



Your technology partner for cost-effective machining

SUPPLEMENTARY VOLUME: PRODUCT INNOVATIONS **2026**



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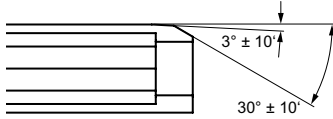
Scan the QR code
for more information.



Milling	>	Shoulder milling Face milling Chamfer milling Internal cooling Long	Trimming Ramps 45° chamfer Shank form HA compatible with DIN 6535 Design DIN 6527	Groove milling Helix milling Process conditions good Shank form HB compatible with DIN 6535	Trochoidal milling Pocket milling Process conditions unfavourable Short																																																																																																									
Clamping	>	DirectCool	Hydraulic clamping technology																																																																																																											
Configuration	>	CONFIG	Product with configurable features																																																																																																											
Product category	>	Performance LINE	Performance Line: High-performance tools, broad field of application, high productivity in series production																																																																																																											
Material suitability	>	Highly suitable Suitable in some situations	Example standard material suitability table <table border="1"> <thead> <tr> <th>P</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>M</th><th>1</th><th>2</th><th>3</th><th>K</th><th>1</th><th>2</th><th>3</th><th>N</th><th>1</th><th>2</th><th>3</th><th>4</th><th>S</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>H</th><th>1</th><th>2</th><th>3</th></tr> </thead> <tbody> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table> Example material suitability table for non-ferrous metals and lightweight materials <table border="1"> <thead> <tr> <th>N</th><th>1.1</th><th>1.2</th><th>1.3</th><th>1.4</th><th>2.1</th><th>2.2</th><th>2.3</th><th>3.1</th><th>4.1</th><th>4.2</th><th>4.3</th><th>C</th><th>1.1</th><th>1.2</th><th>1.3</th><th>2.1</th><th>3.1</th><th>4.1</th><th>4.2</th><th>5.1</th><th>5.2</th><th>5.3</th></tr> </thead> <tbody> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>			P	1	2	3	4	5	6	M	1	2	3	K	1	2	3	N	1	2	3	4	S	1	2	3	4	5	H	1	2	3																														N	1.1	1.2	1.3	1.4	2.1	2.2	2.3	3.1	4.1	4.2	4.3	C	1.1	1.2	1.3	2.1	3.1	4.1	4.2	5.1	5.2	5.3																							
P	1	2	3	4	5	6	M	1	2	3	K	1	2	3	N	1	2	3	4	S	1	2	3	4	5	H	1	2	3																																																																																	
N	1.1	1.2	1.3	1.4	2.1	2.2	2.3	3.1	4.1	4.2	4.3	C	1.1	1.2	1.3	2.1	3.1	4.1	4.2	5.1	5.2	5.3																																																																																								

Indexable inserts, AS lead

With P06 chip breaker, for tools with a guide pad



Cutting material				Carbide		Cermet
MMG*				P	M	P
				1.1 2.1 2.2	1.1	1 - 2.2
Cutting material type				HP026	HP016	CP410
Rake angle	Size	Lead	Specification	Order no.	Order no.	Order no.
positive	90	AS	WP-AS90R-P06-...	31607197	31542082	31607479
	91		WP-AS91R-P06-...	31607199	31542084	31607500
	92		WP-AS92R-P06-...	31607211	31418068	31607501
	93		WP-AS93R-P06-...	31607213	31241364	31607502

AS lead

Lead suitable for all materials, high surface quality even at high cutting speeds. Lead length 1.3 mm.

Max. cutting depth: 0.25 mm
Rake angle: 0°, 6°, 12°

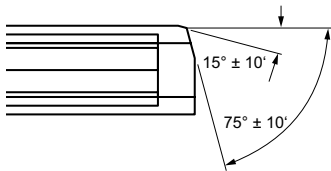
* MAPAL machining groups

Cutting data recommendations: P workpiece material, see page 9 | M workpiece material, see page 13.

Cutting edges with special lead available on request.

Indexable inserts, DZ lead

With P06 chip breaker, for tools with a guide pad



Cutting material				Carbide		Cermet
MMG*				P	M	P
				1.1 2.1 2.2	1.1	1 - 2.2
Cutting material type				HP026	HP016	CP410
Rake angle	Size	Lead	Specification	Order no.	Order no.	Order no.
positive	90	DZ	WP-DZ90R-P06-...	31607215	31542083	31603709
	91		WP-DZ91R-P06-...	31607216	31542085	31603740
	92		WP-DZ92R-P06-...	31607217	31393050	31603708
	93		WP-DZ93R-P06-...	31607218	31438298	31607503

DZ lead

Specifically for short chipping materials (EN-GJL) and large cutting depths. The 15° lead angle of the finishing edge slightly increases the radial forces, making it suitable for thin-walled workpieces as well.

Max. cutting depth: 0.15 mm
Rake angle: 0°, 6°, 12°

* MAPAL machining groups

For cutting data recommendations, see pages 11/12.

Cutting edges with special lead available on request.

TEC indexable inserts

With P06 chip breaker, for tools with a guide pad



Cutting material	Carbide				Cermet	
MMG*	P		M		P	
	1.1 2.1 2.2		1.1		1 - 2.2	
Cutting material type	HP026		HP016		CP410	

Rake angle	Size	Lead	Specification	Order no.	Order no.	Order no.
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Cutting direction right

positive	2	AS	WP-TEC2-ASF01R-2P06-...	31607228	31607227	31607229
		EK	WP-TEC2-EKF01R-2P06-...	31607241	31607240	31607242
		DZ	WP-TEC2-DZF01R-2P06-...	31607244	31607243	31607245
		R0.4	WP-TEC2-04F01R-2P06-...	31607225	31429210	31607226

Cutting direction left

positive	2	AS	WP-TEC2-ASF01L-2P06-...	31607250	31607249	31607251
		EK	WP-TEC2-EKF01L-2P06-...	31607253	31607252	31607254
		DZ	WP-TEC2-DZF01L-2P06-...	31607256	31607255	31607257
		R0.4	WP-TEC2-04F01L-2P06-...	31607247	31607246	31607248

* MAPAL machining groups
For cutting data recommendations, see pages 15-17.
Cutting edges with special lead available on request.

HX indexable inserts

With P06 chip breaker, for tools with a guide pad



Cutting material				Carbide		Cermet
MMG*				P	M	P
				1.1 2.1 2.2	1.1	1 - 2.2
Cutting material type				HP026	HP018	CP410
Rake angle	Size	Lead	Specification	Order no.	Order no.	Order no.
positive	2	R0.4	WP-607641119-P06-...	31607220	31607222	31607221
		R0.8	WP-607641114-P06-...	31607223	31439018	31607224

* MAPAL machining groups

For cutting data recommendations, see pages 18/19.

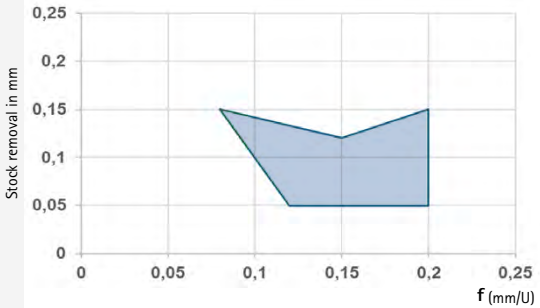
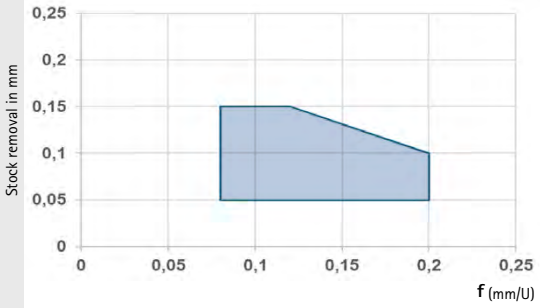
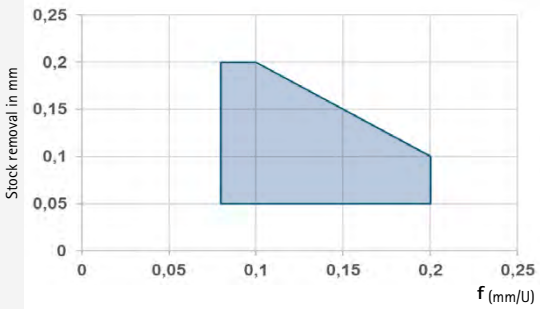
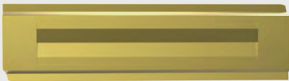
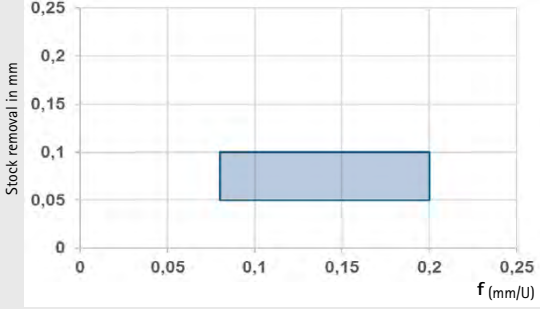
Cutting edges with special lead available on request.

Cutting data recommendations

Indexable inserts with AS lead
Chip breaker geometry P06 – HP026

Application:

Cutting edges using an AS lead in combination with HP026 can be used for surface qualities > Rz 6.3.

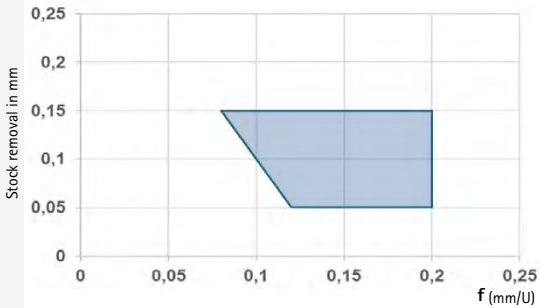
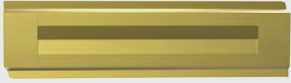
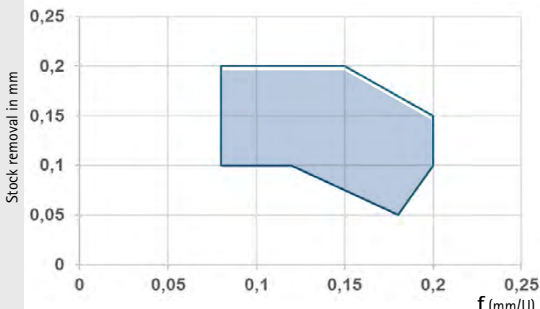
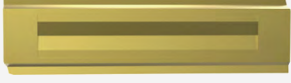
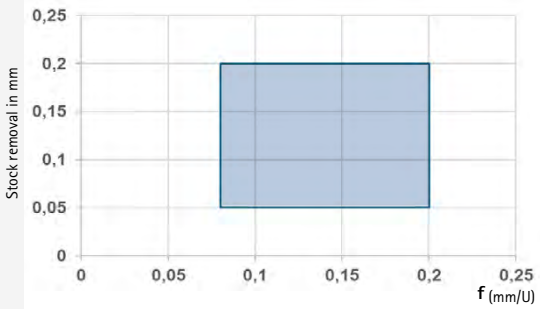
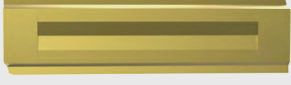
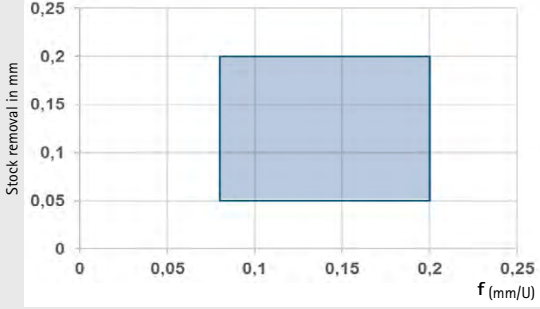
Specification Order no.	MAPAL machining groups	Cutting speed vc (m/min)	Feed f (mm/rev) depending on stock removal
AS90R-P06-HP026 31607197 	P 1 – 2	80 – 120	
AS91R-P06-HP026 31607199 	P 1 – 2	80 – 120	
AS92R-P06-HP026 31607211 	P 1 – 2	80 – 120	
AS93R-P06-HP026 31607213 	P 1 – 2	80 – 120	

Cutting data recommendations

Indexable inserts with AS lead
Chip breaker geometry P06 – CP410

Application:

The combination of AS lead and CP410 achieves the highest requirements in terms of surface finish. As a general rule, it has a roughness value of <Rz 6.3.

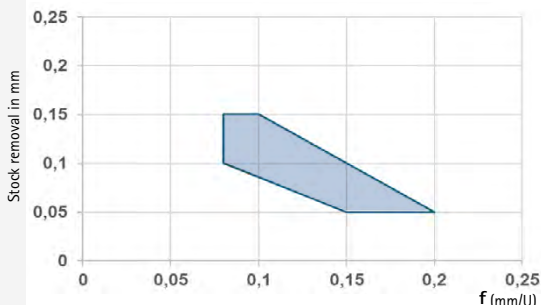
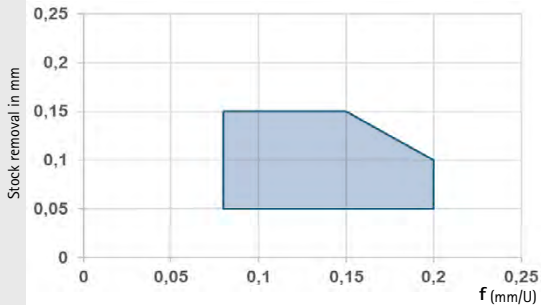
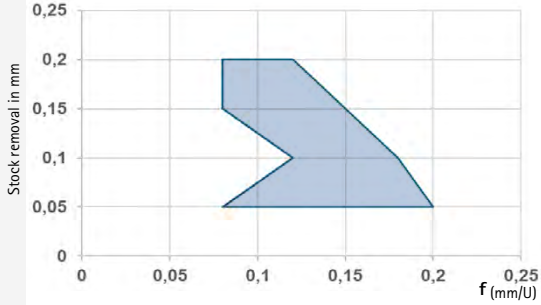
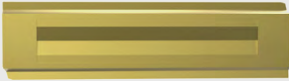
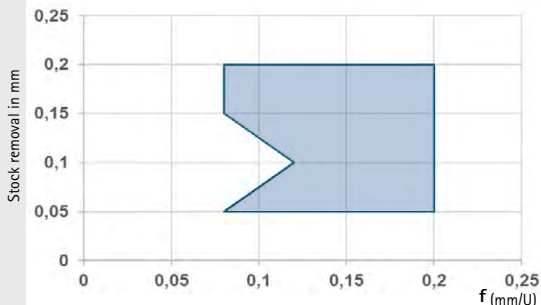
Specification Order no.	MAPAL machining groups	Cutting speed vc (m/min)	Feed f (mm/rev) depending on stock removal
AS90R-P06-CP410 31607479 	P 1 – 2	160 – 200	
AS91R-P06-CP410 31607500 	P 1 – 2	160 – 200	
AS92R-P06-CP410 31607501 	P 1 – 2	160 – 200	
AS93R-P06-CP410 31607502 	P 1 – 2	160 – 200	

Cutting data recommendations

Indexable inserts with DZ lead
Chip breaker geometry P06 – HP026

Application:

As opposed to the AS lead, the DZ lead lowers radial force, making it suitable for workpieces with thin walls.

Specification Order no.	MAPAL machining groups	Cutting speed vc (m/min)	Feed f (mm/rev) depending on stock removal
DZ90R-P06-HP026 31607215 	P 1 – 2	80 – 120	
DZ91R-P06-HP026 31607216 	P 1 – 2	80 – 120	
DZ92R-P06-HP026 31607217 	P 1 – 2	80 – 120	
DZ93R-P06-HP026 31607218 	P 1 – 2	80 – 120	

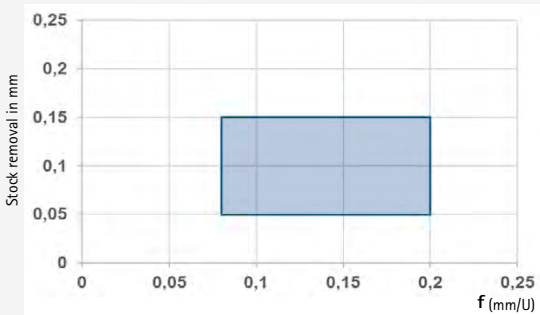
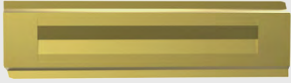
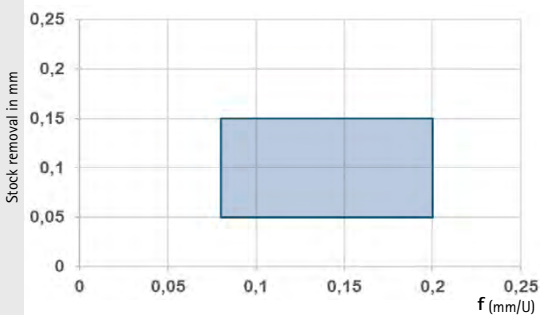
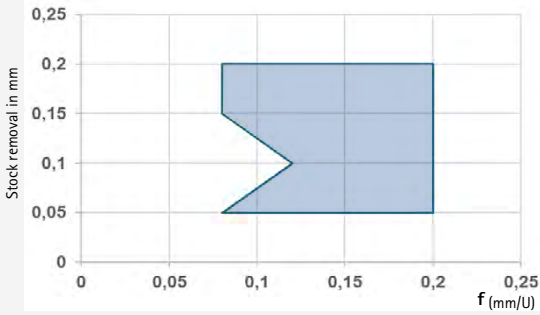
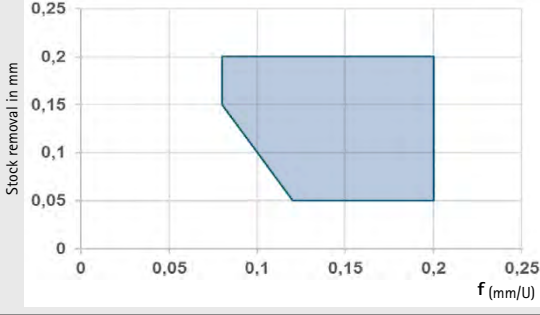
Cutting data recommendations

Indexable inserts with DZ lead

Chip breaker geometry P06 – CP410

Application:

Thanks to the increased cutting speed, more economical results can be achieved using the cermet versions of the DZ lead.

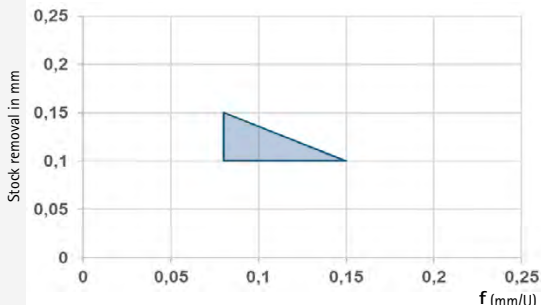
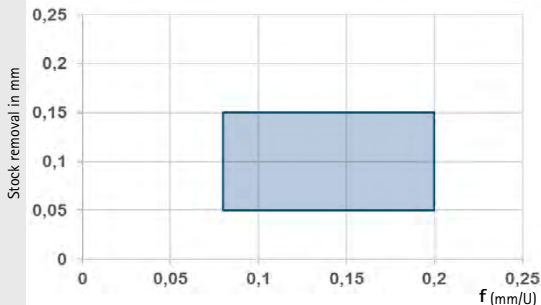
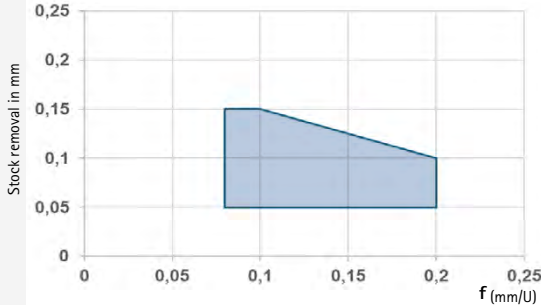
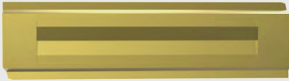
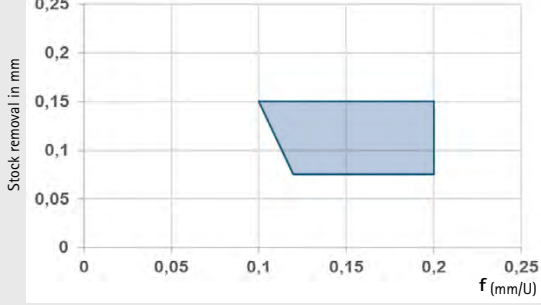
Specification Order no.	MAPAL machining groups	Cutting speed vc (m/min)	Feed f (mm/rev) depending on stock removal
DZ90R-P06-CP410 31603709 	P 1 – 2	160 – 200	
DZ91R-P06-CP410 31603740 	P 1 – 2	160 – 200	
DZ92R-P06-CP410 31603708 	P 1 – 2	160 – 200	
DZ93R-P06-CP410 31607503 	P 1 – 2	160 – 200	

Cutting data recommendations

Indexable inserts with AS lead
Chip breaker geometry P06 – HP016

Application:

For applications involving stainless workpiece materials, the cutting edge with an AS lead and the HP016 combination of cutting materials is available.

Specification Order no.	MAPAL machining groups	Cutting speed v_c (m/min)	Feed f (mm/rev) depending on stock removal
AS90R-P06-HP016 31542082 	M 1	60	
AS91R-P06-HP016 31542084 	M 1	60	
AS92R-P06-HP016 31418068 	M 1	60	
AS93R-P06-HP016 31241364 	M 1	60	

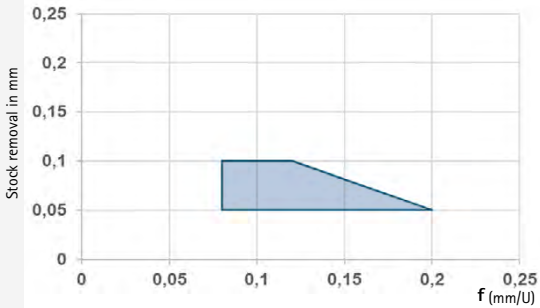
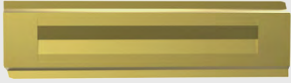
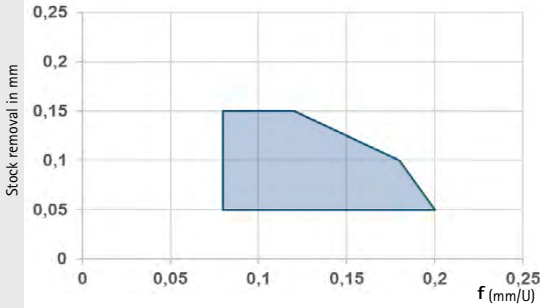
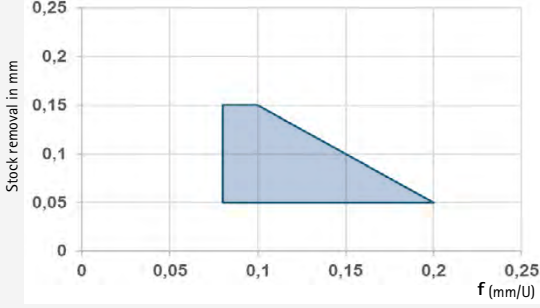
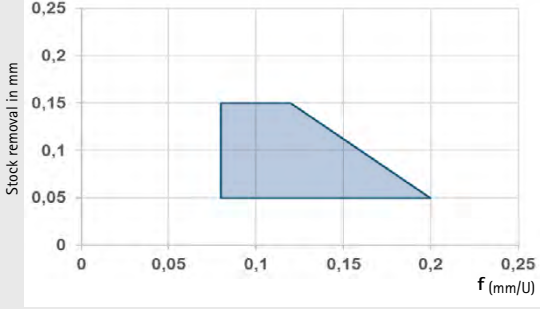
Cutting data recommendations

Indexable inserts with DZ lead

Chip breaker geometry P06 – HP016

Application:

In order to reduce radial forces, we recommend using our DZ lead with HP016 when working on stainless steels.

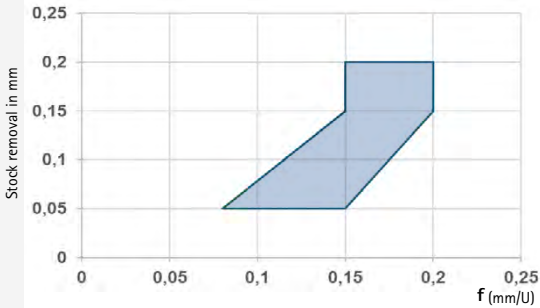
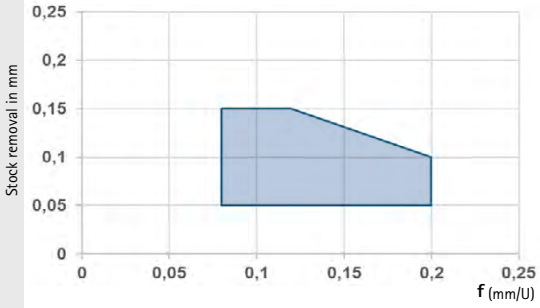
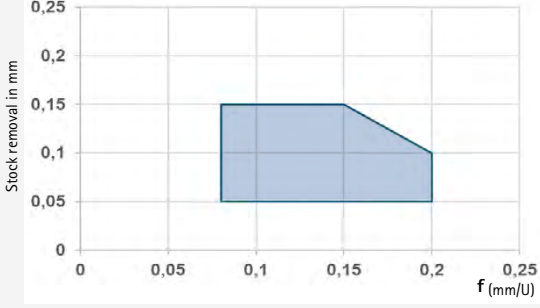
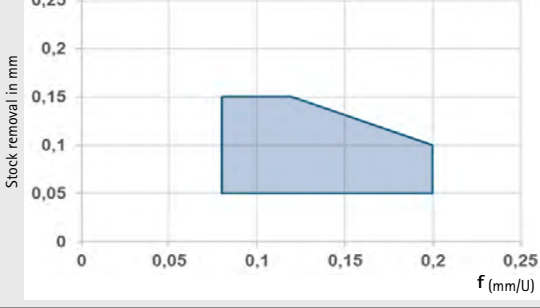
Specification Order no.	MAPAL machining groups	Cutting speed vc (m/min)	Feed f (mm/rev) depending on stock removal
DZ90R-P06-HP016 31542083 	M 1	60	
DZ91R-P06-HP016 31542085 	M 1	60	
DZ92R-P06-HP016 31393050 	M 1	60	
DZ93R-P06-HP016 31438298 	M 1	60	

Cutting data recommendations

TEC indexable inserts
Chip breaker geometry P06 - HP026

Application:

To use the TEC insert economically, the following selection of lead geometries is available for internal and external machining. It is not possible to have a plan section.

Specification Order no.	MAPAL machining groups	Cutting speed vc (m/min)	Feed f (mm/rev) depending on stock removal
TEC2-04F01R-2P06-HP026 31607225 TEC2-04F01L-2P06-HP026 31607247 	P 1 - 2	80 - 120	
TEC2-ASF01R-2P06-HP026 31607228 TEC2-ASF01L-2P06-HP026 31607250 	P 1 - 2	80 - 120	
TEC2-DZF01R-2P06-HP026 31607244 TEC2-DZF01L-2P06-HP026 31607256 	P 1 - 2	80 - 120	
TEC2-EKF01R-2P06-HP026 31607241 TEC2-EKF01L-2P06-HP026 31607253 	P 1 - 2	80 - 120	

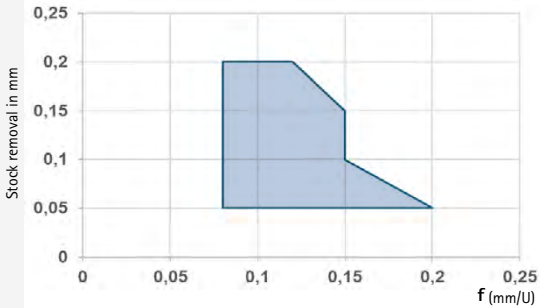
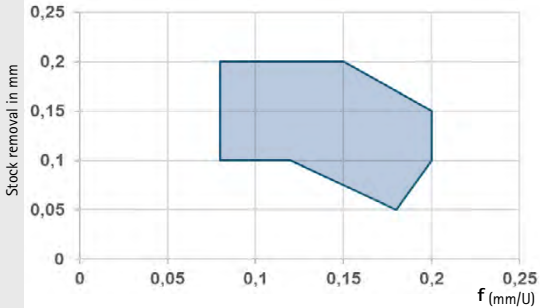
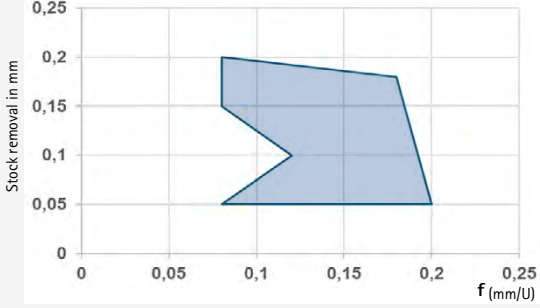
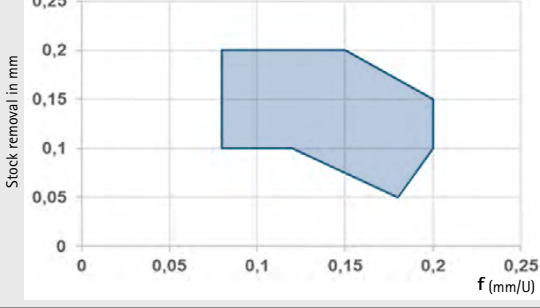
Cutting data recommendations

TEC indexable inserts

Chip breaker geometry P06 – CP410

Application:

TEC inserts in the CP410 design significantly increase the cutting speed, which reduces the cycle time.

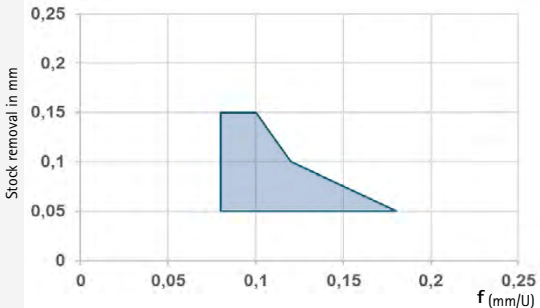
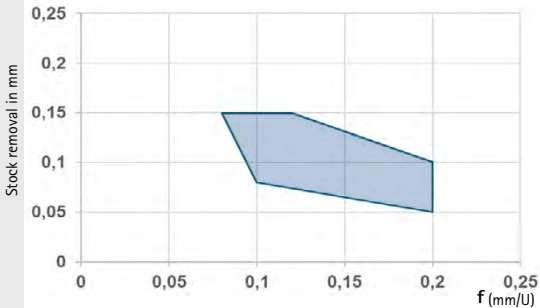
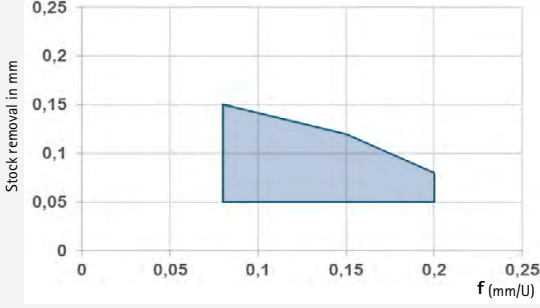
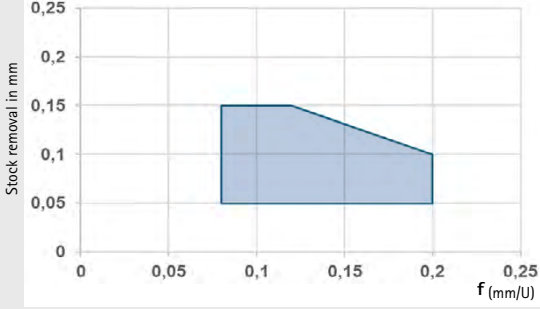
Specification Order no.	MAPAL machining groups	Cutting speed vc (m/min)	Feed f (mm/rev) depending on stock removal
TEC2-04F01R-2P06-CP410 31607226 TEC2-04F01L-2P06-CP410 31607248 	P 1 – 2	160 – 200	
TEC2-ASF01R-2P06-CP410 31607229 TEC2-ASF01L-2P06-CP410 31607251 	P 1 – 2	160 – 200	
TEC2-DZF01R-2P06-CP410 31607245 TEC2-DZF01L-2P06-CP410 31607257 	P 1 – 2	160 – 200	
TEC2-EKF01R-2P06-CP410 31607242 TEC2-EKF01L-2P06-CP410 31607254 	P 1 – 2	160 – 200	

Cutting data recommendations

TEC indexable inserts
Chip breaker geometry P06 – HP016

Application:

For use in stainless steels, the following insert variants at HP016 quality are available.

Specification Order no.	MAPAL machining groups	Cutting speed vc (m/min)	Feed f (mm/rev) depending on stock removal
TEC2-04F01R-2P06-HP016 31429210 TEC2-04F01L-2P06-HP016 31607246 	M 1	60	
TEC2-ASF01R-2P06-HP016 31607227 TEC2-ASF01L-2P06-HP016 31607249 	M 1	60	
TEC2-DZF01R-2P06-HP016 31607243 TEC2-DZF01L-2P06-HP016 31607255 	M 1	60	
TEC2-EKF01R-2P06-HP016 31607240 TEC2-EKF01L-2P06-HP016 31607252 	M 1	60	

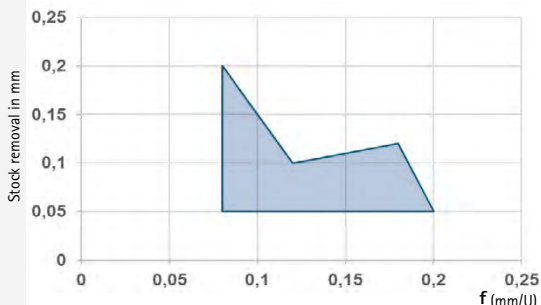
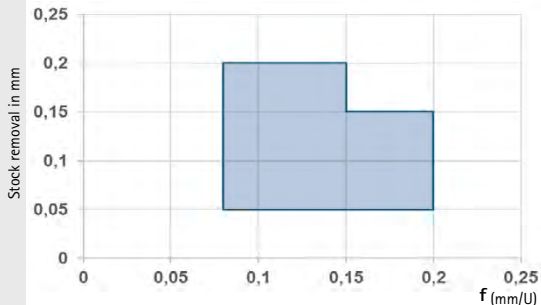
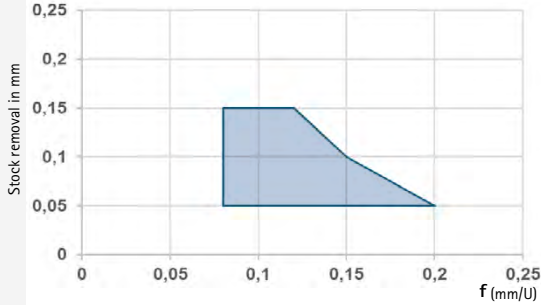
Cutting data recommendations

HX indexable insert with R0.4

Chip breaker geometry P06 – HP026 / CP410 / HP018

Application:

To achieve powerful and economical machining, proven HX inserts with six cutting edges are available.

Specification Order no.	MAPAL machining groups	Cutting speed vc (m/min)	Feed f (mm/rev) depending on stock removal
607641119-P06-HP026 31607220 	P 1 – 2	80 – 120	
607641119-P06-CP410 31607221 	P 1 – 2	160 – 200	
607641119-P06-HP018 31607222 	M 1	60	

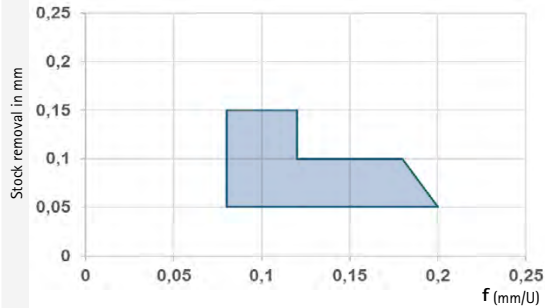
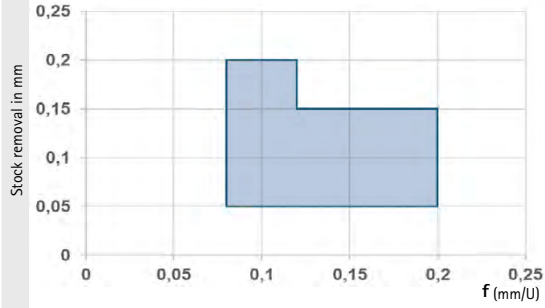
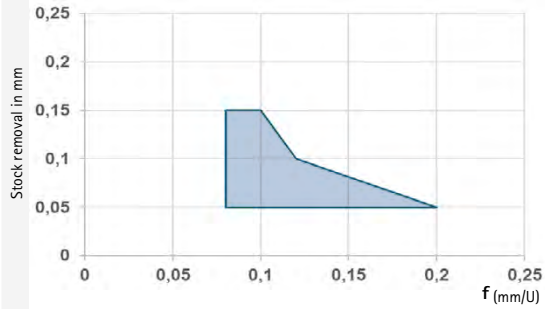
Cutting data recommendations

HX indexable insert with R0.8

Chip breaker geometry P06 – HP026 / CP410 / HP018

Application:

Radius lead R0.8 for higher surface requirements <Rz 6.3 compared to radius R0.4.

Specification Order no.	MAPAL machining groups	Cutting speed vc (m/min)	Feed f (mm/rev) depending on stock removal
607641114-P06-HP026 31607223 	P 1 - 2	80 - 120	
607641114-P06-CP410 31607224 	P 1 - 2	160 - 200	
607641114-P06-HP018 31439018 	M 1	60	

OptiMill®-Uni-HPC

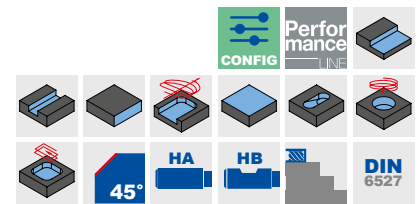
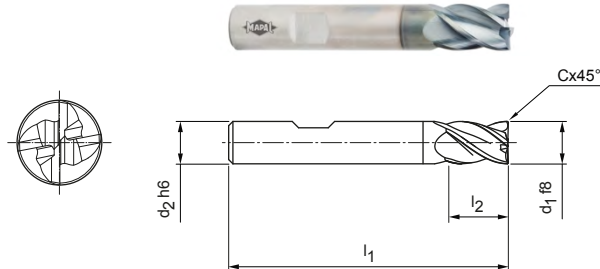
Shoulder milling cutter, short design
SCM763, 3. Generation

Design:

Diameter of milling cutter: 3.00 – 20.00 mm
Cutting material: HP830
Number of cutting edges: 4
Helix angle: 36°/38°
Special features: Unequal spacing

Application:

For maximum process reliability, dynamic loads and automated processes.



Preferred series available from stock

Dimensions					z	Specification	Order no.
d ₁ f8	d ₂ h6	l ₁	l ₂	Cx45°			
3,00	6	50	6	0,06	4	SCM763-0300Z04R-F0006HB-HP830	31578668
4,00	6	54	8	0,08	4	SCM763-0400Z04R-F0008HB-HP830	31578669
5,00	6	54	9	0,10	4	SCM763-0500Z04R-F0010HB-HP830	31578760
6,00	6	54	10	0,12	4	SCM763-0600Z04R-F0012HB-HP830	31578761
8,00	8	58	12	0,16	4	SCM763-0800Z04R-F0016HB-HP830	31578762
10,00	10	66	14	0,20	4	SCM763-1000Z04R-F0020HB-HP830	31578763
12,00	12	73	16	0,24	4	SCM763-1200Z04R-F0024HB-HP830	31578764
16,00	16	82	22	0,32	4	SCM763-1600Z04R-F0032HB-HP830	31578766
20,00	20	92	26	0,40	4	SCM763-2000Z04R-F0040HB-HP830	31578768

Available on request

14,00	14	73	16	0,28	4	SCM763-1400Z04R-F0028HB-HP830	31578765
18,00	18	82	22	0,36	4	SCM763-1800Z04R-F0036HB-HP830	31578767

Configurable features



Shank form:
Shank form: HA



Cutting edge design:
- Sharp cutting edge
- Cx45°: 0.5% min. to 7.5% max. from d₁
- Radius R: 1.0% min. to 37.5% max. from d₁

Specification:

SCM763-1200Z04R-[cutting edge design][shank form]-HP830

Example:

SCM763-1200Z04R-R0024HA-HP830



Dimensions in mm.

For cutting data recommendations, see pages 22/23.

Special designs and other coatings available upon request.

OptiMill®-Uni-HPC

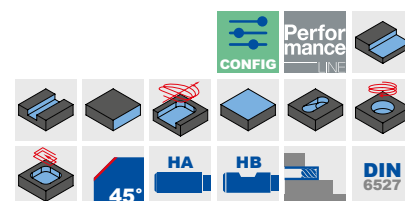
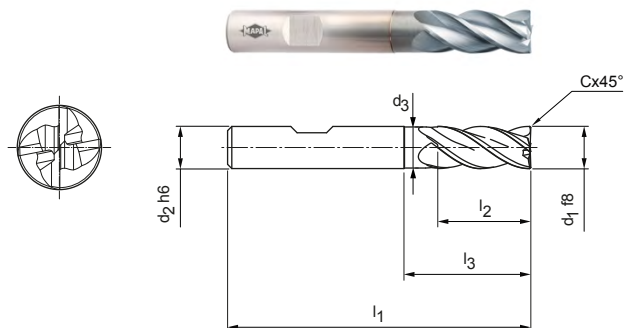
Shoulder milling cutter, long design with neck
SCM773, 3rd Generation

Design:

Diameter of milling cutter: 3.00 – 25.00 mm
Cutting material: HP830
Number of cutting edges: 4
Helix angle: 36°/37°
Special features: Unequal spacing

Application:

For maximum process reliability, dynamic loads and automated processes.



Preferred series available from stock

Dimensions							z	Specification	Order no.
d1 f8	d2 h6	d3	l1	l2	l3	Cx45°			
3,00	6	2,8	57	8	11	0,06	4	SCM773-0300Z04R-F0006HB-HP830	31578775
4,00	6	3,8	57	11	13	0,08	4	SCM773-0400Z04R-F0008HB-HP830	31578776
5,00	6	4,8	57	13	15,5	0,10	4	SCM773-0500Z04R-F0010HB-HP830	31578769
6,00	6	5,8	57	13	20	0,12	4	SCM773-0600Z04R-F0012HB-HP830	31578770
8,00	8	7,8	63	21	25	0,16	4	SCM773-0800Z04R-F0016HB-HP830	31578771
10,00	10	9,8	72	22	30	0,20	4	SCM773-1000Z04R-F0020HB-HP830	31578772
12,00	12	11,8	83	26	36	0,24	4	SCM773-1200Z04R-F0024HB-HP830	31578773
14,00	14	13,8	83	26	36	0,28	4	SCM773-1400Z04R-F0028HB-HP830	31578774
16,00	16	15,8	92	36	42	0,32	4	SCM773-1600Z04R-F0032HB-HP830	31578777
20,00	20	19,8	104	41	55	0,40	4	SCM773-2000Z04R-F0040HB-HP830	31578779
25,00	25	24,5	136	68	80	0,50	4	SCM773-2500Z04R-F0050HB-HP830	31578780

Available on request

18,00	18	17,8	92	36	47	0,36	4	SCM773-1800Z04R-F0036HB-HP830	31578778
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Preferred series available from stock | Design with chip breaker

6,00	6	5,8	57	13	20	0,12	4	SCM773-0600Z04R-F0012HB-HP830	31578781
8,00	8	7,8	63	21	25	0,16	4	SCM773-0800Z04R-F0016HB-HP830	31578782
10,00	10	9,8	72	22	30	0,20	4	SCM773-1000Z04R-F0020HB-HP830	31578783
12,00	12	11,8	83	26	36	0,24	4	SCM773-1200Z04R-F0024HB-HP830	31578784
16,00	16	15,8	92	36	42	0,32	4	SCM773-1600Z04R-F0032HB-HP830	31578785
20,00	20	19,8	104	41	55	0,40	4	SCM773-2000Z04R-F0040HB-HP830	31578786
25,00	25	24,5	136	68	80	0,50	4	SCM773-2500Z04R-F0050HB-HP830	31578787

Configurable features



Shank form:
Shank form: HA



Cutting edge design:
- Sharp cutting edge
- Cx45°: 0.5% min. to 7.5% max. from d1
- Radius R: 1.0% min. to 37.5% max. from d1

Specification:

SCM773-1200Z04R-[cutting edge design][shank form]-HP830

Example:

SCM773-1200Z04R-R0024HA-HP830



Dimensions in mm.

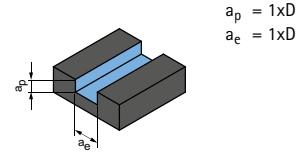
For cutting data recommendations, see pages 24/25.

Special designs and other coatings available upon request.

Cutting data recommendations for shoulder milling cutters

Feed and cutting speed

Groove milling

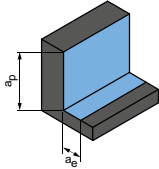
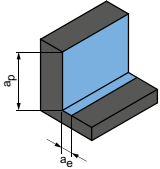
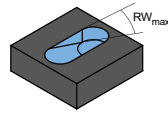
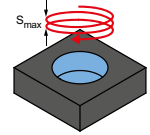


OptiMill-Uni-HPC | SCM763

MMG*			Workpiece material	Strength/hardness [N/mm ²] [HRC]	Cooling			v _c [m/min]	f _z [mm]								
					MQL/Air	Dry	KSS		Diameter of milling cutter [mm]								
									3.00	4.00	6.00	8.00	10.00	12.00	16.00	20.00	
P	P1	P1.1	Structural, machining, case hardened and tempering steels, unalloyed	< 700	✓	✓	✓	200	0.019	0.025	0.036	0.046	0.055	0.064	0.078	0.089	
		P1.2	Structural, machining, case hardened and tempering steels, unalloyed	< 1,200	✓	✓	✓	165	0.018	0.024	0.034	0.043	0.052	0.059	0.073	0.083	
	P2	P2.1	Nitriding, hardening and tempering steels, alloyed	< 900	✓	✓	✓	180	0.019	0.025	0.036	0.046	0.055	0.064	0.078	0.089	
		P2.2	Nitriding, hardening and tempering steels, alloyed	< 1,400	✓		✓	125	0.016	0.021	0.030	0.039	0.046	0.053	0.065	0.074	
	P3	P3.1	Tool, bearing, spring and high-speed steels**	< 800	✓	✓	✓	120	0.019	0.024	0.035	0.045	0.054	0.062	0.075	0.086	
		P3.2	Tool, bearing, spring and high-speed steels**	< 1,000	✓		✓	110	0.018	0.023	0.033	0.042	0.051	0.058	0.071	0.081	
		P3.3	Tool, bearing, spring and high-speed steels**	< 1,500	✓		✓	100	0.017	0.022	0.031	0.040	0.048	0.055	0.067	0.077	
	P4	P4.1	Stainless steels, ferritic and martensitic		✓		✓	80	0.013	0.017	0.024	0.031	0.037	0.042	0.052	0.059	
	P5	P5.1	Cast steel				✓	120	0.019	0.024	0.035	0.045	0.054	0.062	0.075	0.086	
P6	P6.1	Stainless cast steels, ferritic and martensitic				✓	80	0.009	0.012	0.017	0.022	0.026	0.030	0.036	0.041		
M	M1	M1.1	Stainless steels, austenitic	< 700	✓		✓	55	0.011	0.014	0.020	0.026	0.031	0.036	0.043	0.050	
		M1.2	Stainless steels, ferritic/austenitic (duplex)	< 1,000			✓	50	0.009	0.012	0.017	0.021	0.026	0.029	0.036	0.041	
	M2	M2.1	Stainless cast steel, austenitic	< 700	✓		✓	60	0.012	0.015	0.022	0.028	0.034	0.039	0.047	0.054	
	M3	M3.1	Stainless cast steel, ferritic/austenitic (duplex)	< 1,000			✓	55	0.009	0.012	0.017	0.022	0.027	0.031	0.037	0.043	
K	K1	K1.1	Cast iron with lamellar graphite (grey cast iron), GJL	< 300	✓	✓	✓	215	0.031	0.040	0.058	0.074	0.088	0.102	0.124	0.142	
		K2.1	Cast iron with spheroidal graphite, GJS	< 500	✓	✓	✓	200	0.026	0.034	0.049	0.063	0.075	0.086	0.106	0.121	
	K2	K2.2	Cast iron with spheroidal graphite, GJS	≤ 800	✓	✓	✓	160	0.022	0.028	0.040	0.052	0.062	0.071	0.087	0.099	
		K2.3	Cast iron with spheroidal graphite, GJS	> 800	✓	✓	✓	90	0.012	0.016	0.023	0.030	0.035	0.041	0.050	0.057	
	K3	K3.1	Cast iron with vermicular graphite, GJV; malleable cast iron, GJM	< 500	✓	✓	✓	145	0.022	0.028	0.040	0.052	0.062	0.071	0.087	0.099	
		K3.2	Cast iron with vermicular graphite, GJV; malleable cast iron, GJM	> 500	✓	✓	✓	135	0.019	0.024	0.035	0.044	0.053	0.061	0.075	0.085	
H	H1	H1.1	Hardened steel/cast steel	< 44	✓	✓	✓	100	0.016	0.021	0.030	0.038	0.046	0.053	0.065	0.057	
		H1.2	Hardened steel/cast steel	< 55	✓	✓	✓										

* MAPAL machining groups

** If the alloy parts Cr, Mo, Ni, V, W in total > 8%, then select the next highest MAPAL machining group.

Roughing										Finishing															
 $a_p = 1,5xD$ $a_e = 0,25xD$										 $a_p = 1xD$ $a_e = 0,1xD$															
	v_c [m/min]	f_z [mm]								v_c [m/min]	f_z [mm]								Ramps		Helix milling				
		Diameter of milling cutter [mm]									Diameter of milling cutter [mm]								RW _{max} .	G=1.5		G=1.8			
		3.00	4.00	6.00	8.00	10.00	12.00	16.00	20.00		3.00	4.00	6.00	8.00	10.00	12.00	16.00	20.00		S _{max} .	EW _{max} .	S _{max} .	EW _{max} .		
	355	0.026	0.034	0.049	0.063	0.075	0.086	0.106	0.121	480	0.032	0.042	0.060	0.077	0.092	0.106	0.129	0.148	10°		0.5xD	20°	1.5xD	30°	
	290	0.024	0.032	0.046	0.059	0.070	0.081	0.099	0.113	395	0.030	0.039	0.056	0.072	0.086	0.099	0.121	0.138	6°		0.4xD	15°	1.25xD	25°	
	325	0.026	0.034	0.049	0.063	0.075	0.086	0.106	0.121	435	0.032	0.042	0.060	0.077	0.092	0.106	0.129	0.148	8°		0.5xD	20°	1.5xD	30°	
	225	0.022	0.029	0.041	0.052	0.063	0.072	0.088	0.101	305	0.027	0.035	0.050	0.064	0.077	0.088	0.108	0.123	6°		0.25xD	10°	1.5xD	30°	
	210	0.025	0.033	0.048	0.061	0.073	0.084	0.102	0.117	285	0.031	0.040	0.058	0.074	0.089	0.102	0.125	0.143	6°		0.5xD	20°	1.5xD	30°	
	195	0.024	0.031	0.045	0.058	0.069	0.079	0.097	0.111	260	0.029	0.038	0.055	0.071	0.084	0.097	0.119	0.136	4°		0.5xD	20°	1.5xD	30°	
	180	0.023	0.030	0.043	0.054	0.065	0.075	0.092	0.105	240	0.028	0.036	0.052	0.067	0.080	0.092	0.112	0.128	2°		0.25xD	10°	0.75xD	20°	
	145	0.017	0.023	0.033	0.042	0.050	0.058	0.070	0.081	195	0.021	0.028	0.040	0.051	0.061	0.071	0.086	0.099	2°		0.03xD	1°	0.06xD	1.5°	
	215	0.025	0.033	0.048	0.061	0.073	0.084	0.102	0.117	295	0.031	0.040	0.058	0.074	0.089	0.102	0.125	0.143	4°		0.25xD	10°	0.75xD	20°	
	145	0.012	0.016	0.023	0.029	0.035	0.040	0.049	0.056	195	0.015	0.020	0.028	0.036	0.043	0.049	0.060	0.069	2°		0.03xD	1°	0.06xD	1.5°	
	110	0.022	0.028	0.040	0.052	0.062	0.071	0.087	0.099	160	0.034	0.045	0.064	0.082	0.098	0.113	0.137	0.157	2°		0.03xD	1°	0.06xD	1.5°	
	105	0.018	0.023	0.034	0.043	0.051	0.059	0.072	0.082	150	0.028	0.037	0.053	0.068	0.081	0.093	0.114	0.130	2°		0.03xD	1°	0.06xD	1.5°	
	120	0.023	0.031	0.044	0.056	0.067	0.077	0.094	0.108	180	0.037	0.048	0.069	0.089	0.106	0.122	0.149	0.171	2°		0.03xD	1°	0.06xD	1.5°	
	110	0.019	0.024	0.035	0.044	0.053	0.061	0.075	0.085	160	0.029	0.038	0.055	0.070	0.084	0.096	0.118	0.135	2°		0.03xD	1°	0.06xD	1.5°	
	440	0.062	0.080	0.116	0.148	0.177	0.203	0.248	0.284	650	0.098	0.127	0.183	0.234	0.280	0.322	0.393	0.449	15°		0.8xD	30°	2xD	40°	
	405	0.052	0.068	0.098	0.126	0.150	0.173	0.211	0.241	595	0.083	0.108	0.155	0.199	0.238	0.273	0.334	0.382	15°		0.8xD	30°	2xD	40°	
	330	0.043	0.056	0.081	0.103	0.124	0.142	0.174	0.199	485	0.068	0.089	0.128	0.164	0.196	0.225	0.275	0.314	10°		0.5xD	20°	1.5xD	30°	
	185	0.025	0.032	0.046	0.059	0.071	0.081	0.099	0.114	270	0.039	0.051	0.073	0.093	0.112	0.129	0.157	0.180	8°		0.25xD	8°	0.7xD	15°	
	295	0.043	0.056	0.081	0.103	0.124	0.142	0.174	0.199	430	0.068	0.089	0.128	0.164	0.196	0.225	0.275	0.314	10°		0.4xD	15°	0.75xD	20°	
	275	0.037	0.048	0.069	0.089	0.106	0.122	0.149	0.170	405	0.059	0.076	0.110	0.140	0.168	0.193	0.236	0.269	10°		0.4xD	15°	0.75xD	20°	
	200	0.025	0.032	0.046	0.059	0.071	0.081	0.099	0.114	295	0.051	0.066	0.095	0.121	0.145	0.167	0.204	0.234	6°		0.25xD	10°	1.5xD	30°	

Explanation of terms:RW_{max} = maximum angle of the rampS_{max} = maximum slope of the helixG = Ratio of circular pocket ϕ when plunging into the tool ϕ E.g.: Tool ϕ 12 mm at G=1.5 results in a pocket ϕ of 18 mmEW_{max} = slope angle of the helix (results from G and S_{max})

The specified machining values are guide values.

The optimum data for the respective machining task should be determined during the test or machining.

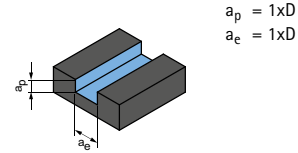
Bold text: highly suitable

Normal text: Suitable in some situations

Cutting data recommendations for shoulder milling cutters

Feed and cutting speed

Groove milling

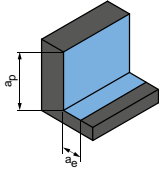
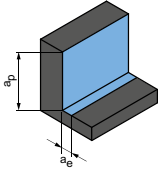
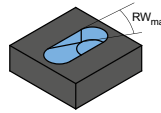
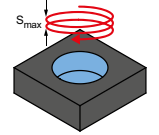


OptiMill-Uni-HPC | SCM773

MMG*			Workpiece material	Strength/hardness [N/mm ²] [HRC]	Cooling			v _c [m/min]	f _z [mm]								
					MQL/Air	Dry	KSS		Diameter of milling cutter [mm]								
									3.00	4.00	6.00	8.00	10.00	12.00	16.00	20.00	
P	P1	P1.1	Structural, machining, case hardened and tempering steels, unalloyed	< 700	✓	✓	✓	200	0.019	0.025	0.036	0.046	0.055	0.064	0.078	0.089	
		P1.2	Structural, machining, case hardened and tempering steels, unalloyed	< 1,200	✓	✓	✓	165	0.018	0.024	0.034	0.043	0.052	0.059	0.073	0.083	
	P2	P2.1	Nitriding, hardening and tempering steels, alloyed	< 900	✓	✓	✓	180	0.019	0.025	0.036	0.046	0.055	0.064	0.078	0.089	
		P2.2	Nitriding, hardening and tempering steels, alloyed	< 1,400	✓		✓	125	0.016	0.021	0.030	0.039	0.046	0.053	0.065	0.074	
	P3	P3.1	Tool, bearing, spring and high-speed steels**	< 800	✓	✓	✓	120	0.019	0.024	0.035	0.045	0.054	0.062	0.075	0.086	
		P3.2	Tool, bearing, spring and high-speed steels**	< 1,000	✓		✓	110	0.018	0.023	0.033	0.042	0.051	0.058	0.071	0.081	
		P3.3	Tool, bearing, spring and high-speed steels**	< 1,500	✓		✓	100	0.017	0.022	0.031	0.040	0.048	0.055	0.067	0.077	
	P4	P4.1	Stainless steels, ferritic and martensitic		✓		✓	80	0.013	0.017	0.024	0.031	0.037	0.042	0.052	0.059	
	P5	P5.1	Cast steel				✓	120	0.019	0.024	0.035	0.045	0.054	0.062	0.075	0.086	
P6	P6.1	Stainless cast steels, ferritic and martensitic				✓	80	0.009	0.012	0.017	0.022	0.026	0.030	0.036	0.041		
M	M1	M1.1	Stainless steels, austenitic	< 700	✓		✓	55	0.011	0.014	0.020	0.026	0.031	0.036	0.043	0.050	
		M1.2	Stainless steels, ferritic/austenitic (duplex)	< 1,000			✓	50	0.009	0.012	0.017	0.021	0.026	0.029	0.036	0.041	
	M2	M2.1	Stainless cast steel, austenitic	< 700	✓		✓	60	0.012	0.015	0.022	0.028	0.034	0.039	0.047	0.054	
	M3	M3.1	Stainless cast steel, ferritic/austenitic (duplex)	< 1,000			✓	55	0.009	0.012	0.017	0.022	0.027	0.031	0.037	0.043	
K	K1	K1.1	Cast iron with lamellar graphite (grey cast iron), GJL	< 300	✓	✓	✓	215	0.031	0.040	0.058	0.074	0.088	0.102	0.124	0.142	
		K2.1	Cast iron with spheroidal graphite, GJS	< 500	✓	✓	✓	200	0.026	0.034	0.049	0.063	0.075	0.086	0.106	0.121	
	K2	K2.2	Cast iron with spheroidal graphite, GJS	≤ 800	✓	✓	✓	160	0.022	0.028	0.040	0.052	0.062	0.071	0.087	0.099	
		K2.3	Cast iron with spheroidal graphite, GJS	> 800	✓	✓	✓	90	0.012	0.016	0.023	0.030	0.035	0.041	0.050	0.057	
	K3	K3.1	Cast iron with vermicular graphite, GJV; malleable cast iron, GJM	< 500	✓	✓	✓	145	0.022	0.028	0.040	0.052	0.062	0.071	0.087	0.099	
		K3.2	Cast iron with vermicular graphite, GJV; malleable cast iron, GJM	> 500	✓	✓	✓	135	0.019	0.024	0.035	0.044	0.053	0.061	0.075	0.085	
H	H1	H1.1	Hardened steel/cast steel	< 44	✓	✓	✓	100	0.016	0.021	0.030	0.038	0.046	0.053	0.065	0.057	
		H1.2	Hardened steel/cast steel	< 55	✓	✓	✓										

* MAPAL machining groups

** If the alloy parts Cr, Mo, Ni, V, W in total > 8%, then select the next highest MAPAL machining group.

	Roughing $a_p = 1,5 \times D$ $a_e = 0,25 \times D$									Finishing $a_p = 1 \times D$ $a_e = 0,1 \times D$													
	v_c [m/min]	f_z [mm]								v_c [m/min]	f_z [mm]								Ramps	Helix milling			
		Diameter of milling cutter [mm]									Diameter of milling cutter [mm]								RW _{max} .	G=1.5		G=1.8	
		3.00	4.00	6.00	8.00	10.00	12.00	16.00	20.00		3.00	4.00	6.00	8.00	10.00	12.00	16.00	20.00		S _{max} .	EW _{max} .	S _{max} .	EW _{max} .
	355	0.026	0.034	0.049	0.063	0.075	0.086	0.106	0.121	480	0.032	0.042	0.060	0.077	0.092	0.106	0.129	0.148	10°	0.5xD	20°	1.5xD	30°
	290	0.024	0.032	0.046	0.059	0.070	0.081	0.099	0.113	395	0.030	0.039	0.056	0.072	0.086	0.099	0.121	0.138	6°	0.4xD	15°	1.25xD	25°
	325	0.026	0.034	0.049	0.063	0.075	0.086	0.106	0.121	435	0.032	0.042	0.060	0.077	0.092	0.106	0.129	0.148	8°	0.5xD	20°	1.5xD	30°
	225	0.022	0.029	0.041	0.052	0.063	0.072	0.088	0.101	305	0.027	0.035	0.050	0.064	0.077	0.088	0.108	0.123	6°	0.25xD	10°	1.5xD	30°
	210	0.025	0.033	0.048	0.061	0.073	0.084	0.102	0.117	285	0.031	0.040	0.058	0.074	0.089	0.102	0.125	0.143	6°	0.5xD	20°	1.5xD	30°
	195	0.024	0.031	0.045	0.058	0.069	0.079	0.097	0.111	260	0.029	0.038	0.055	0.071	0.084	0.097	0.119	0.136	4°	0.5xD	20°	1.5xD	30°
	180	0.023	0.030	0.043	0.054	0.065	0.075	0.092	0.105	240	0.028	0.036	0.052	0.067	0.080	0.092	0.112	0.128	2°	0.25xD	10°	0.75xD	20°
	145	0.017	0.023	0.033	0.042	0.050	0.058	0.070	0.081	195	0.021	0.028	0.040	0.051	0.061	0.071	0.086	0.099	2°	0.03xD	1°	0.06xD	1.5°
	215	0.025	0.033	0.048	0.061	0.073	0.084	0.102	0.117	295	0.031	0.040	0.058	0.074	0.089	0.102	0.125	0.143	4°	0.25xD	10°	0.75xD	20°
145	0.012	0.016	0.023	0.029	0.035	0.040	0.049	0.056	195	0.015	0.020	0.028	0.036	0.043	0.049	0.060	0.069	2°	0.03xD	1°	0.06xD	1.5°	
	110	0.018	0.024	0.034	0.044	0.053	0.060	0.074	0.084	160	0.029	0.038	0.054	0.069	0.083	0.095	0.117	0.133	2°	0.03xD	1°	0.06xD	1.5°
	105	0.015	0.020	0.028	0.036	0.044	0.050	0.061	0.070	150	0.024	0.031	0.045	0.057	0.069	0.079	0.097	0.110	2°	0.03xD	1°	0.06xD	1.5°
	120	0.020	0.026	0.037	0.048	0.057	0.066	0.080	0.092	180	0.031	0.041	0.059	0.075	0.090	0.104	0.127	0.145	2°	0.03xD	1°	0.06xD	1.5°
	110	0.016	0.020	0.029	0.038	0.045	0.052	0.063	0.072	160	0.025	0.032	0.047	0.059	0.071	0.082	0.100	0.114	2°	0.03xD	1°	0.06xD	1.5°
	440	0.052	0.068	0.098	0.125	0.150	0.172	0.211	0.241	650	0.083	0.108	0.155	0.198	0.237	0.273	0.333	0.381	15°	0.8xD	30°	2xD	40°
	405	0.044	0.058	0.083	0.106	0.128	0.147	0.179	0.205	595	0.070	0.092	0.132	0.168	0.202	0.232	0.283	0.324	15°	0.8xD	30°	2xD	40°
	330	0.037	0.048	0.069	0.088	0.105	0.121	0.147	0.169	485	0.058	0.076	0.109	0.139	0.166	0.191	0.233	0.267	10°	0.5xD	20°	1.5xD	30°
	185	0.021	0.027	0.039	0.050	0.060	0.069	0.084	0.096	270	0.033	0.043	0.062	0.079	0.095	0.109	0.133	0.152	8°	0.25xD	8°	0.7xD	15°
	295	0.037	0.048	0.069	0.088	0.105	0.121	0.147	0.169	430	0.058	0.076	0.109	0.139	0.166	0.191	0.233	0.267	10°	0.4xD	15°	0.75xD	20°
	275	0.031	0.041	0.059	0.075	0.090	0.103	0.126	0.145	405	0.050	0.065	0.093	0.119	0.142	0.164	0.200	0.228	10°	0.4xD	15°	0.75xD	20°
	200	0.021	0.027	0.039	0.050	0.060	0.069	0.084	0.096	295	0.043	0.056	0.081	0.103	0.123	0.142	0.173	0.198	6°	0.25xD	10°	1.5xD	30°

Explanation of terms:RW_{max} = maximum angle of the rampS_{max} = maximum slope of the helixG = Ratio of circular pocket ϕ when plunging into the tool ϕ E.g.: Tool ϕ 12 mm at G=1.5 results in a pocket ϕ of 18 mmEW_{max} = slope angle of the helix (results from G and S_{max})

The specified machining values are guide values.

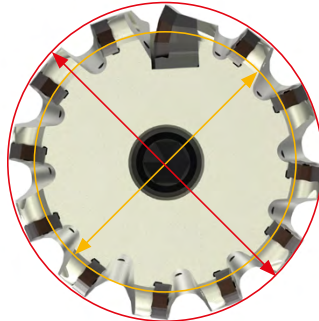
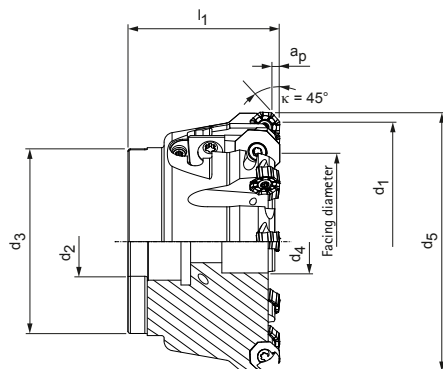
The optimum data for the respective machining task should be determined during the test or machining.

Bold text: highly suitable

Normal text: Suitable in some situations

NeoMill®-16-Finish

45° face milling cutter, with radial technology
ONMU05 / OFGW07



Design:

Diameter of milling cutter: 63.00 – 200.00 mm

Cutting material: Carbide: PVD- and CVD-coated

Number of cutting edges: 6+1 – 18+2

Special features: Internal coolant supply

Application:

High demands in terms of surface finish and dimensional accuracy when finishing steel and cast. Longer useful life of the tool. Double utilisation of cutting edge.

— Max. diameter [d₅]

— Effective facing diameter



Dimensions						Facing diameter	Z _{eff}	a _p max.	Weight [kg]	Max. operating speed [rpm]	Internal cooling	Specification	Order no.
d ₁	d ₂	d ₃	d ₄	d ₅	l ₁								
63	22	48	18	70,8	60	53,3	6+1	2	1,0	12.300	✓	IFM451-063-CA22-Z06+1R-ON_OF	31564342
80	32	78	26	87,8	60	70,3	8+1	2	1,8	10.600	✓	IFM451-080-CA32-Z08+1R-ON_OF	31564343
100	32	78	26	107,8	63	90,3	11+1	2	2,7	9.300	✓	IFM451-100-CA32-Z11+1R-ON_OF	31564344
125	40	89	33	132,8	63	115,3	12+2	2	4,1	8.100	✓	IFM451-125-CA40-Z12+2R-ON_OF	31564345
160	40	89	-	167,8	63	150,3	16+2	2	6,1	7.000	✓	IFM451-160-CA40-Z16+2R-ON_OF	31564346
200	60	140	-	207,8	63	190,3	18+2	2	9,7	6.100	✓	IFM451-200-CA60-Z18+2R-ON_OF	31564347

Accessories

	ONMU05	Indexable inserts	Page 28
	OFGW07	Indexable inserts	Page 28
	MCA-...	Milling cutter arbor with decentralised coolant delivery	See EGB p.215

Spare parts*

	ONMU05	Clamping screw for indexable insert (MN659) M4x9,4 – TX15-IP	Order no. 30480629
	OFGW07	Clamping screw for indexable insert (MN659) M5x11 – TX20-IP	Order no. 10105083
		Milling cutter clamping screw for milling cutter ø 63 mm: ø 80 mm: ø 100 mm: ø 125 mm: ø 160 mm: ø 200 mm:	Order no. 10005358 10003691 10003691 10111521 10003679 (4) 10006564 (4)
		Cartridges SoFFR 12 CX-07	Order no. 31113626
		Cartridge clamping screw	Order no. 30606074
		Wedge for length adjustment	Order no. 31071645
		Threaded spindle for length adjustment	Order no. 31041869

Dimensions in mm.

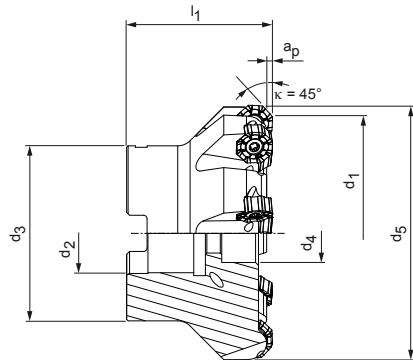
The maximum operating speeds refer only to the cutting edge system.

*Included in scope of delivery.

For cutting data recommendations, see pages 32/33.

NeoMill®-16-Face

45° face milling cutter, with radial technology
ONMU05



Design:

Diameter of milling cutter: 32.00 - 100.00 mm

Cutting material: Carbide: PVD- and CVD-coated

Number of cutting edges: 4 - 12

Special features: Internal coolant supply

Application:

The 16 cutting edges on the indexable insert facilitate low costs per part and stable processes – ideally suited to roughing cast and steel parts with stock removals of up to 2 mm.



Dimensions						Z _{eff}	a _p max.	Weight [kg]	Max. operating speed [rpm]	Internal cooling	Specification	Order no.
d ₁	d ₂	d ₃	d ₄	d ₅	l ₁							
32	16	34	13,5	39,8	40	4	2	0,2	60.700	✓	IFM451-032-CA16-Z04R-ON_U05	31564349
40	16	38	15	47,8	40	5	2	0,3	54.000	✓	IFM451-040-CA16-Z05R-ON_U05	31564350
50	22	48	18	57,8	45	6	2	0,5	48.100	✓	IFM451-050-CA22-Z06R-ON_U05	31564351
63	22	48	18	70,8	50	8	2	0,7	42.700	✓	IFM451-063-CA22-Z08R-ON_U05	31564352
80	27	60	20	87,8	50	9	2	1,2	37.700	✓	IFM451-080-CA27-Z09R-ON_U05	31564353
100	32	78	26	107,8	50	12	2	1,9	33.600	✓	IFM451-100-CA32-Z12R-ON_U05	31564354

Accessories

	ONMU05	Indexable inserts	Page 28
	MCA-...	Milling cutter arbor with decentralised coolant delivery	See EGB p.215

Spare parts*

	ONMU05	Clamping screw for indexable insert (MN659) M4x9,4 - TX15-IP	Order no. 30480629
		Milling cutter clamping screw for milling cutter	Order no.
		ø 32 mm:	10003637
		ø 40 mm:	10003638
		ø 50 mm:	10003660
		ø 63 mm:	10003661
		ø 80 mm:	10003677
		ø 100 mm:	10006565

Dimensions in mm.

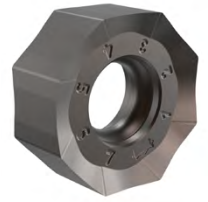
The maximum operating speeds refer only to the cutting edge system.

*Included in scope of delivery.

For cutting data recommendations, see pages 34/35.

ONMU | OFGW

Radial indexable inserts



ONMU05

Radial indexable inserts, 16 cutting edges, right-hand cutting design

Workpiece material	P			K				
	Unalloyed Wear-resistant	Alloyed Ductile		GJL Wear-resistant	GJS Ductile	GJL Wear-resistant	GJS Ductile	
Substrate	Carbide			Carbide				
Coating	PVD		CVD	PVD		CVD		
Cutting material type	HP981	HP986	HC775	HP966	HP976	HC760	HC770	
Cutting edge design	U03	U03	U05	U03	U03	U05	U05	
ONMU05	a _p max. [mm]							
ONMU050404R-...-...	*	31608308	31608309	31608340	31543338	31531124	31551823	31551824



OFGW07

Radial indexable inserts, 8 cutting edges, right-hand cutting design

Workpiece material	P	K
Substrate	Carbide	Carbide
Coating	PVD	PVD
Cutting material type	HP969	HP954
Cutting edge design	0A	0A
OFGW07	a_p max. [mm]	
OFGW070404E01N-...-M300-...	*	31608382
OFGW070404E01N-...-M500-...	*	31608383
OFGW070404E01N-...-M700-...	*	31608384

Feed per tooth

Application		NeoMill-16-Finish			NeoMill-16-Face	
Cutting edge design		U05	U03	OA	U05	U03
Coating		CVD	PVD	PVD	CVD	PVD
Edge rounding		+++	++	++	+++	++
Feed/tooth [mm]	P	0.12 – 0.30	0.1 – 0.30	**	0.12 – 0.35	0.1 – 0.30
	M					
	K	0.12 – 0.35	0.1 – 0.35	**	0.12 – 0.40	0.1 – 0.35
	N					

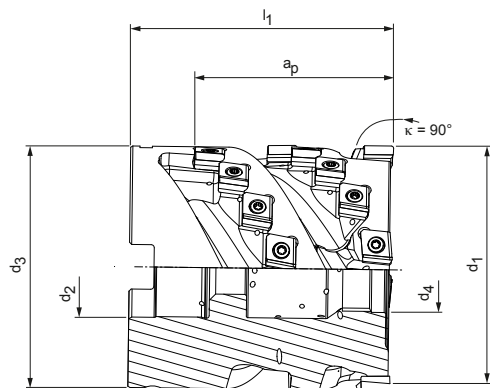
Legend: ++ = medium rounded | +++ = sharp edged

* a_p max. depends on the type of milling cutter and application.

** The cutting speed is determined based on the cutting material of the peripheral cutting edge (ONMU05).

NeoMill®-Alu-Rough

Shell end milling cutter with tangential technology
CTHQ09



Design:

Diameter of milling cutter: 63.00 – 100.00 mm

Cutting material: Carbide: uncoated,
PVD- and CVD-coated,
as well as PCD

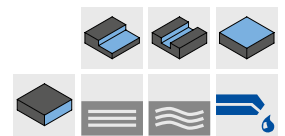
Number of cutting edges: 21 – 45

Special features: Internal coolant supply

Application:

Perfectly suited for initial machining and roughing where large quantities of material must be removed on cast aluminium components in the automotive, aerospace, and mechanical engineering industries.

N	1.1	1.2	1.3	1.4	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	C	1.1	1.2	1.3	2.1	3.1	4.1	4.2	5.1	5.2	5.3



Dimensions					Z _{eff}	No. of indexable inserts	a _p max.	Weight [kg]	Max. operating speed [rpm]	Internal cooling	Specification	Order no.
d ₁	d ₂	d ₃	d ₄	l ₁								
63	27	58	20,5	75	3	21	50	1,2	25.800	✓	ISM901-063-CA27-Z3R-CT_Q09	31565346
80	32	78	25	85	4	32	60	2,4	23.000	✓	ISM901-080-CA32-Z4R-CT_Q09	31565347
100	32	78	25	95	5	45	65	4,3	20.400	✓	ISM901-100-CA32-Z5R-CT_Q09	31565348

Accessories

	CTHQ0905...	Indexable insert	Page 31
	MCA-....	Milling cutter arbor with decentralised coolant delivery	See EGB p.215

Spare parts*

	CTHQ	Clamping screw for indexable insert TORX PLUS® M3.5x11-TX10-IP	Order no. 10105079
		Milling cutter clamping screw for milling cutter ø 63 mm: ø 80 mm – 100 mm	Order no. 10003677 10003691
		Coolant sealing screw ø 63 mm: ø 80 mm – 100 mm	Order no. 31248082 31248083

Dimensions in mm.

The maximum operating speeds refer only to the cutting edge system.

*Included in scope of delivery.

For cutting data recommendations, see pages 36/37.

CTHQ

Tangential indexable inserts, right-hand cutting design

Carbide: four-edged | PCD: single-edged



Workpiece material	N			
	Al alloyed Wear-resistant Cu alloyed Ductile			
Substrate	Carbide			PCD
Coating	–	PVD	CVD	–
Cutting material type	HU616	HP616	HC695	PU617
Cutting edge design	H20	H20	H20	A70
CTHQ09	a_p max. [mm]			
CTHQ090504...R-...	*	31389667	31389680	31091137
CTHQ090508...R-...	*	31316862	31389687	31126185
				31584414
				31584418

Feed per tooth

Application	NeoMill-Alu-Rough			
Cutting edge design	H20			A70
Coating	–	PVD	CVD	–
Edge rounding	0	0	0	0
Feed/tooth [mm]	P			
	M			
	K			
	N	0.1 – 0.35	0.1 – 0.35	0.15 – 0.35

Legend: 0 = Sharp edged

Recommendation: Whenever the indexable inserts are changed, replace the clamping screws as well.

* a_p max. depends on the type of milling cutter and application.

Cutting Data recommendation for Face Milling Cutter with Indexable Inserts

Cutting speed

NeoMill-16-Finish

MMG*		Workpiece material	Strength/hardness [N/mm ²] [HRC]	Cooling			
				MQL/Air	Dry	KSS	
P	P1	P1.1 Structural, machining, case hardened and tempering steels, unalloyed	< 700	✓		✓	
		P1.2 Structural, machining, case hardened and tempering steels, unalloyed	< 1,200	✓		✓	
	P2	P2.1 Nitriding, hardening and tempering steels, alloyed	< 900	✓		✓	
		P2.2 Nitriding, hardening and tempering steels, alloyed	< 1,400	✓		✓	
	P3	P3.1 Tool, bearing, spring and high-speed steels**	< 800	✓		✓	
		P3.2 Tool, bearing, spring and high-speed steels**	< 1,000	✓		✓	
		P3.3 Tool, bearing, spring and high-speed steels**	< 1,500	✓		✓	
	P4	P4.1 Stainless steels, ferritic and martensitic		✓		✓	
	P5	P5.1 Cast steel		✓		✓	
	P6	P6.1 Stainless cast steels, ferritic and martensitic		✓		✓	
K	K1	K1.1 Cast iron with lamellar graphite (grey cast iron), GJL	< 300	✓		✓	
		K2.1 Cast iron with spheroidal graphite, GJS	< 500	✓		✓	
	K2	K2.2 Cast iron with spheroidal graphite, GJS	500-800	✓		✓	
		K2.3 Cast iron with spheroidal graphite, GJS	> 800	✓		✓	
	K3	K3.1 Cast iron with vermicular graphite, GJV; malleable cast iron, GJM	< 500	✓		✓	
		K3.2 Cast iron with vermicular graphite, GJV; malleable cast iron, GJM	> 500	✓		✓	

* MAPAL machining groups

** If the alloy parts Cr, Mo, Ni, V, W in total > 8%, then select the next highest MAPAL machining group.



NeoMill-16-Finish

		v_c [m/min] according to cutting material type and contact ratio a_e/D																	
		Carbide PVD-coated												Carbide CVD-coated					
		HP954		HP969		HP966		HP976		HP981		HP986		HC760		HC770		HC775	
		>0.6	<0.6	>0.6	<0.6	>0.6	<0.6	>0.6	<0.6	>0.6	<0.6	>0.6	<0.6	>0.6	<0.6	>0.6	<0.6	>0.6	<0.6
	The cutting speed is determined based on the cutting material of the peripheral cutting edge (ONMU05).							210	260	210	260					300	330		
								180	210	180	210					290	320	280	300
								190	230	190	230					280	300	270	290
										150	190	130	170					260	280
										150	190	130	170						
										150	190	130	170						
										140	180	120	150						
										140	180	120	150						
										150	190	130	170						
										130	170	110	140						
	The cutting speed is determined based on the cutting material of the peripheral cutting edge (ONMU05).			260	320	230	280							380	410	370	380		
				230	280	210	260							350	380	350	370		
				210	260	190	230									300	350		
				190	230	170	200									260	300		
				200	250	180	210							250	280	230	260		
				190	230	170	200							230	260	210	230		

The specified machining values are guide values.

The optimum data for the respective machining task should be determined during the test or machining.

Cutting Data recommendation for Face Milling Cutter with Indexable Inserts

Cutting speed

NeoMill-16-Face

MMG*		Workpiece material	Strength/hardness [N/mm ²] [HRC]	Cooling			
				MQL/Air	Dry	KSS	
P	P1	P1.1 Structural, machining, case hardened and tempering steels, unalloyed	< 700	✓		✓	
		P1.2 Structural, machining, case hardened and tempering steels, unalloyed	< 1,200	✓		✓	
	P2	P2.1 Nitriding, hardening and tempering steels, alloyed	< 900	✓		✓	
		P2.2 Nitriding, hardening and tempering steels, alloyed	< 1,400	✓		✓	
	P3	P3.1 Tool, bearing, spring and high-speed steels**	< 800	✓		✓	
		P3.2 Tool, bearing, spring and high-speed steels**	< 1,000	✓		✓	
		P3.3 Tool, bearing, spring and high-speed steels**	< 1,500	✓		✓	
	P4	P4.1 Stainless steels, ferritic and martensitic		✓		✓	
	P5	P5.1 Cast steel		✓		✓	
	P6	P6.1 Stainless cast steels, ferritic and martensitic		✓		✓	
K	K1	K1.1 Cast iron with lamellar graphite (grey cast iron), GJL	< 300	✓		✓	
		K2.1 Cast iron with spheroidal graphite, GJS	< 500	✓		✓	
	K2	K2.2 Cast iron with spheroidal graphite, GJS	500-800	✓		✓	
		K2.3 Cast iron with spheroidal graphite, GJS	> 800	✓		✓	
	K3	K3.1 Cast iron with vermicular graphite, GJV; malleable cast iron, GJM	< 500	✓		✓	
		K3.2 Cast iron with vermicular graphite, GJV; malleable cast iron, GJM	> 500	✓		✓	

* MAPAL machining groups

** If the alloy parts Cr, Mo, Ni, V, W in total > 8%, then select the next highest MAPAL machining group.



NeoMill-16-Face

	v_c [m/min] according to cutting material type and contact ratio a_e/D													
	Carbide PVD-coated								Carbide CVD-coated					
	HP966		HP976		HP981		HP986		HC760		HC770		HC775	
	>0.6	<0.6	>0.6	<0.6	>0.6	<0.6	>0.6	<0.6	>0.6	<0.6	>0.6	<0.6	>0.6	<0.6
			180	220	180	220					260	280		
			150	180	150	180					250	270	240	260
			160	200	160	200					240	260	230	250
					130	160	110	140					220	240
					130	160	110	140						
					130	160	110	140						
					120	150	100	130						
					120	150	100	130						
					130	160	110	140						
					110	140	90	120						
	220	270	200	240					330	350	320	330		
	200	240	180	220					300	330	300	320		
	180	220	160	200							260	300		
	160	200	140	170							220	260		
	170	210	150	180					210	240	200	220		
	160	200	140	170					200	220	180	200		

The specified machining values are guide values.

The optimum data for the respective machining task should be determined during the test or machining.

Cutting data recommendations for milling cutter with indexable inserts

Cutting speed

NeoMill-Alu-Rough

MMG*		Workpiece material	Strength/hardness [N/mm ²] [HRC]	Cooling			
				MQL/Air	Dry	KSS	
N	N1	N1.1 Aluminium, unalloyed and alloyed < 3% Si		✓	✓	✓	
		N1.2 Aluminium, alloyed < 7% Si		✓	✓	✓	
		N1.3 Aluminium, alloyed > 7 - 12% Si		✓	✓	✓	
		N1.4 Aluminium, alloyed > 12% Si		✓	✓	✓	
	N2	N2.1 Copper, unalloyed and low alloyed	< 300	✓	✓	✓	
		N2.2 Copper, alloyed	> 300	✓	✓	✓	
		N2.3 Brass, bronze, gunmetal	< 1,200	✓	✓	✓	
	N4	N4.1 Plastic, thermoplastics		✓	✓	✓	
		N4.2 Plastic, duroplastics		✓	✓	✓	

* MAPAL machining groups



Shoulder milling cutter (ICM)



Shell end face milling cutters (ISM)

	v_c [m/min] according to cutting material type and contact ratio a_e/D								v_c [m/min] according to cutting material type and contact ratio a_e/D							
	Carbide uncoated		Carbide, PVD-coated		Carbide, CVD-coated		Diamond		Carbide uncoated		Carbide, PVD-coated		Carbide, CVD-coated		Diamond	
	HU616		HP616		HC695		PU617		HU616		HP616		HC695		PU617	
	>0.6	<0.6	>0.6	<0.6	>0.6	<0.6	>0.6	<0.6	>0.6	<0.6	>0.6	<0.6	>0.6	<0.6	>0.6	<0.6
	500	600	700	700	1,200	1,800	5,600	6,000	500	500	700	700	800	900	2,000	2,000
	500	600	700	700	1,200	1,800	5,600	6,000	300	360	700	700	800	900	2,000	2,000
	500	600	700	700	1,200	1,800	5,600	6,000	230	280	700	700	500	600	2,000	2,000
	300	360	400	480	1,000	1,100	4,800	5,000	230	280	400	480	500	600	1,500	1,800
	250	300					600	720	250	300					600	720
	120	150					500	600	120	150					500	600
	180	220					450	540	180	220					450	540
	300	360					500	600	300	360					500	600
	250	300					400	480	250	300					400	480

The specified machining values are guide values.

The optimum data for the respective machining task should be determined during the test or machining.

UNIQ DirectCool

Innovative cooling technology for hydraulic chucks

DirectCool offers a new cooling solution for the UNIQ series of hydraulic chucks. Three integrated cooling channels enable precise decentralised cooling along the tool shank to the cutting edge. This ensures even temperature distribution, reduces thermal distortion and increases tool life, resulting in greater process reliability in demanding machining processes.



Advantages of the DirectCool system

**Decentralised cooling**

For longer tool life and stable processes.

**Maximum tool life**

Wear is reduced thanks to cooled tool and chucks.

**Cost-efficient and flexible**

No expensive shank grooves necessary. Standard and other tools can be used without internal cooling.

**Effective chip removal**

Flushing effect improves process reliability and surface quality.

**Compatibility with no restrictions**

No change to tool restriction with simple integration into existing systems.

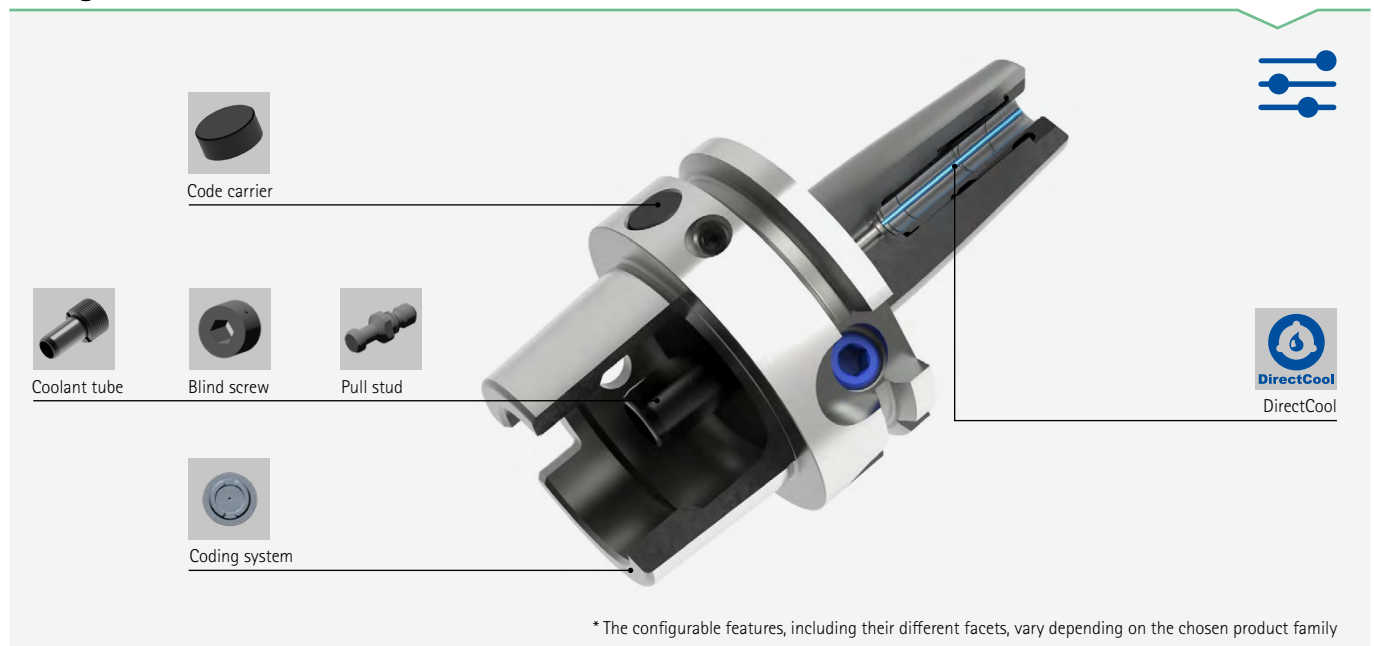
CONFIGURATION

Configurator for clamping technology – quick, simple and productive

How does the configuration work?

- **Individual configurability:** All series can be flexibly adapted to your requirements – e.g. through the use of configurable features such as coolant tubes, blind screws, pull studs, coding systems and code carriers.
- **UNIQ series with DirectCool:** For hydraulic chucks of the UNIQ series UNIQ Mill Chuck, HA and UNIQ DReaM Chuck, 4.5°, you have the option of configuring decentralised cooling via the DirectCool system.
- **Rapid availability:** Our configurable products can also be delivered in next to no time. This is because we always keep a large number of products from our preferred series in stock.

Configurable features*



Configuration for UNIQ series

Technology		Design	Features					
			 Code carrier	 Pull stud	 Coolant tube	 Coding system	 Blind screw	 DirectCool
Hydraulic clamping technology 	UNIQ	UNIQ Mill Chuck, HA	HSK, SK	SK, BT, BT-FC, CAT	HSK	HSK	HSK	HSK, SK, BT, BT-FC, CAT
		UNIQ DReaM Chuck, 4.5°	HSK, SK	SK, BT, CAT	HSK	HSK	HSK	HSK, SK, BT, CAT



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