø 63 – 250 mm available ex-stock
- **reduced spindle loading** thanks to light aluminium body (i.e. 7.3 kg with D = 250 mm)
- **surface finish qualities up to Rz 2** achievable
- compatible with **standard tool holders**
- PCD inserts available with different geometries
- with integrated balancing screws

Basic milling cutter body in aluminium with refined surface finish:
The basic milling cutter body is manufactured in high-tensile aluminium for the reduction of mass. This reduces the forces on your machine spindle bearing.

PCD inserts:
The cutter heads are available from Ø 63 to 250 mm and carry up to 36 PCD inserts depending on diameter. The PCD inserts are available with different geometries and can be re-ground up to three times.

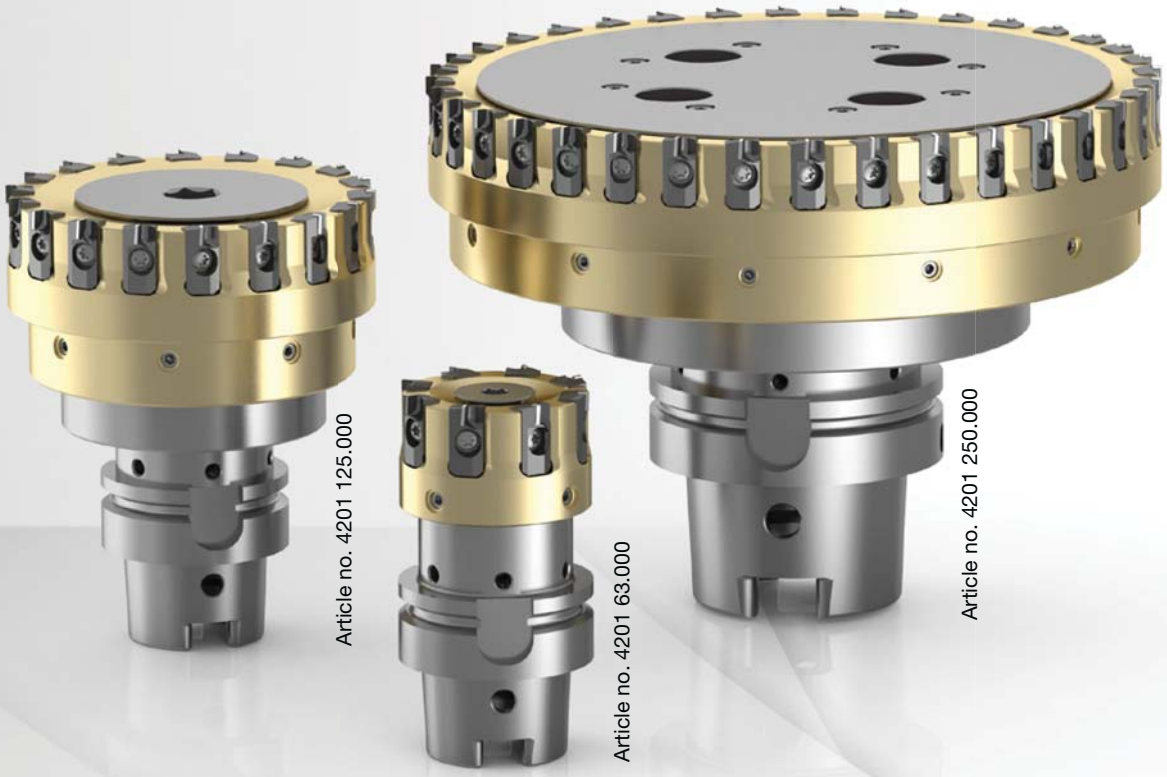
Coolant distribution disc:
The coolant distribution disc mounted on the basic milling cutter body (up to including Ø 125 mm with coolant distribution screw) ensures an optimal distribution of the delivered coolant to the inserts. It also guarantees the perfect seat of the basic milling cutter body – even at maximum speeds.

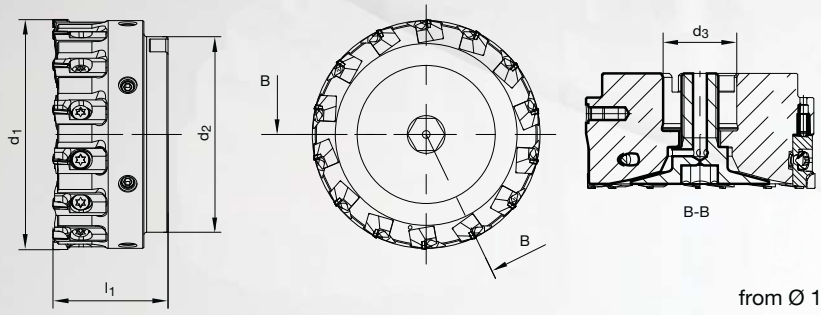
Insert axial run-out
µm accurate adjustable



Balancing screws
for optimal smooth running

PF 3000





Carrier tools*

from Ø 160 mm with coolant distribution disc

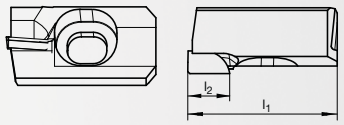
Article no. 4201

d1	d2	d3	l1	Z	Weight	Code no.
mm	mm	mm	mm		kg	
63.00	49.00	22.00	40.00	8	0.34	63.000
80.00	65.00	27.00	50.00	10	0.61	80.000
100.00	85.00	32.00	50.00	14	0.94	100.000
125.00	110.00	40.00	63.00	18	1.77	125.000
160.00	145.00	40.00	63.00	24	3.15	160.000
200.00	185.00	60.00	63.00	28	4.89	200.000
250.00	235.00	60.00	63.00	36	7.84	250.000

* Tool holder, inserts and coolant distribution disc (up to including Ø 125 mm) are not included in the scope of delivery, please order separately.

Standard range – inserts, replacement parts and accessories

Inserts

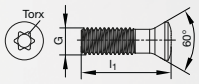


Article no. 4204

Application	l1	l2	Weight	Code no.
	mm	mm	kg	
Good surface finish quality Rz 2 to 4	23.00	6.45	0.156	30.000
Defined peak-to-valley height Rz 10 to 25	23.00	6.45	0.158	30.200
Broad finishing*	23.00	6.45	0.159	30.300

* Optimising the waviness only in combination with code no. 30.000 or 30.200.
Ø 63 – 100 mm: 2x Article no. 4204 30.300
Ø 125 – 250 mm: 3x Article no. 4204 30.300

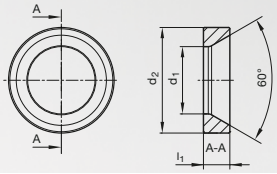
Clamping screw M5 x 17



Article no. 6128

Torx	l1	G	Code no.
	mm		
20	17	M5	5.000

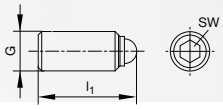
Washer



Article no. 4207

d1	d2	l1	Code no.
mm	mm	mm	
5.10	8.00	2.00	30.000

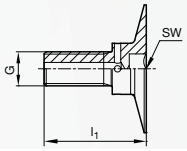
Ball pressure screw

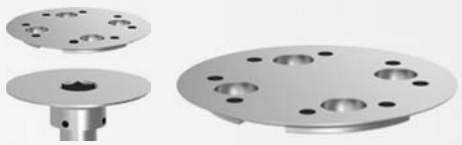


Article no. 20081

l1	G	SW	Code no.
mm			
10.00	M4	2.000	4.000

Coolant distribution screw / coolant distribution disc





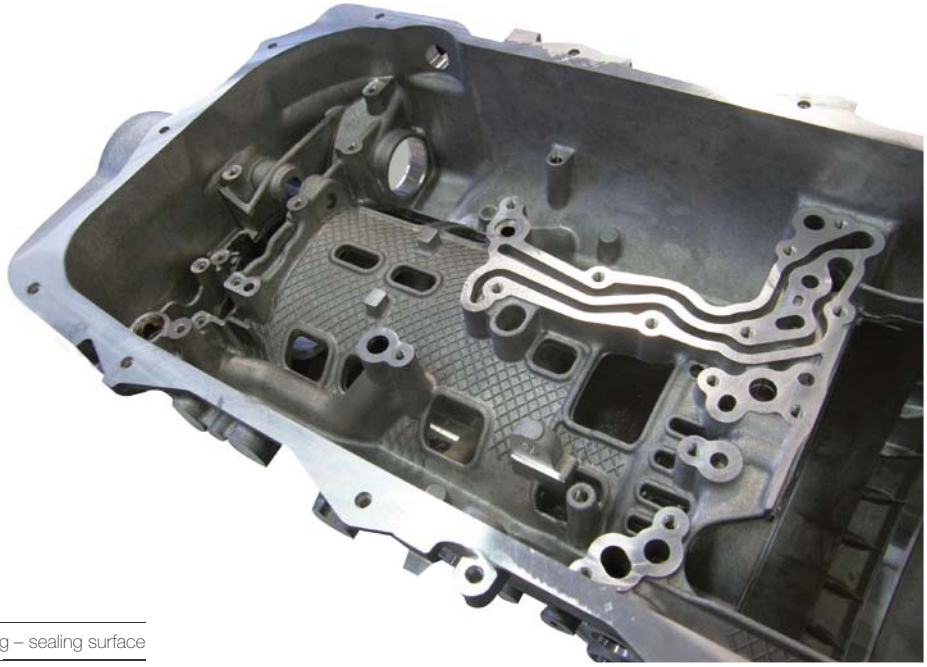
Article no. 4203

Description	l1	G	SW	Code no.
	mm			
Coolant distribution screw for Ø 63	39.00	M10	8.000	63.000
Coolant distribution screw for Ø 80	47.00	M12	10.000	80.000
Coolant distribution screw for Ø 100	48.00	M16	14.000	100.000
Coolant distribution screw for Ø 125	58.00	M20	17.000	125.000
Coolant distribution disc for Ø 160				160.000
Coolant distribution disc for Ø 200				200.000
Coolant distribution disc for Ø 250				250.000

Cutting data recommendations, application examples

The specified values are guide values.
They are heavily affected by machine, equipment and workpiece stability.

Machining groups	Material group	Composition / structure	Hardness HB	Cutting speed v_c m/min	Feed rate f_z (mm) Article no. 4204 30.000 (good surface finish quality) Article no. 4204 30.300 (broad finishing)	Feed rate f_z (mm) Article no. 4204 30.200 (defined peak-to-valley height)
21	Aluminium wrought alloy	not hardenable	60	to 6000	0.05–0.20	0.10–0.25
22		hardenable / hardened	100	to 6000	0.05–0.20	0.10–0.25
23	Aluminium cast alloy	<12% Si not hardenable	75	to 6000	0.05–0.20	0.10–0.25
24		<12% Si hardenable / hardened	90	to 6000	0.05–0.20	0.10–0.25
25		>12% Si not hardenable	130	to 2000	0.05–0.20	0.10–0.25
26	Copper	Machine alloy Pb >1%	110	to 2000	0.05–0.20	0.10–0.25
27	Copper alloy	CuZn. CuSnZn	90	to 2000	0.05–0.20	0.10–0.25
28	(bronze, brass)	Cu lead-free copper/electrolyte copper	100	to 2000	0.05–0.20	0.10–0.25



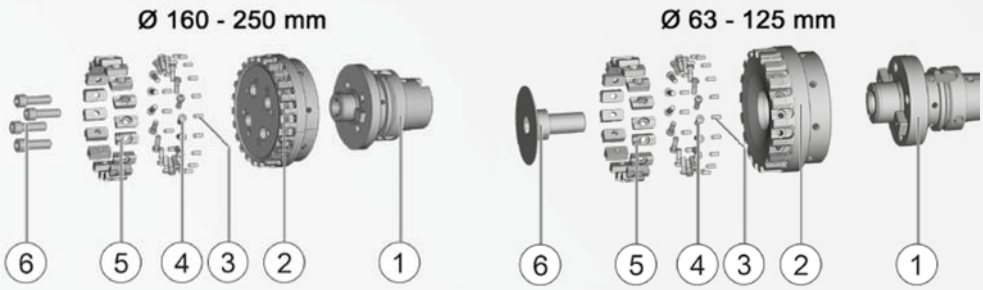
PF 3000 for finish machining sealing surface milling

Workpiece	Transmission housing – sealing surface
Material	GD-AlSi9Cu3
Tools	PF 3000, D = 63 mm, Z = 8, HSK 63-A
Cutting speed	vc = 2,970 m/min
Speed	n = 15,000 rev./min
Feed rate per tooth	0.05 mm
Feed speed	6,000 mm/min
Cutting depth	0.5 mm
Achieved surface finish quality	Rz = 5, Pt = 7, evenness = 0.025

Assembly and operating instructions

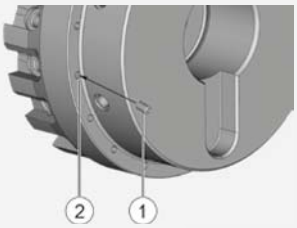
Designation of individual components

The exploded views below serve to clarify the designation of the individual components



1	GUHROJET cutter head holder	3	Ball pressure screw	5	PCD cartridge
2	Basic body (from Ø 160 mm with pre-installed coolant distribution disc)	4	Clamping screw	6	Coolant distribution screw to Ø 125 mm / cheese-head screws from Ø 160 mm

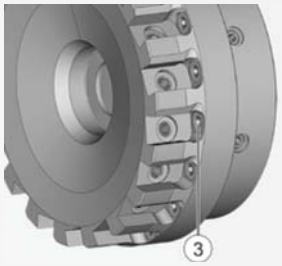
1. Assembly of ball pressure screws



The ball pressure screws in delivery condition are pre-assembled.
After you have checked that the ball pressure screws do not protrude into the cartridge seat you can continue with “2. Cartridge assembly”.

If you want to replace the ball pressure screws proceed as described below.

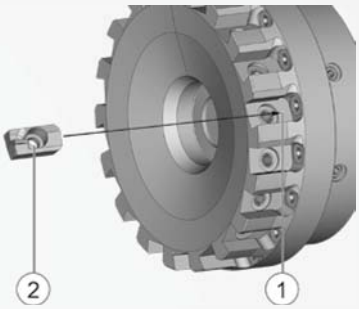
1. Lubricate the thread of the ball pressure screw with assembly paste.
   This guarantees a smooth adjustment.
2. Using the Allen key screw the ball pressure screw (1) into the basic body (2).



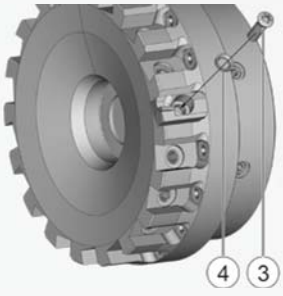
   ▸ The ball pressure screw must not protrude into the cartridge seat (3) for the cartridge to be able to be installed in the lowest position.

3. Assemble the remaining ball pressure screws in the same way.

2. Cartridge assembly

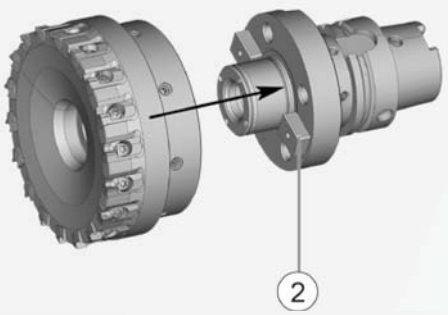


1. Install the cartridge (2) in the lowest position on the basic body (1).
2. Lubricate the thread of the clamping screw with the assembly paste.
3. Locate the cartridge with the washer (4) and the clamping screw (3).
   Use the Torx key T20.

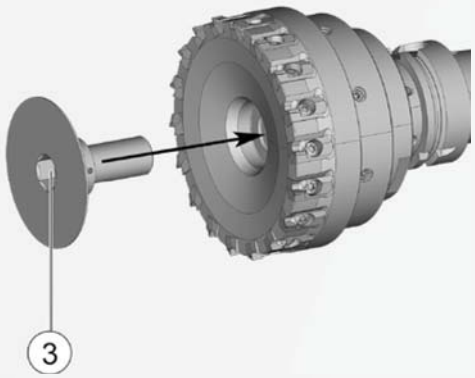


4. Repeat the steps with all cartridges.

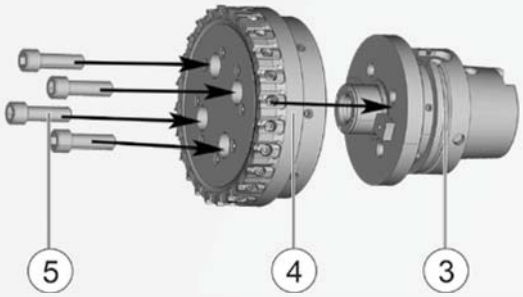
3. Mounting shell mill on GUHROJET cutter head holder



1. In delivery condition the GUHROJET cutter head holder has a balancing quality of G6.3/15,000 rev./min (static). If you use another cutter head holder ensure that it also has a balancing quality of G6.3/15,000 rev./min. Balancing may be necessary prior to mounting the shell mill.
2. Locate the GUHRINGJET cutter head holder in a tool assembly block (i.e. Guhring no. 4990). The following assembly steps must not be carried out in the spindle by setting or measuring machines.
3. Push the shell mill onto the GUHROJET cutter head holder. Pay attention to the grooves and key blocks (2).



4. For tool diameter **up to 125 mm**:
   Screw both components together with the coolant distribution screw (3).
   Use the torque wrench with a suitable hexagonal socket key.
   Adhere to the tightening torque figures in the table below.



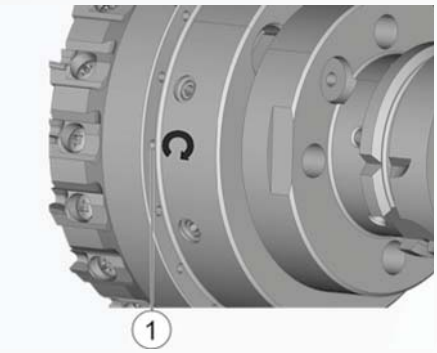
For tool diameter **from 160 mm**:
The coolant distribution disc is pre-installed in the shell mill.
Push the shell mill (4) onto the GUHROJET cutter head holder (3).
Screw both components together with the four cheese-head screws (5).
Use the torque wrench with a suitable hexagonal socket key.
Adhere to the tightening torque figures in the table below.

Tool diameter		Nominal dimension	Torque Ma
Ø 63	Coolant distribution screw 4203 63.000	SW 8	60 Nm
Ø 80	Coolant distribution screw 4203 80.000	SW 10	80 Nm
Ø 100	Coolant distribution screw 4203 100.000	SW 14	95 Nm
Ø 125	Coolant distribution screw 4203 125.000	SW 17	100 Nm
Ø 160	4x cheese-head screws M12	SW 10	85 Nm
Ø 200	4x cheese-head screws M16	SW 14	200 Nm
Ø 250	4x cheese-head screws M16	SW 14	200 Nm

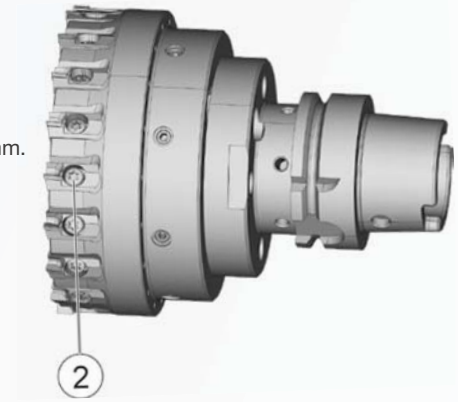
Torque specification table

4. Cartridge adjustment

1. With all the cartridges in the axial lowest position: Tighten the clamping screw with torque wrench to approximately 1 Nm.
2. Adjust all the cartridges to 0.02 to 0.03 mm less than the setting dimension using the Allen key. When doing this turn the ball pressure screw (1) clockwise. Specifications of the setting dimension can be found in the attached tool drawing.

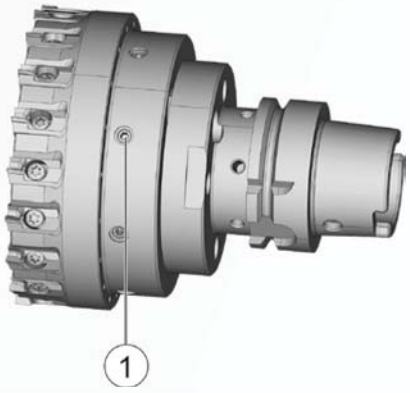


3. Tighten all the clamping screws (2) with the torque wrench to 5 Nm.
4. Adjust all the cartridges to the setting dimension. The axial run-out may not exceed 0.002 mm.
5. Record the adjustments.



5. Balancing the fully assembled tool

1. Balance the tool to a balancing quality of G6.3/15,000 rev./min (static). Apply the balancing screws (1). Other balancing qualities on request.



GUHROJET HSK-A cutter head holders

HSK-A

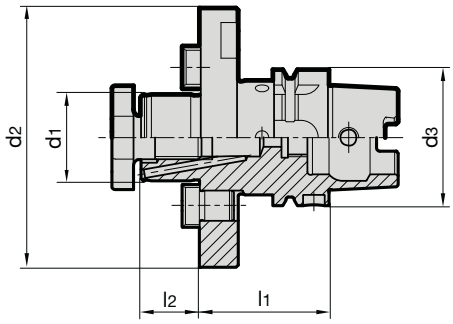
GÜHROJET

Product information

- HSK-A to ISO 12164-1/DIN 69893-1
- for holding milling cutter heads
- balancing quality: G6.3/15.000 rev./min
- to DIN 69882-3
- for central and de-central internal cooling; therefore process and tool life improvement
- holder Ø 40 and Ø 60 additionally with 4 threaded holes for holding cutter heads with tool fixing to DIN 2079 and enlarged device Ø D2

Scope of delivery

- incl. milling cutter tightening screw Article no. 4908 and key blocks



Article no. **4362**

HSK-A d3	Arbor Ø d1	d2	l1	l2	kg	Code no.
	mm	mm	mm	mm		
63	22	50	50	19	1.1	22.063
63	27	60	60	21	1.3	27.063
63	32	78	60	24	1.5	32.063
63	40	120	60	27	2.7	40.063
63	40	89	60	27	2.7	140.063
80	27	60	50	21	1.8	27.080
80	32	78	50	24	2.1	32.080
80	40	120	60	27	3.3	40.080
80	60	160	70	40	6.3	60.080
80	40	89	60	27	3.3	140.080
100	27	60	50	21	2.9	27.100
100	32	78	50	24	3.3	32.100
100	40	120	60	27	4.2	40.100
100	60	160	70	40	7.2	60.100
100	40	89	60	27	4.2	140.100

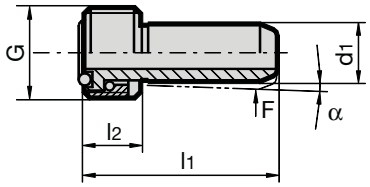
Coolant delivery sets for conventional cooling

Product information

- sealing capacity of screw connection tested up to 80 bar
- to DIN 69895
- F = angle movement ± 1°
- for HSK-A and HSK-E hollow taper shanks

Scope of delivery

- incl. union nut and O-rings



Article no. **4949**

for	d1	α	F	G	l1	l2	Code no.
HSK-A	mm	°			mm	mm	
63	12	1.3	6N	M18x1	36.5	11.5	18.063
80	14	1.4	7N	M20x1.5	40.0	13.5	20.080
100	16	1.4	7N	M24x1.5	44.0	15.5	24.100

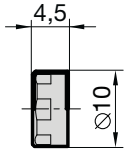
Data carrier coding chip

Product information

- BIS C identification systems
- for installation space to DIN 69 873
- data carrier writeable/readable
- 511 Bytes
- operating temperature 0… + 70°C
- degree of protection to IEC 60529
- product data exchange to DIN 4000
- to be glued in hole Ø10 H11

Scope of delivery

- data carrier coding chip
- installation in clamping chuck and additional balancing can be ordered separately.



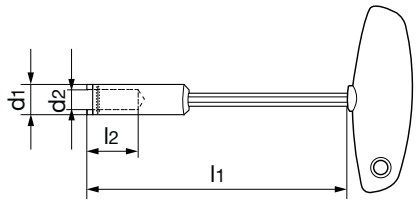
Article no. **4955**

Coding chip BIS C	Code no.
10 x 4.5	10.000

Socket spanner for coolant delivery sets

Product information

- with T-bar
- for conventional and for MQL coolant delivery sets
- for assembly adapter Article no. 4948



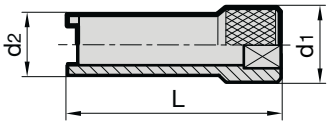
Article no. **4911**

for HSK	d1 mm	d2 mm	l1 mm	l2 mm	Code no.
63	17.0	12.1	135	31.5	48.000
80	20.0	14.1	138	32.0	60.000
100	22.5	16.1	138	35.0	75.000

Socket spanner

Product information

- suitable for torque wrench Article no. 4915, 3/8" drive
- for coolant delivery sets



Article no. **4910**

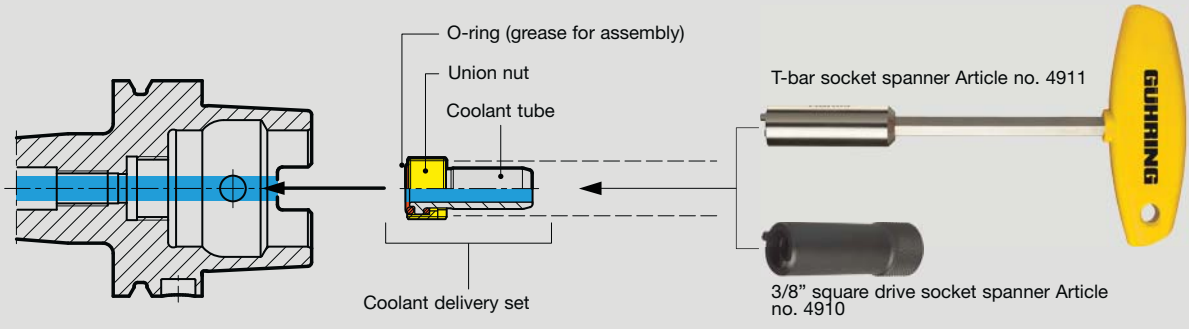
for HSK	MA Nm	d1 mm	d2 mm	L mm	Code no.
63	20	20	18	60	48.000
80	25	20	20	75	60.000
100	30	22	22	80	75.000

Assembly of coolant delivery sets 4949

1. The HSK holder must be clean and free of chips and undamaged.
2. Grease the O-rings prior to assembly.
3. Insert the complete coolant delivery set (coolant tube, union nut and 2 O-rings) centrically into the HSK using the socket spanner.
4. Screw in and tighten the coolant delivery set / coolant delivery sets (torque see table right).
5. Check the coolant tube for radial movement.

Torque

for HSK	MA Nm
63	20
80	25
100	30



SK cutter head holders

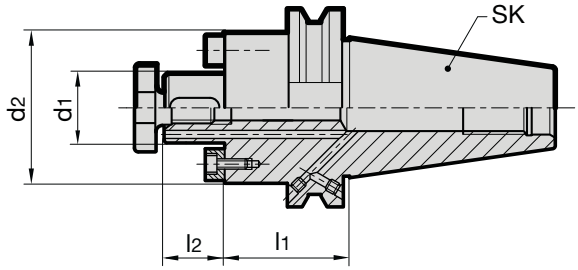
SK

Product information

- for holding cutter heads
- balancing quality: G6.3/15,000 rev./min
- SK to DIN ISO 7388-1 Form AD/AF
- for central and de-central internal cooling, therefore process and tool life improvement
- coolant delivery form AD/AF
- holder Ø 40 additionally with 4 threaded holes for holding cutter heads with tool fixing to DIN 2079 and enlarged device Ø d2.

Scope of delivery

- incl. cutter tightening screw Article no. 4908 and key blocks



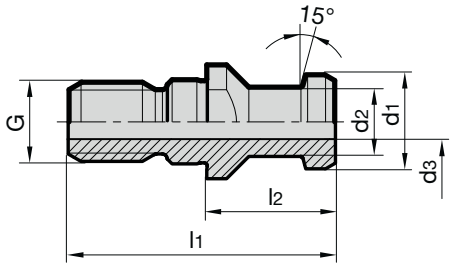
Article no. **4231**

SK	Arbor Ø d1	d2	l1	l2	**Code no.**
	mm	mm	mm	mm	
40	22	48	35	19	22.040
40	27	58	40	21	27.040
40	32	78	50	24	32.040
40	40	88	50	27	40.040
50	22	48	35	19	22.050
50	27	58	40	21	27.050
50	32	78	50	24	32.050
50	40	88	50	27	40.050

SK DIN ISO 7388-3 form AD pull studs

Product information

- for SK tool holders to DIN ISO 7388-3 form AD
- drilled through for central internal coolant delivery



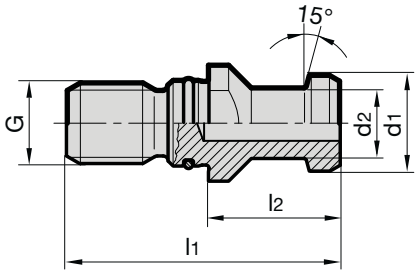
Article no. **4925**

for	d1	d2	d3	l1	l2	G	Code no.
SK	mm	mm	mm	mm	mm		
40	19.0	14.0	7.0	54.0	26	M16	40.000
50	28.0	21.0	11.5	74.0	34	M24	50.000

SK DIN ISO 7388-3 form AF pull studs

Product information

- for SK tool holders to DIN ISO 7388-3 form AF
- drilled through for central internal cooling



Article no. **4926**

for	d1	d2	l1	l2	G	Code no.
SK	mm	mm	mm	mm		
40	19.0	14.0	54.0	26	M16	40.000
50	28.0	21.0	74.0	34	M24	50.000

Tool assembly blocks

Product information

- incl. interchangeable inserts Article no. 4991

Article no. **4990**

for HSK-A/C	for SK	length mm	width mm	height mm	kg	Code no.
–	40	260	130	160	9	400.040
–	50	260	130	160	9	400.050
63	–	260	130	160	9	450.063
80	–	260	130	160	9	450.080
100	–	260	130	160	9	450.100

Interchangeable inserts

Product information

- for tool assembly blocks Article no. 4990

Scope of delivery

- pair

Article no. **4991**

for HSK-A/C	for SK	kg	Code no.
–	40	1.50	400.100
–	50	1.50	400.200
63	–	0.12	450.400
80	–	0.27	450.500
100	–	0.46	450.600

Torque wrench

Product information

- with reversible ratchet
- torque setting range 1...200 Nm; with automatic quick release; audible, visible and palpable after reaching the set value. Release accuracy ± 4% of scale value.

Article no. **4915**

Type	Drive	L mm	Torque Nm	Code no.
A	1/4“	160	1-5	5.001
B	3/8“	390	5-50	50.000
C	1/2“	514	40-200	200.000

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