145 YEARS
1879–2024

SARATOOLS.com
POWER TO PRODUCE
A BRAND OF SARTORIUS WERKZEUGE

01.07.2026

TOOL CATALOGUE

THAT'S POWER TO PRODUCE





Dear Customer,

The new SARTORIUS Tools Catalog 2026 has arrived: compact, practical, and consistently tailored to the requirements of your daily work.

Since our foundation in 1879, we have stood for reliability, quality, and strong partnerships. As a machining specialist, we understand the day-to-day challenges of manufacturing and know what truly matters in practice: precise results, efficient processes, and dependable solutions.

With more than 45,000 products, our own brands ATORN and ORION, and a comprehensive range of services, we offer you a powerful all-in-one solution. While ATORN represents the highest standards of quality and performance, we are gradually transforming our previous brand SARA into our new entry-level value brand, ORION.

We offer particular expertise in the fields of machining, workholding, metrology, and environmental technology. These areas are complemented by services such as calibration, regrinding, and repairs, ensuring you can rely on maximum support in your daily operations.

A special highlight is our SARABOT, our smart automation solution for part loading. It helps you streamline processes, save valuable time, and sustainably increase productivity.

We sincerely thank you for your trust and look forward to continuing to support you as a reliable partner, with expert knowledge, a strong product portfolio, and solutions that truly add value to your daily work.

SARTORIUS Werkzeuge GmbH & Co. KG

Özcan Esen
Managing Director

Karsten Bloch
Managing Director



WE ARE GLOBAL. BUT WE'RE LOCAL TOO.

POWER TO PRODUCE is for everyone. That is why we have built up a large network of sales partners throughout Europe, so that you can always rely on SARTORIUS. No matter where you are. No matter where you work.

OUR DISTRIBUTION PARTNERS:

Austria
Bosnia and Herzegovina
Bulgaria
Croatia
Czech Republic
Denmark
Estonia
Finland
Greece
Hungary
Iceland
Italy
Kazakhstan
Latvia
Lithuania
Macedonia
Netherlands
Norway
Poland
Portugal
Romania
Serbia
Slovakia
Slovenia
Spain
Sweden
Switzerland
Ukraine
Uzbekistan



OUR PRODUCT PARTNERS

Professional products for almost any application. It's no coincidence – and it's all down to our many partners. Partners with high-quality, innovative products. Partners like:

Mahr · GG · palbit CUTTING TOOLS SOLUTIONS · VAN HOORN CARBIDE · Mitutoyo

kitagawa EUROPE · ARIANA · BAUER SÜDLOHN · SAUTER · PFERD

RÖHM · Dümmel WERKZEUGFABRIK · FAHRION PRÄZISION · bedrunka+hirth

MAPAL · EPPINGER SMARTER TOOLING SOLUTIONS · diebold Goldring-Werkzeuge · amf

pig · FILTERMIST · IMC · NOGA · REVENDO

Milling tools

Solid carbide milling tools

INFO	Overview of solid carbide end milling cutters	421
	Solid carbide end milling cutter	425
	End milling cutters PALBIT	432
	SFront face torus milling cutters WXS-CRE	440
	Radius milling cutter 220°	443
	HPC series solid carbide	444
	Carbide HPC drilling and plunge milling cutter NEW	450
	Trochoidal end milling cutters	457
	Aluminium milling programme VHMUltra N	463
	Aluminium milling programme VHMUltra N PRO	480
	Milling programme VHM stainless steel / titanium / special alloy	489
	Graphite milling programme VHMDIA+	498
	Solid carbide contour milling cutter for GFRP and CFRP	504
	Rotary cutters	506
	Hard milling programme RockTec 65 up to 65 HRc	510
	Hard milling range RockTec PRO 47 to 65 HRc	524

Form milling cutters and deburring tools

	Sealing surface cutter	549
	Circle segment milling cutter	550
	Solid carbide die-sinking cutters	551
	Solid carbide form milling cutters	552
	Solid carbide engraving milling cutters	553
	Multifunction tool	554
	Solid carbide deburring tools	555
	Solid carbide forward and reverse deburring tools	557
	Orbitool deburring tool	560

HSS milling tools

INFO	Overview of end milling cutters HSS / HSS-E / HSS-E-PM	561
	End milling cutters HSS / HSS-E / HSS-E-PM	564
	Form milling cutter HSS	578
	Disc milling cutters	580
	Shell end mills	581

Saw blades

	Metal circular saw blades	583

	Machine saw blades	591
	Metal saw blades	595

Thread milling cutter

INFO	ATORN thread milling cutters	596
	SARA thread milling cutters	597
	Thread milling cutter WHO-EM-PNC	598
	Indexable insert thread milling cutter	603
	Circular cutters	606
	Vertical thread-milling range	610
	Vertikal-Gewindefräsprogramm	614

Indexable insert milling cutters and modular milling systems

	Modular milling system	623
INFO	Overview of tool holders	632
	Indexable insert face milling cutters	635
	Indexable insert copy milling cutter	640
	Indexable insert shoulder milling cutter SDMT	643
	Indexable milling cutter inserts APKT 10	644
	Indexable milling cutter inserts APKT 16	651
	Wendeplatten Fräser 4-10 / 4-15 Power	657
	Wendeplatten Fräser SP..T	659

	90° corner milling cutter WNEU	662
	Tangential milling cutters TGPLUS 90190	663
	High-performance milling cutter AD..X 06..AD..X 09.. AD..X 12.. AD..X 17..	665
	High feed-rate milling cutters XDM..	672
	High feed-rate milling cutters HIFEED 06410 / 06690	674
	Milling cutter 90° LINEPRO 20090/20190/20290	676
	High feed-rate milling cutters TETRAFEED	682
	Milling cutter 95° LINEPRO 40095/41095/40595	684
	Plunge milling cutters for non-ferrous metals	686
	Indexable insert copy milling cutter TOROMILL	688
	Ball-nose and torus milling cutters	692
	Indexable insert milling counter-bore, adjustable	698
	Chamfer cutters	701
	Engraving milling cutter	705
	Indexable T-slot cutter inserts	706
INFO	ISO milling inserts	707
	Indexable insert disc milling cutters	715
	Push broaches	718

Technical information, usage recommendations

i Vc/fz	Usage recommendations	719

Summary of icons used for milling tools

INFO

Cutting material	HSS High-performance, high-speed steel	HSS-E High-performance, high-speed steel Cobalt-alloyed	VHM Solid carbide
Coating	TiN Titanium-nitride coating	TiCN Titanium-carbo-nitride coating	TiAlN Titanium-aluminium-nitride coating
Surface treatment	Nit. Nitrided surface	Vap. Vapour-treated surface (steam-treated)	
Type/profile	Typ N e.g. type N, for normal materials	NF e.g. NF Roughing-finishing toothing	HR e.g. HR Fine knuckle-type toothing
Standard	DIN 327 Complies with DIN 327	DIN 844 Complies with DIN 844	Werks-norm Complies with factory standard
Shank design	DIN 6535 HA e.g. straight shank according to DIN 6535 HA	e.g. straight shank with Weldon clamping surface	e.g. MT shank
Number of cutting edges	Z 3 e.g. 3 cutting edges and/or 3 insert seats	Z 5 e.g. 5 cutting edges and/or 5 insert seats	Z 8+ e.g. 8 or more cutting edges and/or 8 or more insert seats
Spiral angle	30° e.g. 30° right-hand twist	41° 43° 45° e.g. unequal helix angle	10° e.g. 10° left-handed twist
Tooth pitch	Unequal tooth pitch		
Tolerance	h5 Shank tolerance	e8 Diameter tolerance	±0,005 Radius tolerance
Application	Centre cutting	Over-centre cutting	
Coolant design	Axial coolant bore	Radial coolant bore	
Milling technology	HSC High-Speed-Cutting (High-speed milling)	HPC High-Performance-Cutting (High-performance milling)	TVC Trochoidal-Volume-Cutting (Trochoidal milling)
Cutting data	i Vc/fz More information such as cutting data recommendations in the technical appendix		
Milling applications	Face milling	Corner milling	Groove milling
	Face milling	Pocket milling	Chamfering
	Circular cutting	Drill cutting	Ramping
	Copy milling	Contour milling	T-groove milling
suitable for	3D PRINT 3D additive		

Usage recommendations diagram (example)

- **Materials group**
- **Usage recommendation**: Depicted by ISO colour code. Full dot = very well suited, circle = well suited
- **Recommended cutting speed:** Cutting speed range Vc m/min. for medium-sized tool diameter.

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG / GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	○	●	●	○	●	○	●	○	○	●	●	●	○	●	●	○
		175	100	80	85	55	55	100	100	65	30	25	315	225	160	160	75	55	55
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		

Overview of solid carbide end milling cutters

INFO

Sort by type and number of cutting edges	End milling cutter				
					
Brand	SARA	SARA	SARA	SARA	SARA
Main application	P K	P K	P K	P K	P K
Secondary application	M S N H	M N	M S N H	M	M S N
Number of cutting edges	2	2	3	3	3
Diameter range / mm	1.0 - 20.0	2.0 - 20.0	0.5 - 20.0	2.0 - 20.0	3.0 - 20.0
Standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard
Version	short	short	Extra-short	short	Long
Type / Profile	N	N	N	N	N
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	TiAlN Ultra	TiAlN	TiAlN Ultra	TiAlN	TiAlN
Order No.	254050....	250109....	251009....	251056....	251047....
Catalogue page	**425**	**426**	**427**	**428**	**428**

Sort by type and number of cutting edges	End milling cutter					
						
Brand	SARA	SARA	SARA	SARA	SARA	SARA
Main application	P K	P M K	P K	P K	P K	P K
Secondary application	M N	N H	M S N H	M S N H	M S N H	M S N H
Number of cutting edges	3	3	4	4	4	4
Diameter range / mm	3.0 - 20.0	3.0 - 20.0	2.0 - 20.0	3.0 - 16.0	3.0 - 20.0	3.0 - 20.0
Standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard
Version	short	Normal	Normal	Extra-long	short	Long
Type / Profile	N	N	N	N	N	N
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	TiAlN Ultra	TiAlN	TiAlN Ultra	TiAlN Ultra	TiAlN	TiAlN
Order No.	254052....	251033....	254054....	254056....	251516....	251517....
Catalogue page	**429**	**429**	**430**	**430**	**431**	**431**

Sort by type and number of cutting edges	End milling cutter					
						
Brand	SARA	palbit	VAN HOORN CARBIDE	VAN HOORN CARBIDE	SARA	SARA
Main application	P M	P K	P M	P M	P K	P K
Secondary application	K N		K		M S H	M S H
Number of cutting edges	4	4	4	5	6 - 8	6
Diameter range / mm	4.0 - 20.0	3.0 - 20.0	2.0 - 25.0	2.0 - 25.0	4 - 20	6 - 25
Standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard
Version	Standard	Standard	Normal	Normal	Normal	Extra-long
Type / Profile	N	N	N	N	N	N
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	AlCrN	AlTiN+	TiAlN	TiAlN	TiAlN Ultra	TiAlN
Order No.	254111....	254300....	255100....	255101....	254058....	254109....
Catalogue page	**432**	**432**	**433**	**434**	**434**	**435**

Overview of solid carbide end milling cutters

INFO

	End milling cutter	Roughing end mill			Roughing end mill
Sort by type and number of cutting edges					
Brand	SARA	SARA	SARA	SARA	SARA
Main application	P H	P K	P K	P K	P K
Secondary application	K	M H	M H	H	H
Number of cutting edges	6	3 - 6	3 - 6	3 - 5	2
Diameter range / mm	6,0 - 20,0	4,0 - 20,0	4,0 - 20,0	6 - 20	5 - 20
Standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard
Version	long	long	long	short	short
Type / Profile	N	HR	HR	HR	N
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN Ultra
Order No.	254012.....	254022...	254025....	254018....	254090....
Catalogue page	**435**	**436**	**436**	**437**	**437**

	Torus cutter			Torus cutter	
Sort by type and number of cutting edges					
Brand	SARA	SARA		SARA	SARA
Main application	P K	P K	P H	P K	P K
Secondary application	M S H	M S H	K	M N H	M N
Number of cutting edges	2	4	4 - 5	2	2
Diameter range / mm	3 - 20	3 - 20	6 - 12	3 - 20	3 - 20
Standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard
Version	long	long	short - long	short	short
Type / Profile	N	N	N	N	N
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN
Order No.	254017....	254019....	294248.... 294249....	250512....	250515....
Catalogue page	**438**	**439**	**440**	**440**	**441**

	Radius cutter				
Sort by type and number of cutting edges					
Brand	SARA	SARA	SARA	SARA	SARA
Main application	P H	P H	P K	P K	P K
Secondary application	M K S	M K S	M N	M S H	H
Number of cutting edges	2	2	4	4	2
Diameter range / mm	1 - 20	2 - 20	3 - 20	1 - 20	1 - 16
Standard	Factory standard	Factory standard	Factory standard	Werksnorm	Factory standard
Version	long	extra long	extra long	extra lang	short
Type / Profile	N	N	N	N	N
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	TiAlN	TiAlN	TiAlN	TiAlN	AlTiN
Order No.	254011....	254112....	251532....	254013....	250510....
Catalogue page	**441**	**442**	**442**	**443**	**443**

Overview of solid carbide end milling cutters

INFO

	Milling cutter programme			
Sort by type and number of cutting edges				
Brand	SARA	ATORN	ATORN	SARA
Main application	P K	P M K	P M K	P M
Secondary application	M S N H	S N H	S N H	K S N H
Number of cutting edges	4	3	4	3 - 8
Diameter range / mm	3.0 - 25.0	3 - 20	3 - 20	3 - 20
Standard	Factory standard			Factory standard
Version	short - extra long			Normal
Type / Profile	N / NA			N / H
Cutting material	Solid carbide			Solid carbide
Coating	TiAlN / AlTiN	TiAlN	TiAlN	TiAlSiN
Order No.	from 254130....	254198	254194	from 254155....
Catalogue page	**445**	**450**	**451**	**458**

	Milling cutter programme			
Sort by type and number of cutting edges				
Brand	ATORN		SARA	ATORN
Main application	N	M S	N	N
Secondary application		P K		
Number of cutting edges	1 - 4	2 - 4	2 - 4	
Diameter range / mm	0.5 - 20.0	0.2 - 20.0	1 - 16	4 - 20
Standard	Factory standard	Factory standard	Factory standard	Factory standard
Version	short - extra long	short - long	short - long	Long
Type / Profile	W / WR	N / H	N	-
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	ZrCN	AlCrN	DIA+	DIA HC
Order No.	from 249001....	from 256011....	from 258005....	from 250600....
Catalogue page	**465**	**490**	**498**	**505**

	Milling cutter programme		Sealing surface cutter	Circular segment cutter
Sort by type and number of cutting edges				
Brand	ATORN	ATORN	ATORN	ATORN
Main application	P H	P H	P N	P M
Secondary application	S	M K	M K H	K N H
Number of cutting edges	2 - 8	2 - 8	3	4
Diameter range / mm	0.1 - 20.0	0.1 - 20	3 - 20	2 - 8
Standard	Factory standard	Factory standard	WN	WN
Version	short - long	short - long	short	Normal
Type / Profile	N / H	N / H	N	N
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	TiSi	TiAlSiN	TiAlN	TiAlN
Order No.	from 257002....	from 257100....	255152	254170 - 254173
Catalogue page	**512**	**524**	**549**	**550**

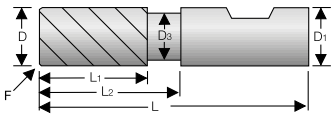
Overview of solid carbide end milling cutters

INFO

	Die-sinking cutter	Quarter-round cutter	Form milling cutter	Engraving milling cutter
Sort by type and number of cutting edges				
Brand	SARA	SARA	SARA	SARA
Main application	P K	P M	P K	N
Secondary application	M N H	K S N H	M	P M S
Number of cutting edges	3 - 4	4	6 - 10	1
Diameter range / mm	2,5 - 8,0	8 - 16	10 - 45	3 - 6
Standard	Factory standard	Factory standard	Factory standard	Factory standard
Version	short - long	short	short	short
Type / Profile	N	N	N	N
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	TiAlN	AlCrN	AlCrN	
Order No.	253002....	291310....	292004....	251545....
Catalogue page	**551**	**552**	**552**	**553**

SARA® Slot milling cutter

VHM | 30° | e8 | h5 | Z 2 | TiAlN | HSC | Vc/fz | 735



- **With clearance**
- Straight shank up to Ø 2.5 mm smooth, from Ø 2.8 mm with driving planes in accordance with DIN 6535-HB
- **Optimum chip removal due to extremely smooth surface**
- **For P9 grooves**
- **Cutting material: ultra-fine grain solid carbide, TiAlN-Ultra-coated**

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		110	90	70	58	55	45	115	100	50	45	35	350	250	120				
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		



ULTRA

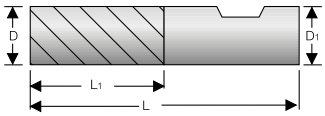
D mm	L1 mm	L2 mm	L mm	D1 mm	D3 mm	F x 45° mm	Z	Feed fz steel < 1400 N/mm² mm/tooth	Feed fz steel < 1400 N/mm² mm/tooth	art.no.	€
1.0	3	-	50	3.0	-	-	2	0.006	0.007	254050 0010	
1.1	3	-	50	3.0	-	-	2	0.006	0.007	254050 0011	
1.2	4	-	50	3.0	-	-	2	0.006	0.007	254050 0012	
1.4	4	-	50	3.0	-	-	2	0.006	0.007	254050 0014	
1.5	4	-	50	3.0	-	-	2	0.006	0.007	254050 0015	
1.6	4	-	50	3.0	-	-	2	0.006	0.007	254050 0016	
1.8	5	-	50	3.0	-	-	2	0.006	0.007	254050 0018	
2.0	5	-	50	3.0	-	0.05	2	0.006	0.007	254050 0020	
2.5	6	-	50	3.0	-	0.05	2	0.012	0.015	254050 0025	
2.8	8	15	57	6.0	2.6	0.05	2	0.012	0.015	254050 0028	
3.0	8	15	57	6.0	2.8	0.05	2	0.012	0.015	254050 0030	
3.8	11	15	57	6.0	3.6	0.1	2	0.012	0.015	254050 0038	
4.0	11	15	57	6.0	3.8	0.1	2	0.012	0.015	254050 0040	
4.8	13	21	57	6.0	4.6	0.1	2	0.024	0.030	254050 0048	
5.0	13	21	57	6.0	4.8	0.1	2	0.024	0.030	254050 0050	
5.8	13	21	57	6.0	5.6	0.1	2	0.024	0.030	254050 0058	
6.0	13	21	57	6.0	5.8	0.1	2	0.024	0.030	254050 0060	
6.8	16	27	63	8.0	6.6	0.1	2	0.024	0.030	254050 0068	
7.0	16	27	63	8.0	6.8	0.1	2	0.024	0.030	254050 0070	
7.8	19	27	63	8.0	7.5	0.1	2	0.024	0.030	254050 0078	
8.0	19	27	63	8.0	7.7	0.1	2	0.024	0.030	254050 0080	
8.7	19	32	72	10.0	8.5	0.1	2	0.032	0.040	254050 0087	
9.0	19	32	72	10.0	8.8	0.1	2	0.032	0.040	254050 0090	
9.7	22	32	72	10.0	9.5	0.1	2	0.032	0.040	254050 0097	
10.0	22	32	72	10.0	9.8	0.1	2	0.032	0.040	254050 0100	
10.7	26	38	83	12.0	10.5	0.1	2	0.032	0.040	254050 0107	
11.0	26	38	83	12.0	10.8	0.1	2	0.032	0.040	254050 0110	
11.7	26	38	83	12.0	11.5	0.1	2	0.032	0.040	254050 0117	
12.0	26	38	83	12.0	11.8	0.1	2	0.032	0.040	254050 0120	
13.7	26	38	83	14.0	13.5	0.1	2	0.040	0.050	254050 0137	
14.0	26	38	83	14.0	13.8	0.1	2	0.040	0.050	254050 0140	
15.7	32	44	92	16.0	15.4	0.1	2	0.040	0.050	254050 0157	
16.0	32	44	92	16.0	15.7	0.1	2	0.040	0.050	254050 0160	
17.7	32	44	92	18.0	17.4	0.1	2	0.048	0.060	254050 0177	
18.0	32	44	92	18.0	17.7	0.1	2	0.048	0.060	254050 0180	
19.7	38	54	104	20.0	19.4	0.1	2	0.048	0.060	254050 0197	
20.0	38	54	104	20.0	19.7	0.1	2	0.048	0.060	254050 0200	

2145

SARA® Basic Line longitudinal slot cutter

VHM | 30° | h6 | Z 2 | TiAlN | Vc/fz | 735

- **2 cutting edges, short**, 30° right-hand cutting
- Eccentric relief grinding
- **Cutting material: superfine grain solid carbide**



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 180	● 80	● 100	○ 80	○ 90		● 140	● 100	○ 70	○ 50		● 270	● 190	● 150				
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		



D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
2.0	6	50	6.0	2	0.011	0.016	250109 0020	
3.0	6	50	6.0	2	0.011	0.016	250109 0030	
4.0	8	50	6.0	2	0.017	0.026	250109 0040	
5.0	8	50	6.0	2	0.017	0.026	250109 0050	
6.0	16	50	6.0	2	0.021	0.032	250109 0060	
8.0	20	60	8.0	2	0.029	0.044	250109 0080	
10.0	22	70	10.0	2	0.040	0.060	250109 0100	
12.0	22	70	12.0	2	0.040	0.060	250109 0120	
16.0	25	75	16.0	2	0.053	0.080	250109 0160	
20.0	32	100	20.0	2	0.067	0.1	250109 0200	

2148

Over 200,000 tools available online!

Advantages:
- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



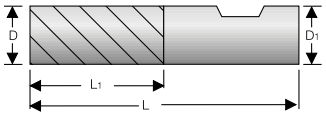
Register online now!

www.saratools.com

SARA® Mini end milling cutter



- Straight shank with driving plane, up to Ø 1.8 mm smooth
- **Cutting material: ultra-fine grain solid carbide, TiAlN-Ultra-coated**
- **Note:** This milling cutter is not cost-effective to re-sharpen. It is more economical to use the cutters up to their wear limit and replace them with brand new tools.



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 100	● 90	● 50	● 50	● 43	○ 30	● 120	● 90	● 35	● 28	○ 28	● 225	● 170	● 130				
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		





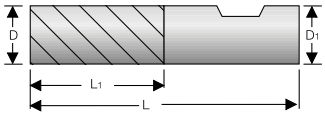
ULTRA

D mm	L1 mm	L mm	D1 mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	● Feed fz steel < 1000 N/mm² mm/tooth	TiAlN art.no.	€
0.5	2.0	38.0	3.0	3	0.012	0.015	251009 0005	
0.6	2.0	38.0	3.0	3	0.012	0.015	251009 0006	
0.8	2.0	38.0	3.0	3	0.012	0.015	251009 0008	
1.0	2.0	38.0	3.0	3	0.012	0.015	251009 0010	
1.2	2.0	38.0	3.0	3	0.012	0.015	251009 0012	
1.5	2.0	38.0	3.0	3	0.012	0.015	251009 0015	
1.8	2.0	38.0	3.0	3	0.012	0.015	251009 0018	
2.0	4.0	35.0	6.0	3	0.012	0.015	251009 0020	
2.5	4.0	35.0	6.0	3	0.023	0.03	251009 0025	
3.0	5.0	36.0	6.0	3	0.031	0.038	251009 0030	
3.5	5.0	36.0	6.0	3	0.040	0.045	251009 0035	
4.0	7.0	38.0	6.0	3	0.048	0.052	251009 0040	
4.5	7.0	38.0	6.0	3	0.050	0.056	251009 0045	
5.0	8.0	38.0	6.0	3	0.051	0.057	251009 0050	
5.5	8.0	38.0	6.0	3	0.053	0.06	251009 0055	
5.75	8.0	38.0	6.0	3	0.053	0.06	251009 0057	
6.0	8.0	38.0	6.0	3	0.054	0.06	251009 0060	
6.75	11.0	43.0	8.0	3	0.056	0.062	251009 0067	
7.0	11.0	43.0	8.0	3	0.057	0.062	251009 0070	
7.75	11.0	43.0	8.0	3	0.059	0.066	251009 0077	
8.0	11.0	43.0	8.0	3	0.060	0.066	251009 0080	
8.7	13.0	50.0	10.0	3	0.061	0.067	251009 0087	
9.0	13.0	50.0	10.0	3	0.062	0.067	251009 0090	
9.7	13.0	50.0	10.0	3	0.063	0.068	251009 0097	
10.0	13.0	50.0	10.0	3	0.063	0.068	251009 0100	
12.0	15.0	55.0	12.0	3	0.063	0.068	251009 0120	

2109

SARA® Basic Line end milling cutter

VHM | 30° | h6 | Z 3 | TiAlN | Vc/fz | 735



- **3 cutting edges, short,** 30° right-hand cutting
- Eccentric relief grinding
- **Cutting material: superfine grain solid carbide**

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 110	● 90	● 70	● 80	● 60		● 180	● 100		○ 80	○ 60	● 270	● 190	● 150				
	Cutting speed Vc m/min.										Please adjust these guidelines according to clamping operation and machine set-up.								

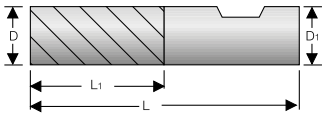


D mm	L1 mm	L mm	D1 mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	6	50	6.0	3	0.012	0.016	251056 0030	
4.0	8	50	6.0	3	0.019	0.026	251056 0040	
5.0	8	50	6.0	3	0.019	0.026	251056 0050	
6.0	16	50	6.0	3	0.024	0.032	251056 0060	
8.0	20	60	8.0	3	0.033	0.044	251056 0080	
10.0	22	70	10.0	3	0.044	0.060	251056 0100	
12.0	22	70	12.0	3	0.044	0.060	251056 0120	
16.0	25	75	16.0	3	0.059	0.080	251056 0160	
20.0	32	100	20.0	3	0.074	0.100	251056 0200	

2148

SARA® Basic Line end milling cutter

VHM | 45° | e8 | h5 | Z 3 | TiAlN | Vc/fz | 735



- **3 cutting edges, long,** 45° right-hand cutting
- Eccentric relief grinding
- **Cutting material: superfine grain solid carbide**

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 110	● 90	● 70	● 80	● 60		● 180	● 100		○ 80	○ 60	● 270	● 190	● 150				
	Cutting speed Vc m/min.										Please adjust these guidelines according to clamping operation and machine set-up.								

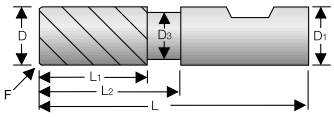


D mm	L1 mm	L mm	D1 mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	7	57	6.0	3	0.012	0.016	251047 0030	
3.5	7	57	6.0	3	0.012	0.016	251047 0035	
4.0	8	57	6.0	3	0.019	0.026	251047 0040	
4.5	8	57	6.0	3	0.019	0.026	251047 0045	
5.0	10	57	6.0	3	0.019	0.026	251047 0050	
6.0	10	57	6.0	3	0.024	0.032	251047 0060	
8.0	16	63	8.0	3	0.033	0.044	251047 0080	
10.0	19	72	10.0	3	0.044	0.060	251047 0100	
12.0	22	83	12.0	3	0.044	0.060	251047 0120	
14.0	22	83	14.0	3	0.052	0.070	251047 0140	
16.0	26	92	16.0	3	0.059	0.080	251047 0160	
20.0	32	104	20.0	3	0.074	0.10	251047 0200	

2148

SARA® End milling cutters

VHM | 45° | e8 | h5 | Z 3 | TiAlN | HPC | Vc/fz | 735



- **With clearance**
- **First-rate chip removal due to extremely smooth surface**
- **Cutting material: ultra-fine grain solid carbide, TiAlN-Ultra-coated**

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		110	90	70	58	55	45	115	100	50	45	35	350	250	120				
	Cutting speed Vc m/min.																		

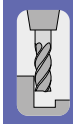
Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L2 mm	L mm	D1 mm	D3 mm	F x 45° mm	Z	Feed fz steel < 1400 N/mm² mm/tooth	Feed fz steel < 1400 N/mm² mm/tooth	art.no.	€
3.0	8	15	57	6.0	2.8	0.1	3	0.012	0.015	254052 0030	
3.5	11	15	57	6.0	3.3	0.1	3	0.012	0.015	254052 0035	
4.0	11	15	57	6.0	3.8	0.1	3	0.012	0.015	254052 0040	
4.5	13	21	57	6.0	4.3	0.1	3	0.024	0.03	254052 0045	
5.0	13	21	57	6.0	4.8	0.1	3	0.024	0.03	254052 0050	
5.5	13	21	57	6.0	5.3	0.1	3	0.024	0.03	254052 0055	
6.0	13	21	57	6.0	5.8	0.1	3	0.024	0.03	254052 0060	
6.5	16	27	63	8.0	6.3	0.1	3	0.024	0.03	254052 0065	
7.0	16	27	63	8.0	6.8	0.1	3	0.024	0.03	254052 0070	
7.5	19	27	63	8.0	7.3	0.1	3	0.024	0.03	254052 0075	
8.0	21	27	63	8.0	7.7	0.1	3	0.024	0.03	254052 0080	
8.5	21	32	72	10.0	8.3	0.1	3	0.032	0.04	254052 0085	
9.0	21	32	72	10.0	8.8	0.1	3	0.032	0.04	254052 0090	
9.5	22	32	72	10.0	9.3	0.1	3	0.032	0.04	254052 0095	
10.0	22	32	72	10.0	9.8	0.1	3	0.032	0.04	254052 0100	
11.0	26	32	83	12.0	10.8	0.1	3	0.032	0.04	254052 0110	
12.0	26	38	83	12.0	11.8	0.1	3	0.032	0.04	254052 0120	
14.0	26	38	83	14.0	13.8	0.1	3	0.04	0.05	254052 0140	
16.0	36	44	92	16.0	15.7	0.1	3	0.04	0.05	254052 0160	
18.0	36	44	92	18.0	17.7	0.1	3	0.048	0.06	254052 0180	
20.0	41	54	104	20.0	19.7	0.1	3	0.048	0.06	254052 0200	

2145

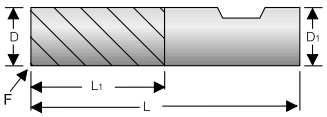


ULTRA



SARA® End milling cutters

VHM | 38°/40°/42° | h10 | h6 | Z 3 | TiAlN | HPC | Vc/fz | 735



Universal

- **38°/40°/42° right-hand helix**
- For universal applications
- **For roughing and finishing**
- For large cutting depths
- **Very high degree of smoothness**
- Protective chamfer for increased service life

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		240	160	85	75	220	110	180	140										
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	D1 mm	L mm	F x 45° mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3	8	6	57	0.1	3	0.01	0.012	251033 0030	
4	11	6	57	0.1	3	0.017	0.02	251033 0040	
5	13	6	57	0.15	3	0.029	0.035	251033 0050	
6	13	6	57	0.2	3	0.029	0.035	251033 0060	
8	19	8	63	0.2	3	0.038	0.045	251033 0080	
10	22	10	72	0.2	3	0.038	0.045	251033 0100	
12	26	12	83	0.3	3	0.063	0.075	251033 0120	
16	32	16	92	0.3	3	0.084	0.1	251033 0160	
20	38	20	104	0.4	3	0.101	0.12	251033 0200	

2145



SARA® End milling cutters

VHM | 30° | e8 | h5 | Z 4 | TiAlN | HPC | Vc/fz | 735

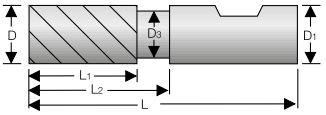
- **With clearance**
- Straight shank in accordance with DIN 6535 HA and with driving plane in accordance with DIN 6535 HB
- **First-rate chip removal due to extremely smooth surface**
- **Cutting material: ultra-fine grain solid carbide, TiAlN-Ultra-coated**

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		110	90	70	58	55	45	115	100	50	45	35	350	250	120				
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		

Standard version

- Smooth shank
- up to Ø 6 mm with driving planes in accordance with DIN 6535 HB





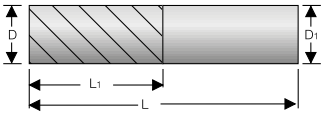
D mm	L1 mm	L2 mm	L mm	D1 mm	D3 mm	Z	Feed fz steel < 1400 N/mm² mm/tooth	Feed fz steel < 1400 N/mm² mm/tooth	art.no.	€
2.0	8	-	32	2.0	-	4	0.0056	0.007	254054 0020	
3.0	12	-	38	3.0	-	4	0.012	0.015	254054 0030	
4.0	12	-	40	4.0	-	4	0.012	0.015	254054 0040	
5.0	15	20	50	5.0	4.8	4	0.024	0.03	254054 0050	
6.0	16	20	58	6.0	5.8	4	0.024	0.03	254054 0060	
8.0	22	32	70	8.0	7.7	4	0.024	0.03	254054 0080	
10.0	25	31	73	10.0	9.6	4	0.032	0.04	254054 0100	
12.0	28	37	84	12.0	11.6	4	0.032	0.04	254054 0120	
16.0	35	43	93	16.0	15.5	4	0.04	0.05	254054 0160	
20.0	40	52	104	20.0	19.5	4	0.048	0.06	254054 0200	

2145

Extra-long without clearance

- Smooth shank





D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1400 N/mm² mm/tooth	Feed fz steel < 1400 N/mm² mm/tooth	art.no.	€
3.0	30	60	3.0	4	0.012	0.015	254056 0030	
4.0	30	75	4.0	4	0.012	0.015	254056 0040	
5.0	35	75	5.0	4	0.024	0.03	254056 0050	
6.0	40	100	6.0	4	0.024	0.03	254056 0060	
8.0	40	100	8.0	4	0.024	0.03	254056 0080	
10.0	40	100	10.0	4	0.032	0.04	254056 0100	
12.0	45	100	12.0	4	0.032	0.04	254056 0120	
14.0	45	100	14.0	4	0.04	0.05	254056 0140	
16.0	75	150	16.0	4	0.04	0.05	254056 0160	

2145

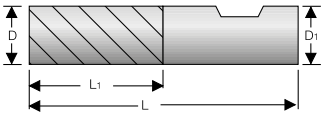
Over 200,000 tools available online!
Register online now!
www.saratools.com



SARA® Basic Line end milling cutter

VHM | 30° | h6 | Z 4 | TiAlN

- **4 cutting edges, long,** 30° right-hand cutting
- Eccentric relief grinding
- **Cutting material: superfine grain solid carbide**

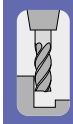


material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 110	● 90	● 70	● 80	● 60		● 180	● 100		○ 80	○ 60	● 270	● 190	● 150				
	Cutting speed Vc m/min.										Please adjust these guidelines according to clamping operation and machine set-up.								

D mm	L1 mm	L mm	D1 mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	8	57	6.0	4	0.012	0.015	251516 0030	
4.0	11	57	6.0	4	0.012	0.015	251516 0040	
5.0	13	57	6.0	4	0.024	0.030	251516 0050	
6.0	13	57	6.0	4	0.024	0.030	251516 0060	
8.0	19	63	8.0	4	0.024	0.030	251516 0080	
10.0	22	72	10.0	4	0.032	0.040	251516 0100	
12.0	26	83	12.0	4	0.032	0.040	251516 0120	
14.0	26	83	14.0	4	0.038	0.042	251516 0140	
16.0	32	92	16.0	4	0.040	0.050	251516 0160	
20.0	38	104	20.0	4	0.048	0.060	251516 0200	

2148

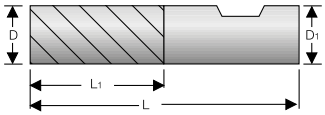




SARA® Basic Line end milling cutter

VHM | 30° | e8 | Z 4 | TiAlN

- **4 cutting edges, extra-long,** 30° right-hand cutting
- Eccentric relief grinding
- **Cutting material: fine grain solid carbide**



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 110	● 90	● 70	● 80	● 60		● 180	● 100		○ 80	○ 60	● 270	● 190	● 150				
	Cutting speed Vc m/min.										Please adjust these guidelines according to clamping operation and machine set-up.								

D mm	L1 mm	L mm	D1 mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	12	50	6.0	4	0.012	0.015	251517 0030	
4.0	15	50	6.0	4	0.012	0.015	251517 0040	
5.0	20	60	6.0	4	0.024	0.030	251517 0050	
6.0	20	60	6.0	4	0.024	0.030	251517 0060	
8.0	25	70	8.0	4	0.024	0.030	251517 0080	
10.0	30	90	10.0	4	0.032	0.040	251517 0100	
12.0	30	90	12.0	4	0.032	0.040	251517 0120	
16.0	50	110	16.0	4	0.040	0.050	251517 0160	
20.0	55	110	20.0	4	0.048	0.060	251517 0200	

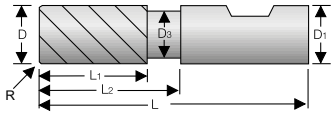
2148



SARA® Steel end milling cutter

VHM | 40° | h9 | h6 | Z 4 | AlCrN | HPC | Vc/fz | 738

- **Unequal pitch for vibration-free milling**
- With corner protection radius R for improved service life



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		200	160	150	80	120	80	170	110	60	30	30	330	300	280				
		Cutting speed Vc m/min.			Please adjust these guidelines according to clamping operation and machine set-up.														

D mm	L1 mm	L2 mm	L mm	D1 mm	D3 mm	R mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
4	11	20	57	6	3.7	0.1	4	0.012	0.02	254111 0040	
5	13	20	57	6	4.6	0.1	4	0.016	0.025	254111 0050	
6	13	20	57	6	5.5	0.1	4	0.019	0.031	254111 0060	
8	20	26	64	8	7.4	0.2	4	0.026	0.043	254111 0080	
10	22	32	72	10	9.2	0.2	4	0.034	0.056	254111 0100	
12	26	37	83	12	11	0.2	4	0.041	0.070	254111 0120	
14	26	37	83	14	13	0.2	4	0.047	0.079	254111 0140	
16	32	42	92	16	15	0.2	4	0.053	0.087	254111 0160	
18	32	42	92	18	17	0.2	4	0.058	0.092	254111 0180	
20	38	50	104	20	19	0.2	4	0.064	0.098	254111 0200	

2179

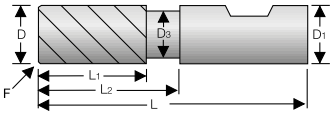


Steel professional

palbit End milling cutters

VHM | 35° -38° | Z 4 | AlTiN+ | HPC | Vc/fz | 765

- **With clearance**
- **Unequal helix angle and pitch for low-vibration milling**
- With protective chamfer F for improved service life



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		170	155	140				200	185										
		Cutting speed Vc m/min.			Please adjust these guidelines according to clamping operation and machine set-up.														

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	8	15	57	2.8	6	0.15	4	0.012	0.015	254300 0030	
4.0	11	17	57	3.8	6	0.15	4	0.012	0.015	254300 0040	
5.0	13	19	57	4.8	6	0.15	4	0.024	0.030	254300 0050	
6.0	13	21	57	5.8	6	0.15	4	0.024	0.030	254300 0060	
8.0	19	27	63	7.6	8	0.15	4	0.024	0.030	254300 0080	
10.0	22	32	72	9.5	10	0.20	4	0.032	0.040	254300 0100	
12.0	26	38	83	11.5	12	0.20	4	0.032	0.040	254300 0120	
16.0	32	44	92	15.5	16	0.35	4	0.040	0.050	254300 0160	
20.0	38	54	104	19.5	20	0.60	4	0.048	0.060	254300 0200	

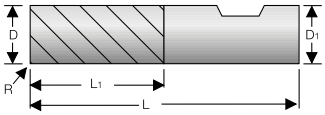
2157



VAN HOORN CARBIDE **VHRS** end milling cutter

VHM | 35° -38° | e8 | h5 | Z 4 | Z 5 | TiAlN | Vc/fz

736
737



- **Cutting material, solid carbide ultra-fine grain TiAlN-coated**
- Special pre-treatment and finishing treatment due to **micro radiation**
- **Version with 4 or 5 cutting edges**
- For wet and dry machining, **extremely high chip removal rates and service life**

material — ● very well suited ○ well suited

steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
● 180	● 140	● 115	● 105	● 80		● 130	● 115										

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

Standard, 4 cutting edges

D mm	R mm	D1 mm	L mm	L1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	Feed fz steel < 1000 N/mm² mm/tooth	DIN 6535-HB art.no.	€
3.0	0.2	6	51	7	4	0.01	0.015	255100 0302	
4.0	0.2	6	51	9	4	0.012	0.02	255100 0402	
5.0	0.2	6	51	11	4	0.02	0.03	255100 0502	
6.0	0.1	6	64	13	4	0.025	0.035	255100 0601	
6.0	0.3	6	64	13	4	0.025	0.035	255100 0603	
6.0	0.5	6	64	13	4	0.025	0.035	255100 0605	
6.0	1.0	6	64	13	4	0.025	0.035	255100 0610	
8.0	0.1	8	64	18	4	0.035	0.045	255100 0801	
8.0	0.3	8	64	18	4	0.035	0.045	255100 0803	
8.0	0.5	8	64	18	4	0.035	0.045	255100 0805	
8.0	1.0	8	64	18	4	0.035	0.045	255100 0810	
10.0	0.1	10	70	22	4	0.04	0.055	255100 1001	
10.0	0.3	10	70	22	4	0.04	0.055	255100 1003	
10.0	0.5	10	70	22	4	0.04	0.055	255100 1005	
10.0	1.0	10	70	22	4	0.04	0.055	255100 1010	
12.0	0.1	12	78	25	4	0.05	0.065	255100 1201	
12.0	0.3	12	78	25	4	0.05	0.065	255100 1203	
12.0	0.5	12	78	25	4	0.05	0.065	255100 1205	
12.0	1.0	12	78	25	4	0.05	0.065	255100 1210	
14.0	0.5	14	89	30	4	0.055	0.08	255100 1405	
14.0	1.0	14	89	30	4	0.055	0.08	255100 1410	
16.0	0.1	16	89	35	4	0.06	0.08	255100 1601	
16.0	0.5	16	89	35	4	0.06	0.08	255100 1605	
16.0	1.0	16	89	35	4	0.06	0.08	255100 1610	
20.0	0.5	20	102	42	4	0.08	0.1	255100 2005	
20.0	1.0	20	102	42	4	0.08	0.1	255100 2010	
25.0	0.5	25	120	45	4	0.11	0.12	255100 2505	
25.0	1.0	25	120	45	4	0.11	0.12	255100 2510	

2113



The specialist in steel

Standard, 5 cutting edges

D mm	R mm	D1 mm	L mm	L1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	DIN 6535-HB art.no.	€
3.0	0.2	6	51	7	5	0.015	255101 0302	
4.0	0.2	6	51	9	5	0.02	255101 0402	
5.0	0.2	6	51	11	5	0.03	255101 0502	
6.0	0.1	6	64	13	5	0.035	255101 0601	
6.0	0.3	6	64	13	5	0.035	255101 0603	
6.0	0.5	6	64	13	5	0.035	255101 0605	
6.0	1.0	6	64	13	5	0.035	255101 0610	
8.0	0.1	8	64	18	5	0.045	255101 0801	
8.0	0.3	8	64	18	5	0.045	255101 0803	
8.0	0.5	8	64	18	5	0.045	255101 0805	
8.0	1.0	8	64	18	5	0.045	255101 0810	
10.0	0.1	10	70	22	5	0.055	255101 1001	
10.0	0.3	10	70	22	5	0.055	255101 1003	
10.0	0.5	10	70	22	5	0.055	255101 1005	
10.0	1.0	10	70	22	5	0.055	255101 1010	
12.0	0.1	12	78	25	5	0.065	255101 1201	
12.0	0.3	12	78	25	5	0.065	255101 1203	
12.0	0.5	12	78	25	5	0.065	255101 1205	
12.0	1.0	12	78	25	5	0.065	255101 1210	
14.0	0.5	14	89	30	5	0.08	255101 1405	
14.0	1.0	14	89	30	5	0.08	255101 1410	
16.0	0.1	16	89	35	5	0.08	255101 1601	
16.0	0.5	16	92	35	5	0.08	255101 1605	
16.0	1.0	16	92	35	5	0.08	255101 1610	
20.0	0.5	20	102	42	5	0.1	255101 2005	
20.0	1.0	20	102	42	5	0.1	255101 2010	
25.0	0.5	25	120	45	5	0.12	255101 2505	
25.0	1.0	25	120	45	5	0.12	255101 2510	

2113



for trochoid milling

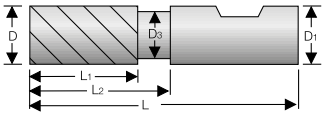
Other tools with clearance in the van Hoorn manufacturer catalogue

SARA® End milling cutters

VHM | 45° | e8 | h5 | Z 6 | Z 8+ | TiAlN | HSC | Vc/fz

735

- **With clearance**
- **First-rate chip removal due to extremely smooth surface**
- **Cutting material: ultra-fine grain solid carbide, TiAlN-Ultra-coated**



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/therma.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 150	● 130	● 120	● 80	● 90		● 190	● 180								○ 45		
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

Standard version

- Shank with driving planes in accordance with DIN 6535-HB

D mm	L1 mm	L2 mm	L mm	D1 mm	D3 mm	Z	Feed fz steel < 1400 N/mm² mm/tooth	Feed fz steel < 1400 N/mm² mm/tooth	DIN 6535-HB art.no.	€
4.0	11	19	57	6.0	3.7	6	0.015	0.020	254058 0040	
5.0	13	19	57	6.0	4.7	6	0.150	0.020	254058 0050	
6.0	13	19	57	6.0	5.7	6	0.020	0.030	254058 0060	
8.0	19	25	63	8.0	7.7	6	0.020	0.030	254058 0080	
10.0	22	30	72	10.0	9.7	6	0.030	0.040	254058 0100	
12.0	26	36	83	12.0	11.5	6	0.050	0.060	254058 0120	
14.0	26	36	83	14.0	13.5	6	0.050	0.060	254058 0140	
16.0	32	42	92	16.0	15.5	6	0.070	0.080	254058 0160	
18.0	32	42	92	18.0	17.5	8	0.090	0.100	254058 0180	
20.0	38	52	104	20.0	19.5	8	0.100	0.120	254058 0200	

2145



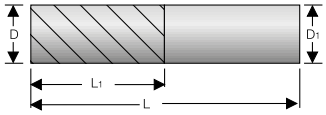
ULTRA

SARA® End milling cutters

VHM | 45° | e8 | h5 | Z 6 | TiAlN | HSC | Vc/fz | 750

- **Extra-long version**
- **Cutting material: ultra-fine grain solid carbide, TiAlN-coated**

Up to 55 HRC



material — ● very well suited ○ well suited

steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
● 150	● 130	● 120	○ 80	○ 90		● 190	● 180								● 45	○ 45	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



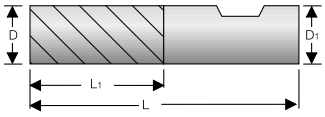
D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
6.0	26	70	6.0	6	0.030	254109 0060	
8.0	36	90	8.0	6	0.040	254109 0080	
10.0	46	100	10.0	6	0.060	254109 0100	
12.0	56	110	12.0	6	0.060	254109 0120	
16.0	66	130	16.0	6	0.080	254109 0160	
20.0	76	140	20.0	6	0.100	254109 0200	

2148

SARA® Basic Line end milling cutter

VHM | 45° | h10 | h6 | Z 6 | Z 8+ | TiAlN | Vc/fz | 750

- **6/8 cutting edges, long,** 45° right-hand cutting
- Eccentric relief grinding
- **Cutting material: fine grain solid carbide**



material — ● very well suited ○ well suited

steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
● 150	● 140	● 130													● 70	○ 60	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

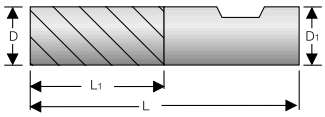


D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
6.0	13	57	6.0	6	0.06	254012 0060	
8.0	19	63	8.0	6	0.08	254012 0080	
10.0	22	72	10.0	6	0.10	254012 0100	
12.0	26	83	12.0	6	0.12	254012 0120	
16.0	32	92	16.0	6	0.16	254012 0160	
20.0	38	104	20.0	8	0.20	254012 0200	

2148

SARA® Basic Line roughing cutter

VHM | HR | 45° | h6 | Z 3 | Z 4 | Z 5 | Z 6 | TiAlN | Vc/fz | 746



- **3-6 cutting edges, long,** 20° right-hand cutting
- Eccentric relief grinding
- **Cutting material: fine grain solid carbide**

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 150	● 110	● 90	○ 85			● 150	● 100								○ 70		
	Cutting speed Vc m/min.										Please adjust these guidelines according to clamping operation and machine set-up.								

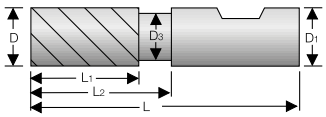


D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth ●	Feed fz steel < 1000 N/mm² mm/tooth ●	art.no.	€
4.0	11	57	6.0	3	0.013	0.015	254022 0040	
5.0	13	57	6.0	4	0.021	0.025	254022 0050	
6.0	16	57	6.0	4	0.021	0.025	254022 0060	
8.0	16	63	8.0	4	0.027	0.032	254022 0080	
10.0	22	72	10.0	4	0.044	0.052	254022 0100	
12.0	26	83	12.0	4	0.044	0.052	254022 0120	
16.0	32	92	16.0	5	0.059	0.070	254022 0160	
20.0	38	104	20.0	6	0.071	0.084	254022 0200	

2148

SARA® Basic Line roughing cutter

VHM | HR | 45° | h5 | Z 3 | Z 4 | Z 5 | Z 6 | TiAlN | Vc/fz | 746



- **3-6 cutting edges, long,** 20° right-hand cutting
- **With clearance**
- Eccentric relief grinding
- **Cutting material: fine grain solid carbide**

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 150	● 110	● 90	○ 85			● 150	● 100								○ 70		
	Cutting speed Vc m/min.										Please adjust these guidelines according to clamping operation and machine set-up.								

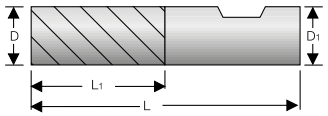


D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth ●	Feed fz steel < 1000 N/mm² mm/tooth ●	art.no.	€
4	11	21	57	3.7	6	3	0.013	0.015	254025 0040	
5	13	21	57	4.6	6	4	0.021	0.025	254025 0050	
6	16	21	57	5.5	6	4	0.021	0.025	254025 0060	
8	16	27	63	7.4	8	4	0.027	0.032	254025 0080	
10	22	32	72	9.2	10	4	0.044	0.052	254025 0100	
12	26	38	83	11	12	4	0.044	0.052	254025 0120	
16	32	44	92	15	16	5	0.059	0.070	254025 0160	
20	38	54	104	19	20	6	0.071	0.084	254025 0200	

2148

SARA® Basic Line roughing cutter

VHM | HR | 20° | h6 | Z 3 | Z 4 | TiAlN | Vc/fz | 746



- **3/4 cutting edges, long,** 20° right-hand cutting
- Eccentric relief grinding
- **Cutting material: fine grain solid carbide**

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 140	● 90	● 70				● 140	● 130								○ 70		
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		

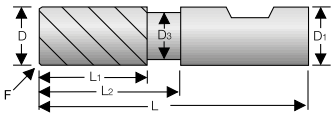


D mm	L1 mm	L mm	D1 mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
6.0	16	57	6.0	3	0.024	0.030	254018 0060	
8.0	16	63	8.0	3	0.024	0.030	254018 0080	
10.0	22	72	10.0	4	0.032	0.040	254018 0100	
12.0	26	83	12.0	4	0.032	0.040	254018 0120	
16.0	32	92	16.0	4	0.040	0.050	254018 0160	
20.0	38	104	20.0	4	0.048	0.060	254018 0200	

2148

SARA® Roughing cutter

VHM | NR | 30° | e8 | h5 | Z 4 | TiAlN | HPC | Vc/fz | 750



- **With clearance**
- **First-rate chip removal due to extremely smooth surface**
- **Cutting material: ultra-fine grain solid carbide, TiAlN-Ultra-coated**

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 125	● 95	● 70				● 145	● 140										
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		



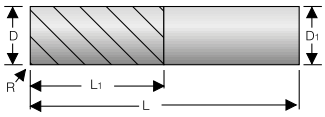
ULTRA

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	● Feed fz steel < 1400 N/mm² mm/tooth	● Feed fz steel < 1400 N/mm² mm/tooth	art.no.	€
5.0	13	19	57	4.8	6.0	0.5	4	0.024	0.030	254090 0050	
6.0	13	19	57	5.8	6.0	0.5	4	0.024	0.030	254090 0060	
8.0	19	25	63	7.7	8.0	0.5	4	0.024	0.030	254090 0080	
10.0	22	30	72	9.8	10.0	0.5	4	0.032	0.040	254090 0100	
12.0	26	36	83	11.8	12.0	0.5	4	0.032	0.040	254090 0120	
14.0	26	36	83	13.8	14.0	0.5	4	0.040	0.050	254090 0140	
16.0	32	42	92	15.7	16.0	0.5	4	0.040	0.050	254090 0160	
18.0	32	42	92	17.7	18.0	0.5	4	0.048	0.060	254090 0180	
20.0	38	52	104	19.7	20.0	0.5	4	0.048	0.060	254090 0200	

2145

SARA® Torus milling cutter

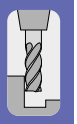
VHM | 30° | e8 | h5 | Z 2 | TiAlN | HSC | Vc/fz | 751



- **Long version**
- **Cutting material: ultra-fine grain solid carbide, TiAlN-coated**

Up to 60 HRC

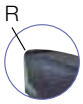
material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 78	● 65	● 60	○ 45	○ 45		● 70	● 55								● 25	● 18	
	Cutting speed Vc m/min.									Please adjust these guidelines according to clamping operation and machine set-up.									



D mm	L1 mm	L mm	D1 mm	R mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	12	50	6.0	0.3	2	0.152	254017 0001	
4.0	15	50	6.0	0.3	2	0.151	254017 0002	
4.0	15	50	6.0	0.5	2	0.151	254017 0003	
5.0	20	60	6.0	0.3	2	0.149	254017 0004	
5.0	20	60	6.0	0.5	2	0.149	254017 0005	
6.0	20	60	6.0	0.3	2	0.149	254017 0006	
6.0	20	60	6.0	0.5	2	0.149	254017 0060	
6.0	20	60	6.0	1.0	2	0.149	254017 1060	
8.0	25	70	8.0	0.3	2	0.149	254017 0010	
8.0	25	70	8.0	0.5	2	0.149	254017 0080	
8.0	25	70	8.0	1.0	2	0.149	254017 1080	
8.0	25	70	8.0	1.5	2	0.149	254017 1580	
8.0	25	70	8.0	2.0	2	0.149	254017 2080	
10.0	30	90	10.0	0.3	2	0.157	254017 0015	
10.0	30	90	10.0	0.5	2	0.157	254017 0100	
10.0	30	90	10.0	1.0	2	0.157	254017 1100	
10.0	30	90	10.0	1.5	2	0.157	254017 1105	
10.0	30	90	10.0	2.0	2	0.157	254017 2100	
12.0	30	90	12.0	0.5	2	0.157	254017 0120	
12.0	30	90	12.0	1.0	2	0.157	254017 1120	
12.0	30	90	12.0	1.5	2	0.157	254017 1125	
12.0	30	90	12.0	2.0	2	0.157	254017 2120	
16.0	50	110	16.0	0.5	2	0.161	254017 0024	
16.0	50	110	16.0	1.0	2	0.161	254017 0025	
16.0	50	110	16.0	1.5	2	0.161	254017 0026	
16.0	50	110	16.0	2.0	2	0.161	254017 0027	
20.0	50	110	20.0	0.5	2	0.167	254017 0028	
20.0	50	110	20.0	1.0	2	0.167	254017 0029	
20.0	50	110	20.0	1.5	2	0.167	254017 0030	
20.0	50	110	20.0	2.0	2	0.167	254017 0031	

2109





Over 200,000 tools available online!
Register online now!



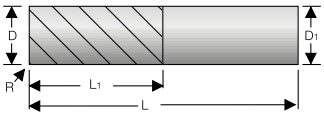
www.saratools.com

SARA® Torus milling cutter

VHM | 30° | e8 | h5 | Z 4 | TiAlN | HSC | Vc/fz | 741

- **Long version**
- **Cutting material: ultra-fine grain solid carbide, TiAlN-coated**

Up to 60 HRC



material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	● 78	● 65	● 60	○ 45	○ 45		● 70	● 55								● 25	● 18	
Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L1 mm	L mm	D1 mm	R mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	12	50	6.0	0.3	4	0.041	254019 0001	
4.0	15	50	6.0	0.3	4	0.041	254019 0002	
4.0	15	50	6.0	0.5	4	0.041	254019 0003	
5.0	20	60	6.0	0.3	4	0.041	254019 0004	
5.0	20	60	6.0	0.5	4	0.041	254019 0005	
6.0	20	60	6.0	0.3	4	0.041	254019 0006	
6.0	20	60	6.0	0.5	4	0.041	254019 0060	
6.0	20	60	6.0	1.0	4	0.041	254019 1060	
8.0	25	70	8.0	0.3	4	0.041	254019 0010	
8.0	25	70	8.0	0.5	4	0.041	254019 0080	
8.0	25	70	8.0	1.0	4	0.041	254019 1080	
8.0	25	70	8.0	1.5	4	0.041	254019 1580	
8.0	25	70	8.0	2.0	4	0.041	254019 2080	
10.0	30	90	10.0	0.3	4	0.042	254019 0015	
10.0	30	90	10.0	0.5	4	0.042	254019 0100	
10.0	30	90	10.0	1.0	4	0.042	254019 1100	
10.0	30	90	10.0	1.5	4	0.042	254019 1105	
10.0	30	90	10.0	2.0	4	0.042	254019 2100	
12.0	30	90	12.0	0.5	4	0.042	254019 0120	
12.0	30	90	12.0	1.0	4	0.042	254019 1120	
12.0	30	90	12.0	1.5	4	0.042	254019 1125	
12.0	30	90	12.0	2.0	4	0.042	254019 2120	
16.0	50	110	16.0	0.5	4	0.043	254019 0024	
16.0	50	110	16.0	1.0	4	0.043	254019 1160	
16.0	50	110	16.0	1.5	4	0.043	254019 1165	
16.0	50	110	16.0	2.0	4	0.043	254019 2160	
20.0	50	110	20.0	0.5	4	0.044	254019 0028	
20.0	50	110	20.0	1.0	4	0.044	254019 1200	
20.0	50	110	20.0	1.5	4	0.044	254019 1205	
20.0	50	110	20.0	2.0	4	0.044	254019 2200	

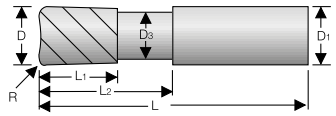
2109

Torus milling cutter *WXS-CRE HPC-Turbomill*

VHM | Z 4 | Z 5 | TiAlN | HSC | 752

Twisted cutting edge, quiet operation up to 65 HRC, finishing geometry, feed rates up to 20,000 mm/min

- **5 cutting edges, face cutter geometry for plunge milling**
- Straight shank, suitable for use in shrink fit holders
- Thanks to a **newly developed cutting edge geometry**, this milling cutter is especially suitable for **extremely high feed rates** with normal-strength and **hardened materials**
- New, extremely ductile and fracture-proof ultra-fine grain quality with enhanced multi-layer coating (Ultra-WXS)
- **Cutting material: ultra-fine grain solid carbide, TiAlN-coated**



material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	●	●	●													●	●	●
	160	150	130													110	100	90
Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.





Short (WXS-HS-CRE)

D mm	R mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	art.no.	€
6.0	1.5	6	5.4	50	2.5	24	5	294248 0615	
8.0	2.0	8	7.2	60	3.5	32	5	294248 0820	
10.0	2.0	10	9.0	70	4.0	40	5	294248 1020	
12.0	3.0	12	11.0	80	5.0	48	5	294248 1230	

2110

long (WXS-CRE)

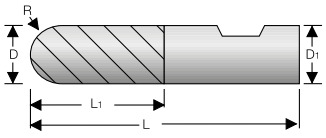


D mm	R mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	art.no.	€
2	0.5	6	2	50	0.8	8	4	294249 0020	
3	0.75	6	2.7	55	1.2	12	5	294249 0030	
4	1	6	3.6	55	1.6	12	5	294249 0040	
6	1.5	6	5.4	90	2.5	12	5	294249 0060	
8	2	8	7.2	100	3.5	16	5	294249 0080	
10	2	10	9	100	4	20	5	294249 0100	
12	3	12	11	110	5	24	5	294249 0120	

2110

SARA® *Basic Line* radius milling cutter

VHM | 30° | e8 | h5 | Z 2 | TiAlN | Vc/fz | 752



- **2 cutting edges, short,** 30° right-hand cutting
- Eccentric relief grinding
- **Cutting material: fine grain solid carbide**

material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	●	●	●	●	●		●	●				●	●	●		○		
	150	110	85	80	60		120	90				330	240	290		45		
Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.



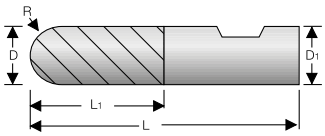
D mm	L1 mm	L mm	D1 mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	4	50	6.0	2	0.011	250512 0030	
4.0	5	54	6.0	2	0.035	250512 0040	
5.0	6	54	6.0	2	0.035	250512 0050	
6.0	7	54	6.0	2	0.045	250512 0060	
8.0	9	58	8.0	2	0.055	250512 0080	
10.0	11	66	10.0	2	0.065	250512 0100	
12.0	12	73	12.0	2	0.065	250512 0120	
16.0	16	82	16.0	2	0.09	250512 0160	
20.0	20	92	20.0	2	0.12	250512 0200	

2148

SARA® Basic Line radius milling cutter

VHM | 30° | h6 | Z 2 | TiAlN | Vc/fz | 752

- **2 cutting edges, long,** 30° right-hand cutting
- Eccentric relief grinding
- **Cutting material: fine grain solid carbide**



material — ● very well suited ○ well suited

	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	● 130	● 90	● 65				● 110	● 80				● 300	● 210	● 250				
	Cutting speed Vc m/min.						Please adjust these guidelines according to clamping operation and machine set-up.											

D mm	L1 mm	L mm	D1 mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	7	57	6.0	2	0.011	250515 0030	
4.0	8	57	6.0	2	0.035	250515 0040	
5.0	10	57	6.0	2	0.035	250515 0050	
6.0	10	57	6.0	2	0.045	250515 0060	
8.0	16	63	8.0	2	0.055	250515 0080	
10.0	19	72	10.0	2	0.065	250515 0100	
12.0	22	83	12.0	2	0.065	250515 0120	
16.0	26	92	16.0	2	0.090	250515 0160	
20.0	32	104	20.0	2	0.120	250515 0200	

2148

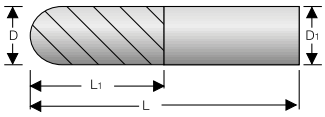


SARA® Radius milling cutter

VHM | 30° | e8 | h5 | Z 2 | TiAlN | HSC | Vc/fz | 752

- **Long and extra-long versions**
- **Cutting material: ultra-fine grain solid carbide, TiAlN-coated**

Up to 60 HRC



material — ● very well suited ○ well suited

	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
254011....	● 160	● 135	● 120	○ 80	○ 80		● 200	● 180								● 70	● 55	
254112....	● 135	● 115	● 110	○ 63	○ 63											● 60	● 45	
	Cutting speed Vc m/min.						Please adjust these guidelines according to clamping operation and machine set-up.											

Long

D mm	L1 mm	L mm	D1 mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
1.0	2.5	50	4.0	2	0.082	254011 0010	
1.5	4	50	4.0	2	0.082	254011 0015	
2.0	5	50	6.0	2	0.082	254011 0020	
3.0	8	60	6.0	2	0.081	254011 0030	
4.0	8	70	6.0	2	0.081	254011 0040	
5.0	10	80	6.0	2	0.078	254011 0050	
6.0	12	90	6.0	2	0.078	254011 0060	
7.0	14	90	8.0	2	0.078	254011 0070	
8.0	14	100	8.0	2	0.066	254011 0080	
10.0	18	100	10.0	2	0.066	254011 0100	
12.0	22	110	12.0	2	0.074	254011 0120	
16.0	30	140	16.0	2	0.081	254011 0160	
20.0	38	160	20.0	2	0.089	254011 0200	

2109





Extra-long

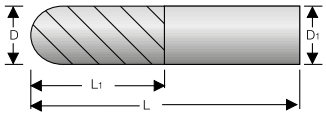
D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
2.0	6	80	3.0	2	0.082	254112 0020	
3.0	8	100	3.0	2	0.081	254112 0030	
4.0	8	100	4.0	2	0.081	254112 0040	
5.0	10	120	6.0	2	0.078	254112 0050	
6.0	10	120	6.0	2	0.078	254112 0060	
8.0	14	140	8.0	2	0.066	254112 0080	
10.0	18	180	10.0	2	0.066	254112 0100	
12.0	22	200	12.0	2	0.074	254112 0120	
16.0	30	250	16.0	2	0.081	254112 0160	
20.0	38	250	20.0	2	0.089	254112 0200	

2109

SARA® Radius milling cutter

VHM | 30° | e8 | h5 | Z 4 | TiAlN | Vc/fz | 752

- **Short version**
- Eccentric relief grinding



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 110	● 90	● 60	○ 75	○ 75		● 105	○ 90				○ 300	○ 150	○ 200				
		Cutting speed Vc m/min.																	

D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	TiAlN art.no.	€
3.0	10	40	3.0	4	0.009	251532 0030	
4.0	15	50	4.0	4	0.030	251532 0040	
5.0	15	50	5.0	4	0.030	251532 0050	
6.0	20	65	6.0	4	0.041	251532 0060	
8.0	20	65	8.0	4	0.050	251532 0080	
10.0	22	70	10.0	4	0.058	251532 0100	
12.0	25	78	12.0	4	0.680	251532 0120	
14.0	30	89	14.0	4	0.095	251532 0140	
16.0	32	89	16.0	4	0.095	251532 0160	
20.0	38	102	20.0	4	0.115	251532 0200	

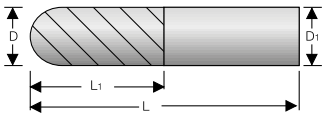
2109



SARA® Radius milling cutter

VHM | 30° | h9 | h5 | Z 4 | TiAlN | HSC | Vc/fz | 754

- **Long version**
- **Cutting material: ultra-fine grain solid carbide, TiAlN-coated**



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 160	● 135	● 120	○ 80	○ 80		● 200	● 180								● 70		
	Cutting speed Vc m/min.										Please adjust these guidelines according to clamping operation and machine set-up.								

D mm	L1 mm	L mm	D1 mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
1.0	2.5	50	4.0	4	0.020	254013 0010	
1.5	4	50	4.0	4	0.025	254013 0015	
2.0	5	50	6.0	4	0.025	254013 0020	
3.0	8	60	6.0	4	0.025	254013 0030	
5.0	10	80	6.0	4	0.030	254013 0050	
6.0	12	90	6.0	4	0.040	254013 0060	
8.0	14	100	8.0	4	0.058	254013 0080	
10.0	18	100	10.0	4	0.068	254013 0100	
12.0	22	110	12.0	4	0.095	254013 0120	
16.0	30	140	16.0	4	0.095	254013 0160	
20.0	38	160	20.0	4	0.115	254013 0200	

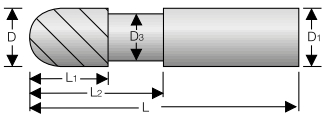
2109



SARA® Radius milling cutter 220°

VHM | 15° | f7 | h5 | Z 2 | AlTiN | Vc/fz | 754

- **with clearance**
- **Enclosing angle 220°**
- **Cutting material: ultra micro-grain SC, TiAlN-Ultra-coated**



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 350	● 250	● 170				● 450	● 410								○ 120	○ 90	○ 70
	Cutting speed Vc m/min.										Please adjust these guidelines according to clamping operation and machine set-up.								

D mm	D1 mm	D3 mm	L mm	L2 mm	L1 mm	R mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
1.00	6.00	0.90	80	5	0.72	0.5	2	0.007	250510 0010	
2.0	6.0	1.80	80	10	1.44	1.0	2	0.011	250510 0020	
3.0	6.0	2.80	80	15	2.04	1.5	2	0.011	250510 0030	
4.0	6.0	3.80	80	20	2.62	2.0	2	0.035	250510 0040	
5.0	6.0	4.70	90	25	3.35	2.5	2	0.035	250510 0050	
6.0	6.0	5.70	70	30	3.94	3.0	2	0.045	250510 0060	
6.0	6.0	5.70	100	30	3.94	3.0	2	0.045	250510 1060	
8.0	8.0	7.50	100	50	5.39	4.0	2	0.055	250510 0080	
10.0	10.0	9.40	120	50	6.71	5.0	2	0.065	250510 0100	
12.0	12.0	11.20	120	50	8.15	6.0	2	0.065	250510 0120	
16.0	16.0	15.0	150	60	10.78	8.0	2	0.09	250510 0160	

2109





Overview 35 - 38° HPC series

INFO

	End milling cutter								Drilling and plunge milling cutters
Sort by type and number of cutting edges									
Brand	SARA	SARA	SARA	SARA	SARA	SARA	SARA	SARA	ATORN
Main application	P K	P K	P K	P K	P K	M S	P K	P M	P M K
Secondary application	M	M	M	M	M	P	M S	K S	S N H
Number of cutting edges	4	4	4	4	4	4	4	4	3 / 4
Diameter range [mm]	3.0 - 25.0	3.0 - 25.0	5.0 - 20.0	3.0 - 25.0	3.0 - 25.0	2.0 - 20.0	3.0 - 20.0	3.0 - 20.0	3,0 - 20,0
Standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard
Version	short	Long	Extra-long	Long	Long	Long	Long	Long	HA-shank
Type / Profile	N / H	N / H	N / H	N / H	N / H	N / H	N / H	N / H	
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN
Article no.	254130....	254131....	254132....	254165....	254166....	254169....	254125....	254119....	254198/254194....
Catalogue page	**445**	**445**	**446**	**446**	**447**	**448**	**449**	**449**	**450/451**

	End milling cutter			Roughing cutter			Torus milling cutter	Radius milling cutter
Sort by type and number of cutting edges								
Brand	SARA	SARA	SARA	SARA	SARA	SARA	SARA	SARA
Main application	P M	P M	P M	P K	P K	P K	P K	P K
Secondary application	K	K S	K S	M	M	M	M	M
Number of cutting edges	4	4	4	4	4	4	4	4
Diameter range [mm]	6.0 - 20.0	3.0 - 25.0	3.0 - 25.0	4.0 - 20.0	4.0 - 20.0	6.0 - 20.0	4.0 - 20.0	3.0 - 20.0
Standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard	Factory standard
Version	Long	short	Long	short	Standard	Long		
Type / Profile	N / H	N / H	N / H	NF	NF	NF	NH	
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	AlTiN	AlTiN	AlTiN	AlTiN	AlTiN	AlTiN	TiAlN	TiAlN
Article no.	254140....	254134....	254136....	254141....	254137....	254142....	254139....	254138....
Catalogue page	**453**	**453**	**454**	**454**	**455**	**455**	**456**	**455**

SARA The 35 – 38° HPC series

INFO

The universal tool for all roughing and finishing work

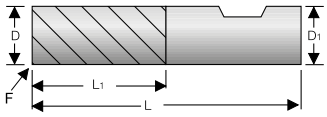
With irregular helix angle and an extremely high material removal rate

- Minimisation of vibration
- Better surface finish
- Protective chamfer F for increased service life
- Optional shank for greater cutting depths
- High-performance layer for high hot hardness and oxidation resistance
- Ideally suited for high performance cutting
- Short and long designs for machining steel, cast iron, stainless steel and titanium alloys



SARA® End milling cutters

VHM | NH | 35°-38° | h10 | h6 | Z 4 | TiAlN | HPC | Vc/fz | 739



- **Irregular helix angle and pitch for low-vibration milling**
- With protective chamfer F for improved service life
- Also suitable for dry machining

ISO P

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 125	● 110	● 70	○ 63	○ 63		● 120	● 120										
		Cutting speed Vc m/min.																	
		Please adjust these guidelines according to clamping operation and machine set-up.																	

Short



D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	6	54	6	0.10	4	0.008	0.009	254130 0030	
4.0	8	54	6	0.13	4	0.013	0.015	254130 0040	
5.0	9	54	6	0.18	4	0.021	0.025	254130 0050	
6.0	10	54	6	0.20	4	0.021	0.025	254130 0060	
7.0	12	58	8	0.20	4	0.027	0.032	254130 0070	
8.0	12	58	8	0.20	4	0.027	0.032	254130 0080	
9.0	14	66	10	0.30	4	0.027	0.032	254130 0090	
10.0	14	66	10	0.30	4	0.044	0.052	254130 0100	
11.0	16	73	12	0.30	4	0.044	0.052	254130 0110	
12.0	16	73	12	0.30	4	0.044	0.052	254130 0120	
13.0	18	75	14	0.30	4	0.044	0.052	254130 0130	
14.0	18	75	14	0.30	4	0.059	0.07	254130 0140	
16.0	22	82	16	0.40	4	0.059	0.07	254130 0160	
18.0	24	84	18	0.40	4	0.071	0.084	254130 0180	
20.0	26	92	20	0.50	4	0.071	0.084	254130 0200	
25.0	32	92	25	0.50	4	0.077	0.091	254130 0250	

2156

Long



D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	8	57	6	0.10	4	0.008	0.009	254131 0030	
4.0	11	57	6	0.13	4	0.013	0.015	254131 0040	
5.0	13	57	6	0.18	4	0.021	0.025	254131 0050	
6.0	13	57	6	0.20	4	0.021	0.025	254131 0060	
7.0	19	63	8	0.20	4	0.027	0.032	254131 0070	
8.0	19	63	8	0.20	4	0.027	0.032	254131 0080	
9.0	22	72	10	0.30	4	0.027	0.032	254131 0090	
10.0	22	72	10	0.30	4	0.044	0.052	254131 0100	
11.0	26	83	12	0.30	4	0.044	0.052	254131 0110	
12.0	26	83	12	0.30	4	0.044	0.052	254131 0120	
13.0	26	83	14	0.30	4	0.059	0.07	254131 0130	
14.0	26	83	14	0.30	4	0.059	0.07	254131 0140	
16.0	32	92	16	0.40	4	0.059	0.07	254131 0160	
18.0	32	92	18	0.40	4	0.071	0.084	254131 0180	
20.0	38	104	20	0.50	4	0.071	0.084	254131 0200	
25.0	38	104	25	0.50	4	0.077	0.091	254131 0250	

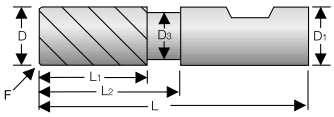
2156

SARA® End milling cutters

VHM | NH | 35°/-38° | Z 4 | TiAlN | HPC | Vc/fz | 740

- **With clearance**
- **Irregular helix angle and pitch for low-vibration milling**
- With protective chamfer F for improved service life
- Also suitable for dry machining

ISO P



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	○	○		●	●										
	Cutting speed Vc m/min.	100	73	50	50	50		103	103										
	Please adjust these guidelines according to clamping operation and machine set-up.																		

Extra-long



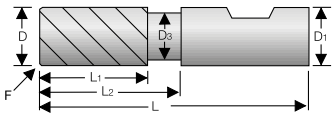
D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
5.0	21	27	63	4.7	6	0.18	4	0.021	0.025	254132 0050	
6.0	22	27	63	5.5	6	0.20	4	0.021	0.025	254132 0060	
8.0	28	40	80	7.5	8	0.20	4	0.027	0.032	254132 0080	
10.0	33	55	100	9.5	10	0.30	4	0.044	0.052	254132 0100	
12.0	42	55	100	11	12	0.30	4	0.044	0.052	254132 0120	
14.0	48	60	100	13	14	0.30	4	0.059	0.07	254132 0140	
16.0	53	67	150	15	16	0.40	4	0.059	0.07	254132 0160	
20.0	68	85	150	19	20	0.50	4	0.071	0.084	254132 0200	

SARA® End milling cutters

VHM | NH | 35°/-38° | h10 | h6 | Z 4 | TiAlN | HPC | Vc/fz | 740

- **With clearance**
- **Unequal helix angle and pitch for low-vibration milling**
- With protective chamfer F for improved service life
- Also suitable for dry machining

ISO P



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	○	○	○	●	●										
	Cutting speed Vc m/min.	125	110	70	65	65	55	120	120										
	Please adjust these guidelines according to clamping operation and machine set-up.																		

Standard version



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	8	12	54	2.8	6	0.10	4	0.008	0.009	254165 0030	
4.0	8	12	54	3.8	6	0.10	4	0.013	0.015	254165 0040	
5.0	10	15	54	4.7	6	0.15	4	0.021	0.025	254165 0050	
6.0	13	19	57	5.6	6	0.20	4	0.021	0.025	254165 0060	
7.0	19	27	57	6.7	8	0.20	4	0.027	0.032	254165 0070	
8.0	19	27	63	7.7	8	0.20	4	0.027	0.032	254165 0080	
9.0	22	32	72	8.7	10	0.20	4	0.027	0.032	254165 0090	
10.0	22	32	72	9.6	10	0.20	4	0.044	0.052	254165 0100	
11.0	26	38	83	10.6	12	0.20	4	0.044	0.052	254165 0110	
12.0	26	38	83	11.6	12	0.20	4	0.044	0.052	254165 0120	
13.0	26	38	83	12.6	14	0.30	4	0.059	0.07	254165 0130	
14.0	26	38	83	13.6	14	0.30	4	0.059	0.07	254165 0140	
16.0	32	44	92	15.6	16	0.30	4	0.059	0.07	254165 0160	
18.0	32	44	92	17.6	18	0.30	4	0.071	0.084	254165 0180	
20.0	38	50	104	19.6	20	0.30	4	0.071	0.084	254165 0200	
25.0	42	56	121	24.6	25	0.30	4	0.077	0.091	254165 0250	

extended cutting edge

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	10	15	57	2.8	6	0.10	4	0.009	0.008	254166 0030	
4.0	14	20	57	3.8	6	0.10	4	0.015	0.013	254166 0040	
5.0	16	21	57	4.7	6	0.15	4	0.025	0.021	254166 0050	
6.0	18	21	57	5.6	6	0.20	4	0.025	0.021	254166 0060	
8.0	22	32	63	7.7	8	0.20	4	0.032	0.027	254166 0080	
10.0	27	38	72	9.6	10	0.20	4	0.052	0.044	254166 0100	
11.0	30	38	83	10.6	12	0.20	4	0.052	0.044	254166 0110	
12.0	30	38	83	11.6	12	0.20	4	0.052	0.044	254166 0120	
13.0	30	38	83	12.6	14	0.30	4	0.07	0.059	254166 0130	
14.0	30	38	83	13.6	14	0.30	4	0.07	0.059	254166 0140	
16.0	37	44	92	15.6	16	0.30	4	0.07	0.059	254166 0160	
18.0	37	44	92	17.6	18	0.30	4	0.084	0.071	254166 0180	
20.0	42	54	104	19.6	20	0.30	4	0.084	0.071	254166 0200	

2156



WHEN YOUR
TOOL FINDER WORKS
FASTER THAN YOU.
THIS IS POWER TO PRODUCE

- Time savings – no lengthy catalogue searches
- STEP and DFX data for your tool
- Download the cutting data as a PDF
- Immediate access to the online shop

Find the right tool now

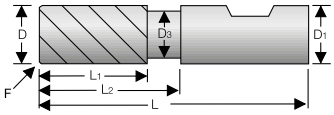
https://toolfinder.sartorius-werkzeuge.de/

SARA® End milling cutter stainless steel

VHM | 35° -38° | h10 | h6 | Z 4 | TiAlN | HPC | Vc/fz | 747

ISO M

- Special geometry for **stainless steel machining**
- **with exemption**
- **of unequal twist angles and pitch for low-vibration milling**
- also suitable for dry machining



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
					● 135	● 120	● 110			● 70	● 50	● 50							
	Cutting speed Vc m/min.							Please adjust these guidelines according to clamping operation and machine set-up.											

long with corner radius



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz stainless steel austenitic mm/tooth	Feed fz stainless steel austenitic mm/tooth	art.no.	€
2.0	5	11	57	1.9	6	0.20	4	0.012	0.006	254168 0020	
3.0	8	16	57	2.9	6	0.25	4	0.018	0.009	254168 0030	
4.0	8	19	57	3.8	6	0.25	4	0.024	0.012	254168 0040	
5.0	10	21	57	4.8	6	0.30	4	0.03	0.015	254168 0050	
6.0	13	23	57	5.8	6	0.50	4	0.032	0.018	254168 0060	
8.0	19	31	63	7.7	8	0.50	4	0.04	0.024	254168 0080	
10.0	22	33	72	9.7	10	0.50	4	0.05	0.03	254168 0100	
12.0	26	37	83	11.6	12	0.75	4	0.065	0.036	254168 0120	
16.0	32	44	92	15.5	16	1.0	4	0.08	0.048	254168 0160	
20.0	38	55	104	19.5	20	1.5	4	0.12	0.06	254168 0200	

2156

extended cutting edge with edge protection chamfer



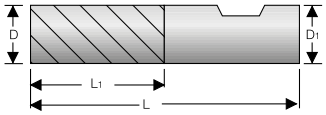
D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz stainless steel austenitic mm/tooth	Feed fz stainless steel austenitic mm/tooth	art.no.	€
2.0	8	12	57	1.9	6	0.08	4	0.012	0.006	254169 1020	
3.0	10	15	57	2	6	0.10	4	0.018	0.009	254169 1030	
4.0	14	20	57	2	6	0.10	4	0.024	0.012	254169 1040	
5.0	16	21	57	2	6	0.15	4	0.03	0.015	254169 1050	
6.0	18	21	57	2	6	0.20	4	0.032	0.018	254169 1060	
8.0	22	27	63	2	8	0.20	4	0.04	0.024	254169 1080	
10.0	27	32	72	2	10	0.20	4	0.05	0.03	254169 1100	
12.0	30	38	83	2	12	0.20	4	0.065	0.036	254169 1120	
16.0	37	44	92	2	16	0.30	4	0.08	0.048	254169 1160	
20.0	42	54	104	2	20	0.30	4	0.1	0.06	254169 1200	

2156

SARA® Basic Line end milling cutter

VHM | NH | 35° -38° | e8 | h5 | Z 4 | TiAlN | HPC | Vc/fz | 739

- **4 cutting edges, long,** 35°/38° right-hand cutting
- Irregular helix angle for vibration-free milling
- Eccentric relief grinding
- Straight shank in accordance with DIN 6535 HB
- **Cutting material: fine grain solid carbide**



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 190	● 150	● 110	○ 70	○ 60		● 100	● 150	○ 60	○ 60	○ 40							
	Cutting speed Vc m/min.							Please adjust these guidelines according to clamping operation and machine set-up.											

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	8	57	6.0	0.05	4	0.008	0.009	254125 0030	
3.5	10	57	6.0	0.05	4	0.010	0.013	254125 0035	
4.0	11	57	6.0	0.05	4	0.013	0.015	254125 0040	
4.5	11	57	6.0	0.07	4	0.016	0.020	254125 0045	
5.0	13	57	6.0	0.1	4	0.020	0.025	254125 0050	
6.0	13	57	6.0	0.1	4	0.020	0.025	254125 0060	
8.0	19	63	8.0	0.2	4	0.025	0.032	254125 0080	
10.0	22	72	10.0	0.25	4	0.030	0.052	254125 0100	
12.0	26	83	12.0	0.3	4	0.030	0.052	254125 0120	
14.0	26	83	14.0	0.35	4	0.035	0.060	254125 0140	
16.0	32	92	16.0	0.4	4	0.040	0.070	254125 0160	
18.0	32	92	18.0	0.45	4	0.050	0.080	254125 0180	
20.0	38	104	20.0	0.5	4	0.070	0.084	254125 0200	

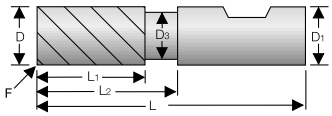
2148



SARA® Basic Line end milling cutter

VHM | NH | 35° -38° | h10 | h5 | Z 4 | TiAlN | HPC | Vc/fz | 740

- **4 cutting edges, long,** 35°/38° right-hand cutting
- **Irregular helix angle for vibration-free milling**
- With clearance
- Eccentric relief grinding
- Straight shank in accordance with DIN 6535 HB
- **Cutting material: fine grain solid carbide**



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 190	● 150	● 110	○ 70	○ 60		● 100	● 150	○ 60	○ 60	○ 40							
	Cutting speed Vc m/min.							Please adjust these guidelines according to clamping operation and machine set-up.											

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3	8	14	57	2.8	6.0	0.05	4	0.008	0.025	254119 0030	
4	11	16	57	3.8	6.0	0.05	4	0.013	0.025	254119 0040	
5	13	18	57	4.8	6.0	0.1	4	0.020	0.025	254119 0050	
6	13	19	57	5.7	6.0	0.1	4	0.020	0.025	254119 0060	
8	19	25	63	7.6	8.0	0.2	4	0.030	0.032	254119 0080	
10	22	30	72	9.5	10.0	0.25	4	0.030	0.052	254119 0100	
12	26	36	83	11.5	12.0	0.3	4	0.030	0.052	254119 0120	
14	26	36	83	13.5	14.0	0.35	4	0.035	0.07	254119 0140	
16	32	42	92	15.5	16.0	0.4	4	0.040	0.07	254119 0160	
18	32	42	92	17.5	18.0	0.45	4	0.050	0.075	254119 0180	
20	38	52	104	19.5	20.0	0.5	4	0.070	0.084	254119 0200	

2148



ATORN Carbide HPC drilling and plunge milling cutter

VHM | 41° 43° 45° | h10 | h6 | Z 3 | HPC

748

- **3 cutting edges** Ultrafine solid carbide milling cutter
- **Ramping, drilling, roughing and finishing** with just one tool
- Special face geometry allows for **ramps of up to 45°**
- **Uneven angle of twist** (41°, 43°, 45°) for extremely quiet running
- Defined edge protection chamfer for optimal tool life
- **With clearance**
- TiAlN-coated







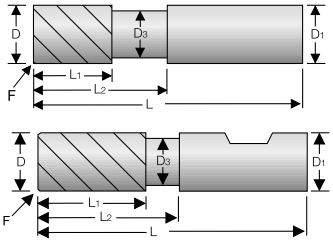
material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	● 350	● 300	● 235	● 125	● 120			● 200	○ 100	○ 25	○ 20	● 500	● 340	● 265		○ 180		

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

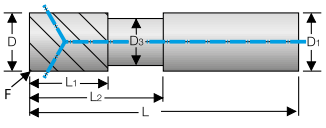
End milling cutter Z3 ●

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	HA art.no.	€	HB art.no.	€
3	8	15	57	2,8	6	0,05	3	0.02	254198 0030		254199 0030	
3,5	10	15	57	3,3	6	0,05	3	0.03	254198 0035		254199 0035	
3,7	11	15	57	3,5	6	0,06	3	0.03	254198 0037		254199 0037	
4	11	18	57	3,8	6	0,06	3	0.03	254198 0040		254199 0040	
4,5	11	18	57	4,3	6	0,07	3	0.04	254198 0045		254199 0045	
4,7	13	18	57	4,5	6	0,07	3	0.04	254198 0047		254199 0047	
5	13	18	57	4,8	6	0,08	3	0.04	254198 0050		254199 0050	
5,5	13	19,4	57	5,3	6	0,08	3	0.05	254198 0055		254199 0055	
5,7	13	19,6	57	5,5	6	0,09	3	0.05	254198 0057		254199 0057	
6	13	20	57	5,7	6	0,09	3	0.05	254198 0060		254199 0060	
6,5	16	24,4	63	6,2	8	0,10	3	0.05	254198 0065		254199 0065	
7	16	24,9	63	6,7	8	0,11	3	0.07	254198 0070		254199 0070	
7,5	19	25,3	63	7,2	8	0,11	3	0.07	254198 0075		254199 0075	
8	19	26	63	7,7	8	0,12	3	0.07	254198 0080		254199 0080	
8,5	19	29,4	72	8,2	10	0,13	3	0.07	254198 0085		254199 0085	
9	19	29,9	72	8,7	10	0,14	3	0.08	254198 0090		254199 0090	
9,5	22	30,3	72	9,2	10	0,14	3	0.08	254198 0095		254199 0095	
10	22	30	72	9,5	10	0,15	3	0.08	254198 0100		254199 0100	
12	26	36	83	11,5	12	0,18	3	0.10	254198 0120		254199 0120	
16	32	42	92	15,5	16	0,19	3	0.13	254198 0160		254199 0160	
20	38	52	104	19,5	20	0,24	3	0.14	254198 0200		254199 0200	
									2119		2119	



End milling cutter Z3 with internal cooling ●

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	HA art.no.	€	HB art.no.	€
6	13	20	57	5,7	6	0,09	3	0.05	254182 0060		254183 0060	
8	19	26	63	7,7	8	0,12	3	0.07	254182 0080		254183 0080	
10	22	30	72	9,5	10	0,15	3	0.08	254182 0100		254183 0100	
12	26	36	83	11,5	12	0,18	3	0.10	254182 0120		254183 0120	
16	32	42	92	15,5	16	0,19	3	0.13	254182 0160		254183 0160	
									2119		2119	



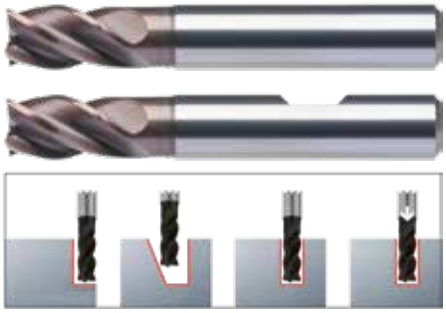
ATORN Carbide HPC drilling and plunge milling cutter

VHM | h10 | h6 | Z 4 | HPC

- **4 cutting edges** Ultra-fine solid carbide milling cutter
- **Ramping, drilling, roughing and finishing** with just one tool
- Special face geometry allows for **ramps of up to 45°**
- **Uneven helix angle** (41°, 43°, 45°) for extremely quiet running
- Defined edge protection chamfer for optimal tool life
- **With clearance**
- TiAlN-coated







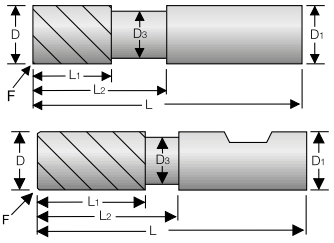
material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 350	● 300	● 235	● 125	● 120			● 200	○ 100	○ 25	○ 20	● 500	● 340	● 265		○ 180		
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

End milling cutter VHM Z4 short

● Feed fz steel < 1000 N/mm² mm/tooth

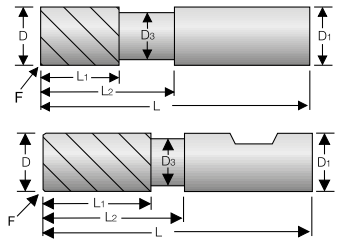
D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	HA art.no.	€	HB art.no.	€
3	5	12	50	2,8	6	0,03	4	0.02	254194 0030		254195 0030	
3,7	8	12	54	3,5	6	0,04	4	0.03	254194 0037		254195 0037	
4	8	15	54	3,8	6	0,04	4	0.03	254194 0040		254195 0040	
4,7	9	15	54	4,5	6	0,05	4	0.04	254194 0047		254195 0047	
5	9	15	54	4,8	6	0,05	4	0.04	254194 0050		254195 0050	
5,7	10	16,6	54	5,5	6	0,06	4	0.05	254194 0057		254195 0057	
6	10	17	54	5,7	6	0,06	4	0.05	254194 0060		254195 0060	
7	11	19,9	58	6,7	8	0,07	4	0.06	254194 0070		254195 0070	
7,7	12	20,5	58	7,4	8	0,08	4	0.07	254194 0077		254195 0077	
8	12	21	58	7,7	8	0,08	4	0.08	254194 0080		254195 0080	
9	13	23,9	66	8,7	10	0,09	4	0.08	254194 0090		254195 0090	
9,7	14	24,5	66	9,4	10	0,1	4	0.08	254194 0097		254195 0097	
10	14	24	66	9,5	10	0,1	4	0.08	254194 0100		254195 0100	
11,7	16	25,3	73	11,2	12	0,12	4	0.10	254194 0117		254195 0117	
12	16	26	73	11,5	12	0,12	4	0.10	254194 0120		254195 0120	
15,6	22	31,2	82	15,1	16	0,16	4	0.13	254194 0156		254195 0156	
16	22	32	82	15,5	16	0,16	4	0.13	254194 0160		254195 0160	
19	26	38,7	92	18,5	20	0,19	4	0.14	254194 0190		254195 0190	
20	26	40	92	19,5	20	0,2	4	0.14	254194 0200		254195 0200	
									2119		2119	



End milling cutter VHM Z4 long

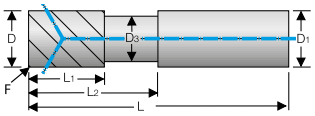
● Feed fz steel < 1000 N/mm² mm/tooth

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	HB art.no.	€	HA art.no.	€
4	11	18	57	3,8	6	0,04	4	0.03	254196 0040		254197 0040	
5	13	18	57	4,8	6	0,05	4	0.04	254196 0050		254197 0050	
5,7	13	19,6	57	5,5	6	0,06	4	0.05	254196 0057		254197 0057	
6	13	20	57	5,7	6	0,06	4	0.05	254196 0060		254197 0060	
7,7	19	25,5	63	7,4	8	0,08	4	0.07	254196 0077		254197 0077	
8	19	26	63	7,7	8	0,08	4	0.07	254196 0080		254197 0080	
9,7	22	30,5	72	9,4	10	0,1	4	0.08	254196 0097		254197 0097	
10	22	30	72	9,5	10	0,1	4	0.08	254196 0100		254197 0100	
11,7	26	35,3	83	11,2	12	0,12	4	0.10	254196 0117		254197 0117	
12	26	36	83	11,5	12	0,12	4	0.10	254196 0120		254197 0120	
13,7	26	35,3	83	13,2	14	0,14	4	0.11	254196 0137		254197 0137	
14	26	36	83	13,5	14	0,14	4	0.12	254196 0140		254197 0140	
15,6	32	41,2	92	15,1	16	0,16	4	0.13	254196 0156		254197 0156	
16	32	42	92	15,5	16	0,16	4	0.13	254196 0160		254197 0160	
19,5	38	51,1	104	19	20	0,2	4	0.14	254196 0195		254197 0195	
20	38	52	104	19,5	20	0,2	4	0.14	254196 0200		254197 0200	
									2119		2119	



End milling cutter Z4 with internal cooling

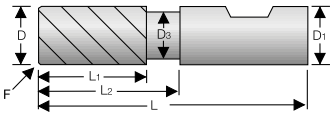
D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	HA art.no.	€	HB art.no.	€
6	13	20	57	5,7	6	0,06	4	0.05	254184 0060		254187 0060	
8	19	26	63	7,7	8	0,08	4	0.07	254184 0080		254187 0080	
10	22	30	72	9,5	10	0,1	4	0.08	254184 0100		254187 0100	
12	26	36	83	11,5	12	0,12	4	0.10	254184 0120		254187 0120	
16	32	42	92	15,5	16	0,16	4	0.13	254184 0160		254187 0160	
20	38	52	104	19,5	20	0,2	4	0.14	254184 0200		254187 0200	
25	45	63	121	24	25	0,25	4	0.15	254184 0250		254187 0250	
									2119		2119	



SARA® End milling cutters

VHM | NH | 35°-38° | h10 | h6 | Z 4 | AlTiN | HPC | Vc/fz | 740

- **With internal coolant supply**
- **Irregular helix angle and pitch for low-vibration milling**
- With protective chamfer F for improved service life



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 130	● 115	● 70	● 70	● 70	● 50	● 120	● 90										
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
6.0	13	57	6	0.20	4	0.021	0.025	254140 0060	
8.0	19	63	8	0.20	4	0.027	0.032	254140 0080	
10.0	22	72	10	0.30	4	0.044	0.052	254140 0100	
12.0	26	83	12	0.30	4	0.044	0.052	254140 0120	
16.0	32	92	16	0.40	4	0.059	0.07	254140 0160	
20.0	38	104	20	0.50	4	0.071	0.084	254140 0200	

2156



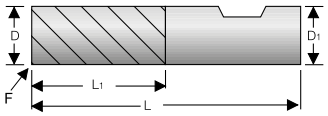
ISO M

SARA® Stainless steel end milling cutter

VHM | Typ N | 35°-38° | h10 | h6 | Z 4 | AlTiN | HPC | Vc/fz | 745

- **Irregular helix angle and pitch for low-vibration milling**
- With protective chamfer F for improved service life
- Specially designed for stainless steel machining

ISO M



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 135	● 95		● 55	● 55	● 40	○ 120	○ 90	● 35	● 35	● 30							
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		

Short

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	● Feed fz stainless steel austenitic mm/tooth	● Feed fz stainless steel austenitic mm/tooth	art.no.	€
3.0	6	54	6	0.10	4	0.008	0.009	254134 0030	
4.0	8	54	6	0.13	4	0.013	0.015	254134 0040	
5.0	9	54	6	0.18	4	0.021	0.025	254134 0050	
6.0	10	54	6	0.20	4	0.021	0.025	254134 0060	
8.0	12	58	8	0.20	4	0.027	0.032	254134 0080	
10.0	14	66	10	0.30	4	0.044	0.052	254134 0100	
12.0	16	73	12	0.30	4	0.044	0.052	254134 0120	
16.0	22	82	16	0.40	4	0.059	0.07	254134 0160	
20.0	26	92	20	0.50	4	0.071	0.084	254134 0200	

2156

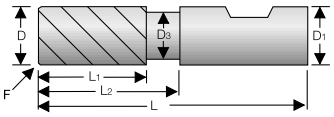


SARA® End milling cutters *Stainless steel*

VHM | Typ N | 35°-38° | h10 | h6 | Z 4 | AlTiN | HPC | Vc/fz | 745

- **With clearance**
- **Irregular helix angle and pitch for low-vibration milling**
- With protective chamfer F for improved service life
- Specially designed for stainless steel machining

ISO M



material — ● very well suited ○ well suited

steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
● 135	● 95		● 50	● 50	● 40	○ 120	○ 90	● 35	● 35	● 30							

Cutting speed Vc m/min. — Please adjust these guidelines according to clamping operation and machine set-up.



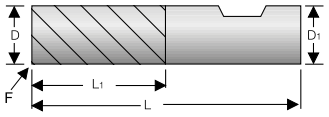
D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz stainless steel austenitic mm/tooth	Feed fz stainless steel austenitic mm/tooth	art.no.	€
3.0	8	18	57	2.8	6	0.13	4	0.008	0.009	254136 0030	
4.0	11	21	57	3.6	6	0.18	4	0.013	0.015	254136 0040	
5.0	13	21	57	4.6	6	0.20	4	0.021	0.025	254136 0050	
6.0	13	21	57	5.5	6	0.20	4	0.021	0.025	254136 0060	
8.0	19	27	63	7.5	8	0.20	4	0.027	0.032	254136 0080	
10.0	22	32	72	9.5	10	0.30	4	0.044	0.052	254136 0100	
12.0	26	38	83	11.5	12	0.30	4	0.044	0.052	254136 0120	
16.0	32	44	92	15.5	16	0.40	4	0.059	0.07	254136 0160	
20.0	38	54	104	19.5	20	0.50	4	0.071	0.084	254136 0200	

2156

SARA® Roughing cutter

VHM | NF | 35°-38° | h10 | h6 | Z 4 | AlTiN | HPC | Vc/fz | 751

- **Irregular helix angle for low-vibration milling**
- With protective chamfer F for improved service life
- Also suitable for dry machining
- High material removal rate



material — ● very well suited ○ well suited

steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
● 140	● 90	● 55	○ 55	○ 55	○ 40	● 110	● 60										

Cutting speed Vc m/min. — Please adjust these guidelines according to clamping operation and machine set-up.

Short



D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
4.0	6	54	6	0.13	4	0.013	0.015	254141 0040	
5.0	8	54	6	0.15	4	0.021	0.025	254141 0050	
6.0	10	54	6	0.20	4	0.021	0.025	254141 0060	
8.0	12	58	8	0.20	4	0.027	0.032	254141 0080	
10.0	14	66	10	0.30	4	0.044	0.052	254141 0100	
12.0	16	73	12	0.30	4	0.044	0.052	254141 0120	
14.0	18	75	14	0.30	4	0.059	0.07	254141 0140	
16.0	22	82	16	0.40	4	0.059	0.07	254141 0160	
20.0	26	92	20	0.50	4	0.071	0.084	254141 0200	

2156

Standard

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
5.0	13	57	6	0.18	4	0.044	0.025	254137 0050	
6.0	13	57	6	0.20	4	0.059	0.025	254137 0060	
8.0	19	63	8	0.20	4	0.059	0.032	254137 0080	
10.0	22	72	10	0.30	4	0.071	0.052	254137 0100	
12.0	26	83	12	0.30	4	0.021	0.052	254137 0120	
14.0	26	83	14	0.30	4	0.027	0.070	254137 0140	
16.0	32	92	16	0.40	4	0.044	0.070	254137 0160	
20.0	38	104	20	0.50	4	0.044	0.084	254137 0200	

2156





Extra-long

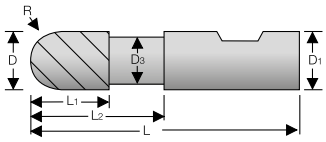
D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
6.0	24	68	6	0.3	4	0.021	0.025	254142 0060	
8.0	38	88	8	0.3	4	0.027	0.032	254142 0080	
10.0	45	95	10	0.4	4	0.044	0.052	254142 0100	
12.0	53	110	12	0.5	4	0.044	0.052	254142 0120	
16.0	63	123	16	0.6	4	0.059	0.07	254142 0160	
20.0	75	141	20	0.6	4	0.071	0.084	254142 0200	

2156

SARA® Radius milling cutter

VHM | 35° -38° | h10 | h6 | Z 4 | TiAlN | HPC | Vc/fz | 753

- **Irregular helix angle for low-vibration milling**
- Also suitable for dry machining



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 500	● 300	● 225				● 500	● 450								○ 120		
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		

D mm	L1 mm	L mm	L2 mm	D1 mm	R mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	8	57	18	6	1.50	4	0.011	254138 0030	
4.0	10	57	21	6	2.00	4	0.035	254138 0040	
5.0	13	57	21	6	2.50	4	0.035	254138 0050	
6.0	13	57	21	6	3.0	4	0.045	254138 0060	
8.0	16	63	27	8	4.0	4	0.055	254138 0080	
10.0	22	72	32	10	5.0	4	0.065	254138 0100	
12.0	26	83	38	12	6.0	4	0.065	254138 0120	
14.0	26	83	38	14	7.0	4	0.09	254138 0140	
16.0	32	92	44	16	8.0	4	0.09	254138 0160	
20.0	38	104	54	20	10.0	4	0.12	254138 0200	

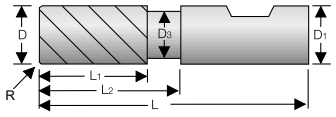
2156



SARA® Torus milling cutter

VHM | NH | 35°-38° | h10 | h6 | Z 4 | TiAlN | HPC | Vc/fz | 740

- **Irregular helix angle for low-vibration milling**
- Also suitable for dry machining



material	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
● very well suited ○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	● 125	● 110	● 65	○ 45	○ 45		● 115	● 85								● 50	● 35	
Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
4.0	11	21	57	3.7	6	0.25	4	0.013	0.015	254139 0402	
4.0	11	21	57	3.7	6	0.50	4	0.013	0.015	254139 0405	
4.0	11	21	57	3.7	6	1.00	4	0.013	0.015	254139 0410	
5.0	13	21	57	4.7	6	0.50	4	0.021	0.025	254139 0505	
5.0	13	21	57	4.7	6	1.00	4	0.021	0.025	254139 0510	
5.0	13	21	57	4.7	6	1.50	4	0.021	0.025	254139 0515	
6.0	13	21	57	5.5	6	0.50	4	0.021	0.025	254139 0605	
6.0	13	21	57	5.5	6	1.00	4	0.021	0.025	254139 0610	
6.0	13	21	57	5.5	6	1.50	4	0.021	0.025	254139 0615	
6.0	13	21	57	5.5	6	2.00	4	0.021	0.025	254139 0620	
8.0	19	27	63	7.5	8	0.50	4	0.027	0.032	254139 0805	
8.0	19	27	63	7.5	8	1.00	4	0.027	0.032	254139 0810	
8.0	19	27	63	7.5	8	1.50	4	0.027	0.032	254139 0815	
8.0	19	27	63	7.5	8	2.00	4	0.027	0.032	254139 0820	
10.0	22	32	72	9.5	10	0.50	4	0.044	0.052	254139 1005	
10.0	22	32	72	9.5	10	1.00	4	0.044	0.052	254139 1010	
10.0	22	32	72	9.5	10	1.50	4	0.044	0.052	254139 1015	
10.0	22	32	72	9.5	10	2.00	4	0.044	0.052	254139 1020	
12.0	26	38	83	11	12	0.50	4	0.044	0.052	254139 1205	
12.0	26	38	83	11	12	1.00	4	0.044	0.052	254139 1210	
12.0	26	38	83	11	12	1.50	4	0.044	0.052	254139 1215	
12.0	26	38	83	11	12	2.00	4	0.044	0.052	254139 1220	
16.0	32	44	92	15	16	1.00	4	0.059	0.07	254139 1610	
16.0	32	44	92	15	16	1.50	4	0.059	0.07	254139 1615	
16.0	32	44	92	15	16	2.00	4	0.059	0.07	254139 1620	
16.0	32	44	92	15	16	2.50	4	0.059	0.07	254139 1625	
18.0	32	44	92	17	18	1.50	4	0.071	0.084	254139 1815	
18.0	32	44	92	17	18	2.50	4	0.071	0.084	254139 1825	
20.0	38	54	104	19	20	1.00	4	0.071	0.084	254139 2010	
20.0	38	54	104	19	20	1.50	4	0.071	0.084	254139 2015	
20.0	38	54	104	19	20	2.00	4	0.071	0.084	254139 2020	
20.0	38	54	104	19	20	2.50	4	0.071	0.084	254139 2025	
20.0	38	54	104	19	20	3.00	4	0.071	0.084	254139 2030	
20.0	38	54	104	19	20	4.00	4	0.071	0.084	254139 2040	
20.0	38	54	104	19	20	5.00	4	0.071	0.084	254139 2050	

2156

The advantages of trochoidal milling

High chip volume
In conventional full-cut groove milling, the wrap angle is 180 degrees. In trochoidal milling, the angle can be limited to less than 90 degrees depending on the spiral feed. This is made possible with a milling cutter that has a smaller diameter and is used trochoidally at an increased speed.

Lower machine load
The horizontal infeed takes place in loops along a centre path. The chip cross-section at the cutting edge is relatively the same in trochoidal milling and is independent of horizontal changes in milling direction. This results in a lower load on the machine and tool, which allows higher cutting values to be achieved.

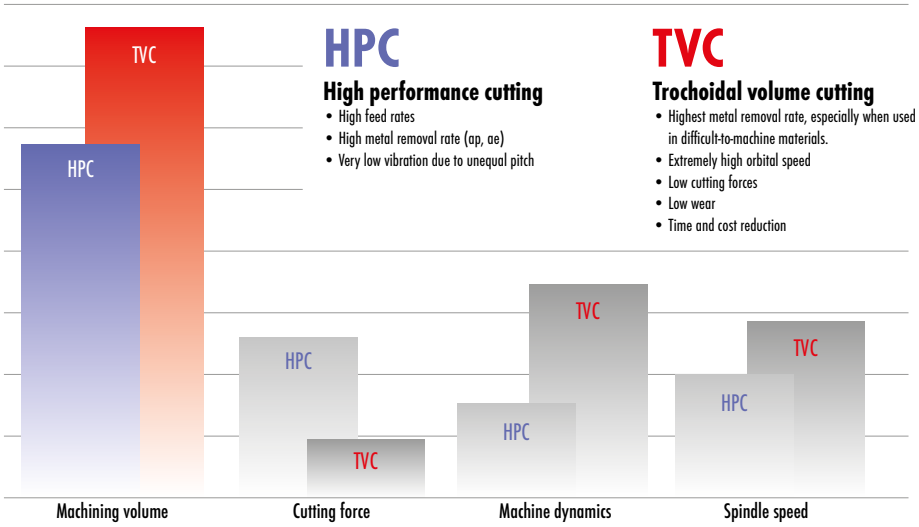
Higher cutting depths (lower heat generation)
In conventional milling, a max. milling depth of 1 x D to 1.5 x D is common. In trochoidal milling, cutting depths of up to 5 x D can be achieved by bypassing the full cut even without specially developed cutters.

Shorter machining times
Trochoidal milling allows machining with a large cutting depth and high cutting speed and accelerates roughing. For the user, this means shorter machining times, better tool utilisation and noticeably less tool wear. Because different groove widths or pocket sizes can be produced with only one tool, the tool has to be changed less often.

Up to 10 times longer tool life!
Scientific analyses have shown that the tool life has more than just a positive effect on the milling tools. This is also clear and quite simple to explain. Whereas with conventional milling you could only add 10 mm in depth, and the milling cutter was therefore extremely stressed in this lower 10 mm range and also subject to wearing out there, the entire wear process is now shifted to almost the full cutting depth of the milling cutter.

Lower cutting edge load on the tool
As a result, the cutting edge load is considerably lower. This also avoids unsightly break-outs on the milling cutter at the most frequently used "depth edge" of the cutting edges, which can result in unsightly longitudinal grooves in the milled surface.

All the advantages mentioned are extremely noticeable, especially with smaller CNC machines – and in this day and age they are almost a compulsory "MUST" for anyone who wants to work more efficiently and with less strain on the machine and tools.



Overview TVC series

INFO

	Trochoidal milling cutter			
				
Brand	ATORN	ATORN	SARA	ATORN
ISO application area	P	M	P M S H	N
Number of cutting edges	5	5	5	4
Diameter range [mm]	6-20	6-20	6-25	4-20
Standard	WN	WN	WN	WN
Version	N	N	N	WN
Type / Profile	TVC	TVC	TVC	TVC
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	AlTiN	TiAlSiN	AlCrN	
Article no.	254155....	254157....	254117....	254159....
Catalogue page	**458**	**459**	**461**	**461**

ATORN Trochoidal end milling cutter (steel)

VHM | Typ N | 10° γ | 45° γ | h10 | h6 | Z 5 | Z 4 | AlTiN | TVC | Vc/fz

777

- With clearance
- **Milling cutter designed for TVC use**
- Reinforced core
- With chip breaker
- **Cutting material: superfine grain solid carbide**
- Rounded chip space for improved chip removal
- **ae max. 20 %**

Trochoidal

ISO P

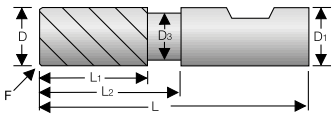


material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 270	● 250	● 220					● 170										
		Cutting speed Vc m/min.			Please adjust these guidelines according to clamping operation and machine set-up.														

3 x D

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
6	19	21	62	5.7	6	0.12	5	0.05	254155 0060	
8	26	28	68	7.7	8	0.16	5	0.065	254155 0080	
10	32	35	80	9.7	10	0.2	5	0.080	254155 0100	
12	38	42	93	11.7	12	0.24	5	0.095	254155 0120	
16	50	56	108	15.7	16	0.32	5	0.13	254155 0160	
20	62	70	126	19.7	20	0.4	5	0.16	254155 0200	

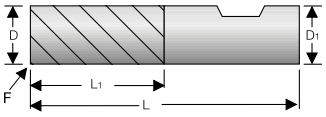
2153



4 x D

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
6	25	70	6	0.12	4	0.05	254156 0060	
8	34	80	8	0.16	4	0.065	254156 0080	
10	42	95	10	0.2	4	0.080	254156 0100	
12	50	105	12	0.24	4	0.095	254156 0120	
16	66	125	16	0.32	4	0.13	254156 0160	

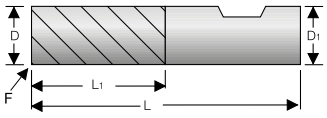
2153



4 x D Z5

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
6	25	70	6	0,12	5	0.06	254180 0060	
8	34	80	8	0,16	5	0.07	254180 0080	
10	42	95	10	0,2	5	0.08	254180 0100	
12	50	105	12	0,24	5	0.095	254180 0120	
16	66	125	16	0,32	5	0.14	254180 0160	
20	82	145	20	0,4	5	0.16	254180 0200	

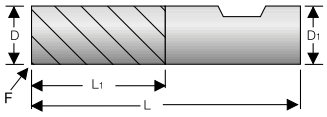
2153



5 x D Z5

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
6	32	72	6	0,12	5	0.06	254181 0060	
8	42	83	8	0,16	5	0.07	254181 0080	
10	52	100	10	0,2	5	0.085	254181 0100	
12	62	110	12	0,24	5	0.095	254181 0120	
16	82	140	16	0,32	5	0.14	254181 0160	
20	102	165	20	0,4	5	0.16	254181 0200	

2153



ATORN Trochoidal end milling cutter (stainless steel)

VHM | Typ VA | 40° | h10 | h6 | Z 5 | Z 4 | TiAlSiN | TVC | Vc/fz | 775

- With clearance
- **Milling cutter designed for TVC use**
- Reinforced core
- With chip breaker
- **Cutting material: superfine grain solid carbide**
- Irregular tooth pitch for a strong head centre
- **ae max. 15 %**

Trochoidal

ISO M

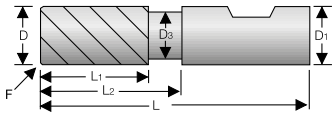


material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	254157....				140	100	75			60	50	40							
	254158....				140	100	75			60	50	40							
	254185....				140	100	75			60	50	40							
	254186....				140	100	75			60	50	40							
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		

3 x D

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz stainless steel ferrit./martens. mm/tooth	art.no.	€
6	19	21	62	5.7	6	0.12	5	0.050	254157 0060	
8	26	28	68	7.7	8	0.16	5	0.065	254157 0080	
10	32	35	80	9.7	10	0.2	5	0.080	254157 0100	
12	38	42	93	11.7	12	0.24	5	0.095	254157 0120	
16	50	56	108	15.7	16	0.32	5	0.13	254157 0160	
20	62	70	126	19.7	20	0.4	5	0.16	254157 0200	

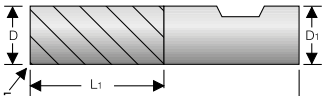
2153



4 x D

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	Feed fz stainless steel ferrit./martens. mm/tooth	art.no.	€
6	25	70	6	0.12	4	0.050	254158 0060	
8	34	80	8	0.16	4	0.065	254158 0080	
10	42	95	10	0.2	4	0.080	254158 0100	
12	50	105	12	0.24	4	0.095	254158 0120	
16	66	125	16	0.32	4	0.13	254158 0160	

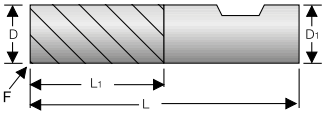
2153



4 x D Z5

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	Feed fz stainless steel austenitic mm/tooth	art.no.	€
6	25	70	6	0,12	5	0.05	254185 0060	
8	34	80	8	0,16	5	0.065	254185 0080	
10	42	95	10	0,2	5	0.08	254185 0100	
12	50	105	12	0,24	5	0.095	254185 0120	
16	66	125	16	0,32	5	0.13	254185 0160	
20	82	145	20	0,4	5	0.16	254185 0200	

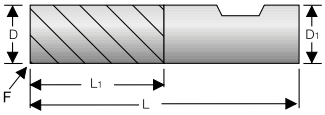
2153



5 x D Z5

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	Feed fz stainless steel austenitic mm/tooth	art.no.	€
6	32	72	6	0,12	5	0.06	254186 0060	
8	42	83	8	0,16	5	0.07	254186 0080	
10	52	100	10	0,2	5	0.09	254186 0100	
12	62	110	12	0,24	5	0.11	254186 0120	
16	82	140	16	0,32	5	0.15	254186 0160	
20	102	165	20	0,4	5	0.17	254186 0200	

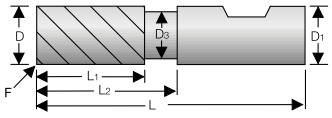
2153



SARA® Trochoidal milling cutter *Basic Line*

VHM | 42° | e8 | h5 | Z 5 | AlCrN | Vc/fz | 746

- With clearance
- **Milling cutter designed for TVC use**
- Reinforced core
- With chip breaker
- **Cutting material: superfine grain solid carbide**
- Irregular tooth pitch for a strong head centre
- **ae steel max. 20 %**
- **ae stainless steel max. 15 %**
- **fz based on 0.1xD**



material: ● very well suited ○ well suited

steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
● 300	● 250	● 210	● 170	● 190				○ 130	○ 80						○ 100	○ 90	

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
6.0	18	24	62	5.7	6.0	0.12	5	0.03	254117 0060	
8.0	24	30	68	7.6	8.0	0.16	5	0.04	254117 0080	
10.0	30	38	80	9.5	10.0	0.20	5	0.05	254117 0100	
12.0	36	46	93	11.5	12.0	0.24	5	0.06	254117 0120	
14.0	42	50	100	13.5	14.0	0.28	5	0.07	254117 0140	
16.0	48	58	108	15.5	16.0	0.32	5	0.08	254117 0160	
18.0	54	67	115	17.5	18.0	0.36	5	0.09	254117 0180	
20.0	60	74	126	19.5	20.0	0.40	5	0.10	254117 0200	
25.0	75	92	150	24.0	25.0	0.50	5	0.13	254117 0250	

2148

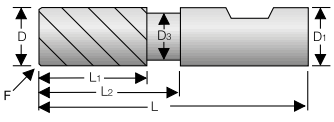
ATORN Trochoidal end milling cutter (aluminium)

VHM | Typ W | 20° | e8 | h5 | Z 4 | TVC | Vc/fz | 777

- With clearance
- **Milling cutter designed for TVC use**
- Reinforced core
- **Cutting material: superfine grain solid carbide**
- Polished cutting edges for perfect chip removal
- **ae max. 30 %**

Trochoidal

ISO N



material: ● very well suited ○ well suited

steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
											● 400	● 600					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
4	13	14.0	62	3.8	6	0.08	4	0.06	254159 0040	
5	16	17.5	62	4.8	6	0.1	4	0.08	254159 0050	
6	19	21.0	62	5.8	6	0.12	4	0.1	254159 0060	
8	26	28.0	68	7.8	8	0.16	4	0.12	254159 0080	
10	32	35.0	80	9.8	10	0.2	4	0.15	254159 0100	
12	38	42.0	93	11.8	12	0.24	4	0.17	254159 0120	
16	50	56.0	108	15.8	16	0.32	4	0.20	254159 0160	
20	62	70.0	126	19.8	20	0.4	4	0.25	254159 0200	

2153

The ULTRA-N high-speed milling range for the milling of aluminium

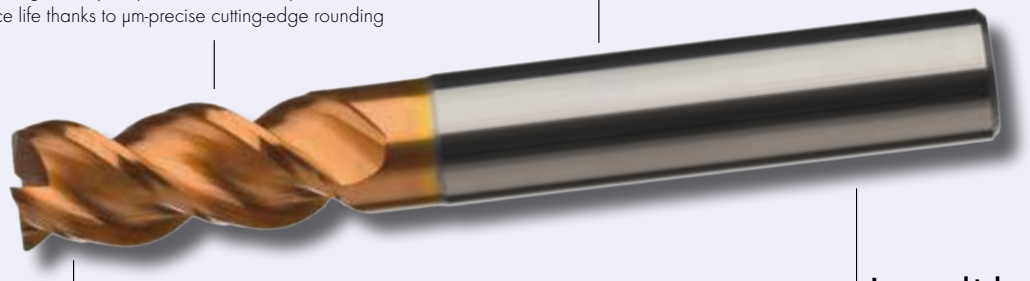
With the new ATORN range. Sartorius offers a complete milling range for machining aluminium.
The ATORN milling program ULTRA-N sets technical benchmarks here:

- extremely soft cut. optimum chip removal and excellent running smoothness
- short processing times thanks to high usage parameters
- excellent surface quality
- no or minimal burr formation
- Precision thanks to low manufacturing tolerances
- coating specially designed for machining aluminium



Tool geometry
An optimal cutting-, micro- and chip-space geometry is particularly crucial in aluminium machining. Based on numerous machining tests, the geometries have been revised and adapted perfectly to the requirements of aluminium machining:
- maximum core diameter for high stability
- special cutting geometry to reduce cutting pressure
- optimal chip-space geometry for process-reliable chip removal
- Increased service life thanks to µm-precise cutting-edge rounding

Wear-resistant carbide metal
The basic substrate consists of H10F fine-grade solid carbide for aluminium with a grain size of 0.6 - 0.8 µm. This substrate is especially wear-resistant, hard and resistant to pressure.
It can best withstand the dynamic and mechanical loads to be encountered. This is particularly important in the event of vibrations, which can easily lead to chunking on the cutting edge.



Defined cutting-edge rounding
The basic aim of a cutting-edge rounding is to increase the service life of the tool and of the cutting edge. In the cutting tool grinding process, the cutting edge loses its definition due to micro-fractures (chunking). Through a defined honing, a process environment can be achieved at an early stage; that is, grinding-related points are removed and the risk of comb cracks minimised.

Conventional methods for the cutting edge rounding had the disadvantage that they were unable to create a reproducible and even honing of the cutting edge. The new technology allows optimum process control and reproducibility. With it, a uniform, µm-precise honing of the cutting edge and face can be achieved. This has a positive effect on the quality and service life of the tools and significantly improves your workpiece surfaces.

Improved tolerances
Precision produces quality: one reason why this new generation of tools is manufactured to tighter tolerances. Basically, all shanks are made in h5 quality and all cutting edges in g7 quality.

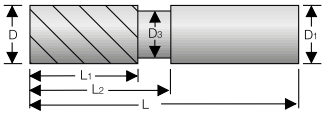
Overview of the range	Z	Ultra-N	stan-dard	short	long	extra long	HA	HB	Ø-area mm	Page
Solid carbide, single cutting edge end milling cutter	1		●				●		Ø 1,5 - 16	464
Solid carbide mini end milling cutters	2		●				●		Ø 0,5 - 2,5	465
Solid carbide slot drills	2		●				●	●	Ø 3 - 20	466
Solid carbide end milling cutters	3			●			●	●	Ø 3 - 20	468
					●		●		Ø 3 - 20	468
Solid carbide end milling cutter with edge protection F	3			●			●	●	Ø 3 - 20	469
					●		●		Ø 3 - 20	470
Solid carbide end milling cutter with internal cooling	3			●			●		Ø 4 - 16	472
Solid carbide end milling cutters with edge protection F	4			●			●	●	Ø 3 - 20	471
					●		●		Ø 4 - 16	471
						●	●		Ø 6 - 16	471
Solid carbide end milling cutters HPC with edge protection F Unequal helix angle 35 ° - 38 °	4			●			●		Ø 3 - 20	470
					●		●		Ø 4 - 20	470
Solid carbide end milling cutter with internal cooling and face chip breaker	4		●				●		Ø 6 - 20	473
Solid carbide roughing cutters	3		●				●	●	Ø 6 - 20	474
Solid carbide roughing cutter with internal cooling	3			●			●		Ø 6 - 20	473
Solid carbide mini-torus cutter	2		●				●		Ø 0,5 - 2,5	475
Solid carbide torus cutters	2			●			●		Ø 3 - 16	476
					●		●		Ø 3 - 16	476
						●	●		Ø 6 - 16	477
Solid carbide torus cutters	3		●				●	●	Ø 5 - 20	477
Solid carbide mini-radius milling cutter	2		●				●		Ø 0,5 - 2,5	478
Solid carbide radius milling cutters	2			●			●		Ø 3 - 16	479
					●		●		Ø 3 - 16	479
						●	●		Ø 3 - 12	479

material	● very well suited ○ nagyon alkalmas	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													●	●	●	●			

ATORN **Ultra-N single-blade end milling cutter**

VHM | Typ W | 30° | h9 | h5 | Z 1 | Vc/fz | 754

- **With clearance**
- **With defined cutting edge rounding**
- **Polished version, sharp-edged, ground**
- For non-ferrous materials
- Cutting material: superfine grain solid carbide, uncoated with **mirror finish / polished version**
- Large chip space for unhindered chip removal



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	249100....												● 425	● 200	● 190	● 275			
	249700....												● 200	● 425	● 250	● 275			
	Cutting speed Vc m/min.												Please adjust these guidelines according to clamping operation and machine set-up.						

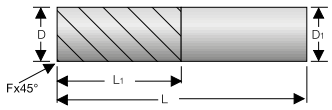
D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	Mirror finish art.no.	€	Polished art.no.	€
1.5	6	50	22.0	1.45	3	1	0.0175	0.025	249100 0015		249700 0015	
2	8	50	22.0	1.8	3	1	0.02555	0.0365	249100 0020		249700 0020	
3	12	50	22.0	2.8	3	1	0.04025	0.0575	249100 0030		249700 0030	
4	15	57	29.0	3.8	4	1	0.0455	0.065	249100 0040		249700 0040	
5	17	60	32.0	4.8	5	1	0.056	0.08	249100 0050		249700 0050	
6	20	64	28.0	5.8	6	1	0.06825	0.0975	249100 0060		249700 0060	
8	24	64	28.0	7.8	8	1	0.08225	0.1175	249100 0080		249700 0080	
10	25	73	33.0	9.7	10	1	0.091	0.13	249100 0100		249700 0100	
12	32	84	39.0	11.7	12	1	0.105	0.15	249100 0120		249700 0120	
16	38	93	45.0	15.7	16	1	0.1155	0.165	249100 0160		249700 0160	
									2149		2149	



VAN HOORN CARBIDE **Single-blade end milling cutter**

VHM | 30° | e8 | h5 | Z 1 | HSC | Vc/fz | 754

- **Especially for machining non-ferrous materials**



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													● 250	● 175	○ 150				
	Cutting speed Vc m/min.												Please adjust these guidelines according to clamping operation and machine set-up.						

D mm	D1 mm	L1 mm	L mm	F x 45° mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
0.6	3	3	38	-	1	0.00875	0.0125	250001 0006	
0.8	3	4	38	-	1	0.0112	0.016	250001 0008	
1.0	3	5	38	-	1	0.01225	0.0175	250001 0010	
1.2	3	5	38	-	1	0.01435	0.0205	250001 0012	
1.5	3	5	38	-	1	0.0175	0.025	250001 0015	
1.6	3	6	38	-	1	0.01995	0.0285	250001 0016	
1.8	3	7	38	-	1	0.02205	0.0315	250001 0018	
2.0	3	8	38	-	1	0.02765	0.0395	250001 0020	
2.5	3	9	38	-	1	0.0329	0.047	250001 0025	
3.0	3	12	38	0.10	1	0.04025	0.0575	250001 0030	
4.0	4	12	50	0.10	1	0.0455	0.065	250001 0040	
5.0	5	15	50	0.15	1	0.056	0.08	250001 0050	
6.0	6	16	50	0.20	1	0.06825	0.0975	250001 0060	
7.0	7	20	60	0.20	1	0.07525	0.1075	250001 0070	
8.0	8	20	60	0.25	1	0.08575	0.1225	250001 0080	
10.0	10	22	70	0.30	1	0.105	0.15	250001 0100	
12.0	12	25	75	0.35	1	0.1295	0.185	250001 0120	
								2112	



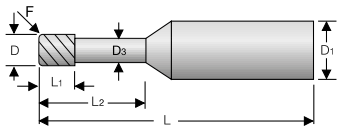
Also very good for synthetic materials

ISO N

ATORN Ultra-N mini end milling cutter

VHM | Typ W | 30° | h9 | h5 | Z 2 | ZrCN | Vc/fz | 755

ISO N



- **With clearance**
- **2 cutting edges, with edge chamfer F**
- **With defined cutting edge rounding from Ø 1.5 mm**
- Long-necked version for non-ferrous materials
- Cutting edge tolerance 0/-0.015 mm
- Cutting material: superfine grain solid carbide, **ZrCN Ultra-N**-coated

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													● 450	● 280	● 230				
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		



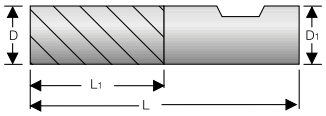
D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F x 45° mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
0.5	0.9	55	4.0	0.48	4	0.05	2	0.012	249001 0504	
0.5	0.9	65	6.0	0.48	4	0.05	2	0.012	249001 0506	
0.5	0.9	65	10.0	0.48	4	0.05	2	0.012	249001 0510	
1	1.5	55	5.0	0.95	4	0.1	2	0.021	249001 1005	
1	1.5	65	10.0	0.95	4	0.1	2	0.021	249001 1010	
1	1.5	65	15.0	0.95	4	0.1	2	0.021	249001 1015	
1.5	1.8	55	8.0	1.44	4	0.1	2	0.033	249001 1508	
1.5	1.8	65	15.0	1.44	4	0.1	2	0.033	249001 1515	
1.5	1.8	65	20.0	1.44	4	0.1	2	0.033	249001 1520	
2	2	55	10.0	1.92	4	0.1	2	0.043	249001 2010	
2	2	65	20.0	1.92	4	0.1	2	0.043	249001 2020	
2.5	2.5	55	12.0	2.4	4	0.1	2	0.050	249001 2512	
2.5	2.5	65	20.0	2.4	4	0.1	2	0.050	249001 2520	

2149

SARA® Basic Line end milling cutter

VHM | 45° | e8 | h5 | Z 2 | Vc/fz | 756

ISO N



- **2 cutting edges, long,** 45° right-hand cutting
- Eccentric relief grinding
- **Cutting material: superfine grain solid carbide**

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													● 160	● 220	● 160				
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		



D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3.0	8	57	6.0	0.05	2	0.010	0.020	251520 0030	
4.0	11	57	6.0	0.05	2	0.013	0.027	251520 0040	
5.0	13	57	6.0	0.05	2	0.017	0.033	251520 0050	
6.0	13	57	6.0	0.06	2	0.020	0.040	251520 0060	
8.0	19	63	8.0	0.08	2	0.027	0.053	251520 0080	
10.0	22	72	10.0	0.10	2	0.033	0.069	251520 0100	
12.0	26	83	12.0	0.12	2	0.040	0.080	251520 0120	
14.0	26	83	14.0	0.14	2	0.047	0.093	251520 0140	
16.0	32	92	16.0	0.16	2	0.053	0.170	251520 0160	
20.0	38	104	20.0	0.2	2	0.067	0.133	251520 0200	

2148

ATORN **Ultra-N slot drill**

VHM | Typ W | 45° | h9 | h5 | Z 2 | ZrCN | Vc/fz | 756

ISO N

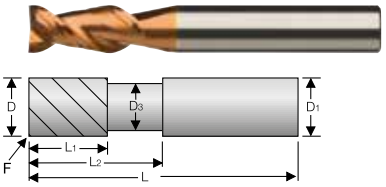
- **With clearance**
- **2 cutting edges, with edge chamfer F**
- **With defined cutting edge rounding**
- **Polished version, sharp-edged, ground**
- For non-ferrous materials
- Cutting material: superfine grain solid carbide, uncoated with **mirror finish / polished version**
- Cutting material: superfine grain solid carbide, **ZrCN Ultra-N** coated

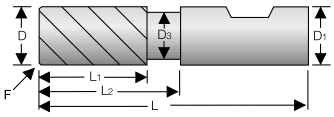
material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													● 425	● 200	● 190				
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

Standard

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz aluminium < 8 % Si mm/tooth	Straight shank HA ZrCN art.no.	€
3	8	57	18	2.9	6	0.1	2	0.045	249201 0030	
4	11	57	18	3.9	6	0.1	2	0.053	249201 0040	
5	13	57	20	4.9	6	0.1	2	0.060	249201 0050	
6	13	57	20	5.8	6	0.1	2	0.068	249201 0060	
8	19	63	26	7.8	8	0.1	2	0.075	249201 0080	
10	22	72	29	9.7	10	0.2	2	0.085	249201 0100	
12	26	83	36	11.7	12	0.2	2	0.095	249201 0120	
16	32	92	42	15.7	16	0.2	2	0.110	249201 0160	
									2149	







Standard with driving plane

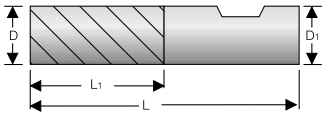
D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	Z	Feed fz aluminium < 8 % Si mm/tooth	Mirror finish DIN 6535-HB art.no.	€	Straight shank HB polished art.no.	€	Straight shank HB ZrCN art.no.	€
3	8	57	18	2.9	6	2	0.045	249200 0030		249207 0030		249202 0030	
4	11	57	18	3.9	6	2	0.053	249200 0040		249207 0040		249202 0040	
5	13	57	20	4.9	6	2	0.060	249200 0050		249207 0050		249202 0050	
6	13	57	20	5.8	6	2	0.068	249200 0060		249207 0060		249202 0060	
8	19	63	26	7.8	8	2	0.075	249200 0080		249207 0080		249202 0080	
10	22	72	29	9.7	10	2	0.085	249200 0100		249207 0100		249202 0100	
12	26	83	36	11.7	12	2	0.095	249200 0120		249207 0120		249202 0120	
16	32	92	42	15.7	16	2	0.110	249200 0160		249207 0160		249202 0160	
20	38	104	52	19.7	20	2	0.125	249200 0200		249207 0200			
								2149		2149		2149	



SARA® Basic Line end milling cutter

VHM | 50° | e8 | h5 | Z 3 | Vc/fz | 757

ISO N



- **3 cutting edges, long,** 50° right-hand cutting
- Eccentric relief grinding
- **Cutting material: superfine grain solid carbide**

material	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
● very well suited ○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
												●	●	●				
												160	220	160				
Cutting speed Vc m/min.																		
Please adjust these guidelines according to clamping operation and machine set-up.																		



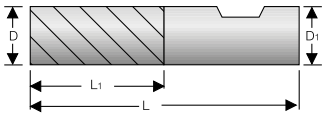
D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3.0	8	57	6.0	0.05	3	0.010	0.020	251519 0030	
4.0	11	57	6.0	0.05	3	0.013	0.027	251519 0040	
5.0	13	57	6.0	0.05	3	0.017	0.033	251519 0050	
6.0	13	57	6.0	0.06	3	0.020	0.040	251519 0060	
8.0	19	63	8.0	0.08	3	0.027	0.053	251519 0080	
10.0	22	72	10.0	0.1	3	0.0363	0.069	251519 0100	
12.0	26	83	12.0	0.12	3	0.040	0.080	251519 0120	
16.0	32	92	16.0	0.16	3	0.053	0.170	251519 0160	
20.0	38	104	20.0	0.20	3	0.067	0.133	251519 0200	

2148

VAN HOORN CARBIDE VHLAW end milling cutter

VHM | 30° | Z 3 | HSC | Vc/fz | 756

ISO N



- **Roughing cutter** for a broad range of applications (non-ferrous metals and plastics)
- Highly positive rake and clearance angles as well as sharp cutting edges guarantee
- **very low cutting forces** and **minimal cutting pressure
Large chip flutes for reliable chip removal at **up to 50 % higher feed rates, resulting in shorter machining times

material	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
● very well suited ○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
												●	●	●				
												450	215	275				
Cutting speed Vc m/min.																		
Please adjust these guidelines according to clamping operation and machine set-up.																		

VHLAW finishing version, 25° helix angle



D mm	L1 mm	L mm	D1 mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
6.0	13	64	6	3	0.050	255169 0060	
8.0	19	64	8	3	0.060	255169 0080	
10.0	22	70	10	3	0.120	255169 0100	
12.0	26	78	12	3	0.120	255169 0120	
16.0	32	89	16	3	0.180	255169 0160	
20.0	38	102	20	3	0.200	255169 0200	
25.0	45	120	25	3	0.220	255169 0250	

2112

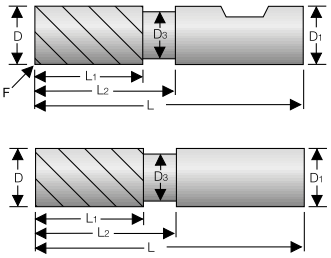
ATORN **Ultra-N end milling cutter**

VHM | 45° | h9 | h5 | Z 3 | ZrCN | Vc/fz | 757

- **With clearance**
- **3 cutting edges, sharp-edged**
- **With defined cutting edge rounding**
- **Polished version, sharp-edged, ground**
- For non-ferrous materials
- Cutting material: superfine grain solid carbide, uncoated with **mirror finish / polished version**
- Cutting material: superfine grain solid carbide, **ZrCN Ultra-N** coated

ISO N

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													● 380	● 180	● 170				
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		





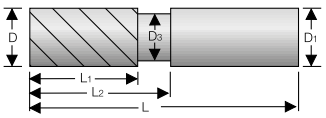
Short

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	Straight shank HA ZrCN art.no.	€	Straight shank HB polished art.no.	€	Straight shank HB mirror finish art.no.	€
3.0	12	57	16	2.8	6	3	0.025	0.018	249304 0030		249309 0030		249305 0030	
4.0	12	57	18	3.8	6	3	0.030	0.021	249304 0040		249309 0040		249305 0040	
5.0	15	57	18	4.7	6	3	0.038	0.026	249304 0050		249309 0050		249305 0050	
6.0	16	57	21	5.6	6	3	0.045	0.032	249304 0060		249309 0060		249305 0060	
8.0	22	64	28	7.6	8	3	0.060	0.042	249304 0080		249309 0080		249305 0080	
10.0	25	73	33	9.6	10	3	0.075	0.053	249304 0100		249309 0100		249305 0100	
12.0	28	84	39	11.4	12	3	0.085	0.060	249304 0120		249309 0120		249305 0120	
16.0	35	93	45	15.4	16	3	0.098	0.068	249304 0160		249309 0160		249305 0160	
20.0	40	104	54	19.4	20	3	0.113	0.079	249304 0200		249309 0200		249305 0200	
									2149		2149		2149	

Long

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	Straight shank HA ZrCN art.no.	€
3.0	15	64	21	2.8	6	3	0.025	0.020	249352 0030	
4.0	19	64	27	3.8	6	3	0.030	0.024	249352 0040	
5.0	20	64	28	4.7	6	3	0.038	0.030	249352 0050	
6.0	20	64	28	5.6	6	3	0.045	0.036	249352 0060	
8.0	38	80	44	7.6	8	3	0.060	0.048	249352 0080	
10.0	45	95	55	9.6	10	3	0.075	0.060	249352 0100	
12.0	53	100	55	11.4	12	3	0.085	0.068	249352 0120	
16.0	63	123	75	15.4	16	3	0.098	0.078	249352 0160	
20.0	65	125	75	19.4	20	3	0.113	0.090	249352 0200	
									2149	





ATORN Ultra-N end milling cutter

VHM | Typ W | 45° | h9 | h5 | Z 3 | ZrCN | Vc/fz | 757

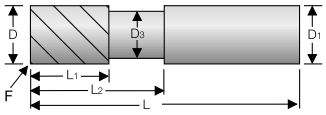
- **With clearance**
- **3 cutting edges, with edge protection F**
- **With defined cutting edge rounding**
- **Polished version, sharp-edged, ground**
- For non-ferrous materials
- Cutting material: superfine grain solid carbide, uncoated with **mirror finish / polished version**
- Cutting material: superfine grain solid carbide, **ZrCN Ultra-N** coated

ISO N

material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
												● 400	● 180	● 175				
Cutting speed Vc m/min.																		

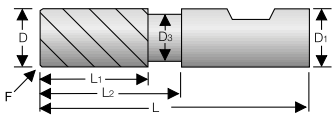
Please adjust these guidelines according to clamping operation and machine set-up.





Short

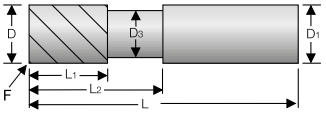
D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F x 45° mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	Straight shank HA mirror finish art.no.	€	Straight shank HA polished art.no.	€	Straight shank HA ZrCN art.no.	€
3	12	57	16	2.8	6	0.1	3	0.018	0.025	249300 0030		249307 0030		249302 0030	
4	12	57	18	3.8	6	0.1	3	0.021	0.030	249300 0040		249307 0040		249302 0040	
5	15	57	18	4.7	6	0.1	3	0.026	0.038	249300 0050		249307 0050		249302 0050	
6	16	57	21	5.6	6	0.1	3	0.032	0.045	249300 0060		249307 0060		249302 0060	
8	22	64	28	7.6	8	0.1	3	0.042	0.060	249300 0080		249307 0080		249302 0080	
10	25	73	33	9.6	10	0.2	3	0.053	0.075	249300 0100		249307 0100		249302 0100	
12	28	84	39	11.4	12	0.2	3	0.060	0.085	249300 0120		249307 0120		249302 0120	
16	35	93	45	15.4	16	0.2	3	0.068	0.098	249300 0160		249307 0160		249302 0160	
20	40	104	54	19.4	20	0.2	3	0.079	0.113	249300 0200		249307 0200		249302 0200	
										2149		2149		2149	





Short with driving plane

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F x 45° mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	Straight shank HB mirror finish art.no.	€	Straight shank HB polished art.no.	€	Straight shank HB ZrCN art.no.	€
3	12	57	16	2.8	6	0.1	3	0.018	0.025	249301 0030		249308 0030		249303 0030	
4	12	57	18	3.8	6	0.1	3	0.021	0.030	249301 0040		249308 0040		249303 0040	
5	15	57	18	4.7	6	0.1	3	0.026	0.038	249301 0050		249308 0050		249303 0050	
6	16	57	21	5.6	6	0.1	3	0.032	0.045	249301 0060		249308 0060		249303 0060	
8	22	64	28	7.6	8	0.1	3	0.042	0.060	249301 0080		249308 0080		249303 0080	
10	25	73	33	9.6	10	0.2	3	0.053	0.075	249301 0100		249308 0100		249303 0100	
12	28	84	39	11.4	12	0.2	3	0.060	0.085	249301 0120		249308 0120		249303 0120	
16	35	93	45	15.4	16	0.2	3	0.068	0.098	249301 0160		249308 0160		249303 0160	
20	40	104	54	19.4	20	0.2	3	0.079	0.113	249301 0200		249308 0200		249303 0200	
										2149		2149		2149	





Long

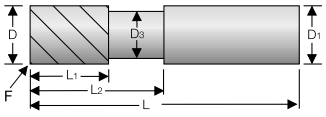
D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	Straight shank HA mirror finish art.no.	€	Straight shank HA polished art.no.	€	Straight shank HA ZrCN art.no.	€
3	15	64	21	2.8	6	0.1	3	0.020	0.025	249351 0030		249355 0030		249350 0030	
4	19	64	27	3.8	6	0.1	3	0.024	0.030	249351 0040		249355 0040		249350 0040	
5	20	64	28	4.7	6	0.1	3	0.030	0.038	249351 0050		249355 0050		249350 0050	
6	20	64	28	5.6	6	0.1	3	0.036	0.045	249351 0060		249355 0060		249350 0060	
8	38	80	44	7.6	8	0.1	3	0.048	0.060	249351 0080		249355 0080		249350 0080	
10	45	95	55	9.6	10	0.2	3	0.060	0.075	249351 0100		249355 0100		249350 0100	
12	53	100	55	11.4	12	0.2	3	0.068	0.085	249351 0120		249355 0120		249350 0120	
16	63	123	75	15.4	16	0.2	3	0.078	0.098	249351 0160		249355 0160		249350 0160	
20	65	125	75	19.4	20	0.2	3	0.090	0.113	249351 0200		249355 0200		249350 0200	
										2149		2149		2149	

ATORN Ultra-N end milling cutter

VHM | Typ W | 35°-38° | h9 | h5 | Z 4 | ZrCN | HPC | Vc/fz | 759

- **With clearance**
- **4 cutting edges, with edge protection F**
- **With defined cutting edge rounding**
- For non-ferrous materials
- Irregular helix angle for vibration-free milling
- Cutting material: superfine grain solid carbide, **ZrCN Ultra-N**-coated

ISO N



material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
												● 400	● 190	● 180				
Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

Short



D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3	6	57	10	2.8	6	0.1	4	0.019	0.028	249480 0030	
4	8	57	14	3.8	6	0.1	4	0.023	0.033	249480 0040	
5	10	57	16	4.7	6	0.1	4	0.028	0.040	249480 0050	
6	12	57	19	5.6	6	0.2	4	0.033	0.048	249480 0060	
8	16	63	25	7.6	8	0.2	4	0.042	0.060	249480 0080	
10	20	72	30	9.6	10	0.2	4	0.242	0.345	249480 0100	
12	24	83	36	11.4	12	0.2	4	0.060	0.085	249480 0120	
16	32	92	42	15.4	16	0.2	4	0.077	0.110	249480 0160	
20	40	104	52	19.4	20	0.2	4	0.126	0.180	249480 0200	
										2149	

Long



D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
4	16	62	22	3.8	6	0.1	4	0.029	0.033	249490 0040	
5	17	62	24	4.7	6	0.1	4	0.036	0.040	249490 0050	
6	18	62	24	5.6	6	0.2	4	0.043	0.048	249490 0060	
8	24	68	30	7.6	8	0.2	4	0.054	0.060	249490 0080	
10	30	80	38	9.6	10	0.2	4	0.311	0.345	249490 0100	
12	36	93	46	11.4	12	0.2	4	0.077	0.085	249490 0120	
16	48	108	58	15.4	16	0.2	4	0.099	0.110	249490 0160	
20	60	126	74	19.4	20	0.2	4	0.162	0.180	249490 0200	
										2149	

ATORN Ultra-N end milling cutter

VHM | Typ W | 45° | h9 | h5 | Z 4 | ZrCN | Vc/fz | 757

ISO N

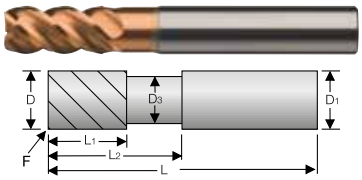
- **With clearance**
- **4 cutting edges, with edge protection F**
- **With defined cutting edge rounding**
- For non-ferrous materials
- Cutting material: superfine grain solid carbide, **ZrCN Ultra-N**-coated

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													● 400	● 180	● 175				
	Cutting speed Vc m/min.							Please adjust these guidelines according to clamping operation and machine set-up.											

Short

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F x 45° mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3	6	57	10	2.8	6	0.1	4	0.021	0.030	249400 0030	
4	8	57	14	3.8	6	0.1	4	0.025	0.035	249400 0040	
5	10	57	16	4.7	6	0.1	4	0.030	0.043	249400 0050	
6	12	57	19	5.6	6	0.2	4	0.033	0.048	249400 0060	
8	16	63	25	7.6	8	0.2	4	0.042	0.060	249400 0080	
10	20	72	30	9.6	10	0.2	4	0.053	0.075	249400 0100	
12	24	83	36	11.4	12	0.2	4	0.060	0.085	249400 0120	
16	32	92	42	15.4	16	0.2	4	0.077	0.110	249400 0160	
20	40	104	52	19.4	20	0.2	4	0.126	0.180	249400 0200	

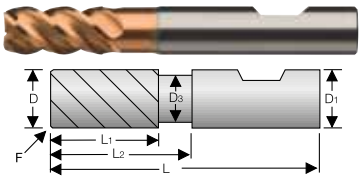
2149



Short with driving plane

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F x 45° mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3	6	57	10	2.8	6	0.1	4	0.021	0.030	249401 0030	
4	8	57	14	3.8	6	0.1	4	0.025	0.035	249401 0040	
5	10	57	16	4.7	6	0.1	4	0.030	0.043	249401 0050	
6	12	57	19	5.6	6	0.2	4	0.033	0.048	249401 0060	
8	16	63	25	7.6	8	0.2	4	0.042	0.060	249401 0080	
10	20	72	30	9.6	10	0.2	4	0.053	0.075	249401 0100	
12	24	83	36	11.4	12	0.2	4	0.060	0.085	249401 0120	
16	32	92	42	15.4	16	0.2	4	0.077	0.110	249401 0160	
20	40	104	52	19.4	20	0.2	4	0.126	0.180	249401 0200	

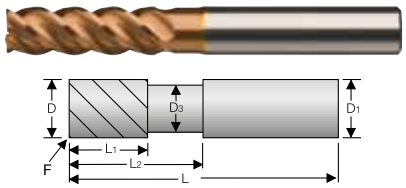
2149



Long

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F x 45° mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	DIN 6535-HA art.no.	€
4	16	62	22	3.8	6	0.1	4	0.032	0.035	249450 0040	
5	17	62	24	4.7	6	0.1	4	0.038	0.043	249450 0050	
6	18	62	24	5.6	6	0.2	4	0.043	0.048	249450 0060	
8	24	72	30	7.6	8	0.2	4	0.054	0.060	249450 0080	
10	30	80	38	9.6	10	0.2	4	0.068	0.075	249450 0100	
12	36	93	46	11.5	12	0.2	4	0.077	0.085	249450 0120	
16	48	108	58	15.4	16	0.2	4	0.099	0.110	249450 0160	

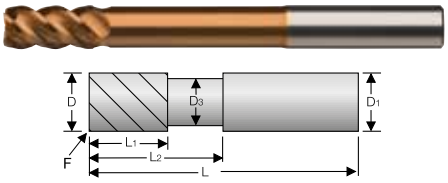
2149



Extra-long

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F x 45° mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
6	12	80	42	5.6	6	0.2	4	0.038	0.048	249460 0060	
8	16	100	58	7.6	8	0.2	4	0.048	0.060	249460 0080	
10	20	100	62	9.6	10	0.2	4	0.060	0.075	249460 0100	
12	24	120	75	11.4	12	0.2	4	0.068	0.085	249460 0120	
16	32	150	100	15.4	16	0.2	4	0.088	0.110	249460 0160	

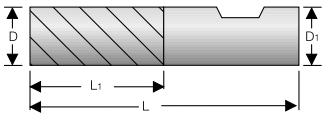
2149



SARA® Basic Line end milling cutter

VHM | 38° | h6 | Z 4 | Vc/fz | 757

- **4 cutting edges, extra-long,** 38° right-hand cutting
- Eccentric relief grinding
- **Cutting material: fine grain solid carbide**



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													● 160	● 220	● 160				
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		

D mm	L1 mm	L mm	D1 mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
4.0	15	62	6.0	4	0.016	0.027	251518 0040	
5.0	18	62	6.0	4	0.020	0.033	251518 0050	
6.0	18	62	6.0	4	0.024	0.040	251518 0060	
8.0	24	68	8.0	4	0.032	0.053	251518 0080	
10.0	30	80	10.0	4	0.040	0.067	251518 0100	
12.0	36	93	12.0	4	0.048	0.080	251518 0120	
16.0	48	108	16.0	4	0.064	0.107	251518 0160	
20.0	60	126	20.0	4	0.080	0.133	251518 0200	

2148

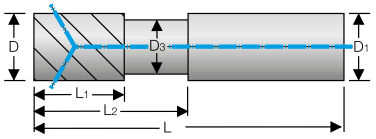


ISO N

ATORN End milling cutter Ultra-N

VHM | NH | 40° | h6 | Z 3 | Vc/fz | 758

- **with internal coolant supply**
- Ø 4 mm and Ø 5 mm with central coolant outlet
- unequal pitch for low-vibration milling
- with clearance
- high material removal rate
- **Cutting material: fine-grain SC**



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													● 550	● 355	● 185				
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
4.0	12	20	50	3.7	6.0	3	0.017	0.031	249601 0400	
5.0	15	20	50	4.6	6.0	3	0.024	0.043	249601 0500	
6.0	16	20	50	5.5	6.0	3	0.034	0.058	249601 0600	
8.0	20	30	64	7.4	8.0	3	0.050	0.086	249601 0800	
10.0	22	32	70	9.2	10.0	3	0.068	0.117	249601 1000	
12.0	25	37	75	11.0	12.0	3	0.085	0.154	249601 1200	
16.0	32	46	90	15.0	16.0	3	0.134	0.212	249601 1600	

2149



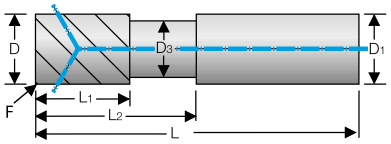
ISO N

ATORN End milling cutter *Ultra-N*

VHM | 38° -41° | h6 | Z 4 | HPC | Vc/fz | 758

- **With internal coolant supply**
- Irregular helix angle and unequal pitch for low-vibration milling
- With clearance
- With edge chamfer F
- **Cutting material: fine grain solid carbide**

ISO N



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													● 750	● 615	● 200				
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

Internal cooling

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F x 45° mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
6.0	13	57	20	5.5	6.0	0.1	4	0.069	0.050	249605 0600	
8.0	20	64	26	7.4	8.0	0.1	4	0.092	0.067	249605 0800	
10.0	22	72	30	9.2	10.0	0.2	4	0.116	0.084	249605 1000	
12.0	26	83	36	11.0	12.0	0.2	4	0.139	0.101	249605 1200	
16.0	32	92	42	15.0	16.0	0.2	4	0.185	0.134	249605 1600	
20.0	38	104	52	19.0	20.0	0.3	4	0.231	0.168	249605 2000	

2149





Face-cutter

Internal cooling and chip breaker

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F x 45° mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
6.0	13	57	20	5.5	6.0	0.1	4	0.053	0.073	249607 0600	
8.0	20	64	26	7.4	8.0	0.1	4	0.071	0.097	249607 0800	
10.0	22	72	30	9.2	10.0	0.2	4	0.088	0.121	249607 1000	
12.0	26	83	36	11.0	12.0	0.2	4	0.106	0.146	249607 1200	
16.0	32	92	42	15.0	16.0	0.2	4	0.141	0.194	249607 1600	
20.0	38	104	52	19.0	20.0	0.3	4	0.176	0.243	249607 2000	

2149





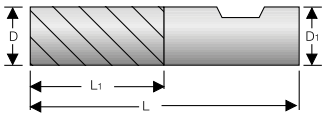
Face-cutter

SARA® *Basic Line* roughing cutter

VHM | HR | 25° | e8 | h5 | Z 3 | Vc/fz | 756

- **3 cutting edges, long,** 25° right-hand cutting
- Eccentric relief grinding
- **Cutting material: fine grain solid carbide**

ISO N



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													● 160	● 220	● 160				
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

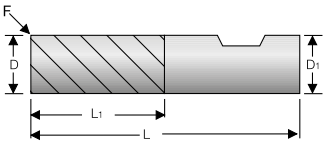
D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
6.0	13	57	6.0	0.3	3	0.040	0.055	251525 0060	
8.0	19	63	8.0	0.4	3	0.053	0.073	251525 0080	
10.0	22	72	10.0	0.5	3	0.067	0.092	251525 0100	
12.0	26	83	12.0	0.6	3	0.080	0.110	251525 0120	
16.0	32	92	16.0	0.8	3	0.107	0.147	251525 0160	
20.0	38	104	20.0	1.0	3	0.123	0.183	251525 0200	

2148



VAN HOORN CARBIDE Roughing cutter

VHM | HR | 40° | h9 | h6 | Z 3 | Vc/fz | 756



- **Very low cutting forces** and **minimal cutting pressure**
- Large chip flutes for reliable chip removal at **up to 50 % higher feed rates**

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													● 450	● 215	● 275				
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
6.0	16	64	6	0.25	3	0.031	0.050	255168 0060	
8.0	20	64	8	0.50	3	0.036	0.060	255168 0080	
10.0	22	70	10	0.50	3	0.040	0.100	255168 0100	
12.0	25	78	12	0.50	3	0.048	0.120	255168 0120	
16.0	35	89	16	1.00	3	0.072	0.180	255168 0160	
20.0	40	102	20	1.00	3	0.081	0.200	255168 0200	
25.0	50	120	25	1.00	3	0.090	0.220	255168 0250	

2112



ISO N

ATORN Ultra-N roughing cutter

VHM | WF | 40° | h9 | h5 | Z 3 | ZrCN | Vc/fz | 760

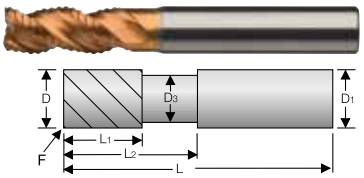
- **With clearance**
- **3 cutting edges, with edge protection F**
- **With defined cutting edge rounding**
- For non-ferrous materials
- Cutting material: superfine grain solid carbide, **ZrCN Ultra-N**-coated
- **249372.... with internal cooling**

ISO N

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	249370....												● 425	● 200	● 190				
	249372....												● 470	● 220	● 210				
	249371....												● 425	● 200	● 190				
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		

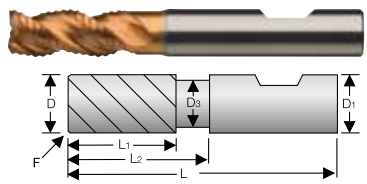
Standard

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F x 45° mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	HA parallel shank art.no.	€	Straight shank HA with internal cooling art.no.	€
6	13	57	18	5.6	6	0.4	3	0.039	0.055	249370 0060		249372 0060	
8	21	63	25	7.6	8	0.4	3	0.049	0.070	249370 0080		249372 0080	
10	22	72	30	9.6	10	0.4	3	0.060	0.085	249370 0100		249372 0100	
12	26	83	36	11.4	12	0.4	3	0.067	0.095	249370 0120		249372 0120	
16	36	92	42	15.4	16	0.4	3	0.084	0.120	249370 0160		249372 0160	
20	41	104	52	19.4	20	0.4	3	0.140	0.200	249370 0200		249372 0200	
											2149		2149



Standard with driving plane

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F x 45° mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	HB parallel shank art.no.	€
6	13	57	18	5.6	6	0.4	3	0.039	0.055	249371 0060	
8	21	63	25	7.6	8	0.4	3	0.049	0.070	249371 0080	
10	22	72	30	9.6	10	0.4	3	0.060	0.085	249371 0100	
12	26	83	36	11.4	12	0.4	3	0.067	0.095	249371 0120	
16	36	92	42	15.4	16	0.4	3	0.084	0.120	249371 0160	
20	41	104	52	19.4	20	0.4	3	0.140	0.200	249371 0200	
											2149

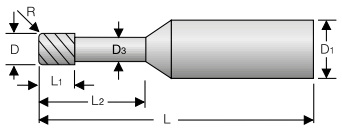


ATORN Ultra-N mini torus cutter

VHM | Typ W | 30° | h9 | h5 | Z 2 | ZrCN | Vc/fz | 755

- **With clearance**
- **With defined cutting edge rounding from Ø 1.5 mm**
- Long-necked version for non-ferrous materials
- Radius tolerance +/- 0.01 mm
- Cutting material: superfine grain solid carbide, **ZrCN Ultra-N**-coated

ISO N



material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
												● 450	● 280	● 230				
Cutting speed Vc m/min.							Please adjust these guidelines according to clamping operation and machine set-up.											



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
0.5	0.9	4	55	0.48	4	0.05	2	0.012	0.008	249002 0504	
0.5	0.9	6.0	65	0.48	4	0.05	2	0.012	0.008	249002 0506	
0.5	0.9	10.0	65	0.48	4	0.08	2	0.012	0.008	249002 0510	
1	1.5	5.0	55	0.95	4	0.08	2	0.021	0.014	249002 1005	
1	1.5	10.0	65	0.95	4	0.10	2	0.021	0.014	249002 1010	
1	1.5	15.0	65	0.95	4	0.10	2	0.021	0.014	249002 1015	
1.5	1.8	8.0	55	1.44	4	0.15	2	0.033	0.023	249002 1508	
1.5	1.8	15.0	65	1.44	4	0.15	2	0.033	0.023	249002 1515	
1.5	1.8	20.0	65	1.44	4	0.15	2	0.033	0.023	249002 1520	
2	2	10.0	55	1.92	4	0.20	2	0.043	0.030	249002 2010	
2	2	20.0	65	1.92	4	0.20	2	0.043	0.030	249002 2020	
2.5	2.5	12.0	55	2.4	4	0.25	2	0.050	0.035	249002 2512	
2.5	2.5	20.0	65	2.4	4	0.25	2	0.050	0.035	249002 2520	

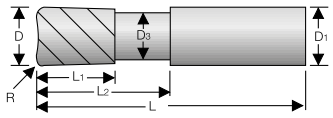
2149

ATORN **Ultra-N torus cutter**

VHM | Typ W | 30° | h9 | h5 | Z 2 | ZrCN | Vc/fz | 760

- **With clearance**
- **With defined cutting edge rounding**
- For non-ferrous materials
- Radius tolerance +/- 0.015 mm
- Cutting material: superfine grain solid carbide, **ZrCN Ultra-N**-coated

ISO N



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	249211....												● 475	● 225	● 275				
	249212....												● 425	● 200	● 190				
	249213....												● 360	● 170	● 160				
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		

Short



D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	R mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3.0	4	50	14	2.9	3	0.3	2	0.019	0.028	249211 0303	
4.0	5	50	16	3.8	4	0.3	2	0.023	0.033	249211 0203	
5.0	6	54	18	4.8	5	0.3	2	0.028	0.040	249211 0503	
6.0	7	57	21	5.7	6	0.3	2	0.033	0.048	249211 0603	
6.0	7	57	21	5.7	6	1.0	2	0.033	0.048	249211 0610	
6.0	7	57	21	5.7	6	2.0	2	0.033	0.048	249211 0620	
8.0	9	63	27	7.7	8	0.3	2	0.042	0.060	249211 0803	
8.0	9	63	27	7.7	8	1.0	2	0.042	0.060	249211 0810	
8.0	9	63	27	7.7	8	2.0	2	0.042	0.060	249211 0820	
10.0	11	72	32	9.6	10	0.3	2	0.053	0.075	249211 1003	
10.0	11	72	32	9.6	10	1.5	2	0.053	0.075	249211 1015	
10.0	11	72	32	9.6	10	3.0	2	0.053	0.075	249211 1030	
12.0	12	83	38	11.6	12	1.5	2	0.060	0.085	249211 1215	
12.0	12	83	38	11.6	12	4.0	2	0.060	0.085	249211 1240	
16.0	16	92	44	15.5	16	2.0	2	0.077	0.110	249211 1620	
16.0	16	92	44	15.5	16	4.0	2	0.077	0.110	249211 1640	

2149

Long



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3	4	32	75	2.8	3	0.3	2	0.025	0.028	249212 0303	
4	5	36	75	3.75	4	0.3	2	0.029	0.033	249212 0203	
5	6	40	75	4.7	5	0.3	2	0.036	0.040	249212 0503	
6	7	44	80	5.6	6	0.3	2	0.043	0.048	249212 0603	
6	7	44	80	5.6	6	1.0	2	0.043	0.048	249212 0610	
6	7	44	80	5.6	6	2	2	0.043	0.048	249212 0620	
8	9	54	100	7.6	8	0.3	2	0.054	0.060	249212 0803	
8	9	54	100	7.6	8	1.0	2	0.054	0.060	249212 0810	
8	9	54	100	7.6	8	2	2	0.054	0.060	249212 0820	
10	11	60	100	9.5	10	0.3	2	0.068	0.075	249212 1003	
10	11	60	100	9.5	10	1.5	2	0.068	0.075	249212 1015	
10	11	60	100	9.5	10	3	2	0.068	0.075	249212 1030	
12	12	75	120	11.5	12	1.5	2	0.077	0.085	249212 1215	
12	12	75	120	11.5	12	4	2	0.077	0.085	249212 1240	
16	16	92	150	15.5	16	2	2	0.099	0.110	249212 1620	
16	16	92	150	15.5	16	4	2	0.099	0.110	249212 1640	

2149

Extra-long



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
6	7	80	120	5.6	6	0.3	2	0.038	0.048	249213 0603	
6	7	80	120	5.6	6	1.0	2	0.038	0.048	249213 0610	
8	9	90	130	7.6	8	0.3	2	0.048	0.060	249213 0803	
8	9	90	130	7.6	8	1.0	2	0.048	0.060	249213 0810	
8	9	90	130	7.6	8	2	2	0.048	0.060	249213 0820	
10	11	110	150	9.5	10	0.3	2	0.060	0.075	249213 1003	
10	11	110	150	9.5	10	3	2	0.060	0.075	249213 1030	
12	12	115	160	11.5	12	1.5	2	0.060	0.075	249213 1215	
12	12	115	160	11.5	12	4	2	0.060	0.075	249213 1240	
16	16	140	200	15.5	16	2	2	0.088	0.110	249213 1620	

2149

ATORN Ultra-N torus cutter

VHM | Typ W | 45° | h9 | h5 | Z 3 | ZrCN | HPC | Vc/fz | 760

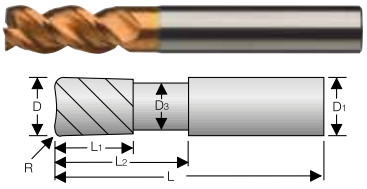
- **With clearance**
- **With defined cutting edge rounding**
- For non-ferrous materials
- Radius tolerance +/- 0.015 mm
- Cutting material: superfine grain solid carbide, **ZrCN Ultra-N**-coated

ISO N

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													● 425	● 200	● 190				
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

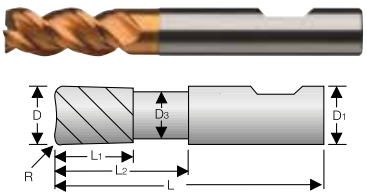
Standard



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	HA parallel shank art.no.	€
5	13	18	57	4.7	6	0.5	3	0.026	0.038	249311 0505	
5	13	18	57	4.7	6	1.0	3	0.026	0.038	249311 0510	
6	13	18	57	5.6	6	0.5	3	0.032	0.045	249311 0605	
6	13	18	57	5.6	6	1.0	3	0.032	0.045	249311 0610	
8	21	25	63	7.6	8	0.5	3	0.042	0.060	249311 0805	
8	21	25	63	7.6	8	1.0	3	0.042	0.060	249311 0810	
10	22	30	72	9.6	10	0.5	3	0.053	0.075	249311 1005	
10	22	30	72	9.6	10	1.0	3	0.053	0.075	249311 1010	
12	26	36	83	11.4	12	0.5	3	0.060	0.085	249311 1205	
12	26	36	83	11.4	12	1.0	3	0.060	0.085	249311 1210	
16	36	42	92	15.4	16	2	3	0.068	0.098	249311 1620	
16	36	42	92	15.4	16	4	3	0.068	0.098	249311 1640	
20	41	52	104	19.4	20	4	3	0.079	0.113	249311 2040	

2149

Standard with driving plane



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	HB parallel shank art.no.	€
5	13	18	57	4.7	6	0.5	3	0.026	0.038	249312 0505	
5	13	18	57	4.7	6	1.0	3	0.026	0.038	249312 0510	
6	13	18	57	5.6	6	0.5	3	0.032	0.045	249312 0605	
6	13	18	57	5.6	6	1.0	3	0.032	0.045	249312 0610	
8	21	25	63	7.6	8	0.5	3	0.042	0.060	249312 0805	
8	21	25	63	7.6	8	1.0	3	0.042	0.060	249312 0810	
10	22	30	72	9.6	10	0.5	3	0.053	0.075	249312 1005	
10	22	30	72	9.6	10	1.0	3	0.053	0.075	249312 1010	
12	26	36	83	11.4	12	0.5	3	0.060	0.085	249312 1205	
12	26	36	83	11.4	12	1.0	3	0.060	0.085	249312 1210	
16	36	42	92	15.4	16	2	3	0.068	0.098	249312 1620	
16	36	42	92	15.4	16	4	3	0.068	0.098	249312 1640	
20	41	52	104	19.4	20	4	3	0.079	0.113	249312 2040	

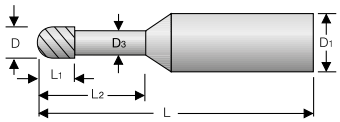
2149

ATORN **Ultra-N mini radius milling cutter**

VHM | Typ W | 30° | h9 | h5 | Z 2 | ZrCN | Vc/fz | 761

- **With clearance**
- **With defined cutting edge rounding from Ø 1.5 mm**
- Long-necked version for non-ferrous materials
- Radius tolerance +/- 0.01 mm
- Cutting material: superfine grain solid carbide, **ZrCN Ultra-N**-coated

ISO N



material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
												● 495	● 310	● 250				
Cutting speed Vc m/min.							Please adjust these guidelines according to clamping operation and machine set-up.											



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
0.5	0.9	4.0	55	0.48	4	0.25	2	0.009	0.014	249003 0504	
0.5	0.9	6.0	65	0.48	4	0.25	2	0.009	0.014	249003 0506	
0.5	0.9	10.0	65	0.48	4	0.25	2	0.009	0.014	249003 0510	
1	1.5	5.0	55	0.95	4	0.5	2	0.018	0.025	249003 1005	
1	1.5	10.0	65	0.95	4	0.5	2	0.018	0.025	249003 1010	
1	1.5	15.0	65	0.95	4	0.5	2	0.018	0.025	249003 1015	
1.5	1.8	8.0	55	1.44	4	0.75	2	0.026	0.038	249003 1508	
1.5	1.8	15.0	65	1.44	4	0.75	2	0.026	0.038	249003 1515	
1.5	1.8	20.0	65	1.44	4	0.75	2	0.026	0.038	249003 1520	
2	2	10.0	55	1.92	4	1	2	0.033	0.048	249003 2010	
2	2	20.0	65	1.92	4	1	2	0.033	0.048	249003 2020	
2.5	2.5	12.0	55	2.4	4	1.25	2	0.040	0.058	249003 2512	
2.5	2.5	20.0	65	2.4	4	1.25	2	0.040	0.058	249003 2520	

2149

Over 200,000 tools available online!

Advantages:
- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages

Register online now!



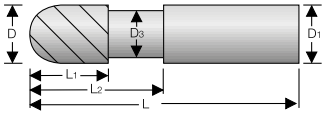
www.saratools.com

ATORN **Ultra-N** radius milling cutter

VHM | Typ W | 45° | h9 | h5 | Z 2 | ZrCN | Vc/fz | 761

- **With clearance**
- **With defined cutting edge rounding**
- For non-ferrous materials
- Radius tolerance +/- 0.01 mm
- Cutting material: superfine grain solid carbide, **ZrCN Ultra-N**-coated

ISO N



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	249240....												● 470	● 220	● 210				
	249250....												● 425	● 200	● 190				
	249260....												● 425	● 200	● 190				
	Cutting speed Vc m/min.												Please adjust these guidelines according to clamping operation and machine set-up.						

Short



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3	6	16	50	2.9	3	1.5	2	0.021	0.030	249240 0030	
4	7	17	54	3.8	4	2	2	0.023	0.033	249240 0040	
5	8	18	54	4.8	5	2.5	2	0.026	0.038	249240 0050	
6	10	21	54	5.7	6	3	2	0.030	0.043	249240 0060	
8	12	27	60	7.7	8	4	2	0.042	0.060	249240 0080	
10	13	32	67	9.6	10	5	2	0.053	0.075	249240 0100	
12	16	38	73	11.6	12	6	2	0.060	0.085	249240 0120	
16	20	44	83	15.5	16	8	2	0.077	0.110	249240 0160	

2149

Long



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3	10	32	75	2.9	3	1.5	2	0.027	0.030	249250 0030	
4	13	36	75	3.8	4	2	2	0.029	0.033	249250 0040	
5	15	40	75	4.8	5	2.5	2	0.034	0.038	249250 0050	
6	16	44	100	5.7	6	3	2	0.038	0.043	249250 0060	
8	22	54	100	7.7	8	4	2	0.054	0.060	249250 0080	
10	25	60	100	9.6	10	5	2	0.068	0.075	249250 0100	
12	26	60	100	11.6	12	6	2	0.077	0.085	249250 0120	
16	30	92	150	15.5	16	8	2	0.099	0.110	249250 0160	

2149

Extra-long



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3	10	82	125	2.8	3	1.5	2	0.024	0.030	249260 0030	
4	13	86	125	3.75	4	2	2	0.026	0.033	249260 0040	
6	16	94	150	5.6	6	3	2	0.034	0.043	249260 0060	
8	22	104	150	7.6	8	4	2	0.048	0.060	249260 0080	
10	25	110	150	9.6	10	5	2	0.060	0.075	249260 0100	
12	26	110	150	11.4	12	6	2	0.068	0.085	249260 0120	

2149

ATORN Coating *Ultra-N PRO* INFO

Carbon high-performance thin-layer coating
for machining CFRP, GFRP, aluminium, copper, graphite, ceramic, wood and sandwich materials, for forming materials with an adhesive tendency (e.g. aluminium)

Ta-C

Hardness **6000 HV**



Coating properties

Material	amorphous, hydrogen-free carbon layer
Micro hardness	> 5000 HVpl 20 mN; standard: 6000-7500 HVpl 20 mN
Application temperature	max. 550°C
Colour	rainbow colours, up to anthracite

Advantages

- Good sliding properties and high layer hardness (approx. 60-80 % the hardness of diamond)
- Extremely durable and low-friction (wear protection coating for lubricated and non-lubricated inserts)
- Good milling and cutting quality
- No rounding of sharp-edged tools
- Coating performed at < 250°C. Even temperature-sensitive substrates can be coated.

Range overview	Z	*Ultra-N PRO* range	Standard	Short	Long	Extra-long	HA	HB	Ø range mm	Page
Solid carbide, single cutting edge end milling cutter	1		●				●		Ø 1 - 12	481
Solid carbide drill groove cutter	2		●				●	●	Ø 3 - 20	481
Solid carbide end milling cutter	3		●			●	●	●	Ø 4 - 20	482
Solid carbide end milling cutter HPC	3						●	●	Ø 3 - 20	483
Solid carbide end milling cutter HPC	4		●				●	●	Ø 3 - 20	484
Solid carbide torus cutter	2		●		●		●		Ø 3 - 16	485
Solid carbide torus cutter	3		●				●		Ø 6 - 20	486
Solid carbide radius milling cutter	2		●				●		Ø 3 - 16	486
Solid carbide roughing cutter	3		●				●	●	Ø 6 - 20	487
Solid carbide trochoidal milling cutter	3				●		●	●	Ø 6 - 20	488

material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
												● 440	● 400					

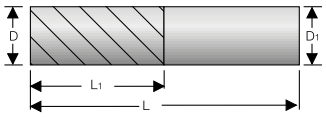
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

ATORN Single-blade milling cutter *Ultra-N PRO*

VHM | Typ W | h9 | h6 | Z 1 | Ta-C | Vc/fz | 762

- **1 cutting edge, sharp**
- For non-ferrous materials
- **Cutting material: solid carbide with DLC-sp3 coating**
- Spiral angle 30°
- With polish grinding in the chip chambers
- Large chip space for unhindered chip removal

ISO N



material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
												● 425	● 200	● 190				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L1 mm	L mm	D1 mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
1	4	50	3	1	0.004	249005 0010	
1.5	6	50	3	1	0.004	249005 0015	
2	8	50	3	1	0.008	249005 0020	
3	12	50	3	1	0.008	249005 0030	
4	15	60	4	1	0.015	249005 0040	
5	17	60	5	1	0.015	249005 0050	
6	20	65	6	1	0.025	249005 0060	
8	22	65	8	1	0.03	249005 0080	
10	25	75	10	1	0.04	249005 0100	
12	30	80	12	1	0.05	249005 0120	

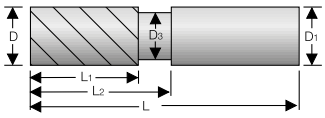
2169

ATORN Drill groove milling cutter 20° *Ultra-N PRO*

VHM | Typ W | 20° | h9 | h6 | Z 2 | Z 3 | Z 4 | Ta-C | Vc/fz | 762

- **With clearance**
- **Spiral angle 20°**
- For non-ferrous materials
- **Cutting material: solid carbide with DLC-sp3 coating**
- With polish grinding in the chip chambers
- Large chip space for unhindered chip removal

ISO N



material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
												● 425	● 200	● 190				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Z	● Feed fz aluminium ≥ 8 % Si mm/tooth	● Feed fz aluminium ≥ 8 % Si mm/tooth	art.no.	€
3	11	14	50	2.9	6	2	0.008	0.01	249006 0030	
4	13	16	54	3.9	6	2	0.015	0.025	249006 0040	
5	15	18	54	4.9	6	2	0.015	0.025	249006 0050	
6	16	21	64	5.8	6	2	0.025	0.04	249006 0060	
8	22	27	70	7.8	8	2	0.03	0.05	249006 0080	
10	25	32	72	9.7	10	2	0.04	0.065	249006 0100	
12	28	38	83	11.7	12	3	0.05	0.09	249006 0120	
16	36	44	92	15.7	16	3	0.065	0.12	249006 0160	
20	41	54	104	19.5	20	4	0.085	0.15	249006 0200	

2169

ATORN Drill groove milling cutter 45° *Ultra-N PRO*

VHM | 45° | h9 | h6 | Z 2 | Ta-C | Vc/fz | 762

- **With clearance**
- **2 cutting edges, with edge chamfer**
- **Spiral angle 45°**
- For non-ferrous materials
- **Cutting material: solid carbide with DLC-sp3 coating**
- With polish grinding in the chip chambers
- Large chip space for unhindered chip removal

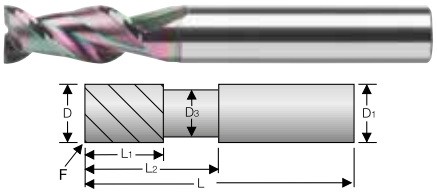
ISO N

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													● 380	● 180	● 170				
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

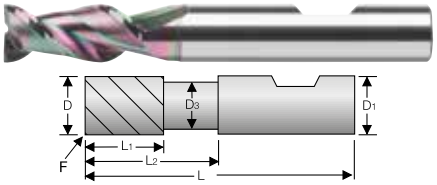
Shank version HA

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3	8	18	57	2.9	6	0.1	2	0.008	0.010	249007 0030	
4	11	18	57	3.9	6	0.1	2	0.015	0.025	249007 0040	
5	13	20	57	4.9	6	0.1	2	0.020	0.032	249007 0050	
6	13	20	57	5.8	6	0.1	2	0.025	0.040	249007 0060	
8	19	26	63	7.8	8	0.1	2	0.030	0.050	249007 0080	
10	22	29	72	9.7	10	0.2	2	0.040	0.065	249007 0100	
12	26	36	83	11.7	12	0.2	2	0.050	0.090	249007 0120	
										2169	



Shank version HB

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
16	32	42	92	15.7	16	0.2	2	0.065	0.12	249007 0160	
20	38	52	104	19.5	20	0.2	2	0.080	0.15	249007 0200	
										2169	



ATORN End milling cutter *Ultra-N PRO*

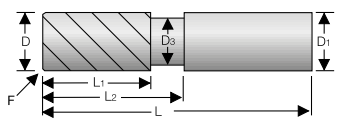
VHM | 43° -47° | 45° | h9 | h6 | Z 3 | Ta-C | HPC | Vc/fz | 762

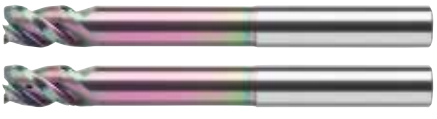
- **With clearance**
- **3 cutting edges, with edge chamfer**
- **Irregular spiral angle 43° / 47°**
- For non-ferrous materials
- **Cutting material: solid carbide with DLC-sp3 coating**
- With polish grinding in the chip chambers
- Large chip space for unhindered chip removal

ISO N

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													● 380	● 180	● 170				
	Cutting speed Vc m/min.																		

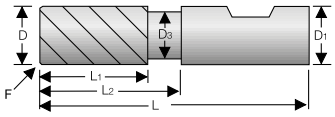
Please adjust these guidelines according to clamping operation and machine set-up.





Shank version HA

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	Without internal cooling art.no.	€	With internal cooling art.no.	€
4	6	24	80	3.9	6	0.1	3	0.015	0.02	249008 0040			
5	8	30	80	4.9	6	0.1	3	0.025	0.02	249008 0050			
6	10	42	80	5.8	6	0.2	3	0.025	0.03	249008 0060		249009 0060	
8	13	62	100	7.8	8	0.2	3	0.03	0.04	249008 0080		249009 0080	
10	16	58	100	9.7	10	0.2	3	0.04	0.05	249008 0100		249009 0100	
12	19	73	120	11.7	12	0.2	3	0.05	0.07	249008 0120		249009 0120	
										2169		2169	





Shank version HB

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	Without internal cooling art.no.	€	With internal cooling art.no.	€
16	25	92	150	15.7	16	0.2	3	0.065	0.09	249008 0160		249009 0160	
20	32	100	150	19.5	20	0.2	3	0.085	0.12	249008 0200		249009 0200	
										2169		2169	

ATORN End milling cutter HPC *Ultra-N PRO*

VHM | 43° -47° | h9 | h6 | Z 3 | Ta-C | HPC | Vc/fz | 763

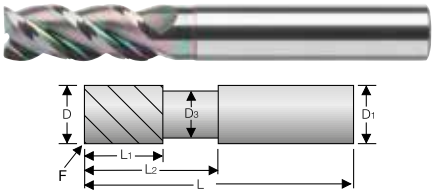
ISO N

- **With clearance**
- **3 cutting edges, with edge chamfer**
- **Irregular spiral angle 43° / 47°**
- For non-ferrous materials
- **Cutting material: solid carbide with DLC-sp3 coating**
- With polish grinding in the chip chambers
- Large chip space for unhindered chip removal

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													● 425	● 200	● 190				
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		

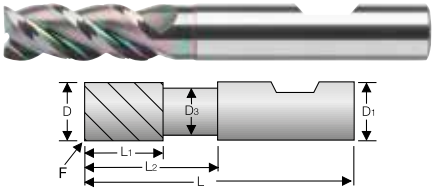
Shank version HA

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3	12	16	57	2.9	6	0.1	3	0.015	0.020	249010 0030	
4	12	18	57	3.9	6	0.1	3	0.020	0.025	249010 0040	
5	15	18	57	4.9	6	0.1	3	0.025	0.030	249010 0050	
6	15	21	57	5.8	6	0.1	3	0.030	0.040	249010 0060	
8	22	28	64	7.8	8	0.1	3	0.040	0.050	249010 0080	
10	25	33	73	9.7	10	0.2	3	0.050	0.070	249010 0100	
12	28	39	84	11.7	12	0.2	3	0.010	0.015	249010 0120	
										2169	



Shank version HB

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz aluminium < 8 % Si mm/tooth	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
16	35	45	93	15.7	16	0.2	3	0.065	0.090	249010 0160	
20	41	52	104	19.5	20	0.2	3	0.085	0.120	249010 0200	
										2169	



ATORN End milling cutter HPC *Ultra-N PRO*

VHM | 43° -47° | h9 | h6 | Z 4 | Ta-C | HPC | Vc/fz | 763

- **With clearance**
- **4 cutting edges, with edge chamfer**
- **Irregular spiral angle 43° / 47°**
- For non-ferrous materials
- **Cutting material: solid carbide with DLC-sp3 coating**
- With polish grinding in the chip chambers
- Large chip space for unhindered chip removal

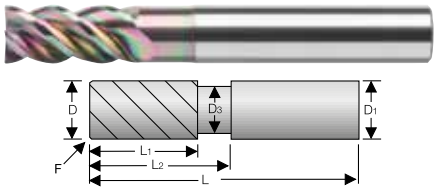
ISO N

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													● 425	● 200	● 190				
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		

Shank version HA

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3	6	10	57	2.9	6	0.1	4	0.010	0.015	249011 0030	
4	8	14	57	3.9	6	0.1	4	0.015	0.20	249011 0040	
5	10	16	57	4.9	6	0.1	4	0.020	0.025	249011 0050	
6	12	19	57	5.8	6	0.2	4	0.025	0.030	249011 0060	
8	16	25	63	7.8	8	0.2	4	0.030	0.040	249011 0080	
10	20	30	72	9.7	10	0.2	4	0.040	0.050	249011 0100	
12	24	36	83	11.7	12	0.2	4	0.050	0.070	249011 0120	

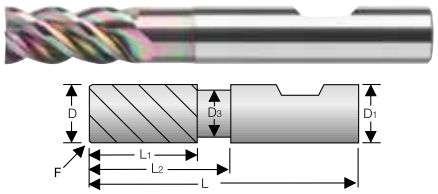
2169



Shank version HB

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
16	32	42	92	15.7	16	0.2	4	0.065	0.090	249011 0160	
20	40	52	104	19.5	20	0.2	4	0.085	0.120	249011 0200	

2169

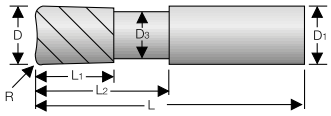


ATORN Torus milling cutter *Ultra-N PRO*

VHM | Typ W | 10° γ | γ 30° | h9 | h6 | Z 2 | Ta-C | Vc/fz | 763

- **With clearance**
- **2 cutting edges**
- **Spiral angle 45°**
- For non-ferrous materials
- **Cutting material: solid carbide with DLC-sp3 coating**
- With polish grinding in the chip chambers
- Large chip space for unhindered chip removal

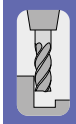
ISO N



material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
249013....												● 300	● 230	● 190				
249012....												● 160	● 120	● 190				
Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.



Short



D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	R mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3	4	50	14	2.9	6	0.3	2	0.011	0.01	249013 0303	
4	5	50	16	3.9	6	0.3	2	0.023	0.02	249013 0403	
5	6	54	18	4.9	6	0.3	2	0.023	0.02	249013 0503	
6	7	57	21	5.8	6	0.3	2	0.034	0.03	249013 0603	
6	7	57	21	5.8	6	1	2	0.034	0.03	249013 0610	
6	7	57	21	5.8	6	2	2	0.034	0.03	249013 0620	
8	9	63	27	7.8	8	0.3	2	0.045	0.04	249013 0803	
8	9	63	27	7.8	8	1	2	0.045	0.04	249013 0810	
8	9	63	27	7.8	8	2	2	0.045	0.04	249013 0820	
10	11	72	32	9.7	10	0.3	2	0.056	0.05	249013 1003	
10	11	72	32	9.7	10	1.5	2	0.056	0.05	249013 1015	
10	11	72	32	9.7	10	3	2	0.056	0.05	249013 1030	
12	13	83	38	11.7	12	1.5	2	0.079	0.07	249013 1215	
12	13	83	38	11.7	12	4	2	0.079	0.07	249013 1240	
16	17	92	44	15.7	16	2	2	0.1	0.09	249013 1620	
16	17	92	44	15.7	16	5	2	0.1	0.09	249013 1650	

2169

Long



D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	R mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3	4	75	32	2.9	6	0.3	2	0.011	0.01	249012 0303	
4	5	75	36	3.9	6	0.3	2	0.023	0.02	249012 0403	
5	6	75	40	4.9	6	0.3	2	0.023	0.02	249012 0503	
6	7	80	44	5.8	6	0.3	2	0.034	0.03	249012 0603	
6	7	80	44	5.8	6	1	2	0.034	0.03	249012 0610	
6	7	80	44	5.8	6	2	2	0.034	0.03	249012 0620	
8	9	100	54	7.8	8	0.3	2	0.045	0.04	249012 0803	
8	9	100	54	7.8	8	1	2	0.045	0.04	249012 0810	
8	9	100	54	7.8	8	2	2	0.045	0.04	249012 0820	
10	11	100	60	9.7	10	0.3	2	0.056	0.05	249012 1003	
10	11	100	60	9.7	10	1.5	2	0.056	0.05	249012 1015	
10	11	100	60	9.7	10	3	2	0.056	0.05	249012 1030	
12	13	120	75	11.7	12	1.5	2	0.079	0.07	249012 1215	
12	13	120	75	11.7	12	4	2	0.079	0.07	249012 1240	
16	17	150	92	15.7	16	2	2	0.1	0.09	249012 1620	
16	17	150	92	15.7	16	5	2	0.1	0.09	249012 1650	

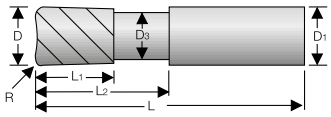
2169

ATORN Torus milling cutter *Ultra-N PRO*

VHM | 43° -47° | h9 | h6 | Z 3 | Ta-C | HPC | Vc/fz | 764

- **with clearance**
- **3 cutting edges**
- **unequal spiral angle 43°/47°**
- for non-ferrous materials
- **Cutting material: solid carbide with DLC-sp3 coating**
- with polish grinding in the chip chambers
- large chip space for unhindered chip removal
- **chip separator**

ISO N



material	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
● very well suited ○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
												● 425	● 200	● 190				
Cutting speed Vc m/min.																Please adjust these guidelines according to clamping operation and machine set-up.		



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
6	25	31	71	5.8	6	0.5	3	0.032	249014 0605	
6	25	31	71	5.8	6	1.0	3	0.032	249014 0610	
8	33	41	80	7.8	8	0.5	3	0.045	249014 0805	
8	33	41	80	7.8	8	1.0	3	0.045	249014 0810	
8	33	41	80	7.8	8	2.0	3	0.045	249014 0820	
10	41	51	95	9.7	10	0.5	3	0.055	249014 1005	
10	41	51	95	9.7	10	1.0	3	0.055	249014 1010	
10	41	51	95	9.7	10	2.0	3	0.055	249014 1020	
12	49	61	109	11.7	12	0.5	3	0.08	249014 1205	
12	49	61	109	11.7	12	1.0	3	0.08	249014 1210	
12	49	61	109	11.7	12	2.0	3	0.08	249014 1220	
16	65	81	132	15.7	16	2.0	3	0.095	249014 1620	
16	65	81	132	15.7	16	3	3	0.095	249014 1630	
20	82	101	154	19.5	20	2.0	3	0.125	249014 2020	
20	82	101	154	19.5	20	3	3	0.125	249014 2030	

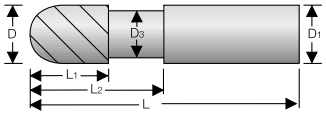
2169

ATORN Radius milling cutter *Ultra-N PRO*

VHM | 45° | h9 | h6 | Z 2 | Ta-C | Vc/fz | 764

- **With clearance**
- **2 cutting edges**
- **Spiral angle 45°**
- For non-ferrous materials
- **Cutting material: solid carbide with DLC-sp3 coating**
- With polish grinding in the chip chambers
- Large chip space for unhindered chip removal

ISO N



material	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
● very well suited ○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
249015....												● 470	● 220	● 210				
249016....												● 425	● 200	● 190				
Cutting speed Vc m/min.																Please adjust these guidelines according to clamping operation and machine set-up.		

Short



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3	6	16	50	2.9	3	1.5	2	0.03	249015 0030	
4	7	17	54	3.9	4	2	2	0.03	249015 0040	
5	8	18	54	4.9	5	2.5	2	0.06	249015 0050	
6	10	21	54	5.8	6	3	2	0.06	249015 0060	
8	12	27	59	7.8	8	4	2	0.06	249015 0080	
10	13	32	67	9.8	10	5	2	0.08	249015 0100	
12	16	38	73	11.7	12	6	2	0.08	249015 0120	
16	20	44	83	15.7	16	8	2	0.15	249015 0160	

2169

Long

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3	10	32	75	2.9	3	1.5	2	0.03	249016 0030	
4	13	36	75	3.9	4	2	2	0.03	249016 0040	
5	15	40	75	4.9	5	2.5	2	0.06	249016 0050	
6	16	44	100	5.8	6	3	2	0.06	249016 0060	
8	22	54	100	7.8	8	4	2	0.06	249016 0080	
10	25	60	100	9.8	10	5	2	0.08	249016 0100	
12	26	60	100	11.7	12	6	2	0.08	249016 0120	
16	30	92	150	15.7	16	8	2	0.15	249016 0160	

2169



ATORN Roughing cutter *Ultra-N PRO*

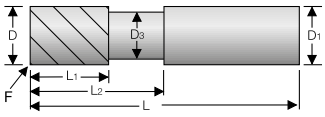
VHM | WR | 30° | e8 | h6 | Z 3 | Ta-C | Vc/fz

764

ISO N

- **With clearance**
- **3 cutting edges, with edge chamfer**
- **Spiral angle 30°**
- For non-ferrous materials
- **Cutting material: solid carbide with DLC-sp3 coating**
- With polish grinding in the chip chambers
- Large chip space for unhindered chip removal

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													● 320	● 260	● 190				
	Cutting speed Vc m/min.															Please adjust these guidelines according to clamping operation and machine set-up.			

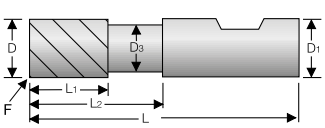




Shank version HA

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F x 45° mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	**Without internal cooling** art.no.	€	**With internal cooling** art.no.	€
6	14	57	20	5.9	6	0.2	3	0.08	0.06	249017 0060		249018 0060	
8	21	63	26	7.8	8	0.25	3	0.08	0.06	249017 0080		249018 0080	
10	23	72	31	9.8	10	0.3	3	0.09	0.07	249017 0100		249018 0100	
12	27	83	37	11.7	12	0.35	3	0.09	0.07	249017 0120		249018 0120	

2169 2169





Shank version HB

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F x 45° mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	**Without internal cooling** art.no.	€	**With internal cooling** art.no.	€
16	36	92	43	15.7	16	0.4	3	0.09	0.11	249017 0160		249018 0160	
20	41	104	52	19.5	20	0.4	3	0.12	0.14	249017 0200		249018 0200	

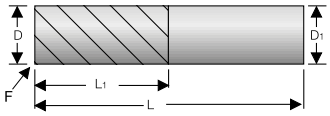
2169 2169

ATORN Trochoidal milling cutter *Ultra-N PRO*

VHM | Typ W | 30° | h9 | h6 | Z 3 | Ta-C | TVC | Vc/fz | 764

ISO N

- **3 cutting edges, with edge chamfer**
- **Spiral angle 30°**
- **3.5 x D**
- For non-ferrous materials
- **Cutting material: solid carbide with DLC-sp3 coating**
- With polish grinding in the chip chambers
- Large chip space for unhindered chip removal



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													● 470	● 220	● 210				
	Cutting speed Vc m/min.																Please adjust these guidelines according to clamping operation and machine set-up.		

Shank version HA

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
6	21	62	6	0.2	3	0.036	249019 0060	
8	28	68	8	0.2	3	0.048	249019 0080	
10	35	80	10	0.2	3	0.06	249019 0100	
12	42	93	12	0.2	3	0.084	249019 0120	
							2169	



Shank version HB

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
16	56	108	16	0.2	3	0.108	249019 0160	
20	70	126	20	0.2	3	0.144	249019 0200	
							2169	



High-speed milling cutters for stainless steel and special alloys

INFO

The new generation of ATORN milling cutters are characterised by excellent performance in the machining of stainless steel and special alloys containing metals such as nickel, cobalt and titanium. An ultra-fine-grain carbide metal substrate in combination with high-performance geometry and specially developed ULTRA-MS coating make these tools absolutely process-safe and wear-resistant and allow a high metal removal rate.
The new geometries – i.e., adapted core diameters, optimal and positive rake and helix angles and corresponding micro geometries – allow for high feed rates and deliveries. One example of this are the 4-edge HPC milling cutters. These are designed with unequal flute spacing and unequal helix pitch. This design not only makes the tools suitable for use in **HPC milling**, but allows trouble-free **trochoidal milling** as well.
The range includes HSC- and HPC-enabled tools for roughing, semi-roughing and finishing from Ø0.2-20 mm. The excellent stability during machining leads to process safety and high-quality surfaces, which cuts costs and boosts efficiency.
The mini-end milling cutters, also available as torus and radius milling cutters, round out the range.



Extreme temperature resistance thanks to ULTRA-MS
The special ULTRA-MS coating can handle application temperatures of up to 1100 ° C. That's important, because these special alloys are poor heat dissipaters.

Maximum service life
The ULTRA-MS coating significantly increases the service life of the tools.

Perfect cutting edge geometry makes for quiet running
Perfectly matched to the machining conditions in stainless steel and special alloys:
positive cutting geometries ensure soft cuts and smooth running

Low vibrations, even in border areas
The unequal helix pitch and unequal flute spacing reduce vibrations during machining

High precision
For precise components, high-precision edge radii, among other things, with a tolerance of less than 0.01 mm, ensure

The highest surface quality
The multitude of special features guarantees the highest quality surface finishes with no chatter marks, and much more.

Overview of the range		Ø-area mm	Page
Solid carbide mini end milling cutters		**Ø 0.5 - 4**	**490**
Solid carbide VHM-Schruppfräser HPC Roughing cutter VHM-Schruppfräser HPC		**Ø 5 - 20**	**492**
Solid carbide VHM-Trochoidalfräser Trochoidal end milling cutter		**Ø 5 - 20**	**492**
Solid carbide mini torus cutters		**Ø 0.5 - 4**	**495**
Solid carbide mini radius milling cutters		**Ø 0.5 - 4**	**497**
Solid carbide end milling cutters for stainless steel		**Ø 4 - 20**	**493**
Solid carbide end milling cutters for titanium materials		**Ø 3 - 25**	**494**
Solid carbide torus cutters		**Ø 4 - 20**	**496**
Solid carbide radius milling cutters, standard		**Ø 3 - 20**	**496**

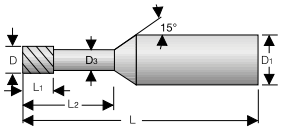
material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	○	●	●	●	○	○	●	●	●							

ATORN Ultra-MS mini end milling cutter

VHM | Typ VA | 40° | h6 | Z 2 | AlCrN | Vc/fz | 766

- With clearance

ISO M



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 65	● 65	○ 65	● 35	● 35	● 70	○ 65	○ 65	● 70	● 70	● 70							
	Cutting speed Vc m/min.																		



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Z	Feed fz stainless steel austenitic mm/tooth	Feed fz stainless steel austenitic mm/tooth	art.no.	€
0.5	0.7	2.0	50	0.45	4	2	0.002	0.001	256011 0011	
0.5	0.7	4.0	50	0.45	4	2	0.002	0.001	256011 0012	
0.5	0.7	6.0	50	0.45	4	2	0.002	0.001	256011 0013	
0.5	0.7	8.0	50	0.45	4	2	0.002	0.001	256011 0014	
0.8	1.2	4.0	50	0.75	4	2	0.004	0.003	256011 0020	
0.8	1.2	6.0	50	0.75	4	2	0.004	0.003	256011 0021	
0.8	1.2	8.0	50	0.75	4	2	0.004	0.003	256011 0022	
0.8	1.2	10.0	50	0.75	4	2	0.004	0.003	256011 0023	
0.8	1.2	12.0	50	0.75	4	2	0.004	0.003	256011 0024	
1	1.5	6,0	50	0.95	4	2	0.005	0.004	256011 0025	
1	1.5	8,0	50	0.95	4	2	0.005	0.004	256011 0026	
1	1.5	10.0	50	0.95	4	2	0.005	0.004	256011 0027	
1	1.5	12.0	50	0.95	4	2	0.005	0.004	256011 0028	
1	1.5	16.0	50	0.95	4	2	0.005	0.004	256011 0029	
1.2	1.8	6,0	50	1.15	4	2	0.006	0.005	256011 0030	
1.2	1.8	8,0	50	1.15	4	2	0.006	0.005	256011 0031	
1.2	1.8	10.0	50	1.15	4	2	0.006	0.005	256011 0032	
1.2	1.8	12.0	50	1.15	4	2	0.006	0.005	256011 0033	
1.5	2.3	6,0	50	1.45	4	2	0.007	0.006	256011 0034	
1.5	2.3	8,0	50	1.45	4	2	0.007	0.006	256011 0035	
1.5	2.3	10.0	50	1.45	4	2	0.007	0.006	256011 0036	
1.5	2.3	12.0	50	1.45	4	2	0.007	0.006	256011 0037	
1.5	2.3	16.0	50	1.45	4	2	0.007	0.006	256011 0038	
1.5	2.3	20.0	60	1.45	4	2	0.007	0.006	256011 0039	
2	3	6.0	50	1.95	4	2	0.010	0.008	256011 0040	
2	3	8.0	50	1.95	4	2	0.010	0.008	256011 0041	
2	3	10.0	50	1.95	4	2	0.010	0.008	256011 0042	
2	3	12.0	50	1.95	4	2	0.010	0.008	256011 0043	
2	3	16.0	50	1.95	4	2	0.010	0.008	256011 0044	
2	3	20.0	60	1.95	4	2	0.010	0.008	256011 0045	
2	3	25.0	75	1.95	4	2	0.010	0.008	256011 0046	
2.5	3.7	8.0	50	2.4	4	2	0.013	0.010	256011 0048	
2.5	3.7	10.0	50	2.4	4	2	0.013	0.010	256011 0049	
2.5	3.7	12.0	50	2.4	4	2	0.013	0.010	256011 0050	
2.5	3.7	16.0	50	2.4	4	2	0.013	0.010	256011 0051	
2.5	3.7	20.0	60	2.4	4	2	0.013	0.010	256011 0052	
2.5	3.7	25.0	60	2.4	4	2	0.013	0.010	256011 0053	
3	4.5	8.0	50	2.85	6	2	0.015	0.012	256011 0055	
3	4.5	10.0	50	2.85	6	2	0.015	0.012	256011 0056	
3	4.5	12.0	50	2.85	6	2	0.015	0.012	256011 0057	
3	4.5	16.0	60	2.85	6	2	0.015	0.012	256011 0058	
3	4.5	20.0	60	2.85	6	2	0.015	0.012	256011 0059	
3	4.5	25.0	75	2.85	6	2	0.015	0.012	256011 0060	
4	4.5	20.0	60	3.85	6	2	0.021	0.016	256011 0063	
4	4.5	25.0	75	3.85	6	2	0.021	0.016	256011 0064	
4	4.5	30.0	75	3.85	6	2	0.021	0.016	256011 0065	
4	4.5	40.0	75	3.85	6	2	0.021	0.016	256011 0066	

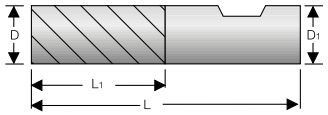
2153

SARA® Basic Line end milling cutter

VHM | 40° | h10 | h6 | Z 4 | AlCrN | HPC | Vc/fz | 742

ISO M

- **4 cutting edges, long,** 40° right-hand cutting
- **Unequal pitch to minimise the vibrations**
- CNC repetition precision to within 10 µm
- **For milling stainless steel, exotic materials and general applications**
- Especially suitable for slot milling and for lateral machining
- **Cutting material: fine grain solid carbide**



material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	●	●	○	●	●	●			●	●	●	●	●	●				
	175	100	80	75	55	55			65	28	38	315	225	175				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	9	57	6.0	4	0.016	0.020	254124 0030	
4.0	12	57	6.0	4	0.021	0.026	254124 0040	
5.0	13	57	6.0	4	0.026	0.032	254124 0050	
6.0	13	57	6.0	4	0.031	0.038	254124 0060	
8.0	20	64	8.0	4	0.037	0.046	254124 0080	
10.0	22	72	10.0	4	0.044	0.054	254124 0100	
12.0	26	83	12.0	4	0.050	0.062	254124 0120	
16.0	32	92	16.0	4	0.063	0.078	254124 0160	
20.0	38	104	20.0	4	0.075	0.094	254124 0200	

2148

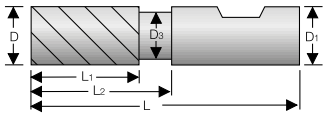


HPMT End milling cutters

VHM | 40° | h10 | h6 | Z 4 | AlCrN | HPC | Vc/fz | 742

- **With clearance**
- **Irregular pitch to minimise vibrations**
- CNC repetition precision to within 10 µm
- **For milling stainless steel, machining exotic materials, and general applications**
- Especially suitable for groove milling and lateral machining

EXCLUSIVE item: The all-rounder!



material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	●	●	○	●	●	●			●	●	●	●	●	●				
	175	110	80	55	55	55			55	20	15	315	225	175				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L2 mm	D1 mm	L mm	D3 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	9	15	6	57	2.80	4	0.016	0.020	254121 0030	
4.0	12	20	6	57	3.70	4	0.021	0.026	254121 0040	
5.0	13	20	6	57	4.60	4	0.026	0.032	254121 0050	
6.0	13	20	6	57	5.50	4	0.031	0.038	254121 0060	
8.0	20	30	8	64	7.40	4	0.037	0.046	254121 0080	
10.0	22	32	10	72	9.20	4	0.044	0.054	254121 0100	
12.0	26	37	12	83	11.00	4	0.050	0.062	254121 0120	
16.0	32	46	16	92	15.00	4	0.063	0.078	254121 0160	
20.0	38	58	20	104	19.00	4	0.075	0.094	254121 0200	

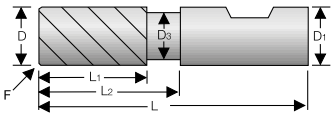
2180



SARA® Solid carbide roughing cutter HPC

VHM | 38° | Z 4 | AlCrN | HPC | Vc/fz | 743

- Roughing or finishing in one tool
- Very smooth running at highest feed rates up to 0.7xD into the solid material
- Eccentric relief grinding with large chip spaces



material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	● 150	● 100	○ 75	● 55	● 90	● 50	● 180	● 180	● 65									

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



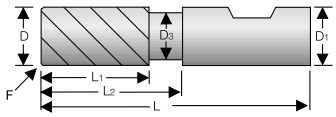
D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
5	13	25	62	4.8	6	0.2	4	0.028	254146 0050	
6	13	25	62	5.5	6	0.2	4	0.032	254146 0060	
8	19	32	68	7.5	8	0.2	4	0.045	254146 0080	
10	22	40	80	9.5	10	0.3	4	0.060	254146 0100	
12	26	48	93	11.5	12	0.3	4	0.080	254146 0120	
16	32	56	108	15.5	16	0.4	4	0.103	254146 0160	
20	38	70	126	19.5	20	0.5	4	0.124	254146 0200	

2179

SARA® Solid carbide trochoidal milling cutter

VHM | 40° | Z 4 | AlCrN | TVC | Vc/fz | 744

- Special trochoidal geometry with reinforced core
- High-performance cutters for universal use
- Special substrates guarantee bending strength
- Controlled chip breaking thanks to optimum chip separator



material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	● 220	● 190		● 110	● 100	● 90	● 180	● 180	● 70									

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
5	25	30	70	4.8	6	0.1	4	0.017	254147 0050	
6	30	36	75	5.8	6	0.1	4	0.021	254147 0060	
8	40	48	90	7.8	8	0.12	4	0.030	254147 0080	
10	50	60	104	9.8	10	0.16	4	0.042	254147 0100	
12	60	72	120	11.8	12	0.2	4	0.054	254147 0120	
16	80	96	150	15.8	16	0.32	4	0.067	254147 0160	
20	100	120	175	19.8	20	0.4	4	0.074	254147 0200	

2179

ATORN Ultra-MS end milling cutter

VHM | Typ VA | 10° γ | 35° -38° | h6 | Z 4 | AlCrN | HPC | Vc/fz 766

ISO M

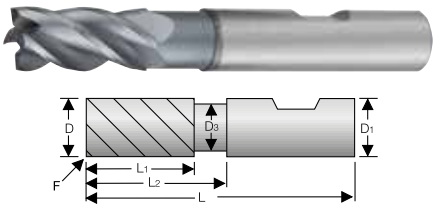
- With clearance

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 130	● 130	○ 130	● 70	● 70	● 70	○ 130	○ 130	● 70	● 70	● 70							
	Cutting speed Vc m/min.				Please adjust these guidelines according to clamping operation and machine set-up.														

Standard with driving plane

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz stainless steel austenitic mm/tooth	Feed fz stainless steel austenitic mm/tooth	HB parallel shank art.no.	€
4	11	20	57	3.7	6	0.1	4	0.016	0.021	256007 0040	
5	13	20	57	4.6	6	0.1	4	0.02	0.026	256007 0050	
6	13	20	57	5.5	6	0.1	4	0.024	0.031	256007 0060	
8	20	30	64	7.4	8	0.2	4	0.03	0.038	256007 0080	
10	22	32	72	9.2	10	0.2	4	0.036	0.046	256007 0100	
12	26	37	83	11	12	0.2	4	0.043	0.054	256007 0120	
16	32	46	92	15	16	0.3	4	0.054	0.068	256007 0160	
20	38	58	104	19	20	0.4	4	0.066	0.083	256007 0200	

2153





Standard end milling cutter set with driving plane

Contents	art.no.	€
End milling cutter set, solid carbide 35°/38°, irreg. pitch, Ø6, 8, 10, 12 mm, clear. (stainless steel) 4 S., HB, Ultra-MS	256007 1004	

2153

VAN HOORN CARBIDE VHVTR/W 4/5 end milling cutter

VHM | 35° -38° | e8 | h9 | Z 4 | Z 5 | TiAlSiN | Vc/fz 749

- **Cutting material: ultra-fine grain solid carbide, TiAlSiN-coated**
- Special pre-treatment and finishing treatment due to **micro radiation**
- **New chip flute geometry** for enhanced cooling and chip flow
- For wet machining, **high material removal rate**

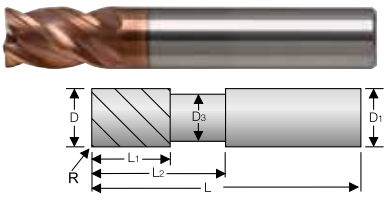
For machining titanium and stainless steel

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
					● 115	● 90	● 70			● 85	● 40	● 25							
	Cutting speed Vc m/min.				Please adjust these guidelines according to clamping operation and machine set-up.														

Short Z4

D mm	R mm	D3 mm	D1 mm	L mm	L1 mm	L2 mm	Z	Feed fz stainless steel ferrit./martens. mm/tooth	Feed fz stainless steel ferrit./martens. mm/tooth	DIN 6535-HB art.no.	€
3.0	0.2	2.8	6	51	5	7	4	0.015	0.020	255088 0030	
4.0	0.2	3.8	6	51	6	9	4	0.025	0.030	255088 0040	
5.0	0.2	4.6	6	51	7	11	4	0.025	0.030	255088 0050	
6.0	0.3	5.6	6	64	8	13	4	0.030	0.040	255088 0060	
8.0	0.5	7.4	8	64	11	18	4	0.040	0.050	255088 0080	
10.0	0.5	9.4	10	70	13	22	4	0.055	0.070	255088 0100	
12.0	1.0	11.4	12	78	15	25	4	0.065	0.080	255088 0120	
16.0	1.0	15.4	16	89	19	35	4	0.080	0.100	255088 0160	
20.0	1.0	19.2	20	102	23	42	4	0.010	0.200	255088 0200	
25.0	1.0	24.21	25	120	28	45	4	0.125	0.250	255088 0250	

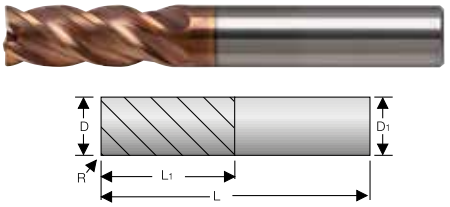
2113



Standard Z4

D mm	R mm	D1 mm	L mm	L1 mm	Z	Feed fz stainless steel ferrit./martens. mm/tooth	Feed fz stainless steel ferrit./martens. mm/tooth	DIN 6535-HA art.no.	€
4.0	0.2	6	51	9	4	0.025	0.030	255087 0040	
5.0	0.2	6	51	11	4	0.025	0.030	255087 0050	
6.0	0.3	6	64	13	4	0.030	0.040	255087 0060	
8.0	0.5	8	64	18	4	0.040	0.050	255087 0080	
10.0	0.5	10	70	22	4	0.055	0.070	255087 0100	
12.0	1.0	12	78	25	4	0.065	0.080	255087 0120	
16.0	1.0	16	92	35	4	0.080	0.100	255087 0160	
20.0	1.0	20	102	42	4	0.010	0.200	255087 0200	
25.0	1.0	25	120	45	4	0.125	0.250	255087 0250	

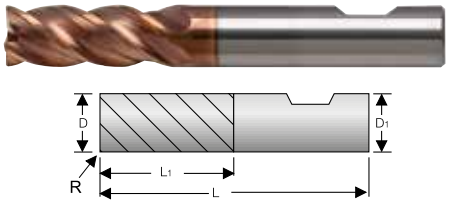
2113



Standard with driving plane Z4

D mm	R mm	D1 mm	L mm	L1 mm	Z	Feed fz stainless steel ferrit./martens. mm/tooth	Feed fz stainless steel ferrit./martens. mm/tooth	DIN 6535-HB art.no.	€
6.0	0.3	6	64	13	4	0.030	0.040	255084 0060	
8.0	0.5	8	64	18	4	0.040	0.050	255084 0080	
10.0	0.5	10	70	22	4	0.055	0.070	255084 0100	
12.0	1.0	12	78	25	4	0.065	0.080	255084 0120	
16.0	1.0	16	89	35	4	0.080	0.100	255084 0160	
20.0	1.0	20	102	42	4	0.010	0.200	255084 0200	
25.0	1.0	25	120	45	4	0.125	0.250	255084 0250	

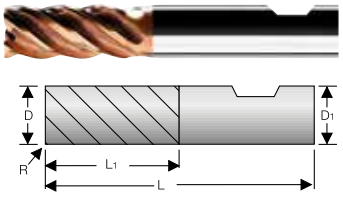
2113



Standard with driving plane Z5

D mm	R mm	D1 mm	L mm	L1 mm	Z	Feed fz stainless steel ferrit./martens. mm/tooth	DIN 6535-HB art.no.	€
3.0	0.2	6	51	7	5	0.01	255102 0302	
4.0	0.2	6	51	9	5	0.012	255102 0402	
5.0	0.2	6	51	11	5	0.02	255102 0502	
6.0	0.1	6	64	13	5	0.025	255102 0601	
6.0	0.3	6	64	13	5	0.025	255102 0603	
6.0	0.5	6	64	13	5	0.025	255102 0605	
6.0	1.0	6	64	13	5	0.025	255102 0610	
8.0	0.1	8	64	18	5	0.035	255102 0801	
8.0	0.3	8	64	18	5	0.035	255102 0803	
8.0	0.5	8	64	18	5	0.035	255102 0805	
8.0	1.0	8	64	18	5	0.035	255102 0810	
10.0	0.1	10	70	22	5	0.04	255102 1001	
10.0	0.3	10	70	22	5	0.04	255102 1003	
10.0	0.5	10	70	22	5	0.04	255102 1005	
10.0	1.0	10	70	22	5	0.04	255102 1010	
12.0	0.1	12	78	25	5	0.05	255102 1201	
12.0	0.3	12	78	25	5	0.05	255102 1203	
12.0	0.5	12	78	25	5	0.05	255102 1205	
12.0	1.0	12	78	25	5	0.05	255102 1210	
14.0	0.5	14	89	30	5	0.055	255102 1405	
14.0	1.0	14	89	30	5	0.055	255102 1410	
16.0	0.1	16	89	35	5	0.06	255102 1601	
16.0	0.5	16	89	35	5	0.06	255102 1605	
16.0	1.0	16	89	35	5	0.06	255102 1610	
20.0	0.5	20	102	42	5	0.08	255102 2005	
20.0	1.0	20	102	42	5	0.08	255102 2010	
25.0	0.5	25	120	45	5	0.11	255102 2505	
25.0	1.0	25	120	45	5	0.11	255102 2510	

2113

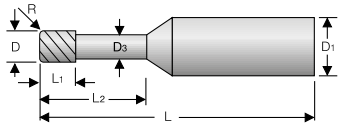


Trochoidal

ATORN Ultra-MS mini torus cutter

VHM | Typ VA | 40° | h6 | Z 2 | AlCrN | Vc/fz | 766

- With clearance



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 100	● 100	○ 100	● 35	● 35	● 70	○ 100	○ 100	● 70	● 70	● 70							
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		



ISO M

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz stainless steel austenitic mm/tooth	Feed fz stainless steel austenitic mm/tooth	art.no.	€
0.5	0.7	2.0	50	0.45	4	0.05	2	0.002	0.001	256012 0011	
0.5	0.7	4	50	0.45	4	0.05	2	0.002	0.001	256012 0012	
0.5	0.7	6.0	50	0.45	4	0.05	2	0.002	0.001	256012 0013	
0.5	0.7	8.0	50	0.45	4	0.05	2	0.002	0.001	256012 0014	
0.8	1.2	4	50	0.75	4	0.10	2	0.004	0.003	256012 0018	
0.8	1.2	6.0	50	0.75	4	0.10	2	0.004	0.003	256012 0019	
0.8	1.2	8.0	50	0.75	4	0.10	2	0.004	0.003	256012 0020	
0.8	1.2	10.0	50	0.75	4	0.10	2	0.004	0.003	256012 0021	
0.8	1.2	12.0	50	0.75	4	0.10	2	0.004	0.003	256012 0022	
1	1.5	6,0	50	0.95	4	0.10	2	0.005	0.004	256012 0023	
1	1.5	8,0	50	0.95	4	0.10	2	0.005	0.004	256012 0024	
1	1.5	10.0	50	0.95	4	0.10	2	0.005	0.004	256012 0025	
1	1.5	12.0	50	0.95	4	0.10	2	0.005	0.004	256012 0026	
1	1.5	16.0	50	0.95	4	0.10	2	0.005	0.004	256012 0027	
1.2	1.8	6,0	50	1.15	4	0.10	2	0.006	0.005	256012 0028	
1.2	1.8	8,0	50	1.15	4	0.10	2	0.006	0.005	256012 0029	
1.2	1.8	10.0	50	1.15	4	0.10	2	0.006	0.005	256012 0030	
1.2	1.8	12.0	50	1.15	4	0.10	2	0.006	0.005	256012 0031	
1.5	2.3	6,0	50	1.45	4	0.20	2	0.007	0.006	256012 0032	
1.5	2.3	8,0	50	1.45	4	0.20	2	0.007	0.006	256012 0033	
1.5	2.3	10.0	50	1.45	4	0.20	2	0.007	0.006	256012 0034	
1.5	2.3	12.0	50	1.45	4	0.20	2	0.007	0.006	256012 0035	
1.5	2.3	16.0	50	1.45	4	0.20	2	0.007	0.006	256012 0036	
1.5	2.3	20.0	60	1.45	4	0.20	2	0.007	0.006	256012 0037	
2	3	6.0	50	1.95	4	0.20	2	0.010	0.008	256012 0038	
2	3	8.0	50	1.95	4	0.20	2	0.010	0.008	256012 0039	
2	3	10.0	50	1.95	4	0.20	2	0.010	0.008	256012 0040	
2	3	12.0	50	1.95	4	0.20	2	0.010	0.008	256012 0041	
2	3	16.0	50	1.95	4	0.20	2	0.010	0.008	256012 0042	
2	3	20.0	60	1.95	4	0.20	2	0.010	0.008	256012 0043	
2	3	25.0	75	1.95	4	0.20	2	0.010	0.008	256012 0044	
2.5	3.7	8.0	50	2.4	4	0.30	2	0.013	0.010	256012 0046	
2.5	3.7	10.0	50	2.4	4	0.30	2	0.013	0.010	256012 0047	
2.5	3.7	12.0	50	2.4	4	0.30	2	0.013	0.010	256012 0048	
2.5	3.7	16.0	50	2.4	4	0.30	2	0.013	0.010	256012 0049	
2.5	3.7	20.0	60	2.4	4	0.30	2	0.013	0.010	256012 0050	
2.5	3.7	25.0	60	2.4	4	0.30	2	0.013	0.010	256012 0051	
3	4.5	8.0	50	2.85	6	0.30	2	0.015	0.012	256012 0053	
3	4.5	10.0	50	2.85	6	0.30	2	0.015	0.012	256012 0054	
3	4.5	12.0	50	2.85	6	0.30	2	0.015	0.012	256012 0055	
3	4.5	16.0	60	2.85	6	0.30	2	0.015	0.012	256012 0056	
3	4.5	20.0	60	2.85	6	0.30	2	0.015	0.012	256012 0057	
3	4.5	25.0	75	2.85	6	0.30	2	0.015	0.012	256012 0058	
4	4.5	20.0	60	3.85	6	0.40	2	0.021	0.016	256012 0061	
4	4.5	25.0	75	3.85	6	0.40	2	0.021	0.016	256012 0062	
4	4.5	30.0	75	3.85	6	0.40	2	0.021	0.016	256012 0063	
4	4.5	40.0	75	3.85	6	0.40	2	0.021	0.016	256012 0064	

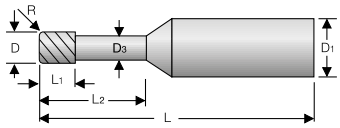
2153

ATORN Ultra-MS torus cutter

VHM | Typ VA | 10° | 35°-38° | h6 | Z 4 | AlCrN | HPC | Vc/fz | 766

ISO M

• With clearance



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 140	● 130		● 70	● 60	● 70	○ 110		● 70	● 70	● 70							
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

Standard



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz stainless steel austenitic mm/tooth	Feed fz stainless steel austenitic mm/tooth	art.no.	€
4	11	20	57	3.7	6	0.30	4	0.021	0.016	256010 0001	
4	11	20	57	3.7	6	0.50	4	0.021	0.016	256010 0002	
5	13	20	57	4.6	6	0.30	4	0.026	0.020	256010 0003	
5	13	20	57	4.6	6	0.50	4	0.026	0.020	256010 0004	
6	13	20	57	5.5	6	0.30	4	0.031	0.024	256010 0005	
6	13	20	57	5.5	6	0.50	4	0.031	0.024	256010 0006	
6	13	20	57	5.5	6	1.00	4	0.031	0.024	256010 0007	
8	20	30	64	7.4	8	0.50	4	0.038	0.030	256010 0009	
8	20	30	64	7.4	8	1.00	4	0.038	0.030	256010 0010	
10	22	32	72	9.2	10	0.50	4	0.046	0.036	256010 0012	
10	22	32	72	9.2	10	1.00	4	0.046	0.036	256010 0013	
12	26	37	83	11	12	0.50	4	0.054	0.043	256010 0014	
12	26	37	83	11	12	1.00	4	0.054	0.043	256010 0015	
12	26	37	83	11	12	2.00	4	0.054	0.043	256010 0016	
12	26	37	83	11	12	3.00	4	0.054	0.043	256010 0018	
16	32	46	92	15	16	1.00	4	0.068	0.054	256010 0020	
16	32	46	92	15	16	2.00	4	0.068	0.054	256010 0021	
16	32	46	92	15	16	3.00	4	0.068	0.054	256010 0022	
20	38	58	104	19	20	1.00	4	0.083	0.066	256010 0025	
20	38	58	104	19	20	2.00	4	0.083	0.066	256010 0026	
20	38	58	104	19	20	3.00	4	0.083	0.066	256010 0027	
20	38	58	104	19	20	4.00	4	0.083	0.066	256010 0028	

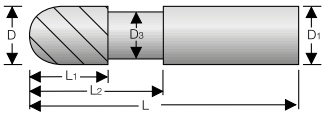
2153

ATORN Ultra-MS radius milling cutter

VHM | Typ VA | 30° | h6 | Z 2 | AlCrN | Vc/fz | 755

ISO M

• With clearance



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 150	● 140		● 75	● 65	● 80	○ 175		● 70	● 70	● 60							
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

Standard



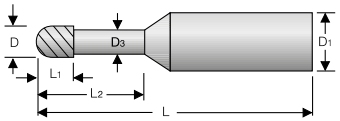
D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz stainless steel austenitic mm/tooth	Feed fz stainless steel austenitic mm/tooth	HA parallel shank art.no.	€
3	5	20	57	2.8	6	1.5	2	0.015	0.012	256016 0030	
4	6	20	57	3.7	6	2	2	0.021	0.016	256016 0040	
5	7	20	57	4.6	6	2.5	2	0.026	0.020	256016 0050	
6	8	20	57	5.5	6	3	2	0.031	0.024	256016 0060	
8	10	25	64	7.4	8	4	2	0.038	0.030	256016 0080	
10	12	35	75	9.2	10	5	2	0.046	0.036	256016 0100	
12	14	35	75	11	12	6	2	0.054	0.043	256016 0120	
16	18	45	90	15	16	8	2	0.068	0.054	256016 0160	
20	22	50	100	19	20	10	2	0.083	0.066	256016 0200	

2153

ATORN Ultra-MS mini radius milling cutter

VHM | Typ VA | 30° | h6 | Z 2 | AlCrN | Vc/fz | 766

- With clearance



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 45	● 40		● 35	● 30	● 70	○ 104		● 45	● 45	● 40							
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		



ISO M

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz stainless steel austenitic mm/tooth	Feed fz stainless steel austenitic mm/tooth	art.no.	€
0.5	0.4	2,0	50	0.45	4	0.25	2	0.003	0.002	256013 0012	
0.5	0.4	4,0	50	0.45	4	0.25	2	0.003	0.002	256013 0014	
0.5	0.4	6,0	50	0.45	4	0.25	2	0.003	0.002	256013 0016	
0.5	0.4	8,0	50	0.45	4	0.25	2	0.003	0.002	256013 0017	
0.8	0.6	2,0	50	0.75	4	0.40	2	0.003	0.002	256013 0024	
0.8	0.6	4,0	50	0.75	4	0.4	2	0.004	0.003	256013 0025	
0.8	0.6	6,0	50	0.75	4	0.4	2	0.004	0.003	256013 0027	
0.8	0.6	8,0	50	0.75	4	0.4	2	0.004	0.003	256013 0028	
0.8	0.6	10,0	50	0.75	4	0.40	2	0.004	0.003	256013 0029	
1	0.8	3,0	50	0.95	4	0.5	2	0.005	0.004	256013 0030	
1	0.8	4,0	50	0.95	4	0.5	2	0.005	0.004	256013 0031	
1	0.8	6,0	50	0.95	4	0.5	2	0.005	0.004	256013 0033	
1	0.8	8,0	50	0.95	4	0.5	2	0.005	0.004	256013 0034	
1	0.8	10,0	50	0.95	4	0.5	2	0.005	0.004	256013 0035	
1	0.8	12,0	50	0.95	4	0.5	2	0.005	0.004	256013 0036	
1	0.8	20,0	50	0.95	4	0.5	2	0.005	0.004	256013 0037	
1.5	1.2	8,0	50	1.45	4	0.75	2	0.007	0.006	256013 0042	
1.5	1.2	12,0	50	1.45	4	0.75	2	0.007	0.006	256013 0043	
1.5	1.2	16,0	50	1.45	4	0.75	2	0.007	0.006	256013 0044	
2	1.6	6.0	50	1.95	4	1	2	0.010	0.008	256013 0045	
2	1.6	8.0	50	1.95	4	1	2	0.010	0.008	256013 0046	
2	1.6	10.0	50	1.95	4	1	2	0.010	0.008	256013 0047	
2	1.6	12.0	50	1.95	4	1	2	0.010	0.008	256013 0048	
2	1.6	16.0	50	1.95	4	1	2	0.010	0.008	256013 0049	
2	1.6	20.0	60	1.95	4	1	2	0.010	0.008	256013 0050	
2	1.6	25.0	75	1.95	4	1	2	0.010	0.008	256013 0051	
3	2.4	8.0	50	2.85	6	1.5	2	0.015	0.012	256013 0053	
3	2.4	10.0	50	2.85	6	1.5	2	0.015	0.012	256013 0054	
3	2.4	16.0	60	2.85	6	1.5	2	0.015	0.012	256013 0055	
3	2.4	20.0	60	2.85	6	1.5	2	0.015	0.012	256013 0056	
3	2.4	25.0	75	2.85	6	1.5	2	0.015	0.012	256013 0057	
3	2.4	30.0	75	2.85	6	1.5	2	0.015	0.012	256013 0058	
4	3.2	10.0	50	3.85	6	2	2	0.021	0.016	256013 0059	
4	3.2	16.0	60	3.85	6	2	2	0.021	0.016	256013 0060	
4	3.2	20.0	60	3.85	6	2	2	0.021	0.016	256013 0061	
4	3.2	25.0	75	3.85	6	2	2	0.021	0.016	256013 0062	
4	3.2	30.0	75	3.85	6	2	2	0.021	0.016	256013 0063	
4	3.2	35.0	75	3.85	6	2	2	0.021	0.016	256013 0064	
4	3.2	40.0	100	3.85	6	2	2	0.021	0.016	256013 0065	
4	3.2	50.0	100	3.85	6	2	2	0.021	0.016	256013 0066	

2153

SARA® Diamond-coated end milling cutter DIA+

INFO

Specially designed for our diamond range, the crystalline diamond coating is ideal for machining **graphite**, **GFRP materials** and **copper**. Thanks to the outstanding coating adhesion on the specially selected carbide, you achieve maximum service life with our diamond range.

This coating is also extremely abrasion-resistant, and there is no typical CVD nose on the sharp cutting edges. This means greater efficiency, lower costs and thus increased yield.

Special features

- High-tech CVD diamond coating
- Improved geometry
- Increased wear resistance thanks to crystalline diamond coating
- Layer thickness 10+2 µm
- Hardness 10,000 HV

Especially for machining graphite

		Ø range mm	Page
Mini torus milling cutter DIA+		Ø 0.2-12	496
Mini radius milling cutter DIA+		Ø 0.2-12	498
Torus milling cutter DIA+, short		Ø 3-16	500
Torus milling cutter DIA+, long		Ø 3-16	501

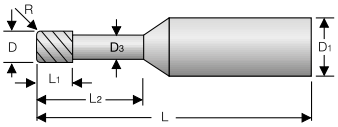
material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
																● 200			
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

SARA® DIA+ mini torus cutter

VHM | Typ N | 30° | h9 | h5 | Z 2 | DIA | HSC | Vc/fz | 767

- Crystalline diamond coating
- Reliable graphite, GFRP and CFRP machining
- With clearance
- Radius tolerance +/- 0.0003



Layer thickness 10+2 µm

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
																● 200			
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	● Feed fz graphite mm/tooth	● Feed fz graphite mm/tooth	art.no.	€
0.20	0.20	1	55	0.20	3.00	0.05	2	0.002	0.003	258005 0001	
0.30	0.30	3	55	0.27	3.00	0.05	2	0.003	0.004	258005 0004	
0.30	0.30	3	55	0.27	4.00	0.05	2	0.003	0.004	258005 0005	
0.40	0.40	2	55	0.35	3.00	0.05	2	0.003	0.004	258005 0007	
0.40	0.40	4	55	0.35	3.00	0.05	2	0.003	0.004	258005 0008	
0.40	0.40	8	55	0.35	3.00	0.05	2	0.003	0.004	258005 0009	
0.40	0.40	8	55	0.35	4.00	0.05	2	0.003	0.004	258005 0010	
0.40	0.40	4	55	0.35	4.00	0.05	2	0.003	0.004	258005 0012	
0.50	0.50	2	55	0.45	3.00	0.05	2	0.003	0.004	258005 0013	
0.50	0.50	5	55	0.45	3.00	0.05	2	0.003	0.004	258005 0014	
0.50	0.50	10	55	0.45	3.00	0.05	2	0.003	0.004	258005 0015	
0.50	0.50	10	55	0.45	4.00	0.05	2	0.003	0.004	258005 0016	
0.50	0.50	2	55	0.45	4.00	0.05	2	0.003	0.004	258005 0017	
0.50	0.50	5	55	0.45	4.00	0.05	2	0.003	0.004	258005 0018	
0.60	0.80	3	55	0.56	3.00	0.06	2	0.005	0.008	258005 0019	
0.60	0.80	6	55	0.56	3.00	0.06	2	0.005	0.008	258005 0020	
0.60	0.80	9	55	0.56	3.00	0.06	2	0.005	0.008	258005 0021	
0.60	0.80	3	55	0.56	4.00	0.06	2	0.005	0.008	258005 0023	
0.60	0.80	9	55	0.56	4.00	0.06	2	0.005	0.008	258005 0025	
0.80	1.00	4	55	0.75	3.00	0.08	2	0.005	0.008	258005 0027	
0.80	1.00	8	55	0.75	3.00	0.08	2	0.005	0.008	258005 0028	
0.80	1.00	12	55	0.75	3.00	0.08	2	0.005	0.008	258005 0029	
0.80	1.00	16	55	0.75	3.00	0.08	2	0.005	0.008	258005 0030	

2154

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz graphite mm/tooth	Feed fz graphite mm/tooth	art.no.	€
0.80	1.00	4	55	0.75	4.00	0.08	2	0.005	0.008	258005 0031	
0.80	1.00	8	55	0.75	4.00	0.08	2	0.005	0.008	258005 0032	
0.80	1.00	12	55	0.75	4.00	0.08	2	0.005	0.008	258005 0033	
0.80	1.00	16	55	0.75	4.00	0.08	2	0.005	0.008	258005 0034	
1.00	1.00	5	55	0.90	3.00	0.10	2	0.01	0.015	258005 0035	
1.00	1.00	10	55	0.90	3.00	0.10	2	0.01	0.015	258005 0036	
1.00	1.00	15	55	0.90	3.00	0.10	2	0.01	0.015	258005 0037	
1.00	1.00	20	55	0.90	3.00	0.10	2	0.01	0.015	258005 0038	
1.00	1.00	25	55	0.90	3.00	0.10	2	0.01	0.015	258005 0039	
1.00	1.00	5	55	0.90	4.00	0.10	2	0.01	0.015	258005 0040	
1.00	1.00	10	55	0.90	4.00	0.10	2	0.01	0.015	258005 0041	
1.00	1.00	15	55	0.90	4.00	0.10	2	0.01	0.015	258005 0042	
1.00	1.00	20	55	0.90	4.00	0.10	2	0.01	0.015	258005 0043	
1.00	1.00	25	55	0.90	4.00	0.10	2	0.01	0.015	258005 0044	
1.20	1.50	10	55	1.10	3.00	0.12	2	0.01	0.015	258005 0047	
1.20	1.50	15	55	1.10	4.00	0.12	2	0.01	0.015	258005 0049	
1.20	1.50	10	55	1.10	4.00	0.12	2	0.01	0.015	258005 0050	
1.20	1.50	5	55	1.10	4.00	0.12	2	0.01	0.015	258005 0051	
1.50	2.00	5	55	1.40	3.00	0.15	2	0.012	0.02	258005 0052	
1.50	2.00	8	55	1.40	3.00	0.15	2	0.012	0.02	258005 0053	
1.50	2.00	10	55	1.40	3.00	0.15	2	0.012	0.02	258005 0054	
1.50	2.00	15	55	1.40	3.00	0.15	2	0.012	0.02	258005 0055	
1.50	2.00	20	55	1.40	3.00	0.15	2	0.012	0.02	258005 0056	
1.50	2.00	25	55	1.40	3.00	0.15	2	0.012	0.02	258005 0057	
1.50	2.00	25	55	1.40	4.00	0.15	2	0.012	0.02	258005 0058	
1.50	2.00	20	55	1.40	4.00	0.15	2	0.012	0.02	258005 0059	
1.50	2.00	15	55	1.40	4.00	0.15	2	0.012	0.02	258005 0060	
1.50	2.00	10	55	1.40	4.00	0.15	2	0.012	0.02	258005 0061	
1.80	2.00	20	55	1.70	3.00	0.18	2	0.012	0.025	258005 0066	
2.00	2.00	10	65	1.90	3.00	0.20	2	0.015	0.025	258005 0069	
2.00	2.00	15	65	1.90	3.00	0.20	2	0.015	0.025	258005 0070	
2.00	2.00	20	65	1.90	3.00	0.20	2	0.015	0.025	258005 0071	
2.00	2.00	25	65	1.90	3.00	0.20	2	0.015	0.025	258005 0072	
2.00	2.00	10	65	1.90	3.00	0.50	2	0.015	0.025	258005 0073	
2.00	2.00	15	65	1.90	3.00	0.50	2	0.015	0.025	258005 0074	
2.00	2.00	20	65	1.90	3.00	0.50	2	0.015	0.025	258005 0075	
2.00	2.00	25	65	1.90	3.00	0.50	2	0.015	0.025	258005 0076	
2.00	2.00	25	65	1.90	4.00	0.50	2	0.015	0.025	258005 0077	
2.00	2.00	10	65	1.90	4.00	0.20	2	0.015	0.025	258005 0079	
2.00	2.00	15	65	1.90	4.00	0.20	2	0.015	0.025	258005 0080	
2.00	2.00	20	65	1.90	4.00	0.20	2	0.015	0.025	258005 0081	
2.00	2.00	25	65	1.90	4.00	0.20	2	0.015	0.025	258005 0082	
2.00	2.00	10	65	1.90	4.00	0.50	2	0.015	0.025	258005 0083	
2.00	2.00	15	65	1.90	4.00	0.50	2	0.015	0.025	258005 0085	
2.00	2.00	20	65	1.90	4.00	0.50	2	0.015	0.025	258005 0086	
3.00	3.00	15	65	2.90	4.00	0.30	2	0.02	0.03	258005 0087	
3.00	3.00	25	75	2.90	4.00	0.30	2	0.02	0.03	258005 0088	
3.00	3.00	10	65	2.90	4.00	0.50	2	0.02	0.03	258005 0089	
3.00	3.00	15	65	2.90	4.00	0.50	2	0.02	0.03	258005 0090	
3.00	3.00	20	65	2.90	4.00	0.50	2	0.02	0.03	258005 0091	
3.00	3.00	25	75	2.90	4.00	0.50	2	0.02	0.03	258005 0092	
3.00	3.00	30	75	2.90	4.00	0.50	2	0.02	0.03	258005 0093	
3.00	3.00	20	65	2.90	6.00	0.50	2	0.02	0.03	258005 0095	
4.00	4.00	15	65	3.90	6.00	0.30	2	0.03	0.04	258005 0094	
4.00	4.00	15	65	3.90	6.00	0.40	2	0.03	0.04	258005 0097	
4.00	4.00	25	75	3.90	6.00	0.40	2	0.03	0.04	258005 0098	
4.00	4.00	20	65	3.90	6.00	0.50	2	0.03	0.04	258005 0099	
4.00	4.00	30	75	3.90	6.00	0.50	2	0.03	0.04	258005 0100	
4.00	4.00	40	90	3.90	6.00	0.50	2	0.03	0.04	258005 0101	

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz graphite mm/tooth	Feed fz graphite mm/tooth	art.no.	€
5.00	5.00	20	75	4.90	6.00	0.50	2	0.045	0.06	258005 0102	
5.00	5.00	30	75	4.90	6.00	0.50	2	0.045	0.06	258005 0103	
5.00	5.00	40	90	4.90	6.00	0.50	2	0.045	0.06	258005 0104	
5.00	5.00	50	90	4.90	6.00	0.50	2	0.045	0.06	258005 0105	
6.00	6.00	30	75	5.90	6.00	0.30	2	0.045	0.06	258005 0106	
6.00	6.00	30	75	5.90	6.00	0.50	2	0.045	0.06	258005 0107	
6.00	6.00	40	90	5.90	6.00	0.50	2	0.045	0.06	258005 0108	
6.00	6.00	50	90	5.90	6.00	0.50	2	0.045	0.06	258005 0109	
6.00	6.00	60	100	5.90	6.00	0.50	2	0.045	0.06	258005 0110	
6.00	6.00	30	75	5.90	6.00	1.00	2	0.045	0.06	258005 0111	
6.00	6.00	40	90	5.90	6.00	1.00	2	0.045	0.06	258005 0112	
8.00	8.00	30	80	7.80	8.00	0.50	2	0.06	0.08	258005 0113	
8.00	8.00	60	100	7.80	8.00	0.50	2	0.06	0.08	258005 0114	
8.00	8.00	30	80	7.80	8.00	1.00	2	0.06	0.08	258005 0115	
8.00	8.00	60	100	7.80	8.00	1.00	2	0.06	0.08	258005 0116	
10.00	10.00	30	80	9.80	10.00	0.50	2	0.08	0.1	258005 0117	
10.00	10.00	60	100	9.80	10.00	0.50	2	0.08	0.1	258005 0118	
10.00	10.00	30	80	9.80	10.00	1.00	2	0.08	0.1	258005 0119	
10.00	10.00	60	100	9.80	10.00	1.00	2	0.08	0.1	258005 0120	
12.00	12.00	60	100	11.80	12.00	1.00	2	0.1	0.12	258005 0124	

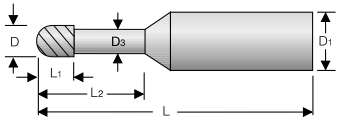
2154

SARA® DIA+ mini radius milling cutter

VHM | Typ N | 30° | h9 | h5 | Z 2 | DIA | HSC | Vc/fz | 767

- Crystalline diamond coating
- Reliable graphite, GFRP and CFRP machining
- With clearance
- Radius tolerance +/- 0.0003

Layer thickness 10+2 µm



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
																● 200			
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz graphite mm/tooth	Feed fz graphite mm/tooth	art.no.	€
0.20	0.20	1	55	0.18	3.00	0.1	2	0.002	0.003	258006 0001	
0.20	0.20	1	55	0.18	4.00	0.1	2	0.002	0.003	258006 0002	
0.30	0.30	1	55	0.27	3.00	0.15	2	0.003	0.004	258006 0003	
0.30	0.30	3	55	0.27	3.00	0.15	2	0.003	0.004	258006 0004	
0.30	0.30	5	55	0.27	3.00	0.15	2	0.003	0.004	258006 0005	
0.30	0.30	1	55	0.27	4.00	0.15	2	0.003	0.004	258006 0006	
0.30	0.30	3	55	0.27	4.00	0.15	2	0.003	0.004	258006 0007	
0.30	0.30	5	55	0.27	4.00	0.15	2	0.003	0.004	258006 0008	
0.30	0.30	8	55	0.27	4.00	0.15	2	0.003	0.004	258006 0009	
0.40	0.40	4	55	0.35	3.00	0.2	2	0.003	0.004	258006 0011	
0.40	0.40	6	55	0.35	3.00	0.2	2	0.003	0.004	258006 0012	
0.40	0.40	8	55	0.35	3.00	0.2	2	0.003	0.004	258006 0013	
0.40	0.40	4	55	0.35	4.00	0.2	2	0.003	0.004	258006 0014	
0.40	0.40	6	55	0.35	4.00	0.2	2	0.003	0.004	258006 0015	
0.40	0.40	8	55	0.35	4.00	0.2	2	0.003	0.004	258006 0016	
0.50	0.50	5	55	0.45	3.00	0.25	2	0.003	0.004	258006 0017	
0.50	0.50	10	55	0.45	3.00	0.25	2	0.003	0.004	258006 0018	
0.50	0.50	5	55	0.45	4.00	0.25	2	0.003	0.004	258006 0019	
0.50	0.50	10	55	0.45	4.00	0.25	2	0.003	0.004	258006 0020	

2154

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz graphite mm/tooth	Feed fz graphite mm/tooth	art.no.	€
0.60	0.80	6	55	0.56	3.00	0.3	2	0.005	0.008	258006 0021	
0.60	0.80	9	55	0.56	3.00	0.3	2	0.005	0.008	258006 0022	
0.60	0.80	12	55	0.56	3.00	0.3	2	0.005	0.008	258006 0023	
0.60	0.80	6	55	0.56	4.00	0.3	2	0.005	0.008	258006 0024	
0.60	0.80	9	55	0.56	4.00	0.3	2	0.005	0.008	258006 0025	
0.60	0.80	12	55	0.56	4.00	0.3	2	0.005	0.008	258006 0026	
0.70	0.90	7	55	0.65	3.00	0.35	2	0.005	0.008	258006 0027	
0.70	0.90	14	55	0.65	3.00	0.35	2	0.005	0.008	258006 0028	
0.70	0.90	7	55	0.65	4.00	0.35	2	0.005	0.008	258006 0029	
0.80	1.00	8	55	0.75	3.00	0.4	2	0.005	0.008	258006 0031	
0.80	1.00	12	55	0.75	3.00	0.4	2	0.005	0.008	258006 0032	
0.80	1.00	16	55	0.75	3.00	0.4	2	0.005	0.008	258006 0033	
0.80	1.00	8	55	0.75	4.00	0.4	2	0.005	0.008	258006 0034	
0.80	1.00	12	55	0.75	4.00	0.4	2	0.005	0.008	258006 0035	
0.80	1.00	16	55	0.75	4.00	0.4	2	0.005	0.008	258006 0036	
1.00	1.00	5	55	0.90	3.00	0.5	2	0.01	0.015	258006 0037	
1.00	1.00	10	55	0.90	3.00	0.5	2	0.01	0.015	258006 0038	
1.00	1.00	15	55	0.90	3.00	0.5	2	0.01	0.015	258006 0039	
1.00	1.00	20	55	0.90	3.00	0.5	2	0.01	0.015	258006 0040	
1.00	1.00	25	55	0.90	3.00	0.5	2	0.01	0.015	258006 0041	
1.00	1.00	30	55	0.90	3.00	0.5	2	0.01	0.015	258006 0042	
1.00	1.00	5	55	0.90	4.00	0.5	2	0.01	0.015	258006 0077	
1.00	1.00	10	55	0.90	4.00	0.5	2	0.01	0.015	258006 0078	
1.00	1.00	15	55	0.90	4.00	0.5	2	0.01	0.015	258006 0079	
1.00	1.00	20	55	0.90	4.00	0.5	2	0.01	0.015	258006 0080	
1.00	1.00	25	55	0.90	4.00	0.5	2	0.01	0.015	258006 0081	
1.00	1.00	30	55	0.90	4.00	0.5	2	0.01	0.015	258006 0082	
1.20	1.50	5	55	1.10	3.00	0.6	2	0.01	0.015	258006 0044	
1.20	1.50	10	55	1.10	3.00	0.6	2	0.01	0.015	258006 0045	
1.20	1.50	15	55	1.10	3.00	0.6	2	0.01	0.015	258006 0046	
1.20	1.50	10	55	1.10	4.00	0.6	2	0.01	0.015	258006 0084	
1.20	1.50	15	55	1.10	4.00	0.6	2	0.01	0.015	258006 0085	
1.50	2.00	5	55	1.40	3.00	0.75	2	0.012	0.02	258006 0047	
1.50	2.00	10	55	1.40	3.00	0.75	2	0.012	0.02	258006 0048	
1.50	2.00	15	55	1.40	3.00	0.75	2	0.012	0.02	258006 0049	
1.50	2.00	20	55	1.40	3.00	0.75	2	0.012	0.02	258006 0050	
1.50	2.00	25	55	1.40	3.00	0.75	2	0.012	0.02	258006 0051	
1.50	2.00	15	55	1.40	6.00	0.75	2	0.012	0.02	258006 0052	
1.50	2.00	5	55	1.40	4.00	0.75	2	0.012	0.02	258006 0086	
1.50	2.00	10	55	1.40	4.00	0.75	2	0.012	0.02	258006 0087	
1.50	2.00	15	55	1.40	4.00	0.75	2	0.012	0.02	258006 0088	
1.50	2.00	20	55	1.40	4.00	0.75	2	0.012	0.02	258006 0089	
1.50	2.00	25	55	1.40	4.00	0.75	2	0.012	0.02	258006 0090	
2.00	2.00	10	55	1.90	3.00	1	2	0.015	0.025	258006 0055	
2.00	2.00	15	55	1.90	3.00	1	2	0.015	0.025	258006 0056	
2.00	2.00	20	55	1.90	3.00	1	2	0.015	0.025	258006 0057	
2.00	2.00	25	65	1.90	3.00	1	2	0.015	0.025	258006 0058	
2.00	2.00	30	65	1.90	3.00	1	2	0.015	0.025	258006 0059	
2.00	2.00	20	65	2.40	6.00	1.25	2	0.015	0.025	258006 0061	
2.00	2.00	10	55	1.90	4.00	1	2	0.015	0.025	258006 0093	
2.00	2.00	15	55	1.90	4.00	1	2	0.015	0.025	258006 0094	
2.00	2.00	20	55	1.90	4.00	1	2	0.015	0.025	258006 0095	
2.00	2.00	25	65	1.90	4.00	1	2	0.015	0.025	258006 0096	
2.00	2.00	30	65	1.90	4.00	1	2	0.015	0.025	258006 0097	
3.00	3.00	10	65	2.90	4.00	1.5	2	0.02	0.03	258006 0063	
3.00	3.00	15	65	2.90	4.00	1.5	2	0.02	0.03	258006 0064	
3.00	3.00	20	65	2.90	4.00	1.5	2	0.02	0.03	258006 0065	
3.00	3.00	25	75	2.90	4.00	1.5	2	0.02	0.03	258006 0066	
3.00	3.00	30	75	2.90	4.00	1.5	2	0.02	0.03	258006 0067	

2154

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz graphite mm/tooth	Feed fz graphite mm/tooth	art.no.	€
3.00	3.00	20	65	2.90	6.00	1.5	2	0.02	0.03	258006 0068	
4.00	4.00	20	65	3.90	6.00	2	2	0.03	0.04	258006 0070	
4.00	4.00	30	75	3.90	6.00	2	2	0.03	0.04	258006 0071	
4.00	4.00	40	90	3.90	6.00	2	2	0.03	0.04	258006 0072	
5.00	5.00	20	65	4.90	6.00	2.5	2	0.045	0.06	258006 0073	
5.00	5.00	30	75	4.90	6.00	2.5	2	0.045	0.06	258006 0074	
5.00	5.00	40	90	4.90	6.00	2.5	2	0.045	0.06	258006 0075	
5.00	5.00	50	90	4.90	6.00	2.5	2	0.045	0.06	258006 0076	
6.00	6.00	30	75	5.90	6.00	3	2	0.045	0.06	258006 0098	
6.00	6.00	40	90	5.90	6.00	3	2	0.045	0.06	258006 0099	
6.00	6.00	50	90	5.90	6.00	3	2	0.045	0.06	258006 0100	
6.00	6.00	60	100	5.90	6.00	3	2	0.045	0.06	258006 0101	
8.00	8.00	30	80	7.80	8.00	4	2	0.06	0.08	258006 0102	
8.00	8.00	60	100	7.80	8.00	4	2	0.06	0.08	258006 0103	
10.00	10.00	30	80	9.80	10.00	5	2	0.08	0.1	258006 0104	
10.00	10.00	60	100	9.80	10.00	5	2	0.08	0.1	258006 0105	
12.00	12.00	30	83	11.80	12.00	6	2	0.1	0.12	258006 0106	
12.00	12.00	60	100	11.80	12.00	6	2	0.1	0.12	258006 0107	

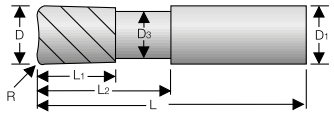
2154

SARA® DIA+ torus cutter

VHM | Typ N | 30° | h9 | h5 | Z 4 | DIA | HSC | Vc/fz | 767

- Crystalline diamond coating
- Reliable graphite, GFRP and CFRP machining
- With clearance

Layer thickness 6+2 µm



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
																● 200			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

Short



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz graphite mm/tooth	Feed fz graphite mm/tooth	art.no.	€
3.00	6.00	14	50	2.70	3.00	0.3	4	0.02	0.03	258013 0001	
3.00	6.00	14	50	2.70	3.00	0.5	4	0.02	0.03	258013 0002	
4.00	8.00	16	50	3.70	4.00	0.4	4	0.03	0.04	258013 0004	
4.00	8.00	16	50	3.70	4.00	0.5	4	0.03	0.04	258013 0005	
4.00	8.00	16	50	3.70	4.00	1	4	0.03	0.04	258013 0006	
5.00	10.00	18	54	4.60	5.00	0.5	4	0.045	0.06	258013 0007	
6.00	13.00	21	57	5.50	6.00	0.5	4	0.045	0.06	258013 0009	
8.00	15.00	27	63	7.40	8.00	0.5	4	0.06	0.08	258013 0012	
8.00	15.00	27	63	7.40	8.00	1	4	0.06	0.08	258013 0013	
10.00	18.00	32	72	9.20	10.00	0.5	4	0.08	0.1	258013 0016	
10.00	18.00	32	72	9.20	10.00	1	4	0.08	0.1	258013 0017	
12.00	26.00	38	83	11.00	12.00	0.5	4	0.1	0.12	258013 0020	

2154

Long



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz graphite mm/tooth	Feed fz graphite mm/tooth	art.no.	€
3.00	6.00	32	80	2.70	3.00	0.3	4	0.020	0.030	258014 0001	
3.00	6.00	32	80	2.70	3.00	0.5	4	0.020	0.030	258014 0002	
4.00	8.00	36	80	3.70	4.00	0.5	4	0.030	0.040	258014 0005	
6.00	13.00	44	90	5.50	6.00	0.5	4	0.045	0.055	258014 0009	
6.00	13.00	44	90	5.50	6.00	1	4	0.045	0.055	258014 0010	
8.00	15.00	54	100	7.40	8.00	0.5	4	0.060	0.070	258014 0012	
10.00	18.00	60	100	9.20	10.00	0.5	4	0.080	0.100	258014 0016	
10.00	18.00	60	100	9.20	10.00	1	4	0.080	0.100	258014 0017	
10.00	18.00	60	100	9.20	10.00	1.5	4	0.080	0.100	258014 0018	
10.00	18.00	60	100	9.20	10.00	2	4	0.080	0.100	258014 0019	
12.00	26.00	75	120	11.00	12.00	0.5	4	0.100	0.120	258014 0020	
12.00	26.00	75	120	11.00	12.00	1	4	0.100	0.120	258014 0021	
12.00	26.00	75	120	11.00	12.00	1.5	4	0.100	0.120	258014 0022	
12.00	26.00	75	120	11.00	12.00	2	4	0.100	0.120	258014 0023	
16.00	32.00	85	120	15.00	16.00	0.5	4	0.200	0.250	258014 0024	
16.00	32.00	85	120	15.00	16.00	1	4	0.200	0.250	258014 0025	
16.00	32.00	85	120	15.00	16.00	1.5	4	0.200	0.250	258014 0026	
16.00	32.00	85	120	15.00	16.00	2	4	0.200	0.250	258014 0027	

2154

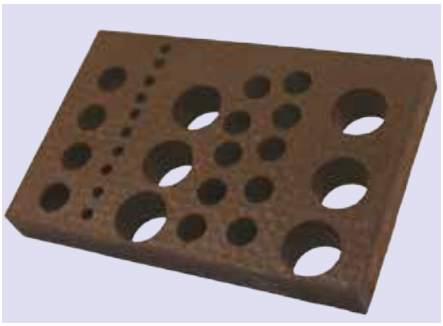
Milling modern materials

INFO

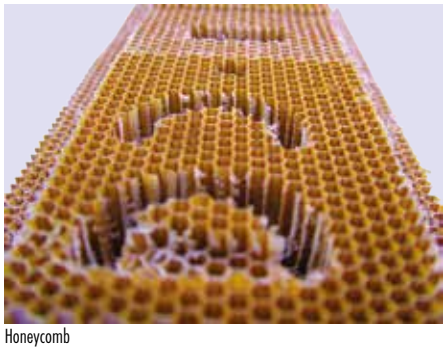
Solutions for composite

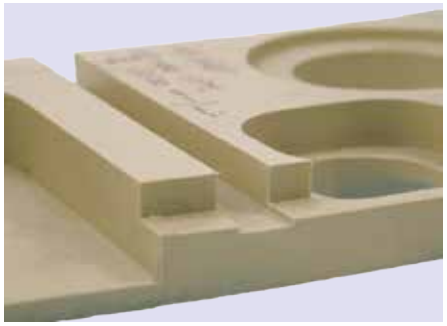
The efficient machining of modern materials such as fibre-reinforced plastics, honeycomb composites, aluminium, titanium and composites requires a new generation of cutting tools. The interaction of geometry, cutting material and coating creates the right material for machining such modern materials. All materials are designed to satisfy a range of requirements that occur when machining new materials.

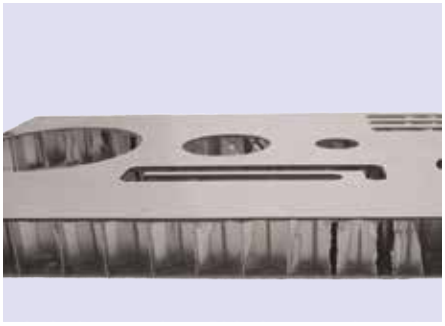
Our tools have proven their quality in various tests: Proven cutting angle and cutting material combined with specially polished chip flutes ensure low cutting forces and problem-free chip removal. This prevents delamination, outstanding residual fibres, roll-over and thermal damage to the workpiece.
We offer a comprehensive range of high-performance tools for optimum drilling and milling results in modern materials.


CFRP


CFRP-titanium sandwich


Honeycomb

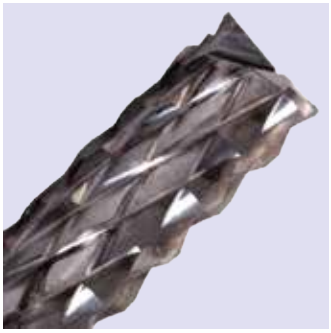

Fibre plastics


Alu honeycomb with GFRP cover


Aluminium honeycomb with aluminium cover



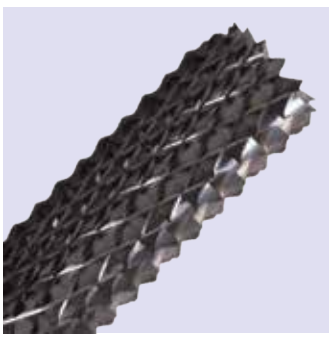
Polished chip flute
Rapid-Line HSC milling cutters have considerably enhanced chip flow. Machining temperatures are lower, thus avoiding overheating and welding pick-up. Rapid-Line milling cutters have a significantly longer service life and can also produce better surface qualities. We recommend our "RAPID-Shine" product range for machining ultra-transparent surfaces. Thanks to their special cutting geometry and lapped cutting edges, these milling cutters are ideal for machining ultra-transparent plastic materials.



Pyramid toothing
A special grinding process combines polished chip flutes and ultra-sharp cutting edges. This results in low friction coefficients and high cutting stability. Designed primarily for machining CFRP and GFRP, we offer 3 different profile types – Fine, Medium and Coarse – as well as 3 different spur toothings for drilling, face milling and edge banding.



Honeycomb
The honeycomb structure is first cut and then separated, but never crushed. The result is high-quality surfaces that can be machined further with ease.



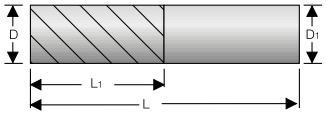
Coating
Our customers' requirements are diverse. Depending on the machining process, we offer various coatings to enhance the machining result.
Whether extremely thin diamond HC coating or a multi-layer diamond coating, we have the right coating for your application.

ATORN Face milling cutter with face radius

VHM | h10 | h6 | DLC | Vc/fz | 768

- Pyramid-shaped bevel toothing, draw cutting
- Face radius for copy milling
- Extremely sharp cutting edges
- **Medium: soft fibre plastics with an adhesive tendency**
- **Dia-HC-coated**

Additional versions available from the manufacturer



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
																● 200			
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		

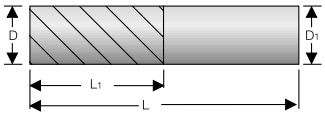
D mm	L1 mm	L mm	D1 mm	Medium art.no.	€
4	15	40	4	250614 0040	
6	20	50	6	250614 0060	
8	25	63	8	250614 0080	
8	40	100	8	250614 0081	
10	30	72	10	250614 0100	
12	32	83	12	250614 0120	
				2168	



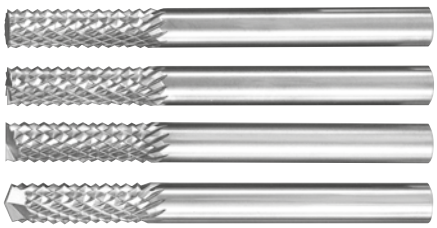
SARA® Contour cutter for GFRP and CFRP

VHM | h5 | Vc/fz | 769

- Various versions
- **Type A** - smooth front face
- **Type B** - rotary cutter front face
- **Type C** - end mill front face
- **Type D** - drill point



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
																● 215			
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		

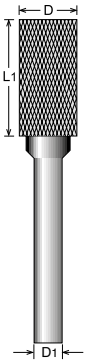


D mm	L1 mm	L mm	D1 mm	● Feed fz graphite mm/tooth	Type A art.no.	€	Type B art.no.	€	Type C art.no.	€	Type D art.no.	€
1.6	5	38	3	1000-1500	250050 0001		250051 0001		250052 0001		250053 0001	
2.4	9.5	38	3	1100-1800	250050 0002		250051 0002		250052 0002		250053 0002	
3.0	12	38	3	1100-1800	250050 0003		250051 0003		250052 0003		250053 0003	
4.0	16	50	4	900-1700	250050 0004		250051 0004		250052 0004		250053 0004	
4.0	16	50	6	900-1700	250050 0005		250051 0005		250052 0005		250053 0005	
6.0	19	50	6	900-1700	250050 0007		250051 0007		250052 0007		250053 0007	
6.0	19	63	6	900-1700	250050 0008		250051 0008		250052 0008		250053 0008	
6.0	25	75	6	900-1700	250050 0009		250051 0009		250052 0009		250053 0009	
8.0	25	63	8	900-1700	250050 0006		250051 0006		250052 0006		250053 0006	
10.0	25	75	10	500-1300	250050 0010		250051 0010		250052 0010		250053 0010	
12.0	25	75	12	500-1300	250050 0011		250051 0011		250052 0011		250053 0011	
					2109		2109		2109		2109	

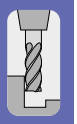
ATORN Carbide rotary burs

HM | Vc/fz 769

- **Similar to DIN 8033**
- **Shank Ø 6 mm**
- Solid carbide up to head Ø 6 mm, brazed from head Ø 8 mm
- Precision manufacturing on the latest CNC grinding machines guarantees exact and uniform cut with optimised cutting geometry
- For machining high-strength and tough materials as well as non-ferrous and lightweight metals
- Roughing and finishing on hand-operated machines
- Effective when used on stationary internal grinding machines and jig boring machines (milling and finish milling)







ZYA - cylindrical shape without spur cut





D mm	L1 mm	D1 mm	Cut 6 art.no.	€	Cut 2 art.no.	€	Aluminium cut art.no.	€
6	18	6	605051 0618		608054 0618		608035 0618	
8	20	6	605051 0820		608054 0820		608035 0820	
10	20	6	605051 1020		608054 1020		608035 1020	
12	25	6	605051 1225		608054 1225		608035 1225	
15	25	6	605051 1525		608054 1525		608035 1525	
			6108		6108		6108	




ZYAS - cylindrical shape with spur cut

D mm	L1 mm	D1 mm	Cut 1 art.no.	€	Aluminium cut art.no.	€
6	18	6	605001 0616			
8	20	6	605001 0819		608001 0819	
10	20	6	605001 0919		608001 0919	
12	25	6	605001 1225		608001 1225	
15	25	6	605001 1625			
			6108		6108	




WRC - radius end shape

D mm	L1 mm	D1 mm	Cut 6 art.no.	€	Cut 2 art.no.	€	Aluminium cut art.no.	€
6	18	6	605005 0616		608006 0616			
8	20	6	605005 0819		608006 0819			
10	20	6	605005 0919		608006 0919		608005 0919	
12	25	6	605005 1225		608006 1225		608005 1225	
15	25	6	605005 1625		608006 1625		608005 1625	
			6108		6108		6108	




KUD - ball shape

D mm	D1 mm	Cut 6 art.no.	€	Cut 2 art.no.	€	Aluminium cut art.no.	€
5	6	605010 0530					
6	6	605010 0650		605013 0606		608010 0606	
8	6	605010 0860		605013 0860			
10	6	605010 0980				608010 0906	
12	6	605010 1211		605013 1211		608010 1206	
15	6	605010 1614				608010 1606	
		6108		6108		6108	



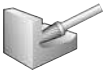

TRE - drop shape

D mm	L1 mm	D1 mm	Cut 6 art.no.	€	Cut 2 art.no.	€	Aluminium cut art.no.	€
6	10	6	605015 0609		605018 0609			
8	15	6	605015 0815		605018 0815			
10	15	6	605015 0916		605018 0916		608015 0916	
12	20	6	605015 1222		605018 1222		608015 1222	
15	25	6	605015 1625				608015 1625	
			6108		6108		6108	




RBF - rounded arch shape

D mm	L1 mm	D1 mm	Cut 6 art.no.	€	Cut 2 art.no.	€	Aluminium cut art.no.	€
6	18	6	605020 0616		608023 0616			
8	20	6	605020 0820		608023 0820		608020 0820	
10	20	6	605020 0919		608023 0919		608020 0919	
12	25	6	605020 1225		608023 1225		608020 1225	
15	25	6	605020 1625				608020 1625	
20	25	6	605020 1925					
			6108		6108		6108	




SPG - pointed arch shape

D mm	L1 mm	D1 mm	Cut 6 art.no.	€	Cut 2 art.no.	€
6	18	6	605025 0616		605028 0616	
8	20	6	605025 0819		605028 0819	
10	20	6	605025 0919		605028 0919	
12	25	6	605025 1219			
15	25	6	605025 1625		605028 1625	
			6108		6108	




H - flame shape

D mm	L1 mm	D1 mm	Cut 6 art.no.	€	Cut 2 art.no.	€
8	20	6	605035 0819		605038 0819	
12	32	6	605035 1232		605038 1232	
15	35	6	605035 1636			
			6108		6108	




KEL - round taper

D mm	L1 mm	D1 mm	Cut 6 art.no.	€	Cut 2 art.no.	€	Aluminium cut art.no.	€
6	18	6	605030 0616		608033 0616			
8	22	6	605030 0822					
10	26	6	605030 0927		608033 0927		608030 0927	
12	32	6	605030 1228		608033 1228		608030 1228	
15	33	6	605030 1630		608033 1630		608030 1630	
			6108		6108		6108	




SKM - pointed taper

D mm	L1 mm	D1 mm	Cut 6 art.no.	€	Cut 2 art.no.	€
6	20	6	605040 0619		605043 0619	
10	20	6	605040 0916		605043 0916	
12	25	6	605040 1222			
16	25	6	605040 1625		605043 1625	
			6108		6108	




WKN - angle milling cutter shape

D mm	L1 mm	D1 mm	Cut 1 art.no.	€	Cut 2 art.no.	€
10	10	6	605045 0909		605048 0909	
12	12	6	605045 1212			
12	12	6			605048 1212	
			6108		6108	




Sets

Contents	Cut 6 art.no.	€
5-pcs. in plastic box: ZYAS 12x25, WRC 12x25, KUD 12, RBF 12x25, SKM 12x25	605083 0005	
10-pcs. in metal cartridge: ZYA 10x20, ZYA 12x25, WRC 10x20, WRC 12x25, KUD 12, TRE 10x15, RBF 12x25, SPG 10x20, SPG 12x25, KEL 12x28	605083 0010	
	6108	



605083 0005

605083 0010

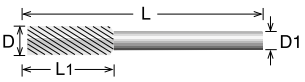
ATORN Carbide miniature burrs

HM

Vc/fz

Up to a head Ø of 6 mm

- **Similar to DIN 8033**
- **Shank Ø 3 mm**







ZYA - cylindrical shape without spur cut





D mm	L1 mm	D1 mm	L mm	Cut 6 art.no.	€	Cut 2 art.no.	€
2	11	3	38			605502 0211	
3	14	3	38	605501 0314			
6	12	3	45	605501 0612			
				6108		6108	

ZYAS - cylindrical shape with spur cut







D mm	L1 mm	D1 mm	L mm	Cut 6 art.no.	€	Cut 2 art.no.	€
2	11	3	38	605541 0211			
3	14	3	38	605541 0314		605544 0314	
6	12	3	45	605541 0612		605544 0612	
				6108		6108	

WRC - radius end shape





D mm	L1 mm	D1 mm	L mm	Cut 6 art.no.	€	Cut 2 art.no.	€
2	11	3	38	605505 0211		605508 0211	
3	12	3	38	605505 0314		605508 0314	
6	12	3	45	605505 0612		605508 0612	
				6108		6108	

KUD - ball shape





D mm	L1 mm	D1 mm	L mm	Cut 6 art.no.	€	Cut 2 art.no.	€
3	2	3	38	605510 0303			
6	4	3	38	605510 0306		605513 0306	
				6108		6108	

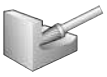
TRE - drop shape





D mm	L1 mm	D1 mm	L mm	Cut 6 art.no.	€	Cut 2 art.no.	€
3	6	3	38	605515 0355		605518 0355	
6	10	3	42	605515 0610		605518 0610	
				6108		6108	

RBF - rounded arch shape





D mm	L1 mm	D1 mm	L mm	Cut 6 art.no.	€	Cut 2 art.no.	€
3	8	3	38	605520 0308		605523 0308	
3	12	3	38	605520 0312		605523 0312	
6	12	3	45	605520 0612		605523 0612	
				6108		6108	

SPG - pointed arch shape





D mm	L1 mm	D1 mm	L mm	Cut 6 art.no.	€	Cut 2 art.no.	€
3	6	3	38	605525 0307		605524 0307	
3	12	3	38	605525 0395		605524 0395	
6	12	3	45	605525 0642		605524 0642	
				6108		6108	

H - flame shape





D mm	L1 mm	D1 mm	L mm	Cut 6 art.no.	€	Cut 2 art.no.	€
3	6	3	38	605525 0306		605528 0306	
				6108		6108	

KEL - round taper





D mm	L1 mm	D1 mm	L mm	Cut 6 art.no.	€	Cut 2 art.no.	€
3	15	3	38	605525 0312		605534 0312	
6	16	3	48	605525 0612		605534 0612	
				6108		6108	

SKM - pointed taper

D mm	L1 mm	D1 mm	L mm	Cut 6 art.no.	€	Cut 2 art.no.	€
3	8	3	38	605530 0308		605533 0308	
3	11	3	38	605530 0311		605533 0311	
3	15	3	38	605530 0315		605533 0315	
6	12	3	48	605530 0612		605533 0612	
				6108		6108	



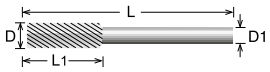
Set

Contents	Cut 6 art.no.	€
10-pcs. in plastic box: ZYA 2x14, ZYAS 3x14, WRC 3x12, KUD 3, TRE 3x6, RBF 3x12, H 3x6, SPG 3x12, KEL 3x12, SKM 3x12	605583 0010	
	6108	



ATORN Carbide miniature burrs, extra-long

769



- **Shank Ø 3 mm**



ZYA - cylindrical shape

D mm	L1 mm	D1 mm	L mm	Cut 6 art.no.	€
3	14	3	38	606001 0014	
				6108	



WRC - radius end shape

D mm	L1 mm	D1 mm	L mm	Cut 6 art.no.	€
3	12	3	38	606005 0014	
				6108	



KUD - ball shape

D mm	D1 mm	L mm	Cut 6 art.no.	€
3	3	38	606010 0003	
			6108	



TRE - drop shape

D mm	L1 mm	D1 mm	L mm	Cut 6 art.no.	€
3	6	3	38	606015 0055	
				6108	



RBF - rounded arch shape

D mm	L1 mm	D1 mm	L mm	Cut 6 art.no.	€
3	14	3	38	606020 0127	
				6108	



SPG - pointed arch shape

D mm	L1 mm	D1 mm	L mm	Cut 6 art.no.	€
3	14	3	38	606025 0127	
				6108	



KEL - round taper

D mm	L1 mm	D1 mm	L mm	Cut 6 art.no.	€
3	14	3	38	606035 0127	
				6108	



SKM - pointed taper

D mm	L1 mm	D1 mm	L mm	Cut 6 art.no.	€
3	11	3	38	606030 0011	
				6108	



RockTec complete range for materials up to 65 HRc

INFO

ll instances of machining and usage, you now get a complete
RN range of solid carbide end milling cutters, solid carbide torus milling cutters
solid carbide radius milling cutters.
neter range from Ø 0.1 – Ø 20 mm
different geometries are matched to different
ng operations.
ing material: solid carbide ultra-micrograin of high hardness and eme toughness

Over 660 innovative solid carbide milling tools

	Ø-range mm	RockTec 65	Page
carbide miniature end milling cutters	Ø 0,1 - 0,9		512
carbide miniature end milling cutters, long neck	Ø 0,2 - 3,0		513
carbide miniature torus milling cutters, long neck	Ø 0,2 - 3,0		517
carbide miniature s milling cutters	Ø 0,2 - 0,9		520
carbide miniature s milling cutters, long neck	Ø 0,2 - 3,0		521
carbide end milling cutters	Ø 3,0 - 20,0		514
carbide end milling · with short cutting edge, long design	Ø 3,0 - 20,0		514
carbide end milling cutter with short cutting edge, extra-long n	Ø 3,0 - 20,0		515
carbide multi-flute g cutters, standard design	Ø 3,0 - 20,0		516
carbide multi-flute milling cutters, design	Ø 3,0 - 20,0		516
carbide torus milling cutters	Ø 3,0 - 20,0		518
carbide torus milling cutter with short cutting edge, standard n	Ø 3,0 - 16,0		519
carbide torus milling cutter with short cutting edge, long n	Ø 3,0 - 16,0		519
carbide torus milling cutter with short cutting edge, extra-long n	Ø 3,0 - 16,0		520
carbide radius milling cutters, short, Z 2	Ø 2,0 - 20,0		522
carbide radius milling cutters, long, Z 2	Ø 2,0 - 20,0		522
carbide radius milling cutters, extra-long, Z 2	Ø 2,0 - 20,0		522
carbide radius milling cutters, short, Z 4	Ø 3,0 - 20,0		523
carbide radius milling cutters, long, Z 4	Ø 3,0 - 20,0		523

ery well suited / ell suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
			○						○	○	○					●	●	●

ATORN **RockTec Höchste Effizienz durch neue Beschichtungen** INFO

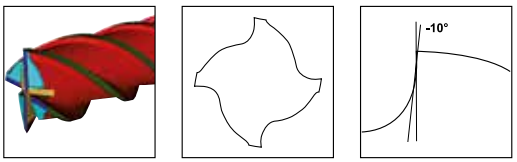
Die ATORN-Fräswerkzeuge bieten die besten Bedingungen für effiziente Bearbeitung von Materialien bis 65 HRc.
Durch eine spezielle Schneidkantenbehandlung sowie die neuen Beschichtungen erreichen Sie höchste Zerspanungsleistungen, Präzision und Standzeiten.

RockTec 65

Schneidstoff:	**Ultra-Feinstkorn**
Korngröße:	**0,005 mm**
ISO-Qualität:	**K 10 / K 40**
Beschichtung:	**TiSi-basierend (multilayer PVD)**
Schichtdicke:	**2,5 ~ 3,5 µm**
Mikrohärte:	**(HV 0,05) 3.600**
Anwendungstemperatur:	**≥ 1.200 °C**
Reibungskoeffizient:	**0,3**



Werkzeuge bis 65 HRc



Beispiel VHM-Schaftfräser

Drallwinkel:	**40°**
Spanwinkel am Außen-Ø:	**-10°**
Kerndurchmesser:	**65%**

ATORN

Vorteile der Hartbearbeitung

Kosten sparen – Effizienz steigern durch Hartbearbeitung

HSC HPC

hohe Flexibilität
- Hartfräsbearbeitung kann in vielen Fällen Schleifen und Erodieren ersetzen

Qualität steigern
- kein Wärmeverzug durch nachträgliches Härten
- hohe Oberflächengüte

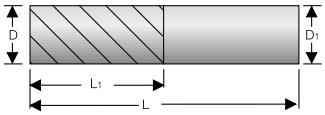
Zeitersparnis
- Werkstückbearbeitung in einer Aufspannung möglich
- weniger Arbeitsgänge durch hohes Zerspanungsvolumen

Erleben Sie höchste Qualität in allen Bereichen des Werkzeug- und Formenbaus.

ATORN RockTec 65 mini end milling cutter

VHM | 40° | h6 | Z 2 | TiSiN | Vc/fz | 770

ISO H



- Short, stable design for machining materials **up to 65 HRC**
- Cutting edge tolerance: at Ø 0.1 – 0.7 mm = 0/– 0.012 mm, at Ø 0.8 – 0.9 mm = 0/– 0.020 mm
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle -5°~-7°

material	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
● very well suited ○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
			○ 80						○ 50	○ 50	○ 40					● 70	● 70	● 60
Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.



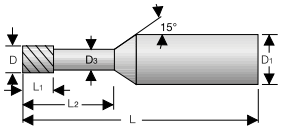
D mm	L1 mm	L mm	D1 mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
0.1	0.2	40	4	2	0.002	257002 0001	
0.2	0.4	40	4	2	0.002	257002 0002	
0.3	0.6	40	4	2	0.002	257002 0003	
0.4	0.8	40	4	2	0.002	257002 0004	
0.5	1.2	40	4	2	0.002	257002 0005	
0.6	1.4	40	4	2	0.002	257002 0006	
0.7	1.6	40	4	2	0.002	257002 0007	
0.8	1.6	40	4	2	0.002	257002 0008	
0.9	1.8	40	4	2	0.006	257002 0009	

2146

ATORN RockTec 65 mini end milling cutter

VHM | Typ H | 40° | h6 | Z 2 | TiSiN | Vc/fz | 768

ISO H



- Long-necked version for machining materials **up to 65 HRC**
- Cutting edge tolerance: at Ø 0.1 - 0.7 mm = 0/- 0.012 mm, at Ø 0.8 - 3.0 mm = 0/- 0.020 mm
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle -5°~-7°
- With clearance

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
				● 100							○ 55						● 80	● 70	● 70
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
0.2	0.3	0.5	50	0.16	4	2	0.002	257010 0001	
0.2	0.3	1.0	50	0.16	4	2	0.002	257010 0002	
0.2	0.3	1.5	50	0.16	4	2	0.002	257010 0003	
0.3	0.4	1.0	50	0.26	4	2	0.002	257010 0004	
0.3	0.4	2.0	50	0.26	4	2	0.002	257010 0005	
0.3	0.4	3.0	50	0.26	4	2	0.002	257010 0006	
0.4	0.6	2.0	50	0.37	4	2	0.002	257010 0007	
0.4	0.6	3.0	50	0.37	4	2	0.002	257010 0008	
0.4	0.6	4.0	50	0.37	4	2	0.002	257010 0009	
0.4	0.6	5.0	50	0.37	4	2	0.002	257010 0010	
0.5	0.7	2.0	50	0.45	4	2	0.002	257010 0011	
0.5	0.7	4.0	50	0.45	4	2	0.002	257010 0012	
0.5	0.7	6.0	50	0.45	4	2	0.002	257010 0013	
0.5	0.7	8.0	50	0.45	4	2	0.002	257010 0014	
0.6	0.9	2.0	50	0.55	4	2	0.002	257010 0015	
0.6	0.9	4.0	50	0.55	4	2	0.002	257010 0016	
0.6	0.9	6.0	50	0.55	4	2	0.002	257010 0017	
0.6	0.9	8.0	50	0.55	4	2	0.002	257010 0018	
0.6	0.9	10.0	50	0.55	4	2	0.002	257010 0019	
0.8	1.2	4.0	50	0.75	4	2	0.002	257010 0020	
0.8	1.2	6.0	50	0.75	4	2	0.002	257010 0021	
0.8	1.2	8.0	50	0.75	4	2	0.002	257010 0022	
0.8	1.2	10.0	50	0.75	4	2	0.002	257010 0023	
0.8	1.2	12.0	50	0.75	4	2	0.002	257010 0024	
1	1.5	6.0	50	0.95	4	2	0.006	257010 0025	
1	1.5	8.0	50	0.95	4	2	0.006	257010 0026	
1	1.5	10.0	50	0.95	4	2	0.006	257010 0027	

2146

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
1	1.5	12.0	50	0.95	4	2	0.006	257010 0028	
1	1.5	14.0	50	0.95	4	2	0.006	257010 0029	
1	1.5	16.0	60	0.95	4	2	0.006	257010 0030	
1.2	1.8	6.0	50	1.15	4	2	0.006	257010 0031	
1.2	1.8	10.0	50	1.15	4	2	0.006	257010 0032	
1.5	2.3	8.0	50	1.45	4	2	0.006	257010 0033	
1.5	2.3	12.0	50	1.45	4	2	0.006	257010 0034	
1.5	2.3	16.0	50	1.45	4	2	0.006	257010 0035	
1.5	2.3	20.0	60	1.45	4	2	0.006	257010 0036	
2	3	6.0	50	1.95	4	2	0.012	257010 0037	
2	3	8.0	50	1.95	4	2	0.012	257010 0038	
2	3	12.0	50	1.95	4	2	0.012	257010 0039	
2	3	16.0	50	1.95	4	2	0.012	257010 0040	
2	3	20.0	60	1.95	4	2	0.012	257010 0041	
2	3	25.0	75	1.95	4	2	0.012	257010 0042	
2.5	3.7	8.0	50	2.4	4	2	0.019	257010 0043	
2.5	3.7	10.0	50	2.4	4	2	0.019	257010 0044	
2.5	3.7	12.0	50	2.4	4	2	0.019	257010 0045	
2.5	3.7	16.0	50	2.4	4	2	0.019	257010 0046	
2.5	3.7	20.0	60	2.4	4	2	0.019	257010 0047	
2.5	3.7	25.0	75	2.4	4	2	0.019	257010 0048	
3	4.5	8.0	50	2.85	6	2	0.019	257010 0049	
3	4.5	10.0	50	2.85	6	2	0.019	257010 0050	
3	4.5	12.0	50	2.85	6	2	0.019	257010 0051	
3	4.5	16.0	60	2.85	6	2	0.019	257010 0052	
3	4.5	20.0	60	2.85	6	2	0.019	257010 0053	
3	4.5	25.0	75	2.85	6	2	0.019	257010 0054	

2146

Over 200,000 tools available online!
Register online now!
www.saratools.com

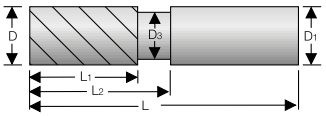


ATORN RockTec 65 end milling cutter

VHM | Typ H | -6° | 40° | e8 | h6 | Z 4 | TiSiN | Vc/fz | 770

- **With clearance**
- For machining materials **up to 65 HRC**
- Cutting edge tolerance: at Ø 3.0 – 20.0 mm = 0/- 0.020 mm
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle -6°

ISO H



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
				● 180							○ 95						● 140	● 140	● 120
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
3	9	15	50	2.8	6	4	0.015	257004 0030	
4	12	20	50	3.7	6	4	0.02	257004 0040	
5	15	20	50	4.6	6	4	0.025	257004 0050	
6	16	20	50	5.5	6	4	0.038	257004 0060	
8	20	30	64	7.4	8	4	0.05	257004 0080	
10	22	32	70	9.2	10	4	0.052	257004 0100	
12	25	37	75	11	12	4	0.06	257004 0120	
16	32	46	90	15	16	4	0.07	257004 0160	
20	38	58	100	19	20	4	0.08	257004 0200	

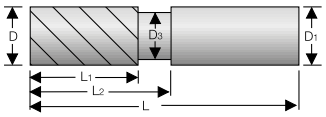
2146

ATORN RockTec 65 end milling cutter

VHM | Typ H | 40° | h6 | Z 4 | TiSiN | Vc/fz | 771

- **With clearance**
- For machining materials **up to 65 HRC**
- Cutting edge tolerance: at Ø 3.0 – 20.0 mm = 0/- 0.020 mm
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle -6°

ISO H



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	257006....			○ 150						○ 230	○ 230	○ 230					● 115	● 115	● 85
	257008....			○ 130						○ 150	○ 75	○ 150					● 115	● 95	● 100
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		

Long



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
3	5	30	75	2.8	6	4	0.015	257006 0030	
4	8	32	75	3.7	6	4	0.02	257006 0040	
5	9	32	75	4.6	6	4	0.025	257006 0050	
6	10	40	75	5.5	6	4	0.035	257006 0060	
8	12	40	75	7.4	8	4	0.05	257006 0080	
10	14	60	100	9.2	10	4	0.055	257006 0100	
12	16	60	100	11	12	4	0.06	257006 0120	
16	22	85	125	15	16	4	0.07	257006 0160	
20	26	85	125	19	20	4	0.08	257006 0200	

2146

Extra-long



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
3	5	60	100	2.8	6	4	0.015	257008 0030	
4	8	60	100	3.7	6	4	0.02	257008 0040	
5	9	60	100	4.6	6	4	0.025	257008 0050	
6	10	60	100	5.5	6	4	0.04	257008 0060	
8	12	60	100	7.4	8	4	0.05	257008 0080	
10	14	85	125	9.2	10	4	0.055	257008 0100	
12	16	110	150	11	12	4	0.06	257008 0120	
16	22	110	150	15	16	4	0.07	257008 0160	
20	26	110	150	19	20	4	0.08	257008 0200	

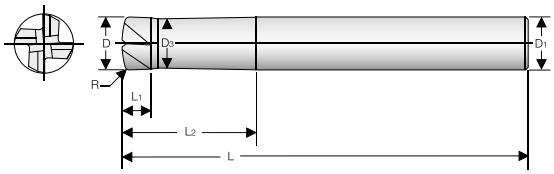
2146

ATORN High feed-rate end milling cutter *RockTec 65*

VHM | h6 | Z 4 | Z 6 | TiSiN | Vc/fz 769

- 4-6 cutting edges
- **For machining materials up to 65 HRC**
- **For copy and line milling**
- **Very high machining volumes are achieved with a special milling strategy**
- Solid carbide ultra-fine grain cutting material

High feed-rate milling cutter



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
				● 160													● 140	● 110	● 100
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		

Roughing cutter, standard





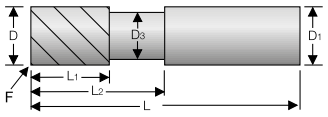
D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
4	1.5	8	57	3.7	6	0.4	4	0.028	257040 0001	
4	1.5	15	57	3.7	6	0.4	4	0.028	257040 0002	
5	2	10	57	4.6	6	0.5	4	0.035	257040 0003	
5	2	21	57	4.6	6	0.5	4	0.035	257040 0004	
6	2.5	12	57	5.5	6	0.6	4	0.045	257040 0005	
6	2.5	26	57	5.5	6	0.6	4	0.045	257040 0006	
8	3	16	63	7.4	8	0.8	6	0.060	257040 0007	
8	3	31	63	7.4	8	0.8	6	0.060	257040 0008	
10	3.5	20	72	9.2	10	1.0	6	0.070	257040 0009	
10	3.5	36	72	9.2	10	1.0	6	0.070	257040 0010	
12	4	24	83	11	12	1.2	6	0.080	257040 0011	
12	4	41	83	11	12	1.2	6	0.080	257040 0012	

2146

ATORN RockTec 65 multi-flute milling cutter

VHM | 50° | h6 | Z 6 | Z 8+ | TiSiN | Vc/fz | 770

ISO H



- For machining materials **up to 65 HRC**
- Edge protection chamfer
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle -26°

material

● very well suited
○ well suited

	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
257012....		○ 200	● 180	○ 140						○ 95						● 140	● 140	● 120
257014....		○ 180	● 160	○ 125						○ 85						● 125	● 115	● 110
Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

Standard



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
3	8	20	50	2.8	6	6	0.015	257012 0030	
4	11	20	50	3.7	6	6	0.03	257012 0040	
5	13	20	50	4.6	6	6	0.05	257012 0050	
6	15	20	50	5.5	6	6	0.05	257012 0060	
8	20	30	64	7.4	8	6	0.05	257012 0080	
10	22	32	70	9.2	10	6	0.06	257012 0100	
12	25	37	75	11	12	6	0.06	257012 0120	
16	30	46	90	15	16	8	0.07	257012 0160	
20	38	58	100	19	20	8	0.08	257012 0200	

2146

Long



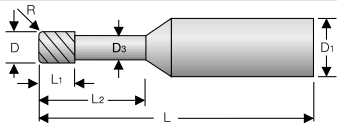
D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
3	19	30	75	2.8	6	6	0.015	257014 0030	
4	19	32	75	3.7	6	6	0.03	257014 0040	
5	19	32	75	4.6	6	6	0.05	257014 0050	
6	31	40	75	5.5	6	6	0.05	257014 0060	
8	31	40	75	7.4	8	6	0.05	257014 0080	
10	45	60	100	9.2	10	6	0.06	257014 0100	
12	50	60	100	11	12	6	0.06	257014 0120	
16	57	85	125	15	16	8	0.07	257014 0160	
20	57	85	125	19	20	8	0.08	257014 0200	

2146

ATORN RockTec 65 mini torus cutter

VHM | 40° | h6 | Z 2 | TiSiN | Vc/fz | 770

ISO H





- Long-necked version for machining materials **up to 65 HRC**
- Cutting edge tolerance: at Ø 0.1 – 0.7 mm = 0/– 0.012 mm, at Ø 0.8 – 3.0 mm = 0/– 0.020 mm
- Radius tolerance: 0/-0.01 mm
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle -5°~7°

material	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
● very well suited ○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
			● 110							○ 60						● 80	● 80	● 80
Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
0.2	0.3	0.5	50	0.16	4	0.02	2	0.002	257024 0001	
0.2	0.3	1.0	50	0.16	4	0.02	2	0.002	257024 0002	
0.2	0.3	1.5	50	0.16	4	0.02	2	0.002	257024 0003	
0.3	0.4	1.0	50	0.26	4	0.03	2	0.002	257024 0004	
0.3	0.4	2	50	0.26	4	0.03	2	0.002	257024 0005	
0.3	0.4	3.0	50	0.26	4	0.03	2	0.002	257024 0006	
0.4	0.6	2	50	0.37	4	0.03	2	0.002	257024 0007	
0.4	0.6	3.0	50	0.37	4	0.03	2	0.002	257024 0008	
0.4	0.6	4.0	50	0.37	4	0.03	2	0.002	257024 0009	
0.4	0.6	5.0	50	0.37	4	0.03	2	0.002	257024 0010	
0.5	0.7	2	50	0.45	4	0.05	2	0.002	257024 0011	
0.5	0.7	4.0	50	0.45	4	0.05	2	0.002	257024 0012	
0.5	0.7	6.0	50	0.45	4	0.05	2	0.002	257024 0013	
0.5	0.7	8.0	50	0.45	4	0.05	2	0.002	257024 0014	
0.6	0.9	2	50	0.55	4	0.05	2	0.002	257024 0015	
0.6	0.9	4.0	50	0.55	4	0.05	2	0.002	257024 0016	
0.6	0.9	6.0	50	0.55	4	0.05	2	0.002	257024 0017	
0.6	0.9	8.0	50	0.55	4	0.05	2	0.002	257024 0018	
0.6	0.9	10.0	50	0.55	4	0.05	2	0.002	257024 0019	
0.8	1.2	4.0	50	0.75	4	0.08	2	0.002	257024 0020	
0.8	1.2	6.0	50	0.75	4	0.08	2	0.002	257024 0021	
0.8	1.2	8.0	50	0.75	4	0.08	2	0.002	257024 0022	
0.8	1.2	10.0	50	0.75	4	0.08	2	0.002	257024 0023	
0.8	1.2	12.0	50	0.75	4	0.08	2	0.002	257024 0024	
1	1.5	6.0	50	0.95	4	0.10	2	0.006	257024 0025	
1	1.5	8.0	50	0.95	4	0.10	2	0.006	257024 0026	
1	1.5	10.0	50	0.95	4	0.10	2	0.006	257024 0027	

2146

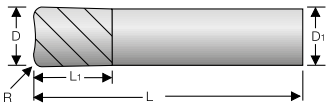
D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
1	1.5	12.0	50	0.95	4	0.10	2	0.006	257024 0028	
1	1.5	14.0	50	0.95	4	0.10	2	0.006	257024 0029	
1	1.5	16.0	60	0.95	4	0.10	2	0.006	257024 0030	
1.2	1.8	6.0	50	1.15	4	0.10	2	0.006	257024 0031	
1.2	1.8	10.0	50	1.15	4	0.10	2	0.006	257024 0032	
1.5	2.3	8.0	50	1.45	4	0.15	2	0.006	257024 0033	
1.5	2.3	12.0	50	1.45	4	0.15	2	0.006	257024 0034	
1.5	2.3	16.0	50	1.45	4	0.15	2	0.006	257024 0035	
1.5	2.3	20.0	60	1.45	4	0.15	2	0.006	257024 0036	
2	3	6.0	50	1.95	4	0.20	2	0.012	257024 0037	
2	3	8.0	50	1.95	4	0.20	2	0.012	257024 0038	
2	3	12.0	50	1.95	4	0.20	2	0.012	257024 0039	
2	3	16.0	50	1.95	4	0.20	2	0.012	257024 0040	
2	3	20.0	60	1.95	4	0.20	2	0.012	257024 0041	
2	3	25.0	75	1.95	4	0.20	2	0.012	257024 0042	
2.5	3.7	8.0	50	2.4	4	0.30	2	0.0185	257024 0043	
2.5	3.7	10.0	50	2.4	4	0.30	2	0.0185	257024 0044	
2.5	3.7	12.0	50	2.4	4	0.30	2	0.0185	257024 0045	
2.5	3.7	16.0	50	2.4	4	0.30	2	0.0185	257024 0046	
2.5	3.7	20.0	60	2.4	4	0.30	2	0.0185	257024 0047	
2.5	3.7	25.0	75	2.4	4	0.30	2	0.0185	257024 0048	
3	4.5	8.0	50	2.85	6	0.30	2	0.0185	257024 0049	
3	4.5	10.0	50	2.85	6	0.30	2	0.0185	257024 0050	
3	4.5	12.0	50	2.85	6	0.30	2	0.0185	257024 0051	
3	4.5	16.0	60	2.85	6	0.30	2	0.0185	257024 0052	
3	4.5	20.0	60	2.85	6	0.30	2	0.0185	257024 0053	
3	4.5	25.0	75	2.85	6	0.30	2	0.0185	257024 0054	

2146

ATORN Torus milling cutter *RockTec 65*

VHM | 40° | h6 | Z 4 | TiSiN | Vc/fz | 770

ISO H



- Long-necked version for machining materials **up to 65 HRC**
- Cutting edge tolerance: at Ø 0.1 – 0.7 mm = 0/– 0.012 mm, at Ø 0.8 – 3.0 mm = 0/– 0.020 mm
- Radius tolerance: 0/-0.01 mm
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle -5°~7°

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
				● 180							○ 95						● 140	● 140	● 120
	Cutting speed Vc m/min.	Please adjust these guidelines according to clamping operation and machine set-up.																	



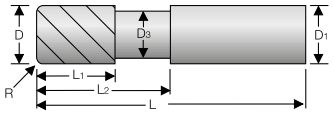
D mm	L1 mm	L mm	D1 mm	R mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
3	9	50	6	0.3	4	0.015	257016 0001	
3	9	50	6	0.5	4	0.015	257016 0002	
4	12	50	6	0.3	4	0.015	257016 0003	
4	12	50	6	0.5	4	0.015	257016 0004	
4	12	50	6	1.0	4	0.015	257016 0005	
5	15	50	6	0.3	4	0.025	257016 0027	
5	15	50	6	0.5	4	0.025	257016 0006	
5	15	50	6	1.0	4	0.025	257016 0007	
6	20	60	6	0.3	4	0.025	257016 0008	
6	20	60	6	0.5	4	0.025	257016 0009	
6	20	60	6	1.0	4	0.025	257016 0010	
8	20	64	8	0.5	4	0.05	257016 0011	
8	20	64	8	1.0	4	0.05	257016 0012	
8	20	64	8	1.5	4	0.05	257016 0013	
8	20	64	8	2.0	4	0.05	257016 0014	
10	22	75	10	0.5	4	0.05	257016 0015	
10	22	75	10	1.0	4	0.05	257016 0028	
10	22	75	10	1.5	4	0.05	257016 0016	
10	22	75	10	2.0	4	0.05	257016 0017	
12	25	75	12	1.0	4	0.06	257016 0018	
12	25	75	12	2.0	4	0.06	257016 0019	
12	25	75	12	3.0	4	0.06	257016 0020	
16	32	90	16	1.0	4	0.07	257016 0021	
16	32	90	16	2.0	4	0.07	257016 0022	
16	32	90	16	3.0	4	0.07	257016 0023	
20	38	100	20	1.0	4	0.08	257016 0024	
20	38	100	20	2.0	4	0.08	257016 0025	
20	38	100	20	3.0	4	0.08	257016 0026	

2146

ATORN RockTec 65 torus cutter

VHM | 40° | e8 | h6 | Z 4 | TiSiN | Vc/fz | 770

ISO H



- **With clearance**
- For machining materials **up to 65 HRC**
- Radius tolerance: 0/-0.01 mm
- **Cutting material: ultra-fine grain solid carbide**
- -6°~-10° rake angle

material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
257018....			○ 180						○ 275	○ 275	○ 275					● 130	● 130	● 100
257020....			○ 230						○ 230	○ 230	○ 230					● 115	● 115	● 85
257022....			○ 130						○ 150	○ 150	○ 150					● 95	● 95	● 65

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

Standard



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
3	4	14	60	2.8	6	0.3	4	0.015	257018 0001	
3	4	14	60	2.8	6	0.5	4	0.015	257018 0002	
4	5	16	60	3.7	6	0.3	4	0.015	257018 0003	
4	5	16	60	3.7	6	0.5	4	0.015	257018 0004	
5	6	18	60	4.6	6	0.3	4	0.025	257018 0005	
5	6	18	60	4.6	6	0.5	4	0.025	257018 0006	
6	7	20	60	5.5	6	0.5	4	0.025	257018 0007	
6	7	20	60	5.5	6	1.0	4	0.025	257018 0008	
8	9	26	64	7.4	8	0.5	4	0.05	257018 0009	
8	9	26	64	7.4	8	1.0	4	0.05	257018 0010	
10	11	31	70	9.2	10	1.0	4	0.05	257018 0011	
10	11	31	70	9.2	10	2.0	4	0.05	257018 0012	
12	13	37	75	11	12	1.0	4	0.06	257018 0013	
12	13	37	75	11	12	2.0	4	0.06	257018 0014	
16	17	43	90	15	16	1.0	4	0.07	257018 0015	
16	17	43	90	15	16	2.0	4	0.07	257018 0016	

2146

Long



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
3	5	30	75	2.8	6	0.3	4	0.015	257020 0001	
3	5	30	75	2.8	6	0.5	4	0.015	257020 0002	
4	8	32	75	3.7	6	0.3	4	0.015	257020 0003	
4	8	32	75	3.7	6	0.5	4	0.015	257020 0004	
5	9	32	75	4.6	6	0.3	4	0.025	257020 0005	
5	9	32	75	4.6	6	0.5	4	0.025	257020 0006	
6	10	40	75	5.5	6	0.5	4	0.025	257020 0007	
6	10	40	75	5.5	6	1.0	4	0.025	257020 0008	
8	12	40	75	7.4	8	0.5	4	0.05	257020 0009	
8	12	40	75	7.4	8	1.0	4	0.05	257020 0010	
10	14	60	100	9.2	10	1.0	4	0.05	257020 0011	
10	14	60	100	9.2	10	2.0	4	0.05	257020 0012	
12	16	60	100	11	12	1.0	4	0.06	257020 0013	
12	16	60	100	11	12	2.0	4	0.06	257020 0014	
16	22	85	125	15	16	1.0	4	0.07	257020 0015	
16	22	85	125	15	16	2.0	4	0.07	257020 0016	

2146



Extra-long

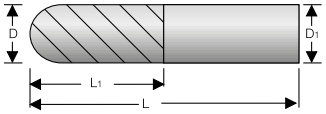
D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
3	5	60	100	2.8	6	0.3	4	0.015	257022 0001	
3	5	60	100	2.8	6	0.5	4	0.015	257022 0002	
4	8	60	100	3.7	6	0.3	4	0.02	257022 0003	
4	8	60	100	3.7	6	0.5	4	0.02	257022 0004	
5	9	60	100	4.6	6	0.3	4	0.025	257022 0005	
5	9	60	100	4.6	6	0.5	4	0.025	257022 0006	
6	10	60	100	5.5	6	0.5	4	0.035	257022 0007	
6	10	60	100	5.5	6	1	4	0.035	257022 0008	
8	12	60	100	7.4	8	0.5	4	0.05	257022 0009	
8	12	60	100	7.4	8	1	4	0.05	257022 0010	
10	14	85	125	9.2	10	1	4	0.05	257022 0011	
10	14	85	125	9.2	10	2	4	0.05	257022 0012	
12	16	110	150	11	12	1	4	0.06	257022 0013	
12	16	110	150	11	12	2	4	0.06	257022 0014	
16	22	110	150	15	16	1	4	0.07	257022 0015	
16	22	110	150	15	16	2	4	0.07	257022 0016	

2146

ATORN RockTec 65 mini radius milling cutter

VHM | -5° | 30° | Z 2 | TiSiN | Vc/fz | 772

- Short, stable design for machining materials **up to 65 HRC**
- Cutting edge tolerance: at Ø 0.1 - 0.7 mm = 0/- 0.012 mm, at Ø 0.8 - 0.9 mm = 0/- 0.020 mm
- Radius tolerance: 0/-0.01 mm
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle -5°



material: ● very well suited ○ well suited

steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		○ 80						○ 65	○ 50	○ 60					● 70	● 70	● 60

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	R mm	L1 mm	L mm	D1 mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
0.2	0.1	0.4	40	4	2	0.0025	257026 0002	
0.3	0.15	0.6	40	4	2	0.0025	257026 0003	
0.4	0.2	0.8	40	4	2	0.003	257026 0004	
0.5	0.25	1	40	4	2	0.003	257026 0005	
0.6	0.3	1.4	40	4	2	0.003	257026 0006	
0.7	0.35	1.6	40	4	2	0.003	257026 0007	
0.8	0.4	1.8	40	4	2	0.003	257026 0008	
0.9	0.45	2	40	4	2	0.0065	257026 0009	

2146

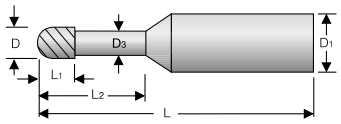


ISO H

ATORN RockTec 65 mini radius milling cutter

VHM | -5° | 30° | h6 | Z 2 | TiSiN | Vc/fz | 772

ISO H



- **With clearance**
- Long-necked version for machining materials **up to 65 HRC**
- Cutting edge tolerance: at Ø 0.1 – 0.7 mm = 0/– 0.012 mm, at Ø 0.8 – 3.0 mm = 0/– 0.020 mm
- Radius tolerance: 0/-0.01 mm
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle -5°

material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
			○						○	○	○					●	●	●
			80						65	50	50					70	70	60
Cutting speed Vc m/min.							Please adjust these guidelines according to clamping operation and machine set-up.											



D mm	R mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
0.2	0.1	0.2	0.5	50	0.15	4	2	0.0025	257034 0001	
0.2	0.1	0.2	1	50	0.15	4	2	0.0025	257034 0002	
0.2	0.1	0.2	1.5	50	0.15	4	2	0.0025	257034 0003	
0.3	0.15	0.3	1	50	0.25	4	2	0.0025	257034 0004	
0.3	0.15	0.3	2	50	0.25	4	2	0.0025	257034 0005	
0.3	0.15	0.3	3	50	0.25	4	2	0.0025	257034 0006	
0.4	0.2	0.4	1	50	0.35	4	2	0.003	257034 0007	
0.4	0.2	0.4	2	50	0.35	4	2	0.003	257034 0008	
0.4	0.2	0.4	3	50	0.35	4	2	0.003	257034 0009	
0.4	0.2	0.4	4	50	0.35	4	2	0.003	257034 0010	
0.4	0.2	0.4	5	50	0.35	4	2	0.003	257034 0011	
0.5	0.25	0.4	2	50	0.45	4	2	0.003	257034 0012	
0.5	0.25	0.4	3	50	0.45	4	2	0.003	257034 0013	
0.5	0.25	0.4	4	50	0.45	4	2	0.003	257034 0014	
0.5	0.25	0.4	5	50	0.45	4	2	0.003	257034 0015	
0.5	0.25	0.4	6	50	0.45	4	2	0.003	257034 0016	
0.5	0.25	0.4	8	50	0.45	4	2	0.003	257034 0017	
0.6	0.3	0.5	2	50	0.55	4	2	0.003	257034 0018	
0.6	0.3	0.5	3	50	0.55	4	2	0.003	257034 0019	
0.6	0.3	0.5	4	50	0.55	4	2	0.003	257034 0020	
0.6	0.3	0.5	5	50	0.55	4	2	0.003	257034 0021	
0.6	0.3	0.5	6	50	0.55	4	2	0.003	257034 0022	
0.6	0.3	0.5	8	50	0.55	4	2	0.003	257034 0023	
0.8	0.4	0.6	2	50	0.75	4	2	0.003	257034 0024	
0.8	0.4	0.6	4	50	0.75	4	2	0.003	257034 0025	
0.8	0.4	0.6	5	50	0.75	4	2	0.003	257034 0026	
0.8	0.4	0.6	6	50	0.75	4	2	0.003	257034 0027	

2146

D mm	R mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
0.8	0.4	0.6	7	50	0.75	4	2	0.003	257034 0028	
0.8	0.4	0.6	8	50	0.75	4	2	0.003	257034 0029	
0.8	0.4	0.6	10	50	0.75	4	2	0.003	257034 0030	
1	0.5	0.8	3	50	0.95	4	2	0.0065	257034 0031	
1	0.5	0.8	6	50	0.95	4	2	0.0065	257034 0032	
1	0.5	0.8	8	50	0.95	4	2	0.0065	257034 0033	
1	0.5	0.8	10	50	0.95	4	2	0.0065	257034 0034	
1	0.5	0.8	12	50	0.95	4	2	0.0065	257034 0035	
1	0.5	0.8	16	50	0.95	4	2	0.0065	257034 0036	
1	0.5	0.8	20	60	0.95	4	2	0.0065	257034 0037	
1.2	0.6	1	6	50	1.15	4	2	0.0065	257034 0038	
1.2	0.6	1	10	50	1.15	4	2	0.0065	257034 0039	
1.5	0.75	1.2	8	50	1.45	4	2	0.0065	257034 0040	
1.5	0.75	1.2	12	50	1.45	4	2	0.0065	257034 0041	
1.5	0.75	1.2	16	50	1.45	4	2	0.0065	257034 0042	
1.5	0.75	1.2	18	60	1.45	4	2	0.0065	257034 0043	
2	1	1.6	4	50	1.95	4	2	0.0075	257034 0044	
2	1	1.6	8	50	1.95	4	2	0.0075	257034 0045	
2	1	1.6	12	50	1.95	4	2	0.0075	257034 0046	
2	1	1.6	16	50	1.95	4	2	0.0075	257034 0047	
2	1	1.6	20	60	1.95	4	2	0.0075	257034 0048	
2	1	1.6	25	75	1.95	4	2	0.0075	257034 0049	
3	1.5	2.4	8	50	2.85	6	2	0.0155	257034 0050	
3	1.5	2.4	10	50	2.85	6	2	0.0155	257034 0051	
3	1.5	2.4	16	60	2.85	6	2	0.0155	257034 0052	
3	1.5	2.4	20	60	2.85	6	2	0.0155	257034 0053	
3	1.5	2.4	25	75	2.85	6	2	0.0155	257034 0054	

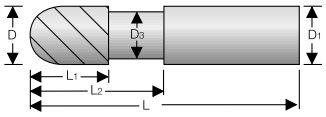
2146

ATORN RockTec 65 radius milling cutter

VHM | -10° | 30° | h6 | Z 2 | TiSiN | Vc/fz | 773

- **With clearance**
- For machining materials **up to 65 HRC**
- Radius tolerance: 0/-0.01 mm
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle -10°

ISO H



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	257028....			○ 275						○ 215	○ 215	○ 180					● 155	● 155	● 65
	257030....			○ 215						○ 215	○ 215	○ 190					● 150	● 150	● 55
	257032....			○ 135						○ 135	○ 135	○ 125					● 95	● 95	● 35
	Cutting speed Vc m/min.									Please adjust these guidelines according to clamping operation and machine set-up.									

Short



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
2	4	8	40	1.85	4	1	2	0.03	257028 0020	
2.5	4	10	40	2.35	4	1.25	2	0.03	257028 0025	
3	5	14	50	2.8	4	1.5	2	0.03	257028 0030	
4	8	20	50	3.7	4	2	2	0.0425	257028 0040	
5	9	20	50	4.6	6	2.5	2	0.0425	257028 0050	
6	10	20	50	5.5	6	3	2	0.0625	257028 0060	
8	12	30	64	7.4	8	4	2	0.0625	257028 0080	
10	14	32	70	9.2	10	5	2	0.09	257028 0100	
12	16	38	75	11	12	6	2	0.09	257028 0120	
16	32	46	90	15	16	8	2	0.095	257028 0160	
20	38	58	100	19	20	10	2	0.095	257028 0200	

2146

Long



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
2	4	14	75	1.85	6	1	2	0.03	257030 0020	
2.5	4	18	75	2.35	6	1.25	2	0.03	257030 0025	
3	5	21	75	2.8	6	1.5	2	0.03	257030 0030	
4	8	28	75	3.7	6	2	2	0.0425	257030 0040	
5	9	32	75	4.6	6	2.5	2	0.0425	257030 0050	
6	10	40	75	5.5	6	3	2	0.0625	257030 0060	
8	12	40	75	7.4	8	4	2	0.0625	257030 0080	
10	14	60	100	9.2	10	5	2	0.09	257030 0100	
12	16	60	100	11	12	6	2	0.09	257030 0120	
16	32	80	125	15	16	8	2	0.095	257030 0160	
20	38	80	125	19	20	10	2	0.095	257030 0200	

2146

Extra-long



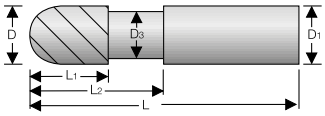
D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
2	4	20	100	1.85	6	1	2	0.03	257032 0020	
2.5	4	25	100	2.35	6	1.25	2	0.03	257032 0025	
3	5	30	100	2.8	6	1.5	2	0.03	257032 0030	
4	8	40	100	3.7	6	2	2	0.0425	257032 0040	
5	9	50	100	4.6	6	2.5	2	0.0425	257032 0050	
6	10	60	150	5.5	6	3	2	0.0625	257032 0060	
8	12	80	150	7.4	8	4	2	0.0625	257032 0080	
10	14	100	150	9.2	10	5	2	0.09	257032 0100	
12	16	110	150	11	12	6	2	0.09	257032 0120	
16	32	150	200	15	16	8	2	0.095	257032 0160	
20	38	150	200	19	20	10	2	0.095	257032 0200	

2146

ATORN RockTec 65 radius milling cutter

VHM | -10° | 30° | h6 | Z 4 | TiSiN | Vc/fz | 773

ISO H



- **With clearance**
- For machining materials **up to 65 HRC**
- Radius tolerance: 0/-0.01 mm
- **Cutting material: ultra-fine grain solid carbide**
- Rake angle -10°

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	257036....			○ 275						○ 215	○ 215	○ 180					● 160	● 160	● 65
	257038....			○ 225						○ 190	○ 205	○ 190					● 150	● 150	● 50
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

Short



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
3	5	14	50	2.8	6	1.5	4	0.03	257036 0030	
4	8	20	50	3.7	6	2	4	0.0425	257036 0040	
5	9	20	50	4.6	6	2.5	4	0.0425	257036 0050	
6	10	20	50	5.5	6	3	4	0.0625	257036 0060	
8	12	30	64	7.4	8	4	4	0.0625	257036 0080	
10	14	32	70	9.2	10	5	4	0.09	257036 0100	
12	16	38	75	11	12	6	4	0.09	257036 0120	
16	32	46	90	15	16	8	4	0.095	257036 0160	
20	38	58	100	19	20	10	4	0.095	257036 0200	

2146

Long



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
3	5	21	75	2.8	6	1.5	4	0.03	257038 0030	
4	8	28	75	3.7	6	2	4	0.0425	257038 0040	
5	9	32	75	4.6	6	2.5	4	0.0425	257038 0050	
6	10	40	75	5.5	6	3	4	0.0625	257038 0060	
8	12	40	75	7.4	8	4	4	0.0625	257038 0080	
10	14	60	100	9.2	10	5	4	0.09	257038 0100	
12	16	60	100	11	12	6	4	0.09	257038 0120	
16	32	80	125	15	16	8	4	0.095	257038 0160	
20	38	80	125	19	20	10	4	0.095	257038 0200	

2146

ATORN RockTec PRO

INFO

TRUE, INHERENT POWER

- **particularly suited to machining steels <1400 N/mm, <55 HRC, <60 HRC and <65 HRC**
- **wide product range, all geometries with maximum precision**
- **new TiAlSiN multi-layer coating, extreme hardness and minimal friction**



Hard machining is playing a growing role in tool and mould making and is increasingly replacing time-consuming processes such as grinding or eroding. But also in other sectors, components must still be reworked after hardening. This often poses enormous challenges for milling tools. And now, ATORN presents ultra-specialist milling tools for all conceivable milling applications.

These **high-performance tools** are optimally designed for hard machining **up to 65 HRC**.

Due to their optimised geometry and the new extremely hard multi-layer coating, ATORN RockTec PRO milling tools guarantee low abrasion and are therefore particularly wear-resistant.

For example, they can handle high-alloy tool steels such as 1.2379 at high feed rates up to 250 m/min and tooth feeds 0.001 to 0.15 mm.


Mini-radius milling cutter from Ø 0.1 mm



Range overview	Z	RockTec PRO range	Short	Standard	Long	Ø range mm	Page
Multi-flute milling cutter 90°	6 - 10		●	●	●	Ø 3 - 20	531
Multi-flute milling cutter with corner radius	6 - 10		●	●	●	Ø 3 - 20	533
Trochoidal end milling cutter	4 - 5			●	●	Ø 6 - 20	535
Mini torus milling cutter	2			●		Ø 0.2 - 0.5	536
Miniature radius milling cutter	2			●		Ø 0.5 - 2	543
Mini end milling cutter	2			●		Ø 1 - 2	526
Solid carbide end milling cutter Z2	2			●		Ø 1 - 20	526
Solid carbide end milling cutter Z4	4		●	●	●	Ø 4 - 20	530
Torus milling cutter	4			●	●	Ø 1 - 16	539
Front face torus milling cutter	4			●	●	Ø 2 - 16	542
Radius milling cutter Z2	2		●	●	●	Ø 1 - 20	545
Radius milling cutter Z4	4		●	●		Ø 1 - 20	547

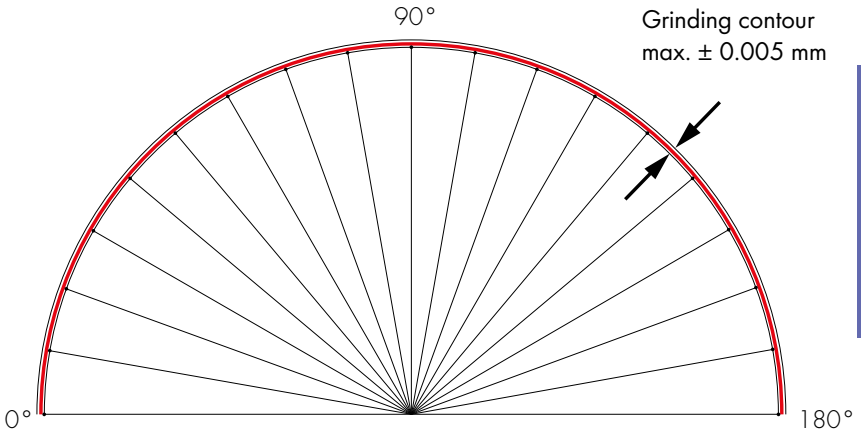
material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
		● 110	● 130	● 150	○ 120	○ 110	○ 90	● 120	● 140								● 95	● 95	● 65
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

ATORN RockTec PRO to 65 HRC

to 65 HRC





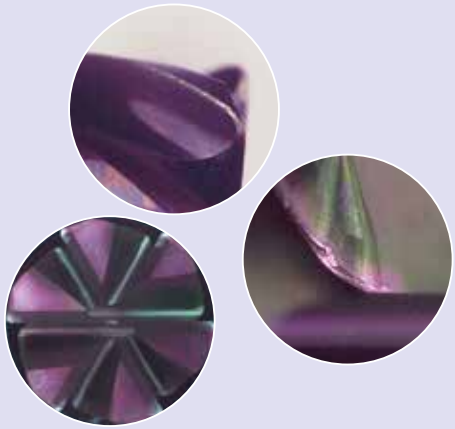
Tolerances

Cutting edge diameter	0 / -0.005 mm
Radius / torus milling cutter	± 0.0025 mm
Radius contour radius copy milling cutter	0 / -0.005 mm
Clearance diameter	0 / -0.01 mm

Test Winner

RockTec PRO emerged the winner in a comparative test conducted by GFE Gesellschaft für Fertigungstechnik und Entwicklung Schmalkalden e.V. Set against the competition, RockTec PRO milling cutters proved themselves in hard milling trials.

A 1.2379 (X153 CrMo V12) tool steel with a hardness of 58 HRC was machined. This involved milling test tracks with defined ap and ae using different solid carbide milling cutters. RockTec PRO milling cutters exhibited the longest tool life overall and thus were Number 1 in the overall rating.



Test results

- low flank wear
- few nicks
- low edge build-up
- minimal coating wear



Front face
optimised radii and front face geometries

Spiral angle
for extremely soft cutting in hard materials

Cutting edges
relief-ground cutting edges

Geometry
reliable chip removal and consistently high process reliability

Coating
TiAlSiN multi-layer coating with extreme hardness

Cutting material
Micrograin solid carbide, especially for hardened steels

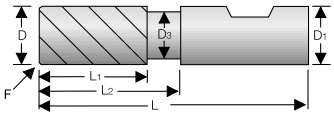
ATORN Solid carbide end milling cutter Z2 *RockTec PRO*

VHM | 35° | f7 | h5 | Z 2 | TiAlSiN | HPC | Vc/fz

796

- For machining materials **from 47 to 65 HRC**
- Optimised geometry for hard machining
- **Cutting material, ultra-fine grain solid carbide**
- State-of-the-art coating technology for reduced abrasion and extreme hardness
- **Subject to process-related colour variations in the coating.**

ISO H



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	○	○	○	●	●								●	●	●
		250	220	200	120	110	90	120	140								180	170	150
	Cutting speed Vc m/min.									Please adjust these guidelines according to clamping operation and machine set-up.									

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1	3		57		6	0,02	2	0.008	257235 0010	
2	5	12	57	1,8	6	0,03	2	0.016	257235 0020	
3	8	15	57	2,8	6	0,04	2	0.020	257235 0030	
4	11	15	57	3,8	6	0,05	2	0.030	257235 0040	
5	13	18	57	4,8	6	0,06	2	0.035	257235 0050	
6	16	20	57	5,8	6	0,07	2	0.040	257235 0060	
8	19	27	63	7,8	8	0,08	2	0.050	257235 0080	
10	22	32	72	9,8	10	0,1	2	0.055	257235 0100	
12	26	36	83	11,8	12	0,13	2	0.065	257235 0120	
16	32	42	92	15,7	16	0,18	2	0.075	257235 0160	
20	38	52	104	19,7	20	0,2	2	0.085	257235 0200	

2178



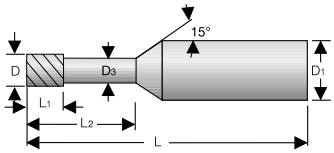
ATORN Mini end milling cutter *RockTec PRO*

VHM | 30° | f7 | h5 | Z 2 | TiAlSiN | Vc/fz

783

- For machining materials **from 47 to 65 HRC**
- Optimised geometry for hard machining
- **Cutting material, ultra-fine grain solid carbide**
- State-of-the-art coating technology for reduced abrasion and extreme hardness
- **Subject to process-related colour variations in the coating.**

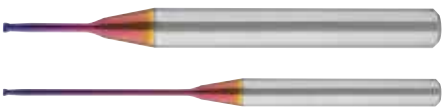
ISO H



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	○	○	○	●	●								●	●	●
		160	140	120	90	80	75	95	100								180	200	220
	Cutting speed Vc m/min.									Please adjust these guidelines according to clamping operation and machine set-up.									

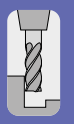
D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
0,2	0,3	0,5	45	0,18	4	2	0.002	257102 0001	
0,2	0,3	1	45	0,18	4	2	0.002	257102 0002	
0,2	0,3	1,5	45	0,18	4	2	0.002	257102 0003	
0,2	0,3	2	45	0,18	4	2	0.002	257102 0004	
0,2	0,3	3	45	0,18	4	2	0.002	257102 0005	
0,3	0,4	0,5	45	0,28	4	2	0.003	257102 0006	
0,3	0,4	1	45	0,28	4	2	0.003	257102 0007	
0,3	0,4	2	45	0,28	4	2	0.003	257102 0008	
0,3	0,4	3	45	0,28	4	2	0.003	257102 0009	
0,3	0,4	4	45	0,28	4	2	0.003	257102 0010	
0,4	0,6	1	45	0,38	4	2	0.004	257102 0011	
0,4	0,6	2	45	0,38	4	2	0.004	257102 0012	
0,4	0,6	3	45	0,38	4	2	0.004	257102 0013	
0,4	0,6	4	45	0,38	4	2	0.004	257102 0014	
0,4	0,6	5	45	0,38	4	2	0.004	257102 0015	

2178



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
0,4	0,6	6	45	0,38	4	2	0.004	257102 0016	
0,5	0,7	1	45	0,48	4	2	0.005	257102 0017	
0,5	0,7	2	45	0,48	4	2	0.005	257102 0018	
0,5	0,7	3	45	0,48	4	2	0.005	257102 0019	
0,5	0,7	4	45	0,48	4	2	0.005	257102 0020	
0,5	0,7	5	45	0,48	4	2	0.005	257102 0021	
0,5	0,7	6	45	0,48	4	2	0.005	257102 0022	
0,5	0,7	8	45	0,48	4	2	0.005	257102 0023	
0,5	0,7	10	50	0,48	4	2	0.005	257102 0024	
0,6	0,9	1	45	0,58	4	2	0.006	257102 0025	
0,6	0,9	2	45	0,58	4	2	0.006	257102 0026	
0,6	0,9	3	45	0,58	4	2	0.006	257102 0027	
0,6	0,9	4	45	0,58	4	2	0.006	257102 0028	
0,6	0,9	5	45	0,58	4	2	0.006	257102 0029	
0,6	0,9	6	45	0,58	4	2	0.006	257102 0030	
0,6	0,9	8	45	0,58	4	2	0.006	257102 0031	
0,6	0,9	10	50	0,58	4	2	0.006	257102 0032	
0,7	1	2	45	0,68	4	2	0.006	257102 0033	
0,8	1,2	2	45	0,78	4	2	0.007	257102 0034	
0,8	1,2	3	45	0,78	4	2	0.007	257102 0035	
0,8	1,2	4	45	0,78	4	2	0.007	257102 0036	
0,8	1,2	5	45	0,78	4	2	0.007	257102 0037	
0,8	1,2	6	45	0,78	4	2	0.007	257102 0038	
0,8	1,2	8	45	0,78	4	2	0.007	257102 0039	
0,8	1,2	10	50	0,78	4	2	0.007	257102 0040	
0,9	1,3	4	45	0,88	4	2	0.007	257102 0041	
1	1,5	2	45	0,95	4	2	0.008	257102 0042	
1	1,5	3	45	0,95	4	2	0.008	257102 0043	
1	1,5	4	45	0,95	4	2	0.008	257102 0044	
1	1,5	5	45	0,95	4	2	0.008	257102 0045	
1	1,5	6	45	0,95	4	2	0.008	257102 0046	
1	1,5	8	45	0,95	4	2	0.008	257102 0047	
1	1,5	10	50	0,95	4	2	0.008	257102 0048	
1	1,5	12	50	0,95	4	2	0.008	257102 0049	
1	1,5	14	50	0,95	4	2	0.008	257102 0050	
1	1,5	16	60	0,95	4	2	0.008	257102 0051	
1	1,5	18	60	0,95	4	2	0.008	257102 0052	
1	1,5	20	60	0,95	4	2	0.008	257102 0053	
1,2	1,8	2	45	1,14	4	2	0.010	257102 0054	
1,2	1,8	4	45	1,14	4	2	0.010	257102 0055	
1,2	1,8	6	45	1,14	4	2	0.010	257102 0056	
1,2	1,8	8	45	1,14	4	2	0.010	257102 0057	
1,2	1,8	10	45	1,14	4	2	0.010	257102 0058	
1,2	1,8	12	50	1,14	4	2	0.010	257102 0059	
1,2	1,8	14	50	1,14	4	2	0.010	257102 0060	
1,2	1,8	16	50	1,14	4	2	0.010	257102 0061	
1,2	1,8	18	60	1,14	4	2	0.010	257102 0062	
1,2	1,8	20	60	1,14	4	2	0.010	257102 0063	
1,4	2,1	6	45	1,34	4	2	0.011	257102 0064	
1,4	2,1	8	45	1,34	4	2	0.011	257102 0065	
1,5	2,3	3	45	1,44	4	2	0.012	257102 0066	
1,5	2,3	4	45	1,44	4	2	0.012	257102 0067	
1,5	2,3	6	45	1,44	4	2	0.012	257102 0068	
1,5	2,3	8	45	1,44	4	2	0.012	257102 0069	
1,5	2,3	10	45	1,44	4	2	0.012	257102 0070	
1,5	2,3	12	50	1,44	4	2	0.012	257102 0071	
1,5	2,3	14	50	1,44	4	2	0.012	257102 0072	
1,5	2,3	16	50	1,44	4	2	0.012	257102 0073	

2178



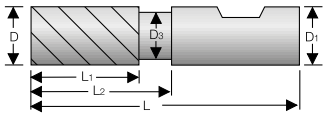
D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1,5	2,3	18	55	1,44	4	2	0.012	257102 0074	
1,5	2,3	20	55	1,44	4	2	0.012	257102 0075	
1,6	2,4	4	45	1,51	4	2	0.014	257102 0076	
1,6	2,4	8	45	1,51	4	2	0.014	257102 0077	
1,6	2,4	10	45	1,51	4	2	0.014	257102 0078	
1,6	2,4	12	45	1,51	4	2	0.014	257102 0079	
1,6	2,4	16	55	1,51	4	2	0.014	257102 0080	
1,6	2,4	20	55	1,51	4	2	0.014	257102 0081	
1,8	2,7	6	45	1,71	4	2	0.015	257102 0082	
1,8	2,7	8	45	1,71	4	2	0.015	257102 0083	
1,8	2,7	10	50	1,71	4	2	0.015	257102 0084	
1,8	2,7	12	50	1,71	4	2	0.015	257102 0085	
1,8	2,7	16	50	1,71	4	2	0.015	257102 0086	
1,8	2,7	20	55	1,71	4	2	0.015	257102 0087	
2	3	4	45	1,91	4	2	0.016	257102 0088	
2	3	6	45	1,91	4	2	0.016	257102 0089	
2	3	8	45	1,91	4	2	0.016	257102 0090	
2	3	10	45	1,91	4	2	0.016	257102 0091	
2	3	12	50	1,91	4	2	0.016	257102 0092	
2	3	14	50	1,91	4	2	0.016	257102 0093	
2	3	16	50	1,91	4	2	0.016	257102 0094	
2	3	18	55	1,91	4	2	0.016	257102 0095	
2	3	20	55	1,91	4	2	0.016	257102 0096	
2	3	22	60	1,91	4	2	0.016	257102 0097	
2	3	25	60	1,91	4	2	0.016	257102 0098	
2	3	30	70	1,91	4	2	0.016	257102 0099	
2	3	35	80	1,91	4	2	0.016	257102 0100	
2	3	40	80	1,91	4	2	0.016	257102 0101	
2,5	3,7	6	45	2,41	4	2	0.018	257102 0102	
2,5	3,7	8	45	2,41	4	2	0.018	257102 0103	
2,5	3,7	10	45	2,41	4	2	0.018	257102 0104	
2,5	3,7	12	50	2,41	4	2	0.018	257102 0105	
2,5	3,7	15	50	2,41	4	2	0.018	257102 0106	
2,5	3,7	20	60	2,41	4	2	0.018	257102 0107	
2,5	3,7	25	60	2,41	4	2	0.018	257102 0108	
2,5	3,7	30	70	2,41	4	2	0.018	257102 0109	
3	4,6	6	45	2,91	4	2	0.020	257102 0110	
3	4,6	8	45	2,91	4	2	0.020	257102 0111	
3	4,6	10	45	2,91	4	2	0.020	257102 0112	
3	4,6	12	45	2,91	4	2	0.020	257102 0113	
3	4,6	14	50	2,91	4	2	0.020	257102 0114	
3	4,6	16	50	2,91	4	2	0.020	257102 0115	
3	4,6	18	60	2,91	4	2	0.020	257102 0116	
3	4,6	20	60	2,91	4	2	0.020	257102 0117	
3	4,6	25	60	2,91	4	2	0.020	257102 0118	
3	4,6	30	70	2,91	4	2	0.020	257102 0119	
3	4,6	35	70	2,91	4	2	0.020	257102 0120	
3	4,6	40	80	2,91	4	2	0.020	257102 0121	

2178

ATORN Solid carbide end milling cutter Z4 *RockTec PRO*

VHM | 40° | f7 | h5 | Z 4 | TiAlSiN | Vc/fz | 796

ISO H



- For machining materials **from 47 to 65 HRC**
- Optimised geometry for hard machining
- **Cutting material, ultra-fine grain solid carbide**
- State-of-the-art coating technology for reduced abrasion and extreme hardness
- **Subject to process-related colour variations in the coating.**

material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
257215....	● 160	● 150	● 150	○ 105	○ 90	○ 80	● 100	● 120								● 180	● 200	● 220
257210....	● 160	● 150	● 140	○ 115	○ 100	○ 90	● 110	● 130								● 140	● 180	● 200
257220....	● 180	● 160	● 150	○ 95	○ 80	○ 70	● 90	● 110								● 250	● 220	● 200
Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

Standard



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
3	9	15	57	2,8	6	4	0.020	257210 0030	
4	12	17	57	3,7	6	4	0.030	257210 0040	
5	15	19	57	4,6	6	4	0.035	257210 0050	
6	16	20	57	5,5	6	4	0.040	257210 0060	
8	20	25	63	7,4	8	4	0.050	257210 0080	
10	22	30	72	9,2	10	4	0.055	257210 0100	
12	25	36	83	11	12	4	0.065	257210 0120	
16	32	42	92	15	16	4	0.075	257210 0160	
20	38	52	104	19	20	4	0.085	257210 0200	

2178

Long



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
3	5	30	75	2,8	6	4	0.020	257215 0030	
4	8	32	75	3,7	6	4	0.030	257215 0040	
5	9	32	75	4,6	6	4	0.035	257215 0050	
6	10	36	75	5,5	6	4	0.040	257215 0060	
8	12	36	75	7,4	8	4	0.050	257215 0080	
10	14	52	100	9,2	10	4	0.055	257215 0100	
12	16	52	100	11	12	4	0.065	257215 0120	
16	22	72	125	15	16	4	0.075	257215 0160	
20	26	72	125	19	20	4	0.085	257215 0200	

2178

Extra-long



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
3	5	60	100	2,8	6	4	0.020	257220 0030	
4	8	60	100	3,7	6	4	0.30	257220 0040	
5	9	60	100	4,6	6	4	0.035	257220 0050	
6	10	60	100	5,5	6	4	0.040	257220 0060	
8	12	60	100	7,4	8	4	0.050	257220 0080	
10	14	83	125	9,2	10	4	0.055	257220 0100	
12	16	100	150	11	12	4	0.065	257220 0120	
16	22	100	150	15	16	4	0.075	257220 0160	
20	26	100	150	19	20	4	0.085	257220 0200	

2178

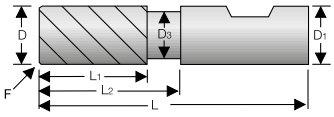
ATORN Solid carbide end milling cutter HPC *RockTec PRO*

VHM | 42° | 45° | f7 | h5 | Z 4 | TiAlSiN | HPC | Vc/fz

796

- For machining materials **from 47 to 65 HRC**
- **With corner radius and/or edge protection chamfer**
- Optimised geometry for hard machining
- **Cutting material, ultra-fine grain solid carbide**
- State-of-the-art coating technology for reduced abrasion and extreme hardness
- **Subject to process-related colour variations in the coating.**

ISO H



material	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
● very well suited ○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	● 180	● 160	● 140	○ 110	○ 100	○ 90	● 160	● 150								● 120	● 115	● 110
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		

short with edge protection chamfer

● Feed fz hardened steel < 60 HRC mm/tooth



D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
4	8	54	6	0,05	4	0.030	257225 0040	
5	9	54	6	0,1	4	0.035	257225 0050	
6	10	54	6	0,1	4	0.040	257225 0060	
8	12	58	8	0,1	4	0.050	257225 0080	
10	14	66	10	0,15	4	0.055	257225 0100	
12	16	73	12	0,15	4	0.065	257225 0120	
16	22	82	16	0,15	4	0.075	257225 0160	
20	26	92	20	0,25	4	0.085	257225 0200	

2178

Standard with extended cutting edge, edge protection chamfer

● Feed fz hardened steel < 60 HRC mm/tooth



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
4	11	16	57	3,8	6	0,05	4	0.030	257226 0040	
5	13	18	57	4,7	6	0,1	4	0.035	257226 0050	
6	13	20	57	5,5	6	0,1	4	0.040	257226 0060	
8	21	25	63	7,4	8	0,1	4	0.050	257226 0080	
10	22	30	72	9,2	10	0,15	4	0.055	257226 0100	
12	26	35	83	11	12	0,15	4	0.065	257226 0120	
16	36	40	92	15	16	0,15	4	0.075	257226 0160	
20	41	50	104	19	20	0,25	4	0.085	257226 0200	

2178

long with edge protection chamfer

● Feed fz hardened steel < 60 HRC mm/tooth



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
4	16	21	62	3,8	6	0,05	4	0.030	257227 0040	
5	17	22	62	4,7	6	0,1	4	0.035	257227 0050	
6	18	23	62	5,5	6	0,1	4	0.040	257227 0060	
8	24	30	68	7,4	8	0,1	4	0.050	257227 0080	
10	30	35	80	9,2	10	0,15	4	0.055	257227 0100	
12	36	45	93	11	12	0,15	4	0.065	257227 0120	
16	48	55	108	15	16	0,15	4	0.075	257227 0160	
20	60	70	126	19	20	0,25	4	0.085	257227 0200	

2178

Standard with extended cutting edge and corner radius



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
4	11	16	57	3,8	6	0.1	4	0.030	257230 0401	
5	13	18	57	4,7	6	0.1	4	0.035	257230 0501	
6	13	20	57	5,5	6	0.1	4	0.040	257230 0601	
8	21	25	63	7,4	8	0.2	4	0.050	257230 0802	
10	22	30	72	9,2	10	0.2	4	0.055	257230 1002	
12	26	35	83	11	12	0.3	4	0.065	257230 1203	
16	36	40	92	15	16	0.3	4	0.075	257230 1603	
20	41	50	104	19	20	0.3	4	0.085	257230 2003	

2178

long with corner radius



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
4	16	21	62	3,8	6	0.1	4	0.030	257231 0401	
5	17	22	62	4,7	6	0.1	4	0.035	257231 0501	
6	18	23	62	5,5	6	0.1	4	0.040	257231 0601	
8	24	30	68	7,4	8	0.2	4	0.050	257231 0802	
10	30	35	80	9,2	10	0.2	4	0.055	257231 1002	
12	36	45	93	11	12	0.3	4	0.065	257231 1203	
16	48	55	108	15	16	0.3	4	0.075	257231 1603	
20	60	70	126	19	20	0.3	4	0.085	257231 2003	

2178

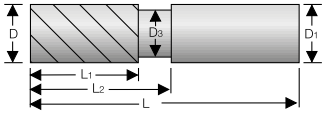
ATORN Multi-flute milling cutter 90° *RockTec PRO*

VHM | -3° | 45° | f7 | h5 | Z 6 | Z 8+ | TiAlSiN | Vc/fz

780

- For machining materials **from 47 to 65 HRC**
- Optimised geometry for hard machining
- **Cutting material: ultra micro-grain SC**
- state-of-the-art coating technology for reduced wear and extreme hardness
- **Subject to process-related colour variations in the coating.**

ISO H



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	257170....	● 160	● 150	● 200	○ 115	○ 100	○ 90	● 110	● 130								● 170	● 110	● 140
	257175....	● 160	● 150	● 200	○ 115	○ 100	○ 90	● 110	● 130								● 170	● 110	● 140
	257185....	● 180	● 160	● 140	○ 115	○ 100	○ 90	● 110	● 130								● 120	● 100	● 80
	257180....	● 160	● 150	● 140	○ 105	○ 90	○ 90	● 110	● 120								● 120	● 110	● 100
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

Short



D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
3	6	2.9	57	4	12	6	0.020	257170 0030	
4	6	3.8	57	5	14	6	0.03	257170 0040	
5	6	4.7	57	6	16	6	0.035	257170 0050	
6	6	5.6	57	7	20	6	0.04	257170 0060	
8	8	7.6	63	9	26	6	0.05	257170 0080	
10	10	9.4	72	11	32	6	0.055	257170 0100	
12	12	11.4	83	12	38	6	0.065	257170 0120	
16	16	15.4	92	16	44	8	0.075	257170 0160	
20	20	19.4	104	20	52	10	0.085	257170 0200	

2178

Standard



D mm	D1 mm	D3 mm	L mm	L1 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
3	6	-	57	9	6	0.02	257175 0030	
4	6	-	57	11	6	0.03	257175 0040	
5	6	-	57	13	6	0.035	257175 0050	
6	6	-	57	15	6	0.04	257175 0060	
8	8	-	63	19	6	0.05	257175 0080	
10	10	-	72	24	6	0.055	257175 0100	
12	12	-	83	28	6	0.065	257175 0120	
16	16	-	92	36	8	0.075	257175 0160	
20	20	-	104	44	10	0.085	257175 0200	

2178

Standard with extended cutting edge



D mm	D1 mm	D3 mm	L mm	L1 mm	Z	L2 mm	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
3	6	2,8	57	9	6	15	0.020	257185 0030	
4	6	3,7	57	11	6	17	0.030	257185 0040	
5	6	4,6	57	13	6	19	0.035	257185 0050	
6	6	5,5	57	15	6	20	0.040	257185 0060	
8	8	7,4	63	19	6	25	0.050	257185 0080	
10	10	9,2	72	24	6	30	0.055	257185 0100	
12	12	11	83	28	6	36	0.065	257185 0120	
16	16	15	92	36	8	42	0.075	257185 0160	
20	20	19	104	44	10	52	0.085	257185 0200	

2178

Long



D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
3	6	-	65	9	11	6	0.020	257180 0030	
4	6	-	65	12	13	6	0.03	257180 0040	
5	6	-	65	15	15	6	0.035	257180 0050	
6	6	-	65	18	-	6	0.04	257180 0060	
8	8	-	70	24	-	6	0.05	257180 0080	
10	10	-	85	30	-	6	0.055	257180 0100	
12	12	-	93	36	-	6	0.065	257180 0120	
16	16	-	110	48	-	8	0.075	257180 0160	
20	20	-	126	60	-	10	0.085	257180 0200	

2178

Over 200,000 tools available online!

Advantages:
- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages





Register online now!

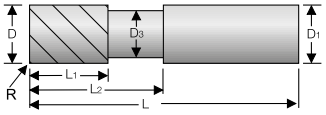
www.saratools.com

ATORN Multi-flute milling cutter with corner radius *RockTec PRO*

VHM | 45° | f7 | h5 | Z 6 | Z 8+ | TiAlSiN | Vc/fz | 781

- For machining materials **from 47 to 65 HRC**
- Optimised geometry for hard machining
- **Cutting material: ultra micro-grain SC**
- state-of-the-art coating technology for reduced wear and extreme hardness
- **Subject to process-related colour variations in the coating.**

ISO H



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 160	● 140	● 105	○ 120	○ 110	○ 100	● 120	● 140								● 105	● 115	● 160
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		

Short



D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
3	6	2.9	57	4	12	0.1	6	0.020	257155 0301	
3	6	2.9	57	4	12	0.5	6	0.02	257155 0305	
4	6	3.8	57	5	14	0.1	6	0.03	257155 0401	
4	6	3.8	57	5	14	0.5	6	0.03	257155 0405	
4	6	3.8	57	5	14	1	6	0.03	257155 0410	
5	6	4.7	57	6	16	0.1	6	0.035	257155 0501	
5	6	4.7	57	6	16	0.5	6	0.035	257155 0505	
5	6	4.7	57	6	16	1	6	0.035	257155 0510	
6	6	5.6	57	7	20	0.1	6	0.04	257155 0601	
6	6	5.6	57	7	20	0.5	6	0.04	257155 0605	
6	6	5.6	57	7	20	0.8	6	0.04	257155 0608	
6	6	5.6	57	7	20	1	6	0.04	257155 0610	
6	6	5.6	57	7	20	1.5	6	0.04	257155 0615	
8	8	7.6	63	9	26	0.1	6	0.05	257155 0801	
8	8	7.6	63	9	26	0.5	6	0.05	257155 0805	
8	8	7.6	63	9	26	0.8	6	0.05	257155 0808	
8	8	7.6	63	9	26	1	6	0.05	257155 0810	
8	8	7.6	63	9	26	1.5	6	0.05	257155 0815	
8	8	7.6	63	9	26	2	6	0.05	257155 0820	
10	10	9.4	72	11	32	0.1	6	0.055	257155 1001	
10	10	9.4	72	11	32	0.5	6	0.055	257155 1005	
10	10	9.4	72	11	32	0.8	6	0.055	257155 1008	
10	10	9.4	72	11	32	1	6	0.055	257155 1010	
10	10	9.4	72	11	32	1.5	6	0.055	257155 1015	
10	10	9.4	72	11	32	2	6	0.055	257155 1020	
12	12	11.4	83	12	38	0.1	6	0.065	257155 1201	
12	12	11.4	83	12	38	0.5	6	0.065	257155 1205	
12	12	11.4	83	12	38	1	6	0.065	257155 1210	
12	12	11.4	83	12	38	1.5	6	0.065	257155 1215	
12	12	11.4	83	12	38	2	6	0.065	257155 1220	
16	16	15.4	92	16	44	0.5	8	0.075	257155 1605	
16	16	15.4	92	16	44	1	8	0.075	257155 1610	
16	16	15.4	92	16	44	2	8	0.075	257155 1620	
16	16	15.4	92	16	44	3	8	0.075	257155 1630	
20	20	19.4	104	20	52	1	10	0.085	257155 2010	

2178

Standard



D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
3	6	-	57	9	11	0.1	6	0.02	257160 0301	
3	6	-	57	9	11	0.5	6	0.02	257160 0305	
4	6	-	57	11	13	0.1	6	0.03	257160 0401	
4	6	-	57	11	13	0.5	6	0.03	257160 0405	
4	6	-	57	11	13	1	6	0.03	257160 0410	
5	6	-	57	13	15	0.1	6	0.035	257160 0501	
5	6	-	57	13	15	0.5	6	0.035	257160 0505	
5	6	-	57	13	15	1	6	0.035	257160 0510	
6	6	-	57	15	-	0.1	6	0.04	257160 0601	
6	6	-	57	15	-	0.5	6	0.04	257160 0605	
6	6	-	57	15	-	1	6	0.04	257160 0610	
8	8	-	63	19	-	0.1	6	0.05	257160 0801	
8	8	-	63	19	-	0.5	6	0.05	257160 0805	
8	8	-	63	19	-	1	6	0.05	257160 0810	
10	10	-	72	24	-	0.1	6	0.055	257160 1001	
10	10	-	72	24	-	0.5	6	0.055	257160 1005	
10	10	-	72	24	-	1	6	0.055	257160 1010	
10	10	-	72	24	-	1.5	6	0.055	257160 1015	
12	12	-	83	28	-	0.1	6	0.065	257160 1201	
12	12	-	83	28	-	0.5	6	0.065	257160 1205	
12	12	-	83	28	-	1	6	0.065	257160 1210	
12	12	-	83	28	-	1.5	6	0.065	257160 1215	
16	16	-	92	36	-	0.5	8	0.075	257160 1605	
16	16	-	92	36	-	1	8	0.075	257160 1610	
20	20	-	104	44	-	1	10	0.085	257160 2010	

2178

Long



D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
3	6	-	65	9	-	0.1	6	0.020	257165 0301	
3	6	-	65	9	-	0.5	6	0.02	257165 0305	
4	6	-	65	12	-	0.1	6	0.03	257165 0401	
4	6	-	65	12	-	0.5	6	0.03	257165 0405	
4	6	-	65	12	-	1	6	0.03	257165 0410	
5	6	-	65	15	-	0.1	6	0.035	257165 0501	
5	6	-	65	15	-	0.5	6	0.035	257165 0505	
5	6	-	65	15	-	1	6	0.035	257165 0510	
6	6	-	65	18	-	0.1	6	0.04	257165 0601	
6	6	-	65	18	-	0.5	6	0.04	257165 0605	
6	6	-	65	18	-	1	6	0.04	257165 0610	
8	8	-	70	24	-	0.1	6	0.05	257165 0801	
8	8	-	70	24	-	0.5	6	0.05	257165 0805	
8	8	-	80	24	-	1	6	0.05	257165 0810	
10	10	-	85	30	-	0.1	6	0.055	257165 1001	
10	10	-	85	30	-	0.5	6	0.055	257165 1005	
10	10	-	85	30	-	1	6	0.055	257165 1010	
10	10	-	85	30	-	1.5	6	0.055	257165 1015	
12	12	-	93	36	-	0.1	6	0.065	257165 1201	
12	12	-	93	36	-	0.5	6	0.065	257165 1205	
12	12	-	93	36	-	1	6	0.065	257165 1210	
16	16	-	110	48	-	0.5	8	0.075	257165 1605	
16	16	-	110	48	-	1	8	0.075	257165 1610	
20	20	-	126	60	-	1	10	0.085	257165 2010	

2178

ATORN Trochoidal *RockTec PRO* end milling cutter

VHM | 40° | e8 | h5 | Z 5 | Z 4 | TiAlSiN | TVC | Vc/fz | 782

- For machining materials **from 47 to 65 HRC**
- **Milling cutter designed for TVC use**
- With chip breaker
- Reinforced core
- Optimised geometry for hard machining
- **Solid carbide ultra-fine grain cutting material**
- State-of-the-art coating technology for reduced wear and extreme hardness
- **Subject to process-related colour variations in the coating.**

ISO H

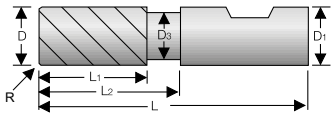
material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 180	● 160	● 150	○ 110	○ 100	○ 95	● 120	● 130								● 130	● 100	● 100
	Cutting speed Vc m/min.									Please adjust these guidelines according to clamping operation and machine set-up.									

3 x D with clearance

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
6	6	5.8	65	19	25	0.1	5	0.04	257190 0060	
8	8	7.8	68	26	30	0.2	5	0.05	257190 0080	
10	10	9.8	80	32	35	0.2	5	0.055	257190 0100	
12	12	11.8	93	38	45	0.3	5	0.065	257190 0120	
16	16	15.8	110	50	55	0.3	5	0.075	257190 0160	
20	20	19.8	126	62	70	0.3	5	0.085	257190 0200	

2178



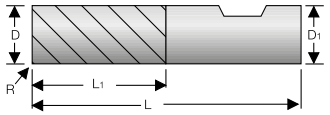


4 x D without clearance

D mm	D1 mm	L mm	L1 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
6	6	70	25	0.1	4	0.04	257195 0060	
8	8	80	34	0.2	4	0.05	257195 0080	
10	10	95	42	0.2	4	0.055	257195 0100	
12	12	105	50	0.3	4	0.065	257195 0120	
16	16	125	66	0.3	4	0.075	257195 0160	
20	20	150	82	0.3	4	0.085	257195 0200	

2178





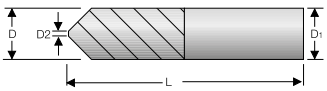
ATORN Solid carbide deburrer 90°, spiralled *RockTec PRO*

VHM | 90° | 15° | f7 | h5 | Z 5 | TiAlSiN | Vc/fz | 732

- For machining materials **from 47 to 65 HRC**
- **Spiralled**
- Optimised geometry for hard machining
- **Cutting material, ultra-fine grain solid carbide**
- State-of-the-art coating technology for reduced abrasion and extreme hardness
- **Subject to process-related colour variations in the coating.**

ISO H

D2 = hole Ø



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 200	● 180	● 160	○ 90	○ 70	○ 70	● 150	● 150								● 120	● 100	● 90
	Cutting speed Vc m/min.									Please adjust these guidelines according to clamping operation and machine set-up.									

Standard

D mm	L1 mm	L mm	D1 mm	Z	Drill Ø mm	Feed fz hardened steel < 60 HRC mm/tooth	90° HA art.no.	€
6	2,5	57	6	5	1.0	0.030	257260 0060	
8	3,5	63	8	5	1.0	0.040	257260 0080	
10	4,5	72	10	5	1.0	0.040	257260 0100	
12	5,5	83	12	5	1.0	0.040	257260 0120	
16	7,5	93	16	5	1.0	0.060	257260 0160	

2178

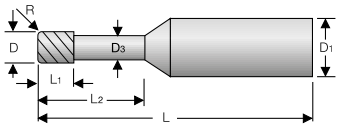


ATORN Mini torus milling cutter *RockTec PRO*

VHM | 30° | f7 | h5 | Z 2 | TiAlSiN | Vc/fz | 783

- For machining materials **from 47 to 65 HRC**
- Optimised geometry for hard machining
- **Cutting material: ultra micro-grain SC**
- state-of-the-art coating technology for reduced wear and extreme hardness
- **Subject to process-related colour variations in the coating.**

ISO H



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	○	○	○	●	●								●	●	●
		130	100	95	80	85	60	70	80								105	115	160
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		

Corner radius 0.05

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
0.2	4	0.18	50	0.2	0.5	0.05	2	0.002	257120 0001	
0.2	4	0.18	50	0.2	1	0.05	2	0.002	257120 0002	
0.2	4	0.18	50	0.2	3	0.05	2	0.002	257120 0003	
0.3	4	0.28	50	0.3	1	0.05	2	0.003	257120 0004	
0.3	4	0.28	50	0.3	2	0.05	2	0.003	257120 0005	
0.3	4	0.28	50	0.3	4	0.05	2	0.003	257120 0006	
0.4	4	0.38	50	0.4	1	0.05	2	0.004	257120 0007	
0.4	4	0.38	50	0.4	2	0.05	2	0.004	257120 0008	
0.4	4	0.38	50	0.4	5	0.05	2	0.004	257120 0009	
0.5	4	0.48	50	0.5	1	0.05	2	0.005	257120 0010	
0.5	4	0.48	50	0.5	2	0.05	2	0.005	257120 0011	
0.5	4	0.48	50	0.5	4	0.05	2	0.005	257120 0012	
0.5	4	0.48	50	0.5	6	0.05	2	0.005	257120 0013	
0.5	4	0.48	50	0.5	8	0.05	2	0.005	257120 0014	
0.5	4	0.48	50	0.5	10	0.05	2	0.005	257120 0015	

2178


257120 0003


257120 0013

Corner radius 0.1

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
0.5	4	0.48	50	0.5	1	0.1	2	0.005	257125 0001	
0.5	4	0.48	50	0.5	2	0.1	2	0.005	257125 0002	
0.5	4	0.48	50	0.5	4	0.1	2	0.005	257125 0003	
0.5	4	0.48	50	0.5	6	0.1	2	0.005	257125 0004	
0.5	4	0.48	50	0.5	8	0.1	2	0.005	257125 0005	
0.5	4	0.48	50	0.5	10	0.1	2	0.005	257125 0006	
0.6	4	0.58	50	0.6	2	0.1	2	0.006	257125 0007	
0.6	4	0.58	50	0.6	4	0.1	2	0.006	257125 0008	
0.6	4	0.58	50	0.6	6	0.1	2	0.006	257125 0009	
0.6	4	0.58	50	0.6	8	0.1	2	0.006	257125 0010	
0.6	4	0.58	50	0.6	10	0.1	2	0.006	257125 0011	
0.8	4	0.78	50	0.8	2	0.1	2	0.007	257125 0012	
0.8	4	0.78	50	0.8	4	0.1	2	0.007	257125 0013	
0.8	4	0.78	50	0.8	6	0.1	2	0.007	257125 0014	
0.8	4	0.78	50	0.8	8	0.1	2	0.007	257125 0015	
0.8	4	0.78	50	0.8	10	0.1	2	0.007	257125 0016	

2178


257125 0006


257125 0027


257125 0038

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1	4	0.95	50	1	2	0.1	2	0.008	257125 0017	
1	4	0.95	50	1	4	0.1	2	0.008	257125 0018	
1	4	0.95	50	1	6	0.1	2	0.008	257125 0019	
1	4	0.95	50	1	8	0.1	2	0.008	257125 0020	
1	4	0.95	50	1	10	0.1	2	0.008	257125 0021	
1	4	0.95	50	1	15	0.1	2	0.008	257125 0022	
1	4	0.95	60	1	20	0.1	2	0.008	257125 0023	
1	4	0.95	60	1	25	0.1	2	0.008	257125 0024	
1.2	4	1.14	50	1.2	5	0.1	2	0.01	257125 0025	
1.2	4	1.14	50	1.2	10	0.1	2	0.01	257125 0026	
1.2	4	1.14	50	1.2	15	0.1	2	0.01	257125 0027	
1.2	4	1.14	60	1.2	20	0.1	2	0.01	257125 0028	
1.2	4	1.14	60	1.2	25	0.1	2	0.01	257125 0029	
1.5	4	1.44	50	1.5	3	0.1	2	0.012	257125 0030	
1.5	4	1.44	50	1.5	4	0.1	2	0.012	257125 0031	
1.5	4	1.44	50	1.5	6	0.1	2	0.012	257125 0032	
1.5	4	1.44	50	1.5	8	0.1	2	0.012	257125 0033	
1.5	4	1.44	50	1.5	10	0.1	2	0.012	257125 0034	
1.5	4	1.44	50	1.5	15	0.1	2	0.012	257125 0035	
1.5	4	1.44	60	1.5	20	0.1	2	0.012	257125 0036	
1.5	4	1.44	60	1.5	25	0.1	2	0.012	257125 0037	
2	4	1,91	50	2	4	0.1	2	0.013	257125 0038	

2178

Corner radius 0.2


257130 0008


257130 0018


257130 0022

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1	4	0.95	50	1	2	0.2	2	0.008	257130 0001	
1	4	0.95	50	1	4	0.2	2	0.008	257130 0002	
1	4	0.95	50	1	6	0.2	2	0.008	257130 0003	
1	4	0.95	50	1	8	0.2	2	0.008	257130 0004	
1	4	0.95	50	1	10	0.2	2	0.008	257130 0005	
1	4	0.95	50	1	15	0.2	2	0.008	257130 0006	
1	4	0.95	60	1	20	0.2	2	0.008	257130 0007	
1	4	0.95	60	1	25	0.2	2	0.008	257130 0008	
1.2	4	1.14	50	1.2	5	0.2	2	0.01	257130 0009	
1.2	4	1.14	50	1.2	10	0.2	2	0.01	257130 0010	
1.2	4	1.14	50	1.2	15	0.2	2	0.01	257130 0011	
1.2	4	1.14	60	1.2	20	0.2	2	0.01	257130 0012	
1.2	4	1.14	60	25	25	0.2	2	0.01	257130 0013	
1.5	4	1.44	50	1.5	3	0.2	2	0.012	257130 0014	
1.5	4	1.44	50	1.5	4	0.2	2	0.012	257130 0015	
1.5	4	1.44	50	1.5	6	0.2	2	0.012	257130 0016	
1.5	4	1.44	50	1.5	8	0.2	2	0.012	257130 0017	
1.5	4	1.44	50	1.5	10	0.2	2	0.012	257130 0018	
1.5	4	1.44	50	1.5	15	0.2	2	0.012	257130 0019	
1.5	4	1.44	60	1.5	20	0.2	2	0.012	257130 0020	
1.5	4	1.44	60	1.5	25	0.2	2	0.012	257130 0021	
2	4	1.91	50	2	4	0.2	2	0.016	257130 0022	
2	4	1.91	50	2	6	0.2	2	0.016	257130 0023	
2	4	1.91	50	2	8	0.2	2	0.016	257130 0024	
2	4	1.91	50	2	10	0.2	2	0.016	257130 0025	
2	4	1.91	50	2	15	0.2	2	0.016	257130 0026	
2	4	1.91	60	2	20	0.2	2	0.016	257130 0027	
2	4	1.91	60	2	25	0.2	2	0.016	257130 0028	
2	4	1.91	65	2	30	0.2	2	0.016	257130 0029	
2	4	1.91	70	2	35	0.2	2	0.016	257130 0030	
2	4	1.91	75	2	40	0.2	2	0.016	257130 0031	

2178

Corner radius 0.3


257135 0006


257135 0027

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1.5	4	1.44	50	1.5	3	0.3	2	0.012	257135 0001	
1.5	4	1.44	50	1.5	4	0.3	2	0.012	257135 0002	
1.5	4	1.44	50	1.5	6	0.3	2	0.012	257135 0003	
1.5	4	1.44	50	1.5	8	0.3	2	0.012	257135 0004	
1.5	4	1.44	50	1.5	10	0.3	2	0.012	257135 0005	
1.5	4	1.44	50	1.5	15	0.3	2	0.012	257135 0006	
1.5	4	1.44	60	1.5	20	0.3	2	0.012	257135 0007	
1.5	4	1.44	60	1.5	25	0.3	2	0.012	257135 0008	
2	4	1.91	50	2	4	0.3	2	0.016	257135 0009	
2	4	1.91	50	2	6	0.3	2	0.016	257135 0010	
2	4	1.91	50	2	8	0.3	2	0.016	257135 0011	
2	4	1.91	50	2	10	0.3	2	0.016	257135 0012	
2	4	1.91	50	2	15	0.3	2	0.016	257135 0013	
2	4	1.91	60	2	20	0.3	2	0.016	257135 0014	
2	4	1.91	60	2	25	0.3	2	0.016	257135 0015	
2	4	1.91	65	2	30	0.3	2	0.016	257135 0016	
2	4	1.91	70	2	35	0.3	2	0.016	257135 0017	
2	4	1.91	75	2	40	0.3	2	0.016	257135 0018	
2.5	4	2.41	50	2.5	8	0.3	2	0.018	257135 0019	
2.5	4	2.41	50	2.5	10	0.3	2	0.018	257135 0020	
2.5	4	2.41	50	2.5	15	0.3	2	0.018	257135 0021	
2.5	4	2.41	60	2.5	20	0.3	2	0.018	257135 0022	
2.5	4	2.41	60	2.5	25	0.3	2	0.018	257135 0023	
2.5	4	2.41	65	2.5	30	0.3	2	0.018	257135 0024	
2.5	4	2.41	70	2.5	35	0.3	2	0.018	257135 0025	
2.5	4	2.41	75	2.5	40	0.3	2	0.018	257135 0026	
3	4	2.92	50	3	8	0.3	2	0.02	257135 0027	
3	4	2.92	50	3	10	0.3	2	0.02	257135 0028	
3	4	2.92	50	3	15	0.3	2	0.02	257135 0029	
3	4	2.92	60	3	20	0.3	2	0.02	257135 0030	
3	4	2.92	60	3	25	0.3	2	0.02	257135 0031	
3	4	2.92	65	3	30	0.3	2	0.02	257135 0032	
3	4	2.92	70	3	35	0.3	2	0.02	257135 0033	
3	4	2.92	75	3	40	0.3	2	0.02	257135 0034	

2178

Corner radius 0.5


257140 0003


257140 0009

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
2.5	4	2.41	50	2.5	8	0.5	2	0.018	257140 0001	
2.5	4	2.41	50	2.5	10	0.5	2	0.018	257140 0002	
2.5	4	2.41	50	2.5	15	0.5	2	0.018	257140 0003	
2.5	4	2.41	60	2.5	20	0.5	2	0.018	257140 0004	
2.5	4	2.41	60	2.5	25	0.5	2	0.018	257140 0005	
2.5	4	2.41	65	2.5	30	0.5	2	0.018	257140 0006	
2.5	4	2.41	70	2.5	35	0.5	2	0.018	257140 0007	
2.5	4	2.41	75	2.5	40	0.5	2	0.018	257140 0008	
3	4	2.92	50	3	8	0.5	2	0.02	257140 0009	
3	4	2.92	50	3	10	0.5	2	0.02	257140 0010	
3	4	2.92	50	3	15	0.5	2	0.02	257140 0011	
3	4	2.92	60	3	20	0.5	2	0.02	257140 0012	
3	4	2.92	60	3	25	0.5	2	0.02	257140 0013	
3	4	2.92	65	3	30	0.5	2	0.02	257140 0014	
3	4	2.92	70	3	35	0.5	2	0.02	257140 0015	
3	4	2.92	75	3	40	0.5	2	0.02	257140 0016	

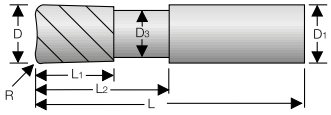
2178

ATORN Torus milling cutter *RockTec PRO*

VHM | 30° | f7 | h5 | Z 4 | TiAlSiN | Vc/fz | 786

- For machining materials **from 47 to 65 HRC**
- Optimised geometry for hard machining
- **Cutting material: ultra micro-grain SC**
- state-of-the-art coating technology for reduced wear and extreme hardness
- **Subject to process-related colour variations in the coating.**

ISO H



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 160	● 180	● 200	○ 120	○ 100	○ 90	● 110	● 130								● 105	● 115	● 160
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		

short



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
2	2,5	8	50	1,8	6	0.20	4	0.016	257240 0220	
3	4	8	50	2,7	6	0.25	4	0.020	257240 0325	
4	5	10	50	3,7	6	0.20	4	0.030	257240 0420	
4	5	10	50	3,7	6	0.025	4	0.030	257240 0425	
5	6	16	57	4,6	6	0.025	4	0.035	257240 0525	
6	7	20	57	5,5	6	0.025	4	0.040	257240 0625	
6	7	20	57	5,5	6	0.80	4	0.040	257240 0680	
8	9	27	63	7,4	8	0.25	4	0.050	257240 0825	
8	9	27	63	7,4	8	0.80	4	0.050	257240 0880	
10	11	32	72	9,2	10	0.25	4	0.055	257240 1025	
10	11	32	72	9,2	10	0.80	4	0.055	257240 1080	

2178

Standard



D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1	6	0.95	57	1.5	10	0.1	4	0.008	257145 0101	
1	6	0.95	57	1.5	10	0.2	4	0.008	257145 0102	
2	6	1.85	57	2.5	12	0.1	4	0.016	257145 0201	
2	6	1.85	57	2.5	12	0.3	4	0.016	257145 0203	
2	6	1.85	57	2.5	12	0.5	4	0.016	257145 0205	
3	6	2.9	57	3.5	12	0.1	4	0.02	257145 0301	
3	6	2.9	57	3.5	12	0.3	4	0.02	257145 0303	
3	6	2.9	57	3.5	12	0.5	4	0.02	257145 0305	
3	6	2.9	57	3.5	12	1	4	0.02	257145 0310	
4	6	3.8	57	4.5	14	0.1	4	0.03	257145 0401	
4	6	3.8	57	4.5	14	0.3	4	0.03	257145 0403	
4	6	3.8	57	4.5	14	0.5	4	0.03	257145 0405	
4	6	3.8	57	4.5	14	1	4	0.03	257145 0410	
5	6	4.7	57	5.5	16	0.1	4	0.035	257145 0501	
5	6	4.7	57	5.5	16	0.3	4	0.035	257145 0503	
5	6	4.7	57	5.5	16	0.5	4	0.035	257145 0505	
5	6	4.7	57	5.5	16	1	4	0.035	257145 0510	
6	6	5.7	57	7	20	0.1	4	0.04	257145 0601	
6	6	5.7	57	7	20	0.3	4	0.04	257145 0603	

2178

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
6	6	5.7	57	7	20	0.5	4	0.04	257145 0605	
6	6	5.7	57	7	20	1	4	0.04	257145 0610	
6	6	5.7	57	7	20	1.5	4	0.04	257145 0615	
6	6	5.7	57	7	20	2	4	0.04	257145 0620	
8	8	7.6	63	9	26	0.1	4	0.05	257145 0801	
8	8	7.6	63	9	26	0.3	4	0.05	257145 0803	
8	8	7.6	63	9	26	0.5	4	0.05	257145 0805	
8	8	7.6	63	9	26	1	4	0.05	257145 0810	
8	8	7.6	63	9	26	2	4	0.05	257145 0820	
8	8	7.6	63	9	26	3	4	0.05	257145 0830	
10	10	9.6	72	12	32	0.1	4	0.055	257145 1001	
10	10	9.6	72	12	32	0.3	4	0.055	257145 1003	
10	10	9.6	72	12	32	0.5	4	0.055	257145 1005	
10	10	9.6	72	12	32	1	4	0.055	257145 1010	
10	10	9.6	72	12	32	2	4	0.055	257145 1020	
10	10	9.6	72	12	32	3	4	0.055	257145 1030	
12	12	11.6	83	14	38	0.5	4	0.065	257145 1205	
12	12	11.6	83	14	38	1	4	0.065	257145 1210	
12	12	11.6	83	14	38	2	4	0.065	257145 1220	
12	12	11.6	83	14	38	3	4	0.065	257145 1230	
16	16	15.4	92	18	44	1	4	0.075	257145 1610	
16	16	15.4	92	18	44	2	4	0.075	257145 1620	

2178

Long



D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1	6	0.95	65	1.5	20	0.1	4	0.008	257150 0101	
1	6	0.95	65	1.5	20	0.2	4	0.008	257150 0102	
2	6	1.85	70	2.5	25	0.1	4	0.016	257150 0201	
2	6	1.85	70	2.5	25	0.3	4	0.016	257150 0203	
2	6	1.85	70	2.5	25	0.5	4	0.016	257150 0205	
3	6	2.9	75	3.5	32	0.1	4	0.02	257150 0301	
3	6	2.9	75	3.5	32	0.3	4	0.02	257150 0303	
3	6	2.9	75	3.5	32	0.5	4	0.02	257150 0305	
3	6	2.9	75	3.5	32	1	4	0.02	257150 0310	
4	6	3.8	80	4.5	36	0.1	4	0.03	257150 0401	
4	6	3.8	80	4.5	36	0.3	4	0.03	257150 0403	
4	6	3.8	80	4.5	36	0.5	4	0.03	257150 0405	
4	6	3.8	80	4.5	36	1	4	0.03	257150 0410	
5	6	4.7	80	5.5	40	0.1	4	0.035	257150 0501	
5	6	4.7	80	5.5	40	0.3	4	0.035	257150 0503	
5	6	4.7	80	5.5	40	0.5	4	0.035	257150 0505	
5	6	4.7	80	5.5	40	1	4	0.035	257150 0510	
6	6	5.7	80	7	44	0.1	4	0.04	257150 0601	
6	6	5.7	80	7	44	0.3	4	0.04	257150 0603	
6	6	5.7	80	7	44	0.5	4	0.04	257150 0605	
6	6	5.7	80	7	44	1	4	0.04	257150 0610	
6	6	5.7	80	7	44	1.5	4	0.04	257150 0615	
6	6	5.7	80	7	44	2	4	0.04	257150 0620	
8	8	7.6	100	9	54	0.1	4	0.05	257150 0801	
8	8	7.6	100	9	54	0.3	4	0.05	257150 0803	
8	8	7.6	100	9	54	0.5	4	0.05	257150 0805	
8	8	7.6	100	9	54	1	4	0.05	257150 0810	
8	8	7.6	100	9	54	2	4	0.05	257150 0820	
8	8	7.6	100	9	54	3	4	0.05	257150 0830	
10	10	9.6	100	12	60	0.1	4	0.055	257150 1001	
10	10	9.6	100	12	60	0.3	4	0.055	257150 1003	

2178

D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
10	10	9.6	100	12	60	0.5	4	0.055	257150 1005	
10	10	9.6	100	12	60	1	4	0.055	257150 1010	
10	10	9.6	100	12	60	2	4	0.055	257150 1020	
10	10	9.6	100	12	60	3	4	0.055	257150 1030	
12	12	11.6	120	14	75	0.5	4	0.065	257150 1205	
12	12	11.6	120	14	75	1	4	0.065	257150 1210	
12	12	11.6	120	14	75	2	4	0.065	257150 1220	
12	12	11.6	120	14	75	3	4	0.065	257150 1230	
16	16	15.4	150	18	92	1	4	0.075	257150 1610	
16	16	15.4	150	18	92	2	4	0.075	257150 1620	
16	16	15.4	150	18	92	3	4	0.075	257150 1630	

2178



long extended corner radii

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
2	2,5	25	75	1,8	6	0.20	4	0.016	257241 0220	
3	4	32	75	2,7	6	0.25	4	0.020	257241 0325	
4	5	34	75	3,7	6	0.20	4	0.030	257241 0420	
4	5	34	75	3,7	6	0.25	4	0.030	257241 0425	
5	6	38	75	4,6	6	0.25	4	0.035	257241 0525	
6	7	44	80	5,5	6	0.25	4	0.040	257241 0625	
6	7	44	80	5,5	6	0.80	4	0.040	257241 0680	
8	9	54	100	7,4	8	0.25	4	0.050	257241 0825	
8	9	54	100	7,4	8	0.80	4	0.050	257241 0880	
10	11	60	120	9,2	10	0.25	4	0.055	257241 1025	
10	11	60	120	9,2	10	0.80	4	0.055	257241 1080	

2178



Extra-long

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
3	5	60	100	2,8	6	0.3	4	0.020	257151 0303	
3	5	60	100	2,8	6	0.5	4	0.020	257151 0305	
4	8	60	100	3,7	6	0.3	4	0.030	257151 0403	
4	8	60	100	3,7	6	0.5	4	0.030	257151 0405	
5	9	60	100	4,6	6	0.3	4	0.035	257151 0503	
5	9	60	100	4,6	6	0.5	4	0.035	257151 0505	
6	10	60	100	5,5	6	0.5	4	0.040	257151 0605	
6	10	60	100	5,5	6	1.0	4	0.040	257151 0610	
10	14	83	125	9,2	10	1.0	4	0.055	257151 1010	
10	14	83	125	9,2	10	2.0	4	0.055	257151 1020	
12	16	105	150	11	12	1.0	4	0.065	257151 1210	
12	16	105	150	11	12	2.0	4	0.065	257151 1220	

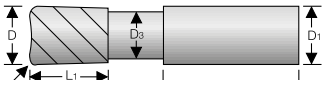
2178

ATORN RockTec PRO torus face milling cutter

VHM | 13° | e8 | h5 | Z 4 | TiAlSiN | HPC | Vc/fz | 787

ISO H

- For machining materials **from 47 to 65 HRC**
- **4 cutting edges, face-cutter geometry for immersing**
- Optimised geometry for hard machining
- Straight shank, suitable for use in shrink fit holders
- **Solid carbide ultra-fine grain cutting material**
- State-of-the-art coating technology for reduced wear and extreme hardness
- **Subject to process-related colour variations in the coating.**



material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
257200....	● 220	● 200	● 190	○ 115	○ 110	○ 100	● 130	● 130								● 150	● 120	● 120
257205....	● 220	● 200	● 160	○ 105	○ 100	○ 90	● 110	● 110								● 120	● 90	● 90
Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

Standard



D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
2	6	1.7	57	1.5	13	0.25	4	0.015	257200 0020	
3	6	2.7	57	1.5	15	0.3	4	0.04	257200 0030	
4	6	3.6	57	2.5	16	0.4	4	0.055	257200 0040	
5	6	4.6	57	3.5	18	0.5	4	0.065	257200 0050	
6	6	5.2	57	3.5	20	0.6	4	0.07	257200 0060	
8	8	7	63	4.8	24	1.2	4	0.1	257200 0080	
10	10	9	72	5.8	26	1.8	4	0.13	257200 0100	
12	12	11	83	6.8	30	1.9	4	0.15	257200 0120	
16	16	14.5	92	8.8	35	2.1	4	0.18	257200 0160	

2178

Long



D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
2	6	1.7	75	1.5	18	0.25	4	0.005-0.020	257205 0020	
3	6	2.7	75	1.5	20	0.3	4	0.030-0.050	257205 0030	
4	6	3.6	85	2.5	24	0.4	4	0.040-0.060	257205 0040	
5	6	4.6	100	3.5	28	0.5	4	0.050-0.070	257205 0050	
6	6	5.2	100	3.5	28	0.6	4	0.060-0.085	257205 0060	
8	8	7	100	4.8	40	1.2	4	0.085-0.110	257205 0080	
10	10	9	100	5.8	48	1.8	4	0.115-0.150	257205 0100	
12	12	11	120	6.8	56	1.9	4	0.135-0.170	257205 0120	

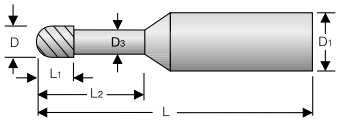
2178

ATORN Mini radius milling cutter *RockTec PRO*

VHM | 30° | f7 | h5 | Z 2 | TiAlSiN | Vc/fz | 788

ISO H

- For machining materials **from 47 to 65 HRC**
- Optimised geometry for hard machining
- **Cutting material: ultra micro-grain SC**
- state-of-the-art coating technology for reduced wear and extreme hardness
- **Subject to process-related colour variations in the coating.**



material — ● very well suited ○ well suited

steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
● 135	● 110	● 95	○ 90	○ 85	○ 65	● 70	● 90								● 105	● 115	● 160

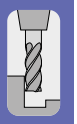
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

Standard



D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
0.1	4	0.08	50	0.08	0.3	2	0.001	257100 0001	
0.1	4	0.08	50	0.08	0.5	2	0.001	257100 0002	
0.1	4	0.08	50	0.08	1	2	0.001	257100 0003	
0.2	4	0.17	50	0.16	0.5	2	0.002	257100 0004	
0.2	4	0.17	50	0.16	1	2	0.002	257100 0005	
0.2	4	0.17	50	0.16	2	2	0.002	257100 0006	
0.2	4	0.17	50	0.16	3	2	0.002	257100 0007	
0.3	4	0.27	50	0.24	0.5	2	0.003	257100 0008	
0.3	4	0.27	50	0.24	1	2	0.003	257100 0009	
0.3	4	0.27	50	0.24	2	2	0.003	257100 0010	
0.3	4	0.27	50	0.24	3	2	0.003	257100 0011	
0.3	4	0.27	50	0.24	4	2	0.003	257100 0012	
0.4	4	0.37	50	0.32	1	2	0.004	257100 0013	
0.4	4	0.37	50	0.32	2	2	0.004	257100 0014	
0.4	4	0.37	50	0.32	3	2	0.004	257100 0015	
0.4	4	0.37	50	0.32	4	2	0.004	257100 0016	
0.4	4	0.37	50	0.32	5	2	0.004	257100 0017	
0.4	4	0.37	50	0.32	6	2	0.004	257100 0018	
0.5	4	0.47	50	0.4	1	2	0.005	257100 0019	
0.5	4	0.47	50	0.4	2	2	0.005	257100 0020	
0.5	4	0.47	50	0.4	3	2	0.005	257100 0021	
0.5	4	0.47	50	0.4	4	2	0.005	257100 0022	
0.5	4	0.47	50	0.4	5	2	0.005	257100 0023	
0.5	4	0.47	50	0.4	6	2	0.005	257100 0024	
0.5	4	0.47	50	0.4	8	2	0.005	257100 0025	
0.5	4	0.47	50	0.4	10	2	0.005	257100 0026	
0.6	4	0.57	50	0.48	2	2	0.006	257100 0027	
0.6	4	0.57	50	0.48	4	2	0.006	257100 0028	
0.6	4	0.57	50	0.48	6	2	0.006	257100 0029	
0.6	4	0.57	50	0.48	8	2	0.006	257100 0030	
0.6	4	0.57	50	0.48	10	2	0.006	257100 0031	
0.8	4	0.77	50	0.64	2	2	0.007	257100 0032	
0.8	4	0.77	50	0.64	4	2	0.007	257100 0033	
0.8	4	0.77	50	0.64	6	2	0.007	257100 0034	
0.8	4	0.77	50	0.64	8	2	0.007	257100 0035	
0.8	4	0.77	50	0.64	10	2	0.007	257100 0036	
1	4	0.96	50	0.8	2	2	0.007	257100 0037	
1	4	0.96	50	0.8	4	2	0.008	257100 0038	
1	4	0.96	50	0.8	6	2	0.008	257100 0039	
1	4	0.96	50	0.8	8	2	0.008	257100 0040	
1	4	0.96	50	0.8	10	2	0.008	257100 0041	
1	4	0.96	50	0.8	15	2	0.008	257100 0042	
1	4	0.96	60	0.8	20	2	0.008	257100 0043	
1	4	0.96	60	0.8	25	2	0.008	257100 0044	

2178



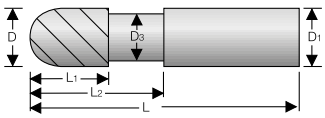
D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1.2	4	1.16	50	0.96	2	2	0.01	257100 0045	
1.2	4	1.16	50	0.96	4	2	0.01	257100 0046	
1.2	4	1.16	50	0.96	6	2	0.01	257100 0047	
1.2	4	1.16	50	0.96	8	2	0.01	257100 0048	
1.2	4	1.16	50	0.96	10	2	0.01	257100 0049	
1.2	4	1.16	50	0.96	15	2	0.01	257100 0050	
1.2	4	1.16	60	0.96	20	2	0.01	257100 0051	
1.2	4	1.16	60	0.96	25	2	0.01	257100 0052	
1.5	4	1.44	50	1.2	3	2	0.012	257100 0053	
1.5	4	1.44	50	1.2	4	2	0.012	257100 0054	
1.5	4	1.44	50	1.2	6	2	0.012	257100 0055	
1.5	4	1.44	50	1.2	8	2	0.012	257100 0056	
1.5	4	1.44	50	1.2	10	2	0.012	257100 0057	
1.5	4	1.44	50	1.2	15	2	0.012	257100 0058	
1.5	4	1.44	60	1.2	20	2	0.012	257100 0059	
1.5	4	1.44	60	1.2	25	2	0.012	257100 0060	
1.6	4	1.54	50	1.28	4	2	0.012	257100 0061	
1.6	4	1.54	50	1.28	8	2	0.012	257100 0062	
1.6	4	1.54	50	1.28	10	2	0.012	257100 0063	
1.6	4	1.54	50	1.28	15	2	0.012	257100 0064	
1.6	4	1.54	60	1.28	20	2	0.012	257100 0065	
1.6	4	1.54	60	1.28	25	2	0.012	257100 0066	
1.8	4	1.74	50	1.44	8	2	0.014	257100 0067	
1.8	4	1.74	50	1.44	10	2	0.014	257100 0068	
1.8	4	1.74	50	1.44	15	2	0.014	257100 0069	
1.8	4	1.74	60	1.44	20	2	0.014	257100 0070	
1.8	4	1.74	60	1.44	25	2	0.016	257100 0071	
2	4	1.94	50	1.6	4	2	0.016	257100 0072	
2	4	1.94	50	1.6	6	2	0.016	257100 0073	
2	4	1.94	50	1.6	8	2	0.016	257100 0074	
2	4	1.94	50	1.6	10	2	0.016	257100 0075	
2	4	1.94	50	1.6	15	2	0.016	257100 0076	
2	4	1.94	60	1.6	20	2	0.016	257100 0077	
2	4	1.94	60	1.6	25	2	0.016	257100 0078	
2	4	1.94	65	1.6	30	2	0.016	257100 0079	
2	4	1.94	70	1.6	35	2	0.016	257100 0080	
2	4	1.94	75	1.6	40	2	0.016	257100 0081	
2.5	4	2.41	50	2	6	2	0.018	257100 0082	
2.5	4	2.41	50	2	8	2	0.018	257100 0083	
2.5	4	2.41	50	2	10	2	0.018	257100 0084	
2.5	4	2.41	50	2	15	2	0.018	257100 0085	
2.5	4	2.41	60	2	20	2	0.018	257100 0086	
2.5	4	2.41	60	2	25	2	0.018	257100 0087	
2.5	4	2.41	65	2	30	2	0.018	257100 0088	
2.5	4	2.41	70	2	35	2	0.018	257100 0089	
2.5	4	2.41	75	2	40	2	0.018	257100 0090	
3	4	2.92	50	3.5	6	2	0.02	257100 0091	
3	4	2.92	50	3.5	8	2	0.02	257100 0092	
3	4	2.92	50	3.5	10	2	0.02	257100 0093	
3	4	2.92	50	3.5	15	2	0.02	257100 0094	
3	4	2.92	60	3.5	20	2	0.02	257100 0095	
3	4	2.92	60	3.5	25	2	0.02	257100 0096	
3	4	2.92	65	3.5	30	2	0.02	257100 0097	
3	4	2.92	70	3.5	35	2	0.02	257100 0098	
3	4	2.92	75	3.5	40	2	0.02	257100 0099	

2178

ATORN Radius milling cutter *RockTec PRO*

VHM | 30° | f7 | h5 | Z 2 | TiAlSiN | Vc/fz | 790

ISO H



- For machining materials **from 47 to 65 HRC**
- Optimised geometry for hard machining
- **Cutting material: ultra micro-grain SC**
- state-of-the-art coating technology for reduced wear and extreme hardness
- **Subject to process-related colour variations in the coating.**

material

● very well suited
○ well suited

steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
●	●	●	○	○	○	●	●								●	●	●
160	140	95	240	200	180	200	220								105	115	160
Cutting speed Vc m/min.								Please adjust these guidelines according to clamping operation and machine set-up.									

Short



D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1	6	0.96	57	1.5	3.5	2	0.008	257105 0010	
1.5	6	1.44	57	1.5	4	2	0.012	257105 0015	
2	6	1.95	57	2	4.5	2	0.016	257105 0020	
2.5	6	-	57	3	-	2	0.018	257105 0025	
3	6	-	57	3.5	-	2	0.02	257105 0030	
4	6	-	57	4.5	-	2	0.03	257105 0040	
5	6	-	57	5.5	-	2	0.035	257105 0050	
6	6	-	57	7	-	2	0.04	257105 0060	
8	8	-	70	9	-	2	0.05	257105 0080	
10	10	-	72	12	-	2	0.055	257105 0100	
12	12	-	83	14	-	2	0.065	257105 0120	
16	16	-	92	18	-	2	0.075	257105 0160	
20	20	-	104	22	-	2	0.085	257105 0200	

2178

short with neck



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1	1,5	3,5	57	0,96	6	0,5	2	0.008	257245 0010	
1,5	2	5	57	1,44	6	0,75	2	0.012	257245 0015	
2	2,5	7	57	1,95	6	1	2	0.016	257245 0020	
2,5	3	9	57	2,45	6	1,25	2	0.018	257245 0025	
3	3,5	11	57	2,8	6	1,5	2	0.020	257245 0030	
4	4,5	14	57	3,7	6	2	2	0.030	257245 0040	
5	5,5	18	57	4,6	6	2,5	2	0.035	257245 0050	
6	7	20	57	5,5	6	3	2	0.040	257245 0060	
8	9	28	70	7,4	8	4	2	0.050	257245 0080	
10	12	30	72	9,2	10	5	2	0.055	257245 0100	
12	14	36	83	11	12	6	2	0.065	257245 0120	
16	18	42	92	15	16	8	2	0.075	257245 0160	
20	22	52	104	19	20	10	2	0.085	257245 0200	

2178

Standard



D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1	6	0.96	65	1.5	3.5	2	0.008	257110 0010	
1.5	6	1.44	65	2	4	2	0.012	257110 0015	
2	6	1.95	65	2.5	4.5	2	0.016	257110 0020	
2.5	6	-	65	3	-	2	0.018	257110 0025	
3	6	-	65	3.5	-	2	0.02	257110 0030	
4	6	-	65	4.5	-	2	0.03	257110 0040	
5	6	-	65	5.5	-	2	0.035	257110 0050	
6	6	-	65	7	-	2	0.04	257110 0060	
8	8	-	85	9	-	2	0.05	257110 0080	
10	10	-	85	12	-	2	0.055	257110 0100	
12	12	-	93	14	-	2	0.065	257110 0120	
16	16	-	110	18	-	2	0.075	257110 0160	
20	20	-	126	22	-	2	0.085	257110 0200	

2178

Long



D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1	6	0.96	80	1.5	3.5	2	0.008	257115 0010	
1.5	6	1.44	80	2	4	2	0.012	257115 0015	
2	6	1.95	80	2.5	4.5	2	0.016	257115 0020	
2.5	6	-	80	3	-	2	0.018	257115 0025	
3	6	-	80	3.5	-	2	0.02	257115 0030	
4	6	-	80	3.5	-	2	0.03	257115 0040	
5	6	-	80	5.5	-	2	0.035	257115 0050	
6	6	-	80	7	-	2	0.04	257115 0060	
8	8	-	100	9	-	2	0.05	257115 0080	
10	10	-	100	12	-	2	0.055	257115 0100	
12	12	-	100	14	-	2	0.065	257115 0120	
16	16	-	150	18	-	2	0.075	257115 0160	
20	20	-	150	22	-	2	0.085	257115 0200	

2178

Extra-long



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
2	2,5	20	100	1,85	6	1	2	0.016	257116 0020	
2,5	3	25	100	2,35	6	1,25	2	0.018	257116 0025	
3	5	30	100	2,8	6	1,5	2	0.020	257116 0030	
4	8	40	100	3,7	6	2	2	0.030	257116 0040	
5	9	50	100	4,6	6	2,5	2	0.035	257116 0050	
6	10	60	150	5,5	6	3	2	0.040	257116 0060	
8	12	80	150	7,4	8	4	2	0.050	257116 0080	
10	14	100	150	9,2	10	5	2	0.055	257116 0100	
12	16	110	160	11	12	6	2	0.065	257116 0120	

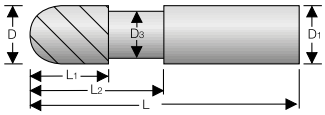
2178

ATORN RockTec PRO radius milling cutter

VHM | 30° | f7 | h5 | Z 4 | TiAlSiN | Vc/fz | 791

- For machining materials **from 47 to 65 HRC**
- Optimised geometry for hard machining
- **Solid carbide ultra-fine grain cutting material**
- State-of-the-art coating technology for reduced wear and extreme hardness
- **Subject to process-related colour variations in the coating.**

ISO H



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	○	○	○	●	●								●	●	●
		175	165	95	125	110	180	250	145								105	115	160
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		

Short



D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1	6	0.96	57	1.5	3.5	4	0.008	257106 0010	
1.5	6	1.44	57	1.5	4	4	0.012	257106 0015	
2	6	1.95	57	2	4.5	4	0.016	257106 0020	
2.5	6	-	57	3	6.5	4	0.018	257106 0025	
3	6	-	57	3.5	7	4	0.02	257106 0030	
4	6	-	57	4.5	7	4	0.03	257106 0040	
5	6	-	57	5.5	10	4	0.035	257106 0050	
6	6	-	57	7	-	4	0.04	257106 0060	
8	8	-	70	9	-	4	0.05	257106 0080	
10	10	-	72	12	-	4	0.055	257106 0100	
12	12	-	83	14	-	4	0.065	257106 0120	
16	16	-	92	18	-	4	0.075	257106 0160	
20	20	-	104	22	-	4	0.085	257106 0200	

2178

Standard



D mm	D1 mm	D3 mm	L mm	L1 mm	L2 mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1	6	0.96	80	1.5	3.5	4	0.008	257111 0010	
1.5	6	1.44	65	2	4	4	0.012	257111 0015	
2	6	1.95	65	2.5	4.5	4	0.016	257111 0020	
2.5	6	-	65	3	6.5	4	0.018	257111 0025	
3	6	-	65	3.5	7	4	0.02	257111 0030	
4	6	-	65	4.5	7	4	0.03	257111 0040	
5	6	-	65	5.5	10	4	0.035	257111 0050	
6	6	-	65	7	-	4	0.04	257111 0060	
8	8	-	85	9	-	4	0.05	257111 0080	
10	10	-	85	12	-	4	0.055	257111 0100	
12	12	-	93	14	-	4	0.065	257111 0120	
16	16	-	110	18	-	4	0.075	257111 0160	
20	20	-	126	22	-	4	0.085	257111 0200	

2178

with longer neck



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Z	Feed fz hardened steel < 60 HRC mm/tooth	art.no.	€
1	1,5	3,5	57	0,96	6	0,5	4	0.008	257250 0010	
1,5	2	5	57	1,44	6	0,75	4	0.012	257250 0015	
2	2,5	7	57	1,95	6	1	4	0.016	257250 0020	
2,5	3	9	57	2,45	6	1,25	4	0.018	257250 0025	
3	3,5	11	57	2,8	6	1,5	4	0.020	257250 0030	
4	4,5	14	57	3,7	6	2	4	0.030	257250 0040	
5	5,5	18	57	4,6	6	2,5	4	0.035	257250 0050	
6	7	20	57	5,5	6	3	4	0.040	257250 0060	
8	9	28	70	7,4	8	4	4	0.050	257250 0080	
10	12	30	72	9,2	10	5	4	0.055	257250 0100	
12	14	36	83	11	12	6	4	0.065	257250 0120	
16	18	42	92	15	16	8	4	0.075	257250 0160	
20	22	52	104	19	20	10	4	0.085	257250 0200	

2178

ATORN Machining of concentric sealing surfaces

INFO

Cutting data

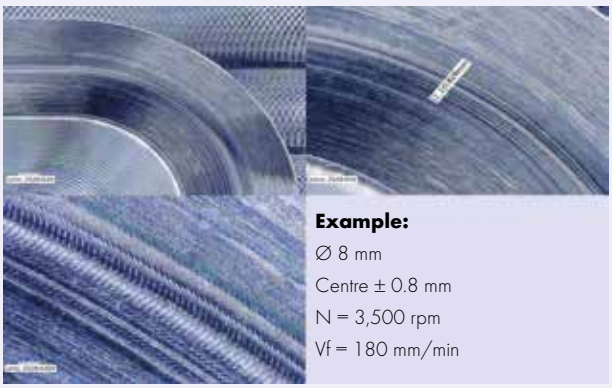
The following cutting data are recommended irrespective of the diameters used:

N	3500 rpm
Vf	180 mm/min
ae	max. 1 x D
ap roughing	max. 0.05 mm
ap finishing	0.005 mm (max. 0.01 mm)

Please adjust these guideline values for different applications and according to clamping operation and machine set-up!

Entry and exit

Entry angle	max. 0.5°
Exit angle	max. 0.0115° (over 25 mm movement 0.005 mm retraction)



Example:
Ø 8 mm
Centre ± 0.8 mm
N = 3,500 rpm
Vf = 180 mm/min

Important:

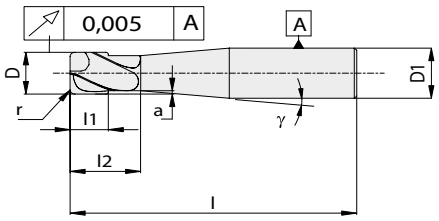
- The achievable planarity is 0.02 – 0.03 mm.
- The tool length must be measured at R0 (Blum laser, pre-setting device).
- The true running accuracy of the clamped tool must not be more than 0.005 mm.
- Circular orbits are visible at ae > 0.5 x D. This corresponds to no more than 10% of the diameter.

ATORN Sealing surface milling cutter

VHM | e8 | h5 | Z 3 | TiAlN+

778

- **For manufacturing concentric sealing surfaces for high-quality products**
- Only concentric milling contours
- No post-machining required
- Smooth surface
- Helix angle 30°



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	●	○		●					●	●	●		●		

coated

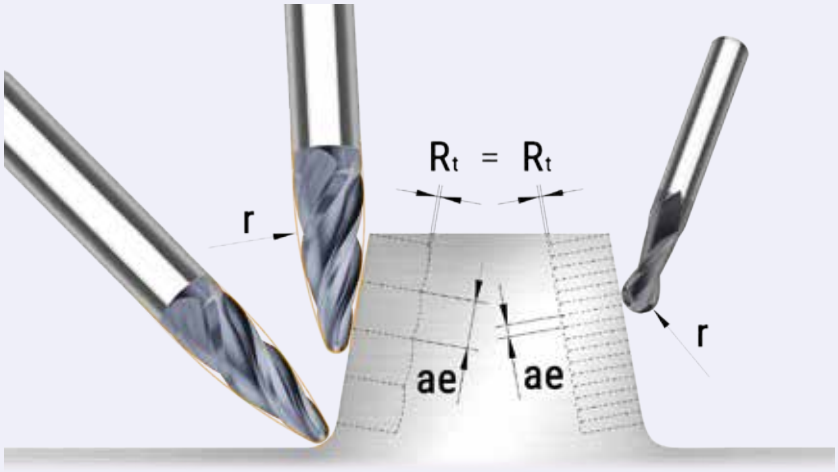
D mm	R mm	D1 mm	L mm	L1 mm	L2 mm	γ °	Z	art.no.	€
3.0	0.02	6	51	1.0	4.0	15	3	255152 0030	
4.0	0.05	6	51	2.0	4.0	15	3	255152 0040	
5.0	0.05	6	51	2.0	4.0	15	3	255152 0050	
6.0	0.1	6	51	4.0			3	255152 0060	
8.0	0.1	8	64	6.0			3	255152 0080	
10.0	0.15	10	64	7.0			3	255152 0100	
12.0	0.15	12	73	9.0			3	255152 0120	
16.0	0.15	16	89	12.0			3	255152 0160	
20.0	0.2	20	102	15.0			3	255152 0200	

2111



ATORN Curve segment milling cutter

INFO



Reduction of workpiece costs and considerably shorter manufacturing times based on the significant increase in the line spacing ae.

$$ae = 2 \times \sqrt{r^2 - (r - R_t)^2} \quad [mm]$$

$$R_t = r - \sqrt{r^2 - \left(\frac{ae}{2}\right)^2} \quad [mm]$$

$$\rightarrow R_t \times 1000 \quad [\mu m]$$

r = Radius curve segment milling cutter / copy milling cutter
ae = line spacing
Rt = theoretical roughness

ATORN Circle segment milling cutter

VHM | Typ N | 15° | h6 | Z 4 | TiAlN

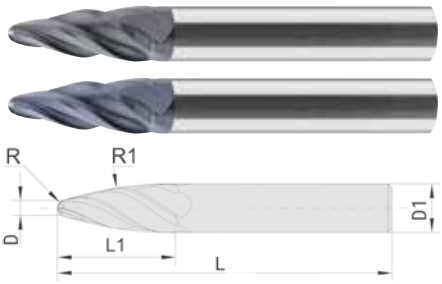
- **Reduction of workpiece costs and considerably shorter manufacturing times based on the significant increase in the line spacing ae**
- **New manufacturing possibilities**
  - Undercuts
  - Semi-finishing and finishing of tight contours
  - Variable setting angle possible
  - Machining of tight inner radii
  - Freeform surfaces
- **Improved surface finish**
- Increased tool life

material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
254170....	● 190	● 150	● 130	● 100	● 80		● 180	● 185				● 600	● 550	● 200		○ 120		
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		

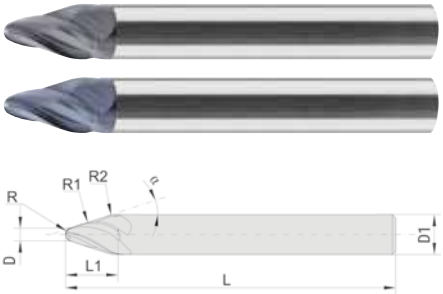
Tangential

D mm	D1 mm	L mm	L1 mm	R mm	R1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€	TiAlN art.no.	€
2	8	70	24	1	95	4	0.048	254170 0020		254171 0020	
4	12	83	28	2	90	4	0.072	254170 0040		254171 0040	
6	16	105	30	3	80	4	0.096	254170 0060		254171 0060	
								2169		2169	



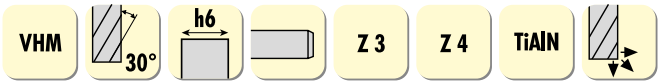
Conical

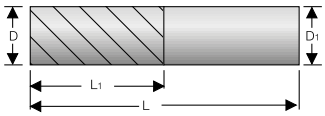
D mm	D1 mm	L mm	L1 mm	Setting angle	R mm	R1 mm	R2 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€	TiAlN art.no.	€
2	8	75	10	18	1	300	1	4	0.048	254172 1820		254173 1820	
4	12	100	14	18	2	450	2	4	0.072	254172 1840		254173 1840	
6	16	120	18	18	3	1200	3	4	0.096	254172 1860		254173 1860	
6	16	120	12	28	3	800	3	4	0.096	254172 2860		254173 2860	
8	16	120	16	18	4	1200	4	4	0.096	254172 1880		254173 1880	
8	16	120	11	28	4	800	4	4	0.096	254172 2880		254173 2880	
										2169		2169	



Alpha = setting angle

SARA® Die-sinking cutter





- Tapered form
- Constructional dimensions in compliance with factory standard
- For use in extruder, die, mould, model and tool making

material — ● very well suited ○ well suited

	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	● 50	● 48	● 45	● 38	● 38	○ 25	● 50	● 50								● 35		
Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.



Angle °	D mm	L1 mm	L mm	D1 mm	Z	art.no.	€
1	2.5	20	60	4	3	253002 1001	
1	3.0	20	60	4	3	253002 1002	
1	4.0	20	65	5	3	253002 1003	
1	5.0	30	75	6	3	253002 1004	
1	6.0	30	75	8	3	253002 1005	
1	8.0	30	75	10	4	253002 1006	
1	10.0	30	75	12	4	253002 1007	
1	12.0	55	100	14	4	253002 1008	
1	16.0	55	100	18	4	253002 1009	
1.5	2.5	20	60	4	3	253002 1501	
1.5	3.0	19	60	4	3	253002 1502	
1.5	4.0	19	60	5	3	253002 1503	
1.5	5.0	35	75	8	3	253002 1504	
1.5	6.0	35	75	8	3	253002 1505	
1.5	8.0	35	75	10	4	253002 1506	
1.5	10.0	38	75	12	4	253002 1507	
1.5	12.0	60	100	16	4	253002 1508	
1.5	16.0	65	100	20	4	253002 1509	
2	2.5	20	60	4	3	253002 2001	
2	3.0	25	60	5	3	253002 2002	
2	3.5	20	60	5	3	253002 2003	
2	4.0	20	60	6	3	253002 2004	
2	5.0	35	75	8	3	253002 2006	
2	6.0	28	75	8	3	253002 2008	
2	6.0	57	100	10	3	253002 2009	
2	8.0	28	75	10	4	253002 2010	
2	8.0	57	100	12	4	253002 2011	
2	10.0	28	75	12	4	253002 2012	
2	12.0	28	75	14	4	253002 2013	

2109

Angle °	D mm	L1 mm	L mm	D1 mm	Z	art.no.	€
2	12.0	57	100	16	4	253002 2014	
2	16.0	55	100	20	4	253002 2015	
3	2.5	20	60	5	3	253002 3001	
3	3.0	25	60	6	3	253002 3002	
3	3.0	40	75	8	3	253002 3003	
3	4.0	38	75	8	3	253002 3004	
3	5.0	28	75	8	3	253002 3005	
3	6.0	38	75	10	3	253002 3006	
3	6.0	57	100	12	3	253002 3007	
3	8.0	38	75	12	4	253002 3008	
3	8.0	57	100	14	4	253002 3009	
3	10.0	38	75	14	4	253002 3010	
3	12.0	55	100	18	4	253002 3012	
5	2.5	20	60	6	3	253002 5001	
5	3.0	28	75	8	3	253002 5002	
5	3.0	40	75	10	3	253002 5003	
5	3.5	25	75	8	3	253002 5004	
5	4.0	22	75	8	3	253002 5005	
5	5.0	28	75	10	3	253002 5008	
5	6.0	34	75	12	3	253002 5009	
5	6.0	57	100	16	3	253002 5010	
5	8.0	57	100	18	4	253002 5011	
5	10.0	34	75	16	4	253002 5012	
5	10.0	45	100	18	4	253002 5013	
5	12.0	45	100	20	4	253002 5015	
7	2.5	22	75	8	3	253002 7001	
7	5.0	28	75	12	3	253002 7002	
10	2.5	21	75	10	3	253002 1101	
10	3.0	25	75	12	3	253002 1102	

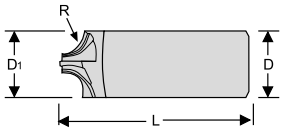
2109

Over 200,000 tools available online!
Register online now!
www.saratools.com



SARA® Quadrant milling cutter

VHM | Werks-norm | Typ N | h10 | h6 | Z 4



- Factory standard
- **Design**: straight-fluted, no profile distortion
- **Application**: for rounding off and deburring edges

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 85	● 75	● 48	● 53	● 43	○ 43	● 83	● 70		● 20	● 20	○ 450	○ 500	● 200		● 78	● 78	○ 50
	Cutting speed Vc m/min.										Please adjust these guidelines according to clamping operation and machine set-up.								

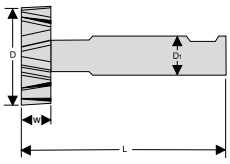


D mm	L mm	R mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
8.0	70	0.5	7	4	0.004	291310 0050	
8.0	70	1.0	6	4	0.009	291310 0100	
10.0	75	1.5	7	4	0.009	291310 0150	
10.0	75	2.0	6	4	0.015	291310 0200	
12.0	75	2.5	7	4	0.015	291310 0250	
12.0	75	3.0	6	4	0.015	291310 0300	
16.0	80	3.5	9	4	0.015	291310 0350	
16.0	80	4.0	8	4	0.033	291310 0400	
16.0	80	4.5	7	4	0.033	291310 0450	
20.0	80	5.0	10	4	0.033	291310 0500	
20.0	80	6.0	8	4	0.055	291310 0600	
25.0	100	8.0	9	4	0.064	291310 0800	
25.0	100	10.0	5	4	0.073	291310 1000	

2152

SARA® Slotting cutter

VHM | DIN 850 | Typ N | h11 | h6 | Z 6 | Z 8+ | AlCrN



- For keyway milling in accordance with DIN 6888
- For slot milling
- Circumferential cutting
- With cross-cut toothing
- in accordance with DIN 850

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 105	● 70					● 110	● 90										
	Cutting speed Vc m/min.										Please adjust these guidelines according to clamping operation and machine set-up.								



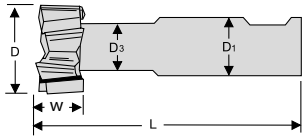
D mm	w mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
10.5	2	50	6.0	6	0.036	292004 1052	
10.5	3	50	6.0	6	0.036	292004 1053	
13.5	2	56	10.0	8	0.036	292004 1352	
13.5	3	56	10.0	8	0.036	292004 1353	
13.5	4	56	10.0	8	0.036	292004 1354	
16.5	3	56	10.0	10	0.036	292004 1653	
16.5	4	56	10.0	10	0.036	292004 1654	
19.5	3	63	10.0	10	0.039	292004 1953	
19.5	4	63	10.0	10	0.039	292004 1954	
22.5	4	63	10.0	10	0.039	292004 2254	
25.5	5	63	10.0	10	0.039	292004 2555	
28.5	5	63	10.0	10	0.041	292004 2855	
32.5	5	71	12.0	10	0.041	292004 3255	
38.5	10	71	12.0	10	0.041	292004 3851	
45.5	10	71	12.0	10	0.041	292004 4551	

2152

SARA® T-slot milling cutter

VHM | DIN 851 | Typ N | NF | d11 | h6 | Z 6 | AlCrN

- For milling T-slots in accordance with DIN 650
- Circumferential cutting
- With cross-cut toothing



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 105	● 70					● 110	● 90										
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

Type N



D mm	w mm	L mm	D3 mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
12.5	6	57	5	10	6	0.033	292005 1256	
16	8	62	7	10	6	0.034	292005 1680	
18	8	70	8	12	6	0.034	292005 1880	
21	9	74	10	12	6	0.034	292005 2190	
25	11	82	12	16	6	0.034	292005 2511	
28	12	85	13	16	6	0.35	292005 2812	
32	14	90	15	16	6	0.045	292005 3214	

2152

Type NF



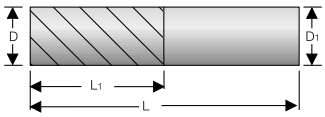
D mm	w mm	L mm	D3 mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
12.5	6	57	5	10	6	0.033	292006 1256	
16	8	62	7	10	6	0.034	292006 1608	
18	8	70	8	12	6	0.034	292006 1808	
21	9	74	10	12	6	0.034	292006 2109	
25	11	82	12	16	6	0.034	292006 2511	
28	12	85	13	16	6	0.035	292006 2812	
32	14	90	15	16	6	0.045	292006 3214	

2152

SARA® Engraving cutter

VHM | Werks-norm | Typ N | 60° | h11 | Z 1

- 1 cutting edge, centre cutting
- For engraving plastics and non-ferrous metals
- Lettering width 0.1 mm



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		○ 50	○ 35	○ 25	○ 30	○ 30		○ 45					● 130	● 95	○ 170				
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.



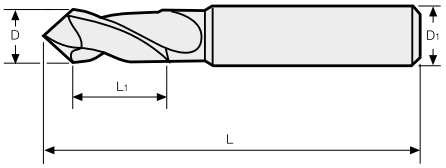
D mm	D1 mm	L mm	L1 mm	Z	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3.0	3.0	40	15	1	0.01	251545 0030	
4.0	4.0	40	15	1	0.02	251545 0040	
6.0	6.0	40	15	1	0.03	251545 0060	

2152

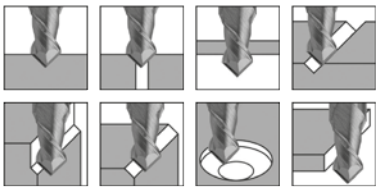
SARA® Multifunction tool

VHM | Typ N | 60° | 90° | 120° | 30° | TiAlN

- Reinforced straight shank
- **Cutting material: K15F solid carbide, TiAlN-coated**
- Milling, drilling and countersinking with a single tool
- Especially suitable for use on CNC machining centres
- Up to eight machining operations without tool change



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	○	○		●	●	○	○		●	○	○				
	Cutting speed Vc m/min.	55	40	35	35	35		40	35	30	15		125	85	70				
	Please adjust these guidelines according to clamping operation and machine set-up.																		

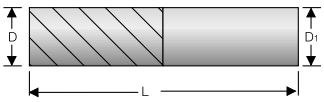




D mm	L mm	L1 mm	D1 mm	Drill Ø mm	● Feed fz steel < 1000 N/mm² mm/tooth	● Feed fz steel < 1000 N/mm² mm/tooth	60° art.no.	€	90° art.no.	€	120° art.no.	€
0.5	39	1.0	3.0	0.05	0.002	0.004			251556 0050			
0.6	39	1.2	3.0	0.06	0.002	0.004			251556 0060			
0.7	39	1.4	3.0	0.07	0.002	0.004			251556 0070			
0.8	39	1.6	3.0	0.08	0.002	0.004			251556 0080			
0.9	39	1.8	3.0	0.09	0.002	0.004			251556 0090			
1.0	39	2.0	3.0	0.10	0.003	0.006	251548 0100		251556 0100		251542 0100	
1.2	39	2.4	3.0	0.12	0.003	0.006			251556 0120			
1.4	39	2.8	3.0	0.14	0.003	0.006			251556 0140			
1.5	39	3.0	3.0	0.15	0.003	0.006	251548 0150		251556 0150		251542 0150	
1.8	39	3.6	3.0	0.18	0.003	0.006			251556 0180			
2.0	39	4.0	3.0	0.20	0.004	0.008	251548 0200		251556 0200		251542 0200	
2.5	39	5.0	3.0	0.25	0.004	0.008	251548 0250		251556 0250		251542 0250	
3.0	50	6.0	4.0	0.30	0.004	0.008	251548 0300		251556 0300		251542 0300	
4.0	50	8.0	5.0	0.40	0.004	0.008	251548 0400		251556 0400		251542 0400	
5.0	50	10.0	6.0	0.50	0.006	0.013	251548 0500		251556 0500		251542 0500	
6.0	60	12.0	8.0	0.60	0.006	0.013	251548 0600		251556 0600			
8.0	70	16.0	10.0	0.80	0.012	0.025	251548 0800		251556 0800		251542 0800	
10.0	70	18.0	12.0	1.00	0.012	0.025	251548 1000		251556 1000		251542 1000	
12.0	70	20.0	12.0	1.20	0.017	0.040	251548 1200		251556 1200		251542 1200	
16.0	80	26.0	16.0	1.60	0.020	0.050	251548 1600		251556 1600		251542 1600	
20.0	100	32.0	20.0	2.00	0.027	0.062	251548 2000		251556 2000		251542 2000	
							2108		2108		2108	

ATORN Deburring tool

VHM | Typ N | 60° | 90° | 120° | Z 3 | Z 4 | Z 5 | Z 6 | TiAlN



- **Ideal for chamfering and deburring workpiece edges, and for contour milling**

material: ● very well suited ○ well suited

steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
● 170	● 130	● 110	● 90	○ 70	○ 70	● 150	● 150	○ 90	○ 90	○ 70							

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	L mm	D1 mm	Z	60° art.no.	€	90° art.no.	€	120° art.no.	€
1	38	3	3	251550 0010		251551 0010		251552 0010	
2	38	3	3	251550 0020		251551 0020		251552 0020	
3	38	3	3	251550 0030		251551 0030		251552 0030	
4	51	4	4	251550 0040		251551 0040		251552 0040	
6	64	6	4	251550 0060		251551 0060		251552 0060	
8	64	8	5	251550 0080		251551 0080		251552 0080	
10	70	10	6	251550 0100		251551 0100		251552 0100	
12	78	12	6	251550 0120		251551 0120		251552 0120	
16	89	16	6	251550 0160		251551 0160		251552 0160	
				2108		2108		2108	

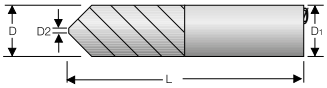


ATORN Solid carbide deburrer 90°, spiralled *RockTec PRO*

VHM | 90° | 15° | f7 | h5 | Z 5 | TiAlSiN | Vc/fz

732

ISO H



- For machining materials **from 47 to 65 HRC**
- **Spiralled**
- Optimised geometry for hard machining
- **Cutting material, ultra-fine grain solid carbide**
- State-of-the-art coating technology for reduced abrasion and extreme hardness
- **Subject to process-related colour variations in the coating.**

material: ● very well suited ○ well suited

steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
● 200	● 180	● 160	○ 90	○ 70	○ 70	● 150	● 150								● 120	● 100	● 90

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

Standard

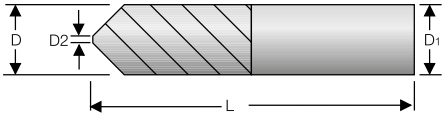
D mm	L1 mm	L mm	D1 mm	Z	Drill Ø mm	Feed fz hardened steel < 60 HRC mm/tooth	90° HA art.no.	€
6	2,5	57	6	5	1.0	0.030	257260 0060	
8	3,5	63	8	5	1.0	0.040	257260 0080	
10	4,5	72	10	5	1.0	0.040	257260 0100	
12	5,5	83	12	5	1.0	0.040	257260 0120	
16	7,5	93	16	5	1.0	0.060	257260 0160	
							2178	



SARA® Deburrer spiralled

VHM | 60° | 90° | 15° | Z 5 | Z 3 | TiAlSiN | Vc/fz

- **uncoated: 3 cutting edges**
- **coated: 5 cutting edges**
- **spiralised design**
- ideally suited for universal use
- **Cutting material, solid carbide ultra-fine grain TiAlSiN-coated**
- Deburring, chamfering and contouring in one tool



material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
251575....	●	●	●	●	●	●	●	●	○	○	○							
251576....	●	●	●	●	●	●	●	●	○	○	○							
251580....												●	●	●				
251581....												●	●	●				

coated

D mm	L mm	D1 mm	Z	Drill Ø mm	60° art.no.	€	90° art.no.	€
4.0	51	4	5	1	251575 0040		251576 0040	
6.0	64	6	5	1	251575 0060		251576 0060	
8.0	64	8	5	1	251575 0080		251576 0080	
10.0	70	10	5	1	251575 0100		251576 0100	
12.0	78	12	5	1	251575 0120		251576 0120	
16.0	89	16	5	1	251575 0160		251576 0160	
					2169		2169	



uncoated

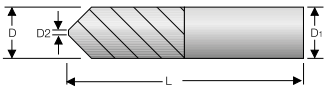
D mm	L mm	D1 mm	Z	Drill Ø mm	60° art.no.	€	90° art.no.	€
4.0	51	4	3	1	251580 0040		251581 0040	
6.0	64	6	3	1	251580 0060		251581 0060	
8.0	64	8	3	1	251580 0080		251581 0080	
10.0	70	10	3	1	251580 0100		251581 0100	
12.0	78	12	3	1	251580 0120		251581 0120	
16.0	89	16	3	1	251580 0160		251581 0160	
					2169		2169	



SARA® Basic Line deburring tool

VHM | Typ N | 90° | e8 | h5 | Z 4 | TiAlN

- **4 cutting edges**
- Factory standard
- **Cutting material: superfine grain solid carbide**



material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	● 170	● 130	● 110	● 90	○ 70	○ 70	● 150	● 150	○ 90	○ 90	○ 70							
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		

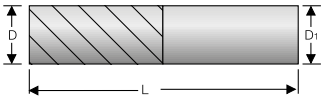
D mm	L mm	D1 mm	Drill Ø mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
6.0	57	6.0	1.2	4	0.030	251555 8060	
8.0	63	8.0	1.6	4	0.040	251555 8080	
10.0	72	10.0	2.0	4	0.060	251555 8100	
12.0	83	12.0	2.4	4	0.090	251555 8120	
						2148	



SARA® Deburring tool

VHM | Typ N | 60° | 90° | 120° | Z 4 | TiAlN

- **4 cutting edges**
- Ideal for chamfering and deburring workpiece edges, and for contour milling
- **Cutting material: superfine grain solid carbide, TiAlN-coated**



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 170	● 130	● 110	● 90	○ 70	○ 70	● 150	● 150	○ 90	○ 90	○ 70							
	Cutting speed Vc m/min.				Please adjust these guidelines according to clamping operation and machine set-up.														

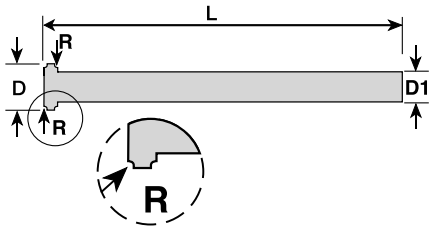
D mm	L mm	D1 mm	Z	60° HA art.no.	€	90° HA art.no.	€	90° HB art.no.	€	120° HA art.no.	€
4	51	4	4	251538 0040		251540 0040				255165 0040	
6	64	6	4	251538 0060		251540 0060		251543 0060		255165 0060	
8	64	8	4	251538 0080		251540 0080		251543 0080		255165 0080	
10	70	10	4	251538 0100		251540 0100		251543 0100		255165 0100	
12	78	12	4	251538 0120		251540 0120		251543 0120		255165 0120	
				2112		2112		2112		2112	



SARA® Front and rear-side quadrant milling cutter

VHM | Z 4 | Z 4 | TiAlN

- **For linear and circular front and rear-side radius milling**



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 50	● 45	● 30	● 35	● 20	● 20	● 30	● 30				● 190	● 95	● 50		● 25	● 20	
	Cutting speed Vc m/min.				Please adjust these guidelines according to clamping operation and machine set-up.														

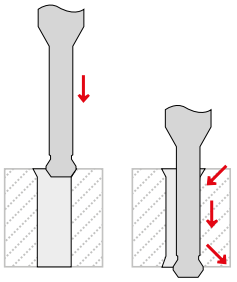


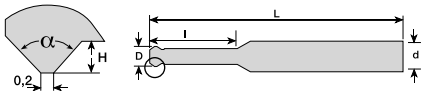
D mm	D1 mm	L mm	R mm	Z	art.no.	€
8.0	6	100	0.2	4	291320 0002	
8.0	6	100	0.3	4	291320 0003	
8.0	6	100	0.4	4	291320 0004	
8.0	6	100	0.5	4	291320 0005	
10.0	6	100	0.8	4	291320 0008	
10.0	6	100	1.0	4	291320 0010	
10.0	6	100	1.2	4	291320 0012	
10.0	6	100	1.5	4	291320 0015	
					2152	

ATORN Front and rear-side deburring tool

VHM | 90° | Z 3 | TiAlN

- **For linear and circular front and rear-side deburring or chamfering**
- Two cutting edges
- Spiral-fluted for an easy cut





material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 90	● 75	● 65	● 85	○ 75	○ 75	● 60	● 60	○ 30	○ 30	○ 25	○ 150	○ 100	○ 80		● 55		
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

90°

D mm	D1 mm	L mm	L2 mm	H mm	γ °	Z	art.no.	€
1.5	3	39	3.8	0.3	90	3	250005 0015	
2.0	3	39	5.0	0.4	90	3	250005 0020	
2.5	3	39	6.3	0.5	90	3	250005 0025	
3.0	3	39	7.5	0.6	90	3	250005 0030	
3.5	4	51	8.8	0.7	90	3	250005 0035	
4.0	4	51	10.0	0.8	90	3	250005 0040	
4.5	5	51	11.3	1.0	90	3	250005 0045	
5.0	5	51	12.5	1.1	90	3	250005 0050	
5.5	6	51	13.8	1.2	90	3	250005 0055	
6.0	6	51	15.0	1.5	90	3	250005 0060	

2108



90° for large projecting lengths

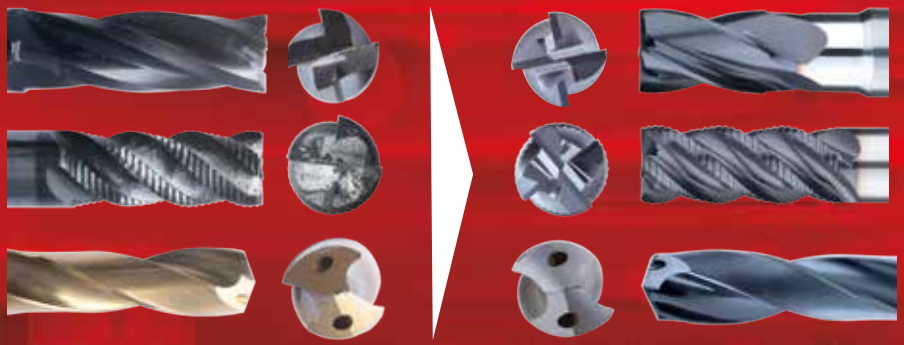
D mm	D1 mm	L mm	L2 mm	H mm	γ °	Z	art.no.	€
3.0	3	39	12.0	0.6	90	3	250006 0030	
3.5	4	51	14.0	0.7	90	3	250006 0035	
4.0	4	51	16.0	0.8	90	3	250006 0040	
4.5	5	51	18.0	1.0	90	3	250006 0045	
5.0	5	51	20.0	1.1	90	3	250006 0050	
5.5	6	58	22.0	1.2	90	3	250006 0055	
6.0	6	58	24.0	1.5	90	3	250006 0060	
8.0	8	64	28.0	1.6	90	3	250006 0080	
10.0	10	73	35.0	1.8	90	3	250006 0100	
12.0	12	84	42.0	2.1	90	3	250006 0120	

2108

RESHARPENING AND COATING SERVICE

COMPLETE PROFESSIONAL RECONDITIONING OF YOUR CUTTING TOOLS WITH IMPRESSIVE BEFORE AND AFTER

- **Only the best for your tools!**
- **Up to 85% cost savings thanks to resharpening**
- **Reduced storage and capital costs**
- **Shorter turnaround times with maximum productivity and process reliability**
- **Latest coating technology**



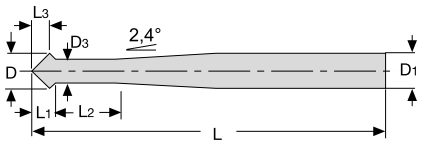
ATORN Front and rear-side deburring tool

VHM | 90° | h6 | Z 4 | TiAlN

- **For linear and circular front and rear-side deburring or chamfering**



250004 0040
250004 0080





250004 0060
250004 0100
250004 0120



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	●	●	○	●	●	○	○	○	○	●	●				
		60	45	35	40	30	75	60	50	20	15	15	180	140	100				
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		

D mm	D1 mm	L mm	L1 mm	L3 mm	L2 mm	D3 mm	Z	art.no.	€
3.9	4	75	2.95	1.95	10	1.9	4	250004 0040	
5.8	6	100	3.8	1.9	15	4	4	250004 0060	
7.8	6	100	1.8	-	0.9	-	4	250004 0080	
9.8	6	100	3.8	-	1.9	-	4	250004 0100	
11.8	6	100	5.8	-	2.9	-	4	250004 0120	

2169

Orbitool *deburring tool*® for machining on the inside



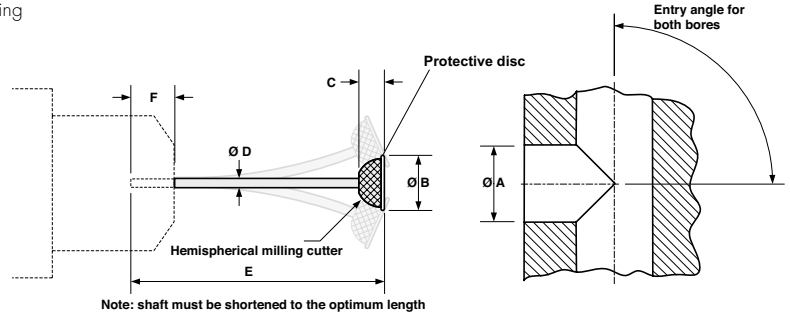


Vc/fz **810**

- **Deburring tool system for intersecting bores**
- Can be used reliably in automated applications with CNC machines
- Fully integrated into the production process **from 2.0 mm bore diameter**
- Free of burrs with no manual finishing
- With the ORBITOOL®deburring tool, the deburring process is easy to control. Material abrasion only occurs on the edges of the workpiece. The (bore) surfaces are not touched thanks to the protective disc. Intact surfaces are not scratched and workpieces are not damaged. This makes work considerably easier, especially with precision parts. Once the protective disc has passed the edges, the cutting surfaces of the deburring tool can cut away material from the edges. Deburring is carried out as the milling cutter moves in a spiral through the axial bore to the centre of the radial bore. In the case of manual deburring with an electric grinding machine, the burrs are removed by forward and backward movements.

Advantages:

- Consistent results – consistent quality
- Increased throughput capacity/shorter cycle times
- Reduced deburring costs
- No additional deburring work required
- No backlogs in the machining process
- Ideal for CNC machining

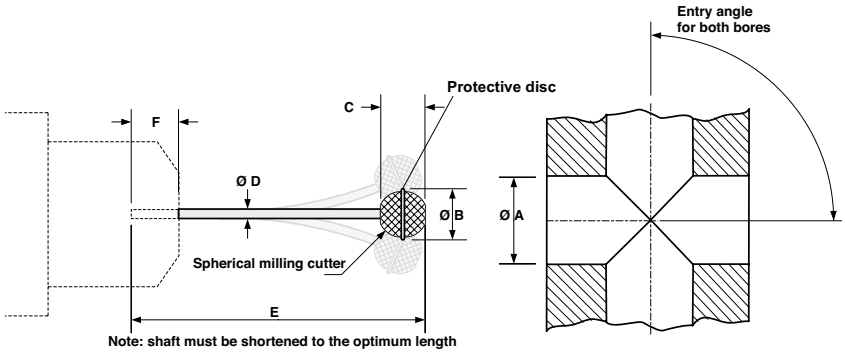




Hemisphere

Dimensions	Approach angle 90°/ A min. mm	Approach angle 60°/ A min. mm	Approach angle 45°/ A min. mm	B mm	C mm	D mm	E mm	f min. mm	f max. mm	art.no.	€
1.90	2.0	a.A.	a.A.	-	2.1	0.78	60	3.8	9.2	250010 0001	
2.38	3.2	4.5	6.2	2.7	2.1	0.78	60	3.8	9.2	250010 0002	
3.18	4.4	6.0	8.2	3.6	2.4	1.14	100	3.8	9.2	250010 0003	
3.97	5.5	7.5	10.2	4.4	2.8	1.55	100	3.8	14.2	250010 0004	
4.77	6.6	9.0	12.3	5.2	3.2	1.55	100	3.8	14.2	250010 0005	
6.35	8.8	12.0	16.4	6.9	3.9	2.39	150	3.8	14.2	250010 0006	
9.58	13.2	18.0	22.5	10.3	5.5	2.39	150	3.8	18.3	250010 0007	

2147





Ball

Dimensions	Approach angle 90°/ A min. mm	Approach angle 60°/ A min. mm	Approach angle 45°/ A min. mm	B mm	C mm	D mm	E mm	f min. mm	f max. mm	art.no.	€
1.9	2.0	a.A.	a.A.	-	3.2	0.78	60	3.8	9.2	250011 0001	
2.38	3.2	4.5	6.2	2.7	3.2	0.78	60	3.8	9.2	250011 0002	
3.18	4.4	6.0	8.2	3.6	3.9	1.14	100	3.8	9.2	250011 0003	
3.97	5.5	7.5	10.2	4.4	4.6	1.55	100	3.8	14.2	250011 0004	
4.77	6.6	9.0	12.3	5.2	5.4	1.55	100	3.8	14.2	250011 0005	
6.35	8.8	12.0	16.4	6.9	6.8	2.39	150	3.8	14.2	250011 0006	
9.58	13.2	18.0	22.5	10.3	10.1	2.39	150	3.8	18.3	250011 0007	

2147

Overview of end milling cutters HSS / HSS-E / HSS-E-PM

	End milling cutter							
Sort by type and number of cutting edges								
Brand	SARA	SARA	SARA	SARA	SARA	SARA	SARA	SARA
							ALU	ALU
ISO application area	N	N	P M K N	P M K N	P M K N	P M K N	N	N
Number of cutting edges	1	1	2	2	2	2	2	2
Diameter range [mm]	3 - 8	3 - 8	1 - 40	2 - 25	2 - 22	2 - 20	6 - 25	6 - 20
Standard	Factory standard	Factory standard	327D	327D	327D	327D	DIN844	DIN844
Version	short	Long	short	short	Long	Long	short	Long
Type / Profile	W	W	N	N	N	N	W	W
Cutting material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
Coating				AlCrN		AlCrN		
Article no.	290534....	290535....	220101....	220110....	220115....	220125....	290533....	290539....
Catalogue page	**564**	**564**	**565**	**565**	**565**	**565**	**566**	**566**

	End milling cutter					
Sort by type and number of cutting edges						
Brand	ATORN	SARA	SARA	SARA	SARA	SARA
ISO application area	P M K S N H	P M K N	P M K N	P M K N	P M K N	P M K N
Number of cutting edges	2	3	3	3	3	3
Diameter range [mm]	4 - 28	1 - 10	2 - 10	1.5 - 30.0	2 - 20	3 - 30
Standard	DIN327N	Factory standard	Factory standard	DIN844B	DIN844B	DIN844B
Version	short	short	Long	short	short	Long
Type / Profile	N	N	N	N	N	N
Cutting material	HSS-E-PM	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
Coating	TiAlN				AlCrN	
Article no.	226205....	222001....	222010....	220501....	220510....	220515....
Catalogue page	**566**	**567**	**567**	**568**	**568**	**568**

	End milling cutter							
Sort by type and number of cutting edges								
Brand	SARA	SARA	SARA	SARA	SARA	ATORN	ATORN	ATORN
ISO application area	P M K N	P M K N	P M K S N H	P M K S N H	P M K S N H	P M K N H S	P M K N H S	P M K N H S
Number of cutting edges	3	4 - 6	4	4 - 6	4	4 - 6	3	4 - 6
Diameter range [mm]	3 - 20	2 - 30	3 - 20	3 - 32	6 - 20	2 - 32	4 - 28	6 - 32
Standard	DIN844B	DIN844B	DIN844	DIN844	DIN844	DIN844N	DIN844W	DIN844N
Version	Long	short	short	Long	Long	short	short	Long
Type / Profile	N	N	N	N	N	N	N	N
Cutting material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E-PM	HSS-E-PM	HSS-E-PM
Coating	AlCrN		AlCrN		AlCrN	TiAlN	TiAlN	TiAlN
Article no.	220525....	224001....	224010....	224015....	224055....	226225....	226215....	226235....
Catalogue page	**568**	**569**	**569**	**569**	**569**	**570**	**570**	**571**

Overview of end milling cutters HSS / HSS-E / HSS-E-PM (continued)

	Roughing cutter						
Sort by type and number of cutting edges							
Brand	SARA	ATORN	ATORN	ATORN	ATORN	SARA	SARA
ISO application area	P M K N	P M K S N H	P M K S N H	P M K S N H	P M K S N H	P M K N	P M K N
Number of cutting edges	4 - 6	4 - 5	4	4 - 6	4 - 6	4 - 5	4 - 5
Diameter range [mm]	6 - 40	6 - 20	6 - 20	6 - 32	6 - 32	6 - 25	6 - 25
Standard	DIN844B	DIN844	DIN844	DIN844	DIN844	DIN844B	DIN844B
Version	short	short	Long	short	Long	short	short
Type / Profile	NF	NF	NF	NR-F	NR-F	HR	HR
Cutting material	HSS-E	HSS-E-PM	HSS-E-PM	HSS-E-PM	HSS-E-PM	HSS-E	HSS-E
Coating		TiAlN	TiAlN	TiAlN	TiAlN		AlCrN
Article no.	226001....	226255....	226275....	226245....	226265....	225030....	225040....
Catalogue page	**571**	**572**	**572**	**572**	**573**	**573**	**573**

	Roughing cutter							
Sort by type and number of cutting edges								
Brand	SARA	SARA	SARA	SARA	SARA	SARA	SARA	SARA
								ALU
ISO application area	P M K N	P M K N	P M K N	P M K N	P M K N	P M K N	P M K S N H	N
Number of cutting edges	4 - 6	4 - 6	3 - 6	3 - 6	4 - 6	4 - 5	3 - 6	3
Diameter range [mm]	8 - 30	8 - 30	6 - 40	6 - 32	6 - 40	6 - 32	4 - 25	6 - 30
Standard	DIN844B	DIN844B	DIN844B	DIN844B	DIN844HR	DIN844B	DIN844HR	DIN844
Version	Long	Long	short	short	Long	Long	short	short
Type / Profile	HR	HR	NR	NR	NR		HR	WR
Cutting material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E-PM	HSS-E
Coating		AlCrN		AlCrN		AlCrN	TiAlN	
Article no.	290929....	290931....	225001....	225010....	225015....	225025....	226247....	290963....
Catalogue page	**573**	**573**	**574**	**574**	**574**	**574**	**575**	**575**

	Radius milling cutter		Form milling cutter		
Sort by type and number of cutting edges					
Brand	SARA	SARA	SARA	SARA	SARA
ISO application area	P M K N	P M K N	P M K N	P M K N	P M K N
Number of cutting edges	2	2	6 - 10	6 -10	4 - 8
Diameter range [mm]	3 - 20	3 - 20	4.5 - 45.5	11 - 60	12.5 - 40.0
Standard	327	327	DIN850	DIN851	DIN851
Version	short	Long	short	short	short
Type / Profile	N	N	N	N	NR
Cutting material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
Coating					
Article no.	221001....	221005....	291360....	291365....	291367....
Catalogue page	**576**	**576**	**577**	**577**	**578**

	Form milling cutter				
Sort by type and number of cutting edges					
Brand	SARA	SARA	SARA	SARA	SARA
ISO application area	P M K N	P M K N	P M K N	P M K N	P M K N
Number of cutting edges	6 - 10	6 - 10	10 - 12	10 - 12	4 - 6
Diameter range [mm]	16 - 32	16 - 32	16 - 32	16 - 32	8 - 56
Standard	DIN1833	DIN1833	DIN1833	DIN1833	DIN6518
Version	short 45°	short 60°	short 45°	short 60°	short
Type / Profile	N	N	N	N	N
Cutting material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
Coating					
Article no.	291392....	291393....	291394....	291395....	291304....
Catalogue page	**578**	**578**	**579**	**579**	**579**

WHEN YOUR
TOOL FINDER WORKS
FASTER THAN YOU.
THIS IS POWER TO PRODUCE

- Time savings – no lengthy catalogue searches
- STEP and DFX data for your tool
- Download the cutting data as a PDF
- Immediate access to the online shop

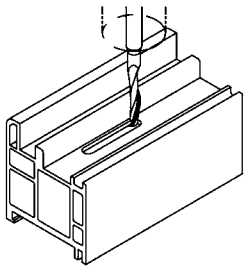
Find the right tool now

https://toolfinder.sartorius-werkzeuge.de/

SARA® Single-blade end milling cutters

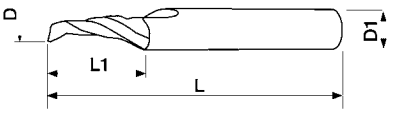
HSS-E | Werks-norm | Typ W | 30° | Z 1

- **Special geometry for aluminium and plastics**
- Centre cutting



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													● 100	● 120	● 90				
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		



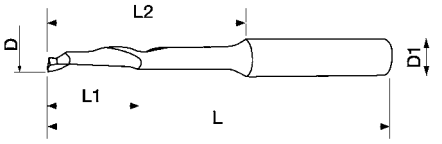


Short

D mm	L1 mm	L mm	D1 mm	Z	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
3.0	10	60	8	1	0.005	0.007	290534 0030	
4.0	12	60	8	1	0.006	0.008	290534 0040	
5.0	14	60	8	1	0.009	0.013	290534 0050	
6.0	14	60	8	1	0.012	0.017	290534 0060	
8.0	14	80	8	1	0.018	0.025	290534 0080	

2105





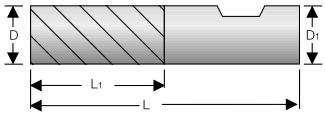
Long

D mm	L1 mm	L mm	L2 mm	Z	D1 mm	● Feed fz aluminium < 8 % Si mm/tooth	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
4.0	14	80	45	1	8	0.006	0.008	290535 0040	
5.0	16	80	45	1	8	0.009	0.013	290535 0050	
6.0	14	80	37	1	8	0.012	0.017	290535 0060	
8.0	14	80	55	1	8	0.018	0.025	290535 0080	

2105

SARA® Slot drill

HSS-E | DIN 327 | Typ N | 30° | Z 2 | AlCrN | Vc/fz | 730



- **For P9 keyways**

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	220101....	● 24	● 24		○ 13	○ 17		○ 27	○ 27				○ 180	○ 55	○ 45				
	220110....	● 41	● 41		○ 19	○ 24		○ 38	○ 38				○ 260	○ 80	○ 55				
	220115....	● 24	● 24		○ 13	○ 17		○ 27	○ 27				○ 180	○ 55	○ 45				
	220125....	● 41	● 41		○ 19	○ 24		○ 38	○ 38				○ 260	○ 80	○ 55				
	Cutting speed Vc m/min.							Please adjust these guidelines according to clamping operation and machine set-up.											



Short

D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€	AlCrN art.no.	€
1.0	2.5	47	6	2	0.002	220101 0010			
1.5	3	47	6	2	0.002	220101 0015			
2.0	4	48	6	2	0.003	220101 0020		220110 0020	
2.5	5	49	6	2	0.003	220101 0025		220110 0025	
3.0	5	49	6	2	0.003	220101 0030		220110 0030	
3.5	6	50	6	2	0.003	220101 0035		220110 0035	
3.8	7	51	6	2	0.003	220101 0038		220110 0038	
4.0	7	51	6	2	0.005	220101 0040		220110 0040	
4.5	7	51	6	2	0.005	220101 0045		220110 0045	
4.8	8	52	6	2	0.005	220101 0048		220110 0048	
5.0	8	52	6	2	0.005	220101 0050		220110 0050	
5.5	8	52	6	2	0.005	220101 0055		220110 0055	
6.0	8	52	6	2	0.007	220101 0060		220110 0060	
6.5	10	60	10	2	0.007	220101 0065			
7.0	10	60	10	2	0.007	220101 0070		220110 0070	
7.5	10	60	10	2	0.007	220101 0075			
7.75	11	61	10	2	0.007	220101 0077			
8.0	11	61	10	2	0.01	220101 0080		220110 0080	
8.5	11	61	10	2	0.01	220101 0085			
						2106		2106	

D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€	AlCrN art.no.	€
9.0	11	61	10	2	0.01	220101 0090			
9.5	11	61	10	2	0.01	220101 0095			
10.0	13	63	10	2	0.016	220101 0100		220110 0100	
11.0	13	70	12	2	0.016	220101 0110		220110 0110	
12.0	16	73	12	2	0.025	220101 0120		220110 0120	
13.0	16	73	12	2	0.025	220101 0130			
14.0	16	73	12	2	0.025	220101 0140		220110 0140	
15.0	16	73	16	2	0.025	220101 0150		220110 0150	
16.0	19	79	16	2	0.03	220101 0160		220110 0160	
18.0	19	79	16	2	0.03	220101 0180		220110 0180	
20.0	22	88	20	2	0.035	220101 0200		220110 0200	
22.0	22	98	25	2	0.035	220101 0220		220110 0220	
25.0	26	102	25	2	0.035	220101 0250		220110 0250	
26.0	26	102	25	2	0.035	220101 0260			
28.0	26	102	25	2	0.035	220101 0280			
30.0	26	102	25	2	0.035	220101 0300			
32.0	32	112	32	2	0.035	220101 0320			
36.0	32	112	32	2	0.035	220101 0360			
40.0	38	120	40	2	0.035	220101 0400			
						2106		2106	



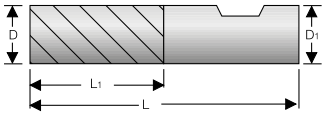
Long

D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€	AlCrN art.no.	€
2.0	7	51	6	2	0.003	220115 0020		220125 0020	
2.5	8	52	6	2	0.003	220115 0025		220125 0025	
3.0	8	52	6	2	0.003	220115 0030		220125 0030	
3.5	10	54	6	2	0.003	220115 0035		220125 0035	
4.0	11	55	6	2	0.004	220115 0040		220125 0040	
4.5	11	55	6	2	0.004	220115 0045		220125 0045	
5.0	13	57	6	2	0.004	220115 0050		220125 0050	
5.5	13	57	6	2	0.004	220115 0055		220125 0055	
6.0	13	57	6	2	0.006	220115 0060		220125 0060	
6.5	16	66	10	2	0.006	220115 0065		220125 0065	
7.0	16	66	10	2	0.006	220115 0070			
						2106		2106	

D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€	AlCrN art.no.	€
8.0	19	69	10	2	0.009	220115 0080		220125 0080	
8.5	19	69	10	2	0.009	220115 0085			
9.0	19	69	10	2	0.009	220115 0090			
10.0	22	72	10	2	0.014	220115 0100		220125 0100	
11.0	22	79	12	2	0.014	220115 0110			
12.0	26	83	12	2	0.021	220115 0120		220125 0120	
14.0	26	83	12	2	0.021	220115 0140		220125 0140	
16.0	32	92	16	2	0.025	220115 0160		220125 0160	
18.0	32	92	16	2	0.025	220115 0180		220125 0180	
20.0	38	104	20	2	0.031	220115 0200		220125 0200	
22.0	38	104	20	2	0.031	220115 0220			
						2106		2106	

SARA® Aluminium slot drill

HSS-E | DIN 844 | Typ W | 40° | Z 2



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													● 78	● 40	○ 33				
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

Short



D mm	L1 mm	L mm	D1 mm	Z	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
6.0	13	57	6	2	0.013	290533 0060	
8.0	19	69	10	2	0.019	290533 0080	
10.0	22	72	10	2	0.025	290533 0100	
12.0	26	83	12	2	0.03	290533 0120	
16.0	32	92	16	2	0.038	290533 0160	
20.0	38	104	20	2	0.045	290533 0201	
25.0	45	121	25	2	0.055	290533 0250	

2105

Long

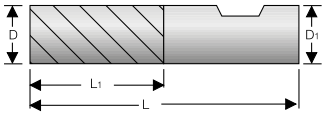


D mm	L1 mm	L mm	D1 mm	Z	Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
6.0	24	68	6	2	0.013	290539 0060	
8.0	38	88	10	2	0.019	290539 0080	
10.0	45	95	10	2	0.025	290539 0100	
12.0	53	110	12	2	0.03	290539 0120	
16.0	63	123	16	2	0.038	290539 0160	
20.0	75	141	20	2	0.045	290539 0201	

2105

SARA® End milling cutters

HSS-E | Werks-norm | Typ N | 30° | Z 3



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	222001....	● 40	● 30		○ 15	○ 20		○ 30	○ 30				○ 70	○ 60	○ 50				
	222010....	● 24	● 24		○ 13	○ 17		○ 27	○ 27				○ 180	○ 55	○ 45				
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

Short



D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
1.0	2	34	6	3	0.002	222001 0010	
1.5	3	34	6	3	0.002	222001 0015	
1.8	3	34	6	3	0.002	222001 0018	
2.0	3	35	6	3	0.002	222001 0020	
2.3	4	35	6	3	0.004	222001 0023	
2.5	5	36	6	3	0.004	222001 0025	
2.8	5	36	6	3	0.004	222001 0028	
3.0	5	36	6	3	0.007	222001 0030	
3.3	6	37	6	3	0.007	222001 0033	
3.5	6	37	6	3	0.007	222001 0035	
3.8	7	38	6	3	0.007	222001 0038	
4.0	7	38	6	3	0.007	222001 0040	
4.3	7	38	6	3	0.01	222001 0043	
4.5	7	38	6	3	0.01	222001 0045	
4.8	8	39	6	3	0.01	222001 0048	
5.0	8	39	6	3	0.01	222001 0050	
5.3	8	39	6	3	0.013	222001 0053	
5.5	8	39	6	3	0.013	222001 0055	
6.0	8	39	6	3	0.013	222001 0060	
6.5	10	42	8	3	0.013	222001 0065	
7.0	10	42	8	3	0.016	222001 0070	
8.0	11	43	8	3	0.016	222001 0080	
8.5	11	48	10	3	0.02	222001 0085	
9.0	11	48	10	3	0.02	222001 0090	
10.0	13	50	10	3	0.02	222001 0100	

2106

Long

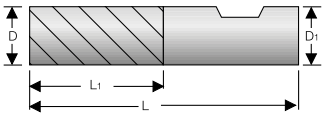


D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
2.0	7	38	6	3	0.002	222010 0020	
2.5	8	39	6	3	0.002	222010 0025	
3.0	8	39	6	3	0.007	222010 0030	
3.5	10	41	6	3	0.007	222010 0035	
4.0	11	42	6	3	0.007	222010 0040	
4.5	11	42	6	3	0.01	222010 0045	
5.0	13	44	6	3	0.01	222010 0050	
5.5	13	44	6	3	0.013	222010 0055	
6.0	13	44	6	3	0.013	222010 0060	
6.5	16	48	8	3	0.015	222010 0065	
7.0	16	48	8	3	0.016	222010 0070	
8.0	19	51	8	3	0.016	222010 0080	
9.0	19	56	10	3	0.02	222010 0090	
10.0	22	59	10	3	0.02	222010 0100	

2106

SARA® End milling cutters

HSS-E | DIN 844 | Typ N | 30° | Z 3 | AlCrN



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	220501....	● 24	● 24		○ 13	○ 17		○ 27	○ 27				○ 180	○ 55	○ 45				
	220510....	● 41	● 41		○ 19	○ 24		○ 38	○ 38				○ 260	○ 80	○ 55				
	220515....	● 23	● 23		○ 12	○ 16		○ 25	○ 25				○ 162	○ 50	○ 40				
	220525....	● 37	● 37		○ 17	○ 22		○ 28	○ 28				○ 234	○ 72	○ 50				
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

Short



D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€	AlCrN art.no.	€
1.5	7	51	6	3	0.002	220501 0015			
2.0	7	51	6	3	0.003	220501 0020		220510 0020	
3.0	8	52	6	3	0.003	220501 0030		220510 0030	
4.0	11	55	6	3	0.005	220501 0040		220510 0040	
4.5	11	55	6	3	0.005	220501 0045		220510 0045	
5.0	13	57	6	3	0.005	220501 0050		220510 0050	
5.5	13	57	6	3	0.005	220501 0055		220510 0055	
6.0	13	57	6	3	0.007	220501 0060		220510 0060	
6.5	16	66	10	3	0.007	220501 0065			
7.0	16	66	10	3	0.007	220501 0070		220510 0070	
7.5	16	66	10	3	0.007	220501 0075			
8.0	19	69	10	3	0.01	220501 0080		220510 0080	
8.5	19	69	10	3	0.01	220501 0085			
9.0	19	69	10	3	0.01	220501 0090		220510 0090	
9.5	19	69	10	3	0.01	220501 0095			
10.0	22	72	10	3	0.016	220501 0100		220510 0100	
11.0	22	79	12	3	0.016	220501 0110		220510 0110	
12.0	26	83	12	3	0.025	220501 0120		220510 0120	
13.0	26	83	12	3	0.025	220501 0130		220510 0130	
14.0	26	83	12	3	0.025	220501 0140		220510 0140	
15.0	26	83	16	3	0.025	220501 0150		220510 0150	
16.0	32	92	16	3	0.03	220501 0160		220510 0160	
17.0	32	92	16	3	0.03	220501 0170			
18.0	32	92	16	3	0.03	220501 0180		220510 0180	
20.0	38	104	20	3	0.035	220501 0200		220510 0200	
22.0	38	104	20	3	0.035	220501 0220		220510 0220	
24.0	45	121	25	3	0.035	220501 0240			
25.0	45	121	25	3	0.035	220501 0250			
28.0	45	121	25	3	0.035	220501 0280			
30.0	45	121	25	3	0.035	220501 0300			
						2106		2106	

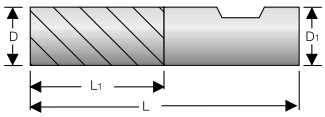
Long



D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€	AlCrN art.no.	€
3.0	12	56	6	3	0.003	220515 0030		220525 0030	
4.0	19	63	6	3	0.004	220515 0040		220525 0040	
5.0	24	68	6	3	0.004	220515 0050		220525 0050	
6.0	24	68	6	3	0.005	220515 0060		220525 0060	
8.0	38	88	10	3	0.009	220515 0080		220525 0080	
10.0	45	95	10	3	0.014	220515 0100		220525 0100	
12.0	53	110	12	3	0.021	220515 0120		220525 0120	
14.0	53	110	12	3	0.021	220515 0140		220525 0140	
16.0	63	123	16	3	0.025	220515 0160		220525 0160	
18.0	63	123	16	3	0.025	220515 0180		220525 0180	
20.0	75	141	20	3	0.031	220515 0200		220525 0200	
						2106		2106	

SARA® End milling cutters

HSS-E | DIN 844 | Typ N | 30° | Z 4 | Z 5 | Z 6 | AlCrN



- **Face cutter geometry for plunge milling (not extra-long version)**

material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
224001....	● 23	● 23		○ 13	○ 13		○ 19	○ 19				○ 90	○ 45	○ 40				
224010....	● 55	● 55		○ 28	○ 28		○ 50	○ 50				○ 130	○ 115	○ 95				
224015....	● 23	● 20		○ 13	○ 13		○ 13	○ 18				○ 80	○ 40	○ 55				
224055....	● 50	● 45		○ 35	○ 35		○ 40	○ 40				○ 115	○ 110	○ 90				
Cutting speed Vc m/min.							Please adjust these guidelines according to clamping operation and machine set-up.											

Short



D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€	AlCrN art.no.	€
2.0	7	51	6	4	0.002	224001 0020			
2.5	8	52	6	4	0.002	224001 0025			
3.0	8	52	6	4	0.003	224001 0030		224010 0030	
3.5	10	54	6	4	0.003	224001 0035			
4.0	11	55	6	4	0.007	224001 0040		224010 0040	
5.0	13	57	6	4	0.009	224001 0050		224010 0050	
6.0	13	57	6	4	0.011	224001 0060		224010 0060	
7.0	16	66	10	4	0.011	224001 0070		224010 0070	
8.0	19	69	10	4	0.016	224001 0080		224010 0080	
8.5	19	69	10	4	0.016	224001 0085			
9.0	19	69	10	4	0.016	224001 0090			
10.0	22	72	10	4	0.021	224001 0100		224010 0100	
11.0	22	79	12	4	0.021	224001 0110			
12.0	26	83	12	4	0.026	224001 0120		224010 0120	
13.0	26	83	12	4	0.026	224001 0130			
14.0	26	83	12	4	0.026	224001 0140		224010 0140	
15.0	26	83	16	4	0.026	224001 0150			
16.0	32	92	16	4	0.032	224001 0160		224010 0160	
18.0	32	92	16	4	0.032	224001 0180		224010 0180	
20.0	38	104	20	4	0.038	224001 0200		224010 0200	
22.0	38	104	20	5	0.038	224001 0220			
24.0	45	121	25	5	0.04	224001 0240			
28.0	45	121	25	6	0.045	224001 0280			
30.0	45	121	25	6	0.05	224001 0300			
						2106		2106	

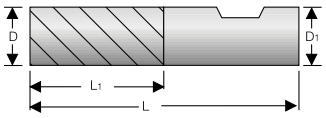
Long



D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€	AlCrN art.no.	€
3.0	12	56	6	4	0.002	224015 0030			
4.0	19	63	6	4	0.004	224015 0040			
5.0	24	68	6	4	0.006	224015 0050			
6.0	24	68	6	4	0.008	224015 0060		224055 0060	
7.0	30	80	10	4	0.008	224015 0070			
8.0	38	88	10	4	0.012	224015 0080		224055 0080	
9.0	38	88	10	4	0.012	224015 0090			
10.0	45	95	10	4	0.015	224015 0100		224055 0100	
11.0	45	102	12	4	0.015	224015 0110			
12.0	53	110	12	4	0.018	224015 0120		224055 0120	
14.0	53	110	12	4	0.018	224015 0140		224055 0140	
16.0	63	123	16	4	0.023	224015 0160		224055 0160	
18.0	63	123	16	4	0.023	224015 0180		224055 0180	
20.0	75	141	20	4	0.028	224015 0200		224055 0200	
22.0	75	141	20	5	0.03	224015 0220			
25.0	90	166	25	5	0.038	224015 0250			
28.0	90	166	25	6	0.04	224015 0280			
30.0	90	166	25	6	0.045	224015 0300			
32.0	106	186	32	6	0.05	224015 0320			
						2106		2106	

ATORN End milling cutters

HSS-E PM | DIN 844 | Typ W | 45° | e8 | h6 | Z 3 | TiAlN | Vc/fz | 731



- Eccentric relief grinding

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		○	●	○	○	○		●	○	○	○	○	○	●	●				
		78	55	38	43	43		35	35	38	20	23	325	130	110				
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		

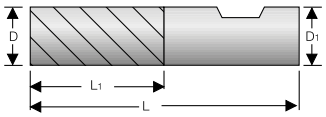


D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
4	11	55	6	0.1	3	0.008	226215 0040	
5	13	57	6	0.1	3	0.008	226215 0050	
6	13	57	6	0.1	3	0.018	226215 0060	
7	16	66	10	0.1	3	0.018	226215 0070	
8	19	69	10	0.1	3	0.021	226215 0080	
10	22	72	10	0.1	3	0.036	226215 0100	
12	26	83	12	0.2	3	0.036	226215 0120	
14	26	83	12	0.2	3	0.036	226215 0140	
16	32	92	16	0.2	3	0.053	226215 0160	
18	32	92	16	0.2	3	0.053	226215 0180	
20	38	104	20	0.2	3	0.053	226215 0200	

2106

ATORN End milling cutters

HSS-E PM | DIN 844 | Typ N | 30° | k10 | h6 | Z 4 | Z 6 | TiAlN | Vc/fz | 729



- Eccentric relief grinding

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	○	●	●		●	●	●	○	○	●	●	○		○		
		78	60	38	43	38		50	75	38	20	23	355	130	160		28		
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		

Short



D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
2	7	51	6	4	0.008	226225 0020	
3	8	52	6	4	0.008	226225 0030	
4	11	55	6	4	0.009	226225 0040	
5	13	57	6	4	0.01	226225 0050	
6	13	57	6	4	0.018	226225 0060	
7	16	66	10	4	0.018	226225 0070	
8	19	69	10	4	0.021	226225 0080	
9.0	19	69	10	4	0.021	226225 0090	
10	22	72	10	4	0.035	226225 0100	
12	26	83	12	4	0.041	226225 0120	
14	26	83	12	4	0.041	226225 0140	
16	32	92	16	4	0.069	226225 0160	
18	32	92	16	4	0.069	226225 0180	
20	38	104	20	4	0.069	226225 0200	
25	45	121	25	6	0.069	226225 0250	
28.0	45	121	25	6	0.069	226225 0280	
30.0	45	121	25	6	0.069	226225 0300	
32	53	133	32	6	0.069	226225 0320	

2106



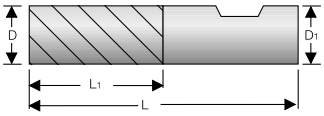
Long

D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
6.0	24	68	6	4	0.018	226235 0060	
8.0	38	88	10	4	0.021	226235 0080	
10.0	45	95	10	4	0.035	226235 0100	
12.0	53	110	12	4	0.011	226235 0120	
14.0	53	110	12	4	0.011	226235 0140	
16.0	63	123	16	4	0.069	226235 0160	
18.0	63	123	16	4	0.069	226235 0180	
20.0	75	141	20	4	0.069	226235 0200	
25.0	90	166	25	6	0.069	226235 0250	
32.0	106	186	32	6	0.069	226235 0320	

2106

SARA® Roughing / finishing cutter

HSS-E | DIN 844 | NF | 30° | Z 4 | Z 6



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 28	● 28		○ 21	○ 21		○ 28	○ 28										
	Cutting speed Vc m/min.																		

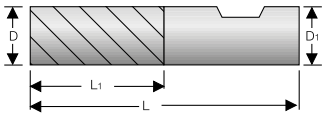
D mm	L1 mm	L mm	D1 mm	Feed fz steel < 1000 N/mm² mm/tooth	Z	art.no.	€
6.0	13	57	6	0.009	4	226001 0060	
7.0	16	60	8	0.009	4	226001 0070	
8.0	19	69	10	0.014	4	226001 0080	
10.0	22	72	10	0.018	4	226001 0100	
11.0	22	79	12	0.018	4	226001 0110	
12.0	26	83	12	0.022	4	226001 0120	
14.0	26	83	12	0.022	4	226001 0140	
16.0	32	92	16	0.027	4	226001 0160	
18.0	32	92	16	0.027	4	226001 0180	
20.0	38	104	20	0.033	4	226001 0200	
22.0	38	104	20	0.035	4	226001 0220	
32.0	53	133	32	0.055	6	226001 0320	



2105

ATORN Roughing / finishing cutter

HSS-E PM | DIN 844 | 30° | h6 | Z 4 | Z 5 | TiAlN | Vc/fz | 732



- Eccentric relief grinding

material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	● 68	● 55	● 38	● 38	○ 38		● 35	○ 35	● 38					○ 140		○ 28		
Cutting speed Vc m/min.										Please adjust these guidelines according to clamping operation and machine set-up.								

Short

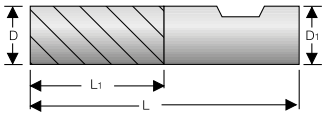


D mm	L1 mm	L mm	D1 mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
6	13	57	6	4	0.009	0.018	226255 0060	
8	19	69	10	4	0.011	0.021	226255 0080	
10	22	72	10	5	0.017	0.035	226255 0100	
12	26	83	12	5	0.021	0.042	226255 0120	
16	32	92	16	5	0.035	0.069	226255 0160	
20	38	104	20	5	0.035	0.069	226255 0200	

2106

ATORN Roughing cutter

HSS-E PM | DIN 844 | NRf | 30° | k12 | h6 | Z 4 | Z 5 | Z 6 | TiAlN | Vc/fz | 732



- **With fine knuckle-type tooth profile**
- Eccentric relief grinding

material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	● 78	● 51	● 35	● 43	○ 37		● 35	○ 75	○ 38	○ 20	○ 23	○ 325	○ 130	○ 110				
Cutting speed Vc m/min.										Please adjust these guidelines according to clamping operation and machine set-up.								

Short



D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
6	13	57	6	0.1	4	0.012	0.021	226245 0060	
8	19	69	10	0.1	4	0.014	0.025	226245 0080	
10	22	72	10	0.1	5	0.023	0.041	226245 0100	
12	26	83	12	0.2	5	0.028	0.041	226245 0120	
14	26	83	12	0.2	5	0.028	0.041	226245 0140	
16	32	92	16	0.2	5	0.046	0.081	226245 0160	
18	32	92	16	0.2	5	0.046	0.081	226245 0180	
20	38	104	20	0.2	5	0.046	0.081	226245 0200	
22	38	104	20	0,2	5	0.046	0.081	226245 0220	
25	45	121	25	0.2	5	0.046	0.081	226245 0250	
30	45	121	25	0,2	5	0.046	0.081	226245 0300	
32	53	133	32	0.2	6	0.046	0.081	226245 0320	

2106

Long

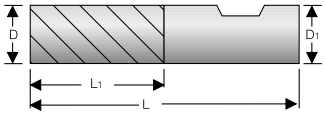
D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
6	24	68	6	0.1	4	0.012	0.021	226265 0060	
8	38	88	10	0.1	4	0.014	0.025	226265 0080	
10	45	95	10	0.1	4	0.023	0.041	226265 0100	
12	53	110	12	0.2	4	0.028	0.042	226265 0120	
14	53	110	12	0.2	4	0.028	0.042	226265 0140	
16	63	123	16	0.2	4	0.046	0.081	226265 0160	
18	63	123	16	0.2	4	0.046	0.081	226265 0180	
20	75	141	20	0.2	4	0.046	0.081	226265 0200	
25	90	166	25	0.2	5	0.046	0.081	226265 0250	
32	106	186	32	0.2	6	0.046	0.081	226265 0320	
								2106	



SARA® Roughing cutter

HSS-E | DIN 844 | HR | 30° | Z 4 | Z 5 | AlCrN

- **Relief-ground knuckle profile**



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	225030....	● 28	● 28		○ 21	○ 21		○ 28	○ 28										
	225040....	● 55	● 50		○ 40	○ 40		○ 50	○ 50										
	290929....	● 28	● 23	○ 18	○ 18	○ 18		○ 25	○ 25										
	290931....	● 50	● 45	○ 35	○ 35	○ 35		○ 45	○ 45				○ 115	○ 110	○ 90				
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

Short

D mm	L1 mm	L mm	D1 mm	Feed fz steel < 1000 N/mm² mm/tooth	Z	art.no.	€	AlCrN art.no.	€
6.0	13	57	6	0.009	4	225030 0060		225040 0060	
8.0	19	69	10	0.014	4	225030 0080		225040 0080	
10.0	22	72	10	0.018	4	225030 0100		225040 0100	
12.0	26	83	12	0.022	4	225030 0120		225040 0120	
14.0	26	83	12	0.022	4	225030 0140		225040 0140	
16.0	32	92	16	0.027	4	225030 0160		225040 0160	
18.0	32	92	16	0.027	4	225030 0180		225040 0180	
20.0	38	104	20	0.033	4	225030 0200		225040 0200	
25.0	45	121	25	0.04	5	225030 0250		225040 0250	
						2105		2105	



Long

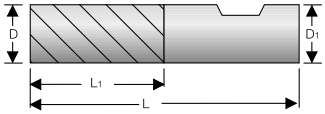
D mm	L1 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€	AlCrN art.no.	€
8.0	38	88	10	4	0.012	290929 0080		290931 0080	
10.0	45	95	10	4	0.015	290929 0100		290931 0100	
12.0	53	110	12	4	0.018	290929 0120		290931 0120	
16.0	63	123	16	4	0.023	290929 0160		290931 0160	
18.0	63	123	16	4	0.023	290929 0180		290931 0180	
20.0	75	141	20	4	0.028	290929 0201		290931 0201	
25.0	90	166	25	4	0.035	290929 0250		290931 0250	
						2105		2105	



SARA® Roughing cutter

HSS-E | DIN 844 | NR | 30° | Z 4 | Z 5 | Z 6 | AlCrN

- **Multi-blade milling cutter, relief-ground knurled profile**



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	225001....	● 28	● 28		○ 21	○ 21		○ 28	○ 28										
	225010....	● 55	● 50		○ 40	○ 40		○ 50	○ 50										
	225015....	● 28	● 28		○ 21	○ 21		○ 28	○ 28										
	225025....	● 55	● 50		○ 40	○ 40		○ 50	○ 50										
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

Short



D mm	L1 mm	L mm	D1 mm	Feed fz steel < 1000 N/mm² mm/tooth	Z	art.no.	€	AlCrN art.no.	€
6.0	13	57	6	0.009	4	225001 0060		225010 0060	
8.0	19	69	10	0.014	4	225001 0080		225010 0080	
10.0	22	72	10	0.018	4	225001 0100		225010 0100	
12.0	26	83	12	0.022	4	225001 0120		225010 0120	
14.0	26	83	12	0.022	4	225001 0140		225010 0140	
16.0	32	92	16	0.027	4	225001 0160		225010 0160	
18.0	32	92	16	0.027	4	225001 0180		225010 0180	
20.0	38	104	20	0.033	4	225001 0200		225010 0200	
22.0	38	104	20	0.033	5	225001 0220		225010 0220	
25.0	45	121	25	0.04	5	225001 0250		225010 0250	
28.0	45	121	25	0.045	5	225001 0280		225010 0280	
30.0	45	121	25	0.05	5	225001 0300		225010 0300	
32.0	53	133	32	0.055	6	225001 0320		225010 0320	
36.0	53	133	32	0.06	6	225001 0360			
40.0	63	155	40	0.065	6	225001 0400			
						2105		2105	

Long

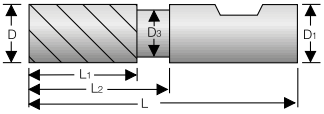


D mm	L1 mm	L mm	D1 mm	Feed fz steel < 1000 N/mm² mm/tooth	Z	art.no.	€	AlCrN art.no.	€
6.0	24	68	6	0.009	4	225015 0060		225025 0060	
8.0	38	88	10	0.014	4	225015 0080		225025 0080	
10.0	45	95	10	0.018	4	225015 0100		225025 0100	
12.0	53	110	12	0.022	4	225015 0120		225025 0120	
14.0	53	110	12	0.022	4	225015 0140		225025 0140	
16.0	63	123	16	0.027	4	225015 0160		225025 0160	
18.0	63	123	16	0.027	4	225015 0180		225025 0180	
20.0	75	141	20	0.033	4	225015 0200		225025 0200	
22.0	75	141	20	0.033	4	225015 0220		225025 0220	
25.0	90	166	25	0.04	5	225015 0250		225025 0250	
28.0	90	166	25	0.045	5	225015 0280		225025 0280	
30.0	90	166	25	0.05	5	225015 0300		225025 0300	
32.0	106	186	32	0.055	6	225015 0320		225025 0320	
36.0	106	186	32	0.06	6	225015 0360			
40.0	125	217	32	0.07	6	225015 0400			
						2105		2105	

SARA® Roughing cutter

HSS-E PM | DIN 844 | HR | 45° | h6 | Z 3 | Z 4 | Z 5 | Z 6 | TiAlN | Vc/fz | 732

- Eccentric relief grinding



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	●	○		●	○								○		
	Cutting speed Vc m/min.	60	55	38	38	38		35	35								28		
	Please adjust these guidelines according to clamping operation and machine set-up.																		

D mm	L1 mm	L mm	D1 mm	L2 mm	D3 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth ●	Feed fz steel < 1000 N/mm² mm/tooth ●	art.no.	€
4.0	11	55	6	19	4.0	3	0.008	0.014	226247 0040	
5.0	13	57	6	21	4.8	4	0.008	0.014	226247 0050	
6.0	13	57	6	21	5.5	4	0.012	0.021	226247 0060	
8.0	19	69	10	29	7.5	4	0.014	0.0245	226247 0080	
10.0	22	72	10	32	9.5	4	0.0232	0.0406	226247 0100	
12.0	26	83	12	38	11.5	4	0.024	0.042	226247 0120	
16.0	32	92	16	44	15.5	5	0.046	0.0805	226247 0160	
20.0	38	104	20	54	19.5	6	0.046	0.0805	226247 0200	
25.0	45	121	25	65	12.5	6	0.046	0.0805	226247 0250	

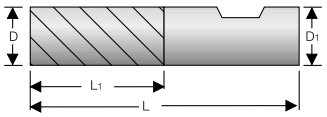
2105



SARA® Aluminium roughing cutter

HSS-E | DIN 844 | WR | 30° | Z 3

- **Aluminium teeth**



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													●	●	○				
	Cutting speed Vc m/min.												78	40	33				
	Please adjust these guidelines according to clamping operation and machine set-up.																		



D mm	L1 mm	L mm	D1 mm	Z	Feed fz aluminium < 8 % Si mm/tooth ●	art.no.	€
6.0	13	57	6	3	0.013	290963 0060	
8.0	19	69	10	3	0.019	290963 0080	
10.0	22	72	10	3	0.025	290963 0100	
12.0	26	83	12	3	0.03	290963 0120	
14.0	26	83	12	3	0.03	290963 0140	

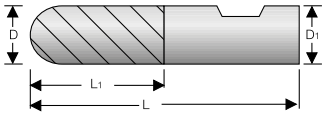
2105

D mm	L1 mm	L mm	D1 mm	Z	Feed fz aluminium < 8 % Si mm/tooth ●	art.no.	€
16.0	32	92	16	3	0.038	290963 0160	
18.0	32	92	16	3	0.045	290963 0180	
20.0	38	104	20	3	0.05	290963 0201	
25.0	45	121	25	3	0.055	290963 0250	
30.0	45	121	25	3	0.06	290963 0300	

2105

SARA® Radius milling cutter

HSS-E | DIN 844 | Typ N | 30° | Z 2



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●		○	○		○	○				○	○	○				
		28	23		12	16		25	25				162	50	40				
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		



Short

D mm	L1 mm	L mm	D1 mm	R mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	8	52	6	1.5	2	0.004	221001 0030	
4.0	11	55	6	2	2	0.01	221001 0040	
5.0	13	57	6	2.5	2	0.01	221001 0050	
6.0	13	57	6	3	2	0.014	221001 0060	
8.0	19	69	10	4	2	0.022	221001 0080	
10.0	22	72	10	5	2	0.036	221001 0100	

2106

D mm	L1 mm	L mm	D1 mm	R mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
12.0	26	83	12	6	2	0.05	221001 0120	
14.0	26	83	12	7	2	0.05	221001 0140	
16.0	32	92	16	8	2	0.062	221001 0160	
18.0	32	92	16	9	2	0.064	221001 0180	
20.0	38	104	20	10	2	0.07	221001 0200	

2106



Long

D mm	L1 mm	L mm	D1 mm	R mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
3.0	8	56	6	1.5	2	0.003	221005 0030	
4.0	19	63	6	2	2	0.01	221005 0040	
5.0	24	68	6	2.5	2	0.01	221005 0050	
6.0	24	68	6	3	2	0.012	221005 0060	
8.0	38	82	10	4	2	0.02	221005 0080	
10.0	45	95	10	5	2	0.034	221005 0100	

2106

D mm	L1 mm	L mm	D1 mm	R mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
12.0	53	110	12	6	2	0.048	221005 0120	
14.0	53	110	12	7	2	0.048	221005 0140	
16.0	63	123	16	8	2	0.058	221005 0160	
18.0	63	123	16	9	2	0.06	221005 0180	
20.0	75	141	20	10	2	0.068	221005 0200	

2106

Over 200,000 tools available online!

Advantages:
- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages

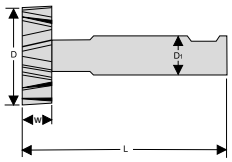


Register online now!

www.saratools.com

SARA® Slotting cutter

HSS-E | DIN 850 | Typ N | h12 | h6 | Z 6 | Z 8+



- With cross-cut toothing
- For groove milling in accordance with DIN 6888, P9 fit
- * = not DIN-compliant

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		○ 35	○ 30		○ 25	○ 25		○ 25	○ 25				○ 45	○ 158					
	Cutting speed Vc m/min.										Please adjust these guidelines according to clamping operation and machine set-up.								



D mm	w mm	for T-slot mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
4.5	1	1 x 1.4	50	6	6	0.006	291360 0045	
7.5	1.5	1.5 x 2.6	50	6	6	0.008	291360 0075	
7.5	2	2 x 2.6	50	6	6	0.008	291360 0076	
10.5	2	2 x 3.7	50	6	6	0.008	291360 0105	
10.5	2.5	2.5 x 3.7	50	6	6	0.008	291360 0106	
10.5	3	3 x 3.7	50	6	6	0.008	291360 0107	
13.5	2	2 x 5	56	10	6	0.015	291360 0135	
13.5	3	3 x 5	56	10	6	0.015	291360 0137	
13.5	4	4 x 5	56	10	6	0.015	291360 0138	
16.5	3	3 x 6.5	56	10	6	0.025	291360 0166	
16.5	4	4 x 6.5	56	10	6	0.025	291360 0167	
16.5	5	5 x 6.5	56	10	6	0.025	291360 0168	
19.5	3	3 x 7.5*	63	10	8	0.035	291360 0195	
19.5	4	4 x 7.5	63	10	8	0.035	291360 0196	
19.5	5	5 x 7.5	63	10	8	0.035	291360 0197	
19.5	6	6 x 7.5	63	10	8	0.035	291360 0198	

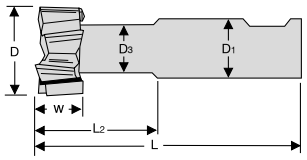
2107

D mm	w mm	for T-slot mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
22.5	4	4 x 9	63	10	8	0.04	291360 0225	
22.5	5	5 x 9	63	10	8	0.04	291360 0226	
22.5	6	6 x 9	63	10	8	0.04	291360 0227	
22.5	8	8 x 9	63	10	8	0.04	291360 0228	
25.5	5	5 x 10*	63	10	10	0.045	291360 0255	
25.5	6	6 x 10	63	10	10	0.045	291360 0256	
28.5	6	6 x 11	63	10	10	0.05	291360 0286	
28.5	8	8 x 11	63	10	10	0.05	291360 0288	
28.5	10	10 x 11	71	12	10	0.05	291360 0289	
32.5	6	6 x 13*	71	12	10	0.06	291360 0326	
32.5	7	*	71	12	10	0.06	291360 0327	
32.5	8	8 x 13	71	12	10	0.06	291360 0328	
32.5	10	10 x 13	71	12	12	0.06	291360 0329	
38.5	8	*	71	12	12	0.06	291360 0385	
45.5	8	8 x 16*	71	12	12	0.07	291360 0454	
45.5	10	10 x 16	71	12	12	0.07	291360 0455	

2107

SARA® T-slot milling cutter

HSS-E | DIN 851 | Typ N | d11 | h6 | Z 6 | Z 8+



- With cross-cut toothing
- For milling grooves according to DIN 650
- *= not according to DIN

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		○ 35	○ 30		○ 25	○ 25		○ 25	○ 25				○ 45	○ 158					
	Cutting speed Vc m/min.										Please adjust these guidelines according to clamping operation and machine set-up.								



Suitable for groove width	D mm	w mm	L2 mm	L mm	D1 mm	D3 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
M5	11.0	4	12.5	53.4	10	4	6	0.008	291365 0040	
M6	12.5	6	17.0	57	10	5	6	0.008	291365 0060	
M8	16.0	8	22.0	62	10	7	6	0.013	291365 0080	
M10	18.0	8	25.0	70	12	8	6	0.014	291365 0100	
*	19.0	9	26.0	71	12	8	6	0.014	291365 0110	
M12	21.0	9	29.0	74	12	10	6	0.017	291365 0120	
*	22.0	10	30.0	75	12	10	6	0.017	291365 0130	
M14	25.0	11	34.0	82	16	12	8	0.028	291365 0140	

2107

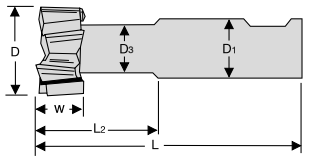
Suitable for groove width	D mm	w mm	L2 mm	L mm	D1 mm	D3 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
M16	28.0	12	37.0	85	16	13	8	0.028	291365 0160	
M18	32.0	14	42.0	90	16	15	8	0.036	291365 0180	
M20	36.0	16	47.0	103	25	17	8	0.036	291365 0200	
M22	40.0	18	52.0	108	25	19	10	0.042	291365 0220	
M24	45.0	20	57.0	113	25	21	10	0.042	291365 0240	
M28	50.0	22	64.0	124	32	25	10	0.05	291365 0250	
M36	60.0	28	79.0	139	32	30	10	0.057	291365 0260	

2107

SARA® T-slot milling cutter

HSS-E | DIN 851 | NR | d11 | h6 | Z 6 | Z 8+

- With cross-cut toothing
- * = not DIN-compliant



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		○	○		○	○		○	○				○	○					
	Cutting speed Vc m/min.	35	30		25	25		25	25				45	158					
	Please adjust these guidelines according to clamping operation and machine set-up.																		

Suitable for groove width	D mm	w mm	L2 mm	L mm	D1 mm	D3 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
M6	12.5	6	17.0	57	10	5	6	0.01	291367 0125	
M8	16.0	8	22.0	62	10	7	6	0.017	291367 0160	
M10	18.0	8	25.0	70	12	8	6	0.018	291367 0180	
*	19.0	9	26.0	71	12	8	6	0.018	291367 0190	
M12	21.0	9	29.0	74	12	10	6	0.023	291367 0210	
*	22.0	10	30.0	75	12	10	6	0.023	291367 0220	
M14	25.0	11	34.0	82	16	12	8	0.036	291367 0250	
M16	28.0	12	37.0	85	16	13	8	0.036	291367 0280	
M18	32.0	14	42.0	90	16	15	8	0.047	291367 0320	
M20	36.0	16	47.0	103	25	17	8	0.047	291367 0360	
M22	40.0	18	52.0	108	25	19	8	0.055	291367 0400	

2107



SARA® Angle milling cutter

HSS-E | DIN 1833 | Typ N | js16 | h6 | Z 8+

- **Type N, 45° and 60°**
- Straight-fluted

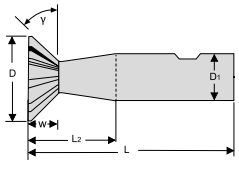
material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		○	○		○	○		○	○				○	○					
	Cutting speed Vc m/min.	35	30		25	25		25	25				45	158					
	Please adjust these guidelines according to clamping operation and machine set-up.																		

Form C, 45°

D mm	γ °	w mm	L2 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
16.0	45	4	15	60	12	10	0.01	291392 0160	
20.0	45	5	18	63	12	10	0.014	291392 0200	
25.0	45	6.3	22	67	12	10	0.015	291392 0250	
32.0	45	8	23	71	16	12	0.022	291392 0320	

2107



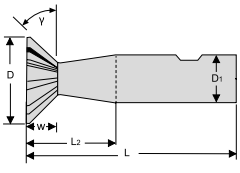


Form C, 60°

D mm	γ °	w mm	L2 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
16.0	60	6.3	15	60	12	12	0.01	291393 0160	
20.0	60	8	18	63	12	10	0.014	291393 0200	
25.0	60	10	22	67	12	10	0.015	291393 0250	
32.0	60	12.5	23	71	16	10	0.019	291393 0320	

2107

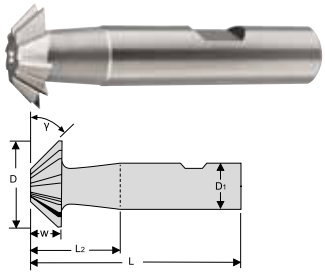




Form D, 45°

D mm	γ °	w mm	L2 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
16.0	45	4	15	60	12	10	0.01	291394 0160	
20.0	45	5	18	63	12	10	0.014	291394 0200	
25.0	45	6.3	22	67	12	10	0.016	291394 0250	
32.0	45	8	23	71	16	12	0.019	291394 0320	

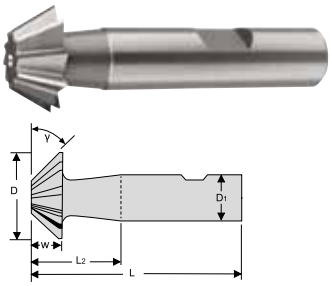
2107



Form D, 60°

D mm	γ °	w mm	L2 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
16.0	60	6.3	15	60	12	10	0.01	291395 0160	
20.0	60	8	18	63	12	10	0.014	291395 0200	
25.0	60	10	22	67	12	10	0.016	291395 0250	
32.0	60	12.5	23	71	16	12	0.019	291395 0320	

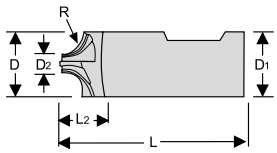
2107



SARA® Quadrant milling cutter, concave

HSS-E | DIN 6518 | Typ N | h11 | h6 | Z 4 | Z 6

- Radially / axially relieved
- Cutting edge angle (axial) approx. 5°
- Straight shank in accordance with DIN 1835 B, up to shank Ø 16 mm with additional driving planes



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		○ 30	○ 30					○ 25	○ 25				○ 80	○ 55					
		Cutting speed Vc m/min.						Please adjust these guidelines according to clamping operation and machine set-up.											



R mm	D mm	Drill Ø mm	L2 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
1.0	8.0	6	20	60	10.0	4	0.002	291304 0010	
1.5	9.0	6	20	60	10.0	4	0.002	291304 0015	
1.6	9.2	6	20	60	10.0	4	0.002	291304 0016	
2.0	10.0	6	20	60	10.0	4	0.003	291304 0020	
2.5	11.0	6	20	60	10.0	4	0.003	291304 0025	
3.0	12.0	6	15	60	12.0	4	0.003	291304 0030	
3.5	13.0	6	15	60	12.0	4	0.003	291304 0035	
4.0	14.0	6	15	60	12.0	4	0.004	291304 0040	
4.5	15.0	6	15	60	12.0	4	0.004	291304 0045	
5.0	16.0	6	15	60	12.0	4	0.004	291304 0050	
6.0	20.0	8	19	67	16.0	4	0.006	291304 0060	
6.5	21.0	8	23	71	16.0	4	0.006	291304 0065	
7.0	22.0	8	23	71	16.0	4	0.006	291304 0070	
7.5	23.0	8	23	71	16.0	4	0.009	291304 0075	

2107

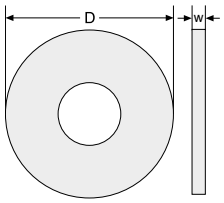
R mm	D mm	Drill Ø mm	L2 mm	L mm	D1 mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
8.0	24.0	8	23	71	16.0	4	0.009	291304 0080	
8.5	25.0	8	29	85	25.0	4	0.009	291304 0085	
9.0	26.0	8	29	85	25.0	4	0.009	291304 0090	
10.0	28.0	8	29	85	25.0	4	0.014	291304 0100	
10.5	31.0	10	34	90	25.0	4	0.014	291304 0105	
11.0	32.0	10	34	90	25.0	4	0.018	291304 0110	
12.0	34.0	10	34	90	25.0	4	0.021	291304 0120	
12.5	41.0	16	40	100	25.0	6	0.021	291304 0125	
13.0	42.0	16	40	100	25.0	6	0.021	291304 0130	
14.0	44.0	16	40	100	25.0	6	0.023	291304 0140	
15.0	46.0	16	44	100	25.0	6	0.023	291304 0150	
16.0	48.0	16	44	100	25.0	6	0.025	291304 0160	
18.0	52.0	16	52	112	32.0	6	0.028	291304 0180	
20.0	56.0	16	52	112	32.0	6	0.03	291304 0200	

2107

SARA® Disc milling cutters

HSS-E | DIN 1834 | Typ N

- **Narrow version**
- **3 cutting edges**
- Type N, cross-cut toothing
- Bore with longitudinal groove in accordance with DIN 138
- Smooth cut thanks to helical toothing
- Optimum chip removal with spacious chip chambers
- Milling cutters are self-freeing to prevent jamming





material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		○	○	○	○	○	○	○	○				○	○	○				
		24	19	13	8	8	8	23	23				150	150	40				
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		

D mm	w mm	Bore hole Ø mm	Number of teeth pc.	art.no.	€
63	1.6	22	28	210105 0001	
63	2.0	22	28	210105 0002	
63	2.5	22	28	210105 0003	
63	3.0	22	28	210105 0004	
63	4.0	22	28	210105 0005	
63	5.0	22	28	210105 0006	
80	1.6	27	32	210105 0007	
80	2.0	27	32	210105 0008	
80	3.0	27	32	210105 0010	
80	4.0	27	32	210105 0011	
80	5.0	27	32	210105 0012	
80	6.0	27	32	210105 0013	
100	1.6	32	36	210105 0014	
100	2.0	32	36	210105 0015	
100	2.5	32	36	210105 0016	
100	3.0	32	36	210105 0017	
100	4.0	32	36	210105 0018	
100	5.0	32	36	210105 0019	
100	6.0	32	36	210105 0020	
125	1.6	32	40	210105 0022	
125	2.0	32	40	210105 0023	

2103

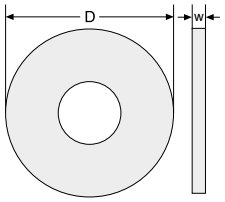
D mm	w mm	Bore hole Ø mm	Number of teeth pc.	art.no.	€
125	2.5	32	40	210105 0024	
125	3.0	32	40	210105 0025	
125	4.0	32	40	210105 0026	
125	5.0	32	40	210105 0027	
125	6.0	32	40	210105 0028	
125	8.0	32	32	210105 0029	
125	10.0	32	32	210105 0030	
160	2.0	40	48	210105 0031	
160	3.0	40	48	210105 0033	
160	4.0	40	48	210105 0034	
160	5.0	40	48	210105 0035	
160	6.0	40	48	210105 0036	
160	8.0	40	36	210105 0037	
160	10.0	40	36	210105 0038	
200	2.5	40	52	210105 0040	
200	3.0	40	52	210105 0041	
200	4.0	40	52	210105 0042	
200	6.0	40	52	210105 0044	
200	10.0	40	40	210105 0046	

2103

SARA® Disc milling cutters

HSS-E | DIN 885 | Typ N

- Type N, cross-cut toothing
- Bore with longitudinal groove in accordance with DIN 138
- Helix angle up to Ø 100 mm = 12°, from Ø 125 mm = 15°
- 3 cutting edges
- Milling cutters are self-freeing to prevent jamming





material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	○ 24	○ 19	○ 13	○ 8	○ 8	○ 8	○ 23	○ 23				○ 150	○ 150					
Cutting speed Vc m/min.									Please adjust these guidelines according to clamping operation and machine set-up.									

D mm	w mm	Bore hole Ø mm	Number of teeth pc.	art.no.	€
63	4	22	12	210115 0006	
63	5	22	12	210115 0007	
63	6	22	12	210115 0008	
63	8	22	12	210115 0009	
63	10	22	12	210115 0010	
63	14	22	12	210115 0012	
80	5	27	14	210115 0015	
80	6	27	14	210115 0016	
80	8	27	14	210115 0017	
80	10	27	14	210115 0018	
80	12	27	14	210115 0019	
80	14	27	14	210115 0020	
80	16	27	14	210115 0021	
100	6	32	14	210115 0024	

2103

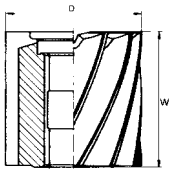
D mm	w mm	Bore hole Ø mm	Number of teeth pc.	art.no.	€
100	8	32	14	210115 0025	
100	10	32	14	210115 0026	
100	12	32	14	210115 0027	
100	14	32	14	210115 0028	
100	16	32	14	210115 0029	
125	8	32	16	210115 0034	
125	10	32	16	210115 0035	
125	12	32	16	210115 0036	
125	14	32	16	210115 0037	
125	16	32	16	210115 0038	
125	20	32	16	210115 0040	
160	8	40	18	210115 0044	
160	10	40	18	210115 0045	

2103

SARA® Shell end mills

HSS-E | DIN 841 | Typ N | 30°

- **With longitudinal and transverse grooves in accordance with DIN 138**
- Right-hand cutting, right-hand twist = 30°
- Profile relief grinding



material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	● 28	● 23	○ 18	○ 15	○ 15	13	25	○ 25				○ 140	○ 125	○ 50				
Cutting speed Vc m/min.									Please adjust these guidelines according to clamping operation and machine set-up.									

D mm	w mm	Bore hole Ø mm	Number of teeth pc.	**Type N, finishing** art.no.	€
30.0	30	13	6	210530 0001	
35.0	35	16	6	210530 0002	
40.0	20	16	8	210530 0003	
40.0	40	16	8	210530 0004	
50.0	50	22	8	210530 0005	
60.0	60	27	8	210530 0006	
75.0	75	27	10	210530 0007	

2104



SARA® Shell end mills

HSS-E | DIN 1880 | Typ N | NR | HR | 30° | TiAlN

- **With longitudinal and transverse grooves in accordance with DIN 138**
- Right-hand cutting, right-hand twist = 30°
- Profile relief grinding

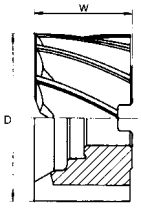
Type N: Finishing version
Type NR: Knuckle-type tooth profile for roughing work, chip separator with round profile, designed for large machining volumes
Type HR: Knuckle-type tooth profile for roughing work, chip separator with fine round profile, designed for high-strength materials

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 28	● 23	○ 18	○ 15	○ 15	○ 13	○ 25	○ 25				○ 140	○ 125	○ 50				
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

Type N, finishing version

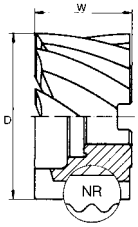
D mm	w mm	Bore hole Ø mm	Number of teeth pc.	art.no.	€	TiAlN art.no.	€
40.0	32	16	6	210501 0040		210506 0040	
50.0	36	22	8	210501 0050		210506 0050	
63.0	40	27	8	210501 0063		210506 0063	
80.0	45	27	10	210501 0080		210506 0080	
100.0	50	32	10	210501 0100			
				2104		2104	





Type NR, roughing version

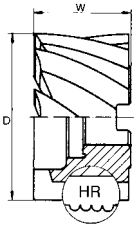
D mm	w mm	Bore hole Ø mm	Number of teeth pc.	art.no.	€
40.0	32	16	6	210520 0040	
50.0	36	22	6	210520 0050	
63.0	40	27	8	210520 0063	
80.0	45	27	8	210520 0080	
100.0	50	32	10	210520 0100	
				2104	





Type HR, roughing version

D mm	w mm	Bore hole Ø mm	Number of teeth pc.	TiAlN art.no.	€
40.0	32	16	8	210523 0040	
50.0	36	22	8	210523 0050	
63.0	40	27	10	210523 0063	
80.0	45	27	10	210523 0080	
100.0	50	32	12	210523 0100	
				2104	









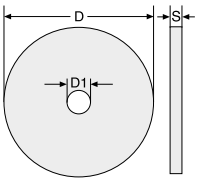
PALBIT
Machining tools
908 pages
Art.no. 019900 0317

Overview of all free manufacturers' catalogues
on page 20/21

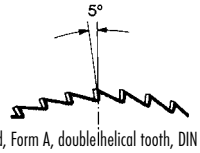
SARA® Metal circular saw blade

HSS | DIN 1837 | Typ N | 726

- **Fine-toothed**
- **Double helical tooth, form A,** lateral bevel grinding (hollow-ground)
- Hole without keyway
- For fine slotting and end-to-end cutting work, for low-depth cutting or for thin-walled materials



S = cutting thickness



Fine-toothed, Form A, doublehelical tooth, DIN 1840 (rake angle 5°)



material — ● very well suited ○ well suited

steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
○ 35	○ 20	○ 13	○ 11	○ 11		○ 35	○ 28				○ 260	○ 260					

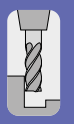
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Thickness of cutting edge mm	D1 mm	Number of teeth pc.	art.no.	€
20.0	0.2	5	80	200101 0001	
20.0	0.25	5	64	200101 0002	
20.0	0.3	5	64	200101 0003	
20.0	0.4	5	64	200101 0004	
20.0	0.5	5	48	200101 0005	
20.0	0.6	5	48	200101 0006	
20.0	0.8	5	48	200101 0007	
20.0	1.0	5	40	200101 0008	
20.0	1.2	5	40	200101 0009	
20.0	1.6	5	40	200101 0010	
20.0	2.0	5	32	200101 0011	
20.0	2.5	5	32	200101 0012	
20.0	3.0	5	32	200101 0013	
20.0	4.0	5	24	200101 0014	
20.0	5.0	5	24	200101 0015	
20.0	6.0	5	24	200101 0016	
25.0	0.2	8	80	200101 0017	
25.0	0.25	8	80	200101 0018	
25.0	0.3	8	80	200101 0019	
25.0	0.4	8	64	200101 0020	
25.0	0.5	8	64	200101 0021	
25.0	0.6	8	64	200101 0022	
25.0	0.8	8	48	200101 0023	
25.0	1.0	8	48	200101 0024	
25.0	1.2	8	48	200101 0025	
25.0	1.6	8	40	200101 0026	
25.0	2.0	8	40	200101 0027	
25.0	2.5	8	40	200101 0028	
25.0	3.0	8	32	200101 0029	
25.0	4.0	8	32	200101 0030	
25.0	5.0	8	32	200101 0031	
25.0	6.0	8	24	200101 0032	
32.0	0.2	8	100	200101 0033	
32.0	0.25	8	100	200101 0034	
32.0	0.3	8	80	200101 0035	
32.0	0.4	8	80	200101 0036	
32.0	0.5	8	80	200101 0037	
32.0	0.6	8	64	200101 0038	

2101

D mm	Thickness of cutting edge mm	D1 mm	Number of teeth pc.	art.no.	€
32.0	0.8	8	64	200101 0039	
32.0	1.0	8	64	200101 0040	
32.0	1.2	8	48	200101 0041	
32.0	1.6	8	48	200101 0042	
32.0	2.0	8	48	200101 0043	
32.0	2.5	8	40	200101 0044	
32.0	3.0	8	40	200101 0045	
32.0	4.0	8	40	200101 0046	
32.0	5.0	8	32	200101 0047	
32.0	6.0	8	32	200101 0048	
40.0	0.2	10	128	200101 0049	
40.0	0.25	10	100	200101 0050	
40.0	0.3	10	100	200101 0051	
40.0	0.4	10	100	200101 0052	
40.0	0.5	10	80	200101 0053	
40.0	0.6	10	80	200101 0054	
40.0	0.8	10	80	200101 0055	
40.0	1.0	10	64	200101 0056	
40.0	1.2	10	64	200101 0057	
40.0	1.6	10	64	200101 0058	
40.0	2.0	10	48	200101 0059	
40.0	2.5	10	48	200101 0060	
40.0	3.0	10	48	200101 0061	
40.0	4.0	10	40	200101 0062	
40.0	5.0	10	40	200101 0063	
40.0	6.0	10	40	200101 0064	
50.0	0.2	13	128	200101 0065	
50.0	0.25	13	128	200101 0066	
50.0	0.3	13	128	200101 0067	
50.0	0.4	13	100	200101 0068	
50.0	0.5	13	100	200101 0069	
50.0	0.6	13	100	200101 0070	
50.0	0.8	13	80	200101 0071	
50.0	1.0	13	80	200101 0072	
50.0	1.2	13	80	200101 0073	
50.0	1.6	13	64	200101 0074	
50.0	2.0	13	64	200101 0075	
50.0	2.5	13	64	200101 0076	

2101



D mm	Thickness of cutting edge mm	D1 mm	Number of teeth pc.	art.no.	€
50.0	3.0	13	48	200101 0077	
50.0	4.0	13	48	200101 0078	
50.0	5.0	13	48	200101 0079	
50.0	6.0	13	40	200101 0080	
63.0	0.25	16	160	200101 0081	
63.0	0.3	16	128	200101 0082	
63.0	0.4	16	128	200101 0083	
63.0	0.5	16	128	200101 0084	
63.0	0.6	16	100	200101 0085	
63.0	0.8	16	100	200101 0086	
63.0	1.0	16	100	200101 0087	
63.0	1.2	16	80	200101 0088	
63.0	1.6	16	80	200101 0089	
63.0	2.0	16	80	200101 0090	
63.0	2.5	16	64	200101 0091	
63.0	3.0	16	64	200101 0092	
63.0	4.0	16	64	200101 0093	
63.0	5.0	16	48	200101 0094	
63.0	6.0	16	48	200101 0095	
80.0	0.3	22	160	200101 0096	
80.0	0.4	22	160	200101 0097	
80.0	0.5	22	128	200101 0098	
80.0	0.6	22	128	200101 0099	
80.0	0.8	22	128	200101 0100	
80.0	1.0	22	100	200101 0101	
80.0	1.2	22	100	200101 0102	
80.0	1.6	22	100	200101 0103	
80.0	2.0	22	80	200101 0104	
80.0	2.5	22	80	200101 0105	
80.0	3.0	22	80	200101 0106	
80.0	4.0	22	64	200101 0107	
80.0	5.0	22	64	200101 0108	
80.0	6.0	22	64	200101 0109	
100.0	0.5	22	160	200101 0110	
100.0	0.6	22	160	200101 0111	
100.0	0.8	22	128	200101 0112	
100.0	1.0	22	128	200101 0113	
100.0	1.2	22	128	200101 0114	

2101

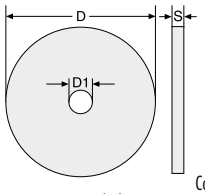
D mm	Thickness of cutting edge mm	D1 mm	Number of teeth pc.	art.no.	€
100.0	1.6	22	100	200101 0115	
100.0	2.0	22	100	200101 0116	
100.0	2.5	22	100	200101 0117	
100.0	3.0	22	80	200101 0118	
100.0	4.0	22	80	200101 0119	
100.0	5.0	22	80	200101 0120	
100.0	6.0	22	64	200101 0121	
125.0	0.6	22	160	200101 0122	
125.0	0.8	22	160	200101 0123	
125.0	1.0	22	160	200101 0124	
125.0	1.2	22	128	200101 0125	
125.0	1.6	22	128	200101 0126	
125.0	2.0	22	128	200101 0127	
125.0	2.5	22	100	200101 0128	
125.0	3.0	22	100	200101 0129	
125.0	4.0	22	100	200101 0130	
125.0	5.0	22	80	200101 0131	
125.0	6.0	22	80	200101 0132	
160.0	1.0	32	160	200101 0133	
160.0	1.2	32	160	200101 0134	
160.0	1.6	32	160	200101 0135	
160.0	2.0	32	128	200101 0136	
160.0	2.5	32	128	200101 0137	
160.0	3.0	32	128	200101 0138	
160.0	4.0	32	100	200101 0139	
160.0	5.0	32	100	200101 0140	
160.0	6.0	32	100	200101 0141	
200.0	1.0	32	200	200101 0142	
200.0	1.2	32	200	200101 0143	
200.0	1.6	32	160	200101 0144	
200.0	2.0	32	160	200101 0145	
200.0	2.5	32	160	200101 0146	
200.0	3.0	32	128	200101 0147	
200.0	4.0	32	128	200101 0148	
200.0	5.0	32	128	200101 0149	
200.0	6.0	32	100	200101 0150	

2101

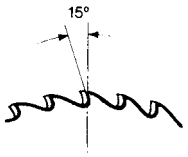
SARA® Metal circular saw blade

HSS | DIN 1838 | Typ N | 726

- **Coarse-toothed**
- **With curved tooth, form B,** lateral bevel grinding (hollow-ground)
- Hole without keyway
- For coarse slotting and end-to-end cutting work, and for machining with large cutting depths and cross-sections up to max. 100 mm depending on dimensions, pitch, number of teeth and feed rate/ cutting speed



S = cutting thickness



Coarse-toothed, Form B, curved tooth, DIN 1840 (rake angle 15°)



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		○	○	○	○	○		●	●				○	○					
		35	20	13	11	11		35	28				260	260					
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		

D mm	Thickness of cutting edge mm	D1 mm	Number of teeth pc.	art.no.	€
50.0	0.5	13	48	200105 0001	
50.0	0.6	13	48	200105 0002	
50.0	0.8	13	40	200105 0003	
50.0	1.0	13	40	200105 0004	
50.0	1.2	13	40	200105 0005	
50.0	1.6	13	32	200105 0006	
50.0	2.0	13	32	200105 0007	
50.0	2.5	13	32	200105 0008	
50.0	3.0	13	24	200105 0009	
50.0	4.0	13	24	200105 0010	
50.0	5.0	13	24	200105 0011	
50.0	6,0	13	20	200105 0012	
63.0	0.5	16	64	200105 0013	
63.0	0.6	16	48	200105 0014	
63.0	0.8	16	48	200105 0015	
63.0	1.0	16	48	200105 0016	
63.0	1.2	16	40	200105 0017	
63.0	1.6	16	40	200105 0018	
63.0	2.0	16	40	200105 0019	
63.0	2.5	16	32	200105 0020	
63.0	3.0	16	32	200105 0021	
63.0	4.0	16	32	200105 0022	
63.0	5.0	16	24	200105 0023	
63.0	6.0	16	24	200105 0024	
80.0	0.5	22	64	200105 0025	
80.0	0.6	22	64	200105 0026	
80.0	0.8	22	64	200105 0027	
80.0	1.0	22	48	200105 0028	
80.0	1.2	22	48	200105 0029	
80.0	1.6	22	48	200105 0030	
80.0	2.0	22	40	200105 0031	
80.0	2.5	22	40	200105 0032	
80.0	3.0	22	40	200105 0033	
80.0	4.0	22	32	200105 0034	
80.0	5.0	22	32	200105 0035	
80.0	6.0	22	32	200105 0036	
100.0	0.6	22	80	200105 0037	
100.0	0.8	22	64	200105 0038	
100.0	1.0	22	64	200105 0039	
100.0	1.2	22	64	200105 0040	
100.0	1.6	22	48	200105 0041	

2101

D mm	Thickness of cutting edge mm	D1 mm	Number of teeth pc.	art.no.	€
100.0	2.0	22	48	200105 0042	
100.0	2.5	22	48	200105 0043	
100.0	3.0	22	40	200105 0044	
100.0	4.0	22	40	200105 0045	
100.0	5.0	22	40	200105 0046	
100.0	6.0	22	32	200105 0047	
125.0	0.8	22	80	200105 0048	
125.0	1.0	22	80	200105 0049	
125.0	1.2	22	64	200105 0050	
125.0	1.6	22	64	200105 0051	
125.0	2.0	22	64	200105 0052	
125.0	2.5	22	48	200105 0053	
125.0	3.0	22	48	200105 0054	
125.0	4.0	22	48	200105 0055	
125.0	5.0	22	40	200105 0056	
125.0	6.0	22	40	200105 0057	
160.0	1.0	32	80	200105 0058	
160.0	1.2	32	80	200105 0059	
160.0	1.6	32	80	200105 0060	
160.0	2.0	32	64	200105 0061	
160.0	2.5	32	64	200105 0062	
160.0	3.0	32	64	200105 0063	
160.0	4.0	32	48	200105 0064	
160.0	5.0	32	48	200105 0065	
160.0	6.0	32	48	200105 0066	
200.0	1.0	32	100	200105 0067	
200.0	1.2	32	100	200105 0068	
200.0	1.6	32	80	200105 0069	
200.0	2.0	32	80	200105 0070	
200.0	2.5	32	80	200105 0071	
200.0	3.0	32	64	200105 0072	
200.0	4.0	32	64	200105 0073	
200.0	5.0	32	64	200105 0074	
200.0	6.0	32	48	200105 0075	
250.0	1.6	32	100	200105 0076	
250.0	2.0	32	100	200105 0077	
250.0	2.5	32	80	200105 0078	
250.0	3.0	32	80	200105 0079	
250.0	4.0	32	80	200105 0080	
250.0	5.0	32	64	200105 0081	
250.0	6.0	32	64	200105 0082	

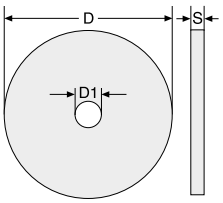
2101

SARA® Metal circular saw blade

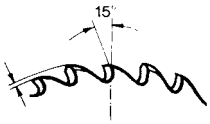
HSS | DIN 1838 | Typ N | 726

- **Coarse-toothed**
- **Curved toothing with lead and raker teeth (HZ toothing)**
- Lateral bevel grinding (hollow grinding), bore hole without keyway
- This tooth form is primarily used for end-to-end cutting as the raised lead tooth makes it impossible to achieve a straight finish at the base of the cut with non-continuous cutting or milling. Otherwise, these blades can be used as specified in DIN 1838 B.





S = cutting thickness



Coarse-toothed/HZ, Form C, curved tooth, DIN 1840 (rake angle 15°)

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		○	○	○	○	○		○	○				○	○					
		35	20	13	11	11		35	28				260	260					
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		

D mm	Thickness of cutting edge mm	D1 mm	Number of teeth pc.	art.no.	€
50.0	1.0	13	40	200110 0001	
50.0	1.2	13	40	200110 0002	
50.0	1.6	13	32	200110 0003	
50.0	2.0	13	32	200110 0004	
50.0	2.5	13	32	200110 0005	
50.0	4.0	13	24	200110 0007	
50.0	5.0	13	24	200110 0008	
50.0	6.0	13	20	200110 0009	
63.0	1.0	16	48	200110 0010	
63.0	1.2	16	40	200110 0011	
63.0	1.6	16	40	200110 0012	
63.0	2.0	16	40	200110 0013	
63.0	2.5	16	32	200110 0014	
63.0	3.0	16	32	200110 0015	
63.0	4.0	16	32	200110 0016	
63.0	5.0	16	24	200110 0017	
63.0	6.0	16	24	200110 0018	
80.0	1.0	22	48	200110 0019	
80.0	1.2	22	48	200110 0020	
80.0	1.6	22	48	200110 0021	
80.0	2.0	22	40	200110 0022	
80.0	2.5	22	40	200110 0023	
80.0	3.0	22	40	200110 0024	
80.0	4.0	22	32	200110 0025	
80.0	5.0	22	32	200110 0026	
80.0	6.0	22	32	200110 0027	
100.0	1.0	22	64	200110 0028	
100.0	1.2	22	64	200110 0029	
100.0	1.6	22	48	200110 0030	
100.0	2.0	22	48	200110 0031	
100.0	2.5	22	48	200110 0032	
100.0	3.0	22	40	200110 0033	
100.0	4.0	22	40	200110 0034	
100.0	5.0	22	40	200110 0035	

2101

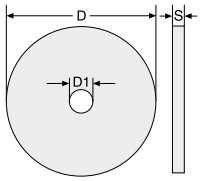
D mm	Thickness of cutting edge mm	D1 mm	Number of teeth pc.	art.no.	€
100.0	6.0	22	32	200110 0036	
125.0	1.0	22	80	200110 0037	
125.0	1.2	22	64	200110 0038	
125.0	1.6	22	64	200110 0039	
125.0	2.0	22	64	200110 0040	
125.0	2.5	22	48	200110 0041	
125.0	3.0	22	48	200110 0042	
125.0	4.0	22	48	200110 0043	
125.0	5.0	22	40	200110 0044	
125.0	6.0	22	40	200110 0045	
160.0	1.0	32	80	200110 0046	
160.0	1.2	32	80	200110 0047	
160.0	1.6	32	80	200110 0048	
160.0	2.0	32	64	200110 0049	
160.0	2.5	32	64	200110 0050	
160.0	3.0	32	64	200110 0051	
160.0	4.0	32	48	200110 0052	
160.0	5.0	32	48	200110 0053	
160.0	6.0	32	48	200110 0054	
200.0	1.2	32	100	200110 0056	
200.0	1.6	32	80	200110 0057	
200.0	2.0	32	80	200110 0058	
200.0	2.5	32	80	200110 0059	
200.0	3.0	32	64	200110 0060	
200.0	4.0	32	64	200110 0061	
200.0	5.0	32	64	200110 0062	
200.0	6.0	32	48	200110 0063	
250.0	1.6	32	100	200110 0064	
250.0	2.0	32	100	200110 0065	
250.0	2.5	32	80	200110 0066	
250.0	3.0	32	80	200110 0067	
250.0	4.0	32	80	200110 0068	
250.0	5.0	32	64	200110 0069	
250.0	6.0	32	64	200110 0070	

2101

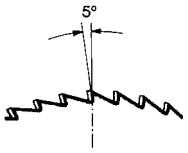
SARA® Solid carbide circular saw blade

VHM | DIN 1837 | 727

- **Fine-toothed**
- **Double helical tooth, form A,** lateral bevel grinding (hollow-ground)
- Hole without keyway
- For fine slotting and end-to-end cutting work, for low-depth cutting or for thin-walled materials



S = cutting thickness



Fine-toothed, Form A, double helical tooth, DIN 1840 (rake angle 5°)



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		○ 125	○ 100		○ 70	○ 70			○ 70	○ 50			○ 900	○ 900	○ 250				
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		

D mm	Thickness of cutting edge mm	D1 mm	Number of teeth pc.	art.no.	€
20	0.25	5	64	202001 0033	
20	0.3	5	64	202001 0034	
20	0.5	5	48	202001 0037	
20	0.6	5	48	202001 0038	
20	1.0	5	40	202001 0042	
20	1.6	5	40	202001 0048	
25	0.2	8	80	202001 0061	
25	0.3	8	80	202001 0063	
25	0.4	8	64	202001 0065	
25	0.5	8	64	202001 0066	
25	0.6	8	64	202001 0067	
25	0.7	8	48	202001 0068	
25	1.0	8	48	202001 0071	
25	1.2	8	40	202001 0073	
25	1.6	8	40	202001 0077	
25	2.0	8	40	202001 0081	
30	0.25	8	100	202001 0091	
30	0.3	8	80	202001 0092	
30	0.4	8	80	202001 0094	
30	0.5	8	80	202001 0095	
30	0.6	8	64	202001 0096	
30	0.8	8	64	202001 0098	
30	1.0	8	64	202001 0100	
30	1.2	8	48	202001 0102	
30	1.6	8	48	202001 0106	
30	2.0	8	48	202001 0110	
30	2.5	8	40	202001 0111	
40	0.4	10	100	202001 0123	
40	0.5	10	80	202001 0124	
40	0.6	10	80	202001 0125	
40	0.8	10	80	202001 0127	
40	1.0	10	64	202001 0129	
40	1.2	10	64	202001 0131	
40	1.6	10	64	202001 0135	
40	2.0	10	48	202001 0139	
40	2.5	10	48	202001 0140	
40	3.0	10	48	202001 0141	
50	0.5	13	100	202001 0151	
50	0.6	13	100	202001 0152	
50	0.8	13	80	202001 0154	
50	1.0	13	80	202001 0156	

2142

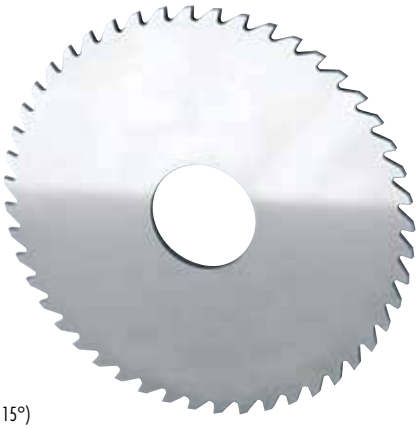
D mm	Thickness of cutting edge mm	D1 mm	Number of teeth pc.	art.no.	€
50	1.2	13	80	202001 0158	
50	1.6	13	64	202001 0162	
50	2.0	13	64	202001 0166	
50	2.5	13	64	202001 0167	
50	3.0	13	48	202001 0168	
63	0.3	16	128	202001 0175	
63	0.4	16	128	202001 0177	
63	0.5	16	128	202001 0178	
63	0.6	16	100	202001 0179	
63	0.8	16	100	202001 0181	
63	1.0	16	100	202001 0183	
63	1.2	16	80	202001 0185	
63	1.6	16	80	202001 0189	
63	2.0	16	80	202001 0193	
63	2.5	16	64	202001 0194	
63	3.0	16	64	202001 0195	
80	0.5	22	128	202001 0203	
80	0.6	22	128	202001 0204	
80	0.8	22	128	202001 0206	
80	1.0	22	100	202001 0208	
80	1.2	22	100	202001 0210	
80	1.6	22	100	202001 0214	
80	2.0	22	80	202001 0218	
80	2.5	22	80	202001 0219	
80	3.0	22	80	202001 0220	
100	0.6	22	160	202001 0226	
100	0.8	22	128	202001 0228	
100	1.0	22	128	202001 0230	
100	1.2	22	128	202001 0232	
100	1.6	22	100	202001 0236	
100	2.0	22	100	202001 0240	
100	3.0	22	80	202001 0242	
125	0.8	22	160	202001 0249	
125	1.0	22	160	202001 0251	
125	1.2	22	128	202001 0253	
125	1.6	22	128	202001 0257	
125	2.0	22	128	202001 0261	
125	3.0	22	100	202001 0263	
160	1.0	32	160	202001 0268	
160	2.5	32	128	202001 0273	
160	3.0	32	128	202001 0274	

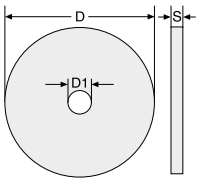
2142

SARA® Solid carbide circular saw blade

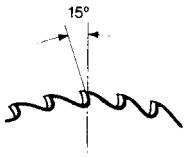
VHM | DIN 1838 | 727

- **Coarse-toothed**
- **With curved tooth, form B,** lateral bevel grinding (hollow-ground)
- Hole without keyway
- For coarse slotting and end-to-end cutting work, and for machining with large cutting depths and cross-sections up to max. 100 mm depending on dimensions, pitch, number of teeth and feed rate/cutting speed





S = cutting thickness



Coarse-toothed, Form B, curved tooth, DIN 1840 (rake angle 15°)

material

● very well suited
○ well suited

steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
○ 125	○ 100		○ 70	○ 70	○ 50	○ 90	○ 70	○ 50			○ 900	○ 900	○ 250				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.

D mm	Thickness of cutting edge mm	D1 mm	Number of teeth pc.	art.no.	€
20	0.25	5	20	202002 0022	
20	0.3	5	20	202002 0023	
20	0.5	5	20	202002 0025	
20	0.6	5	20	202002 0026	
20	1.0	5	20	202002 0030	
20	1.6	5	20	202002 0033	
25	0.2	8	20	202002 0041	
25	0.5	8	20	202002 0045	
25	0.6	8	20	202002 0046	
25	0.8	8	20	202002 0048	
25	1.0	8	20	202002 0050	
25	1.2	8	20	202002 0051	
25	1.6	8	20	202002 0053	
25	2.0	8	20	202002 0055	
30	0.4	8	30	202002 0064	
30	0.5	8	30	202002 0065	
30	0.6	8	30	202002 0066	
30	0.8	8	24	202002 0068	
30	1.0	8	24	202002 0070	
30	1.2	8	24	202002 0071	
30	1.6	8	24	202002 0073	
30	2.0	8	24	202002 0075	
30	2.5	8	24	202002 0076	
40	0.4	10	40	202002 0084	
40	0.5	10	40	202002 0085	
40	0.6	10	40	202002 0086	
40	0.8	10	32	202002 0088	
40	1.0	10	32	202002 0090	
40	1.2	10	32	202002 0091	
40	1.6	10	32	202002 0093	
40	2.0	10	32	202002 0095	
40	2.5	10	32	202002 0096	
40	3.0	10	32	202002 0097	
50	0.5	13	48	202002 0102	
50	0.6	13	48	202002 0103	
50	0.8	13	40	202002 0105	
50	1.0	13	40	202002 0107	

2142

D mm	Thickness of cutting edge mm	D1 mm	Number of teeth pc.	art.no.	€
50	1.2	13	40	202002 0108	
50	1.6	13	32	202002 0110	
50	2.0	13	32	202002 0112	
50	2.5	13	32	202002 0113	
50	3.0	13	24	202002 0114	
63	0.5	16	64	202002 0119	
63	0.6	16	48	202002 0120	
63	0.8	16	48	202002 0122	
63	1.0	16	48	202002 0124	
63	1.2	16	40	202002 0125	
63	1.6	16	40	202002 0127	
63	2.0	16	40	202002 0129	
63	2.5	16	32	202002 0130	
63	3.0	16	32	202002 0131	
80	0.6	22	64	202002 0135	
80	0.8	22	64	202002 0137	
80	1.0	22	48	202002 0139	
80	1.2	22	48	202002 0140	
80	1.6	22	48	202002 0142	
80	2.0	22	40	202002 0144	
80	2.5	22	40	202002 0145	
80	3.0	22	40	202002 0146	
100	0.6	22	80	202002 0150	
100	0.8	22	64	202002 0152	
100	1.0	22	64	202002 0154	
100	1.2	22	64	202002 0155	
100	1.6	22	48	202002 0157	
100	2.0	22	48	202002 0159	
100	3.0	22	40	202002 0161	
125	0.8	22	80	202002 0165	
125	1.0	22	80	202002 0167	
125	1.2	22	64	202002 0168	
125	1.6	22	64	202002 0170	
125	2.0	22	64	202002 0172	
125	2.5	22	48	202002 0173	
125	3.0	22	48	202002 0174	

2142

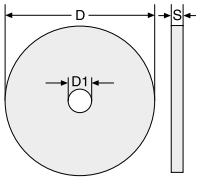
SARA® Metal circular saw blade, precision version

HSS HSS-E

- Precision version for use on slow-running circular saw machines or cold circular saws from various manufacturers (ADIGE, EISELE, BERG&SCHMID, IBP, THOMAS, MEP, KALTENBACH, TRENNJÄGER, HÄBERLE etc.)
- Steam-treated surface to prevent material welding, enhance coolant absorption and increase wear resistance
- **Quantity and dimensions of driving pin holes: (quantity / bore hole Ø / pitch circle Ø)**

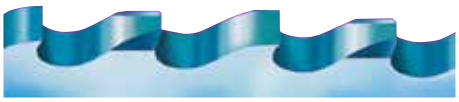


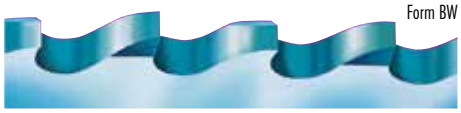
Usage recommendation for
tooth pitch t: 3 + 4
tooth form BW = profiles and pipes, wall thickness 1.0-2.0 mm
approx. 40-60 rpm depending on diameter
tooth pitch t: 5
tooth form BW = profiles and pipes, wall thickness 2.0-3.0 mm
approx. 40-60 rpm depending on diameter
solid material, cross section 10-20 mm,
approx. 20-40 rpm depending on diameter
tooth pitch t: 6 + 8
tooth form HZ = solid material, cross section 20-40 mm
approx. 20-40 rpm depending on diameter
tooth pitch t: 10
tooth form HZ = solid material, cross section 40-60 mm
approx. 20-40 rpm depending on diameter



S = cutting thickness

Note: Please ensure that the saw blade is undamaged, that it has been mounted correctly, that there is sufficient cooling, that the blade is engaged correctly and that workpieces are properly secured to prevent slippage. Failure to do so puts the saw blade at risk of breaking!


Form BW


Form HZ

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		○	○	○	○	○	○	●	●				●	●	●				
	Cutting speed Vc m/min.	40	28	15	14	14	13	28	28				250	250	38				
	Please adjust these guidelines according to clamping operation and machine set-up.																		

D mm	Thickness of cutting edge mm	D1 mm	Tooth pitch	Number of teeth pc.	Side holes	HSS art.no.	€	HSS Co5 art.no.	€
225.0	2.0	32	4	180	2/8/45 + 2/11/63 + 4/9/50	200150 0104		200151 0104	
225.0	2.0	32	6	120		200150 0106		200151 0106	
225.0	2.0	32	8	90		200150 0108		200151 0108	
225.0	2.0	40	4	180	2/8/55 + 4/12/64	200150 0204		200151 0204	
225.0	2.0	40	6	120		200150 0206		200151 0206	
225.0	2.0	40	8	90		200150 0208		200151 0208	
250.0	2.0	32	4	200	2/8/45 + 2/11/63 + 4/9/50	200150 0304		200151 0304	
250.0	2.0	32	5	160		200150 0305		200151 0305	
250.0	2.0	32	6	128		200150 0306		200151 0306	
250.0	2.0	32	8	100		200150 0308		200151 0308	
250.0	2.0	40	4	200	2/8/55 + 4/12/64	200150 0404		200151 0404	
250.0	2.0	40	5	160		200150 0405		200151 0405	
250.0	2.0	40	6	128		200150 0406		200151 0406	
250.0	2.0	40	8	100		200150 0408		200151 0408	
275.0	2.5	32	4	220	2/8/45 + 2/11/63 + 4/9/50	200150 0504		200151 0504	
275.0	2.5	32	5	180		200150 0505		200151 0505	
275.0	2.5	32	6	140		200150 0506		200151 0506	
275.0	2.5	32	8	110		200150 0508		200151 0508	
275.0	2.5	32	10	90		200150 0510		200151 0510	
275.0	2.5	40	4	220	2/8/55 + 4/12/64	200150 0604		200151 0604	
275.0	2.5	40	5	180		200150 0605		200151 0605	
275.0	2.5	40	6	140		200150 0606		200151 0606	
275.0	2.5	40	8	110		200150 0608		200151 0608	
275.0	2.5	40	10	84		200150 0610		200151 0610	
300.0	2.5	32	4	240	2/8/45 + 2/11/63 + 4/9/50	200150 0704		200151 0704	
300.0	2.5	32	6	160		200150 0706		200151 0706	
						2102		2102	

D mm	Thickness of cutting edge mm	D1 mm	Tooth pitch	Number of teeth pc.	Side holes	HSS art.no.	€	HSS Co5 art.no.	€
315.0	2.5	32	4	250		200150 0904		200151 0904	
315.0	2.5	32	5	200		200150 0905		200151 0905	
315.0	2.5	32	6	160	2/8/45 + 2/11/63 + 4/9/50	200150 0906		200151 0906	
315.0	2.5	32	8	120		200150 0908		200151 0908	
315.0	2.5	32	10	100		200150 0910		200151 0910	
315.0	2.5	40	4	250		200150 1004		200151 1004	
315.0	2.5	40	5	200		200150 1005		200151 1005	
315.0	2.5	40	6	160	2/8/55 + 4/12/64	200150 1006		200151 1006	
315.0	2.5	40	8	120		200150 1008		200151 1008	
315.0	2.5	40	10	100		200150 1010		200151 1010	
315.0	3.0	32	4	250		200150 1104		200151 1104	
315.0	3.0	32	5	200		200150 1105		200151 1105	
315.0	3.0	32	6	160	2/8/45 + 2/11/63 + 4/9/50	200150 1106		200151 1106	
315.0	3.0	32	8	120		200150 1108		200151 1108	
315.0	3.0	32	10	100		200150 1110		200151 1110	
315.0	3.0	40	4	250		200150 1204		200151 1204	
315.0	3.0	40	5	200		200150 1205		200151 1205	
315.0	3.0	40	6	160		200150 1206		200151 1206	
315.0	3.0	40	8	120		200150 1208		200151 1208	
315.0	3.0	40	10	100		200150 1210		200151 1210	
350.0	3.0	32	5	220		200150 1305		200151 1305	
350.0	3.0	32	6	180		200150 1306		200151 1306	
350.0	3.0	32	7	160	2/8/55 + 4/12/64	200150 1307		200151 1307	
350.0	3.0	32	8	140		200150 1308		200151 1308	
350.0	3.0	32	10	110		200150 1310		200151 1310	
350.0	3.0	40	5	220		200150 1405		200151 1405	
350.0	3.0	40	6	180		200150 1406		200151 1406	
350.0	3.0	40	7	160		200150 1407		200151 1407	
350.0	3.0	40	8	140		200150 1408		200151 1408	
350.0	3.0	40	10	110		200150 1410		200151 1410	
370.0	3.0	50	7	160		200150 1507		200151 1507	
370.0	3.0	50	9	120		200150 1509		200151 1509	
370.0	3.0	50	11	100		200150 1512		200151 1512	
400.0	3.0	50	6	200	4/15/80 + 4/14/85	200150 1606		200151 1606	
400.0	3.0	50	8	160		200150 1608		200151 1608	
400.0	3.0	50	10	120		200150 1610		200151 1610	
400.0	3.0	50	12	100		200150 1612		200151 1612	
						2102		2102	





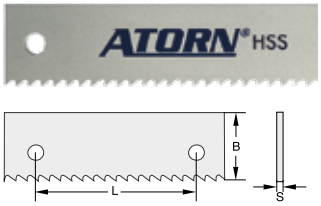
STAHLWILLE
Hand tools
401 pages
Art.no. 019900 5633

Overview of all free manufacturers' catalogues on page 20/21

ATORN Machine saw blades HSS

HSS

- Precision-machined machine saw blade HSS with special heat treatment for a long service life
- Very high surface quality for exact and straight cutting
- High-quality cutting material for high demands on service life
- **Use:** for precise, quick and efficient sawing
- **Quality:** HSS DMo 5 Quality (Material No. 1.3343)
- **For materials up to a tensile strength of 1100 N/mm²**



material — ● very well suited ○ well suited

steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
● 35	● 25	● 15					● 28				● 40	● 42	● 38				

Cutting speed Vc m/min. — Please adjust these guidelines according to clamping operation and machine set-up.

L mm	Width mm	Thickness mm	Number of teeth per inch	art.no.	€
300	25	1.5	10	620520 3010	
300	25	1.5	14	620520 3014	
350	30	1.5	6	620520 3506	
350	30	1.5	8	620520 3508	
350	30	1.5	10	620520 3510	
350	30	1.5	14	620520 3514	
350	30	2.0	4	620520 3604	
350	30	2.0	6	620520 3606	
350	30	2.0	8	620520 3608	
350	30	2.0	10	620520 3610	
400	25	1.25	14	620520 4014	
400	25	1.25	22	620520 4022	
400	25	1.5	10	620520 4110	
400	25	1.5	14	620520 4114	
400	30	1.5	6	620520 4106	
400	30	1.5	8	620520 4108	
400	30	1.5	10	620520 4210	
400	30	1.5	14	620520 4214	
400	30	1.5	18	620520 4218	
400	30	1.5	22	620520 4222	

6132

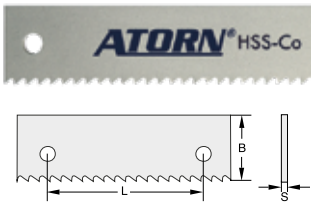
L mm	Width mm	Thickness mm	Number of teeth per inch	art.no.	€
400	30	2.0	4	620520 4304	
400	30	2.0	6	620520 4306	
400	30	2.0	8	620520 4308	
400	30	2.0	10	620520 4310	
400	40	2.0	4	620520 4404	
400	40	2.0	6	620520 4406	
400	40	2.0	8	620520 4408	
450	30	2.0	6	620520 4506	
450	30	2.0	8	620520 4508	
450	40	2.0	4	620520 4604	
450	40	2.0	6	620520 4606	
450	40	2.0	8	620520 4608	
450	40	2.0	10	620520 4610	
500	40	2.0	4	620520 5006	
500	40	2.0	6	620520 5008	
550	50	2.5	6	620520 5506	
600	50	2.5	6	620520 6006	
650	50	2.5	4	620520 6504	
650	50	2.5	6	620520 6506	

6132

ATORN Machine saw blades HSS-Co

HSS-E

- Long service life and short cutting times
- Cobalt-alloyed machine saw blades are particularly suitable for tough and hard materials such as alloyed, unalloyed and heat-treated steel, as well as high-strength steel and stainless steel.
- High-quality cutting material for high demands on service life
- **Use:** for precise, quick and efficient sawing
- **Quality:** HSS-Co. EMo 5 Co 5 Quality (Material No. 1.3243).
- **For extremely hard materials up to 1300 N/mm² e.g. austenitic steels and steels with a high chromium-nickel content**



material — ● very well suited ○ well suited

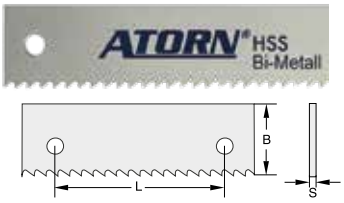
steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
● 35	● 25	● 15	● 12	● 10			● 28	● 4	○ 5	● 8	● 40	● 42	● 38				

Cutting speed Vc m/min. — Please adjust these guidelines according to clamping operation and machine set-up.

L mm	Width mm	Thickness mm	Number of teeth per inch	art.no.	€
400	32	2.0	4	620521 4004	
400	32	2.0	6	620521 4006	
400	32	2.0	8	620521 4008	
450	40	2.0	4	620521 4504	
450	40	2.0	6	620521 4506	
450	40	2.0	8	620521 4508	

6132

ATORN Machine saw blades HSS bi-metal



- Long service life and short cutting times
- The perfect combination of flexibility and durability with special heat treatment for a long service life
- Very high surface quality for exact and straight cutting
- **Use:** for precise, quick and efficient sawing
- **Quality:** HSS bi-metal, DMo 5-cutting edge quality (Material No. 1.3343) on a special steel back
- **For materials up to a tensile strength of 1100 N/mm²**

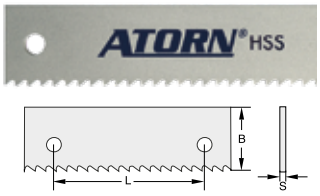
material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	○					●				●	●	●				
		35	25	15					28				40	42	38				
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		

L mm	Width mm	Thickness mm	Number of teeth per inch	art.no.	€
300	32	1.6	10	620522 3010	
350	32	1.6	6	620522 3506	
350	32	1.6	8	620522 3508	
400	32	1.6	4	620522 4004	
400	32	1.6	6	620522 4006	
400	32	1.6	8	620522 4008	
500	38	1.9	6	620522 5006	
500	50	2.5	6	620522 5106	
600	50	2.5	4	620522 6004	
600	50	2.5	6	620522 6006	

6132

ATORN Machine saw blades HSS for KASTO saws

HSS



- Precision-machined machine saw blade HSS with special heat treatment for a long service life
- Very high surface quality for exact and straight cutting
- High-quality cutting material for high demands on service life
- **Use:** for precise, quick and efficient sawing
- **Quality:** HSS DMo 5 Quality (Material No. 1.3343)
- **For materials up to a tensile strength of 1100 N/mm²**

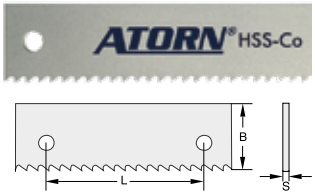
material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	○					●				●	●	●				
		35	25	15					28				40	42	38				
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		

L mm	Width mm	Thickness mm	Number of teeth per inch	art.no.	€
300	30	1.5	6	620523 3006	
300	30	1.5	10	620523 3010	
300	30	1.5	14	620523 3014	
350	36	2.0	4	620523 3504	
350	36	2.0	6	620523 3506	
350	36	2.0	10	620523 3510	
400	32	2.0	4	620523 4004	
400	32	2.0	6	620523 4006	
400	32	2.0	8	620523 4008	
400	32	2.0	10	620523 4010	
450	36	2.0	4	620523 4504	
450	36	2.0	6	620523 4506	
450	36	2.0	8	620523 4508	
450	40	2.0	4	620523 4604	
450	40	2.0	6	620523 4606	
450	40	2.0	8	620523 4608	
450	40	2.0	10	620523 4610	
550	45	2.0	4	620523 5504	
550	45	2.0	6	620523 5506	
575	50	2.5	4	620523 5704	
575	50	2.5	6	620523 5706	
600	50	2.5	4	620523 6004	
600	50	2.5	6	620523 6006	
650	55	2.5	4	620523 6504	
650	55	2.5	6	620523 6506	
700	55	2.5	4	620523 7004	
700	55	2.5	6	620523 7006	

6132

ATORN Machine saw blades HSS-Co for KASTO saws

HSS-E



- Long service life and short cutting times
- Cobalt-alloyed machine saw blades are particularly suitable for tough and hard materials such as alloyed, unalloyed and heat-treated steel, as well as high-strength steel and stainless steel.
- High-quality cutting material for high demands on service life
- **Use:** for precise, quick and efficient sawing
- **Quality:** HSS-Co. EMo 5 Co 5 Quality (Material No. 1.3243).
- **For extremely hard materials up to 1300 N/mm² e.g. austenitic steels and steels with a high chromium-nickel content**

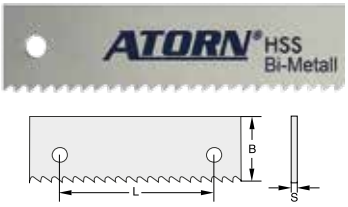
material: ● very well suited ○ well suited

steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
● 35	● 25	● 15	● 12	● 10			● 28	● 4	○ 5	● 8	● 40	● 42	● 38				
Cutting speed Vc m/min.									Please adjust these guidelines according to clamping operation and machine set-up.								

L mm	Width mm	Thickness mm	Number of teeth per inch	art.no.	€
400	36	2.0	4	620524 4004	
400	36	2.0	6	620524 4006	
450	40	2.0	4	620524 4504	
450	40	2.0	6	620524 4506	
450	40	2.0	8	620524 4508	
450	40	2.0	10	620524 4510	
500	40	2.0	6	620524 5006	
550	45	2.0	6	620524 5506	
600	50	2.5	4	620524 6004	
600	50	2.5	6	620524 6006	
700	55	2.5	4	620524 7004	
700	55	2.5	6	620524 7006	

6132

ATORN Machine saw blades HSS bi-metal for KASTO saws



- Long service life and short cutting times
- The perfect combination of flexibility and durability with special heat treatment for a long service life
- Very high surface quality for exact and straight cutting
- **Use:** for precise, quick and efficient sawing
- **Quality:** HSS bi-metal. DMo 5-cutting-edge quality (Material No. 1.3343) on a special steel back
- **For materials up to a tensile strength of 1100 N/mm²**

material: ● very well suited ○ well suited

steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
● 35	● 25	○ 15					● 28				● 40	● 42	● 38				
Cutting speed Vc m/min.									Please adjust these guidelines according to clamping operation and machine set-up.								

L mm	Width mm	Thickness mm	Number of teeth per inch	art.no.	€
400	38	1.9	4	620525 4004	
400	38	1.9	6	620525 4006	
400	38	1.9	10	620525 4010	
500	38	1.9	6	620525 5006	
575	50	2.5	4	620525 5704	
575	50	2.5	6	620525 5706	
600	50	2.5	4	620525 6004	
600	50	2.5	6	620525 6006	
700	50	2.5	4	620525 7004	
700	50	2.5	6	620525 7006	

6132

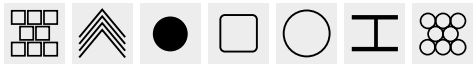
SARA® Metal band saw blades, continuous

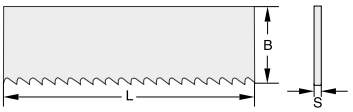
- Additional dimensions and toothing available on request

Bi-metal band saw blades with combination teeth, continuous

- **For machines, for example Heska, Amada, DoAll, Jaespa, Pehaka, Kaltenbach, Müller**
- Particularly wear-resistant with a high degree of cutting precision
- For rust-proof and acid-proof steel in medium and large cross-sections
- For all steel grades up to 45 HRC
- For non-ferrous metals
- For all material diameters and contour cuts







L mm	Width mm	Thickness mm	Number of teeth per inch	**Bi-metal M42** art.no.	€
1,325	13	0.65	6 / 10	620540 1306	
1,325	13	0.65	8 / 12	620540 1308	
1,325	13	0.65	10 / 14	620540 1310	
2,362	20	0.90	5 / 8	620540 2305	
2,362	20	0.90	6 / 10	620540 2306	
2,362	20	0.90	8 / 12	620540 2308	
2,750	27	0.90	3 / 4	620540 2703	
2,750	27	0.90	4 / 6	620540 2704	
2,750	27	0.90	6 / 10	620540 2706	
2,750	27	0.90	10 / 14	620540 2710	
2,835	27	0.90	3 / 4	620540 2803	
2,835	27	0.90	4 / 6	620540 2804	
2,835	27	0.90	6 / 10	620540 2806	
2,835	27	0.90	10 / 14	620540 2810	
3,150	27	0.90	3 / 4	620540 3103	
3,150	27	0.90	4 / 6	620540 3104	
3,150	27	0.90	6 / 10	620540 3106	
3,150	27	0.90	10 / 14	620540 3110	
3,660	27	0.90	3 / 4	620540 3604	
3,660	27	0.90	5 / 8	620540 3606	
3,660	27	0.90	6 / 10	620540 3608	
3,660	27	0.90	8 / 12	620540 3610	
3,660	27	0.90	10 / 14	620540 3614	
3,830	27	0.90	3 / 4	620540 3803	
3,830	27	0.90	4 / 6	620540 3804	
3,830	27	0.90	6 / 10	620540 3806	
3,830	27	0.90	10 / 14	620540 3810	
4,150	27	0.90	4 / 6	620540 4104	
4,150	27	0.90	6 / 10	620540 4106	
4,150	27	0.90	10 / 14	620540 4110	
4,100	34	1.10	2 / 3	620540 4123	
4,100	34	1.10	3 / 4	620540 4134	
4,100	34	1.10	4 / 6	620540 4146	
4,100	34	1.10	5 / 8	620540 4158	
4,640	34	1.10	2 / 3	620540 4623	
4,640	34	1.10	3 / 4	620540 4634	
4,640	34	1.10	4 / 6	620540 4646	
4,640	34	1.10	5 / 8	620540 4658	
4,115	41	1.30	2 / 3	620540 4112	
4,115	41	1.30	3 / 4	620540 4113	
4,115	41	1.30	4 / 6	620540 4114	
4,115	41	1.30	5 / 8	620540 4115	
4,570	41	1.30	2 / 3	620540 4523	
4,570	41	1.30	3 / 4	620540 4534	
4,570	41	1.30	4 / 6	620540 4546	
4,570	41	1.30	5 / 8	620540 4558	
5,800	41	1.30	2 / 3	620540 5823	
5,800	41	1.30	3 / 4	620540 5834	
5,800	41	1.30	4 / 6	620540 5846	
5,800	41	1.30	5 / 8	620540 5858	

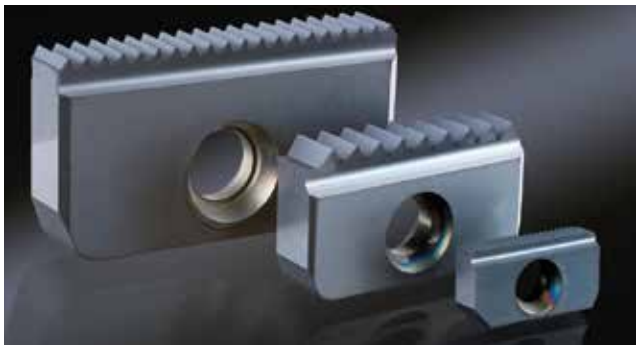
6132

Thread milling cutters / Circular milling cutters

INFO

The thread milling cutters are specially designed for use on CNC milling machines and machining centres that have a 3-axis control with screw interpolation.





Advantages and use

- Internal and external thread
- Through-hole and blind hole thread
- Synchronised or counter-rotation milling and changing the axial feed direction
- enables the production of cylindrical and conical threads as well as the production of almost all conventional thread variants
- Thread production with deviating tolerances
- optimum voltage
- short chips
- low cutting pressure

HM quality AMT7
TiAlN-coated ultra-fine grain quality for universal applications in all materials with medium to high cutting speeds

Overview of solid carbide thread milling cutters

Brand	ATORN SARA	ATORN SARA	ATORN SARA	ATORN SARA	ATORN	G55	G55
ISO application area	P M K S N	P M K S N	P M K S N	S H	P M K N	P M K S H	P M K N H
Thread	MMF	G55BSFBSP	M	M	M	M	M G55
Thread depth	2.2 x D	1.5 x D	2 x D	2 x D	2 x D	2 x D	2.2 x D
Size range	4 - 27	⅛" - 1"	1 - 20	2 - 16	6 - 23	3 - 16	6 - 24
Coating	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	WXS	-
Application				Hard machining	DMT		
Order No.	258002.... 258027....	258003....	258010.... 258025....	258011....	258100....	258510....	294300.... 294301....
Catalogue page	**597**	**598**	**599**	**599**	**600**	**603**	**605**

Modular thread/circular milling cutters

Brand	ATORN	ATORN	ATORN
ISO application area	P M K N	P M K S N H	P M K N
Number of cutting edges	1 - 2	3 - 6	1 - 6
Coolant bore	IC	IC	IC
Milling inserts type ISO	ISOUNBSWNPT	ISOBSE	ISOUNBSW, BSFNPTTR
Order No.	25900.....	26300.	26600. ....
Catalogue page	**606**	**610**	**615**

ATORN Thread end milling cutter

VHM | h6 | 2xD | Z 3 | Z 4 | Z 5 | Z 6 | TiAlN | Vc/fz | 793

- The thread is machined in just one operation
- Chip flutes permit an easy cut
- Short machine times thanks to multiple (3-6) cutting edges
- Operating range from dimension D = 2.2 mm
- Allows thread cutting in blind bores up to the shoulder
- One tool for right-hand and left-hand threads
- One tool for material groups P, M, K, S and H
- Excellent surface finish quality
- Long service life due to special multi-layer coating
- Low cutting pressure makes it possible to machine thin-walled workpieces
- **Cutting material: AMT7 solid carbide, multi-layer TiAlN coating for universal applications**
- **Through-hole version (internal cooling outlet in flute) available on request!**



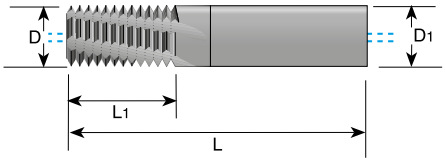
Solid carbide thread end milling cutter for the following thread types available on request:
-UN
-BSPT
-NPT
-NPS
-NPTF
-NPSF
-external threads, metr. full profile
-external threads, UN

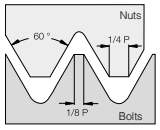
material

● very well suited
○ well suited

	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
258002....	● 120	● 110	● 90	● 100	● 80			● 90	● 50	● 40	● 40	● 240	● 220	● 200	○ 150			
258003....	● 100	● 90	● 80	● 80	● 60			● 70				● 200	● 200	● 160	○ 120			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.



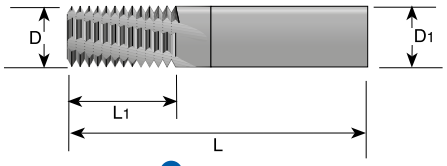


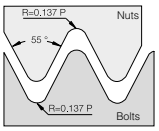


Metric, full profile, ISO 60°, internal, with internal coolant supply

Designation	Pitch mm	Standard thread	Fine thread	D mm	D1 mm	L1 mm	L mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
MTB06038C10 0.5 ISO	0.5	-	MF5	3.8	6	10.3	58	3	0.03	258002 0002	
MTB06031C7 0.7 ISO	0.7	M4	MF4	3.1	6	7.4	58	3	0.03	258002 0003	
MTB06045C10 0.75 ISO	0.75	-	MF6	4.5	6	10.1	58	3	0.03	258002 0004	
MTB06038C9 0.8 ISO	0.8	M5	MF6	3.8	6	9.2	58	3	0.03	258002 0005	
MTB06046C10 1.0 ISO	1	M6	MF7	4.6	6	10.5	58	3	0.03	258002 0010	
MTB06046C14 1.0 ISO	1	M6	MF7	4.6	6	14.5	58	3	0.03	258002 0015	
MTB0606C12 1.0 ISO	1	-	MF9	6	6	12.5	58	3	0.03	258002 0020	
MTB0808D16 1.0 ISO	1	-	MF10	8	8	16.5	64	4	0.04	258002 0030	
MTB0606C14 1.25 ISO	1.25	M8	MF10	6	6	14.4	58	3	0.03	258002 0040	
MTB0606C19 1.25 ISO	1.25	M8	MF10	6	6	19.4	58	6	0.03	258002 0045	
MTB08078C17 1.5 ISO	1.5	M10	MF12	7.8	8	17	64	3	0.04	258002 0050	
MTB08078C24 1.5 ISO	1.5	M10	MF12	7.8	8	24.8	76	3	0.04	258002 0055	
MTB1010D21 1.5 ISO	1.5	-	MF14	10	10	21.8	73	4	0.05	258002 0060	
MTB1212D26 1.5 ISO	1.5	-	MF16	12	12	26.3	84	4	0.05	258002 0065	
MTB1616F33 1.5 ISO	1.5	-	MF20	16	16	33.8	105	6	0.07	258002 0070	
MTB1009C20 1.75 ISO	1.75	M12	MF12	9	10	20.1	73	3	0.05	258002 0080	
MTB1009C28 1.75 ISO	1.75	M12	MF12	9	10	28.8	73	3	0.05	258002 0085	
MTB1010C27 2.0 ISO	2	M14	MF15	10	10	27	73	3	0.05	258002 0090	
MTB12118D27 2.0 ISO	2	M16	MF17	11.8	12	27	84	4	0.05	258002 0100	
MTB12118D39 2.0 ISO	2	M16	MF17	11.8	12	39	105	4	0.05	258002 0105	
MTB2020F41 2.0 ISO	2	-	MF26	20	20	41	105	6	0.08	258002 0110	
MTB1615E33 2.5 ISO	2.5	M20	MF22	15	16	33.8	105	5	0.07	258002 0120	
MTB1615E48 2.5 ISO	2.5	M20	MF22	15	16	48.8	105	5	0.07	258002 0125	
MTB2018D40 3.0 ISO	3	M24	MF25	18	20	40.5	105	4	0.08	258002 0130	
MTB2018D58 3.0 ISO	3	M24	MF25	18	20	58.5	120	4	0.08	258002 0135	
MTB2020D43 3.0 ISO	3	M27	MF27	20	20	43.5	105	4	0.08	258002 0140	

2115





Ww 55° internal = external

Designation	Pitch	D mm	D1 mm	L1 mm	L mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	Suitable from thread size	art.no.	€
MT0606C9 28W	28	6	6	9.5	58	3	0.03	G 1/16 inch | G 1/8 inch	258003 0010	
MT0808C14 19W	19	8	8	14	64	3	0.04	G 1/4 inch | G 3/8 inch	258003 0020	
MT1212D19 14W	14	12	12	19	84	4	0.05	G 1/2 inch | G 7/8 inch	258003 0030	
MT1212D26 14W	14	12	12	26.3	84	4	0.05	G 1/2 inch | G 7/8 inch	258003 0035	
MT1212C24 11W	11	12	12	24.2	84	3	0.05	G 1 Zoll	258003 0040	
MT1616D38 11W	11	16	16	38.1	105	4	0.07	G 1 Zoll	258003 0050	
MT2020E47 11W	11	20	20	47.3	105	5	0.08	G 1 Zoll	258003 0060	

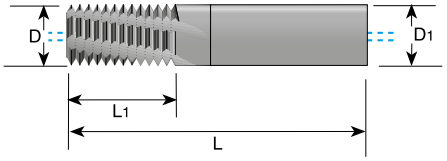
2115

SARA® Thread end milling cutter

VHM | Z 3 | Z 4 | Vc/fz | 793

- the thread is machined in only one process step
- chip flutes permit soft cutting
- short machining times due to multiple (3-6) cutting edges
- operating range from dimension D = 2.2mm
- thread cutting in blind holes possible up to the shoulder
- one tool for right-handed and left-handed threads
- one tool for the material groups P, M, K, S, H
- excellent surface quality
- long service life thanks to special multi-layer coating
- low cutting pressure permits the machining of thin-walled workpieces





material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	●	●			●	●	●	●	●	●	●				
		60	60	55	30	30			75	40	40	40	75	75	75				
	Cutting speed Vc m/min.																		
	Please adjust these guidelines according to clamping operation and machine set-up.																		

Metric, ISO full profile, internal

Designation	Pitch mm	Standard thread	D mm	D1 mm	L1 mm	L mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
VHTM 3 M040 064 06 40	0.70	M4	3.10	6	9.0	64	3	0.03	258027 0010	
VHTM 3 M050 064 06 40	0.80	M5	4.00	6	11.0	64	3	0.03	258027 0015	
VHTM 3 M060 064 06 40	1.00	M6	4.50	6	13.5	64	3	0.03	258027 0020	
VHTM 3 M080 064 06 40	1.25	M8	6.00	6	18.0	64	3	0.03	258027 0025	
VHTM 3 M100 064 08 40	1.50	M10	7.50	8	22.0	64	3	0.04	258027 0030	
VHTM 4 M120 070 10 40	1.75	M12	9.50	10	26.0	70	3	0.05	258027 0035	
VHTM 4 M140 070 10 40	2.00	M14	10.0	10	30.0	70	3	0.05	258027 0040	
VHTM 4 M160 083 12 40	2.00	M16	12.00	12	34.0	83	3	0.05	258027 0045	
VHTM 4 M200 100 16 40	2.50	M20	16.00	16	42.0	100	3	0.07	258027 0050	

2166

Metric, full profile ISO, internal, with internal coolant supply

Designation	Pitch mm	Standard thread	D mm	D1 mm	L1 mm	L mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
VHTMI 3 M040 064 06 40	0.70	M 4	3.10	6	9.0	64	3	0.03	258028 0010	
VHTMI 3 M050 064 06 40	0.80	M 5	4.00	6	11.0	64	3	0.03	258028 0015	
VHTMI 3 M060 064 06 40	1.00	M 6	4.50	6	13.5	64	3	0.03	258028 0020	
VHTMI 3 M080 064 06 40	1.25	M 8	6.00	6	18.0	64	3	0.03	258028 0025	
VHTMI 3 M100 064 08 40	1.50	M 10	7.50	8	22.0	64	4	0.04	258028 0030	
VHTMI 4 M120 070 10 40	1.75	M 12	9.50	10	26.0	70	3	0.05	258028 0035	
VHTMI 4 M140 070 10 40	2.00	M 14	10.0	10	30.0	70	3	0.05	258028 0040	
VHTMI 4 M160 083 12 40	2.00	M 16	12.00	12	34.0	83	3	0.05	258028 0045	
VHTMI 4 M200 100 16 40	2.50	M 20	16.00	16	42.0	100	3	0.07	258028 0050	

2166

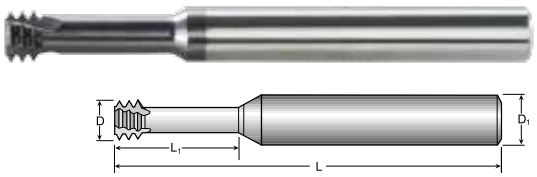
ATORN Thread end milling cutter for small bores

VHM | h6 | 2xD | Z 3 | Z 4 | Z 5 | TiAlN | HSC | Vc/fz | 793



- **Especially for small bores, with straight shank**
- Thread cutting from M1 x 0.25 mm, **thread depth up to 2 x D1**
- **Version for thread depths up to 3 x D1 available on request**
- Suitable for HSC, extremely low cutting pressure, excellent surface finish quality
- Allows thread cutting in blind bores up to the shoulder
- Long service life due to special multi-layer coating
- One tool for right-hand and left-hand threads
- **Cutting material: AMT7 solid carbide, multi-layer TiAlN coating for universal applications**
- **MTSH version for hard machining up to 62 HRC available on request!**





material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	258010....	● 90	● 70	● 60	● 70	● 60			● 50	● 30	● 25	● 25	● 140	● 140	● 135	○ 120			
	258011....																● 50		● 40
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

Metric, full profile, ISO 60°, internal

Designation	Pitch mm	Standard thread	D mm	D1 mm	L1 mm	L mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
MTS03007C2 0.25 ISO	0.25	M1	0.72	3	2.5	39	3	0.04	258010 0010	
MTS06016C4 0.4 ISO	0.4	M2	1.55	6	4.5	58	3	0.04	258010 0020	
MTS06017C5 0.45 ISO	0.45	M2.2	1.65	6	5.0	58	3	0.04	258010 0022	
MTS0602C5 0.45 ISO	0.45	M2.5	1.95	6	5.5	58	3	0.04	258010 0025	
MTS06024C6 0.5 ISO	0.5	M3	2.35	6	6.5	58	3	0.04	258010 0030	
MTS06028C7 0.6 ISO	0.6	M3.5	2.75	6	7.5	58	3	0.05	258010 0035	
MTS06031C9 0.7 ISO	0.7	M4	3.1	6	9.0	58	3	0.05	258010 0040	
MTS06038C12 0.8 ISO	0.8	M5	3.8	6	12.5	58	3	0.05	258010 0050	
MTS06047C14 1.0 ISO	1	M6	4.65	6	14.0	58	3	0.06	258010 0060	
MTS0606C18 1.25 ISO	1.25	M8	5.95	6	18.0	58	3	0.07	258010 0080	
MTS08078C23 1.5 ISO	1.5	M10	7.8	8	23.0	64	3	0.07	258010 0100	
MTS01009C26 1.75 ISO	1.75	M12	9	10	26.0	73	3	0.07	258010 0120	
MTS12118D35 2.0 ISO	2	M16	11.8	12	35.0	84	4	0.07	258010 0160	
MTS1615E43 2.5 ISO	2.5	M20	15	16	43.0	105	5	0.07	258010 0200	

2115

Code M04, anti-clockwise

Metric, full profile, ISO 60°, internal, for hard machining up to 62 HRC, anticlockwise rotation (code M04)

Designation	Pitch mm	Standard thread	Suitable for thread	D mm	D1 mm	L1 mm	L mm	Z	Feed fz hardened steel ≥ 60 HRC mm/tooth	art.no.	€
MTSH06016C4 0.4 ISO	0.4	M2	M2-M16	1.53	6	4.5	58	3	0.02	258011 0020	
MTSH06017C5 0.45 ISO	0.45	M2.2	M2-M16	1.65	6	5.0	58	3	0.02	258011 0022	
MTSH0602C5 0.45 ISO	0.45	M2.5	M2-M16	1.95	6	5.5	58	3	0.02	258011 0025	
MTSH06024C6 0.5 ISO	0.5	M3	M2-M16	2.37	6	6.5	58	3	0.02	258011 0030	
MTSH06028C7 0.6 ISO	0.6	M3.5	M2-M16	2.75	6	7.5	58	3	0.03	258011 0035	
MTSH06031C9 0.7 ISO	0.7	M4	M2-M16	3.1	6	9.0	58	3	0.03	258011 0040	
MTSH06038C12 0.8 ISO	0.8	M5	M2-M16	3.8	6	12.5	58	3	0.03	258011 0050	
MTSH06047C14 1.0 ISO	1	M6	M2-M16	4.65	6	14.0	58	3	0.04	258011 0060	
MTSH0606C18 1.25 ISO	1.25	M8	M2-M16	6	6	18.0	58	3	0.04	258011 0080	
MTSH08078C23 1.5 ISO	1.5	M10	M2-M16	7.8	8	23.0	64	3	0.05	258011 0100	
MTSH1009C26 1.75 ISO	1.75	M12	M2-M16	9	10	26.0	73	3	0.06	258011 0120	
MTSH12118D35 2.0 ISO	2	M16	M2-M16	11.8	12	35.0	84	4	0.07	258011 0160	

2115

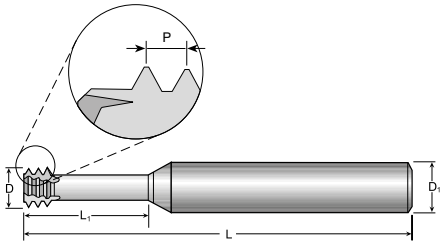
ATORN DMT drilling and thread milling cutter

VHM | Z 3 | Z 4 | Vc/fz | 793

Drilling Thread milling Chamfering



- **High-performance tool with IC for manufacturing female threads**
- Using a circular motion, you cut the tapping hole, mill the thread and countersink in a single operation
- Eliminates the need to pre-drill the tapping hole
- Fast turnaround reduces your machine times
- Suitable for through-holes and blind bores
- **No time wasted on tool changes as only one tool is used for drilling, thread milling and chamfering**
- Full profile tool
- **Anticlockwise spindle rotation, code M04:**
  Left-hand thread = reverse rotation
  Right-hand thread = synchronous rotation
- Can be used with a large variety of materials
- **Thread depth 2 x D**
- **Cutting material: AMT7 solid carbide, multi-layer TiAlN coating for universal applications**



material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	90	75	65	85	75	80	60	60				150	100	125				
Cutting speed Vc m/min.									Please adjust these guidelines according to clamping operation and machine set-up.									

Metric, full profile, ISO 60°, internal

Designation	Pitch mm	Standard thread	D mm	D1 mm	L1 mm	L mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
DMT08047C14 1.0 ISO	1	M 6 - M 9	4,7	8	14	64	3	0.02	258100 0060	
DMT08061D18 1.25 ISO	1,25	M 8 - M 12	6,1	8	18	64	4	0.02	258100 0080	
DMT08078D23 1.5 ISO	1,5	M 10 - M 15	7,8	8	23	64	4	0.02	258100 0100	
DMT1009D26 1.75 ISO	1,75	M 12	9	10	26	73	4	0.03	258100 0120	
DMT12118D35 2.0 ISO	2	M 16 - M 23	11,8	12	35	84	4	0.04	258100 0160	

2115

SARA® Thread end milling cutter

VHM | Z 3 | Z 4 | Vc/fz | 793



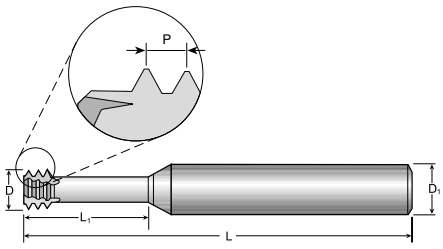
- Thread cutting from M1.6 x 0.35mm to M36 x 4
- **Thread depth 3 to 5 x D**
- HSC-suitable, extremely low cutting pressure, excellent surface quality
- Thread cutting in blind holes possible up to the shoulder
- long service life thanks to special multi-layer coating
- one tool for right-handed and left-handed threads

material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
258025....	60	60	65	45	50			75	40	40	40	75	75	75				
258026....	60	60	65	55	50			75	45	45	45	75	75	75				
Cutting speed Vc m/min.									Please adjust these guidelines according to clamping operation and machine set-up.									

Designation	Pitch mm	Standard thread	D mm	D1 mm	L1 mm	L mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
VHTMM 3 M016 064 06 40	0.35	M1.6	1.20	6	4.8	64	3	0.04	258025 0010	
VHTMM 3 M016 064 06 40 L080	0.35	M1.6	1.20	6	8.0	64	3	0.04	258025 0015	
VHTMM 3 M018 064 06 40	0.35	M1.8	1.40	6	5.4	64	3	0.04	258025 0020	
VHTMM 3 M018 064 06 40 L090	0.35	M1.8	1.40	6	9.0	64	3	0.04	258025 0025	
VHTMM 3 M020 064 06 40	0.40	M2.0	1.50	6	6.0	64	3	0.04	258025 0030	
VHTMM 3 M020 064 06 40 L100	0.40	M2.0	1.50	6	10.0	64	3	0.04	258025 0035	
VHTMM 3 M025 064 06 40	0.45	M2.5	1.90	6	7.5	64	3	0.04	258025 0040	
VHTMM 3 M025 064 06 40 L125	0.45	M2.5	1.90	6	12.5	64	3	0.04	258025 0045	
VHTMM 3 M030 064 06 40	0.50	M3	2.40	6	9.5	64	3	0.04	258025 0050	
VHTMM 3 M030 064 06 40 L150	0.50	M3	2.40	6	15.0	64	3	0.04	258025 0055	
VHTMM 3 M040 064 06 40	0.70	M4	3.10	6	12.5	64	3	0.05	258025 0060	

2166



Designation	Pitch mm	Standard thread	D mm	D1 mm	L1 mm	L mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
VHTMM 3 M040 064 06 40 L200	0.70	M4	3.10	6	20.0	64	3	0.05	258025 0065	
VHTMM 3 M050 064 06 40	0.80	M5	4.00	6	16.0	64	3	0.05	258025 0070	
VHTMM 3 M050 064 06 40 L250	0.80	M5	4.00	6	25.00	64	3	0.05	258025 0075	
VHTMM 3 M060 064 06 40	1.00	M6	4.50	6	20.0	64	3	0.06	258025 0080	
VHTMM 3 M060 070 06 40 L300	1.00	M6	4.50	6	30.0	70	3	0.06	258025 0085	
VHTMM 4 M080 064 06 40	1.25	M8	6.00	6	24.0	64	4	0.07	258025 0090	
VHTMM 4 M080 078 06 40 L400	1.25	M8	6.00	6	40.0	78	4	0.07	258025 0095	
VHTMM 4 M100 078 08 40	1.50	M10	7.50	8	33.0	78	4	0.07	258025 0100	
VHTMM 4 M100 089 08 40 L500	1.50	M10	7.50	8	50.0	89	4	0.07	258025 0105	
VHTMM 4 M120 089 10 40	1.75	M12	9.50	10	38.0	89	4	0.07	258025 0110	
VHTMM 4 M120 110 10 40 L600	1.75	M12	9.50	10	60.0	110	4	0.07	258025 0115	
VHTMM 4 M160 100 12 40	2.00	M16	12.00	12	50.0	100	4	0.07	258025 0120	
VHTMM 4 M160 130 12 40 L800	2.00	M16	12.00	12	80.0	130	4	0.07	258025 0125	
VHTMM 4 M200 102 16 40	2.50	M20	14.95	16	50.0	102	4	0.07	258025 0130	
VHTMM 4 M240 102 18 40	3.00	M24	17.95	18	50.0	102	4	0.07	258025 0135	
VHTMM 4 M300 120 20 40	3.50	M30	19.95	20	60.0	120	4	0.07	258025 0140	
VHTMM 4 M360 120 20 40	4.00	M36	19.95	20	60.0	120	4	0.07	258025 0145	

2166

Metric, full profile, ISO 60°, internal, with internal coolant supply

Designation	Pitch mm	Standard thread	D mm	D1 mm	L1 mm	L mm	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
VHTMMI 3 M030 064 06 40	0.50	M3	2.40	6	9.5	64	3	0.04	258026 0010	
VHTMMI 3 M030 064 06 40 L150	0.50	M3	2.40	6	15.0	64	3	0.04	258026 0015	
VHTMMI 3 M040 064 06 40	0.70	M4	3.10	6	12.5	64	3	0.04	258026 0020	
VHTMMI 3 M040 064 06 40 L200	0.70	M4	3.10	6	20.0	64	3	0.04	258026 0025	
VHTMMI 3 M050 064 06 40	0.80	M5	4.00	6	16.0	64	3	0.05	258026 0030	
VHTMMI 3 M050 064 06 40 L250	0.80	M5	4.0	6	25.0	64	3	0.05	258026 0035	
VHTMMI 3 M060 064 06 40	1.00	M6	4.50	6	20.0	64	3	0.06	258026 0040	
VHTMMI 3 M060 070 06 40 L300	1.00	M6	4.50	6	30.0	70	3	0.06	258026 0045	
VHTMMI 4 M080 064 06 40	1.25	M8	6.0	6	24.0	64	4	0.07	258026 0050	
VHTMMI 4 M080 078 06 40 L400	1.25	M8	6.0	6	40.0	78	4	0.07	258026 0055	
VHTMMI 4 M100 078 08 40	1.50	M10	7.50	8	33.0	78	4	0.07	258026 0060	
VHTMMI 4 M100 089 08 40 L500	1.50	M10	7.50	8	50.0	89	4	0.07	258026 0065	
VHTMMI 4 M120 089 10 40	1.75	M12	9.50	10	38.0	89	4	0.07	258026 0070	
VHTMMI 4 M120 110 10 40 L600	1.75	M12	9.50	10	60.0	110	4	0.07	258026 0075	
VHTMMI 4 M160 100 12 40	2.00	M16	12.00	12	50.0	100	4	0.07	258026 0080	
VHTMMI 4 M160 130 12 40 L130	2.00	M16	12.00	12	80.0	130	4	0.07	258026 0085	
VHTMMI 4 M200 102 16 40	2.50	M20	14.95	16	50.0	102	4	0.07	258026 0090	
VHTMMI 4 M240 102 18 40	3.00	M24	17.95	18	50.0	102	4	0.07	258026 0095	
VHTMMI 4 M300 120 20 40	3.50	M30	19.95	20	60.0	120	4	0.07	258026 0100	
VHTMMI 4 M360 120 20 40	4.00	M36	19.95	20	60.0	120	4	0.07	258026 0105	

2166



1. 45° cutting edge for countersunk chamfer
2. Solid thread milling
3. also with internal cooling
4. Tool is left-cutting (anti-clockwise spindle rotation)
5. Right-hand feed (clockwise)
6. Ultra-fine carbide

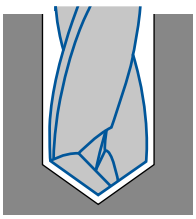
Thread milling cutters *WH(O)-EM-PNC*

INFO

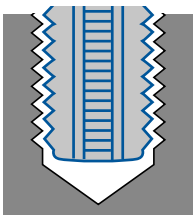
Tapping hole and thread are chamfered in one operation. Problems that arise when machining hardened materials are significantly reduced.

Drills + Taps

1. Operation



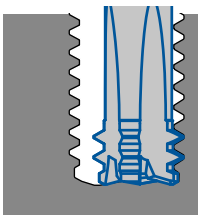
2. Operation



Conventional drilling and tapping of hardened materials is not reliable.

WH(O)-EM-PNC

1. Operation



With the WH(O)-EM-PNC, tool breakage resulting from chip jamming is eliminated and a safe process is guaranteed.

Thread milling cutter *WHO-EM-PNC*

VHM | Z 4 | Vc/fz | 795

- Thread milling cutter in full
- **WXS coating**
- Tool is left-cutting (anti-clockwise spindle rotation)
- Right-hand feed (clockwise)
- Ultra-fine carbide
- 4 grooves, sturdy negative rake angle



material

● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	○ 70	○ 70	○ 70		○ 70			○ 80	● 60	● 60	● 60					● 50		
Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

Metric, full profile, ISO 60°, internal, with internal coolant supply

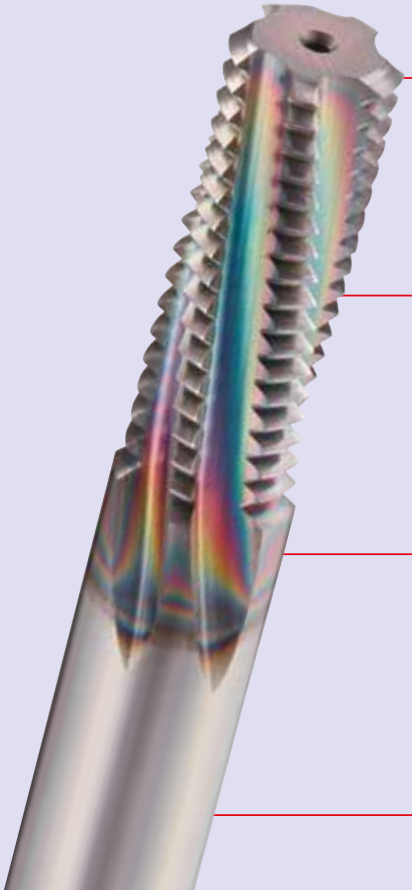


Pitch mm	Standard thread	d1 mm	D1 mm	A mm	L1 mm	L mm	Z	art.no.	€
0.5	M 3	1.7	6	12.3	7.5	50	4	258510 0030	
0.7	M 4	2.18	6	14.2	9.9	50	4	258510 0040	
0.8	M 5	2.97	6	15.5	12	50	4	258510 0050	
1.0	M 6	3.36	6	17.5	14.5	50	4	258510 0060	
1.25	M 8	4.66	10	24.1	19.2	70	4	258510 0080	
1.5	M 10	5.78	10	27.7	23.7	70	4	258510 0100	
1.75	M 12	6.92	10	31.4	28.4	80	4	258510 0120	
2.0	M 14	6.62	12	37.9	33	90	4	258510 0140	
2.0	M 16	9.36	12	39.5	37	90	4	258510 0160	

2110

1-cut thread milling cutter AT-1

INFO



1 The **unequal pitch** and **irregular spiral angle** reduce vibrations.

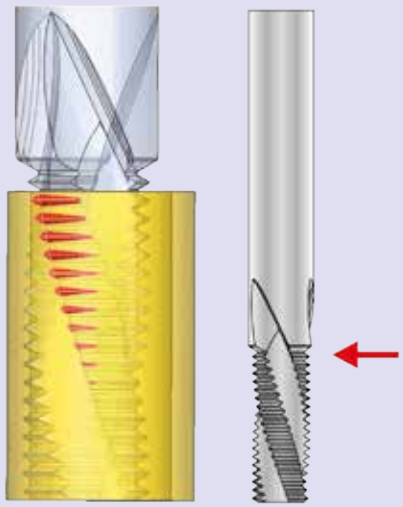
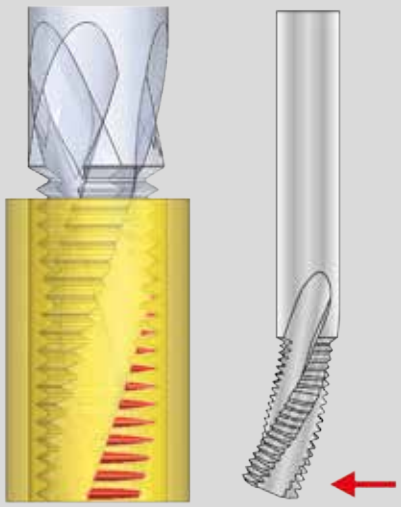
2 The **left-hand twist** prevents lateral deflection.

3 New **EgiAs coating**: Outstanding wear resistance and robustness

4 **Ultra-fine carbide** with high resistance and durability

The secret of 1-cut machining:

Evolution from 2-cut machining to 1-cut machining, Minimised lateral deflection

AT-1 Left-hand twist	Conventional thread milling cutter Right-hand twist
	
Enters the material at the top end **Reduced deflection** Up-cut milling recommended	Enters the material at the bottom end **Strong deflection**

1-cut thread milling cutter *AT-1*

VHM | Z 4 | Z 5 | Z 6 | Vc/fz | 794

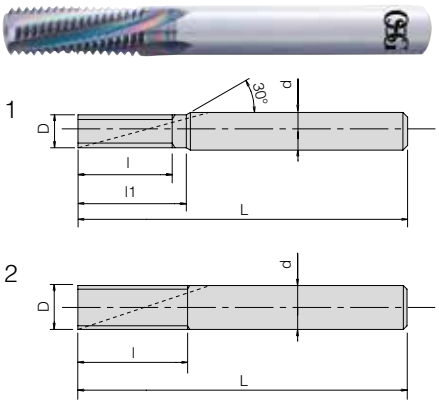
- Evolution from 2-cut machining to 1-cut machining
- Unequal pitch and irregular spiral angle reduce vibrations
- Left-hand twist prevents lateral deflection
- New EgiAs coating
- Outstanding wear resistance and robustness
- Ultra-fine carbide with high resistance and durability
- Milling cutter for female threads
- For hardened materials of 25-45 HRC

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 120	● 120	● 90		● 90			○ 90				○ 120	● 200			● 140		
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		

Metric, ISO full profile, internal

Pitch mm	Standard thread	Fine thread	D mm	D1 mm	L1 mm	A mm	L mm	Type	Z	art.no.	€
0.75		M6	4.5	6	13.5	16	75	1	4	294300 0001	
1.0	M 6		4.5	6	14	16	75	1	4	294300 0002	
0.5		M8	5.7	6	17		75	2	4	294300 0003	
1.0		M8	5.7	6	18		75	2	4	294300 0004	
1.25	M 8		5.7	6	18.75		75	2	4	294300 0005	
1.0		M10	7.7	8	22		85	2	4	294300 0006	
1.25		M10	7.7	8	22.5		85	2	4	294300 0007	
1.5	M 10		7.7	8	24		85	2	4	294300 0008	
1.0		M12	9.7	10	26		100	2	5	294300 0009	
1.25		M12	9.7	10	27.5		100	2	5	294300 0010	
1.5		M12	9.7	10	27		100	2	5	294300 0011	
1.75	M 12		9.7	10	28		100	2	5	294300 0012	
0.5		M14	11.7	12	29		120	2	5	294300 0013	
0.75		M14	11.7	12	30		120	2	5	294300 0014	
1.0		M14	11.7	12	30		120	2	5	294300 0015	
1.5		M14	10.7	12	31.5	34.5	120	1	5	294300 0016	
2.0	M 14		9.7	10	32		100	2	5	294300 0017	
1.0		M16	13.7	16	34	39	135	1	5	294300 0018	
1.5		M16	13.7	16	36	39	135	1	5	294300 0019	
2.0	M 16		11.7	12	36		120	2	5	294300 0020	
2.5	M 18		11.7	12	42.5		120	2	5	294300 0021	
1.5		M20	15.7	16	43.5		135	2	5	294300 0022	
2.5	M 20		13.7	16	45	50	135	1	5	294300 0023	
1.5		M24	19.7	20	51		150	2	6	294300 0024	
2.0		M24	19.7	20	52		150	2	6	294300 0025	
3.0	M 24		19.7	20	54		150	2	6	294300 0026	

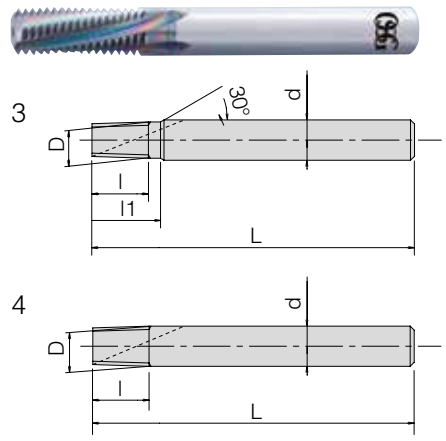
2110



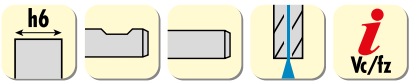
Whitworth Rc(PT), R (PT) tapered, internal

Pitch TPI	Standard thread	D mm	D1 mm	A mm	L1 mm	L mm	Type	Z	art.no.	€
28	1/16	5.67	6		9.1	60	4	4	294301 0001	
28	1/8	7.67	8	12.7	9.1	60	3	4	294301 0002	
19	1/4 3/8	9.67	10		14.7	75	4	5	294301 0003	
19	3/8	11.67	12	20	14.7	85	3	5	294301 0004	
14	1/2 3/4	11.67	12		20	85	4	5	294301 0005	
14	3/4	15.67	16		20	95	4	5	294301 0006	
11	1 - 2	19.67	20		27.7	105	4	6	294301 0007	

2110



ATORN Holder for thread mill inserts

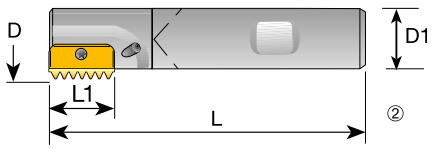


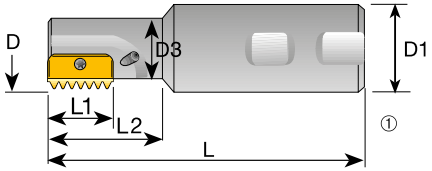
795

- **With internal cooling**
- Supplied with clamping screw and chuck key
- **Force-fit insert seat due to 15° bevel on the milling insert**

Standard holder

- Straight shank in accordance with DIN 1835B
- **Holder SR0009H12 not for use with the following inserts:** 12-18 NPT/NPTF, 12-19 BSPT
- **Holder SR0018H21 not for use with the following inserts:** 21 I34 ISO, 21 I8 UN, 21 I7 UN, 21-11 BSPT, 21-11.5 NPT, 21-11.5 NPTF





Designation	L1 mm	D mm	D1 mm	D3 mm	L mm	Effective length of thread milling mm			art.no.	€
SR0009 H12	12	9.5	20	7.5	85	14	A1	B1	259001 0912	
SR0010 H12	12	9.9	20	7.6	85	16	A1	B1	259001 1012	
SR0012 F14	14	12	20	8.9	75	20	A2	B1	259001 1214	
SR0014 H14	14	14.5	20	11.2	85	25	A2	B1	259001 1414	
SR0017 H14	14	17	20	13.4	85	30	A2	B1	259001 1714	
SR0018 H21	21	18	20	14.4	85	30	A3	B2	259001 1821	
SR0021 H21	21	21	20	16.5	94	40	A3	B2	259001 2121	
SR0025 K21	21	25	20	-	125	-	A3	B2	259001 2521	
SR0029 J30	30	29	25	22.4	110	50	A4	B3	259001 2930	
SR0031 M30	30	31	25	-	150	-	A4	B3	259001 3130	
SR0038 M30	30	38	32	-	150	-	A4	B3	259001 3830	
SR0048 M40	40	48	40	35	153	78	A5	B3	259001 4840	

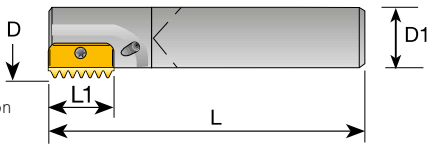
2116





Solid carbide holder

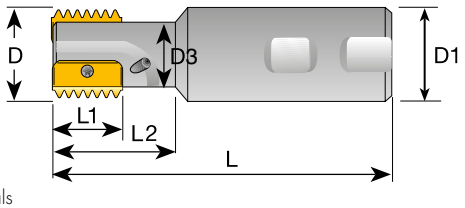
- **Long version**
- Particularly low-vibration thanks to solid carbide construction
- Straight shank
- SR0010 K12C without internal cooling



Designation	L1 mm	D mm	D1 mm	L mm			art.no.	€
SR0010 K12C	12	9.9	8	125	A1	B1	259002 1012	
SR0013 H14C	14	13.2	10	110	A2	B1	259002 1214	
SR0013 J14C	14	13.2	10	150	A2	B1	259002 1314	
SR0015 K14C	14	15.2	12	175	A2	B1	259002 1514	
SR0021 K21C	21	21.0	16	130	A3	B2	259002 2125	
SR0021 M21C	21	21	16	200	A3	B2	259002 2121	
SR0027 S30C	30	27	20	270	A4	B3	259002 2730	

2116





Double-seat holder

- **For use with two thread mill inserts**
- For increased feed rates and specially for hard materials
- Straight shank in accordance with DIN 1835B

Designation	L1 mm	D mm	D1 mm	D3 mm	L mm	Effective length of thread milling mm			art.no.	€
SR0020 H14-2	14	20	20	16	93	41	A2	B1	259003 2014	
SR0030 J21-2	21	30	25	24	108	52	A3	B2	259003 3021	
SR0040 L30-2	30	40	32	30	130	70	A4	B3	259003 4030	
SR0050 M40-2	40	50	40	38	153	78	A5	B3	259003 5040	

2116

Spare parts

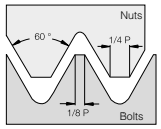
Screw			TORX		
	art.no.	€		art.no.	€
A1	259501 9000		B1	703040 0080	
A2	259501 9001		B2	703040 0150	
A3	259501 9002		B3	703040 0250	
A4	259501 9003				
A5	259501 9004				
	3116			7111	

ATORN ISO thread mill inserts

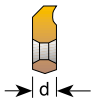
VHM | Vc/fz | 795

- **Metric, full profile, ISO**
- **Carbide quality AMT7**

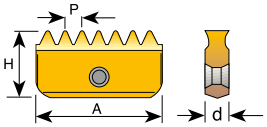
  TiAlN-coated ultra-fine grain quality for universal applications in all materials at medium to high cutting speeds







Size A inserts = 12 mm have one cutting edge!



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	●	●			●	●	●	●	●	●	●				
		140	130	100	120	100			90	60	50	50	240	240	220				
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up.																		

Full profile, 60°, internal

A	Pitch mm	H mm	d mm	Designation	Feed fz steel < 1000 N/mm² mm/tooth		art.no.	€
12	0.5	6.3	2.9	12 I 0.5 ISO	0.05-0.15	5	259501 4135	
12	0.75	6.3	2.9	12 I 0.75 ISO	0.05-0.15	5	259501 4235	
12	1	6.3	2.9	12 I 1.0 ISO	0.05-0.15	5	259501 4335	
12	1.25	6.3	2.9	12 I 1.25 ISO	0.05-0.15	5	259501 4435	
14	0.5	7.5	3.1	14 I 0.5 ISO	0.05-0.15	5	259501 0135	
14	0.75	7.5	3.1	14 I 0.75 ISO	0.05-0.15	5	259501 0235	
14	1	7.5	3.1	14 I 1.0 ISO	0.05-0.15	5	259501 0335	
14	1.25	7.5	3.1	14 I 1.25 ISO	0.05-0.15	5	259501 0435	
14	1.5	7.5	3.1	14 I 1.5 ISO	0.05-0.15	5	259501 0535	
14	1.75	7.5	3.1	14 I 1.75 ISO	0.05-0.15	5	259501 0835	
14	2	7.5	3.1	14 I 2.0 ISO	0.05-0.15	5	259501 0635	
14	2.5	7.5	3.1	14 I 2.5 ISO	0.05-0.15	5	259501 0735	
21	1	12	4.7	21 I 1.0 ISO	0.05-0.15	5	259501 1035	
21	1.5	12	4.7	21 I 1.5 ISO	0.05-0.15	5	259501 1135	
21	1.75	12	4.7	21 I 1.75ISO	0.05-0.15	5	259501 1635	
21	2	12	4.7	21 I 2.0 ISO	0.05-0.15	5	259501 1235	
21	2.5	12	4.7	21 I 2.5 ISO	0.05-0.15	5	259501 1335	

2117

A	Pitch mm	H mm	d mm	Designation	Feed fz steel < 1000 N/mm² mm/tooth		art.no.	€
21	3	12	4.7	21 I 3.0 ISO	0.05-0.15	5	259501 1435	
21	3.5	12	4.7	21 I 3.5 ISO	0.05-0.15	5	259501 1535	
30	1.5	16	5.5	30 I 1.5 ISO	0.05-0.15	5	259501 2035	
30	2	16	5.5	30 I 2.0 ISO	0.05-0.15	5	259501 2135	
30	3	16	5.5	30 I 3.0 ISO	0.05-0.15	5	259501 2235	
30	3.5	16	5.5	30 I 3.5 ISO	0.05-0.15	5	259501 2435	
30	4	16	5.5	30 I 4.0 ISO	0.05-0.15	5	259501 2335	
30	4.5	16	5.5	30 I 4.5 ISO	0.05-0.15	5	259501 3635	
30	5	16	5.5	30 I 5.0 ISO	0.05-0.15	5	259501 2535	
40	1.5	20	6.3	40 I 1.5 ISO	0.05-0.15	5	259501 3035	
40	2	20	6.3	40 I 2.0 ISO	0.05-0.15	5	259501 3135	
40	3.5	20	6.3	40 I 3.5 ISO	0.05-0.15	5	259501 3735	
40	4	20	6.3	40 I 4.0 ISO	0.05-0.15	5	259501 3335	
40	4.5	20	6.3	40 I 4.5 ISO	0.05-0.15	5	259501 3835	
40	5	20	6.3	40 I 5.0 ISO	0.05-0.15	5	259501 3435	
40	5.5	20	6.3	40 I 5.5 ISO	0.05-0.15	5	259501 3935	
40	6	20	6.3	40 I 6.0 ISO	0.05-0.15	5	259501 3535	

2117

Full profile, 60°, external

A	Pitch mm	H mm	d mm	Designation	Feed fz steel < 1000 N/mm² mm/tooth		art.no.	€
14	0.75	7.5	3.1	14 E 0.75 ISO	0.05-0.15	5	259502 0135	
14	1	7.5	3.1	14 E 1.0 ISO	0.05-0.15	5	259502 0235	
14	1.25	7.5	3.1	14 E 1.25 ISO	0.05-0.15	5	259502 0335	
14	1.5	7.5	3.1	14 E 1.5 ISO	0.05-0.15	5	259502 0435	
14	1.75	7.5	3.1	14 E 1.75 ISO	0.05-0.15	5	259502 0735	
14	2	7.5	3.1	14 E 2.0 ISO	0.05-0.15	5	259502 0535	
14	2.5	7.5	3.1	14 E 2.5 ISO	0.05-0.15	5	259502 0635	
21	1	12	4.7	21 E 1.0 ISO	0.05-0.15	5	259502 1035	
21	1.5	12	4.7	21 E 1.5 ISO	0.05-0.15	5	259502 1135	
21	2	12	4.7	21 E 2.0 ISO	0.05-0.15	5	259502 1235	
21	2.5	12	4.7	21 E 2.5 ISO	0.05-0.15	5	259502 1335	
21	3	12	4.7	21 E 3.0 ISO	0.05-0.15	5	259502 1435	

2117

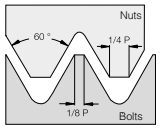
A	Pitch mm	H mm	d mm	Designation	Feed fz steel < 1000 N/mm² mm/tooth		art.no.	€
30	1.5	16	5.5	30 E 1.5 ISO	0.05-0.15	5	259502 2035	
30	2	16	5.5	30 E 2.0 ISO	0.05-0.15	5	259502 2135	
30	3	16	5.5	30 E 3.0 ISO	0.05-0.15	5	259502 2235	
30	3.5	16	5.5	30 E 3.5 ISO	0.05-0.15	5	259502 2435	
30	4	16	5.5	30 E 4.0 ISO	0.05-0.15	5	259502 2335	
40	1.5	20	6.3	40 E 1.5 ISO	0.05-0.15	5	259502 3035	
40	2	20	6.3	40 E 2.0 ISO	0.05-0.15	5	259502 3135	
40	3	20	6.3	40 E 3.0 ISO	0.05-0.15	5	259502 3235	
40	4	20	6.3	40 E 4.0 ISO	0.05-0.15	5	259502 3335	
40	5	20	6.3	40 E 5.0 ISO	0.05-0.15	5	259502 3435	
40	6	20	6.3	40 E 6.0 ISO	0.05-0.15	5	259502 3535	

2117

ATORN UN thread mill inserts

VHM | Vc/fz | 795

- **Metric, full profile, UN**
- **Carbide quality AMT7**
  TiAlN-coated ultra-fine grain quality for universal applications in all materials at medium to high cutting speeds
- **Other thread pitches available on request**



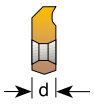


material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		140	165	100	120	100			90	60	50	50	240	240	220				
		Cutting speed Vc m/min.									Please adjust these guidelines according to clamping operation and machine set-up.								

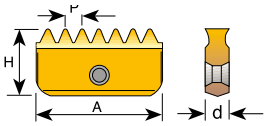
Full profile, UN, internal

A	Pitch TPI	H mm	d mm	Designation	Feed fz steel < 1000 N/mm² mm/tooth		art.no.	€
12	32	6.3	2.9	12 I 32 UN	0.05-0.15	5	259503 4135	
12	28	6.3	2.9	12 I 28 UN	0.05-0.15	5	259503 4235	
12	24	6.3	2.9	12 I 24 UN	0.05-0.15	5	259503 4335	
12	20	6.3	2.9	12 I 20 UN	0.05-0.15	5	259503 4435	
12	18	6.3	2.9	12 I 18 UN	0.05-0.15	5	259503 4535	
12	16	6.3	2.9	12 I 16 UN	0.05-0.15	5	259503 4635	
14	32	7.5	3.1	14 I 32 UN	0.05-0.15	5	259503 0135	
14	28	7.5	3.1	14 I 28 UN	0.05-0.15	5	259503 0235	
14	24	7.5	3.1	14 I 24 UN	0.05-0.15	5	259503 0335	
14	20	7.5	3.1	14 I 20 UN	0.05-0.15	5	259503 0435	
14	18	7.5	3.1	14 I 18 UN	0.05-0.15	5	259503 0535	
14	16	7.5	3.1	14 I 16 UN	0.05-0.15	5	259503 0635	
14	14	7.5	3.1	14 I 14 UN	0.05-0.15	5	259503 0735	
14	12	7.5	3.1	14 I 12 UN	0.05-0.15	5	259503 0835	
21	24	12	4.7	21 I 24 UN	0.05-0.15	5	259503 1035	
21	20	12	4.7	21 I 20 UN	0.05-0.15	5	259503 1135	
21	18	12	4.7	21 I 18 UN	0.05-0.15	5	259503 1235	
21	16	12	4.7	21 I 16 UN	0.05-0.15	5	259503 1335	
21	14	12	4.7	21 I 14 UN	0.05-0.15	5	259503 1435	
21	12	12	4.7	21 I 12 UN	0.05-0.15	5	259503 1535	
21	10	12	4.7	21 I 10 UN	0.05-0.15	5	259503 1635	
30	20	16	5.5	30 I 20 UN	0.05-0.15	5	259503 2035	
30	18	16	5.5	30 I 18 UN	0.05-0.15	5	259503 2135	
30	16	16	5.5	30 I 16 UN	0.05-0.15	5	259503 2235	
30	14	16	5.5	30 I 14 UN	0.05-0.15	5	259503 2335	
30	12	16	5.5	30 I 12 UN	0.05-0.15	5	259503 2435	
30	10	16	5.5	30 I 10 UN	0.05-0.15	5	259503 2535	
30	8	16	5.5	30 I 8 UN	0.05-0.15	5	259503 2635	
30	11,5	16	5.5	30 I 6 UN	0.05-0.15	5	259503 2735	
40	14	20	6.3	40 I 14 UN	0.05-0.15	5	259503 3035	
40	12	20	6.3	40 I 12 UN	0.05-0.15	5	259503 3135	
40	10	20	6.3	40 I 10 UN	0.05-0.15	5	259503 3235	
40	8	20	6.3	40 I 8 UN	0.05-0.15	5	259503 3335	
40	6	20	6.3	40 I 6 UN	0.05-0.15	5	259503 3435	

2117



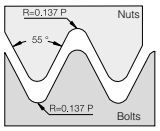
Size A inserts = 12 mm have one cutting edge



ATORN BSW/NPT thread mill inserts

795

- **BSW, NPT**
- **Carbide quality AMT7**
  TiAlN-coated ultra-fine grain quality for universal applications in all materials at medium to high cutting speeds
- **Other versions available on request (NPTF, BSPT, NPS and NPSF)**



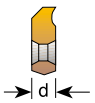


material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		140	130	100	120	100			90	60	50	50	240	240	220				
		Cutting speed Vc m/min.						Please adjust these guidelines according to clamping operation and machine set-up.											

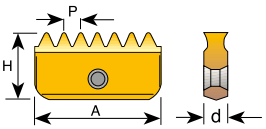
BSW, internal = external

A	Pitch	H mm	d mm	Designation	Feed fz steel < 1000 N/mm² mm/tooth		art.no.	€
12	19	6.3	2.9	12-19 W	0.05-0.15	5	259505 0035	
14	24	7.5	3.1	14-24 W	0.05-0.15	5	259505 0135	
14	20	7.5	3.1	14-20 W	0.05-0.15	5	259505 0235	
14	19	7.5	3.1	14-19 W	0.05-0.15	5	259505 0335	
14	16	7.5	3.1	14-16 W	0.05-0.15	5	259505 0435	
14	14	7.5	4.7	14-14 W	0.05-0.15	5	259505 0535	
21	20	12	4.7	21-20 W	0.05-0.15	5	259505 1035	
21	19	12	4.7	21-19 W	0.05-0.15	5	259505 1135	
21	16	12	4.7	21-16 W	0.05-0.15	5	259505 1235	
21	14	12	4.7	21-14 W	0.05-0.15	5	259505 1335	
21	11	12	4.7	21-11 W	0.05-0.15	5	259505 1435	
30	16	16	5.5	30-16 W	0.05-0.15	5	259505 2035	
30	14	16	5.5	30-14 W	0.05-0.15	5	259505 2135	
30	11	16	5.5	30-11 W	0.05-0.15	5	259505 2235	
40	11	20	6.3	40-11 W	0.05-0.15	5	259505 3035	
40	8	20	6.3	40- 8 W	0.05-0.15	5	259505 3135	

2117



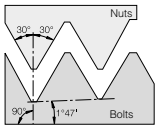
Size A inserts = 12 mm have one cutting edge!



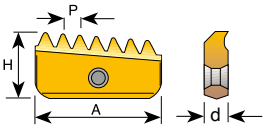
NPT, internal = external

A	Pitch TPI	H mm	d mm	Designation	Feed fz steel < 1000 N/mm² mm/tooth		art.no.	€
12	18	6.3	2.9	12-18 NPT	0.05-0.15	5	259506 0035	
14	18	7.5	3.1	14-18 NPT	0.05-0.15	5	259506 0135	
14	14	7.5	3.1	14-14 NPT	0.05-0.15	5	259506 0235	
21	14	12	4.7	21-14 NPT	0.05-0.15	5	259506 1035	
21	11,5	12	4.7	21-11.5 NPT	0.05-0.15	5	259506 1135	
30	11,5	16	5.5	30-11.5 NPT	0.05-0.15	5	259506 2035	
30	8	16	5.5	30- 8 NPT	0.05-0.15	5	259506 2135	
40	11,5	20	6.3	40-11.5 NPT	0.05-0.15	5	259506 3035	
40	8	20	6.3	40- 8 NPT	0.05-0.15	5	259506 3135	

2117







Inserts for conical threads have one cutting edge!

Over 200,000 tools available online!
Register online now!
www.saratools.com



Dümmel® Tool system for machining drill holes *MINI-MILL*

DIN 6535 HA | DIN 6535 HB | Vc/fz | 802

- Type ZH 22 **from bore Ø 22 mm**
- Solid carbide inserts, quality grade **HC 8620**
- **Solid carbide milling cutter shank** with internal coolant supply
- **Steel milling cutter shank** with internal coolant supply
- 3-rib toothing
- For machining grooves, circlip grooves, ISO metric threads, Whitworth pipe threads and full radius grooves, as well as for chamfering and deburring

Further tools for bore diameters 10 to 33 mm available on request



material — ● very well suited ○ well suited

steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
●	●	●	●	○		●	●	○	○		○	○	○		○		





DIN 6535 HA solid carbide shar

Designation	D1 mm	D3 mm	L mm	L2 mm	Cutting circle average mm	t max. mm	art.no.	€
ZH22,1212..42.A.HM	12	-	100	42	21.7	4.5	263001 1242	
ZH22,1212..60.A.HM	12	-	130	60	21.7	4.5	263001 1260	
ZH22,1611..30.A.HM	16	11.5	90	30	21.7	3.9	263001 1630	
ZH22,1612..42.A.HM	16	12.0	100	42	21.7	4.5	263001 1642	
ZH22,1612..60.A.HM	16	12.0	130	60	21.7	4.5	263001 1660	
ZH22,1612..85.A.HM	16	12.0	160	85	21.7	4.5	263001 1685	
ZH22,2016..45.A.HM	20	16.0	110	45	21.7	2.5	263001 2045	
ZH22,2016..65.A.HM	20	16.0	130	65	21.7	2.5	263001 2065	

2141



DIN 1835 A steel shank

Designation	D1 mm	D3 mm	L mm	L2 mm	Cutting circle average mm	t max. mm	art.no.	€
ZH22,1011,10.A.ST	10	11.3	60	10.7	21.7	4.5	263005 0010	
ZH22,1311,25.A.ST	13	11.3	70	25.7	21.7	4.0	263005 0025	
ZH22,1612,24.A.ST	16	12.0	80	24.0	21.7	4.5	263005 0024	

2141





DIN 6535 HB solid carbide sh

Designation	D1 mm	D3 mm	L mm	L2 mm	Cutting circle average mm	t max. mm	art.no.	€
ZH22,1212..42.B.HM	12	-	100	42	21.7	4.5	263002 1242	
ZH22,1212..60.B.HM	12	-	130	60	21.7	4.5	263002 1260	
ZH22,1611..30.B.HM	16	11.5	90	30	21.7	3.9	263002 1630	
ZH22,1612..42.B.HM	16	12.0	100	42	21.7	4.5	263002 1642	
ZH22,1612..60.B.HM	16	12.0	130	60	21.7	4.5	263002 1660	
ZH22,1612..85.B.HM	16	12.0	160	85	21.7	4.5	263002 1685	
ZH22,2016..45.B.HM	20	16.0	110	45	21.7	2.5	263002 2045	
ZH22,2016..65.B.HM	20	16.0	130	65	21.7	2.5	263002 2065	

2141



DIN 1835 B steel shank

Designation	D1 mm	D3 mm	L mm	L2 mm	Cutting circle average mm	t max. mm	art.no.	€
ZH22,1612,24.B.ST	16	12.0	80	24	21.7	4.5	263004 0024	

2141

Spare parts

	Screw art.no.	€
A1	263999 0001	

2141

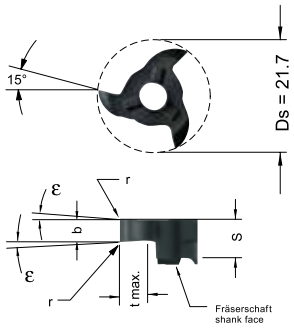
	TORX art.no.	€
B1	703053 0200	

7114

Cutting inserts for DIN 471/472 circlip grooves

Designation	S mm	r mm	ε °	t max. mm	b -0.02 mm	HC8620 art.no.	€
Z 22,0070,00	5.7	-	1.0	1.5	0.74	263100 0007	
Z 22,0080,00	5.7	-	1.0	1.7	0.84	263100 0008	
Z 22,0090,00	5.7	-	1.0	1.9	0.94	263100 0009	
Z 22,0100,00	5.7	-	1.0	2.1	1.04	263100 0010	
Z 22,0110,00	5.7	-	1.0	2.5	1.21	263100 0011	
Z 22,0130,00	5.7	0.1	3.0	4.5	1.41	263100 0013	
Z 22,0160,00	5.7	0.1	3.0	4.5	1.71	263100 0016	
Z 22,0185,02	5.7	0.15	3.0	4.5	1.96	263100 0185	
Z 22,0215,02	5.7	0.15	3.0	4.5	2.26	263100 0215	
Z 22,0265,02	5.7	0.15	3.0	4.5	2.76	263100 0265	
Z 22,0315,02	5.7	0.15	3.0	4.5	3.26	263100 0315	
Z 22,0415,02	5.7	0.15	3.0	4.5	4.26	263100 0414	
Z 22,0515,02	5.7	0.15	3.0	4.5	5.26	263100 0515	

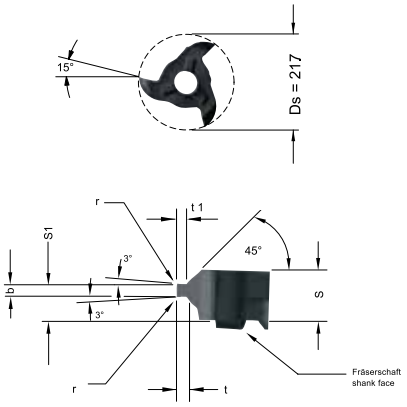
2141



Cutting inserts with groove outer edge chamfering for DIN 471/472 circlip grooves

Designation	S mm	s1 mm	r mm	b -0.02 mm	t mm	t1 max. mm	HC8620 art.no.	€
Z 22,1105,30	5.85	5.07	-	1.21	0.5	0.49	263101 1105	
Z 22,1307,30	5.85	5.17	-	1.41	0.7	0.67	263101 1307	
Z 22,1308,30	5.85	5.17	-	1.41	0.85	0.83	263101 1308	
Z 22,1609,35	5.85	5.07	-	1.71	0.85	0.83	263101 1609	
Z 22,1610,35	5.85	5.07	-	1.71	1.0	0.97	263101 1610	
Z 22,1812,35	5.85	5.19	0.15	1.96	1.25	1.23	263101 1812	
Z 22,2215,35	5.85	5.34	0.15	2.26	1.5	1.47	263101 2215	
Z 22,2616,45	5.85	5.09	0.15	2.76	1.5	1.47	263101 2616	
Z 22,2617,45	5.85	5.09	0.15	2.76	1.75	1.72	263101 2617	
Z 22,3118,45	5.85	5.34	0.20	3.26	1.75	1.72	263101 3118	
Z 22,4120,55	5.85	5.34	0.20	4.26	2.0	1.97	263101 4120	
Z 22,4125,55	5.85	5.34	0.20	4.26	2.5	2.47	263101 4125	

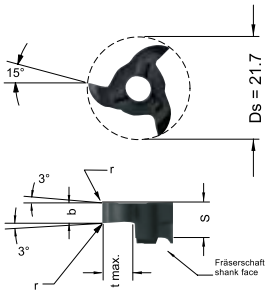
2141



Cutting inserts for general groove milling

Designation	S mm	r mm	b +0.02 mm	t max. mm	HC8620 art.no.	€
Z 22,0150,02	5.7	0.2	1.5	4.5	263102 0015	
Z 22,0200,02	5.7	0.2	2.0	4.5	263102 0020	
Z 22,0250,02	5.7	0.2	2.5	4.5	263102 0025	
Z 22,0300,02	5.7	0.2	3.0	4.5	263102 0030	
Z 22,0400,02	5.7	0.2	4.0	4.5	263102 0040	

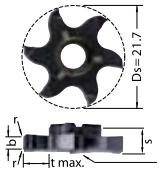
2141



6-tooth cutting inserts for general groove milling

Designation	S mm	r mm	b mm	t max. mm	HC8620 art.no.	€
Z622,0150,01	6.2	0.1	1.5	4.5	263108 0015	
Z622,0200,02	6.2	0.2	2.0	4.5	263108 0020	
Z622,0250,02	6.2	0.2	2.5	4.5	263108 0025	
Z622,0300,02	6.2	0.2	3.0	4.5	263108 0030	
Z622,0400,02	6.2	0.2	4.0	4.5	263108 0040	

2141



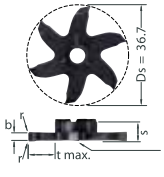
Bevel grinding on the front face

6-tooth cutting inserts for general groove milling

- t-max. 12 mm only with holder ZH22

Designation	S mm	r mm	b mm	t max. mm	D min. mm	HC8620 art.no.	€
Z637,0050,00	5.85	-	0.5	12.0	37.0	263111 0005	
Z637,0100,01	5.85	0.1	1.0	12.0	37.0	263111 0010	
Z637,0150,01	5.85	0.1	1.5	12.0	37.0	263111 0015	

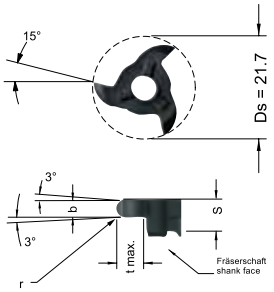
2141



Bevel grinding on the front face for b ≥ 1 mm

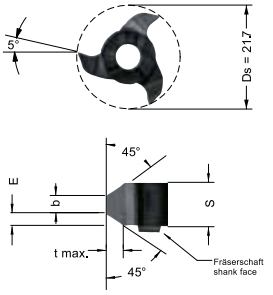
Cutting inserts for full radius grooves

Designation	S mm	r mm	b +0.03 mm	t max. mm	HC8620 art.no.	€
Z 22,0005,10	5,75	0.5	1.0	4.5	263103 0010	
Z 22,0010,20	5,75	1.0	2.0	4.5	263103 0020	
Z 22,0014,28	5,75	1.4	2.8	4.5	263103 0028	
Z 22,0015,30	5,75	1.5	3.0	4.5	263103 0030	
Z 22,0020,40	5,75	2.0	4.0	4.5	263103 0040	
					2141	



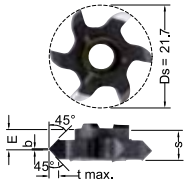
Bore milling cutter inserts, front and rear-side chamfering

Designation	S mm	E mm	b mm	t max. mm	HC8620 art.no.	€
Z 22,4545,58	5.85	2.00	2.0	1.7	263106 0015	
Z 22,4545,94	9.4	3.25	3.0	3.0	263106 0020	
					2141	



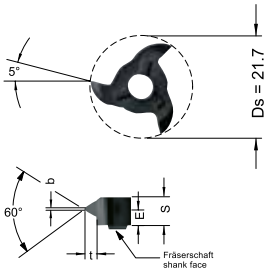
Bore milling cutter inserts, front and rear-side chamfering with 6 teeth

Designation	S mm	E mm	b +0.03 mm	t max. mm	HC8620 art.no.	€
Z622,4545,63	6.4	3.9	0.2	1.9	263109 0015	
					2141	



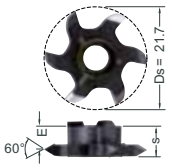
Cutting inserts for ISO metric threads, partial profile

Designation	S mm	Pitch P mm	E mm	b mm	t mm	HC8620 art.no.	€
Z 22,0720,01	5.85	1.0 - 2.0	4.6	0.12	1.19	263104 1020	
Z 22,2545,01	5.85	2.0 - 4.5	3.7	0.31	2.71	263104 2545	
Z 22,0815,01	5.85	1.5 - 2.75	4.8	0.18	1.62	263104 0015	
Z 22,1020,01	5.85	2.0 - 3.75	4.6	0.25	2.22	263104 0020	
Z 22,1630,01	5.85	2.5 - 5.0	4.3	0.37	2.98	263104 0030	
					2141		



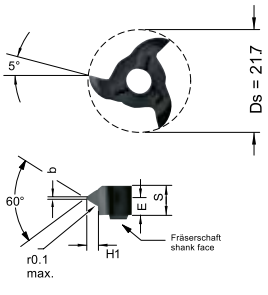
Cutting inserts for ISO metric threads, internal, partial profile, 6 teeth

Designation	S mm	Pitch P mm	E mm	Thread nominal Ø mm	HC8620 art.no.	€
Z622,0720,01	6.20	1.0 - 2.0	5.1	> 27.0	263110 1020	
Z622,2545,01	6.05	2.0 - 4.5	4.3	> 33.0	263110 2545	
					2141	



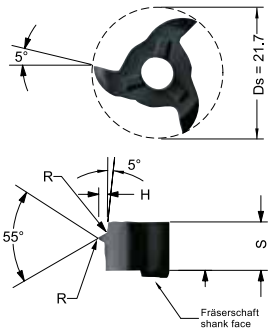
Cutting inserts for ISO metric threads, full profile

Designation	S mm	Pitch P mm	E mm	b mm	H1 mm	HC8620 art.no.	€
Z 22,0815,02	5.85	1.5	4.8	0.18	0.81	263105 0150	
Z 22,0917,02	5.85	1.75	4.7	0.20	0.95	263105 0175	
Z 22,1020,02	5.85	2.0	4.6	0.25	1.08	263105 0200	
Z 22,1630,02	5.85	3.0	4.3	0.37	1.62	263105 0300	
Z 22,1835,02	5.85	3.5	4.1	0.43	1.89	263105 0350	
Z 22,2140,02	5.85	4.0	3.9	0.5	2.16	263105 0400	
Z 22,2445,02	5.85	4.5	3.7	0.56	2.43	263105 0450	
						2141	



Cutting inserts for Whitworth pipe threads, DIN ISO 228 (259) + 2999 full profile

Designation	s mm	Pitch TPI	R mm	H mm	HC8620 art.no.	€
Z 22,5506,02	5.85	6 (4.23)	0.58	2.71	263107 0060	
Z 22,5508,02	5.85	8 (3.17)	0.43	2.03	263107 0080	
Z 22,5511,02	5.85	11 (2.30)	0.31	1.48	263107 0011	
					2141	



Dümmel® Tool system for machining drill holes *MINI-MILL XL*

DIN 6535 HA | Vc/fz | 802

- **4-rib teeth**
- Type XH 50 max. immersion depth 16.5 mm
- Solid carbide cutting insert quality **HC 8620**
- **Solid carbide milling cutter shank** with internal coolant supply
- **Steel milling cutter** with internal coolant supply
- Groove milling, cut-off milling and slot milling



material: ● very well suited ○ well suited

	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
263201....	●	●	●	●	○		●	●	○	○		○	○	○		○		
263202....	●	●	●	●	○		●	●	○	○		○	○	○		○		

Steel shank, DIN 1835 A



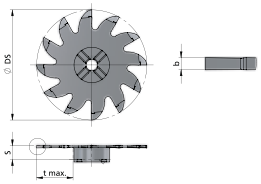
Designation	D1 mm	D3 mm	L mm	L2 mm	Cutting circle average mm	t max. mm	art.no.	€
XH50,2016,32.A.ST	20	16.0	100	32.0	50.0	16.5	263011 0016	
							2177	

Solid carbide shank DIN 6535 HA



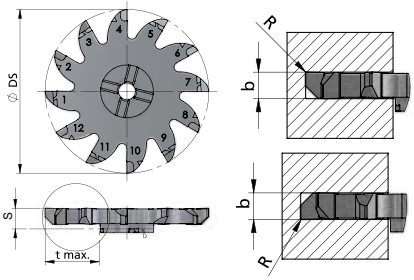
Designation	D1 mm	D3 mm	L mm	L2 mm	Cutting circle average mm	t max. mm	art.no.	€
XH50,1616,060.A.HM	16	16.0	125	60	50.0	16.5	263012 1016	
XH50,1616,090.A.HM	16	16.0	155	90	50.0	16.5	263012 2016	
XH50,1616,120.A.HM	16	16.0	185	120	50.0	16.5	263012 3016	
							2177	

Cutting inserts for groove and cut-off milling, general with 12 teeth



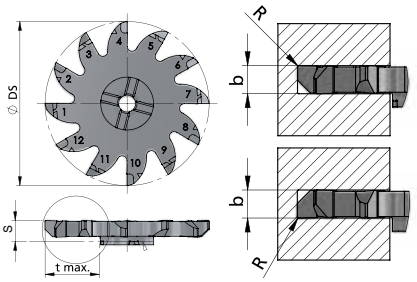
Designation	S mm	D mm	b mm	t max. mm	HC8620 art.no.	€
X1250,0050,00	6.35	50	0.5	16.5	263201 5005	
X1250,0100,00	6.35	50	1.0	16.5	263201 5010	
					2177	

Cutting inserts for groove and cut-off milling, one-sided radius with 12 teeth



Designation	S mm	D mm	b mm	r mm	t max. mm	art.no.	€
X1250.X150,01	6.35	50	1.5	0.1	16.5	263202 5015	
X1250.X200,02	6.35	50	2.0	0.2	16.5	263202 5020	
X1250.X250,02	6.35	50	2.5	0.2	16.5	263202 5025	
X1250.X300,02	6.35	50	3.0	0.2	16.5	263202 5030	
						2177	

Cutting inserts for groove and cut-off milling, double-sided radius, 12 teeth



Designation	D mm	S mm	b mm	r mm	t max. mm	art.no.	€
X1250.X400,02	50	6.35	4.0	0.2	16.5	263203 5040	
X1250.X500,02	50	6.35	5.0	0.2	16.5	263203 5050	
X1250.X600,02	50	6.35	6.0	0.2	16.5	263203 5060	
						2177	

Spare parts

	Screw art.no.	€
A1	263999 0002	
	2141	

	TORX art.no.	€
B1	703053 0200	
	7114	

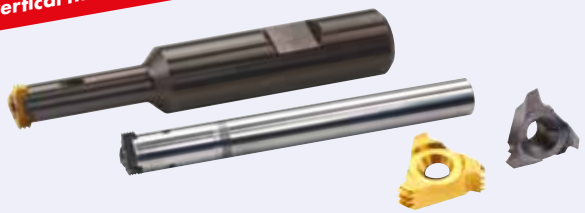
ATORN The CMT system

INFO

Removable, vertical thread-mill inserts and holders for a variety of thread profiles

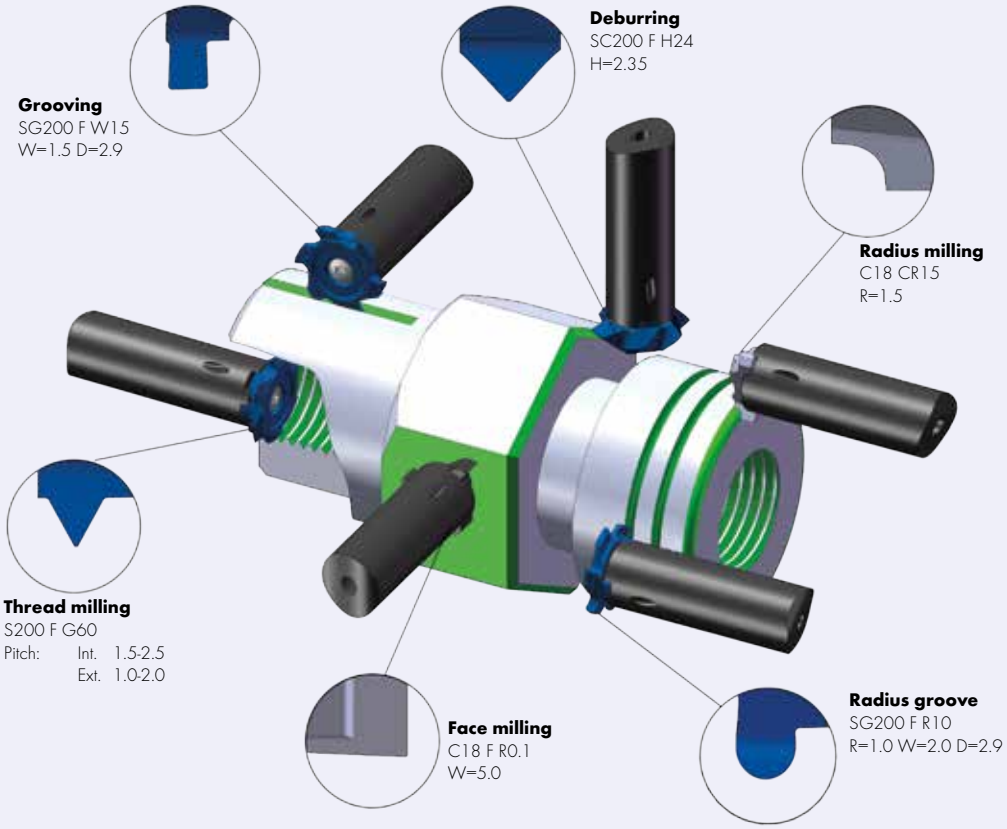
- Front-mounted plate for high precision and excellent performance
- Milling with high cutting rates and perfect surface finish
- Stable and precise clamping for consistent reproducibility
- Same plate for right-hand and left-hand threads
- Tool holders with Weldon shank and internal cooling
- Plates for countersinking, grooving and face milling

Tool system for vertical thread milling



One holder for all machining situations

SRC 2018 J with internal coolant supply



ATORN CMT tool system for vertical thread milling

Sarter kit, consisting of

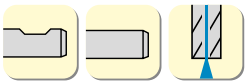
- steel mounting SRC 2018 J
- Partial profile insert S200 F G60 for internal pitch 1.5-2.5 mm, external pitch 1.0-2.0 mm
- Chamfer insert SC20 F H24 90°
- Recessing insert SG200 F W15 1.5 mm
- Radius insert SG200 F R10 R1.0
- Corner radius insert C18 CR15 R1.5
- Milling insert C18 F R0.1 Ø 17.8





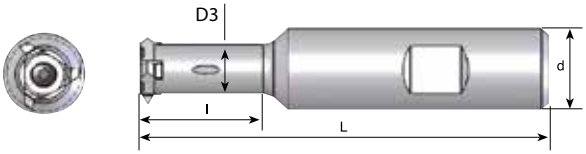
Contents	art.no.	€
Set of steel mountings incl. 6 inserts	266005 0001	
	2151	

ATORN CMT tool system for vertical thread milling



- Solid carbide milling cutter shank with internal coolant supply
- Steel milling cutter shank with internal coolant supply

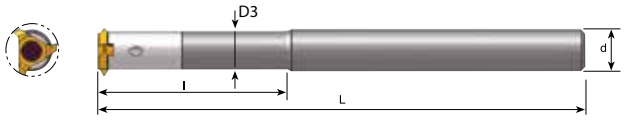




DIN 6535 HB steel shank with internal coolant supply

Model	Type	Indexable insert type	D1 mm	D3 mm	L1 mm	L mm			art.no.	€
SRC 1210 E	A1	A10	12	7.3	19	70	A1	B1	266001 0001	
SRC 1610 G	A2	A10	16	7.3	19	90	A1	B1	266001 0002	
SRC 1212 E	A3	A12, S17	12	9	25	70	A2	B2	266001 0003	
SRC 1612 G	A4	A12, S17	16	9	25	90	A2	B2	266001 0004	
SRC 1612 H	A5	A12, S17	16	9	35	100	A2	B2	266001 0005	
SRC 1618 H	A6	A18, S20	16	13.8	48	100	A4	B2	266001 0006	
SRC 2018 H	A7	A18, S20	20	13.8	32	100	A4	B2	266001 0007	
SRC 2018 J	A8	A18, S20	20	13.8	48	110	A4	B2	266001 0008	
SRC 2018 L	A9	A18, S20	20	13.8	74	140	A4	B2	266001 0009	
SRC 2525 J	A10	A25	25	17.5	45	115	A5	B3	266001 0010	
SRC 2525 M	A11	A25	25	17.5	80	150	A5	B3	266001 0011	
SRC 1210 F	A1,1	A10	12	8	25	80	A1	B1	266001 0012	
SRC 1212 G	A3,1	A12, S17	12	10	40	90	A2	B2	266001 0013	
SRC 1618 F	A5,1	A18, S20	16	12	25	80	A4	B3	266001 0014	
SRC 1618 G	A5,2	A18, S20	16	12	40	90	A4	B3	266001 0015	
SRC 2035 K	A12	S35	20	22	44	130	A3	B4	266001 0016	
SRC 2535 H	A13	S35	25	22	40	100	A3	B4	266001 0017	
SRC 2535 K	A14	S35	25	22	60	130	A3	B4	266001 0018	

2150





DIN 1835 A solid carbide shank with internal coolant supply

Model	Type	Indexable insert type	D1 mm	D3 mm	L1 mm	L mm	art.no.	€
CRC 0810 L35 K	A12	A10	8	7.3	35	125	266002 0001	
CRC 0810 K	A13	A10	8	8	-	125	266002 0002	
CRC 1012 M	A14	A12, S17	10	10	-	150	266002 0003	
CRC 1218 P	A15	A18, S20	12	12	-	170	266002 0004	
CRC 1625 R	A16	A25	16	16	-	205	266002 0005	
CRC 2025 L85 S	A17	A25	20	17.5	85	250	266002 0006	
CRC 1010 L45 M	A17	A10	10	7.3	45	150	266002 0007	
CRC 1012 L40 M	A18	A12, S17	10	9	40	150	266002 0008	
CRC 1212 L57 P	A20	A12, S17	12	9	57	165	266002 0009	
CRC 1618 L48 R	A22	A18, S20	16	13.8	48	195	266002 0010	
CRC 1618 L74 R	A23	A18, S20	16	13.8	74	195	266002 0011	
CRC 2035 S	A26	S35	20	22	37	260	266002 0012	

2150

Spare parts

	Screw art.no.	€
A1	259501 9009	
A2	259501 9010	
A3	259501 9011	
A4	341401 0011	
A5	341401 0041	

3116

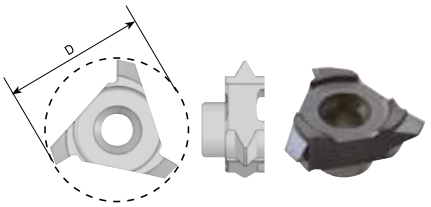
	Wrench art.no.	€
B1	705141 0006	
B2	705141 0010	
B3	705141 0025	
B4	705141 0030	

7114

ATORN Cutting inserts for vertical thread milling work *CMT*

Z1 | Z4 | Z5 | Z6 | Z8+

- Type C10, from Ø 11 mm bore
- **Solid carbide cutting inserts in quality grade AMT7 for all materials up to 55 HRC**
- **Solid carbide cutting inserts in quality grade AMT8, extremely heat-resistant, for materials up to 62 HRC**
- For partial profile 55 and 60°, full profile ISO, UN, G55°, NPT, ACME, RD DIN405 and trapezoidal threading



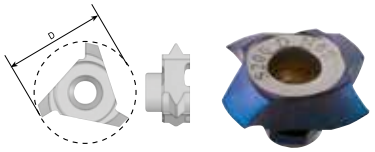
Partial profile, 60°

- the same tool for internal and external threads

ISO P M K N S H

Model	Indexable insert type	Min./max. pitch internal	Min./max. number of thread starts per inch internal	Min./max. pitch external	Min./max. number of thread starts per inch external	D mm	D min. mm	Suitable for holder	AMT7 art.no.	€
C10 A60	A10	0.5-0.8 mm	56-28	0.4-0.8 mm	64-32	10	11	A1 | A2 | A12 | A13	266100 1001	
C10 G60	A10	1-2 mm	28-13	0.8-1.75 mm	32-15	10	12	A1 | A2 | A12	266100 1002	
C12 A60	A12	0.5-0.8 mm	56-28	0.4-0.8 mm	64-32	12	13	A3 | A4 | A5 | A14	266100 1201	
C12 G60	A12	1-2 mm	28-13	0.8-1.75 mm	32-15	12	14	A3 | A4 | A5 | A14	266100 1202	
C12 AG60	A12	1.5 - 2.5	18 - 11	1.25 - 2.0	24 - 13	12.4	15	A3 | A4 | A5 | A18 | A20	266100 1203	
C18 A60	A18	0.5-0.8 mm	56-28	0.4-0.8 mm	64-32	18	19	A6 | A7 | A8 | A9 | A15	266100 1801	
C18 G60	A18	1-1.75 mm	28-14	0.8-1.5 mm	32-16	18	20	A6 | A7 | A8 | A9 | A15	266100 1802	
C18 D60	A18	2-3 mm	13-8	1.75-2.5 mm	15-10	18	21	A6 | A7 | A8 | A9 | A15	266100 1803	
C25 G60	A25	1.5-2.5 mm	16-10	1-2 mm	28-13	25	28	A10 | A11 | A16 | A17	266100 2501	
C25 N60	A25	3-5 mm	8-5	2.5-4.5 mm	10-6	25	30	A10 | A11 | A16 | A17	266100 2502	
C25 Q60	A25	5-6 mm	5-4	4.5-5 mm	6-5	25	34	A10 | A11 | A16 | A17	266100 2503	

2151



Partial profile, 60°, multi-flute

- the same tool for internal and external threads

ISO P M K N S H

Model	Indexable insert type	Min./max. pitch internal mm	Max. number of thread starts per inch internal TPI	Min./max. pitch external mm	Min./max. number of thread starts per inch TPI	D mm	D min. mm	Number of teeth pc.	Suitable for holder	ATM8 art.no.	€
S160 F AG60	S17	1.0 - 3.5	28 - 7	0.8 - 3.0	32 - 8.5	16	20	6	A3 | A3,1 | A4 | A5 | A18 | A19 | A20	266110 1701	
S200 D N60	S20	3.0-5.0	8-5	2.5-4.5	10-6	20	25	4	A15	266110 2002	
S200 F G60	S20	1.5-2.5	16-10	1.0-2.0	28-13	20	23	6	A6 | A7 | A8 | A9 | A15	266110 2001	
S350 F N60	S35	3.0 - 5.0	8 - 5	2.5 - 4.5	10 - 6	35	38	6	A12 | A13 | A14 | A26	266110 3501	
S350 F Q60	S35	5.0 - 6.0	5 - 4	4.5 - 5.0	6 - 5	35	40	6	A12 | A13 | A14 | A26	266110 3502	

2151

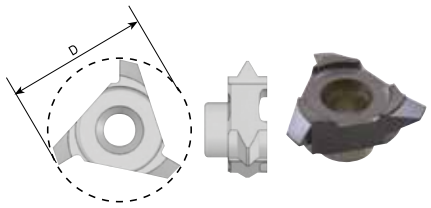
Partial profile, 55°

- the same tool for internal and external threads

ISO P M K N S H

Model	Indexable insert type	Min./max. number of thread starts per inch	D mm	D min. mm	Suitable for holder	AMT7 art.no.	€
C10 G55	A10	19-14	10	13	A1 | A2 | A12	266101 1001	
C12 G55	A12	28-19	12	14	A3 | A4 | A5 | A14	266101 1201	
C12 N55	A12	14-11	12.2	16	A3 | A4 | A5	266101 1202	
C18 G55	A18	14-8	18	23	A6 | A7 | A8 | A9 | A15	266101 1801	
C25 N55	A25	7-5	25	31	A10 | A11 | A16 | A17	266101 2501	

2151



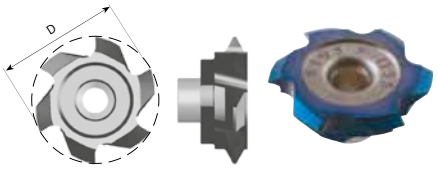
Partial profile, 55°, BSP (G), BSF, BSW, multi-flute

- the same tool for internal and external threads

ISO P M K N S H

Model	Indexable insert type	Pitch TPI	D mm	D min. mm	Number of teeth pc.	Suitable for holder	AMT8 art.no.	€
S195 F G55	S20	14	19.5	23	6	A6, 7, 8, 9, 15	266112 2001	
S200 D N55	S20	8-6	20.0	25	4	A15	266112 2002	

2151



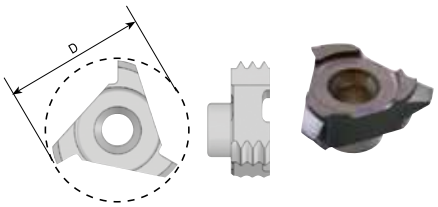
Full profile, UN

• for female threads

ISO P M K N S H

Model	Indexable insert type	Pitch mm	D mm	D min. mm	Number of teeth pc.	Suitable for holder	AMT7 art.no.	€
C10 I 0.5 ISO	A10	0.5	9	10	6	A1 | A2 | A12 | A13	266102 1001	
C10 I 1.0 ISO	A10	1.0	10	12	3	A1 | A2 | A12 | A13	266102 1002	
C10 I 1.5 ISO	A10	1.5	10	13	2	A1 | A2 | A12 | A13	266102 1003	
C10 I 2.0 ISO	A10	2	10	14	1	A1 | A2 | A12	266102 1004	
C12 I 0.5 ISO	A12	0.5	12	13	6	A3 | A4 | A5 | A14	266102 1201	
C12 I 0.75 ISO	A12	0.75	12	13	4	A3 | A4 | A5 | A14	266102 1202	
C12 I 1.0 ISO	A12	1	12	14	3	A3 | A4 | A5 | A14	266102 1203	
C12 I 1.5 ISO	A12	1.5	12	15	2	A3 | A4 | A5 | A14	266102 1204	
C12 I 2.0 ISO	A12	2	12.4	16	1	A3 | A4 | A5 | A14	266102 1205	
C12 I 2.5 ISO	A12	2.5	12	17	1	A3 | A4 | A5	266102 1206	
C12 I 3.0 ISO	A12	3	12.4	17	1	A3 | A4 | A5	266102 1207	
C18 I 0.5 ISO	A18	0.5	17.8	19	9	A6 | A7 | A8 | A9 | A15	266102 1801	
C18 I 0.75 ISO	A18	0.75	17.8	19	6	A6 | A7 | A8 | A9 | A15	266102 1802	
C18 I 1.0 ISO	A18	1	17.8	20	5	A6 | A7 | A8 | A9 | A15	266102 1803	
C18 I 1.5 ISO	A18	1.5	17.8	20	3	A6 | A7 | A8 | A9 | A15	266102 1804	
C18 I 2.0 ISO	A18	2	17.8	21	2	A6 | A7 | A8 | A9 | A15	266102 1805	
C18 I 2.5 ISO	A18	2.5	17.8	22	2	A6 | A7 | A8 | A9 | A15	266102 1806	
C18 I 3.0 ISO	A18	3	17.8	23	1	A6 | A7 | A8 | A9 | A15	266102 1807	
C18 I 3.5 ISO	A18	3.5	17.8	24	1	A6 | A7 | A8 | A9 | A15	266102 1808	
C25 I 3.0 ISO	A25	3	25	30	2	A10 | A11 | A16 | A17	266102 2501	
C25 I 4.0 ISO	A25	4	25	32	1	A10 | A11 | A16 | A17	266102 2502	
C25 I 4.5 ISO	A25	4.5	25	33	1	A10 | A11 | A16 | A17	266102 2503	
C25 I 5.0 ISO	A25	5	25	34	1	A10 | A11 | A16 | A17	266102 2504	
C25 I 5.5 ISO	A25	5.5	25	35	1	A10 | A11 | A16 | A17	266102 2505	
C25 I 6.0 ISO	A25	6	25	36	1	A10 | A11 | A16 | A17	266102 2506	
C10 1.75 ISO	A10	1.75	9.6	12	1	A10 | A2 | A15 | A17	266102 1006	
C10 I 0.75 ISO	A10	0.75	10	12	4	A1 | A1,1 | A2 | A15 | A16 | A17	266102 1005	
C25 I 3.5 ISO	A25	3.5	25.0	33	1	A10 | A11 | A24 | A25	266102 2507	

2151



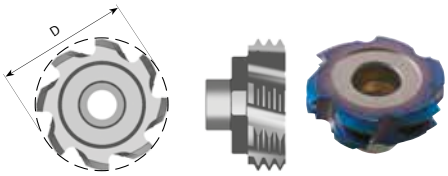
Full profile ISO 60°, multi-flute

• for female threads

ISO P M K N S H

Model	Indexable insert type	Pitch mm	D mm	D min. mm	Number of teeth pc.	Z	Suitable for holder	AMT8 art.no.	€
S 160 F 2.5 ISO	S17	2.5	16	20	1	1	A3, 3.1, 4, 5, 18, 19, 20	266113 1701	
S163 H 1.0 ISO	S20	1.0	16.3	18	5	8	A6, 7, 8, 9, 15	266113 2001	
S175 H 1.5 ISO	S20	1.5	17.5	20	3	8	A6, 7, 8, 9, 15	266113 2002	
S178 F 2.5 ISO	S20	2.5	17.8	22	2	6	A6, 7, 8, 9, 15	266113 2004	
S186 F 2.0 ISO	S20	2	18.6	22	2	6	A6, 7, 8, 9, 15	266113 2003	
S189 F 3.0 ISO	S20	3	18.9	24	1	6	A6, 7, 8, 9, 15	266113 2005	
S200 F 3.5 ISO	S20	3.5	20.0	26	1	6	A6, 7, 8, 9, 15	266113 2006	
S200 F 4.0 ISO	S20	4	20.0	27	1	6	A6, 7, 8, 9, 15	266113 2007	
S200 F 4.5 ISO	S20	4.5	20.0	28	1	5	A6, 7, 8, 9, 15	266113 2008	
S200 F 5.0 ISO	S20	5	20.0	29	1	4	A15	266113 2009	
S350 F 4.5 ISO	S35	4.5	35	45	1	1	A12, 13, 14, 26	266113 3501	
S350 F 6.0 ISO	S35	6.0	35	64	1	1	A12, 13, 14, 26	266113 3502	
S350 F 8.0 ISO	S35	8.0	35	130	1	1	A12, 13, 14, 26	266113 3503	

2151



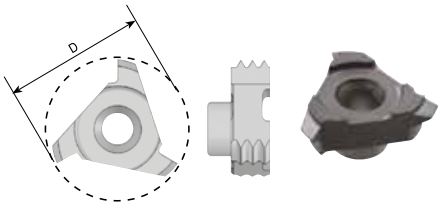
Full profile ISO 60°

- for female threads

ISO P M K N S H

Model	Indexable insert type	Pitch TPI	D mm	Number of teeth pc.	Suitable for holder	AMT7 art.no.	€
C10 I 20 UN	A10	20	10.0	2	A1, 2, 12, 13	266103 1001	
C10 I 18 UN	A10	18	10.0	2	A1, 2, 12, 13	266103 1002	
C10 I 12 UN	A10	12	10.0	1	A1, 2, 12	266103 1003	
C10 I 13 UN	A10	13	10.0	1	A1, 2, 15, 17	266103 1004	
C12 I 32 UN	A12	32	12.0	3	A3, 4, 5, 14	266103 1201	
C12 I 28 UN	A12	28	12.0	3	A3, 4, 5, 14	266103 1202	
C12 I 24 UN	A12	24	12.0	2	A3, 4, 5, 14	266103 1203	
C12 I 20 UN	A12	20	12.0	2	A3, 4, 5, 14	266103 1204	
C12 I 18 UN	A12	18	12.0	2	A3, 4, 5, 14	266103 1205	
C12 I 16 UN	A12	16	12.0	1	A3, 4, 5, 14	266103 1206	
C12 I 11 UN	A12	11	12.0	1	A3, 4, 5	266103 1207	
C12 I 10 UN	A12	10	12.0	1	A3, 4, 5	266103 1208	
C12 I 12 UN	A12	12	12.4	1	A3, 3.1, 4, 5, 18, 19, 20	266103 1209	
C18 I 32 UN	A18	32	17.8	6	A6, 7, 8, 9, 15	266103 1801	
C18 I 28 UN	A18	28	17.8	5	A6, 7, 8, 9, 15	266103 1802	
C18 I 24 UN	A18	24	17.8	4	A6, 7, 8, 9, 15	266103 1803	
C18 I 20 UN	A18	20	17.8	3	A6, 7, 8, 9, 15	266103 1804	
C18 I 18 UN	A18	18	17.8	3	A6, 7, 8, 9, 15	266103 1805	
C18 I 16 UN	A18	16	17.8	3	A6, 7, 8, 9, 15	266103 1806	
C18 I 14 UN	A18	14	17.8	2	A6, 7, 8, 9, 15	266103 1807	
C18 I 12 UN	A18	12	17.8	2	A6, 7, 8, 9, 15	266103 1808	
C18 I 11 UN	A18	11	17.8	2	A6, 7, 8, 9, 15	266103 1809	
C18 I 9 UN	A18	9	17.8	1	A6, 7, 8, 9, 15	266103 1810	
C18 I 8 UN	A18	8	17.8	1	A6, 7, 8, 9, 15	266103 1811	
C25 I 8 UN	A25	8	25.0	2	A10, 11, 16, 17	266103 2501	
C25 I 7 UN	A25	7	25.0	1	A10, 11, 16, 17	266103 2502	
C25 I 6 UN	A25	6	25.0	1	A10, 11, 16, 17	266103 2503	
C25 I 5 UN	A25	5	25.0	1	A10, 11, 16, 17	266103 2504	
C25 I 4 UN	A25	4	25.0	1	A10, 11, 16, 17	266103 2505	

2151



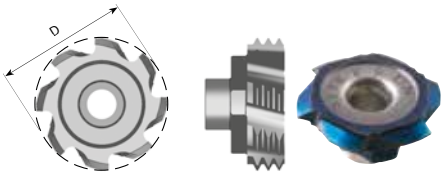
Full profile, UN, multi-flute

- for female threads

ISO P M K N S H

Model	Indexable insert type	Pitch TPI	D mm	Number of teeth pc.	Suitable for holder	AMT8 art.no.	€
S150 F 10 UN	S17	10	15.0	1	A3, 3.1, 4, 5, 18, 19, 20	266114 1701	
S160 H 24 UN	S20	24	16.0	8	A6, 7, 8, 9, 15	266114 2001	
S164 F 16 UN	S20	16	16.4	6	A6, 7, 8, 9, 15	266114 2003	
S169 H20 UN	S20	20	16.9	8	A6, 7, 8, 9, 15	266114 2002	
S178 F 9 UN	S20	9	17.8	6	A6, 7, 8, 9, 15	266114 2006	
S186 F 12 UN	S20	12	18.6	6	A6, 7, 8, 9, 15	266114 2005	
S191 F14 UN	S20	14	19.1	6	A6, 7, 8, 9, 15	266114 2004	
S200 D 5 UN	S20	5	20.0	4	A15	266114 2010	
S200 E 6 UN	S20	6	20.0	5	A6, 7, 8, 9, 15	266114 2009	
S200 F 7 UN	S20	7	20.0	6	A6, 7, 8, 9, 15	266114 2008	
S200 F 8 UN	S20	8	20.0	6	A6, 7, 8, 9, 15	266114 2007	
S350 F 4 UN	S35	4	35.0	1	A12, 13, 14, 26	266114 3502	
S350 F 8 UN	S35	8	35.0	2	A12, 13, 14, 26	266114 3501	

2151



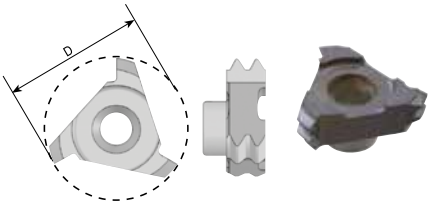
G55° BSW, BSF, BSP

- the same tool for internal and external threads

ISO P M K N S H

Model	Indexable insert type	Pitch	D mm	Number of teeth pc.	Suitable for holder	AMT7 art.no.	€
C10 19 W	A10	19	10	2	A1 | A2 | A12 | A13	266104 1001	
C12 19 W	A12	19	12	2	A3 | A4 | A5 | A14	266104 1201	
C18 14 W	A18	14	17.8	2	A6 | A7 | A8 | A9 | A15	266104 1801	
C18 11 W	A18	11	17.8	2	A6 | A7 | A8 | A9 | A16	266104 1802	

2151

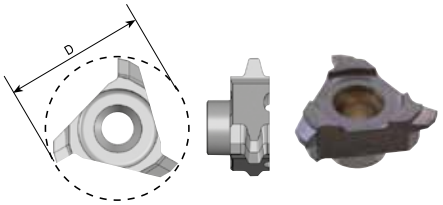


Trapezoid

- DIN 103
- For female threads

ISO P M K N S H

Model	Indexable insert type	Suitable for holder	D mm	Number of teeth pc.	Pitch mm	AMT7 art.no.	€
C10 I 2 TR	A10	A1 | A2 | A12	10	1	2	266105 1001	
C12 I 2 TR	A12	A3 | A4 | A5 | A18 | A20	12	1	2	266105 1201	
C18 I 3 TR	A18	A6 | A7 | A8 | A9 | A15	17.8	1	3	266105 1801	
C18 I 4 TR	A18	A15	17.8	1	4	266105 1802	
C18 I 5 TR	A18	A15	17.8	1	5	266105 1803	
C25 I 6 TR	A25	A10 | A11 | A16 | A17	25	1	6	266105 2501	

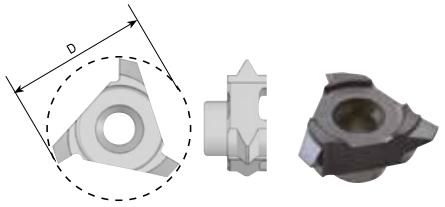


2151

Full profile, NPT

ISO P M K N S H

Model	Indexable insert type	Pitch TPI	D mm	Suitable for holder	AMT7 art.no.	€
C10 18 NPT	A10	18	10.0	A1, 1.1, 2, 15, 17	266119 1001	
C18 14 NPT	A18	14	15.8	A5.1, 5.2, 21	266119 1801	
C25 11,5 NPT	A25	11.5	25.0	A10, 11, 24, 25	266119 2501	
C25 8 NPT	A25	8	25.0	A10, 11, 24, 25	266119 2502	

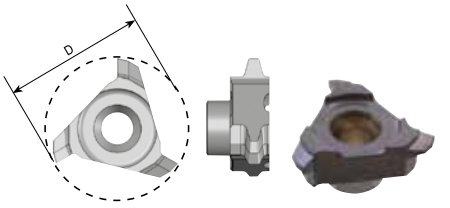


2151

Full profile, ACME

ISO P M K N S H

Model	Indexable insert type	Pitch TPI	D mm	Suitable for holder	AMT7 art.no.	€
C18 I5 ACME	A18	5	18.0	A5.1, 5.2, 21	266120 1801	
C25 I4 ACME	A25	4	25.0	A10, 11, 24, 25	266120 2501	



2151

Full profil RD DIN405

ISO P M K N S H

Model	Pitch TPI	D mm	Suitable for holder	ATM7 art.no.	€
C18 1/6 RD	6	17.8	A5.1, 5.2, 21	266121 1801	
C18 1/8 RD	8	17.8	A5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266121 1802	
C25 1/4 RD	4	25.0	A10, 11, 24, 25	266121 2501	



2151

ATORN Cutting inserts for vertical milling work *CMT*

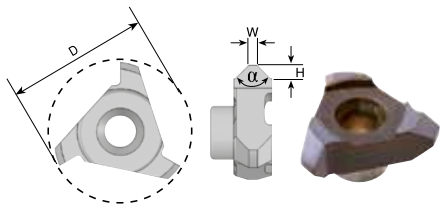
- Type C10, from Ø 11 mm bore
- **Solid carbide cutting inserts in quality grade AMT7 for all materials up to 55 HRC**
- **Solid carbide cutting inserts in quality grade AMT8, extremely heat-resistant, for materials up to 62 HRC**
- For countersinking, grooving, plunge milling, face milling and finishing

Countersinking and grooving

- suitable for deburring, reverse countersinking, and grooving
- Two cutting edges
- suitable for all materials

ISO H K M N P S

Model	Indexable insert type	D mm	H mm	Bore hole Ø mm	γ °	Suitable for holder		AMT7 art.no.	€
C10 C90	A10	10.0	1.30	0.4	90	A1, 2, 12	1	266107 1001	
C12 C90	A12	12.0	1.35	0.3	90	A3.4.5	1	266107 1201	
C18 C90	A18	17.8	1.95	1.1	90	A6, 7, 8, 9, 15	3	266107 1801	
C25 C90	A25	25.0	2.50	1.0	90	A10, 11, 16, 17	1	266107 2501	



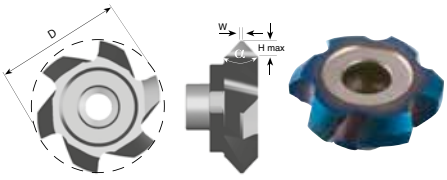
2151

Countersinking and grooving, multi-flute

- suitable for deburring, reverse countersinking, and grooving
- Two cutting edges
- suitable for all materials

ISO H K M N P S

Model	Indexable insert type	D mm	H mm	Bore hole Ø mm	γ °	Number of teeth pc.	Suitable for holder	AMT8 art.no.	€
SC160 E H14	S17	16.0	1.35	0.2	90°	5	A3, 3.1, 4, 5, 18, 19, 20	266116 1701	
SC170 E H14	S20	17.0	1.35	0.2	90°	5	A6, 7, 8, 9, 15	266116 2001	
SC200 F H12	S20	20.0	1.20	2.5	90°	6	A6, 7, 8, 9, 15	266116 2007	
SC200 F H14	S20	20.0	1.35	0.2	90°	6	A6, 7, 8, 9, 15	266116 2002	
SC200 F H15	S20	20.0	1.50	2.0	90°	6	A6, 7, 8, 9, 15	266116 2006	
SC200 F H17	S20	20.0	1.70	1.5	90°	6	A6, 7, 8, 9, 15	266116 2005	
SC200 F H20	S20	20.0	1.95	1.0	90°	6	A6, 7, 8, 9, 15	266116 2004	
SC200 F H24	S20	20.0	2.35	0.2	90°	6	A6, 7, 8, 9, 15	266116 2003	
SC350 F H42	S35	35.0	4.20	0.2	90°	6	A12, 13, 14, 26	266116 3501	



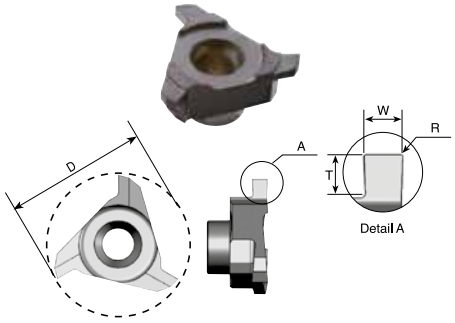
2151

Plunge milling

ISO H K M N P S

Model	Indexable insert type	D mm	w mm	Depth mm	R mm	D min. mm	Suitable for holder	AMT7 art.no.	€
C10 W08	A10	10.0	0.80	0.80	0.1	10.0	A1, 1.1, 2, 15, 16, 17	266108 1001	
C10 W09	A10	10.0	0.90	0.90	0.1	10.0	A1, 1.1, 2, 15, 16, 17	266108 1002	
C10 W10	A10	10.0	1.00	0.90	0.1	10.0	A1, 1.1, 2, 15, 16, 17	266108 1003	
C12 W08	A12	12.0	0.80	0.80	0.1	12.0	A3, 3.1, 4, 5, 18, 19, 20	266108 1201	
C12 W10	A12	12.0	1.00	0.90	0.1	12.0	A3, 3.1, 4, 5, 18, 19, 20	266108 1202	
C18 W10	A18	17.8	1.00	1.50	0.1	17.8	A5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266108 1801	
C18 W12	A18	17.8	1.20	1.50	0.1	17.8	A5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266108 1802	
C18 W15	A18	17.8	1.50	1.95	0.1	17.8	A5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266108 1803	
C18 W20	A18	17.8	2.00	2.80	0.1	17.8	A5.1, 5.2, 21	266108 1804	
C25 W20	A25	25.0	2.00	3.00	0.2	25.0	A10, 11, 24, 25	266108 2501	
C25 W25	A25	25.0	2.50	3.00	0.2	25.0	A10, 11, 24, 25	266108 2502	
C25 W30	A25	25.0	3.00	3.00	0.2	25.0	A10, 11, 24, 25	266108 2503	
C25 W35	A25	25.0	3.50	3.50	0.2	25.0	A10, 11, 24, 25	266108 2504	
C25 W40	A25	25.0	4.00	3.50	0.2	25.0	A10, 11, 24, 25	266108 2505	
C25 W50	A25	25.0	5.00	3.50	0.2	25.0	A10, 11, 24, 25	266108 2506	
C10 W15	A10	10	1.50	1.20	0.1	10.0	A1, 2, 15, 17	266108 1004	
C10 W20	A10	10	2.00	1.20	0.1	10.0	A1, 2, 15, 17	266108 1005	
C12 W10T	A12	12.3	1.00	1.60	0.2	12.3	A3, 4, 5, 18, 20	266108 1203	
C12 W15	A12	12.4	1.50	1.60	0.1	12.4	A3, 4, 5, 18, 20	266108 1204	
C12 W20	A12	12.4	2.00	1.60	0.1	12.4	A3, 4, 5, 18, 20	266108 1205	
C12 W25	A12	12.4	2.50	1.60	0.1	12.4	A3, 4, 5, 18, 20	266108 1206	

2151

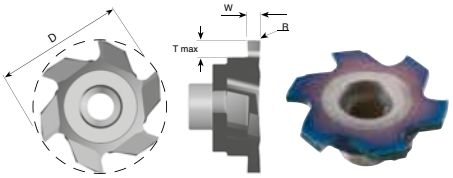


Plunge milling, multi-flute

ISO H K M N P S

Model	Indexable insert type	D mm	w mm	Depth mm	R mm	D min. mm	Number of teeth pc.	Suitable for holder	AMT8 art.no.	€
SG170 F W15	S17	17.0	1.5	2.8	0.2	17	6	A3, 4, 5, 14, 15	266117 1701	
SG170 F W20	S17	17.0	2.0	2.8	0.2	17	6	A3, 4, 5, 14, 15	266117 1702	
SG170 F W25	S17	17.0	2.5	2.8	0.2	17	6	A3, 4, 5, 14, 15	266117 1703	
SG200 E W20T	S20	20.0	2.0	3.7	0.2	20	5	A15	266117 2007	
SG200 E W25T	S20	20.0	2.5	3.7	0.2	20	5	A15	266117 2008	
SG200 E W30T	S20	20.0	3.0	3.7	0.2	20	5	A15	266117 2009	
SG200 F W15	S20	20.0	1.5	2.9	0.2	20	6	A6, 7, 8, 9, 15	266117 2001	
SG200 F W20	S20	20.0	2.0	2.9	0.2	20	6	A6, 7, 8, 9, 15	266117 2002	
SG200 F W25	S20	20.0	2.5	2.9	0.2	20	6	A6, 7, 8, 9, 15	266117 2003	
SG200 F W30	S20	20.0	3.0	2.9	0.2	20	6	A6, 7, 8, 9, 15	266117 2004	
SG200 F W40	S20	20.0	4.0	2.9	0.2	20	6	A6, 7, 8, 9, 15	266117 2005	
SG200 F W49	S20	20.0	4.9	2.9	0.2	20	6	A6, 7, 8, 9, 15	266117 2006	
SG350 E W30T	S35	35.0	3.0	6.3	0.2	35	6	A19, 20, 21	266117 3501	
SG350 E W40T	S35	35.0	4.0	6.3	0.2	35	6	A19, 20, 21	266117 3502	
SG350 E W50T	S35	35.0	5.0	6.3	0.2	35	6	A19, 20, 21	266117 3503	
SG350 E W60T	S35	35.0	6.0	6.3	0.2	35	6	A19, 20, 21	266117 3504	
SG350 E W80T	S35	35.0	8.0	6.3	0.2	35	6	A19, 20, 21	266117 3505	

2151

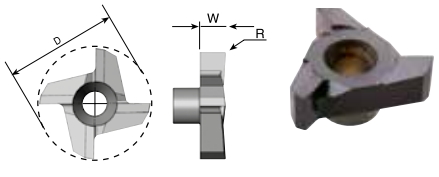


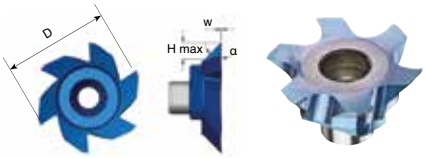
Face milling and finishing

ISO H K M N P S

Model	Indexable insert type	D mm	w mm	R mm	Suitable for holder	AMT7 art.no.	€
C10 F R0.1	A10	10.0	3.0	0.1	A1, 1.1, 2, 15, 16, 17	266109 1001	
C12 F R0.1	A12	12.0	3.0	0.1	A3, 3.1, 4, 5, 18, 19, 20	266109 1201	
C18 F R 0.1	A18	17.8	5.0	0.1	A6, 7, 8, 9, 15	266109 1801	
C25 F R 0.2	A25	25.0	6.0	0.2	A10, 11, 16, 17	266109 2501	

2151



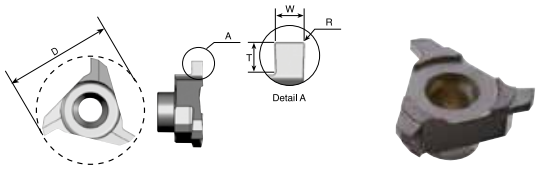


angle milling 45°

ISO H K M N P S

Model	Indexable insert type	D mm	H mm	w mm	γ °	Number of teeth pc.	Suitable for holder	AMT8 art.no.	€
SC170 F A45	S17	17.0	2.5	0.1	45	6	A3, 3.1, 4, 5, 18, 19, 20	266122 1701	
SC200 F A45	S20	20.0	3.0	0.1	45	6	A5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	266122 2001	

2151

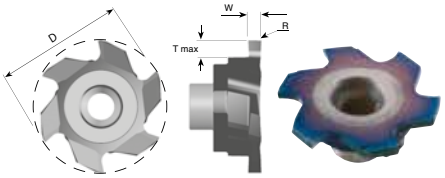


Circlip plunge milling

ISO H K M N P S

Model	D mm	Bore hole Ø mm	Depth mm	R mm	D min. mm	Suitable for holder	AMT7 art.no.	€
C10 W087	10.0	0.87	1.3	0	10.0	A1, 2, 15, 17	266123 1001	
C10 W097	10.0	0.97	1.3	0	10.0	A1, 2, 15, 17	266123 1002	
C10 W121	10.0	1.21	1.3	0	10.0	A1, 2, 15, 17	266123 1003	
C10 W141	10.0	1.41	1.3	0.1	10.0	A1, 2, 15, 17	266123 1004	
C10 W171	10.0	1.71	1.3	0.1	10.0	A1, 2, 15, 17	266123 1005	
C12 W121	12.4	1.21	1.7	0	12.4	A3, 4, 5, 18, 20	266123 1201	
C12 W141	12.4	1.41	1.7	0.1	12.4	A3, 4, 5, 18, 20	266123 1202	
C12 W171	12.4	1.71	1.7	0.1	12.4	A3, 4, 5, 18, 20	266123 1203	
C18 W121	17.8	1.21	2.9	0.1	17.8	A5.1, 5.2, 21	266123 1801	
C18 W141	17.8	1.41	2.9	0.1	17.8	A5.1, 5.2, 21	266123 1802	
C18 W171	17.8	1.71	2.9	0.1	17.8	A5.1, 5.2, 21	266123 1803	
C18 W196	17.8	1.96	2.9	0.15	17.8	A5.1, 5.2, 21	266123 1804	

2151



Circlip plunge milling, multi-flute

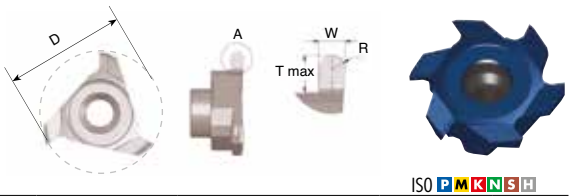
ISO H K M N P S

Model	Indexable insert type	D mm	Bore hole Ø mm	t max. mm	R mm	Number of teeth pc.	Suitable for holder	AMT8 art.no.	€
SG200 F W 196	S20	20.0	1.96	4.0	0.1	6	A5.1, 5.2, 21	266124 2004	
SG200 F W121	S20	20.0	1.21	4.0	0	6	A5.1, 5.2, 21	266124 2001	
SG200 F W141	S20	20.0	1.41	4.0	0.1	6	A5.1, 5.2, 21	266124 2002	
SG200 F W171	S20	20.0	1.71	4.0	0.1	6	A5.1, 5.2, 21	266124 2003	

2151

ATORN Cutting inserts for vertical radius milling work *CMT*

- Type C10, from Ø 11 mm bore
- **Solid carbide cutting inserts in quality grade AMT7 for all materials up to 55 HRC**
- **Solid carbide cutting inserts in quality grade AMT8, extremely heat-resistant, for materials up to 62 HRC**
- For partial radius and full radius plunge milling



Full radius plunge milling

ISO P M K N S H

Model	Indexable insert type	D mm	w mm	R mm	t max. mm	D min. mm	Suitable for holder	AMT7 art.no.	€
C12 R11	A12	12.4	2.2	1.1	1.7	12.4	A3, 4, 5, 18, 20	266125 1201	
C18 R08	A18	17.8	1.6	0.8	2.9	17.8	A5.1, 5.2, 21	266125 1801	
C18 R11	A18	17.8	2.2	1.1	2.9	17.8	A5.1, 5.2, 21	266125 1802	

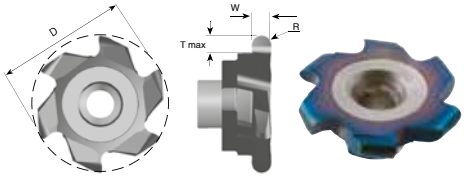
2151

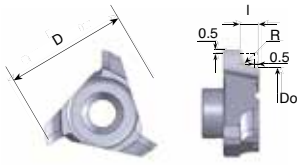
Full radius plunge milling, multi-flute

ISO P M K N S H

Model	Indexable insert type	D	w	Depth	R	D min.	Number of teeth pc.	Suitable for holder	AMT8 art.no.	€
SG200 F R10	S20	20.0	2.0	2.9	1.0	20	6	A6, 7, 8, 9, 15	266118 2001	
SG200 F R12	S20	20.0	2.4	2.9	1.2	20	6	A6, 7, 8, 9, 15	266118 2002	
SG200 F R15	S20	20.0	3.0	2.9	1.5	20	6	A6, 7, 8, 9, 15	266118 2003	
SG200 F R20	S20	20.0	4.0	2.9	2.0	20	6	A6, 7, 8, 9, 15	266118 2004	

2151



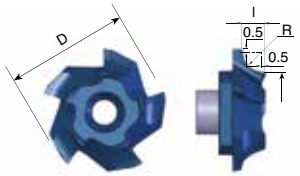


One-sided partial radius plunge milling

ISO P M K N S H

Model	Indexable insert type	D mm	D min. mm	Suitable for holder	R mm	AMT7 art.no.	€
C10 CR05	A10	10.0	10.5	A1, 1.1, 2, 15, 16, 17	0.5	266126 1001	
C10 CR10	A10	10.0	10.5	A1, 1.1, 2, 15, 16, 17	1.0	266126 1002	
C18 CR13	A18	18.0	18	A5, 5.2, 6, 7, 8, 9, 21, 22, 23	1.25	266126 1801	
C18 CR15	A18	18.0	18	A5, 5.2, 6, 7, 8, 9, 21, 22, 23	1.5	266126 1802	
C18 CR20	A18	18.0	18	A5, 5.2, 6, 7, 8, 9, 21, 22, 23	2.0	266126 1803	
C25 CR30	A25	25.0	25	A10, 11, 24, 25	3.0	266126 2501	

2151

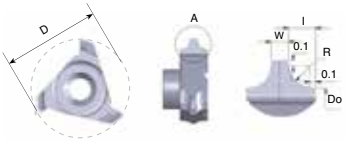


One-sided partial radius plunge milling, multi-flute

ISO P M K N S H

Model	Indexable insert type	D mm	D min. mm	Suitable for holder	R mm	Number of teeth pc.	AMT8 art.no.	€
S170 E CR10	S17	17.0	17	A3, 3.1, 4, 5, 18, 19, 20	1.0	5	266127 1701	
S170 E CR13	S17	17.0	17	A3, 3.1, 4, 5, 18, 19, 20	1.25	5	266127 1702	
S170 E CR15	S17	17.0	17	A3, 3.1, 4, 5, 18, 19, 20	1.5	5	266127 1703	

2151

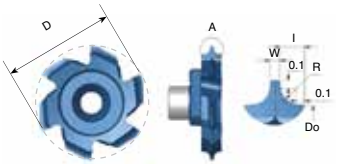


Double-sided partial radius plunge milling

ISO P M K N S H

Model	Indexable insert type	D mm	D min. mm	Suitable for holder	R mm	Bore hole Ø mm	w mm	AMT7 art.no.	€
C10 CRD08	A10	10.0	10	A1, 1.1, 2, 15, 16, 17	0.8	1.2	1.2	266128 1001	
C18 CRD15	A18	17.8	18	A5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	1.5	1.8	1.8	266128 1801	
C25 CRD20	A25	25.0	25	A10, 11, 24, 25	2.0	2.0	2.0	266128 2501	

2151



Double-sided partial radius plunge milling, multi-flute

ISO P M K N S H

Model	Indexable insert type	D	D min.	Suitable for holder	R	Bore hole Ø	Number of teeth pc.	AMT8 art.no.	€
S170 F CRD08	S17	17.0	17	A3, 3.3, 4, 5, 18, 19, 20	0.8	1.2	6	266129 1701	
S200 F CDR15	A25	20.0	20	A5.1, 5.2, 6, 7, 8, 9, 21, 22, 23	1.5	1.8	6	266129 2001	

2151

ATORN Modular milling system

INFO

Properties

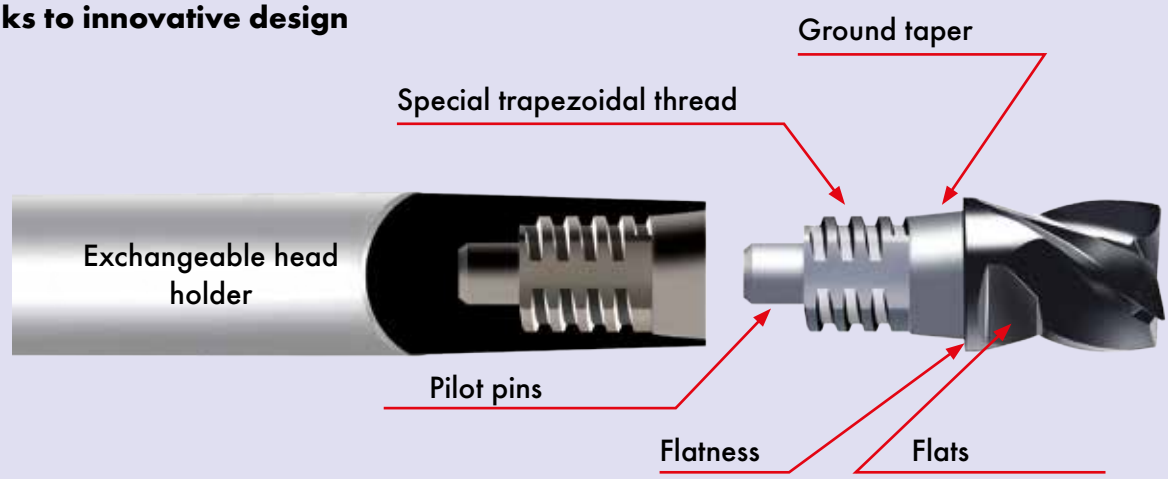
- Low tooling times
- A wide range of geometries
- Various shank shapes
- Diameters from 10 to 20 mm

Advantages

Reduced costs

- High true-running accuracy < 20µm
- High stability and stiffness thanks to pilot pins
- Low-vibration
- Guaranteed repetition precision

Perfect friction and form fit thanks to innovative design



A modular system for a wide range of tasks

- For ISO material groups P, M, N, K, H
- For roughing and finishing all contours
- Optimal for series production
- Particularly suitable for multiple-spindle automated lathes without tool changer and lathes with driven tools



Cost advantages

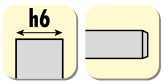
- Replacement of the head, shank remains clamped
- Up to 50 change cycles per shank possible
- Replaceable heads can be resharpened
- Quick change
- Reduced auxiliary processing times

Modular milling system

								
Brand	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN
ISO	P M K N	P M K N	P N	P M K	P M K	P M K	P M K	P M K
Number of cutting edges	2	3	3	4	4	6-8	4-6	4-5
Diameter range / mm	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20
Standard	WN	WN	WN	WN	WN	WN	WN	WN
Version			HPC		HPC		MTC	MTC
Type/profile	N	N	W	N	NH	N	NRf	NR
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	TiAlN	TiAlN	ZrN	TiAlN	AlTiN	TiAlN	AlTiN	AlTiN
Item number	255604...	255605...	255603...	255606...	255600	255607	255601	255602
Page	**626**	**626**	**627**	**627**	**627**	**628**	**628**	**628**

								
Brand	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN
ISO	P K H	P K H	P K H	P K H	P K H	P M K N	P M K N	P M K N
Number of cutting edges	4	2	2	2	4	2	6	4
Diameter range / mm	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20
Standard	WN	WN	WN	WN	WN	WN	WN	WN
Version	HPC/HSC	HPC	HPC/HSC	HSC				
Type/profile	N	NH	H	H	N	N	N	N
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	AlTiN+	AlTiN	AlTiN+	AlTiN	TiAlN	TiAlN	TiAlN	TiAlN
Item number	255608	255609	255610	255612	255611	255613	255614	255615
Page	**629**	**259**	**629**	**630**	**630**	**630**	**631**	**631**

ATORN Straight exchangeable head holder



- Please order chuck key separately

Steel holder, short

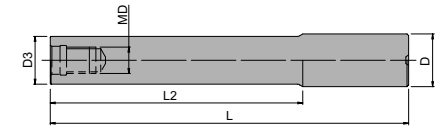
D1 mm	L mm	L2 mm	D3 mm	Replaceable head system	art.no.	€
10	65	5	9.6	WKS 20	255500 0020	
12	75	5	11.6	WKS 30	255500 0030	
16	80	6	15.4	WKS 40	255500 0040	
20	90	6	19.2	WKS 50	255500 0050	
					2159	

Steel holder, long

D1 mm	L mm	L2 mm	D3 mm	Replaceable head system	art.no.	€
10	75	18	9.6	WKS 20	255501 0020	
12	85	21	11.6	WKS 30	255501 0030	
16	95	23	15.4	WKS 40	255501 0040	
20	110	28	19.2	WKS 50	255501 0050	
					2159	

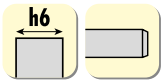
Solid carbide holder, extra-long

D1 mm	L mm	L2 mm	D3 mm	Replaceable head system	art.no.	€
10	111	56	9.6	WKS 20	255502 0020	
12	128	63	11.6	WKS 30	255502 0030	
16	149	79	15.4	WKS 40	255502 0040	
20	174	94	19.2	WKS 50	255502 0050	
					2159	





ATORN Tapered exchangeable head holder



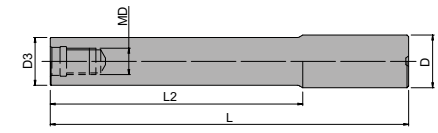
- Please order chuck key separately

Steel holder 5 °

D1 mm	L mm	L2 mm	D3 mm	Replaceable head system	art.no.	€
16	105	36	9.6	WKS 20	255503 0020	
20	120	48	11.6	WKS 30	255503 0030	
20	135	26	15.4	WKS 40	255503 0040	
25	150	33	19.2	WKS 50	255503 0050	
					2159	

Steel holder 1 °

D1 mm	L mm	L2 mm	D3 mm	Replaceable head system	art.no.	€
16	110	36	9.6	WKS 20	255504 0020	
20	130	53	11.6	WKS 30	255504 0030	
20	145	59	15.4	WKS 40	255504 0040	
25	180	74	19.2	WKS 50	255504 0050	
					2159	



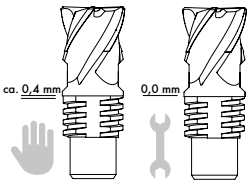


ATORN Assembly key for exchangeable head holder



Replaceable head system	Wr. width	L mm	Thickness mm	art.no.	€
WKS 20	8 mm	92	2.8	255698 0020	
WKS 30	10 mm	100	3.8	255698 0030	
WKS 40	13 mm	135	3.8	255698 0040	
WKS 50	16 mm	145	4.8	255698 0050	
				2161	

Initial tightening by hand, then using specified torque



Open-end snap-in spanner for exchangeable head holder

Replaceable head system	Wr. width	h mm	Insert shank square mm	art.no.	€
WKS 20	8 mm	2.8	9x12	255699 0020	
WKS 30	10 mm	3.8	9x12	255699 0030	
WKS 40	13 mm	3.8	9x12	255699 0040	
WKS 50	16 mm	4.8	9x12	255699 0050	

2161







For snap-in tools, please visit the online shop



For snap-in tools

- Including serial number and certificate

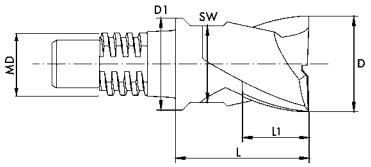
Min./max. torque measuring range	Insert shank square	Scale value N-m	L mm	Error limit (%) %	art.no.	€
10-60 Nm	9 x 12 mm	0.5	312	3	702603 0002	

7109

ATORN Exchangeable head milling cutter, Z2

VHM | Typ N | 30° | h10 | h6 | Z 2 | TiAlN | Vc/fz

797



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		210	175	165	120	110		180	180				350	300	200				
	Cutting speed Vc m/min.									Please adjust these guidelines according to clamping operation and machine set-up.									

D mm	L1 mm	L mm	D1 mm	Wr. width	Replaceable head system	Tightening torque N-m	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
10	7	14	9.6	8 x 3 mm	WKS 20	12	2	0.084	255604 0100	
12	9	17	11.6	10 x 4 mm	WKS 30	15	2	0.084	255604 0120	
16	12	21	15.4	13 x 4 mm	WKS 40	30	2	0.11	255604 0160	
20	15	26	19.2	16 x 5 mm	WKS 50	45	2	0.14	255604 0200	

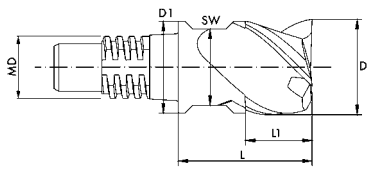
2160



ATORN Exchangeable head milling cutter, Z3 Type N

VHM | Typ N | 45° | h10 | h6 | Z 3 | TiAlN | Vc/fz

797



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		210	175	165	120	110		180	180				350	300	200				
	Cutting speed Vc m/min.									Please adjust these guidelines according to clamping operation and machine set-up.									

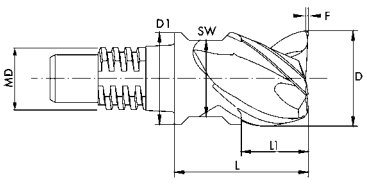
D mm	L1 mm	L mm	D1 mm	Wr. width	Replaceable head system	Tightening torque N-m	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
10	7	14	9.6	8 x 3 mm	WKS 20	12	3	0.084	255605 0100	
12	9	17	11.6	10 x 4 mm	WKS 30	15	3	0.084	255605 0120	
16	12	21	15.4	13 x 4 mm	WKS 40	30	3	0.11	255605 0160	
20	15	26	19.2	16 x 5 mm	WKS 50	45	3	0.14	255605 0200	

2160



ATORN Exchangeable head milling cutter, Z3 Type W

VHM | Typ W | 45° | h10 | h6 | Z 3 | ZrN | HPC | Vc/fz | 796



material	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
● very well suited ○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
												● 400	● 350	● 160				
Cutting speed Vc m/min.																Please adjust these guidelines according to clamping operation and machine set-up.		

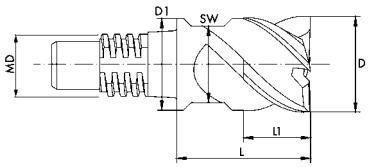
D mm	L1 mm	L mm	D1 mm	F x 45° mm	Wr. width	Replaceable head system	Tightening torque N·m	Z	● Feed fz aluminium < 8 % Si mm/tooth	art.no.	€
10	7	14	9.6	0.2	8 x 3 mm	WKS 20	12	3	0.065	255603 0100	
12	9	17	11.6	0.2	10 x 4 mm	WKS 30	15	3	0.065	255603 0120	
16	12	21	15.4	0.2	13 x 4 mm	WKS 40	30	3	0.085	255603 0160	
20	15	26	19.2	0.2	16 x 5 mm	WKS 50	45	3	0.11	255603 0200	

2160



ATORN Exchangeable head milling cutter, Z4

VHM | Typ N | 45° | h10 | h6 | Z 4 | TiAlN | Vc/fz | 796



material	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
● very well suited ○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	● 210	● 175	● 165	● 120	● 110		● 180	● 180				● 350	● 300	● 200				
Cutting speed Vc m/min.																Please adjust these guidelines according to clamping operation and machine set-up.		

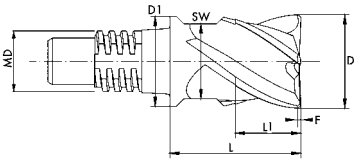
D mm	L1 mm	L mm	D1 mm	Wr. width	Replaceable head system	Tightening torque N·m	Z	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
10	7	14	9.6	8 x 3 mm	WKS 20	12	4	0.084	255606 0100	
12	9	17	11.6	10 x 4 mm	WKS 30	15	4	0.084	255606 0120	
16	12	21	15.4	13 x 4 mm	WKS 40	30	4	0.11	255606 0160	
20	15	26	19.2	16 x 5 mm	WKS 50	45	4	0.14	255606 0200	

2160



ATORN Exchangeable head milling cutter, Z4 irregular

VHM | Typ N | 35°-38° | h10 | h6 | Z 4 | AlTiN | HPC | Vc/fz | 796



material	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
● very well suited ○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	● 180	● 150	● 130	● 80	● 75		● 190	● 170										
Cutting speed Vc m/min.																Please adjust these guidelines according to clamping operation and machine set-up.		

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Wr. width	Replaceable head system	Tightening torque N·m	Z	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
10	7	14	9.6	0.3	8 x 3 mm	WKS 20	12	4	0.075	255600 0100	
12	9	17	11.6	0.3	10 x 4 mm	WKS 30	15	4	0.075	255600 0120	
16	12	21	15.4	0.4	13 x 4 mm	WKS 40	30	4	0.1	255600 0160	
20	15	26	19.2	0.5	16 x 5 mm	WKS 50	45	4	0.12	255600 0200	

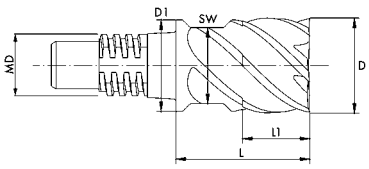
2160



ATORN Exchangeable head milling cutter, multi-flute

VHM | Typ N | 45° | h10 | h6 | Z 6 | Z 8+ | TiAlN | Vc/fz

797



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 200	● 140	● 110	● 120	● 110		● 200	● 180										
	Cutting speed Vc m/min.										Please adjust these guidelines according to clamping operation and machine set-up.								

● Feed fz

D mm	L1 mm	L mm	D1 mm	Wr. width	Replaceable head system	Tightening torque N-m	Z	steel < 1000 N/mm² mm/tooth	art.no.	€
10	7	14	9.6	8 x 3 mm	WKS 20	12	6	0.065	255607 0100	
12	9	17	11.6	10 x 4 mm	WKS 30	15	6	0.065	255607 0120	
16	12	21	15.4	13 x 4 mm	WKS 40	30	6	0.075	255607 0160	
20	15	26	19.2	16 x 5 mm	WKS 50	45	8	0.1	255607 0200	

2160



ATORN Exchangeable head roughing cutter NR

VHM | NRf | NR | 45° | h11 | h6 | Z 4 | Z 5 | Z 6 | AlTiN | MTC | Vc/fz

796

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 180	● 130	● 120	● 80	● 75		● 170	● 170										
	Cutting speed Vc m/min.										Please adjust these guidelines according to clamping operation and machine set-up.								

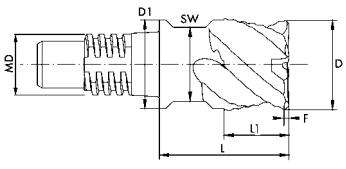


NRf - toothing

● Feed fz

D mm	L1 mm	L mm	D1 mm	Wr. width	Replaceable head system	Tightening torque N-m	Z	steel < 1000 N/mm² mm/tooth	art.no.	€
10	7	14	9.6	8 x 3 mm	WKS 20	12	4	0.052	255601 0100	
12	9	17	11.6	10 x 4 mm	WKS 30	15	4	0.052	255601 0120	
16	12	21	15.4	13 x 4 mm	WKS 40	30	5	0.07	255601 0160	
20	15	26	19.2	16 x 5 mm	WKS 50	45	6	0.084	255601 0200	

2160

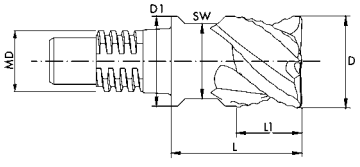


NR - toothing

● Feed fz

D mm	L1 mm	L mm	D1 mm	Wr. width	Replaceable head system	Tightening torque N-m	Z	steel < 1000 N/mm² mm/tooth	art.no.	€
10	7	14	9.6	8 x 3 mm	WKS 20	12	4	0.052	255602 0100	
12	9	17	11.6	10 x 4 mm	WKS 30	15	4	0.052	255602 0120	
16	12	21	15.4	13 x 4 mm	WKS 40	30	5	0.07	255602 0160	
20	15	26	19.2	16 x 5 mm	WKS 50	45	5	0.084	255602 0200	

2160



ATORN Exchangeable head torus milling cutter

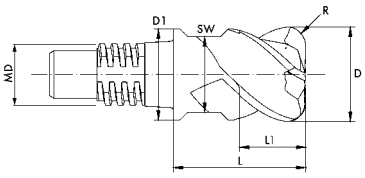
VHM | Typ N | 45° | 15° | h10 | h11 | h6 | Z 4 | Z 2 | AlTiN+ | AlTiN | HPC | | Vc/fz | 798

material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
	255608....	● 195	● 175	● 150				● 250										○ 85	
	255609....	● 190	● 130	● 120				● 180	● 170								○ 90	○ 70	○ 70
	Cutting speed Vc m/min.							Please adjust these guidelines according to clamping operation and machine set-up.											

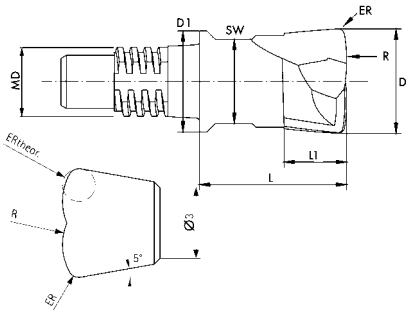
Type H (HPC/HSC) 45°

- For dry machining

D mm	L1 mm	L mm	D1 mm	R mm	Wr. width	Replaceable head system	Tightening torque N·m	Z	● Feed fz steel < 1000 N/mm² mm/tooth	● Feed fz steel < 1000 N/mm² mm/tooth	AlTiN+ art.no.	€
10	7	14	9.6	0.5	8 x 3 mm	WKS 20	12	4	0.1	0.074	255608 1005	
10	7	14	9.6	1.0	8 x 3 mm	WKS 20	12	4	0.1	0.074	255608 1010	
10	7	14	9.6	1.5	8 x 3 mm	WKS 20	12	4	0.1	0.074	255608 1015	
10	7	14	9.6	2.0	8 x 3 mm	WKS 20	12	4	0.1	0.074	255608 1020	
12	9	17	11.6	0.5	10 x 4 mm	WKS 30	15	4	0.1	0.074	255608 1205	
12	9	17	11.6	1.0	10 x 4 mm	WKS 30	15	4	0.1	0.074	255608 1210	
12	9	17	11.6	1.5	10 x 4 mm	WKS 30	15	4	0.1	0.074	255608 1215	
12	9	17	11.6	2.0	10 x 4 mm	WKS 30	15	4	0.1	0.074	255608 1220	
16	12	21	15.4	0.5	13 x 4 mm	WKS 40	30	4	0.12	0.089	255608 1605	
16	12	21	15.4	1.0	13 x 4 mm	WKS 40	30	4	0.12	0.089	255608 1610	
16	12	21	15.4	1.5	13 x 4 mm	WKS 40	30	4	0.12	0.089	255608 1615	
16	12	21	15.4	2.0	13 x 4 mm	WKS 40	30	4	0.12	0.089	255608 1620	
20	15	26	19.2	1.0	16 x 5 mm	WKS 50	45	4	0.15	0.111	255608 2010	
												2160







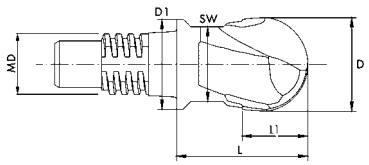
Type H-N (HSC) 15°

D mm	L1 mm	L mm	D1 mm	R mm	Wr. width	Replaceable head system	Tightening torque N·m	Radius, theoretical mm	Z	● Feed fz steel < 1000 N/mm² mm/tooth	AlTiN art.no.	€
10	7	14	9.6	0.64	8 x 3 mm	WKS 20	12	0.9	2	0.2	255609 0100	
12	9	17	11.6	0.75	10 x 4 mm	WKS 30	15	1.1	2	0.2	255609 0120	
16	12	21	15.4	1.06	13 x 4 mm	WKS 40	30	1.45	2	0.25	255609 0160	
20	15	26	19.2	1.25	16 x 5 mm	WKS 50	45	1.65	2	0.3	255609 0200	
												2160



ATORN Exchangeable head radius milling cutter, Type H Z2

VHM | Typ H | 30° | h11 | h6 | Z 2 | AlTiN+ | HPC | HSC | | Vc/fz | 799



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 450	● 300	● 250				○ 400									○ 160	○ 160	○ 120
	Cutting speed Vc m/min.							Please adjust these guidelines according to clamping operation and machine set-up.											

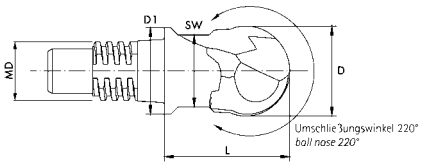
30°

D mm	L1 mm	L mm	D1 mm	R mm	Wr. width	Replaceable head system	Tightening torque N·m	Z	● Feed fz steel < 1000 N/mm² mm/tooth	AlTiN+ art.no.	€
10	7	14	9.6	5	8 x 3 mm	WKS 20	12	2	0.065	255610 0100	
12	9	17	11.6	6	10 x 4 mm	WKS 30	15	2	0.065	255610 0120	
16	12	21	15.4	8	13 x 4 mm	WKS 40	30	2	0.09	255610 0160	
20	15	26	19.2	10	16 x 5 mm	WKS 50	45	2	0.12	255610 0200	
											2160



ATORN Exchangeable head radius milling cutter, Type H Z2 220°

VHM | NH | 15° | h10 | h6 | Z 2 | AlTiN | Vc/fz | 800



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 300	● 250	● 210				● 450	● 400								● 90	● 90	● 70
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

15°

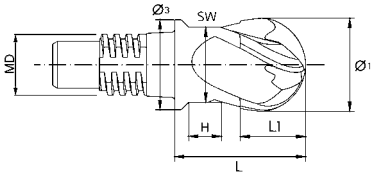
D mm	L1 mm	L mm	D1 mm	R mm	Wr. width	Replaceable head system	Tightening torque N·m	Z	Feed fz steel < 1000 N/mm² mm/tooth	AlTiN art.no.	€
10	7	14	9.6	5	8 x 3 mm	WKS 20	12	2	0.065	255612 0100	
12	9	17	11.6	6	10 x 4 mm	WKS 30	15	2	0.065	255612 0120	
16	12	21	15.4	8	13 x 4 mm	WKS 40	30	2	0.09	255612 0160	
20	15	26	19.2	10	16 x 5 mm	WKS 50	45	2	0.1	255612 0200	

2160



ATORN Exchangeable head radius milling cutter, Type N

VHM | Typ N | 30° | h11 | h6 | Z 4 | TiAlN | Vc/fz | 799



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 450	● 300	● 250				● 550	● 450										
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

30°

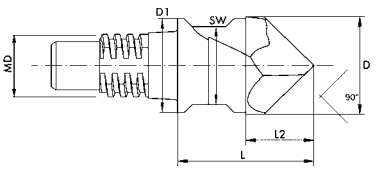
D mm	L1 mm	L mm	D1 mm	R mm	Wr. width	Replaceable head system	Tightening torque N·m	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
10	7	14	9.6	5	8 x 3 mm	WKS 20	12	4	0.065	255611 0100	
12	9	17	11.6	6	10 x 4 mm	WKS 30	15	4	0.065	255611 0120	
16	12	21	15.4	8	13 x 4 mm	WKS 40	30	4	0.09	255611 0160	
20	15	26	19.2	10	16 x 5 mm	WKS 50	45	4	0.12	255611 0200	

2160



ATORN Exchangeable head chamfer and centring milling cutter

VHM | Typ N | 90° | 30° | h10 | h6 | Z 2 | TiAlN | Vc/fz | 800



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 105	● 80	● 70				● 120	● 120				● 300	● 280	● 190				
	Cutting speed Vc m/min.																		

Please adjust these guidelines according to clamping operation and machine set-up.

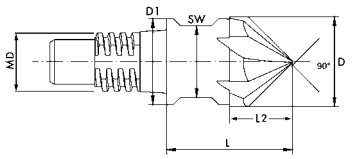
D mm	L1 mm	L mm	D1 mm	Wr. width	Replaceable head system	Tightening torque N·m	Z	Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
10	7	14	9.6	8 x 3 mm	WKS 20	12	2	0.045	255613 0100	
12	9	17	11.6	10 x 4 mm	WKS 30	15	2	0.065	255613 0120	
16	12	21	15.4	13 x 4 mm	WKS 40	30	2	0.08	255613 0160	
20	15	26	19.2	16 x 5 mm	WKS 50	45	2	0.09	255613 0200	

2160



ATORN Exchangeable head deburring milling cutter

VHM | Typ N | 90° | h10 | h6 | Z 6 | TiAlN | Vc/fz | 800



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 170	● 120	● 110	● 110	● 100		● 150	● 140				● 700	● 500	● 290				
	Cutting speed Vc m/min.										Please adjust these guidelines according to clamping operation and machine set-up.								

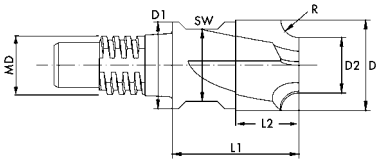
D mm	L1 mm	L mm	D1 mm	Wr. width	Replaceable head system	Tightening torque N·m	Z	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
10	7	14	9.6	8 x 3 mm	WKS 20	12	6	0.044	255614 0100	
12	9	17	11.6	10 x 4 mm	WKS 30	15	6	0.05	255614 0120	
16	12	21	15.4	13 x 4 mm	WKS 40	30	6	0.075	255614 0160	
20	15	26	19.2	16 x 5 mm	WKS 50	45	6	0.1	255614 0200	

2160



ATORN Exchangeable head quadrant milling cutter

VHM | Typ N | h10 | h6 | Z 4 | TiAlN | Vc/fz | 801



material	● very well suited ○ well suited	steel			stainless steel			cast iron		titanium alloys	superalloys Fe/NiCo-based		aluminium		copper	graphite	hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 170	● 120	● 110	● 110	● 100		● 150	● 140				● 700	● 500	● 290				
	Cutting speed Vc m/min.										Please adjust these guidelines according to clamping operation and machine set-up.								

D mm	L2 mm	L1 mm	D1 mm	R mm	Wr. width	Replaceable head system	Tightening torque N·m	Z	● Feed fz steel < 1000 N/mm² mm/tooth	art.no.	€
10	7	14	7	1.5	8 x 3 mm	WKS 20	12	4	0.012	255615 1015	
10	7	14	6	2	8 x 3 mm	WKS 20	12	4	0.012	255615 1020	
12	9	17	7	2.5	10 x 4 mm	WKS 30	15	4	0.015	255615 1225	
12	9	17	6	3	10 x 4 mm	WKS 30	15	4	0.015	255615 1230	
16	12	21	9	3.5	13 x 4 mm	WKS 40	30	4	0.025	255615 1635	
16	12	21	8	4	13 x 4 mm	WKS 40	30	4	0.025	255615 1640	
16	12	21	7	4.5	13 x 4 mm	WKS 40	30	4	0.025	255615 1645	
20	15	26	10	5	16 x 5 mm	WKS 50	45	4	0.032	255615 2050	
20	15	26	8	6	16 x 5 mm	WKS 50	45	4	0.032	255615 2060	

2160



Overview of tool holders

	Exchangeable head milling cutter	Face milling cutters			
Sorting by type					
Brand	ATORN	ATORN	ATORN	ATORN	ATORN
ISO application area	P M K N H	P M K N	P M K N	P M K N	P M K N H
Order No.	255500-504.... 255600-615....	260801.... 260202....	262555....	260200....	262550....
Setting angle	various	45°	45°	45°	45°
Number of cutting edges	2 - 8	2 - 16	4 - 20	4 - 13	4 - 16
Coolant bore		●	●	●	●
Milling inserts type ISO		SE.T 1204	SN.X 1206 SNMU 1206	SE.N 1203	SE.T 13T3 XEHW 13T3
Catalogue page	**625**	**635**	**636**	**639**	**641**

	Face milling cutters			Drilling/die sinking cutter	
Sorting by type					
Brand	ATORN	ATORN	ATORN	ATORN	ATORN
ISO application area	P M K	P M K N	P M K N	P M K N	P M K N
Order No.	260111....	262532....	262533....	262515.... 262516....	262515.... 262516....
Setting angle		75°	75°	90°	90°
Number of cutting edges	4 - 8	4	3 - 7	3	3
Coolant bore				●	●
Milling inserts type ISO	OCKX 1606 XCKX 1606 RCKX 1606 SAHT 1306	APKT 1003 APHX 1003	APKT 1604 APHX 1604	APKT 1003APHX 1003	APKT 1604APHX 1604
Catalogue page	**640**	**649**	**649**	**653**	**653**

	Shoulder milling cutter				
Sorting by type					
Brand	ATORN	ATORN	palbit	ATORN	ATORN
ISO application area	P M K N	P M K S	P M K N	P M K N	P M K N
Order No.	various	262547....	260259....	262540.... 262542.... 262546....	262559.... 262561.... 262563....
Setting angle	89.5	90°	90°	90°	90°
Number of cutting edges	1 - 9	4 - 9	1 - 4	1 - 12	3 - 10
Coolant bore	●	●	●	●	
Milling inserts type ISO	SPMT 06..SPMT 12..SPGT 06..SPGT 12..	SDMT 1205	AP.. 1003	AP.. 1003	LN.X 100605
Catalogue page	**659**	**643**	**643**	**646**	**657**

	Shoulder milling cutter			Roughing helical milling cutter		Chamfer helical milling cutter
Sorting by type						
Brand	ATORN	ATORN	palbit	ATORN	ATORN	ATORN
ISO application area	P M K N	P M K	P M K N H	P M K N	P M K N	P M K N
Order No.	262523.... 262525.... 262530....	262565....	260293.... 260294.... 260295....	262529.... 262544....	262523....	262531....
Setting angle	90°	90°	95°	90°	90°	15 - 75°
Number of cutting edges	4 - 16	5 - 11	2 - 7	1 - 4	3 - 6	9
Coolant bore	●	●	●	●		●
Milling inserts type ISO	APKT 1604 APHX 1604	WNEU 08	XD.. 04.. XD.. 06.. XD.. 08..	APKT 1003 APHX 1003	APKT 1604 APHX 1604	APKT 1003 APHX 1003
Catalogue page	**654**	**662**	**684**	**648**	**654**	**648**

	Chamfer helical milling cutter	Engraving milling cutter	Milling counterbore, adjustable		Chamfer cutter	
Sorting by type						
Brand	ATORN	palbit	ATORN	ATORN	ATORN	ATORN
ISO application area	P M K N	P M S	P M K S	P M K S	P M K S	P M K S
Order No.	262527....	260130....	260123....	260123....	260121.... 260125....	260126....
Setting angle	15 - 75°	45°	10 - 80°	10 - 80°	30 - 45 - 60°	45°
Number of cutting edges	6	1	1	1	1-3	1
Coolant bore						●
Milling inserts type ISO	APKT 1604 APHX 1604	VPGT 0602	TC.. 1102	TC.. 16T3 SCMT 1204	TCMT 1102 TCMT 16T3 SCMT 0602 SCMT 09T3	TCMT 16T3
Catalogue page	**655**	**705**	**698**	**698**	**701**	**704**

	High-speed shoulder milling cutter		High-speed shoulder milling cutter	High-speed helical milling cutter	
Sorting by type					
Brand	ATORN	ATORN	ATORN	ATORN	ATORN
ISO application area	P M K N	P M K N	P M K N	P M K N	P M K N
Order No.	264003.... 264004....	264006.... 264007.... 264009....	264011.... 264012.... 264014....	264008.... 264010....	264013....
Setting angle	90°	90°	90°	90°	90°
Number of cutting edges	2 - 6	2 - 9	2 - 9	8 - 20	12 - 20
Coolant bore	●	●	●	●	●
Milling inserts type ISO	AD..X 09..	AD..X 12..	AD..X 17..	AD..X 12..	AD..X 17..
Catalogue page	**666**	**667**	**669**	**668**	**670**

	T-slot milling cutters	Plunge milling cutter		High feed-rate milling cutter		
Sorting by type						
Brand	SARA	ATORN	palbit	palbit	palbit	palbit
ISO application area	P M K	N	N	P M K S	P M K S	P M K N
Order No.	263007....	260400.... 260402....	260252.... 260253....260250....260251....	260218.... 260219....	260220.... 260221....	260239.... 260243....
Setting angle		90°	90°	10°	10°	90°
Number of cutting edges	2 - 4	2 - 5	3 - 6	2 - 5	3 - 8	2 - 9
Coolant bore	●	●	●	●	●	●
Milling inserts type ISO	SPMT 0603 SPMT 09T3 SPMT 1204	VCGT 220530 VPGT 160412	XDGX 15...	SOE...08	SOE...13	XP 06... XP 10... XP 17...
Catalogue page	**706**	**687**	**686**	**674**	**675**	**67**

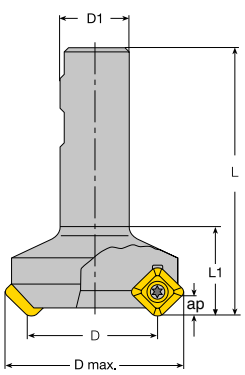
	High feed-rate milling cutter	Copy cutter	High feed-rate milling cutter	Ball-nose cutters	Torus milling cutter	High feed-rate milling cutter
Sorting by type						
Brand	palbit	palbit	palbit	OSG	OSG	palbit
ISO application area	P M K S	P K H	P M K S	P M K S N H	P M K S N H	P M K
Order No.	260312.... 260313....	260289.... 260290.... 260281.... 260884.... 260817....	260314.... 260315....	260530.... - 260534....	260540.... 260544....	260247.... 260248....
Setting angle			20°			90°
Number of cutting edges	2 - 9	2 - 7	2 - 8	1	1	2 - 11
Coolant bore	●	●	●			●
Milling inserts type ISO	XNMU06...	RD.. 07.. RD.. 10.. RD.. 12.. RD.. 16..	XNKU12...	PFB	PFR	LNXT13
Catalogue page	**682**	**689**	**683**	**692**	**695**	**663**

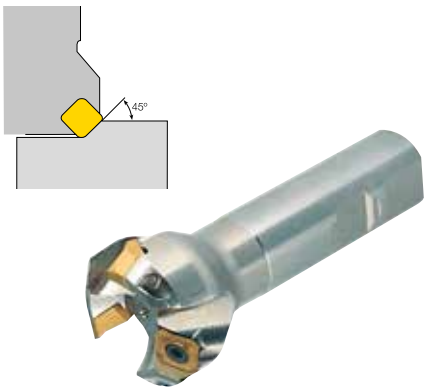
	Disc milling cutters
Sorting by type	
Brand	ATORN
ISO application area	P M K N
Order No.	262600.... 262610....
Setting angle	
Number of cutting edges	8 - 24
Coolant bore	
Milling inserts type ISO	SNHX 110.T SNHX 120.T
Catalogue page	**715**

ATORN 45° end milling cutter, SE.T 1204



- **For ISO milling inserts, type SE.T 1204**
- Highly positive rake angle
- Weldon shank
- Easy-action, low-noise milling
- Large insert thickness
- For plunge milling and face milling
- Supplied with clamping screws and wrench
- Can be used on machines with low drive power and in unstable conditions
- **Cutting angle:** Tool cutting edge angle 45°, axial rake angle 16°, radial rake angle -6°





D mm	D1 mm	D max. mm	L mm	ap max. mm	L1 mm	Weight kg	Max. tightening torque N-m	Z			art.no.	€
25.0	25	38	100	6	44	0.40	7.93	2	A1	B1	260801 0025	
32.0	25	45	110	6	54	0.45	7.93	3	A1	B1	260801 0032	
40.0	32	53.0	115	6	55	0.50	7.93	4	A1	B1	260801 0040	

2124

Spare parts

	Screw art.no.	€
A1	321701 0108	

3106

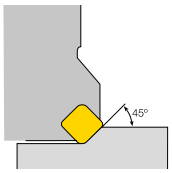
	Wrench art.no.	€
B1	705141 0020	

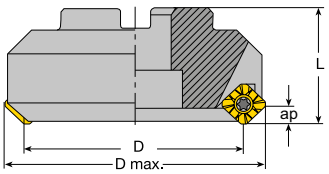
7114

ATORN 45° face milling cutter



- **For ISO milling inserts, type SE.T 1204**
- Highly positive rake angle
- Easy-action, low-noise milling
- Large insert thickness
- For plunge milling and face milling
- **Up to Ø 160 mm with internal coolant supply**
- Supplied with clamping screws and wrench
- Can be used on machines with low drive power and in unstable conditions
- **Cutting angle:** Tool cutting edge angle 45°, axial rake angle 20°, radial rake angle -10°







SEET

D mm	Bore hole Ø mm	D max. mm	L mm	ap max. mm	Max. tightening torque N-m	Z			art.no.	€
40.0	16	53	40	6	7.93	3	A1	B1	260202 0040	
50.0	22	63	48	6	7.93	4	A1	B1	260202 0050	
50.0	22	63	48	6	7.93	5	A1	B1	260202 0150	
63.0	22	76	48	6	7.93	5	A1	B1	260202 0063	
63.0	22	76	48	6	7.93	6	A1	B1	260202 0163	
80.0	27	93	50	6	7.93	6	A1	B1	260202 0080	
80.0	27	93	50	6	7.93	7	A1	B1	260202 0180	
100.0	32	113	50	6	7.93	6	A1	B1	260202 0100	
100.0	32	113	50	6	7.93	8	A1	B1	260202 1100	
125.0	40	138	63	6	7.93	7	A1	B1	260202 0125	
125.0	40	138	63	6	7.93	9	A1	B1	260202 1125	
160.0	40	173	63	6	7.93	8	A1	B1	260202 0160	
160.0	40	173	63	6	7.93	10	A1	B1	260202 1160	
200.0	60	213	63	6	7.93	12	A1	B1	260202 0200	
250.0	60	263	63	6	7.93	16	A1	B1	260202 0250	

2124

Spare parts

	Screw art.no.	€
A1	321701 0108	

3106

	Wrench art.no.	€
B1	705141 0020	

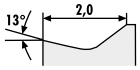
7114

SEHT

F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
●	●	●											
			SEHT 1204 AFEN	●	●	●				PH6740	10	285229 0139	



Universal use



SEHT

2170

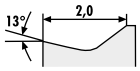
ISO	PH6740
ISO P steel	Vc = 80 - 180
ISO M stainless steel	Vc = 80 - 220
ISO K cast iron	Vc = 80 - 290
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 6.0

SEET

F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
●	●	●											
			SEET 1204 AF-FN			●	●			HW4410	10	284225 3001	
			SEET 1204 AFSN	●	●	●				HC4620	10	284225 3005	
			SEET 1204 AF-SN	●	●	●				HC4640	10	284225 3007	



Universal use



2129

ISO	HC4620	HC4640	HW4410
ISO P steel	Vc = 205 - 280	Vc = 200 - 255	
ISO M stainless steel	Vc = 120 - 165	Vc = 120 - 150	
ISO K cast iron	Vc = 190 - 265	Vc = 190 - 240	Vc = 125 - 145
ISO N Al/non-ferrous			Vc = 125 - 680
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 6.0		

ATORN 45° face milling cutter

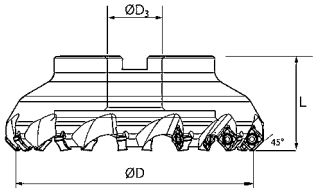
Z 4 | Z 6 | Z 7 | Z 8+ | Vc/fz

804

- **For ISO milling inserts, SN.X 1206, SNMU 1206, ONMU1205**
- Novel double-sided indexable cutting inserts with large rake angle, use of eight cutting edges (SN_X, SNMU)
- Novel double-sided indexable cutting inserts, use of sixteen cutting edges (ONMU)
- Light cut with low cutting force
- Excellent surface finish
- Very wide range of applications
- Use on many metals including steel, stainless steel, cast iron and aluminium
- Supplied with clamping screw and wrench
- ap max. 5.5 mm (SN_X, SNMU)
- ap max. 3.0 mm (ONMU)







D3 = bore hole Ø

Standard

D mm	L mm	Bore hole Ø mm	ap max. mm	Max. tightening torque N·m	Z			art.no.	€
50.0	40	22	5.5	4.01	4	A1	B1	262555 0050	
63.0	40	22	5.5	4.01	6	A1	B1	262555 0063	
80.0	50	27	5.5	4.01	7	A1	B1	262555 0080	
100.0	50	32	5.5	4.01	8	A1	B1	262555 0100	
125.0	63	40	5.5	4.01	10	A1	B1	262555 0125	
160.0	63	40	5.5	4.01	12	A1	B1	262555 0160	
200.0	63	60	5.5	4.01	14	A1	B1	262555 0200	
250.0	63	60	5.5	4.01	16	A1	B1	262555 0250	

2124

Set includes SNMU 1206 and ONMU 1205 HC4630 indexable cutting inserts (10 of.e.)

D mm	L mm	Bore hole Ø mm	ap max. mm	Contents	Max. tightening torque N·m	Z	art.no.	€
63	40	22	5.5	incl. 10 indexable inserts SNMU 1260 and ONMU 1205 HC4630	4.01	6	262555 2063	

2124

Narrow pitch

- Ø 160 mm supplied with sealing washers

D mm	L mm	Bore hole Ø mm	ap max. mm	Max. tightening torque N·m	Z			art.no.	€
50.0	40	22	5.5	4.01	6	A1	B1	262555 1050	
63.0	40	22	5.5	4.01	8	A1	B1	262555 1063	
80.0	50	27	5.5	4.01	10	A1	B1	262555 1080	
100.0	50	32	5.5	4.01	12	A1	B1	262555 1100	
125.0	63	40	5.5	4.01	16	A1	B1	262555 1125	
160.0	63	40	5.5	4.01	20	A1	B1	262555 1160	

2124



Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	260124 0002		B1	703053 0200	
	3106			7114	



Milling inserts

ISO designation	Z	ISO P Coated HC4630 art.no.	€	ISO PM Coated HC 4535 art.no.	€	ISO PK Coated HC4410 art.no.	€	ISO N HW 4310 art.no.	€	ISO PMK Coated HC4635 art.no.	€
SNEX 1206 ANN-MA	8							10 295730 0101			
SNKX 1206 ANN-MM1	8									10 295734 0101	
SNMX 1206 ANN-MM	8	10 295732 0101		10 295731 0101		10 295733 0101					
		2129		2129		2129		2129		2129	

Milling insert with chip breaker

- For particularly good surface quality

ISO designation	Z	ISO PM Coated HC4535 art.no.	€	ISO PK Coated HC4410 art.no.	€
SNMU 1206 ANER	8	10 295735 0101		10 295737 0101	
		2129		2129	

Double-sided, 8 cutting edges, with chip breaker



Milling insert with 16 cutting edges

ISO designation	Z	ISO P Coated HC4630 art.no.	€	ISO PM Coated HC4535 art.no.	€	ISO PK Coated HC4410 art.no.	€
ONMU 1205 ANN	16	10 295738 0101		10 295739 0101		10 295740 0101	
		2129		2129		2129	

double-sided, 16 cutting edges

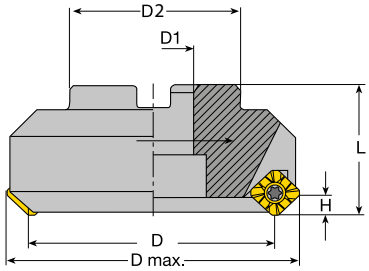


palbit Face milling cutter 45° PLUS 91245

Z 5 | Z 6 | Z 7 | Z 8+ | Vc/fz

805

- **For ISO milling inserts SN.. 16.., ON.. 06..**
- Excellent surface finish
- Very broad range of applications
- Wide range of materials, including steel, stainless steel, cast iron and aluminium
- Supplied with clamping screw and wrench
- ap. max. 8.5 mm (SN..)
- ap. max. 3.8 mm (ON..)





D mm	D max. mm	D1 mm	L mm	Z	ap max. mm	Max. tightening torque N-m	Weight kg	A1	B1	C1	art.no.	€
63	80.1	22	50	5	8.5/3.8	5.0	0.81	A1	B1	C1	260211 0063	
80	97.1	27	50	6	8.5/3.8	5.0	1.06	A1	B1	C1	260211 0080	
80	97.1	27	50	8	8.5/3.8	5.0	1.09	A1	B1	C1	260211 0081	
100	117.1	32	63	7	8.5/3.8	5.0	2.24	A1	B2	C1	260211 0100	
100	117.1	32	63	10	8.5/3.8	5.0	2.28	A1	B2	C1	260211 0101	
125	142.1	40	63	8	8.5/3.8	5.0	3.04	A1		C1	260211 0125	
160	177.1	40	63	10	8.5/3.8	5.0	4.40	A1		C1	260211 0160	
200	217.1	60	63	12	8.5/3.8	5.0	9.12	A1		C1	260211 0200	
250	267.1	60	63	14	8.5/3.8	5.0	11.93	A1		C1	260211 0250	
												2174

Spare parts

	Screw art.no.	€
A1	321099 0019	
		3160

	Cutter retaining screw with through-hole art.no.	€
B1	321099 0043	
B2	321099 0044	
		3160

	TORX art.no.	€
C1	703053 0200	
		7114

Indexable milling inserts SN..1606 / ON..0606 *PLUS 91245*

SNHX 1606..

F finishing	M medium	R roughing
●	●	-



Universal use

palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
SNHX 1606 ANER-LP	●	●					**PH7740**	10	285217 0148	
SNHX 1606 ANER-MP	●	●					**PH7740**	10	285217 0248	
SNHX 1606 ANER-MK			●				**PH5740**	10	285217 0330	
SNHX 1606 ANER-LP	●		●				**PHP920**	10	285217 0191	
	●		●				**PHP930**	10	285217 0190	
SNHX 1606 ANER-MP	●		●				**PHP920**	10	285217 0291	

2170

ISO	PH5740	PH7740	PHP920	PHP930
ISO P steel		Vc = 120 - 240	Vc = 140 - 250	Vc = 120 - 230
ISO M stainless steel		Vc = 80 - 160		
ISO K cast iron	Vc = 115 - 290		Vc = 120 - 270	Vc = 100 - 250
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.4 ap = max. 8.5			

SNKX 1606..

F finishing	M medium	R roughing
○	●	-



palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
SNKX 1606 ANER-MP	●						**PH7740**	10	285218 0148	
	●						**PH7920**	10	285218 0150	
SNKX 1606 ANER-MK			●				**PH5740**	10	285218 0230	

2170

ISO	PH5740	PH7740	PH7920
ISO P steel		Vc = 120 - 240	Vc = 140 - 320
ISO K cast iron	Vc = 115 - 290		
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.4 ap = max. 8.5		

ONHX 0606..

F finishing	M medium	R roughing
○	●	-



palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
ONHX 0606 ANEN-LP	●	●					**PH7740**	10	285222 0148	
ONHX 0606 ANEN-MP	●	●					**PH7740**	10	285222 0248	
ONHX 0606 ANEN-MK			●				**PH5705**	10	285222 0328	
			●				**PH5740**	10	285222 0330	
ONHX 0606 ANEN-W			●				**PH5705**	10	285222 0428	
	●						**PH7920**	10	285222 0450	
ONHX 0606 ANEN-LP	●		●				**PHP920**	10	285222 0191	
	●		●				**PHP930**	10	285222 0190	
ONHX 0606 ANEN-MP	●		●				**PHP920**	10	285222 0291	

2170

ISO	PH5705	PH5740	PH7740	PH7920	PHP920	PHP930
ISO P steel			Vc = 120 - 240	Vc = 140 - 320	Vc = 140 - 250	Vc = 120 - 230
ISO M stainless steel			Vc = 80 - 160			
ISO K cast iron	Vc = 130 - 350	Vc = 115 - 290			Vc = 120 - 270	Vc = 100 - 250
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.17 ap = max. 3.8					

ONKX 0606..

F finishing	M medium	R roughing
-	●	○



palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
ONKX 0606 ANEN-LP			●				**PH5320**	10	285228 0126	
	●	●					**PH7740**	10	285228 0148	
	●						**PH7920**	10	285228 0150	
		●					**PH7930**	10	285228 0151	
ONKX 0606 ANEN-MP	●						**PH7740**	10	285228 0248	
ONKX 0606 ANEN-MK			●				**PH5705**	10	285228 0328	
			●				**PH5740**	10	285228 0330	
ONKX 0606 ANEN-LP	●		●				**PHP920**	10	285228 0191	
ONKX 0606 ANEN-MP	●		●				**PHP920**	10	285228 0291	

2170

ISO	PH5320	PH5705	PH5740	PH7740	PH7920	PH7930	PHP920
ISO P steel				Vc = 120 - 240	Vc = 140 - 320		Vc = 140 - 250
ISO M stainless steel				Vc = 80 - 160		Vc = 90 - 200	
ISO K cast iron	Vc = 130 - 350	Vc = 130 - 350	Vc = 115 - 290				Vc = 120 - 270
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.17 ap = max. 3.8						

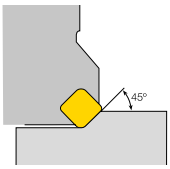
ATORN 45° face milling cutter

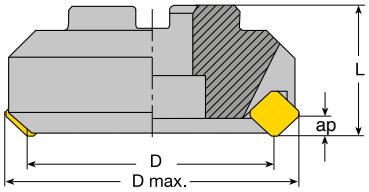
Z4 Z5 Z6 Z7 Z8+

- **For ISO milling inserts, type SE.N 1203**
- Highly positive cutting edge geometry
- Easy cutting action
- Also for machines with low drive power or unstable conditions
- Wedge for fast and reliable clamping of the indexable insert
- Supplied with clamping screws and wrench
- from Ø 160 mm with sealing washers
- **Cutting angle:** Tool cutting edge angle 45°, axial rake angle 20°, radial rake angle -4.5°



Ø 160 to 250 mm with sealing washers







D mm	Bore hole Ø mm	D max. mm	L mm	ap max. mm	Z	Max. tightening torque N-m					art.no.	€
50.0	22	63	48	6	4	4.01	A1	B1	C1	D1	260200 0050	
63.0	22	76	40	6	5	4.01	A1	B1	C1	D1	260200 0063	
80.0	27	93	50	6	6	4.01	A1	B1	C1	D1	260200 0080	
100.0	32	113	50	6	6	4.01	A1	B1	C1	D1	260200 0100	
125.0	40	138	63	6	7	4.01	A1	B1	C1	D1	260200 0125	
160.0	40	173	63	6	7	4.01	A1	B1	C1	D1	260200 0160	
200.0	60	213	63	6	10	4.01	A1	B1	C1	D1	260200 0200	
250.0	60	263	63	6	13	4.01	A1	B1	C1	D1	260200 0250	

2124

Spare parts

Spacer			Screw			Clamping screw			TORX		
	art.no.	€		art.no.	€		art.no.	€		art.no.	€
A1	321701 0002		B1	321701 0109		C1	321701 0111		D1	703040 1250	
3106			3106			3106			7111		

SEEN

F finishing	M medium	R roughing	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
●	●	●											
 Universal use	SEEN 1203 AFFN		●	●					HC4620	10	284215 2905	
			●	●	●					HC4540		
	SEEN 1203 AF-SN		●	●						HC4620	10	284215 3005	
			●	●	●					HC4640	10	284215 3007	

2129

ISO	HC4540	HC4620	HC4640
ISO P steel	Vc = 180 - 230	Vc = 120 - 210	Vc = 180 - 230
ISO M stainless steel	Vc = 105 - 135	Vc = 110 - 155	Vc = 105 - 135
ISO K cast iron	Vc = 170 - 215		Vc = 170 - 215
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 6.0		

SEKN

F finishing	M medium	R roughing	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
●	●	●											
 Universal use	SEKN 1203 AFSN		●	●	●					PH6920	10	285448 0142	

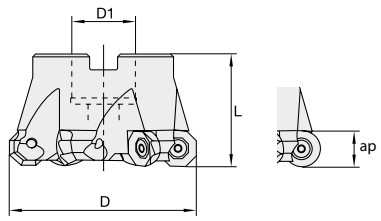
2170

ISO	PH6920
ISO P steel	Vc = 120 - 250
ISO M stainless steel	Vc = 100 - 200
ISO K cast iron	Vc = 120 - 220
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 6.0

ATORN Face and copy milling cutter (OCKX, XCKX, RCKX)

VHM | Z 4 | Z 5 | Z 6 | Z 7 | Z 8+ | Vc/fz | 608

- **Can be fitted with octagonal, double-hexagon or round milling inserts**
- High feed rates and smooth operation
- Low power requirements due to small number of teeth
- Allows axial and diagonal plunging, well suited to excavation and pocket milling
- Directly-pressed indexable insert with 8 or 12 effective cutting edges
- Stable insert seat, anti-twist protection and defined indexing possible
- Indexable insert with rotational direction index, reliable production and high usability





- ∅ 125 mm without internal coolant supply

D mm	ap max. mm	L mm	D1 mm	Z	Max. tightening torque N·m			art.no.	€
52.0	16	40	22	4	10	A1	B1	260111 0052	
66.0	16	50	27	5	10	A1	B1	260111 0066	
80.0	16	50	27	6	10	A1	B1	260111 0080	
100.0	16	50	32	7	10	A1	B1	260111 0100	
125.0	16	63	40	8	10	A1	B1	260111 0125	
								2125	

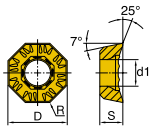
Spare parts

Screw			Wrench		
	art.no.	€		art.no.	€
A1	260400 0050		B1	705141 0015	
	2125			7114	

OCKX octagonal milling inserts

- With cutting depths up to ap = 3 mm, all 8 cutting edges can be used

ISO designation	s mm	D mm	d1 mm	R mm	ISO P M HC 4640			ISO P M K N HC 4410		
						art.no.	€		art.no.	€
OCKX 0606 AD-TR	6.35	16.0	5.8	0.5	10	270100 0624		10	270100 0661	
						2126			2126	

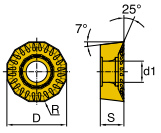




XCKX double-hexagon milling inserts

- With cutting depths up to ap = 1 mm, all 12 cutting edges can be used

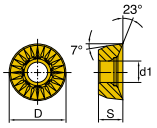
ISO designation	s mm	D mm	d1 mm	ISO P M HC 4640		
					art.no.	€
XCKK 1606 ZDR-TR	6.35	16.0	5.8	10	270101 1624	
					2126	





RCKX round milling inserts

ISO designation	s mm	D mm	d1 mm	ISO P M HC 4640			ISO P M K N HC 4410		
					art.no.	€		art.no.	€
RCKX 1606 MO-TR	6.35	16.0	5.8	10	270102 1624		10	270102 1661	
					2126			2126	

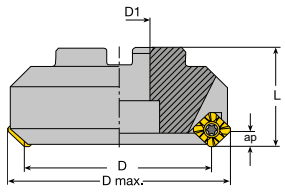




SARA® Smooth-running 45° face milling cutter

Z4 Z5 Z6 Z7 Z8+ Vc/fz 804

- **For ISO milling inserts, SE.. 13T3**
- **Internal cooling up to Ø 125 mm**
- High productivity from finishing to roughing
- Excellent surface finish
- Very broad range of applications
- Universal application for steel, stainless steel and cast iron
- Supplied with clamping screw and wrench
- **Now also with indexable cutting insert for non-ferrous materials**
- **ap max. 6 mm**





Compatible with: SANDVIK Coro Mil® 245, SUMITOMO WGC

Narrow pitch

D mm	D max. mm	D1 mm	L mm	Z	ap max. mm	Max. tightening torque N·m			art.no.	€
50.0	63.0	22	40	4	6	2.68	A1	B1	262550 0050	
63.0	76.0	22	40	5	6	2.68	A1	B1	262550 0063	
80.0	93.0	27	50	6	6	2.68	A1	B1	262550 0080	
100.0	113.0	32	50	7	6	2.68	A1	B1	262550 0100	
125.0	138.0	40	63	8	6	2.68	A1	B1	262550 0125	
160.0	173.0	40	63	10	6	2.68	A1	B1	262550 0160	
200.0	213.0	60	63	12	6	2.68	A1	B1	262550 0200	
250.0	263.0	60	63	16	6	2.68	A1	B1	262550 0250	

2118

Extra-narrow pitch

D mm	D max. mm	D1 mm	L mm	Z	ap max. mm	Max. tightening torque N·m			art.no.	€
50.0	63.0	22	40	5	6	2.68	A1	B1	262550 1050	
63.0	76.0	22	40	6	6	2.68	A1	B1	262550 1063	
80.0	93.0	27	50	8	6	2.68	A1	B1	262550 1080	
100.0	113.0	32	50	10	6	2.68	A1	B1	262550 1100	
125.0	138.0	40	63	12	6	2.68	A1	B1	262550 1125	
160.0	173.0	40	63	16	6	2.68	A1	B1	262550 1160	

2118

Spare parts

	Screw art.no.	€
A1	262551 3511	

3106

	Wrench art.no.	€
B1	705141 0015	

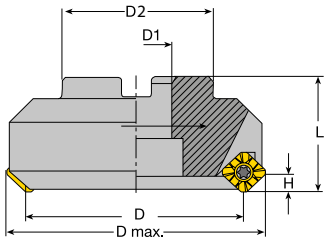
7114

palbit Face milling cutter 45° *LINEPRO 09945*

Z4 Z5 Z6 Z7 Z8+ Vc/fz 805

- **For ISO milling inserts SE.. 13T3**
- Highly positive rake angle
- **With spacers to protect the milling shank**
- Smooth, low-noise milling
- For plunge milling and face milling
- Supplied with spacers, clamping screws and wrench
- **Cutting angle:** Tool cutting-edge angle 45°, axial rake angle 20°

With spacers





D mm	D max. mm	D1 mm	L mm	Z	ap max. mm	Weight kg	Max. tightening torque N·m					art.no.	€
50	63	22	40	4	6.0	0.36	3.0	A1	B1	C1	D1	260213 0050	
63	76	22	40	5	6.0	0.59	3.0	A1	B1	C1	D1	260213 0063	
80	93	27	50	6	6.0	1.02	3.0	A1	B1	C1	D1	260213 0080	
100	113	32	50	7	6.0	1.52	3.0	A1	B1	C1	D1	260213 0100	
125	138	40	63	8	6.0	3.16	3.0	A1	B1	C1	D1	260213 0125	
160	173	40	63	10	6.0	4.61	3.0	A1	B1	C1	D1	260213 0160	

2174

Spare parts

	Spacer art.no.	€
A1	260219 0101	

3160

	Screw art.no.	€
B1	321099 0011	

3160

	Screw for spacer art.no.	€
C1	321099 0046	

3160

	TORX art.no.	€
D1	703053 0150	

7114

Milling inserts SE..13T3.. *LINEPRO 09945*

SEHT 13T3

F finishing	M medium	R roughing	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
○	●	-	SEHT 13T3 AGSN	●	●	●				**PH6740**	10	285234 0139	
				●		●				**PH6920**	10	285234 0142	



Universal use

2170

ISO	PH6740	PH6920
ISO P steel	Vc = 100 - 160	Vc = 130 - 230
ISO M stainless steel	Vc = 70 - 120	
ISO K cast iron	Vc = 80 - 250	Vc = 80 - 280
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.25 ap = 0.05 - 6.0	

SEHW 13T3

F finishing	M medium	R roughing	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
-	○	●	SEHT 13T3 AGFN	●		●				**PH6920**	10	285237 0142	



2170

ISO	PH6920
ISO P steel	Vc = 130 - 230
ISO K cast iron	Vc = 80 - 280
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.25 ap = 0.05 - 6.0

SEHT 13T3 ALU

F finishing	M medium	R roughing	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
●	○	○	SEHT 13T3 AGFN-LN				●			**PH0910**	10	285234 0320	



2171

ISO	PH0910
ISO N Al/non-ferrous	Vc = 350 - 1400
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.2 ap = 0.05 - 6.0

SEHT 13T3 WIPER

F finishing	M medium	R roughing	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
●	○	-	SEHT 13T3 AGSN-WIPER	●		●				**PH6920**	10	285234 0442	



For finishing machining

2170

ISO	PH6920
ISO P steel	Vc = 130 - 230
ISO K cast iron	Vc = 80 - 280
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.3 ap = 0.05 - 6.0





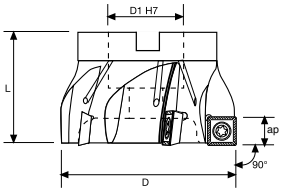
OSG
Catalogue VII
1168 pages
Art.no. 019900 0208

Overview of all free manufacturers' catalogues on page 20/21

ATORN 90° shoulder milling cutter

Z 4 | Z 5 | Z 6 | Z 8+ | Vc/fz | 808

- **For ISO milling inserts, type SDMT 1205 PDR.69**
- **Exactly 90°**
- **Internal coolant supply**
- General corner milling and face milling
- Drilling by means of circular interpolation
- Insert design with four cutting edges per plate
- Cutting depths up to max. 10.5 mm





D mm	D1 mm	L mm	Z	Max. tightening torque N-m	ap max. mm	A1	B1	art.no.	€
40	16.0	45	4	4.01	10,5	A1	B1	262547 0040	
50	22.0	40	5	4.01	10,5	A1	B1	262547 0050	
63	22.0	40	6	4.01	10,5	A1	B1	262547 0063	
80	27.0	50	6	4.01	10,5	A1	B1	262547 0080	
100	32.0	50	8	4.01	10,5	A1	B1	262547 0100	
125	40.0	63	9	4.01	10,5	A1	B1	262547 0125	

2124

Spare parts

	Screw art.no.	€
A1	320901 2504	

3106

	Wrench art.no.	€
B1	705141 0015	

7114

ISO P M K S

ISO designation		HC 4625 art.no.	€
SDMT 1205 PDR69	10	283310 2765	

2129

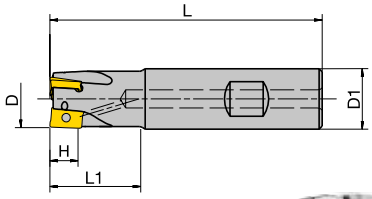
Improved model



palbit 90° LINEPRO 17090 end milling cutter

DIN 6535 HB | Z 2 | Z 3 | Z 4

- **For ISO milling inserts, type AP.. 1003**
- **Internal coolant supply**
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm
- For groove milling and side milling
- Precise 90° corner milling
- Shank according to DIN 1835B
- Supplied with clamping screws and wrench





D mm	D1 mm	L mm	L1 mm	ap max. mm	Z	Max. tightening torque N-m	art.no.	€
16	16	85	26	9.3	2	1.2	260259 0016	
16	16	150	26	9.3	2	1.2	260259 0017	
20	20	90	28	9.3	3	1.2	260259 0020	
20	20	150	28	9.3	3	1.2	260259 0021	
25	20	150	26	9.3	4	1.2	260259 0025	
25	25	95	30	9.3	4	1.2	260259 0026	

2174

Spare parts

	Screw art.no.	€
A1	321099 0005	

3160

	TORX art.no.	€
B1	703053 0080	

7114

Contents	art.no.	€
End milling cutter Ø20 Z3 plus 50 x APKT 1003-PDS-R PH7930	260259 1020	

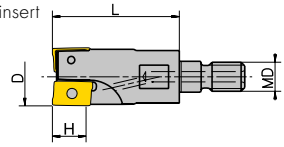
2170



palbit Screw-in milling cutter 90° *LINEPRO 17090*

Z 2 | Z 3 | Z 4

- **For ISO milling inserts, type AP.. 1003**
- Easy cutting action thanks to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm





D mm	L mm	MD	ap max. mm	Z	Max. tightening torque N-m			art.no.	€
16	25	M8	9.3	2	1.2	A1	B1	260260 0016	
20	30	M10	9.3	3	1.2	A1	B1	260260 0020	
25	35	M12	9.3	4	1.2	A1	B1	260260 0025	

2174

Spare parts

	Screw art.no.	€
A1	321099 0005	

3160

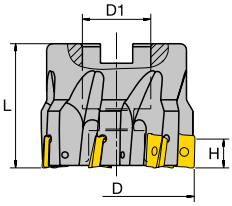
	TORX art.no.	€
B1	703053 0080	

7114

palbit Shoulder milling cutter 90° *LINEPRO 17090*

Z 6 | Z 7 | Z 8+

- **For ISO milling inserts, type AP.. 1003**
- Easy cutting action thanks to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm





D mm	D1 mm	L mm	ap max. mm	Z	Max. tightening torque N-m			art.no.	€
40	22	40	9.3	6	1.2	A1	B1	260261 0040	
50	22	40	9.3	7	1.2	A1	B1	260261 0050	
63	22	40	9.3	8	1.2	A1	B1	260261 0063	

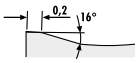
2174

APKT

F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
●	●	●	APKT 1003 PDER-S	●		●				HC4615	10	281514 3005	
				●	●					HC4535	10	281514 3007	
				●	●	●				HC4635	10	281514 3009	



Universal use

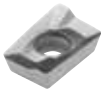


2129

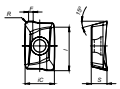
ISO	HC4535	HC4615	HC4635
ISO P steel	Vc = 100 - 170	Vc = 180 - 280	Vc = 110 - 220
ISO M stainless steel	Vc = 70 - 130		Vc = 90 - 160
ISO K cast iron		Vc = 160 - 270	Vc = 120 - 250
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 0.7 x cutting edge length		

APKT 10 PDER-X1

F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
●	●	●	APKT 100305 PDER-X1	●		●				PH6920	10	285320 0242	
				○	●	○				PH6930	10	285320 0243	



Universal use

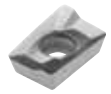


2170

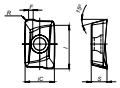
ISO	PH6920	PH6930
ISO P steel	Vc = 130 - 230	Vc = 120 - 180
ISO M stainless steel		Vc = 70 - 150
ISO K cast iron	Vc = 80 - 280	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.07 - 0.15 per cutting edge ap = max. 0.7 x cutting edge length	

APKT 10 PDSR-X1

F finishing	M medium	R roughing
●	●	●



Universal use



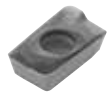
ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
APKT 100305 PDSR-X1	●		●				**PH6920**	10 285321 0342	
	●		●				**PH6930**	10 285321 0343	

2170

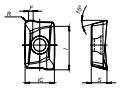
ISO	PH6920	PH6930
ISO P steel	Vc = 130 - 230	Vc = 120 - 180
ISO K cast iron	Vc = 80 - 280	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.25 per cutting edge ap = max. 0.7 x cutting edge length	

APKT 10 PDER-X

F finishing	M medium	R roughing
●	●	●



Universal use



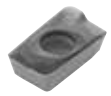
ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
APKT 100308 PDER-X	●		●				**PH6920**	10 285322 0442	
	○	●	○				**PH6930**	10 285322 0443	

2170

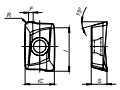
ISO	PH6920	PH6930
ISO P steel	Vc = 130 - 230	Vc = 120 - 180
ISO M stainless steel		Vc = 70 - 150
ISO K cast iron	Vc = 80 - 280	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.07 - 0.15 per cutting edge ap = max. 0.7 x cutting edge length	

APKT 10 PDSR-X

F finishing	M medium	R roughing
●	●	●



Universal use



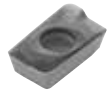
ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
APKT 100308 PDSR-X	●		●				**PH6920**	10 285323 0542	

2170

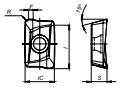
ISO	PH6920
ISO P steel	Vc = 130 - 230
ISO K cast iron	Vc = 80 - 280
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.25 per cutting edge ap = max. 0.7 x cutting edge length

APKT 10 PDTR-X

F finishing	M medium	R roughing
●	●	●



Universal use



ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
APKT 100308 PDTR-X	●		●				**PH6920**	10 285324 0642	

2170

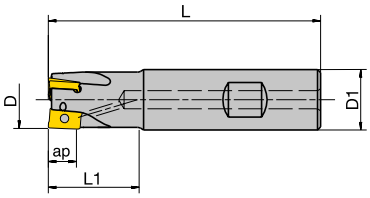
ISO	PH6920
ISO P steel	Vc = 130 - 230
ISO K cast iron	Vc = 80 - 280
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.25 per cutting edge ap = max. 0.7 x cutting edge length

ATORN 90° end milling cutter

Z1 Z2 Z3 Z4 Z5

- **For ISO milling inserts, type AP.. 1003**
- **Internal coolant supply**
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm
- For groove milling and side milling
- Precise 90° shoulder milling
- Shank according to DIN 1835B
- Supplied with clamping screws and wrench





Short

D mm	D1 mm	L mm	L1 mm	ap max. mm	Z	Max. tightening torque N-m			art.no.	€
10	16	80	24	9.3	1	1	A1	B1	262540 0100	
11	16	80	24	9.3	1	1	A1	B1	262540 0110	
12	16	80	24	9.3	1	1	A1	B1	262540 0120	
13	16	80	24	9.3	1	1	A1	B1	262540 0130	
14	16	80	24	9.3	1	1	A1	B1	262540 0140	
15	16	85	25	9.3	2	1	A1	B1	262540 0150	
15.7	16	85	25	9.3	2	1	A1	B1	262540 0157	
16	16	85	25	9.3	2	1	A1	B1	262540 0160	
17	16	85	25	9.3	2	1	A1	B1	262540 0170	
18	20	85	25	9.3	2	1	A1	B1	262540 0180	
19.7	20	90	25	9.3	3	1	A1	B1	262540 0197	
20	20	90	25	9.3	3	1	A1	B1	262540 0200	
22	25	95	25	9.3	3	1	A1	B1	262540 0220	
24.7	25	95	25	9.3	4	1	A1	B1	262540 0247	
25	25	95	25	9.3	4	1	A1	B1	262540 0250	
28	25	95	25	9.3	4	1	A1	B1	262540 0280	
30	25	95	25	9.3	4	1	A1	B1	262540 0300	
32	25	95	31	9.3	5	1	A1	B1	262540 0320	

2124



Long

D mm	D1 mm	L mm	L1 mm	ap max. mm	Z	Max. tightening torque N-m			art.no.	€
10	16	150	24	9.3	1	1	A1	B1	262540 0101	
12	16	150	24	9.3	1	1	A1	B1	262540 0121	
16	16	150	100	9.3	2	1	A1	B1	262540 0161	
18	16	150	25	9.3	2	1	A1	B1	262540 0181	
20	20	150	100	9.3	3	1	A1	B1	262540 0201	
25	20	150	100	9.3	4	1	A1	B1	262540 0251	
32	25	150	26	9.3	5	1	A1	B1	262540 0321	

2124

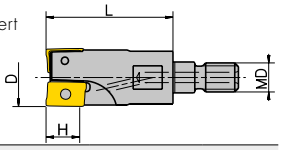
Spare parts

	Screw			TORX	
	art.no.	€		art.no.	€
A1	262551 0025		B1	703053 0080	
	3106			7114	

ATORN 90° screw-in milling cutter

Z1 Z2 Z3 Z4 Z5

- **For ISO milling inserts, type AP.. 1003**
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm





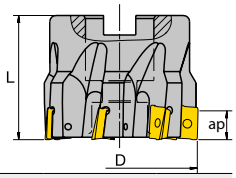
D mm	L mm	MD	Z	Max. tightening torque N·m			art.no.	€
10	20	M6	1	1.0	A1	B1	262542 0010	
12	20	M6	1	1.0	A1	B1	262542 0012	
16	25	M8	2	1.0	A1	B1	262542 0016	
20	30	M10	3	1.0	A1	B1	262542 0020	
25	35	M12	4	1.0	A1	B1	262542 0025	
28.0	35	M12	4	1.0	A1	B1	262542 0028	
30.0	34	M16	4	1.0	A1	B1	262542 0030	
32	43	M16	5	1.0	A1	B1	262542 0032	

2124

ATORN 90° shoulder milling cutter

Z6 Z7 Z8+ Nit.

- **For ISO milling inserts, type AP.. 1003**
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm





D mm	Bore hole Ø mm	L mm	ap max. mm	Z	Max. tightening torque N·m			art.no.	€
40	16	40	9.3	6	1.0	A1	B1	262546 0040	
50	22	40	9.3	7	1.0	A1	B1	262546 0050	
63	22	40	9.3	8	1.0	A1	B1	262546 0063	
80	27	50	9.3	11	1.0	A1	B1	262546 0080	
100	32	50	9.3	12	1.0	A1	B1	262546 0100	

2124

Spare parts

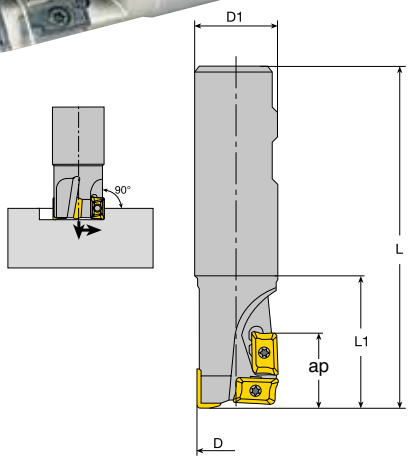
Screw			TORX		
	art.no.	€		art.no.	€
A1	262551 0025		B1	703053 0080	
3106			7114		

ATORN 90° drilling/die sinking cutter

Z2

- **For ISO milling inserts, type AP.. 1003**
- **Internal coolant supply**
- With Weldon shank
- High cutting capacity
- Reliable chip flow even when drilling due to positive indexable insert geometry
- Supplied with clamping screws and wrench





Short

D mm	D1 mm	L1 mm	L mm	ap max. mm	Z	Max. tightening torque N·m			art.no.	€
20	20	35	90	17	2	1.0	A1	B1	262515 0002	
25	25	50	110	19	2	1.0	A1	B1	262515 0003	

2124

Long

D mm	D1 mm	L1 mm	L mm	ap max. mm	Z	Max. tightening torque N·m			art.no.	€
20	20	98	150	17	2	1.0	A1	B1	262516 0002	
25	25	94	150	19	2	1.0	A1	B1	262516 0003	

2124

Extra-long

D mm	D1 mm	L1 mm	L mm	ap max. mm	Number of index. inserts pc.	Z	Max. tightening torque N·m			art.no.	€
20	20	125	180	17	3	2	1.0	A1	B1	262517 0020	
25	25	140	200	19	3	2	1.0	A1	B1	272517 0025	

2124

Spare parts

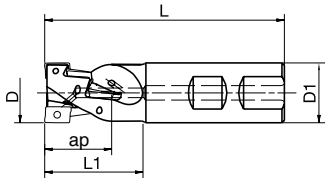
Screw			TORX		
	art.no.	€		art.no.	€
A1	262551 0025		B1	703053 0080	
3106			7114		

ATORN 90° roughing spiral flute end mill

Z1 Z2 Z3 Vc/fz 806

- **For ISO milling inserts, type AP.. 1003**
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm
- Shank according to DIN 1835B





D mm	D1 mm	L mm	L1 mm	ap max. mm	Number of index. inserts pc.	Z	Max. tightening torque N-m			art.no.	€
20	20	87	37	28	4	1	1.0	A1	B1	262544 0020	
25	25	105	49	36	8	2	1.0	A1	B1	262544 0025	
32	32	115	55	45	10	2	1.0	A1	B1	262544 0032	
32	32	115	55	45	15	3	1.0	A1	B1	262544 0033	
40	32	130	70	54	18	3	1.0	A1	B1	262544 0040	

2124

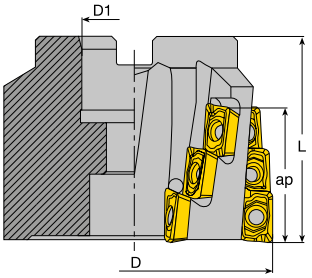
Spare parts

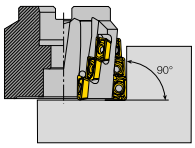
Screw			TORX		
	art.no.	€		art.no.	€
A1	262551 0025		B1	703053 0080	
3106			7114		

ATORN 90° roughing spiral flute milling cutter

Z3 Z4

- **For ISO milling inserts, type AP.. 1003**
- **Internal coolant supply**
- Just one insert type for both face and side cutting edges
- High right-hand helix configuration for good chip shaping
- Full coverage within one row of teeth
- Supplied with clamping screws and wrench







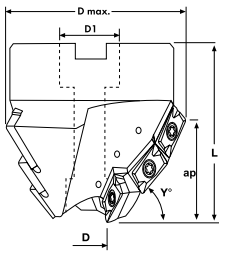
D mm	Bore hole Ø mm	D1 mm	ap max. mm	L mm	Z	Number of index. inserts pc.	Max. tightening torque N-m			art.no.	€
40	16	16	37	50	3	12	1.0	A1	B1	262529 0040	
50	22	22	46	60	3	15	1.0	A1	B1	262529 0050	
63	27	27	46	60	4	20	1.0	A1	B1	262529 0063	

2124

ATORN Spiral flute chamfer milling cutter

Z3

- **For roughing**
- **15 °, 30 °, 40 °, 45 °, 60 °, 75 °**
- **For ISO milling inserts, type AP.. 1003**
- **Internal coolant supply**
- Ideal for pre-machining welded seams
- Manufacturing and indexable insert tolerances allow crank formation
- Supplied with clamping screws and wrench
- **Additional versions with user-defined chamfer angles are manufactured on request (minimum purchase 2 units)**





D mm	D max. mm	Bore hole Ø mm	L mm	y °	ap max. mm	Z	Number of index. inserts pc.	Max. tightening torque N-m					art.no.	€
17.0	70	22	50	15	7	3	9	1.0	A1		C1	D1	262531 1715	
17.0	69	22	50	20	9	3	9	1.0	A1	B1	C1	D1	262531 1720	
17.0	65	22	50	30	13	3	9	1.0	A1		C1	D1	262531 1730	
17.0	60	22	50	40	17	3	9	1.0	A1		C1	D1	262531 1740	
17.0	56	22	50	45	19	3	9	1.0	A1		C1	D1	262531 1745	
17.0	45	16	50	60	24	3	9	1.0	A1		C2	D1	262531 1760	
19.0	33	16	60	75	27	3	9	1.0	A1		C2	D1	262531 1975	

2125

Spare parts

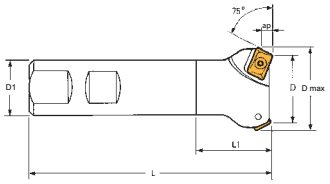
Screw					Retaining screw		TORX		
	art.no.	€		art.no.	€		art.no.	€	
A1	262551 0025		B1	320901 2501		C1	320901 2509	D1	703053 0080	
						C2	320901 2510			
3106						3106		7114		

ATORN 75° end / face milling cutter

Z 2 | Z 3 | Z 4



- With Weldon shank
- **For ISO milling inserts, type AP..1003**
- Also ideal for indexable inserts that are already worn from use in 90° shoulder milling cutters or 90° end milling cutter Worn inserts can be reused by utilising the unworn cutting edge
- Supplied with clamping screws and wrench



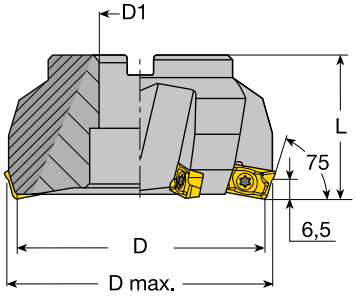
D mm	D max. mm	D1 mm	L1 mm	L mm	Z	ap max. mm	Max. tightening torque N-m			art.no.	€
25	28.6	20	25	95	2	4	1.0	A1	B1	262532 0025	
32	35.6	25	25	95	3	4	1.0	A1	B1	262532 0032	
40	43.6	25	25	100	4	4	1.0	A1	B1	262532 0040	

2124

ATORN 75° face milling cutter

Z 5 | Z 6

- **For ISO milling inserts, type AP..1003**
- Also ideal for indexable inserts that are already worn from use in 90° shoulder milling cutters or 90° end milling cutter Worn inserts can be reused by utilising the unworn cutting edge
- Supplied with clamping screws and wrench





D mm	D1 mm	D max. mm	L mm	Z	Max. tightening torque N-m			art.no.	€
50.0	22	54	40	5	1.0	A1	B1	262533 0050	
63.0	22	67	40	6	1.0	A1	B1	262533 0063	

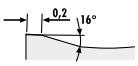
2124

APKT

F finishing	M medium	R roughing	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
●	●	●	APKT 1003 PDER-S	●		●				HC4615	10	281514 3005	
				●	●					HC4535	10	281514 3007	
				●	●	●				HC4635	10	281514 3009	



Universal use



2129

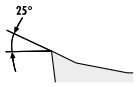
ISO	HC4535	HC4615	HC4635
ISO P steel	Vc = 100 - 170	Vc = 180 - 280	Vc = 110 - 220
ISO M stainless steel	Vc = 70 - 130		Vc = 90 - 160
ISO K cast iron		Vc = 160 - 270	Vc = 120 - 250
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 0.7 x cutting edge length		

APHX specially for non-ferrous metals

F finishing	M medium	R roughing	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
●	●	●	APHX 100304 FR-ALU				●			HW4415	10	281517 2003	



Universal use



Polished design!

2129

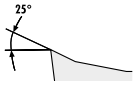
ISO	HW4415
ISO N Al/non-ferrous	Vc = 200 - 700
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 0.7 x cutting edge length

APKR specially for non-ferrous metals

F finishing	M medium	R roughing	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
●	●	●	APKT 1003 PDFR				●			HW4415	10	281715 0025	



Universal use



ISO	HW4415
ISO N Al/non-ferrous	Vc = 200 - 700
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 0.7 x cutting edge length

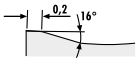
2129

APKT Radius

F finishing	M medium	R roughing	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
●	●	●	APKT 100308 PDER	●	●	●				HC4540	10	281514 4011	
			APKT 100312 PDER	●	●	●				HC4540	10	281514 4012	
			APKT 100320 PDER	●	●	●				HC4540	10	281514 4013	



Universal use



ISO	HC4540
ISO P steel	Vc = 70 - 130
ISO M stainless steel	Vc = 90 - 160
ISO K cast iron	Vc = 120 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 0.7 x cutting edge length

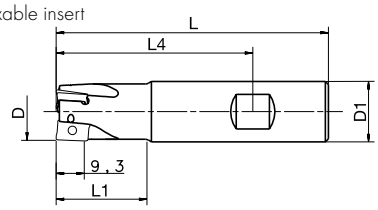
2129

SARA® 90° end milling cutter

The affordable alternative

Z 2 | Z 3 | Z 4

- **For ISO milling inserts, type AP.. 1003**
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm
- For groove milling and side milling
- Precise 90° corner milling
- Shank according to DIN 1835B
- Supplied with clamping screws and wrench





D mm	D1 mm	L mm	L1 mm	L4 mm	Z	Max. tightening torque N-m			art.no.	€
16	16	85	34	60	2	1.2	A1	B1	262556 0016	
20	20	90	37	65	3	1.2	A1	B1	262556 0020	
25	25	95	46	70	4	1.2	A1	B1	262556 0025	

2118

Spare parts

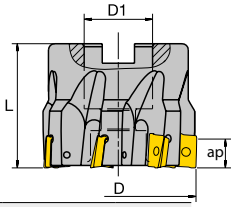
Screw			TORX		
	art.no.	€		art.no.	€
A1	262551 0025		B1	703053 0080	
3106			7114		

SARA® 90° corner milling cutter

The affordable alternative

Z 6 | Z 7

- **For ISO milling inserts, type AP.. 1003**
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm





D mm	D1 mm	L mm	Z	Max. tightening torque N-m			art.no.	€
40	16	40	6	1.2	A1	B1	262557 0040	
50	22	40	7	1.2	A1	B1	262557 0050	

2118

Spare parts

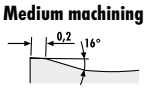
Screw			TORX		
	art.no.	€		art.no.	€
A1	262551 0025		B1	703053 0080	
3106			7114		

APMT 10

F finishing	M medium	R roughing	SARA® ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
●	●	●	APMT 100305 PDER-M	●	●	●				SC4635	10	281516 3009	



Medium machining



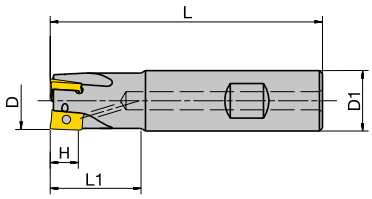
ISO	SC4635
ISO P steel	Vc = 110 - 120
ISO M stainless steel	Vc = 90 - 160
ISO K cast iron	Vc = 120 - 250
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.3 per cutting edge ap = max. 0.7 x cutting edge length

2167

palbit 90° LINEPRO 18090 end milling cutter

Z2 Z3 Z4

- **For ISO milling inserts AP.. 1604**
- Easy cutting action thanks to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm
- Precise 90° corner milling
- Rhombic shape for large cutting depths
- For groove milling and side milling
- Shank according to DIN 1835B
- Supplied with clamping screws and wrench





D mm	D1 mm	L mm	L1 mm	ap max. mm	Z	Max. tightening torque N-m	art.no.	€
25	25	100	44	14.5	2	3.0	260262 0025	
25	25	200	60	14.5	2	3.0	260262 0026	
32	32	110	50	14.5	3	3.0	260262 0032	
32	32	200	60	14.5	3	3.0	260262 0033	
40	32	115	40	14.5	4	3.0	260262 0040	
40	32	200	40	14.5	4	3.0	260262 0041	

2174

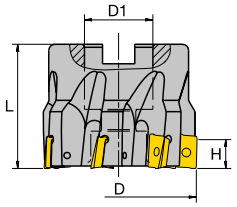
Spare parts

	Screw art.no.	€		TORX art.no.	€
A1	262551 0025		B1	703053 0080	
	3106			7114	

palbit Shoulder milling cutter 90° LINEPRO 18090

Z4 Z5 Z6 Z7 Z8+

- **For ISO milling inserts AP.. 1604**
- Easy cutting action thanks to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**
- * Without internal coolant supply
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm
- Precise 90° corner milling
- Rhombic shape for large cutting depths
- Supplied with clamping screws and wrench
- **Cutting angle:** Tool cutting edge angle 90°, axial rake angle 7° + 13°, radial rake angle 20°





D mm	D1 mm	L mm	ap max. mm	Z	Max. tightening torque N-m			art.no.	€
40	16	40	14.9	4	3.0	A1	B1	260263 0040	
50	22	40	14.9	5	3.0	A1	B1	260263 0050	
63	22	40	14.9	6	3.0	A1	B1	260263 0063	
80	27	50	14.9	7	3.0	A1	B1	260263 0080	
100	32	50	14.9	8	3.0	A1	B1	260263 0100	
125	40	63	14.9	9	3.0	A1	B1	260263 0125	

2174

Spare parts

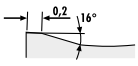
	Screw art.no.	€		TORX art.no.	€
A1	262551 0025		B1	703053 0080	
	3106			7114	

APKT 1604-PDR

F finishing	M medium	R roughing	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
●	●	●	APKT 1604 PDR	●	●	●				PH7930	10 285440 0151	



Universal use



Universal insert

ISO	PH7930
ISO P steel	Vc = 120 - 180
ISO M stainless steel	Vc = 70 - 150
ISO K cast iron	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.07 - 0.20 per cutting edge ap = max. 0.7 x cutting edge length

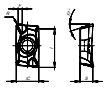
2170

APKT 1604-PDER-X1

F finishing	M medium	R roughing
●	●	●



Universal use



palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
APKT 160408 PDER-X1	●		●				**PH6920**	10 285328 0142	

2170

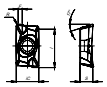
ISO	PH6920
ISO P steel	Vc = 130 - 230
ISO K cast iron	Vc = 80 - 280
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.07 - 0.15 per cutting edge ap = max. 0.7 x cutting edge length

APKT 1604-PDER-X2

F finishing	M medium	R roughing
●	●	●



Universal use



palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
APKT 160408 PDER-X2	●		●				**PH7920**	10 285329 0250	
	○	●	○				**PH7930**	10 285329 0251	

2170

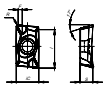
ISO	PH7920	PH7930
ISO P steel	Vc = 130 - 230	Vc = 120 - 180
ISO M stainless steel		Vc = 70 - 150
ISO K cast iron	Vc = 80 - 280	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.07 - 0.15 per cutting edge ap = max. 0.7 x cutting edge length	

APKT 1604-PDSR-X1

F finishing	M medium	R roughing
●	●	●



Universal use



palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
APKT 160408 PDSR-X1	●		●				**PH6920**	10 285330 0342	
	●		●				**PH6930**	10 285330 0343	

2170

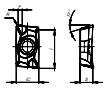
ISO	PH6920	PH6930
ISO P steel	Vc = 130 - 230	Vc = 120 - 180
ISO K cast iron	Vc = 80 - 280	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.25 per cutting edge ap = max. 0.7 x cutting edge length	

APKT 1604-PDSR-X2

F finishing	M medium	R roughing
●	●	●



Universal use



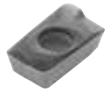
palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
APKT 160408 PDSR-X2	●		●				**PH7920**	10 285331 0450	
	●		●				**PH7930**	10 285331 0451	

2170

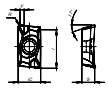
ISO	PH7920	PH7930
ISO P steel	Vc = 130 - 230	Vc = 120 - 180
ISO K cast iron	Vc = 80 - 280	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.25 per cutting edge ap = max. 0.7 x cutting edge length	

APKT 1604-PDSR-X

F finishing	M medium	R roughing
●	●	●



Universal use



palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	art.no.	€
APKT 160416 PDSR-X	●		●				**PH6920**	10 285333 0642	

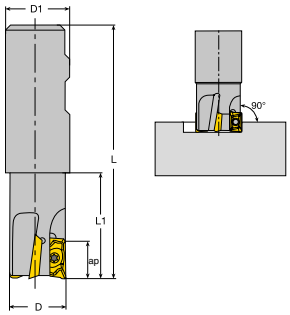
2170

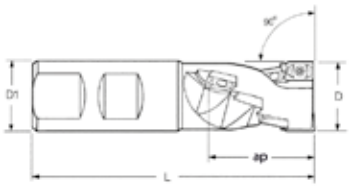
ISO	PH6920
ISO P steel	Vc = 130 - 230
ISO K cast iron	Vc = 80 - 280
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.25 per cutting edge ap = max. 0.7 x cutting edge length

ATORN 90° end milling cutter

Z 2 | Z 3 | Z 4 | Z 1

- **For ISO milling inserts, type AP.. 1604**
- **Internal coolant supply**
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm
- For groove milling and side milling
- Precise 90° shoulder milling
- Shank according to DIN 1835B
- Supplied with clamping screws and wrench







262505 0025



262505 0032

Short

D mm	D1 mm	L1 mm	L mm	ap max. mm	Z	Max. tightening torque N·m			art.no.	€
25	25	44	100	14.9	2	4.01	A1	B1	262505 0025	
32	32	50	110	14.9	3	4.01	A1	B1	262505 0032	
40	32	45	115	14.9	4	4.01	A1	B1	262505 0040	

2124



Roughing spiral flute end mill

D mm	D1 mm	L mm	ap max. mm	Z	Number of index. inserts pc.	Max. tightening torque N·m			art.no.	€
25	25	105	29	1	2	4.01	A1	B1	262511 0025	
32	32	115	44	2	6	4.01	A1	B1	262511 0032	
40	32	130	58	2	8	4.01	A1	B1	262511 0040	

2124

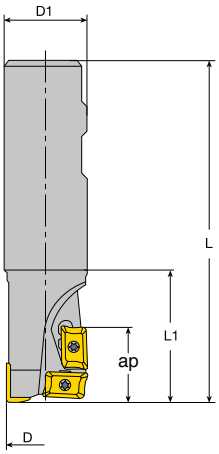
Spare parts

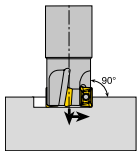
	Screw			TORX	
	art.no.	€		art.no.	€
A1	321099 0014		B1	703053 0150	
	3160			7114	

ATORN 90° drilling/die sinking cutter

Z 3

- **For ISO milling inserts, type AP.. 1604**
- **Internal coolant supply**
- With Weldon shank
- High cutting capacity
- Reliable chip flow even when drilling due to positive indexable insert geometry
- Supplied with clamping screws and wrench







Short

D mm	D1 mm	ap max. mm	L1 mm	L mm	Z	Max. tightening torque N·m			art.no.	€
32	32	30	50	130	3	4.01	A1	B1	262515 0004	

2124

Extra-long

D mm	D1 mm	ap max. mm	L1 mm	L mm	Z	Max. tightening torque N·m			art.no.	€
32	32	30	160	220	2	4.01	A1	B1	262516 0004	

2124

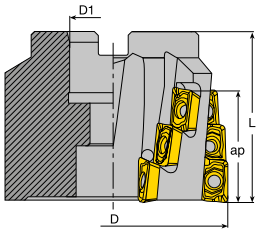
Spare parts

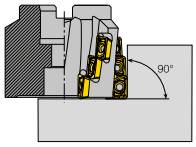
	Screw			Wrench	
	art.no.	€		art.no.	€
A1	320901 2502		B1	705141 0015	
	3106			7114	

ATORN 90° roughing spiral flute milling cutter

Z3 Z4 Z5 Z6

- **For ISO milling inserts, type AP.. 1604**
- Just one insert type for both face and side cutting edges
- High right-hand helix configuration for good chip shaping
- Full coverage within one row of teeth
- Supplied with clamping screws and wrench







D mm	D1 mm	L mm	ap max. mm	Z	Number of index. inserts pc.	Max. tightening torque N·m			art.no.	€
50	27	50	30	3	6	4.01	A1	B1	262523 0050	
63	27	60	44	4	12	4.01	A1	B1	262523 0063	
80	32	60	44	5	15	4.01	A1	B1	262523 0080	
100	40	60	44	6	18	4.01	A1	B1	262523 0100	
									2124	

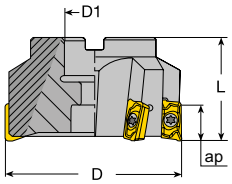
Spare parts

	Screw art.no.	€		Wrench art.no.	€
A1	320901 2502		B1	705141 0015	
	3106			7114	

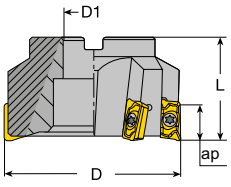
ATORN 90° shoulder milling cutter

Z4 Z5 Z6 Z7 Z8+

- **For ISO milling inserts, type AP.. 1604**
- Precise 90° shoulder milling
- Rhombic shape for large cutting depths
- **Internal coolant supply**
- Supplied with clamping screws and wrench
- **Cutting angle:** Tool cutting edge angle 90°, axial rake angle 7° + 13°, radial rake angle 20°
- * Without internal coolant supply



Type A



Type B



Type	D mm	D1 mm	L mm	ap max. mm	Z	Max. tightening torque N·m			art.no.	€
A	40	16	40	14.9	4	4.01	A1	B1	262525 0040	
A	50	22	40	14.9	5	4.01	A1	B1	262525 0050	
A	63	22	40	14.9	6	4.01	A1	B1	262525 0063	
A	80	27	50	14.9	7	4.01	A1	B1	262525 0080	
B	100	32	50	14.9	8	4.01	A1	B1	262525 0100	
B	125	40	63	14.9	9	4.01	A1	B1	262525 0125	
B*	160	40	63	14.9	10	4.01	A1	B1	262525 0160	
B*	200	60	63	14.9	13	4.01	A1	B1	262525 0200	
B*	250	60	63	14.9	16	4.01	A1	B1	262525 0250	
									2124	

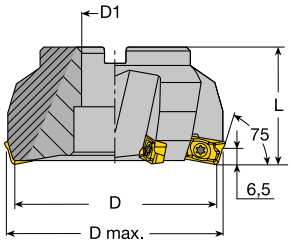
Spare parts

	Screw art.no.	€		Wrench art.no.	€
A1	320901 2502		B1	705141 0015	
	3106			7114	

ATORN 75° face milling cutter

Z3 Z4 Z5 Z6 Z7

- **For ISO milling inserts, type AP..1604**
- Also ideal for indexable inserts that are already worn from use in 90° shoulder milling cutters or 90° end milling cutter Worn inserts can be reused by utilising the unworn cutting edge
- Supplied with clamping screws and wrench





D mm	D1 mm	D max. mm	L mm	Z	Max. tightening torque N·m			art.no.	€
50.0	16	54	40	3	4.01	A1	B1	262530 0050	
63.0	22	67	40	4	4.01	A1	B1	262530 0063	
80.0	27	84	50	5	4.01	A1	B1	262530 0080	
100.0	32	104	50	6	4.01	A1	B1	262530 0100	
125.0	40	129	63	7	4.01	A1	B1	262530 0125	
								2124	

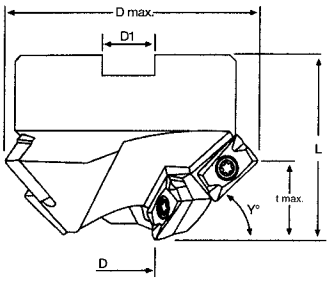
Spare parts

	Screw art.no.	€		Wrench art.no.	€
A1	320901 2502		B1	705141 0015	
	3106			7114	

ATORN Spiral flute chamfer milling cutter

Z 3

- **For roughing**
- **15 °, 20°, 30 °, 40 °, 45 °, 60 °, 75 °**
- **For ISO milling inserts, type AP.. 1604**
- Ideal for pre-machining welded seams
- Indexable insert tolerances allow crank formation
- Supplied with clamping screws and wrench
- **Additional versions with user-defined chamfer angles are manufactured on request (minimum purchase 2 units)**





D mm	D max. mm	D1 mm	L mm	γ °	Number of index. inserts pc.	t max. mm	Max. tightening torque N-m	Z			art.no.	€
35.0	94	27	50	15	6	8	4.01	3	A1	B1	262527 3515	
35	91	27	50	20	6	10	4.01	3	A1	B1	262527 3520	
35.0	88	27	50	30	6	15	4.01	3	A1	B1	262527 3530	
35.0	77.8	27	50	45	6	21.5	4.01	3	A1	B1	262527 3545	
35.0	65	27	50	60	6	26.5	4.01	3	A1	B1	262527 3560	
35.0	50.7	22	60	75	6	29.5	4.01	3	A1	B1	262527 3575	

2125

Spare parts

	Screw art.no.	€
A1	320901 2502	

3106

	Wrench art.no.	€
B1	705141 0015	

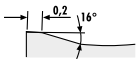
7114

APKT 1604-PDR

F finishing	M medium	R roughing	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
●	●	●	APKT 1604 PDR	●	●	●				PH7930	10	285440 0151	



Universal use



Universal insert

2170

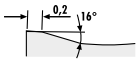
ISO	PH7930
ISO P steel	Vc = 120 - 180
ISO M stainless steel	Vc = 70 - 150
ISO K cast iron	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.07 - 0.20 per cutting edge ap = max. 0.7 x cutting edge length

APKT

F finishing	M medium	R roughing	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
●	●	●	APKT 1604 PDER-S	●		●				HC4615	10	281514 3205	
				●	●					HC4535	10	281514 3207	
				●	●	●				HC4635	10	281514 3209	



Universal use



2129

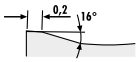
ISO	HC4535	HC4615	HC4635
ISO P steel	Vc = 100 - 170	Vc = 180 - 280	Vc = 110 - 220
ISO M stainless steel	Vc = 70 - 130		Vc = 90 - 160
ISO K cast iron		Vc = 160 - 270	Vc = 120 - 250
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 0.7 x cutting edge length		

APKT Radius

F finishing	M medium	R roughing	SARA ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
●	●	●	APKT 160416-PDER-HCM	●	●	●				SP35P	10	281522 1610	
			APKT 160424-PDER-HCM	●	●	●				SP35P	10	281522 2410	
			APKT 160432-PDER-HCM	●	●	●				SP35P	10	281522 3210	



Medium finishing



2167

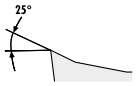
ISO	SP35P
ISO P steel	Vc = 80 - 180
ISO M stainless steel	Vc = 80 - 220
ISO K cast iron	Vc = 80 - 290
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.4 ap = max. 0.7 x cutting edge length

APHX specially for non-ferrous metals

F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
●	●	●	APHX 160404 FR-ALU				●			HW4415	10	281517 2203	



Universal use



Polished design!

ISO	HW4415
ISO N Al/non-ferrous	Vc = 200 - 700
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 0.7 x cutting edge length

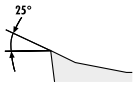
2129

APKR specially for non-ferrous metals

F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
●	●	●	APKT 1604 PDFR				●			HW4415	10	281715 0030	



Universal use



ISO	HW4415
ISO N Al/non-ferrous	Vc = 200 - 700
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 to 0.4 per cutting edge ap = max. 0.7 x cutting edge length

2129

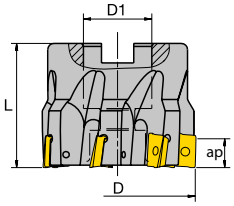
SARA® Shoulder milling cutter 90°

Z4 Z5 Z6

- **For ISO milling inserts AP.. 1604**
- Soft cutting due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- Axial run-out max. 0.03 mm
- Radial run-out max. 0.03 mm

The affordable alternative





D mm	D1 mm	L mm	ap max. mm	Z	Max. tightening torque N-m			art.no.	€
40	16	40	14.9	4	4.01	A1	B1	262558 0040	
50	22	40	14.9	5	4.01	A1	B1	262558 0050	
63	22	40	14.9	6	4.01	A1	B1	262558 0063	

2118

Spare parts

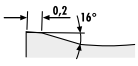
Screw			Wrench		
	art.no.	€		art.no.	€
A1	320901 2502		B1	705141 0015	
3106			7114		

APMT 16

F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
●	●	●	APMT 1604 PDER-M	●	●	●				SC4635	10	281517 3009	



Medium finishing



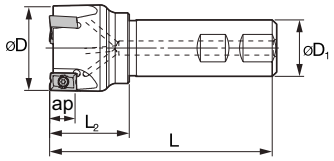
ISO	SC4635
ISO P steel	Vc = 110 - 220
ISO M stainless steel	Vc = 90 - 160
ISO K cast iron	Vc = 120 - 250
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.3 per cutting edge ap = max. 0.7 x cutting edge length

2167

ATORN End milling cutters 4-10 Power

Z 3 | Z 4 | Vc/fz | 807

- **For ISO milling inserts, type LN.X 100605 PNR**
- **Internal coolant supply**
- **For face milling, shoulder milling, straight-line edge milling and groove milling**
- Multi-functional milling tool system with **4 cutting edges** on a **double-sided indexable cutting insert**
- High tool life quantities due to low machining forces
- Special chip shape geometry allows low power consumption due to a large rake angle despite the thick cutting edge
- With the new carbide types, the chip geometry ensures consistently high tool life quantities
- Nickel-plated design for high wear-resistance and increased base body service life





Short

D mm	D1 mm	L mm	L2 mm	Z	ap max. mm	Max. tightening torque N·m			art.no.	€
20	20	100	30	3	9	1.75	A1	C1	262559 0020	
25	25	115	35	3	9	1.75	A1	C1	262559 0025	
32	25	125	40	4	9	1.75	A1	C1	262559 0032	

2124



Long

D mm	D1 mm	L mm	L2 mm	Z	ap max. mm	Max. tightening torque N·m			art.no.	€
20	20	150	50	3	9	1.75	A1	B1	262561 0020	
25	25	150	60	3	9	1.75	A1	B1	262561 0032	
32	25	200	50	4	9	1.75	A1	B1	262561 0025	

2124

Spare parts

	Screw art.no.	€
A1	285799 0102	

3106

	TORX art.no.	€
B1	703053 0090	

7114

	TORX PLUS art.no.	€
C1	703054 0080	

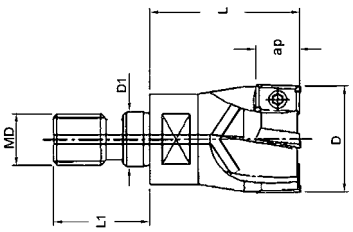
7114

ATORN Screw-in milling cutter 4-10 Power

Z 3 | Z 4 | Vc/fz | 807



- **For ISO milling inserts, type LN.X 100605 PNR**
- **Internal coolant supply**
- **For face milling, shoulder milling, straight-line edge milling and groove milling**
- Multi-functional milling tool system with **4 cutting edges** on a **double-sided indexable cutting insert**
- High tool life quantities due to low machining forces
- Special chip shape geometry allows low power consumption due to a large rake angle despite the thick cutting edge
- With the new carbide types, the chip geometry ensures consistently high tool life quantities
- Nickel-plated design for high wear-resistance and increased base body service life



D mm	L mm	D1 mm	L1 mm	MD	Z	ap max. mm	Max. tightening torque N·m			art.no.	€
20	30	10.5	20	M12	3	10	1.75	A1	B1	262563 0020	
25	35	12.5	22	M12	3	10	1.75	A1	B1	262563 0025	
32	43	17	24	M16	4	10	1.75	A1	B1	262563 0032	

2124

Spare parts

	Screw art.no.	€
A1	285799 0102	

3106

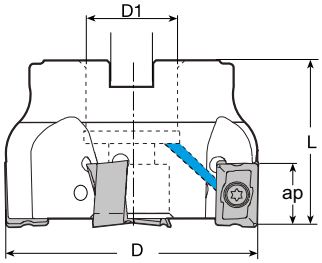
	TORX art.no.	€
B1	703053 0090	

7114

ATORN Shoulder milling cutter 4-10 power / 4-15 power

Z 5 | Z 7 | Z 8+ | Z 6 | Vc/fz

809



- **Internal coolant supply**
- **For face milling, shoulder milling, straight-line edge milling and groove milling**
- Multi-functional milling tool system with **4 cutting edges** on a **double-sided milling insert**
- High tool life quantities due to low machining force
- Special chip shape geometry allows low power consumption due to a large rake angle despite the thick cutting edge
- With the new carbide types, the chip geometry ensures consistently high tool life quantities
- Nickel-plated design for high wear-resistance and increased base body service life



4-10 Power

- **For ISO milling inserts, type LN.X 100605 PNR**

D mm	D1 mm	L mm	Z	ap max. mm	Max. tightening torque N-m			art.no.	€
40	16	40	5	9	1.75	A1	B1	262560 0040	
50	22	40	7	9	1.75	A1	B1	262560 0050	
63	22	40	9	9	1.75	A1	B1	262560 0063	

2124



4-15 Power

- **For ISO milling inserts, type LN.X 151008 PNR**

D mm	D1 mm	L mm	Z	ap max. mm	Max. tightening torque N-m			art.no.	€
50	22	40	5	14	4.01	A2	B2	262562 0050	
63	22	40	6	14	4.01	A2	B2	262562 0063	
80	27	50	7	14	4.01	A2	B2	262562 0080	
100	32	50	8	14	4.01	A2	B2	262562 0100	
125	40	63	10	14	4.01	A2	B2	262562 0125	
160	40	63	11	14	4.01	A2	B2	262562 0160	

2124

Spare parts

	Screw art.no.	€
A1	285799 0102	
A2	285799 0103	

3106

	TORX art.no.	€
B1	703053 0090	
B2	703053 0150	

7114

LNM(E)X 10

F finishing	M medium	R roughing	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
●	●	●	LNMX 100605 PNR-MM	●	●	●				HC4630	10	295811 0001	
					●					HC4535	10	295813 0001	
							●			HW4410	10	295815 0002	



Universal use

2129

ISO	HC4535	HC4630	HW4410
ISO P steel		Vc = 110 - 220	
ISO M stainless steel	Vc = 120 - 180	Vc = 90 - 160	
ISO K cast iron		Vc = 120 - 230	
ISO N Al/non-ferrous			Vc = 200 - 300
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.05 - 0.20 per cutting edge ap = max. 0.7 x cutting edge length		

LNM(E)X 15

F finishing	M medium	R roughing	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
●	●	●	LNMX 151008 PNR-MM	●	●	●				HC4630	10	295821 0001	
					●					HC4535	10	295825 0001	
							●			HW4410	10	295826 0002	



Universal use

2129

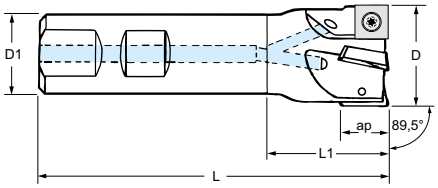
ISO	HC4535	HC4630	HW4410
ISO P steel		Vc = 110 - 220	
ISO M stainless steel	Vc = 120 - 180	Vc = 90 - 160	
ISO K cast iron		Vc = 120 - 230	
ISO N Al/non-ferrous			Vc = 200 - 300
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.05 - 0.20 per cutting edge ap = max. 0.7 x cutting edge length		

ATORN 89.5° end milling cutter

Z1 Z2 Z3 Z4 Z5

Particularly cost-effective thanks to 4 cutting edges

- **For milling inserts SP.T 0603**
- Positive indexable insert basic form
- Four cutting edges per indexable insert
- Also suitable for machines with low drive power
- For excellent surfaces
- Burr-free milling
- **Internal coolant supply**
- Shank according to DIN 1835B
- Supplied with clamping screw and wrench





Short

D mm	D1 mm	L1 mm	L mm	ap max. mm	Z	Max. tightening torque N·m			art.no.	€
10	16	24	80	6	1	1	A1	B1	265000 0010	
12	16	24	80	6	1	1	A1	B1	265000 0012	
16	16	37	85	6	2	1	A1	B1	265000 0016	
20	20	40	90	6	3	1	A1	B1	265000 0020	
25	25	39	95	6	4	1	A1	B1	265000 0025	
32	25	30	95	6	5	1	A1	B1	265000 0032	

2124

Long

D mm	D1 mm	L1 mm	L mm	ap max. mm	Z	Max. tightening torque N·m			art.no.	€
16	16	100	150	6	2	1	A1	B1	265001 0016	
20	20	100	150	6	3	1	A1	B1	265001 0020	
25	20	25	150	6	4	1	A1	B1	265001 0025	
32	25	30	150	6	5	1	A1	B1	265001 0032	

2124

Spare parts

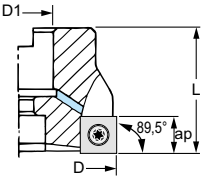
Screw			TORX		
	art.no.	€		art.no.	€
A1	262551 0025		B1	703053 0080	
	3106			7114	

ATORN 89.5° shell-type milling cutter

Z6 Z7 Z8+

Particularly cost-effective thanks to 4 cutting edges

- **For milling inserts SP.T 0603**
- Positive indexable insert basic form
- Four cutting edges per indexable insert
- Also suitable for machines with low drive power
- For excellent surfaces
- Burr-free milling
- **Internal coolant supply**
- Supplied with clamping screw and wrench





D mm	L mm	D1 mm	ap max. mm	Z	Max. tightening torque N·m			art.no.	€
40	40	16	6	6	1.0	A1	B1	265002 0040	
50	40	22	6	7	1.0	A1	B1	265002 0050	
63	40	22	6	8	1.0	A1	B1	265002 0063	

2124

Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	262551 0025		B1	703053 0080	
	3106			7114	

SPMT

F finishing	M medium	R roughing	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
○	○	○	SPMT 060304	●	○	○				HC4635	10	263008 0006	



Medium finishing

2131

ISO	HC4635
ISO P steel	Vc = 110 - 220
ISO M stainless steel	Vc = 70 - 130
ISO K cast iron	Vc = 120 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.05 - 0.2 ap = 0.5 - 5.0

SPGT ALU

F finishing	M medium	R roughing	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
○	●	○	SPGT 060304 ALU				●			HW4415	10	263009 0006	



Universal use

2131

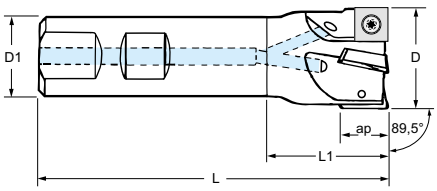
ISO	HW4415
ISO N Al/non-ferrous	Vc = 200 - 700
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.15 ap = 0.5 - 4.0

ATORN 89.5° end milling cutter

Z 2 | Z 3 | Z 4

Particularly cost-effective thanks to 4 cutting edges

- **For milling inserts SP.T 09T3**
- Positive indexable insert basic form
- Four cutting edges per indexable insert
- Also suitable for machines with low drive power
- For excellent surfaces
- Burr-free milling
- **Internal coolant supply**
- Shank according to DIN 1835B
- Supplied with clamping screw and wrench





D mm	D1 mm	L1 mm	L mm	ap max. mm	Z	Max. tightening torque N-m			art.no.	€
25	25	44	100	9	2	2.68	A1	B1	265003 0025	
32	32	50	110	9	3	2.68	A1	B1	265003 0032	
40	32	45	115	9	4	2.68	A1	B1	265003 0040	

2124

Spare parts

	Screw art.no.	€
A1	262551 0035	

3106

	TORX art.no.	€
B1	703053 0150	

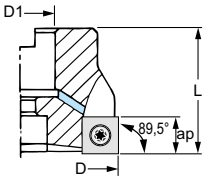
7114

ATORN 89.5° shell-type milling cutter

Z 4 | Z 5 | Z 6 | Z 7 | Z 8+

Particularly cost-effective thanks to 4 cutting edges

- **For milling inserts SP.T 09T3**
- Positive indexable insert basic form
- Four cutting edges per indexable insert
- Also suitable for machines with low drive power
- For excellent surfaces
- Burr-free milling
- **Internal coolant supply**
- Supplied with clamping screw and wrench





D mm	L mm	D1 mm	ap max. mm	Z	Max. tightening torque N-m			art.no.	€
40	40	16	9	4	2.68	A1	B1	265004 0040	
50	40	22	9	5	2.68	A1	B1	265004 0050	
63	40	22	9	6	2.68	A1	B1	265004 0063	
80	50	27	9	7	2.68	A1	B1	265004 0080	
100	50	32	9	8	2.68	A1	B1	265004 0100	

2124

SPMT

F finishing	M medium	R roughing	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
○	○	○	SPMT 09T308	●	○	○				HC4635	10	263008 0009	



Medium finishing

2131

ISO	HC4635
ISO P steel	Vc = 110 - 220
ISO M stainless steel	Vc = 70 - 130
ISO K cast iron	Vc = 120 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.05 - 0.2 ap = 0.5 - 5.0

SPGT ALU

F finishing	M medium	R roughing	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
○	●	○	SPGT 09T308 ALU				●			HW4415	10	263009 0009	



Universal use

2131

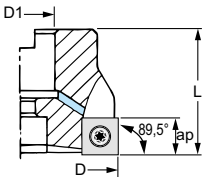
ISO	HW4415
ISO N Al/non-ferrous	Vc = 200 - 700
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.15 ap = 0.5 - 4.0

ATORN 89.5° shell-type milling cutter

Z 5 | Z 6 | Z 8+ | Vc/fz | 808

- **for milling inserts SP.T 1204**
- Positive indexable insert basic form
- Four cutting edges per indexable insert
- Also suitable for machines with low drive power
- For excellent surface quality
- Burr-free milling cutter
- **Internal coolant supply**
- Supplied with clamping screw and wrench

Particularly cost-effective thanks to 4 cutting edges





D mm	L mm	D1 mm	ap max. mm	Z	Max. tightening torque N-m			art.no.	€
50	40	22	12	5	7.93	A1	B1	265005 0050	
63	40	22	12	6	7.93	A1	B1	265005 0063	
80	50	27	12	6	7.93	A1	B1	265005 0080	
100	50	32	12	8	7.93	A1	B1	265005 0100	
125	63	40	12	9	7.93	A1	B1	265005 0125	

2124

Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	262551 0035		B1	703053 0150	
3106			7114		

SPMT

F finishing	M medium	R roughing	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
○	○	○											
 Medium finishing	SPMT 120408	●	○	○				HC4635	10	263008 0012	

2131

ISO	HC4635
ISO P steel	Vc = 110 - 220
ISO M stainless steel	Vc = 70 - 130
ISO K cast iron	Vc = 120 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.05 - 0.2 ap = 0.5 - 5.0

SPGT ALU

F finishing	M medium	R roughing	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
○	●	○											
 Universal use	SPGT 120408 ALU					●				HW4415	10	263009 0012	

2131

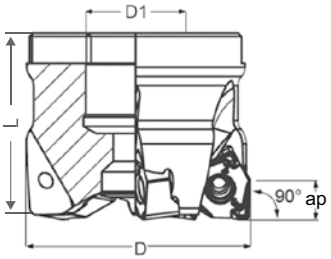
ISO	HW4415
ISO N Al/non-ferrous	Vc = 200 - 700
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.15 ap = 0.5 - 4.0

ATORN 90° corner milling cutter

Z 3 | Z 5 | Z 6 | Z 7 | Z 8+ | 823

6 cutting edges

- **For WNE.. 0806 milling inserts**
- Wear-resistant, nickel-plated design
- Positive indexable insert basic form
- Very low power consumption thanks to special chip shape geometry
- Six cutting edges per indexable insert
- Double-sided indexable insert
- Large insert thickness
- **Internal coolant supply**
- Supplied with clamping screw and wrench





D mm	L mm	D1 mm	Z	ap max. mm	Max. tightening torque N-m			art.no.	€
40	40	22	3	6	3.0	A1	B1	262565 0040	
50	40	22	5	6	3.0	A1	B1	262565 0050	
63	40	22	6	6	3.0	A1	B1	262565 0063	
63	40	22	6	6	3.0	A1	B1	262565 1063	
80	50	27	7	6	3.0	A1	B1	262565 0080	
80	50	27	9	6	3.0	A1	B1	262565 1080	
100	50	32	8	6	3.0	A1	B1	262565 0100	
100	50	32	10	6	3.0	A1	B1	262565 1100	
125	63	40	11	6	3.0	A1	B1	262565 0125	
160	63	40	12	6	3.0	A1	B1	262565 0160	

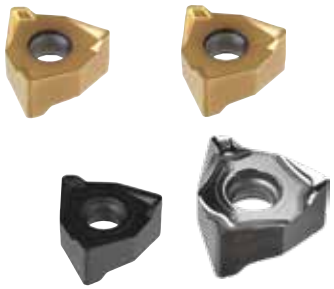
2124

Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	262551 4035		B1	703053 0150	
3106			7114		

ATORN Milling inserts WNE.. 08

Vc/fz | 823

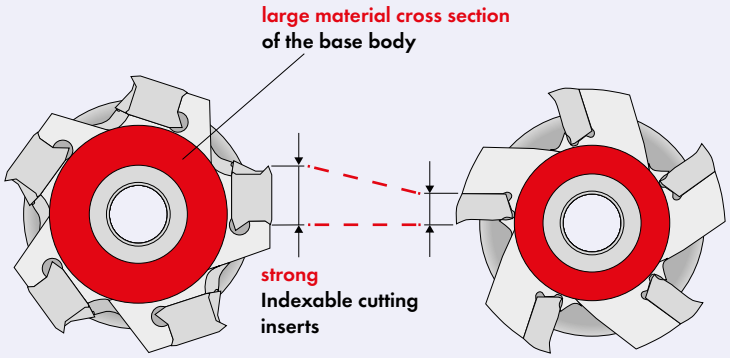


ISO designation	ISO P K Coated HC4620		ISO P M Coated HC4630		ISO P M K Coated HC4430		ISO N Uncoated HW4415	
	art.no.	€	art.no.	€	art.no.	€	art.no.	€
WNEU 080608-ALU							10 295833 0001	
WNEU 080608-M	10 295827 0001		10 295828 0001		10 295829 0001			
	2131		2131		2131		2131	

Tangential Milling Cutters

INFO

- **Process reliability due to tangential installation position**
  The tangential installation position of the indexable cutting inserts provides some special features. The favourable contact surface and clamping force conditions ensure maximum stability. The tools are therefore extremely reliable even at high cutting performance.
- **Efficiency due to good cutting properties**
  The stable indexable cutting inserts have a positive rake angle, resulting in excellent cutting performance and low power consumption of the machine. This significantly increases the service life of the cutting edge. This has a direct and positive effect on tool costs.
- **Cost savings thanks to reduced cycle times**
  The ratio of tool diameter to the number of teeth, combined with high achievable feed rates, facilitates enormous removal rates. This results in significantly shorter cycle times, which considerably reduces the total process costs and cost per part.



palbit Tangential shoulder milling cutter 90° *TGPLUS 90190*

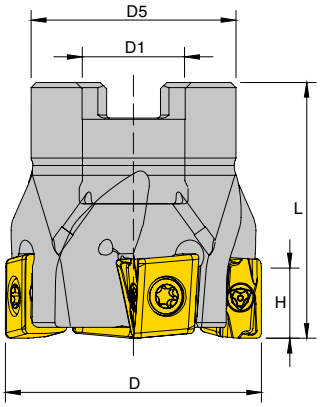
Z 4 | Z 5 | Z 6 | Z 7 | Z 8+ | Vc/fz 821

- **for milling inserts LNXT 1306..**
- maximum stability thanks to tangentially-arranged indexable inserts
- high feed rates for maximum removal rate
- **internal coolant supply**
- from Ø 80 mm special tightening screw for coolant



D mm	D1 mm	L mm	ap max. mm	Z	Max. tightening torque N·m				art.no.	€
40	16	40	11	4	3.0	A1		C1	260247 0040	
40	16	40	11	5	3.0	A1		C1	260247 0041	
50	22	40	11	5	3.0	A1		C1	260247 0050	
50	22	40	11	6	3.0	A1		C1	260247 0051	
63	22	40	11	6	3.0	A1		C1	260247 0063	
63	22	40	11	8	3.0	A1		C1	260247 0064	
80	27	50	11	7	3.0	A1	B1	C1	260247 0080	
80	27	50	11	10	3.0	A1	B1	C1	260247 0081	
100	32	50	11	9	3.0	A1	B2	C1	260247 0100	
100	32	50	11	13	3.0	A1	B2	C1	260247 0101	
125	40	63	11	11	3.0	A1	B3	C1	260247 0125	

2174



Spare parts

	Screw			Cutter retaining screw with through-hole			TORX	
	art.no.	€		art.no.	€		art.no.	€
A1	321099 0017		B1	321099 0043		C1	703053 0150	
			B2	321099 0044				
			B3	321099 0045				
	3160			3160			7114	

palbit Tangential end milling cutter 90° *TGPLUS 90190*

Z 2 | Z 3 | Z 4 | Vc/fz | 821

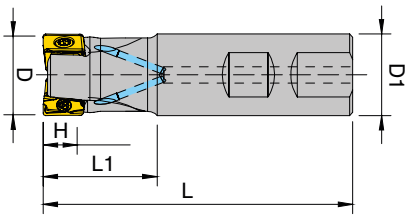


- **for milling inserts LNXT 1306..**
- maximum stability thanks to tangentially-arranged indexable inserts
- high feed rates for maximum removal rate
- **internal coolant supply**

D mm	D1 mm	L mm	L1 mm	ap max. mm	Z	Max. tightening torque N-m			art.no.	€
25	25	95	45	11	2	3.0	A1	B1	260248 0025	
32	32	110	50	11	3	3.0	A2	B1	260248 0032	
40	32	110	50	11	4	3.0	A2	B1	260248 0040	

2174





Spare parts

	Screw	
	art.no.	€
A1	321099 0014	
A2	321099 0017	

3160

	TORX	
	art.no.	€
B1	703053 0150	

7114

Tangential milling inserts LN.. 1306.. *TGPLUS 90190*

F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
•	•	•											
			LNXT 130604 PNER-MP			●				**PH 5320**	10	285295 0126	
				●	●					**PH7740**	10	285295 0148	
				●		●				**PHP920**	10	285295 0191	
			LNXT 130608 PNER-MP			●				**PH5320**	10	285295 0226	
				●	●					**PH7740**	10	285295 0248	
				●						**PHS740**	10	285295 0274	
				●		●				**PHP920**	10	285295 0291	

2170

ISO	PH 5320	PH5320	PH7740	PHP920	PHS740
ISO P steel			Vc = 110 - 170	Vc = 140 - 250	Vc = 110 - 170
ISO M stainless steel			Vc = 70 - 180		
ISO K cast iron	Vc = 100 - 270	Vc = 100 - 270		Vc = 90 - 300	
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.25		fz = 0.1 - 0.2	fz = 0.1 - 0.35	
	ap = 11				

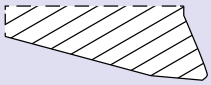
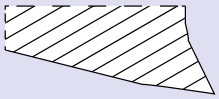
ATORN High-speed milling cutters range

INFO

Exactly 90°

- Shoulder milling at exactly 90° in steel, cast iron, stainless steel and non-ferrous materials
- Extremely smooth running with low power consumption
- Large selection of base bodies and indexable cutting inserts
- Indexable cutting inserts in four sizes with different corner radii
- Extra-long end milling cutters for deep cavities
- Cutting depths of up to 16.5 mm
- High feed rate due to the large number of thread ridges
- Soft cut due to extremely positive geometry and irregular pitch
- All milling cutters have an internal coolant supply and have been surface-treated



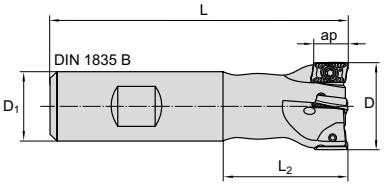
Indexable insert designation	Features	Chip shape levels
ADKX	Universal indexable cutting insert geometry with circumferential protective chamfer for machining steel and cast iron materials as well as stainless steels	 -SR -SR-TR
ADHX	Special ground indexable cutting insert geometry with polished face and sharp cutting edges for machining non-ferrous materials (aluminium, soft copper alloys and plastics)	 -FR-ALC

ATORN 90° end milling cutter



820

- **For milling inserts, type AD..X 09..**
- Easy cutting action due to the positive cutting edge geometry
- Tools deliver smooth milling performance due to irregular pitch
- Precise 90° shoulder milling
- **Internal coolant supply**
- Shank according to DIN 1835B
- Precision-sintered milling inserts (ADKX)
- Precision-ground milling inserts (ADHX) for maximum accuracy





D mm	D1 mm	ap max. mm	L2 mm	L mm	Z	Max. tightening torque N·m	A1	B1	art.no.	€
16	16	8.5	28	76	2	1.2	A1	B1	264004 0016	
20	20	8.5	36	86	3	1.2	A1	B1	264004 0020	
20	20	8.5	36	86	4	1.2	A1	B1	264004 0021	
25	20	8.5	36	86	4	1.2	A1	B1	264004 0025	
25	20	8.5	36	86	5	1.2	A1	B1	264004 0026	
32	25	8.5	40	86	6	1.2	A1	B1	264004 0032	

2127

Spare parts

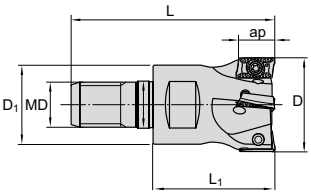
	Screw			TORX	
	art.no.	€		art.no.	€
A1	264000 9902		B1	703053 0080	
	3106			7114	

ATORN 90° screw-in milling cutter

Z 3 | Z 4 | Z 6 | 820



- **For milling inserts, type AD..X 09..**
- Easy cutting action due to the positive cutting edge geometry
- Tools deliver smooth milling performance due to irregular pitch
- Precise 90° shoulder milling
- **Internal coolant supply**
- Precision-sintered milling inserts (ADKX)
- Precision-ground milling inserts (ADHX) for maximum accuracy



D mm	D1 mm	L mm	MD	Z	ap max. mm	Max. tightening torque N-m			art.no.	€
20	18	49	M10	3	8.5	1.2	A1	B1	264003 0020	
25	21	55	M12	4	8.5	1.2	A1	B1	264003 0025	
32	29	67	M16	6	8.5	1.2	A1	B1	264003 0032	
									2127	

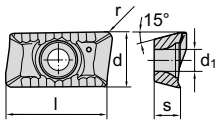
Spare parts

	Screw art.no.	€		TORX art.no.	€
A1	264000 9902		B1	703053 0080	
	3106			7114	

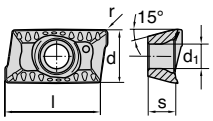
ATORN AD..X 09.. milling inserts

ADHX FR

ISO designation	l mm	D1 mm	s mm	d1 mm	R mm	ISO P K N	HC4410 art.no.	€	ISO N	HW4410 art.no.	€
ADHX 090308 FR-ALC	9.52	5.56	3.18	2.8	0.8	10	282003 1006		10	282003 1007	
ADHX 090312 FR-ALC	9.52	5.56	3.18	2.8	1.2	10	282003 2006		10	282003 2007	
							2131			2131	









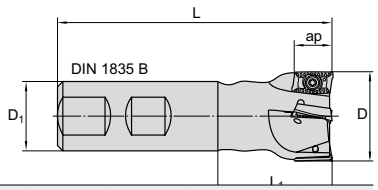
ADKX SR-TR

ISO designation	l mm	d mm	s mm	d1 mm	R mm	ISO P M	HC4640 art.no.	€	ISO M	HC4540 dry milling art.no.	€	ISO M	HC4544 wet milling art.no.	€	ISO P K N	HC4410 art.no.	€
ADKX 090304 SR-TR	9.52	5.56	3.18	2.8	0.4	10	282004 1001								10	282004 1006	
ADKX 090308 SR-TR	9.52	5.56	3.18	2.8	0.8	10	282004 2001		10	282004 2003		10	282004 2004		10	282004 2006	
ADKX 090312 SR-TR	9.52	5.56	3.18	2.8	1.2	10	282004 3001		10	282004 3003		10	282004 3004		10	282004 3006	
ADKX 090316 SR-TR	9.52	5.56	3.18	2.8	1.6	10	282004 4001		10	282004 4003		10	282004 4004		10	282004 4006	
							2131			2131			2131			2131	

ATORN 90° end milling cutter

Z2 Z3 Z4 Z5 Z6 820

- **For milling inserts, type AD..X 12..**
- Easy cutting action due to the positive cutting edge geometry
- Tools deliver smooth milling performance due to irregular pitch
- Precise 90° shoulder milling
- **Internal coolant supply**
- Shank according to DIN 1835B
- Precision-sintered milling inserts (ADKX)
- Precision-ground milling inserts (ADHX) for maximum





D mm	D1 mm	L1 mm	L mm	Z	ap max. mm	Max. tightening torque N·m			art.no.	€
20	20	36	86	2	11.5	2.25	A1	B1	264007 0020	
25	20	36	86	3	11.5	2.25	A1	B1	264007 0025	
32	25	40	96	4	11.5	2.25	A1	B1	264007 0032	
32	25	40	96	5	11.5	2.25	A1	B1	264007 0033	
40	32	50	110	6	11.5	2.25	A1	B1	264007 0040	

2127

Spare parts

	Screw art.no.	€
A1	264000 9903	

3106

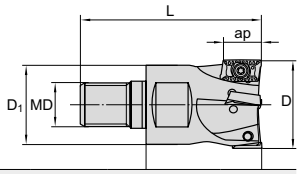
	TORX art.no.	€
B1	703053 0080	

7114

ATORN 90° screw-in milling cutter

Z4 Z6 820

- **For milling inserts, type AD..X 12..**
- Easy cutting action due to the positive cutting edge geometry
- Tools deliver smooth milling performance due to irregular pitch
- Precise 90° shoulder milling
- **Internal coolant supply**
- Precision-sintered milling inserts (ADKX)
- Precision-ground milling inserts (ADHX) for maximum accuracy





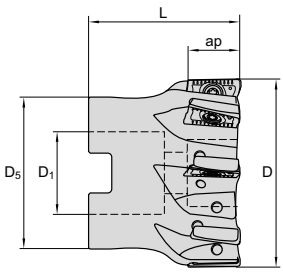
D mm	D1 mm	L mm	MD	Z	ap max. mm	Max. tightening torque N·m			art.no.	€
32	29	67	M16	4	11.5	2.25	A1	B1	264006 0032	
40	29	67	M16	6	11.5	2.25	A1	B1	264006 0040	

2127

ATORN 90° shoulder milling cutter

Z4 Z5 Z6 Z7 Z8+      i Vc/fz 820

- **For milling inserts, type AD..X 12..**
- Easy cutting action due to the positive cutting edge geometry
- Tools deliver smooth milling performance due to irregular pitch
- Precise 90° shoulder milling
- **Internal coolant supply**
- Precision-sintered milling inserts (ADKX)
- Precision-ground milling inserts (ADHX) for maximum accuracy





D mm	L mm	D5 mm	D1 mm	Z	ap max. mm	Max. tightening torque N·m			art.no.	€
40	40	32	16	4	11.5	2.25	A1	B1	264009 0040	
40	40	32	16	6	11.5	2.25	A1	B1	264009 0041	
50	40	40	22	5	11.5	2.25	A1	B1	264009 0050	
50	40	40	22	7	11.5	2.25	A1	B1	264009 0051	
63	40	50	22	6	11.5	2.25	A1	B1	264009 0063	
63	40	50	22	9	11.5	2.25	A1	B1	264009 0064	
									2127	

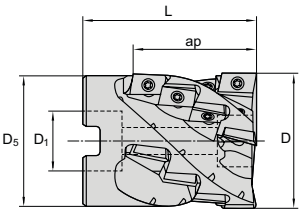
Spare parts

	Screw art.no.	€		TORX art.no.	€
A1	264000 9903		B1	703053 0080	
	3106			7114	

ATORN 90° roughing spiral flute milling cutter

Z3 Z4 Z5    i Vc/fz 818

- **For milling inserts, type AD..X 12..**
- Just one insert type for both face and side cutting edges
- Easy cutting action due to the positive cutting edge geometry
- Tools deliver smooth milling performance due to irregular pitch
- Precise 90° shoulder milling
- **Internal coolant supply**
- Precision-sintered milling inserts (ADKX)
- Precision-ground milling inserts (ADHX) for maximum accuracy





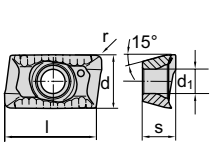
D mm	L mm	D5 mm	D1 mm	Z	ap max. mm	Number of index. inserts pc.	Max. tightening torque N·m			art.no.	€
40	55	38	16	3	34	9	2.25	A1	B1	264010 0040	
50	65	48	22	4	45	16	2.25	A1	B1	264010 0050	
63	70	58	27	5	45	20	2.25	A1	B1	264010 0063	
										2127	

Spare parts

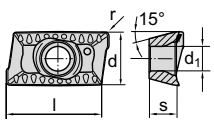
	Screw art.no.	€		TORX art.no.	€
A1	264000 9903		B1	703053 0080	
	3106			7114	

ATORN AD..X 12.. milling inserts

ISO designation	l mm	d mm	s mm	d1 mm	R mm		ISO PKN HC4410 art.no.	€		ISO N HW4410 art.no.	€
ADHX 120408 FR-ALC	12.7	7.4	4.76	3.4	0.8	10	282005 1006		10	282005 1007	
ADHX 120412 FR-ALC	12.7	7.4	4.76	3.4	1.2	10	282005 2006		10	282005 2007	
ADHX 120416 FR-ALC	12.7	7.4	4.76	3.4	1.6	10	282005 3006		10	282005 3007	
							2131			2131	







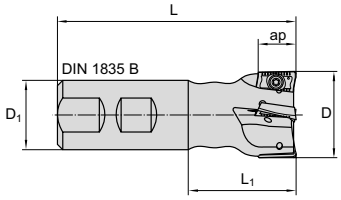


ISO designation	l mm	d mm	s mm	d1 mm	R mm		ISO PMS HC4640 art.no.	€		ISO PM HC4540 dry milling art.no.	€		ISO PM HC4544 wet milling art.no.	€		ISO PKN HC4410 art.no.	€
ADKX 120408 SR-TR	12.7	7.4	4.76	3.4	0.8	10	282006 1001		10	282006 1003		10	282006 1004		10	282006 1006	
ADKX 120412 SR-TR	12.7	7.4	4.76	3.4	1.2	10	282006 2001		10	282006 2003		10	282006 2004		10	282006 2006	
ADKX 120416 SR-TR	12.7	7.4	4.76	3.4	1.6	10	282006 3001		10	282006 3003		10	282006 3004		10	282006 3006	
ADKX 120420 SR-TR	12.7	7.4	4.76	3.4	2	10	282006 4001								10	282006 4006	
							2131			2131			2131			2131	

ATORN 90° end milling cutter

Z 2 | Z 3 | Z 4 | Vc/fz | 820

- **For milling inserts, type AD..X 17..**
- Easy cutting action due to the positive cutting edge geometry
- Tools deliver smooth milling performance due to irregular pitch
- Precise 90° shoulder milling
- **Internal coolant supply**
- Shank according to DIN 1835B
- Precision-sintered milling inserts (ADKX)
- Precision-ground milling inserts (ADHX) for maximum accuracy





D mm	D1 mm	ap max. mm	L1 mm	L mm	Z	Max. tightening torque N-m			art.no.	€
25	25	16.5	40	96	2	3.5	A1	B1	264011 0025	
32	32	16.5	40	110	3	3.5	A2	B1	264011 0032	
40	32	16.5	50	110	4	3.5	A2	B1	264011 0040	
									2127	

Spare parts

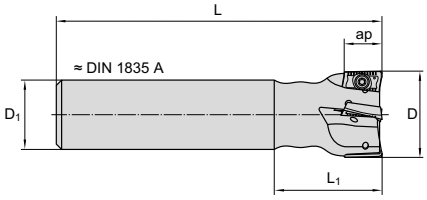
	Screw art.no.	€		TORX art.no.	€
A1	264000 9904		B1	703053 0150	
A2	264000 9905				
	3106			7114	

ATORN 90° end milling cutter, long

Z 2 | Z 3 | Z 4 | Vc/fz | 818

- **For milling inserts, type AD..X 17..**
- Easy cutting action due to the positive cutting edge geometry
- Tools deliver smooth milling performance due to irregular pitch
- Precise 90° shoulder milling
- **Internal coolant supply**
- Shank in accordance with DIN 1835 A
- Precision-sintered milling inserts (ADKX)
- Precision-ground milling inserts (ADHX) for maximum accuracy





D mm	D1 mm	ap max. mm	L1 mm	L mm	Z	Max. tightening torque N-m			art.no.	€
25	25	16.5	40	200	2	3.5	A1	B1	264012 0025	
32	32	16.5	50	250	3	3.5	A2	B1	264012 0032	
40	32	16.5	50	250	4	3.5	A2	B1	264012 0040	
									2127	

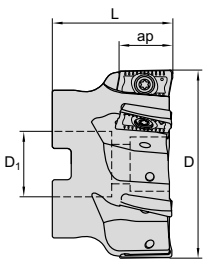
Spare parts

	Screw art.no.	€		TORX art.no.	€
A1	264000 9904		B1	703053 0150	
A2	264000 9905				
	3106			7114	

ATORN 90° shoulder milling cutter

Z 4 | Z 5 | Z 6 | Z 8+ | Vc/fz | 818

- **For milling inserts, type AD..X 17..**
- Easy cutting action due to the positive cutting edge geometry
- Tools deliver smooth milling performance due to irregular pitch
- Precise 90° shoulder milling
- **Internal coolant supply**
- Precision-sintered milling inserts (ADKX)
- Precision-ground milling inserts (ADHX) for maximum accuracy





D mm	L mm	D1 mm	Z	ap max. mm	Max. tightening torque N-m			art.no.	€
40	36	16	4	16.5	3.5	A1	B1	264014 0040	
50	40	22	5	16.5	3.5	A1	B1	264014 0050	
63	40	22	6	16.5	3.5	A1	B1	264014 0063	
80	50	27	8	16.5	3.5	A1	B1	264014 0080	
100	50	32	9	16.5	3.5	A1	B1	264014 0100	
125	63	40	9	16.5	3.5	A1	B1	264014 0125	
125	63	40	11	16.5	3.5	A1	B1	264014 0126	
								2127	

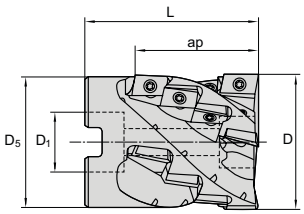
Spare parts

	Screw art.no.	€		TORX art.no.	€
A1	264000 9905		B1	703053 0150	
	3106			7114	

ATORN 90° roughing spiral flute milling cutter

Z 4 | Z 5 | 820

- **For milling inserts, type AD..X 17..**
- Just one insert type for both face and side cutting edges
- Easy cutting action due to the positive cutting edge geometry
- Tools deliver smooth milling performance due to irregular pitch
- Precise 90° shoulder milling
- **Internal coolant supply**
- Precision-sintered milling inserts (ADKX)
- Precision-ground milling inserts (ADHX) for maximum accuracy





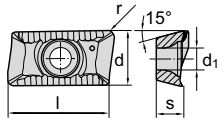
D mm	D5 mm	L mm	D1 mm	ap max. mm	Z	Number of index. inserts pc.	Max. tightening torque N-m			art.no.	€
63	58	70	27	48	4	12	3.5	A1	B1	264013 0063	
80	63	85	32	63	5	20	3.5	A1	B1	264013 0080	
										2127	

Spare parts

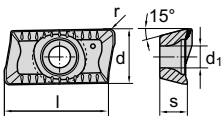
Screw			TORX		
	art.no.	€		art.no.	€
A1	285000 9903		B1	703053 0150	
	3106			7114	

ATORN AD..X 17.. milling inserts

ISO designation	l mm	d mm	s mm	d1 mm	R mm		ISO P K N HC4410 art.no.	€		ISO N HW4410 art.no.	€
ADHX 170508 FR-ALC	17.5	9.62	5.6	3.8	0.8	10	282007 1006		10	282007 1007	
ADHX 170512 FR-ALC	17.5	9.62	5.6	3.8	1.2	10	282007 2006		10	282007 2007	
ADHX 170516 FR-ALC	17.5	9.62	5.6	3.8	1.6	10	282007 3006		10	282007 3007	
							2131			2131	









ISO designation	l mm	d mm	s mm	d1 mm	R mm		ISO P M S HC4640 art.no.	€		ISO P K HC4430 art.no.	€		ISO P M HC4540 dry milling art.no.	€		ISO P M HC4544 wet milling art.no.	€		ISO P K N HC4410 art.no.	€
ADKX 170508 SR-TR	17.5	9.62	5.6	3.8	0.8	10	282008 1001		10	282008 1002								10	282008 1006	
ADKX 170512 SR-TR	17.5	9.62	5.6	3.8	1.2	10	282008 2001		10	282008 2002		10	282008 2003		10	282008 2004		10	282008 2006	
ADKX 170516 SR-TR	17.5	9.62	5.6	3.8	1.6	10	282008 3001		10	282008 3002		10	282008 3003		10	282008 3004		10	282008 3006	
ADKX 170520 SR-TR	17.5	9.62	5.6	3.8	2	10	282008 4001		10	282008 4002		10	282008 4003		10	282008 4004		10	282008 4006	
							2131			2131			2131			2131			2131	

High feed-rate milling cutters are not only able to achieve longer service lives and greater removal rates, but also minimise production costs and processing times. It differs from high-speed machining, which is used primarily for finish machining with outstanding surface qualities, in the sense that high feed-rate milling predominantly offers short machining times for roughing. Special high feed-rate geometries were developed for this, which generally possess large radii. Thus the axial feed ap is limited somewhat.

Depending on the reduced setting angle K (Kappa), the radial cutting force "F_r" on the milling cutter and on the machine spindle is significantly reduced, allowing very high tooth feeds to be achieved without issue (Image 1). Tooth feed rates of up to f_z = 5 mm are already used for machining steel. However should the axial force F_a increase in high feed-rate milling, this is not disruptive as it is absorbed directly by the tool and the machine spindle and in no way causes significant deformation or damage.

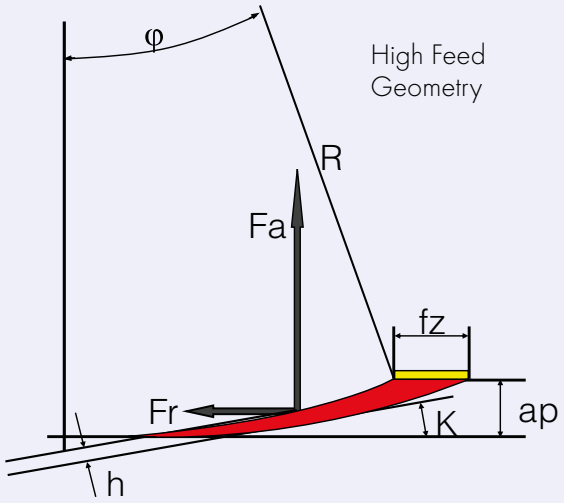


Image 1

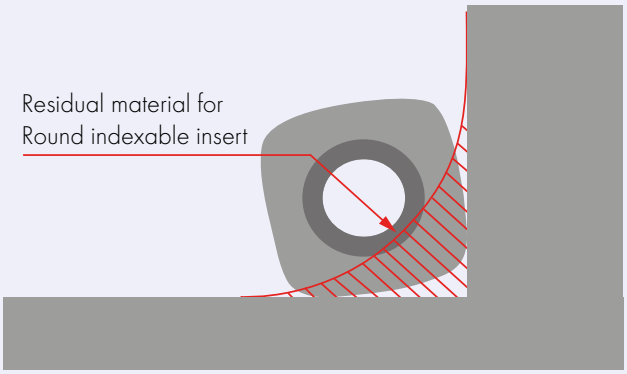


Image 2

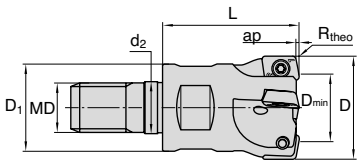
The special indexable insert geometry for high feed-rate milling helps to minimise the residual material during roughing tasks and thus improves the prerequisites for the subsequent finish machining. Image 2 illustrates the reduced residual material compared to machining with round indexable inserts.

ATORN High feed-rate screw-in milling cutter XDM.

Z 2 | Z 3 | Z 4 | Z 5 | Z 6 | Vc/fz | 809



- **For milling inserts XDM.. 09**
- 2-edged, small, extremely robust indexable insert
- Positive geometry for easy cutting
- **High material removal rate, even with less powerful machining centres**
- Long service life thanks to nickel-plated design
- **High feed rates achievable**
- Uniform size of indexable cutting inserts



D mm	D1 mm	D min. mm	d2 mm	L mm	MD	Z	Max. tightening torque N-m	ap max. mm	Radius, theoretical mm			art.no.	€
16	13	7	8.5	28	M8	2	1.2	1	1.3	A1	B1	286001 2016	
16	13	7	8.5	28	M8	3	1.2	1	1.3	A1	B1	286001 3016	
20	18	11	10.5	30	M10	3	1.2	1	1.3	A2	B1	286001 3020	
20	18	11	10.5	30	M10	4	1.2	1	1.3	A2	B1	286001 4020	
25	21	16	12.5	33	M12	4	1.2	1	1.3	A2	B1	286001 4025	
32	29	23	17	43	M16	5	1.2	1	1.3	A2	B1	286001 5032	
35	29	26	17	43	M16	5	1.2	1	1.3	A2	B1	286001 5035	
42	29	33	17	43	M16	6	1.2	1	1.3	A2	B1	286001 6042	

2125

Spare parts

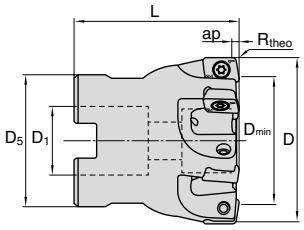
Screw			TORX		
	art.no.	€		art.no.	€
A1	286900 9901		B1	703053 0080	
A2	286900 9902				
	3106			7114	

ATORN High feed-rate shell-type milling cutter XDM.

Z 5 | Z 6 | Z 7 | Z 8+ | Vc/fz | 809



- **For milling inserts XDM.. 09**
- 2-edged, small, extremely robust indexable insert
- Positive geometry for easy cutting
- **High material removal rate, even with less powerful machining centres**
- Long service life thanks to nickel-plated design
- **High feed rates achievable**
- Uniform size of indexable cutting inserts



D mm	L mm	D5 mm	Bore hole Ø mm	ap max. mm	D min. mm	Z	Max. tightening torque N-m	Radius, theoretical mm			art.no.	€
35	40	32	16	1	26	5	1.2	1.3	A1	B1	286002 5035	
35	40	32	16	1	26	6	1.2	1.3	A1	B1	286002 6035	
40	40	32	16	1	31	6	1.2	1.3	A1	B1	286002 6040	
42	40	32	16	1	33	6	1.2	1.3	A1	B1	286002 6042	
50	40	40	22	1	41	7	1.2	1.3	A1	B1	286002 7050	
52	40	40	22	1	43	7	1.2	1.3	A1	B1	286002 7052	
63	50	50	27	1	54	8	1.2	1.3	A1	B1	286002 8063	
66	50	50	27	1	57	8	1.2	1.3	A1	B1	286002 8066	
80	50	50	27	1	71	9	1.2	1.3	A1	B1	286002 9080	

2125

Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	286900 9902		B1	703053 0080	
	3106			7114	

ATORN High feed milling cutter XDM

INFO

The ATORN high feed-rate milling cutter is used for rough machining small and medium-sized components. The positive high feed-rate geometry of the small, uniform indexable inserts delivers the maximum material removal rate even with lower performance machining centres.

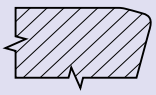
Two different insert geometries with two different types of cutting materials ensure that nearly all standard materials in tool and mould construction can be processed.

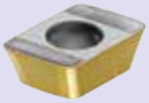
The mini system is available as a screw-fit milling cutter in diameters from 16 - 42 mm with 2 - 6 cutting edges and as a shell-type milling cutter in diameters from 40 - 80 mm with up to 9 cutting edges. All cutting edges have an internal coolant supply. Only one indexable insert size is required for all tool diameters.



XDMW SR

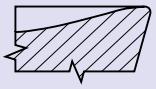
- Stable indexable cutting insert geometry for cutting high-strength tempered and tool steels
- Negative protective chamfer with cutting edge rounding





XDMT ER

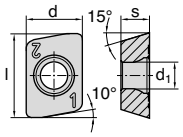
- Soft-cutting indexable cutting insert geometry for reduced cutting forces
- Use in unstable setups
- Particularly suitable for tool machines with low drive output



ATORN Milling inserts XDM.. 0903

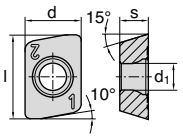
- **HC4640**
  Ideal for high feed rates, tough carbide substrate with double PVD coating and outstanding suitability for roughing, with additional TiN layer around circumference for improved wear detection
- **HC4410**
  Wear-resistant superfine grain substrate for high machining capacity, universally suitable for high cutting speeds in steel at reduced feed rates
- **HC4544**
  Special superfine grain substrate for high machining capacity with stainless steel materials

ISO designation	l mm	d mm	s mm	d1 mm	Radius, theoretical mm	ISO P K H HC4410			ISO P M HC4640		
							art.no.	€		art.no.	€
XDMW 0903 SR	9	6	3	2.8	1.5	10	286100 0110		10	286100 0140	
							2126			2126	



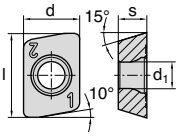


ISO designation	l mm	d mm	s mm	d1 mm	Radius, theoretical mm	ISO P K H HC4410			ISO P M HC4640		
							art.no.	€		art.no.	€
XDMT 0903 ER	9	6	3	2.8	1.5	10	286101 0110		10	286101 0140	
							2126			2126	



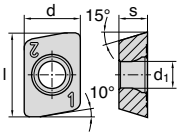


ISO designation	l mm	d mm	s mm	d1 mm	Radius, theoretical mm	ISO P M S HC4544		
							art.no.	€
XDMW 0903 SR	9	6	3	2.8	2	10	286102 0144	
							2126	



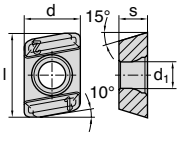


ISO designation	l mm	d mm	s mm	d1 mm	Radius, theoretical mm	ISO K H HC4415		
							art.no.	€
XDMW 0903 SR	9	6	3	2.8	2	10	286103 0115	
							2126	



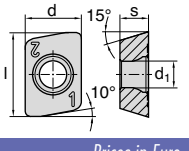


ISO designation	l mm	d mm	s mm	d1 mm	Radius, theoretical mm	ISO P M HC4640		
							art.no.	€
XDMW 0903 SR	9	6	3	2.8	2	10	286104 0140	
							2126	





ISO designation	l mm	d mm	s mm	d1 mm	Radius, theoretical mm	ISO M P HC4640		
							art.no.	€
XDMT 0903 ER	9	6	3	2.8	2.0	10	286105 0140	
							2126	

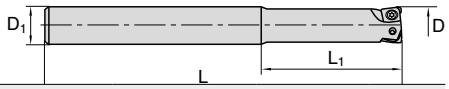




High feed-rate end milling cutter *HIFEED 06410*

Z 2 | Z 3 | Z 4 | Vc/fz | 811

- **For milling inserts SO.. 0803**
- 4-edged, extremely robust indexable insert
- **Wide range of applications**





D mm	D1 mm	L mm	L1 mm	Z	Max. tightening torque N-m	Indexable insert type	art.no.	€
20	20	130	75	2	1.4	SO..0803..	260218 0020	
20	20	190	110	2	1.4	SO..0803..	260218 1020	
25	25	140	80	3	1.4	SO..0803..	260218 0025	
25	25	200	130	3	1.4	SO..0803..	260218 1025	
32	32	150	90	4	1.4	SO..0803..	260218 0032	
32	32	200	130	4	1.4	SO..0803..	260218 1032	

2174

Spare parts

	Screw art.no.	€
A1	321099 0007	

3160

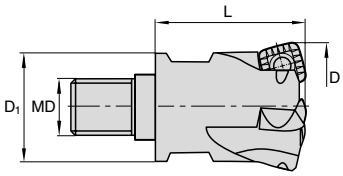
	TORX art.no.	€
B1	703053 0090	

7114

High feed-rate screw-in milling cutter *HIFEED 06410*

Z 2 | Z 3 | Z 4 | Z 5 | Vc/fz | 811

- **For milling inserts SO.. 0803**
- 4-edged, extremely robust indexable insert
- **Wide range of applications**





D mm	D1 mm	L mm	Z	MD	Indexable insert type	Max. tightening torque N-m			art.no.	€
20	16	25	2	M10	SO..0803..	1.4	A1	B1	260219 0020	
25	21	28	3	M12	SO..0803..	1.4	A1	B1	260219 0025	
32	29	35	4	M16	SO..0803..	1.4	A1	B1	260219 0032	
35	29	35	4	M16	SO..0803..	1.4	A1	B1	260219 0035	
42	29	35	5	M16	SO..0803..	1.4	A1	B1	260219 0042	

2174

Spare parts

	Screw art.no.	€
A1	321099 0007	

3160

	TORX art.no.	€
B1	703053 0090	

7114

Milling inserts SO..0803.... *HIFEED 06410*

SOET 080315

F finishing	M medium	R roughing
●	●	-



ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
SOET 080315-MS	●	●			●		PH7740	10	285242 0148	
		●			●		PHH930	10	285242 0193	

2170

ISO	PH7740	PHH930
ISO P steel	Vc = 80 - 180	
ISO M stainless steel	Vc = 70 - 180	Vc = 100 - 210
ISO S superalloys	Vc = 25 - 60	Vc = 30 - 110
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.40 - 1.8	fz = 0.10 - 1.3
	ap = 0.05 - 1.0	

SOEW 080310

F finishing	M medium	R roughing
-	●	●



ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
SOEW 080310 S	●		●				PHP910	10	285241 0192	
	●		●				PHP920	10	285241 0191	

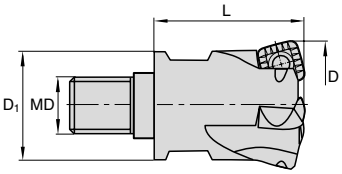
2170

ISO	PHP910	PHP920
ISO P steel	Vc = 140 - 250	Vc = 140 - 250
ISO K cast iron	Vc = 150 - 300	Vc = 120 - 270
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.30 - 1.80	
	ap = 0.05 - 1.0	

palbit High feed-rate screw-in milling cutter *HIFEED 06690*

Z 3 | Z 4 | 812

- **For milling inserts SO.. 13M**
- 4-edged, extremely robust indexable insert
- **Wide range of applications**





D mm	D1 mm	L mm	Z	MD	Max. tightening torque N-m	Indexable insert type			art.no.	€
32	29	35	3	M16	3.0	SO..13M..	A1	B1	260220 0032	
35	29	35	3	M16	3.0	SO..13M..	A1	B1	260220 0035	
42	29	35	4	M16	3.0	SO..13M..	A1	B1	260220 0042	

2174

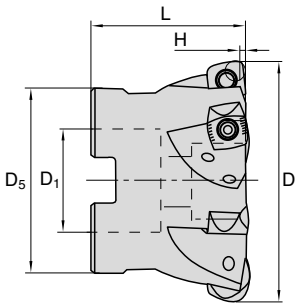
Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	321099 0017		B1	703053 0150	
3160			7114		

palbit High feed-rate shoulder milling cutter *HIFEED 06690*

Z 4 | Z 5 | Z 6 | Z 8+ | 812

- **For milling inserts SO.. 13M**
- 4-edged, extremely robust indexable insert
- **Wide range of applications**





D mm	D1 mm	L mm	Z	ap max. mm	Max. tightening torque N-m	Indexable insert type			art.no.	€
50	22	45	4	1.5	3.0	SO..13M5..	A1	B1	260221 0050	
52	22	45	4	1.5	3.0	SO..13M5..	A1	B1	260221 0052	
63	27	50	5	1.5	3.0	SO..13M5..	A1	B1	260221 0063	
66	27	50	5	1.5	3.0	SO..13M5..	A1	B1	260221 0066	
80	27	50	6	1.5	3.0	SO..13M5..	A1	B1	260221 0080	
100	32	50	8	1.5	3.0	SO..13M5..	A1	B1	260221 0100	

2174

Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	321099 0017		B1	703053 0150	
3160			7114		

Milling inserts SO..13M5.... *HIFEED 06690*

SOET 13M520

F finishing	M medium	R roughing
●	○	-



palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
SOET 13M520-MS	●	●			●		PH7740	10	285245 0148	
		●			●		PHH930	10	285245 0193	

2170

ISO	PH7740	PHH930
ISO P steel	Vc = 80 - 180	
ISO M stainless steel	Vc = 70 - 180	Vc = 90 - 190
ISO S superalloys	Vc = 25 - 60	Vc = 40 - 80
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.4 - 2.0 ap = 0.05 - 1.5	

SOEW 13M510

F finishing	M medium	R roughing
-	○	●



palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
SOEW 13M510 S	●						PH7740	10	285244 0148	
	●		●				PHP910	10	285244 0192	
	●		●				PHP920	10	285244 0191	

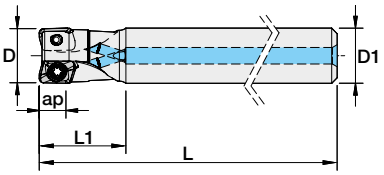
2170

ISO	PH7740	PHP910	PHP920
ISO P steel	Vc = 80 - 180	Vc = 140 - 250	Vc = 140 - 250
ISO K cast iron		Vc = 150 - 300	Vc = 120 - 270
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.5 - 2.2 ap = 0.05 - 1.5		

palbit End milling cutter 90° *LINEPRO 20090*

Z 2 | Z 3 | Z 4 | Vc/fz | 814

- **For milling inserts XP.. 0602**
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**





D mm	D1 mm	L1 mm	L mm	Z	Indexable insert type	Max. tightening torque N·m	A1	B1	art.no.	€
10	10	16	55	2	XP..0602..	0.3	A1	B1	260239 0010	
10	10	25	100	2	XP..0602..	0.3	A1	B1	260239 1010	
12	12	17	80	2	XP..0602..	0.3	A1	B1	260239 0012	
12	12	30	120	3	XP..0602..	0.3	A1	B1	260239 0013	
16	16	20	90	3	XP..0602..	0.3	A1	B1	260239 0016	
16	16	20	90	4	XP..0602..	0.3	A1	B1	260239 1016	
17	16	35	90	3	XP..0602..	0.3	A1	B1	260239 0017	
21	20	35	90	4	XP..0602..	0.3	A1	B1	260239 0021	
									2174	

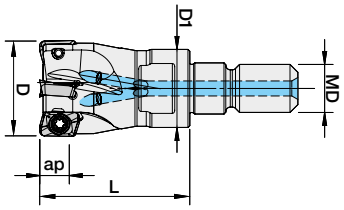
Spare parts

	Screw			TORX	
	art.no.	€		art.no.	€
A1	321099 0001		B1	703053 0060	
	3160			7114	

palbit Screw-in milling cutter 90° *LINEPRO 20090*

Z 2 | Z 3 | Z 4 | Z 5 | Z 7 | Z 8+ | Vc/fz | 814

- **For milling inserts XP.. 0602**
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**





D mm	D1 mm	L mm	MD	Z	Indexable insert type	Max. tightening torque N·m	A1	B1	art.no.	€
10	9.8	20	M6	2	XP..0602..	0.3	A1	B1	260240 0010	
11	9.8	20	M6	2	XP..0602..	0.3	A1	B1	260240 0011	
12	9.8	20	M6	3	XP..0602..	0.3	A1	B1	260240 0012	
16	13.0	25	M8	4	XP..0602..	0.3	A1	B1	260240 0016	
17	13.0	25	M8	4	XP..0602..	0.3	A1	B1	260240 0017	
20	18.0	30	M10	5	XP..0602..	0.3	A1	B1	260240 0020	
25	21.0	30	M12	7	XP..0602..	0.3	A1	B1	260240 0025	
32	29.0	35	M16	8	XP..0602..	0.3	A1	B1	260240 0032	
									2174	

Spare parts

	Screw			TORX	
	art.no.	€		art.no.	€
A1	321099 0002		B1	703053 0060	
	3160			7114	

Premium partner

PALBIT is represented on five continents with an extensive sales network and serves a large number of customers in over 60 countries with state-of-the-art tool technology for a wide range of applications. Since 1 January 2019, the PALBIT brand has been exclusively distributed in Germany by SARTORIUS.

palbit® CUTTING TOOLS SOLUTIONS

Milling inserts XP.. 0602.. *LINEPRO 20090*

Improved successor qualities

XPET-LP shoulder milling insert

F finishing	M medium	R roughing	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
-	-	-	XPET 060204 PDER-LP	●		●				PHP 920	10	285276 0191	
				●		●				PHP 930	10	285276 0190	
					●			●		PHH 930	10	285276 0193	
			XPET 060208 PDER-LP	●		●				PHP 920	10	285276 0291	
				●		●				PHP 930	10	285276 0290	
					●			●		PHH 930	10	285276 0293	
			XPET 060216 PDER-LP	●		●				PHP 920	10	285276 0491	
				●		●				PHP 930	10	285276 0490	

2170

ISO	PHH 930	PHP 920	PHP 930
ISO P steel		Vc = 140 - 250	Vc = 120 - 230
ISO M stainless steel	Vc = 100 - 210		
ISO K cast iron		Vc = 120 - 270	Vc = 100 - 250
ISO S superalloys	Vc = 30 - 110		
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.05 - 0.07 ap = 1.0 - 4.0		

XPET-MH finishing insert

F finishing	M medium	R roughing	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
○	○	●	XPHW 060208 ZER-MH	●					●	PHH 603	10	285276 1576	
				●					●	PHH 910	10	285276 1595	

2170

ISO	PHH 603	PHH 910
ISO P steel	Vc = 180 - 310	Vc = 140 - 270
ISO H hard	Vc = 70 - 270	Vc = 70 - 260
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.03 - 0.10 ap = 1.0 - 4.0	

XPET-HF high feed-rate insert

F finishing	M medium	R roughing	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
-	○	●	XPET 060210 ZER-HF	●		●				PHP 930	10	285276 0390	
				●		●				PHP 920	10	285276 0391	
					●			●		PHH 930	10	285276 0393	

2170

ISO	PHH 930	PHP 920	PHP 930
ISO P steel		Vc = 140 - 250	Vc = 120 - 230
ISO M stainless steel	Vc = 100 - 210		
ISO K cast iron		Vc = 120 - 270	Vc = 100 - 250
ISO S superalloys	Vc = 30 - 110		
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.40 - 0.80 ap = max. 0.3		

XPET-LN aluminium insert

F finishing	M medium	R roughing	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
●	●	○	XPET 060202 PDFR-LN				●			PH 0910	10	285276 1320	
			XPET 060204 PDFR-LN				●			PH 0910	10	285276 1420	

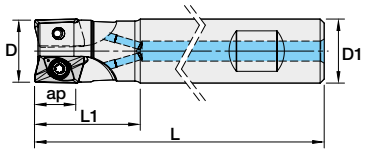
2171

ISO	PH 0910
ISO N Al/non-ferrous	Vc = 350 - 1400
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.05 - 0.07 ap = 1.0 - 4.0

palbit End milling cutter 90° *LINEPRO 20190*

Z 2 | Z 3 | Z 4 | Vc/fz | 815

- **For milling inserts XP..1003**
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**





D mm	D1 mm	L1 mm	L mm	Z	Indexable insert type	Max. tightening torque N·m			art.no.	€
16	16	32	85	2	XP..1003..	1.2	A1	B1	260241 0016	
16	16	70	150	2	XP..1003..	1.2	A1	B1	260241 1016	
17	16	36	150	2	XP..1003..	1.2	A1	B1	260241 0017	
20	20	28	90	3	XP..1003..	1.2	A1	B1	260241 0020	
20	20	70	150	3	XP..1003..	1.2	A1	B1	260241 1020	
22	20	70	150	3	XP..1003..	1.2	A1	B1	260241 0022	
25	25	30	95	4	XP..1003..	1.2	A1	B1	260241 0025	
25	25	80	150	4	XP..1003..	1.2	A1	B1	260241 1025	
27	25	80	150	4	XP..1003..	1.2	A1	B1	260241 0027	
									2174	

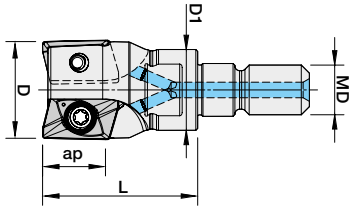
Spare parts

	Screw			TORX	
	art.no.	€		art.no.	€
A1	321099 0006		B1	703053 0080	
	3160			7114	

palbit Screw-in milling cutter 90° *LINEPRO 20190*

Z 2 | Z 3 | Z 4 | Z 5 | Vc/fz | 815

- **For milling inserts XP..1003**
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**





D mm	D1 mm	L mm	MD	Z	Indexable insert type	Max. tightening torque N·m			art.no.	€
16	14	25	M8	2	XP..1003..	1.2	A1	B1	260242 0016	
20	18	30	M10	3	XP..1003..	1.2	A1	B1	260242 0020	
25	21	35	M12	4	XP..1003..	1.2	A1	B1	260242 0025	
32	29	35	M16	5	XP..1003..	1.2	A1	B1	260242 0032	
									2174	

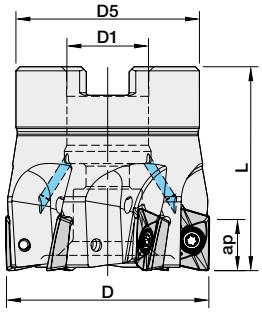
Spare parts

	Screw			TORX	
	art.no.	€		art.no.	€
A1	321099 0006		B1	703053 0080	
	3160			7114	

palbit Shoulder milling cutter 90° *LINEPRO 20190*

Z 6 | Z 7 | Z 8+ | Vc/fz | 815

- **For milling inserts XP..1003**
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**





D mm	L mm	D1 mm	Z	Indexable insert type	Max. tightening torque N·m			art.no.	€
40	40	16	6	XP..1003..	1.2	A1	B1	260243 0040	
50	40	22	7	XP..1003..	1.2	A1	B1	260243 0050	
63	40	22	8	XP..1003..	1.2	A1	B1	260243 0063	
								2174	

Spare parts

	Screw			TORX	
	art.no.	€		art.no.	€
A1	321099 0006		B1	703053 0080	
	3160			7114	

Milling inserts XP.. 1003.. *LINEPRO 20190*

Improved successor qualities

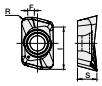
XPET-LP shoulder milling insert

F finishing -	M medium -	R roughing -	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
			XPET 100304 PDER-LP	●		●				**PHP 930**	10	285276 0590	
				●		●				**PHP 920**	10	285276 0591	
					●			●		**PHH 930**	10	285276 0593	
			XPET 100308 PDER-LP	●		●				**PHP 930**	10	285276 0890	
				●		●				**PHP 920**	10	285276 0891	
					●			●		**PHH930**	10	285276 0893	
			XPET 100316 PDER-LP	●		●				**PHP 930**	10	285276 1290	
				●		●				**PHP 920**	10	285276 1291	
					●			●		**PHH 930**	10	285276 1293	

2170

ISO	PHH 930	PHH930	PHP 920	PHP 930
ISO P steel			Vc = 140 - 250	Vc = 120 - 230
ISO M stainless steel	Vc = 100 - 210	Vc = 100 - 210		
ISO K cast iron			Vc = 120 - 270	Vc = 100 - 250
ISO S superalloys	Vc = 30 - 110	Vc = 30 - 110		
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.08 - 0.25 ap = 0.4 - 10.0		fz = 0.08 - 0.20 ap = 2.0 - 9.0	fz = 0.05 - 0.07

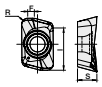
XPET-MP shoulder milling insert

F finishing ○	M medium ○	R roughing ○	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
			XPET 100304 PDSR-MP			●				**PH 5705**	10	285276 0728	
						●				**PH 5740**	10	285276 0730	
				●		●				**PHP 920**	10	285276 0791	
			XPET 100308 PDSR-MP			●				**PH 5705**	10	285276 0928	
						●				**PH 5740**	10	285276 0930	
				●		●				**PHP 920**	10	285276 0991	
				●		●				**PHP 930**	10	285276 0990	

2170

ISO	PH 5705	PH 5740	PHP 920	PHP 930
ISO P steel			Vc = 140 - 250	Vc = 120 - 230
ISO K cast iron	Vc = 120 - 390	Vc = 90 - 240	Vc = 120 - 270	Vc = 100 - 250
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.25 ap = 2.0 - 9.0			

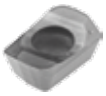
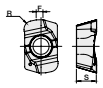
XPET-MH finishing insert

F finishing -	M medium -	R roughing -	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
			XPHW 100308 ZER-MH	●					●	**PHH 603**	10	285276 1676	
				●					●	**PHH 910**	10	285276 1695	
			XPHW 100310 ZER-MH	●					●	**PHH 603**	10	285276 1710	

2170

ISO	PHH 603	PHH 910
ISO P steel	Vc = 180 - 310	Vc = 140 - 270
ISO H hard	Vc = 70 - 270	Vc = 70 - 260
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.08 - 0.25 ap = ap max. 3.0	ap = 0.80 - 3.0

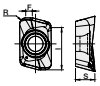
XPET-HF high feed-rate insert

F finishing -	M medium -	R roughing -	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
			XPET 100312 ZDR-HF	●		●				**PHP 930**	10	285276 1190	
					●			●		**PHH 930**	10	285276 1193	
				●		●				**PHP 910**	10	285276 1192	
				●		●				**PHP 920**	10	285276 1191	

2170

ISO	PHH 930	PHP 910	PHP 920	PHP 930
ISO P steel		Vc = 140 - 250	Vc = 140 - 250	Vc = 120 - 230
ISO M stainless steel	Vc = 100 - 210			
ISO K cast iron		Vc = 150 - 300	Vc = 120 - 270	Vc = 100 - 250
ISO S superalloys	Vc = 30 - 110			
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.40 - 0.80 ap = max. 0.8			

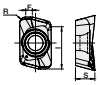
XPET-LN aluminium shoulder milling insert

F finishing -	M medium -	R roughing -	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
			XPET 100304 PDFR-L				●			PH 0910	10	285276 0620	
			XPET 100308 PDFR-LN				●			PH 0910	10	285276 0920	
			XPET 100312 PDFR-LN				●			PH 0910	10	285276 1020	

2171

ISO	PH 0910
ISO N Al/non-ferrous	Vc = 350 - 1400
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.07 - 0.25 ap = 2.0 - 9.0

XPET-LS shoulder milling insert

F finishing ○	M medium ○	R roughing ●	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
			XPET 100304 PDER-LS	○	●			●		PHH930	10	285276 1075	
			XPET 100308 PDER-LS	○	●			●		PHH930	10	285276 1077	
			XPET 100312 PDER-LS	○	●			●		PHH930	10	285276 1079	
			XPET 100316 PDER-LS	○	●			●		PHH930	10	285276 1081	
			XPET 100320 PDER-LS	○	●			●		PHH930	10	285276 1083	
			XPET 100332 PDER-LS	○	●			●		PHH930	10	285276 1085	

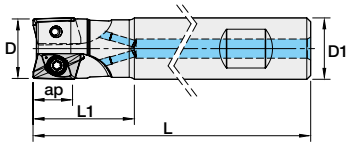
2170

ISO	PHH930
ISO M stainless steel	Vc = 100 - 210
ISO S superalloys	Vc = 30 - 110
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.08 - 0.25 per cutting edge ap = ap max. 9.0

palbit End milling cutter 90° *LINEPRO 20290*

Z 2 | Z 3 |  |  |  |  |  |  | i Vc/fz | 816

- **For milling inserts XP..1706**
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**





D mm	D1 mm	L1 mm	L mm	Z	Indexable insert type	Max. tightening torque N·m	art.no.	€
32	32	50	110	2	XPET 1706..	5.0	260244 0032	
32	32	60	200	3	XPET 1706..	5.0	260244 1032	
40	32	50	115	2	XPET 1706..	5.0	260244 0040	
40	32	60	200	3	XPET 1706..	5.0	260244 1040	

2174

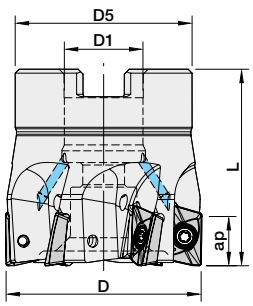
Spare parts

Screw			TORX		
	art.no.	€		art.no.	€
A1	321099 0018		B1	703053 0200	
3160			7114		

palbit Shoulder milling cutter 90° *LINEPRO 20290*

Z 4 | Z 5 | Z 6 | Z 7 | Z 8+ |  |  | i Vc/fz | 816

- **For milling inserts XP..1706**
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**





D mm	D1 mm	L mm	Z	Indexable insert type	Max. tightening torque N·m	art.no.	€
40	16	40	4	XPET 1706..	5.0	260245 0040	
50	22	40	5	XPET 1706..	5.0	260245 0050	
63	22	40	6	XPET 1706..	5.0	260245 0063	
80	27	50	7	XPET 1706..	5.0	260245 0080	
100	32	50	8	XPET 1706..	5.0	260245 0100	
125	40	63	9	XPET 1706..	5.0	260245 0125	

2174

Spare parts

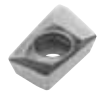
Screw			TORX		
	art.no.	€		art.no.	€
A1	321099 0018		B1	703053 0200	
3160			7114		

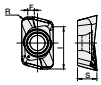
Milling inserts XPET 1706.. *LINEPRO 20290*

Improved successor qualities

XPET-LP shoulder milling insert

F finishing	M medium	R roughing
-	○	●





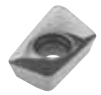
ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
XPET 170608 PDER-LP	●	●	●		●		**PH 7740**	10	285288 0148	
	●		●				**PHP 920**	10	285288 0191	
XPET 170616 PDER-LP	●	●	●		●		**PH 7740**	10	285289 0148	

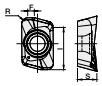
2170

ISO	PH 7740	PHP 920
ISO P steel	Vc = 100 - 220	Vc = 140 - 250
ISO M stainless steel	Vc = 70 - 220	
ISO K cast iron	Vc = 100 - 260	Vc = 120 - 270
ISO S superalloys	Vc = 30 - 65	
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.35 ap = 0.05 - 17.0	

XPET-MP shoulder milling insert

F finishing	M medium	R roughing
○	○	○





ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
XPET 170608 PDSR-MP			●				**PH 5705**	10	285290 0128	
			●				**PH 5740**	10	285290 0130	
	●	●	●				**PH 7740**	10	285290 0148	
	●		●				**PHP 920**	10	285290 0191	
XPET 170616 PDSR-MP			●				**PH 5705**	10	285291 0128	
			●				**PH 5740**	10	285291 0130	
	●	●	●				**PH 7740**	10	285291 0148	
	●		●				**PHP 920**	10	285291 0191	

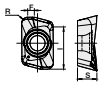
2170

ISO	PH 5705	PH 5740	PH 7740	PHP 920
ISO P steel			Vc = 100 - 220	Vc = 140 - 250
ISO M stainless steel			Vc = 70 - 220	
ISO K cast iron	Vc = 120 - 380	Vc = 120 - 300	Vc = 100 - 260	Vc = 120 - 270
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.35 ap = 0.05 - 17.0			

XPET-LN aluminium shoulder milling insert

F finishing	M medium	R roughing
○	●	●





ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
XPET 170608 PDFR-LN				●			**PH 0910**	10	285292 0120	
XPET 170620 PDFR-LN				●			**PH 0910**	10	285293 0120	
XPET 170632 PDFR-LN				●			**PH 0910**	10	285294 0120	

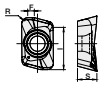
2171

ISO	PH 0910
ISO N Al/non-ferrous	Vc = 350 - 1400
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.35 ap = 0.05 - 17.0

XPET-LS shoulder milling insert

F finishing	M medium	R roughing
○	○	●





ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
XPET 170608 PDER - LS	○	●			●		**PHH 930**	10	285591 0193	
XPET 170616 PDER - LS	○	●			●		**PHH 930**	10	285591 0195	
XPET 170620 PDER - LS	○	●			●		**PHH 930**	10	285591 0196	
XPET 170632 PDER - LS	○	●			●		**PHH 930**	10	285591 0197	

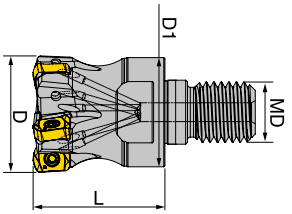
2170

ISO	PHH 930
ISO M stainless steel	Vc = 100 - 210
ISO S superalloys	Vc = 30 - 110
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.10 - 0.35 pro Blade ap = ap max. 17.0

palbit Screw-in milling cutter 20° TETRAFEED

Z2 Z3 Z4 Z5 Z6 Z7 — Vc/fz — 817

- **for milling inserts XNKU 06**
- easy cutting action due to the positive installation position of the indexable insert
- **four cutting edges per insert**
- tools deliver smooth milling performance
- **internal coolant supply**





D mm	MD	D1 mm	L mm	Z	Max. tightening torque N-m			art.no.	€
16	M8	13	25	2	1.20	A1	B1	260312 0016	
20	M10	18	28	3	1.20	A1	B1	260312 0020	
25	M12	18	30	4	1.20	A1	B1	260312 0025	
32	M16	29	35	5	1.20	A1	B1	260312 0032	
35	M16	29	35	6	1.20	A1	B1	260312 0035	
40	M16	29	45	5	1.20	A1	B1	260312 0040	
42	M16	29	35	7	1.20	A1	B1	260312 0042	

2174

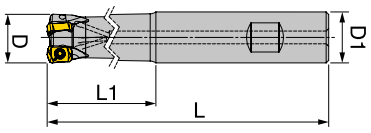
Spare parts

	Screw art.no.	€		TORX art.no.	€
A1	321099 0006		B1	703053 0080	
	3160			7114	

palbit End milling cutter 20° TETRAFEED

Z3 Z4 Z5 — Vc/fz — 817

- **for milling inserts XNKU 06**
- easy cutting action due to the positive installation position of the indexable insert
- **four cutting edges per insert**
- tools deliver smooth milling performance
- **internal coolant supply**





D mm	D1 mm	L mm	L1 mm	Z	Max. tightening torque N-m	Z			art.no.	€
20	20	160	90	3	1.20	3	A1	B1	260311 0020	
25	25	180	100	4	1.20	4	A1	B1	260311 0025	
32	32	200	120	5	1.20	5	A1	B1	260311 0032	

2174

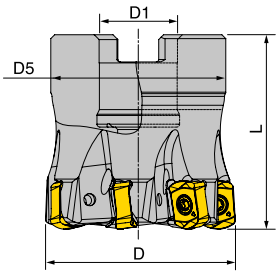
Spare parts

	Screw art.no.	€		TORX art.no.	€
A1	321099 0006		B1	703053 0080	
	3160			7114	

palbit Shoulder milling cutter 20° TETRAFEED

Vc/fz — 817

- **for milling inserts XNKU 06**
- easy cutting action due to the positive installation position of the indexable insert
- **four cutting edges per insert**
- tools deliver smooth milling performance
- **internal coolant supply**





D mm	D1 mm	D5 mm	L mm	Z	Max. tightening torque N-m			art.no.	€
40	16	36	40	7	1.20	A1	B1	260313 0040	
50	22	42	40	8	1.20	A1	B1	260313 0050	
52	22	40	40	8	1.20	A1	B1	260313 0052	
63	22	40	40	9	1.20	A1	B1	260313 0063	

2174

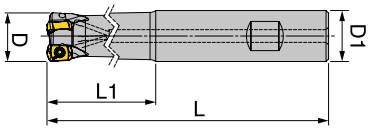
Spare parts

	Screw art.no.	€		TORX art.no.	€
A1	321099 0006		B1	703053 0080	
	3160			7114	

palbit End milling cutter 20° *TETRAFEED*

Z 2 | Z 3 | Vc/fz | 817

- **For milling inserts XNKU 12..**
- Easy cutting action due to the positive installation position of the indexable cutting insert
- **Four cutting edges per insert**
- Tools deliver smooth milling performance
- **Internal coolant supply**





D mm	D1 mm	L1 mm	L mm	Z	Max. tightening torque N-m			art.no.	€
32	32	70	150	2	3.0	A1	B1	260315 0132	
40	32	45	220	3	3.0	A1	B1	260315 0240	

2174

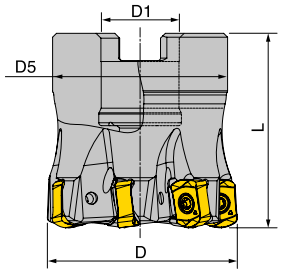
Spare parts

	Screw art.no.	€		TORX art.no.	€
A1	321099 0019		B1	703053 0200	
	3160			7114	

palbit Shoulder milling cutter 20° *TETRAFEED*

Z 4 | Z 5 | Z 6 | Z 8+ | Vc/fz | 817

- **For milling inserts XNKU 12..**
- Easy cutting action due to the positive installation position of the indexable cutting insert
- **Four cutting edges per insert**
- Tools deliver smooth milling performance
- **Internal coolant supply**





D mm	D1 mm	D5 mm	L mm	Z	Max. tightening torque N-m			art.no.	€
50	22	42	45	4	5.0	A1	B1	260314 0050	
50	22	42	45	5	5.0	A1	B1	260314 1050	
52	22	42	45	4	5.0	A1	B1	260314 0052	
52	22	42	45	5	5.0	A1	B1	260314 1052	
63	27	48	50	5	5.0	A1	B1	260314 0063	
63	27	48	50	6	5.0	A1	B1	260314 1063	
66	27	48	50	5	5.0	A1	B1	260314 0066	
66	27	48	50	6	5.0	A1	B1	260314 1066	
80	27	60	50	6	5.0	A1	B1	260314 0080	
80	27	60	50	8	5.0	A1	B1	260314 1080	
100	32	80	50	8	5.0	A1	B1	260314 1100	

2174

Spare parts

	Screw art.no.	€		TORX art.no.	€
A1	321099 0019		B1	703053 0200	
	3160			7114	

Milling inserts XNKU.. 06.. *TETRAFEED*

F finishing -	M medium -	R roughing -	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
			XNKU 06T310-MP		●			●		PHH930	10	285560 0167	
				●		●				PHP920	10	285560 0168	
				●	●	●		●		PHS740	10	285560 0174	
				●						PHP910	10	285560 0192	

2170

ISO	PHH930	PHP910	PHP920	PHS740
ISO P steel		Vc = 140 - 250	Vc = 160 - 250	Vc = 140 - 230
ISO M stainless steel	Vc = 80 - 170			Vc = 70 - 180
ISO K cast iron			Vc = 100 - 320	Vc = 70 - 260
ISO S superalloys	Vc = 30 - 75			Vc = 30 - 70
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.5 - 1.4	fz = 0.5 - 1.5 ap = 1.0		fz = 0.5 - 1.3

Milling inserts XNKU 12.. *TETRAFEED*

F finishing -	M medium -	R roughing -	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
			XNKU 120516-MP		●			●		**PHH930**	10	285599 0167	
				●		●				**PHP920**	10	285599 0168	
				●	●	●		●		**PHS740**	10	285599 0174	
				●		●				**PHP910**	10	285599 0192	

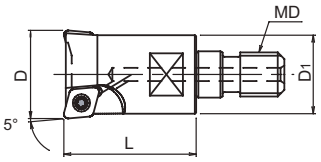
2170

ISO	PHH930	PHP910	PHP920	PHS740
ISO P steel		Vc = 140 - 250	Vc = 160 - 250	Vc = 140 - 230
ISO M stainless steel	Vc = 80 - 170			Vc = 70 - 180
ISO K cast iron		Vc = 150 - 300	Vc = 100 - 320	Vc = 80 - 300
ISO S superalloys	Vc = 30 - 75			Vc = 30 - 70
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.50 - 1.40	fz = 0.50 - 1.50 ap = 1.5		

palbit Screw-in milling cutter 95° *LINEPRO 40095 / 41095*

824

- **For milling inserts XD..0401.. / XD.. 0602..**
- Easy cutting action due to the positive installation position of t he indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**





D mm	D1 mm	L mm	Z	MD	Max. tightening torque N·m	suitable indexable inserts	art.no.	€
10	9.8	20	2	6	0.3	XD..0401..	260293 0010	
12	9.8	20	2	6	0.3	XD..0401..	260293 0012	
16	13	23	2	8	1.2	XD..0602..	260293 0016	
20	18	28	3	10	1.2	XD..0602..	260293 0020	
25	21	30	3	12	1.2	XD..0602..	260293 0025	
25	21	30	4	12	1.2	XD..0602..	260293 1025	

2174

Spare parts

	Screw art.no.	€
A1	321099 0003	
A2	321099 0005	

3160

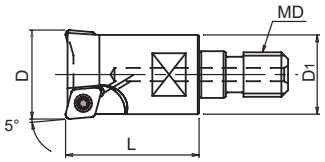
	TORX art.no.	€
B1	703053 0060	
B2	703053 0080	

7114

palbit Screw-in milling cutter 95° *LINEPRO 40595*

824

- **For milling inserts XD..1003**
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**





D mm	D1 mm	L mm	Z	MD	Max. tightening torque N·m	suitable indexable inserts	art.no.	€
25	21	35	2	12	3.0	XD..10T3..	260294 0025	
35	29	43	3	16	3.0	XD..10T3..	260294 0035	
42	29	43	4	16	3.0	XD..10T3..	260294 0042	

2174

Spare parts

	Screw art.no.	€
A1	321099 0009	

3160

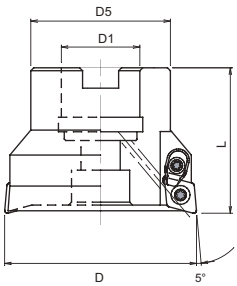
	TORX art.no.	€
B1	703053 0150	

7114

palbit Shoulder milling cutter 95° *LINEPRO 40595*

822

- **For milling inserts XP..10T3**
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**





D mm	L mm	D5 mm	D1 mm	Z	Max. tightening torque N-m	suitable indexable inserts	art.no.	€
52	50	40	22	5	3.0	XD..10T3..	260295 0052	
66	50	48	27	6	3.0	XD..10T3..	260295 0066	
80	50	60	27	7	3.0	XD..10T3..	260295 0080	

2174

Spare parts

Clamping screw	art.no.	€
A1	321099 0008	

3160

Screw	art.no.	€
B1	321099 0009	

3160

TORX	art.no.	€
C1	703053 0150	

7114

Milling inserts XDHW *LINEPRO 40095 / 40595 / 41095*

XDHT shoulder milling inserts

F finishing	M medium	R roughing	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
-	-	-	XDHW 040105				●			**PHD103**	10	285367 0162	
			XDHW 040110	●					●	**PH6103**	10	285367 0231	
				●		●				**PH6125**	10	285367 0232	
			XDHW 060210	●					●	**PH6103**	10	285367 0331	
				●		●				**PH6125**	10	285367 0332	
				●						**PH6135**	10	285367 0333	
				●		●				**PH6910**	10	285367 0341	
			XDHW 10T310	●					●	**PH6103**	10	285367 0431	
				●		●				**PH6125**	10	285367 0432	
				●						**PH6135**	10	285367 0433	
				●		●				**PH6910**	10	285367 0441	

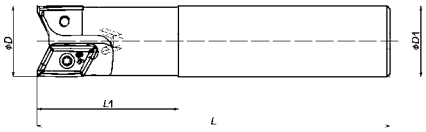
2170

ISO	PH6103	PH6125	PH6135	PH6910	PHD103
ISO P steel	Vc = 180 - 300	Vc = 130 - 190	Vc = 120 - 180	Vc = 160 - 250	
ISO K cast iron		Vc = 80 - 290		Vc = 90 - 300	
ISO N Al/non-ferrous					Vc = 300 - 1000
ISO H hard	Vc = 120 - 260				
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 02		fz = 0.1 - 0.35	fz = 0.1 - 0.3	fz = 0.1 - 0.2
	ap = 0.05 - 1.0				

palbit End milling cutter 90° ALUPRO 76090

819

- **For milling inserts XDGX 15M..**
- Tools deliver smooth milling performance
- **Internal coolant supply**





up to r = 3.2

D mm	D1 mm	L mm	L1 mm	Z	suitable indexable inserts	Max. tightening torque N·m	art.no.	€
20	20	150	60	1	XDGX 15M5	3.0	260252 0020	
25	25	180	90	2	XDGX 15M5	3.0	260252 0025	
32	32	200	120	2	XDGX 15M5	3.0	260252 0032	
40	32	250	65	3	XDGX 15M5	3.0	260252 0040	
								2174

greater than r = 4.0

D mm	D1 mm	L mm	L1 mm	Z	Max. tightening torque N·m	suitable indexable inserts	art.no.	€
20	20	150	60	1	3.0	XDGX 15M5	260253 0020	
25	25	180	90	2	3.0	XDGX 15M5	260253 0025	
32	32	200	120	2	3.0	XDGX 15M5	260253 0032	
40	32	250	65	3	3.0	XDGX 15M5	260253 0040	
								2174

Spare parts

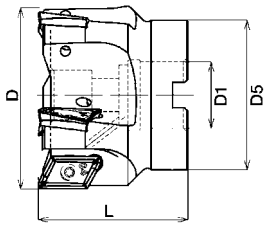
	Screw art.no.	€
A1	321099 0012	
A2	321099 0014	
		3160

	TORX art.no.	€
B1	703053 0150	
		7114

palbit Shoulder milling cutter 90° ALUPRO 76090

819

- **For milling inserts XDGX 15M..**
- Tools deliver smooth milling performance
- **Internal coolant supply**





up to r = 3.2

D mm	L mm	D1 mm	D5 mm	Z	Max. tightening torque N·m	suitable indexable inserts	art.no.	€
40	50	16	32	3	3.0	XDGX 15M5	260250 0040	
50	50	22	42	4	3.0	XDGX 15M5	260250 0050	
63	50	22	48	5	3.0	XDGX 15M5	260250 0063	
80	50	27	60	5	3.0	XDGX 15M5	260250 0080	
100	63	32	73	6	3.0	XDGX 15M5	260250 0100	
								2174

greater than r = 4.0

D mm	L mm	D1 mm	D5 mm	Z	Max. tightening torque N·m	suitable indexable inserts	art.no.	€
40	50	16	32	3	3.0	XDGX 15M5	260251 0040	
50	50	22	42	4	3.0	XDGX 15M5	260251 0050	
63	50	22	48	5	3.0	XDGX 15M5	260251 0063	
80	50	27	60	5	3.0	XDGX 15M5	260251 0080	
100	63	32	73	6	3.0	XDGX 15M5	260251 0100	
								2174

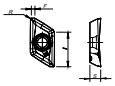
Spare parts

	Screw art.no.	€
A1	321099 0014	
		3160

	TORX art.no.	€
B1	703053 0150	
		7114

Milling inserts XDGX 15M5.. *ALUPRO 76090*

XDGX 15M5..

F finishing -	M medium -	R roughing -	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
			XDGX 15M504 PDFR-LN				●			**PH0910**	10	285301 0120	
			XDGX 15M508 PDFR-LN				●			**PH0910**	10	285301 0220	
			XDGX 15M512 PDFR-LN				●			**PH0910**	10	285301 0320	
			XDGX 15M516 PDFR-LN				●			**PH0910**	10	285301 0420	
			XDGX 15M520 PDFR-LN				●			**PH0910**	10	285301 0520	
			XDGX 15M530 PDFR-LN				●			**PH0910**	10	285301 0620	
			XDGX 15M532 PDFR-LN				●			**PH0910**	10	285301 0720	
			XDGX 15M540 PDFR-LN				●			**PH0910**	10	285301 0820	
			XDGX 15M550 PDFR-LN				●			**PH0910**	10	285301 0920	

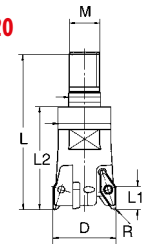
2171

ISO	PH0910
ISO N Al/non-ferrous	Vc = 350 - 1400
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.15 - 0.4 ap = 0.05 - 14.0

ATORN 90° indexable insert milling cutter for non-ferrous metals and plastics

Z 2 | Z 3 | Z 4 | Z 5 | HPC | Vc/fz | 820

- **For excavation and plunge milling without pilot holes**

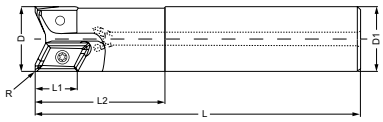




Screw-in milling cutter

D mm	R mm	L1 mm	L mm	L2 mm	Max. tightening torque N-m	MD	suitable indexable inserts	Z			art.no.	€
25	1.2	13.5	40	21	5.2	M12	VPGT 1604..	2	A1	B1	260400 2540	
32	3	15	50	29	10	M16	VCGT 2205..	2	A2	B2	260400 3250	
42	3	15	50	29	10	M16	VCGT 2205..	3	A2	B2	260400 4250	

2125

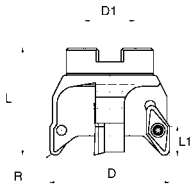




End milling cutters

D mm	R mm	L1 mm	L2 mm	D1 mm	L mm	Max. tightening torque N-m	suitable indexable inserts	Z			art.no.	€
25	1.2	13.5	40	20	200	5.2	VPGT 1604..	2	A1	B1	260402 5200	
32	3.0	15	50	25	220	10	VCGT 2205..	2	A2	B2	260403 2220	

2125





Shell-type milling cutter

D mm	R mm	L1 mm	L mm	Bore hole Ø mm	D1 mm	Max. tightening torque N-m	suitable indexable inserts	Z			art.no.	€
42	3	15	55	16	16	10	VCGT 2205..	3	A2	B2	260400 4255	
52	3	15	55	22	22	10	VCGT 2205..	3	A2	B2	260400 5255	
66	3	15	60	27	27	10	VCGT 2205..	4	A2	B2	260400 6660	
80	3	15	60	27	27	10	VCGT 2205..	4	A2	B2	260400 8060	
100	3	15	60	32	32	10	VCGT 2205..	5	A2	B2	260401 0065	

2125

Spare parts

	Screw art.no.	€
A1	260400 0040	
A2	260400 0050	

2125

	TORX art.no.	€
B1	703040 0080	
B2	703040 0150	

7111

VCGT/VPGT ISO milling inserts

ISO designation	R mm	Z		ISO N Uncoated HW4410 art.no.	€		ISO N Coated HC4410 art.no.	€
VPGT 1604012-ALM	1.2	2	10	270104 0161		10	270104 1661	
VCGT 220530-ALM	3	2	10	270104 1221		10	270104 0221	

2126 2126

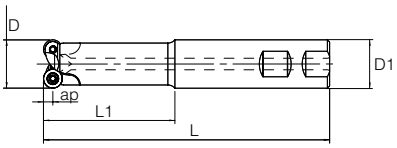

HC44210


HW4410

palbit Copy milling cutter TOROMILL 24590 / 25090 / 25190

821

- For copy milling, radius cutting and contour milling in die and mould production
- Suitable for diagonal or axial plunge milling thanks to the clearance of the round indexable insert
- Internal coolant supply

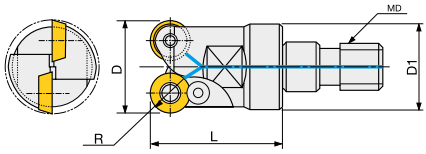




End milling cutter

D mm	Z	suitable indexable inserts	L mm	L1 mm	ap max. mm	Max. tightening torque N·m	D1 mm			art.no.	€
15	2	RD..0702..	160	60	3.5	1.2	16	A1	C1	260281 0001	
15	2	RD..0702..	220	120	3.5	1.2	25	A1	C1	260281 0002	
20	2	RD..1003..	110	60	5.0	3.0	20	A2	C2	260281 0007	
20	2	RD..1003..	160	60	5.0	3.0	20	A2	C2	260281 0003	
20	2	RD..1003..	220	120	5.0	3.0	25	A2	C2	260281 0004	
25	2	RD..12T3..	220	120	6.0	3.0	25	A2	C2	260281 0005	
25	2	RD..12T3..	230	130	6.0	3.0	32	A2	C2	260281 0006	

2174

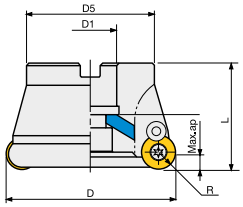


Screw-in milling cutter

D mm	R mm	MD	Z	suitable indexable inserts	L mm	ap max. mm	Max. tightening torque N·m	D1 mm	art.no.	€
15	3.5	M8	3	RD..0702..	20	3.5	1.2	13	260284 0001	
16	3.5	M8	2	RD..0702..	20	3.5	1.2	13	260284 0002	
16	3.5	M8	3	RD..0702..	20	3.5	1.2	13	260284 0003	
20	3.5	M10	4	RD..0702..	25	3.5	1.2	18	260284 0004	
20	5.0	M10	2	RD..1003..	25	5	3.0	18	260284 0005	
25	5.0	M12	3	RD..1003..	30	5	3.0	21	260284 0006	
35	5.0	M16	5	RD..1003..	43	5	3.0	29	260284 0008	
42	5.0	M16	5	RD..1003..	40	5	3.0	29	260284 0009	
24	6.0	M16	2	RD..12T3..	32	6	3.0	21	260284 0010	
35	6.0	M16	3	RD..12T3..	42	6	3.0	29	260284 0011	
42	6.0	M16	4	RD..12T3..	42	6	3.0	29	260284 0012	

2174





Shell-type milling cutter

D mm	R mm	D5 mm	γ °	Z	suitable indexable inserts	L mm	ap max. mm	Max. tightening torque N·m	D1 mm				art.no.	€
42	5	36	0	6	RD..1003..	44	5	3.0	16	A2		C2	260287 0001	
52	5	40	0	7	RD..1003..	50	5	3.0	22	A2		C2	260287 0002	
50	6	48	7	5	RD..12T3..	50	6	3.0	22	A2	B1	C2	260288 0001	
52	6	40	0	5	RD..12T3..	50	6	3.0	22	A2	B1	C2	260287 0003	
52	6	48	7	5	RD..12T3..	50	6	3.0	22	A2	B1	C2	260288 0002	
66	6	40	0	6	RD..12T3..	50	6	3.0	27	A2	B1	C2	260287 0004	
66	6	60	7	6	RD..12T3..	50	6	3.0	27	A2	B1	C2	260288 0003	
80	6	40	0	7	RD..12T3..	50	6	3.0	27	A2	B1	C2	260287 0005	
80	6	60	7	7	RD..12T3..	52.5	6	3.0	27	A2	B1	C2	260288 0004	

2174



Spare parts

	Screw art.no.	€
A1	321099 0005	
A2	321099 0009	

3160

	Clamping screw art.no.	€
B1	321099 0008	

3160

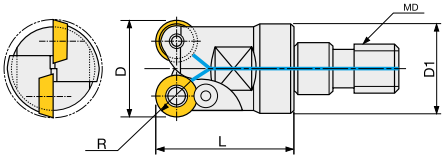
	TORX art.no.	€
C1	703053 0080	
C2	703053 0150	

7114

palbit Copy milling cutter TOROMILL 25290 / 25390

821

- For copy milling, radius cutting and contour milling in die and mould production
- Suitable for diagonal or axial plunge milling thanks to the clearance of the round indexable insert
- Internal coolant supply
- 7° positive setting angle for moderate and heavy machining, long-chipping materials with lower power consumption

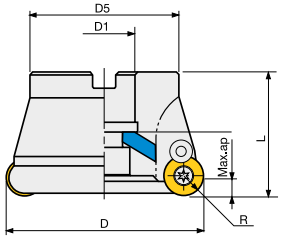




Screw-in milling cutter

D mm	R mm	MD	Z	suitable indexable inserts	L mm	ap max. mm	Max. tightening torque N-m	D1 mm	art.no.	€
32	8	M16	2	RD..1604..	40	8	5.0	29	260289 0032	

2174





Shell-type milling cutter

D mm	R mm	D5 mm	γ °	Z	suitable indexable inserts	L mm	ap max. mm	Max. tightening torque N-m	D1 mm	art.no.	€
52	8	40	0	4	RD..1604..	50	8	5.0	22	260290 0001	
52	8	48	7	4	RD..1604..	50	8	5.0	22	260291 0001	
66	8	40	0	5	RD..1604..	50	8	5.0	27	260290 0002	
66	8	60	7	5	RD..1604..	52	8	5.0	27	260291 0002	
80	8	48	0	6	RD..1604..	50	8	5.0	27	260290 0003	
80	8	60	7	6	RD..1604..	52	8	5.0	27	260291 0003	
125	8	90	7	8	RD..1604..	52	8	5.0	40	260291 0004	
160	8	120	7	9	RD..1604..	52	8	5.0	40	260291 0005	
80	10	60	7	5	RD..2006..	50	10	10.0	27	260291 0006	
100	10	70	7	6	RD..2006..	52	10	10.0	32	260291 0007	
125	10	90	7	7	RD..2006..	52	10	10.0	40	260291 0008	
160	10	120	7	8	RD..2006..	52	10	10.0	40	260291 0009	

2174

Spare parts

Screw	art.no.	€
A1	321099 0018	
A2	321099 0429	

3160

Washer	art.no.	€
B1	321099 0241	

3160

TORX	art.no.	€
C1	703053 0200	

7114

Milling inserts RD.. TOROMILL 24590 / 25090 / 25190 / 25290 / 25390

RDHT

F finishing -	M medium -	R roughing -	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
			RDHT 1003 M0T	●						PH6125	10	285351 0132	
				●						PH6135	10	285351 0133	
			RDHT 12T3 M0T	●						PH6125	10	285356 0132	
				●						PH6135	10	285356 0133	
			RDHT 1604 M0T	●						PH6125	10	285361 0132	
			RDHT 12T3 M0S-MP	●		●				PH6740	10	285355 0139	
				●	●	●		●	●	PH6920	10	285355 0142	
			RDHT 1604 M0S-MP	●		●				PH6740	10	285360 0139	
				●	●	●		●	●	PH6920	10	285360 0142	

2170

ISO	PH6125	PH6135	PH6740	PH6920
ISO P steel	Vc = 130 - 190	Vc = 120 - 180	Vc = 100 - 160	Vc = 130 - 230
ISO M stainless steel				Vc = 100 - 200
ISO K cast iron			Vc = 80 - 250	Vc = 80 - 280
ISO S superalloys				Vc = 20 - 30
ISO H hard				Vc = 50 - 100
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.15 - 0.45 ap = max. 8.0	ap = max. 6.0	fz = 0.20 - 0.45 ap = max. 8.0	

RDHW

F finishing -	M medium -	R roughing -	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
			RDHW 0702 MOT	●		●		●	●	**PH6103**	10	285349 0131	
				●		●				**PH6910**	10	285349 0141	
				●	●	●		●	○	**PH6920**	10	285349 0142	
			RDHW 1003 MOT	●		●		●	●	**PH6103**	10	285350 0131	
				●						**PH6135**	10	285350 0133	
				●		●				**PH6910**	10	285350 0141	
				●	●	●		●	○	**PH6920**	10	285350 0142	
			RDHW 12T3 MOT	●		●		●	●	**PH6103**	10	285354 0131	
				●						**PH6135**	10	285354 0133	
				●		●				**PH6910**	10	285354 0141	
				●	●	●		●	○	**PH6920**	10	285354 0142	
			RDHW 1604 MOT	●		●		●	●	**PH6103**	10	285359 0131	
				●						**PH6135**	10	285359 0133	
				●		●				**PH6910**	10	285359 0141	
				●	●	●		●	○	**PH6920**	10	285359 0142	

2170

ISO	PH6103	PH6135	PH6910	PH6920
ISO P steel	Vc = 180 - 300	Vc = 120 - 180	Vc = 160 - 250	Vc = 130 - 230
ISO M stainless steel				Vc = 100 - 200
ISO K cast iron	Vc = 200 - 300		Vc = 90 - 300	Vc = 80 - 280
ISO S superalloys	Vc = 30 - 40			Vc = 20 - 30
ISO H hard	Vc = 120 - 240			Vc = 50 - 100
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.15 - 0.45 ap = max. 8.0			

RDMT

F finishing -	M medium -	R roughing -	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
			RDMT 1003 MOT	●						**PH6125**	10	285352 0132	
				●						**PH6135**	10	285352 0133	
			RDMT 12T3 MOT	●						**PH6125**	10	285357 0132	
				●						**PH6135**	10	285357 0133	
			RDMT 1604 MOT	●						**PH6125**	10	285362 0132	
				●						**PH6135**	10	285362 0133	

2170

ISO	PH6125	PH6135
ISO P steel	Vc = 130 - 190	Vc = 120 - 180
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.15 - 0.45 ap = max. 8.0	

RDMW

F finishing -	M medium -	R roughing -	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
			RDMW 1003 MOT	●						**PH6125**	10	285353 0132	
				●						**PH6135**	10	285353 0133	
				●		●				**PH6920**	10	285353 0142	
			RDMW 12T3 MOT	●						**PH6125**	10	285358 0132	
				●						**PH6135**	10	285358 0133	
				●		●				**PH6920**	10	285358 0142	
			RDMW 1604 MOT	●						**PH6125**	10	285363 0132	
				●						**PH6135**	10	285363 0133	
				●		●				**PH6920**	10	285363 0142	
			RDMW 2006 MOT	●						**PH6125**	10	285365 0132	

2170

ISO	PH6125	PH6135	PH6920
ISO P steel	Vc = 130 - 190	Vc = 120 - 180	Vc = 130 - 230
ISO K cast iron			Vc = 80 - 280
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.15 - 0.45 ap = max. 8.0		

PHOENIX PFB ball-nose cutter and PFR torus cutter

INFO

- **PFB: Radius accuracy ± 6 µm**
- **PFR: Surface tolerance + 0 / - 20 µm, corner radius ± 8 µm**
- **Spiralled, stable and extremely sharp cutting edges**
- **Steel and solid carbide shanks**

Advantages
- Optimum surface finishes with short and long projection lengths
- Vibration reduction

Plain ball cutter PHOENIX PFB

Torus milling cutter PHOENIX PFR



Please contact us for more information, free of charge and without obligation.

Ball-nose cutter *PFB*



825

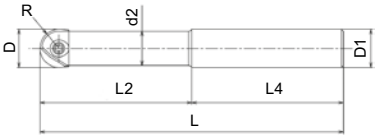
- **Radius accuracy ± 6 µm**
- High performance
- Ball cutter for finishing
- 2 cutting edges
- **Spiralled, stable and extremely sharp cutting edges**
- Steel and solid carbide shanks
- Short, long and extra-long designs

Advantages

- Optimum surface finishes with short and long projecting lengths
- Vibration reduction



Steel shank

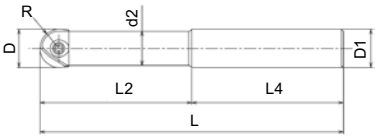


Type	R mm	D mm	L2 mm	L4 mm	L mm	d2 mm	D1 mm	Max. tightening torque N-m			art.no.	€
PFB-R080SS08-S120	4	8	36	84	120	7	8	1.0	A2	C2	260530 0080	
PFB-R100SS10-S130	5	10	45	85	130	9	10	1.2	A3	C3	260530 0100	
PFB-R120SS12-S130	6	12	54	76	130	11	12	2.0	A4	C4	260530 0120	
PFB-R160SS16-S140	8	16	64	76	140	14	16	3.0	A5	C5	260530 0160	
PFB-R200SS20-S160	10	20	80	80	160	18	20	5.0	A6	C6	260530 0200	
PFB-R250SS25-S160	12.5	25	75	85	160	22	25	5.0	A7	C6	260530 0250	
PFB-R300SS32-S170	15	30	90	80	170	27	32	6.0	A8	B1	260530 0300	
PFB-R320SS32-S180	16	32	96	84	180	29	32	6.0	A8	B1	260530 0320	

2132



Solid carbide shank, short



Type	R mm	D mm	L2 mm	L4 mm	L mm	D1 mm	d2 mm	Max. tightening torque N-m			art.no.	€
PFB-R060SS06-S80CS	3	6	15	65	80	6	5.4	0.8	A1	C1	260531 0060	
PFB-R080SS08-S100CS	4	8	20	80	100	8	7	1.0	A2	C2	260531 0080	
PFB-R100SS10-S100CS	5	10	25	75	100	10	9	1.2	A3	C3	260531 0100	
PFB-R120SS12-S110CS	6	12	30	80	110	12	11	2.0	A4	C4	260531 0120	
PFB-R160SS16-S140CS	8	16	40	100	140	16	14	3.0	A5	C5	260531 0160	
PFB-R200SS20-S160CS	10	20	50	110	160	20	18	5.0	A6	C6	260531 0200	
PFB-R250SS25-S160CS	12.5	25	62.5	97.5	160	25	22	5.0	A7	C6	260531 0250	
PFB-R300SS32-S170CS	15	30	75	95	170	32	27	6.0	A8	B1	260531 0300	
PFB-R320SS32-S180CS	16	32	80	100	180	32	29	6.0	A8	B1	260531 0320	

2132

Solid carbide shank, long

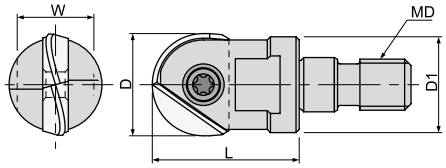
Type	R mm	D mm	L2 mm	L4 mm	L mm	D1 mm	d2 mm	Max. tightening torque N-m			art.no.	€
PFB-R060SS06-L100CS	3	6	30	70	100	6	5.4	0.8	A1	C1	260532 0060	
PFB-R080SS08-L120CS	4	8	40	80	120	8	7	1.0	A2	C2	260532 0080	
PFB-R100SS10-L130CS	5	10	50	80	130	10	9	1.2	A3	C3	260532 0100	
PFB-R120SS12-L140CS	6	12	60	80	140	12	11	2.0	A4	C4	260532 0120	
PFB-R160SS16-L160CS	8	16	72	88	160	16	14	3.0	A5	C5	260532 0160	
PFB-R200SS20-L180CS	10	20	90	90	180	20	18	5.0	A6	C6	260532 0200	
PFB-R250SS25-L200CS	12.5	25	100	100	200	25	22	5.0	A7	C6	260532 0250	
PFB-R300SS32-L220CS	15	30	120	100	220	32	27	6.0	A8	B1	260532 0300	
PFB-R320SS32-L230CS	16	32	128	102	230	32	29	6.0	A8	B1	260532 0320	

2132

Solid carbide shank, extra-long

Type	R mm	D mm	L2 mm	L4 mm	L mm	d2 mm	D1 mm	Max. tightening torque N-m				art.no.	€
PFB-R060SS06-LL120CS	3	6	42	78	120	5.4	6	0.8	A1		C1	260533 0060	
PFB-R080SS08-LL140CS	4	8	56	84	140	7	8	1.0	A2		C2	260533 0080	
PFB-R100SS10-LL150CS	5	10	70	80	150	9	10	1.2	A3		C3	260533 0100	
PFB-R120SS12-LL160CS	6	12	84	76	160	11	12	2.0	A4		C4	260533 0120	
PFB-R160SS16-LL200CS	8	16	96	104	200	14	16	3.0	A5		C5	260533 0160	
PFB-R200SS20-LL240CS	10	20	120	120	240	18	20	5.0	A6		C6	260533 0200	
PFB-R250SS25-LL260CS	12.5	25	137.5	122.5	260	22	25	5.0	A7		C6	260533 0250	
PFB-R300SS32-LL290CS	15	30	165	125	290	27	32	6.0	A8	B1		260533 0300	
PFB-R320SS32-LL300CS	16	32	176	124	300	29	32	6.0	A8	B1		260533 0320	

2132





Screw-in milling cutter

Type	Max. tightening torque N-m	D mm	D1 mm	L mm	MD	Bore hole Ø mm				art.no.	€
PFB-R100SF6	1.2	10	9	26	M6	7	A3		C3	260534 0100	
PFB-R120SF6	2.0	12	11	26	M6	7	A4		C4	260534 0120	
PFB-R160SF8	3.0	16	14.5	32	M8	10	A5		C5	260534 0160	
PFB-R200SF10	5.0	20	18	38	M10	14	A6		C6	260534 0200	
PFB-R250SF12	5.0	25	23	38	M12	17	A7		C6	260534 0250	
PFB-R300SF16	6.0	30	28	43	M16	22	A8	B1		260534 0300	

2132

Spare parts

TORX screw			TORX			TORX		
	art.no.	€		art.no.	€		art.no.	€
A1	260561 9901		B1	703040 0300		C1	703053 0060	
A2	260561 9902					C2	703053 0070	
A3	260561 9903					C3	703053 0080	
A4	260561 9904					C4	703053 0100	
A5	260561 9905					C5	703053 0150	
A6	260561 9906					C6	703053 0200	
A7	260561 9907							
A8	260561 9908							
2132			7111			7114		





PALBIT
Machining tools
908 pages
Art.no. 019900 0317

Overview of all free manufacturers' catalogues on page 20/21

Geometries

PFB-SP
- Wide range of applications, from soft steel to superalloy
- Sharp but rigid cutting edge
- Outstanding wear resistance

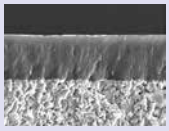
PFB-Q
- 220° full radius
- Effective cutting edge insert
- No straight cutting edge on the outside
- Wall milling without rattling

PFB-SH
- Milling of cast iron and hardened steel
- Reinforced indexable cutting insert
- High-grade resistant carbide

PFB-D
- Sharp cutting edges especially for milling graphite
- Diamond coatings for adhesive materials

Qualities / Substrates

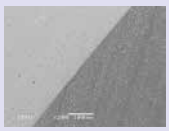
XP3320
- for dry machining of steel and stainless steel, as well as cast iron
- for wet machining of heat-resistant superalloy



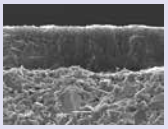
XP3225
- Stable milling of various materials
- Excellent lubrication and wear resistance
- For wet machining of steel and stainless steel

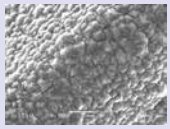


XP3310
- Ideal for dry machining of hardened steel and cast iron
- Excellent heat and wear resistance



XC4505
- Machining of non-ferrous materials
- Optimal diamond coating for milling graphite





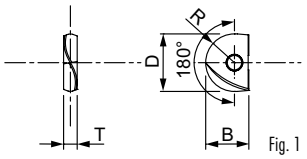


Fig. 1

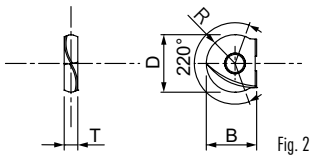


Fig. 2



Type SP

Type	D mm	R mm	Depth mm	Jaw width mm	Model	XP3225 art.no.	€	XP3320 art.no.	€
PFB080-SP	8	4	2.4	7	1	260600 0080		260601 0080	
PFB100-SP	10	5	2.6	8.5	1	260600 0100		260601 0100	
PFB120-SP	12	6	3	10	1	260600 0120		260601 0120	
PFB160-SP	16	8	4	12	1	260600 0160		260601 0160	
PFB200-SP	20	10	5	15	1	260600 0200		260601 0200	
PFB250-SP	25	12.5	6	18.5	1	260600 0250		260601 0250	
PFB300-SP	30	15	7	22.5	1	260600 0300		260601 0300	
						2133		2133	

Type SH

Type	D mm	R mm	Depth mm	Jaw width mm	Model	XP3310 art.no.	€
PFB060-SH	6	3	2	5	2	260602 0060	
PFB080-SH	8	4	2.4	7	1	260602 0080	
PFB100-SH	10	5	2.6	8.5	1	260602 0100	
PFB120-SH	12	6	3	10	1	260602 0120	
PFB160-SH	16	8	4	12	1	260602 0160	
PFB200-SH	20	10	5	15	1	260602 0200	
PFB250-SH	25	12.5	6	18.5	1	260602 0250	
PFB300-SH	30	15	7	22.5	1	260602 0300	
PFB320-SH	32	16	7	23.5	1	260602 0320	
						2133	

Type D
- **dijamantski obloženi**

Type	D mm	R mm	Depth mm	Jaw width mm	Model	XC4505 art.no.	€
PFB060-D	6	3	2	5	2	260603 0060	
PFB070-D	7	3.5	2	5.5	2	260603 0070	
PDF080-D	8	4	2.4	7	1	260603 0080	
PFB100-D	10	5	2.6	8.5	1	260603 0100	
PFB120-D	12	6	3	10	1	260603 0120	
PFB160-D	16	8	4	12	1	260603 0160	
PFB200-D	20	10	5	15	1	260603 0200	
PFB250-D	25	12.5	6	18.5	1	260603 0250	
PFB300-D	30	15	7	22.5	1	260603 0300	
						2133	

Type Q

Type	D mm	R mm	Depth mm	Jaw width mm	Model	XP3225 art.no.	€
PFB060-Q	6	3	2	5	2	260604 0060	
PFB070-Q	7	3.5	2	5.5	2	260604 0070	
PFB080-Q	8	4	2.4	7	2	260604 0080	
PFB100-Q	10	5	2.6	8.5	2	260604 0100	
PFB120-Q	12	6	3	10	2	260604 0120	
PFB160-Q	16	8	4	12	2	260604 0160	
PFB200-Q	20	10	5	15	2	260604 0200	
PFB250-Q	25	12.5	6	18.5	2	260604 0250	
PFB300-Q	30	15	7	22.5	2	260604 0300	
						2133	

Torus milling cutter *PFR*

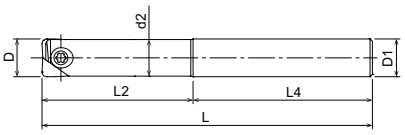
827

- **Radius accuracy ± 8 µm**
- High performance
- High measurement accuracy
- 2 cutting edges
- Steel and solid carbide shanks
- Short, long and extra-long designs

Advantages

- Optimum surface finishes with short and long projecting lengths
- Vibration reduction



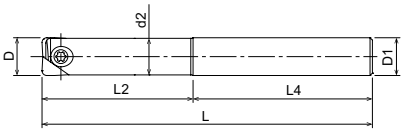


Steel shank

Type	D mm	L2 mm	L mm	L4 mm	d2 mm	D1 mm	Max. tightening torque N·m			art.no.	€
PFR-R080SS08-S120	8	36	120	84	7.5	8	1.0	A1	C1	260540 0080	
PFR-R100SS10-S130	10	45	130	85	9.5	10	1.2	A2	C2	260540 0100	
PFR-R120SS12-S130	12	54	130	76	11.5	12	2.0	A3	C3	260540 0120	
PFR-R160SS16-S140	16	64	140	76	15.5	16	3.0	A4	C4	260540 0160	
PFR-R200SS20-S160	20	80	160	80	19.5	20	5.0	A5	C5	260540 0200	
PFR-R250SS25-S160	25	75	160	85	24.5	25	5.0	A6	C5	260540 0250	
PFR-R300SS32-S170	30	90	170	80	29.5	32	6.0	A7	B1	260540 0300	
PFR-R320SS32-S180	32	96	180	84	31.5	32	6.0	A7	B1	260540 0320	

2132





Solid carbide shank, short

Type	D mm	L2 mm	L mm	L4 mm	d2 mm	D1 mm	Max. tightening torque N·m			art.no.	€
PFR-R080SS08-S100CS	8	20	100	80	7.5	8	1.0	A1	C1	260541 0080	
PFR-R100SS10-S100CS	10	25	100	75	9.5	10	1.2	A2	C2	260541 0100	
PFR-R120SS12-S110CS	12	30	110	80	11.5	12	2.0	A3	C3	260541 0120	
PFR-R160SS16-S140CS	16	40	140	100	15.5	16	3.0	A4	C4	260541 0160	
PFR-R200SS20-S160CS	20	50	160	110	19.5	20	5.0	A5	C5	260541 0200	
PFR-R250SS25-S160CS	25	62.5	160	97.5	24.5	25	5.0	A6	C5	260541 0250	
PFR-R300SS32-S170CS	30	75	170	95	29.5	32	6.0	A7	B1	260541 0300	
PFR-R320SS32-S180CS	32	80	180	100	31.5	32	6.0	A7	B1	260541 0320	

2132

Solid carbide shank, long

Type	D mm	L2 mm	L mm	L4 mm	d2 mm	D1 mm	Max. tightening torque N·m			art.no.	€
PFR-R080SS08-L120CS	8	40	120	80	7.5	8	1.0	A1	C1	260542 0080	
PFR-R100SS10-L130CS	10	50	130	80	9.5	10	1.2	A2	C2	260542 0100	
PFR-R120SS12-L140CS	12	60	140	80	11.5	12	2.0	A3	C3	260542 0120	
PFR-R160SS16-L160CS	16	72	160	88	15.5	16	3.0	A4	C4	260542 0160	
PFR-R200SS20-L180CS	20	90	180	90	19.5	20	5.0	A5	C5	260542 0200	
PFR-R250SS25-L200CS	25	100	200	100	24.5	25	5.0	A6	C5	260542 0250	
PFR-R300SS32-L220CS	30	120	220	100	29.5	32	6.0	A7	B1	260542 0300	
PFR-R320SS32-L230CS	32	128	230	102	31.5	32	6.0	A7	B1	260542 0320	

2132

Solid carbide shank, extra-long

Type	D mm	L2 mm	L mm	L4 mm	d2 mm	D1 mm	Max. tightening torque N·m			art.no.	€
PFR-R080SS08-LL140CS	8	56	140	84	7.5	8	1.0	A1	C1	260543 0080	
PFR-R100SS10-LL150CS	10	70	150	80	9.5	10	1.2	A2	C2	260543 0100	
PFR-R120SS12-LL160CS	12	84	160	76	11.5	12	2.0	A3	C3	260543 0120	
PFR-R160SS16-LL200CS	16	96	200	104	15.5	16	3.0	A4	C4	260543 0160	
PFR-R200SS20-LL240CS	20	120	240	120	19.5	20	5.0	A5	C5	260543 0200	
PFR-R250SS25-LL260CS	25	137.5	260	122.5	24.5	25	5.0	A6	C5	260543 0250	
PFR-R300SS32-LL290CS	30	165	290	125	29.5	32	6.0	A7	B1	260543 0300	
PFR-R320SS32-LL300CS	32	176	300	124	31.5	32	6.0	A7	B1	260543 0320	

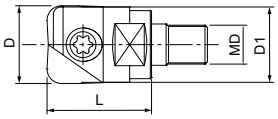
2132

Screw-in milling cutter

Type	Max. tightening torque N·m	D mm	D1 mm	L mm	MD				art.no.	€
PFR-R100SF6	1.2	10	9	26	M6	A2		C2	260544 0100	
PFR-R120SF6	2.0	12	11	26	M6	A3		C3	260544 0120	
PFR-R160SF8	3.0	16	15	32	M8	A4		C4	260544 0160	
PFR-R200SF10	5.0	20	19	38	M10	A5		C5	260544 0200	
PFR-R250SF12	5.0	25	24	38	M12	A6		C5	260544 0250	
PFR-R300SF16	6.0	30	29	43	M16	A7	B1		260544 0300	
PFR-R320SF16	6.0	32	31	43	M16	A7	B1		260544 0320	

2132





Spare parts

TORX screw			TORX			TORX		
	art.no.	€		art.no.	€		art.no.	€
A1	260561 9902		B1	703040 0300		C1	703053 0070	
A2	260561 9903					C2	703053 0080	
A3	260561 9904					C3	703053 0100	
A4	260561 9905					C4	703053 0150	
A5	260561 9906					C5	703053 0200	
A6	260561 9907							
A7	260561 9908							
2132			7111			7114		

Geometries

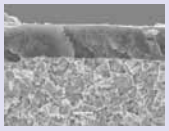
PFR-ST
- Wide range of applications from soft to hard steel
- Positive rake angle
- Excellent sharpness and hardness

PFR-SH
- For milling cast iron, ductile iron and hardened steel
- Ultra-rigid cutting edge with two-dimensional negative chamfer
- For stable machining
- Especially for milling graphite

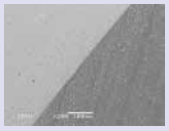
PFR-D
- Sharp cutting edges especially for milling graphite
- Diamond coatings for adhesive materials

Qualities / Substrates

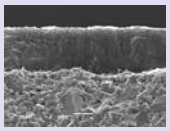
XP3225
- Stable milling of various materials
- Excellent lubrication and wear resistance
- For wet machining of steel and stainless steel

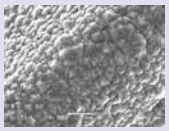


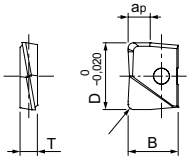
XP3310
- Ideal for dry machining of hardened steel and cast iron
- Excellent heat and wear resistance

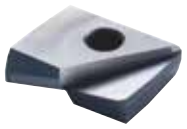


XC4505
- Machining of non-ferrous materials
- Optimal diamond coating for milling graphite









Type
ST

Type	R mm	D mm	Jaw width mm	Depth mm	XP3225 art.no.	€
PFR080R03-ST	0.3	8	2.7	2.4	260650 0803	
PFR080R05-ST	0.5	8	2.7	2.4	260650 0805	
PFR080R10-ST	1	8	2.7	2.4	260650 0810	
PFR080R20-ST	2	8	2.7	2.4	260650 0820	
PFR100R03-ST	0.3	10	3.3	2.6	260650 1003	
PFR100R05-ST	0.5	10	3.3	2.6	260650 1005	
PFR100R10-ST	1	10	3.3	2.6	260650 1010	
PFR100R20-ST	2	10	3.3	2.6	260650 1020	
PFR120R03-ST	0.3	12	4	3	260650 1203	
PFR120R05-ST	0.5	12	4	3	260650 1205	
PFR120R10-ST	1	12	4	3	260650 1210	
PFR120R20-ST	2	12	4	3	260650 1220	
PFR120R30-ST	3	12	4	3	260650 1230	
PFR160R03-ST	0.3	16	5.3	4	260650 1603	
PFR160R05-ST	0.5	16	5.3	4	260650 1605	
PFR160R10_ST	1	16	5.3	4	260650 1610	
PFR160R20-ST	2	16	5.3	4	260650 1620	
PFR160R30-ST	3	16	5.3	4	260650 1630	
PFR200R03-ST	0.3	20	6.7	5	260650 2003	
2133						

Type	R mm	D mm	Jaw width mm	Depth mm	XP3225 art.no.	€
PFR200R05-ST	0.5	20	6.7	5	260650 2005	
PFR200R10-ST	1	20	6.7	5	260650 2010	
PFR200R20-ST	2	20	6.7	5	260650 2020	
PFR200R30-ST	3	20	6.7	5	260650 2030	
PFR250R03-ST	0.3	25	8.3	6	260650 2503	
PFR250R05-ST	0.5	25	8.3	6	260650 2505	
PFR250R10-ST	1	25	8.3	6	260650 2510	
PFR250R20-ST	2	25	8.3	6	260650 2520	
PFR250R30-ST	3	25	8.3	6	260650 2530	
PFR300R03-ST	0.3	30	10	7	260650 3003	
PFR300R05-ST	0.5	30	10	7	260650 3005	
PFR300R10_ST	1	30	10	7	260650 3010	
PFR300R20-ST	2	30	10	7	260650 3020	
PFR300R30_ST	3	30	10	7	260650 3030	
PFR320R03-ST	0.3	32	10.3	7	260650 3203	
PFR320R05-ST	0.5	32	10.3	7	260650 3205	
PFR320R10-ST	1	32	10.3	7	260650 3210	
PFR320R20-ST	2	32	10.3	7	260650 3220	
PFR320R30-ST	3	32	10.3	7	260650 3230	
2133						

Type SH

Type	R mm	D mm	Jaw width mm	Depth mm	XP3310 art.no.	€
PFR080R03-SH	0.3	8	7	2.4	260651 0803	
PFR080R05-SH	0.5	8	7	2.4	260651 0805	
PFR080R10-SH	1	8	7	2.4	260651 0810	
PFR080R20-SH	2	8	7	2.4	260651 0820	
PFR100R03-SH	0.3	10	8.5	2.6	260651 1003	
PFR100R05-SH	0.5	10	8.5	2.6	260651 1005	
PFR100R10-SH	1	10	8.5	2.6	260651 1010	
PFR100R20-SH	2	10	8.5	2.6	260651 1020	
PFR120R03-SH	0.3	12	10	3	260651 1203	
PFR120R05-SH	0.5	12	10	3	260651 1205	
PFR120R10-SH	1	12	10	3	260651 1210	
PFR120R20-SH	2	12	10	3	260651 1220	
PFR120R30-SH	3	12	10	3	260651 1230	
PFR160R03-SH	0.3	16	12	4	260651 1603	
PFR160R05-SH	0.5	16	12	4	260651 1605	
PFR160R10-SH	1	16	12	4	260651 1610	
PFR160R20-SH	2	16	12	4	260651 1620	
PFR160R30-SH	3	16	12	4	260651 1630	
PFR200R03-SH	0.3	20	15	5	260651 2003	
					2133	

Type	R mm	D mm	Jaw width mm	Depth mm	XP3310 art.no.	€
PFR200R05-SH	0.5	20	15	5	260651 2005	
PFR200R10-SH	1	20	15	5	260651 2010	
PFR200R20-SH	2	20	15	5	260651 2020	
PFR200R30-SH	3	20	15	5	260651 2030	
PFR250R03-SH	0.3	25	18.5	6	260651 2503	
PFR250R05-SH	0.5	25	18.5	6	260651 2505	
PFR250R10-SH	1	25	18.5	6	260651 2510	
PFR250R20-SH	2	25	18.5	6	260651 2520	
PFR250R30-SH	3	25	18.5	6	260651 2530	
PFR300R03-SH	0.3	30	22.5	7	260651 3003	
PFR300R05-SH	0.5	30	22.5	7	260651 3005	
PFR300R10-SH	1	30	22.5	7	260651 3010	
PFR300R20-SH	2	30	22.5	7	260651 3020	
PFR300R30-SH	3	30	22.5	7	260651 3030	
PFR320R03-SH	0.3	32	23.5	7	260651 3203	
PFR320R05-SH	0.5	32	23.5	7	260651 3205	
PFR320R10-SH	1	32	23.5	7	260651 3210	
PFR320R20-SH	2	32	23.5	7	260651 3220	
PFR320R30-SH	3	32	23.5	7	260651 3230	
					2133	

Type D diamond-coated

Type	R mm	D mm	Jaw width mm	Depth mm	XC4505 art.no.	€
PFR080R05-D	0.5	8	7	2.4	260652 0805	
PFR080R10-D	1	8	7	2.4	260652 0810	
PFR100R03-D	0.3	10	8.5	2.6	260652 1003	
PFR100R05-D	0.5	10	8.5	2.6	260652 1005	
PFR100R10-D	1	10	8.5	2.6	260652 1010	
PFR120R03-D	0.3	12	10	3	260652 1203	
PFR120R05-D	0.5	12	10	3	260652 1205	
					2133	

Type	R mm	D mm	Jaw width mm	Depth mm	XC4505 art.no.	€
PFR120R10-D	1	12	10	3	260652 1210	
PFR160R03-D	0.3	16	12	4	260652 1603	
PFR160R05-D	0.5	16	12	4	260652 1605	
PFR160R10-D	1	16	12	4	260652 1610	
PFR200R03-D	0.3	20	15	5	260652 2003	
PFR200R05-D	0.5	20	15	5	260652 2005	
PFR200R10-D	1	20	15	5	260652 2010	
					2133	

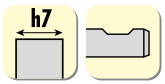
Premium partner

OSG Corporation is the world's largest manufacturer of shank tools. Founded in 1938, OSG has a long-standing reputation for providing total cutting tool solutions throughout the manufacturing industry.

OSG is the No. 1 player in the Japanese cutting tool market and holds a leading position worldwide with a production, sales and technical network in 33 countries.

shaping your dreams

ATORN Countersinking mill, adjustable



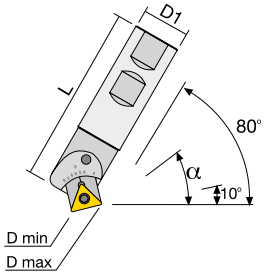
- **Adjustable from 10° to 80°**
- Universal indexable insert countersinking mill for chamfering, deburring and countersinking in fixed operating conditions. Cannot be used on drilling machines
- Stable, smooth operation
- Straight shank with driving planes in accordance with DIN 1835B in tolerance zone h6
- Scale tolerance ± 2.5°, please use a pre-setting device for precise adjustment
- Supplied with clamping screws and wrench



For ISO indexable inserts, type TC.. 1102

- incl. cartridge

D1 mm	L mm	γ °	D min. mm	D max. mm	Max. tightening torque N·m	suitable indexable inserts					art.no.	€
20	100	10°	5.0	26.0	1	TC.. 1102..	A1	B1	C1	D1	260122 0020	
		20°	8.0	27.0								
		30°	10.0	27.0								
		40°	13.0	27.0								
		45°	14.0	27.0								
		50°	15.0	27.0								
		60°	17.0	26.0								
		70°	19.0	25.0								
		80°	20.0	24.0								



Spare parts

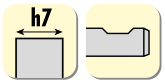
	Cartridge art.no.	€
A1	320901 2001	

	Screw art.no.	€
B1	320901 2002	

	Screw for cartridge art.no.	€
C1	320901 2003	

	TORX art.no.	€
D1	703053 0080	

ATORN Countersinking mill with 2 cartridges, adjustable



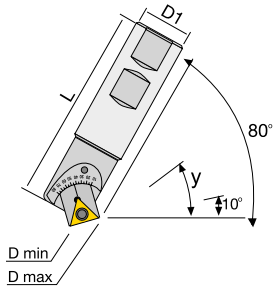
- **Adjustable from 10° to 80°**
- Universal indexable insert countersinking mill for chamfering, deburring and countersinking in fixed operating conditions. Cannot be used on drilling machines. Stable, smooth operation
- Straight shank with driving planes in accordance with DIN 1835B in tolerance zone h6
- Scale tolerance ± 2.5°, please use a pre-setting device for precise adjustment
- Supplied with clamping screws and wrench


Cartridge for SC.. 1204..


Cartridge for TC.. 16T3..

Including two cartridges, one cartridge each for **TCMT 16T3..** and **SCMT 1204..**

D1 mm	L mm	γ °	D min. mm	D max. mm	Max. tightening torque N·m	suitable indexable inserts	art.no.	€
25	95	10° 20° 30° 40° 45° 50° 60° 70° 80°	5.0 6.0 7.0 10.0 11.0 13.0 16.0 19.0 23.0	32.0 33.0 34.0 33.0 33.0 32.0 31.0 29.0 27.0	4.01	TC.. 16T3..	260123 0025	



Spare cartridges

Designation				art.no.	€
Cartridge for SCMT1204..	A1	B1	C2	260124 0012	
Cartridge for TCMT16T3..	A2	B1	C1	260124 0016	


260124 0012


260124 0016

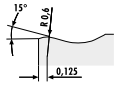
Spare parts

	Screw art.no.	€
A1	260124 0002	
A2	320901 2502	

	Screw for cartridge art.no.	€
B1	260124 0010	

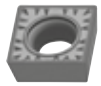
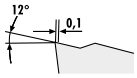
	TORX art.no.	€
C1	703053 0150	
C2	703053 0200	

Chip breaker type MP

F finishing -	M medium ●	R roughing -	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
 Medium processing 	TCMT 16T304-MP			●		○				HC7610	10	311501 3411	
				●		○				HC7620	10	311501 3412	
				●						HC7630	10	311501 3413	
	TCMT 16T308-MP			●		○				HC7610	10	311501 3511	
				●		○				HC7620	10	311501 3512	
				●						HC7630	10	311501 3513	

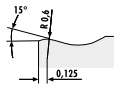
ISO	HC7610	HC7620	HC7630
ISO P steel	Vc = 160 - 340	Vc = 110 - 320	Vc = 80 - 220
ISO K cast iron	Vc = 140 - 240	Vc = 140 - 260	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.16 - 0.25 ap = 0.6 - 4		

Chip breaker type MP

F finishing -	M medium ●	R roughing -	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
 Medium processing 	SCMT 120404-MP			●		○				HC7620	10	311401 2612	
	SCMT 120408-MP			●		○				HC7620	10	311401 2712	

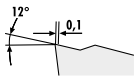
ISO	HC7620
ISO P steel	Vc = 110 - 320
ISO K cast iron	Vc = 140 - 240
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.25 ap = 0.6 - 4

Chip breaker type MP, stainless steel

F finishing -	M medium ●	R roughing -	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
 Medium processing 	TCMT 110204-MP				●			○		HC7520	10	310501 1525	

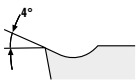
ISO	HC7520
ISO M stainless steel	Vc = 80 - 210
ISO S superalloys	Vc = 30 - 60
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.25 ap = 0.6 - 4

Chip breaker type MP, stainless steel

F finishing -	M medium ●	R roughing -	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
 Medium processing 	SCMT 120408-MP				●			○		HC7520	10	311401 2722	

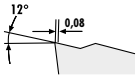
ISO	HC7520
ISO M stainless steel	Vc = 80 - 240
ISO S superalloys	Vc = 30 - 60
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.16 - 0.4 ap = 0.6 - 5

Chip breaker *FFP* Cermet *version*

F finishing ●	M medium -	R roughing -	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
 Fine smoothing 	TCGT 110202-FFP			●	○	○				ATU10T	10	366666 0140	
	TCMT 110204-FFP			●	○	○				ATU10T	10	366666 0240	

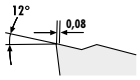
ISO	ATU10T
ISO P steel	Vc = 160 - 300
ISO M stainless steel	Vc = 130 - 240
ISO K cast iron	Vc = 220 - 350
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.2 ap = 0.1 - 1.65

Chip breaker *MP5*

F finishing -	M medium ●	R roughing ○	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
 Medium finishing 			SCMT 09T304-MP5	●	○	○				ACP25T	10	366722 0114	
			SCMT 09T308-MP5	●	○					ACP35T	10	366649 0335	
			SCMT 120408-MP5	●	○	○				ACP25T	10	366649 0625	
				●	○					ACP35T	10	366649 0735	
			SCMT 120412-MP5	●	○	○				ACP25T	10	366722 0514	
				●	○					ACP35T	10	366649 0935	

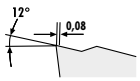
ISO	ACP25T	ACP35T
ISO P steel	Vc = 100 - 240	Vc = 90 - 190
ISO M stainless steel	Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 4.5	

Chip breaker *MM3*, especially for stainless steel

F finishing -	M medium ●	R roughing ○	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
 Medium finishing 			SCMT 120404-MM3	○	●					APM25T	10	366650 0321	
			SCMT 120408-MM3	○	●					APM25T	10	366650 0421	

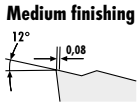
ISO	APM25T
ISO P steel	Vc = 60 - 250
ISO M stainless steel	Vc = 40 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 3.5

Chip breaker *MP5*

F finishing -	M medium ●	R roughing ○	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
 Medium finishing 			TCMT 110204-MP5	●	○	○				ACP25T	10	366665 0225	
				●	○					ACP35T	10	366665 0325	

ISO	ACP25T	ACP35T
ISO P steel	Vc = 100 - 240	Vc = 90 - 200
ISO M stainless steel	Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 4.5	

Chip breaker *MP5*

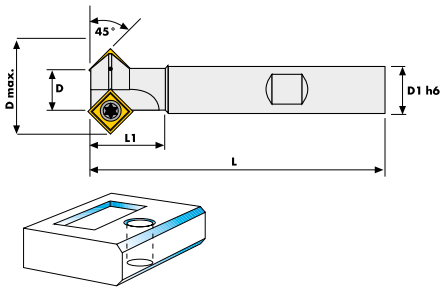
F finishing -	M medium ●	R roughing ○	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
 Medium finishing 			TCMT 090204-MP5	●	○	○				ACP25T	10	366665 0025	
			TCMT 110204-MP5	●		○				ACP15T	10	366665 0115	
				●	○	○				ACP25T	10	366665 0225	
				●	○					ACP35T	10	366665 0325	
			TCMT 110208-MP5	●	○	○				ACP25T	10	366665 0425	
				●	○					ACP35T	10	366665 0535	
			TCMT 16T304-MP5	●	○	○				ACP25T	10	366665 0625	
				●	○					ACP35T	10	366665 0735	
			TCMT 16T308-MP5	●	○	○				ACP25T	10	366665 0825	
				●	○					ACP35T	10	366665 0935	
			TCMT 16T312-MP5	●	○	○				ACP25T	10	366665 1025	

ISO	ACP15T	ACP25T	ACP35T
ISO P steel	Vc = 180 - 400	Vc = 100 - 240	Vc = 90 - 200
ISO M stainless steel		Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 140 - 520	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 4.5		

ATORN 30°/45°/60° chamfer cutter, SCMT and TCMT

h6 | Z 1 | Z 2 | Z 3

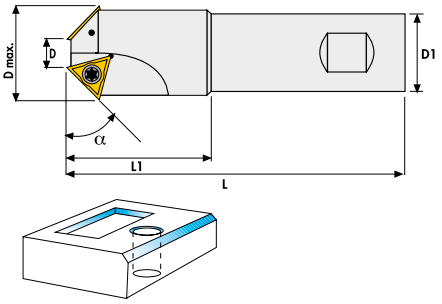
- With Weldon shank
- Suitable for bore diameters from Ø 12 mm
- Uses ISO indexable cutting inserts SCMT.. and TCMT..
- **Internal coolant supply**





45° SCMT.. with IC

D mm	D max. mm	L mm	L1 mm	D1 mm	Z	Max. tightening torque N-m	suitable indexable inserts			art.no.	€
4.0	12	80	28	12.0	1	1	SCMT 0602..	A3	B1	260121 0001	
11.0	20.0	80	32	12.0	2	1	SCMT 0602..	A3	B1	260121 0002	
12.0	23.7	100	37	20.0	1	4	SCMT 09T3..	A2	B2	260121 0003	
12.0	23.7	200	37	20.0	1	4	SCMT 09T3..	A2	B2	260121 1001	
16.0	28.8	100	32	16.0	2	4	SCMT 09T3..	A2	B2	260121 0004	
16.0	28.8	200	32	16.0	2	4	SCMT 09T3..	A2	B2	260121 1002	
30.0	42.3	100	32	20.0	3	4	SCMT 09T3..	A2	B2	260121 0005	
30.0	42.3	200	32	20	3	4	SCMT 09T3..	A2	B2	260121 1003	





30° 45° 60° TCMT.. with internal cooling

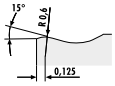
D mm	D max. mm	L mm	L1 mm	D1 mm	γ °	suitable indexable inserts	Max. tightening torque N-m	Z	art.no.	€
1.2	16	70	20	12	45	TC.. 1102..	1	1	260125 4516	
5.4	16	70	20	12	60	TC.. 1102..	1	1	260125 6016	
6	32	100	38	25	30	TC.. 16T3..	4	2	260125 3032	
6.2	21	90	35	20	45	TC.. 1102..	1	2	260125 4521	
10.4	32.5	100	42	25	45	TC.. 16T3..	4	2	260125 4532	
15.8	26	90	35	20	60	TC.. 1102..	1	1	260125 6026	
20.0	35.0	100	39	25.0	60	TC.. 16T3..	4	2	260125 6035	

Spare parts

	Screw	
	art.no.	€
A1	262551 0025	
A2	320901 2502	
A3	320901 2513	

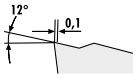
	TORX	
	art.no.	€
B1	703053 0080	
B2	703053 0150	

Chip breaker type MP

F finishing -	M medium ●	R roughing -	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
 Medium processing 	TCMT 110204-MP			●		○				**HC7610**	10	311501 1511	
				●		○				**HC7620**	10	311501 1512	
				●						**HC7630**	10	311501 1513	
	TCMT 16T304-MP			●		○				**HC7610**	10	311501 3411	
				●		○				**HC7620**	10	311501 3412	
				●						**HC7630**	10	311501 3413	
	TCMT 16T308-MP			●		○				**HC7610**	10	311501 3511	
				●		○				**HC7620**	10	311501 3512	
				●						**HC7630**	10	311501 3513	

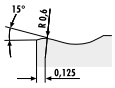
ISO	HC7610	HC7620	HC7630
ISO P steel	Vc = 160 - 340	Vc = 110 - 320	Vc = 80 - 220
ISO K cast iron	Vc = 140 - 240	Vc = 140 - 260	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.25 ap = 0.6 - 4		

Chip breaker type MP

F finishing -	M medium ●	R roughing -	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
 Medium processing 	SCMT 09T304-MP			●		○				**HC7620**	10	311401 1212	
				●						**HC7630**	10	311401 1213	
	SCMT 09T308-MP			●		○				**HC7620**	10	311401 1312	
				●						**HC7630**	10	311401 1313	
	SCMT 120404-MP			●		○				**HC7620**	10	311401 2612	
	SCMT 120408-MP			●		○				**HC7620**	10	311401 2712	

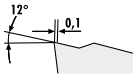
ISO	HC7620	HC7630
ISO P steel	Vc = 110 - 320	Vc = 80 - 220
ISO K cast iron	Vc = 140 - 240	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.25 ap = 0.6 - 4	

Chip breaker type MP, stainless steel

F finishing -	M medium ●	R roughing -	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
 Medium processing 	TCMT 110204-MP				●			○		**HC7520**	10	310501 1525	
	TCMT 16T304-MP				●			○		**HC7520**	10	310501 3425	
	TCMT 16T308-MP				●			○		**HC7520**	10	310501 3525	
					●			○		**HC7530**	10	310501 3526	

ISO	HC7520	HC7530
ISO M stainless steel	Vc = 80 - 210	Vc = 90 - 160
ISO S superalloys	Vc = 30 - 60	Vc = 20 - 50
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.25	f = 0.18 - 0.35
	ap = 0.6 - 4	

Chip breaker type MP, stainless steel

F finishing -	M medium ●	R roughing -	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
 Medium processing 	SCMT 09T308-MP				●			○		**HC7520**	10	311401 1322	
	SCMT 120408-MP				●			○		**HC7520**	10	311401 2722	

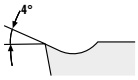
ISO	HC7520
ISO M stainless steel	Vc = 80 - 240
ISO S superalloys	Vc = 30 - 60
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.16 - 0.35 ap = 0.6 - 5

Chip breaker *FFP* Cermet *version*

F finishing	M medium	R roughing
●	-	-



Fine smoothing



ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
TCGT 110202-FFP	●	○	○				**ATU10T**	10	366666 0140	
TCMT 110204-FFP	●	○	○				**ATU10T**	10	366666 0240	

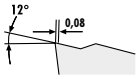
ISO	ATU10T
ISO P steel	Vc = 160 - 300
ISO M stainless steel	Vc = 130 - 240
ISO K cast iron	Vc = 220 - 350
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.05 - 0.2 ap = 0.1 - 1.65

Chip breaker *MP5*

F finishing	M medium	R roughing
-	●	○



Medium finishing



ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
SCMT 09T308-MP5	●	○	○				**ACP25T**	10	366649 0225	
	●	○					**ACP35T**	10	366649 0335	
SCMT 120408-MP5	●	○	○				**ACP25T**	10	366649 0625	

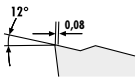
ISO	ACP25T	ACP35T
ISO P steel	Vc = 100 - 240	Vc = 90 - 190
ISO M stainless steel	Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 4.5	

Chip breaker *MM3*, especially for stainless steel

F finishing	M medium	R roughing
-	●	○



Medium finishing



ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
SCMT 09T304-MM3	○	●					**APM25T**	10	366650 0121	
SCMT 09T308-MM3	○	●					**APM25T**	10	366650 0221	
SCMT 120404-MM3	○	●					**APM25T**	10	366650 0321	
SCMT 120408-MM3	○	●					**APM25T**	10	366650 0421	

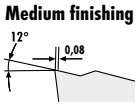
ISO	APM25T
ISO P steel	Vc = 60 - 250
ISO M stainless steel	Vc = 40 - 250
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 3.5

Chip breaker *MP5*

F finishiF finishing	M medium	R roughing
-	●	○



Medium finishing



ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
TCMT 110204-MP5	●	○	○				**ACP25T**	10	366665 0225	
	●	○					**ACP35T**	10	366665 0325	
TCMT 16T304-MP5	●	○	○				**ACP25T**	10	366665 0625	
	●	○					**ACP35T**	10	366665 0735	
TCMT 16T308-MP5	●	○	○				**ACP25T**	10	366665 0825	
	●	○					**ACP35T**	10	366665 0935	

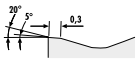
ISO	ACP25T	ACP35T
ISO P steel	Vc = 100 - 240	Vc = 90 - 200
ISO M stainless steel	Vc = 70 - 210	Vc = 55 - 200
ISO K cast iron	Vc = 120 - 250	
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.12 - 0.4 ap = 0.25 - 4.5	

SCMT

F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
●	●	-	SCMT 060204	●						**HC4635**	10	327410 1510	



Medium finishing



ISO	HC4635
ISO P steel	Vc = 60 - 160
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1 - 0.4 ap = max. 0.7 x cutting edge length

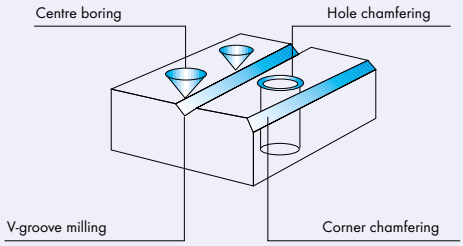
45° chamfer and centring cutter

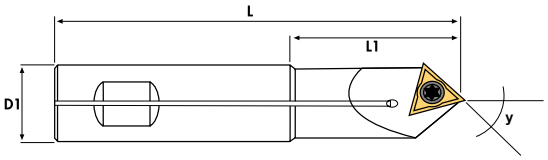
h6 | Z 1 | Vc/fz | 828

- **Internal coolant supply**
- NC spot drilling, engraving, chamfering, centring, V-groove milling
- **When used for chamfering only, an ISO turning insert of type TCMT 16T3.. can be utilised instead**



Suitable for use as standing tool on turning machines for facing





D1 mm	L mm	L1 mm	y °	D min. mm	D max. mm	Z	suitable indexable inserts	Max. tightening torque N-m			art.no.	€
20	115	40	90	0.2	20	1	TCMX 16T3..	4	A1	B1	260126 4540	
20	150	60	90	0.2	20	1	TCMX 16T3..	4	A1	B1	260126 4560	
20	200	80	90	0.2	20	1	TCMX 16T3..	4	A1	B1	260126 4580	

Spare parts

	Screw	
	art.no.	€
A1	320901 2502	

	TORX	
	art.no.	€
B1	703053 0150	

Turning insert for centring

F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
●	●	●	TCMX 16T3ZR	●	●	●				**HC4625**	10	260127 1603	
				●	●	●				**HC4630**	10	260127 1613	



Universal use

ISO	HC4625	HC4630
ISO P steel	Vc = 30 - 70	Vc = 30 - 70
ISO M stainless steel	Vc = 30 - 50	Vc = 30 - 50
ISO K cast iron	Vc = 50 - 90	Vc = 50 - 90
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.02 - 0.04 per cutting edge ap = 0.5 - 1.5	

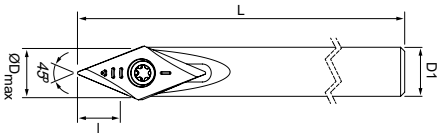
palbit Engraving milling cutters 45°

828

- **For indexable inserts VPGT0602.**
- Very shallow cutting depth, thus very fine engraving
- Steel shank and carbide shank version
- Can be used for different materials by changing the insert



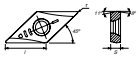
D1 mm	L mm	l mm	D min. mm	D max. mm	Shank	γ °	Max. tightening torque N·m			art.no.	€
6	40	2.0	0.45	2.10	Steel	45	0.6	A1	B1	260130 0040	
6	60	2.0	0.45	2.10	Carbide	45	0.6	A1	B1	260130 0060	
6	100	2.0	0.45	2.10	Carbide	45	0.6	A1	B1	260130 0100	



Spare parts

	Screw		
	art.no.	€	
A1	321099 0526		

	TORX		
	art.no.	€	
B1	703053 0060		

F finishing -	M medium -	R roughing -	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
 Universal use 	VPGT 060202-45LN						●			PH0610	10	270106 0283	
	VPGT 060202-45LM		●	●				●		PHH920	10	270106 0194	

ISO	PH0610	PHH920
ISO M stainless steel		Vc = 100 - 130
ISO N Al/non-ferrous	Vc = 140 - 180	
ISO P steel		Vc = 110 - 160
ISO S superalloys		Vc = 90 - 120
Vc = [m/min] f = [mm/U] ap = [mm]	f = 0.008 - 0.05 ap = 0.10 - 1.00	ap = 0.10 - 0.70

Over 200,000 tools available online!

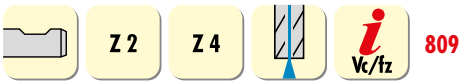
Advantages:
- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages



Register online now!

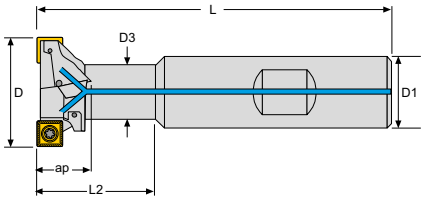
www.saratools.com

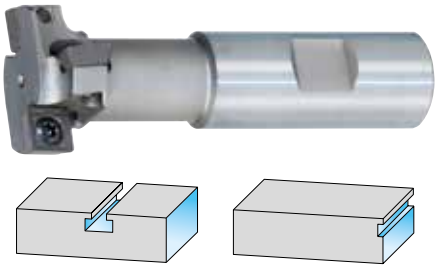
ATORN T-slot milling cutter



809

- **For T-slots in accordance with DIN 650-UNI 4788-ISO 299**
- Straight shank with driving plane
- For ISO milling inserts, type SPMT....
- Supplied with clamping screws and wrench





D mm	D3 mm	L mm	L2 mm	ap max. mm	D1 mm	Z	Max. tightening torque N·m	suitable indexable inserts			art.no.	€
21	11	76	26	9	16	2	1.0	SP.T 0603..	A1	B1	263007 0021	
25	13	82	31	11	16	4	1.0	SP.T 0603..	A1	B1	263007 0025	
32	17	88	38	14	20	4	2.68	SP.T 09T3..	A2	B2	263007 0032	
40	21	108	50	17	25	4	2.68	SP.T 09T3..	A2	B2	263007 0040	
50	27	120	56	22	32	4	7.93	SP.T 1204..	A3	B3	263007 0050	

Spare parts

	Screw art.no.	€
A1	262551 0025	
A2	262551 0035	
A3	321701 0108	

	TORX art.no.	€
B1	703053 0080	
B2	703053 0150	
B3	703053 0200	

SPMT

F finishing	M medium	R roughing	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
○	○	○	SPMT 060304	●	○	○				HC4635	10	263008 0006	
			SPMT 09T308	●	○	○				HC4635	10	263008 0009	
			SPMT 120408	●	○	○				HC4635	10	263008 0012	



Medium finishing

ISO	HC4635
ISO P steel	Vc = 110 - 220
ISO M stainless steel	Vc = 70 - 130
ISO K cast iron	Vc = 120 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.05 - 0.2 ap = 0.5 - 5.0

SPGT ALU

F finishing	M medium	R roughing	ATORN ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		art.no.	€
○	●	○	SPGT 060304 ALU				●			HW4415	10	263009 0006	
			SPGT 09T308 ALU				●			HW4415	10	263009 0009	
			SPGT 120408 ALU				●			HW4415	10	263009 0012	



Universal use

ISO	HW4415
ISO N Al/non-ferrous	Vc = 200 - 700
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.15 ap = 0.5 - 4.0

Marólapka geometria

ISO-jelölési kód az INFORMÁCIÓ részben

INFORMÁCIÓ



AP... a 707. oldaltól



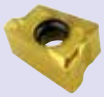
SC... a 711. oldaltól



SE... a 711. oldaltól



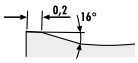
SP... a 713. oldaltól



LN... a 714. oldaltól

ISO milling inserts *APKT / APMX / APMT / ADKT / APKR / APHX*

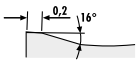
APMT 10

F simító ●	M közepes ●	R nagyoló ●	SARA ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség	Cikkszám	€
 Közepes megmunkálás 			APMT 100305 PDER-M	●	●	●				SC4635	10 281516 3009	

2167

ISO	SC4635
ISO P Acél	Vc = 110 - 120
ISO M Rozsdamentes	Vc = 90 - 160
ISO K Öntvény	Vc = 120 - 250
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,1-0,3 vágóélenként ap = max. 0,7 x vágóélhossz

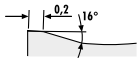
APMT 16

F simító ●	M közepes ●	R nagyoló ●	SARA ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség	Cikkszám	€
 Közepes megmunkálás 			APMT 160408 PDER-M	●	●	●				SC4635	10 281517 3009	

2167

ISO	SC4635
ISO P Acél	Vc = 110 - 220
ISO M Rozsdamentes	Vc = 90 - 160
ISO K Öntvény	Vc = 120 - 250
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,1-0,3 vágóélenként ap = max. 0,7 x vágóélhossz

APKT

F simító ●	M közepes ●	R nagyoló ●	ATORN ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség	Cikkszám	€
 Univerzális felhasználás 			APKT 100305 PDER-S	●		●				HC4615	10 281514 3005	
				●	●					HC4535	10 281514 3007	
				●	●	●				HC4635	10 281514 3009	
			APKT 160408 PDER-S	●		●				HC4615	10 281514 3205	
				●	●					HC4535	10 281514 3207	
				●	●	●				HC4635	10 281514 3209	

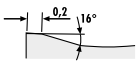
2129

ISO	HC4535	HC4615	HC4635
ISO P Acél	Vc = 100 - 170	Vc = 180 - 280	Vc = 110 - 220
ISO M Rozsdamentes	Vc = 70 - 130		Vc = 90 - 160
ISO K Öntvény		Vc = 160 - 270	Vc = 120 - 250
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,1-0,4 vágóélenként ap = max. 0,7 x vágóélhossz		

APKT Radius

F simító	M közepes	R nagyoló	ATORN ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség		Cikkszám	€
●	●	●											
			APKT 100308 PDER	●	●	●				**HC4540**	10	281514 4011	
			APKT 100312 PDER	●	●	●				**HC4540**	10	281514 4012	
			APKT 100320 PDER	●	●	●				**HC4540**	10	281514 4013	

Univerzális felhasználás



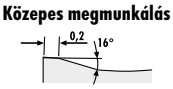
ISO	HC4540
ISO P Acél	Vc = 70 - 130
ISO M Rozsdamentes	Vc = 90 - 160
ISO K Öntvény	Vc = 120 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,1-0,4 vágóélenként ap = max. 0,7 x vágóélhossz

2129

APKT Radius

F simító	M közepes	R nagyoló	SARA ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség		Cikkszám	€
●	●	●											
			APKT 160416-PDER-HCM	●	●	●				**SP35P**	10	281522 1610	
			APKT 160424-PDER-HCM	●	●	●				**SP35P**	10	281522 2410	
			APKT 160432-PDER-HCM	●	●	●				**SP35P**	10	281522 3210	

Közepes megmunkálás



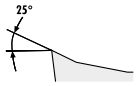
ISO	SP35P
ISO P Acél	Vc = 80 - 180
ISO M Rozsdamentes	Vc = 80 - 220
ISO K Öntvény	Vc = 80 - 290
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,1 - 0,4 ap = max. 0,7 x vágóélhossz

2167

APKR specially for non-ferrous metals

F simító	M közepes	R nagyoló	ATORN ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség		Cikkszám	€
●	●	●											
			APKT 1003 PDFR				●			**HW4415**	10	281715 0025	
			APKT 1604 PDFR				●			**HW4415**	10	281715 0030	

Univerzális felhasználás



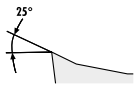
ISO	HW4415
ISO N Alu/nem mágnesezhető fémek	Vc = 200 - 700
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,1-0,4 vágóélenként ap = max. 0,7 x vágóélhossz

2129

APHX specially for non-ferrous metals

F simító	M közepes	R nagyoló	ATORN ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség		Cikkszám	€
●	●	●											
			APHX 100304 FR-ALU				●			**HW4415**	10	281517 2003	
			APHX 160404 FR-ALU				●			**HW4415**	10	281517 2203	

Univerzális felhasználás



polírozott kivitel!

ISO	HW4415
ISO N Alu/nem mágnesezhető fémek	Vc = 200 - 700
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,1-0,4 vágóélenként ap = max. 0,7 x vágóélhossz

2129

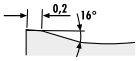
APKT / APHT ISO indexable milling inserts

APKT 10 PDS-R

F simító	M közepes	R nagyoló
●	●	●



Univerzális felhasználás



palbit ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség		Cikkszám	€
APKT 1003-PDS-R	●	●	●				**PH7930**	10	281514 1051	

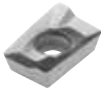
Univerzális lapka

2170

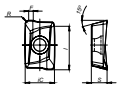
ISO	PH7930
ISO P Acél	Vc = 120 - 180
ISO M Rozsdamentes	Vc = 70 - 150
ISO K Öntvény	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,07-0,20 vágóélenként ap = max. 0,7 x vágóélhossz

APKT 10 PDER-X1

F simító	M közepes	R nagyoló
●	●	●



Univerzális felhasználás



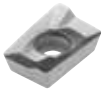
palbit ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség		Cikkszám	€
APKT 100305 PDER-X1	●		●				**PH6920**	10	285320 0242	
	○	●	○				**PH6930**	10	285320 0243	

2170

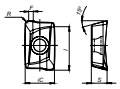
ISO	PH6920	PH6930
ISO P Acél	Vc = 130 - 230	Vc = 120 - 180
ISO M Rozsdamentes		Vc = 70 - 150
ISO K Öntvény	Vc = 80 - 280	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,07-0,15 vágóélenként ap = max. 0,7 x vágóélhossz	

APKT 10 PDSR-X1

F simító	M közepes	R nagyoló
●	●	●



Univerzális felhasználás



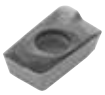
palbit ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség		Cikkszám	€
APKT 100305 PDSR-X1	●		●				**PH6920**	10	285321 0342	
	●		●				**PH6930**	10	285321 0343	

2170

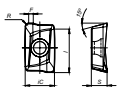
ISO	PH6920	PH6930
ISO P Acél	Vc = 130 - 230	Vc = 120 - 180
ISO K Öntvény	Vc = 80 - 280	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,10-0,25 vágóélenként ap = max. 0,7 x vágóélhossz	

APKT 10 PDER-X

F simító	M közepes	R nagyoló
●	●	●



Univerzális felhasználás



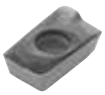
palbit ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség		Cikkszám	€
APKT 100308 PDER-X	●		●				**PH6920**	10	285322 0442	
	○	●	○				**PH6930**	10	285322 0443	

2170

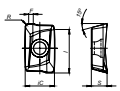
ISO	PH6920	PH6930
ISO P Acél	Vc = 130 - 230	Vc = 120 - 180
ISO M Rozsdamentes		Vc = 70 - 150
ISO K Öntvény	Vc = 80 - 280	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,07-0,15 vágóélenként ap = max. 0,7 x vágóélhossz	

APKT 10 PDSR-X

F simító	M közepes	R nagyoló
●	●	●



Univerzális felhasználás



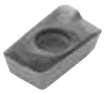
palbit ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség		Cikkszám	€
APKT 100308 PDSR-X	●		●				**PH6920**	10	285323 0542	

2170

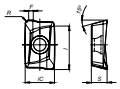
ISO	PH6920
ISO P Acél	Vc = 130 - 230
ISO K Öntvény	Vc = 80 - 280
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,10-0,25 vágóélenként ap = max. 0,7 x vágóélhossz

APKT 10 PDTR-X

F simító	M közepes	R nagyoló	palbit ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség	Cikkszám	€
●	●	●	APKT 100308 PDTR-X	●		●				**PH6920**	10 285324 0642	



Univerzális felhasználás



ISO	PH6920
ISO P Acél	Vc = 130 - 230
ISO K Öntvény	Vc = 80 - 280
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,10-0,25 vágóélenként ap = max. 0,7 x vágóélhossz

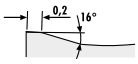
2170

APKT 1604-PDR

F simító	M közepes	R nagyoló	palbit ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség	Cikkszám	€
●	●	●	APKT 1604 PDR	●	●	●				**PH7930**	10 285440 0151	



Univerzális felhasználás



Univerzális lapka

ISO	PH7930
ISO P Acél	Vc = 120 - 180
ISO M Rozsdamentes	Vc = 70 - 150
ISO K Öntvény	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,07-0,20 vágóélenként ap = max. 0,7 x vágóélhossz

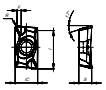
2170

APKT 1604-PDER-X1

F simító	M közepes	R nagyoló	palbit ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség	Cikkszám	€
●	●	●	APKT 160408 PDER-X1	●		●				**PH6920**	10 285328 0142	



Univerzális felhasználás



ISO	PH6920
ISO P Acél	Vc = 130 - 230
ISO K Öntvény	Vc = 80 - 280
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,07-0,15 vágóélenként ap = max. 0,7 x vágóélhossz

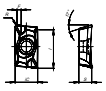
2170

1604-PDER-X2

F simító	M közepes	R nagyoló	palbit ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség	Cikkszám	€
●	●	●	APKT 160408 PDER-X2	●		●				**PH7920**	10 285329 0250	
				○	●	○				**PH7930**	10 285329 0251	



Univerzális felhasználás



ISO	PH7920	PH7930
ISO P Acél	Vc = 130 - 230	Vc = 120 - 180
ISO M Rozsdamentes		Vc = 70 - 150
ISO K Öntvény	Vc = 80 - 280	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,07-0,15 vágóélenként ap = max. 0,7 x vágóélhossz	

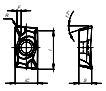
2170

APKT 1604-PDSR-X1

F simító	M közepes	R nagyoló	palbit ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség	Cikkszám	€
●	●	●	APKT 160408 PDSR-X1	●		●				**PH6920**	10 285330 0342	
				●		●				**PH6930**	10 285330 0343	



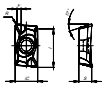
Univerzális felhasználás



ISO	PH6920	PH6930
ISO P Acél	Vc = 130 - 230	Vc = 120 - 180
ISO K Öntvény	Vc = 80 - 280	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,10-0,25 vágóélenként ap = max. 0,7 x vágóélhossz	

2170

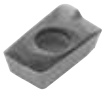
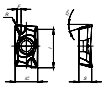
APKT 1604-PDSR-X2

F simító ●	M közepes ●	R nagyoló ●	palbit ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség		Cikkszám	€
 Univerzális felhasználás 			APKT 160408 PDSR-X2	●		●				**PH7920**	10	285331 0450	
				●		●				**PH7930**	10	285331 0451	

2170

ISO	PH7920	PH7930
ISO P Acél	Vc = 130 - 230	Vc = 120 - 180
ISO K Öntvény	Vc = 80 - 280	Vc = 80 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,10-0,25 vágóélenként ap = max. 0,7 x vágóélhossz	

APKT 1604-PDSR-X

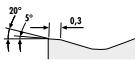
F simító ●	M közepes ●	R nagyoló ●	palbit ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség		Cikkszám	€
 Univerzális felhasználás 			APKT 160416 PDSR-X	●		●				**PH6920**	10	285333 0642	

2170

ISO	PH6920
ISO P Acél	Vc = 130 - 230
ISO K Öntvény	Vc = 80 - 280
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,10-0,25 vágóélenként ap = max. 0,7 x vágóélhossz

SCMT ISO milling inserts

SCMT

F simító ●	M közepes ●	R nagyoló -	ATORN ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség		Cikkszám	€
 Közepes megmunkálás 			SCMT 060204	●						**HC4635**	10	327410 1510	

2129

ISO	HC4635
ISO P Acél	Vc = 60 - 160
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,1 - 0,4 ap = max. 0,7 x vágóélhossz

SEEN ISO marólapkák

SEEN

F simító ●	M közepes ●	R nagyoló ●	ATORN ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség		Cikkszám	€
 Univerzális felhasználás			SEEN 1203 AFFN	●	●					**HC4620**	10	284215 2905	
			SEEN 1203 AF-SN	●	●					**HC4620**	10	284215 3005	
				●	●	●				**HC4640**	10	284215 3007	
			SEEN 1203 AF-SN							**HC4640**			

2129

ISO	HC4540	HC4620	HC4640
ISO P Acél	Vc = 180 - 230	Vc = 120 - 210	Vc = 180 - 230
ISO M Rozsdamentes	Vc = 105 - 135	Vc = 110 - 155	Vc = 105 - 135
ISO K Öntvény	Vc = 170 - 215		Vc = 170 - 215
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,1-0,4 vágóélenként ap = max. 6,0		

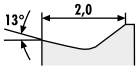
SEET ISO milling inserts

SEET

F simító	M közepes	R nagyoló	ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség		Cikkszám	€
			SEET 1204 AF-FN			●	●			**HW4410**	10	284225 3001	
			SEET 1204 AFSN	●	●	●				**HC4620**	10	284225 3005	
			SEET 1204 AF-SN	●	●	●				**HC4540**	10	284225 3007	



Univerzális felhasználás



ISO	HC4620	HC4640	HW4410
ISO P Acél	Vc = 205 - 280		
ISO M Rozsdamentes	Vc = 120 - 165		
ISO K Öntvény	Vc = 190 - 265		
ISO N Alu/nem mágnesezhető fémek			Vc = 125 - 680
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,1-0,4 vágóélenként ap = max. 6,0		

2129

SEKN ISO milling inserts

SEKN

F simító	M közepes	R nagyoló	ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség		Cikkszám	€
			SEKN 1203 AFSN	●	●	●				**PH6920**	10	285448 0142	



Univerzális felhasználás

ISO	PH6920
ISO P Acél	Vc = 120 - 250
ISO M Rozsdamentes	Vc = 100 - 200
ISO K Öntvény	Vc = 120 - 220
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,1-0,4 vágóélenként ap = max. 6,0

2170

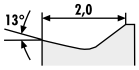
SEHT ISO milling inserts

SEHT

F simító	M közepes	R nagyoló	ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség		Cikkszám	€
			SEHT 1204 AFEN	●	●	●				**PH6740**	10	285229 0139	



Univerzális felhasználás



ISO	PH6740
ISO P Acél	Vc = 80 - 180
ISO M Rozsdamentes	Vc = 80 - 220
ISO K Öntvény	Vc = 80 - 290
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,1-0,4 vágóélenként ap = max. 6,0

2170

SPKN ISO milling inserts

SPKN

F simító	M közepes	R nagyoló	ATORN ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség		Cikkszám	€
●	●	●											
 Univerzális felhasználás			SPKN 1203 EDSR	●	●	●				**HC4620**	10	285720 5605	
				●	●	●				**HC4540**	10	285720 5607	

ISO	HC4540	HC4620
ISO P Acél	Vc = 200 - 270	Vc = 205 - 280
ISO M Rozsdamentes	Vc = 120 - 160	Vc = 120 - 165
ISO K Öntvény	Vc = 190 - 255	Vc = 190 - 265
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,1-0,4 vágóélenként ap = max. 6,0	

2129

ISO milling inserts *SPMT / SPGT*

SPMT

F simító	M közepes	R nagyoló	ATORN ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség		Cikkszám	€
○	○	○											
 Közepes megmunkálás			SPMT 060304	●	○	○				**HC4635**	10	263008 0006	
			SPMT 09T308	●	○	○				**HC4635**	10	263008 0009	
			SPMT 120408	●	○	○				**HC4635**	10	263008 0012	

ISO	HC4635
ISO P Acél	Vc = 110 - 220
ISO M Rozsdamentes	Vc = 70 - 130
ISO K Öntvény	Vc = 120 - 230
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,05 - 0,2 ap = 0,5 - 5,0

2131

SPGT ALU

F simító	M közepes	R nagyoló	ATORN ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség		Cikkszám	€
○	●	○											
 Univerzális felhasználás			SPGT 060304 ALU				●			**HW4415**	10	263009 0006	
			SPGT 09T308 ALU				●			**HW4415**	10	263009 0009	
			SPGT 120408 ALU				●			**HW4415**	10	263009 0012	

ISO	HW4415
ISO N Alu/nem mágnesezhető fémek	Vc = 200 - 700
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,15 ap = 0,5 - 4,0

2131

Több mint 200 000 szerszámot kínálunk online!

Előnyök:
- kényelmes, áttekinthető és gyors
- a 17:30-ig megrendelt terméket már másnapra kiszállítjuk
- mérőműszerek rendelése kalibrálással együtt
- valós idejű rendelkezésre állás
- 8 nyelven is elérhető



Regisztráljon most online!

www.saratools.com

4-10 Power / 4-15 Power

- Cutting edges are marked with dots; please always use cutting edges with the same dots
- Quality grade HC 4535, ideal for stainless steel
- MM universal milling
- HW 4310 for aluminium, uncoated K10
- **PVD TiAlN/TiN**: coated carbide metal types

LNM(E)X 10

F simító	M közepes	R nagyoló	ATORN ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség	Cikkszám	€
●	●	●										
			LNMX 100605 PNR-MM	●	●	●				**HC4630**	10 295811 0001	
					●					**HC4535**	10 295813 0001	
							●			**HW4410**	10 295815 0002	
Univerzális felhasználás												

2129

ISO	HC4535	HC4630	HW4410
ISO P Acél		Vc = 110 - 220	
ISO M Rozsdamentes	Vc = 120 - 180	Vc = 90 - 160	
ISO K Öntvény		Vc = 120 - 230	
ISO N Alu/nem mágnesezhető fémek			Vc = 200 - 300
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,05-0,20 vágóélenként ap = max. 0,7 x vágóélhossz		

LNM(E)X 15

F simító	M közepes	R nagyoló	ATORN ISO-jelölés	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Minőség	Cikkszám	€
●	●	●										
			LNMX 151008 PNR-MM	●	●	●				**HC4630**	10 295821 0001	
					●					**HC4535**	10 295825 0001	
							●			**HW4410**	10 295826 0002	
Univerzális felhasználás												

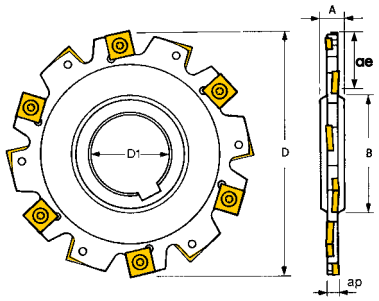
2129

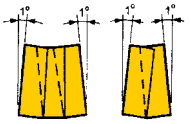
ISO	HC4535	HC4630	HW4410
ISO P Acél		Vc = 110 - 220	
ISO M Rozsdamentes	Vc = 120 - 180	Vc = 90 - 160	
ISO K Öntvény		Vc = 120 - 230	
ISO N Alu/nem mágnesezhető fémek			Vc = 200 - 300
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0,05-0,20 vágóélenként ap = max. 0,7 x vágóélhossz		

ATORN Disc milling cutters

828

- Three cutting edges
- Fixed width
- Generates a slight roof shape at the base of the groove
- Screw-in indexable inserts
- For slotting, cutting and groove milling
- Supplied with clamping screws





Axiális szög: -3°, radiális szög: -12°



D mm	D1 mm	ap mm	A mm	B mm	Z	Z eff.	Vágási mélység ae max. mm	megfelelő váltólapkák	Cikkszám	€
63,0	22,0	4	8	34	8	4	14	SNHX 1102T	262600 6304	
63,0	22,0	5	8	34	8	4	14	SNHX 1103T	262600 6305	
63,0	22,0	6	8	34	6	3	14	SNHX 1203T	262600 6306	
80,0	22,0	4	8	34	10	5	22	SNHX 1102T	262600 8004	
80,0	22,0	5	8	34	10	5	22	SNHX 1103T	262600 8005	
80,0	22,0	6	8	34	8	4	22	SNHX 1203T	262600 8006	
100,0	27,0	4	12	45	12	6	25	SNHX 1102T	262600 1004	
100,0	27,0	5	12	45	12	6	25	SNHX 1103T	262600 1005	
100,0	27,0	6	12	45	10	5	25	SNHX 1203T	262600 1006	
100,0	27,0	10	12	45	10	5	25	SNHX 1205T	262600 1010	
125,0	40,0	4	12	58	12	6	31	SNHX 1102T	262600 1204	
125,0	40,0	5	12	58	12	6	31	SNHX 1103T	262600 1205	
125,0	40,0	6	12	58	12	6	31	SNHX 1203T	262600 1206	
125,0	40,0	10	12	58	12	6	31	SNHX 1205T	262600 1210	
160,0	40,0	4	12	68	18	9	44	SNHX 1102T	262600 1604	
160,0	40,0	5	12	68	18	9	44	SNHX 1103T	262600 1605	
160,0	40,0	6	12	68	16	8	44	SNHX 1203T	262600 1606	
160,0	40,0	10	12	68	16	8	44	SNHX 1205T	262600 1610	
160,0	40,0	14	14	68	15	5	44	SNHX 1205T	262600 1614	
200,0	50,0	4	12	72	18	9	62	SNHX 1102T	262600 2004	
200,0	50,0	5	12	72	18	9	62	SNHX 1103T	262600 2005	
200,0	50,0	6	12	72	18	9	62	SNHX 1203T	262600 2006	
200,0	50,0	10	12	72	18	9	62	SNHX 1205T	262600 2010	
200,0	50,0	14	14	72	18	6	62	SNHX 1205T	262600 2014	
250,0	50,0	10	12	72	24	12	87	SNHX 1205T	262600 2510	

2125

Alkatrészek

	Csavar			TORX	
	Cikkszám	€		Cikkszám	€
A1	285799 3530		B1	703053 0090	
A2	285799 3540		B2	703053 0150	
A3	285799 4050				
A4	285799 4080				
	3106			7114	

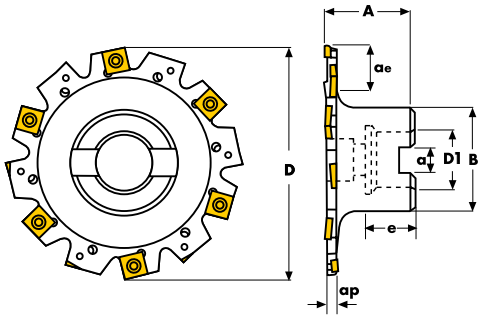
Több mint 200 000 szerszámot kínálunk online!
Regisztráljon most online!

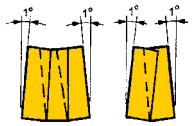


www.saratools.com

Vc/fz **828**

- Three cutting edges
- Fixed width
- Generates a slight roof shape at the base of the groove
- Screw-in indexable inserts
- For slotting, cutting and groove milling
- Supplied with clamping screws





Axiális szög: -3°, radiális szög: -12°



D mm	D1 mm	ap mm	A mm	B mm	Z	Z eff.	Vágási mélység ae max. mm	a mm	e mm	megfelelő váltólapkák	Cikkszám	€
63,0	22	4	50	40	8	4	10,5	10,4	21	SNHX 1102T	262610 6304	
63,0	22	5	50	40	8	4	10,5	10,4	21	SNHX 1103T	262610 6305	
63,0	22	6	50	40	6	3	10,5	10,4	21	SNHX 1203T	262610 6306	
80,0	22	4	50	40	10	5	20,0	10,4	21	SNHX 1102T	262610 8004	
80,0	22	5	50	40	10	5	20,0	10,4	21	SNHX 1103T	262610 8005	
80,0	22	6	50	40	8	4	20,0	10,4	21	SNHX 1203T	262610 8006	
100,0	27	4	50	48	12	6	24,2	12,4	23	SNHX 1102T	262610 1004	
100,0	27	5	50	48	12	6	24,2	12,4	23	SNHX 1103T	262610 1005	
100,0	27	6	50	48	10	5	24,2	12,4	23	SNHX 1203T	262610 1006	
100,0	27	10	50	48	10	5	24,2	12,4	23	SNHX 1205T	262610 1010	
125,0	40	6	50	70	12	6	23,7	16,4	30	SNHX 1203T	262610 1206	
125,0	40	10	50	70	12	6	23,7	16,4	30	SNHX 1205T	262610 1210	
160,0	40	6	50	70	16	8	41,2	16,4	30	SNHX 1203T	262610 1606	
160,0	40	10	50	70	16	8	41,2	16,4	30	SNHX 1205T	262610 1610	

2125

Alkatrészek

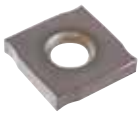
	Csavar	
	Cikkszám	€
A1	285799 3530	
A2	285799 3540	
A3	285799 4050	
A4	285799 4080	

3106

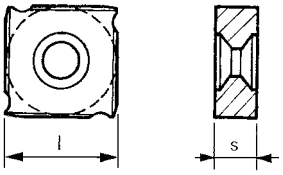
	TORX	
	Cikkszám	€
B1	703053 0090	
B2	703053 0150	

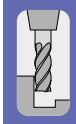
7114

ATORN *SNHX* milling inserts



ISO-jelölés	l mm	s mm	ISO P M K	HC4630 TiAlN Cikkszám	€	ISO N	HW4415 bevonat nélkül Cikkszám	€
SNHX 1102T	11	2,3	10	285705 0107		10	285707 0107	
SNHX 1103T	11	2,7	10	285705 0207		10	285707 0207	
SNHX 1203T	13	3,2	10	285705 0307		10	285707 0307	
SNHX 1205T	13	5,4	10	285705 0507		10	285707 0507	
				2129			2129	

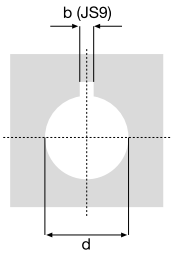




Push broaches (keyway broaches)

- For manufacturing true-to-size and precisely centred keyways in accordance with DIN 6885
- Can be used on normal workshop presses (hand press or hydraulic press), no special machinery required
- Low tooling time
- Good surface finish on machined workpieces
- Manufacturing time for one keyway only approx. 1 minute
- Broaches supplied with inserts for achieving the cutting depth
- Special alloy HSS steel for machining any materials with a hardness of up to 34 HRC
- Broaches with other rake angles are available on request for machining solid or very soft materials.
- Square and multi-purpose four square broaches are available on request.
- **From size 32 x 102, guide bush without collar**
- **Use:**
  1. Slide guide bush into workpiece bore and insert broach until the first tooth on the workpiece is standing upright
  2. Lubricate broach
  3. Push broach in approx. 1/3
  4. Briefly release plunger and push broach in fully
  5. Clean broach and fit insert for the second pass
  6. Repeat broaching operation





Broaches

Groove in workpiece b (JS9) x depth mm	Broach length mm	Broaching length min./max. mm	Number of faces	art.no.	€
2 x 1.0	133	6 - 30	1	234001 0020	
3 x 1.4	133	6 - 30	2	234001 0030	
4 x 1.8	178	8 - 43	2	234001 0040	
5 x 2.3	178	8 - 43	2	234001 0050	
6 x 2.8	302	10 - 64	2	234001 0060	
8 x 3.3	302	10 - 64	2	234001 0080	
10 x 3.3	352	20 - 150	3	234001 0100	
12 x 3.3	352	20 - 150	3	234001 0120	
14 x 3.8	352	20 - 150	3	234001 0140	
16 x 4.3	387	20 - 150	4	234001 0160	
18 x 4.4	387	20 - 150	4	234001 0180	

2114



Guide bushes

d h9 mm	L mm	Guide bushes for broaches mm	art.no.	€
6	32	2-3	234005 0632	
7	32	2-3	234005 0732	
8	32	2-3	234005 0832	
9	32	2-3	234005 0932	
10	32	2-3	234005 1032	
11	46	4-5	234005 1146	
12	46	4-5	234005 1246	
14	46	4-5	234005 1446	
15	46	4-5	234005 1546	
16	46	4-5	234005 1646	
17	46	4-5	234005 1746	
17	65	6-8	234005 1765	
18	65	6-8	234005 1865	
19	65	6-8	234005 1965	
20	65	6-8	234005 2065	
22	65	6-8	234005 2265	
24	65	6-8	234005 2465	
25	65	6-8	234005 2565	

2114

d h9 mm	L mm	Guide bushes for broaches mm	art.no.	€
26	65	6-8	234005 2665	
28	65	6-8	234005 2865	
30	65	6-8	234005 3065	
32	102	10-14	234005 3210	
34	102	10-14	234005 3410	
35	102	10-14	234005 3510	
36	102	10-14	234005 3610	
38	102	10-14	234005 3810	
40	102	10-14	234005 4010	
42	102	10-14	234005 4210	
44	102	10-14	234005 4410	
45	127	10-14	234005 4512	
46	127	10-14	234005 4612	
48	127	10-14	234005 4812	
50	127	10-14	234005 5012	
52	127	16-18	234005 5212	
54	127	16-18	234005 5412	
55	127	16-18	234005 5512	

2114

d h9 mm	L mm	Guide bushes for broaches mm	art.no.	€
56	127	16-18	234005 5612	
58	127	16-18	234005 5812	
60	154	16-18	234005 6015	
62	154	16-18	234005 6215	
64	154	16-18	234005 6415	
65	154	16-18	234005 6515	
66	154	16-18	234005 6615	
68	154	16-18	234005 6815	
70	154	16-18	234005 7015	

2114



Sets

Contents	art.no.	€
1 broach for each keyway width, 2/3/4/5/6/8 mm, incl. inserts. 1 guide bush in each size, 8/10/12/14/15/16/18/20/22/24/25/28/30	234010 0208	
1 broach for each keyway width, 4/5/6/8 mm, incl. inserts. 1 guide bush in each size, 12/14/15/16/18/20/22/24/25	234010 0408	

2114

MILLING TOOLS
TECHNICAL

CUTTING DATA

USAGE RECOMMENDATIONS

MACHINING NOTES

TYPE DESCRIPTIONS

SYSTEMS OVERVIEWS

PROGRAMMING NOTES

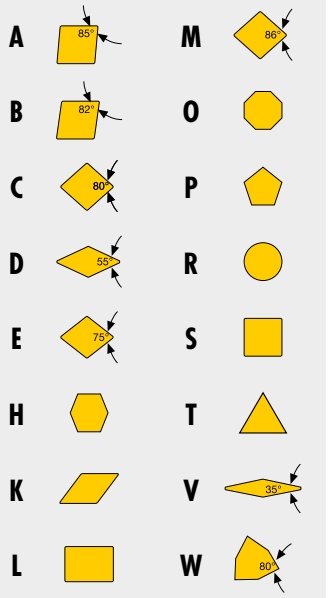


ISO designation system for indexable cutting inserts according to ISO 1832

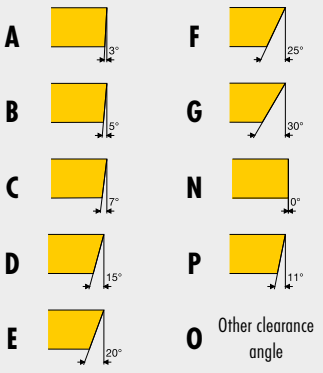
Example of indexable milling inserts

S	E	K	N	12	03	AF	T	N	...
1	2	3	4	5	6	7	8	9	10

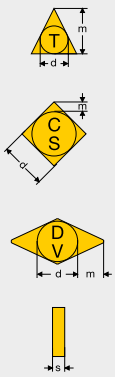
1 Insert form



2 Clearance angle



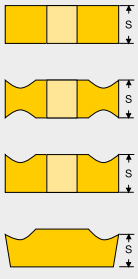
3 Tolerances



	d	m	s
A	± 0.025	± 0.005	± 0.025
C	± 0.025	± 0.013	± 0.025
E	± 0.025	± 0.025	± 0.025
F	± 0.013	± 0.005	± 0.025
G	± 0.025	± 0.025	± 0.05-0.13
H	± 0.013	± 0.013	± 0.025
J[1]	± 0.05-0.15[2]	± 0.005	± 0.025
K[1]	± 0.05-0.15[2]	± 0.013	± 0.025
L[1]	± 0.05-0.15[2]	± 0.013	± 0.025[1]
M	± 0.05-0.15[2]	± 0.08-0.20[2]	± 0.013
M	± 0.05-0.15[2]	± 0.08-0.20[2]	± 0.025
N	± 0.05-0.25[2]	± 0.13-0.38[2]	± 0.05-0.13

[1] Inserts with ground face-edge cutters
[2] Each according to insert size (see ISO standard 1832)
The tolerances m and d are not dependent on the insert form.

6 Insert thickness



	s (mm)
01	1.59
T1	1.98
02	2.38
T2	2.78
03	3.18
T3	3.97
04	4.76
05	5.56
06	6.35
07	7.94
09	9.52

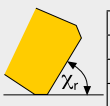
7 Corner rounding



	r (mm)
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
24	2.4

R

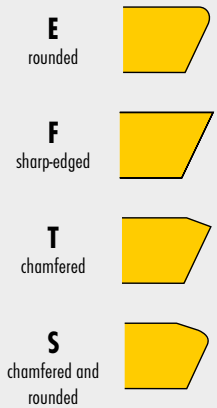
00	for diameter in inches converted into mm
M0	for diameter in metric dimensions



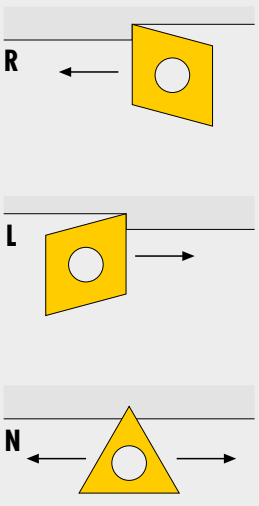
Tool cutting edge angle	
A	45°
D	60°
E	75°
F	85 °
P	90°
Z	Other

Clearance angle on the face plate	
A	3 °
B	5 °
C	7°
D	15 °
E	20 °
F	25°
G	30 °
N	0 °
P	11 °
Z	Other

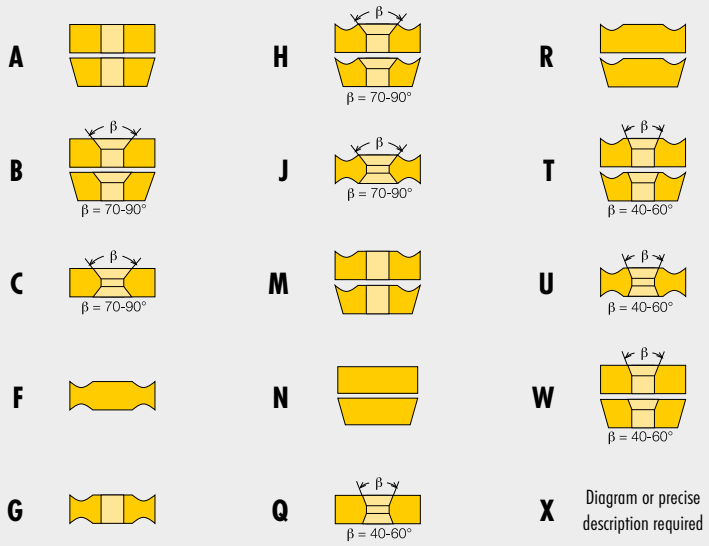
8 Cutting edge formation



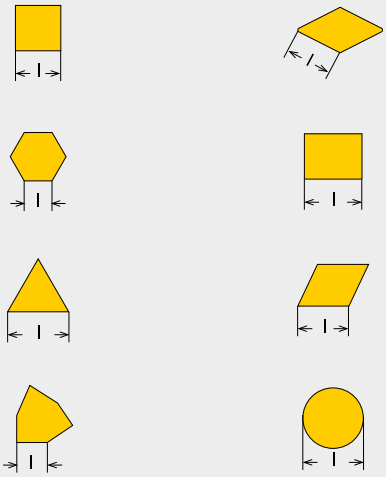
9 Cutting direction



4 Cutting and fixing qualities



5 Cutting edge length



10 Manufacturer information

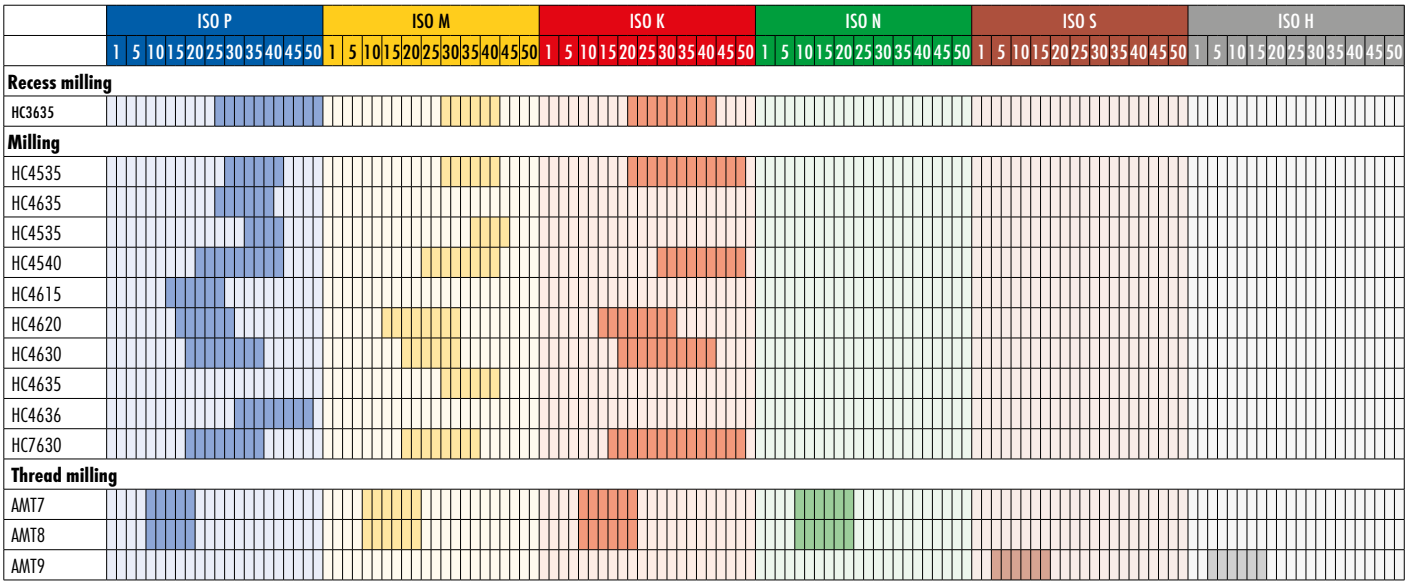
**The ISO code comprises 9 symbols, whereby symbols 8 and/or 9 are used only where necessary.
The manufacturer can affix further symbols to the ISO code with a hyphen
e.g. to indicate the chip breaker form).**



ATORN Cutting material table Carbide qualities, coated

Cutting speed – Wear resistance

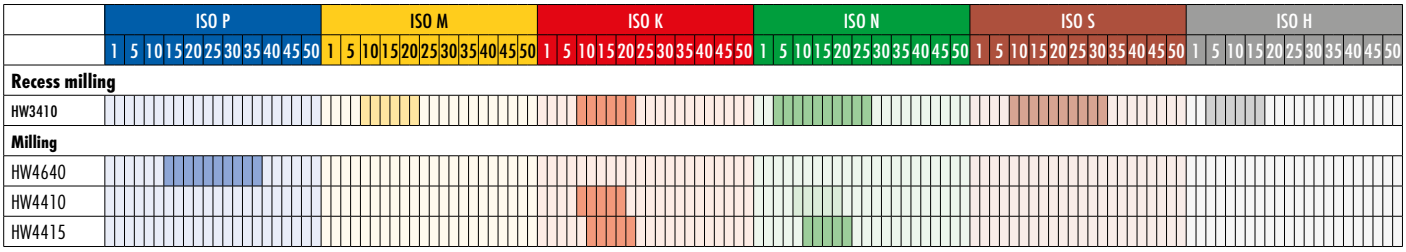
Feed – Toughness



ATORN Cutting material table Carbide qualities, uncoated

Cutting speed – Wear resistance

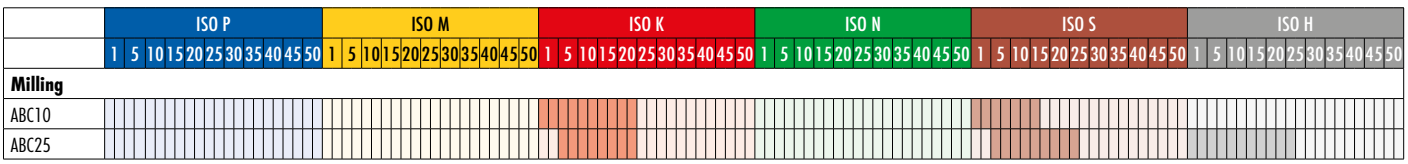
Feed – Toughness



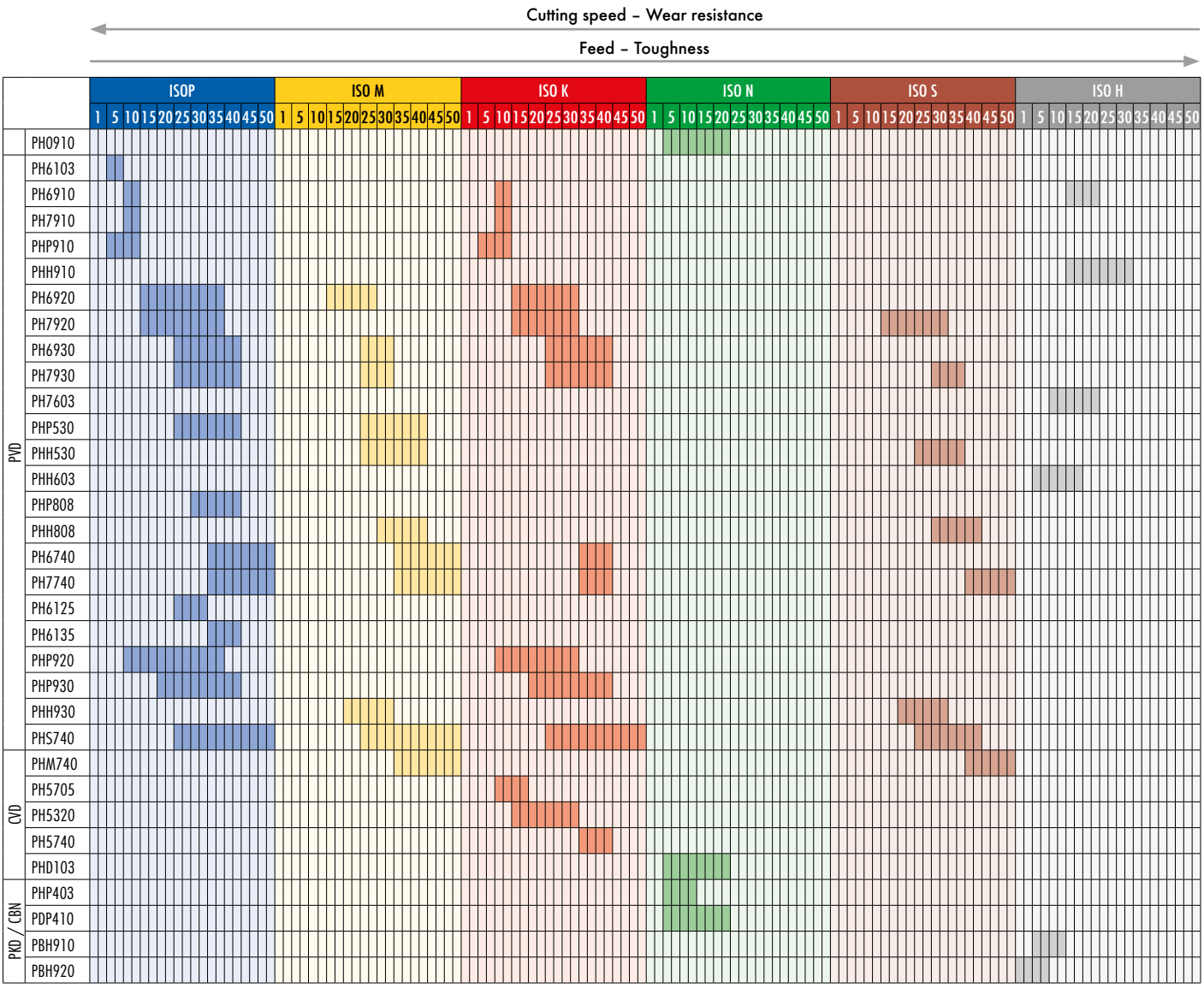
ATORN Cutting material table CBN / PKD

Cutting speed – Wear resistance

Feed – Toughness



palbit Cutting material table Carbide qualities



YOUR DRILL
GIVES UP. WHAT DO YOU DO? YOU REACH
FOR A NEW ONE
AND SIMPLY CARRY ON:
SARA®GO TOOL DISPENSING SYSTEM.
THAT'S POWER TO PRODUCE
SARATOOLS.com
POWER TO PRODUCE
A BRAND OF SARTORIUS WERKZEUGE

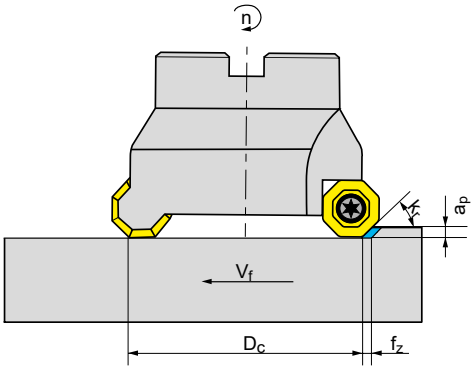
Designations and formulae (milling)

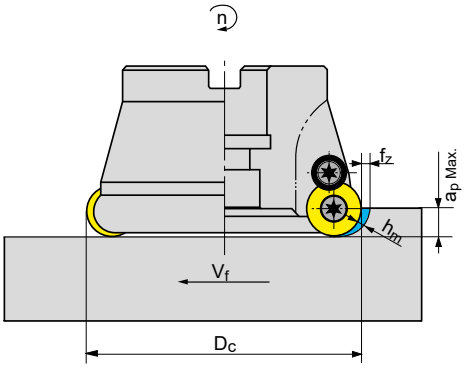
Dc	Cutting diameter	mm
ae	Radial cutting width	mm
ap	Axial cutting depth	mm
f	Feed per revolution	mm/rev
fz	Feed per tooth	mm/rev
De	Effective cutting diameter	mm
Vc	Cutting speed	m/min.
Q	Material removal rate	cm^3/min.
l	Working length	mm
Vf	Feed rate	m/min.
Dap	Max. cutting diameter for specified cutting depth	mm
zn	Number of cutting corners in the tool	

zc	Effective number of cutting edges	
hex	Maximum chip thickness	mm
hm	Average chip thickness	mm
kc1	Specific cutting force (hex = 1 mm)	N/mm^2
Pa	Drive power	kW
kr	Tool cutting edge angle	° (degree)
Vco	Cutting speed (constant)	
Cvc	Cutting speed correction factor	
n	Rotational speed	rpm
ηmt	Efficiency	%
mc	Increasing the specific cutting force through the chip thickness	

Cutting speed	$V_c = \frac{\pi \times D_c \times n}{1000} = m/min.$
Feed	$V_f = f_z \times n \times z_n = mm/min.$
Feed per revolution	$f_n = \frac{V_f}{n} = mm/U$
Specif. cutting force	$k_c = k_{c1} \times h_{nm}^{-mc} = N/mm^2$
Average chip thickness (face and shoulder milling) ae / Dc ≤ 0.1	$h_m = f_z \sqrt{\frac{a_e}{D_c}} = mm$
Average chip thickness ae / Dc ≥ 0.1	$h_m = \frac{\sin k_r \times 180 \times a_e \times f_z}{\pi \times D_c \times \arcsin\left(\frac{a_e}{D_c}\right)} = mm$

Rotational speed	$n = \frac{V_c \times 1000}{\pi \times D_c} = U/min.$
Feed per tooth	$f_z = \frac{V_f}{n \times z_n} = mm/U$
Material removal rate	$Q = \frac{a_p \times a_e \times V_f}{1000} = cm^3/min.$
Effective cutting edge diameter	$D_e = 2 \times \sqrt{a_p \times (D_c - a_p)} = mm$
Drive power	$P_a = \frac{a_p \times a_e \times V_f \times k_c}{60 \times 10^6 \times \eta_{mt}} = kW$
Machining time	$T_c = \frac{l}{V_f} = min.$





Recommendations for toothing and tooth shapes

INFO

Sawing solid material

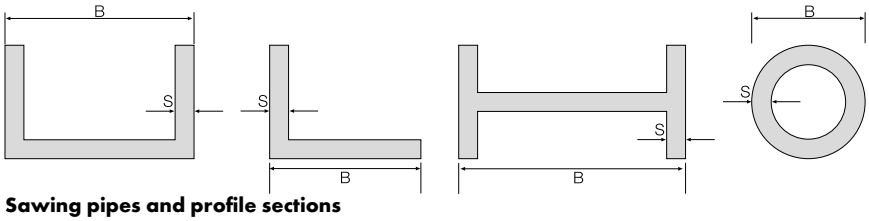
Standard toothing		Combination toothing	
Material cross-section	Tooth pitch with tooth shape	Material cross-section	Tooth pitch with tooth shape
< 12 mm	**14 TPI.N**	**< 25 mm**	**10/14 standard**
12 - 30 mm	**10 TPI.N**	**20 - 40 mm**	**8/12 standard**
30 - 50 mm	**8 TPI.N**	**25 - 70 mm**	**6/10 standard**
50 - 80 mm	**6 TPI.N**	**35 - 90 mm**	**5/8 ZpZ. standard**
80 - 100 mm	4 TPI.small	50 - 100 mm	4/6 TPI.plus
110 - 200 mm	3 TPI.small	80 - 150 mm	3/4 TPI.plus
200 - 350 mm	2 TPI.small	120 - 350 mm	2/3 TPI.plus
300 - 700 mm	1,25 small	300 - 500 mm	1,33/2 TPI.plus
> 700 mm	0,75 small	> 500 mm	0,75 - 1,25 TPI.plus

in bold = catalogue version

Correct toothing

Selecting the correct tooth pitch is essential to achieve the best possible cutting results:

- The tooth pitch is calculated from the working length of the saw band.
- Selecting too low a pitch can cause deviations in cutting, as chips may block the cutting teeth and force the saw band off its cutting line.
- Selecting too high a pitch can cause teeth to become bent, as the cutting pressure on individual teeth is too large.
- At least three teeth should be engaged to achieve cost-effective results.



Sawing pipes and profile sections

Wall thickness S mm	Teeth per inch diam. B 20	40	60	80	100	120	150	200	300	500	750	1000
2	32	24	18	18	**14**	**14**	**10/14**	**10/14**	**8/12**	**6/10**	**5/8**	**5/8**
3	24	18	**14**	**14**	**10/14**	**10/14**	**8/12**	**8/12**	**6/10**	**5/8**	**4/6 0°**	**4/6 0°**
4	**18**	**10/14**	**10/14**	**10/14**	**8/12**	**8/12**	**6/10**	**6/10**	**5/8**	**4/6 0°**	**4/6 0°**	**4/6 0°**
5	**18**	**10/14**	**10/14**	**8/12**	**6/10**	**6/10**	**6/10**	**5/8**	**4/6 0°**	**4/6 0°**	**4/6 0°**	**3/4 0°**
6	**14**	**8/12**	**8/12**	**8/12**	**6/10**	**6/10**	**5/8**	**5/8**	**4/6 0°**	**4/6 0°**	**3/4 0°**	**3/4 0°**
8		**6/10**	**6/10**	**6/10**	**5/8**	**5/8**	**5/8**	**4/6 0°**	**4/6 0°**	**3/4 0°**	**3/4 0°**	**3/4 0°**
10		**6/10**	**6/10**	**5/8**	**5/8**	**5/8**	**4/6 0°**	**4/6 0°**	**4/6 0°**	**3/4 0°**	**3/4 0°**	**3/4 0°**
12		**5/8**	**5/8**	**5/8**	4/6 pos	4/6 pos	4/6 pos	4/6 pos	3/4 pos	3/4 pos	2/3 pos	2/3 pos
15			**5/8**	4/6 pos	4/6 pos	4/6 pos	4/6 pos	3/4 pos	3/4 pos	2/3 pos	2/3 pos	2/3 pos
20			4/6 pos	4/6 pos	4/6 pos	3/4 pos	3/4 pos	3/4 pos	2/3 pos	2/3 pos	2/3 pos	2/3 pos
30			3/4 pos	3/4 pos	3/4 pos	3/4 pos	2/3 pos	2/3 pos	2/3 pos	2/3 pos	1,33/2 pos	1,33/2 pos
50						3/4 pos	2/3 pos	2/3 pos	2/3 pos	1,33/2 pos	1,33/2 pos	1,33/2 pos
75								2/3 pos	1,33/2 pos	1,33/2 pos	1,33/2 pos	0,75/1,25 pos
100									1,33/2 pos	0,75/1,25 pos	0,75/1,25 pos	0,75/1,25 pos
150										0,75/1,25 pos	0,75/1,25 pos	0,75/1,25 pos
200										0,75/1,25 pos	0,75/1,25 pos	0,75/1,25 pos

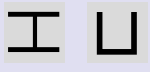
in bold = catalogue version

If two or more pipes need to be cut alongside one another, take into consideration the doubled wall thickness when using the table.

Critical factors in choosing the correct tooth pitch:
- Sawing pipes and profile sections in layers and bandles
- Sawing pipes and profile sections individually

Summary of icons used for metal saws

INFO

Pipes	
Supports	
Bandles	
Solid material	

SARA® Metal circular saw blade



200101....

200105....
200110....

Vc = Cutting speed (m/min)
n = Rotational speed (rpm), mean value
f = The feed per revolution must be calculated depending on the material cross-section and stability, saw blade toothing, as well as the mechanical circumstances.

ISO		Cutting speed Vc m/min	Rotational speed min. - max. rpm									Coolant / lubricant
			Ø 32 mm	Ø 40 mm	Ø 50 mm	Ø 63 mm	Ø 80 mm	Ø 100 mm	Ø 125 mm	Ø 160 mm	Ø 200 mm	Ø 250 mm	
P	Steel up to 500 N/mm²	25 - 50	250 - 500	200-400	160 - 320	125 - 250	100 - 200	80-100	63 - 130	50 - 100	40 - 80	31 - 62	High-performance cooling lubricant concentrate with water 1:20
	Steel up to 800 N/mm²	15 - 30	120 - 300	120 - 240	95 - 190	75 - 150	60 - 120	47 - 95	38 - 76	30 - 60	24 - 47	19 - 38	
	Steel up to 1100 N/mm²	10 - 20	100 - 200	79 - 160	63 - 125	50 - 100	40 - 80	31 - 63	25 - 50	20 - 40	16 - 32	12.7 - 25	High-performance cooling lubricant concentrate with water 1:15
M	Stainless steel (V2A, V4A)	7 - 15	75 - 150	55 - 120	45 - 95	35 - 75	28 - 60	22 - 47	18 - 38	14 - 30	11 - 24	9 - 19	High-performance cooling lubricant concentrate with water 1:12
K	Grey cast iron up to GG18	25 - 45	250 - 450	200 - 350	160 - 290	125 - 225	100 - 180	80 - 145	63 - 115	50 - 90	40 - 70	31 - 57	Dry or compressed air
	Grey cast iron above GG18	25 - 30	250 - 300	200 - 240	160 - 190	125 - 150	100 - 120	80 - 95	63 - 76	50 - 60	40 - 47	31 - 38	Dry or compressed air
S	Bronze, Cu alloys	120 - 200	1,200 - 2,000	955 - 1,600	760 - 1,300	610 - 1,000	480 - 800	380 - 630	300 - 500	240 - 400	190 - 320	152 - 250	High-performance cooling lubricant concentrate with water 1:30
	Copper, brass, aluminium	400 - 1,000	4,000 - 10,000	3,200 - 8,000	2,500 - 6,300	2,000 - 5,050	1,600 - 4,000	1,300 - 3,200	1,000 - 2,500	800 - 2,000	650 - 1,600	510 - 1,270	High-performance cooling lubricant concentrate with water 1:50
	Lightweight metal profiles*	1,000 - 2,400	10,000 - 24,000	8,000 - 19,100	6,300 - 15,300	5,050 - 12,120	4,000 - 9,560	3,200 - 7,650	2,500 - 6,120	2,000 - 4,780	1,600 - 3,820	1,270 - 3,050	Lubrication pin
	Plastics*	1,500 - 2,400	15,000 - 24,000	12,000 - 19,100	9,500 - 15,300	7,500 - 12,120	6,000 - 9,560	5,000 - 7,650	3,800 - 4,780	3,000 - 4,780	2,400 - 3,820	1,900 - 3,050	Dry

* = for high cutting speeds (from 1000 m/min) always use extra-tough saw blades!
When ordering, please indicate: machine speed or cutting speed and material to be cut.

All blades are laterally bevel-ground (hollow grinding).
All sizes from Ø 200 mm and very slim blades have a borehole collar for extra stability.
Accuracy, tooth form and lateral bevel grinding correspond to DIN 1840.

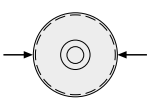


DIN 1837 A fine-toothed with Type A double helical tooth
- Straight teeth with relatively small tooth pockets
- For thin-walled workpieces and smaller cutting depths
- Ideal for machining brittle, short-chipping materials

DIN 1838 B coarse-toothed with Type B curved tooth
- Curved teeth with relatively large tooth pockets
- More universal than DIN 1837 A thanks to improved chip formation and increased chip space
- For stronger material and greater cutting depths

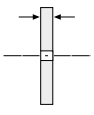
DIN 1838 C coarse-toothed with Type C curved tooth
- High-performance toothing (HZ) with taper tap and regroover
- The taper tap is 0.15-0.3 mm higher than the regroover and is tapered on both tooth corners.
- Thus both teeth share the task of machining.
- Ideal for separating workpieces with low to medium strength
- Excellent chip management is achieved by the chip-separating tooth form.

Manufacturing accuracy according to DIN and ISO for HSS metal circular saw blades



Diameter tolerance according to ISO

	Nominal dimension range mm					
	30 - 50	50 - 80	80-120	120-180	180 -250	250 - 315
Tolerance field in accordance with js 15 (µm)	± 500	± 600	± 700	± 800	± 925	± 1050



Thickness tolerance according to ISO

	Nominal dimension range mm		
	≤ 1	1 - 3	3 - 6
Tolerance field in accordance with js 11 (µm)	± 20	± 30	± 38



Bore tolerance according to ISO

	Nominal dimension range mm					
	3 - 6	6 - 10	10 - 18	18 - 30	30 - 50	50 - 80
Tolerance field in accordance with js 15 (µm)	+ 12 - 0	+ 15 - 0	+ 18 - 0	+ 21 - 0	+ 25 - 0	+ 30 - 0



Radial run-out according to DIN 1840

External Ø mm	Perm. deviation mm
≤ 100	0.10
> 100	0.16



Front run-out (lateral run-out) according to DIN 1840

External Ø mm	Perm. deviation mm
≤ 40	0.10
> 40-100	0.16
> 100-200	0.25
> 200-315	0.40

SARA® Solid carbide circular saw blade



202001....

- **Tooth type A**
- For small cutting depths and short-chipping material
- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	Feed fz mm/tooth	Coolant / lubricant
P	Steel	Up to 700	St-52	1.0052	150	0.010 - 0.03	Emulsion 1:20
P	Steel	Up to 1000	16 MnCr 5	1.7131	120	0.005 - 0.02	Emulsion 1:10
M	Stainless steel, austenitic	500 – 950	X 5 CrNi 18 10	1.4301	80	0.005 - 0.015	Emulsion 1:10
K	Grey cast iron	100 – 400	GG 25	0.6025	100	0.005 - 0.010	Dry
S	Titanium alloy	Up to 950	TiAl6V4	3.7165	60	0.003 - 0.005	Cutting oil
N	Copper alloys				300	0.02 - 0.040	Emulsion
N	Brass alloys				500	0.010 - 0.040	Emulsion
N	Aluminium				1,000 - 2,000	0.010 - 0.040	Emulsion

SARA® Solid carbide circular saw blade



202002....

- **Tooth type B**
- For solid materials, large cutting depths and long-chipping material
- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	Feed fz mm/tooth	Coolant / lubricant
P	Steel	Up to 700	St-52	1.0052	150	0.010 - 0.03	Emulsion 1:20
P	Steel	Up to 1000	16 MnCr 5	1.7131	120	0.005 - 0.02	Emulsion 1:10
M	Stainless steel, austenitic	500 – 950	X 5 CrNi 18 10	1.4301	80	0.005 - 0.015	Emulsion 1:10
K	Grey cast iron	100 – 400	GG 25	0.6025	100	0.005 - 0.010	Dry
S	Titanium alloy	Up to 950	TiAl6V4	3.7165	60	0.003 - 0.005	Cutting oil
N	Copper alloys				300	0.02 - 0.040	Emulsion
N	Brass alloys				500	0.010 - 0.040	Emulsion
N	Aluminium				1,000 - 2,000	0.010 - 0.040	Emulsion



SARA® Metal circular saw blade, precision version

200150.... 200151....

- Choose the correct tooth pitch in relation to the materials to be cut
- Feed, in relation to the materials to be cut and the selected tooth pitch
- Rotational speed, in relation to the materials to be cut and the saw blade diameter
- The data relates to the circular saw blades with standard surface. Surface coatings can increase the feed and revolution values.
- When cutting ensure the saw blade is correctly tensioned, as well as sufficient cooling, correct machine operation and optimum condition of the saw blade.
- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Tooth pitch											
			Pipes / profiles, wall thickness mm					Solid material, cross section mm						
			< 1	1 - 1.5	1.5 - 2	2 - 3	> 3	10 - 20	20 - 40	40 - 60	60 - 90	90 - 110	110 - 130	130 - 150
P	Steel	Up to 500	3	4	4	5	≥ 6	5	8	10	12	14	16	18
P	Steel	Up to 600	3	4	4	5	≥ 6	5	6	1	12	14	16	16
P	Steel	Up to 1200	3	3	4	4	≥ 5	4	6	8	10	12	14	14
M	Stainless steel, austenitic		3	4	4	5	≥ 6	4	6	8	11	14	16	16
K	Grey cast iron							5	6	8	11	14	16	16
N	Bronze and copper		4	5	6	7	≥ 8	6	8	10	12 - 14	14 - 16	16 - 18	18 - 20
N	Aluminium alloys		4	5	6	7	≥ 8	6	8	12	16	18	20	20
N	Brass alloys		4	4	5	5	≥ 8	6	8	10	12	16	18	18

ISO	Materials group	Strength/ Hardness N/mm²	Feed mm/min.																	
			Pipes / profiles, for tooth pitch									Solid material, for tooth pitch								
			3	4	5	6	8	10	12	14	16	3	4	5	6	8	10	12	14	16
P	Steel	Up to 500	450	400	350	300	250	200	150	130	120	350	300	250	200	150	100	80	70	50
P	Steel	Up to 600	350	300	250	180	130	100	90	80	70	250	200	150	100	80	70	65	60	55
P	Steel	Up to 1200	160	140	130	120	90	80	65	50	40	90	80	70	60	45	40	35	25	15
M	Stainless steel, austenitic		150	130	110	90	75	60	55	50	35	70	60	55	50	40	35	30	20	15
K	Grey cast iron		550	440	350	300	220	180	150	125	110	350	280	210	180	140	120	90	75	65
N	Bronze and copper					2.000	1.600	1.200	850	700	600				1.400	1.000	700	550	500	400
N	Aluminium alloys						8.500	6.000	5.000	4.600	3.700					4.500	3.800	3.000	2.800	3.700
N	Brass alloys					4.000	3.200	2.500	1.800	1.400	1.000				2.000	1.500	1.000	800	700	600

ISO	Materials group	Strength/ Hardness N/mm²	Rotational speed rpm																	
			Pipes / profiles, for saw blade Ø mm									Solid material, for saw blade Ø mm								
			200	225	250	275	300	315	350	370	400	200	225	250	275	300	315	350	370	400
P	Steel	Up to 500	80	70	65	60	55	50	45	45	5	45	45	40	35	30	30	25	25	5
P	Steel	Up to 600	65	60	50	45	45	40	35	35	40	30	30	25	25	20	20	20	15	20
P	Steel	Up to 1200	40	35	30	30	25	25	25	20	30	25	20	20	15	15	15	15	15	15
M	Stainless steel, austenitic		35	30	25	25	20	20	20	15	20	15	15	15	10	10	10	10	10	10
K	Grey cast iron		80	70	65	60	55	50	45	45	40	45	45	40	35	30	30	25	25	20
N	Bronze and copper		480	430	380	350	350	300	270	260	240	320	300	250	230	210	200	180	170	160
N	Aluminium alloys		1500	1250	1100	1050	950	900	820	770	720	950	850	750	700	650	600	550	520	470
N	Brass alloys		950	850	770	700	640	600	550	520	480	650	550	500	450	430	400	350	350	300





VAN HOORN
End milling cutters
255 pages
Art.no. 019900 0079

Overview of all free manufacturers' catalogues
on page 12/13

Calculation of HSS-E milling cutter

Note:

- Please use the tables on pages 20-14 to 20-17 to assign the materials to be machined.
- All milling specifications apply to a rigid setup, including clamping, sufficient machine output and applications of coolant.
- Please adjust these guideline values according to clamping operation and machine set-up!
- The feed (Vf) should be halved for milling in long version.

1. Table

Please see Table 1 for the cutting speed of the respective material.

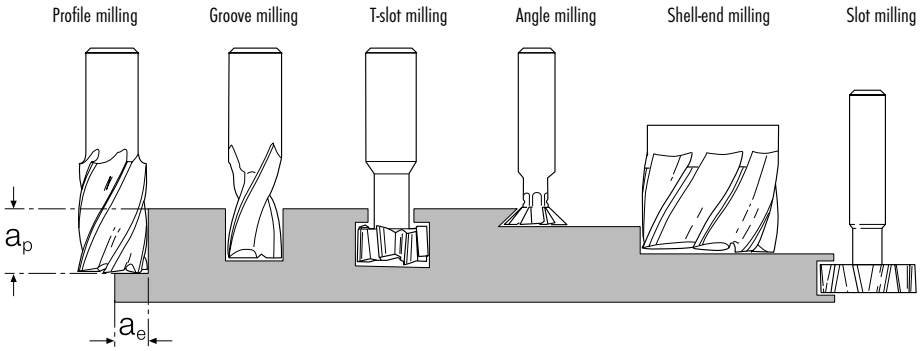
ISO	Material	Hardness HB	Tensile strength N/mm²	Cutting speed Vc m/min.
P	magnetic, soft steel	< 120	< 400	40
	Structural steel, steel for case hardening	< 200	< 700	32
	Carbon steel, unalloyed	< 250	< 850	25
	Alloyed steel	< 250	< 850	25
	Alloyed steel, hardened and tempered	250-350	850-1.200	20
	Alloyed steel, hardened and tempered	> 350	> 1200	12
M	Good machinability	< 250	< 850	20
	austenitic	< 250	< 850	16
	ferritic, austenitic	< 300	< 1000	12
K	with lamellar graphite	< 150	< 500	32
	with lamellar graphite	150-300	500-1.000	25
	with spheroidal graphite, malleable cast iron	< 200	< 700	32
	with spheroidal graphite, malleable cast iron	200-300	700-1.000	20
S	Titanium, unalloyed	< 200	< 700	16
	Titanium, alloyed	< 270	< 900	12
	Titanium, alloyed	270-350	900-1.250	10
	Nickel, unalloyed	< 150	< 500	8
	Nickel, alloyed	> 270	< 900	8
	Nickel, alloyed	270-350	900-1.200	6
N	Copper	< 100	< 350	80
	Brass, bronze	< 200	< 700	40
	Brass	< 200	< 700	50
	High-strength bronze	< 470	< 1500	16
	Aluminium, magnesium, non-alloyed	< 100	< 350	100
	Aluminium alloyed, Si < 5%	< 150	< 500	80
	Aluminium alloyed, Si 5-10%	< 120	< 400	60
	Aluminium alloyed, Si > 10% Whisker-reinforced Aluminium and aluminium alloy	< 120	< 400	50
	Thermoplastics	-	-	80
	Thermoset plastics	-	-	60
	Fibre-reinforced plastics	-	-	60

2. Table

Using the cutting speed (Vc) from Table 1, you obtain the rotational speed depending on the diameter of the tool use.

∅ mm	Cutting speed Vc m/min.															
	6	8	10	12	16	20	25	32	40	50	60	80	100	125	160	200
	Rotational speed rev/min.															
2	955	1.273	1.592	1.910	2.546	3.183	3.979	5.093	6.366	7.958	9.549	12.732	15.915	19.894	25.465	31.831
2.5	764	1.019	1.273	1.528	2.037	2.546	3.183	4.074	5.093	6.366	7.639	10.186	12.732	15.915	20.372	25.465
3	637	849	1.061	1.273	1.698	2.122	2.653	3.395	4.244	5.305	6.366	8.488	10.610	13.263	16.977	21.221
4	477	637	796	955	1.273	1.592	1.989	2.546	3.183	3.979	4.775	6.366	7.958	9.947	12.732	15.915
5	382	509	637	764	1.019	1.273	1.592	2.037	2.546	3.183	3.820	5.093	6.366	7.958	10.186	12.732
6	318	424	531	637	849	1.061	1.326	1.698	2.122	2.653	3.183	4.244	5.305	6.631	8.488	10.610
8	239	318	398	477	637	796	995	1.273	1.592	1.989	2.387	3.183	3.979	4.974	6.366	7.958
10	191	255	318	382	509	637	796	1.019	1.273	1.592	1.910	2.546	3.183	3.979	5.093	6.366
12	159	212	265	318	424	531	663	849	1.061	1.326	1.592	2.122	2.653	3.316	4.244	5.305
16	119	159	199	239	318	398	497	637	796	995	1.194	1.592	1.989	2.487	3.183	3.979
20	95	127	159	191	255	318	398	509	637	796	955	1.273	1.592	1.989	2.546	3.183
25	76	102	127	153	204	255	318	407	509	637	764	1.019	1.273	1.592	2.037	2.546
32	60	80	99	119	159	199	249	318	398	497	597	796	995	1.243	1.592	1.989
40	48	64	80	95	127	159	199	255	318	398	477	637	796	995	1.273	1.592
50	38	51	64	76	102	127	159	204	255	318	382	509	637	796	1.019	1.273
63	30	40	51	61	81	101	126	162	202	253	303	404	505	632	808	1.011
80	24	32	40	48	64	80	99	127	159	199	239	318	398	497	637	796
100	19	25	32	38	51	64	80	102	127	159	191	255	318	398	509	637
125	15	20	25	31	41	51	64	81	102	127	153	204	255	318	407	509
160	12	16	20	24	32	40	50	64	80	99	119	159	199	249	318	398

Calculation of HSS-E milling cutter Continued



3. Table

The cross section to be machined can be selected here. This also indicates the recommended tool type and the feed code letter.

	Tool application																							
	Profile milling												Groove milling				Special							
Radial cutting width ae	0.125 X D			0.25 X D			0.5 X D			0.75 X D			1 X D				0.5 X D	0.25 X D	0.75 X D					
Axial cut depth ap	1.25 X D	1.5 X D	2 X D	1.25 X D	1.5 X D	2 X D	1.25 X D	1.5 X D	2 X D	1.25 X D	1.5 X D	2 X D	0.5 X D	1 X D	1.5 X D	2 X D	0.5 X D	0.5 X D	3 mm	6 mm	10 mm	6 mm	12 mm	20 mm
Disposable milling cutter	-	-	-	-	-	-	J	I	H	G	E	C	L	F	-	-	-	-	-	-	-	-	-	-
2-flute cutter	-	-	-	-	-	-	-	-	-	-	-	-	J	E	-	-	-	-	-	-	-	-	-	-
3-flute cutter	-	-	-	-	-	-	I	H	G	F	D	B	J	E	-	-	-	-	-	-	-	-	-	-
3-flute cutter, aluminium	-	-	-	-	-	-	M	L	J	I	G	F	N	H	E	-	-	-	-	-	-	-	-	-
Multi-flute cutter	P	P	M	N	L	I	K	I	G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Roughing cutter	-	-	-	-	-	-	L	L	L	J	H	F	L	J	F	C	-	-	-	-	-	-	-	-
Roughing cutter (fine)	-	-	-	-	-	-	M	M	M	M	K	I	M	M	I	E	-	-	-	-	-	-	-	-
T-slot milling cutter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	J	-	-	-	-	-	-	-
Slotting cutter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	E	-	-	-	-	-	-
Angle milling cutter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	G	-	-	-	-	-	-
Shell-end milling cutter (finishing)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	J	J	H	-	-	-
Shell-end milling cutter (roughing)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	J	J	H

4. Table

The cutting speed from Table 1 and the feed code letter from Table 3 produce the feed (Vf) in Table 4.

Feed code letter	Cutting speed Vc m/min.															
	6	8	10	12	16	20	25	32	40	50	60	80	100	125	160	200
	Feed (Vf) mm/min.															
A	6	8	10	12	16	20	25	32	40	50	60	80	100	120	160	200
B	7	9	11	14	18	22	28	35	45	55	70	90	110	140	180	220
C	8	10	12	16	20	25	32	40	50	60	80	100	120	160	200	250
D	9	11	14	18	22	28	35	45	55	70	90	110	140	180	220	280
E	10	12	16	20	25	32	40	50	60	80	100	120	160	200	250	320
F	11	14	18	22	28	35	45	55	70	90	110	140	180	220	280	350
G	12	16	20	25	32	40	50	60	80	100	120	160	200	250	320	400
H	14	18	22	28	35	45	55	70	90	110	140	180	220	280	350	450
I	16	20	25	32	40	50	60	80	100	120	160	200	250	320	400	500
J	18	22	28	35	45	55	70	90	110	140	180	220	280	350	450	560
K	20	25	32	40	50	60	80	100	120	160	200	250	320	400	500	600
L	22	28	35	45	55	70	90	110	140	180	220	280	350	450	560	700
M	25	32	40	50	60	80	100	120	160	200	250	320	400	500	600	800
N	28	35	45	55	70	90	110	140	180	220	280	350	450	560	700	900
O	32	40	50	60	80	100	120	160	200	250	320	400	500	600	800	1000
P	35	45	55	70	90	110	140	180	220	280	350	450	560	700	900	1100

ATORN HSS-E-PM-milling cutter — Groove milling

- Please adjust these guideline values according to clamping operation and machine set-up!
- The guide values apply for the TiAlN-coating version; for uncoated tools the cutting speeds must be reduced by 20-30%.


226215....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
						4 - 5	6 - 7	8 - 9	10	12 - 14	16 - 18	20	25 - 28
P	Machining steel	Up to 700	9 SMn 28	1.0715	45 - 75	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Unalloyed structural steel	Up to 700	St-52	1.0052	45 - 75	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Structural steel	700 - 950	Ck45	1.1191	45 - 75	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Cast steel	Up to 950	GS 40	1.0416	30 - 45	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	45 - 65	0.02	0.03	0.035	0.058	0.06	0.115	0.115	0.115
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	30 - 45	0.014	0.03	0.035	0.058	0.069	0.115	0.115	0.115
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	30 - 45	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	30 - 45	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	35 - 65	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	25 - 45	0.014	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Ductile iron	Up to 280 HB	GGG 60	0.7060	25 - 45	0.014	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	25 - 45	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	20 - 35	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075
	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	20 - 35	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075
	Hardened materials up to 64 HRc		100Cr6	1.2067	10 - 20	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075

ae	ap	Correction factor
2-flute cutter 1 x D	0.5 x D	1
3-flute cutter 1 x D	0.5 x D	0.7

ATORN HSS-E-PM milling cutter

- Please adjust these guideline values according to clamping operation and machine set-up!


226225.... 226235....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
						4 - 5	6 - 7	8 - 9	10	12 - 14	16 - 18	20	25 - 28
P	Machining steel	Up to 700	9 SMn 28	1.0715	45 - 75	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Unalloyed structural steel	Up to 700	St-52	1.0052	45 - 75	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Structural steel	700 - 950	Ck45	1.1191	45 - 75	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Cast steel	Up to 950	GS 40	1.0416	30 - 45	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	45 - 65	0.02	0.03	0.035	0.058	0.06	0.115	0.115	0.115
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	30 - 45	0.014	0.03	0.035	0.058	0.069	0.115	0.115	0.115
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	30 - 45	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	30 - 45	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	35 - 65	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	25 - 45	0.014	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Ductile iron	Up to 280 HB	GGG 60	0.7060	25 - 45	0.014	0.03	0.035	0.058	0.069	0.115	0.115	0.115
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	25 - 45	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	20 - 35	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075
	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	20 - 35	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075
	Hardened materials up to 64 HRc		100Cr6	1.2067	10 - 20	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075

ae	ap	Correction factor
0.10 x D	1.5 x D	1
0.25 x D	1.5 x D	0.7
0.50 x D	1.5 x D	0.4

ATORN HSS-E-PM milling cutter

- Please adjust these guideline values according to clamping operation and machine set-up!

226245....
226265....
226255....
226275....
226247....



ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
						4 - 5	6 - 7	8 - 9	10	12 - 14	16 - 18	20	25 - 28
P	Machining steel	Up to 700	9 SMn 28	1.0715	45 - 75	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
P	Unalloyed structural steel	Up to 700	St-52	1.0052	45 - 75	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
P	Structural steel	700 - 950	Ck45	1.1191	45 - 75	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
P	Cast steel	Up to 950	GS 40	1.0416	30 - 45	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
P	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	45 - 65	0.02	0.03	0.035	0.058	0.06	0.115	0.115	0.115
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	30 - 45	0.014	0.03	0.035	0.058	0.069	0.115	0.115	0.115
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	30 - 45	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	30 - 45	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	35 - 65	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
K	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	25 - 45	0.014	0.03	0.035	0.058	0.069	0.115	0.115	0.115
K	Ductile iron	Up to 280 HB	GGG 60	0.7060	25 - 45	0.014	0.03	0.035	0.058	0.069	0.115	0.115	0.115
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	25 - 45	0.02	0.03	0.035	0.058	0.069	0.115	0.115	0.115
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	20 - 35	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075
H	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	20 - 35	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075
H	Hardened materials up to 64 HRc		100Cr6	1.2067	10 - 20	0.012	0.025	0.03	0.052	0.052	0.075	0.075	0.075

ae	ap	Correction factor
0.10 x D	1.5 x D	1
0.25 x D	1.5 x D	0.7
1 x D	1 x D	0.4

ATORN Deburrer spiralled



251580....
251581....

0.04 - 0.08	Materials group	Strength/ Hardness N/mm²	Material chemical example	Material number	Cutting speed Vc m/min	Ø [mm] 4.000 fz	Ø [mm] 5.000 fz	Ø [mm] 6.000 fz	Ø [mm] 8.000 fz	Ø [mm] 10.000 fz	Ø [mm] 12.000 fz	Ø [mm] 16.000 fz
N	Al. alloys, long-chipping	up to 500	AlMg 3	3.3535	350 - 650	0.04 - 0.08	0.008 - 0.05	0.06 - 0.15	0.08 - 0.18	0.1 - 0.2	0.12 - 0.22	0.16 - 0.2
N	Al. alloys, short-chipping	up to 500	G-AlSi 12	3.2581	200 - 300	0.04 - 0.08	0.008 - 0.05	0.06 - 0.15	0.08 - 0.18	0.1 - 0.2	0.12 - 0.22	0.16 - 0.2
N	Copper alloy (bronze), long-chipping	up to 1200	CuSn4	2.1016	250 - 350	0.04 - 0.08	0.008 - 0.05	0.06 - 0.15	0.08 - 0.18	0.1 - 0.2	0.12 - 0.22	0.16 - 0.2
N	Copper alloy (bronze), short-chipping	up to 850	CuNi12Zn24	2.0730	200 - 300	0.04 - 0.08	0.008 - 0.05	0.06 - 0.15	0.08 - 0.18	0.1 - 0.2	0.12 - 0.22	0.16 - 0.2
N	Copper alloy (brass), long-chipping	up to 600	Cu ZN 20	2.0250	250 - 350	0.04 - 0.08	0.008 - 0.05	0.06 - 0.15	0.08 - 0.18	0.1 - 0.2	0.12 - 0.22	0.16 - 0.2
N	Copper alloy (brass), short-chipping	up to 600	Cu Zn 39 Pb 3	2.0381	200 - 300	0.04 - 0.08	0.008 - 0.05	0.06 - 0.15	0.08 - 0.18	0.1 - 0.2	0.12 - 0.22	0.16 - 0.2
N	Thermoplastic		PVC		350 - 600	0.04 - 0.08	0.008 - 0.05	0.06 - 0.15	0.08 - 0.18	0.1 - 0.2	0.12 - 0.22	0.16 - 0.2
N	Thermosetting plastic		Melamine		300 - 450	0.04 - 0.08	0.008 - 0.05	0.06 - 0.15	0.08 - 0.18	0.1 - 0.2	0.12 - 0.22	0.16 - 0.2
N	fibre-reinforced plastics		CFRP, GFRP		250 - 350	0.04 - 0.08	0.008 - 0.05	0.06 - 0.15	0.08 - 0.18	0.1 - 0.2	0.12 - 0.22	0.16 - 0.2



251576....
251575....

ISO	Materials group	Strength/ Hardness N/mm²	Material chemical example	Material number	Cutting speed Vc m/min	Feed rate fz in mm/Z in relation to milling cutter diameter in mm					
						Ø 4	Ø 6	Ø 8	Ø 10	Ø 12	Ø 16
P	Machining steel	up to 700	9 SMn 28	1.0715	180 - 300	0.01 - 0.03	0.025 - 0.07	0.03 - 0.08	0.04 - 0.09	0.05 - 0.10	0.06 - 0.12
P	Unalloyed structural steel	up to 700	St-52	1.0052	140 - 260	0.01 - 0.03	0.025 - 0.07	0.03 - 0.08	0.04 - 0.09	0.05 - 0.10	0.06 - 0.12
P	Structural steel	700-950	Ck45	1.1191	120 - 220	0.01 - 0.03	0.025 - 0.07	0.03 - 0.08	0.04 - 0.09	0.05 - 0.10	0.06 - 0.12
P	Cast steel	up to 950	GS 40	1.0416	100 - 200	0.01 - 0.03	0.025 - 0.07	0.03 - 0.08	0.04 - 0.09	0.05 - 0.10	0.06 - 0.12
P	Case-hardening steel	up to 1200	16 MnCr 5	1.7131	150 - 250	0.01 - 0.03	0.025 - 0.07	0.03 - 0.08	0.04 - 0.09	0.05 - 0.10	0.06 - 0.12
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	120 - 220	0.01 - 0.03	0.025 - 0.07	0.03 - 0.08	0.04 - 0.09	0.05 - 0.10	0.06 - 0.12
M	Stainless steel, ferr./marten.	500-950	X10Cr13	1.4006	80 - 140	0.01 - 0.03	0.025 - 0.07	0.03 - 0.08	0.04 - 0.09	0.05 - 0.10	0.06 - 0.12
M	Stainless steel, austenitic	500-950	X 5 CrNi 18 10	1.4301	100 - 200	0.01 - 0.03	0.025 - 0.07	0.03 - 0.08	0.04 - 0.09	0.05 - 0.10	0.06 - 0.12
K	Grey cast iron	up to 260 HB	GG 25	0.6025	100 - 150	0.01 - 0.03	0.025 - 0.07	0.03 - 0.08	0.04 - 0.09	0.05 - 0.10	0.06 - 0.12
K	alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	120 - 250	0.01 - 0.03	0.025 - 0.07	0.03 - 0.08	0.04 - 0.09	0.05 - 0.10	0.06 - 0.12
K	Ductile iron	up to 280 HB	GGG 60	0.7060	90 - 180	0.01 - 0.03	0.025 - 0.07	0.03 - 0.08	0.04 - 0.09	0.05 - 0.10	0.06 - 0.12
K	Malleable cast iron	up to 280 HB	GTS 55	0.8155	110 - 160	0.01 - 0.03	0.025 - 0.07	0.03 - 0.08	0.04 - 0.09	0.05 - 0.10	0.06 - 0.12
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	100 - 160	0.01 - 0.03	0.025 - 0.07	0.03 - 0.08	0.04 - 0.09	0.05 - 0.10	0.06 - 0.12
H	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	110 - 180	0.01 - 0.03	0.025 - 0.07	0.03 - 0.08	0.04 - 0.09	0.05 - 0.10	0.06 - 0.12
H	hardened materials up to 64 HRC		100Cr6	1.2067	110-170	0.01 - 0.03	0.025 - 0.07	0.03 - 0.08	0.04 - 0.09	0.05 - 0.10	0.06 - 0.12

Calculation: solid carbide end milling cutter

Note:

- Please use the tables on pages 20-34 to 20-35 to assign the materials to be machined.
- All milling specifications apply to a rigid setup, including clamping, sufficient machine output and applications of coolant.
- Please adjust these guideline values according to clamping operation and machine set-up!
- The feed (Vf) should be halved for milling in long version.



1. Table

Please see Table 1 for the cutting speed of the respective material.

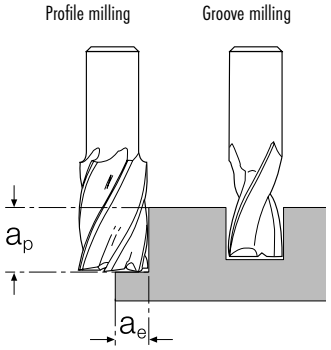
ISO	Material	Hardness HB	Tensile strength N/mm²	Cutting speed Vc m/min.
P	magnetic, soft steel	< 120	< 400	150
	Structural steel, steel for case hardening	< 200	< 700	120
	Carbon steel, unalloyed	< 250	< 850	96
	Alloyed steel	< 250	< 850	96
	Alloyed steel, hardened and tempered	250-350	850-1.200	72
	Alloyed steel, hardened and tempered	> 350	> 1200	48
M	Good machinability	< 250	< 850	96
	austenitic	< 250	< 850	72
	ferritic, austenitic	< 300	< 1000	60
K	with lamellar graphite	< 150	< 500	120
	with lamellar graphite	150-300	500-1.000	96
	with spheroidal graphite, malleable cast iron	< 200	< 700	120
	with spheroidal graphite, malleable cast iron	200-300	700-1.000	60
S	Titanium, unalloyed	< 200	< 700	72
	Titanium, alloyed	< 270	< 900	60
	Titanium, alloyed	270-350	900-1.250	38
	Nickel, unalloyed	< 150	< 500	72
	Nickel, alloyed	> 270	< 900	38
	Nickel, alloyed	270-350	900-1.200	24
N	Copper	< 100	< 350	300
	Brass, bronze	< 200	< 700	150
	Brass	< 200	< 700	192
	High-strength bronze	< 470	< 1500	60
	Aluminium, magnesium, non-alloyed	< 100	< 350	384
	Aluminium alloyed, Si < 5%	< 150	< 500	300
	Aluminium alloyed, Si 5-10%	< 120	< 400	192
	Aluminium alloyed, Si > 10% Whisker-reinforced Aluminium and aluminium alloy	< 120	< 400	120
	Thermoplastics	-	-	300
	Thermoset plastics	-	-	240
	Fibre-reinforced plastics	-	-	240

2. Table

Using the cutting speed (Vc) from Table 1, you obtain the rotational speed depending on the diameter of the tool use.

Ø mm	Cutting speed Vc m/min.															
	14	19	24	30	38	48	60	72	96	120	150	192	240	300	384	480
	Rotational speed rev/min.															
2	2.292	3.055	3.820	4.775	6.112	7.639	9.550	11.459	15.278	19.098	23.873	30.558	38.197	47.747	61.116	76.394
2.5	1.834	2.444	3.055	3.820	4.889	6.112	7.639	9.167	12.223	15.278	19.098	24.446	30.558	38.197	48.893	61.116
3	1.528	2.038	2.546	3.184	4.074	5.093	6.366	7.639	10.186	12.732	15.916	20.372	25.465	31.831	40.744	50.929
4	1.146	1.528	1.910	2.387	3.055	3.820	4.775	5.730	7.639	9.550	11.936	15.278	19.098	23.873	30.558	38.197
5	917	1.223	1.528	1.910	2.444	3.055	3.820	4.584	6.112	7.639	9.550	12.223	15.278	19.098	24.446	30.558
6	764	1.019	1.273	1.591	2.038	2.546	3.184	3.820	5.093	6.366	7.957	10.186	12.732	15.916	20.372	25.465
8	572	764	955	1.194	1.528	1.910	2.387	2.864	3.820	4.775	5.969	7.639	9.550	11.936	15.278	19.098
10	458	611	764	955	1.223	1.528	1.910	2.292	3.055	3.820	4.775	6.112	7.639	9.550	12.223	15.278
12	382	509	637	796	1.019	1.273	1.591	1.910	2.546	3.184	3.979	5.093	6.366	7.957	10.186	12.732
16	287	382	478	596	764	955	1.194	1.433	1.910	2.387	2.984	3.820	4.775	5.969	7.639	9.550
20	229	306	382	478	611	764	955	1.146	1.528	1.910	2.387	3.055	3.820	4.775	6.112	7.639
25	184	245	306	382	488	611	764	917	1.223	1.528	1.910	2.444	3.055	3.820	4.889	6.112

Calculation: solid carbide end milling cutterContinued



3. Table

The cross section to be machined can be selected here. This also indicates the recommended tool type and the feed code letter.

	Tool application															
	Profile milling												Groove milling			
Radial cutting width ae	0.125 X D			0.25 X D			0.5 X D			0.75 X D			1 X D			
Axial cut depth ap	1.25 X D	1.5 X D	2 X D	1.25 X D	1.5 X D	2 X D	1.25 X D	1.5 X D	2 X D	1.25 X D	1.5 X D	2 X D	0.5 X D	1 X D	1.5 X D	2 X D
2-flute cutter	-	-	-	-	-	-	-	-	-	-	-	-	J	E	-	-
3-flute cutter	-	-	-	-	-	-	I	H	G	F	D	B	J	E	-	-
4-flute cutter	P	P	M	N	L	I	K	I	G	-	-	-	-	-	-	-
60° milling cutter	N	N	K	O	J	G	I	G	E	-	-	-	-	-	-	-
2-flute cutter, aluminium	-	-	-	-	-	-	L	K	I	H	F	E	M	G	D	-
Roughing cutter	-	-	-	-	-	-	L	L	L	J	H	F	L	J	F	C
Roughing cutter (fine)	-	-	-	-	-	-	M	M	M	M	K	I	M	M	I	E

4. Table

The cutting speed from Table 1 and the feed code letter from Table 3 produce the feed (Vf) in Table 4.

Feed code letter	Cutting speed Vc m/min.															
	14	19	24	30	38	48	60	72	96	120	150	192	240	300	384	480
	Feed (Vf) mm/min.															
A	12	14	19	24	30	38	48	60	72	96	120	144	192	240	300	384
B	13	17	22	26	34	42	54	66	84	108	132	168	216	264	336	420
C	14	19	24	30	38	48	60	72	96	120	144	192	240	300	384	480
D	17	22	26	34	42	54	66	84	108	132	168	216	264	336	420	540
E	19	24	30	38	48	60	72	96	120	144	192	240	300	384	480	600
F	22	26	34	42	54	66	84	108	132	168	216	264	336	420	540	672
G	24	30	38	48	60	72	96	120	144	192	240	300	384	480	600	720
H	26	34	42	54	66	84	108	132	168	216	264	336	420	540	672	840
I	30	38	48	60	72	96	120	144	192	240	300	384	480	600	720	960
J	34	42	54	66	84	108	132	168	216	264	336	420	540	672	840	1.080
K	38	48	60	72	96	120	144	192	240	300	384	480	600	720	960	1.200
L	42	54	66	84	108	132	168	216	264	336	420	540	672	840	1.080	1.320
M	48	60	72	96	120	144	192	240	300	384	480	600	720	960	1.200	1.440
N	54	66	84	108	132	168	216	264	336	420	540	672	840	1.080	1.320	1.680
O	60	72	96	120	144	192	240	300	384	480	600	720	960	1.200	1.440	1.920
P	66	84	108	132	168	216	264	336	420	540	672	840	1.080	1.320	1.680	2.160

SARA® Solid carbide end milling cutter

- Please adjust these guideline values according to clamping operation and machine set-up!


254058....


254052....


254050....


254054....
254056....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
						≤ Ø 2	≤ Ø 4	≤ Ø 8	≤ Ø 12	≤ Ø 16	≤ Ø 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	110 - 160	0.01	0.02	0.04	0.05	0.06	0.07
	Unalloyed structural steel	Up to 700	St-52	1.0052	90 - 160	0.01 - 0.015	0.02 - 0.03	0.04 - 0.05	0.05	0.06 - 0.07	0.07 - 0.08
	Cast steel	Up to 950	GS 40	1.0416	90 - 150	0.015	0.03	0.05	0.05	0.07	0.08
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	90 - 140	0.007 - 0.01	0.015 - 0.02	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.07
	Tempering steel	950 -1300	43CrMo4	1.3563	80-120	0.007	0.015	0.03	0.04	0.05	0.06
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	80 - 110	0.007	0.015	0.03	0.04	0.05	0.06
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	70 - 84	0.005	0.01	0.02	0.03	0.04	0.05
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	70	0.005	0.01	0.02	0.03	0.04	0.05
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	90 - 156	0.007 - 0.018	0.015 - 0.035	0.03 - 0.06	0.04 - 0.07	0.05 - 0.09	0.06 - 0.12
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	104 - 156	0.005 - 0.015	0.01 - 0.03	0.02 - 0.05	0.03 - 0.05	0.04 - 0.07	0.05 - 0.08
	Ductile iron	Up to 280 HB	GGG 60	0.7060	130 - 156	0.018	0.035	0.06	0.07	0.09	0.12
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	100	0.01	0.02	0.04	0.06	0.08	0.12
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	120	0.01	0.02	0.04	0.06	0.08	0.12
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	120	0.01	0.02	0.04	0.06	0.08	0.12
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	140	0.01	0.02	0.04	0.06	0.08	0.12
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	150	0.01	0.02	0.04	0.06	0.08	0.12
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	200	0.01	0.02	0.04	0.06	0.08	0.12
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	20 - 50	0.01	0.01	0.02	0.03	0.04	0.05
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	30	0.01	0.01	0.02	0.03	0.04	0.05

Cutting speed and feed correction factors

ae	10%	20%	50%	100%
Factor for Vc	1.3	1.1	1	0.85
Factor for fz	1.5	1.3	1	0.8

Solid carbide high-performance end milling cutter


251033....

- **Note:**
  The recommended cutting data are guide values for conventional roughing and assume stable machine conditions, low-vibration workpiece clamping and the application of suitable cooling lubricant. The cutting speed Vc can be increased by 20% for finishing. For full slot milling we recommend reducing the cutting speed Vc by approx. 15% and the feed Vf mm/min by 30%.

ISO	**Grooving** ap: 1.00 x D/ ae: 1.00 x D Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter range in mm				
						3-4	5 - 6	8 -10	12 - 16	18 - 25
P	Unalloyed structural steel	Up to 700	St-52	1.0052	156	0.01	0.029	0.038	0.063	0.101
	Machining steel	Up to 700	9 SMn 28	1.0715	170	0.01	0.029	0.038	0.063	0.101
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	127	0.01	0.029	0.038	0.063	0.101
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	99	0.008	0.021	0.027	0.044	0.071
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	85	0.008	0.021	0.027	0.044	0.071
	Cast steel	Up to 950	GS 40	1.0416	105	0.01	0.029	0.038	0.063	0.101
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	156	0.01	0.029	0.038	0.063	0.101
	Stainless steel, sulphurised	500 - 950	X 12 CrMoS 17	1.4104	53	0.008	0.021	0.027	0.044	0.071
	Stainless steel, martensitic	500 - 950	X 10 Cr 13	1.4006	53	0.008	0.021	0.027	0.044	0.071
K	Grey cast iron	100 - 400	GG 25	0.6025	127	0.01	0.029	0.038	0.063	0.101
	Alloyed grey cast iron	150-250	GGL-NiCr 35 2	0.6678	99	0.01	0.029	0.038	0.063	0.101
	Ductile iron	400 - 800	GGG 60	0.7060	99	0.01	0.029	0.038	0.063	0.101
	Malleable cast iron	350 - 700	GTS 55	0.8155	99	0.01	0.029	0.038	0.063	0.101
S	Titanium alloy	900 - 1400	TiAl6Sn 2	3.7174	25	0.006	0.013	0.021	0.027	0.059
	Nickel-based alloy	900 - 1400	NiCr19Fe19NbMo	Inconel 718	25	0.006	0.013	0.021	0.027	0.059

ISO	**Finishing / Edge-banding** ap: 1.00 x D/ ae: 0.50 x D Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter range in mm				
						3-4	5 - 6	8 -10	12 - 16	18 - 25
P	Unalloyed structural steel	Up to 700	St-52	1.0052	156	0.012	0.035	0.045	0.075	0.12
	Machining steel	Up to 700	9 SMn 28	1.0715	170	0.012	0.035	0.045	0.075	0.12
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	127	0.012	0.035	0.045	0.075	0.12
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	99	0.009	0.025	0.032	0.052	0.084
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	85	0.009	0.025	0.032	0.052	0.084
	Cast steel	Up to 950	GS 40	1.0416	105	0.012	0.035	0.045	0.075	0.12
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	156	0.012	0.035	0.045	0.075	0.12
	Stainless steel, sulphurised	500 - 950	X 12 CrMoS 17	1.4104	53	0.009	0.025	0.032	0.052	0.084
	Stainless steel, martensitic	500 - 950	X 10 Cr 13	1.4006	53	0.009	0.025	0.032	0.052	0.084
K	Grey cast iron	100 - 400	GG 25	0.6025	127	0.012	0.035	0.045	0.075	0.12
	Alloyed grey cast iron	150-250	GGL-NiCr 35 2	0.6678	99	0.012	0.035	0.045	0.075	0.12
	Ductile iron	400 - 800	GGG 60	0.7060	99	0.012	0.035	0.045	0.075	0.12
	Malleable cast iron	350 - 700	GTS 55	0.8155	99	0.012	0.035	0.045	0.075	0.12
S	Titanium alloy	900 - 1400	TiAl6Sn 2	3.7174	25	0.007	0.015	0.025	0.032	0.07
	Nickel-based alloy	900 - 1400	NiCr19Fe19NbMo	Inconel 718	25	0.007	0.015	0.025	0.032	0.07

VAN HOORN CARBIDE End milling cutter VHRSW Z4



- Please adjust these guideline values according to clamping operation and machine set-up!

255100 ....

ISO	**Roughing / Grooving** fz for ae = 1.0 x D and ap = 1.0 x D Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm										
						3	4	5	6	8	10	12	14	16	20	25
P	Machining steel	Up to 700	9 SMn 28	1.0715	200	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
	Unalloyed structural steel	Up to 700	St-52	1.0052	200	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
	Structural steel	700 - 950	Ck45	1.1191	200	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
	Cast steel	Up to 950	GS 40	1.0416	130	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	180	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	130	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	80	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	90	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	100	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	180	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	160	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
	Ductile iron	Up to 280 HB	GGG 60	0.7060	100	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	100	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	50	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	30	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	100	0.01	0.015	0.02	0.025	0.035	0.04	0.05	0.055	0.065	0.08	0.110

ISO	**Finishing / Edge-banding** fz for ae = 0.5 x D and ap = 1.0 x D Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm										
						3	4	5	6	8	10	12	14	16	20	25
P	Machining steel	Up to 700	9 SMn 28	1.0715	225	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Unalloyed structural steel	Up to 700	St-52	1.0052	225	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Structural steel	700 - 950	Ck45	1.1191	225	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Cast steel	Up to 950	GS 40	1.0416	150	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	200	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	150	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	110	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	120	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	130	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	200	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	180	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Ductile iron	Up to 280 HB	GGG 60	0.7060	120	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	120	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	60	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	40	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	120	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125

ATORN End milling cutter VHRSW Z5



- Please adjust these guideline values according to clamping operation and machine set-up!

255101 ....

ISO	**Finishing / Edge-banding** fz for ae = 0.5 x D and ap = 1.0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm										
	Materials group					3	4	5	6	8	10	12	14	16	20	25
P	Machining steel	Up to 700	9 SMn 28	1.0715	225	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Unalloyed structural steel	Up to 700	St-52	1.0052	225	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Structural steel	700 - 950	Ck45	1.1191	225	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Cast steel	Up to 950	GS 40	1.0416	150	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	200	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	150	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	110	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	120	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	130	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	200	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	180	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Ductile iron	Up to 280 HB	GGG 60	0.7060	120	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	120	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	60	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	40	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	120	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.08	0.1	0.125





SARA® End milling cutter Steel



- Please adjust these guideline values according to clamping operation and machine set-up!

254111 ....

ISO	**Roughing / Grooving** fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm									
	Materials group					4	5	6	8	10	12	14	16	18	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	200	0,012	0,016	0,019	0,026	0,033	0,041	0,047	0,053	0,059	0,065
	Unalloyed structural steel	Up to 700	St-52	1.0052	200	0,012	0,016	0,019	0,026	0,033	0,041	0,047	0,053	0,059	0,065
	Structural steel	700 - 950	Ck45	1.1191	160	0,012	0,016	0,019	0,026	0,034	0,041	0,047	0,053	0,058	0,064
	Tempering steel	500 - 950	42 CrMo4	1.7225	150	0,013	0,016	0,020	0,028	0,036	0,043	0,049	0,055	0,061	0,067
	Cast steel	Up to 950	GS 40	1.0416	140	0,013	0,017	0,021	0,029	0,038	0,046	0,052	0,058	0,065	0,071
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	130	0,014	0,018	0,022	0,031	0,040	0,049	0,055	0,062	0,069	0,075
	Tempering steel	950 -1300	43CrMo4	1.3563	120	0,015	0,020	0,024	0,033	0,043	0,052	0,059	0,066	0,073	0,080
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	120	0,014	0,018	0,022	0,030	0,039	0,047	0,054	0,061	0,067	0,073
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	120	0,014	0,018	0,022	0,030	0,039	0,047	0,054	0,061	0,067	0,073
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	80	0,016	0,020	0,025	0,034	0,043	0,054	0,062	0,069	0,076	0,083
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	110	0,013	0,016	0,020	0,027	0,035	0,043	0,049	0,055	0,061	0,066
	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	80	0,016	0,020	0,025	0,034	0,043	0,054	0,062	0,069	0,076	0,083
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	170	0,012	0,015	0,019	0,026	0,034	0,042	0,048	0,054	0,060	0,065
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	130	0,014	0,018	0,022	0,030	0,039	0,049	0,055	0,061	0,067	0,074
	Ductile iron	Up to 280 HB	GGG 60	0.7060	130	0,014	0,017	0,021	0,029	0,038	0,047	0,053	0,059	0,065	0,071
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	130	0,013	0,017	0,021	0,029	0,037	0,046	0,052	0,057	0,063	0,069
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	330	0,016	0,021	0,026	0,037	0,048	0,060	0,068	0,075	0,083	0,090
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	300	0,015	0,020	0,026	0,036	0,048	0,061	0,070	0,078	0,084	0,089
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	220	0,013	0,017	0,021	0,029	0,038	0,048	0,054	0,062	0,069	0,074
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	240	0,014	0,018	0,023	0,032	0,043	0,053	0,061	0,069	0,075	0,081
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	260	0,015	0,019	0,025	0,035	0,046	0,058	0,066	0,075	0,081	0,087
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	280	0,015	0,020	0,026	0,037	0,049	0,062	0,071	0,080	0,086	0,092
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	60	0,018	0,024	0,029	0,040	0,051	0,063	0,072	0,080	0,087	0,095
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	30	0,019	0,025	0,033	0,048	0,063	0,078	0,088	0,096	0,104	0,104

ISO	**Finishing / Edge-banding** fz for ae = 0,4 x D and ap = 1,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm									
	Materials group					4	5	6	8	10	12	14	16	18	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	280	0,017	0,022	0,027	0,037	0,047	0,057	0,065	0,072	0,079	0,085
	Unalloyed structural steel	Up to 700	St-52	1.0052	280	0,017	0,022	0,027	0,037	0,047	0,057	0,065	0,072	0,079	0,085
	Structural steel	700 - 950	Ck45	1.1191	230	0,014	0,018	0,023	0,032	0,042	0,052	0,059	0,065	0,069	0,073
	Tempering steel	500 - 950	42 CrMo4	1.7225	220	0,013	0,017	0,022	0,031	0,040	0,050	0,056	0,062	0,067	0,070
	Cast steel	Up to 950	GS 40	1.0416	210	0,012	0,017	0,021	0,029	0,038	0,048	0,053	0,059	0,064	0,067
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	200	0,012	0,016	0,020	0,027	0,035	0,045	0,050	0,056	0,061	0,063
	Tempering steel	950 -1300	43CrMo4	1.3563	190	0,011	0,015	0,018	0,024	0,033	0,042	0,046	0,052	0,057	0,059
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	160	0,010	0,013	0,016	0,022	0,028	0,035	0,039	0,043	0,046	0,050
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	160	0,010	0,013	0,016	0,022	0,028	0,035	0,039	0,043	0,046	0,050
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	100	0,010	0,013	0,017	0,023	0,029	0,037	0,041	0,044	0,045	0,049
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	140	0,010	0,013	0,016	0,022	0,028	0,036	0,039	0,043	0,046	0,048
	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	100	0,010	0,013	0,017	0,023	0,029	0,037	0,041	0,044	0,045	0,049
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	250	0,017	0,022	0,027	0,037	0,047	0,057	0,065	0,071	0,077	0,084
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	190	0,010	0,012	0,016	0,021	0,028	0,035	0,040	0,045	0,049	0,052
	Ductile iron	Up to 280 HB	GGG 60	0.7060	180	0,010	0,012	0,016	0,022	0,028	0,035	0,040	0,045	0,048	0,051
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	170	0,010	0,012	0,016	0,022	0,028	0,035	0,039	0,044	0,047	0,051
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	400	0,020	0,027	0,034	0,047	0,061	0,076	0,087	0,097	0,106	0,115
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	380	0,020	0,027	0,034	0,048	0,062	0,077	0,086	0,095	0,102	0,110
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	300	0,018	0,023	0,029	0,040	0,051	0,063	0,071	0,079	0,086	0,091
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	320	0,019	0,025	0,031	0,043	0,055	0,069	0,077	0,084	0,091	0,097
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	340	0,019	0,026	0,033	0,046	0,059	0,073	0,082	0,089	0,096	0,102
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	360	0,020	0,027	0,034	0,048	0,062	0,077	0,086	0,094	0,100	0,106
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	70	0,009	0,011	0,014	0,020	0,026	0,032	0,036	0,040	0,044	0,047
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	40	0,007	0,010	0,013	0,019	0,024	0,033	0,033	0,038	0,039	0,039

SARA® End milling cutter



- Please adjust these guideline values according to clamping operation and machine set-up!

254125....
254130....
254131....

ISO	**Roughing** ap: 1.00 x d1 | ae: 1.00 x D1 Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	D1 3 fz	D1 4 fz	D1 5 fz	D1 6 fz	D1 7 fz	D1 8 fz	D1 9 fz	D1 10 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	141	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Unalloyed structural steel	Up to 700	St-52	1.0052	134	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Structural steel	700 - 950	Ck45	1.1191	127	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Tempering steel	500 - 950	42 CrMo4	1.7225	113	0.008	0.013	0.021	0.021	0.027	0.027	0.027	0.044
	Tempering steel	950 -1300	43CrMo4	1.3563	85	0.005	0.013	0.015	0.015	0.027	0.027	0.027	0.044
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	57 - 120	0.008 - 0.01	0.013 - 0.017	0.021 - 0.029	0.021 - 0.029	0.027 - 0.038	0.027 - 0.038	0.027 - 0.038	0.044 - 0.063
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	57	0.008	0.013	0.021	0.021	0.027	0.027	0.027	0.044
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	141	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Ductile iron	Up to 280 HB	GGG 60	0.7060	106	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	106	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063

ISO	**Roughing** ap: 1.00 x d1 | ae: 1.00 x D1 Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	D1 11 fz	D1 12 fz	D1 13 fz	D1 14 fz	D1 16 fz	D1 18 fz	D1 20 fz	D1 25 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	141	0.063	0.063	0.063	0.084	0.084	0.101	0.101	0.109
	Unalloyed structural steel	Up to 700	St-52	1.0052	134	0.063	0.063	0.063	0.084	0.084	0.101	0.101	0.109
	Structural steel	700 - 950	Ck45	1.1191	127	0.063	0.063	0.063	0.084	0.084	0.101	0.101	0.109
	Tempering steel	500 - 950	42 CrMo4	1.7225	113	0.044	0.044	0.044	0.059	0.059	0.071	0.071	0.077
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	57 - 120	0.044 - 0.063	0.044 - 0.063	0.044 - 0.063	0.059 - 0.084	0.059 - 0.084	0.071 - 0.101	0.071 - 0.101	0.071 - 0.101
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	57	0.044	0.044	0.044	0.059	0.059	0.071	0.071	0.077
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	141	0.063	0.063	0.063	0.084	0.084	0.101	0.101	0.109
	Ductile iron	Up to 280 HB	GGG 60	0.7060	106	0.063	0.063	0.063	0.084	0.084	0.101	0.101	0.109
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	106	0.063	0.063	0.063	0.084	0.084	0.101	0.101	0.109

ISO	**Finishing / Edge-banding** ap: 1.00 x d1 | ae: 0.50 x D1 Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	D1 3 fz	D1 4 fz	D1 5 fz	D1 6 fz	D1 7 fz	D1 8 fz	D1 9 fz	D1 10 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	200	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Unalloyed structural steel	Up to 700	St-52	1.0052	190	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Structural steel	700 - 950	Ck45	1.1191	180	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Tempering steel	500 - 950	42 CrMo4	1.7225	160	0.009	0.015	0.025	0.025	0.032	0.032	0.032	0.052
	Tempering steel	950 -1300	43CrMo4	1.3563	120	0.006	0.015	0.018	0.018	0.032	0.032	0.032	0.052
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	80 - 170	0.009 - 0.012	0.015 - 0.02	0.025 - 0.035	0.032 - 0.045	0.032 - 0.045	0.032 - 0.045	0.052 - 0.075	0.052 - 0.075
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	80	0.009	0.015	0.025	0.025	0.032	0.032	0.032	0.052
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	200	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Ductile iron	Up to 280 HB	GGG 60	0.7060	150	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	150	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075

ISO	**Finishing / Edge-banding** ap: 1.00 x d1 | ae: 0.50 x D1 Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	D1 11 fz	D1 12 fz	D1 13 fz	D1 14 fz	D1 16 fz	D1 18 fz	D1 20 fz	D1 25 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	200	0.075	0.075	0.075	0.1	0.1	0.12	0.12	0.13
	Unalloyed structural steel	Up to 700	St-52	1.0052	190	0.075	0.075	0.075	0.1	0.1	0.12	0.12	0.13
	Structural steel	700 - 950	Ck45	1.1191	180	0.075	0.075	0.075	0.1	0.1	0.12	0.12	0.13
	Tempering steel	500 - 950	42 CrMo4	1.7225	160	0.052	0.052	0.052	0.07	0.07	0.084	0.084	0.091
	Tempering steel	950 -1300	43CrMo4	1.3563	120	0.052	0.052	0.052	0.07	0.07	0.084	0.084	0.091
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	80 - 170	0.052 - 0.075	0.052 - 0.075	0.052 - 0.075	0.07 - 0.1	0.07 - 0.1	0.084 - 0.12	0.084 - 0.12	0.091 - 0.13
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	80	0.052	0.052	0.052	0.07	0.07	0.084	0.084	0.091
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	200	0.075	0.075	0.075	0.1	0.1	0.12	0.12	0.13
	Ductile iron	Up to 280 HB	GGG 60	0.7060	150	0.075	0.075	0.075	0.1	0.1	0.12	0.12	0.13
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	150	0.075	0.075	0.075	0.1	0.1	0.12	0.12	0.13

SARA® End milling cutter



- Please adjust these guideline values according to clamping operation and machine set-up!

254119....
254132....

254139....
254140....

ISO	**Roughing** ap: 1.00 x d1 | ae: 1.00 x D1 Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	D1 5 fz	D1 6 fz	D1 8 fz	D1 10 fz	D1 12 fz	D1 14 fz	D1 16 fz	D1 20 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	113	0.029	0.029	0.038	0.063	0.063	0.084	0.084	0.101
	Unalloyed structural steel	Up to 700	St-52	1.0052	106	0.029	0.029	0.038	0.063	0.063	0.084	0.084	0.101
	Structural steel	700 - 950	Ck45	1.1191	99	0.029	0.029	0.038	0.063	0.063	0.084	0.084	0.101
	Tempering steel	500 - 950	42 CrMo4	1.7225	85	0.021	0.021	0.027	0.044	0.044	0.059	0.059	0.071
	Tempering steel	950 -1300	43CrMo4	1.3563	57	0.021	0.021	0.027	0.044	0.044	0.059	0.059	0.071
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	42 - 92	0.021 - 0.029	0.021 - 0.029	0.027 - -0.038	0.044 - 0.063	0.059 - -0.084	0.059 - 0.084	0.059 - 0.084	0.071 - 0.101
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	64	0.021	0.021	0.027	0.044	0.044	0.059	0.059	0.071
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	120	0.029	0.029	0.038	0.063	0.063	0.084	0.084	0.101
	Ductile iron	Up to 280 HB	GGG 60	0.7060	85	0.029	0.029	0.038	0.063	0.063	0.084	0.084	0.101
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	85	0.029	0.029	0.038	0.063	0.063	0.084	0.084	0.101

ISO	**Finishing / Edge-banding** ap: 1.00 x d1 | ae: 0.50 x D1 Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	D1 5 fz	D1 6 fz	D1 8 fz	D1 10 fz	D1 12 fz	D1 14 fz	D1 16 fz	D1 20 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	160	0.035	0.035	0.045	0.075	0.075	0.1	0.1	0.12
	Unalloyed structural steel	Up to 700	St-52	1.0052	150	0.035	0.035	0.045	0.075	0.075	0.1	0.1	0.12
	Structural steel	700 - 950	Ck45	1.1191	140	0.035	0.035	0.045	0.075	0.075	0.1	0.1	0.12
	Tempering steel	500 - 950	42 CrMo4	1.7225	120	0.025	0.025	0.032	0.052	0.052	0.07	0.07	0.084
	Tempering steel	950 -1300	43CrMo4	1.3563	80	0.025	0.025	0.032	0.052	0.052	0.07	0.07	0.084
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	60 - 130	0.025 - 0.035	0.025 - 0.035	0.032 - 0.045	0.052 - 0.075	0.052 - 0.075	0.07 - 0.1	0.07 - 0.1	0.084 - 0.12
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	90	0.025	0.025	0.032	0.052	0.052	0.07	0.07	0.084
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	170	0.035	0.035	0.045	0.075	0.075	0.1	0.1	0.12
	Ductile iron	Up to 280 HB	GGG 60	0.7060	120	0.035	0.035	0.045	0.075	0.075	0.1	0.1	0.12
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	120	0.035	0.035	0.045	0.075	0.075	0.1	0.1	0.12



254166...
254165....

ISO	**Roughing** ap: 1.00 x d1 | ae: 1.00 x D1 Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	D1 3 fz	D1 4 fz	D1 5 fz	D1 6 fz	D1 7 fz	D1 8 fz	D1 9 fz	D1 10 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	190	0,012	0,02	0,035	0,035	0,045	0,045	0,045	0,075
	Unalloyed structural steel	Up to 700	St-52	1.0052	180	0,012	0,02	0,035	0,035	0,045	0,045	0,045	0,075
	Structural steel	700 - 950	Ck45	1.1191	170	0,012	0,02	0,035	0,035	0,045	0,045	0,045	0,075
	Tempering steel	500 - 950	42 CrMo4	1.7225	150	0,009	0,015	0,025	0,025	0,032	0,032	0,032	0,052
	Tempering steel	950 -1300	43CrMo4	1.3563	110	0,006	0,015	0,025	0,025	0,032	0,032	0,032	0,052
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	80 - 160	0,009 - 0,012	0,015 - 0,02	0,025	0,025	0,032 - 0,045	0,032 - 0,045	0,032 - 0,045	0,052 - 0,075
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	75	0,009	0,015	0,025	0,025	0,032	0,032	0,032	0,052
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	35	0,009	0,015	0,025	0,025	0,032	0,032	0,032	0,052
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	190	0,012	0,02	0,035	0,035	0,045	0,045	0,045	0,075
	Ductile iron	Up to 280 HB	GGG 60	0.7060	140	0,012	0,02	0,035	0,035	0,045	0,045	0,045	0,075
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	140	0,012	0,02	0,035	0,035	0,045	0,045	0,045	0,075

ISO	**Roughing** ap: 1.00 x d1 | ae: 1.00 x D1 Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	D1 11 fz	D1 12 fz	D1 13 fz	D1 14 fz	D1 16 fz	D1 18 fz	D1 20 fz	D1 25 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	190	0,075	0,075	0,1	0,1	0,1	0,12	0,12	0,13
	Unalloyed structural steel	Up to 700	St-52	1.0052	180	0,075	0,075	0,1	0,1	0,1	0,12	0,12	0,13
	Structural steel	700 - 950	Ck45	1.1191	170	0,075	0,075	0,1	0,1	0,1	0,12	0,12	0,13
	Tempering steel	500 - 950	42 CrMo4	1.7225	150	0,052	0,052	0,07	0,07	0,07	0,084	0,084	0,091
	Tempering steel	950 -1300	43CrMo4	1.3563	110	0,052	0,052	0,07	0,07	0,07	0,084	0,084	0,091
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	80 - 160	0,052 - 0,075	0,052 - 0,075	0,07 - 0,1	0,07 - 0,1	0,07 - 0,1	0,084 - 0,12	0,084 - 0,12	0,091 - 0,13
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	75	0,052	0,052	0,07	0,07	0,07	0,084	0,084	0,091
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	35	0,052	0,052	0,07	0,07	0,07	0,084	0,084	0,091
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	190	0,075	0,075	0,1	0,1	0,1	0,12	0,12	0,13
	Ductile iron	Up to 280 HB	GGG 60	0.7060	140	0,075	0,075	0,1	0,1	0,1	0,12	0,12	0,13
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	140	0,075	0,075	0,1	0,1	0,1	0,12	0,12	0,13

SARA® Torus milling cutter



254019....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm	
						6 - 8	10 - 12
P	Machining steel	Up to 700	9 SMn 28	1.0715	80	0,04	0,055
	Unalloyed structural steel	Up to 700	St-52	1.0052	80	0,04	0,055
	Structural steel	700 - 950	Ck45	1.1191	70	0,04	0,055
	Cast steel	Up to 950	GS 40	1.0416	70	0,04	0,055
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	70	0,04	0,055
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	70	0,035	0,05
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	35 - 45	0,035	0,05
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	40 - 50	0,035	0,05
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	100	0,035	0,05
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	90	0,035	0,05
	Ductile iron	Up to 280 HB	GGG 60	0.7060	95	0,035	0,05
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	95	0,035	0,05
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	25 - 30	0,03	0,04
	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	15-20	0,03	0,04

	ap	ae
Material up to 45 HRc		
D up to 3 mm	1.5 x D	0.05 x D
D more than 3 mm	1.5 x D	0.1 x D
Material from 45-60 HRc	1 x D	0.02 x D

HPMT End milling cutter



- Please adjust these guideline values according to clamping operation and machine set-up!

254121....
254124....

ISO	**Roughing** ap: 1.00 x d1 | ae: 1.00 x D1 Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm									
						3	4	5	6	8	10	12	14	16	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	150 - 200	0,011	0,015	0,020	0,025	0,035	0,046	0,057	0,069	0,082	0,110
	Unalloyed structural steel	Up to 700	St-52	1.0052	150 - 200	0,011	0,015	0,020	0,025	0,035	0,046	0,057	0,069	0,082	0,110
	Structural steel	700 - 950	Ck45	1.1191	100 - 120	0,013	0,019	0,024	0,030	0,042	0,054	0,068	0,082	0,097	0,129
	Cast steel	Up to 950	GS 40	1.0416	100 - 120	0,011	0,015	0,020	0,025	0,035	0,046	0,057	0,069	0,082	0,110
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	80 - 120	0,013	0,019	0,024	0,030	0,042	0,054	0,068	0,082	0,097	0,129
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	70 - 90	0,011	0,015	0,020	0,025	0,035	0,046	0,057	0,069	0,082	0,110
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	40 - 70	0,011	0,016	0,022	0,028	0,040	0,053	0,068	0,084	0,101	0,138
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	70 - 100	0,012	0,019	0,026	0,035	0,051	0,070	0,091	0,114	1,140	0,198
	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	40 - 70	0,011	0,016	0,022	0,028	0,040	0,053	0,068	0,084	0,101	0,138
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	150 - 200	0,011	0,015	0,020	0,025	0,035	0,046	0,057	0,069	0,082	0,110
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	150 - 200	0,011	0,015	0,020	0,025	0,035	0,046	0,057	0,069	0,082	0,110
	Ductile iron	Up to 280 HB	GGG 60	0.7060	150 - 200	0,009	0,013	0,018	0,024	0,036	0,049	0,063	0,079	0,096	0,136
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	150 - 200	0,009	0,013	0,018	0,024	0,036	0,049	0,063	0,079	0,096	0,136
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	280 - 350	0,025	0,025	0,025	0,025	0,040	0,045	0,050	0,055	0,055	0,060
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	200 - 250	0,025	0,025	0,025	0,025	0,040	0,045	0,050	0,055	0,055	0,060
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	60 - 70	0,031	0,019	0,026	0,034	0,050	0,067	0,080	0,108	0,132	0,184
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	15 - 25	0,031	0,019	0,026	0,034	0,050	0,067	0,080	0,108	0,132	0,184
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	50 - 70	0,031	0,019	0,026	0,034	0,050	0,067	0,080	0,108	0,132	0,184
	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	40 - 60	0,031	0,019	0,026	0,034	0,050	0,067	0,080	0,108	0,132	0,184

ISO	**Finishing / Edge-banding** ap: 1.00 x d1 | ae: 0.50 x D1 Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm									
						3	4	5	6	8	10	12	14	16	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	150 - 200	0,018	0,024	0,032	0,040	0,056	0,074	0,091	0,110	0,131	0,176
	Unalloyed structural steel	Up to 700	St-52	1.0052	150 - 200	0,018	0,024	0,032	0,040	0,056	0,074	0,091	0,110	0,131	0,176
	Structural steel	700 - 950	Ck45	1.1191	100 - 120	0,021	0,030	0,038	0,048	0,067	0,086	0,109	0,131	0,155	0,206
	Cast steel	Up to 950	GS 40	1.0416	100 - 120	0,018	0,024	0,032	0,040	0,056	0,074	0,091	0,110	0,131	0,176
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	80 - 120	0,021	0,030	0,038	0,048	0,067	0,086	0,109	0,131	0,155	0,206
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	70 - 90	0,018	0,024	0,032	0,040	0,056	0,074	0,091	0,110	0,131	0,176
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	40 - 70	0,018	0,026	0,035	0,045	0,064	0,085	0,109	0,134	0,162	0,221
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	40 - 70	0,019	0,030	0,042	0,056	0,082	0,112	0,146	0,182	1,824	0,317
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	150 - 200	0,018	0,024	0,032	0,040	0,056	0,074	0,091	0,110	0,131	0,176
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	150 - 200	0,018	0,024	0,032	0,040	0,056	0,074	0,091	0,110	0,131	0,176
	Ductile iron	Up to 280 HB	GGG 60	0.7060	150 - 200	0,014	0,021	0,029	0,038	0,058	0,078	0,101	0,126	0,154	0,218
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	150 - 200	0,014	0,021	0,029	0,038	0,058	0,078	0,101	0,126	0,154	0,218
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	280 - 350	0,040	0,040	0,040	0,040	0,064	0,072	0,080	0,088	0,088	0,096
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	200 - 250	0,040	0,040	0,040	0,040	0,064	0,072	0,080	0,088	0,088	0,096
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	60 - 70	0,050	0,030	0,042	0,054	0,080	0,107	0,128	0,173	0,211	0,294
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	15 - 25	0,050	0,030	0,042	0,054	0,080	0,107	0,128	0,173	0,211	0,294
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	50 - 70	0,050	0,030	0,042	0,054	0,080	0,107	0,128	0,173	0,211	0,294
	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	40 - 60	0,050	0,030	0,042	0,054	0,080	0,107	0,128	0,173	0,211	0,294



PFERD
Grinding and cutting
730 pages

Overview of all free manufacturers' catalogues
on page 12/13

SARA® Solid carbide roughing cutter HPC



- Please adjust these guideline values according to clamping operation and machine set-up!

254146....

ISO	**Roughing** ap: 1,00 x D | ae: 1,00 x D Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
						5	6	8	10	12	16	18	20
P	Machining steel	up to 700	9 SMn 28	1.0715	135-180	0,016	0,020	0,028	0,037	0,046	0,066	0,072	0,088
	Unalloyed structural steel	up to 700	St-52	1.0052	135-180	0,016	0,020	0,028	0,037	0,046	0,066	0,072	0,088
	Structural steel	700 - 950	Ck45	1.1191	90-100	0,010	0,010	0,010	0,010	0,010	0,010	0,010	0,010
	Cast steel	up to 950	GS 40	1.0416	90-100	0,016	0,020	0,028	0,037	0,046	0,066	0,072	0,088
	Case-hardened steel	up to 1200	16 MnCr 5	1.7131	75-110	0,019	0,024	0,034	0,043	0,054	0,078	0,088	0,103
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	65-90	0,016	0,020	0,028	0,037	0,046	0,066	0,074	0,088
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	40-65	0,016	0,020	0,028	0,037	0,046	0,066	0,072	0,110
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	70-110	0,021	0,028	0,041	0,056	0,073	0,091	0,096	0,958
	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	40-65	0,018	0,022	0,032	0,042	0,054	0,081	0,088	0,110
K	Grey cast iron	up to 260 HB	GG 25	0.6025	150-200	0,016	0,020	0,028	0,037	0,046	0,066	0,072	0,088
	Alloyed grey cast iron	up to 310 HB	GGL-NiCr 35 2	0.6678	150-200	0,016	0,020	0,028	0,037	0,046	0,066	0,072	0,088
	Ductile iron	up to 280 HB	GGG 60	0.7060	150-200	0,014	0,019	0,029	0,039	0,050	0,077	0,080	0,109
	Malleable cast iron	up to 280 HB	GTS 55	0.8155	150-200	0,014	0,019	0,029	0,039	0,050	0,077	0,080	0,109
S	Titanium alloys	up to 1300	TiAl6Sn 2	3.7174	60-70	0,021	0,027	0,040	0,054	0,064	0,106	0,113	0,147
	Nickel-based alloys	up to 1300	NiCr19Fe19NbMo	Inconel 718	18-25	0,021	0,027	0,040	0,054	0,064	0,106	0,113	0,147

ISO	**Finishing / Edge-banding** ap: 1,00 x D | ae: 0,40 x D Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
						5	6	8	10	12	16	18	20
P	Machining steel	up to 700	9 SMn 28	1.0715	135-180	0,040	0,047	0,061	0,075	0,091	0,113	0,122	0,132
	Unalloyed structural steel	up to 700	St-52	1.0052	135-180	0,040	0,047	0,061	0,075	0,091	0,113	0,122	0,132
	Structural steel	700 - 950	Ck45	1.1191	90-100	0,030	0,037	0,051	0,065	0,081	0,103	0,112	0,122
	Cast steel	up to 950	GS 40	1.0416	90-100	0,030	0,037	0,051	0,065	0,081	0,103	0,112	0,122
	Case-hardened steel	up to 1200	16 MnCr 5	1.7131	75-110	0,022	0,029	0,043	0,057	0,073	0,095	0,104	0,114
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	65-90	0,014	0,021	0,035	0,049	0,065	0,087	0,096	0,106
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	40-65	0,028	0,035	0,049	0,063	0,079	0,101	0,110	0,120
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	70-110	0,035	0,042	0,056	0,070	0,086	0,108	0,117	0,127
	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	40-65	0,025	0,032	0,046	0,060	0,076	0,098	0,107	0,117
K	Grey cast iron	up to 260 HB	GG 25	0.6025	150-200	0,028	0,035	0,049	0,063	0,079	0,101	0,110	0,120
	Alloyed grey cast iron	up to 310 HB	GGL-NiCr 35 2	0.6678	150-200	0,028	0,035	0,049	0,063	0,079	0,101	0,110	0,120
	Ductile iron	up to 280 HB	GGG 60	0.7060	150-200	0,028	0,035	0,049	0,063	0,079	0,101	0,110	0,120
	Malleable cast iron	up to 280 HB	GTS 55	0.8155	150-200	0,028	0,035	0,049	0,063	0,079	0,101	0,110	0,120
S	Titanium alloys	up to 1300	TiAl6Sn 2	3.7174	60-70	0,027	0,033	0,047	0,061	0,077	0,099	0,109	0,118
	Nickel-based alloys	up to 1300	NiCr19Fe19NbMo	Inconel 718	18-25	0,011	0,017	0,031	0,045	0,061	0,083	0,093	0,102





VAN HOORN
End milling cutters
255 pages
Art.no. 019900 0079

Overview of all free manufacturers' catalogues
on page 12/13

SARA® Solid carbide trochoidal milling cutter



- Die angegebenen Richtwerte sind der Werkstückaufspannung und den Maschinenverhältnissen anzupassen!

254147....

ISO	**Roughing** ap: 5,00 x D | ae:: 0,05 ~ 0,08 Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
						5	6	8	10	12	16	18	20
P	Machining steel	up to 700	9 SMn 28	1.0715	135-180	0,040	0,047	0,061	0,075	0,091	0,113	0,122	0,132
	Unalloyed structural steel	up to 700	St-52	1.0052	135-180	0,040	0,047	0,061	0,075	0,091	0,113	0,122	0,132
	Structural steel	700 - 950	Ck45	1.1191	90-100	0,030	0,037	0,051	0,065	0,081	0,103	0,112	0,122
	Cast steel	up to 950	GS 40	1.0416	90-100	0,030	0,037	0,051	0,065	0,081	0,103	0,112	0,122
	Case-hardened steel	up to 1200	16 MnCr 5	1.7131	75-110	0,022	0,029	0,043	0,057	0,073	0,095	0,104	0,114
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	65-90	0,014	0,021	0,035	0,049	0,065	0,087	0,096	0,106
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	40-65	0,028	0,035	0,049	0,063	0,079	0,101	0,110	0,120
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	70-110	0,035	0,042	0,056	0,070	0,086	0,108	0,117	0,127
	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	40-65	0,025	0,032	0,046	0,060	0,076	0,098	0,107	0,117
K	Grey cast iron	up to 260 HB	GG 25	0.6025	150-200	0,028	0,035	0,049	0,063	0,079	0,101	0,110	0,120
	Alloyed grey cast iron	up to 310 HB	GGL-NiCr 35 2	0.6678	150-200	0,028	0,035	0,049	0,063	0,079	0,101	0,110	0,120
	Ductile iron	up to 280 HB	GGG 60	0.7060	150-200	0,028	0,035	0,049	0,063	0,079	0,101	0,110	0,120
	Malleable cast iron	up to 280 HB	GTS 55	0.8155	150-200	0,028	0,035	0,049	0,063	0,079	0,101	0,110	0,120
S	Titanium alloys	up to 1300	TiAl6Sn 2	3.7174	60-70	0,027	0,033	0,047	0,061	0,077	0,099	0,109	0,118
	Nickel-based alloys	up to 1300	NiCr19Fe19NbMo	Inconel 718	18-25	0,011	0,017	0,031	0,045	0,061	0,083	0,093	0,102

SARA® End milling cutter stainless steel



- Please adjust these guideline values according to clamping operation and machine set-up!

254134....
254136....

ISO	**Roughing** ap: 1.00 x d1 | ae: 1.00 x D1 Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	D1 3 fz	D1 4 fz	D1 5 fz	D1 6 fz	D1 7 fz	D1 8 fz	D1 9 fz	D1 10 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	163	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Unalloyed structural steel	Up to 700	St-52	1.0052	148	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Structural steel	700 - 950	Ck45	1.1191	124	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Tempering steel	500 - 950	42 CrMo4	1.7225	106	0.008	0.013	0.021	0.021	0.027	0.027	0.027	0.044
	Tempering steel	950 -1300	43CrMo4	1.3563	71	0.005	0.013	0.021	0.021	0.027	0.027	0.027	0.044
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	64 - 113	0.08 - 0.01	0.013 - 0.017	0.021	0.021	0.027 - 0.038	0.027 - 0.038	0.027 - 0.038	0.044 - 0.063
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	62	0.008	0.013	0.021	0.021	0.027	0.027	0.027	0.044
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	34	0.008	0.013	0.021	0.021	0.027	0.027	0.027	0.044
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	134	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Ductile iron	Up to 280 HB	GGG 60	0.7060	99	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	99	0.010	0.017	0.029	0.029	0.038	0.038	0.038	0.063
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	41	0.008	0.013	0.021	0.021	0.027	0.027	0.027	0.044
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	41	0.008	0.013	0.021	0.021	0.027	0.027	0.027	0.044

ISO	**Roughing** ap: 1.00 x d1 | ae: 1.00 x D1 Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	D1 11 fz	D1 12 fz	D1 13 fz	D1 14 fz	D1 16 fz	D1 18 fz	D1 20 fz	D1 25 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	163	0.063	0.063	0.084	0.084	0.084	0.101	0.101	0.109
	Unalloyed structural steel	Up to 700	St-52	1.0052	148	0.063	0.063	0.084	0.084	0.084	0.101	0.101	0.109
	Structural steel	700 - 950	Ck45	1.1191	124	0.063	0.063	0.084	0.084	0.084	0.101	0.101	0.109
	Tempering steel	500 - 950	42 CrMo4	1.7225	106	0.044	0.044	0.059	0.059	0.059	0.071	0.071	0.077
	Tempering steel	950 -1300	43CrMo4	1.3563	71	0.044	0.044	0.059	0.059	0.059	0.071	0.071	0.084
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	64 - 113	0.044 - 0.063	0.044 - 0.063	0.059 - 0.084	0.059 - 0.084	0.059 - 0.084	0.071 - 0.101	0.071 - 0.101	0.084 - 0.109
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	62	0.044	0.044	0.059	0.059	0.059	0.071	0.071	0.077
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	34	0.044	0.044	0.059	0.059	0.059	0.071	0.071	0.077
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	134	0.063	0.063	0.084	0.084	0.084	0.101	0.101	0.109
	Ductile iron	Up to 280 HB	GGG 60	0.7060	99	0.063	0.063	0.084	0.084	0.084	0.101	0.101	0.109
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	99	0.063	0.063	0.084	0.084	0.084	0.101	0.101	0.109
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	41	0.044	0.044	0.059	0.059	0.059	0.071	0.071	0.077
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	41	0.044	0.044	0.059	0.059	0.059	0.071	0.071	0.077

ISO	**Finishing / Edge-banding** ap: 1.00 x d1 | ae: 0.50 x D1 Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	D1 3 fz	D1 4 fz	D1 5 fz	D1 6 fz	D1 7 fz	D1 8 fz	D1 9 fz	D1 10 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	230	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Unalloyed structural steel	Up to 700	St-52	1.0052	210	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Structural steel	700 - 950	Ck45	1.1191	175	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Tempering steel	500 - 950	42 CrMo4	1.7225	150	0.009	0.015	0.025	0.025	0.032	0.032	0.032	0.052
	Tempering steel	950 -1300	43CrMo4	1.3563	100	0.006	0.015	0.025	0.025	0.032	0.032	0.032	0.052
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	90 - 160	0.09 - 0.012	0.015 - 0.02	0.025	0.025	0.032 - 0.045	0.052 - 0.075	0.052 - 0.075	0.052 - 0.075
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	88	0.009	0.015	0.025	0.025	0.032	0.032	0.032	0.052
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	48	0.009	0.015	0.025	0.025	0.032	0.032	0.032	0.052
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	190	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Ductile iron	Up to 280 HB	GGG 60	0.7060	140	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	140	0.012	0.02	0.035	0.035	0.045	0.045	0.045	0.075
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	58	0.009	0.015	0.025	0.025	0.032	0.032	0.032	0.052
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	58	0.009	0.015	0.025	0.025	0.032	0.032	0.032	0.052

ISO	**Finishing / Edge-banding** ap: 1.00 x d1 | ae: 0.50 x D1 Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	D1 11 fz	D1 12 fz	D1 13 fz	D1 14 fz	D1 16 fz	D1 18 fz	D1 20 fz	D1 25 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	230	0.075	0.075	0.1	0.1	0.1	0.12	0.12	0.13
	Unalloyed structural steel	Up to 700	St-52	1.0052	210	0.075	0.075	0.1	0.1	0.1	0.12	0.12	0.13
	Structural steel	700 - 950	Ck45	1.1191	175	0.075	0.075	0.1	0.1	0.1	0.12	0.12	0.13
	Tempering steel	500 - 950	42 CrMo4	1.7225	150	0.052	0.052	0.07	0.07	0.07	0.084	0.084	0.091
	Tempering steel	950 -1300	43CrMo4	1.3563	100	0.052	0.052	0.07	0.07	0.07	0.084	0.084	0.1
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	90 - 160	0.052 - 0.075	0.052 - 0.075	0.07 - 0.1	0.07 - 0.1	0.07 - 0.1	0.084 - 0.12	0.084 - 0.12	0.01 - 0.13
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	88	0.052	0.052	0.07	0.07	0.07	0.084	0.084	0.091
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	48	0.052	0.052	0.07	0.07	0.07	0.084	0.084	0.091
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	190	0.075	0.075	0.1	0.1	0.1	0.12	0.12	0.13
	Ductile iron	Up to 280 HB	GGG 60	0.7060	140	0.075	0.075	0.1	0.1	0.1	0.12	0.12	0.13
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	140	0.075	0.075	0.1	0.1	0.1	0.12	0.12	0.13

SARA® Roughing cutter



- Please adjust these guideline values according to clamping operation and machine set-up!

254018....
254022....

254025....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
						6	8	10	12	16	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	150	0.017	0.022	0.026	0.032	0.04	0.047
	Unalloyed structural steel	Up to 700	St-52	1.0052	150	0.017	0.022	0.026	0.032	0.04	0.047
	Structural steel	700 - 950	Ck45	1.1191	130	0.017	0.022	0.026	0.032	0.04	0.047
	Cast steel	Up to 950	GS 40	1.0416	120	0.017	0.022	0.026	0.032	0.04	0.047
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	130	0.017	0.022	0.026	0.032	0.04	0.047
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	120	0.017	0.022	0.026	0.032	0.04	0.047
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	60	0.012	0.015	0.02	0.021	0.027	0.03
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	60	0.012	0.015	0.02	0.021	0.027	0.03
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	120	0.014	0.017	0.021	0.023	0.027	0.03
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	60	0.012	0.015	0.018	0.02	0.025	0.028
	Ductile iron	Up to 280 HB	GGG 60	0.7060	80	0.014	0.017	0.021	0.023	0.027	0.03
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	80	0.014	0.017	0.021	0.023	0.027	0.03
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	80	0.012	0.015	0.02	0.021	0.023	0.025

	Groove milling	Profile milling	
	ap	ap	ae
Steel up to 1300 N/mm²	0.4 x D	1.5 x D	0.4 x D
Steel up to 1300 N/mm² -2000 N/mm²	0.3 x D	1 x D	0.3 x D
Stainless steel	0.3 x D	1 x D	0.3 x D

SARA® Trochoidal milling cutter



254117 ....

ISO	Materials group	Strength/ Hardness N/mm²	Material chemical example	Material number	Cutting speed Vc m/min	Ø [mm] 4.000 fz	Ø [mm] 5.000 fz	Ø [mm] 6.000 fz	Ø [mm] 8.000 fz	Ø [mm] 10.000 fz	Ø [mm] 12.000 fz	Ø [mm] 16.000 fz	Ø [mm] 20.000 fz
P	Machining steel	up to 700	9 SMn 28	1.0715	300	0.035	0.045	0.055	0.065	0.075	0.090	0.120	0.140
	Unalloyed structural steel	up to 700	St-52	1.0052	300	0.035	0.045	0.055	0.065	0.075	0.090	0.120	0.140
	Structural steel	700 - 950	Ck45	1.1191	250	0.035	0.045	0.055	0.065	0.075	0.090	0.120	0.140
	Tempering steel	500 - 950	42 CrMo4	1.7225	250	0.035	0.045	0.055	0.065	0.075	0.090	0.120	0.140
	Cast steel	up to 950	GS 40	1.0416	250	0.035	0.045	0.055	0.065	0.075	0.090	0.120	0.140
	Case-hardening steel	up to 1200	16 MnCr 5	1.7131	210	0.035	0.045	0.055	0.065	0.075	0.090	0.120	0.140
	Tempering steel	950 - 1300	43CrMo4	1.3563	210	0.035	0.045	0.055	0.065	0.075	0.090	0.120	0.140
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	210	0.035	0.045	0.055	0.065	0.075	0.090	0.120	0.140
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	200	0.035	0.045	0.055	0.065	0.075	0.090	0.120	0.140
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	170	0.021	0.021	0.026	0.037	0.048	0.060	0.086	0.145
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	190	0.027	0.027	0.027	0.034	0.056	0.086	0.086	0.12
	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	120	0.023	0.023	0.029	0.042	0.059	0.071	0.106	0.14
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	130	0.027	0.027	0.036	0.053	0.070	0.084	0.12	0.193
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	100	0.027	0.027	0.036	0.053	0.070	0.084	0.12	0.193
	Superalloys	Up to 1300	X45CrSi 9 3	1.2083	80	0.025	0.025	0.03	0.05	0.065	0.080	0.10	0.185
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	100	0.015	0.015	0.016	0.018	0.02	0.03	0.032	0.036
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	90	0.013	0.013	0.014	0.016	0.018	0.02	0.025	0.032

SARA® HPC Power end milling cutter 4Z steel



- Please adjust these guideline values according to clamping operation and machine set-up!

254130...
254131...

ISO	**Roughing / Grooving** fz for ae = 1.0 x D and ap = 1.0 x D Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm									
						4	5	6	8	10	12	14	16	18	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	200	0.040	0.06	0.07	0.09	0.110	0.13	0.180	0.180	0.220	0.220
	Unalloyed structural steel	Up to 700	St-52	1.0052	200	0.040	0.06	0.07	0.09	0.110	0.13	0.180	0.180	0.220	0.220
	Structural steel	700 - 950	Ck45	1.1191	170	0.040	0.050	0.06	0.080	0.1	0.12	0.160	0.160	0.200	0.200
	Cast steel	Up to 950	GS 40	1.0416	110	0.03	0.040	0.050	0.07	0.09	0.1	0.140	0.140	0.170	0.170
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	135	0.040	0.050	0.06	0.080	0.1	0.12	0.160	0.160	0.200	0.200
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	90	0.03	0.040	0.040	0.06	0.07	0.080	0.110	0.110	0.140	0.140
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	150	0.06	0.07	0.080	0.110	0.140	0.170	0.220	0.220	0.280	0.280
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	140	0.050	0.06	0.07	0.1	0.12	0.140	0.190	0.190	0.240	0.240
	Ductile iron	Up to 280 HB	GGG 60	0.7060	130	0.040	0.06	0.07	0.09	0.110	0.13	0.180	0.180	0.220	0.220
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	100	0.040	0.06	0.07	0.09	0.110	0.13	0.180	0.180	0.220	0.220

ISO	**Finishing / Edge-banding** fz for ae = 0.5 x D and ap = 1.0 x D Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm									
						4	5	6	8	10	12	14	16	18	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	230	0.040	0.06	0.07	0.09	0.110	0.13	0.180	0.180	0.220	0.220
	Unalloyed structural steel	Up to 700	St-52	1.0052	230	0.040	0.06	0.07	0.09	0.110	0.13	0.180	0.180	0.220	0.220
	Structural steel	700 - 950	Ck45	1.1191	200	0.040	0.050	0.06	0.080	0.1	0.12	0.160	0.160	0.200	0.200
	Cast steel	Up to 950	GS 40	1.0416	130	0.03	0.040	0.050	0.07	0.09	0.1	0.140	0.140	0.170	0.170
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	160	0.040	0.050	0.06	0.080	0.1	0.12	0.160	0.160	0.200	0.200
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	100	0.03	0.040	0.040	0.06	0.07	0.080	0.110	0.110	0.140	0.140
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	180	0.06	0.07	0.080	0.110	0.140	0.170	0.220	0.220	0.280	0.280
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	160	0.050	0.06	0.07	0.1	0.12	0.140	0.190	0.190	0.240	0.240
	Ductile iron	Up to 280 HB	GGG 60	0.7060	150	0.040	0.06	0.07	0.09	0.110	0.13	0.180	0.180	0.220	0.220
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	120	0.040	0.06	0.07	0.09	0.110	0.13	0.180	0.180	0.220	0.220

SARA® HPC Power end milling cutter Z4 stainless steel

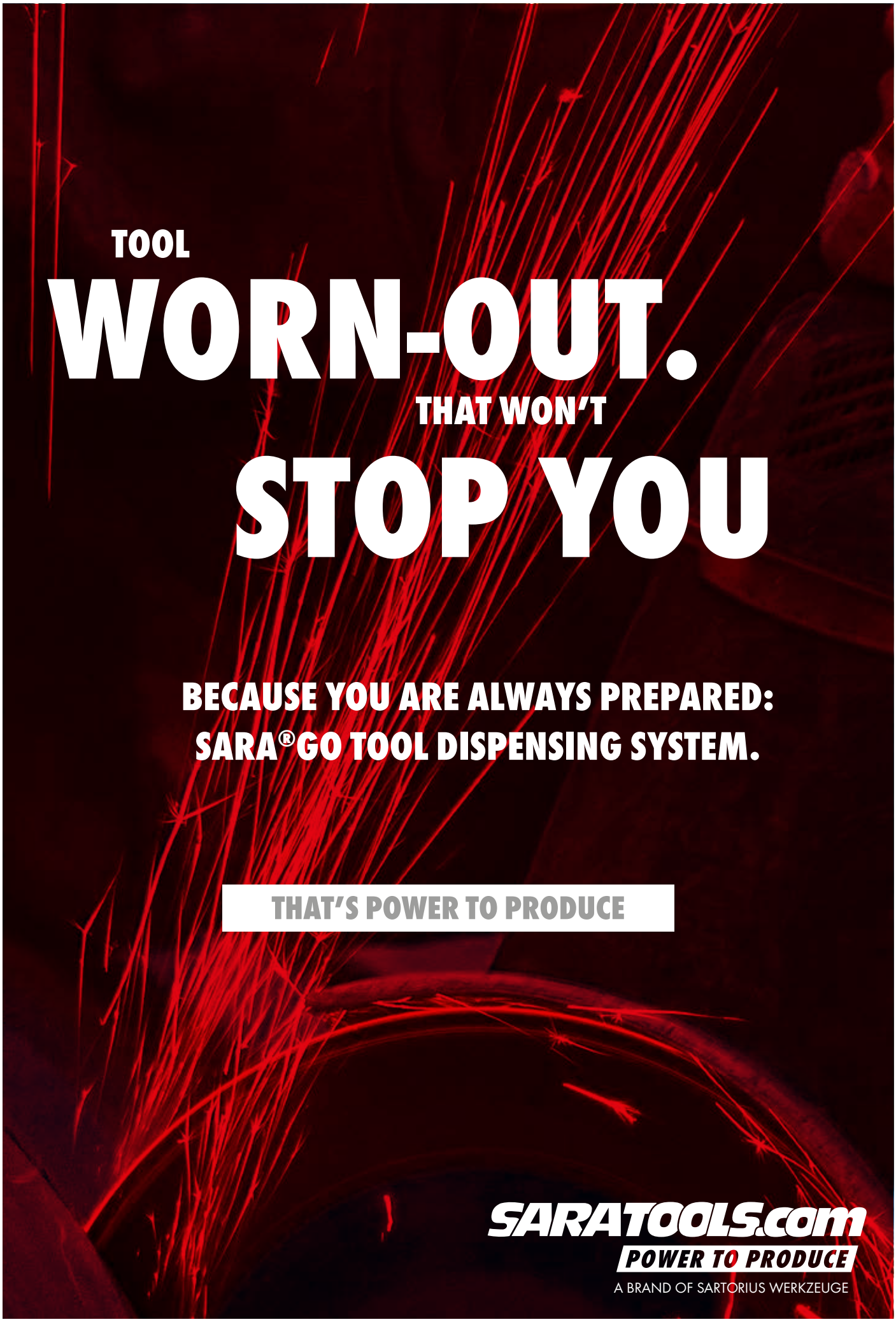


254168 ....
254169....

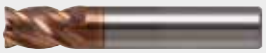
- Please adjust these guideline values according to clamping operation and machine set-up.

ISO	**Roughing / grooving**fz for ae = 1.0 x D and ap = 1.0 x D Materials group	Strength/ Hardness N/mm²	Material chemical example	Material number	Cutting speed Vc m/min	Feed rate fz in mm/Z in relation to milling cutter diameter in mm									
						4	5	6	8	10	12	14	16	18	20
M	Stainless steel, ferr./marten.	500-950	X10Cr13	1.4006	90	0.03	0.03	0.03	0.050	0.050	0.050	0.080	0.080	0.080	0.080
	Stainless steel, austenitic	500-950	X 5 CrNi 18 10	1.4301	80	0.040	0.040	0.040	0.07	0.07	0.07	0.110	0.110	0.110	0.110
	Duplex	700-950	x 2 CrNiMoN 22-5-3	1.4462	80	0.040	0.040	0.040	0.07	0.07	0.07	0.110	0.110	0.110	0.110
N	Al. alloys, short-chipping	up to 500	G-AlSi 12	3.2581	250	0.06	0.06	0.06	0.12	0.12	0.12	0.190	0.190	0.190	0.190
	Copper alloy (bronze), short-chipping	up to 850	CuNi12Zn24	2.0730	210	0.050	0.050	0.050	0.1	0.1	0.1	0.160	0.160	0.160	0.160
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	50	0.02	0.02	0.02	0.040	0.040	0.040	0.06	0.06	0.06	0.06
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	25	0.02	0.02	0.02	0.040	0.040	0.040	0.06	0.06	0.06	0.06

ISO	**Finishing / trimming** fz for ae = 0.5 x D and ap = 1.0 x D Materials group	Strength/ Hardness N/mm²	Material chemical example	Material number	Cutting speed Vc m/min	Feed rate fz in mm/Z in relation to milling cutter diameter in mm									
						4	5	6	8	10	12	14	16	18	20
M	Stainless steel, ferr./marten.	500-950	X10Cr13	1.4006	90	0.03	0.03	0.03	0.050	0.050	0.050	0.080	0.080	0.080	0.080
	Stainless steel, austenitic	500-950	X 5 CrNi 18 10	1.4301	80	0.040	0.040	0.040	0.07	0.07	0.07	0.110	0.110	0.110	0.110
	Duplex	700-950	x 2 CrNiMoN 22-5-3	1.4462	80	0.040	0.040	0.040	0.07	0.07	0.07	0.110	0.110	0.110	0.110
N	Al. alloys, short-chipping	up to 500	G-AlSi 12	3.2581	250	0.06	0.06	0.06	0.12	0.12	0.12	0.190	0.190	0.190	0.190
	Copper alloy (bronze), short-chipping	up to 850	CuNi12Zn24	2.0730	210	0.050	0.050	0.050	0.1	0.1	0.1	0.160	0.160	0.160	0.160
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	50	0.02	0.02	0.02	0.040	0.040	0.040	0.06	0.06	0.06	0.06
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	25	0.02	0.02	0.02	0.040	0.040	0.040	0.06	0.06	0.06	0.06


TOOL
WORN-OUT.
THAT WON'T
STOP YOU
BECAUSE YOU ARE ALWAYS PREPARED:
SARA® GO TOOL DISPENSING SYSTEM.
THAT'S POWER TO PRODUCE
SARATOOLS.com
POWER TO PRODUCE
A BRAND OF SARTORIUS WERKZEUGE

VAN HOORN CARBIDE End milling cutter VHVTR Z4



- Please adjust these guideline values according to clamping operation and machine set-up!

255084....

255087....
255088....

ISO	**Roughing / Grooving** ae = 1.0 x D ap = 0.6 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm									
	Materials group					3	4	5	6	8	10	12	16	20	25
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	80 - 150	0.01	0.02	0.02	0.02	0.03	0.04	0.05	0.06	0.08	0.1
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	80 - 150	0.01	0.02	0.02	0.02	0.03	0.04	0.05	0.06	0.08	0.1
M	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	60 - 120	0.01	0.02	0.02	0.02	0.03	0.04	0.05	0.06	0.08	0.1
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	70 - 100	0.01	0.02	0.02	0.02	0.03	0.04	0.05	0.06	0.08	0.1
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	30 - 50	0.01	0.02	0.02	0.02	0.03	0.04	0.05	0.06	0.08	0.1

ISO	**Finishing / Edge-banding** ae = 0.5 x D ap = 1 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm									
	Materials group					3	4	5	6	8	10	12	16	20	25
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	80 - 150	0.02	0.03	0.03	0.04	0.05	0.07	0.08	0.10	0.12	0.15
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	80 - 150	0.02	0.03	0.03	0.04	0.05	0.07	0.08	0.10	0.12	0.15
M	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	60 - 120	0.02	0.03	0.03	0.04	0.05	0.07	0.08	0.10	0.12	0.15
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	70 - 100	0.02	0.03	0.03	0.04	0.05	0.07	0.08	0.10	0.12	0.15
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	30 - 50	0.02	0.03	0.03	0.04	0.05	0.07	0.08	0.10	0.12	0.15

VAN HOORN CARBIDE End milling cutter VHVTRW Z5



- Please adjust these guideline values according to clamping operation and machine set-up!

255102 ....

ISO	**Finishing / Edge-banding** fz for ae = 0.5 x D and ap = 1.0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm										
	Materials group					3	4	5	6	8	10	12	14	16	20	25
P	Machining steel	Up to 700	9 SMn 28	1.0715	225	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
P	Unalloyed structural steel	Up to 700	St-52	1.0052	225	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
P	Structural steel	700 - 950	Ck45	1.1191	225	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
P	Cast steel	Up to 950	GS 40	1.0416	150	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
P	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	200	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	150	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	110	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	120	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
M	Duplex	700 - 950	x 2 CrNiMoN 22-5-3	1.4462	130	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	200	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
K	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	180	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
K	Ductile iron	Up to 280 HB	GGG 60	0.7060	120	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	120	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	60	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	40	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	120	0.02	0.025	0.03	0.035	0.045	0.055	0.065	0.07	0.080	0.1	0.125

SARA® ATORN End milling cutter



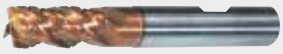
254109....

- Please adjust these guideline values according to clamping operation and machine set-up!
- **Cutting data recommendations for extra-long version:** Please reduce the specified data by 25%.

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm				
						6 - 8	10 - 12	14 - 16	18 - 20	25
P	Machining steel	Up to 700	9 SMn 28	1.0715	160	0,04	0,055	0,075	0,085	0,1
	Unalloyed structural steel	Up to 700	St-52	1.0052	160	0,04	0,055	0,075	0,085	0,1
	Structural steel	700 - 950	Ck45	1.1191	140	0,04	0,055	0,075	0,085	0,1
	Cast steel	Up to 950	GS 40	1.0416	140	0,04	0,055	0,075	0,085	0,1
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	140	0,04	0,055	0,075	0,085	0,1
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	140	0,035	0,05	0,065	0,075	0,09
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	70 - 90	0,035	0,05	0,065	0,075	0,09
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	80 - 100	0,035	0,05	0,065	0,075	0,09
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	200	0,035	0,05	0,065	0,075	0,09
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	180	0,035	0,05	0,065	0,075	0,09
	Ductile iron	Up to 280 HB	GGG 60	0.7060	190	0,035	0,05	0,065	0,075	0,09
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	190	0,035	0,05	0,065	0,075	0,09
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	50 - 60	0,03	0,04	0,06	0,065	0,085
	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	30 - 40	0,03	0,04	0,06	0,065	0,085

	ap	ae
Material up to 45 HRc D up to 3 mm D more than 3 mm	 1.5 x D 1.5 x D	 0.05 x D 0.1 x D
Material from 45-60 HRc	1 x D	0.02 x D

SARA® Roughing cutter



254090....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						≤ Ø 8	≤ Ø 12	≤ Ø 16	≤ Ø 20
P	Machining steel	Up to 700	9 SMn 28	1.0715	112 - 160	0.04	0.05	0.06	0.07
	Unalloyed structural steel	Up to 700	St-52	1.0052	96 - 160	0.04 - 0.05	0.05	0.06 - 0.07	0.07 - 0.08
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	90 - 143	0.03 - 0.04	0.04 - 0.05	0.05 - 0.06	0.06 - 0.07
	Tempering steel	950 -1300	43CrMo4	1.3563	83 - 120	0.03	0.04	0.05	0.06
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	83 - 105	0.03	0.04	0.05	0.06
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	91 - 156	0.03 - 0.06	0.04 - 0.07	0.05 - 0.09	0.06 - 0.12
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	104 - 156	0.02 - 0.05	0.03 - 0.05	0.04 - 0.07	0.05 - 0.08
	Ductile iron	Up to 280 HB	GGG 60	0.7060	130 - 156	0.06	0.07	0.09	0.12

Cutting speed and feed correction factors

ae	50%	100%
Factor for Vc	1	0.85
Factor for fz	1	0.80



SARA® Roughing cutter



- Please adjust these guideline values according to clamping operation and machine set-up!

254137.... 254141.... 254142....

ISO	**Roughing** ap: 1.00 x D1 / ae: 1.00 x D1 Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	D1 4 fz	D1 5 fz	D1 6 fz	D1 8 fz	D1 10 fz	D1 12 fz	D1 14 fz	D1 16 fz	D1 20 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	159	0.017	0.029	0.029	0.038	0.063	0.063	0.084	0.084	0.101
	Unalloyed structural steel	Up to 700	St-52	1.0052	145	0.017	0.029	0.029	0.038	0.063	0.063	0.084	0.084	0.101
	Structural steel	700 - 950	Ck45	1.1191	120	0.017	0.029	0.029	0.038	0.063	0.063	0.084	0.084	0.101
	Tempering steel	500 - 950	42 CrMo4	1.7225	103	0.013	0.021	0.021	0.027	0.044	0.044	0.059	0.059	0.071
	Tempering steel	950 -1300	43CrMo4	1.3563	71	0.013	0.021	0.021	0.027	0.044	0.044	0.059	0.059	0.071
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	46 - 113	0.013 - 0.017	0.021 - 0.029	0.021 - 0.029	0.027 - 0.038	0.044 - 0.063	0.044 - 0.063	0.059 - 0.084	0.059 - 0.084	0.071 - 0.101
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	67	0.013	0.021	0.021	0.027	0.044	0.044	0.059	0.059	0.071
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	47	0.013	0.021	0.021	0.027	0.044	0.044	0.059	0.059	0.071
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	120	0.017	0.029	0.029	0.038	0.067	0.067	0.084	0.084	0.101
	Ductile iron	Up to 280 HB	GGG 60	0.7060	71	0.017	0.029	0.029	0.038	0.067	0.067	0.084	0.084	0.101
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	71	0.017	0.029	0.029	0.038	0.063	0.063	0.084	0.084	0.101

ISO	**Finishing / Edge-banding** ap: 1.00 x D1 / ae: 0.50 x D1 Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	D1 4 fz	D1 5 fz	D1 6 fz	D1 8 fz	D1 10 fz	D1 12 fz	D1 14 fz	D1 16 fz	D1 20 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	225	0.02	0.035	0.035	0.045	0.075	0.075	0.1	0.1	0.12
	Unalloyed structural steel	Up to 700	St-52	1.0052	205	0.02	0.035	0.035	0.045	0.075	0.075	0.1	0.1	0.12
	Structural steel	700 - 950	Ck45	1.1191	170	0.02	0.035	0.035	0.045	0.075	0.075	0.1	0.1	0.12
	Tempering steel	500 - 950	42 CrMo4	1.7225	145	0.015	0.025	0.025	0.032	0.052	0.052	0.07	0.07	0.084
	Tempering steel	950 -1300	43CrMo4	1.3563	100	0.015	0.025	0.025	0.032	0.052	0.052	0.07	0.07	0.084
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	65 - 160	0.015 - 0.2	0.025 - 0.035	0.025 - 0.035	0.032 - 0.045	0.052 - 0.075	0.052 - 0.075	0.07 - 0.1	0.07 - 0.1	0.084 - 0.12
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	95	0.015	0.025	0.025	0.032	0.052	0.052	0.07	0.07	0.084
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	67	0.015	0.025	0.025	0.032	0.052	0.052	0.07	0.07	0.084
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	170	0.02	0.035	0.035	0.045	0.080	0.080	0.1	0.1	0.12
	Ductile iron	Up to 280 HB	GGG 60	0.7060	100	0.02	0.035	0.035	0.045	0.080	0.080	0.1	0.1	0.12
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	100	0.02	0.035	0.035	0.045	0.075	0.075	0.1	0.1	0.12

SARA® Torus milling cutter



- Please adjust these guideline values according to clamping operation and machine set-up!

254017....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm	
						6 - 8	10 - 12
P	Machining steel	Up to 700	9 SMn 28	1.0715	85	0,04	0,055
	Unalloyed structural steel	Up to 700	St-52	1.0052	85	0,04	0,055
	Structural steel	700 - 950	Ck45	1.1191	85	0,04	0,055
	Cast steel	Up to 950	GS 40	1.0416	70	0,04	0,055
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	70	0,04	0,055
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	70	0,035	0,05
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	45	0,035	0,05
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	50	0,035	0,05
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	85	0,035	0,05
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	55	0,035	0,05
	Ductile iron	Up to 280 HB	GGG 60	0.7060	60	0,035	0,05
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	60	0,035	0,05
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	30	0,03	0,04
	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	20	0,03	0,04

Axial cut depth ap in ISO range P M K	
	ap 0.5 x D
Axial cut depth ap in ISO range H	
Hardness 45-50 HRc	ap 0.5 x D
Hardness 50-60 HRc	ap 0.5 x D

SARA® Radius milling cutter



- Please adjust these guideline values according to clamping operation and machine set-up!
- **Cutting data recommendations for extra-long version:** Please reduce the specified data by 25%.

250512....
250515....
254011....
254112....
254013....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm						
						1 - 2	3 - 4	5 - 6	8 - 10	12 - 14	16 - 18	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	168	0,05	0,05	0,06	0,06	0,08	0,08	0,09
P	Unalloyed structural steel	Up to 700	St-52	1.0052	168	0,05	0,05	0,06	0,06	0,08	0,08	0,09
P	Structural steel	700 - 950	Ck45	1.1191	154	0,05	0,05	0,06	0,06	0,08	0,08	0,09
P	Cast steel	Up to 950	GS 40	1.0416	140	0,05	0,05	0,06	0,06	0,08	0,08	0,09
P	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	140	0,05	0,05	0,06	0,06	0,08	0,08	0,09
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	140	0,05	0,05	0,06	0,06	0,08	0,08	0,09
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	98	0,04	0,04	0,05	0,05	0,07	0,07	0,08
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	98	0,04	0,04	0,05	0,05	0,07	0,07	0,08
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	217	0,04	0,04	0,05	0,05	0,07	0,07	0,08
K	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	189	0,04	0,04	0,05	0,05	0,07	0,07	0,08
K	Ductile iron	Up to 280 HB	GGG 60	0.7060	203	0,04	0,04	0,05	0,05	0,07	0,07	0,08
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	203	0,04	0,04	0,05	0,05	0,07	0,07	0,08
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	84	0,03	0,03	0,04	0,04	0,06	0,06	0,06
H	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	63	0,03	0,03	0,04	0,04	0,06	0,06	0,06
H	Hardened materials up to 64 HRc		100Cr6	1.2067	56	0,03	0,03	0,04	0,04	0,06	0,06	0,06

	ap	ae
Material up to 45 HRc	0.1 x D	0.2 x D
Material from 45-60 HRc	0.05 x D	0.1 x D

Torus milling cutter WXS-CRE HPC-Turbomill



294248 ....
294249 ....

- The specified reference values must be adapted to the workpiece clamping and machine conditions.
- Use stable and precise machines, tool holders, and clamping devices.
- These cutting parameters are based on milling cutters with circular corner interpolation. For operations without it, reduce the feed rate to 50–70% and the cutting depth to 50–80 % of the above-mentioned cutting data.
- We recommend air or minimum quantity lubrication.
- Please adjust cutting speed, feed rate, and cutting depth according to your current machining conditions.
- When working in the Z-axis, the feed rate must be reduced to 30–50 % for inclination angles < 2°.
- The cutting values are for a maximum overhang length of 4 × D. For greater overhangs, the respective coefficients must be adjusted.
- Adapt cutting speed, feed rate, and cutting depth to avoid vibrations.w

ISO	**Roughing** Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Schnitt-geschwindigkeit Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm						
						Ø 2 x R 0,5	Ø 3 x R 0,75	Ø 4 x R 1	Ø 6 x R 1,5	Ø 8 x R 2	Ø 10 x R 2	Ø 12 x R2
P	Case-hardened steel	bis 950	16 MnCr 5	1.7131	70	3800	4500	4800	5100	5100	5100	5100
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	60	3350	3900	4200	4450	4450	4450	4450
H	Hardened materials	< 55 HRC	X40Cr14	1.2083	50	2150	2600	2750	2850	2850	2850	2850
H	Hardened materials	< 60 HRC	X153CrMoV12	1.2379	30	860	995	1050	1150	1150	1150	1150
H	Hardened materials	≤ 60 HRC	100Cr6	1.2067	26	615	715	755	825	825	825	825

ISO	**Finishing** Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Schnitt-geschwindigkeit Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm						
						Ø 2 x R 0,5	Ø 3 x R 0,75	Ø 4 x R 1	Ø 6 x R 1,5	Ø 8 x R 2	Ø 10 x R 2	Ø 12 x R2
P	Case-hardened steel	bis 950	16 MnCr 5	1.7131	150	9550	12000	12000	12700	12700	12700	12700
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	150	7150	8400	9000	9550	9550	9550	9550
H	Hardened materials	< 55 HRC	X40Cr14	1.2083	150	6450	7850	8200	8600	8600	8600	8600
H	Hardened materials	< 60 HRC	X153CrMoV12	1.2379	100	2850	3300	3550	3800	3800	3800	3800
H	Hardened materials	≤ 60 HRC	100Cr6	1.2067	90	2050	2370	2550	3800	3800	3800	3800
						0,028	0,050	0,070	0,118	0,157	0,191	0,230

ISO P

ap	ae
0,1 x R	0,3 x D

ISO H

45 - 55 HRC

	ap	ae
R < 2	0,1 x R	0,3 x D
2 < R	0,2 mm	0,3 x D

> 55 HRC

	ap	ae
R < 2	0,05 x R	0,3 x D
2 < R	0,1 mm	0,3 x D

SARA® Radius milling cutter



- Please adjust these guideline values according to clamping operation and machine set-up!

254138....

ISO	Finishing / Edge-banding ap: 0.03 x D1 / ae: 0.30 x D1 Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	D1 3 fz	D1 4 fz	D1 5 fz	D1 6 fz	D1 8 fz	D1 10 fz	D1 12 fz	D1 14 fz	D1 16 fz	D1 20 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	560	0.011	0.035	0.035	0.045	0.055	0.065	0.065	0.09	0.09	0.12
	Unalloyed structural steel	Up to 700	St-52	1.0052	440	0.011	0.035	0.035	0.045	0.055	0.065	0.065	0.09	0.09	0.12
	Structural steel	700 - 950	Ck45	1.1191	380	0.011	0.035	0.035	0.045	0.055	0.065	0.065	0.09	0.09	0.12
	Tempering steel	500 - 950	42 CrMo4	1.7225	370	0.011	0.035	0.035	0.045	0.055	0.065	0.065	0.09	0.09	0.12
	Tempering steel	950 -1300	43CrMo4	1.3563	260	0.007	0.025	0.025	0.032	0.040	0.045	0.045	0.06	0.06	0.080
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	285	0.009	0.03	0.03	0.04	0.045	0.05	0.055	0.075	0.075	0.1
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	560	0.011	0.035	0.035	0.045	0.055	0.065	0.065	0.09	0.09	0.12
	Ductile iron	Up to 280 HB	GGG 60	0.7060	510	0.011	0.035	0.035	0.045	0.055	0.065	0.065	0.09	0.09	0.12
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	510	0.011	0.035	0.035	0.045	0.055	0.065	0.065	0.09	0.09	0.12
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	140	0.007	0.025	0.025	0.032	0.040	0.045	0.045	0.06	0.06	0.080

SARA® Slotting cutter



- Please adjust these guideline values according to clamping operation and machine set-up!

292004....

ISO	Materials group	Tensile strength / Hardness	Cutting speed Vc m/min	Ø 10.5 fz	Ø 13.5 fz	Ø 16.5 fz	Ø 19.5 fz	Ø 22.5 fz	Ø 25.5 fz	Ø 28.5 fz	Ø 32.5 fz	Ø 38.5 fz	Ø 45.5 fz	Ø 20 fz
P	General structural steels	< 500 N/mm²	120	0.03	0.03	0.03	0.03	0.035	0.035	0.035	0.038	0.038	0.038	0.057
		> 500-800 N/mm²	90	0.03	0.03	0.03	0.03	0.035	0.035	0.035	0.038	0.038	0.038	0.057
	Machining steels	< 850 N/mm²	90	0.028	0.028	0.028	0.028	0.033	0.033	0.033	0.036	0.036	0.036	0.066
	Unalloyed tempered steels	< 700 N/mm²	120	0.03	0.03	0.03	0.03	0.035	0.035	0.035	0.038	0.038	0.038	0.057
		700-850 N/mm²	85	0.028	0.028	0.028	0.028	0.033	0.033	0.033	0.036	0.036	0.036	0.066
		850-1000 N/mm²	80	0.028	0.028	0.028	0.028	0.033	0.033	0.033	0.036	0.036	0.036	0.066
	Alloyed tempered steels	850-1000 N/mm²	70	0.028	0.028	0.028	0.028	0.033	0.033	0.033	0.036	0.036	0.036	0.066
K	Cast iron	< 240 HB	120	0.035	0.035	0.035	0.035	0.04	0.04	0.04	0.045	0.045	0.045	0.073
		< 300 HB	100	0.035	0.035	0.035	0.035	0.04	0.04	0.04	0.045	0.045	0.045	0.073

SARA® T-slot milling cutter



- Please adjust these guideline values according to clamping operation and machine set-up!

292005....

ISO	Materials group	Tensile strength / Hardness	Cutting speed Vc m/min	Ø 12.5 fz	Ø 16 fz	Ø 18 fz	Ø 21 fz	Ø 25 fz	Ø 28 fz	Ø 32 fz	Ø 32.5 fz	Ø 38.5 fz	Ø 45.5 fz	Ø 20 fz
P	General structural steels	< 500 N/mm²	120	0.03	0.03	0.03	0.035	0.035	0.035	0.045	0.038	0.038	0.038	0.057
		> 500-800 N/mm²	90	0.03	0.03	0.03	0.035	0.035	0.035	0.045	0.038	0.038	0.038	0.057
	Machining steels	< 850 N/mm²	90	0.028	0.028	0.028	0.033	0.033	0.033	0.04	0.036	0.036	0.036	0.066
	Unalloyed tempered steels	< 700 N/mm²	120	0.03	0.03	0.03	0.035	0.035	0.035	0.045	0.038	0.038	0.038	0.057
		700-850 N/mm²	85	0.028	0.028	0.028	0.033	0.033	0.033	0.04	0.036	0.036	0.036	0.066
		850-1000 N/mm²	80	0.028	0.028	0.028	0.033	0.033	0.033	0.04	0.036	0.036	0.036	0.066
	Alloyed tempered steels	850-1000 N/mm²	70	0.028	0.028	0.028	0.033	0.033	0.033	0.04	0.036	0.036	0.036	0.066
K	Cast iron	< 240 HB	120	0.035	0.035	0.035	0.04	0.04	0.04	0.05	0.045	0.045	0.045	0.073
		< 300 HB	100	0.035	0.035	0.035	0.04	0.04	0.04	0.05	0.045	0.045	0.045	0.073



292006....

ISO	Materials group	Tensile strength / Hardness	Cutting speed Vc m/min	Ø 12.5 fz	Ø 16 fz	Ø 18 fz	Ø 21 fz	Ø 25 fz	Ø 28 fz	Ø 32 fz	Ø 32.5 fz	Ø 38.5 fz	Ø 45.5 fz	Ø 20 fz
P	General structural steels	< 500 N/mm²	120	0.03	0.03	0.03	0.035	0.035	0.035	0.045	0.038	0.038	0.038	0.057
		> 500-800 N/mm²	90	0.03	0.03	0.03	0.035	0.035	0.035	0.045	0.038	0.038	0.038	0.057
	Machining steels	< 850 N/mm²	90	0.028	0.028	0.028	0.033	0.033	0.033	0.04	0.036	0.036	0.036	0.066
	Unalloyed tempered steels	< 700 N/mm²	120	0.03	0.03	0.03	0.035	0.035	0.035	0.045	0.038	0.038	0.038	0.057
		700-850 N/mm²	85	0.028	0.028	0.028	0.033	0.033	0.033	0.04	0.036	0.036	0.036	0.066
		850-1000 N/mm²	80	0.028	0.028	0.028	0.033	0.033	0.033	0.04	0.036	0.036	0.036	0.066
	Alloyed tempered steels	850-1000 N/mm²	70	0.028	0.028	0.028	0.033	0.033	0.033	0.04	0.036	0.036	0.036	0.066
K	Cast iron	< 240 HB	120	0.035	0.035	0.035	0.04	0.04	0.04	0.05	0.045	0.045	0.045	0.073
		< 300 HB	100	0.035	0.035	0.035	0.04	0.04	0.04	0.05	0.045	0.045	0.045	0.073

SARA® Radius milling cutter 220°



- Please adjust these guideline values according to clamping operation and machine set-up!

250510....

ISO	**Roughing / Grooving** fz for ae = 0,3 x D and ap = 0,03 x D Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm								
						1	2	3	5	6	8	10	12	16
P	Machining steel	Up to 700	9 SMn 28	1.0715	450	0,007	0,011	0,011	0,035	0,045	0,055	0,065	0,065	0,090
P	Unalloyed structural steel	Up to 700	St-52	1.0052	350	0,007	0,011	0,011	0,035	0,045	0,055	0,065	0,065	0,090
P	Structural steel	700 - 950	Ck45	1.1191	450	0,007	0,011	0,011	0,035	0,045	0,055	0,065	0,065	0,090
P	Tempering steel	500 - 950	42 CrMo4	1.7225	310	0,007	0,011	0,011	0,035	0,045	0,055	0,065	0,065	0,090
P	Cast steel	Up to 950	GS 40	1.0416	310	0,007	0,011	0,011	0,035	0,045	0,055	0,065	0,065	0,090
P	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	250	0,007	0,011	0,011	0,035	0,045	0,055	0,065	0,065	0,090
P	Tempering steel	950 -1300	43CrMo4	1.3563	250	0,007	0,011	0,011	0,035	0,045	0,055	0,065	0,065	0,090
P	Nitriding steel	950 - 1300	31CrMoV9	1.8519	250	0,007	0,011	0,011	0,035	0,045	0,055	0,065	0,065	0,090
P	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	170	0,005	0,007	0,007	0,025	0,032	0,040	0,045	0,045	0,055
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	450	0,007	0,007	0,007	0,025	0,045	0,055	0,065	0,065	0,090
K	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	410	0,007	0,007	0,007	0,025	0,045	0,055	0,065	0,065	0,090
K	Ductile iron	Up to 280 HB	GGG 60	0.7060	430	0,007	0,007	0,007	0,025	0,045	0,055	0,065	0,065	0,090
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	430	0,007	0,007	0,007	0,025	0,045	0,055	0,065	0,065	0,090
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	120	0,005	0,011	0,011	0,035	0,032	0,040	0,045	0,045	0,055
H	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	90	0,005	0,011	0,011	0,035	0,032	0,040	0,045	0,045	0,055
H	Hardened materials up to 64 HRC		100Cr6	1.2067	70	0,005	0,011	0,011	0,035	0,032	0,040	0,045	0,045	0,055

ATORN Single-blade end milling cutter Ultra-N

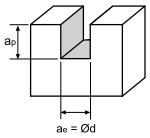


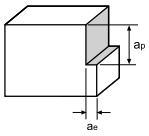
249100....

- **Cooling = emulsion**
- **The specified values apply to ae < 0.5 x D and ap 1 x D.**
  Correction example:
  Correction factor fz for full slot (ae > 0.5 x D) = 0.7
  Correction factor fz for ap < 1 x D = 1.2
- Please adjust these guideline values according to clamping operation and machine set-up!



250001....
249700....





ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm				
							0.6-1.5	2	3	4	5
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	350 - 500	400	0.023 - 0.027	0.03 - 0.043	0.045 - 0.07	0.05 - 0.08	0.06 - 0.1
N	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	150 - 250	175	0.023 - 0.027	0.03 - 0.043	0.045 - 0.07	0.05 - 0.08	0.06 - 0.1
N	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200 - 350	250	0.023 - 0.027	0.03 - 0.043	0.045 - 0.07	0.05 - 0.08	0.06 - 0.1
N	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150 - 250	175	0.023 - 0.027	0.03 - 0.043	0.045 - 0.07	0.05 - 0.08	0.06 - 0.1
N	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	200 - 350	250	0.023 - 0.027	0.03 - 0.043	0.045 - 0.07	0.05 - 0.08	0.06 - 0.1
N	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150 - 250	175	0.023 - 0.027	0.03 - 0.043	0.045 - 0.07	0.05 - 0.08	0.06 - 0.1
N	Thermoplastic		PVC		350 - 500	420	0.023 - 0.027	0.03 - 0.043	0.045 - 0.07	0.05 - 0.08	0.06 - 0.1
N	Thermoset		Melamine		250 - 400	320	0.023 - 0.027	0.03 - 0.043	0.045 - 0.07	0.05 - 0.08	0.06 - 0.1
N	Fibre-reinforced plastics		CFRP, GFRP		200 - 350	250	0.023 - 0.027	0.03 - 0.043	0.045 - 0.07	0.05 - 0.08	0.06 - 0.1

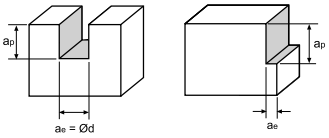
ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm				
							6	8	10	12	16
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	350 - 500	400	0.075 - 0.12	0.095 - 0.14	0.11 - 0.15	0.13 - 0.17	0.15 - 0.18
N	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	150 - 250	175	0.075 - 0.12	0.095 - 0.14	0.11 - 0.15	0.13 - 0.17	0.15 - 0.18
N	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200 - 350	250	0.075 - 0.12	0.095 - 0.14	0.11 - 0.15	0.13 - 0.17	0.15 - 0.18
N	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150 - 250	175	0.075 - 0.12	0.095 - 0.14	0.11 - 0.15	0.13 - 0.17	0.15 - 0.18
N	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	200 - 350	250	0.075 - 0.12	0.095 - 0.14	0.11 - 0.15	0.13 - 0.17	0.15 - 0.18
N	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150 - 250	175	0.075 - 0.12	0.095 - 0.14	0.11 - 0.15	0.13 - 0.17	0.15 - 0.18
N	Thermoplastic		PVC		350 - 500	420	0.075 - 0.12	0.095 - 0.14	0.11 - 0.15	0.13 - 0.17	0.15 - 0.18
N	Thermoset		Melamine		250 - 400	320	0.075 - 0.12	0.095 - 0.14	0.11 - 0.15	0.13 - 0.17	0.15 - 0.18
N	Fibre-reinforced plastics		CFRP, GFRP		200 - 350	250	0.075 - 0.12	0.095 - 0.14	0.11 - 0.15	0.13 - 0.17	0.15 - 0.18

ATORN Mini end milling cutter Ultra-N



249001.... 249002....

- Cooling = emulsion
- The specified values apply to ae < 0.5 x D.
  Correction example:
  Correction factor fz for projecting length (5-10 x D) = 0.7
  Correction factor fz for projecting length (> 10 x D) = 0.5
  Correction factor fz for full slot (ae > 0.5 x D) = 0.7
  Correction factor fz for copying = 1.3
- Please adjust these guideline values according to clamping operation and machine set-up!



ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz min/max in mm/tooth in relation to milling cutter diameter in mm		ap min/max in mm/tooth in relation to milling cutter diameter in mm	
							0.5	1	0.5	1
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	400 - 550	450	0.009 - 0.015	0.016 - 0.025	0.02 - 0.3	0.05 - 0.7
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	180 - 320	220	0.009 - 0.015	0.016 - 0.025	0.02 - 0.3	0.05 - 0.7
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	250 - 420	320	0.009 - 0.015	0.016 - 0.025	0.02 - 0.3	0.05 - 0.7
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	180 - 320	220	0.009 - 0.015	0.016 - 0.025	0.02 - 0.3	0.05 - 0.7
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	250 - 420	320	0.009 - 0.015	0.016 - 0.025	0.02 - 0.3	0.05 - 0.7
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	180 - 320	330	0.009 - 0.015	0.016 - 0.025	0.02 - 0.3	0.05 - 0.7
	Thermoplastic		PVC		400 - 550	450	0.009 - 0.015	0.016 - 0.025	0.02 - 0.3	0.05 - 0.7
	Thermoset		Melamine		300 - 450	360	0.009 - 0.015	0.016 - 0.025	0.02 - 0.3	0.05 - 0.7
	Fibre-reinforced plastics		CFRP, GFRP		250 - 420	320	0.009 - 0.015	0.016 - 0.025	0.02 - 0.3	0.05 - 0.7

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz min/max in mm/tooth in relation to milling cutter diameter in mm		ap min/max in mm/tooth in relation to milling cutter diameter in mm	
							1.5	2	1.5	2
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	400 - 550	450	0.03 - 0.035	0.035 - 0.05	0.07 - 1.2	0.1 - 1.5
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	180 - 320	220	0.03 - 0.035	0.035 - 0.05	0.07 - 1.2	0.1 - 1.5
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	250 - 420	320	0.03 - 0.035	0.035 - 0.05	0.07 - 1.2	0.1 - 1.5
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	180 - 320	220	0.03 - 0.035	0.035 - 0.05	0.07 - 1.2	0.1 - 1.5
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	250 - 420	320	0.03 - 0.035	0.035 - 0.05	0.07 - 1.2	0.1 - 1.5
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	180 - 320	330	0.03 - 0.035	0.035 - 0.05	0.07 - 1.2	0.1 - 1.5
	Thermoplastic		PVC		400 - 550	450	0.03 - 0.035	0.035 - 0.05	0.07 - 1.2	0.1 - 1.5
	Thermoset		Melamine		300 - 450	360	0.03 - 0.035	0.035 - 0.05	0.07 - 1.2	0.1 - 1.5
	Fibre-reinforced plastics		CFRP, GFRP		250 - 420	320	0.03 - 0.035	0.035 - 0.05	0.07 - 1.2	0.1 - 1.5

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz min/max in mm/tooth in relation to milling cutter diameter in mm	ap min/max in mm/tooth in relation to milling cutter diameter in mm
							2.5	2.5
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	400 - 550	450	0.04 - 0.06	0.12 - 2
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	180 - 320	220	0.04 - 0.06	0.12 - 2
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	250 - 420	320	0.04 - 0.06	0.12 - 2
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	180 - 320	220	0.04 - 0.06	0.12 - 2
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	250 - 420	320	0.04 - 0.06	0.12 - 2
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	180 - 320	330	0.04 - 0.06	0.12 - 2
	Thermoplastic		PVC		400 - 550	450	0.04 - 0.06	0.12 - 2
	Thermoset		Melamine		300 - 450	360	0.04 - 0.06	0.12 - 2
	Fibre-reinforced plastics		CFRP, GFRP		250 - 420	320	0.04 - 0.06	0.12 - 2

ATORN Radius milling cutter Ultra-MS



256016....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc m/min Ø < = 0.5 mm	Ø 3 - 4 fz	Ø 5 - 6 fz	Ø 8 - 10 fz	Ø 12 - 16 fz	Ø 16 - 20 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	130 - 150	0.022 - 0.033	0.034 - 0.042	0.042 - 0.058	0.063 - 0.082	0.072 - 0.11
	Unalloyed structural steel	Up to 700	St-52	1.0052	140 - 160	0.022 - 0.033	0.034 - 0.042	0.043 - 0.057	0.062 - 0.083	0.073 - 0.12
	Structural steel	700 - 950	Ck45	1.1191	140 - 160	0.022 - 0.033	0.034 - 0.042	0.043 - 0.057	0.062 - 0.083	0.073 - 0.12
	Tempering steel	500 - 950	42 CrMo4	1.7225	130 - 150	0.022 - 0.033	0.034 - 0.042	0.042 - 0.058	0.063 - 0.082	0.072 - 0.11
	Cast steel	Up to 950	GS 40	1.0416	130 - 150	0.022 - 0.033	0.034 - 0.042	0.042 - 0.058	0.063 - 0.082	0.072 - 0.11
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	65 - 85	0.016 - 0.025	0.026 - 0.035	0.038 - 0.05	0.052 - 0.073	0.063 - 0.1
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	60 - 80	0.018 - 0.028	0.032 - 0.043	0.048 - 0.064	0.068 - 0.095	0.087 - 0.12
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	60 - 80	0.014 - 0.022	0.024 - 0.032	0.036 - 0.048	0.051 - 0.071	0.065 - 0.087
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	60 - 80	0.018 - 0.028	0.032 - 0.043	0.048 - 0.064	0.068 - 0.095	0.087 - 0.12

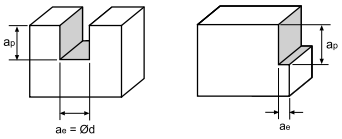
ATORN Longitudinal slot milling cutter Ultra-N



- Cooling = emulsion
- The specified values apply to ae < 0.5 x D and ap 1 x D.
  Correction example:
  Correction factor fz for full slot (ae > 0.5 x D) = 0.7
  Correction factor fz for ap < 1 x D = 1.2
  Uncoated tools:
  please reduced Vc values by 10%! fz values remain the same.
- Please adjust these guideline values according to clamping operation and machine set-up!

249200....
249201....
249202....

249207....
251520....



ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz min/max in mm/tooth in relation to milling cutter diameter in mm				
							3	4	5	6	8
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	350 - 500	400	0.03 - 0.06	0.035 - 0.07	0.04 - 0.08	0.045 - 0.09	0.05 - 0.1
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	150 - 250	175	0.03 - 0.06	0.035 - 0.07	0.04 - 0.08	0.045 - 0.09	0.05 - 0.1
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200 - 350	250	0.03 - 0.06	0.035 - 0.07	0.04 - 0.08	0.045 - 0.09	0.05 - 0.1
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150 - 250	175	0.03 - 0.06	0.035 - 0.07	0.04 - 0.08	0.045 - 0.09	0.05 - 0.1
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	200 - 350	250	0.03 - 0.06	0.035 - 0.07	0.04 - 0.08	0.045 - 0.09	0.05 - 0.1
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150 - 250	175	0.03 - 0.06	0.035 - 0.07	0.04 - 0.08	0.045 - 0.09	0.05 - 0.1
	Thermoplastic		PVC		350 - 500	420	0.03 - 0.06	0.035 - 0.07	0.04 - 0.08	0.045 - 0.09	0.05 - 0.1
	Thermoset		Melamine		250 - 400	320	0.03 - 0.06	0.035 - 0.07	0.04 - 0.08	0.045 - 0.09	0.05 - 0.1
	Fibre-reinforced plastics		CFRP, GFRP		200 - 350	250	0.03 - 0.06	0.035 - 0.07	0.04 - 0.08	0.045 - 0.09	0.05 - 0.1

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz min/max in mm/tooth in relation to milling cutter diameter in mm			
							10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	350 - 500	400	0.06 - 0.11	0.07 - 0.12	0.08 - 0.14	0.1 - 0.15
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	150 - 250	175	0.06 - 0.11	0.07 - 0.12	0.08 - 0.14	0.1 - 0.15
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200 - 350	250	0.06 - 0.11	0.07 - 0.12	0.08 - 0.14	0.1 - 0.15
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150 - 250	175	0.06 - 0.11	0.07 - 0.12	0.08 - 0.14	0.1 - 0.15
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	200 - 350	250	0.06 - 0.11	0.07 - 0.12	0.08 - 0.14	0.1 - 0.15
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150 - 250	175	0.06 - 0.11	0.07 - 0.12	0.08 - 0.14	0.1 - 0.15
	Thermoplastic		PVC		350 - 500	420	0.06 - 0.11	0.07 - 0.12	0.08 - 0.14	0.1 - 0.15
	Thermoset		Melamine		250 - 400	320	0.06 - 0.11	0.07 - 0.12	0.08 - 0.14	0.1 - 0.15
	Fibre-reinforced plastics		CFRP, GFRP		200 - 350	250	0.06 - 0.11	0.07 - 0.12	0.08 - 0.14	0.1 - 0.15

VAN HOORN CARBIDE End milling cutter VHLAW / VHRAW

- Please adjust these guideline values according to clamping operation and machine set-up!



255168....



255169....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
						Roughing			Finishing		
						8	12	16	8	12	16
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	500	0.1	0.2	0.3	0.6	0.8	0.12
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	280	0.1	0.2	0.3	0.6	0.8	0.12
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	280	0.1	0.2	0.3	0.5	0.7	0.1
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	300	0.1	0.2	0.3	0.5	0.7	0.1
	Thermoplastic		PVC		300	0.1	0.2	03	0.5	0.1	0.14
	Thermoset		Melamine		300	0.1	0.2	03	0.5	0.1	0.14

Feed correction f2 = 1		
Roughing	ae = 0.1 x D	ap = max. L1
Finishing	ae = 0.1 x D	ap = max. L1
Feed correction f2 = 0.6		
Roughing	ae = 0.1 x D	ap = max. L1
Finishing	ae = 0.3 x D	ap = max. L1

Feed correction	**f2 = 0.3**	**f2 = 0.5**
1 x D bore depth and then longitudinal slot milling	Drilling	Milling

ae = radial cutting depth
ap = axial cutting depth
D = milling cutter diameter
L1 = cutting edge length

The respective feed rate is calculated as follows:
Vf = fz x z x n x f2

ATORN End milling cutter Ultra-N

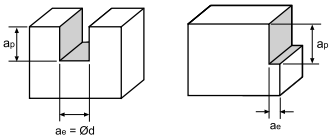


- **The specified values apply to ae < 0.5 x D and ap 1 x D.**

Cooling = emulsion

249300....
249301....
249302....
249303....
249304....
249305....
249307....
249308....
249309....
249350....
249351....
249352....
249355....
251518....
251519....

Correction examples:
Correction factor fz for full slot (ae > 0.5 x D) = 0.7
Correction factor fz for ap < 1 x D = 1.2
Long version: please correct fz values by factor 0.8
Uncoated tools: please reduce Vc values by 10%! fz values remain the same.



- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm				
							3	4	5	6	8
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	350 - 500	400	0.015 - 0.035	0.02 - 0.04	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	150 - 250	175	0.015 - 0.035	0.02 - 0.04	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200 - 350	250	0.015 - 0.035	0.02 - 0.04	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150 - 250	175	0.015 - 0.035	0.02 - 0.04	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	200 - 350	250	0.015 - 0.035	0.02 - 0.04	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150 - 250	175	0.015 - 0.035	0.02 - 0.04	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08
	Thermoplastic		PVC		350 - 500	420	0.015 - 0.035	0.02 - 0.04	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08
	Thermoset		Melamine		250 - 400	320	0.015 - 0.035	0.02 - 0.04	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08
	Fibre-reinforced plastics		CFRP, GFRP		200 - 350	250	0.015 - 0.035	0.02 - 0.04	0.025 - 0.05	0.03 - 0.06	0.04 - 0.08

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
							10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	350 - 500	400	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	150 - 250	175	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200 - 350	250	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150 - 250	175	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	200 - 350	250	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150 - 250	175	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Thermoplastic		PVC		350 - 500	420	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Thermoset		Melamine		250 - 400	320	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Fibre-reinforced plastics		CFRP, GFRP		200 - 350	250	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15

ATORN End milling cutter Ultra-N

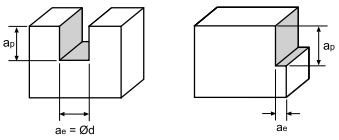


- **The specified values apply to ae < 0.5 x D and ap 1 x D.**

Cooling = emulsion

249400....
249401....
249450....
249460....

Correction examples:
Correction factor fz for full slot (ae > 0.5 x D) = 0.7
Correction factor fz for ap < 1 x D = 1.2
Long version: please correct fz values by factor 0.9
Extra-long version: please correct fz values by factor 0.8



- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm				
							3	4	5	6	8
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	350 - 500	400	0.02 - 0.04	0.025 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.07
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	150 - 250	175	0.02 - 0.04	0.025 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.07
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200 - 350	250	0.02 - 0.04	0.025 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.07
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150 - 250	175	0.02 - 0.04	0.025 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.07
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	200 - 350	250	0.02 - 0.04	0.025 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.07
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150 - 250	175	0.02 - 0.04	0.025 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.07
	Thermoplastic		PVC		350 - 500	420	0.02 - 0.04	0.025 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.07
	Thermoset		Melamine		250 - 400	320	0.02 - 0.04	0.025 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.07
	Fibre-reinforced plastics		CFRP, GFRP		200 - 350	250	0.02 - 0.04	0.025 - 0.045	0.035 - 0.05	0.04 - 0.055	0.05 - 0.07

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
							10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	350 - 500	400	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	150 - 250	175	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200 - 350	250	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150 - 250	175	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	200 - 350	250	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150 - 250	175	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Thermoplastic		PVC		350 - 500	420	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Thermoset		Melamine		250 - 400	320	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Fibre-reinforced plastics		CFRP, GFRP		200 - 350	250	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22

ATORN End milling cutter Ultra N



- Please adjust these guideline values according to clamping operation and machine set-up!

249601 ....

ISO	**Roughing / Grooving** fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm						
	Materials group					4	5	6	8	10	12	16
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	600	0,025	0,030	0,040	0,050	0,070	0,085	0,150
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	450	0,020	0,025	0,030	0,046	0,060	0,080	0,120
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	150	0,015	0,020	0,025	0,030	0,050	0,060	0,080
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150	0,015	0,020	0,025	0,030	0,050	0,060	0,080
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	120	0,015	0,020	0,025	0,030	0,050	0,060	0,080
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	120	0,015	0,020	0,025	0,030	0,050	0,060	0,080
	Thermoplastic		PVC		300	0,020	0,025	0,035	0,045	0,060	0,080	0,100

ISO	**Finishing / Edge-banding** fz for ae = 0,3 x D and ap = 1,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm						
	Materials group					4	5	6	8	10	12	16
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	1000	0,044	0,055	0,066	0,088	0,110	0,132	0,176
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	750	0,040	0,050	0,060	0,080	0,100	0,120	0,160
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	240	0,028	0,350	0,040	0,480	0,060	0,072	0,100
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	240	0,028	0,350	0,040	0,480	0,060	0,072	0,100
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	220	0,022	0,030	0,035	0,040	0,050	0,065	0,080
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	220	0,022	0,030	0,035	0,040	0,050	0,065	0,080
	Thermoplastic		PVC		350	0,025	0,035	0,040	0,050	0,065	0,085	0,120

ATORN End milling cutter Ultra N



- Please adjust these guideline values according to clamping operation and machine set-up!

249605 ....

ISO	**Roughing / Grooving** fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
	Materials group					6	8	10	12	14	16	18	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	650	0,040	0,050	0,070	0,085	0,112	0,150	0,160	0,180
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	450	0,030	0,046	0,060	0,080	0,098	0,120	0,130	0,145
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	180	0,025	0,030	0,050	0,060	0,070	0,080	0,095	0,120
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	180	0,025	0,030	0,050	0,060	0,070	0,080	0,095	0,120
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	150	0,025	0,030	0,050	0,060	0,070	0,080	0,095	0,120
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150	0,025	0,030	0,050	0,060	0,070	0,080	0,095	0,120
	Thermoplastic		PVC		300	0,035	0,045	0,060	0,080	0,090	0,100	0,120	0,130

ISO	**Finishing / Edge-banding** fz for ae = 0,4 x D and ap = 1,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
	Materials group					6	8	10	12	14	16	18	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	1000	0,066	0,088	0,110	0,132	0,150	0,176	0,198	0,220
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	750	0,060	0,080	0,100	0,120	0,140	0,160	0,180	0,200
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	240	0,040	0,480	0,060	0,072	0,085	0,100	0,120	0,150
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	240	0,040	0,480	0,060	0,072	0,085	0,100	0,120	0,150
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	220	0,035	0,040	0,050	0,065	0,070	0,080	0,100	0,120
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	220	0,035	0,040	0,050	0,065	0,070	0,080	0,100	0,120
	Thermoplastic		PVC		350	0,040	0,050	0,065	0,085	0,100	0,120	0,135	0,150

Over 200,000 tools available online!

Register online now!



www.saratools.com

ATORN End milling cutter Ultra-N



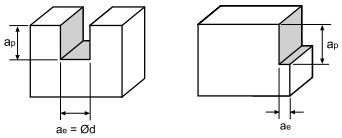
- **The specified values apply to ae < 0.5 x D and ap 1 x D.**

Cooling = emulsion

249480....

249490....

Correction examples:
Correction factor fz for full slot (ae > 0.5 x D) = 0.7
Correction factor fz for ap < 1 x D = 1.2
Long version: please correct fz values by factor 0.9



- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm				
							3	4	5	6	8
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	350 - 500	400	0.02 - 0.035	0.025 - 0.04	0.03 - 0.05	0.04 - 0.055	0.05 - 0.07
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	150 - 250	175	0.02 - 0.035	0.025 - 0.04	0.03 - 0.05	0.04 - 0.055	0.05 - 0.07
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200 - 350	250	0.02 - 0.035	0.025 - 0.04	0.03 - 0.05	0.04 - 0.055	0.05 - 0.07
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150 - 250	175	0.02 - 0.035	0.025 - 0.04	0.03 - 0.05	0.04 - 0.055	0.05 - 0.07
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	200 - 350	250	0.02 - 0.035	0.025 - 0.04	0.03 - 0.05	0.04 - 0.055	0.05 - 0.07
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150 - 250	175	0.02 - 0.035	0.025 - 0.04	0.03 - 0.05	0.04 - 0.055	0.05 - 0.07
	Thermoplastic		PVC		350 - 500	420	0.02 - 0.035	0.025 - 0.04	0.03 - 0.05	0.04 - 0.055	0.05 - 0.07
	Thermoset		Melamine		250 - 400	320	0.02 - 0.035	0.025 - 0.04	0.03 - 0.05	0.04 - 0.055	0.05 - 0.07
	Fibre-reinforced plastics		CFRP, GFRP		200 - 350	250	0.02 - 0.035	0.025 - 0.04	0.03 - 0.05	0.04 - 0.055	0.05 - 0.07

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
							10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	350 - 500	400	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	150 - 250	175	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200 - 350	250	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150 - 250	175	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	200 - 350	250	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150 - 250	175	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Thermoplastic		PVC		350 - 500	420	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Thermoset		Melamine		250 - 400	320	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22
	Fibre-reinforced plastics		CFRP, GFRP		200 - 350	250	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12	0.14 - 0.22

ATORN Roughing cutter Ultra-N



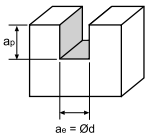
- **The specified values apply to ae < 0.5 x D and ap 1 x D.**

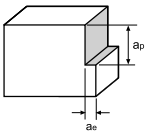
Cooling = emulsion

249370....
249371....

249372....
251525....

Correction examples:
Correction factor fz for full slot (ae > 0.5 x D) = 0.7
Correction factor fz for ap < 1 x D = 1.2





- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
							6	8	10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	350 - 500	400	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.08 - 0.11	0.11 - 0.13	0.15 - 0.25
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	150 - 250	175	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.08 - 0.11	0.11 - 0.13	0.15 - 0.25
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	200 - 350	250	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.08 - 0.11	0.11 - 0.13	0.15 - 0.25
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150 - 250	175	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.08 - 0.11	0.11 - 0.13	0.15 - 0.25
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	200 - 350	250	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.08 - 0.11	0.11 - 0.13	0.15 - 0.25
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	150 -250	175	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.08 - 0.11	0.11 - 0.13	0.15 - 0.25
	Thermoplastic		PVC		350 - 500	420	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.08 - 0.11	0.11 - 0.13	0.15 - 0.25
	Thermoset		Melamine		250 - 400	320	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.08 - 0.11	0.11 - 0.13	0.15 - 0.25
	Fibre-reinforced plastics		CFRP, GFRP		200 - 350	250	0.05 - 0.06	0.06 - 0.08	0.07 - 0.1	0.08 - 0.11	0.11 - 0.13	0.15 - 0.25

ATORN Torus milling cutter Ultra-N



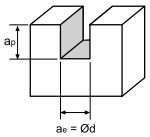
- **The specified values apply to ae < 0.5 x D and ap 0.2 x D.**

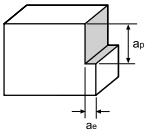
Cooling = emulsion

249211....

249212....
249213....

Correction examples:
Correction factor fz for full slot (ae > 0.5 x D) = 0.7
Long version: please correct fz values by factor 0.9
Extra-long version: please correct fz values by factor 0.8





- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
							3	4	5	6	8	10	12	16
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	375 - 550	425	0.02 - 0.035	0.025 - 0.04	0.03 - 0.05	0.04 - 0.055	0.05 - 0.07	0.06 - 0.09	0.07 - 0.1	0.1 - 0.12
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	175 - 275	200	0.02 - 0.04	0.025 - 0.04	0.03 - 0.045	0.035 - 0.05	0.05 - 0.07	0.06 - 0.09	0.07 - 0.1	0.08 - 0.14
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	225 - 375	275								
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	175 - 275	200								
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	225 - 375	275								
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	175 - 275	200								
	Thermoplastic		PVC		375 - 550	450								
	Thermoset		Melamine		275 - 450	350								
	Fibre-reinforced plastics		CFRP, GFRP		225 - 375	275								

ATORN Torus milling cutter Ultra-N



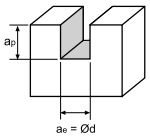
- **The specified values apply to ae < 0.5 x D and ap 1 x D.**

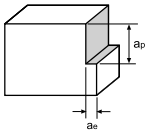
Cooling = emulsion

249311....

249312....

Correction examples:
Correction factor fz for full slot (ae > 0.5 x D) = 0.7
Correction fz for ap < 1 x D = 1.2





- Please adjust these guideline values according to clamping operation and machine set-up!

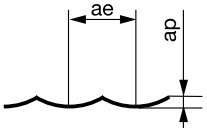
ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm						
							5	6	8	10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	375 - 550	425	0.025 - 0.05	0.03- 0.06	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	175 - 275	200	0.025 - 0.05	0.03- 0.06	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	225 - 375	275	0.025 - 0.05	0.03- 0.06	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	175 - 275	200	0.025 - 0.05	0.03- 0.06	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	225 - 375	275	0.025 - 0.05	0.03- 0.06	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	175 - 275	200	0.025 - 0.05	0.03- 0.06	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Thermoplastic		PVC		375 - 550	450	0.025 - 0.05	0.03- 0.06	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Thermoset		Melamine		275 - 450	350	0.025 - 0.05	0.03- 0.06	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15
	Fibre-reinforced plastics		CFRP, GFRP		225 - 375	275	0.025 - 0.05	0.03- 0.06	0.04 - 0.08	0.05 - 0.1	0.06 - 0.11	0.065 - 0.13	0.075 - 0.15

ATORN Mini radius milling cutter Ultra-N



- **The specified values apply to ae < 0.5 x D.** **Cooling = emulsion** 249003....

Correction examples:
Correction factor fz for projecting length (5-10 x D = 0.7
Correction factor fz for projecting length (> 10 x D) = 0.5
Correction factor fz for full slot (ae > 0.5 x D) = 0.7
Correction factor fz for copying = 1.3



- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm		ap in mm in relation to the milling cutter diameter in mm	
							0.5	1	0.5	1
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	400 - 550	450	0.01 - 0.017	0.02 - 0.03	0.025 - 0.25	0.1 - 0.5
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	180 - 320	220	0.01 - 0.017	0.02 - 0.03	0.025 - 0.25	0.1 - 0.5
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	250 - 420	320	0.01 - 0.017	0.02 - 0.03	0.025 - 0.25	0.1 - 0.5
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	180 - 320	220	0.01 - 0.017	0.02 - 0.03	0.025 - 0.25	0.1 - 0.5
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	250 - 420	320	0.01 - 0.017	0.02 - 0.03	0.025 - 0.25	0.1 - 0.5
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	180 - 320	230	0.01 - 0.017	0.02 - 0.03	0.025 - 0.25	0.1 - 0.5
	Thermoplastic		PVC		400 - 550	450	0.01 - 0.017	0.02 - 0.03	0.025 - 0.25	0.1 - 0.5
	Thermoset		Melamine		300 - 450	360	0.01 - 0.017	0.02 - 0.03	0.025 - 0.25	0.1 - 0.5
	Fibre-reinforced plastics		CFRP, GFRP		250 - 420	320	0.01 - 0.017	0.02 - 0.03	0.025 - 0.25	0.1 - 0.5

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm		ap in mm in relation to the milling cutter diameter in mm	
							1.5	2	1.5	2
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	400 - 550	450	0.03 - 0.045	0.035 - 0.06	0.15-0.75	0.12 - 1
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	180 - 320	220	0.03 - 0.045	0.035 - 0.06	0.15-0.75	0.12 - 1
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	250 - 420	320	0.03 - 0.045	0.035 - 0.06	0.15-0.75	0.12 - 1
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	180 - 320	220	0.03 - 0.045	0.035 - 0.06	0.15-0.75	0.12 - 1
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	250 - 420	320	0.03 - 0.045	0.035 - 0.06	0.15-0.75	0.12 - 1
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	180 - 320	230	0.03 - 0.045	0.035 - 0.06	0.15-0.75	0.12 - 1
	Thermoplastic		PVC		400 - 550	450	0.03 - 0.045	0.035 - 0.06	0.15-0.75	0.12 - 1
	Thermoset		Melamine		300 - 450	360	0.03 - 0.045	0.035 - 0.06	0.15-0.75	0.12 - 1
	Fibre-reinforced plastics		CFRP, GFRP		250 - 420	320	0.03 - 0.045	0.035 - 0.06	0.15-0.75	0.12 - 1

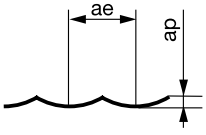
ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm	ap in mm in relation to the milling cutter diameter in mm
							2.5	2.5
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	400 - 550	450	0.045 - 0.07	0.25 - 1.25
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	180 - 320	220	0.045 - 0.07	0.25 - 1.25
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	250 - 420	320	0.045 - 0.07	0.25 - 1.25
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	180 - 320	220	0.045 - 0.07	0.25 - 1.25
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	250 - 420	320	0.045 - 0.07	0.25 - 1.25
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	180 - 320	230	0.045 - 0.07	0.25 - 1.25
	Thermoplastic		PVC		400 - 550	450	0.045 - 0.07	0.25 - 1.25
	Thermoset		Melamine		300 - 450	360	0.045 - 0.07	0.25 - 1.25
	Fibre-reinforced plastics		CFRP, GFRP		250 - 420	320	0.045 - 0.07	0.25 - 1.25

ATORN Radius milling cutter Ultra-N



- **The specified values apply to ae < 0.5 x D and ap 0.2 x D.** **Cooling = emulsion** 249240.... 249250.... 249260....

Correction examples:
Correction factor fz for full slot (ae > 0.5 x D) = 0.7
Correction factor fz for ap < 1 x D = 1.2
Long version: please correct fz values by factor 0.9
Extra-long version: please correct fz values by factor 0.8



- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc min/max m/min	Vc Start m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
							3	4	5	6	8	10	12	16
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	400 - 550	450	0.02 - 0.04	0.025 - 0.04	0.03 - 0.045	0.035 - 0.05	0.05 - 0.07	0.06 - 0.09	0.07 - 0.1	0.08 - 0.14
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	180 - 320	220								
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	250 - 420	320								
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	180 - 320	220								
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	250 - 420	320								
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	180 - 320	330								
	Thermoplastic		PVC		400 - 550	450								
	Thermoset		Melamine		300 - 450	360								
	Fibre-reinforced plastics		CFRP, GFRP		250 - 420	320								

ATORN Single-blade milling cutter Ultra-N PRO



- Please adjust these guideline values according to clamping operation and machine set-up!

249005 ....

ISO	**Roughing / Grooving** fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm									
	Materials group					1	1,5	2	3	4	5	6	8	10	12
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	450	0,004	0,004	0,007	0,007	0,015	0,015	0,025	0,034	0,042	0,050
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	400	0,004	0,004	0,007	0,007	0,015	0,015	0,025	0,034	0,042	0,050
	Thermoplastic		PVC		220	0,004	0,004	0,007	0,007	0,015	0,015	0,025	0,034	0,042	0,050
	Fibre-reinforced plastics		CFRP, GFRP		110	0,004	0,004	0,007	0,007	0,015	0,015	0,025	0,034	0,042	0,050

ATORN Drill groove milling cutter Ultra-N PRO





- Please adjust these guideline values according to clamping operation and machine set-up!

249006 ....

249007....

ISO	**Roughing / Grooving** fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm								
	Materials group					3	4	5	6	8	10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	450	0,009	0,015	0,019	0,022	0,031	0,041	0,055	0,074	0,090
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	400	0,009	0,015	0,019	0,022	0,031	0,041	0,055	0,074	0,090
	Thermoplastic		PVC		220	0,009	0,015	0,019	0,022	0,031	0,041	0,055	0,074	0,090
	Fibre-reinforced plastics		CFRP, GFRP		110	0,009	0,015	0,019	0,022	0,031	0,041	0,055	0,074	0,090

ISO	**Finishing / Edge-banding** fz for ae = 0,3 x D and ap = 1,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm								
	Materials group					3	4	5	6	8	10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	800	0,010	0,020	0,025	0,030	0,042	0,055	0,075	0,100	0,120
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	730	0,010	0,020	0,025	0,030	0,042	0,055	0,075	0,100	0,120
	Thermoplastic		PVC		400	0,010	0,020	0,025	0,030	0,042	0,055	0,075	0,100	0,120
	Fibre-reinforced plastics		CFRP, GFRP		200	0,010	0,020	0,025	0,030	0,042	0,055	0,075	0,100	0,120

ATORN End milling cutter Ultra-N PRO



- Please adjust these guideline values according to clamping operation and machine set-up!

249008 ....

ISO	**Roughing / Grooving** fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
	Materials group					4	5	6	8	10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	300	0,015	0,019	0,022	0,031	0,041	0,055	0,074	0,090
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	280	0,015	0,019	0,022	0,031	0,041	0,055	0,074	0,090
	Thermoplastic		PVC		150	0,015	0,019	0,022	0,031	0,041	0,055	0,074	0,090
	Fibre-reinforced plastics		CFRP, GFRP		80	0,015	0,019	0,022	0,031	0,041	0,055	0,074	0,090

ISO	**Finishing / Edge-banding** fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
	Materials group					4	5	6	8	10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	480	0,020	0,025	0,030	0,042	0,055	0,075	0,100	0,120
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	440	0,020	0,025	0,030	0,042	0,055	0,075	0,100	0,120
	Thermoplastic		PVC		240	0,020	0,025	0,030	0,042	0,055	0,075	0,100	0,120
	Fibre-reinforced plastics		CFRP, GFRP		120	0,020	0,025	0,030	0,042	0,055	0,075	0,100	0,120

ATORN End milling cutter Ultra-N PRO



- Please adjust these guideline values according to clamping operation and machine set-up!

249009 ....

ISO	**Roughing / Grooving** fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
	Materials group					4	5	6	8	10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	300	0,022	0,031	0,041	0,055	0,074	0,090	0,100	0,120
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	280	0,022	0,031	0,041	0,055	0,074	0,090	0,100	0,120
	Thermoplastic		PVC		150	0,022	0,031	0,041	0,055	0,074	0,090	0,100	0,120
	Fibre-reinforced plastics		CFRP, GFRP		80	0,022	0,031	0,041	0,055	0,074	0,090	0,100	0,120

ISO	**Finishing / Edge-banding** fz for ae = 0,3 x D and ap = 1,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
	Materials group					4	5	6	8	10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	480	0,030	0,042	0,055	0,075	0,100	0,120	0,100	0,120
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	440	0,030	0,042	0,055	0,075	0,100	0,120	0,100	0,120
	Thermoplastic		PVC		240	0,030	0,042	0,055	0,075	0,100	0,120	0,100	0,120
	Fibre-reinforced plastics		CFRP, GFRP		120	0,030	0,042	0,055	0,075	0,100	0,120	0,100	0,120

ATORN End milling cutter Ultra-N PRO



- Please adjust these guideline values according to clamping operation and machine set-up!

249010 ....

ISO	**Roughing / Grooving** fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm										
	Materials group					3	4	5	6	8	10	12	14	16	18	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	450	0,009	0,015	0,019	0,022	0,031	0,041	0,055	0,055	0,074	0,074	0,090
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	400	0,009	0,015	0,019	0,022	0,031	0,041	0,055	0,055	0,074	0,074	0,090
	Thermoplastic		PVC		220	0,009	0,015	0,019	0,022	0,031	0,041	0,055	0,055	0,074	0,074	0,090
	Fibre-reinforced plastics		CFRP, GFRP		110	0,009	0,015	0,019	0,022	0,031	0,041	0,055	0,055	0,074	0,074	0,090

ISO	**Finishing / Edge-banding** fz for ae = 0,3 x D and ap = 1,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm										
	Materials group					3	4	5	6	8	10	12	14	16	18	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	800	0,010	0,020	0,025	0,030	0,042	0,055	0,075	0,075	0,100	0,100	0,120
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	730	0,010	0,020	0,025	0,030	0,042	0,055	0,075	0,075	0,100	0,100	0,120
	Thermoplastic		PVC		400	0,010	0,020	0,025	0,030	0,042	0,055	0,075	0,075	0,100	0,100	0,120
	Fibre-reinforced plastics		CFRP, GFRP		200	0,010	0,020	0,025	0,030	0,042	0,055	0,075	0,075	0,100	0,100	0,120



ATORN End milling cutter Ultra-N PRO



- Please adjust these guideline values according to clamping operation and machine set-up!

249011 ....

ISO	**Roughing / Grooving** fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm								
	Materials group					3	4	5	6	8	10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	360	0,027	0,038	0,042	0,051	0,067	0,075	0,084	0,110	0,130
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	380	0,027	0,038	0,042	0,051	0,067	0,075	0,084	0,110	0,130
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	150	0,027	0,038	0,042	0,051	0,067	0,075	0,084	0,110	0,130
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	180	0,027	0,038	0,042	0,051	0,067	0,075	0,084	0,110	0,130
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	240	0,027	0,038	0,042	0,051	0,067	0,075	0,084	0,110	0,130

ISO	**Finishing / Edge-banding** fz for ae = 0,5 x D and ap = 1,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm								
	Materials group					3	4	5	6	8	10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	500	0,032	0,045	0,050	0,060	0,080	0,090	0,100	0,130	0,160
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	520	0,032	0,045	0,050	0,060	0,080	0,090	0,100	0,130	0,160
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	200	0,032	0,045	0,050	0,060	0,080	0,090	0,100	0,130	0,160
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	230	0,032	0,045	0,050	0,060	0,080	0,090	0,100	0,130	0,160
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	320	0,032	0,045	0,050	0,060	0,080	0,090	0,100	0,130	0,160

ATORN Torus milling cutter Ultra-N PRO



- Please adjust these guideline values according to clamping operation and machine set-up!

249012 ....

ISO	**copy / Finishing** fz for ae = 0,5 x D and ap = 0,05 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
	Materials group					3	4	5	6	8	10	12	16
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	220	0,010	0,020	0,020	0,030	0,040	0,050	0,070	0,090
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	180	0,010	0,020	0,020	0,030	0,040	0,050	0,070	0,090
	Thermoplastic		PVC		160	0,010	0,020	0,020	0,030	0,040	0,050	0,070	0,090
	Fibre-reinforced plastics		CFRP, GFRP		120	0,010	0,020	0,020	0,030	0,040	0,050	0,070	0,090

ATORN Torus milling cutter Ultra-N PRO



- Please adjust these guideline values according to clamping operation and machine set-up!

249013 ....

ISO	**copy / Finishing** fz for ae = 0,5 x D and ap = 0,05 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
	Materials group					3	4	5	6	8	10	12	16
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	320	0,010	0,020	0,020	0,030	0,040	0,050	0,070	0,090
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	280	0,010	0,020	0,020	0,030	0,040	0,050	0,070	0,090
	Thermoplastic		PVC		240	0,010	0,020	0,020	0,030	0,040	0,050	0,070	0,090
	Fibre-reinforced plastics		CFRP, GFRP		160	0,010	0,020	0,020	0,030	0,040	0,050	0,070	0,090

ATORN Torus milling cutter Ultra-N PRO



- Please adjust these guideline values according to clamping operation and machine set-up!

249014 ....

ISO	**Trochoidal / Roughing** fz for ae = 0,12 x D and ap = 3,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
	Materials group					6	8	10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	280	0,050	0,065	0,080	0,120	0,150	0,200
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	260	0,050	0,065	0,080	0,120	0,150	0,200
	Thermoplastic		PVC		160	0,050	0,065	0,080	0,120	0,150	0,200
	Fibre-reinforced plastics		CFRP, GFRP		120	0,050	0,065	0,080	0,120	0,150	0,200

ATORN Trochoidal end milling cutter Ultra-N PRO



- Please adjust these guideline values according to clamping operation and machine set-up!

249019....

ISO	**Trochoidal / Roughing** fz for ae = 0,12 x D and ap = 3,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
	Materials group					6	8	10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	280	0,050	0,065	0,080	0,120	0,150	0,200
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	470	0,050	0,065	0,080	0,120	0,150	0,200
	Thermoplastic		PVC		385	0,050	0,065	0,080	0,120	0,150	0,200
	Fibre-reinforced plastics		CFRP, GFRP		280	0,050	0,065	0,080	0,120	0,150	0,200

ATORN Radius milling cutter Ultra-N PRO



- Please adjust these guideline values according to clamping operation and machine set-up!

249015 ....

ISO	**copy / Finishing** fz for ap = 0,03 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
	Materials group					3	4	5	6	8	10	12	16
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	800	0,025	0,030	0,050	0,060	0,070	0,085	0,100	0,150
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	600	0,025	0,030	0,050	0,060	0,070	0,085	0,100	0,150
	Thermoplastic		PVC		500	0,025	0,030	0,050	0,060	0,070	0,085	0,100	0,150

ATORN Radius milling cutter Ultra-N PRO



- Please adjust these guideline values according to clamping operation and machine set-up!

249016 ....

ISO	**copy / Finishing** fz for ap = 0,03 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
	Materials group					3	4	5	6	8	10	12	16
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	700	0,025	0,030	0,050	0,060	0,070	0,085	0,100	0,150
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	550	0,025	0,030	0,050	0,060	0,070	0,085	0,100	0,150
	Thermoplastic		PVC		450	0,025	0,030	0,050	0,060	0,070	0,085	0,100	0,150

ATORN Roughing cutter Ultra-N PRO



- Please adjust these guideline values according to clamping operation and machine set-up!

249017 ....

ISO	**Roughing / Grooving** fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
	Materials group					6	8	10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	370	0,060	0,080	0,110	0,130	0,160	0,200
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	350	0,060	0,080	0,110	0,130	0,160	0,200
	Thermoplastic		PVC		210	0,030	0,035	0,040	0,045	0,055	0,080

ISO	**Finishing / Edge-banding** fz for ae = 0,5 x D and ap = 1,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
	Materials group					6	8	10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	520	0,080	0,100	0,130	0,150	0,200	0,250
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	490	0,080	0,100	0,130	0,150	0,200	0,250
	Thermoplastic		PVC		280	0,032	0,040	0,050	0,055	0,063	0,090

ATORN Roughing cutter Ultra-N PRO



- Please adjust these guideline values according to clamping operation and machine set-up!

249018 ....

ISO	**Roughing / Grooving** fz for ae = 1,0 x D and ap = 1,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
	Materials group					6	8	10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	530	0,090	0,120	0,150	0,180	0,230	0,290
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	500	0,090	0,120	0,150	0,180	0,230	0,290
	Thermoplastic		PVC		300	0,038	0,046	0,059	0,063	0,075	0,100

ISO	**Finishing / Edge-banding** fz for ae = 0,5 x D and ap = 1,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
	Materials group					6	8	10	12	16	20
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	750	0,110	0,140	0,180	0,220	0,280	0,350
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	700	0,110	0,140	0,180	0,220	0,280	0,350
	Thermoplastic		PVC		400	0,045	0,055	0,070	0,075	0,090	0,120



palbit End milling cutter



- Please adjust these guideline values according to clamping operation and machine set-up!

254300....

ISO	**Roughing / Grooving** fz für ae = 1,0 x D und ap = 1,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm								
	Materials group					3	4	5	6	8	10	12	16	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	134	0,010	0,017	0,029	0,029	0,038	0,063	0,063	0,084	0,101
	Unalloyed structural steel	Up to 700	St-52	1.0052	127	0,010	0,017	0,029	0,029	0,038	0,063	0,063	0,084	0,101
	Structural steel	700 - 950	Ck45	1.1191	120	0,010	0,017	0,029	0,029	0,038	0,063	0,063	0,084	0,101
	Tempering steel	500 - 950	42 CrMo4	1.7225	113	0,010	0,017	0,021	0,021	0,038	0,063	0,063	0,084	0,101
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	106	0,008	0,013	0,021	0,021	0,027	0,044	0,044	0,059	0,071
	Tempering steel	950 -1300	43CrMo4	1.3563	78	0,008	0,013	0,021	0,021	0,027	0,044	0,044	0,059	0,071
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	134	0,010	0,017	0,029	0,029	0,038	0,063	0,063	0,084	0,101
	Ductile iron	Up to 280 HB	GGG 60	0.7060	99	0,010	0,017	0,029	0,029	0,038	0,063	0,063	0,084	0,101
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	99	0,010	0,017	0,029	0,029	0,038	0,063	0,063	0,084	0,101

ISO	**Finishing / Edge-banding** fz für ae = 0,5 x D und ap = 1,0 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm								
	Materials group					3	4	5	6	8	10	12	16	20
P	Automatenstahl	up to 700	9 SMn 28	1.0715	190	0,012	0,020	0,035	0,035	0,045	0,075	0,075	0,100	0,120
	unlegierter Baustahl	up to 700	St-52	1.0052	180	0,012	0,020	0,035	0,035	0,045	0,075	0,075	0,100	0,120
	Baustahl	700 - 950	Ck45	1.1191	170	0,012	0,020	0,035	0,035	0,045	0,075	0,075	0,100	0,120
	Vergütungsstahl	500 - 950	42 CrMo4	1.7225	160	0,012	0,020	0,025	0,025	0,045	0,075	0,075	0,100	0,120
	Einsatzstahl	up to 1200	16 MnCr 5	1.7131	150	0,009	0,015	0,025	0,025	0,032	0,052	0,052	0,070	0,084
	Vergütungsstahl	950 -1300	43CrMo4	1.3563	110	0,009	0,015	0,025	0,025	0,032	0,052	0,052	0,070	0,084
K	Grauguss	up to 260 HB	GG 25	0.6025	190	0,012	0,020	0,035	0,035	0,045	0,075	0,075	0,100	0,120
	Sphäroguss	up to 280 HB	GGG 60	0.7060	140	0,012	0,020	0,035	0,035	0,045	0,075	0,075	0,100	0,120
	Temperguss	up to 280 HB	GTS 55	0.8155	140	0,012	0,020	0,035	0,035	0,045	0,075	0,075	0,100	0,120

ATORN Mini end milling cutter, mini torus milling cutter Ultra-MS



- Please adjust these guideline values according to clamping operation and machine set-up!

256011.... 256012....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc m/min Ø < = 0.5 mm	Vc m/min Ø < = 1.5 mm	Vc m/min Ø > = 1,5 mm	ap max. Ø < = 0.5 mm	ap max. Ø < = 1.5 mm	ap max. Ø > = 1,5 mm
P	Machining steel	Up to 700	9 SMn 28	1.0715	20 - 50	30 - 60	40 - 60	0.01 - 0.04	0.01 - 0.09	0.05 - 0.5
P	Unalloyed structural steel	Up to 700	St-52	1.0052	25 - 55	40 - 90	70 - 100	0.01 - 0.05	0.02 - 0.1	0.05 - 0.6
P	Structural steel	700 - 950	Ck45	1.1191	25 - 55	40 - 90	70- 100	0.01 - 0.05	0.02 - 0.1	0.05 - 0.6
P	Tempering steel	500 - 950	42 CrMo4	1.7225	20 - 50	30 - 60	40 - 60	0.01 - 0.04	0.01 - 0.09	0.05 - 0.5
P	Cast steel	Up to 950	GS 40	1.0416	85 - 100	20 - 50	30 - 60	0.01 - 0.04	0.01 - 0.09	0.05 - 0.5
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	20 - 35	20 - 40	30 - 40	0.035	0.08	0.5
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	22 - 50	30 - 60	45 - 60	0.04	0.13	0.65
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	22 - 60	40 - 120	90 - 150	0.04	0.13	0.65
S	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	22 - 50	30 - 60	45 - 60	0.04	0.13	0.65

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Ø 0.5 fz	Ø 0.9 fz	Ø 1-1.5 fz	Ø 1.6-2.5 fz	Ø 2.5-4 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	0.002 - 0.005	0.004 - 0.008	0.005 - 0.014	0.01 - 0.023	0.015 - 0.03
P	Unalloyed structural steel	Up to 700	St-52	1.0052	0.002 - 0.005	0.003 - 0.01	0.006 - 0.015	0.01 - 0.025	0.02 - 0.035
P	Structural steel	700 - 950	Ck45	1.1191	0.002 - 0.005	0.003 - 0.01	0.006 -0.015	0.01 - 0.025	0.02 - 0.035
P	Tempering steel	500 - 950	42 CrMo4	1.7225	0.002 - 0.005	0.004 - 0.008	0.005 - 0.014	0.01 - 0.023	0.015 - 0.03
P	Cast steel	Up to 950	GS 40	1.0416	0.002 - 0.005	0.004 - 0.008	0.005 - 0.014	0.01 - 0.023	0.015 - 0.03
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	0.003 - 0.005	0.004 - 0.008	0.005 - 0.014	0.01 - 0.023	0.015 - 0.035
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	0.002 - 0.007	0.004 - 0.008	0.006 - 0.015	0.01 - 0.023	0.025 - 0.035
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0.001 - 0.005	0.003 - 0.009	0.006 - 0.021	0.016 - 0.03	0.035 - 0.06
S	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	0.002 - 0.007	0.004 - 0.008	0.006 -0.015	0.01 - 0.023	0.025 - 0.035

ATORN End milling cutter, torus milling cutter Ultra-MS



- Please adjust these guideline values according to clamping operation and machine set-up!

256007.... 256010....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc m/min Ø < = 0.5 mm	Ø 3 - 4 fz	Ø 5 - 6 fz	Ø 8 - 10 fz	Ø 12 - 16 fz	Ø 16 - 20 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	120 - 140	0.02 - 0.03	0.03 - 0.04	0.04 - 0.055	0.06 - 0.08	0.07 - 0.1
P	Unalloyed structural steel	Up to 700	St-52	1.0052	130 - 150	0.02 - 0.03	0.03 - 0.04	0.04 - 0.055	0.06 - 0.08	0.07 - 0.1
P	Structural steel	700 - 950	Ck45	1.1191	130 - 150	0.02 - 0.03	0.03 - 0.04	0.04 - 0.055	0.06 - 0.08	0.07 - 0.1
P	Tempering steel	500 - 950	42 CrMo4	1.7225	120 - 140	0.02 - 0.03	0.03 - 0.04	0.04 - 0.055	0.06 - 0.08	0.07 - 0.1
P	Cast steel	Up to 950	GS 40	1.0416	120 - 140	0.02 - 0.03	0.03 - 0.04	0.04 - 0.055	0.06 - 0.08	0.07 - 0.1
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	60 - 80	0.014 - 0.022	0.024 - 0.032	0.036 -0.048	0.05 - 0.07	0.06 - 0.09
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	60 - 80	0.018 - 0.028	0.032 - 0.043	0.048 - 0.064	0.068 - 0.095	0.087 - 0.12
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	60 - 80	0.014 - 0.022	0.024 - 0.032	0.036 - 0.048	0.051 - 0.071	0.065 - 0.087
S	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	60 - 80	0.018 -0.028	0.032 - 0.043	0.048 - 0.064	0.068 - 0.095	0.087 - 0.12

ATORN Mini radius milling cutter Ultra-MS



- Please adjust these guideline values according to clamping operation and machine set-up!

256013....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc m/min Ø < = 1.5 mm	Vc m/min Ø < = 1.5 mm	Vc m/min Ø > = 1,5 mm	Ø 0.2-0.5 fz	Ø 0.6-0.9 fz	Ø 1.0-1.5 fz	Ø 1.6-2.5 fz	Ø 2.5-4.0 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	20 - 45	40 - 60	40 - 60	0.001 - 0.005	0.005 - 0.008	0.006 - 0.01	0.011 - 0.019	0.019 - 0.035
P	Unalloyed structural steel	Up to 700	St-52	1.0052	25 - 60	50-100	70 - 100	0.002 - 0.004	0.004 - 0.01	0.008 - 0.015	0.01 - 0.02	0.02 - 0.035
P	Structural steel	700 - 950	Ck45	1.1191	25 - 60	50-100	70 - 100	0.002 - 0.004	0.004 - 0.01	0.008 - 0.015	0.01 - 0.02	0.02 - 0.035
P	Tempering steel	500 - 950	42 CrMo4	1.7225	25 - 45	40 - 60	40 -60	0.001 - 0.005	0.005 - 0.008	0.006 - 0.01	0.011 - 0.019	0.019 - 0.035
P	Cast steel	Up to 950	GS 40	1.0416	20 - 45	40 - 60	40 - 60	0.001 - 0.005	0.005 - 0.008	0.006 - 0.01	0.011 - 0.019	0.019 - 0.35
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	20 - 40	28 - 40	28 - 40	0.002 - 0.005	0.005 - 0.008	0.007 - 0.014	0.011 - 0.018	0.019 - 0.035
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	20 - 50	40 - 60	45 - 60	0.001 - 0.005	0.005 - 0.006	0.006 - 0.01	0.011 - 0.019	0.019 - 0.035
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	20 - 60	50 - 150	100 - 150	0.002 - 0.007	0.007 - 0.01	0.01 - 0.028	0.021 - 0.038	0.04 - 0.075
S	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	20 - 50	40 - 60	45 - 60	0.001 - 0.005	0.005 - 0.009	0.006 - 0.01	0.011 - 0.019	0.019 - 0.035

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc m/min Ø < = 0.5 mm	Ø 3 - 4 fz	Ø 5 - 6 fz	Ø 8 - 10 fz	Ø 12 - 16 fz	Ø 16 - 20 fz
P	Machining steel	Up to 700	9 SMn 28	1.0715	130 - 150	0.022 - 0.033	0.034 - 0.042	0.042 - 0.058	0.063 - 0.082	0.072 - 0.11
P	Unalloyed structural steel	Up to 700	St-52	1.0052	140 - 160	0.022 - 0.033	0.034 - 0.042	0.043 - 0.057	0.062 - 0.083	0.073 - 0.12
P	Structural steel	700 - 950	Ck45	1.1191	140 - 160	0.022 - 0.033	0.034 - 0.042	0.043 - 0.057	0.062 - 0.083	0.073 - 0.12
P	Tempering steel	500 - 950	42 CrMo4	1.7225	130 - 150	0.022 - 0.033	0.034 - 0.042	0.042 - 0.058	0.063 - 0.082	0.072 - 0.11
P	Cast steel	Up to 950	GS 40	1.0416	130 - 150	0.022 - 0.033	0.034 - 0.042	0.042 - 0.058	0.063 - 0.082	0.072 - 0.11
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	65 - 85	0.016 - 0.025	0.026 - 0.035	0.038 - 0.05	0.052 - 0.073	0.063 - 0.1
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	60 - 80	0.018 - 0.028	0.032 - 0.043	0.048 - 0.064	0.068 - 0.095	0.087 - 0.12
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	60 - 80	0.014 - 0.022	0.024 - 0.032	0.036 - 0.048	0.051 - 0.071	0.065 - 0.087
S	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	60 - 80	0.018 - 0.028	0.032 - 0.043	0.048 - 0.064	0.068 - 0.095	0.087 - 0.12

SARA® Mini torus cutter DIA+



- Please adjust these guideline values according to clamping operation and machine set-up!

258005....

ISO	**Roughing** Materials group	Vc m/min	Ø 0.2 fz	Ø 0.3 0.4 0.5 fz	Ø 0.6 0.7 0.8 fz	Ø 0.9 1.0 1.2 fz	Ø 1.5 fz	Ø 2 fz
N	Graphite, fibre-reinforced plastics	95	0.002	0.003	0.005	0.010	0.012	0.015

ISO	**Roughing** Materials group	Vc m/min	Ø 3 fz	Ø 4 fz	Ø 5.0 6.0 fz	Ø 8 fz	Ø 10 fz	Ø 12 fz
N	Graphite, fibre-reinforced plastics	95	0.02	0.03	0.045	0.06	0.080	0.1

ISO	**Finishing** Materials group	Vc m/min	Ø 0.2 fz	Ø 0.3 0.4 0.5 fz	Ø 0.6 0.7 0.8 fz	Ø 0.9 1.0 1.2 fz	Ø 1.5 fz	Ø 2 fz
N	Graphite, fibre-reinforced plastics	95	0.003	0.004	0.008	0.015	0.02	0.025

ISO	**Finishing** Materials group	Vc m/min	Ø 3 fz	Ø 4 fz	Ø 5.0 6.0 fz	Ø 8 fz	Ø 10 fz	Ø 12 fz
N	Graphite, fibre-reinforced plastics	95	0.03	0.040	0.06	0.080	0.1	0.12

SARA® Mini radius milling cutter DIA+



- Please adjust these guideline values according to clamping operation and machine set-up!

258006....

ISO	**Roughing** Materials group	Vc m/min	Ø 0.2 fz	Ø 0.3 0.4 0.5 fz	Ø 0.6 0.7 0.8 fz	Ø 0.9 1.0 1.2 fz	Ø 1.5 fz	Ø 2 fz
N	Graphite, fibre-reinforced plastics	95	0.002	0.003	0.005	0.010	0.012	0.015

ISO	**Roughing** Materials group	Vc m/min	Ø 3 fz	Ø 4 fz	Ø 5.0 6.0 fz	Ø 8 fz	Ø 10 fz	Ø 12 fz
N	Graphite, fibre-reinforced plastics	95	0.02	0.03	0.045	0.06	0.080	0.1

ISO	**Finishing** Materials group	Vc m/min	Ø 0.2 fz	Ø 0.3 0.4 0.5 fz	Ø 0.6 0.7 0.8 fz	Ø 0.9 1.0 1.2 fz	Ø 1.5 fz	Ø 2 fz
N	Graphite, fibre-reinforced plastics	95	0.003	0.004	0.008	0.015	0.02	0.025

ISO	**Finishing** Materials group	Vc m/min	Ø 3 fz	Ø 4 fz	Ø 5.0 6.0 fz	Ø 8 fz	Ø 10 fz	Ø 12 fz
N	Graphite, fibre-reinforced plastics	95	0.03	0.040	0.06	0.080	0.1	0.12

SARA® Torus milling cutter DIA+



- Please adjust these guideline values according to clamping operation and machine set-up!

258013....

ISO	**Roughing** Materials group	Vc m/min	Ø 0.2 fz	Ø 0.3 0.4 0.5 fz	Ø 0.6 0.7 0.8 fz	Ø 0.9 1.0 1.2 fz	Ø 1.5 fz	Ø 2 fz
N	Graphite, fibre-reinforced plastics	95	0.002	0.003	0.005	0.010	0.012	0.015

ISO	**Roughing** Materials group	Vc m/min	Ø 3 fz	Ø 4 fz	Ø 5.0 6.0 fz	Ø 8 fz	Ø 10 fz	Ø 12 fz
N	Graphite, fibre-reinforced plastics	95	0.02	0.03	0.045	0.06	0.080	0.1

ISO	**Finishing** Materials group	Vc m/min	Ø 0.2 fz	Ø 0.3 0.4 0.5 fz	Ø 0.6 0.7 0.8 fz	Ø 0.9 1.0 1.2 fz	Ø 1.5 fz	Ø 2 fz
N	Graphite, fibre-reinforced plastics	95	0.003	0.004	0.008	0.015	0.02	0.025

ISO	**Finishing** Materials group	Vc m/min	Ø 3 fz	Ø 4 fz	Ø 5.0 6.0 fz	Ø 8 fz	Ø 10 fz	Ø 12 fz
N	Graphite, fibre-reinforced plastics	95	0.03	0.040	0.06	0.080	0.1	0.12

SARA® Torus milling cutter, long DIA+



- Please adjust these guideline values according to clamping operation and machine set-up!

258014....

ISO	**Roughing** Materials group	Vc m/min	Ø 0.2 fz	Ø 0.3 0.4 0.5 fz	Ø 0.6 0.7 0.8 fz	Ø 0.9 1.0 1.2 fz	Ø 1.5 fz	Ø 2 fz
N	Graphite, fibre-reinforced plastics	95	0.002	0.003	0.005	0.010	0.012	0.015

ISO	**Roughing** Materials group	Vc m/min	Ø 3 fz	Ø 4 fz	Ø 5.0 6.0 fz	Ø 8 fz	Ø 10 fz	Ø 12 fz
N	Graphite, fibre-reinforced plastics	95	0.02	0.03	0.045	0.06	0.080	0.1

ISO	**Finishing** Materials group	Vc m/min	Ø 0.2 fz	Ø 0.3 0.4 0.5 fz	Ø 0.6 0.7 0.8 fz	Ø 0.9 1.0 1.2 fz	Ø 1.5 fz	Ø 2 fz
N	Graphite, fibre-reinforced plastics	95	0.002	0.003	0.005	0.010	0.012	0.015

ISO	**Finishing** Materials group	Vc m/min	Ø 3 fz	Ø 4 fz	Ø 5.0 6.0 fz	Ø 8 fz	Ø 10 fz	Ø 12 fz
N	Graphite, fibre-reinforced plastics	95	0.02	0.03	0.045	0.06	0.080	0.1

ATORN Milling cutter for composite materials



- Please adjust these guideline values according to clamping operation and machine set-up!

250603 ....
250604 ....
250618....
250619....

ISO	Materials group	Cutting speed Vc m/min	Application	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
				2	4	6	8	10	12	16	20
N	Thermoset	200 - 300	Roughing	0.024	0.048	0.072	0.096	0.12	0.144	0.192	0.204
	Hardwood	200 - 250	Finishing	0.018	0.036	0.054	0.072	0.09	0.108	0.144	0.18
	Compressed board	200 - 250	Groove milling	0.016	0.032	0.048	0.064	0.08	0.096	0.128	0.16
			Copy-roughing	0.028	0.056	0.084	0.112	0.14	0.168	0.224	0.28
			Copy-finishing	0.024	0.048	0.072	0.096	0.12	0.144	0.192	0.24
	Thermoplastic	250 - 400	Roughing	0.024	0.048	0.072	0.096	0.12	0.144	0.192	0.24
	Polycarbonate	250 - 350	Finishing	0.022	0.044	0.066	0.088	0.11	0.132	0.176	0.22
	Non-ferrous materials	250 - 350	Groove milling	0.017	0.034	0.051	0.068	0.085	0.102	0.163	0.17
	Hard rubber	50 - 150	Copy-roughing	0.037	0.074	0.111	0.148	0.185	0.222	0.296	0.37
			Copy-finishing	0.030	0.060	0.090	0.120	0.15	0.18	0.24	0.3
	Kevlar	90 - 150	All		0.012	0.016	0.022	0.027	0.033	0.043	
	Honeycomb	350	All			0.060	0.060	0.06	0.06	0.07	0.08
	Fibre-reinforced plastics GRRP/CFRP	150 - 250	Roughing	0.026	0.052	0.078	0.104	0.13	0.156	0.028	0.26
			Finishing	0.024	0.048	0.072	0.096	0.12	0.144	0.192	0.24
			Groove milling	0.020	0.040	0.060	0.080	0.1	0.12	0.16	0.2
	Correction factors										
	Corner and contour milling, roughing			ap = 1.0 x D ae = 0.5 x D							
	Corner and contour milling, finishing			ap = 1.0 x D ae = 0.1 x D							
	Groove milling			ap = 0.5 x D ae = 1.0 x D							
	Copy milling, roughing			ap = 0.5 x D ae = 0.5 x D							
	Copy milling, finishing			ap = 0.03 x D ae = 0.02 x D							

250605 ....
250606 ....
250607 ....
250608 ....
250609 ....
250610 ....
250611 ....
250612 ....
250613 ....
250614 ....
250615 ....
250616 ....
250617 ....

ISO	Materials group	Cutting speed Vc m/min	Application	Feed f in mm/rev in relation to milling cutter diameter in mm							
				2	4	6	8	10	12	16	20
N	Thermoset	200 - 300	Fine	0.2	0.4	0.6	0.8	1.0	1.2	1.6	2.0
	Hardwood	200 - 250	Medium	0.14	0.28	0.42	0.56	0.7	0.85	1.12	1.4
	Compressed board	200 - 250	Coarse	0.12	0.24	0.36	0.48	0.6	0.72	0.96	1.2
	Thermoplastic	250 - 400	Fine	0.16	0.32	0.48	0.64	0.8	0.96	1.28	1.6
	Polycarbonate	250 - 350	Medium	0.13	0.26	0.39	0.52	0.65	0.78	1.04	1.3
	Non-ferrous materials	250 - 350	Coarse	0.1	0.2	0.3	0.4	0.5	0.6	0.8	1.0
	Fibre-reinforced plastics GRRP/CFRP	150 - 250	Fine contour	0.16	0.32	0.48	0.64	0.8	0.96	1.28	1.6
			Medium contour	0.14	0.28	0.42	0.56	0.7	0.84	1.12	1.4
			Coarse contour	0.12	0.24	0.36	0.48	0.6	0.72	0.96	1.2
			Fine grooves	0.14	0.28	0.42	0.56	0.7	0.84	1.12	1.4
			Medium grooves	0.12	0.24	0.36	0.48	0.6	0.72	0.96	1.2
			Coarse grooves	0.1	0.2	0.3	0.4	0.5	0.6	0.8	1.0
	Correction factors										
	Corner and contour milling, roughing			ap = 1.0 x D ae = 0.1 x D							
	Corner and contour milling, finishing			ap = 0.75 x D ae = 0.03 x D							
	Groove milling			ap = 0.3 x D ae = 1.0 x D							

250600 ....
250601 ....
250602 ....

ISO	Materials group	Cutting speed Vc m/min	Application	Feed f in mm/rev in relation to milling cutter diameter in mm			
				6	8	10	12
N	Fibre-reinforced plastics GRRP/CFRP	70 - 100	Groove milling	0.06	0.1	0.15	0.2
		150 - 200	Contour milling	0.06	0.1	0.15	0.2
	Correction factors						
	Corner and contour milling, roughing			ap = dependent on up and down-cut transition ae = 0.5 x D			

Contour milling cutter for GFRP and CFRP



- Please adjust these guideline values according to clamping operation and machine set-up!

250050....
250051....
250052....
250053....

Type A: smooth face
Type B: rotary milling cutter face
Type C: end milling cutter face
Type D: drill bit

Ø mm	Rotational speed rpm	Feed mm / min.
1.6	40,000 - 45,000	1,000 - 1,500
2.4	25,000 - 30,000	1,100 - 1,800
3	20,000 - 25,000	1,100 - 1,800
4	20,000 - 24,000	900 - 1,700
6	20,000 - 24,000	900 - 1,700
10	15,000 - 20,000	700 - 1,500
12	10,000 - 15,000	500 - 1,300

Carbide metal rotary burs
Usage recommendations, cut types, comparison tables

INFO





Usage recommendations

Material	Cut 6	Cut 2	Aluminium cut
	universal cross-toothing with high machining performance and smooth running, for use with high-alloy, stainless steels, cast irons and weld seams	standard toothing for machining cast steel, hardened and unhardened steels as well as weld seams	special aluminium teeth with large chip chambers, for machining aluminium, non-ferrous metals, hard rubber, reaction wood, hard wood and plastics
Steel	●	●	
Hardened steel	●	●	
Stainless steel	●	●	
Cast iron	●	●	
Titanium	●	●	
Nickel	●	●	
Copper, copper alloys	●	●	
Aluminium			●
Plastic			●

Comparison of cut type designation

Type of cut	ATORN	BIAX	Pferd	Lukas
Cross cut	**6**	63	3 Plus	7
Standard cut	**2**	3	3	3
Aluminium cut	**ALU**	13	Alu	9

Designations of carbide metal rotary burs

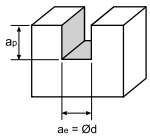
Type	ATORN	DIN (as per 8033)	BIAX	Pferd	Lukas
Cylindrical shape without end cut	**ZYA**	ZYA	TCA	HMA	HFA
Cylindrical shape with end cut	**ZYAS**	ZYA...S	TCB	HMA...ST	HFAS
Ball nosed cylinder shape	**WRC**	WRC	TCC	HMC	HFC
Ball shape	**KUD**	KUD	TCD	HMF	HFD
Oval shape	**TRE**	TRE	TCE	HMO	HFE
Ball nosed tree shape	**RBF**	RBF	TCF	HMH	HFF
Pointed tree shape	**SPG**	SPG	TCG	HMK	HFG
Flame shape	**H**	-	TCH	HMB	HFH
Ball nosed cone shape	**KEL**	KEL	TCK	HML	HFL
Cone shape	**SKM**	SKM	TCI	HMG	HFM
Inverted cone shape	**WKN**	WKN	TCN	HMW	HFN

Speed recommendation

		Head diameter				
		3 mm	**6 mm**	**10 mm**	**12 mm**	**16 mm**
Material	**max. speed r/min**	**90.000**	**65.000**	**55.000**	**35.000**	**25.000**
Aluminium Plastic	Speed range	60.000 - 80.000	15.000 - 60.000	10.000 - 50.000	7.000 - 30.000	6.000 - 20.000
	Optimum speed	**65.000**	**40.000**	**25.000**	**20.000**	**15.000**
Brass, copper, copper alloy, cast iron, bronze	Speed range	45.000 - 80.000	22.500 - 60.000	15.000 - 40.000	11.000 - 30.000	9.000 - 20.000
	Optimum speed	**65.000**	**45.000**	**30.000**	**25.000**	**20.000**
Steel	Speed range	60.000 - 80.000	45.000 - 60.000	30.000 - 40.000	22.500 - 30.000	18.000 - 20.000
	Optimum speed	**80.000**	**50.000**	**30.000**	**25.000**	**20.000**
Hardened steel, stainless steel, Titanium, nickel	Speed range	60.000 - 80.000	30.000 - 45.000	19.000 - 30.000	15.000 - 22.500	12.000 - 18.000
	Optimum speed	**80.000**	**40.000**	**25.000**	**20.000**	**15.000**

ATORN Mini end milling cutter, mini torus milling cutter RockTec 65

- The lower Vc values apply respectively for long clearances and the smaller diameter range; the higher Vc values for short clearance lengths and the larger diameter range. This also applies for the specified ap max. value.
- Please adjust these guideline values according to clamping operation and machine set-up!



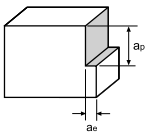


ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Diameter range ≤ 0.5 mm		Diameter range 0.6 - 1 mm		Diameter range > 1 mm	
					Vc m/min	ap max.	Vc m/min	ap max.	Vc m/min	ap max.
P	Nitriding steel	950 - 1300	31CrMoV9	1.8519	60 - 80	0.002 - 0.02	70 - 90	0.003 - 0.045	80-100	0.015 - 0.35
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	60 - 80	0.002 - 0.02	70 - 90	0.003 - 0.045	80-100	0.015 - 0.35
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	15 - 45	0.003 - 0.025	30 - 70	0.004 - 0.05	50 - 80	0.02 - 0.4
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	15 - 45	0.002 - 0.02	30 - 70	0.003 - 0.045	50 - 80	0.015 - 0.35
S	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	13 - 40	0.002 - 0.02	30 - 55	0.003 - 0.04	35 - 65	0.015 - 0.3
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	50 - 70	0.002 - 0.02	60 - 80	0.003 - 0.04	70 - 90	0.015 - 0.15
H	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	50 - 70	0.002 - 0.02	60 - 80	0.003 - 0.04	70 - 90	0.015 - 0.15
H	Hardened materials up to 64 HRc		100Cr6	1.2067	40 - 60	0.001 - 0.01	50 - 70	0.003 - 0.015	60 - 80	0.015 - 0.08

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Feed fz in mm/tooth in relation to milling cutter diameter in mm				
					0.1 - 0.3	0.4-0.8	0.9 - 1.5	1.6 - 2	2.5 - 3
P	Nitriding steel	950 - 1300	31CrMoV9	1.8519	0.003 - 0.007	0.005 - 0.012	0.008 - 0.018	0.014 - 0.025	0.018 - 0.035
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	0.003 - 0.007	0.005 - 0.012	0.008 - 0.018	0.014 - 0.025	0.018 - 0.035
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	0.003 - 0.007	0.005 - 0.012	0.008 - 0.018	0.014 - 0.025	0.018 - 0.035
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0.003 - 0.007	0.005 - 0.012	0.008 - 0.018	0.014 - 0.025	0.018 - 0.035
S	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	0.002 - 0.005	0.003 - 0.007	0.008 - 0.014	0.012 - 0.023	0.018 - 0.035
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	0.002 - 0.004	0.002 - 0.007	0.006 - 0.012	0.011 - 0.018	0.016 - 0.022
H	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	0.002 - 0.004	0.002 - 0.007	0.006 - 0.012	0.011 - 0.018	0.016 - 0.022
H	Hardened materials up to 64 HRc		100Cr6	1.2067	0.001 - 0.003	0.001 - 0.003	0.003 - 0.009	0.008 - 0.016	0.015 - 0.022

ATORN End milling cutter, multi-flute milling cutter, torus milling cutter RockTec 65

- Please adjust these guideline values according to clamping operation and machine set-up!

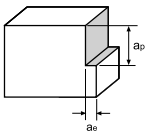




ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	ae Max.	ap Max.	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
								3	5	8	12	16	20
P	Nitriding steel	950 - 1300	31CrMoV9	1.8519	0.2 x D	1.5 x D	160 - 200	0.02	0.04	0.08	0.1	0.11	0.12
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	0.2 x D	1.5 x D	160 - 200	0.02	0.04	0.08	0.1	0.11	0.12
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	0.2 x D	1.5 x D	250 - 300	0.02	0.04	0.08	0.1	0.1	0.1
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0.2 x D	1.5 x D	250 - 300	0.02	0.04	0.08	0.1	0.1	0.1
S	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	0.2 x D	1.5 x D	250 - 300	0.02	0.04	0.08	0.1	0.1	0.1
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	0.05 x D	1 x D	120 - 140	0.02	0.03	0.06	0.08	0.09	0.1
H	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	0.05 x D	1 x D	120 - 140	0.02	0.03	0.06	0.08	0.09	0.1
H	Hardened materials up to 64 HRc		100Cr6	1.2067	0.03-0.05 x D (max. 0.2-0.5 mm)	1 x D	80-120	0.015	0.025	0.05	0.06	0.07	0.08

ATORN End milling cutter, multi-flute milling cutter, torus milling cutter RockTec 65

- Please adjust these guideline values according to clamping operation and machine set-up!





257006....



257014....

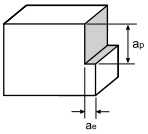


257020....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	ae Max.	ap Max.	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
								3	5	8	12	16	20
P	Nitriding steel	950 - 1300	31CrMoV9	1.8519	0.2 x D	1.5 x D	140 - 160	0.02	0.04	0.08	0.1	0.11	0.12
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	0.2 x D	1.5 x D	140 - 160	0.02	0.04	0.08	0.1	0.11	0.12
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	0.2 x D	1.5 x D	200 - 260	0.02	0.04	0.08	0.1	0.1	0.1
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0.2 x D	1.5 x D	200 - 260	0.02	0.04	0.08	0.1	0.1	0.1
S	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	0.2 x D	1.5 x D	200 - 260	0.02	0.04	0.08	0.1	0.1	0.1
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	0.05 x D	1 x D	100 - 130	0.02	0.03	0.06	0.08	0.09	0.1
H	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	0.05 x D	1 x D	100 - 130	0.02	0.03	0.06	0.08	0.09	0.1
H	Hardened materials up to 64 HRc		100Cr6	1.2067	0.03-0.05 x D (max. 0.2-0.5 mm)	1 x D	70 - 100	0.015	0.025	0.05	0.06	0.07	0.08

ATORN End milling cutter, torus milling cutter RockTec 65

- Please adjust these guideline values according to clamping operation and machine set-up!





257008....



257022....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	ae Max.	ap Max.	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm					
								3	5	8	12	16	20
P	Nitriding steel	950 - 1300	31CrMoV9	1.8519	0.2 x D	1.5 x D	120 - 140	0.02	0.04	0.08	0.1	0.11	0.12
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	0.2 x D	1.5 x D	120 - 140	0.02	0.04	0.08	0.1	0.11	0.12
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	0.2 x D	1.5 x D	130 - 170	0.02	0.04	0.08	0.1	0.1	0.1
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0.2 x D	1.5 x D	130 - 170	0.02	0.04	0.08	0.1	0.1	0.1
S	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	0.2 x D	1.5 x D	130 - 170	0.02	0.04	0.08	0.1	0.1	0.1
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	0.05 x D	1 x D	80 - 110	0.02	0.03	0.06	0.08	0.09	0.1
H	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	0.05 x D	1 x D	80 - 110	0.02	0.03	0.06	0.08	0.09	0.1
H	Hardened materials up to 64 HRc		100Cr6	1.2067	0.03-0.05 x D (max. 0.2-0.5 mm)	1 x D	50 - 80	0.015	0.025	0.05	0.06	0.07	0.08

ATORN Solid carbide high-feed milling cutter RockTec 65



257040...
294048...
294049...

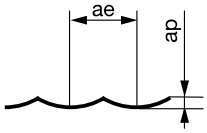
- Please adjust these guideline values according to clamping operation and machine set-up!
- Contour milling or milling in the Z-direction, please mill with an inclination of 1 ° or more, and reduce the feed rate to 60-70%.

Steel < 1.400 N/mm², hardened steel 45-55 HRc				
Diameter	VC= 160 m/min n (rpm	Feed (mm/min)	ae	ap
4	12.500	5.000	2	0.1
5	10.000	5.200	2.5	0.125
6	8.500	5.440	3	0.15
8	6.300	5.500	4	0.2
10	5.100	5.500	5	0.25
12	4.200	5.300	6	0.3

Hard cast iron < 52 HRc, hardened steel 55-60 HRc				
Diameter	VC= 120 m/min n (rpm)	Feed (mm/min)	ae	ap
4	9.500	2.280	2	0.07
5	7.600	2.400	2.5	0.088
6	6.300	2.500	3	0.105
8	4.700	2.600	4	0.14
10	3.800	2.700	5	0.175
12	3.150	2.600	6	0.21

ATORN Mini radius milling cutter RockTec 65

- The lower Vc values apply respectively for long clearances and the smaller diameter range; the higher Vc values for short clearance lengths and the larger diameter range. This also applies for the specified ap max. value.
- Please adjust these guideline values according to clamping operation and machine set-up!





257026....



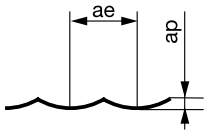
257034....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Diameter range ≤ 0.5 mm		Diameter range 0.6 - 1 mm		Diameter range > 1 mm	
					Vc m/min	ap max.	Vc m/min	ap max.	Vc m/min	ap max.
P	Nitriding steel	950 - 1300	31CrMoV9	1.8519	60 - 80	0.006 - 0.025	70 - 90	0.01 - 0.05	80-100	0.04 - 0.15
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	60 - 80	0.006 - 0.025	70 - 90	0.01 - 0.05	80-100	0.04 - 0.15
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	30 - 55	0.007 - 0.03	30 - 75	0.01 - 0.05	50 - 100	0.04 - 0.15
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	25 - 45	0.006 - 0.025	30 - 60	0.01 - 0.05	40 - 80	0.04 - 0.15
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	25 - 45	0.005 - 0.02	30 - 60	0.01 - 0.05	40 - 80	0.04 - 0.15
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	50 - 70	0.004 - 0.015	60 - 80	0.008 - 0.05	70 - 90	0.02 - 0.15
	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	50 - 70	0.003 - 0.015	60 - 80	0.008- 0.05	70 - 90	0.02- 0.15
	Hardened materials up to 64 HRc		100Cr6	1.2067	40 - 60	0.003 - 0.015	50 - 70	0.008 - 0.05	60 - 80	0.02 - 0.15

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Feed fz in mm/tooth in relation to milling cutter diameter in mm				
					0.2 - 0.3	0.4-0.8	0.9 - 1.5	1.6 - 2	2.5 - 3
P	Nitriding steel	950 - 1300	31CrMoV9	1.8519	0.003 - 0.005	0.004 - 0.009	0.005 - 0.012	0.01 - 0.028	0.015 - 0.032
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	0.003 - 0.005	0.004 - 0.009	0.005 - 0.012	0.01 - 0.028	0.015 - 0.032
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	0.003 - 0.005	0.004 - 0.009	0.005 - 0.012	0.01 - 0.028	0.015 - 0.032
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0.003 - 0.004	0.003 - 0.008	0.004 - 0.01	0.006 - 0.022	0.013 - 0.029
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	0.003 - 0.004	0.003 - 0.007	0.004 - 0.009	0.006 - 0.016	0.013 - 0.022
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	0.002 - 0.004	0.002 - 0.005	0.003 - 0.008	0.004 - 0.011	0.011 - 0.021
	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	0.002 - 0.004	0.002 - 0.005	0.003 - 0.01	0.004 - 0.011	0.011 - 0.021
	Hardened materials up to 64 HRc		100Cr6	1.2067	0.001 - 0.004	0.001 - 0.005	0.003 - 0.01	0.004 - 0.011	0.011 - 0.021

ATORN Radius milling cutter RockTec 65

- Please adjust these guideline values according to clamping operation and machine set-up!



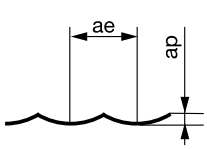


257028....



257036....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	ae Max.	ap Max.	Vc m/min Diameter range		Feed fz in mm/tooth in relation to milling cutter diameter in mm					
							2 - 3 mm	4 - 20 mm	2 - 3	4 - 5	6 - 8	10 - 12	16	20
P	Nitriding steel	950 - 1300	31CrMoV9	1.8519	0.4 x R	0.1 x R	180-270	250 - 370	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	0.4 x R	0.1 x R	180 - 250	250 - 350	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	0.4 x R	0.1 x R	180 - 250	250 - 350	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0.4 x R	0.1 x R	180 - 250	250 - 350	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	0.4 x R	0.1 x R	150 - 210	210-270	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	0.4 x R	0.1 x R	100 - 160	160 - 220	0.025 - 0.035	0.035 - 0.05	0.045 - 0.07	0.075 - 0.12	0.08 - 0.12	0.08 - 0.12
	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	0.4 x R	0.1 x R	100 - 160	160 - 220	0.025 - 0.035	0.035 - 0.05	0.045 - 0.07	0.075 - 0.12	0.08 - 0.12	0.08 - 0.12
	Hardened materials up to 64 HRc		100Cr6	1.2067	0.4 x R	0.1 x R	50 - 75	60 - 80	0.025 - 0.035	0.035 - 0.05	0.045 - 0.08	0.07 - 0.11	0.08 - 0.11	0.08 - 0.11



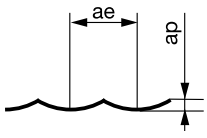


257030....



257038....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	ae Max.	ap Max.	Vc m/min Diameter range		Feed fz in mm/tooth in relation to milling cutter diameter in mm					
							2 - 3 mm	4 - 20 mm	2 - 3	4 - 5	6 - 8	10 - 12	16	20
P	Nitriding steel	950 - 1300	31CrMoV9	1.8519	0.4 x R	0.1 x R	130 - 250	200 - 320	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	0.4 x R	0.1 x R	130 - 230	200 - 300	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	0.4 x R	0.1 x R	130 - 230	200 - 300	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0.4 x R	0.1 x R	130 - 230	200 - 300	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	0.4 x R	0.1 x R	120 - 200	160 - 260	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	0.4 x R	0.1 x R	100 - 150	130 - 200	0.025 - 0.035	0.035 - 0.05	0.045 - 0.07	0.075 - 0.12	0.08 - 0.12	0.08 - 0.12
	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	0.4 x R	0.1 x R	100 - 150	130 - 200	0.025 - 0.035	0.035 - 0.05	0.045 - 0.07	0.075 - 0.12	0.08 - 0.12	0.08 - 0.12
	Hardened materials up to 64 HRc		100Cr6	1.2067	0.4 x R	0.1 x R	40 - 60	45 - 65	0.025 - 0.035	0.035 - 0.05	0.045 - 0.08	0.07 - 0.11	0.08 - 0.11	0.08 - 0.11





257032....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	ae Max.	ap Max.	Vc m/min Diameter range		Feed fz in mm/tooth in relation to milling cutter diameter in mm					
							2 - 3 mm	4 - 20 mm	2 - 3	4 - 5	6 - 8	10 - 12	16	20
P	Nitriding steel	950 - 1300	31CrMoV9	1.8519	0.4 x R	0.1 x R	80 - 140	130 - 190	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	0.4 x R	0.1 x R	80 - 140	130 - 190	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	0.4 x R	0.1 x R	80 - 140	130 - 190	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0.4 x R	0.1 x R	80 - 140	130 - 190	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	0.4 x R	0.1 x R	70 - 130	120-180	0.03 - 0.04	0.04 - 0.055	0.05 - 0.08	0.08 - 0.12	0.09 - 0.12	0.09 - 0.12
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	0.4 x R	0.1 x R	60 - 110	90 - 130	0.025 - 0.035	0.035 - 0.05	0.045 - 0.07	0.075 - 0.12	0.08 - 0.12	0.08 - 0.12
	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	0.4 x R	0.1 x R	60 - 110	90 - 130	0.025 - 0.035	0.035 - 0.05	0.045 - 0.07	0.075 - 0.12	0.08 - 0.12	0.08 - 0.12
	Hardened materials up to 64 HRc		100Cr6	1.2067	0.4 x R	0.1 x R	25 - 40	30 - 45	0.025 - 0.035	0.035 - 0.05	0.045 - 0.08	0.07 - 0.11	0.08 - 0.11	0.08 - 0.11

SARA® Quadrant milling cutter



291310....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in relation to diameter D1 in mm with ae 0.05 x D and ap 1.5 x D				
						8	10	12	16	20 - 25
P	Machining steel	Up to 700	9 SMn 28	1.0715	60 - 95	0.03 - 0.05	0.04 - 0.06	0.05 - 0.07	0.05 - 0.08	0.06 - 0.09
P	Unalloyed structural steel	Up to 700	St-52	1.0052	70 - 100	0.03 - 0.05	0.04 - 0.06	0.05 - 0.07	0.05 - 0.08	0.06 - 0.09
P	Structural steel	700 - 950	Ck45	1.1191	60 - 100	0.04 - 0.05	0.05 - 0.06	0.06 - 0.07	0.07 - 0.08	0.08 - 0.09
P	Cast steel	Up to 950	GS 40	1.0416	60 - 95	0.02 - 0.03	0.03 - 0.04	0.04 - 0.05	0.04 - 0.05	0.05 - 0.06
P	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	60 - 95	0.02 - 0.03	0.03 - 0.04	0.04 - 0.05	0.04 - 0.05	0.05 - 0.06
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	35 - 60	0.02 - 0.03	0.03 - 0.04	0.04 - 0.05	0.04 - 0.05	0.05 - 0.06
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	35 - 70	0.02 - 0.03	0.03 - 0.04	0.04 - 0.05	0.04 - 0.05	0.05 - 0.06
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	25 - 60	0.02 - 0.03	0.03 - 0.04	0.04 - 0.05	0.04 - 0.05	0.05 - 0.06
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	70 - 95	0.02 - 0.03	0.03 - 0.04	0.04 - 0.05	0.04 - 0.05	0.05 - 0.06
K	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	60 - 85	0.02 - 0.03	0.03 - 0.04	0.04 - 0.05	0.04 - 0.05	0.05 - 0.06
K	Ductile iron	Up to 280 HB	GGG 60	0.7060	60 - 80	0.02 - 0.03	0.03 - 0.04	0.04 - 0.05	0.04 - 0.05	0.05 - 0.06
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	60 - 80	0.02 - 0.03	0.03 - 0.04	0.04 - 0.05	0.04 - 0.05	0.05 - 0.06
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	140 - 500	0.02 - 0.04	0.03 - 0.05	0.04 - 0.06	0.04 - 0.07	0.05 - 0.08
N	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	140 - 500	0.02 - 0.04	0.03 - 0.05	0.04 - 0.06	0.04 - 0.07	0.05 - 0.08
N	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	85 - 180	0.01 - 0.015	0.01 - 0.02	0.02 - 0.03	0.02 - 0.03	0.03 - 0.04
N	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	95 - 190	0.01 - 0.015	0.01 - 0.02	0.02 - 0.03	0.02 - 0.03	0.03 - 0.04
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	10 - 30	0.01 - 0.015	0.01 - 0.02	0.02 - 0.03	0.02 - 0.03	0.03 - 0.04
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	65 - 90	0.02 - 0.04	0.03 - 0.05	0.04 - 0.06	0.04 - 0.07	0.05 - 0.08
H	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	65 - 90	0.02 - 0.04	0.03 - 0.05	0.04 - 0.06	0.04 - 0.07	0.05 - 0.08

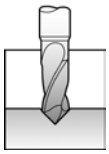
SARA® Multifunction tool



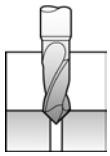
251541....

251546....
251549....

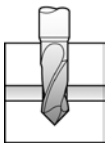
- Please adjust these guideline values according to clamping operation and machine set-up!



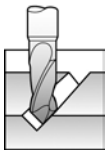
Boring
90°, 120 °



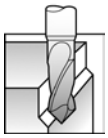
Countersinking
60°, 90°, 120 °



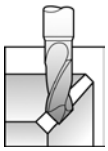
Drilling
90°, 120 °



V-slot milling
60°, 90°, 120 °



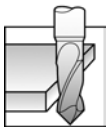
Combi-milling
60°, 90°, 120 °



Chamfer milling
60°, 90°, 120 °



Circular cutting
60°, 90°, 120 °



Side milling
60°, 90°, 120 °

ISO	Materials group	Strength/ Hardness N/mm²	Cutting speed Vc m/min	Feed fz in mm/tooth																	
				Boring / Drilling / Countersinking						V-slot milling						Combi-milling / Chamfer milling / Circular cutting / Side milling					
				Ø 3 - 4	Ø 5 - 6	Ø 8 - 10	Ø 12	Ø 16	Ø 20	Ø 3 - 4	Ø 5 - 6	Ø 8 - 10	Ø 12	Ø 16	Ø 20	Ø 3 - 4	Ø 5 - 6	Ø 8 - 10	Ø 12	Ø 16	Ø 20
P	Steel	Up to 500	70 - 75	0.05	0.08	0.14	0.19	0.24	0.28	0.005	0.008	0.014	0.019	0.025	0.03	0.008	0.014	0.025	0.04	0.052	0.065
P	Steel	500 - 800	40 - 60	0.05	0.08	0.14	0.2	0.25	0.28	0.005	0.008	0.014	0.019	0.025	0.03	0.008	0.013	0.025	0.04	0.052	0.062
P	Steel	800 - 1,000	35 - 40	0.045	0.07	0.12	0.18	0.22	0.28	0.004	0.006	0.012	0.017	0.02	0.027	0.008	0.013	0.025	0.04	0.05	0.062
P	Steel	1,000 - 1,300	30 - 35	0.045	0.07	0.12	0.17	0.22	0.26	0.004	0.006	0.012	0.016	0.02	0.027	0.008	0.013	0.025	0.036	0.05	0.06
M	Stainless steel		30 - 35	0.045	0.07	0.12	0.17	0.22	0.26	0.004	0.006	0.012	0.016	0.02	0.027	0.008	0.013	0.025	0.036	0.045	0.07
K	Grey cast iron up to 180 HB		35 - 40	0.045	0.07	0.12	0.18	0.22	0.28	0.004	0.006	0.012	0.017	0.02	0.027	0.008	0.013	0.025	0.04	0.05	0.062
K	Grey cast iron over 180 HB		30 - 35	0.045	0.07	0.12	0.17	0.22	0.26	0.004	0.006	0.012	0.016	0.02	0.027	0.008	0.013	0.025	0.04	0.05	0.06
N	Aluminium		150	0.05	0.09	0.15	0.2	0.27	0.35	0.008	0.013	0.023	0.03	0.042	0.05	0.008	0.013	0.03	0.045	0.05	0.065
N	Copper alloys		50-120	0.1	0.15	0.25	0.3	0.35	0.45	0.008	0.01	0.017	0.02	0.03	0.04	0.01	0.015	0.03	0.045	0.05	0.065
N	Plastics		150	0.05	0.09	0.19	0.2	0.27	0.35	0.01	0.015	0.025	0.033	0.045	0.056	0.012	0.015	0.035	0.05	0.053	0.07
S	Special alloys		20	0.04	0.06	0.11	0.16	0.2	0.25	0.003	0.005	0.01	0.013	0.018	0.025	0.007	0.011	0.025	0.035	0.050	0.06
S	Titanium		25-30	0.04	0.06	0.11	0.16	0.2	0.25	0.004	0.006	0.01	0.013	0.018	0.027	0.008	0.013	0.025	0.036	0.045	0.07

ATORN Solid carbide milling cutter



- Please adjust these guideline values according to clamping operation and machine set-up!

254157.... **254158....**

ISO	Side / Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	3 fz mm/tooth	3 ap max mm	3 ae max mm	4 fz mm/tooth	4 ap max mm	4 ae max mm	5 fz mm/tooth	5 ap max mm	5 ae max mm
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	115-165	0.015-0.03	< 9.00	< 0.450	0.025-0.050	< 12.00	< 0.600	0.03-0.06	< 15.00	< 0.750
M	Stainless steel, sulphurised	500 - 950	X 12 CrMoS 17	1.4104	115-165	0.015-0.03	< 9.00	< 0.450	0.025-0.050	< 12.00	< 0.600	0.03-0.06	< 15.00	< 0.750
M	Stainless steel, martensitic	500 - 950	X 10 Cr 13	1.4006	85-125	0.015-0.03	< 9.00	< 0.450	0.025-0.050	< 12.00	< 0.600	0.03-0.06	< 15.00	< 0.750
S	Nickel-based alloy	Up to 950	NiCr12Al6MoNb	2.4670	45-65	0.015-0.03	< 9.00	< 0.450	0.025-0.050	< 12.00	< 0.600	0.03-0.06	< 15.00	< 0.750
S	Nickel-based alloy	900 - 1400	NiCr19Fe19NbMo	Inconel 718	45-65	0.015-0.03	< 9.00	< 0.450	0.025-0.050	< 12.00	< 0.600	0.03-0.06	< 15.00	< 0.750

ISO	Side / Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	6 fz mm/tooth	6 ap max mm	6 ae max mm	8 fz mm/tooth	8 ap max mm	8 ae max mm	10 fz mm/tooth	10 ap max mm	10 ae max mm
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	115-165	0.040-0.07	< 18.00	< 0.900	0.050-0.085	< 24.00	< 1.200	0.06-0.1	< 30.00	< 1.500
M	Stainless steel, sulphurised	500 - 950	X 12 CrMoS 17	1.4104	115-165	0.040-0.07	< 18.00	< 0.900	0.050-0.085	< 24.00	< 1.200	0.06-0.1	< 30.00	< 1.500
M	Stainless steel, martensitic	500 - 950	X 10 Cr 13	1.4006	85-125	0.040-0.07	< 18.00	< 0.900	0.050-0.085	< 24.00	< 1.200	0.06-0.1	< 30.00	< 1.500
S	Nickel-based alloy	Up to 950	NiCr12Al6MoNb	2.4670	45-65	0.040-0.07	< 18.00	< 0.900	0.050-0.085	< 24.00	< 1.200	0.06-0.1	< 30.00	< 1.500
S	Nickel-based alloy	900 - 1400	NiCr19Fe19NbMo	Inconel 718	45-65	0.040-0.07	< 18.00	< 0.900	0.050-0.085	< 24.00	< 1.200	0.06-0.1	< 30.00	< 1.500

ISO	Side / Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	12 fz mm/tooth	12 ap max mm	12 ae max mm	16 fz mm/tooth	16 ap max mm	16 ae max mm	20 fz mm/tooth	20 ap max mm	20 ae max mm
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	115-165	0.085-0.12	< 36.00	< 1.800	0.1-0.145	< 40.00	< 2.400	0.125-0.175	< 50.00	< 3.000
M	Stainless steel, sulphurised	500 - 950	X 12 CrMoS 17	1.4104	115-165	0.085-0.12	< 36.00	< 1.800	0.1-0.145	< 40.00	< 2.400	0.125-0.175	< 50.00	< 3.000
M	Stainless steel, martensitic	500 - 950	X 10 Cr 13	1.4006	85-125	0.085-0.12	< 36.00	< 1.800	0.1-0.145	< 40.00	< 2.400	0.125-0.175	< 50.00	< 3.000
S	Nickel-based alloy	Up to 950	NiCr12Al6MoNb	2.4670	45-65	0.085-0.12	< 36.00	< 1.800	0.1-0.145	< 40.00	< 2.400	0.125-0.175	< 50.00	< 3.000
S	Nickel-based alloy	900 - 1400	NiCr19Fe19NbMo	Inconel 718	45-65	0.085-0.12	< 36.00	< 1.800	0.1-0.145	< 40.00	< 2.400	0.125-0.175	< 50.00	< 3.000

ATORN Solid carbide milling cutter



- Please adjust these guideline values according to clamping operation and machine set-up!

254153....

ISO	Side / Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	3 fz mm/tooth	3 ap max mm	3 ae max mm	4 fz mm/tooth	4 ap max mm	4 ae max mm	5 fz mm/tooth	5 ap max mm	5 ae max mm
S	Titanium alloy	Up to 950	TiAl6V4	3.7165	80-120	0.015-0.03	< 9.00	< 0.360	0.025-0.050	< 12.00	< 0.480	0.03-0.06	< 15.00	< 0.600
S	Titanium alloy	900 - 1400	TiAl6Sn 2	3.7174	80-120	0.015-0.03	< 9.00	< 0.360	0.025-0.050	< 12.00	< 0.480	0.03-0.06	< 15.00	< 0.600

ISO	Side / Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	6 fz mm/tooth	6 ap max mm	6 ae max mm	8 fz mm/tooth	8 ap max mm	8 ae max mm	10 fz mm/tooth	10 ap max mm	10 ae max mm
S	Titanium alloy	Up to 950	TiAl6V4	3.7165	80-120	0.040-0.07	< 18.00	< 0.720	0.050-0.085	< 24.00	< 0.960	0.06-0.1	< 30.00	< 1.200
S	Titanium alloy	900 - 1400	TiAl6Sn 2	3.7174	80-120	0.040-0.07	< 18.00	< 0.720	0.050-0.085	< 24.00	< 0.960	0.06-0.1	< 30.00	< 1.200

ISO	Side / Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	12 fz mm/tooth	12 ap max mm	12 ae max mm	16 fz mm/tooth	16 ap max mm	16 ae max mm	20 fz mm/tooth	20 ap max mm	20 ae max mm
S	Titanium alloy	Up to 950	TiAl6V4	3.7165	80-120	0.085-0.12	< 36.00	< 1.440	0.1-0.145	< 40.00	< 1.920	0.125-0.175	< 50.00	< 2.400
S	Titanium alloy	900 - 1400	TiAl6Sn 2	3.7174	80-120	0.085-0.12	< 36.00	< 1.440	0.1-0.145	< 40.00	< 1.920	0.125-0.175	< 50.00	< 2.400

ATORN Solid carbide milling cutter



- Please adjust these guideline values according to clamping operation and machine set-up!

254154....

ISO	Side / Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	2.5			3			4		
						fz mm/tooth	ap max mm	ae max mm	fz mm/tooth	ap max mm	ae max mm	fz mm/tooth	ap max mm	ae max mm
H	Hardened steel	45-50 HRc			100-150	0.015-0.025	< 4.0	< 0.125	0.02-0.035	< 5.0	< 0.150	0.03-0.045	< 11.0	< 0.200
H	Hardened steel	50-60 HRc			110-170	0.015-0.025	< 4.0	< 0.125	0.02-0.035	< 5.0	< 0.150	0.03-0.045	< 11.0	< 0.200

ISO	Side / Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	5			6			8		
						fz mm/tooth	ap max mm	ae max mm	fz mm/tooth	ap max mm	ae max mm	fz mm/tooth	ap max mm	ae max mm
H	Hardened steel	45-50 HRc			100-150	0.035-0.055	< 13.0	< 0.250	0.045-0.065	< 13.0	< 0.300	0.06-0.080	< 20.0	< 0.400
H	Hardened steel	50-60 HRc			110-170	0.035-0.055	< 13.0	< 0.250	0.045-0.065	< 13.0	< 0.300	0.06-0.080	< 20.0	< 0.400

ISO	Side / Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	10			12			14		
						fz mm/tooth	ap max mm	ae max mm	fz mm/tooth	ap max mm	ae max mm	fz mm/tooth	ap max mm	ae max mm
H	Hardened steel	45-50 HRc			100-150	0.07-0.095	< 22.0	< 0.500	0.085-0.110	< 26.0	< 0.600	0.09-0.115	< 26.0	< 0.700
H	Hardened steel	50-60 HRc			110-170	0.07-0.095	< 22.0	< 0.500	0.085-0.110	< 26.0	< 0.600	0.09-0.115	< 26.0	< 0.700

ISO	Side / Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	16			18			20		
						fz mm/tooth	ap max mm	ae max mm	fz mm/tooth	ap max mm	ae max mm	fz mm/tooth	ap max mm	ae max mm
H	Hardened steel	45-50 HRc			100-150	0.095-0.125	< 34.0	< 0.800	0.1-0.13	< 34.0	< 0.900	0.105-0.140	< 41.0	< 1.000
H	Hardened steel	50-60 HRc			110-170	0.095-0.125	< 34.0	< 0.800	0.1-0.13	< 34.0	< 0.900	0.105-0.140	< 41.0	< 1.000

palbit PKD end milling cutter

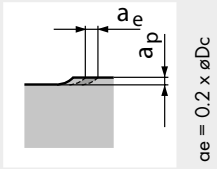
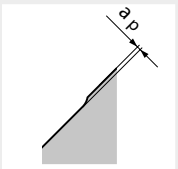


- Please adjust these guideline values according to clamping operation and machine set-up.

253025.... 253026....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	cutting speed Vc m/min		Feed fz (mm/Z)		Cutting fluid
					min.	Max.	min.	Max.	
N	Al. alloys, long-chipping	up to 500	AlMg 3	3.3535	200	6000	0.05	0.30	Emulsion / MMS
N	Al. alloys, short-chipping	up to 500	G-AlSi 12	3.2581	200	4000	0.05	0.25	Emulsion / MMS
N	Copper alloy (bronze), long-chipping	up to 1200	CuSn4	2.1016	250	3000	0.03	0.30	Emulsion / MMS
N	Graphite		C8000		150	2500	0.05	0.40	Dry / air
N	Fibre-reinforced plastics		CFRP, GFRP		200	3000	0.05	0.40	Dry / air
N	Thermoplastic		PVC		100	1200	0.01	0.25	Emulsion / MMS
N	Thermoset		Melamine		100	2500	0.05	0.30	Emulsion / MMS

Materials group	Correction factor	Vc (m/min)
Aluminium casting alloys 5%< Si ≤12%	1.6	790-1000
Aluminium casting alloys 12%< Si	1.5	790-1000
Fibreglass-reinforced synthetic materials	1.0	400-500
Graphite	1.0	700-850

ØD mm	 ap = 0.1 x øDc	 ap = 0.05 x øDc
	fz (mm/Z)	fz (mm/Z)
3	0.020	0.022
4	0.025	0.028
6	0.035	0.040
8	0.050	0.055
10	0.060	0.070
12	0.075	0.078

ATORN Solid carbide milling cutter



- Please adjust these guideline values according to clamping operation and machine set-up!

254155....

ISO	Side / Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	3			4			5		
						fz mm/tooth	ap max mm	ae max mm	fz mm/tooth	ap max mm	ae max mm	fz mm/tooth	ap max mm	ae max mm
P	Unalloyed structural steel	Up to 700	St-52	1.0052	240-300	0.015-0.035	< 9.00	< 0.600	0.025-0.050	< 12.00	< 0.800	0.03-0.06	< 15.00	< 1.000
P	Machining steel	Up to 700	9 SMn 28	1.0715	240-300	0.015-0.035	< 9.00	< 0.600	0.025-0.050	< 12.00	< 0.800	0.03-0.06	< 15.00	< 1.000
P	Unalloyed tempered steel	500 - 950	Ck45	1.1191	160-240	0.015-0.035	< 9.00	< 0.600	0.025-0.050	< 12.00	< 0.800	0.03-0.06	< 15.00	< 1.000
P	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	160-240	0.015-0.035	< 9.00	< 0.600	0.025-0.050	< 12.00	< 0.800	0.03-0.06	< 15.00	< 1.000
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	130-200	0.015-0.035	< 9.00	< 0.600	0.025-0.050	< 12.00	< 0.800	0.03-0.06	< 15.00	< 1.000
P	Cast steel	Up to 950	GS 40	1.0416	130-200	0.015-0.035	< 9.00	< 0.600	0.025-0.050	< 12.00	< 0.800	0.03-0.06	< 15.00	< 1.000
K	Alloyed grey cast iron	150-250	GGL-NiCr 35 2	0.6678	125-225	0.015-0.035	< 9.00	< 0.600	0.025-0.050	< 12.00	< 0.800	0.03-0.06	< 15.00	< 1.000

ISO	Side / Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	6			8			10		
						fz mm/tooth	ap max mm	ae max mm	fz mm/tooth	ap max mm	ae max mm	fz mm/tooth	ap max mm	ae max mm
P	Unalloyed structural steel	Up to 700	St-52	1.0052	240-300	0.040-0.07	< 18.00	< 1.200	0.050-0.085	< 24.00	< 1.600	0.06-0.1	< 30.00	< 2.000
P	Machining steel	Up to 700	9 SMn 28	1.0715	240-300	0.040-0.07	< 18.00	< 1.200	0.050-0.085	< 24.00	< 1.600	0.06-0.1	< 30.00	< 2.000
P	Unalloyed tempered steel	500 - 950	Ck45	1.1191	160-240	0.040-0.07	< 18.00	< 1.200	0.050-0.085	< 24.00	< 1.600	0.06-0.1	< 30.00	< 2.000
P	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	160-240	0.040-0.07	< 18.00	< 1.200	0.050-0.085	< 24.00	< 1.600	0.06-0.1	< 30.00	< 2.000
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	130-200	0.040-0.07	< 18.00	< 1.200	0.050-0.085	< 24.00	< 1.600	0.06-0.1	< 30.00	< 2.000
P	Cast steel	Up to 950	GS 40	1.0416	130-200	0.040-0.07	< 18.00	< 1.200	0.050-0.085	< 24.00	< 1.600	0.06-0.1	< 30.00	< 2.000
K	Alloyed grey cast iron	150-250	GGL-NiCr 35 2	0.6678	125-225	0.040-0.07	< 18.00	< 1.200	0.050-0.085	< 24.00	< 1.600	0.06-0.1	< 30.00	< 2.000

ISO	Side / Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	12			16			20		
						fz mm/tooth	ap max mm	ae max mm	fz mm/tooth	ap max mm	ae max mm	fz mm/tooth	ap max mm	ae max mm
P	Unalloyed structural steel	Up to 700	St-52	1.0052	240-300	0.085-0.12	< 36.00	< 2.400	0.1-0.145	< 40.00	< 3.200	0.125-0.175	< 50.00	< 4.000
P	Machining steel	Up to 700	9 SMn 28	1.0715	240-300	0.085-0.12	< 36.00	< 2.400	0.1-0.145	< 40.00	< 3.200	0.125-0.175	< 50.00	< 4.000
P	Unalloyed tempered steel	500 - 950	Ck45	1.1191	160-240	0.085-0.12	< 36.00	< 2.400	0.1-0.145	< 40.00	< 3.200	0.125-0.175	< 50.00	< 4.000
P	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	160-240	0.085-0.12	< 36.00	< 2.400	0.1-0.145	< 40.00	< 3.200	0.125-0.175	< 50.00	< 4.000
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	130-200	0.085-0.12	< 36.00	< 2.400	0.1-0.145	< 40.00	< 3.200	0.125-0.175	< 50.00	< 4.000
P	Cast steel	Up to 950	GS 40	1.0416	130-200	0.085-0.12	< 36.00	< 2.400	0.1-0.145	< 40.00	< 3.200	0.125-0.175	< 50.00	< 4.000
K	Alloyed grey cast iron	150-250	GGL-NiCr 35 2	0.6678	125-225	0.085-0.12	< 36.00	< 2.400	0.1-0.145	< 40.00	< 3.200	0.125-0.175	< 50.00	< 4.000

ATORN Solid carbide milling cutter



- Please adjust these guideline values according to clamping operation and machine set-up!

254159....

ISO	Side / Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	3			4			5		
						fz mm/tooth	ap max mm	ae max mm	fz mm/tooth	ap max mm	ae max mm	fz mm/tooth	ap max mm	ae max mm
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	400-800	0.025-0.055	< 10.0	< 0.900	0.03-0.065	< 13.0	< 1.200	0.040-0.080	< 16.0	< 1.500
N	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	250-600	0.025-0.055	< 10.0	< 0.900	0.03-0.065	< 13.0	< 1.200	0.040-0.080	< 16.0	< 1.500
N	Copper alloy long-chipping	300 - 700	MS 63	2.0320	400-625	0.025-0.055	< 10.0	< 0.900	0.03-0.065	< 13.0	< 1.200	0.040-0.080	< 16.0	< 1.500
N	Copper alloy short-chipping	Up to 500	MS 58	2.0402	400-625	0.025-0.055	< 10.0	< 0.900	0.03-0.065	< 13.0	< 1.200	0.040-0.080	< 16.0	< 1.500

ISO	Side / Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	6			8			10		
						fz mm/tooth	ap max mm	ae max mm	fz mm/tooth	ap max mm	ae max mm	fz mm/tooth	ap max mm	ae max mm
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	400-800	0.055-0.1	< 18.0	< 1.800	0.080-0.12	< 22.0	< 2.400	0.095-0.140	< 25.0	< 3.000
N	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	250-600	0.055-0.1	< 18.0	< 1.800	0.080-0.12	< 22.0	< 2.400	0.095-0.140	< 25.0	< 3.000
N	Copper alloy long-chipping	300 - 700	MS 63	2.0320	400-625	0.055-0.1	< 18.0	< 1.800	0.080-0.12	< 22.0	< 2.400	0.095-0.140	< 25.0	< 3.000
N	Copper alloy short-chipping	Up to 500	MS 58	2.0402	400-625	0.055-0.1	< 18.0	< 1.800	0.080-0.12	< 22.0	< 2.400	0.095-0.140	< 25.0	< 3.000

ISO	Side / Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	12			14			16		
						fz mm/tooth	ap max mm	ae max mm	fz mm/tooth	ap max mm	ae max mm	fz mm/tooth	ap max mm	ae max mm
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	400-800	0.105-0.175	< 28.0	< 3.600	0.12-0.185	< 30.0	< 4.200	0.140-0.200	< 36.0	< 4.800
N	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	250-600	0.105-0.175	< 28.0	< 3.600	0.12-0.185	< 30.0	< 4.200	0.140-0.200	< 36.0	< 4.800
N	Copper alloy long-chipping	300 - 700	MS 63	2.0320	400-625	0.105-0.175	< 28.0	< 3.600	0.12-0.185	< 30.0	< 4.200	0.140-0.200	< 36.0	< 4.800
N	Copper alloy short-chipping	Up to 500	MS 58	2.0402	400-625	0.105-0.175	< 28.0	< 3.600	0.12-0.185	< 30.0	< 4.200	0.140-0.200	< 36.0	< 4.800

ISO	Side / Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	18			20			25		
						fz mm/tooth	ap max mm	ae max mm	fz mm/tooth	ap max mm	ae max mm	fz mm/tooth	ap max mm	ae max mm
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	400-800	0.160-0.255	< 36.0	< 5.400	0.180-0.250	< 42.0	< 6.000	0.220-0.300	< 45.0	< 7.500
N	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	250-600	0.160-0.255	< 36.0	< 5.400	0.180-0.250	< 42.0	< 6.000	0.220-0.300	< 45.0	< 7.500
N	Copper alloy long-chipping	300 - 700	MS 63	2.0320	400-625	0.160-0.255	< 36.0	< 5.400	0.180-0.250	< 42.0	< 6.000	0.220-0.300	< 45.0	< 7.500
N	Copper alloy short-chipping	Up to 500	MS 58	2.0402	400-625	0.160-0.255	< 36.0	< 5.400	0.180-0.250	< 42.0	< 6.000	0.220-0.300	< 45.0	< 7.500

ATORN Circle segment milling cutter



- Please adjust these guideline values according to clamping operation and machine set-up!

254170.... 254172 ....

ISO	**copy / Finishing** fz for ap = 0,05 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm		
	Materials group					8	12	16
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	600	0,064	0,096	0,130
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	550	0,064	0,096	0,130
	Thermoplastic		PVC		400	0,064	0,096	0,130

ATORN Circle segment milling cutter



- Please adjust these guideline values according to clamping operation and machine set-up!

254171.... 254173 ....

ISO	**Roughing / Grooving** fz for ap = 0,05 x D	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm		
	Materials group					8	12	16
P	Machining steel	Up to 700	9 SMn 28	1.0715	190	0,064	0,096	0,130
	Unalloyed structural steel	Up to 700	St-52	1.0052	190	0,064	0,096	0,130
	Structural steel	700 - 950	Ck45	1.1191	180	0,056	0,084	0,110
	Tempering steel	500 - 950	42 CrMo4	1.7225	180	0,056	0,084	0,110
	Cast steel	Up to 950	GS 40	1.0416	180	0,056	0,084	0,110
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	150	0,048	0,072	0,096
	Tempering steel	950 -1300	43CrMo4	1.3563	150	0,048	0,072	0,096
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	130	0,040	0,060	0,080
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	130	0,040	0,060	0,080
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	80	0,032	0,048	0,064
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	100	0,048	0,072	0,096
	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	80	0,032	0,048	0,064
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	180	0,056	0,084	0,110
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	120	0,048	0,072	0,096
	Ductile iron	Up to 280 HB	GGG 60	0.7060	135	0,048	0,072	0,096
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	135	0,048	0,072	0,096
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	600	0,064	0,096	0,130
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	550	0,064	0,096	0,130
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	180	0,056	0,084	0,110
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	180	0,056	0,084	0,110
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	170	0,056	0,084	0,110
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	170	0,056	0,084	0,110
	Thermoplastic		PVC		400	0,064	0,096	0,130
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	120	0,032	0,048	0,064

ATORN Ceramics milling cutter



- Please adjust these guideline values according to clamping operation and machine set-up!

255153 ....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	6			8			10		
						fz mm/Zahn	ap max mm	ae max mm	fz mm/Zahn	ap max mm	ae max mm	fz mm/Zahn	ap max mm	ae max mm
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	550	0,100	0,180	3,600	0,130	0,240	4,800	0,150	0,300	6,000

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	12			16			20		
						fz mm/Zahn	ap max mm	ae max mm	fz mm/Zahn	ap max mm	ae max mm	fz mm/Zahn	ap max mm	ae max mm
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	550	0,180	0,350	7,000	0,220	0,500	10,000	0,260	0,600	12,000

ATORN Sealing surface milling cutter



- Please adjust these guideline values according to clamping operation and machine set-up!

255151 .... 255152....

ISO	**Roughing / Grooving** fz for ae = 1,0 x D and ap = 0,05 mm max	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
						4	5	6	8	10	12	16	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Unalloyed structural steel	Up to 700	St-52	1.0052	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Structural steel	700 - 950	Ck45	1.1191	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Tempering steel	500 - 950	42 CrMo4	1.7225	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Cast steel	Up to 950	GS 40	1.0416	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Tempering steel	950 -1300	43CrMo4	1.3563	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Ductile iron	Up to 280 HB	GGG 60	0.7060	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Thermoplastic		PVC		3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Thermoset		Melamine		3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Fibre-reinforced plastics		CFRP, GFRP		3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Graphite		C8000		3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	fibre-reinforced plastics		Honeycomp		3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040

ISO	**Finishing / Edge-banding** fz for ae = 1,0 x D and ap = 0,01 mm max	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm							
						4	5	6	8	10	12	16	20
P	Machining steel	Up to 700	9 SMn 28	1.0715	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Unalloyed structural steel	Up to 700	St-52	1.0052	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Structural steel	700 - 950	Ck45	1.1191	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Tempering steel	500 - 950	42 CrMo4	1.7225	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Cast steel	Up to 950	GS 40	1.0416	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Tempering steel	950 -1300	43CrMo4	1.3563	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Ductile iron	Up to 280 HB	GGG 60	0.7060	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Thermoplastic		PVC		3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Thermoset		Melamin		3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Fibre-reinforced plastics		CFK, GFK		3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Graphite		C8000		3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	fibre-reinforced plastics		Honeycomp		3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040
	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	3000	0,010	0,015	0,018	0,020	0,025	0,030	0,035	0,040

ATORN Cutting data recommendations RockTec PRO Multi-flute milling cutter

- Please adjust these guideline values according to clamping operation and machine set-up!



257170.... 257175.... 257180....

Art.no.	Description	ATORN-no.	Ø	Cutting speed Vc			Feed fz Finishing/ Roughing	ae = 0,05 x D			
								ap			
				<1400 N/mm	1400 N/mm up to 52 HRc	52 HRc up to 65 HRc		Edge-banding	Copy	Edge-banding	Copy
								< 55 HRc	< 55 HRc	> 55 HRc	> 55 HRc
			mm	m/min (depending on max. speed)			mm / Z	mm	mm	mm	mm
2571700030	Multi-flute milling cutter Solid carbide 50° 3 mm, Z = 4 short	11264054	3	100 - 180	90 - 140	80 - 120	0,020 - 0,028	4	-	4	-
2571700040	Multi-flute milling cutter Solid carbide 50° 4 mm, Z = 6 short	11264055	4	100 - 180	90 - 140	80 - 120	0,030 - 0,045	5	-	5	-
2571700050	Multi-flute milling cutter Solid carbide 50° 5 mm, Z = 6 short	11264056	5	100 - 180	90 - 140	80 - 120	0,035 - 0,050	6	-	6	-
2571700060	Multi-flute milling cutter Solid carbide 50° 6 mm, Z = 6 short	11264057	6	100 - 180	90 - 140	80 - 120	0,040 - 0,055	7	-	7	-
2571700080	Multi-flute milling cutter Solid carbide 50° 8 mm, Z = 6 short	11264058	8	100 - 180	90 - 140	80 - 120	0,050 - 0,065	9	-	9	-
2571700100	Multi-flute milling cutter Solid carbide 50° 10 mm, Z = 6 short	11264059	10	100 - 180	90 - 140	80 - 120	0,055 - 0,080	11	-	11	-
2571700120	Multi-flute milling cutter Solid carbide 50° 12 mm, Z = 6 short	11264060	12	100 - 180	90 - 140	80 - 120	0,065 - 0,090	12	-	12	-
2571700160	Multi-flute milling cutter Solid carbide 50° 16 mm, Z = 8 short	11264061	16	100 - 180	90 - 140	80 - 120	0,075 - 0,110	16	-	16	-
2571700200	Multi-flute milling cutter Solid carbide 50° 20 mm, Z = 10 short	11264062	20	100 - 180	90 - 140	80 - 120	0,085 - 0,150	20	-	20	-
2571750030	Multi-flute milling cutter Solid carbide 50° 3 mm, Z = 6	11264063	3	100 - 180	90 - 140	80 - 120	0,020 - 0,028	9	-	9	-
2571750040	Multi-flute milling cutter Solid carbide 50° 4 mm, Z = 6	11264064	4	100 - 180	90 - 140	80 - 120	0,030 - 0,045	11	-	11	-
2571750050	Multi-flute milling cutter Solid carbide 50° 5 mm, Z = 6	11264065	5	100 - 180	90 - 140	80 - 120	0,035 - 0,050	13	-	13	-
2571750060	Multi-flute milling cutter Solid carbide 50° 6 mm, Z = 6	11264066	6	100 - 180	90 - 140	80 - 120	0,040 - 0,055	15	-	15	-
2571750080	Multi-flute milling cutter Solid carbide 50° 8 mm, Z = 6	11264067	8	100 - 180	90 - 140	80 - 120	0,050 - 0,065	19	-	19	-
2571750100	Multi-flute milling cutter Solid carbide 50° 10 mm, Z = 6	11264068	10	100 - 180	90 - 140	80 - 120	0,055 - 0,080	24	-	24	-
2571750120	Multi-flute milling cutter Solid carbide 50° 12 mm, Z = 6	11264069	12	100 - 180	90 - 140	80 - 120	0,065 - 0,090	28	-	28	-
2571750160	Multi-flute milling cutter Solid carbide 50° 16 mm, Z = 8	11264070	16	100 - 180	90 - 140	80 - 120	0,075 - 0,110	36	-	36	-
2571750200	Multi-flute milling cutter Solid carbide 50° 20 mm, Z = 10	11264071	20	100 - 180	90 - 140	80 - 120	0,085 - 0,150	44	-	44	-
2571800030	Multi-flute milling cutter Solid carbide 50° 3 mm, Z = 6 long	11264072	3	100 - 180	90 - 140	80 - 120	0,020 - 0,028	9	-	9	-
2571800040	Multi-flute milling cutter Solid carbide 50° 4 mm, Z = 6 long	11264073	4	100 - 180	90 - 140	80 - 120	0,030 - 0,045	12	-	12	-
2571800050	Multi-flute milling cutter Solid carbide 50° 5 mm, Z = 6 long	11264074	5	100 - 180	90 - 140	80 - 120	0,035 - 0,050	15	-	15	-
2571800060	Multi-flute milling cutter Solid carbide 50° 6 mm, Z = 6 long	11264075	6	100 - 180	90 - 140	80 - 120	0,040 - 0,055	18	-	18	-
2571800080	Multi-flute milling cutter Solid carbide 50° 8 mm, Z = 6 long	11264076	8	100 - 180	90 - 140	80 - 120	0,050 - 0,065	24	-	24	-
2571800100	Multi-flute milling cutter Solid carbide 50° 10 mm, Z = 6 long	11264077	10	100 - 180	90 - 140	80 - 120	0,055 - 0,080	30	-	30	-
2571800120	Multi-flute milling cutter Solid carbide 50° 12 mm, Z = 6 long	11264078	12	100 - 180	90 - 140	80 - 120	0,065 - 0,090	36	-	36	-
2571800160	Multi-flute milling cutter Solid carbide 50° 16 mm, Z = 8 long	11264079	16	100 - 180	90 - 140	80 - 120	0,075 - 0,110	48	-	48	-
2571800200	Multi-flute milling cutter Solid carbide 50° 20 mm, Z = 10 long	11264080	20	100 - 180	90 - 140	80 - 120	0,085 - 0,150	60	-	60	-





PALBIT
Machining tools
908 pages
Art.no. 019900 0317

Overview of all free manufacturers' catalogues
on page 12/13

ATORN Cutting data recommendations RockTec PRO Multi-flute milling cutter with corner radius

- Please adjust these guideline values according to clamping operation and machine set-up!



257155.... 257160.... 257165....

Art.no.	Description	ATORN-no.	Ø	Cutting speed Vc			Feed fz Finishing/ Roughing	ae = 0,05 x D			
								ap			
				<1400 N/mm	1400 N/mm up to 52 HRc	52 HRc up to 65 HRc		Edge-banding	Copy	Edge-banding	Copy
								< 55 HRc	< 55 HRc	> 55 HRc	> 55 HRc
			mm	m/min (depending on max. speed)			mm / Z	mm	mm	mm	mm
2571550301	Multi-flute milling cutter with corner radius Solid carbide 50° 3 mm, R = 0,1 mm, Z = 6 short	11263970	3	80 - 130	80 - 150	120 - 200	0,020 - 0,028	0,3	0,15	0,075	0,045
2571550305	Multi-flute milling cutter with corner radius Solid carbide 50° 3 mm, R = 0,5 mm, Z = 6 short	11263971	3	80 - 130	80 - 150	120 - 200	0,020 - 0,028	0,3	0,15	0,075	0,045
2571550401	Multi-flute milling cutter with corner radius Solid carbide 50° 4 mm, R = 0,1 mm, Z = 6 short	11263972	4	80 - 130	80 - 150	120 - 200	0,030 - 0,045	0,4	0,2	0,1	0,06
2571550405	Multi-flute milling cutter with corner radius Solid carbide 50° 4 mm, R = 0,5 mm, Z = 6 short	11263973	4	80 - 130	80 - 150	120 - 200	0,030 - 0,045	0,4	0,2	0,1	0,06
2571550410	Multi-flute milling cutter with corner radius Solid carbide 50° 4 mm, R = 1,0 mm, Z = 6 short	11263974	4	80 - 130	80 - 150	120 - 200	0,030 - 0,045	0,4	0,2	0,1	0,06
2571550501	Multi-flute milling cutter with corner radius Solid carbide 50° 5 mm, R = 0,1 mm, Z = 6 short	11263975	5	80 - 130	80 - 150	120 - 200	0,035 - 0,050	0,5	0,25	0,125	0,075
2571550505	Multi-flute milling cutter with corner radius Solid carbide 50° 5 mm, R = 0,5 mm, Z = 6 short	11263976	5	80 - 130	80 - 150	120 - 200	0,035 - 0,050	0,5	0,25	0,125	0,075
2571550510	Multi-flute milling cutter with corner radius Solid carbide 50° 5 mm, R = 1,0 mm, Z = 6 short	11263977	5	80 - 130	80 - 150	120 - 200	0,035 - 0,050	0,5	0,25	0,125	0,075
2571550601	Multi-flute milling cutter with corner radius Solid carbide 50° 6 mm, R = 0,1 mm, Z = 6 short	11263978	6	80 - 130	80 - 150	120 - 200	0,040 - 0,055	0,6	0,3	0,15	0,09
2571550605	Multi-flute milling cutter with corner radius Solid carbide 50° 6 mm, R = 0,5 mm, Z = 6 short	11263979	6	80 - 130	80 - 150	120 - 200	0,040 - 0,055	0,6	0,3	0,15	0,09
2571550608	Multi-flute milling cutter with corner radius Solid carbide 50° 6 mm, R = 0,8 mm, Z = 6 short	11263980	6	80 - 130	80 - 150	120 - 200	0,040 - 0,055	0,6	0,3	0,15	0,09
2571550610	Multi-flute milling cutter with corner radius Solid carbide 50° 6 mm, R = 1,0 mm, Z = 6 short	11263981	6	80 - 130	80 - 150	120 - 200	0,040 - 0,055	0,6	0,3	0,15	0,09
2571550615	Multi-flute milling cutter with corner radius Solid carbide 50° 6 mm, R = 1,5 mm, Z = 6 short	11263982	6	80 - 130	80 - 150	120 - 200	0,040 - 0,055	0,6	0,3	0,15	0,09
2571550801	Multi-flute milling cutter with corner radius Solid carbide 50° 8 mm, R = 0,1 mm, Z = 6 short	11263983	8	80 - 130	80 - 150	120 - 200	0,050 - 0,065	0,8	0,4	0,2	0,12
2571550805	Multi-flute milling cutter with corner radius Solid carbide 50° 8 mm, R = 0,5 mm, Z = 6 short	11263984	8	80 - 130	80 - 150	120 - 200	0,050 - 0,065	0,8	0,4	0,2	0,12
2571550808	Multi-flute milling cutter with corner radius Solid carbide 50° 8 mm, R = 0,8 mm, Z = 6 short	11263985	8	80 - 130	80 - 150	120 - 200	0,050 - 0,065	0,8	0,4	0,2	0,12
2571550810	Multi-flute milling cutter with corner radius Solid carbide 50° 8 mm, R = 1,0 mm, Z = 6 short	11263986	8	80 - 130	80 - 150	120 - 200	0,050 - 0,065	0,8	0,4	0,2	0,12
2571550815	Multi-flute milling cutter with corner radius Solid carbide 50° 8 mm, R = 1,5 mm, Z = 6 short	11263987	8	80 - 130	80 - 150	120 - 200	0,050 - 0,065	0,8	0,4	0,2	0,12
2571550820	Multi-flute milling cutter with corner radius Solid carbide 50° 8 mm, R = 2,0 mm, Z = 6 short	11263988	8	80 - 130	80 - 150	120 - 200	0,050 - 0,065	0,8	0,4	0,2	0,12
2571551001	Multi-flute milling cutter with corner radius Solid carbide 50° 10 mm, R = 0,1 mm, Z = 6 short	11263989	10	80 - 130	80 - 150	120 - 200	0,055 - 0,080	1	0,5	0,25	0,15
2571551005	Multi-flute milling cutter with corner radius Solid carbide 50° 10 mm, R = 0,5 mm, Z = 6 short	11263990	10	80 - 130	80 - 150	120 - 200	0,055 - 0,080	1	0,5	0,25	0,15
2571551008	Multi-flute milling cutter with corner radius Solid carbide 50° 10 mm, R = 0,8 mm, Z = 6 short	11263991	10	80 - 130	80 - 150	120 - 200	0,055 - 0,080	1	0,5	0,25	0,15
2571551010	Multi-flute milling cutter with corner radius Solid carbide 50° 10 mm, R = 1,0 mm, Z = 6 short	11263992	10	80 - 130	80 - 150	120 - 200	0,055 - 0,080	1	0,5	0,25	0,15
2571551015	Multi-flute milling cutter with corner radius Solid carbide 50° 10 mm, R = 1,5 mm, Z = 6 short	11263993	10	80 - 130	80 - 150	120 - 200	0,055 - 0,080	1	0,5	0,25	0,15
2571551020	Multi-flute milling cutter with corner radius Solid carbide 50° 10 mm, R = 2,0 mm, Z = 6 short	11263994	10	80 - 130	80 - 150	120 - 200	0,055 - 0,080	1	0,5	0,25	0,15
2571551201	Multi-flute milling cutter with corner radius Solid carbide 50° 12 mm, R = 0,1 mm, Z = 6 short	11263995	12	80 - 130	80 - 150	120 - 200	0,065 - 0,090	1,2	0,6	0,3	0,18
2571551205	Multi-flute milling cutter with corner radius Solid carbide 50° 12 mm, R = 0,5 mm, Z = 6 short	11263996	12	80 - 130	80 - 150	120 - 200	0,065 - 0,090	1,2	0,6	0,3	0,18
2571551210	Multi-flute milling cutter with corner radius Solid carbide 50° 12 mm, R = 1,0 mm, Z = 6 short	11263997	12	80 - 130	80 - 150	120 - 200	0,065 - 0,090	1,2	0,6	0,3	0,18
2571551215	Multi-flute milling cutter with corner radius Solid carbide 50° 12 mm, R = 1,5 mm, Z = 6 short	11263998	12	80 - 130	80 - 150	120 - 200	0,065 - 0,090	1,2	0,6	0,3	0,18
2571551220	Multi-flute milling cutter with corner radius Solid carbide 50° 12 mm, R = 2,0 mm, Z = 6 short	11263999	12	80 - 130	80 - 150	120 - 200	0,065 - 0,090	1,2	0,6	0,3	0,18
2571551605	Multi-flute milling cutter with corner radius Solid carbide 50° 16 mm, R = 0,5 mm, Z = 8 short	11264000	16	80 - 130	80 - 150	120 - 200	0,075 - 0,110	1,6	0,8	0,4	0,24
2571551610	Multi-flute milling cutter with corner radius Solid carbide 50° 16 mm, R = 1,0 mm, Z = 8 short	11264001	16	80 - 130	80 - 150	120 - 200	0,075 - 0,110	1,6	0,8	0,4	0,24
2571551620	Multi-flute milling cutter with corner radius Solid carbide 50° 16 mm, R = 2,0 mm, Z = 8 short	11264002	16	80 - 130	80 - 150	120 - 200	0,075 - 0,110	1,6	0,8	0,4	0,24
2571551630	Multi-flute milling cutter with corner radius Solid carbide 50° 16 mm, R = 3,0 mm, Z = 8 short	11264003	16	80 - 130	80 - 150	120 - 200	0,075 - 0,110	1,6	0,8	0,4	0,24
2571552010	Multi-flute milling cutter with corner radius Solid carbide 50° 20 mm, R = 1,0 mm, Z = 10 short	11264004	20	80 - 130	80 - 150	120 - 200	0,085 - 0,150	2	1	0,5	0,3
2571600301	Multi-flute milling cutter with corner radius Solid carbide 45° 3 mm, R = 0,1 mm, Z = 6	11264005	3	100 - 180	90 - 140	80 - 120	0,020 - 0,028	9	-	9	-
2571600305	Multi-flute milling cutter with corner radius Solid carbide 45° 3 mm, R = 0,5 mm, Z = 6	11264006	3	100 - 180	90 - 140	80 - 120	0,020 - 0,028	9	-	9	-
2571600401	Multi-flute milling cutter with corner radius Solid carbide 45° 4 mm, R = 0,1 mm, Z = 6	11264007	4	100 - 180	90 - 140	80 - 120	0,030 - 0,045	11	-	11	-
2571600405	Multi-flute milling cutter with corner radius Solid carbide 45° 4 mm, R = 0,5 mm, Z = 6	11264008	4	100 - 180	90 - 140	80 - 120	0,030 - 0,045	11	-	11	-
2571600410	Multi-flute milling cutter with corner radius Solid carbide 45° 4 mm, R = 1,0 mm, Z = 6	11264009	4	100 - 180	90 - 140	80 - 120	0,030 - 0,045	11	-	11	-
2571600501	Multi-flute milling cutter with corner radius Solid carbide 45° 5 mm, R = 0,1 mm, Z = 6	11264010	5	100 - 180	90 - 140	80 - 120	0,035 - 0,050	13	-	13	-
2571600505	Multi-flute milling cutter with corner radius Solid carbide 45° 5 mm, R = 0,5 mm, Z = 6	11264011	5	100 - 180	90 - 140	80 - 120	0,035 - 0,050	13	-	13	-
2571600510	Multi-flute milling cutter with corner radius Solid carbide 45° 5 mm, R = 1,0 mm, Z = 6	11264012	5	100 - 180	90 - 140	80 - 120	0,035 - 0,050	13	-	13	-
2571600601	Multi-flute milling cutter with corner radius Solid carbide 45° 6 mm, R = 0,1 mm, Z = 6	11264013	6	100 - 180	90 - 140	80 - 120	0,040 - 0,055	15	-	15	-
2571600605	Multi-flute milling cutter with corner radius Solid carbide 45° 6 mm, R = 0,5 mm, Z = 6	11264014	6	100 - 180	90 - 140	80 - 120	0,040 - 0,055	15	-	15	-
2571600610	Multi-flute milling cutter with corner radius Solid carbide 45° 6 mm, R = 1,0 mm, Z = 6	11264015	6	100 - 180	90 - 140	80 - 120	0,040 - 0,055	15	-	15	-
2571600801	Multi-flute milling cutter with corner radius Solid carbide 45° 8 mm, R = 0,1 mm, Z = 6	11264016	8	100 - 180	90 - 140	80 - 120	0,050 - 0,065	19	-	19	-
2571600805	Multi-flute milling cutter with corner radius Solid carbide 45° 8 mm, R = 0,5 mm, Z = 6	11264017	8	100 - 180	90 - 140	80 - 120	0,050 - 0,065	19	-	19	-
2571600810	Multi-flute milling cutter with corner radius Solid carbide 45° 8 mm, R = 1,0 mm, Z = 6	11264018	8	100 - 180	90 - 140	80 - 120	0,050 - 0,065	19	-	19	-
2571601001	Multi-flute milling cutter with corner radius Solid carbide 45° 10 mm, R = 0,1 mm, Z = 6	11264019	10	100 - 180	90 - 140	80 - 120	0,055 - 0,080	24	-	24	-
2571601005	Multi-flute milling cutter with corner radius Solid carbide 45° 10 mm, R = 0,5 mm, Z = 6	11264020	10	100 - 180	90 - 140	80 - 120	0,055 - 0,080	24	-	24	-
2571601010	Multi-flute milling cutter with corner radius Solid carbide 45° 10 mm, R = 1,0 mm, Z = 6	11264021	10	100 - 180	90 - 140	80 - 120	0,055 - 0,080	24	-	24	-
2571601015	Multi-flute milling cutter with corner radius Solid carbide 45° 10 mm, R = 1,5 mm, Z = 6	11264022	10	100 - 180	90 - 140	80 - 120	0,055 - 0,080	24	-	24	-
2571601201	Multi-flute milling cutter with corner radius Solid carbide 45° 12 mm, R = 0,1 mm, Z = 6	11264023	12	100 - 180	90 - 140	80 - 120	0,065 - 0,090	28	-	28	-
2571601205	Multi-flute milling cutter with corner radius Solid carbide 45° 12 mm, R = 0,5 mm, Z = 6	11264024	12	100 - 180	90 - 140	80 - 120	0,065 - 0,090	28	-	28	-

Art.no.	Description	ATORN-no.	Ø	Cutting speed Vc			Feed fz Finishing/ Roughing	ae = 0,05 x D			
								ap			
								Edge-banding	Copy	Edge-banding	Copy
				<1400 N/mm	1400 N/mm up to 52 HRc	52 HRc up to 65 HRc		< 55 HRc	< 55 HRc	> 55 HRc	> 55 HRc
			mm	m/min (depending on max. speed)			mm / Z	mm	mm	mm	mm
2571601605	Mehrzahnfräser mit ER VHM 45° 16 mm, R = 0,5 mm, Z = 8	11264027	16	100 - 180	90 - 140	80 - 120	0,075 - 0,110	36	-	36	-
2571601610	Mehrzahnfräser mit ER VHM 45° 16 mm, R = 1,0 mm, Z = 8	11264028	16	100 - 180	90 - 140	80 - 120	0,075 - 0,110	36	-	36	-
2571602010	Mehrzahnfräser mit ER VHM 45° 20 mm, R = 1,0 mm, Z = 10	11264029	20	100 - 180	90 - 140	80 - 120	0,085 - 0,150	44	-	44	-
2571650301	Multi-flute milling cutter with corner radius Solid carbide 45° 3 mm, R = 0,1 mm, Z = 6 long	11264030	3	100 - 180	90 - 140	80 - 120	0,020 - 0,028	9	-	9	-
2571650305	Multi-flute milling cutter with corner radius Solid carbide 45° 3 mm, R = 0,5 mm, Z = 6 long	11264031	3	100 - 180	90 - 140	80 - 120	0,020 - 0,028	9	-	9	-
2571650401	Multi-flute milling cutter with corner radius Solid carbide 45° 4 mm, R = 0,1 mm, Z = 6 long	11264032	4	100 - 180	90 - 140	80 - 120	0,030 - 0,045	12	-	12	-
2571650405	Multi-flute milling cutter with corner radius Solid carbide 45° 4 mm, R = 0,5 mm, Z = 6 long	11264033	4	100 - 180	90 - 140	80 - 120	0,030 - 0,045	12	-	12	-
2571650410	Multi-flute milling cutter with corner radius Solid carbide 45° 4 mm, R = 1,0 mm, Z = 6 long	11264034	4	100 - 180	90 - 140	80 - 120	0,030 - 0,045	12	-	12	-
2571650501	Multi-flute milling cutter with corner radius Solid carbide 45° 5 mm, R = 0,1 mm, Z = 6 long	11264035	5	100 - 180	90 - 140	80 - 120	0,035 - 0,050	15	-	15	-
2571650505	Multi-flute milling cutter with corner radius Solid carbide 45° 5 mm, R = 0,5 mm, Z = 6 long	11264036	5	100 - 180	90 - 140	80 - 120	0,035 - 0,050	15	-	15	-
2571650510	Multi-flute milling cutter with corner radius Solid carbide 45° 5 mm, R = 1,0 mm, Z = 6 long	11264037	5	100 - 180	90 - 140	80 - 120	0,035 - 0,050	15	-	15	-
2571650601	Multi-flute milling cutter with corner radius Solid carbide 45° 6 mm, R = 0,1 mm, Z = 6 long	11264038	6	100 - 180	90 - 140	80 - 120	0,040 - 0,055	18	-	18	-
2571650605	Multi-flute milling cutter with corner radius Solid carbide 45° 6 mm, R = 0,5 mm, Z = 6 long	11264039	6	100 - 180	90 - 140	80 - 120	0,040 - 0,055	18	-	18	-
2571650610	Multi-flute milling cutter with corner radius Solid carbide 45° 6 mm, R = 1,0 mm, Z = 6 long	11264040	6	100 - 180	90 - 140	80 - 120	0,040 - 0,055	18	-	18	-
2571650801	Multi-flute milling cutter with corner radius Solid carbide 45° 8 mm, R = 0,1 mm, Z = 6 long	11264041	8	100 - 180	90 - 140	80 - 120	0,050 - 0,065	24	-	24	-
2571650805	Multi-flute milling cutter with corner radius Solid carbide 45° 8 mm, R = 0,5 mm, Z = 6 long	11264042	8	100 - 180	90 - 140	80 - 120	0,050 - 0,065	24	-	24	-
2571650810	Multi-flute milling cutter with corner radius Solid carbide 45° 8 mm, R = 1,0 mm, Z = 6 long	11264043	8	100 - 180	90 - 140	80 - 120	0,050 - 0,065	24	-	24	-
2571651001	Multi-flute milling cutter with corner radius Solid carbide 45° 10 mm, R = 0,1 mm, Z = 6 long	11264044	10	100 - 180	90 - 140	80 - 120	0,055 - 0,080	30	-	30	-
2571651005	Multi-flute milling cutter with corner radius Solid carbide 45° 10 mm, R = 0,5 mm, Z = 6 long	11264045	10	100 - 180	90 - 140	80 - 120	0,055 - 0,080	30	-	30	-
2571651010	Multi-flute milling cutter with corner radius Solid carbide 45° 10 mm, R = 1,0 mm, Z = 6 long	11264046	10	100 - 180	90 - 140	80 - 120	0,055 - 0,080	30	-	30	-
2571651015	Multi-flute milling cutter with corner radius Solid carbide 45° 10 mm, R = 1,5 mm, Z = 6 long	11264047	10	100 - 180	90 - 140	80 - 120	0,055 - 0,080	30	-	30	-
2571651201	Multi-flute milling cutter with corner radius Solid carbide 45° 12 mm, R = 0,1 mm, Z = 6 long	11264048	12	100 - 180	90 - 140	80 - 120	0,065 - 0,090	36	-	36	-
2571651205	Multi-flute milling cutter with corner radius Solid carbide 45° 12 mm, R = 0,5 mm, Z = 6 long	11264049	12	100 - 180	90 - 140	80 - 120	0,065 - 0,090	36	-	36	-
2571651210	Multi-flute milling cutter with corner radius Solid carbide 45° 12 mm, R = 1,0 mm, Z = 6 long	11264050	12	100 - 180	90 - 140	80 - 120	0,065 - 0,090	36	-	36	-
2571651605	Multi-flute milling cutter with corner radius Solid carbide 45° 16 mm, R = 0,5 mm, Z = 8 long	11264051	16	100 - 180	90 - 140	80 - 120	0,075 - 0,110	48	-	48	-
2571651610	Multi-flute milling cutter with corner radius Solid carbide 45° 16 mm, R = 1,0 mm, Z = 8 long	11264052	16	100 - 180	90 - 140	80 - 120	0,075 - 0,110	48	-	48	-
2571652010	Multi-flute milling cutter with corner radius Solid carbide 45° 20 mm, R = 1,0 mm, Z = 10 long	11264053	20	100 - 180	90 - 140	80 - 120	0,085 - 0,150	60	-	60	-

ATORN Cutting data recommendations RockTec PRO Trochoidal end milling cutter

- Please adjust these guideline values according to clamping operation and machine set-up!



257190.... 257195....

Art.no.	Description	ATORN-no.	Ø	Cutting speed Vc			Feed fz Finishing/ Roughing	Edge-banding			
								ap	ae max.	ap	ae max.
				<1400 N/mm	1400 N/mm up to 52 HRc	52 HRc up to 65 HRc		< 55 HRc	< 55 HRc	> 55 HRc	> 55 HRc
			mm	m/min (depending on max. speed)			mm / Z	mm	mm	mm	mm
2571900060	End milling cutter Solid carbide TVC 3xD 40° 6mm	11264465	6	150	130	100	0,040 - 0,055	18	0,30	18	0,15
2571900080	End milling cutter Solid carbide TVC 3xD 40° 8mm	11264466	8	150	130	100	0,050 - 0,065	24	0,40	24	0,20
2571900100	End milling cutter Solid carbide TVC 3xD 40° 10mm	11264467	10	150	130	100	0,055 - 0,080	30	0,50	30	0,20
2571900120	End milling cutter Solid carbide TVC 3xD 40° 12mm	11264468	12	150	130	100	0,065 - 0,090	36	0,60	36	0,20
2571900160	End milling cutter Solid carbide TVC 3xD 40° 16mm	11264469	16	150	130	100	0,075 - 0,110	48	0,70	48	0,20
2571900200	End milling cutter Solid carbide TVC 3xD 40° 20mm	11264470	20	150	130	100	0,085 - 0,150	60	0,80	60	0,20
2571950060	End milling cutter Solid carbide TVC 4xD 40° 6mm	11264471	6	150	130	100	0,040 - 0,055	24	0,30	24	0,10
2571950080	End milling cutter Solid carbide TVC 4xD 40° 8mm	11264472	8	150	130	100	0,050 - 0,065	32	0,40	32	0,15
2571950100	End milling cutter Solid carbide TVC 4xD 40° 10mm	11264473	10	150	130	100	0,055 - 0,080	40	0,50	40	0,20
2571950120	End milling cutter Solid carbide TVC 4xD 40° 12mm	11264474	12	150	130	100	0,065 - 0,090	48	0,60	48	0,20
2571950160	End milling cutter Solid carbide TVC 4xD 40° 16mm	11264475	16	150	130	100	0,075 - 0,110	64	0,70	64	0,20
2571950200	End milling cutter Solid carbide TVC 4xD 40° 20mm	11264476	20	150	130	100	0,085 - 0,150	80	0,80	80	0,20

ATORN Cutting data recommendations RockTec PRO Mini torus cutter



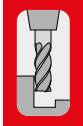
- Please adjust these guideline values according to clamping operation and machine set-up!

257120.... 257130.... 257140....
257125.... 257135....

Art.no.	Description	ATORN-no.	Ø	Cutting speed Vc			Feed fz Finishing/ Roughing	ae			
								0,2 x D	0,05 x D	0,2 x D	0,05 x D
								ap			
								Edge-banding	Copy	Edge-banding	Copy
				<1400 N/mm	1400 N/mm up to 52 HRc	52 HRc up to 65 HRc		< 55 HRc	< 55 HRc	> 55 HRc	> 55 HRc
			mm	m/min (depending on max. speed)			mm / Z	mm	mm	mm	mm
Radius R = 0,05 mm											
2571200001	Mini torus cutter Solid carbide 40° 0,2 mm, L2 = 0,5 mm, R = 0,05 mm	11264107	0,2	60 - 130	80 - 150	120 - 200	0,002 - 0,004	0,02	0,01	0,005	0,003
2571200002	Mini torus cutter Solid carbide 40° 0,2 mm, L2 = 1,0 mm, R = 0,05 mm	11264108	0,2	60 - 130	80 - 150	120 - 200	0,002 - 0,004	0,02	0,01	0,005	0,003
2571200003	Mini torus cutter Solid carbide 40° 0,2 mm, L2 = 3,0 mm, R = 0,05 mm	11264109	0,2	60 - 130	80 - 150	120 - 200	0,002 - 0,004	0,004	0,002	0,001	0,0006
2571200004	Mini torus cutter Solid carbide 40° 0,3 mm, L2 = 1,0 mm, R = 0,05 mm	11264110	0,3	60 - 130	80 - 150	120 - 200	0,003 - 0,006	0,03	0,015	0,0075	0,0045
2571200005	Mini torus cutter Solid carbide 40° 0,3 mm, L2 = 2,0 mm, R = 0,05 mm	11264111	0,3	60 - 130	80 - 150	120 - 200	0,003 - 0,006	0,024	0,012	0,006	0,0036
2571200006	Mini torus cutter Solid carbide 40° 0,3 mm, L2 = 4,0 mm, R = 0,05 mm	11264112	0,3	60 - 130	80 - 150	120 - 200	0,003 - 0,006	0,006	0,003	0,0015	0,0009
2571200007	Mini torus cutter Solid carbide 40° 0,4 mm, L2 = 1,0 mm, R = 0,05 mm	11264113	0,4	60 - 130	80 - 150	120 - 200	0,004 - 0,008	0,04	0,02	0,01	0,006
2571200008	Mini torus cutter Solid carbide 40° 0,4 mm, L2 = 2,0 mm, R = 0,05 mm	11264114	0,4	60 - 130	80 - 150	120 - 200	0,004 - 0,009	0,04	0,02	0,01	0,006
2571200009	Mini torus cutter Solid carbide 40° 0,4 mm, L2 = 5,0 mm, R = 0,05 mm	11264115	0,4	60 - 130	80 - 150	120 - 200	0,004 - 0,010	0,008	0,004	0,002	0,0012
2571200010	Mini torus cutter Solid carbide 40° 0,5 mm, L2 = 1,0 mm, R = 0,05 mm	11264116	0,5	60 - 130	80 - 150	120 - 200	0,005 - 0,009	0,05	0,025	0,0125	0,0075
2571200011	Mini torus cutter Solid carbide 40° 0,5 mm, L2 = 2,0 mm, R = 0,05 mm	11264117	0,5	60 - 130	80 - 150	120 - 200	0,005 - 0,009	0,05	0,025	0,0125	0,0075
2571200012	Mini torus cutter Solid carbide 40° 0,5 mm, L2 = 4,0 mm, R = 0,05 mm	11264118	0,5	60 - 130	80 - 150	120 - 200	0,005 - 0,009	0,03	0,015	0,0075	0,0045
2571200013	Mini torus cutter Solid carbide 40° 0,5 mm, L2 = 6,0 mm, R = 0,05 mm	11264119	0,5	60 - 130	80 - 150	120 - 200	0,005 - 0,009	0,01	0,005	0,0025	0,0015
2571200014	Mini torus cutter Solid carbide 40° 0,5 mm, L2 = 8,0 mm, R = 0,05 mm	11264120	0,5	60 - 130	80 - 150	120 - 200	0,005 - 0,009	0,01	0,005	0,0025	0,0015
2571200015	Mini torus cutter Solid carbide 40° 0,5 mm, L2 = 10,0 mm, R = 0,05 mm	11264121	0,5	60 - 130	80 - 150	120 - 200	0,005 - 0,009	0,01	0,005	0,0025	0,0015
Radius R = 0,1 mm											
2571250001	Mini torus cutter Solid carbide 40° 0,5 mm, L2 = 1,0 mm, R = 0,1 mm	11264122	0,5	60 - 130	80 - 150	120 - 200	0,005 - 0,009	0,05	0,025	0,0125	0,0075
2571250002	Mini torus cutter Solid carbide 40° 0,5 mm, L2 = 2,0 mm, R = 0,1 mm	11264123	0,5	60 - 130	80 - 150	120 - 200	0,005 - 0,009	0,05	0,025	0,0125	0,0075
2571250003	Mini torus cutter Solid carbide 40° 0,5 mm, L2 = 4,0 mm, R = 0,1 mm	11264124	0,5	60 - 130	80 - 150	120 - 200	0,005 - 0,009	0,03	0,015	0,0075	0,0045
2571250004	Mini torus cutter Solid carbide 40° 0,5 mm, L2 = 6,0 mm, R = 0,1 mm	11264125	0,5	60 - 130	80 - 150	120 - 200	0,005 - 0,009	0,01	0,005	0,0025	0,0015
2571250005	Mini torus cutter Solid carbide 40° 0,5 mm, L2 = 8,0 mm, R = 0,1 mm	11264126	0,5	60 - 130	80 - 150	120 - 200	0,005 - 0,009	0,01	0,005	0,0025	0,0015
2571250006	Mini torus cutter Solid carbide 40° 0,5 mm, L2 = 10,0 mm, R = 0,1 mm	11264127	0,5	60 - 130	80 - 150	120 - 200	0,005 - 0,009	0,01	0,005	0,0025	0,0015
2571250007	Mini torus cutter Solid carbide 40° 0,6 mm, L2 = 2,0 mm, R = 0,1 mm	11264128	0,6	60 - 130	80 - 150	120 - 200	0,006 - 0,010	0,06	0,03	0,015	0,009
2571250008	Mini torus cutter Solid carbide 40° 0,6 mm, L2 = 4,0 mm, R = 0,1 mm	11264129	0,6	60 - 130	80 - 150	120 - 200	0,006 - 0,010	0,048	0,024	0,012	0,0072
2571250009	Mini torus cutter Solid carbide 40° 0,6 mm, L2 = 6,0 mm, R = 0,1 mm	11264130	0,6	60 - 130	80 - 150	120 - 200	0,006 - 0,010	0,024	0,012	0,006	0,0036
2571250010	Mini torus cutter Solid carbide 40° 0,6 mm, L2 = 8,0 mm, R = 0,1 mm	11264131	0,6	60 - 130	80 - 150	120 - 200	0,006 - 0,010	0,012	0,006	0,003	0,0018
2571250011	Mini torus cutter Solid carbide 40° 0,6 mm, L2 = 10,0 mm, R = 0,1 mm	11264132	0,6	60 - 130	80 - 150	120 - 200	0,006 - 0,010	0,012	0,006	0,003	0,0018
2571250012	Mini torus cutter Solid carbide 40° 0,8 mm, L2 = 2,0 mm, R = 0,1 mm	11264133	0,8	60 - 130	80 - 150	120 - 200	0,007 - 0,012	0,08	0,04	0,02	0,012
2571250013	Mini torus cutter Solid carbide 40° 0,8 mm, L2 = 4,0 mm, R = 0,1 mm	11264134	0,8	60 - 130	80 - 150	120 - 200	0,007 - 0,012	0,08	0,04	0,02	0,012
2571250014	Mini torus cutter Solid carbide 40° 0,8 mm, L2 = 6,0 mm, R = 0,1 mm	11264135	0,8	60 - 130	80 - 150	120 - 200	0,007 - 0,012	0,048	0,024	0,012	0,0072
2571250015	Mini torus cutter Solid carbide 40° 0,8 mm, L2 = 8,0 mm, R = 0,1 mm	11264136	0,8	60 - 130	80 - 150	120 - 200	0,007 - 0,012	0,032	0,016	0,008	0,0048
2571250016	Mini torus cutter Solid carbide 40° 0,8 mm, L2 = 10,0 mm, R = 0,1 mm	11264137	0,8	60 - 130	80 - 150	120 - 200	0,007 - 0,012	0,016	0,008	0,004	0,0024
2571250017	Mini torus cutter Solid carbide 40° 1,0 mm, L2 = 2,0 mm, R = 0,1 mm	11264138	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,1	0,05	0,025	0,015
2571250018	Mini torus cutter Solid carbide 40° 1,0 mm, L2 = 4,0 mm, R = 0,1 mm	11264139	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,1	0,05	0,025	0,015
2571250019	Mini torus cutter Solid carbide 40° 1,0 mm, L2 = 6,0 mm, R = 0,1 mm	11264140	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,08	0,04	0,02	0,012
2571250020	Mini torus cutter Solid carbide 40° 1,0 mm, L2 = 8,0 mm, R = 0,1 mm	11264141	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,06	0,03	0,015	0,009
2571250021	Mini torus cutter Solid carbide 40° 1,0 mm, L2 = 10,0 mm, R = 0,1 mm	11264142	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,04	0,02	0,01	0,006
2571250022	Mini torus cutter Solid carbide 40° 1,0 mm, L2 = 15,0 mm, R = 0,1 mm	11264143	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,02	0,01	0,005	0,003
2571250023	Mini torus cutter Solid carbide 40° 1,0 mm, L2 = 20,0 mm, R = 0,1 mm	11264144	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,02	0,01	0,005	0,003
2571250024	Mini torus cutter Solid carbide 40° 1,0 mm, L2 = 25,0 mm, R = 0,1 mm	11264145	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,02	0,01	0,005	0,003
2571250025	Mini torus cutter Solid carbide 40° 1,2 mm, L2 = 5,0 mm, R = 0,1 mm	11264146	1,2	60 - 130	80 - 150	120 - 200	0,010 - 0,016	0,12	0,06	0,03	0,018
2571250026	Mini torus cutter Solid carbide 40° 1,2 mm, L2 = 10,0 mm, R = 0,1 mm	11264147	1,2	60 - 130	80 - 150	120 - 200	0,010 - 0,016	0,072	0,036	0,018	0,0108
2571250027	Mini torus cutter Solid carbide 40° 1,2 mm, L2 = 15,0 mm, R = 0,1 mm	11264148	1,2	60 - 130	80 - 150	120 - 200	0,010 - 0,016	0,024	0,012	0,006	0,0036
2571250028	Mini torus cutter Solid carbide 40° 1,2 mm, L2 = 20,0 mm, R = 0,1 mm	11264149	1,2	60 - 130	80 - 150	120 - 200	0,010 - 0,016	0,024	0,012	0,006	0,0036
2571250029	Mini torus cutter Solid carbide 40° 1,2 mm, L2 = 25,0 mm, R = 0,1 mm	11264150	1,2	60 - 130	80 - 150	120 - 200	0,010 - 0,016	0,024	0,012	0,006	0,0036
2571250030	Mini torus cutter Solid carbide 40° 1,5 mm, L2 = 3,0 mm, R = 0,1 mm	11264151	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,15	0,075	0,0375	0,0225
2571250031	Mini torus cutter Solid carbide 40° 1,5 mm, L2 = 4,0 mm, R = 0,1 mm	11264152	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,15	0,075	0,0375	0,0225
2571250032	Mini torus cutter Solid carbide 40° 1,5 mm, L2 = 6,0 mm, R = 0,1 mm	11264153	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,15	0,075	0,0375	0,0225
2571250033	Mini torus cutter Solid carbide 40° 1,5 mm, L2 = 8,0 mm, R = 0,1 mm	11264154	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,15	0,075	0,0375	0,0225
2571250034	Mini torus cutter Solid carbide 40° 1,5 mm, L2 = 10,0 mm, R = 0,1 mm	11264155	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,12	0,06	0,03	0,018
2571250035	Mini torus cutter Solid carbide 40° 1,5 mm, L2 = 15,0 mm, R = 0,1 mm	11264156	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,06	0,03	0,015	0,009
2571250036	Mini torus cutter Solid carbide 40° 1,5 mm, L2 = 20,0 mm, R = 0,1 mm	11264157	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,03	0,015	0,0075	0,0045
2571250037	Mini torus cutter Solid carbide 40° 1,5 mm, L2 = 25,0 mm, R = 0,1 mm	11264158	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,03	0,015	0,0075	0,0045
Radius R = 0,2 mm											
2571300001	Mini torus cutter Solid carbide 40° 1,0 mm, L2 = 2,0 mm, R = 0,2 mm	11264159	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,1	0,05	0,025	0,015
2571300002	Mini torus cutter Solid carbide 40° 1,0 mm, L2 = 4,0 mm, R = 0,2 mm	11264160	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,1	0,05	0,025	0,015

Art.no.	Description	ATORN-no.	Ø	Cutting speed Vc			Feed fz Finishing/ Roughing	ae			
								0,2 x D	0,05 x D	0,2 x D	0,05 x D
								ap			
								Edge-banding	Copy	Edge-banding	Copy
				<1400 N/mm	1400 N/mm up to 52 HRc	52 HRc up to 65 HRc		< 55 HRc	< 55 HRc	> 55 HRc	> 55 HRc
			mm	m/min (depending on max. speed)			mm / Z	mm	mm	mm	mm
2571300003	Mini torus cutter Solid carbide 40° 1,0 mm, L2 = 6,0 mm, R = 0,2 mm	11264161	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,08	0,04	0,02	0,012
2571300004	Mini torus cutter Solid carbide 40° 1,0 mm, L2 = 8,0 mm, R = 0,2 mm	11264162	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,06	0,03	0,015	0,009
2571300005	Mini torus cutter Solid carbide 40° 1,0 mm, L2 = 10,0 mm, R = 0,2 mm	11264163	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,04	0,02	0,01	0,006
2571300006	Mini torus cutter Solid carbide 40° 1,0 mm, L2 = 15,0 mm, R = 0,2 mm	11264164	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,02	0,01	0,005	0,003
2571300007	Mini torus cutter Solid carbide 40° 1,0 mm, L2 = 20,0 mm, R = 0,2 mm	11264165	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,02	0,01	0,005	0,003
2571300008	Mini torus cutter Solid carbide 40° 1,0 mm, L2 = 25,0 mm, R = 0,2 mm	11264166	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,02	0,01	0,005	0,003
2571300009	Mini torus cutter Solid carbide 40° 1,2 mm, L2 = 5,0 mm, R = 0,2 mm	11264167	1,2	60 - 130	80 - 150	120 - 200	0,010 - 0,016	0,12	0,06	0,03	0,018
2571300010	Mini torus cutter Solid carbide 40° 1,2 mm, L2 = 10,0 mm, R = 0,2 mm	11264168	1,2	60 - 130	80 - 150	120 - 200	0,010 - 0,016	0,072	0,036	0,018	0,0108
2571300011	Mini torus cutter Solid carbide 40° 1,2 mm, L2 = 15,0 mm, R = 0,2 mm	11264169	1,2	60 - 130	80 - 150	120 - 200	0,010 - 0,016	0,024	0,012	0,006	0,0036
2571300012	Mini torus cutter Solid carbide 40° 1,2 mm, L2 = 20,0 mm, R = 0,2 mm	11264170	1,2	60 - 130	80 - 150	120 - 200	0,010 - 0,016	0,024	0,012	0,006	0,0036
2571300013	Mini torus cutter Solid carbide 40° 1,2 mm, L2 = 25,0 mm, R = 0,2 mm	11264171	1,2	60 - 130	80 - 150	120 - 200	0,010 - 0,016	0,024	0,012	0,006	0,0036
2571300014	Mini torus cutter Solid carbide 40° 1,5 mm, L2 = 3,0 mm, R = 0,2 mm	11264172	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,15	0,075	0,0375	0,0225
2571300015	Mini torus cutter Solid carbide 40° 1,5 mm, L2 = 4,0 mm, R = 0,2 mm	11264173	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,15	0,075	0,0375	0,0225
2571300016	Mini torus cutter Solid carbide 40° 1,5 mm, L2 = 6,0 mm, R = 0,2 mm	11264174	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,15	0,075	0,0375	0,0225
2571300017	Mini torus cutter Solid carbide 40° 1,5 mm, L2 = 8,0 mm, R = 0,2 mm	11264175	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,15	0,075	0,0375	0,0225
2571300018	Mini torus cutter Solid carbide 40° 1,5 mm, L2 = 10,0 mm, R = 0,2 mm	11264176	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,12	0,06	0,03	0,018
2571300019	Mini torus cutter Solid carbide 40° 1,5 mm, L2 = 15,0 mm, R = 0,2 mm	11264177	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,06	0,03	0,015	0,009
2571300020	Mini torus cutter Solid carbide 40° 1,5 mm, L2 = 20,0 mm, R = 0,2 mm	11264178	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,03	0,015	0,0075	0,0045
2571300021	Mini torus cutter Solid carbide 40° 1,5 mm, L2 = 25,0 mm, R = 0,2 mm	11264179	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,03	0,015	0,0075	0,0045
2571300022	Mini torus cutter Solid carbide 40° 2,0 mm, L2 = 4,0 mm, R = 0,2 mm	11264180	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,2	0,1	0,05	0,03
2571300023	Mini torus cutter Solid carbide 40° 2,0 mm, L2 = 6,0 mm, R = 0,2 mm	11264181	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,2	0,1	0,05	0,03
2571300024	Mini torus cutter Solid carbide 40° 2,0 mm, L2 = 8,0 mm, R = 0,2 mm	11264182	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,2	0,1	0,05	0,03
2571300025	Mini torus cutter Solid carbide 40° 2,0 mm, L2 = 10,0 mm, R = 0,2 mm	11264183	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,2	0,1	0,05	0,03
2571300026	Mini torus cutter Solid carbide 40° 2,0 mm, L2 = 15,0 mm, R = 0,2 mm	11264184	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,12	0,06	0,03	0,018
2571300027	Mini torus cutter Solid carbide 40° 2,0 mm, L2 = 20,0 mm, R = 0,2 mm	11264185	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,08	0,04	0,02	0,012
2571300028	Mini torus cutter Solid carbide 40° 2,0 mm, L2 = 25,0 mm, R = 0,2 mm	11264186	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,04	0,02	0,01	0,006
2571300029	Mini torus cutter Solid carbide 40° 2,0 mm, L2 = 30,0 mm, R = 0,2 mm	11264187	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,04	0,02	0,01	0,006
2571300030	Mini torus cutter Solid carbide 40° 2,0 mm, L2 = 35,0 mm, R = 0,2 mm	11264188	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,04	0,02	0,01	0,006
2571300031	Mini torus cutter Solid carbide 40° 2,0 mm, L2 = 40,0 mm, R = 0,2 mm	11264189	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,04	0,02	0,01	0,006
Radius R = 0,3 mm											
2571350001	Mini torus cutter Solid carbide 40° 1,5 mm, L2 = 3,0 mm, R = 0,3 mm	11264190	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,15	0,075	0,0375	0,0225
2571350002	Mini torus cutter Solid carbide 40° 1,5 mm, L2 = 4,0 mm, R = 0,3 mm	11264191	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,15	0,075	0,0375	0,0225
2571350003	Mini torus cutter Solid carbide 40° 1,5 mm, L2 = 6,0 mm, R = 0,3 mm	11264192	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,15	0,075	0,0375	0,0225
2571350004	Mini torus cutter Solid carbide 40° 1,5 mm, L2 = 8,0 mm, R = 0,3 mm	11264193	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,15	0,075	0,0375	0,0225
2571350005	Mini torus cutter Solid carbide 40° 1,5 mm, L2 = 10,0 mm, R = 0,3 mm	11264194	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,12	0,06	0,03	0,018
2571350006	Mini torus cutter Solid carbide 40° 1,5 mm, L2 = 15,0 mm, R = 0,3 mm	11264195	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,06	0,03	0,015	0,009
2571350007	Mini torus cutter Solid carbide 40° 1,5 mm, L2 = 20,0 mm, R = 0,3 mm	11264196	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,03	0,015	0,0075	0,0045
2571350008	Mini torus cutter Solid carbide 40° 1,5 mm, L2 = 25,0 mm, R = 0,3 mm	11264197	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,03	0,015	0,0075	0,0045
2571350009	Mini torus cutter Solid carbide 40° 2,0 mm, L2 = 4,0 mm, R = 0,3 mm	11264198	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,2	0,1	0,05	0,03
2571350010	Mini torus cutter Solid carbide 40° 2,0 mm, L2 = 6,0 mm, R = 0,3 mm	11264199	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,2	0,1	0,05	0,03
2571350011	Mini torus cutter Solid carbide 40° 2,0 mm, L2 = 8,0 mm, R = 0,3 mm	11264200	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,2	0,1	0,05	0,03
2571350012	Mini torus cutter Solid carbide 40° 2,0 mm, L2 = 10,0 mm, R = 0,3 mm	11264201	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,2	0,1	0,05	0,03
2571350013	Mini torus cutter Solid carbide 40° 2,0 mm, L2 = 15,0 mm, R = 0,3 mm	11264202	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,12	0,06	0,03	0,018
2571350014	Mini torus cutter Solid carbide 40° 2,0 mm, L2 = 20,0 mm, R = 0,3 mm	11264203	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,08	0,04	0,02	0,012
2571350015	Mini torus cutter Solid carbide 40° 2,0 mm, L2 = 25,0 mm, R = 0,3 mm	11264204	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,04	0,02	0,01	0,006
2571350016	Mini torus cutter Solid carbide 40° 2,0 mm, L2 = 30,0 mm, R = 0,3 mm	11264205	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,04	0,02	0,01	0,006
2571350017	Mini torus cutter Solid carbide 40° 2,0 mm, L2 = 35,0 mm, R = 0,3 mm	11264206	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,04	0,02	0,01	0,006
2571350018	Mini torus cutter Solid carbide 40° 2,0 mm, L2 = 40,0 mm, R = 0,3 mm	11264207	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,04	0,02	0,01	0,006
2571350019	Mini torus cutter Solid carbide 40° 2,5 mm, L2 = 8,0 mm, R = 0,3 mm	11264208	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,25	0,125	0,0625	0,0375
2571350020	Mini torus cutter Solid carbide 40° 2,5 mm, L2 = 10,0 mm, R = 0,3 mm	11264209	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,25	0,125	0,0625	0,0375
2571350021	Mini torus cutter Solid carbide 40° 2,5 mm, L2 = 15,0 mm, R = 0,3 mm	11264210	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,2	0,1	0,05	0,03
2571350022	Mini torus cutter Solid carbide 40° 2,5 mm, L2 = 20,0 mm, R = 0,3 mm	11264211	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,15	0,075	0,0375	0,0225
2571350023	Mini torus cutter Solid carbide 40° 2,5 mm, L2 = 25,0 mm, R = 0,3 mm	11264212	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,1	0,05	0,025	0,015
2571350024	Mini torus cutter Solid carbide 40° 2,5 mm, L2 = 30,0 mm, R = 0,3 mm	11264213	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,05	0,025	0,0125	0,0075
2571350025	Mini torus cutter Solid carbide 40° 2,5 mm, L2 = 35,0 mm, R = 0,3 mm	11264214	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,05	0,025	0,0125	0,0075
2571350026	Mini torus cutter Solid carbide 40° 2,5 mm, L2 = 40,0 mm, R = 0,3 mm	11264215	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,05	0,025	0,0125	0,0075
2571350027	Mini torus cutter Solid carbide 40° 3,0 mm, L2 = 8,0 mm, R = 0,3 mm	11264216	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,3	0,15	0,075	0,045
2571350028	Mini torus cutter Solid carbide 40° 3,0 mm, L2 = 10,0 mm, R = 0,3 mm	11264217	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,3	0,15	0,075	0,045
2571350029	Mini torus cutter Solid carbide 40° 3,0 mm, L2 = 15,0 mm, R = 0,3 mm	11264218	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,3	0,15	0,075	0,045
2571350030	Mini torus cutter Solid carbide 40° 3,0 mm, L2 = 20,0 mm, R = 0,3 mm	11264219	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,24	0,12	0,06	0,036
2571350031	Mini torus cutter Solid carbide 40° 3,0 mm, L2 = 25,0 mm, R = 0,3 mm	11264220	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,18	0,09	0,045	0,027

Art.no.	Description	ATORN-no.	Ø	Cutting speed Vc			Feed fz Finishing/ Roughing	ae			
								0,2 x D	0,05 x D	0,2 x D	0,05 x D
								ap			
								Edge-banding	Copy	Edge-banding	Copy
				<1400 N/mm	1400 N/mm up to 52 HRc	52 HRc up to 65 HRc		< 55 HRc	< 55 HRc	> 55 HRc	> 55 HRc
			mm	m/min (depending on max. speed)			mm / Z	mm	mm	mm	mm
2571350032	Mini torus cutter Solid carbide 40° 3,0 mm, L2 = 30,0 mm, R = 0,3 mm	11264221	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,12	0,06	0,03	0,018
2571350033	Mini torus cutter Solid carbide 40° 3,0 mm, L2 = 35,0 mm, R = 0,3 mm	11264222	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,06	0,03	0,015	0,009
2571350034	Mini torus cutter Solid carbide 40° 3,0 mm, L2 = 40,0 mm, R = 0,3 mm	11264223	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,06	0,03	0,015	0,009
Radius R = 0,5 mm											
2571400001	Mini torus cutter Solid carbide 40° 2,5 mm, L2 = 8,0 mm, R = 0,5 mm	11264224	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,25	0,125	0,0625	0,0375
2571400002	Mini torus cutter Solid carbide 40° 2,5 mm, L2 = 10,0 mm, R = 0,5 mm	11264225	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,25	0,125	0,0625	0,0375
2571400003	Mini torus cutter Solid carbide 40° 2,5 mm, L2 = 15,0 mm, R = 0,5 mm	11264226	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,2	0,1	0,05	0,03
2571400004	Mini torus cutter Solid carbide 40° 2,5 mm, L2 = 20,0 mm, R = 0,5 mm	11264227	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,15	0,075	0,0375	0,0225
2571400005	Mini torus cutter Solid carbide 40° 2,5 mm, L2 = 25,0 mm, R = 0,5 mm	11264228	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,1	0,05	0,025	0,015
2571400006	Mini torus cutter Solid carbide 40° 2,5 mm, L2 = 30,0 mm, R = 0,5 mm	11264229	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,05	0,025	0,0125	0,0075
2571400007	Mini torus cutter Solid carbide 40° 2,5 mm, L2 = 35,0 mm, R = 0,5 mm	11264230	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,05	0,025	0,0125	0,0075
2571400008	Mini torus cutter Solid carbide 40° 2,5 mm, L2 = 40,0 mm, R = 0,5 mm	11264231	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,05	0,025	0,0125	0,0075
2571400009	Mini torus cutter Solid carbide 40° 3,0 mm, L2 = 8,0 mm, R = 0,5 mm	11264232	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,3	0,15	0,075	0,045
2571400010	Mini torus cutter Solid carbide 40° 3,0 mm, L2 = 10,0 mm, R = 0,5 mm	11264233	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,3	0,15	0,075	0,045
2571400011	Mini torus cutter Solid carbide 40° 3,0 mm, L2 = 15,0 mm, R = 0,5 mm	11264234	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,3	0,15	0,075	0,045
2571400012	Mini torus cutter Solid carbide 40° 3,0 mm, L2 = 20,0 mm, R = 0,5 mm	11264235	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,24	0,12	0,06	0,036
2571400013	Mini torus cutter Solid carbide 40° 3,0 mm, L2 = 25,0 mm, R = 0,5 mm	11264236	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,18	0,09	0,045	0,027
2571400014	Mini torus cutter Solid carbide 40° 3,0 mm, L2 = 30,0 mm, R = 0,5 mm	11264237	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,12	0,06	0,03	0,018
2571400015	Mini torus cutter Solid carbide 40° 3,0 mm, L2 = 35,0 mm, R = 0,5 mm	11264238	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,06	0,03	0,015	0,009
2571400016	Mini torus cutter Solid carbide 40° 3,0 mm, L2 = 40,0 mm, R = 0,5 mm	11264239	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,06	0,03	0,015	0,009



ATORN Cutting data recommendations RockTec PRO Torus cutter



- Please adjust these guideline values according to clamping operation and machine set-up!

257145.... 257150....

Art.no.	Description	ATORN-no.	Ø	Cutting speed Vc			Feed fz Finishing/ Roughing	ae			
								0,2 x D	0,05 x D	0,2 x D	0,05 x D
								ap			
								Edge-banding	Copy	Edge-banding	Copy
				<1400 N/mm	1400 N/mm up to 52 HRc	52 HRc up to 65 HRc		< 55 HRc	< 55 HRc	> 55 HRc	> 55 HRc
			mm	m/min (depending on max. speed)			mm / Z	mm	mm	mm	mm
2571450101	Torus cutter Solid carbide 40° 1 mm, R = 0,1 mm	11264240	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,04	0,02	0,01	0,006
2571450102	Torus cutter Solid carbide 40° 1 mm, R = 0,2 mm	11264241	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,04	0,02	0,01	0,006
2571450201	Torus cutter Solid carbide 40° 2 mm, R = 0,1 mm	11264242	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,16	0,08	0,04	0,024
2571450203	Torus cutter Solid carbide 40° 2 mm, R = 0,2 mm	11264243	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,16	0,08	0,04	0,024
2571450205	Torus cutter Solid carbide 40° 2 mm, R = 0,5 mm	11264244	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,16	0,08	0,04	0,024
2571450301	Torus cutter Solid carbide 40° 3 mm, R = 0,1 mm	11264245	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,3	0,15	0,075	0,045
2571450303	Torus cutter Solid carbide 40° 3 mm, R = 0,3 mm	11264246	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,3	0,15	0,075	0,045
2571450305	Torus cutter Solid carbide 40° 3 mm, R = 0,5 mm	11264247	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,3	0,15	0,075	0,045
2571450310	Torus cutter Solid carbide 40° 3 mm, R = 1,0 mm	11264248	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,3	0,15	0,075	0,045
2571450401	Torus cutter Solid carbide 40° 4 mm, R = 0,1 mm	11264249	4	60 - 130	80 - 150	120 - 200	0,030 - 0,045	0,4	0,2	0,1	0,06
2571450403	Torus cutter Solid carbide 40° 4 mm, R = 0,3 mm	11264250	4	60 - 130	80 - 150	120 - 200	0,030 - 0,045	0,4	0,2	0,1	0,06
2571450405	Torus cutter Solid carbide 40° 4 mm, R = 0,5 mm	11264251	4	60 - 130	80 - 150	120 - 200	0,030 - 0,045	0,4	0,2	0,1	0,06
2571450410	Torus cutter Solid carbide 40° 4 mm, R = 1,0 mm	11264252	4	60 - 130	80 - 150	120 - 200	0,030 - 0,045	0,4	0,2	0,1	0,06
2571450501	Torus cutter Solid carbide 40° 5 mm, R = 0,1 mm	11264253	5	60 - 130	80 - 150	120 - 200	0,035 - 0,050	0,5	0,25	0,125	0,075
2571450503	Torus cutter Solid carbide 40° 5 mm, R = 0,3 mm	11264254	5	60 - 130	80 - 150	120 - 200	0,035 - 0,050	0,5	0,25	0,125	0,075
2571450505	Torus cutter Solid carbide 40° 5 mm, R = 0,5 mm	11264255	5	60 - 130	80 - 150	120 - 200	0,035 - 0,050	0,5	0,25	0,125	0,075
2571450510	Torus cutter Solid carbide 40° 5 mm, R = 1,0 mm	11264256	5	60 - 130	80 - 150	120 - 200	0,035 - 0,050	0,5	0,25	0,125	0,075
2571450601	Torus cutter Solid carbide 40° 6 mm, R = 0,1 mm	11264257	6	60 - 130	80 - 150	120 - 200	0,040 - 0,055	0,6	0,3	0,15	0,09
2571450603	Torus cutter Solid carbide 40° 6 mm, R = 0,3 mm	11264258	6	60 - 130	80 - 150	120 - 200	0,040 - 0,055	0,6	0,3	0,15	0,09
2571450605	Torus cutter Solid carbide 40° 6 mm, R = 0,5 mm	11264259	6	60 - 130	80 - 150	120 - 200	0,040 - 0,055	0,6	0,3	0,15	0,09
2571450610	Torus cutter Solid carbide 40° 6 mm, R = 1,0 mm	11264260	6	60 - 130	80 - 150	120 - 200	0,040 - 0,055	0,6	0,3	0,15	0,09
2571450615	Torus cutter Solid carbide 40° 6 mm, R = 1,5 mm	11264261	6	60 - 130	80 - 150	120 - 200	0,040 - 0,055	0,6	0,3	0,15	0,09
2571450620	Torus cutter Solid carbide 40° 6 mm, R = 2,0 mm	11264262	6	60 - 130	80 - 150	120 - 200	0,040 - 0,055	0,6	0,3	0,15	0,09
2571450801	Torus cutter Solid carbide 40° 8 mm, R = 0,1 mm	11264263	8	60 - 130	80 - 150	120 - 200	0,050 - 0,065	0,8	0,4	0,2	0,12
2571450803	Torus cutter Solid carbide 40° 8 mm, R = 0,3 mm	11264264	8	60 - 130	80 - 150	120 - 200	0,050 - 0,066	0,8	0,4	0,2	0,12
2571450805	Torus cutter Solid carbide 40° 8 mm, R = 0,5 mm	11264265	8	60 - 130	80 - 150	120 - 200	0,050 - 0,067	0,8	0,4	0,2	0,12
2571450810	Torus cutter Solid carbide 40° 8 mm, R = 1,0 mm	11264266	8	60 - 130	80 - 150	120 - 200	0,050 - 0,068	0,8	0,4	0,2	0,12
2571450820	Torus cutter Solid carbide 40° 8 mm, R = 2,0 mm	11264267	8	60 - 130	80 - 150	120 - 200	0,050 - 0,069	0,8	0,4	0,2	0,12
2571450830	Torus cutter Solid carbide 40° 8 mm, R = 3,0 mm	11264268	8	60 - 130	80 - 150	120 - 200	0,050 - 0,070	0,8	0,4	0,2	0,12
2571451001	Torus cutter Solid carbide 40° 10 mm, R = 0,1 mm	11264269	10	60 - 130	80 - 150	120 - 200	0,055 - 0,080	1	0,5	0,25	0,15
2571451003	Torus cutter Solid carbide 40° 10 mm, R = 0,3 mm	11264270	10	60 - 130	80 - 150	120 - 200	0,055 - 0,081	1	0,5	0,25	0,15
2571451005	Torus cutter Solid carbide 40° 10 mm, R = 0,5 mm	11264271	10	60 - 130	80 - 150	120 - 200	0,055 - 0,082	1	0,5	0,25	0,15
2571451010	Torus cutter Solid carbide 40° 10 mm, R = 1,0 mm	11264272	10	60 - 130	80 - 150	120 - 200	0,055 - 0,083	1	0,5	0,25	0,15
2571451020	Torus cutter Solid carbide 40° 10 mm, R = 2,0 mm	11264273	10	60 - 130	80 - 150	120 - 200	0,055 - 0,084	1	0,5	0,25	0,15
2571451030	Torus cutter Solid carbide 40° 10 mm, R = 3,0 mm	11264274	10	60 - 130	80 - 150	120 - 200	0,055 - 0,085	1	0,5	0,25	0,15
2571451205	Torus cutter Solid carbide 40° 12 mm, R = 0,5 mm	11264275	12	60 - 130	80 - 150	120 - 200	0,065 - 0,090	1,2	0,6	0,3	0,18
2571451210	Torus cutter Solid carbide 40° 12 mm, R = 1,0 mm	11264276	12	60 - 130	80 - 150	120 - 200	0,065 - 0,090	1,2	0,6	0,3	0,18
2571451220	Torus cutter Solid carbide 40° 12 mm, R = 2,0 mm	11264277	12	60 - 130	80 - 150	120 - 200	0,065 - 0,090	1,2	0,6	0,3	0,18
2571451230	Torus cutter Solid carbide 40° 12 mm, R = 3,0 mm	11264278	12	60 - 130	80 - 150	120 - 200	0,065 - 0,090	1,2	0,6	0,3	0,18
2571451610	Torus cutter Solid carbide 40° 16 mm, R = 1,0 mm	11264279	16	60 - 130	80 - 150	120 - 200	0,075 - 0,110	1,6	0,8	0,4	0,24
2571451620	Torus cutter Solid carbide 40° 16 mm, R = 2,0 mm	11264280	16	60 - 130	80 - 150	120 - 200	0,075 - 0,110	1,6	0,8	0,4	0,24
2571451630	Torus cutter Solid carbide 40° 16 mm, R = 3,0 mm	11264281	16	60 - 130	80 - 150	120 - 200	0,075 - 0,110	1,6	0,8	0,4	0,24
2571500101	Torus cutter Solid carbide 30° 1,0 mm, R = 0,1 mm, long	11264282	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,02	0,01	0,005	0,003
2571500102	Torus cutter Solid carbide 30° 1,0 mm, R = 0,2 mm, long	11264283	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,02	0,01	0,005	0,003
2571500201	Torus cutter Solid carbide 30° 2,0 mm, R = 0,1 mm, long	11264284	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,04	0,02	0,01	0,006
2571500203	Torus cutter Solid carbide 30° 2,0 mm, R = 0,3 mm, long	11264285	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,04	0,02	0,01	0,006
2571500205	Torus cutter Solid carbide 30° 2,0 mm, R = 0,5 mm, long	11264286	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,04	0,02	0,01	0,006
2571500301	Torus cutter Solid carbide 30° 3,0 mm, R = 0,1 mm, long	11264287	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,12	0,06	0,03	0,018
2571500303	Torus cutter Solid carbide 30° 3,0 mm, R = 0,3 mm, long	11264288	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,12	0,06	0,03	0,018
2571500305	Torus cutter Solid carbide 30° 3,0 mm, R = 0,5 mm, long	11264289	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,12	0,06	0,03	0,018
2571500310	Torus cutter Solid carbide 30° 3,0 mm, R = 1,0 mm, long	11264290	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,12	0,06	0,03	0,018
2571500401	Torus cutter Solid carbide 30° 4,0 mm, R = 0,1 mm, long	11264291	4	60 - 130	80 - 150	120 - 200	0,030 - 0,045	0,24	0,12	0,06	0,036
2571500403	Torus cutter Solid carbide 30° 4,0 mm, R = 0,3 mm, long	11264292	4	60 - 130	80 - 150	120 - 200	0,030 - 0,045	0,24	0,12	0,06	0,036
2571500405	Torus cutter Solid carbide 30° 4,0 mm, R = 0,5 mm, long	11264293	4	60 - 130	80 - 150	120 - 200	0,030 - 0,045	0,24	0,12	0,06	0,036
2571500410	Torus cutter Solid carbide 30° 4,0 mm, R = 1,0 mm, long	11264294	4	60 - 130	80 - 150	120 - 200	0,030 - 0,045	0,24	0,12	0,06	0,036
2571500501	Torus cutter Solid carbide 30° 5,0 mm, R = 0,1 mm, long	11264295	5	60 - 130	80 - 150	120 - 200	0,035 - 0,050	0,3	0,15	0,075	0,045

Art.no.	Description	ATORN-no.	Ø	Cutting speed Vc			Feed fz Finishing/ Roughing	ae 0,2 x D ap Edge-banding	ae 0,05 x D ap Copy	ae 0,2 x D ap Edge-banding	ae 0,05 x D ap Copy
				<1400 N/mm	1400 N/mm up to 52 HRc	52 HRc up to 65 HRc		< 55 HRc	< 55 HRc	> 55 HRc	> 55 HRc
			mm	m/min (depending on max. speed)			mm / Z	mm	mm	mm	mm
2571500503	Torus cutter Solid carbide 30° 5,0 mm, R = 0,3 mm, long	11264296	5	60 - 130	80 - 150	120 - 200	0,035 - 0,050	0,3	0,15	0,075	0,045
2571500505	Torus cutter Solid carbide 30° 5,0 mm, R = 0,5 mm, long	11264297	5	60 - 130	80 - 150	120 - 200	0,035 - 0,050	0,3	0,15	0,075	0,045
2571500510	Torus cutter Solid carbide 30° 5,0 mm, R = 1,0 mm, long	11264298	5	60 - 130	80 - 150	120 - 200	0,035 - 0,050	0,3	0,15	0,075	0,045
2571500601	Torus cutter Solid carbide 30° 6,0 mm, R = 0,1 mm, long	11264299	6	60 - 130	80 - 150	120 - 200	0,040 - 0,055	0,48	0,24	0,12	0,072
2571500603	Torus cutter Solid carbide 30° 6,0 mm, R = 0,3 mm, long	11264300	6	60 - 130	80 - 150	120 - 200	0,040 - 0,055	0,48	0,24	0,12	0,072
2571500605	Torus cutter Solid carbide 30° 6,0 mm, R = 0,5 mm, long	11264301	6	60 - 130	80 - 150	120 - 200	0,040 - 0,055	0,48	0,24	0,12	0,072
2571500610	Torus cutter Solid carbide 30° 6,0 mm, R = 1,0 mm, long	11264302	6	60 - 130	80 - 150	120 - 200	0,040 - 0,055	0,48	0,24	0,12	0,072
2571500615	Torus cutter Solid carbide 30° 6,0 mm, R = 1,5 mm, long	11264303	6	60 - 130	80 - 150	120 - 200	0,040 - 0,055	0,48	0,24	0,12	0,072
2571500620	Torus cutter Solid carbide 30° 6,0 mm, R = 2,0 mm, long	11264304	6	60 - 130	80 - 150	120 - 200	0,040 - 0,055	0,48	0,24	0,12	0,072
2571500801	Torus cutter Solid carbide 30° 8,0 mm, R = 0,1 mm, long	11264305	8	60 - 130	80 - 150	120 - 200	0,050 - 0,065	0,64	0,32	0,16	0,096
2571500803	Torus cutter Solid carbide 30° 8,0 mm, R = 0,3 mm, long	11264306	8	60 - 130	80 - 150	120 - 200	0,050 - 0,065	0,64	0,32	0,16	0,096
2571500805	Torus cutter Solid carbide 30° 8,0 mm, R = 0,5 mm, long	11264307	8	60 - 130	80 - 150	120 - 200	0,050 - 0,065	0,64	0,32	0,16	0,096
2571500810	Torus cutter Solid carbide 30° 8,0 mm, R = 1,0 mm, long	11264308	8	60 - 130	80 - 150	120 - 200	0,050 - 0,065	0,64	0,32	0,16	0,096
2571500820	Torus cutter Solid carbide 30° 8,0 mm, R = 2,0 mm, long	11264309	8	60 - 130	80 - 150	120 - 200	0,050 - 0,065	0,64	0,32	0,16	0,096
2571500830	Torus cutter Solid carbide 30° 8,0 mm, R = 3,0 mm, long	11264310	8	60 - 130	80 - 150	120 - 200	0,050 - 0,065	0,64	0,32	0,16	0,096
2571501001	Torus cutter Solid carbide 30° 10,0 mm, R = 0,1 mm, long	11264311	10	60 - 130	80 - 150	120 - 200	0,055 - 0,080	0,8	0,4	0,2	0,12
2571501003	Torus cutter Solid carbide 30° 10,0 mm, R = 0,3 mm, long	11264312	10	60 - 130	80 - 150	120 - 200	0,055 - 0,080	0,8	0,4	0,2	0,12
2571501005	Torus cutter Solid carbide 30° 10,0 mm, R = 0,5 mm, long	11264313	10	60 - 130	80 - 150	120 - 200	0,055 - 0,080	0,8	0,4	0,2	0,12
2571501010	Torus cutter Solid carbide 30° 10,0 mm, R = 1,0 mm, long	11264314	10	60 - 130	80 - 150	120 - 200	0,055 - 0,080	0,8	0,4	0,2	0,12
2571501020	Torus cutter Solid carbide 30° 10,0 mm, R = 2,0 mm, long	11264315	10	60 - 130	80 - 150	120 - 200	0,055 - 0,080	0,8	0,4	0,2	0,12
2571501030	Torus cutter Solid carbide 30° 10,0 mm, R = 3,0 mm, long	11264316	10	60 - 130	80 - 150	120 - 200	0,055 - 0,080	0,8	0,4	0,2	0,12
2571501205	Torus cutter Solid carbide 30° 12 mm, R = 0,5 mm, long	11264317	12	60 - 130	80 - 150	120 - 200	0,065 - 0,090	0,96	0,48	0,24	0,144
2571501210	Torus cutter Solid carbide 30° 12 mm, R = 1,0 mm, long	11264318	12	60 - 130	80 - 150	120 - 200	0,065 - 0,090	0,96	0,48	0,24	0,144
2571501220	Torus cutter Solid carbide 30° 12 mm, R = 2,0 mm, long	11264319	12	60 - 130	80 - 150	120 - 200	0,065 - 0,090	0,96	0,48	0,24	0,144
2571501230	Torus cutter Solid carbide 30° 12 mm, R = 3,0 mm, long	11264320	12	60 - 130	80 - 150	120 - 200	0,065 - 0,090	0,96	0,48	0,24	0,144
2571501610	Torus cutter Solid carbide 30° 16 mm, R = 1,0 mm, long	11264321	16	60 - 130	80 - 150	120 - 200	0,075 - 0,110	1,28	0,64	0,32	0,192
2571501620	Torus cutter Solid carbide 30° 16 mm, R = 2,0 mm, long	11264322	16	60 - 130	80 - 150	120 - 200	0,075 - 0,110	1,28	0,64	0,32	0,192
2571501630	Torus cutter Solid carbide 30° 16 mm, R = 3,0 mm, long	11264323	16	60 - 130	80 - 150	120 - 200	0,075 - 0,110	1,28	0,64	0,32	0,192

ATORN Cutting data recommendations RockTec PRO Torus face milling cutter



- Please adjust these guideline values according to clamping operation and machine set-up!

257200.... 257205....

Art.no.	Description	ATORN-no.	Ø	Cutting speed Vc			Feed fz Finishing/ Roughing	Edge-banding ap	Edge-banding ae min.	Edge-banding ap	Edge-banding ae min.
				<1400 N/mm	1400 N/mm up to 52 HRc	52 HRc up to 65 HRc		< 55 HRc	< 55 HRc	> 55 HRc	> 55 HRc
			mm	m/min (depending on max. speed)			mm / Z	mm	mm	mm	mm
2572000020	Torus face milling cutter Solid carbide 12° 2mm	11264477	2	190	150	120	0,015 - 0,030	0,06	1,1	0,06	1,1
2572000030	Torus face milling cutter Solid carbide 12° 3mm	11264478	3	190	150	120	0,040 - 0,060	0,1	1,65	0,1	1,65
2572000040	Torus face milling cutter Solid carbide 12° 4mm	11264479	4	190	150	120	0,055 - 0,075	0,15	2,2	0,15	2,2
2572000050	Torus face milling cutter Solid carbide 12° 5mm	11264480	5	190	150	120	0,065 - 0,085	0,17	2,75	0,17	2,75
2572000060	Torus face milling cutter Solid carbide 12° 6mm	11264481	6	190	150	120	0,070 - 0,095	0,2	3,3	0,2	3,3
2572000080	Torus face milling cutter Solid carbide 12° 8mm	11264482	8	190	150	120	0,100 - 0,125	0,25	4,4	0,2	4,4
2572000100	Torus face milling cutter Solid carbide 12° 10mm	11264483	10	190	150	120	0,130 - 0,170	0,3	5,5	0,2	5,5
2572000120	Torus face milling cutter Solid carbide 12° 12mm	11264484	12	190	150	120	0,150 - 0,185	0,4	6,6	0,25	6,6
2572000160	Torus face milling cutter Solid carbide 12° 16mm	11264485	16	190	150	120	0,180 - 0,230	0,5	8,8	0,25	8,8
2572050020	Torus face milling cutter Solid carbide 12° 2mm, long	11264486	2	160	120	90	0,005 - 0,020	0,06	1,1	0,06	1,1
2572050030	Torus face milling cutter Solid carbide 12° 3mm, long	11264487	3	160	120	90	0,030 - 0,050	0,1	1,65	0,1	1,65
2572050040	Torus face milling cutter Solid carbide 12° 4mm, long	11264488	4	160	120	90	0,040 - 0,060	0,15	2,2	0,15	2,2
2572050050	Torus face milling cutter Solid carbide 12° 5mm, long	11264489	5	160	120	90	0,050 - 0,070	0,17	2,75	0,17	2,75
2572050060	Torus face milling cutter Solid carbide 12° 6mm, long	11264490	6	160	120	90	0,060 - 0,085	0,2	3,3	0,2	3,3
2572050080	Torus face milling cutter Solid carbide 12° 8mm, long	11264491	8	160	120	90	0,085 - 0,110	0,25	4,4	0,2	4,4
2572050100	Torus face milling cutter Solid carbide 12° 10mm, long	11264492	10	160	120	90	0,115 - 0,150	0,3	5,5	0,2	5,5
2572050120	Torus face milling cutter Solid carbide 12° 12mm, long	11264493	12	160	120	90	0,135 - 0,170	0,4	6,6	0,25	6,6

ATORN Cutting data recommendations RockTec PRO Mini Radius milling cutter

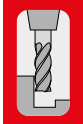
- Please adjust these guideline values according to clamping operation and machine set-up!



257100 ....

Art.no.	Description	ATORN-no.	Ø	Cutting speed Vc			Feed fz Finishing/ Roughing	ae			
								0,2 x D	0,05 x D	0,2 x D	0,05 x D
								ap			
								Edge-banding	Copy	Edge-banding	Copy
				<1400 N/mm	1400 N/mm up to 52 HRc	52 HRc up to 65 HRc		< 55 HRc	< 55 HRc	> 55 HRc	> 55 HRc
			mm	m/min (depending on max. speed)			mm / Z	mm	mm	mm	mm
2571000001	Mini Radius milling cutter Solid carbide 25° 0,1 mm, L2 = 0,3 mm	11264324	0,1	60 - 130	80 - 150	120 - 200	0,001 - 0,003	0,01	0,005	0,0025	0,0015
2571000002	Mini Radius milling cutter Solid carbide 25° 0,1 mm, L2 = 0,5 mm	11264325	0,1	60 - 130	80 - 150	120 - 200	0,001 - 0,003	0,01	0,005	0,0025	0,0015
2571000003	Mini Radius milling cutter Solid carbide 25° 0,1 mm, L2 = 1,0 mm	11264326	0,1	60 - 130	80 - 150	120 - 200	0,001 - 0,003	0,004	0,002	0,001	0,0006
2571000004	Mini Radius milling cutter Solid carbide 25° 0,2 mm, L2 = 0,5 mm	11264327	0,2	60 - 130	80 - 150	120 - 200	0,002 - 0,004	0,02	0,01	0,005	0,003
2571000005	Mini Radius milling cutter Solid carbide 25° 0,2 mm, L2 = 1,0 mm	11264328	0,2	60 - 130	80 - 150	120 - 200	0,002 - 0,005	0,02	0,01	0,005	0,003
2571000006	Mini Radius milling cutter Solid carbide 25° 0,2 mm, L2 = 2,0 mm	11264329	0,2	60 - 130	80 - 150	120 - 200	0,002 - 0,006	0,008	0,004	0,002	0,0012
2571000007	Mini Radius milling cutter Solid carbide 25° 0,2 mm, L2 = 3,0 mm	11264330	0,2	60 - 130	80 - 150	120 - 200	0,002 - 0,007	0,004	0,002	0,001	0,0006
2571000008	Mini Radius milling cutter Solid carbide 25° 0,3 mm, L2 = 0,5 mm	11264331	0,3	60 - 130	80 - 150	120 - 200	0,003 - 0,006	0,03	0,015	0,0075	0,0045
2571000009	Mini Radius milling cutter Solid carbide 25° 0,3 mm, L2 = 1,0 mm	11264332	0,3	60 - 130	80 - 150	120 - 200	0,003 - 0,006	0,03	0,015	0,0075	0,0045
2571000010	Mini Radius milling cutter Solid carbide 25° 0,3 mm, L2 = 2,0 mm	11264333	0,3	60 - 130	80 - 150	120 - 200	0,003 - 0,006	0,024	0,012	0,006	0,0036
2571000011	Mini Radius milling cutter Solid carbide 25° 0,3 mm, L2 = 3,0 mm	11264334	0,3	60 - 130	80 - 150	120 - 200	0,003 - 0,006	0,012	0,006	0,003	0,0018
2571000012	Mini Radius milling cutter Solid carbide 25° 0,3 mm, L2 = 4,0 mm	11264335	0,3	60 - 130	80 - 150	120 - 200	0,003 - 0,006	0,006	0,003	0,0015	0,0009
2571000013	Mini Radius milling cutter Solid carbide 25° 0,4 mm, L2 = 1,0 mm	11264336	0,4	60 - 130	80 - 150	120 - 200	0,004 - 0,008	0,04	0,02	0,01	0,006
2571000014	Mini Radius milling cutter Solid carbide 25° 0,4 mm, L2 = 2,0 mm	11264337	0,4	60 - 130	80 - 150	120 - 200	0,004 - 0,008	0,04	0,02	0,01	0,006
2571000015	Mini Radius milling cutter Solid carbide 25° 0,4 mm, L2 = 3,0 mm	11264338	0,4	60 - 130	80 - 150	120 - 200	0,004 - 0,008	0,024	0,012	0,006	0,0036
2571000016	Mini Radius milling cutter Solid carbide 25° 0,4 mm, L2 = 4,0 mm	11264339	0,4	60 - 130	80 - 150	120 - 200	0,004 - 0,008	0,016	0,008	0,004	0,0024
2571000017	Mini Radius milling cutter Solid carbide 25° 0,4 mm, L2 = 5,0 mm	11264340	0,4	60 - 130	80 - 150	120 - 200	0,004 - 0,008	0,008	0,004	0,002	0,0012
2571000018	Mini Radius milling cutter Solid carbide 25° 0,4 mm, L2 = 6,0 mm	11264341	0,4	60 - 130	80 - 150	120 - 200	0,004 - 0,008	0,008	0,004	0,002	0,0012
2571000019	Mini Radius milling cutter Solid carbide 25° 0,5 mm, L2 = 1,0 mm	11264342	0,5	60 - 130	80 - 150	120 - 200	0,005 - 0,009	0,05	0,025	0,0125	0,0075
2571000020	Mini Radius milling cutter Solid carbide 25° 0,5 mm, L2 = 2,0 mm	11264343	0,5	60 - 130	80 - 150	120 - 200	0,005 - 0,009	0,05	0,025	0,0125	0,0075
2571000021	Mini Radius milling cutter Solid carbide 25° 0,5 mm, L2 = 3,0 mm	11264344	0,5	60 - 130	80 - 150	120 - 200	0,005 - 0,009	0,04	0,02	0,01	0,006
2571000022	Mini Radius milling cutter Solid carbide 25° 0,5 mm, L2 = 4,0 mm	11264345	0,5	60 - 130	80 - 150	120 - 200	0,005 - 0,009	0,03	0,015	0,0075	0,0045
2571000023	Mini Radius milling cutter Solid carbide 25° 0,5 mm, L2 = 5,0 mm	11264346	0,5	60 - 130	80 - 150	120 - 200	0,005 - 0,009	0,02	0,01	0,005	0,003
2571000024	Mini Radius milling cutter Solid carbide 25° 0,5 mm, L2 = 6,0 mm	11264347	0,5	60 - 130	80 - 150	120 - 200	0,005 - 0,009	0,01	0,005	0,0025	0,0015
2571000025	Mini Radius milling cutter Solid carbide 25° 0,5 mm, L2 = 8,0 mm	11264348	0,5	60 - 130	80 - 150	120 - 200	0,005 - 0,009	0,01	0,005	0,0025	0,0015
2571000026	Mini Radius milling cutter Solid carbide 25° 0,5 mm, L2 = 10,0 mm	11264349	0,5	60 - 130	80 - 150	120 - 200	0,005 - 0,009	0,01	0,005	0,0025	0,0015
2571000027	Mini Radius milling cutter Solid carbide 25° 0,6 mm, L2 = 2,0 mm	11264350	0,6	60 - 130	80 - 150	120 - 200	0,006 - 0,010	0,06	0,03	0,015	0,009
2571000028	Mini Radius milling cutter Solid carbide 25° 0,6 mm, L2 = 4,0 mm	11264351	0,6	60 - 130	80 - 150	120 - 200	0,006 - 0,010	0,048	0,024	0,012	0,0072
2571000029	Mini Radius milling cutter Solid carbide 25° 0,6 mm, L2 = 6,0 mm	11264352	0,6	60 - 130	80 - 150	120 - 200	0,006 - 0,010	0,024	0,012	0,006	0,0036
2571000030	Mini Radius milling cutter Solid carbide 25° 0,6 mm, L2 = 8,0 mm	11264353	0,6	60 - 130	80 - 150	120 - 200	0,006 - 0,010	0,012	0,006	0,003	0,0018
2571000031	Mini Radius milling cutter Solid carbide 25° 0,6 mm, L2 = 10,0 mm	11264354	0,6	60 - 130	80 - 150	120 - 200	0,006 - 0,010	0,012	0,006	0,003	0,0018
2571000032	Mini Radius milling cutter Solid carbide 30° 0,8 mm, L2 = 2,0 mm	11264355	0,8	60 - 130	80 - 150	120 - 200	0,007 - 0,012	0,08	0,04	0,02	0,012
2571000033	Mini Radius milling cutter Solid carbide 30° 0,8 mm, L2 = 4,0 mm	11264356	0,8	60 - 130	80 - 150	120 - 200	0,007 - 0,012	0,08	0,04	0,02	0,012
2571000034	Mini Radius milling cutter Solid carbide 30° 0,8 mm, L2 = 6,0 mm	11264357	0,8	60 - 130	80 - 150	120 - 200	0,007 - 0,012	0,048	0,024	0,012	0,0072
2571000035	Mini Radius milling cutter Solid carbide 30° 0,8 mm, L2 = 8,0 mm	11264358	0,8	60 - 130	80 - 150	120 - 200	0,007 - 0,012	0,032	0,016	0,008	0,0048
2571000036	Mini Radius milling cutter Solid carbide 30° 0,8 mm, L2 = 10,0 mm	11264359	0,8	60 - 130	80 - 150	120 - 200	0,007 - 0,012	0,016	0,008	0,004	0,0024
2571000037	Mini Radius milling cutter Solid carbide 30° 1,0 mm, L2 = 2,0 mm	11264360	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,1	0,05	0,025	0,015
2571000038	Mini Radius milling cutter Solid carbide 30° 1,0 mm, L2 = 4,0 mm	11264361	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,1	0,05	0,025	0,015
2571000039	Mini Radius milling cutter Solid carbide 30° 1,0 mm, L2 = 6,0 mm	11264362	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,08	0,04	0,02	0,012
2571000040	Mini Radius milling cutter Solid carbide 30° 1,0 mm, L2 = 8,0 mm	11264363	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,06	0,03	0,015	0,009
2571000041	Mini Radius milling cutter Solid carbide 30° 1,0 mm, L2 = 10,0 mm	11264364	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,04	0,02	0,01	0,006
2571000042	Mini Radius milling cutter Solid carbide 30° 1,0 mm, L2 = 15,0 mm	11264365	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,02	0,01	0,005	0,003
2571000043	Mini Radius milling cutter Solid carbide 30° 1,0 mm, L2 = 20,0 mm	11264366	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,02	0,01	0,005	0,003
2571000044	Mini Radius milling cutter Solid carbide 30° 1,0 mm, L2 = 25,0 mm	11264367	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,02	0,01	0,005	0,003
2571000045	Mini Radius milling cutter Solid carbide 30° 1,2 mm, L2 = 2,0 mm	11264368	1,2	60 - 130	80 - 150	120 - 200	0,010 - 0,016	0,12	0,06	0,03	0,018
2571000046	Mini Radius milling cutter Solid carbide 30° 1,2 mm, L2 = 4,0 mm	11264369	1,2	60 - 130	80 - 150	120 - 200	0,010 - 0,016	0,12	0,06	0,03	0,018
2571000047	Mini Radius milling cutter Solid carbide 30° 1,2 mm, L2 = 6,0 mm	11264370	1,2	60 - 130	80 - 150	120 - 200	0,010 - 0,016	0,12	0,06	0,03	0,018
2571000048	Mini Radius milling cutter Solid carbide 30° 1,2 mm, L2 = 8,0 mm	11264371	1,2	60 - 130	80 - 150	120 - 200	0,010 - 0,016	0,096	0,048	0,024	0,0144

Art.no.	Description	ATORN-no.	Ø	Cutting speed Vc			Feed fz Finishing/ Roughing	ae			
								0,2 x D	0,05 x D	0,2 x D	0,05 x D
								ap			
								Edge-banding	Copy	Edge-banding	Copy
				<1400 N/mm	1400 N/mm up to 52 HRc	52 HRc up to 65 HRc		< 55 HRc	< 55 HRc	> 55 HRc	> 55 HRc
			mm	m/min (depending on max. speed)			mm / Z	mm	mm	mm	mm
2571000049	Mini Radius milling cutter Solid carbide 30° 1,2 mm, L2 = 10,0 mm	11264372	1,2	60 - 130	80 - 150	120 - 200	0,010 - 0,016	0,072	0,036	0,018	0,0108
2571000050	Mini Radius milling cutter Solid carbide 30° 1,2 mm, L2 = 15,0 mm	11264373	1,2	60 - 130	80 - 150	120 - 200	0,010 - 0,016	0,024	0,012	0,006	0,0036
2571000051	Mini Radius milling cutter Solid carbide 30° 1,2 mm, L2 = 20,0 mm	11264374	1,2	60 - 130	80 - 150	120 - 200	0,010 - 0,016	0,024	0,012	0,006	0,0036
2571000052	Mini Radius milling cutter Solid carbide 30° 1,2 mm, L2 = 25,0 mm	11264375	1,2	60 - 130	80 - 150	120 - 200	0,010 - 0,016	0,024	0,012	0,006	0,0036
2571000053	Mini Radius milling cutter Solid carbide 30° 1,5 mm, L2 = 3,0 mm	11264376	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,15	0,075	0,0375	0,0225
2571000054	Mini Radius milling cutter Solid carbide 30° 1,5 mm, L2 = 4,0 mm	11264377	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,15	0,075	0,0375	0,0225
2571000055	Mini Radius milling cutter Solid carbide 30° 1,5 mm, L2 = 6,0 mm	11264378	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,15	0,075	0,0375	0,0225
2571000056	Mini Radius milling cutter Solid carbide 30° 1,5 mm, L2 = 8,0 mm	11264379	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,15	0,075	0,0375	0,0225
2571000057	Mini Radius milling cutter Solid carbide 30° 1,5 mm, L2 = 10,0 mm	11264380	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,12	0,06	0,03	0,018
2571000058	Mini Radius milling cutter Solid carbide 30° 1,5 mm, L2 = 15,0 mm	11264381	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,06	0,03	0,015	0,009
2571000059	Mini Radius milling cutter Solid carbide 30° 1,5 mm, L2 = 20,0 mm	11264382	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,03	0,015	0,0075	0,0045
2571000060	Mini Radius milling cutter Solid carbide 30° 1,5 mm, L2 = 25,0 mm	11264383	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,03	0,015	0,0075	0,0045
2571000061	Mini Radius milling cutter Solid carbide 30° 1,6 mm, L2 = 4,0 mm	11264384	1,6	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,16	0,08	0,04	0,024
2571000062	Mini Radius milling cutter Solid carbide 30° 1,6 mm, L2 = 8,0 mm	11264385	1,6	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,16	0,08	0,04	0,024
2571000063	Mini Radius milling cutter Solid carbide 30° 1,6 mm, L2 = 10,0 mm	11264386	1,6	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,128	0,064	0,032	0,0192
2571000064	Mini Radius milling cutter Solid carbide 30° 1,6 mm, L2 = 15,0 mm	11264387	1,6	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,096	0,048	0,024	0,0144
2571000065	Mini Radius milling cutter Solid carbide 30° 1,6 mm, L2 = 20,0 mm	11264388	1,6	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,032	0,016	0,008	0,0048
2571000066	Mini Radius milling cutter Solid carbide 30° 1,6 mm, L2 = 25,0 mm	11264389	1,6	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,032	0,016	0,008	0,0048
2571000067	Mini Radius milling cutter Solid carbide 30° 1,8 mm, L2 = 8,0 mm	11264390	1,8	60 - 130	80 - 150	120 - 200	0,014 - 0,020	0,18	0,09	0,045	0,027
2571000068	Mini Radius milling cutter Solid carbide 30° 1,8 mm, L2 = 10,0 mm	11264391	1,8	60 - 130	80 - 150	120 - 200	0,014 - 0,020	0,144	0,072	0,036	0,0216
2571000069	Mini Radius milling cutter Solid carbide 30° 1,8 mm, L2 = 15,0 mm	11264392	1,8	60 - 130	80 - 150	120 - 200	0,014 - 0,020	0,108	0,054	0,027	0,0162
2571000070	Mini Radius milling cutter Solid carbide 30° 1,8 mm, L2 = 20,0 mm	11264393	1,8	60 - 130	80 - 150	120 - 200	0,014 - 0,020	0,072	0,036	0,018	0,0108
2571000071	Mini Radius milling cutter Solid carbide 30° 1,8 mm, L2 = 25,0 mm	11264394	1,8	60 - 130	80 - 150	120 - 200	0,014 - 0,020	0,036	0,018	0,009	0,0054
2571000072	Mini Radius milling cutter Solid carbide 30° 2,0 mm, L2 = 4,0 mm	11264395	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,2	0,1	0,05	0,03
2571000073	Mini Radius milling cutter Solid carbide 30° 2,0 mm, L2 = 6,0 mm	11264396	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,2	0,1	0,05	0,03
2571000074	Mini Radius milling cutter Solid carbide 30° 2,0 mm, L2 = 8,0 mm	11264397	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,2	0,1	0,05	0,03
2571000075	Mini Radius milling cutter Solid carbide 30° 2,0 mm, L2 = 10,0 mm	11264398	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,2	0,1	0,05	0,03
2571000076	Mini Radius milling cutter Solid carbide 30° 2,0 mm, L2 = 15,0 mm	11264399	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,12	0,06	0,03	0,018
2571000077	Mini Radius milling cutter Solid carbide 30° 2,0 mm, L2 = 20,0 mm	11264400	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,08	0,04	0,02	0,012
2571000078	Mini Radius milling cutter Solid carbide 30° 2,0 mm, L2 = 25,0 mm	11264401	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,04	0,02	0,01	0,006
2571000079	Mini Radius milling cutter Solid carbide 30° 2,0 mm, L2 = 30,0 mm	11264402	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,04	0,02	0,01	0,006
2571000080	Mini Radius milling cutter Solid carbide 30° 2,0 mm, L2 = 35,0 mm	11264403	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,04	0,02	0,01	0,006
2571000081	Mini Radius milling cutter Solid carbide 30° 2,0 mm, L2 = 40,0 mm	11264404	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,04	0,02	0,01	0,006
2571000082	Mini Radius milling cutter Solid carbide 30° 2,5 mm, L2 = 6,0 mm	11264405	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,25	0,125	0,0625	0,0375
2571000083	Mini Radius milling cutter Solid carbide 30° 2,5 mm, L2 = 8,0 mm	11264406	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,25	0,125	0,0625	0,0375
2571000084	Mini Radius milling cutter Solid carbide 30° 2,5 mm, L2 = 10,0 mm	11264407	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,25	0,125	0,0625	0,0375
2571000085	Mini Radius milling cutter Solid carbide 30° 2,5 mm, L2 = 15,0 mm	11264408	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,2	0,1	0,05	0,03
2571000086	Mini Radius milling cutter Solid carbide 30° 2,5 mm, L2 = 20,0 mm	11264409	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,15	0,075	0,0375	0,0225
2571000087	Mini Radius milling cutter Solid carbide 30° 2,5 mm, L2 = 25,0 mm	11264410	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,1	0,05	0,025	0,015
2571000088	Mini Radius milling cutter Solid carbide 30° 2,5 mm, L2 = 30,0 mm	11264411	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,05	0,025	0,0125	0,0075
2571000089	Mini Radius milling cutter Solid carbide 30° 2,5 mm, L2 = 35,0 mm	11264412	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,05	0,025	0,0125	0,0075
2571000090	Mini Radius milling cutter Solid carbide 30° 2,5 mm, L2 = 40,0 mm	11264413	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,05	0,025	0,0125	0,0075
2571000091	Mini Radius milling cutter Solid carbide 30° 3,0 mm, L2 = 6,0 mm	11264414	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,3	0,15	0,075	0,045
2571000092	Mini Radius milling cutter Solid carbide 30° 3,0 mm, L2 = 8,0 mm	11264415	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,3	0,15	0,075	0,045
2571000093	Mini Radius milling cutter Solid carbide 30° 3,0 mm, L2 = 10,0 mm	11264416	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,3	0,15	0,075	0,045
2571000094	Mini Radius milling cutter Solid carbide 30° 3,0 mm, L2 = 15,0 mm	11264417	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,3	0,15	0,075	0,045
2571000095	Mini Radius milling cutter Solid carbide 30° 3,0 mm, L2 = 20,0 mm	11264418	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,24	0,12	0,06	0,036
2571000096	Mini Radius milling cutter Solid carbide 30° 3,0 mm, L2 = 25,0 mm	11264419	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,18	0,09	0,045	0,027
2571000097	Mini Radius milling cutter Solid carbide 30° 3,0 mm, L2 = 30,0 mm	11264420	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,12	0,06	0,03	0,018
2571000098	Mini Radius milling cutter Solid carbide 30° 3,0 mm, L2 = 35,0 mm	11264421	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,06	0,03	0,015	0,009
2571000099	Mini Radius milling cutter Solid carbide 30° 3,0 mm, L2 = 40,0 mm	11264422	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,06	0,03	0,015	0,009



ATORN Cutting data recommendations RockTec PRO Radius milling cutter 2Z

- Please adjust these guideline values according to clamping operation and machine set-up!



257105.... 257110.... 257115....
257245... 257116....

Art.no.	Description	ATORN-no.	Ø	Cutting speed Vc			Feed fz Finishing/ Roughing	ae			
								0,2 x D	0,05 x D	0,2 x D	0,05 x D
								ap			
								Edge-banding	Copy	Edge-banding	Copy
				<1400 N/mm	1400 N/mm up to 52 HRc	52 HRc up to 65 HRc		< 55 HRc	< 55 HRc	> 55 HRc	> 55 HRc
			mm	m/min (depending on max. speed)			mm / Z	mm	mm	mm	mm
2571050010	Radius milling cutter Solid carbide 30° 1 mm, short	11264423	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,1	0,05	0,025	0,015
2571050015	Radius milling cutter Solid carbide 30° 1,5 mm, short	11264424	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,15	0,075	0,0375	0,0225
2571050020	Radius milling cutter Solid carbide 30° 2 mm, short	11264425	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,2	0,1	0,05	0,03
2571050025	Radius milling cutter Solid carbide 30° 2,5 mm, short	11264426	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,25	0,125	0,0625	0,0375
2571050030	Radius milling cutter Solid carbide 30° 3 mm, short	11264427	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,3	0,15	0,075	0,045
2571050040	Radius milling cutter Solid carbide 30° 4 mm, short	11264428	4	60 - 130	80 - 150	120 - 200	0,030 - 0,045	0,4	0,2	0,1	0,06
2571050050	Radius milling cutter Solid carbide 30° 5 mm, short	11264429	5	60 - 130	80 - 150	120 - 200	0,035 - 0,050	0,5	0,25	0,125	0,075
2571050060	Radius milling cutter Solid carbide 30° 6 mm, short	11264430	6	60 - 130	80 - 150	120 - 200	0,040 - 0,055	0,6	0,3	0,15	0,09
2571050080	Radius milling cutter Solid carbide 30° 8 mm, short	11264431	8	60 - 130	80 - 150	120 - 200	0,050 - 0,065	0,8	0,4	0,2	0,12
2571050100	Radius milling cutter Solid carbide 30° 10 mm, short	11264432	10	60 - 130	80 - 150	120 - 200	0,055 - 0,080	1	0,5	0,25	0,15
2571050120	Radius milling cutter Solid carbide 30° 12 mm, short	11264433	12	60 - 130	80 - 150	120 - 200	0,065 - 0,090	1,2	0,6	0,3	0,18
2571050160	Radius milling cutter Solid carbide 30° 16 mm, short	11264434	16	60 - 130	80 - 150	120 - 200	0,075 - 0,110	1,6	0,8	0,4	0,24
2571050200	Radius milling cutter Solid carbide 30° 20 mm, short	11264435	20	60 - 130	80 - 150	120 - 200	0,085 - 0,150	2	1	0,5	0,3
2571100010	Radius milling cutter Solid carbide 30° 1 mm	11264081	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,1	0,05	0,025	0,015
2571100015	Radius milling cutter Solid carbide 30° 1,5 mm	11264082	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,15	0,075	0,0375	0,0225
2571100020	Radius milling cutter Solid carbide 30° 2 mm	11264083	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,2	0,1	0,05	0,03
2571100025	Radius milling cutter Solid carbide 30° 2,5 mm	11264084	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,25	0,125	0,0625	0,0375
2571100030	Radius milling cutter Solid carbide 30° 3 mm	11264085	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,3	0,15	0,075	0,045
2571100040	Radius milling cutter Solid carbide 30° 4 mm	11264086	4	60 - 130	80 - 150	120 - 200	0,030 - 0,045	0,4	0,2	0,1	0,06
2571100050	Radius milling cutter Solid carbide 30° 5 mm	11264087	5	60 - 130	80 - 150	120 - 200	0,035 - 0,050	0,5	0,25	0,125	0,075
2571100060	Radius milling cutter Solid carbide 30° 6 mm	11264088	6	60 - 130	80 - 150	120 - 200	0,040 - 0,055	0,6	0,3	0,15	0,09
2571100080	Radius milling cutter Solid carbide 30° 8 mm	11264089	8	60 - 130	80 - 150	120 - 200	0,050 - 0,065	0,8	0,4	0,2	0,12
2571100100	Radius milling cutter Solid carbide 30° 10 mm	11264090	10	60 - 130	80 - 150	120 - 200	0,055 - 0,080	1	0,5	0,25	0,15
2571100120	Radius milling cutter Solid carbide 30° 12 mm	11264091	12	60 - 130	80 - 150	120 - 200	0,065 - 0,090	1,2	0,6	0,3	0,18
2571100160	Radius milling cutter Solid carbide 30° 16 mm	11264092	16	60 - 130	80 - 150	120 - 200	0,075 - 0,110	1,6	0,8	0,4	0,24
2571100200	Radius milling cutter Solid carbide 30° 20 mm	11264093	20	60 - 130	80 - 150	120 - 200	0,085 - 0,150	2	1	0,5	0,3
2571150010	Radius milling cutter Solid carbide 30° 1 mm, long	11264094	1	60 - 130	80 - 150	120 - 200	0,008 - 0,015	0,1	0,05	0,025	0,015
2571150015	Radius milling cutter Solid carbide 30° 1,5 mm, long	11264095	1,5	60 - 130	80 - 150	120 - 200	0,012 - 0,018	0,15	0,075	0,0375	0,0225
2571150020	Radius milling cutter Solid carbide 30° 2 mm, long	11264096	2	60 - 130	80 - 150	120 - 200	0,016 - 0,022	0,2	0,1	0,05	0,03
2571150025	Radius milling cutter Solid carbide 30° 2,5 mm, long	11264097	2,5	60 - 130	80 - 150	120 - 200	0,018 - 0,025	0,25	0,125	0,0625	0,0375
2571150030	Radius milling cutter Solid carbide 30° 3 mm, long	11264098	3	60 - 130	80 - 150	120 - 200	0,020 - 0,028	0,3	0,15	0,075	0,045
2571150040	Radius milling cutter Solid carbide 30° 4 mm, long	11264099	4	60 - 130	80 - 150	120 - 200	0,030 - 0,045	0,4	0,2	0,1	0,06
2571150050	Radius milling cutter Solid carbide 30° 5 mm, long	11264100	5	60 - 130	80 - 150	120 - 200	0,035 - 0,050	0,5	0,25	0,125	0,075
2571150060	Radius milling cutter Solid carbide 30° 6 mm, long	11264101	6	60 - 130	80 - 150	120 - 200	0,040 - 0,055	0,6	0,3	0,15	0,09
2571150080	Radius milling cutter Solid carbide 30° 8 mm, long	11264102	8	60 - 130	80 - 150	120 - 200	0,050 - 0,065	0,8	0,4	0,2	0,12
2571150100	Radius milling cutter Solid carbide 30° 10 mm, long	11264103	10	60 - 130	80 - 150	120 - 200	0,055 - 0,080	1	0,5	0,25	0,15
2571150120	Radius milling cutter Solid carbide 30° 12 mm, long	11264104	12	60 - 130	80 - 150	120 - 200	0,065 - 0,090	1,2	0,6	0,3	0,18
2571150160	Radius milling cutter Solid carbide 30° 16 mm, long	11264105	16	60 - 130	80 - 150	120 - 200	0,075 - 0,110	1,6	0,8	0,4	0,24
2571150200	Radius milling cutter Solid carbide 30° 20 mm, long	11264106	20	60 - 130	80 - 150	120 - 200	0,085 - 0,150	2	1	0,5	0,3

ATORN Cutting data recommendations RockTec PRO Radius milling cutter 4Z

- Please adjust these guideline values according to clamping operation and machine set-up!



257106.... 257111.... 257250....

Art.no.	Description	ATORN-no.	Ø	Cutting speed Vc			Feed fz Finishing/ Roughing	ae			
								0,2 x D	0,05 x D	0,2 x D	0,05 x D
								ap			
								Edge-banding	Copy	Edge-banding	Copy
				<1400 N/mm	1400 N/mm up to 52 HRc	52 HRc up to 65 HRc		< 55 HRc	< 55 HRc	> 55 HRc	> 55 HRc
			mm	m/min (depending on max. speed)			mm / Z	mm	mm	mm	mm
2571060010	Radius milling cutter Solid carbide 30° 1 mm, short	11265539	1	60 - 130	60 - 150	120 - 200	0,008 - 0,015	0,1	0,05	0,025	0,015
2571060015	Radius milling cutter Solid carbide 30° 1,5 mm, short	11265540	1,5	60 - 130	60 - 150	120 - 200	0,012 - 0,018	0,15	0,075	0,0375	0,0225
2571060020	Radius milling cutter Solid carbide 30° 2 mm, short	11265541	2	60 - 130	60 - 150	120 - 200	0,016 - 0,022	0,2	0,1	0,05	0,03
2571060025	Radius milling cutter Solid carbide 30° 2,5 mm, short	11265542	2,5	60 - 130	60 - 150	120 - 200	0,018 - 0,025	0,25	0,125	0,0625	0,0375
2571060030	Radius milling cutter Solid carbide 30° 3 mm, short	11265543	3	60 - 130	60 - 150	120 - 200	0,020 - 0,028	0,3	0,15	0,075	0,045
2571060040	Radius milling cutter Solid carbide 30° 4 mm, short	11265544	4	60 - 130	60 - 150	120 - 200	0,030 - 0,045	0,4	0,2	0,1	0,06
2571060050	Radius milling cutter Solid carbide 30° 5 mm, short	11265545	5	60 - 130	60 - 150	120 - 200	0,035 - 0,050	0,5	0,25	0,125	0,075
2571060060	Radius milling cutter Solid carbide 30° 6 mm, short	11265546	6	60 - 130	60 - 150	120 - 200	0,040 - 0,055	0,6	0,3	0,15	0,09
2571060080	Radius milling cutter Solid carbide 30° 8 mm, short	11265547	8	60 - 130	60 - 150	120 - 200	0,050 - 0,065	0,8	0,4	0,2	0,12
2571060100	Radius milling cutter Solid carbide 30° 10 mm, short	11265548	10	60 - 130	60 - 150	120 - 200	0,055 - 0,080	1	0,5	0,25	0,15
2571060120	Radius milling cutter Solid carbide 30° 12 mm, short	11265549	12	60 - 130	60 - 150	120 - 200	0,065 - 0,090	1,2	0,6	0,3	0,18
2571060160	Radius milling cutter Solid carbide 30° 16 mm, short	11265550	16	60 - 130	60 - 150	120 - 200	0,075 - 0,110	1,6	0,8	0,4	0,24
2571060200	Radius milling cutter Solid carbide 30° 20 mm, short	11265551	20	60 - 130	60 - 150	120 - 200	0,085 - 0,150	2	1	0,5	0,3
2571110010	Radius milling cutter Solid carbide 30° 1 mm	11265552	1	60 - 130	60 - 150	120 - 200	0,008 - 0,015	0,1	0,05	0,025	0,015
2571110015	Radius milling cutter Solid carbide 30° 1,5 mm	11265553	1,5	60 - 130	60 - 150	120 - 200	0,012 - 0,018	0,15	0,075	0,0375	0,0225
2571110020	Radius milling cutter Solid carbide 30° 2 mm	11265554	2	60 - 130	60 - 150	120 - 200	0,016 - 0,022	0,2	0,1	0,05	0,03
2571110025	Radius milling cutter Solid carbide 30° 2,5 mm	11265555	2,5	60 - 130	60 - 150	120 - 200	0,018 - 0,025	0,25	0,125	0,0625	0,0375
2571110030	Radius milling cutter Solid carbide 30° 3 mm	11265556	3	60 - 130	60 - 150	120 - 200	0,020 - 0,028	0,3	0,15	0,075	0,045
2571110040	Radius milling cutter Solid carbide 30° 4 mm	11265557	4	60 - 130	60 - 150	120 - 200	0,030 - 0,045	0,4	0,2	0,1	0,06
2571110050	Radius milling cutter Solid carbide 30° 5 mm	11265558	5	60 - 130	60 - 150	120 - 200	0,035 - 0,050	0,5	0,25	0,125	0,075
2571110060	Radius milling cutter Solid carbide 30° 6 mm	11265559	6	60 - 130	60 - 150	120 - 200	0,040 - 0,055	0,6	0,3	0,15	0,09
2571110080	Radius milling cutter Solid carbide 30° 8 mm	11265560	8	60 - 130	60 - 150	120 - 200	0,050 - 0,065	0,8	0,4	0,2	0,12
2571110100	Radius milling cutter Solid carbide 30° 10 mm	11265561	10	60 - 130	60 - 150	120 - 200	0,055 - 0,080	1	0,5	0,25	0,15
2571110120	Radius milling cutter Solid carbide 30° 12 mm	11265562	12	60 - 130	60 - 150	120 - 200	0,065 - 0,090	1,2	0,6	0,3	0,18
2571110160	Radius milling cutter Solid carbide 30° 16 mm	11265563	16	60 - 130	60 - 150	120 - 200	0,075 - 0,110	1,6	0,8	0,4	0,24
2571110200	Radius milling cutter Solid carbide 30° 20 mm	11265564	20	60 - 130	60 - 150	120 - 200	0,085 - 0,150	2	1	0,5	0,3

ATORN Thread milling cutter options

ISO internal thread

Thread	Core dimension	Required tool	Required indexable insert
M4x0.7 R	3.33	MTB 06031 C7 0.7 ISO*	-
M5x0.8 R	4.23	MTB 06038 C9 0.8 ISO*	-
M6x0.75	5.38	MTB 06045 C10 0.75 ISO*	-
M6x1.0 R	5.04	MTB 06046 C10 1.0 ISO*	-
M8x1.0	7.04	MTB 06046 C10 1.0 ISO*	-
M8x1.25 R	6.78	MTB 0606 C14 1.25 ISO*	-
M9x1.0	8.15	MTB 0606 C12 1.0 ISO*	-
M10x1.0	9.04	MTB 0808 D16 1.0 ISO*	-
M10x1.5	8.53	MTB 08078 C17 1.5 ISO*	-
M12x0.5	11.53	SR0009H12	12 I 0.5 ISO
M12x0.75	11.28	SR0009H12	12 I 0.75 ISO
M12x1.0	11.04	SR0009H12	12 I 1.0 ISO
M12x1.25	10.76	SR0009H12	12 I 1.25 ISO
M12x1.5	10.37	MTB 08078 C17 1.5 ISO*	-
M12x1.75 R	10.27	MTB 1009 C20 1.75 ISO*	-
M14x0.5	13.53	SR0012F14	14 I 0.5 ISO
M14x0.75	13.28	SR0012F14	14 I 0.75 ISO
M14x1.0	13.04	SR0009H12	12 I 1.0 ISO
M14x1.5	12.53	SR0009H12	12 I 1.5 ISO
M14x2.0 R	12.02	MTB1010C27 2.0 ISO*	-
M16x0.5	15.53	SR0012F14	14 I 0.5 ISO
M16x0.75	15.28	SR0012F14	14 I 0.75 ISO
M16x1.0	15.04	SR0012F14	14 I 1.0 ISO
M16x1.5	14.53	SR0012F14	14 I 1.5 ISO
M16x2.0 R	14.02	SR0012F14	14 I 2.0 ISO
M18x0.5	17.53	SR0012F14	14 I 0.5 ISO
M18x0.75	17.28	SR0012F14	14 I 0.75 ISO
M18x1.0	17.04	SR0012F14	14 I 1.0 ISO
M18x1.5	16.53	SR0012F14	14 I 1.5 ISO
M18x2.0	16.02	SR0012F14	14 I 2.0 ISO
M18x2.5 R	15.52	SR0012F14	14 I 2.5 ISO
M20x0.5	19.53	SR0014H14	14 I 0.5 ISO
M20x0.75	19.28	SR0014H14	14 I 0.75 ISO
M20x1.0	19.04	SR0014H14	14 I 1.0 ISO
M20x1.5	18.53	SR0014H14	14 I 1.5 ISO
M20x2.0	18.02	SR0014H14	14 I 2.0 ISO
M20x2.5 R	17.52	SR0014H14	14 I 2.5 ISO
M22x0.5	21.53	SR0017H14	14 I 0.5 ISO
M22x0.75	21.28	SR0017H14	14 I 0.75 ISO
M22x1.0	21.04	SR0017H14	14 I 1.0 ISO
M22x1.5	20.53	SR0017H14	14 I 1.5 ISO
M22x2.0	20.02	SR0017H14	14 I 2.0 ISO
M22x2.5 R	19.52	SR0017H14	14 I 2.5 ISO
M24x0.5	23.53	SR0017H14	14 I 0.5 ISO
M24x0.75	23.28	SR0017H14	14 I 0.75 ISO
M24x1.0	23.04	SR0018H21	21 I 1.0 ISO
M24x1.5	22.53	SR0018H21	21 I 1.5 ISO
M24x2.0	22.02	SR0018H21	21 I 2.0 ISO
M24x3.0 R	21.00	SR0018H21	21 I 3.0 ISO
M27x0.5	26.53	SR0017H14	14 I 0.5 ISO
M27x0.75	26.28	SR0017H14	14 I 0.75 ISO
M27x1.0	26.04	SR0021H21	21 I 1.0 ISO
M27x1.5	25.53	SR0021H21	21 I 1.5 ISO
M27x2.0	25.02	SR0021H21	21 I 2.0 ISO
M27x3.0 R	24.00	SR0021H21	21 I 3.0 ISO
M30x0.5	29.53	SR0017H14	14 I 0.5 ISO
M30x0.75	29.28	SR0017H14	14 I 0.75 ISO
M30x1.0	29.04	SR0021H21	21 I 1.0 ISO
M30x1.5	28.53	SR0021H21	21 I 1.5 ISO
M30x2.0	28.02	SR0021H21	21 I 2.0 ISO
M30x3.0	27.00	SR0021H21	21 I 3.0 ISO
M30x3.5 R	26.49	SR0021H21	21 I 3.5 ISO
M33x0.5	32.53	SR0017H14	14 I 0.5 ISO
M33x0.75	32.28	SR0017H14	14 I 0.75 ISO
M33x1.0	32.04	SR0021H21	21 I 1.0 ISO
M33x1.5	31.53	SR0021H21	21 I 1.5 ISO
M33x2.0	31.02	SR0021H21	21 I 2.0 ISO
M33x3.0	30.00	SR0021H21	21 I 3.0 ISO
M33x3.5 R	29.49	SR0021H21	21 I 3.5 ISO
M36x0.5	35.53	SR0017H14	14 I 0.5 ISO
M36x0.75	35.28	SR0017H14	14 I 0.75 ISO
M36x1.0	35.04	SR0021H21	21 I 1.0 ISO
M36x1.5	34.53	SR0029J30	30 I 1.5 ISO
M36x2.0	34.02	SR0029J30	30 I 2.0 ISO
M36x3.0	33.00	SR0029J30	30 I 3.0 ISO
M36x4.0	31.97	SR0029J30	30 I 4.0 ISO
M39x0.5	38.53	SR0017H14	14 I 0.5 ISO
M39x0.75	38.28	SR0017H14	14 I 0.75 ISO
M39x1.0	38.04	SR0021H21	21 I 1.0 ISO
M39x1.5	37.53	SR0029J30	30 I 1.5 ISO
M39x2.0	37.02	SR0029J30	30 I 2.0 ISO
M39x3.0	36.00	SR0029J30	30 I 3.0 ISO
M39x4.0 R	34.97	SR0029J30	30 I 4.0 ISO
M42x0.5	41.53	SR0017H14	14 I 0.5 ISO
M42x0.75	41.28	SR0017H14	14 I 0.75 ISO
M42x1.0	41.04	SR0021H21	21 I 1.0 ISO
M42x1.5	40.53	SR0029J30	30 I 1.5 ISO
M42x2.0	40.02	SR0029J30	30 I 2.0 ISO
M42x3.0	39.00	SR0029J30	30 I 3.0 ISO
M42x4.0	37.97	SR0029J30	30 I 4.0 ISO
M42x4.5 R	37.46	SR0029J30	30 I 4.5 ISO
M45x0.5	44.53	SR0017H14	14 I 0.5 ISO
M45x0.75	44.28	SR0017H14	14 I 0.75 ISO
M45x1.0	44.04	SR0021H21	21 I 1.0 ISO
M45x1.5	43.53	SR0029J30	30 I 1.5 ISO
M45x2.0	43.02	SR0029J30	30 I 2.0 ISO
M45x3.0	42.00	SR0029J30	30 I 3.0 ISO
M45x4.0	40.97	SR0029J30	30 I 4.0 ISO
M45x4.5 R	40.46	SR0029J30	30 I 4.5 ISO
M48x0.5	47.52	SR0017H14	14 I 0.5 ISO
M48x0.75	47.28	SR0017H14	14 I 0.75 ISO
M48x1.0	47.04	SR0021H21	21 I 1.0 ISO
M48x1.5	46.53	SR0029J30	30 I 1.5 ISO
M48x2.0	46.02	SR0029J30	30 I 2.0 ISO
M48x3.0	45.00	SR0029J30	30 I 3.0 ISO
M48x4.0	43.97	SR0029J30	30 I 4.0 ISO
M52x0.5	51.52	SR0017H14	14 I 0.5 ISO
M52x0.75	51.28	SR0017H14	14 I 0.75 ISO
M52x1.0	51.04	SR0021H21	21 I 1.0 ISO
M52x1.5	50.53	SR0029J30	30 I 1.5 ISO
M52x2.0	50.02	SR0029J30	30 I 2.0 ISO
M52x3.0	49.00	SR0029J30	30 I 3.0 ISO
M52x4.0	47.97	SR0029J30	30 I 4.0 ISO
M56x0.5	55.52	SR0017H14	14 I 0.5 ISO
M56x0.75	55.28	SR0017H14	14 I 0.75 ISO
M56x1.0	55.04	SR0021H21	21 I 1.0 ISO
M56x1.5	54.53	SR0048M40	40 I 1.5 ISO
M56x2.0	54.02	SR0048M40	40 I 2.0 ISO
M56x3.0	53.00	SR0048M40	40 I 3.0 ISO
M56x4.0	51.97	SR0048M40	40 I 4.0 ISO
M60x0.5	59.52	SR0017H14	14 I 0.5 ISO
M60x0.75	59.28	SR0017H14	14 I 0.75 ISO
M60x1.0	59.04	SR0021H21	21 I 1.0 ISO
M60x1.5	58.53	SR0048M40	40 I 1.5 ISO
M60x2.0	58.02	SR0048M40	40 I 2.0 ISO
M60x3.0	57.00	SR0048M40	40 I 3.0 ISO
M60x4.0	55.97	SR0048M40	40 I 4.0 ISO
M64x0.5	63.52	SR0017H14	14 I 0.5 ISO
M64x0.75	63.28	SR0017H14	14 I 0.75 ISO
M64x1.0	63.04	SR0021H21	21 I 1.0 ISO
M64x1.5	62.53	SR0048M40	40 I 1.5 ISO
M64x2.0	62.02	SR0048M40	40 I 2.0 ISO
M64x3.0	61.00	SR0048M40	40 I 3.0 ISO
M64x4.0	59.97	SR0048M40	40 I 4.0 ISO
M64x6.0 R	57.90	SR0048M40	40 I 6.0 ISO
M68x0.5	67.52	SR0017H14	14 I 0.5 ISO
M68x0.75	67.28	SR0017H14	14 I 0.75 ISO
M68x1.0	67.04	SR0021H21	21 I 1.0 ISO
M68x1.5	66.53	SR0048M40	40 I 1.5 ISO
M68x2.0	66.02	SR0048M40	40 I 2.0 ISO
M68x3.0	65.00	SR0048M40	40 I 3.0 ISO
M68x4.0	63.97	SR0048M40	40 I 4.0 ISO
M68x6.0 R	61.91	SR0048M40	40 I 6.0 ISO
M70x0.5	69.52	SR0017H14	14 I 0.5 ISO
M70x0.75	69.28	SR0017H14	14 I 0.75 ISO
M70x1.0	69.04	SR0021H21	21 I 1.0 ISO
M70x1.5	68.53	SR0048M40	40 I 1.5 ISO
M70x2.0	68.02	SR0048M40	40 I 2.0 ISO
M70x3.0	67.00	SR0048M40	40 I 3.0 ISO
M70x4.0	65.97	SR0048M40	40 I 4.0 ISO
M70x6.0	63.91	SR0048M40	40 I 6.0 ISO

R = Standard thread
* = Solid carbide milling cutter

UN internal thread

Thread	Core dimension	Required tool	Required indexable insert
1/4x20UNC	5.12	MTB 06047 C12 20 UN*	-
1/4x28UNF	5.47	MTB 0605 C11 28 UN*	-
5/16x18UNC	6.57	MTB 06056 C14 18 UN*	-
5/16x20UN	6.71	MTB 06047 C12 20 UN*	-
5/16x24UNF	6.91	MTB 08066 C14 24 UN*	-
5/16x28UN	7.06	MTB 0606 C14 28 UN*	-
3/8x16UNC	7.98	MTB 08067 C16 16 UN*	-
3/8x18UNC	8.17	MTB 06056 C14 18 UN*	-
3/8x20UN	8.29	MTB 06047 C12 20 UN*	-
3/8x24UNF	8.51	MTB 0808 D21 24 UN*	-
3/8x28UN	8.65	MTB 0606 C14 28 UN*	-
7/16x14UNC	9.35	MTB 08077 C20 14 UN*	-
7/16x16UN	9.58	MTB 08067 C16 16 UN*	-
7/16x18UNS	9.74	MTB 06056 C14 18 UN*	-
7/16x20UNF	9.88	MTB 0808 C21 20 UN*	-
7/16x24UNS	10.08	MTB 0808 D21 24 UN*	-
7/16x28UNEF	10.24	MTB 0606 C14 28 UN*	-
1/2x13UNC	10.81	MTB 10092 C22 13 UN*	-
1/2x14UNS	10.93	MTB 08077 C20 14 UN*	-
1/2x20UNF	11.47	SR0009H12	12 I 20 UN
1/2x24UNS	11.68	SR0009H12	12 I 24 UN
1/2x28UNEF	11.82	SR0009H12	12 I 28 UN
9/16x12UNC	12.22	MTB 12105 C26 12 UN*	-
9/16x14UNS	12.52	MTB 08077 C20 14 UN*	-
9/16x16UN	12.75	SR0009H12	12 I 16 UN
9/16x18UNF	12.92	SR0009H12	12 I 18 UN
9/16x20UN	13.06	SR0009H12	12 I 20 UN
9/16x24UNEF	13.26	SR0009H12	12 I 24 UN
9/16x28UN	13.41	SR0009H12	12 I 28 UN
5/8x11UNC	13.63	MTB 12114 C28 11 UN*	-
5/8x12UN	13.82	SR0012F14	14 I 12 UN
5/8x14UNS	14.12	SR0012F14	14 I 14 UN
5/8x16UN	14.33	SR0012F14	14 I 16 UN
5/8xUNF	14.52	SR0012F14	14 I 18 UN
5/8x20UN	14.64	SR0012F14	14 I 20 UN
5/8x24UNEF	14.86	SR0012F14	14 I 24 UN
5/828UN	15.00	SR0012F14	14 I 28 UN
5/8x32UN	15.11	SR0012F14	14 I 32 UN
11/16x12UN	15.39	SR0012F14	14 I 12 UN
11/16x16UN	15.93	SR0012F14	14 I 16 UN
11/16x20UN	16.23	SR0012F14	14 I 20 UN
11/16x24UNEF	16.43	SR0012F14	14 I 24 UN
11/16x28UN	16.59	SR0012F14	14 I 28 UN
11/16x32UN	16.70	SR0012F14	14 I 32 UN
3/4x10UNC	16.57	MTB 16144 D34 10 UN*	-
3/4x12UN	16.99	SR0012F14	14 I 12 UN
3/4x14UNS	17.28	SR0012F14	14 I 14 UN
3/4x16UNF	17.50	SR0012F14	14 I 16 UN
3/4x18UNS	17.69	SR0012F14	14 I 18 UN
3/4x20UNEF	17.82	SR0012F14	14 I 20 UN
3/4x24UNS	18.03	SR0012F14	14 I 24 UN
3/428UN	18.17	SR0014H14	14 I 28 UN
3/4x32UN	18.29	SR0014H14	14 I 32 UN
13/16x12UN	18.57	SR0014H14	14 I 12 UN
13/16x16UN	19.10	SR0014H14	14 I 16 UN
13/16x20UNEF	19.41	SR0014H14	14 I 20 UN
13/16x28UN	19.76	SR0014H14	14 I 28 UN
13/16x32UN	19.88	SR0014H14	14 I 32 UN
7/8x9UNC	19.47	MTB 1616 C38 9 UN*	
7/8x10UNS	19.75	MTB 16144 D34 10 UN*	
7/8x12UN	20.17	SR0014H14	14 I 12 UN
7/8x14UNF	20.47	SR0014H14	14 I 14 UN
7/8x16UN	20.68	SR0014H14	14 I 16 UN
7/8x18UNS	20.87	SR0014H14	14 I 18 UN
7/8x20UNEF	20.99	SR0014H14	14 I 20 UN
7/8x24UNS	21.21	SR0017H14	14 I 24 UN
7/8x28UN	21.35	SR0017H14	14 I 28 UN
7/8x32UN	21.46	SR0017H14	14 I 32 UN
15/16x12UN	21.74	SR0017H14	14 I 12 UN
15/16x16UN	22.28	SR0017H14	14 I 16 UN
15/16x20UNEF	22.58	SR0017H14	14 I 20 UN
15/16x28UN	22.94	SR0017H14	14 I 28 UN
15/16x32UN	23.05	SR0017H14	14 I 32 UN
1x8UNC	22.29	MTB 20195 D42 8 UN*	-
1x10UNS	22.29	MTB 16144 D34 10 UN*	-
1x12UNF	23.34	SR0017H14	14 I 12 UN
1x14UNS	23.63	SR0017H14	14 I 14 UN
1x16UN	23.85	SR0017H14	14 I 16 UN
1x18UNS	24.04	SR0017H14	14 I 18 UN
1x20UNEF	24.17	SR0017H14	14 I 20 UN
1x24UNS	24.38	SR0017H14	14 I 24 UN
1x28UN	24.52	SR0017H14	14 I 28 UN
1x32UN	24.64	SR0017H14	14 I 32 UN
1 1/16x12UN	24.92	SR0017H14	14 I 12 UN
1 1/16x16UN	25.45	SR0021H21	21 I 16 UN

Thread	Core dimension	Required tool	Required indexable insert
1 1/16x18UNEF	25.62	SR0021H21	21 I 18 UN
1 1/16x20UN	25.76	SR0021H21	21 I 20 UN
1 1/16x28UN	26.11	SR0017H14	14 I 28 UN
1 1/8x10UNS	26.10	SR0021H21	21 I 10 UN
1 1/8x12UNF	26.52	SR0021H21	21 I 12 UN
1 1/8x14UNS	26.82	SR0021H21	21 I 14 UN
1 1/8x16UN	27.03	SR0021H21	21 I 16 UN
1 1/8xUNEF	27.22	SR0021H21	21 I 18 UN
1 1/8x20UN	27.34	SR0021H21	21 I 20 UN
1 1/8x24UNS	27.56	SR0021H21	21 I 24 UN
1 1/8x28UN	27.70	SR0017H14	14 I 28 UN
1 3/16x12UN	28.09	SR0021H21	21 I 12 UN
1 3/16x16UN	28.63	SR0021H21	21 I 16 UN
1 3/16x18UNEF	28.79	SR0021H21	21 I 18 UN
1 3/16x20UN	28.93	SR0021H21	21 I 20 UN
1 3/16x28UN	29.29	SR0017H14	14 I 28 UN
1 1/4x10UNS	29.27	SR0021H21	21 I 10 UN
1 1/4x12UNF	29.69	SR0021H21	21 I 12 UN
1 1/4x14UNS	29.98	SR0021H21	21 I 14 UN
1 1/4x16UN	30.20	SR0021H21	21 I 16 UN
1 1/4x18UNEF	30.39	SR0021H21	21 I 18 UN
1 1/4x20UN	30.52	SR0021H21	21 I 20 UN
1 1/4x24UNS	30.73	SR0021H21	21 I 24 UN
1 1/4x28UN	30.87	SR0017H14	14 I 28 UN
1 5/16x12UN	31.27	SR0021H21	21 I 12 UN
1 5/16x16UN	31.80	SR0021H21	21 I 16 UN
1 5/16x18UNEF	31.97	SR0021H21	21 I 18 UN
1 5/16x20UN	32.11	SR0021H21	21 I 20 UN
1 5/16x28UN	32.46	SR0017H14	14 I 28 UN
1 3/8x10UNS	32.45	SR0021H21	21 I 10 UN
1 3/8x12UNF	32.87	SR0021H21	21 I 12 UN
1 3/8x14UNS	33.17	SR0021H21	21 I 14 UN
1 3/8x16UN	33.38	SR0029J30	30 I 16 UN
1 3/8x18UNEF	33.57	SR0029J30	30 I 18 UN
1 3/8x20UN	33.69	SR0029J30	30 I 20 UN
1 3/8x24UNS	33.91	SR0029J30	30 I 24 UN
1 3/8x28UN	34.05	SR0017H14	14 I 28 UN
1 7/16x8UN	33.39	SR0029J30	30 I 8 UN
1 7/16x12UN	34.44	SR0029J30	30 I 12 UN
1 7/16x16UN	34.98	SR0029J30	30 I 16 UN
1 7/16x18UNEF	35.14	SR0029J30	30 I 18 UN
1 7/16x20UN	35.28	SR0029J30	30 I 20 UN
1 7/16x28UN	35.64	SR0017H14	14 I 28 UN
1 1/2x8UN	34.99	SR0029J30	30 I 8 UN
1 1/2x10UNS	35.62	SR0029J30	30 I 10 UN
1 1/2x12UNF	36.04	SR0029J30	30 I 12 UN
1 1/2x14UNS	36.33	SR0029J30	30 I 14 UN
1 1/2x16UN	36.55	SR0029J30	30 I 16 UN
1 1/2x18UNEF	36.73	SR0029J30	30 I 18 UN
1 1/2x20UN	36.87	SR0029J30	30 I 20 UN
1 1/2x24UNS	37.08	SR0021H21	21 I 24 UN
1 1/2x28UN	37.22	SR0017H14	14 I 28 UN
1 9/16x6UN	35.50	SR0029J30	30 I 6 UN
1 9/16x12UN	37.62	SR0029J30	30 I 12 UN
1 9/16x16UN	38.15	SR0029J30	30 I 16 UN
1 9/16x18UNEF	38.32	SR0029J30	30 I 18 UN
1 9/16x20UN	38.46	SR0029J30	30 I 20 UN
1 5/8x8UN	38.16	SR0029J30	30 I 8 UN
1 5/8x10UNS	38.80	SR0029J30	30 I 10 UN
1 5/8x12UN	39.22	SR0029J30	30 I 12 UN
1 5/8x14UNS	39.52	SR0029J30	30 I 14 UN
1 5/8x16UN	39.73	SR0029J30	30 I 16 UN
1 5/8x18UNEF	39.92	SR0029J30	30 I 18 UN
1 5/8x20UN	40.04	SR0029J30	30 I 20 UN
1 5/8x24UNS	40.26	SR0021H21	21 I 24 UN
1 11/16x6UN	38.67	SR0029J30	30 I 6 UN
1 11/16x8UN	39.74	SR0029J30	30 I 8 UN
1 11/16x12UN	40.79	SR0029J30	30 I 12 UN
1 11/16x16UN	41.33	SR0029J30	30 I 16 UN
1 11/16x18UNEF	41.49	SR0029J30	30 I 18 UN
1 11/16x20UN	41.63	SR0029J30	30 I 20 UN
1 3/4x6UN	40.26	SR0029J30	30 I 6 UN
1 3/4x8UN	41.34	SR0029J30	30 I 8 UN
1 3/4x10UNS	41.97	SR0029J30	30 I 10 UN
1 3/4x12UN	42.39	SR0029J30	30 I 12 UN
1 3/4x14UNS	42.68	SR0029J30	30 I 14 UN
1 3/4x16UN	42.90	SR0029J30	30 I 16 UN
1 3/4x18UNS	43.09	SR0029J30	30 I 18 UN
1 3/4x20UN	43.22	SR0029J30	30 I 20 UN
1 13/16x6UN	41.85	SR0029J30	30 I 6 UN
1 13/16x8UN	42.91	SR0029J30	30 I 8 UN
1 13/16x12UN	43.97	SR0029J30	30 I 12 UN
1 13/16x16UN	44.50	SR0029J30	30 I 16 UN

UN internal thread (continued)

Thread	Core dimension	Required tool	Required indexable insert
1 13/16x20UN	44.81	SR0029J30	30 I 20 UN
1 7/8x6UN	43.43	SR0029J30	30 I 6 UN
1 7/8x8UN	44.51	SR0029J30	30 I 8 UN
1 7/8x10UNS	45.15	SR0029J30	30 I 10 UN
1 7/8x12UN	45.57	SR0029J30	30 I 12 UN
1 7/8x14UNS	45.87	SR0029J30	30 I 14 UN
1 7/8x16UN	46.08	SR0029J30	30 I 16 UN
1 7/8x18UNS	46.27	SR0029J30	30 I 18 UN
1 7/8x20UN	46.39	SR0029J30	30 I 20 UN
1 15/16x6UN	45.02	SR0029J30	30 I 6 UN
1 15/16x8UN	46.09	SR0029J30	30 I 8 UN
1 15/16x12UN	47.14	SR0029J30	30 I 12 UN
1 15/16x16UN	47.68	SR0029J30	30 I 16 UN
1 15/16x20UN	47.98	SR0029J30	30 I 20 UN
2x6UN	46.61	SR0029J30	30 I 6 UN
2x8UN	47.69	SR0029J30	30 I 8 UN
2x10UNS	48.32	SR0029J30	30 I 10 UN
2x12UN	48.74	SR0029J30	30 I 12 UN
2x14UNS	49.03	SR0029J30	30 I 14 UN
2x16UN	49.25	SR0029J30	30 I 16 UN
2x18UNS	49.44	SR0029J30	30 I 18 UN
2x20UN	49.57	SR0029J30	30 I 20 UN
2 1/16x16 UNS	50.85	SR0029J30	30 I 16 UN
2 1/8x6UN	49.78	SR0029J30	30 I 6 UN
2 1/8x8UN	50.86	SR0029J30	30 I 8 UN
2 1/8x12UN	51.92	SR0029J30	30 I 12 UN
2 1/8x16UN	52.43	SR0029J30	30 I 16 UN
2 1/8x20UN	52.74	SR0029J30	30 I 20 UN
2 3/16x16UNS	54.03	SR0029J30	30 I 16 UN
2 1/4x6UN	52.96	SR0048M40	40 I 6 UN
2 1/4x8UN	54.04	SR0048M40	40 I 8 UN
2 1/4x10UNS	54.67	SR0048M40	40 I 10 UN
2 1/4x12UN	55.09	SR0048M40	40 I 12 UN
2 1/4x14 UNS	55.38	SR0048M40	40 I 14 UN
2 1/4x16UN	55.60	SR0029J30	30 I 16 UN
2 1/4x18UNS	55.79	SR0029J30	30 I 18 UN
2 1/4x20UN	55.92	SR0029J30	30 I 20 UN
2 5/16x16UN	57.20	SR0029J30	30 I 16 UN
2 3/8x6UN	56.15	SR0048M40	40 I 6 UN
2 3/8x8UN	57.21	SR0048M40	40 I 8 UN

NPTF internal thread

Thread	Core dimension	Required tool	Required indexable insert
1/8x27NPT	8.33	MTB 08076 C10 27NPT*	——
1/4x18NPT	10.74	SR0009H12	12-18 NPT
3/8x18NPT	14.27	SR0012F14	14-18 NPT
1/2x14NPT	17.50	SR0014H14	14-14NPT
3/4x14NPT	22.81	SR0017H14	14-14NPT
1x11.5NPT	28.65	SR0021H21	21-11.5 NPT
1 1/4x11.5NPT	37.39	SR0029J30	30-11.5 NPT
1 1/2x11.5NPT	43.46	SR0029J30	30-11.5 NPT
2x11.5NPT	55.25	SR0029J30	30-11.5 NPT
2 1/2x8NPT	65.96	SR0048M40	40-8 NPT
3x8NPT	81.74	SR0048M40	40-8 NPT
3 1/2x8NPT	94.36	SR0048M40	40-8 NPT
4x8NPT	106.96	SR0048M40	40-8 NPT

* = Solid carbide milling cutter

NPTF fine internal thread

Thread	Core dimension	Required tool	Required indexable insert
1/8x27NPTF	8.33	MTB 08076 C10 27 NPTF*	——
1/4x18NPTF	10.74	SR0009H12	12-18 NPTF
3/8x18NPTF	14.27	SR0012F14	14-18 NPTF
1/2x14NPTF	17.50	SR0014H14	14-14NPTF
3/4x14NPTF	22.81	SR0017H14	14-14NPTF
1x11.5NPTF	28.65	SR0021H21	21-11.5 NPTF
1 1/4x11.5NPTF	37.39	SR0029J30	30-11.5 NPTF
1 1/2x11.5NPTF	43.46	SR0029J30	30-11.5 NPTF
2x11.5NPTF	55.25	SR0029J30	30-11.5 NPTF
2 1/2x8NPTF	65.96	SR0048M40	40-8 NPTF
3x8NPTF	81.74	SR0048M40	40-8 NPTF
3 1/2x8NPTF	94.36	SR0048M40	40-8 NPTF
4x8NPTF	106.96	SR0048M40	40-8 NPTF

* = Solid carbide milling cutter

Whitworth pipe thread, straight internal thread BSP

Thread	Core dimension	Required tool	Required indexable insert
1/8x28BSP	8.60	MTB 08078 C14 28W*	-
1/4x19BSP	11.50	SR0009H12	12-19W
3/8x19BSP	15.10	SR0012F14	14-19W
1/2x14BSP	18.80	SR0014H14	14-14W
3/4x14BSP	24.20	SR0017H14	14-14W
1x11BSP	30.50	SR0021H21	21-11W
1 1/4x11BSP	39.10	SR0029J30	30-11W
1 1/2x11BSP	45.00	SR0029J30	30-11W
2x11BSP	56.80	SR0029J30	30-11W
2 1/2x11BSP	72.40	SR0048M40	40-11W
3x11BSP	85.10	SR0048M40	40-11W
3 1/2x11BSP	97.50	SR0048M40	40-11W
4x11BSP	110.20	SR0048M40	40-11W
5x11BSP	135.60	SR0048M40	40-11W
6x11BSP	161.00	SR0048M40	40-11W

* = Solid carbide milling cutter

PG internal thread DIN 40430

Thread	Core dimension	Required tool	Required indexable insert
PG 9	13.86	SR0012F14	14-18 PG
PG 11	17.26	SR0014H14	14-18 PG
PG 13.5	19.06	SR0014H14	14-18 PG
PG 16	21.16	SR0017H14	14-18 PG
PG 21	26.78	SR0021H21	21-16 PG
PG 29	35.48	SR0021H21	21-16 PG
PG 36	45.48	SR0021H21	21-16 PG
PG 42	52.48	SR0021H21	21-16 PG
PG 48	57.78	SR0021H21	21-16 PG

Whitworth pipe thread, conical internal thread BSPT

Thread	Core dimension	Required tool	Required indexable insert
1/8x28BSPT	8.60	MTB 08078 C14 28BSPT*	——
1/4x19BSPT	11.50	SR0009H12	12-19BSPT
3/8x19BSPT	15.10	SR0012F14	14-19BSPT
1/2x14BSPT	18.80	SR0014H14	14-14BSPT
3/4x14BSPT	24.20	SR0017H14	14-14BSPT
1x11BSPT	30.50	SR0021H21	21-11BSPT
1 1/4x11BSPT	39.10	SR0029J30	30-11BSPT
1 1/2x11BSPT	45.00	SR0029J30	30-11BSPT
2x11BSPT	56.80	SR0029J30	30-11BSPT
2 1/2x11BSPT	72.40	SR0048M40	40-11BSPT
3x11BSPT	85.10	SR0048M40	40-11BSPT
3 1/2x11BSPT	97.50	SR0048M40	40-11BSPT
4x11BSPT	110.20	SR0048M40	40-11BSPT
5x11BSPT	135.60	SR0048M40	40-11BSPT
6x11BSPT	161.00	SR0048M40	40-11BSPT

* = Solid carbide milling cutter

SARA® ATORN Thread end milling cutter



- Please adjust these guideline values according to clamping operation and machine set-up!

258002....
258003....
258027....
258028....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz mm/tooth								
						Ø4	Ø6	Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø30
P	Machining steel	Up to 700	9 SMn 28	1.0715	100-250	0.04	0.06	0.07	0.08	0.09	0.12	0.15	0.18	0.21
P	Unalloyed structural steel	Up to 700	St-52	1.0052	110 - 180	0.03	0.05	0.06	0.07	0.08	0.1	0.12	0.15	0.18
P	Cast steel	Up to 950	GS 40	1.0416	130 - 170	0.03	0.03	0.04	0.05	0.05	0.07	0.08	0.1	0.11
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	90 - 160	0.03	0.03	0.04	0.05	0.05	0.07	0.08	0.1	0.11
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	110 - 170	0.03	0.03	0.04	0.05	0.05	0.07	0.08	0.1	0.11
K	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	70 - 150	0.04	0.06	0.07	0.08	0.09	0.12	0.15	0.18	0.21
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	160 - 300	0.04	0.06	0.07	0.08	0.09	0.12	0.15	0.18	0.21
N	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	160 - 300	0.04	0.06	0.07	0.08	0.09	0.12	0.15	0.18	0.21
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	20 - 50	0.03	0.03	0.03	0.04	0.05	0.06	0.07	0.08	0.08
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	20 - 50	0.03	0.03	0.03	0.04	0.05	0.06	0.07	0.08	0.08

SARA® ATORN Thread milling cutter, for small bore holes



- Please adjust these guideline values according to clamping operation and machine set-up!

258010....
258022....
258025....
258026....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz mm/tooth					
						Ø1.5	Ø2	Ø3	Ø4	Ø5	Ø6
P	Machining steel	Up to 700	9 SMn 28	1.0715	60 - 120	0.05	0.05	0.07	0.09	0.11	0.13
P	Unalloyed structural steel	Up to 700	St-52	1.0052	60 - 90	0.04	0.05	0.06	0.08	0.09	0.1
P	Cast steel	Up to 950	GS 40	1.0416	70 - 90	0.04	0.04	0.05	0.05	0.06	0.07
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	50 - 80	0.04	0.04	0.05	0.05	0.06	0.07
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	60 - 90	0.03	0.03	0.04	0.05	0.06	0.06
K	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	40 - 80	0.05	0.05	0.07	0.09	0.11	0.13
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	50 - 200	0.1	0.11	0.12	0.14	0.16	0.18
N	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	50 - 200	0.1	0.11	0.12	0.14	0.16	0.18
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	20 - 40	0.03	0.03	0.04	0.04	0.05	0.06
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	20 - 40	0.03	0.03	0.04	0.04	0.05	0.06

SARA® ATORN Thread milling cutter



- Please adjust these guideline values according to clamping operation and machine set-up!
- **Programming code note:** Anticlockwise spindle rotation Code M04

258011....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz mm/tooth													
						Ø1	Ø1.5	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	Ø10	Ø12	Ø14	Ø16
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	60 - 70	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.07	0.08	0.08	0.09	0.1	0.11
H	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	50 - 60	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.07	0.08	0.09	0.1
H	Hardened materials up to 64 HRc		100Cr6	1.2067	40 - 50	0.01	0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.08	0.09

ATORN Drilling and thread milling cutter



- Please adjust these guideline values according to clamping operation and machine set-up!
- **Programming code note:** Anticlockwise spindle rotation Code M04

258100....
258510....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm						
						4	5	6	8	9	10	12
P	Machining steel	Up to 700	9 SMn 28	1.0715	60 - 120	0.03	0.05	0.03	0.04	0.05	0.05	0.05
P	Unalloyed structural steel	Up to 700	St-52	1.0052	60 - 90	0.02	0.02	0.03	0.04	0.04	0.04	0.05
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	50 - 80	0.02	0.02	0.02	0.02	0.03	0.03	0.04
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	70 - 100	0.02	0.02	0.02	0.02	0.03	0.03	0.03
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	60 - 90	0.02	0.02	0.02	0.02	0.03	0.03	0.03 - 0.04
K	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	40 - 80	0.03	0.03	0.04	0.05	0.05	0.05	0.05
K	Ductile iron	Up to 280 HB	GGG 60	0.7060	40 - 80	0.03	0.03	0.04	0.05	0.05	0.05	0.05
N	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	100 - 200	0.03	0.03	0.04	0.05	0.05	0.05	0.05
N	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	60-140	0.02	0.02	0.02	0.02	0.03	0.03	0.03
	Thermoset		Melamine		50 - 200	0.04	0.05	0.05	0.06	0.06	0.06	0.06

1-cut thread milling cutter AT-1



- Please adjust these guideline values according to clamping operation and machine set-up.

294300....

ISO	Materials group	Strength/ Hardness N/mm²	Material chemical example	Material number	cutting speed Vc m/min	Feed rates in mm/rev based on the tool diameter in mm
	Unalloyed structural steel	up to 700	St-52	1.0052	80 - 160	0.01 - 0.05
	Structural steel	700-950	Ck45	1.1191	80 - 160	0.01 - 0.05
	Tempering steel	500-950	42 CrMo4	1.7225	80 - 160	0.01 - 0.05
	Cast steel	up to 950	GS 40	1.0416	60 - 120	0.01 - 0.05
	Tempering steel	950-1300	43CrMo4	1.3563	80 - 120	0.01 - 0.05
M	Stainless steel, ferr./marten.	500-950	X10 Cr13	1.4006	60 - 120	0.01 - 0.05
	Stainless steel, austenitic	500-950	X5 CrNi 18 10	1.4301	60 - 120	0.01 - 0.05
K	Grey cast iron	up to 260 HB	GG 25	0.6025	80 - 160	0.01 - 0.05
	alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	60 - 120	0.01 - 0.05
	Al. alloys, long-chipping	up to 500	AlMg 3	3.3535	100 - 300	0.03 - 0.1
	Al. alloys, short-chipping	up to 500	G-AlSi 12	3.2581	80 - 160	0.03 - 0.1
	Copper alloy (bronze), long-chipping	up to 1200	CuSn4	2.1016	80 - 160	0.03 - 0.1
N	Copper alloy (bronze), short-chipping	up to 850	CuNi12Zn24	2.0730	80 - 160	0.03 - 0.1
	Copper alloy (brass), long-chipping	up to 600	Cu ZN 20	2.0250	80 - 160	0.03 - 0.1
	Copper alloy (brass), short-chipping	up to 600	Cu Zn 39 Pb 3	2.0381	80 - 160	0.03 - 0.1
	Thermoplastic		PVC		80 - 160	0.03 - 0.1

ATORN RockTec Pro Z2 end milling cutter



257235 ....

ISO	Materials group	Strength/ Hardness N/mm²	Material chemical example	Material number	Cutting speed Vc m/min	Ø [mm] 1 - 4 fz	Ø [mm] 5 fz	Ø [mm] 6 fz	Ø [mm] 8 fz	Ø [mm] 10 fz	Ø [mm] 12 fz	Ø [mm] 16 fz	Ø [mm] 20 fz
	Machining steel	up to 700	9 SMn 28	1.0715	160	0.008 - 0.025	0.04	0.06	0.06	0.09	0.09	0.120	0.140
	Unalloyed structural steel	up to 700	St-52	1.0052	160	0.008 - 0.025	0.03	0.05	0.05	0.07	0.07	0.120	0.140
	Structural steel	700-950	Ck45	1.1191	160	0.008 - 0.025	0.03	0.04	0.04	0.07	0.07	0.08	0.10
P	Tempering steel	500-950	42 CrMo4	1.7225	160	0.008 - 0.025	0.03	0.04	0.04	0.07	0.07	0.08	0.10
	Cast steel	up to 950	GS 40	1.0416	150	0.008 - 0.025	0.03	0.04	0.04	0.07	0.07	0.08	0.10
	Case-hardening steel	up to 1200	16 MnCr 5	1.7131	150	0.008 - 0.025	0.03	0.04	0.04	0.07	0.07	0.08	0.10
	Tempering steel	950 - 1300	43CrMo4	1.3563	150	0.008 - 0.025	0.03	0.04	0.04	0.07	0.07	0.08	0.10
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	150	0.008 - 0.025	0.03	0.04	0.04	0.07	0.07	0.08	0.10
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	140	0.008 - 0.025	0.03	0.04	0.04	0.075	0.075	0.08	0.10
	Stainless steel, ferr./marten.	500-950	X10Cr13	1.4006	105	0.008 - 0.025	0.04	0.05	0.05	0.06	0.06	0.07	0.10
M	Stainless steel, austenitic	500-950	X 5 CrNi 18 10	1.4301	90	0.008 - 0.025	0.04	0.06	0.06	0.06	0.06	0.07	0.12
	Duplex	700-950	x 2 CrNiMoN 22-5-3	1.4462	80	0.008 - 0.025	0.04	0.05	0.05	0.05	0.05	0.06	0.14
K	Grey cast iron	up to 260 HB	GG 25	0.6025	100	0.008 - 0.025	0.05	0.04	0.04	0.06	0.06	0.08	0.180
	alloyed cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	120	0.008 - 0.025	0.05	0.04	0.04	0.06	0.06	0.08	0.180
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	180	0.008 - 0.025	0.02	0.03	0.03	0.04	0.04	0.06	0.1
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	150	0.008 - 0.025	0.02	0.03	0.03	0.04	0.04	0.06	0.1

ATORN RockTec Pro Z4 end milling cutter



257215 ....
2572210 ....

257215 ....
257225 ....

ISO	Materials group	Strength/ Hardness N/mm²	Material chemical example	Material number	Cutting speed Vc m/min	Ø [mm] 1 - 4 fz	Ø [mm] 5 fz	Ø [mm] 6 fz	Ø [mm] 8 fz	Ø [mm] 10 fz	Ø [mm] 12 fz	Ø [mm] 16 fz	Ø [mm] 20 fz
	Machining steel	up to 700	9 SMn 28	1.0715	160	0.008 - 0.025	0.04	0.06	0.06	0.09	0.09	0.120	0.140
	Unalloyed structural steel	up to 700	St-52	1.0052	160	0.008 - 0.025	0.03	0.05	0.05	0.07	0.07	0.120	0.140
	Structural steel	700-950	Ck45	1.1191	160	0.008 - 0.025	0.03	0.04	0.04	0.07	0.07	0.08	0.10
P	Tempering steel	500-950	42 CrMo4	1.7225	160	0.008 - 0.025	0.03	0.04	0.04	0.07	0.07	0.08	0.10
	Cast steel	up to 950	GS 40	1.0416	150	0.008 - 0.025	0.03	0.04	0.04	0.07	0.07	0.08	0.10
	Case-hardening steel	up to 1200	16 MnCr 5	1.7131	150	0.008 - 0.025	0.03	0.04	0.04	0.07	0.07	0.08	0.10
	Tempering steel	950 - 1300	43CrMo4	1.3563	150	0.008 - 0.025	0.03	0.04	0.04	0.07	0.07	0.08	0.10
	Nitriding steel	950 - 1300	31CrMoV9	1.8519	150	0.008 - 0.025	0.03	0.04	0.04	0.07	0.07	0.08	0.10
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	140	0.008 - 0.025	0.03	0.04	0.04	0.075	0.075	0.08	0.10
	Stainless steel, ferr./marten.	500-950	X10Cr13	1.4006	105	0.008 - 0.025	0.04	0.05	0.05	0.06	0.06	0.07	0.10
M	Stainless steel, austenitic	500-950	X 5 CrNi 18 10	1.4301	90	0.008 - 0.025	0.04	0.06	0.06	0.06	0.06	0.07	0.12
	Duplex	700-950	x 2 CrNiMoN 22-5-3	1.4462	80	0.008 - 0.025	0.04	0.05	0.05	0.05	0.05	0.06	0.14
K	Grey cast iron	up to 260 HB	GG 25	0.6025	100	0.008 - 0.025	0.05	0.04	0.04	0.06	0.06	0.08	0.180
	alloyed cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	120	0.008 - 0.025	0.05	0.04	0.04	0.06	0.06	0.08	0.180
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	180	0.008 - 0.025	0.02	0.03	0.03	0.04	0.04	0.06	0.1
	Hardened materials up to 60 HRC		X153CrMoV12	1.2379	150	0.008 - 0.025	0.02	0.03	0.03	0.04	0.04	0.06	0.1

ATORN Thread milling inserts

259001 ....
259002 ....
259003 ....

259005.....
259006.....

ATORN thread milling cutters are specially designed for use on CNC milling machines and machining centres which have 3-axis control with helical interpolation.



Advantages and application

- External and internal threads
- For through-hole and blind bore threads
- Synchronous and up-cut milling and change of the axial feed direction enables production of straight and conical threads and of all standard thread variants
- Thread production with varying tolerances
- Optimal clamping
- Short chips
- Low cutting pressure

Carbide quality AMT7

- TiAlN-coated ultra-fine grain quality
- for universal applications in all materials at medium to high cutting speeds

ISO		Cutting speed Vc m/min	Feed f mm/rev
P	Carbon steel	115 - 280	0.05 - 0.15
P	Alloyed steel	130 - 280	
P	High-alloy steel	105 - 180	
P	Cast steel	150 - 190	
M	Stainless steel	130 - 190	
K	Grey cast iron	80 - 170	
N	Non-ferrous metals, aluminium	180 - 34	

CNC Programming for internal threads

Upwards milling operation
(Programme is for use on CNC machining centres)

A = (D0 - D) / 2

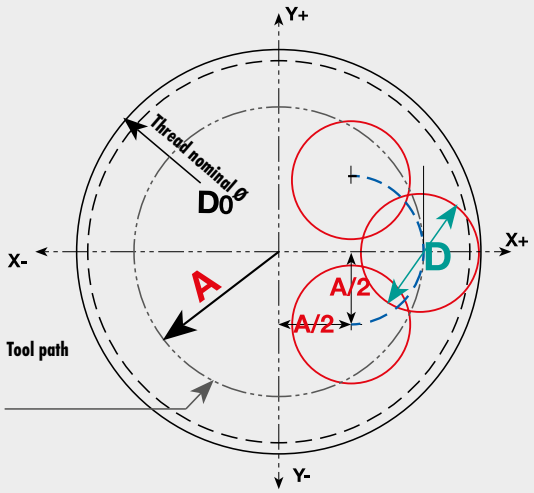
A = radius of the tool path
D0 = thread nominal Ø
D = cutting Ø

Standard Programming

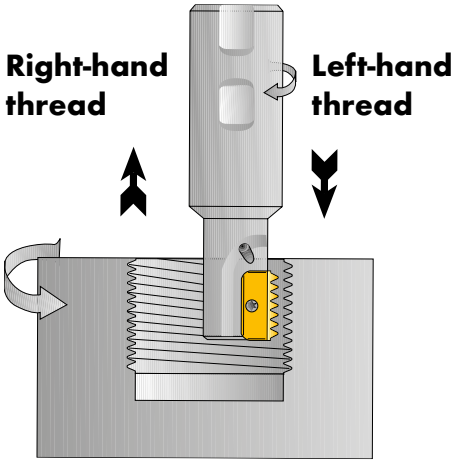
G90 G00 G54 G43 H1X0 Y0 Z10 S–
G00 Z-(thread depth)
G01 G91 G41 D1 X(A/2) Y-(A/2) Z0 F–
G03 X(A/2) Y(A/2) R(A/2) Z(1/8 x pitch)
G03 X0 Y0 I-(A) J0 Z(Steigung)
G03 X-(A/2) Y(A/2) R(A/2) Z(1/8 x pitch)
G01 G40 X-(A/2) Y-(A/2) Z0
G90 X0 Y0 Z0

Example

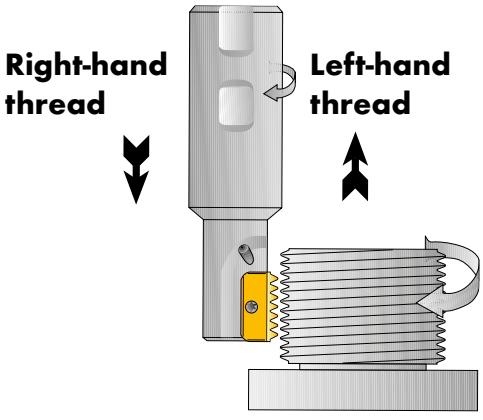
M32 x 2 (thread depth 18 mm)
Tool holder: SR0021 H21
(Cutting Ø 21 mm)
Insert: 21 I 2,0 ISO
A = (32 - 21) / 2 = 5.5
produces the following Programming:
G90 G00 G54 G43 H1X0 Y0 Z10 S2800
G00 Z-18
G01 G91 G41 X2.75 Y2.75 Z0 F85 D1
G03 X2.75 Y2.75 R2.75 Z0.25
G03 X0 Y0 I-5.5 J0 Z2
G03 X-2.75 Y2.75 R2.75 Z0.25
G01 G40 X-2.75 Y-2.75 Z0
G90 G0 X0 Y0 Z0



Internal thread



External thread



ATORN Exchangeable head milling cutter Z4



255600....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	**Side** ae = 0.5 x D ap = 0.6 x D / Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	190	0.075	0.075	0.1	0.12
P	Machining steel	Up to 700	9 SMn 28	1.0715	180	0.075	0.075	0.1	0.12
P	Unalloyed tempered steel	500 - 950	Ck45	1.1191	170	0.075	0.075	0.1	0.12
P	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	160	0.075	0.075	0.1	0.12
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	110	0.052	0.052	0.07	0.084
P	Cast steel	Up to 950	GS 40	1.0416	150	0.052	0.052	0.07	0.084
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	75	0.052	0.052	0.07	0.084
K	Grey cast iron	100 - 400	GG 25	0.6025	190	0.075	0.075	0.1	0.12
K	Ductile iron	400 - 800	GGG 60	0.7060	140	0.075	0.075	0.1	0.12
K	Malleable cast iron	350 - 700	GTS 55	0.8155	140	0.075	0.075	0.1	0.12

ATORN Exchangeable head roughing cutter NRZ



255601....
255602....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	**Side** ae = 0.5 x D ap = 0.6 x D / Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	190	0.075	0.075	0.1	0.12
P	Machining steel	Up to 700	9 SMn 28	1.0715	180	0.075	0.075	0.1	0.12
P	Unalloyed tempered steel	500 - 950	Ck45	1.1191	170	0.075	0.075	0.1	0.12
P	Alloyed	Up to 950	16 MnCr 5	1.7131	150	0.052	0.052	0.07	0.084
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	110	0.052	0.052	0.07	0.084
P	Cast steel	Up to 950	GS 40	1.0416	130	0.052	0.052	0.07	0.084
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	90	0.075	0.075	0.1	0.12
K	Grey cast iron	100 - 400	GG 25	0.6025	170	0.075	0.075	0.1	0.12
K	Ductile iron	400 - 800	GGG 60	0.7060	120	0.075	0.075	0.1	0.12
K	Malleable cast iron	350 - 700	GTS 55	0.8155	120	0.075	0.075	0.1	0.12

ATORN Exchangeable head milling cutter Z3 Type W



255603....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	**Side** ae = 0.5 x D ap = 0.6 x D / Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	400	0.065	0.065	0.085	0.11
N	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	350	0.065	0.065	0.085	0.11
N	Copper alloy long-chipping	300 - 700	MS 63	2.0320	160	0.05	0.05	0.075	0.09
N	Copper alloy short-chipping	Up to 500	MS 58	2.0402	160	0.05	0.05	0.075	0.09
N	Thermoplastic	40 - 70	PVC, acrylic glass		450	0.065	0.065	0.085	0.11

ATORN Exchangeable head milling cutter Z2/Z3/Z4


255604....


255605....


255606....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	**Side** ae = 0.1 x D ap = 0.6 x D Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	220	0.12	0.12	0.16	0.2
	Machining steel	Up to 700	9 SMn 28	1.0715	200	0.084	0.084	0.11	0.14
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	195	0.084	0.084	0.11	0.14
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	190	0.084	0.084	0.11	0.14
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	155	0.06	0.06	0.08	0.1
	Cast steel	Up to 950	GS 40	1.0416	175	0.06	0.06	0.08	0.1
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	120	0.084	0.084	0.11	0.14
K	Grey cast iron	100 - 400	GG 25	0.6025	180	0.084	0.084	0.11	0.14
	Ductile iron	400 - 800	GGG 60	0.7060	140	0.084	0.084	0.11	0.14
	Malleable cast iron	350 - 700	GTS 55	0.8155	150	0.084	0.084	0.11	0.14
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	250	0.084	0.084	0.11	0.14
	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	300	0.084	0.084	0.11	0.14
	Copper alloy long-chipping	300 - 700	MS 63	2.0320	200	0.084	0.084	0.11	0.14
	Copper alloy short-chipping	Up to 500	MS 58	2.0402	200	0.084	0.084	0.11	0.14
	Thermoplastic	40 - 70	PVC, acrylic glass		200	0.084	0.084	0.11	0.14

ATORN Exchangeable head milling cutter, multi-flute


255607....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	**Side** ae = 0.3 x D ap = 0.6 x D Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	220	0.065	0.065	0.075	0.1
	Machining steel	Up to 700	9 SMn 28	1.0715	180	0.065	0.065	0.075	0.1
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	180	0.065	0.065	0.075	0.1
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	160	0.065	0.065	0.075	0.1
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	90	0.045	0.045	0.053	0.07
	Cast steel	Up to 950	GS 40	1.0416	120	0.045	0.045	0.053	0.07
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	120	0.045	0.045	0.053	0.07
K	Grey cast iron	100 - 400	GG 25	0.6025	200	0.065	0.065	0.075	0.1
	Ductile iron	400 - 800	GGG 60	0.7060	170	0.065	0.065	0.075	0.1
	Malleable cast iron	350 - 700	GTS 55	0.8155	170	0.065	0.065	0.075	0.1
N	Copper alloy long-chipping	300 - 700	MS 63	2.0320	200	0.065	0.065	0.075	0.1
	Copper alloy short-chipping	Up to 500	MS 58	2.0402	200	0.065	0.065	0.075	0.1

Over 200,000 tools available online!

Advantages:
- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages





Register online now!

www.saratools.com

ATORN Exchangeable head milling cutter, torus type H



- Please adjust these guideline values according to clamping operation and machine set-up!

255608....

ISO	**Grooving** ae = 0.1 x D ap = 0.6 x D Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	194	0.074	0.074	0.089	0.111
P	Machining steel	Up to 700	9 SMn 28	1.0715	189	0.074	0.074	0.089	0.111
P	Unalloyed tempered steel	500 - 950	Ck45	1.1191	183	0.074	0.074	0.089	0.111
P	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	181	0.074	0.074	0.089	0.111
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	137	0.074	0.074	0.089	0.111
P	Cast steel	Up to 950	GS 40	1.0416	175	0.074	0.074	0.089	0.111
K	Grey cast iron	100 - 400	GG 25	0.6025	178	0.074	0.074	0.089	0.111
K	Alloyed grey cast iron	150-250	GGL-NiCr 35 2	0.6678	162	0.074	0.074	0.089	0.111
K	Ductile iron	400 - 800	GGG 60	0.7060	162	0.074	0.074	0.089	0.111
H	Hardened steel	45-50 HRc			107	0.074	0.074	0.089	0.111
H	Hardened steel	50-60 HRc			60	0.074	0.074	0.089	0.111
H	Hardened steel	60-70 HRc			52	0.074	0.074	0.089	0.111

ISO	**Side** ae = 0.03 x D ap = 0.6 x D Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	355	0.1	0.1	0.12	0.15
P	Machining steel	Up to 700	9 SMn 28	1.0715	345	0.1	0.1	0.12	0.15
P	Unalloyed tempered steel	500 - 950	Ck45	1.1191	335	0.1	0.1	0.12	0.15
P	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	330	0.1	0.1	0.12	0.15
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	320	0.1	0.1	0.12	0.15
P	Cast steel	Up to 950	GS 40	1.0416	320	0.1	0.1	0.12	0.15
K	Grey cast iron	100 - 400	GG 25	0.6025	325	0.1	0.1	0.12	0.15
K	Ductile iron	400 - 800	GGG 60	0.7060	295	0.1	0.1	0.12	0.15
K	Malleable cast iron	350 - 700	GTS 55	0.8155	295	0.1	0.1	0.12	0.15
H	Hardened steel	45-50 HRc			195	0.1	0.1	0.12	0.15
H	Hardened steel	50-60 HRc			110	0.1	0.1	0.12	0.15
H	Hardened steel	60-70 HRc			95	0.1	0.1	0.12	0.15

ATORN Exchangeable head milling cutter, torus type H-N



255609....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	**Side** ae = 1 x D ap = 0.1 x D Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	200	0.2	0.2	0.25	0.3
	Machining steel	Up to 700	9 SMn 28	1.0715	180	0.2	0.2	0.25	0.3
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	150	0.2	0.2	0.25	0.3
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	140	0.2	0.2	0.25	0.3
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	120	0.2	0.2	0.25	0.3
	Cast steel	Up to 950	GS 40	1.0416	130	0.2	0.2	0.25	0.3
K	Grey cast iron	100 - 400	GG 25	0.6025	180	0.2	0.2	0.25	0.3
	Ductile iron	400 - 800	GGG 60	0.7060	150	0.2	0.2	0.25	0.3
	Malleable cast iron	350 - 700	GTS 55	0.8155	150	0.2	0.2	0.25	0.3
H	Hardened steel	45-50 HRc			95	0.15	0.15	0.2	0.25
	Hardened steel	50-60 HRc			70	0.09	0.09	0.12	0.15
	Hardened steel	60-70 HRc			60	0.08	0.08	0.09	0.12



ATORN Exchangeable head milling cutter, radius Z2



255610....



255611....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	**Grooving** ae = 0.3 x D ap = 0.03 x D Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	570	0.065	0.065	0.09	0.12
	Machining steel	Up to 700	9 SMn 28	1.0715	450	0.065	0.065	0.09	0.12
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	390	0.065	0.065	0.09	0.12
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	350	0.065	0.065	0.09	0.12
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	240	0.045	0.045	0.06	0.08
	Cast steel	Up to 950	GS 40	1.0416	300	0.065	0.065	0.09	0.12
K	Grey cast iron	100 - 400	GG 25	0.6025	400	0.065	0.065	0.09	0.12
	Ductile iron	400 - 800	GGG 60	0.7060	380	0.065	0.065	0.09	0.12
	Malleable cast iron	350 - 700	GTS 55	0.8155	380	0.065	0.065	0.09	0.12
H	Hardened steel	45-50 HRc			180	0.045	0.045	0.06	0.08
	Hardened steel	50-60 HRc			160	0.045	0.045	0.06	0.08
	Hardened steel	60-70 HRc			150	0.045	0.045	0.06	0.08

ATORN Exchangeable head milling cutter, radius Z2 220°



255612....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	**Side** ae = 0.3 x D ap = 0.03 x D / Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	450	0.065	0.065	0.09	0.1
P	Machining steel	Up to 700	9 SMn 28	1.0715	350	0.065	0.065	0.09	0.1
P	Unalloyed tempered steel	500 - 950	Ck45	1.1191	305	0.065	0.065	0.09	0.1
P	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	310	0.065	0.065	0.09	0.1
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	170	0.045	0.045	0.055	0.65
P	Cast steel	Up to 950	GS 40	1.0416	250	0.065	0.065	0.09	0.1
K	Grey cast iron	100 - 400	GG 25	0.6025	450	0.065	0.065	0.09	0.1
K	Ductile iron	400 - 800	GGG 60	0.7060	410	0.065	0.065	0.09	0.1
K	Malleable cast iron	350 - 700	GTS 55	0.8155	410	0.065	0.065	0.09	0.1
H	Hardened steel	45-50 HRc			120	0.045	0.045	0.055	0.65
H	Hardened steel	50-60 HRc			90	0.045	0.045	0.055	0.65
H	Hardened steel	60-70 HRc			70	0.045	0.045	0.055	0.65

ATORN Exchangeable head milling cutter



255613....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	**Side** ae = 0.3 x D ap = 0.5 x D / Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	120	0.045	0.065	0.08	0.09
P	Machining steel	Up to 700	9 SMn 28	1.0715	105	0.045	0.065	0.08	0.09
P	Unalloyed tempered steel	500 - 950	Ck45	1.1191	95	0.045	0.065	0.08	0.09
P	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	90	0.045	0.065	0.08	0.09
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	65	0.03	0.045	0.06	0.07
P	Cast steel	Up to 950	GS 40	1.0416	80	0.045	0.065	0.08	0.09
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	80	0.03	0.045	0.06	0.07
K	Grey cast iron	100 - 400	GG 25	0.6025	120	0.045	0.065	0.08	0.09
K	Ductile iron	400 - 800	GGG 60	0.7060	90	0.045	0.065	0.08	0.09
K	Malleable cast iron	350 - 700	GTS 55	0.8155	60	0.045	0.065	0.08	0.09
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	300	0.045	0.065	0.08	0.09
N	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	280	0.045	0.065	0.08	0.09
N	Copper alloy long-chipping	300 - 700	MS 63	2.0320	200	0.045	0.065	0.08	0.09
N	Copper alloy short-chipping	Up to 500	MS 58	2.0402	200	0.045	0.065	0.08	0.09

ATORN Exchangeable head deburring milling cutter



255614....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	**Side** ae = 0.3 x D ap = 0.5 x D / Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	190	0.085	0.113	0.141	0.169
P	Machining steel	Up to 700	9 SMn 28	1.0715	170	0.085	0.113	0.141	0.169
P	Unalloyed tempered steel	500 - 950	Ck45	1.1191	170	0.085	0.113	0.141	0.169
P	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	120	0.044	0.05	0.075	0.1
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	160	0.063	0.075	0.1	0.125
P	Cast steel	Up to 950	GS 40	1.0416	120	0.044	0.05	0.075	0.1
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	110	0.038	0.044	0.063	0.075
M	Stainless steel, sulphurised	500 - 950	X 12 CrMoS 17	1.4104	75	0.031	0.038	0.056	0.075
M	Stainless steel, martensitic	500 - 950	X 10 Cr 13	1.4006	75	0.031	0.038	0.056	0.075
K	Grey cast iron	100 - 400	GG 25	0.6025	150	0.05	0.056	0.075	0.1
K	Ductile iron	400 - 800	GGG 60	0.7060	100	0.07	0.085	0.113	0.144
K	Malleable cast iron	350 - 700	GTS 55	0.8155	70	0.07	0.085	0.113	0.144
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	700	0.05	0.063	0.081	0.106
N	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	500	0.085	0.113	0.141	0.169
N	Copper alloy long-chipping	300 - 700	MS 63	2.0320	300	0.085	0.113	0.141	0.169
N	Copper alloy short-chipping	Up to 500	MS 58	2.0402	300	0.085	0.113	0.141	0.169

ATORN Exchangeable head quadrant milling cutter



255615....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Side ae = 0.1 x D ap = 0.1 x D Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
						10	12	16	20
P	Unalloyed structural steel	Up to 700	St-52	1.0052	190	0.012	0.015	0.025	0.032
	Machining steel	Up to 700	9 SMn 28	1.0715	170	0.012	0.015	0.025	0.032
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	160	0.012	0.015	0.025	0.032
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	140	0.012	0.015	0.025	0.032
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	80	0.012	0.015	0.025	0.032
	Cast steel	Up to 950	GS 40	1.0416	100	0.012	0.015	0.025	0.032
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	110	0.012	0.015	0.025	0.032
	Stainless steel, sulphurised	500 - 950	X 12 CrMoS 17	1.4104	75	0.012	0.015	0.025	0.032
	Stainless steel, martensitic	500 - 950	X 10 Cr 13	1.4006	75	0.012	0.015	0.025	0.032
K	Grey cast iron	100 - 400	GG 25	0.6025	150	0.012	0.015	0.025	0.032
	Ductile iron	400 - 800	GGG 60	0.7060	100	0.012	0.015	0.025	0.032
	Malleable cast iron	350 - 700	GTS 55	0.8155	70	0.012	0.015	0.025	0.032
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	600	0.012	0.015	0.025	0.032
	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	500	0.012	0.015	0.025	0.032
	Copper alloy long-chipping	300 - 700	MS 63	2.0320	300	0.012	0.015	0.025	0.032
	Copper alloy short-chipping	Up to 500	MS 58	2.0402	300	0.012	0.015	0.025	0.032



Dümmel WERKZEUGFABRIK Tool system for machining drill holes MINI-MILL



263001 - 263111....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm	
						Drill cutting	Thread milling
P	Unalloyed structural steel	Up to 700	St-52	1.0052	120 - 200	0.2 - 0.4	0.15 - 0.25
P	Tempering steel	500 - 950	42 CrMo4	1.7225	80 - 160	0.15 - 0.3	0.15 - 0.25
P	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	100 - 180	0.15 - 0.3	0.15 - 0.25
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	120 - 200	0.15 - 0.3	0.15 - 0.25
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	80 - 150	0.1 - 0.25	0.15 - 0.25
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	100 - 170	0.2 - 0.4	0.2 - 0.3
K	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	120	0.2 - 0.4	0.2 - 0.3
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	80-120	0.2 - 0.4	0.2 - 0.3
N	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581	300 - 500	0.15 - 0.4	0.2 - 0.3
N	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381	300 - 500	0.15 - 0.4	0.2 - 0.3
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	80 - 110	0.01 - 0.08	0.01 - 0.08

Dümmel WERKZEUGFABRIK ool system for machining drill holes MINI-MILL XL

263011....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Slot milling, cut-off milling, slot milling
						Feed f in mm/U
P	Free cutting steel	up to 700	9 SMn 28	1.0715	80-200	0,03 - 0,10
P	Structural steel	700 - 950	Ck45	1.1191	70-190	0,03 - 0,10
P	Tempering steel	500 - 950	42 CrMo4	1.7225	40-110	0,03 - 0,10
P	Case hardening steel	up to 1200	16 MnCr 5	1.7131	60-150	0,03 - 0,08
P	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	30-80	0,03 - 0,08
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	50-130	0,02 - 0,07
M	Stainless steel, ferr./ austenitic	500 - 950	X5 CrNi 18 10	1.4301	60-150	0,02 - 0,07
M	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	30-90	0,02 - 0,07
K	Grey cast iron	up to 260 HB	GG 25	0.6025	50-150	0,03 - 0,10
K	Alloyed grey cast iron	up to 280 HB	GGG 60	0.7060	40-100	0,03 - 0,10
K	Malleable cast iron	up to 280 HB	GTS 55	0.8155	60-160	0,03 - 0,10
N	Al. alloy. long-chipping	up to 500	AlMg 3	3.3535	110-270	0,04 - 0,15
N	Al. alloy. short-chipping	up to 500	G-AlSi 12	3.2581	90-240	0,04 - 0,15
N	Copper-Leg. (brass) long-chipping	up to 1200	CuSn4	2.1016	80-210	0,04 - 0,15
N	Copper-Leg. (brass) short-chipping	up to 850	CuNi12Zn24	2.0730	65-190	0,04 - 0,15
N	Copper-Leg. (brass) long-chipping	up to 600	Cu ZN 20	2.0250	90-240	0,04 - 0,15
N	Copper-Leg. (brass) short-chipping	up to 600	Cu Zn 39 Pb 3	2.0381	75-200	0,04 - 0,15
N	Thermoplastic		PVC		110-280	0,04 - 0,15
N	Thermoset		Melamin		120-310	0,04 - 0,15
N	fibre-reinforced plastics		CFK, GFK		70-170	0,04 - 0,15
N	Graphite		C8000		90-230	0,005 - 0,05
N	Composites		Honeycomp		90-200	0,04 - 0,15
S	Titanium alloys	up to 1300	TiAl6Sn 2	3.7174	20-60	0,04 - 0,12
S	Nickel-based alloys	up to 1300	NiCr19Fe19NbMo	Inconel 718	30-80	0,04 - 0,12
S	Superalloys	up to 1300	X45CrSi 9 3	1.4718	40-100	0,04 - 0,12
H	Hardened materials up to 55 HRC		X40Cr14	1.2083	30-90	0,02 - 0,06

$$n = \frac{Vc \times 1000}{d \times \pi}$$

$$U_{eff} = fz \times z \times n$$

Milling - external contour

$$U_{prog} = \frac{U_{eff} \times (D + d)}{D}$$

$$U_{eff} = \frac{D \times U_{prog}}{(D + d)}$$

Milling - internal contour

$$U_{prog} = \frac{U_{eff} \times (D - d)}{D}$$

$$U_{eff} = \frac{D \times U_{prog}}{(D - d)}$$

$$h_m = \frac{f_z}{\sqrt{\frac{d}{a_e}}} \qquad f_z = h_m \times \sqrt{\frac{d}{a_e}}$$

Average chip thickness
h_m > 0.05 mm/rev sought!

n	=	spindle speed	rpm	h_m	=	average chip thickness	mm/rev
Vc	=	cutting speed	m/min.	U_{prog}	=	programmed feed rate	mm/min.
d	=	milling cutter diameter	mm	f_z	=	feed per tooth	mm/min.
D	=	thread diameter	mm	z	=	jaw quantity of the cutter	mm
U_{eff}	=	effective feed rate (at the contour)	mm/min.	a_e	=	radial clamp depth	mm

ATORN Cutting inserts CMT



- Please adjust these guideline values according to clamping operation and machine set-up!

266100 - 266109....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm			
						Ø 10	Ø 12	Ø 18	Ø 25
P	Machining steel	Up to 700	9 SMn 28	1.0715	60 -120	0.16	0.17	0.2	0.22
	Unalloyed structural steel	Up to 700	St-52	1.0052	60 - 90	0.14	0.16	0.2	0.22
	Tempering steel	500 - 950	42 CrMo4	1.7225	50 - 80	0.1	0.12	0.16	0.18
	Cast steel	Up to 950	GS 40	1.0416	70 - 90	0.1	0.12	0.15	0.18
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	70 - 100	0.1	0.11	0.15	0.17
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	60 - 90	0.1	0.11	0.15	0.17
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	40 - 80	0.16	0.17	0.2	0.22
	Ductile iron	Up to 280 HB	GGG 60	0.7060	40 - 80	0.16	0.17	0.2	0.22
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	40 - 80	0.16	0.17	0.2	0.22
N	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	50 - 200	0.19	0.19	0.22	0.24
	Copper alloy (bronze) short-chipping	Up to 850	CuNi12Zn24	2.0730	60-140	0.1	0.11	0.16	0.18
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250	50 - 200	0.19	0.19	0.22	0.24
	Fibre-reinforced plastics		CFRP, GFRP		50 - 200	0.19	0.19	0.22	0.24
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	20 - 40	0.07	0.07	0.1	0.12
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	20 - 40	0.07	0.07	0.1	0.12
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	50 - 70	0.08 - 0.09	0.08 - 0.09	0.12	0.14

Over 200,000 tools available online!

Advantages:
- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages





Register online now!

www.saratools.com

ATORN Face milling cutter 45°



262555....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Indexable insert SN..X 1206 ANN... ap max. 5.0 mm: Cutting speed Vc m/min	Indexable insert SN..X 1206 ANN... ap max. 5.0 mm: Feed per cutting edge fz mm/tooth	Indexable insert SNMU 1260 ANER... ap max. 5.0 mm: Cutting speed Vc m/min	Indexable insert SNMU 1260 ANER... ap max. 5.0 mm: Feed per cutting edge fz mm/tooth	Indexable insert ONMU 1505 ANN... ap max. 0.5-3.0 mm: Cutting speed Vc m/min	Indexable insert ONMU 1505 ANN... ap max. 0.5-3.0 mm: Feed per cutting edge fz mm/tooth	Carbide Type
P	Unalloyed structural steel	Up to 700	St-52	1.0052	150 - 300	0.10 - 0.30	110 - 200	0.05 - 0.25	100 - 170	0.05 - 0.25	HC 4630
	Machining steel	Up to 700	9 SMn 28	1.0715							
	Unalloyed tempered steel	500 – 950	Ck45	1.1191							
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131							
	Tool steel	950 – 1400	X 38 CrMoV 5 1	1.2343							
	Cast steel	Up to 950	GS 40	1.0416							
M	Stainless steel, austenitic	500 – 950	X 5 CrNi 18 10	1.4301	90 - 160	0.10 - 0.35	90 - 170	0.05 - 0.25	90 - 160	0.05 - 0.25	HC 4535
	Stainless steel, sulphurised	500 – 950	X 12 CrMoS 17	1.4104							
	Stainless steel, martensitic	500 – 950	X 10 Cr 13	1.4006							
K	Grey cast iron	100 – 400	GG 25	0.6025	120-180	0.10 - 0.40	200 - 300	0.05 - 0.25	200 - 300	0.05 - 0.25	HC 4410
	Alloyed grey cast iron	150-250	GGL-NiCr 35 2	0.6678							
	Ductile iron	400 – 800	GGG 60	0.7060							
	Malleable cast iron	350 – 700	GTS 55	0.8155							
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	180 - 350	0.10 - 0.20					HW 4310
	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581							
	Copper alloy long-chipping	300 – 700	MS 63	2.0320							
	Copper alloy short-chipping	Up to 500	MS 58	2.0402							

SARA® Smooth-running face milling cutter 45°



262550....

- Indexable cutting insert SEMT 13T3 AGSN-PM, ap max. 6 mm
- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz mm/tooth	Carbide type of the indexable cutting insert used
P	Machining steel	Up to 700	9 SMn 28	1.0715	200 - 300	0.1 - 0.3	JC 5040 (JC 8050)
	Unalloyed structural steel	Up to 700	St-52	1.0052			
	Structural steel	700 - 950	Ck45	1.1191			
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	170 - 250	0.1 - 0.3	JC 5040 (JC 8050)
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	100 - 150	0.1 - 0.3	JC 5040
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	170 - 250	0.1 - 0.3	JC 8050 (JC 8015)
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301			
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	150 - 250	0.1 - 0.3	JC 605W (JC 8015)
	Ductile iron	Up to 280 HB	GGG 60	0.7060	120-180	0.1 - 0.3	JC 8015
H	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	60 - 100	0.1 - 0.2	JC 8015

ATORN Face milling cutter 45°



260150....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Vc m/min	Max. tooth feed rate fz in mm with ae = 0.75 x d1 (d1 = milling cutter diameter) SAHT 1306[2]	Suitable indexable insert
M	Acid-resistant stainless steel, ferritic, martensitic 500-950 N/mm²	140 - 170	0.30	HC4540 HC4640
	Acid-resistant stainless steel, austenitic 500-950 N/mm²	200 - 280	0.25	
		60 - 120[1]		
	Maraging steel 500 – 950 N/mm²	180 - 240	0.25	
		60 - 120[1]		
K	Cast iron with lamellar graphite 100-400 N/mm²	200 - 260	0.40	HC4410
	Alloyed cast iron 150-250 N/mm²	160 - 200	0.30	
	Cast iron with spheroidal graphite 400-800 N/mm²	140 - 180	0.35	
	Alloyed cast iron 350-700 N/mm²	160 - 200	0.35	
N	Aluminium alloys, long-chipping up to 550 N/mm²	300 - 1000	0.40	
	Copper alloys, long-chipping 300-700 N/mm²	250 - 500	0.40	
S	Titanium alloys, medium-strength up to 950 N/mm²	40 - 80[1]	0.15	HC4640
	Titanium alloys, high-strength 900-1400 N/mm²	30 - 40[1]	0.15	

[1] Cutting data for wet chipping
[2] The fz values related to the cutting depths for ap = 3 mm (SAHT 1306)

palbit Face milling cutter 45° PLUS 91245



260211....

- ae = 0,7 x D
- PH5... = Cooling: air or emulsion
- PH7... = Cooling: air
- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Feed fz in mm/tooth	Cutting speed Vc m/min			
						◄ Wear resistance			Toughness ►
						PH5705	PH7920	PH5740	PH7740
						++	±	±	--
P	Unalloyed structural steel	Up to 700	St-52	1.0052	0,15 - 0,4		180 - 320		160 - 240
P	Tempering steel	500 - 950	42 CrMo4	1.7225	0,15 - 0,4		150 - 240		140 - 200
P	Tempering steel	950 -1300	43CrMo4	1.3563	0,15 - 0,4		140 - 200		120 - 170
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	0,1 - 0,3				110 - 160
M	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	0,1 - 0,3				90 - 140
M	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	0,1 - 0,3				80 - 120
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	0,15 - 0,4	170 - 305		150 - 260	
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	0,14 - 0,4	180 - 350		155 - 290	
K	Ductile iron	Up to 280 HB	GGG 60	0.7060	0,14 - 0,4	130 - 210		115 - 180	
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0,1 - 0,17				20 - 55
			Usage conditions:	++ = good	± = average	-- = difficult			

palbit Face milling cutter 45° LINEPRO 09945

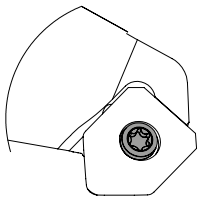


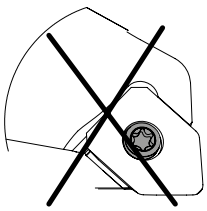
260213....

- ae = 0,7 x D
- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Feed fz in mm/tooth	Cutting speed Vc m/min		
						◄ Wear resistance		Toughness ►
						PH0910	PH6920	PH6740
						++	±	--
P	Unalloyed structural steel	Up to 700	St-52	1.0052	0,1 - 0,3		150 - 230	130 - 160
P	Tempering steel	500 - 950	42 CrMo4	1.7225	0,1 - 0,3		140 - 220	120 - 150
P	Tempering steel	950 -1300	43CrMo4	1.3563	0,1 - 0,3		130 - 180	100 - 130
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	0,1 - 0,2			100 - 120
M	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	0,1 - 0,2			80 - 110
M	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	0,1 - 0,2			70 - 100
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	0,1 - 0,25		150 - 280	130 - 250
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	0,1 - 0,25		130 - 230	110 - 220
K	Ductile iron	Up to 280 HB	GGG 60	0.7060	0,1 - 0,2		80 - 190	80 - 170
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	3.3535	0,1 - 0,2	350 - 1400		
			Usage conditions:	++ = good	± = average	-- = difficult		

Cutting data Wiper indexable cutting insert
Fw = 1,4 x Fn (Fn = Fz x Z)





Over 200,000 tools available online!

Advantages:
- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages





Register online now!

www.saratools.com

ATORN Face and copy milling cutter, OCKX, XCKX, RCKX 1606 and SAHT 1306



260111....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed per cutting edge fz mm/tooth	Carbide Type
P	Machining steel	Up to 700	9 SMn 28	1.0715	135 - 180 120 - 300	0.1 - 0.35	HC 4540 HC 4620
	Unalloyed structural steel	Up to 700	St-52	1.0052			
	Structural steel	700 - 950	Ck45	1.1191			
	Cast steel	Up to 950	GS 40	1.0416			
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131			
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343			
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	180 - 240	0.1 - 0.35	HC 4540
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301			
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	50-120 160 - 300	0.1 - 0.35	HC 4410 HC 4620
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678			
	Ductile iron	Up to 280 HB	GGG 60	0.7060			
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155			

ATORN Shoulder milling cutter 90°



262547.... 283310....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed per cutting edge fz mm/tooth		
						Finishing	Medium machining	Roughing
P	Machining steel	Up to 700	9 SMn 28	1.0715	220 - 250	0.1	0.2	0.3
	Unalloyed structural steel	Up to 700	St-52	1.0052	220 - 250	0.1	0.2	0.3
	Structural steel	700 - 950	Ck45	1.1191	220 - 250	0.1	0.2	0.3
	Cast steel	Up to 950	GS 40	1.0416	220 - 250	0.1	0.2	0.3
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	160 - 200	0.08	0.15	0.2
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	160 - 200	0.08	0.15	0.2
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	130 - 140	0.06	0.12	0.2
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	130 - 140	0.06	0.12	0.2
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	140 - 200	0.12	0.25	0.35
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	140 - 180	0.1	0.2	0.3
	Ductile iron	Up to 280 HB	GGG 60	0.7060	140 - 180	0.1	0.2	0.3
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	140 - 200	0.12	0.25	0.35
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	40 - 60	0.05	0.08	0.12

ae/D	50 - 100%	30%	20%	10%	5%	2%
Factor	1	1.2	1.5	2.1	3	4.8

ATORN Roughing spiral flute end milling cutter 90°



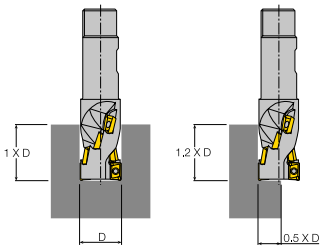
262544....

- Please adjust these guideline values according to clamping operation and machine set-up!

Subsequent cutting conditions must be regarded as guideline values.
Various factors can influence these values:

- Rigidity of the machine
- Workpiece clamping
- Material

A= Groove milling: A_p (axial cutting depth) up to 1 x milling cutter diameter
B= shoulder milling: A_e (radial cutting depth) up to 0.5 x milling cutter diameter and
Ap (axial cutting depth) up to 1.2 x milling cutter diameter



ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Hardness Brinell	Cutting speed Vc m/min	Feed per cutting edge fz mm/tooth			
							Ø 20 + Ø 25		Ø 32 + Ø 40	
							A	B	A	B
P	Machining steel	Up to 700	9 SMn 28	1.0715	150 - 200	110 - 200 110 - 175	0.08 - 0.15	0.08 - 0.18	0.1 - 0.2	0.1 - 0.25
	Tempering steel	500 - 950	42 CrMo4	1.7225	125 - 275	90 - 135 90 - 125	0.08 - 0.15	0.08 - 0.18	0.1 - 0.2	0.1 - 0.25
	Tempering steel	950 -1300	43CrMo4	1.3563	275 - 325	80-100 80 - 90	0.07 - 0.15	0.07 - 0.18	0.08 - 0.2	0.08 - 0.25
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	175 - 275	90 - 150 90 - 160	0.08 - 0.15	0.08 - 0.18	0.1 - 0.2	0.1 - 0.25
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	135 - 175	100 - 130 100 - 110	0.08 - 0.15	0.08 - 0.18	0.1 - 0.2	0.1 - 0.25
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	140 - 200	85 - 105	0.08 - 0.2	0.1 - 0.25	0.1 - 0.25	0.1 - 0.3
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	110 - 250	55 - 85	0.07 - 0.18	0.08 - 0.2	0.08 - 0.23	0.1 - 0.27
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535		250 - 450	0.12 - 0.23	0.11 - 0.28	0.13 - 0.28	0.15 - 0.35

ATORN 4-10 Power / 4-15 Power



262559.... 262560.... 262562.... 262563....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed per cutting edge fz mm/tooth	Carbide type	Indexable inserts designation
P	Machining steel	Up to 700	9 SMn 28	1.0715	100 - 300	0.1 - 0.3	HC 4630	LNMX 10../15.. PNR-MM
	Unalloyed structural steel	Up to 700	St-52	1.0052				
	Structural steel	700 - 950	Ck45	1.1191				
	Cast steel	Up to 950	GS 40	1.0416				
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131				
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343				
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	120-180	0.05 - 0.25	HC 4535	LNMX 10../15.. PNR-MM
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301				
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	120 - 300	0.08 - 0.25	HC 4410	LNMX 10../15.. PNR-MM
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678				
	Ductile iron	Up to 280 HB	GGG 60	0.7060				
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155				
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	200 - 300	0.1 - 0.3	HW 4310	LNMX 10../15.. PNR-MA
	Al. alloy short-chipping	Up to 500	G-AlSi 12	3.2581				
	Copper alloy (brass) long-chipping	Up to 600	Cu ZN 20	2.0250				
	Copper alloy (brass) short-chipping	Up to 600	Cu Zn 39 Pb 3	2.0381				

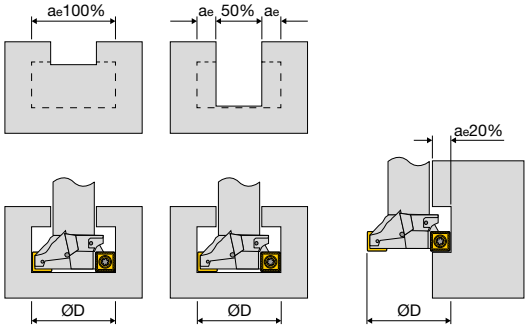
SARA® T-slot milling cutter



263007.... 263008....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed f in mm/rev in relation to drill bit diameter in mm		
						21 - 25	32 - 40	50
P	Unalloyed structural steel	Up to 700	St-52	1.0052	250	0.1	0.12	0.16
	Structural steel	700 - 950	Ck45	1.1191	200	0.08	0.09	0.1
	Tempering steel	500 - 950	42 CrMo4	1.7225	170	0.08	0.06	0.08
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	170	0.08	0.06	0.08
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	200	0.06	0.06	0.06
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	200	0.12	0.16	0.18
	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678	180	0.1	0.12	0.12
	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	200	0.08	0.08	0.1
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	60	0.06	0.06	0.06
	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	40	0.06	0.06	0.06
ap max. [mm]						9 - 11	14 - 17	21



ae/D	100%	50%	20%	10%
Vc	100%	90%	80%	70%
X	1	1	1.3	1.5

The cutting speed Vc must be reduced for decreasing contact width ae/D.
The feed per cutting edge fz must be corrected by factor X.

ATORN High feed-rate milling cutter XDM..



286001..../286002....

- Please adjust these guideline values according to clamping operation and machine set-up!

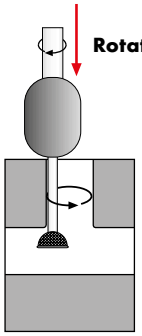
ISO	ae = 0.75 x D ap = 0.6 mm Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Feed fz in mm/tooth HC4640 XDMW 0903SR	Feed fz in mm/tooth HC4640 XDMT 0903ER	Cutting speed Vc m/min	Feed fz in mm/tooth HC4410 XDMW 0903SR	Feed fz in mm/tooth HC4410 XDMT 0903ER
P	Machining steel	Up to 700	9 SMn 28	1.0715	200 - 260	1.7	1.4	260 - 270	1.5	1.3
	Unalloyed structural steel	Up to 700	St-52	1.0052	200 - 260	1.7	1.4	260 - 270	1.5	1.3
	Case-hardened steel	Up to 1200	16 MnCr 5	1.7131	150-180	1.4	1.2	160 - 190	1.3	1.1
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	160 - 210	1.2	1.0	180 - 220	1.2	1.0
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006	200 - 240		0.9			
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	200 - 240		0.9			
K	Alloyed grey cast iron	Up to 310 HB	GGL-NiCr 35 2	0.6678				180 - 200	1.0	
	Ductile iron	Up to 280 HB	GGG 60	0.7060				200 - 240	1.0	
H	Hardened materials up to 55 HRc		X40Cr14	1.2083				100	1.0	
	Hardened materials up to 60 HRc		X153CrMoV12	1.2379				80	0.7	
	Hardened materials up to 64 HRc		100Cr6	1.2067				70	0.4	

Deburring tool Orbitool® for internal machining



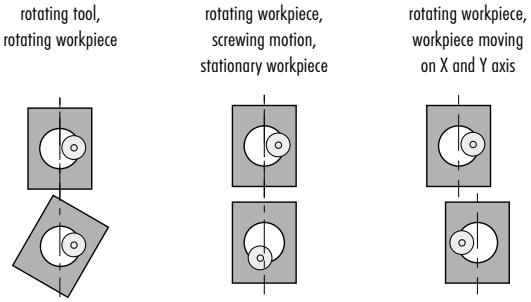
250010.... 250011....

1. Rotational speed rpm
The tool rotates in a clockwise direction. The higher the rotational speed, the more material is removed. Limiting factors include the rotational speed of the machine spindle and the desired surface quality. The recommended rotational speed for ORBITOOL® DEBURRING TOOLS is between 2000 and 8000 rpm.
A lower rotational speed reduces vibrations and produces a better finish.
Harder materials require higher rotational speeds.



2. Feed rate
The feed rate determines the material removal rate and the form of the cutting edges of the intersecting boreholes. For softer materials, e.g. aluminium, smaller feed rates produce chamfers instead of a radius. Feed rates of 0.05 to 0.6 mm per circular motion of the tool are recommended.

3. Rotational speed of the circular motion
There are three options for moving ORBITOOL® DEBURRING TOOLS in the workpiece bore:
Recommended rotational speed range for the circular motion: 20 - 100 min^{-1}



The circular motion diameter calculation is:
D = Dh - Ds
D = diameter of the circular motion
Dh = diameter of the bore
D = ORBITOOL® DEBURRING TOOL end milling cutter diameter

Note
The abrasion capacity of the tool increases with the stiffness of the tool clamping. The flexibility of the tool shank allows almost universal application. However, if the shank lengths of the ORBITOOL® DEBURRING TOOL are too short, particularly with smaller shank diameters, this may cause permanent deformation of the tool shank. For delicate machining processes, sensitive surfaces or insufficient shank lengths, a flexible spacer (optional) can be used to remedy this. Threaded bores can also be easily deburred. The protective disc of the milling tool protects the thread profile from damage.



palbit High feed-rate milling cutter HIFEED 6410

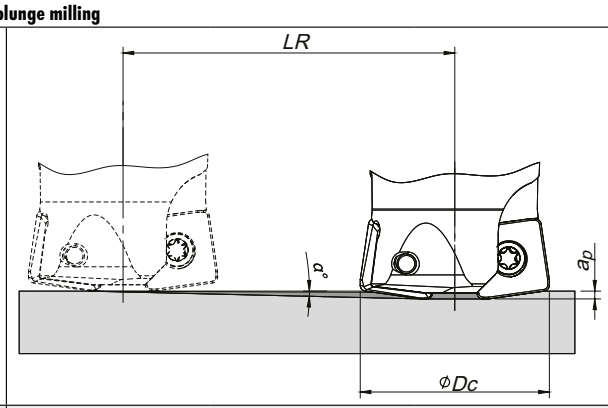


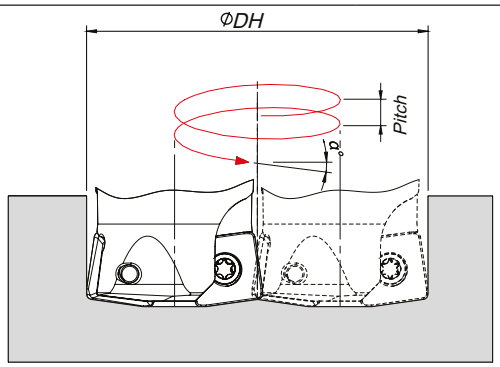
- ae = 0,7 x D
- PH7... = Cooling: air
- Please adjust these guideline values according to clamping operation and machine set-up!

260218....
260219....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Feed fz/tooth	Cutting speed Vc m/min				
						◄ Wear resistance				Toughness ►
						PH7910	PH7920	PH7930	PH7740	PHM740
						++	±	±	--	--
P	Unalloyed structural steel	Up to 700	St-52	1.0052	0,4 - 1,8	160 - 280	150 - 230	140 - 220	100 - 180	
P	Tempering steel	500 - 950	42 CrMo4	1.7225	0,4 - 1,8	150 - 230	140 - 220	130 - 180	90 - 170	
P	Tempering steel	950 -1300	43CrMo4	1.3563	0,3 - 1,5	140 - 190	130 - 180	100 - 170	80 - 140	
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	0,4 - 1,3			130 - 220	100 - 180	100 - 180
M	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	0,4 - 1,3			120 - 180	90 - 150	90 - 150
M	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	0,1 - 1,0			70 - 140	70 - 120	70 - 120
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	0,5 - 1,8	160 - 350	150 - 310			
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	0,5 - 1,8	150 - 300	140 - 260			
K	Ductile iron	Up to 280 HB	GGG 60	0.7060	0,5 - 1,5	120 - 360	100 - 220			
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0,4 - 1,0			35 - 65	25 - 60	25 - 60
Usage conditions: ++ = good ± = average -- = difficult										

Ramping and helical plunge milling

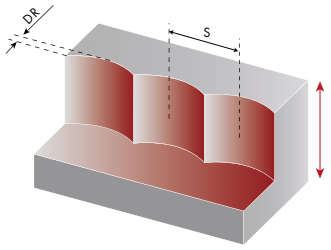




ØDc	Ramping			Helical plunge milling		
	a°	ap max.	LR min.	ØDH min.	ØDH max.	Pitch max. / U
20	15	1	3,2	26,4 -	- 38	6 17
25	9,5	1	6,0	36,4 -	- 48	5 12
32	5,5	1	10,4	50,4 -	- 62	5 9
35	4,5	1	12,7	56,4 -	- 68	5 8
42	3,5	1	16,3	70,4 -	- 82	5 7

Plunging

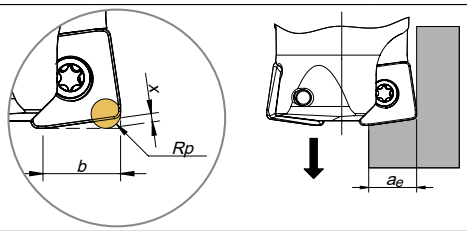
L ≤ 3Dc	L > 3Dc	S max.
fz (mm/z)		
0,08 - 0,15	0,05 - 0,1	S max. = $\sqrt{}$ Dc x DR - DR²



S max. and DR (depending on diameter Dc)

DR	Dc				
	20	25	32	35	42
1	4,4	4,9	5,6	5,8	6,4
2	6,0	6,8	7,7	8,1	8,9
3	7,1	8,1	9,3	9,8	10,8
4	8,0	9,2	10,6	11,1	12,3
5	8,7	10	11,6	12,2	13,6
6	9,2	10,7	12,5	13,2	14,7

Programming



Indexable cutting inserts	Rp	X	b	ae
SO...0803..	2,0	0,8	6,8	6,3

palbit High feed-rate milling cutter HIFEED 06690

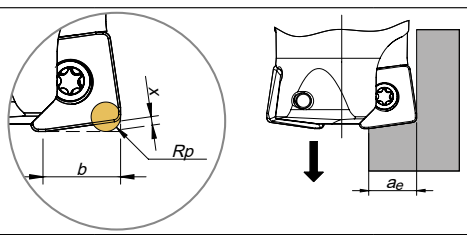


- ae = 0,7 x D
- PH7... = Cooling: air
- Please adjust these guideline values according to clamping operation and machine set-up!

260221....
260220....

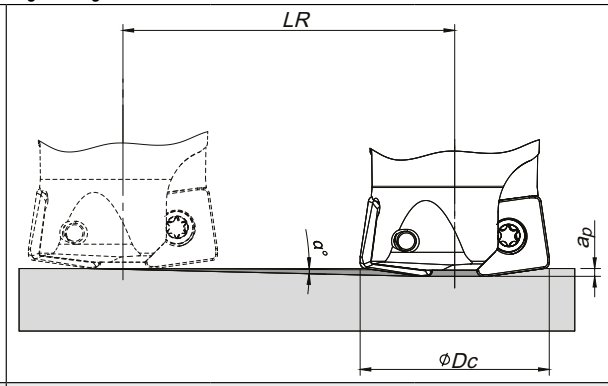
ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Feed fz/tooth	Cutting speed Vc m/min				
						◄ Wear resistance				Toughness ►
						PH7910	PH7920	PH7930	PH7740	PHM740
						++	±	±	--	--
P	Unalloyed structural steel	Up to 700	St-52	1.0052	0,5 - 2,0	160 - 280	150 - 230	140 - 220	100 - 180	
P	Tempering steel	500 - 950	42 CrMo4	1.7225	0,5 - 2,0	150 - 230	140 - 220	130 - 180	90 - 170	
P	Tempering steel	950 -1300	43CrMo4	1.3563	0,5 - 1,8	140 - 190	130 - 180	100 - 170	80 - 140	
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	0,5 - 1,8			130 - 220	100 - 180	100 - 180
M	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	0,5 - 1,8			120 - 180	90 - 150	90 - 150
M	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	0,5 - 1,8			70 - 140	70 - 120	70 - 120
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	0,5 - 2,0	160 - 350	150 - 310		120 - 240	
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	0,5 - 2,0	150 - 300	140 - 260		100 - 200	
K	Ductile iron	Up to 280 HB	GGG 60	0.7060	0,5 - 1,8	120 - 260	100 - 220		80 - 150	
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0,4 - 1,3			35 - 65	25 - 60	25 - 60
Usage conditions: ++ = good ± = average -- = difficult										

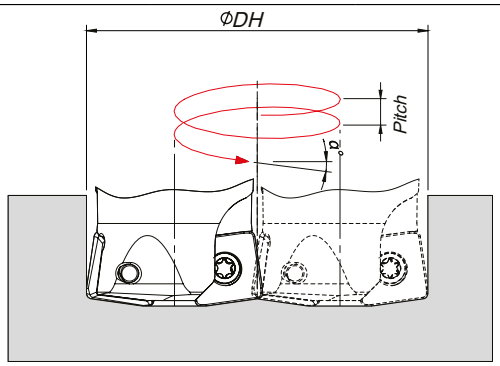
Programming



Indexable cutting inserts	Rp	X	b	ae
SO...13M5..	2,5	1,1	10,5	10,0

Ramping and helical plunge milling

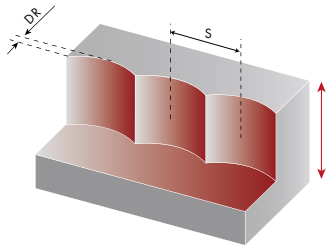




ØDc	Ramping			Helical plunge milling		
	a°	ap max.	LR min.	ØDH min.	ØDH max.	Pitch max. / U
32	10	1,5	6	43 -	- 62	6 16
35	9	1,5	9,5	49 -	- 68	6 16
42	6,4	1,5	13,4	63 -	- 82	7 14
50	4,3	1,5	19,9	79 -	- 98	6 11
52	4	1,5	21,5	83 -	- 102	6 10
63	3	1,5	28,6	105 -	- 124	6 10
66	2,6	1,5	33	111 -	- 130	6 9
80	2	1,5	43	139 -	- 158	6 8

Plunging

L ≤ 3Dc	L > 3Dc	S max.
fz (mm/z)		
0,1 - 0,2	0,07 - 0,14	S max. = $\sqrt{}$ Dc x DR - DR²



S max. and DR (depending on diameter Dc)

DR	Dc							
	32	35	42	50	52	63	66	80
1	5,6	5,8	6,4	7,0	7,1	7,9	8,1	8,9
2	7,7	8,1	8,9	9,8	10,0	11,0	11,3	12,5
3	9,3	9,8	10,8	11,9	12,1	13,4	13,7	15,2
4	10,6	11,1	12,3	13,6	13,9	15,4	15,7	17,4
5	11,6	12,2	13,6	15,0	15,3	17,0	17,5	19,4
6	12,5	13,2	14,7	16,2	16,6	18,5	19,0	21,1
7	13,2	14,0	15,7	17,3	17,7	19,8	20,3	22,6
8	13,9	14,7	16,5	18,3	18,8	21,0	21,5	24,0
9	14,4	15,3	17,2	19,2	19,7	22,0	22,6	25,3
10	14,8	15,8	17,9	20,2	20,5	23,0	23,7	26,5

palbit High feed-rate milling cutter LINEPRO 20090



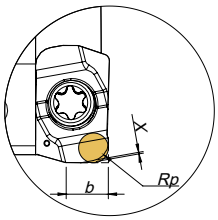
- ae = 0,7 x D
- PH7... = Cooling: air
- Please adjust these guideline values according to clamping operation and machine set-up!

260240....
260239....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Feed fz/tooth			Cutting speed Vc m/min	
								◄ Wear resistance	Toughness ►
								PH7920	PH7930
					XPET 06...LP	XPET 06...HF	XPHW 06...MH	±	--
P	Unalloyed structural steel	Up to 700	St-52	1.0052	0,05 - 0,07	0,4 - 0,8	0,05 - 0,12	180 - 240	160 - 220
P	Tempering steel	500 - 950	42 CrMo4	1.7225	0,05 - 0,07	0,4 - 0,8	0,05 - 0,12	170 - 250	150 - 230
P	Tempering steel	950 -1300	43CrMo4	1.3563	0,05 - 0,07	0,4 - 0,6	0,05 - 0,12	160 - 210	140 - 190
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	0,05 - 0,07	0,4 - 0,8			130 - 220
M	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	0,05 - 0,07	0,4 - 0,6			120 - 180
M	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	0,05 - 0,07	0,4 - 0,6			70 - 140
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	0,05 - 0,07	0,4 - 0,8		160 - 350	160 - 350
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	0,05 - 0,07	0,4 - 0,8		150 - 320	150 - 300
K	Ductile iron	Up to 280 HB	GGG 60	0.7060	0,05 - 0,07	0,4 - 0,8		130 - 280	120 - 260
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0,05 - 0,07	0,4 - 0,6			35 - 65
Usage conditions: ++ = good ± = average -- = difficult									

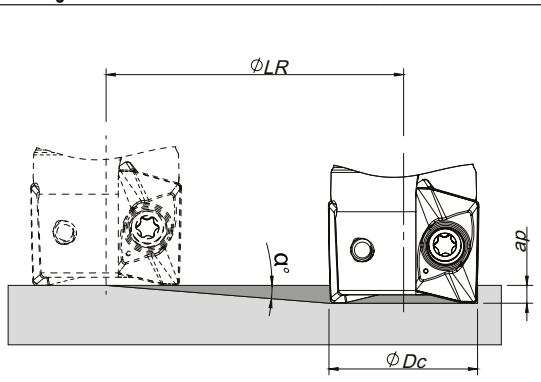
	ae	Vc	fz	ap mm
Grooving	100%	< 20%	< 20%	1 - 3
Side milling	< 50%	> 8%	> 8%	1 - 4
	≤ 25%	> 12%	> 12%	1 - 4

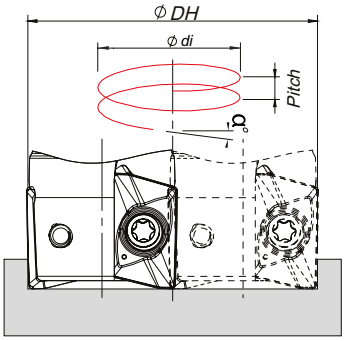
Programming



Indexable cutting inserts	Rp	X	b
XPET 05 HF	1,1	0,84	2,3

Ramping and helical plunge milling





ØDc	Ramping			Helical plunge milling		
	a°	ap max.	LR min.	ØDH min.	ØDH max.	Pitch max. / U
10	5,5	4	41,5	17,2 -	- 18,4	2,2 2,5
12	4,0	4	57,2	21,2 -	- 22,4	2,0 2,3
16	2,5	4	91,6	29,2 -	- 30,4	1,8 2,0
17	2,2	4	104,1	31,2 -	- 32,4	1,7 1,9
20	1,9	4	120,6	37,2 -	- 38,4	1,8 1,9
21	1,6	4	143,2	39,2 -	- 40,4	1,6 1,7
25	1,3	4	171,0	47,2 -	- 48,4	1,6 1,7
32	1,0	4	229,2	61,2 -	- 62,4	1,6 1,7

palbit High feed-rate milling cutter LINEPRO 20190



- ae = 0,7 x D
- PH5... = Cooling: air or emulsion
- PH7... = Cooling: air
- Please adjust these guideline values according to clamping operation and machine set-up!

260243....
260242....
260241....

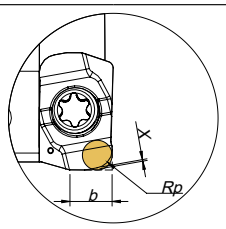
ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min						
					◄ Wear resistance						Toughness ►
					PH7603	PH0910	PH5705	PH7920	PH7930	PH 5740	PHS740
					++	++	++	±	±	--	--
P	Unalloyed structural steel	Up to 700	St-52	1.0052	200 - 260			160 - 220	140 - 200		120 - 150
P	Tempering steel	500 - 950	42 CrMo4	1.7225	190 - 270			150 - 230	130 - 180		110 - 170
P	Tempering steel	950 -1300	43CrMo4	1.3563	180 - 230			140 - 190	100 - 170		100 - 130
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006					130 - 220		
M	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301					120 - 180		
M	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462					70 - 140		
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155			160 - 390	160 - 350	140 - 260	120 - 240	
K	Grey cast iron	Up to 260 HB	GG 25	0.6025			150 - 320	150 - 300	130 - 220	110 - 200	
K	Ductile iron	Up to 280 HB	GGG 60	0.7060			120 - 260	120 - 260	100 - 180	90 - 170	
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535		350 - 1.400					
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718					35 - 65		
H	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	120 - 230						

Usage conditions: ++ = good ± = average -- = difficult

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Feed fz/tooth				
					XPET 10..LP	XPET10..MP	XPET 10..LN	XPET..HF	XPHW 10..MH
P	Unalloyed structural steel	Up to 700	St-52	1.0052	0,08 - 0,2	0,10 - 0,25		0,4 - 0,8	0,1 - 0,25
P	Tempering steel	500 - 950	42 CrMo4	1.7225	0,08 - 0,2	0,10 - 0,2		0,4- 0,8	0,1 - 0,25
P	Tempering steel	950 -1300	43CrMo4	1.3563	0,08 - 0,15	0,10 - 0,2		0,4 - 0,6	0,1 - 0,25
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	0,08 - 0,2	0,10 - 0,2		0,4 - 0,7	
M	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	0,08 - 0,2	0,10 - 0,2		0,4 - 0,7	
M	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	0,08 - 0,15	0,10 - 0,2		0,4 - 0,6	
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	0,08 - 0,2	0,10 - 0,25		0,5 - 0,8	
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	0,08 - 0,2	0,10 - 0,25		0,5 - 0,8	
K	Ductile iron	Up to 280 HB	GGG 60	0.7060	0,08 - 0,2	0,10 - 0,2		0,5 - 0,6	
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535			0,07 - 0,25		
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0,05 - 0,07			0,4 - 0,6	
H	Hardened materials up to 60 HRc		X153CrMoV12	1.2379					0,08 - 0,15

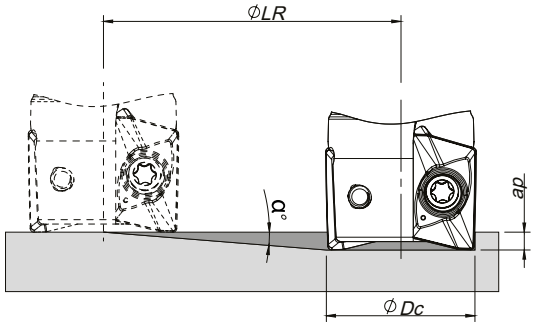
	ae	Vc	fz	ap mm
Grooving	100%	< 20%	< 20%	2 - 4
Side milling	< 50%	> 8%	> 8%	3 - 6
	≤ 25%	> 12%	> 12%	7 - 9

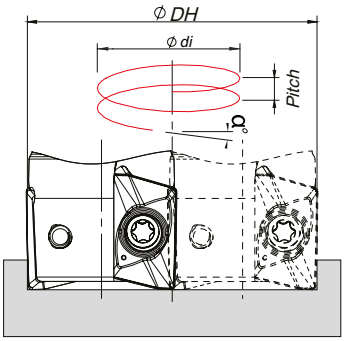
Programming



Indexable cutting inserts	Rp	X	b
XPET 10 HF	1,6	0,33	3,45

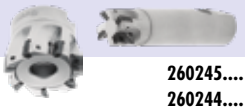
Ramping and helical plunge milling





ØDc	Ramping			Helical plunge milling		
	a°	ap max.	LR min.	ØDH min.	ØDH max.	Pitch max. / U
16	7,5	10	76	27,6 -	- 30,4	4,8 6,0
17	7	10	81,4	29,6 -	- 32,4	5,9 5,9
20	5	10	114,3	35,6 -	- 38,4	4,3 5,1
22	4,5	10	127,1	39,6 -	- 42,4	4,3 5,0
25	3,5	10	163,5	45,6 -	- 48,4	4,0 4,5
27	3	10	190,8	49,6 -	- 52,4	3,7 4,2
32	2,5	10	229	59,6 -	- 62,4	3,8 4,2
40	1,7	10	336,9	75,6 -	- 78,4	3,3 3,6
50	1,3	10	440,7	95,6 -	- 98,4	3,2 3,4
63	1	10	572,9	121,6 -	- 124,4	3,2 3,4

palbit High feed-rate milling cutter LINEPRO 20290

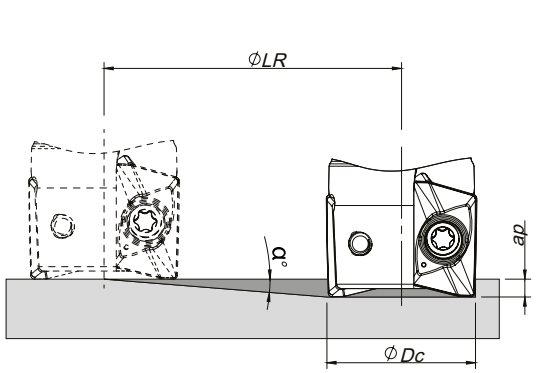


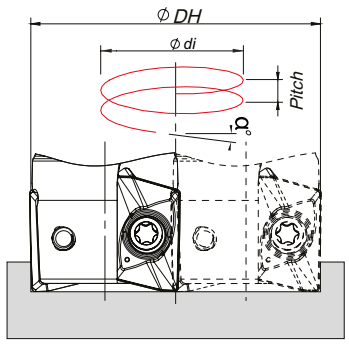
260245....
260244....

- ae = 0,7 x D
- PH5... = Cooling: air or emulsion
- PH7... = Cooling: air
- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Feed fz/tooth	Cutting speed Vc m/min					
						◄ Wear resistance					Toughness ►
						PH0910	PH5705	PH7920	PH5740	PHS740	PH7740
						++	++	±	--	--	--
P	Unalloyed structural steel	Up to 700	St-52	1.0052	0,1 - 0,35			160 - 280		140 - 220	140 - 220
P	Tempering steel	500 - 950	42 CrMo4	1.7225	0,1 - 0,35			150 - 230		130 - 180	130 - 180
P	Tempering steel	950 -1300	43CrMo4	1.3563	0,1 - 0,30			140 - 190		100 - 170	100 - 170
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	0,1 - 0,30						130 - 220
M	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	0,1 - 0,30						120 - 180
M	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	0,1 - 0,25						70 - 140
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	0,1 - 0,35		160 - 380	160 - 350	150 - 300		140 - 260
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	0,1 - 0,35		150 - 320	150 - 300	140 - 250		130 - 220
K	Ductile iron	Up to 280 HB	GGG 60	0.7060	0,1 - 0,30		120 - 280	120 - 260	120 - 220		100 - 180
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	0,1 - 0,35	350 - 1.400					
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0,1 - 0,20						30 - 65
Usage conditions: ++ = good ± = average -- = difficult											

Ramping and helical plunge milling





ØDc	Ramping			Helical plunge milling		
	a°	ap max.	LR min.	ØDH min.	ØDH max.	Pitch max. / U
32	3,8	17	255,9	58,8 -	- 62,4	5,6 6,3
40	2,7	17	360,5	74,8 -	- 78,4	5,2 5,7
50	2,0	17	186,8	94,8 -	- 98,4	4,9 5,3
63	1,5	17	649,2	120,8 -	- 124,4	4,8 5,0
80	1,0	17	973,9	154,8 -	- 158,4	4,1 4,3
100	0,8	17	1.217,5	194,8 -	- 198,4	4,2 4,3
125	0,7	17	1.498,4	244,8 -	- 264,4	4,3 4,4

palbit High feed-rate milling cutter TETRAFEED



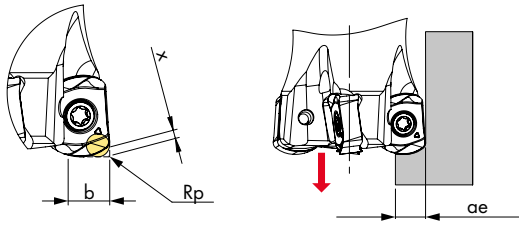
- ae = 0,7 x D
- PH7... = Cooling: air
- Please adjust these guideline values according to clamping operation and machine set-up!

260311....
260312....
260313....

260314....
260315....

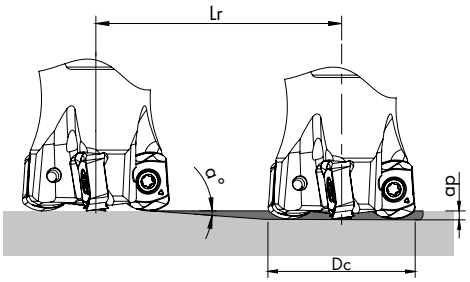
ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Feed fz/tooth	Cutting speed Vc m/min			
						◄ Wear resistance			Toughness ►
						PHP920	PHP930	PHH930	PHS740
					XNKU 06..-MP	±	±	±	--
P	Unalloyed structural steel	Up to 700	St-52	1.0052	0,05 - 1,50	180 - 250	160 - 230		160 - 230
P	Tempering steel	500 - 950	42 CrMo4	1.7225	0,05 - 1,50	170 - 210	150 - 190		150 - 190
P	Tempering steel	950 -1300	43CrMo4	1.3563	0,05 - 1,50	160 - 200	140 - 180		140 - 180
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	0,05 - 1,40			130 - 170	120 - 180
M	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	0,05 - 1,40			100 - 160	100 - 150
M	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	0,05 - 1,40			80 - 140	70 - 130
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	0,05 - 1,50	180 - 320			160 - 300
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	0,05 - 1,50	170 - 280			150 - 260
K	Ductile iron	Up to 280 HB	GGG 60	0.7060	0,05 - 1,50	100 - 240			80 - 220
S	Nickel-based alloys	Up to 1300	NiCr19Fe19NbMo	Inconel 718	0,05 - 1,30			30 -75	30 - 70
Usage conditions: ++ = good ± = average -- = difficult									

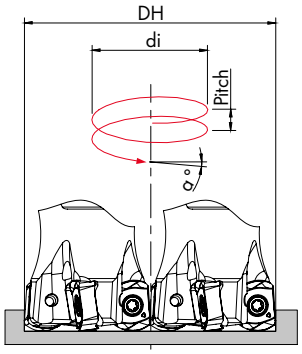
Programming



Indexable cutting inserts	Rp	X	b	a_e
XNKU 06T310-MP	1,8	0,4	3,6	3,4

Ramping and helical plunge milling

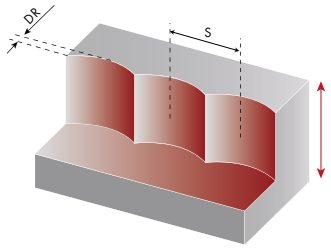




ØDc	Ramping			Helical plunge milling		
	a°	ap max.	LR min.	ØDH min.	ØDH max.	Pitch max. / U
16	0,5	1	114,6	24,8 -	- 30,0	0,2 0,3
20	0,5	1	114,6	32,8 -	- 38,0	0,3 0,4
25	0,8	1	71,6	42,8 -	- 48,0	0,7 1,0
32	0,8	1	71,6	56,8 -	- 62,0	1,0 1,3
35	0,5	1	114,6	62,8 -	- 68,0	0,7 0,9
40	0,4	1	143,2	72,8 -	- 78,0	0,7 0,8
42	0,4	1	143,2	76,8 -	- 82,0	0,7 0,8
50	0,3	1	191,0	92,8 -	- 98,0	0,7 0,7
52	0,3	1	191,0	96,8 -	- 102,0	0,7 0,8
63	0,25	1	229,2	118,8 -	- 124,0	0,7 0,8

Plunging

L ≤ 3Dc	L > 3Dc	S max.
fz (mm/z)		
0,08 - 0,15	0,05 - 0,10	S max. = $\sqrt{Dc \times DR - DR^2}$



S max. and DR (depending on diameter Dc)										
DR mm	Dc mm XNKU 06..									
1	3,9	4,4	4,9	5,6	5,8	6,2	6,4	7,0	7,1	7,9
2	5,3	6,0	6,8	7,7	8,1	8,7	8,9	9,8	10,0	11,0
3	6,2	7,1	8,1	9,3	9,8	10,5	10,8	11,9	12,1	13,4

palbit High feed-rate milling cutter ALUPRO 76090



- ae = 0,7 x D
- Please adjust these guideline values according to clamping operation and machine set-up!

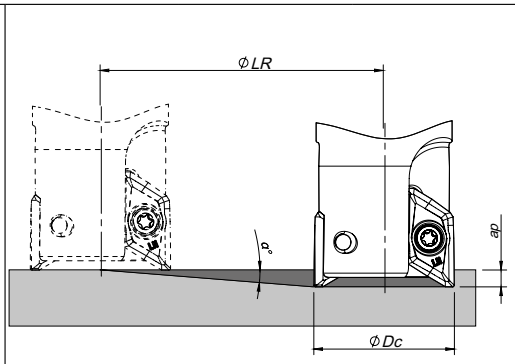
260250....
260251....
260252....
260253....

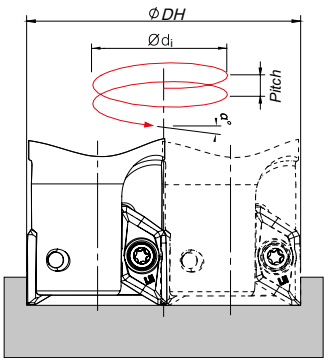
ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Vc m/min PH0910	Cutting width ae mm	Cutting depth ap mm	Feed fz/tooth
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	350 - 3.000	≤ 25% ØDc	≤ 5	0,35 - 0,40
							5 - 10	0,30 - 0,35
							10 - 15	0,25 - 0,30
						≤ 50% ØDc	≤ 5	0,35 - 0,40
							5 - 10	0,30 - 0,35
							10 - 15	0,25 - 0,30
						≤ 75% ØDc	≤ 5	0,30 - 0,35
							5 - 10	0,25 - 0,30
							10 - 15	0,20 - 0,25

Permissible rotational speed

ØDc	Ø20	Ø25	Ø32	Ø4	Ø50	Ø63	Ø80	Ø100
min^{-1}	40.000	38.000	33.000	29.000	24.000	21.000	19.000	16.000

Ramping and helical plunge milling





Indexable cutting inserts - radius	ØDc	Ramping			Helical plunge milling		
		a°	ap max.	LR min.	ØDH min.	ØDH max.	Pitch max. / U
≤ 3,2 mm	20	23	15	35,3	36,2 -	- 38,4	21,6 24,5
	25	21	15	39,1	46,2 -	- 48,4	25,6 28,2
	32	15	15	56,0	60,2 -	- 62,4	23,7 25,6
	40	10	15	85,1	76,2 -	- 78,4	20,0 21,3
	50	8	15	106,7	96,2 -	- 98,4	20,4 21,4
	63	6	15	142,7	122,2 -	- 124,4	19,5 20,3
	80	4	15	214,5	156,2 -	- 158,4	16,7 172
	100	2,5	15	343,6	196,2 -	- 198,4	13,2 13,5
≥ 4,0 mm	20	23	13	37,1	36,2 -	- 38,4	18,5 21,0
	25	21	13	40,3	46,2 -	- 48,4	22,3 24,6
	32	15	13	56,2	60,2 -	- 62,4	21,3 22,9
	40	10	13	90,3	76,2 -	- 78,4	17,0 18,0
	50	8	13	109,9	96,2 -	- 98,4	17,8 18,7
	63	6	13	140,2	122,2 -	- 124,4	17,9 18,6
	80	4	13	220,7	156,2 -	- 158,4	14,6 15,1
	100	2,5	13	309,2	196,2 -	- 198,4	13,2 13,5

ATORN Plunge milling cutter for non-ferrous metals



260400....
260401....
260402....
260403....
270104....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Vc m/min	
		HC4410	HW4410
N	Aluminium alloys, long-chipping 100-400 N/mm²	1500 - 3000 1000 - 2000	1000 - 2000 800 - 1600
	Aluminium alloys, short-chipping up to 400 N/mm²	1000	800
	Copper alloys, long-chipping 150-250 N/mm²	300	250
	Copper alloys, short-chipping up to 500 N/mm²	500	400
	Magnesium alloys, long-chipping 160-300 N/mm²	500	400
	Thermoplastics 350-700 N/mm²	400	300
	Thermosets 20-40 N/mm²	200	150

ISO	Maximum feed per tooth = fz (mm/z.)	
	VPGT 1604... ap max. = 8 mm	VCGT 2205... ap max. = 9 mm
N	0.35	0.5
	0.3	0.4

ATORN High-speed milling cutter range



264001 - 264014

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	Feed fz/tooth HC4640				Cutting speed Vc m/min	Feed fz/tooth HC4540 / HC4544			Cutting speed Vc m/min	Feed fz/tooth HC4410 / HC4430			
						ADKX 0602	ADKX 0903	ADKX 1204	ADKX 1705		ADKX 0903	ADKX 1204	ADKX 1705		ADKX 0602	ADKX 0903	ADKX 1204	ADKX 1705
P	Unalloyed structural steel	Up to 700	St-52	1.0052	180 - 220	0.08	0.12	0.18	0.30					220 - 240	0.06	0.10	0.14	0.24
	Machining steel	Up to 700	9 SMn 28	1.0715	180 - 220	0.08	0.12	0.18	0.30					220 - 240	0.06	0.10	0.14	0.24
	Unalloyed tempered steel	500 - 950	Ck45	1.1191	180 - 220	0.08	0.12	0.18	0.30					220 - 240	0.06	0.10	0.14	0.24
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131	180 - 220	0.06	0.10	0.16	0.24					220 - 240	0.05	0.08	0.14	0.20
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	180 - 220	0.05	0.08	0.14	0.20					220 - 240	0.04	0.06	0.11	0.16
	Cast steel	Up to 950	GS 40	1.0416	180 - 220	0.06	0.10	0.16	0.24					220 - 240	0.05	0.08	0.14	0.20
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301	180 - 220	0.05	0.08	0.10	0.16	180 - 240	0.08	0.12	0.18					
	Stainless steel, sulphurised	500 - 950	X 12 CrMoS 17	1.4104	180 - 220	0.05	0.08	0.10	0.16	180 - 240	0.08	0.12	0.18					
	Stainless steel, martensitic	500 - 950	X 10 Cr 13	1.4006	180 - 220	0.05	0.08	0.10	0.16	180 - 240	0.08	0.12	0.18					
K	Grey cast iron	100 - 400	GG 25	0.6025										220 - 280	0.12	0.18	0.25	0.35
	Alloyed grey cast iron	150-250	GGL-NiCr 35 2	0.6678										220 - 280	0.12	0.18	0.25	0.35
	Ductile iron	400 - 800	GGG 60	0.7060										140 - 180	0.08	0.12	0.20	0.30
	Malleable cast iron	350 - 700	GTS 55	0.8155										140 - 180	0.08	0.12	0.2	0.30
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535										300 - 400	0.10	0.12	0.15	0.20
	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581										300 - 400	0.10	0.12	0.15	0.20
	Copper alloy long-chipping	300 - 700	MS 63	2.0320										200 - 250	0.10	0.12	0.15	0.20
	Copper alloy short-chipping	Up to 500	MS 58	2.0402										200 - 250	0.10	0.12	0.15	0.20
	Thermoplastic	40 - 70	PVC, acrylic glass											250-300	0.12	0.20	0.25	0.35
	Thermoset	20 - 40	Bakelite											200 - 250	0.12	0.20	0.25	0.35
S	Titanium alloy	Up to 950	TiAl6V4	3.7165						60 - 80	0.08	0.12	0.15	60 - 80	0.05	0.08	0.12	0.15
	Titanium alloy	900 - 1400	TiAl6Sn 2	3.7174						40 - 60	0.08	0.12	0.15	40 - 60	0.05	0.08	0.12	0.15
	Nickel-based alloy	Up to 950	NiCr12Al6MoNb	2.4670						40 - 60	0.08	0.12	0.15	40 - 60	0.05	0.08	0.12	0.15
	Nickel-based alloy	900 - 1400	NiCr19Fe19NbMo	Inconel 718						20 -40	0.08	0.12	0.15	20 - 40	0.05	0.08	0.12	0.15

ISO	Materials group	Strength/ Hardness N/mm²	Material examples	Material number	Cutting speed Vc m/min	Feed fz/tooth HC4410 / HW4410			
						ADHX 0602	ADHX 0903	ADHX 1204	ADHX 1705
P	Unalloyed structural steel	Up to 700	St-52	1.0052					
	Machining steel	Up to 700	9 SMn 28	1.0715					
	Unalloyed tempered steel	500 - 950	Ck45	1.1191					
	Alloyed case-hardened steel	Up to 950	16 MnCr 5	1.7131					
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343					
	Cast steel	Up to 950	GS 40	1.0416					
M	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301					
	Stainless steel, sulphurised	500 - 950	X 12 CrMoS 17	1.4104					
	Stainless steel, martensitic	500 - 950	X 10 Cr 13	1.4006					
N	Al. alloy long-chipping	Up to 550	AlMg 3	3.3535	800-1000	0.20	0.25	0.30	0.40
	Al. alloy short-chipping	Up to 400	G-AlSi 12	3.2581	350-500	0.10	0.12	0.15	0.20
	Copper alloy long-chipping	300 - 700	MS 63	2.0320	350-500	0.12	0.15	0.20	0.30
	Copper alloy short-chipping	Up to 500	MS 58	2.0402	250-300	0.10	0.12	0.15	0.20
	Thermoplastic	40 - 70	PVC, acrylic glass		250-300	0.12	0.20	0.24	0.35
	Thermoset	20 - 40	Bakelite		200-350	0.12	0.20	0.24	0.35
S	Titanium alloy	Up to 950	TiAl6V4	3.7165					
	Titanium alloy	900 - 1400	TiAl6Sn 2	3.7174					
	Nickel-based alloy	Up to 950	NiCr12Al6MoNb	2.4670					
	Nickel-based alloy	900 - 1400	NiCr19Fe19NbMo	Inconel 718					

Cutting depth ap / mm			
ADHX ..0602	ADHX ..0903	ADHX ..1204	ADHX ..1705
5.5	8.5	12.0	16.5

palbit Tangential shoulder milling cutter 90° TGPLUS 90190




260247....
260248....

- ae = 0,7 x D
- PH7... = Cooling: air
- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Feed fz/tooth (LNXT 13..MP)	Cutting speed Vc m/min			
						◄ Wear resistance			Toughness ►
						PHS320	PH7920	PHS740	PH7740
						++	±	±	--
P	Unalloyed structural steel	Up to 700	St-52	1.0052	0,10 - 0,35		180 - 250	140 - 170	140 - 170
P	Tempering steel	500 - 950	42 CrMo4	1.7225	0,10 - 0,30		170 - 210	130 - 160	130 - 160
P	Tempering steel	950 -1300	43CrMo4	1.3563	0,10 - 0,20		160 - 200	110 - 140	110 - 140
M	Stainless steel, ferr./marten.	500 - 950	X10 Cr13	1.4006	0,10 - 0,30				120 - 180
M	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	0,10 - 0,25				100 - 150
M	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	0,10 - 0,20				70 - 130
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	0,10 - 0,35	180 - 320	170 - 300		
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	0,10 - 0,30	160 - 270	150 - 250		
K	Ductile iron	Up to 280 HB	GGG 60	0.7060	0,10 - 0,25	100 - 230	90 - 210		
Usage conditions: ++ = good ± = average -- = difficult									



palbit High feed-rate milling cutter TOROMILL 24590 / 25090 / 25190



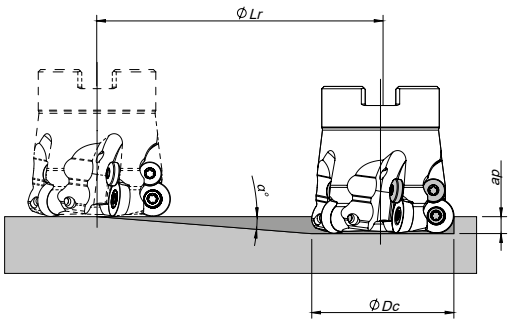

260281....
260284....
260287....
260290....
260289....

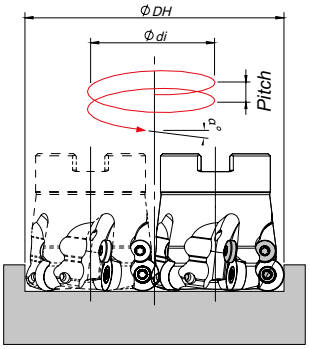
- ae = 0,7 x D
- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min						
					◄ Wear resistance						Toughness ►
					PH6103	PH6910	PH6920	PH6125	PH6135	PH6740	PDP410
					++	++	±	±	--	--	--
P	Unalloyed structural steel	Up to 700	St-52	1.0052	180 - 300	180 - 250	150 - 230	160 - 190	150 - 180	130 - 160	
P	Tempering steel	500 - 950	42 CrMo4	1.7225	180 - 250	170 - 210	140 - 220	140 - 180	140 - 170	120 - 150	
P	Tempering steel	950 -1300	43CrMo4	1.3563	180 - 230	160 - 200	130 - 180	130 - 160	120 - 150	100 - 130	
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155		170 - 300	150 - 280			130 - 250	
K	Grey cast iron	Up to 260 HB	GG 25	0.6025		150 - 250	130 - 230			110 - 220	
K	Ductile iron	Up to 280 HB	GGG 60	0.7060		90 - 210	80 - 190			80 - 170	
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535							
H	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	120 - 240						
Usage conditions: ++ = good ± = average -- = difficult											

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	RD..07		RD..10		RD..12		RD..16		RD..20	
					fz mm/t	ap mm	fz mm/t	ap mm	fz mm/t	ap mm	fz mm/t	ap mm	fz mm/t	ap mm
P	Unalloyed structural steel	Up to 700	St-52	1.0052	≤ 0,18	≤ 1,5	≤ 0,24	≤ 2,5	≤ 0,27	≤ 2,5	≤ 0,33	≤ 3,5	≤ 0,33	≤ 5
P	Tempering steel	500 - 950	42 CrMo4	1.7225	≤ 0,18	≤ 1,5	≤ 0,24	≤ 2,5	≤ 0,25	≤ 2,5	≤ 0,33	≤ 3,5	≤ 0,33	≤ 5
P	Tempering steel	950 -1300	43CrMo4	1.3563	≤ 0,15	≤ 1,5	≤ 0,21	≤ 2,5	≤ 0,20	≤ 2,5	≤ 0,27	≤ 3,5	≤ 0,27	≤ 5
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155	≤ 0,20	≤ 1,5	≤ 0,25	≤ 2,5	≤ 0,24	≤ 2,5	≤ 0,35	≤ 3,5	≤ 0,35	≤ 5
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	≤ 0,20	≤ 1,5	≤ 0,25	≤ 2,5	≤ 0,24	≤ 2,5	≤ 0,35	≤ 3,5	≤ 0,35	≤ 5
K	Ductile iron	Up to 280 HB	GGG 60	0.7060	≤ 0,18	≤ 1,5	≤ 0,22	≤ 2,5	≤ 0,22	≤ 2,5	≤ 0,32	≤ 3,5	≤ 0,32	≤ 5
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	≤ 0,45	≤ 1,5	≤ 0,80	≤ 2,5						
H	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	≤ 0,12	≤ 1,5	≤ 0,18	≤ 2,5	≤ 0,18	≤ 2,5	≤ 0,25	≤ 3,5	≤ 0,20	≤ 5

Ramping and helical plunge milling





Indexable cutting inserts	ØDc	Ramping			Helical plunge milling		
		a°	ap max.	LR min.	ØDH min.	ØDH max.	Pitch max. / U
RD..07	15	9,4	3,5	21,1	23 -	- 30	4 7
	16	8	3,5	24,9	25 -	- 32	3 7
	20	6	3,5	33,3	33 -	- 40	4 6
RD..10	20	25	5	10,7	30 -	- 40	14 29
	25	22	5	12,4	40 -	- 50	19 31
	30	13,5	5	20,8	50 -	- 60	15 22
	35	12	5	23,5	60 -	- 70	16 23
	42	10	5	28,4	74 -	- 84	17 23
	52	7	5	40,7	94 -	- 104	16 20
RD..12	24	17	6	19,6	36 -	- 48	11,1 23
	25	16,2	6	20,7	38 -	- 50	11 22
	35	12	6	28,2	58 -	- 70	15 23
	42	10,3	6	33	72 -	- 84	17 23
	50	64	6	53,5	88 -	- 100	13 17
	52	6	6	57,1	92 -	- 104	13 17
	66	3,5	6	79,8	120 -	- 132	12 15
	80	2,5	6	104,1	148 -	- 160	12 14
RD..16	32	20	8	22	48 -	- 64	18 36
	35	18	8	24,6	54 -	- 70	19 35
	52	113	8	34,7	88 -	- 104	26 37
	66	8,5	8	53,5	116 -	- 132	23 30
	80	6	8	76,1	144 -	- 160	21 26
	125	3,5	8	130,8	234 -	- 250	20 24
	160	2,5	8	183,2	304 -	- 320	19 21
RD..20	80	6	10	76,1	140 -	- 160	19 26
	100	5	10	91,4	180 -	- 200	21 27
	125	4,5	10	101,6	230 -	- 250	25 30
	160	3	10	152,6	300 -	- 320	23 26

ATORN Milling inserts WNEU 08


262565 ....


295828 ....

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min		
					HC 4620	HC 4430	HC 4630
P	Structural steel	700 - 950	Ck45	1.1191	175 - 280	150 - 230	100 - 170
	Tempering steel	500 - 950	42 CrMo4	1.7225	145 - 215	130 - 180	
	Tool steel	950 - 1400	X 38 CrMoV 5 1	1.2343	130 - 190	110 - 160	
M	Stainless steel, ferr./marten.	500 - 950	X10Cr13	1.4006			80 - 130
	Stainless steel, austenitic	500 - 950	X 5 CrNi 18 10	1.4301		80 - 160	110 - 180
K	Grey cast iron	Up to 260 HB	GG 25	0.6025	140 - 270	120-230	
	Ductile iron	Up to 280 HB	GGG 60	0.7060	100 - 160		

Application	ae / Ø	Feed fz mm / tooth			Vc - Correction factor
Contact width	100%	0.05	0.1	0.15	1
Shoulder milling	25%	0.06	0.12	0.2	1.3
	10%	0.08	0.16	0.3	1.5
	5%	0.11	0.22	0.4	1.6
Centre chip thickness hm		0.06	0.09	0.16	-

WHEN YOUR
TOOL FINDER WORKS
FASTER THAN YOU.
THIS IS POWER TO PRODUCE

- Time savings – no lengthy catalogue searches
- STEP and DFX data for your tool
- Download the cutting data as a PDF
- Immediate access to the online shop

Find the right tool now

https://toolfinder.sartorius-werkzeuge.de/

palbit High feed-rate milling cutter LINEPRO 40095 / 40595 / 41095



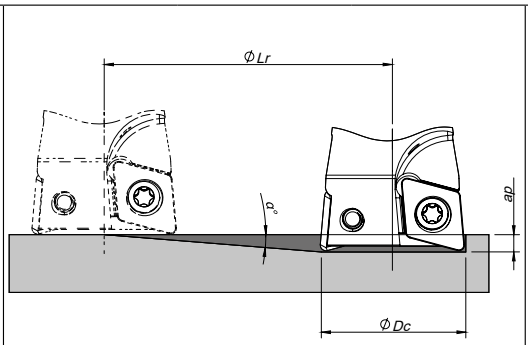

260295.... 260294....
260293....

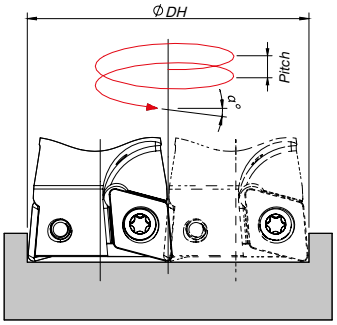
- ae = 0,7 x D
- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min ◄ Wear resistance Toughness ►					PCD	PCBN
					PHD103	PH6103	PH6910	PH6125	PH6135	PDP410	PBH910
					++	++	++	±	--		
P	Unalloyed structural steel	Up to 700	St-52	1.0052		180 - 300	180 - 250	160 - 190	150 - 180		
P	Tempering steel	500 - 950	42 CrMo4	1.7225		180 - 250	170 - 210	140 - 180	140 - 170		
P	Tempering steel	950 -1300	43CrMo4	1.3563		180 - 230	160 - 200	130 - 160	120 - 150		
K	Malleable cast iron	Up to 280 HB	GTS 55	0.8155			170 300	160 - 290			
K	Grey cast iron	Up to 260 HB	GG 25	0.6025			150 - 250	140 - 240			
K	Ductile iron	Up to 280 HB	GGG 60	0.7060			90 - 210	80 - 200			
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	300 - 1.000					800 - 3.000	
H	Hardened materials up to 60 HRc		X153CrMoV12	1.2379		120 - 260					200 - 600
Usage conditions: ++ = good ± = average -- = difficult											

Indexable cutting inserts	fz mm/t		ap Rec.
	ae	Vc	
XD.. 04	0,1 - 0,2	0,1 - 0,15	0,1 - 0,5
XD.. 06	0,15 - 0,3	0,1 - 0,25	0,2 - 0,8
XD.. 10	0,15 - 0,35	0,1 - 0,3	0,2 - 0,8

Ramping and helical plunge milling





Indexable cutting inserts	ØDc	Ramping			Helical plunge milling		
		a°	ap max.	LR min.	ØDH min.	ØDH max.	Pitch max. / U
XDHW 04...	10	7,3	0,8	6,2	18 -	- 20	3,2 4
	12	5,3	0,8	8,6	22 -	- 24	2,9 3,5
XDHW 06...	16	8	1	7,1	30 -	- 32	6,2 7,1
	20	5,7	1	10	38 -	- 40	5,6 6,3
	25	4	1	14,3	48 -	- 50	5,1 5,5
XDHW 10...	25	8,7	1	6,5	48 -	- 50	11,1 12
	35	5,2	1	11	68 -	- 70	9,4 10
	42	4	1	14,3	82 -	- 84	8,8 9,2
	52	3	1	19,1	102 -	- 104	8,2 8,6
	66	2,3	1	24,9	130 -	- 132	8,1 8,3
	80	1,8	1	31,8	158 -	- 160	7,7 7,9

Application recommendations: ball-nose cutter PFB



260530 ....
260531 ....
260532 ....
260533 ....
260534 ....

Recommended qualities for various material groups

Carbide quality	Insert geometry	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H
XP3320	PFB-SP	○	○	○		●	○
XP3225	PFB-SP PFB-Q	●	●		● 1)	○	
XP3310	PFB-SH			●			●
XC4505	PFB-D				● 2)		

1) = best choice for aluminium and copper alloys
2) = best choice for graphite and composite materials

Cutting data recommendations, insert type SP, SH, Q

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Cutting depth ap / mm	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
							6 - 8	10 - 12	16 - 20	25 - 32
P	Machining steel	Up to 575	9 SMn 28	1.0715	300	0.02 x D	0.1	0.12	0.14	0.18
P	Tempering steel	Up to 900	42 CrMo4	1.7225	300	0.02 x D	0.07	0.1	0.12	0.14
P	Tempering steel	Up to 1100	43CrMo4	1.3563	250	0.02 x D	0.07	0.1	0.12	0.14
M	Stainless steel, ferr./marten.	Up to 800	X10 Cr13	1.4006	250	0.02 x D	0.07	0.12	0.14	0.17
K	Grey cast iron	Up to 300	GG 25	0.6025	400	0.02 x D	0.12	0.14	0.18	0.22
K	Alloyed grey cast iron	Up to 600	GGL-NiCr 35 2	0.6678	300	0.02 x D	0.1	0.12	0.14	0.18
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	500	0.03 x D	0.12	0.14	0.18	0.22
N	Copper alloy (bronze) long-chipping	Up to 1200	CuSn4	2.1016	300	0.03 x D	0.11	0.13	0.17	0.22
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	90	0.02 x D	0.06	0.08	0.11	0.13
S	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	50	0.015 x D	0.04	0.05	0.06	0.06
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	180	0.015 x D	0.05	0.06	0.07	0.07
H	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	200	0.015 x D	0.06	0.07	0.08	0.01
H	Hardened materials up to 64 HRc		100Cr6	1.2067	150	0.01 x D	0.05	0.06	0.07	0.07

Cutting data recommendations, insert type D

- Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Cutting depth ap / mm	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
							6 - 8	10 - 12	16 - 20	25 - 32
N	Fibre-reinforced plastics		CFRP, GFRP	3.3535	300	0.03 x D	0.11	0.13	0.17	0.2
N	Graphite		C8000	2.1016	500	0.03 x D	0.14	0.17	0.21	0.25

Over 200,000 tools available online!

Advantages:
- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages

Register online now!



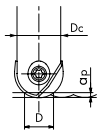


www.saratools.com

Cutting depth and actual cutting diameter

Cutting depth ap / mm		Actual cutting diameter / mm														
Dc	R	0.1	0.2	0.3	0.4	0.5	0.8	1	1.5	2	2.5	3	3.5	4	4.5	5
6	3	1.5	2.2	2.6	3	3.3	4.1									
7	3.5	1.6	2.3	2.8	3.3	3.6	4.5									
8	4	1.8	2.5	3	3.5	3.9	4.8									
10	5	2	2.8	3.4	3.9	4.4	5.4	6	7.1							
12	6	2.2	3.1	3.7	4.3	4.8	6	6.6	7.9	8.9						
16	8	2.5	3.6	4.3	5	5.6	7	7.7	9.3	10.6	11.6					
20	10	2.8	4	4.9	5.6	6.2	7.8	8.7	10.5	12	13.2	14.3	15.2			
25	12.5	3.2	4.5	5.4	6.3	7	8.8	9.8	11.9	13.6	15	16.2	17.3	18.3		
30	15	3.5	4.9	6	6.9	7.7	9.7	10.8	13.1	15	16.6	18	19.3	20.4	21.4	22.4
32	16	3.6	5	6.2	7.1	7.9	10	11.1	13.5	15.5	17.2	18.7	20	21.2	22.2	23.2

Determining the actual cutting diameter D

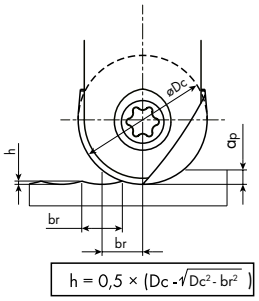


$$D = 2\sqrt{apx(Dc-ap)}$$

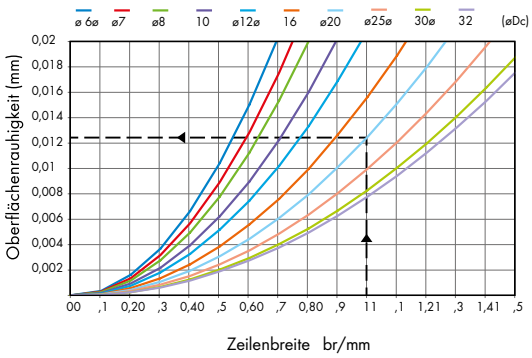
Recommended line width / surface quality

Dc mm	6	7	8	10	12	16	20	25	30	32
Pf mm	0.4	0.45	0.5	0.6	0.7	0.8	1	1.2	1.3	1.4
h mm	0.007	0.007	0.008	0.009	0.01	0.01	0.012	0.014	0.014	0.015

Theoretical milled surface roughness process



Dc = 20 mm
br = 1 mm
→h = 0,0125 mm



Over 200,000 tools available online!

Advantages:
- convenient, clear and fast
- order by 19:30 for next-day delivery
- order measuring instruments including calibration
- available in real time
- in 8 languages

Register online now!



www.saratools.com

Usage recommendations for torus milling cutter PFR



260540 .... 260542 .... 260544 ....
260541 .... 260543 ....

Cutting data recommendations, insert type ST, SH

• Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min			Cutting depth ap / mm	Feed fz in mm/tooth in relation to milling cutter diameter in mm		
					2.5 x D	5 x D	8 x D		8 - 10	12 - 16	20 - 32
P	Machining steel	Up to 575	9 SMn 28	1.0715	200	x 0.8	x 0.6	0.05 x D	0.2	0.22	0.25
P	Tempering steel	Up to 900	42 CrMo4	1.7225	180			0.05 x D	0.18	0.22	0.25
P	Tempering steel	Up to 1100	43CrMo4	1.3563	150			0.05 x D	0.15	0.18	0.2
M	Stainless steel, ferr./marten.	Up to 800	X10 Cr13	1.4006	150			0.03 x D	0.12	0.15	0.18
K	Grey cast iron	Up to 300	GG 25	0.6025	200			0.05 x D	0.2	0.25	0.3
K	Alloyed grey cast iron	Up to 600	GGL-NiCr 35 2	0.6678	150			0.05 x D	0.15	0.2	0.25
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	300			0.05 x D	0.25	0.3	0.35
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	50			0.02 x D	0.08	0.1	0.15
S	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	30			0.02 x D	0.05	0.8	0.12
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	80			0.025 x D	0.08	0.1	0.15
H	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	120			0.03 x D	0.1	0.12	0.18
H	Hardened materials up to 64 HRc		100Cr6	1.2067	60			0.02 x D	0.05	0.08	0.1

Cutting data recommendations, insert type D

• Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min			Cutting depth ap / mm	Feed fz in mm/tooth in relation to milling cutter diameter in mm		
					2.5 x D	5 x D	8 x D		8 - 10	12 - 16	20 - 32
N	Fibre-reinforced plastics		CFRP, GFRP	3.3535	200	x 0.8	x 0.6	0.5 x D	0.1	0.15	0.2
N	Graphite		C8000	2.1016	250			0.1 x D	0.4	0.5	0.5

Cutting data recommendations, steel shank, finish milling

• Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min	Cutting depth ap / mm	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
							8	10 - 12	16 - 20	25 - 32
P	Machining steel	Up to 575	9 SMn 28	1.0715	450	0.02 x D	0.1	0.12	0.14	0.18
P	Tempering steel	Up to 900	42 CrMo4	1.7225	450	0.02 x D	0.07	0.1	0.12	0.14
P	Tempering steel	Up to 1100	43CrMo4	1.3563	375	0.02 x D	0.07	0.1	0.12	0.14
M	Stainless steel, ferr./marten.	Up to 800	X10 Cr13	1.4006	375	0.02 x D	0.07	0.12	0.14	0.17
K	Grey cast iron	Up to 300	GG 25	0.6025	600	0.02 x D	0.12	0.14	0.18	0.22
K	Alloyed grey cast iron	Up to 600	GGL-NiCr 35 2	0.6678	450	0.02 x D	0.1	0.12	0.14	0.18
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	750	0.03 x D	0.12	0.14	0.18	0.22
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	120	0.02 x D	0.06	0.08	0.11	0.13
S	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	70	0.015 x D	0.04	0.05	0.06	0.06
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	270	0.015 x D	0.05	0.06	0.07	0.07
H	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	300	0.015 x D	0.06	0.07	0.08	0.1
H	Hardened materials up to 64 HRc		100Cr6	1.2067	230	0.01 x D	0.05	0.06	0.07	0.07

Cutting data recommendations, solid carbide shank, finish milling

• Please adjust these guideline values according to clamping operation and machine set-up!

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	Cutting speed Vc m/min			Cutting depth ap / mm	Feed fz in mm/tooth in relation to milling cutter diameter in mm			
					Short	Long	Extra-long		8	10 - 12	16 - 20	25 - 32
P	Machining steel	Up to 575	9 SMn 28	1.0715	540	480	360	0.02 x D	0.1	0.12	0.14	0.18
P	Tempering steel	Up to 900	42 CrMo4	1.7225	540	480	360	0.02 x D	0.07	0.1	0.12	0.14
P	Tempering steel	Up to 1100	43CrMo4	1.3563	450	400	300	0.02 x D	0.07	0.1	0.12	0.14
M	Stainless steel, ferr./marten.	Up to 800	X10 Cr13	1.4006	450	400	300	0.02 x D	0.07	0.12	0.14	0.17
K	Grey cast iron	Up to 300	GG 25	0.6025	720	640	480	0.02 x D	0.12	0.14	0.18	0.22
K	Alloyed grey cast iron	Up to 600	GGL-NiCr 35 2	0.6678	540	480	360	0.02 x D	0.1	0.12	0.14	0.18
N	Al. alloy long-chipping	Up to 500	AlMg 3	3.3535	600	800	600	0.03 x D	0.12	0.14	0.18	0.22
S	Titanium alloys	Up to 1300	TiAl6Sn 2	3.7174	150	144	110	0.02 x D	0.06	0.08	0.11	0.13
S	Superalloys	Up to 1300	X45CrSi 9 3	1.4718	80	80	60	0.015 x D	0.04	0.05	0.06	0.06
H	Hardened materials up to 55 HRc		X40Cr14	1.2083	290	288	220	0.015 x D	0.05	0.06	0.07	0.07
H	Hardened materials up to 60 HRc		X153CrMoV12	1.2379	340	320	240	0.015 x D	0.06	0.07	0.08	0.1
H	Hardened materials up to 64 HRc		100Cr6	1.2067	260	240	180	0.01 x D	0.05	0.06	0.07	0.07

palbit Engraving milling cutters 45°



- Please adjust these guideline values according to clamping operation and machine set-up!

260130 ....

ISO	Materials group	Strength/ Hardness N/mm²	Material example chemical	Material number	n (U/min)	f (mm/U)	f (mm/U)
						PHH920	PH0610
						VPGT 060602-45LM	VPGT 060602-45LN
P	Machining steel	up to 700	9 SMn 28	1.0715	5000-40000	0,008 - 0,05	
P	unalloyed structural steel	up to 700	St-52	1.0052	5000-40000	0,008 - 0,05	
P	unalloyed tempered steel	700 - 950	Ck45	1.1191	5000-40000	0,008 - 0,05	
P	Quenched and tempered steel	500 - 950	42 CrMo4	1.7225	5000-40000	0,008 - 0,05	
P	Cast steel	up to 950	GS 40	1.0416	5000-40000	0,008 - 0,05	
P	Case hardening steel	up to 1200	16 MnCr 5	1.7131	5000-40000	0,008 - 0,05	
P	Quenched and tempered steel	950 -1300	43CrMo4	1.3563	5000-40000	0,008 - 0,05	
P	Nitriding steel	950 - 1300	31CrMoV9	1.8519	5000-40000	0,008 - 0,05	
P	Tool steel	950 - 1400	X38 CrMoV 5 1	1.2343	5000-40000	0,008 - 0,05	
M	Stainless steel/marten.	500 - 950	X10 Cr13	1.4006	5000-40000	0,008 - 0,05	
M	Stainless steel, austenitic	500 - 950	X5 CrNi 18 10	1.4301	5000-40000	0,008 - 0,05	
M	Duplex	700 - 950	X2 CrNiMoN 22-5-3	1.4462	5000-40000	0,008 - 0,05	
N	Al. leg. long-chipping	up to 500	AlMg 3	3.3535	5000-40000		0,008 - 0,05
N	Al. alloy, short-chipping	up to 500	G-AlSi 12	3.2581	5000-40000		0,008 - 0,05
N	Copper-alloy. (brass) long-chipping	up to 1200	CuSn4	2.1016	5000-40000		0,008 - 0,05
N	Copper-alloy. (brass) short-chipping	up to 850	CuNi12Zn24	2.0730	5000-40000		0,008 - 0,05
N	Copper-alloy. (brass) long-chipping	up to 600	Cu ZN 20	2.0250	5000-40000		0,008 - 0,05
N	Copper-alloy. (brass) short-chipping	up to 600	Cu Zn 39 Pb 3	2.0381	5000-40000		0,008 - 0,05
N	Thermoplastic	40 - 70	PVC, Acrylglas		5000-40000		0,008 - 0,05
N	Thermoset	20 - 40	Bakelit		5000-40000		0,008 - 0,05
N	fibre-reinforced plastics		CFK, GFK		5000-40000		0,008 - 0,05
N	Graphite		C8000		5000-40000		0,008 - 0,05
N	Composites		Honeycomp		5000-40000		0,008 - 0,05
S	Titanium alloys	up to 1300	TiAl6Sn 2	3.7174	5000-30000	0,008 - 0,05	
S	Nickel-based alloys	up to 1300	NiCr19Fe19NbMo	Inconel 718	5000-30000	0,008 - 0,05	

ATORN Disc milling cutter



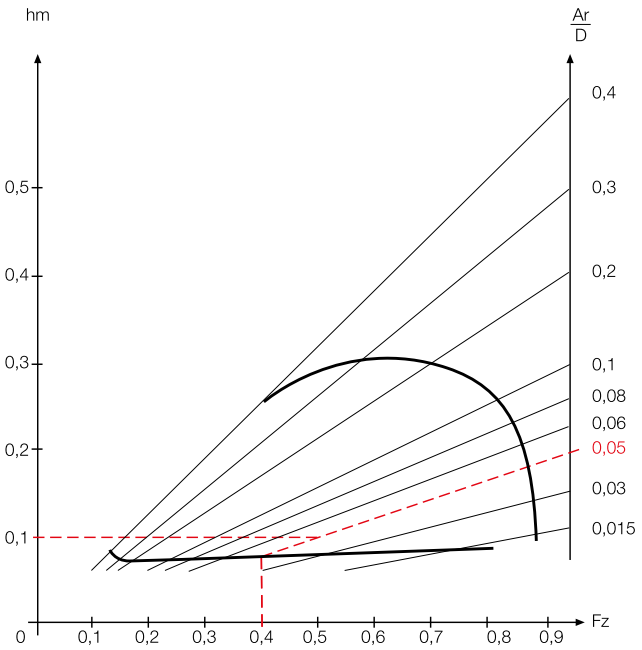
262600....



262610....

- The average **chip thickness hm** should be at least 0.1 mm to prevent the indexable inserts becoming worn quickly. For groove milling the chip thickness is much smaller than the feed per tooth. Thus the ratio between **groove depth Ar** and **milling cutter diameter D** must be observed. The average chip thickness and the corresponding minimum feed rate is illustrated in the following diagram.

Example: milling cutter Ø D 160 mm
Groove depth Ar = 8 mm
Ar / D = 0.05
Result: Feed per tooth fz = 0.4 mm



ISO	Materials group	Type	Cutting speed Vc m/min
P	Carbon steel	HC 4630 TiAlN-coated	200
P	Tool steel	HC 4630 TiAlN-coated	150
M	Stainless steel, austenitic	HC 4630 TiAlN-coated	160
K	Grey cast iron	HW 4415	100
K		HC 4630 TiAlN-coated	140
N	Al. alloys	HW 4415	350


FOR
3000 CHUCKS
FIND THE RIGHT CLAMPING JAWS.
AND DO IT
BLINDFOLDED.
ALL IT TAKES IS A FEW CLICKS:
CLAMPING JAWS FINDER
THAT'S POWER TO PRODUCE
SARATOOLS.com
POWER TO PRODUCE
A BRAND OF SARTORIUS WERKZEUGE