Our suppliers for MILLING TOOLS:

ATORN®

HHW

CERATIZIT

Info — Coatings for machining tools

Advantages:

- Longer service life
- Higher productivity
- Fewer tool changes
- No emulsion, thanks to dry machining
- High speed machining
- Hard machining
- Lower tool costs

Coating material	TiN	TiCN	TiAlN	Alcrona	Hardlube	Alu-CC	Rocktec 52	Rocktec 65	Ultra-N
Microhardness (HV 0.05)	2.300	3.000	3.300	3.200	3.000	4.000	3.300	3.600	3.100
Friction coefficient gg. Steel (dry)	0,4	0,4	0,30 - 0,35	0,35	0,15 - 0,20	–	0,4	0,4	–
Max. application temperature (°C)	600	400	900	1.100	800	800	900	1.200	900
Coating colour	gold-yellow	blue-grey	violet-grey	blue-grey	dark-grey	light transparent	grey-blue	copper-coloured	brownish silver

Materials / Coatings	Plastics	Non-ferrous metals	AlSi alloys	Al wrought alloys	Low-alloy steels	High-alloy steels	Hardened steels to 52 HRC	Hardened steels to 65 HRC	Stainless steels	Cast iron	Titanium alloys	Superalloys
TiN	■				■							
TiCN	■				■	■			■	■		
TiAlN	■				■	■	■	■	■	■	■	■
Alcrona	■				■	■				■		
Hardlube	■		■		■	■			■		■	■
Alu-CC	■	■	■	■	■	■			■			
Rocktec 52					■	■	■		■	■		
Rocktec 65								■			■	■
Ultra-N	■	■	■	■								

www.hhw.de
Fax order hotline: +49 6204 739-1217

= Sales are restricted to the packaging units mentioned in the catalogue. Purchase orders must be in units.

Solid carbide aluminium milling cutters - the complete product range for aluminium machining

The perfect combination of carbide, geometry and coating makes ATORN tools top performers. They manufacture more efficiently, produce more parts and thus increase the productivity of your manufacturing operation.

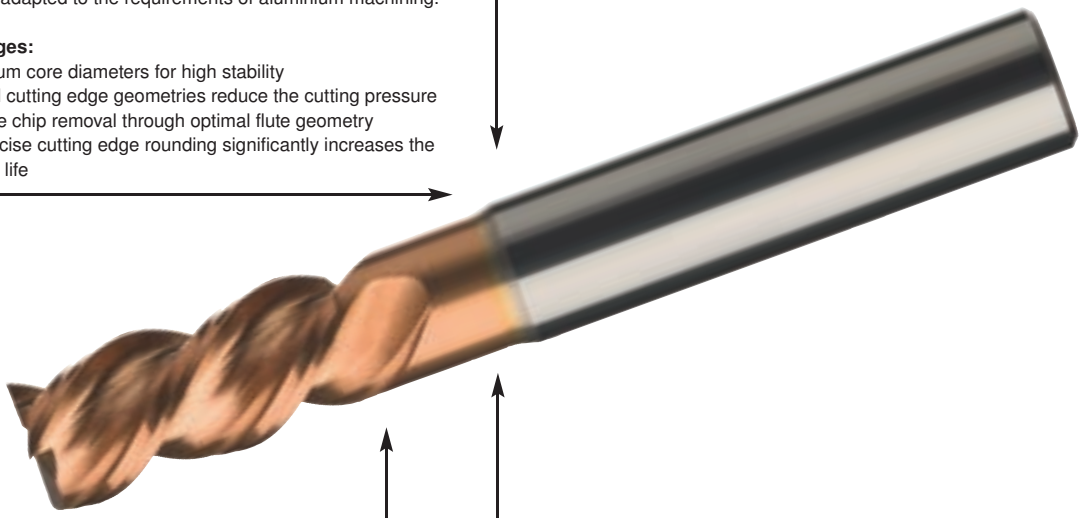
To meet the requirements imposed by aluminium machining, extensive cutting tests were performed, as is the case with all ATORN machining tools. The results determined in these tests flow continuously into tool development. The result is a new generation of tools for high-performance machining of aluminium.

Performance characteristics of the new machining tools
- ▶ Short processing times thanks to high implementation parameters
- ▶ Outstanding surface quality
- ▶ No burr formation, or minimised burr formation
- ▶ Also suitable for low-powered machines
- ▶ Long service life through optimal combination of cutting material, coating and geometry
- ▶ Precision through close manufacturing tolerances
- ▶ Outstanding implementation behaviour: Extremely soft cut, optimal chip removal and extremely quiet operation

Wear-resistant carbide
The base substrate consists of H10F fine grain solid carbide for aluminium with grain sizes from 0.6 - 0.8 µm. This substrate is particularly wear-resistant, hard, and pressure-resistant. It optimally withstands the dynamic and mechanical loads that occur. This becomes particularly important when vibrations occur that can easily cause nicks on the cutting edges.

New tool geometry
Optimal cutting geometry, micro-geometry, and flute geometry are crucial, particularly for aluminium machining. On the basis of numerous machining tests, the geometries have ben reworked and optimally adapted to the requirements of aluminium machining.

Advantages:
- ▶ Maximum core diameters for high stability
- ▶ Special cutting edge geometries reduce the cutting pressure
- ▶ Reliable chip removal through optimal flute geometry
- ▶ µm-precise cutting edge rounding significantly increases the service life



Improved tolerances
Precision generates quality - one reason why this new tool generation is manufactured with more precise tolerances. All shanks are manufactured in h5 quality and all cutters are manufactured in g7 quality.

New coating - ULTRA-N
The new ULTRA-N coating is a zirconium carbon nitride (ZrCN) coating with excellent resistance to corrosion and abrasive wear. Relative to the familiar, light-yellow ZrN coating, it has a higher degree of hardness and abrasion resistance, which is particularly required for machining of aluminium alloys that contain Si. Additional characteristics of the new coating are a lower coefficient of friction and an associated minimal edge build-up tendency.

Advantages:
- ▶ Wear resistant
- ▶ High degree of hardness - 3100 HV
- ▶ Excellent bond of the coating
- ▶ Low coefficient of friction of 0.5

For an overview of solid carbide aluminium milling cutters see catalogue pages 16.10-16.11 ▶

Overview - solid carbide milling cutters for hard machining and high-speed machining (II)

	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®
	Solid carbide mini end milling cutter Short	Solid carbide mini end milling cutter Long neck	Solid carbide mini torus cutter Long neck	Solid carbide mini radius cutter Short	Solid carbide mini radius cutter Long neck	Solid carbide end milling cutter Standard	Solid carbide end milling cutter Short blade, overlong	Solid carbide end milling cutter Long	Solid carbide torus cutter Standard
Art. no.	16800	16801	16802	16805	16806	16810	16812	16813	16816
Ø range in mm	0,1 - 0,9	0,2 - 3	0,2 - 3	0,2 - 0,9	0,2 - 3	3 - 20	3 - 20	3 - 20	3 - 20
Teeth	2	2	2	2	2	4	4	4	4
									

Material Rocktec	52	65	52	65	52	65	52	65	52	65	52	65	52	65	52	65	52	65
Steel and cast steel < 700 N/mm²	●		●		●		●		●		●		●		●		●	
Steel and cast steel 700-1000 N/mm²	●		●		●		●		●		●		●		●		●	
Steels 1000-1300 N/mm²	●		●		●		●		●		●		●		●		●	
Steels 1300-1600 N/mm²	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steels < 52 HRC	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened cast iron		●		●		●		●		●		●		●		●		●
Hardened steels 52-65 HRC		●		●		●		●		●		●		●		●		●

● = Well suited ○ = Limited suitability

Overview - solid carbide milling cutters for hard machining and high-speed machining (II)

ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®
Solid carbide torus cutter Short blade	Solid carbide torus cutter Long	Solid carbide torus cutter Overlong	Solid carbide multi-tooth milling cutter Standard	Solid carbide multi-tooth milling cutter Long	Solid carbide radius form end mill cutter Standard	Solid carbide radius form end mill cutter Long	Solid carbide radius form end mill cutter Overlong	Solid carbide radius cutter Short	Solid carbide radius cutter Long	Solid carbide high-speed cutter Short blade
16817	16818	16819	16824	16825	16827	16828	16829	16830	16831	16832
3 - 16	3 - 16	3 - 16	3 - 20	3 - 20	2 - 20	2 - 20	2 - 20	3 - 20	3 - 20	4 - 12
4	4	4	6 - 8	6 - 8	2	2	2	4	4	4 - 6
										
52 65	52 65	52 65	52 65	52 65	52 65	52 65	52 65	52 65	52 65	65
●	●	●	●	●	●	●	●	●	●	
●	●	●	●	●	●	●	●	●	●	
●	●	●	●	●	●	●	●	●	●	
●	●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●	●
	●		●		●		●		●	●
	●		●		●		●		●	●

● = Well suited ○ = Limited suitability

Info — Heavy-duty milling

Heavy-duty machining is the machining of hardened materials with a hardness of 52 - 65 HRC. Advantages are reduced costs and shorter machining times which may be achieved with heavy-duty milling. Special HSC milling strategies, high surface quality and the elimination of quench distortion make this procedure an interesting possibility for an ever-growing market. Additional advantages are: working steps such as multiple clamping and time-consuming polishing are no longer necessary, saving great amounts of money **- cost benefit for your production!**

We have designed our **ATORN programme** with these machining process in mind. In terms of selection, material, and geometry, this programme leaves nothing to be desired. It is geared towards extremely high requirements.

The **ATORN heavy-duty milling tools**offer you the best conditions for an efficient heavy-duty machining. Different geometries have been perfectly adapted to different milling procedures. The carbide used stands out because of its high hardness and extreme toughness.

With the special edge treatment, as well as the new coatings **RockTec 52** and **RockTec 65** the longest service results for the **ATORN tools.**

RockTec 52

Universal implementation:	to 52 HRC
Tolerance, radius correction:	+/- 0,01 mm
Coating type:	Monolayer
Micro-hardness:	3300 HV
Max. application temperature:	< 900 °C
For wet and dry milling	

RockTec 65

For HPC milling and HSC milling:	to 65 HRC
Tolerance, radius correction:	+/- 0,01 mm
Coating type:	New generation multilayer
Micro-hardness:	3600 HV
Max. application temperature:	< 1200 °C
Longest service life for dry milling	

The expansive programme which satisfies the highest requirements

16800 — Solid Carbide Miniature End Milling Cutters

ATORN®

Type
- Short
- Right-hand cut
- 2 cutting edges
- Right-hand helix 40°
- With smooth straight shank in compliance with DIN 6535 HA.

16800 101-109

16800 301-309

				RockTec 52		RockTec 65	
d_1 mm	l_2 mm	l_1 mm	d_2 (h6) mm	16800	...	16800	...
0,1	0,2	40	4		101		301
0,2	0,4	40	4		102		302
0,3	0,6	40	4		103		303
0,4	0,8	40	4		104		304
0,5	1,0	40	4		105		305
0,6	1,2	40	4		106		306
0,7	1,4	40	4		107		307
0,8	1,6	40	4		108		308
0,9	1,8	40	4		109		309

16800

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St >1400N	>45HRC	< 52HRC	< 58HRC	< 65HRC	VA-steel<900N	VA-steel >900N	Ti	GG(G)	Plastics
Rocktec 52																	
-	-	-	60-90	60-90	60-90	60-90	60-90	30-60	30-60	30-60	-	-	-	-	-	-	-
Rocktec 65																	
-	-	-	-	-	-	-	-	60-90	60-90	50-80	45-60	40-55	-	-	-	-	-

16801 Solid Carbide Miniature End Milling Cutters

Z 2 | ≈ 40° | VHM RockTec | DIN 6535 HA

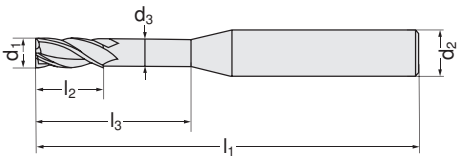
ATORN®

Type
- Long
- Right-hand cut

- 2 cutting edges
- Right-hand helix 40°
- With smooth straight shank in compliance with DIN 6535 HA.

≤ 1600 N/mm² | 52 HRC — 16801 101-154

65 HRC — 16801 301-354



d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_3 mm	d_2 (h6) mm	RockTec 52 16801 ...	RockTec 65 16801 ...
0,2	0,3	0,5	50	0,16	4	101	301
0,2	0,3	1,0	50	0,16	4	102	302
0,2	0,3	1,5	50	0,16	4	103	303
0,3	0,4	1,0	50	0,26	4	104	304
0,3	0,4	2,0	50	0,26	4	105	305
0,3	0,4	3,0	50	0,26	4	106	306
0,4	0,6	2,0	50	0,37	4	107	307
0,4	0,6	3,0	50	0,37	4	108	308
0,4	0,6	4,0	50	0,37	4	109	309
0,4	0,6	5,0	50	0,37	4	110	310
0,5	0,7	2,0	50	0,45	4	111	311
0,5	0,7	4,0	50	0,45	4	112	312
0,5	0,7	6,0	50	0,45	4	113	313
0,5	0,7	8,0	50	0,45	4	114	314
0,6	0,9	2,0	50	0,55	4	115	315
0,6	0,9	4,0	50	0,55	4	116	316
0,6	0,9	6,0	50	0,55	4	117	317
0,6	0,9	8,0	50	0,55	4	118	318
0,6	0,9	10,0	50	0,55	4	119	319
0,8	1,2	4,0	50	0,75	4	120	320
0,8	1,2	6,0	50	0,75	4	121	321
0,8	1,2	8,0	50	0,75	4	122	322
0,8	1,2	10,0	50	0,75	4	123	323
0,8	1,2	12,0	50	0,75	4	124	324
1,0	1,5	6,0	50	0,95	4	125	325
1,0	1,5	8,0	50	0,95	4	126	326
1,0	1,5	10,0	50	0,95	4	127	327
1,0	1,5	12,0	50	0,95	4	128	328
1,0	1,5	14,0	50	0,95	4	129	329
1,0	1,5	16,0	50	0,95	4	130	330
1,2	1,8	6,0	50	1,15	4	131	331
1,2	1,8	10,0	50	1,15	4	132	332
1,5	2,3	8,0	50	1,45	4	133	333
1,5	2,3	12,0	50	1,45	4	134	334
1,5	2,3	16,0	50	1,45	4	135	335
1,5	2,3	20,0	60	1,45	4	136	336
2,0	3,0	6,0	50	1,95	4	137	337
2,0	3,0	8,0	50	1,95	4	138	338
2,0	3,0	12,0	50	1,95	4	139	339
2,0	3,0	16,0	50	1,95	4	140	340
2,0	3,0	20,0	60	1,95	4	141	341
2,0	3,0	25,0	75	1,95	4	142	342
2,5	3,7	8,0	50	2,40	4	143	343
2,5	3,7	10,0	50	2,40	4	144	344
2,5	3,7	12,0	50	2,40	4	145	345
2,5	3,7	16,0	50	2,40	4	146	346
2,5	3,7	20,0	60	2,40	4	147	347
2,5	3,7	25,0	75	2,40	4	148	348
3,0	4,5	8,0	50	2,85	6	149	349
3,0	4,5	10,0	50	2,85	6	150	350
3,0	4,5	12,0	50	2,85	6	151	351
3,0	4,5	16,0	60	2,85	6	152	352
3,0	4,5	20,0	60	2,85	6	153	353

16801

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St >1400N	>45HRC	< 52HRC	< 58HRC	< 65HRC	VA-steel<900N	VA-steel >900N	Ti	GG(G)	Plastics
Rocktec 52																	
-	-	-	60-90	60-90	60-90	60-90	60-90	30-60	30-60	30-60	-	-	-	-	-	-	-
Rocktec 65																	
-	-	-	-	-	-	-	-	60-90	60-90	50-80	45-60	40-55	-	-	-	-	-

= Sales are restricted to the packaging units mentioned in the catalogue. Purchase orders must be in units.

16802 Solid Carbide Miniature End Milling Cutters

Z 2 | ≈ 40° | VHM RockTec | DIN 6535 HA

≤ 1600 N/mm² | 52 HRC

16802 101-154

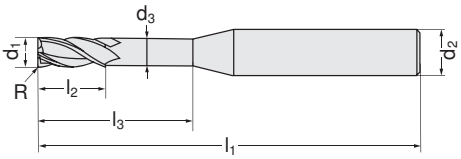
65 HRC

16802 301-354

ATORN®

Type
- Long
- With corner radius
- Right-hand cut

- 2 cutting edges
- Right-hand helix 40°
- With smooth straight shank in compliance with DIN 6535 HA.



							RockTec 52		RockTec 65	
d_1 mm	R mm	l_2 mm	l_3 mm	l_1 mm	d_3 mm	d_2 (h6) mm	16802	...	16802	...
0,2	0,02	0,3	0,5	50	0,16	4		101		301
0,2	0,02	0,3	1,0	50	0,16	4		102		302
0,2	0,02	0,3	1,5	50	0,16	4		103		303
0,3	0,03	0,4	1,0	50	0,26	4		104		304
0,3	0,03	0,4	2,0	50	0,26	4		105		305
0,3	0,03	0,4	3,0	50	0,26	4		106		306
0,4	0,03	0,6	2,0	50	0,37	4		107		307
0,4	0,03	0,6	3,0	50	0,37	4		108		308
0,4	0,03	0,6	4,0	50	0,37	4		109		309
0,4	0,03	0,6	5,0	50	0,37	4		110		310
0,5	0,05	0,7	2,0	50	0,45	4		111		311
0,5	0,05	0,7	4,0	50	0,45	4		112		312
0,5	0,05	0,7	6,0	50	0,45	4		113		313
0,5	0,05	0,7	8,0	50	0,45	4		114		314
0,6	0,05	0,9	2,0	50	0,55	4		115		315
0,6	0,05	0,9	4,0	50	0,55	4		116		316
0,6	0,05	0,9	6,0	50	0,55	4		117		317
0,6	0,05	0,9	8,0	50	0,55	4		118		318
0,6	0,05	0,9	10,0	50	0,55	4		119		319
0,8	0,08	1,2	4,0	50	0,75	4		120		320
0,8	0,08	1,2	6,0	50	0,75	4		121		321
0,8	0,08	1,2	8,0	50	0,75	4		122		322
0,8	0,08	1,2	10,0	50	0,75	4		123		323
0,8	0,08	1,2	12,0	50	0,75	4		124		324
1,0	0,10	1,5	6,0	50	0,95	4		125		325
1,0	0,10	1,5	8,0	50	0,95	4		126		326
1,0	0,10	1,5	10,0	50	0,95	4		127		327
1,0	0,10	1,5	12,0	50	0,95	4		128		328
1,0	0,10	1,5	14,0	50	0,95	4		129		329
1,0	0,10	1,5	16,0	50	0,95	4		130		330
1,2	0,10	1,8	6,0	50	1,15	4		131		331
1,2	0,10	1,8	10,0	50	1,15	4		132		332
1,5	0,15	2,3	8,0	50	1,45	4		133		333
1,5	0,15	2,3	12,0	50	1,45	4		134		334
1,5	0,15	2,3	16,0	50	1,45	4		135		335
1,5	0,15	2,3	20,0	60	1,45	4		136		336
2,0	0,20	3,0	6,0	50	1,95	4		137		337
2,0	0,20	3,0	8,0	50	1,95	4		138		338
2,0	0,20	3,0	12,0	50	1,95	4		139		339
2,0	0,20	3,0	16,0	50	1,95	4		140		340
2,0	0,20	3,0	20,0	60	1,95	4		141		341
2,0	0,20	3,0	25,0	75	1,95	4		142		342
2,5	0,30	3,7	8,0	50	2,40	4		143		343
2,5	0,30	3,7	10,0	50	2,40	4		144		344
2,5	0,30	3,7	12,0	50	2,40	4		145		345
2,5	0,30	3,7	16,0	50	2,40	4		146		346
2,5	0,30	3,7	20,0	60	2,40	4		147		347
2,5	0,30	3,7	25,0	75	2,40	4		148		348
3,0	0,30	4,5	8,0	50	2,85	6		149		349
3,0	0,30	4,5	10,0	50	2,85	6		150		350
3,0	0,30	4,5	12,0	50	2,85	6		151		351
3,0	0,30	4,5	16,0	60	2,85	6		152		352
3,0	0,30	4,5	20,0	60	2,85	6		153		353

16803 Solid Carbide Miniature Torus Milling Cutters

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St >1400N	>45HRC	< 52HRC	< 58HRC	< 65HRC	VA-steel<900N	VA-steel >900N	Ti	GG(G)	Plastics
Rocktec 52																	
-	-	-	60-90	60-90	60-90	60-90	60-90	30-60	30-60	30-60	-	-	-	-	-	-	-
Rocktec 65																	
-	-	-	-	-	-	-	-	60-90	60-90	50-80	45-60	40-55	-	-	-	-	-

Solid Carbide Miniature Milling Cutters With Ball End

16805 Solid Carbide Miniature Milling Cutters With Ball End

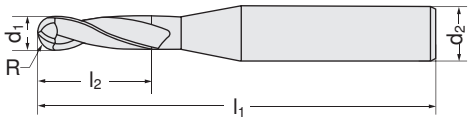
Z 2 | ≈ 30° | VHM RockTec | DIN 6535 HA

ATORN®

Type
- Short
- Right-hand cut
- 2 cutting edges
- Right-hand helix 30°
- With smooth straight shank in compliance with DIN 6535 HA.

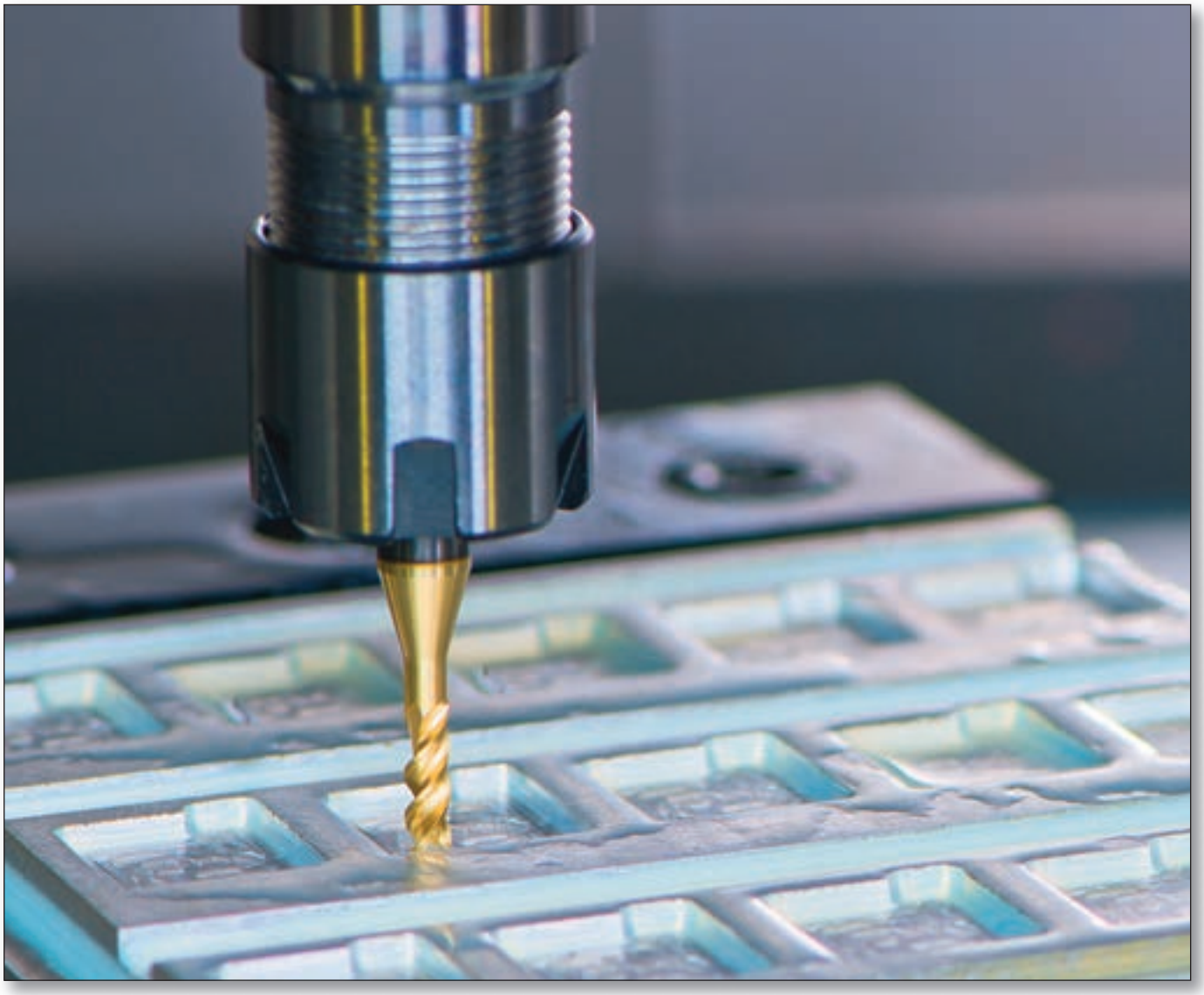
≤ 1600 N/mm² | 52 HRC — 16805 101-108

65 HRC — 16805 301-308



d_1 mm	R mm	l_2 mm	l_1 mm	d_2 (h6) mm	RockTec 52 16805 ...	RockTec 65 16805 ...
0,2	0,10	0,4	40	4	101	301
0,3	0,15	0,6	40	4	102	302
0,4	0,20	0,8	40	4	103	303
0,5	0,25	1,2	40	4	104	304
0,6	0,30	1,4	40	4	105	305
0,7	0,35	1,6	40	4	106	306
0,8	0,40	1,8	40	4	107	307
0,9	0,45	2,0	40	4	108	308

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St >1400N	>45HRC	< 52HRC	< 58HRC	< 65HRC	VA-steel<900N	VA-steel >900N	Ti	GG(G)	Plastics
Rocktec 52																	
-	-	-	60-90	60-90	60-90	60-90	60-90	30-60	30-60	30-60	-	-	-	-	-	-	-
Rocktec 65																	
-	-	-	-	-	-	-	-	60-90	60-90	50-80	45-60	40-55	-	-	-	-	-



16806 Solid Carbide Miniature Milling Cutters With Ball End

Z 2 | ≈ 30° | VHM RockTec | DIN 6535 HA

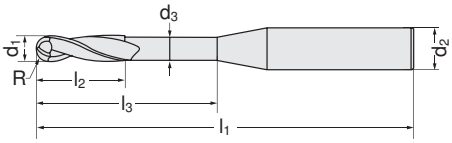
ATORN®

Type
- Long
- Right-hand cut

- 2 cutting edges
- Right-hand helix 30°
- With smooth straight shank in compliance with DIN 6535 HA.

< 1600 N/mm² | 52 HRC — 16806 101-153

65 HRC — 16806 301-353



							RockTec 52		RockTec 65	
d_1 mm	R mm	l_2 mm	l_3 mm	l_1 mm	d_3 mm	d_2 (h6) mm	16806	...	16806	...
0,2	0,10	0,2	0,5	50	0,15	4		101		301
0,2	0,10	0,2	1,0	50	0,15	4		102		302
0,2	0,10	0,2	1,5	50	0,15	4		103		303
0,3	0,15	0,3	1,0	50	0,25	4		104		304
0,3	0,15	0,3	2,0	50	0,25	4		105		305
0,3	0,15	0,3	3,0	50	0,25	4		106		306
0,4	0,20	0,4	1,0	50	0,35	4		107		307
0,4	0,20	0,4	2,0	50	0,35	4		108		308
0,4	0,20	0,4	3,0	50	0,35	4		109		309
0,4	0,20	0,4	4,0	50	0,35	4		110		310
0,4	0,20	0,4	5,0	50	0,35	4		111		311
0,5	0,25	0,4	2,0	50	0,45	4		112		312
0,5	0,25	0,4	3,0	50	0,45	4		113		313
0,5	0,25	0,4	4,0	50	0,45	4		114		314
0,5	0,25	0,4	5,0	50	0,45	4		115		315
0,5	0,25	0,4	6,0	50	0,45	4		116		316
0,5	0,25	0,4	8,0	50	0,45	4		117		317
0,6	0,30	0,5	2,0	50	0,55	4		118		318
0,6	0,30	0,5	3,0	50	0,55	4		119		319
0,6	0,30	0,5	4,0	50	0,55	4		120		320
0,6	0,30	0,5	5,0	50	0,55	4		121		321
0,6	0,30	0,5	6,0	50	0,55	4		122		322
0,6	0,30	0,5	8,0	50	0,55	4		123		323
0,8	0,40	0,6	2,0	50	0,75	4		124		324
0,8	0,40	0,6	4,0	50	0,75	4		125		325
0,8	0,40	0,6	5,0	50	0,75	4		126		326
0,8	0,40	0,6	6,0	50	0,75	4		127		327
0,8	0,40	0,6	7,0	50	0,75	4		128		328
0,8	0,40	0,6	8,0	50	0,75	4		129		329
0,8	0,40	0,6	10,0	50	0,75	4		130		330
1,0	0,50	0,8	3,0	50	0,95	4		131		331
1,0	0,50	0,8	6,0	50	0,95	4		132		332
1,0	0,50	0,8	8,0	50	0,95	4		133		333
1,0	0,50	0,8	10,0	50	0,95	4		134		334
1,0	0,50	0,8	16,0	50	0,95	4		135		335
1,0	0,50	0,8	20,0	60	0,95	4		136		336
1,2	0,60	1,0	6,0	50	1,15	4		137		337
1,2	0,60	1,0	10,0	50	1,15	4		138		338
1,5	0,75	1,2	8,0	50	1,45	4		139		339
1,5	0,75	1,2	12,0	50	1,45	4		140		340
1,5	0,75	1,2	16,0	50	1,45	4		141		341
1,5	0,75	1,2	18,0	60	1,45	4		142		342
2,0	1,00	1,6	4,0	50	1,95	4		143		343
2,0	1,00	1,6	8,0	50	1,95	4		144		344
2,0	1,00	1,6	12,0	50	1,95	4		145		345
2,0	1,00	1,6	16,0	50	1,95	4		146		346
2,0	1,00	1,6	20,0	60	1,95	4		147		347
2,0	1,00	1,6	25,0	75	1,95	4		148		348
3,0	1,50	2,4	8,0	50	2,85	6		149		349
3,0	1,50	2,4	10,0	50	2,85	6		150		350
3,0	1,50	2,4	16,0	60	2,85	6		151		351
3,0	1,50	2,4	20,0	60	2,85	6		152		352
3,0	1,50	2,4	25,0	75	2,85	6		153		353

16806 Solid Carbide Miniature Milling Cutters

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St >1400N	>45HRC	< 52HRC	< 58HRC	< 65HRC	VA-steel<900N	VA-steel >900N	Ti	GG(G)	Plastics
Rocktec 52																	
-	-	-	60-100	60-100	60-100	60-100	60-100	30-70	30-70	30-70	-	-	-	-	-	-	-
Rocktec 65																	
-	-	-	-	-	-	-	-	60-100	60-100	50-90	45-70	40-65	-	-	-	-	-

= Sales are restricted to the packaging units mentioned in the catalogue. Purchase orders must be in units.

16810 Solid Carbide End Milling Cutters

Z 4 | ≈ 40° | VHM RockTec | DIN 6535 HA

ATORN®

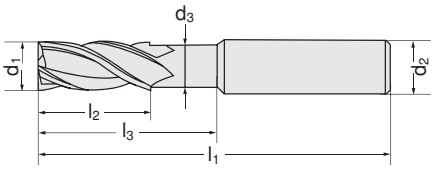
Type
- Short
- With undercut
- Right-hand cut
- 4 cutting edges
- Right-hand helix 40°
- With smooth straight shank in compliance with DIN 6535 HA.

≤ 1600 N/mm² | 52 HRC

16810 101-109

65 HRC

16810 301-309



d_1 (e8) mm	l_2 mm	l_3 mm	l_1 mm	d_3 mm	d_2 (h6) mm	RockTec 52 16810 ...	RockTec 65 16810 ...
3,0	9	15	50	2,8	6	101	301
4,0	12	20	50	3,7	6	102	302
5,0	15	20	50	4,6	6	103	303
6,0	16	20	50	5,5	6	104	304
8,0	20	30	64	7,4	8	105	305
10,0	22	32	70	9,2	10	106	306
12,0	25	37	75	11,0	12	107	307
16,0	32	46	90	15,0	16	108	308
20,0	38	58	100	19,0	20	109	309

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St >1400N	>45HRC	< 52HRC	< 58HRC	< 65HRC	VA-steel<900N	VA-steel >900N	Ti	GG(G)	Plastics
Rocktec 52																	
-	-	-	140-160	140-160	140-160	130-150	120-140	100-130	60-80	60-80	-	-	-	-	-	-	-
Rocktec 65																	
-	-	-	-	-	-	-	-	160-200	120-140	100-130	90-100	80-90	-	-	-	-	-

16812 Solid Carbide End Milling Cutters

Z 4 | ≈ 40° | VHM RockTec | DIN 6535 HA

ATORN®

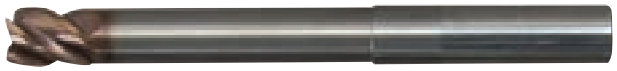
Type
- Long
- With undercut
- Right-hand cut
- 4 short cutting edges
- Right-hand helix 40°
- With smooth straight shank in compliance with DIN 6535 HA.

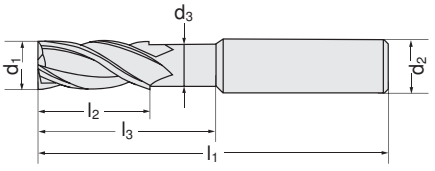
≤ 1600 N/mm² | 52 HRC

16812 101-109

65 HRC

16812 301-309





d_1 (e8) mm	l_2 mm	l_3 mm	l_1 mm	d_3 mm	d_2 (h6) mm	RockTec 52 16812 ...	RockTec 65 16812 ...
3,0	5	30	75	2,8	6	101	301
4,0	8	32	75	3,7	6	102	302
5,0	9	32	75	4,6	6	103	303
6,0	10	40	75	5,5	6	104	304
8,0	12	40	75	7,4	8	105	305
10,0	14	60	100	9,2	10	106	306
12,0	16	60	100	11,0	12	107	307
16,0	22	85	125	15,0	16	108	308
20,0	26	85	125	19,0	20	109	309

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St >1400N	>45HRC	< 52HRC	< 58HRC	< 65HRC	VA-steel<900N	VA-steel >900N	Ti	GG(G)	Plastics
Rocktec 52																	
-	-	-	120-140	120-140	120-140	110-130	100-120	80-100	50-70	50-70	-	-	-	-	-	-	-
Rocktec 65																	
-	-	-	-	-	-	-	-	140-160	100-130	90-100	80-90	70-80	-	-	-	-	-

16813 Solid Carbide End Milling Cutters

Z 4 | ≈ 40° | VHM RockTec | DIN 6535 HA | ≤ 1600 N/mm² | 52 HRC | 65 HRC

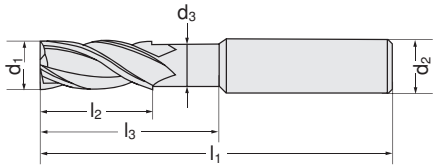
ATORN®

Type
- Extra long
- With undercut
- Right-hand cut
- 4 short cutting edges
- Right-hand helix 40°
- With smooth straight shank in compliance with DIN 6535 HA.

16813 101-109

16813 301-309

d_1 (e8) mm	l_2 mm	l_3 mm	l_1 mm	d_3 mm	d_2 (h6) mm	RockTec 52 16813 ...	RockTec 65 16813 ...
3,0	5	60	100	2,8	6	101	301
4,0	8	60	100	3,7	6	102	302
5,0	9	60	100	4,6	6	103	303
6,0	10	60	100	5,5	6	104	304
8,0	12	60	100	7,4	8	105	305
10,0	14	85	125	9,2	10	106	306
12,0	16	110	150	11,0	12	107	307
16,0	22	110	150	15,0	16	108	308
20,0	26	110	150	19,0	20	109	309



Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St >1400N	>45HRC	< 52HRC	< 58HRC	< 65HRC	VA-steel<900N	VA-steel >900N	Ti	GG(G)	Plastics
Rocktec 52																	
-	-	-	100-120	100-120	90-110	90-110	80-100	60-80	60-80	40-60	-	-	-	-	-	-	-
Rocktec 65																	
-	-	-	-	-	-	-	-	120-140	80-110	70-80	60-70	50-50	-	-	-	-	-

16816 Solid Carbide Torus Milling Cutters

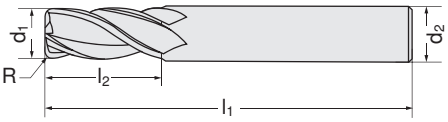
Z 4 | R | ≈ 40° | VHM RockTec | DIN 6535 HA | ≤ 1600 N/mm² | 52 HRC | 65 HRC

ATORN®

Type
- Short
- Right-hand cut
- 4 cutting edges
- Right-hand helix 40°
- With smooth straight shank in compliance with DIN 6535 HA.

16816 101-128

16816 301-328



d_1 (e8) mm	R mm	l_2 mm	l_1 mm	d_2 (h6) mm	RockTec 52 16816 ...	RockTec 65 16816 ...
3,0	0,3	9	50	6	101	301
3,0	0,5	9	50	6	102	302
4,0	0,3	12	50	6	103	303
4,0	0,5	12	50	6	104	304
4,0	1,0	12	50	6	105	305
5,0	0,3	15	50	6	127	327
5,0	0,5	15	50	6	106	306
5,0	1,0	15	50	6	107	307
6,0	0,3	20	60	6	108	308
6,0	0,5	20	60	6	109	309
6,0	1,0	20	60	6	110	310
8,0	0,5	20	64	8	111	311
8,0	1,0	20	64	8	112	312
8,0	1,5	20	64	8	113	313
8,0	2,0	20	64	8	126	326
10,0	0,5	22	75	10	114	314
10,0	1,0	22	75	10	128	328
10,0	1,5	22	75	10	115	315
10,0	2,0	22	75	10	116	316

Continuation ▶

16816 Solid Carbide Torus Milling Cutters

Z 4 | R | ≈ 40° | VHM RockTec | DIN 6535 HA

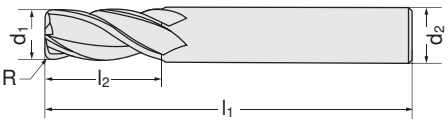
≤ 1600 N/mm² | 52 HRC

Continuation ▶

16816 101-128

65 HRC

16816 301-328



d_1 (e8) mm	R mm	l_2 mm	l_1 mm	d_2 (h6) mm	RockTec 52 16816 ...	RockTec 65 16816 ...
12,0	1,0	25	75	12	117	317
12,0	2,0	25	75	12	118	318
12,0	3,0	25	75	12	119	319
16,0	1,0	32	90	16	120	320
16,0	2,0	32	90	16	121	321
16,0	3,0	32	90	16	122	322
20,0	1,0	38	100	20	123	323
20,0	2,0	38	100	20	124	324
20,0	3,0	38	100	20	125	325

	Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St >1400N	>45HRC	< 52HRC	< 58HRC	< 65HRC	VA-steel<900N	VA-steel >900N	Ti	GG(G)	Plastics
Rocktec 52																		
	-	-	-	140-160	140-160	130-150	130-150	120-140	100-120	80-100	60-80	-	-	-	-	-	-	-
Rocktec 65																		
	-	-	-	-	-	-	-	-	160-200	120-140	100-120	90-100	80-90	-	-	-	-	-

16817 Solid Carbide Torus Milling Cutters

Z 4 | R | ≈ 45° | VHM RockTec | DIN 6535 HA

ATORN®

Type

- Short

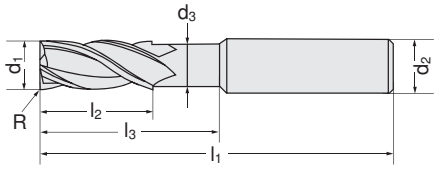
- With undercut
- Right-hand cut
- 4 short cutting edges
- Right-hand helix 45°
- With smooth straight shank in compliance with DIN 6535 HA.

≤ 1600 N/mm² | 52 HRC

16817 101-116

65 HRC

16817 301-316



d_1 (e8) mm	R mm	l_2 mm	l_3 mm	l_1 mm	d_3 mm	d_2 (h6) mm	RockTec 52 16817 ...	RockTec 65 16817 ...
3,0	0,3	4	14	60	2,8	6	101	301
3,0	0,5	4	14	60	2,8	6	102	302
4,0	0,3	5	16	60	3,7	6	103	303
4,0	0,5	5	16	60	3,7	6	104	304
5,0	0,3	6	18	60	4,6	6	105	305
5,0	0,5	6	18	60	4,6	6	106	306
6,0	0,5	7	20	60	5,5	6	107	307
6,0	1,0	7	20	60	5,5	6	108	308
8,0	0,5	9	26	64	7,4	8	109	309
8,0	1,0	9	26	64	7,4	8	110	310
10,0	1,0	11	31	70	9,2	10	111	311
10,0	2,0	11	31	70	9,2	10	112	312
12,0	1,0	13	37	75	11,0	12	113	313
12,0	2,0	13	37	75	11,0	12	114	314
16,0	1,0	17	43	90	15,0	16	115	315
16,0	2,0	17	43	90	15,0	16	116	316

	Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St >1400N	>45HRC	< 52HRC	< 58HRC	< 65HRC	VA-steel<900N	VA-steel >900N	Ti	GG(G)	Plastics
Rocktec 52																		
	-	-	-	140-160	140-160	130-150	130-150	120-140	100-120	80-100	60-80	-	-	-	-	-	-	-
Rocktec 65																		
	-	-	-	-	-	-	-	-	160-200	120-140	100-120	90-100	80-90	-	-	-	-	-

= Sales are restricted to the packaging units mentioned in the catalogue. Purchase orders must be in units.

16818 Solid Carbide Torus Milling Cutters

Z 4 | R | ≈ 40° | VHM RockTec | DIN 6535 HA

ATORN®

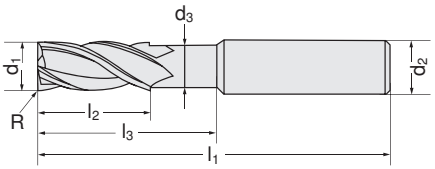
Type
- Long
- With undercut
- Right-hand cut
- 4 short cutting edges
- Right-hand helix 40°
- With smooth straight shank in compliance with DIN 6535 HA.

≤ 1600 N/mm² | 52 HRC | 65 HRC

16818 101-116

16818 301-316

d_1 (e8) mm	R mm	l_2 mm	l_3 mm	l_1 mm	d_3 mm	d_2 (h6) mm	RockTec 52 16818 ...	RockTec 65 16818 ...
3,0	0,3	5	30	75	2,8	6	101	301
3,0	0,5	5	30	75	2,8	6	102	302
4,0	0,3	8	32	75	3,7	6	103	303
4,0	0,5	8	32	75	3,7	6	104	304
5,0	0,3	9	32	75	4,6	6	105	305
5,0	0,5	9	32	75	4,6	6	106	306
6,0	0,5	10	40	75	5,5	6	107	307
6,0	1,0	10	40	75	5,5	6	108	308
8,0	0,5	12	40	75	7,4	8	109	309
8,0	1,0	12	40	75	7,4	8	110	310
10,0	1,0	14	60	100	9,2	10	111	311
10,0	2,0	14	60	100	9,2	10	112	312
12,0	1,0	16	60	100	11,0	12	113	313
12,0	2,0	16	60	100	11,0	12	114	314
16,0	1,0	22	85	125	15,0	16	115	315
16,0	2,0	22	85	125	15,0	16	116	316



Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St >1400N	>45HRC	< 52HRC	< 58HRC	< 65HRC	VA-steel<900N	VA-steel >900N	Ti	GG(G)	Plastics
Rocktec 52																	
-	-	-	120-140	120-140	110-130	110-130	100-120	80-100	70-90	50-70	-	-	-	-	-	-	-
Rocktec 65																	
-	-	-	-	-	-	-	-	140-160	100-130	90-100	80-90	70.80	-	-	-	-	-

16819 Solid Carbide Torus Milling Cutters

Z 4 | R | ≈ 40° | VHM RockTec | DIN 6535 HA

ATORN®

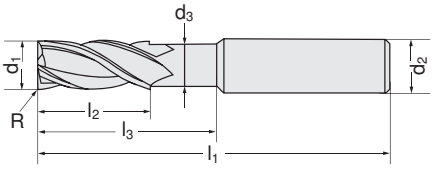
Type
- Extra long
- With undercut
- Right-hand cut
- 4 short cutting edges
- Right-hand helix 40°
- With smooth straight shank in compliance with DIN 6535 HA.

≤ 1600 N/mm² | 52 HRC | 65 HRC

16819 101-116

16819 301-316

d_1 (e8) mm	R mm	l_2 mm	l_3 mm	l_1 mm	d_3 mm	d_2 (h6) mm	RockTec 52 16819 ...	RockTec 65 16819 ...
3,0	0,3	5	60	100	2,8	6	101	301
3,0	0,5	5	60	100	2,8	6	102	302
4,0	0,3	8	60	100	3,7	6	103	303
4,0	0,5	8	60	100	3,7	6	104	304
5,0	0,3	9	60	100	4,6	6	105	305
5,0	0,5	9	60	100	4,6	6	106	306
6,0	0,5	10	60	100	5,5	6	107	307
6,0	1,0	10	60	100	5,5	6	108	308
8,0	0,5	12	60	100	7,4	8	109	309
8,0	1,0	12	60	100	7,4	8	110	310
10,0	1,0	14	85	125	9,2	10	111	311
10,0	2,0	14	85	125	9,2	10	112	312
12,0	1,0	16	110	150	11,0	12	113	313
12,0	2,0	16	110	150	11,0	12	114	314
16,0	1,0	22	110	150	15,0	16	115	315
16,0	2,0	22	110	150	15,0	16	116	316



Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St >1400N	>45HRC	< 52HRC	< 58HRC	< 65HRC	VA-steel<900N	VA-steel >900N	Ti	GG(G)	Plastics
Rocktec 52																	
-	-	-	100-120	100-120	90-110	90-110	80-100	70-80	60-70	40-60	-	-	-	-	-	-	-
Rocktec 65																	
-	-	-	-	-	-	-	-	120-140	80-110	70-80	60-70	50-60	-	-	-	-	-

16824 Solid carbide multiple teeth milling cutter

Z 6-8 | ≈ 50° | VHM RockTec | DIN 6535 HA

ATORN®

Type
- Short
- With undercut
- Right-hand cut
- 6-8 cutting edges
- Right-hand helix 50°
- With smooth straight shank in compliance with DIN 6535 HA.

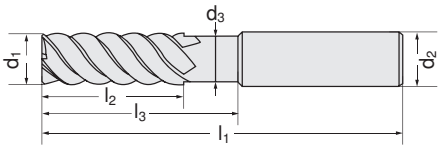
≤ 1600 N/mm² | 52 HRC

16824 101-109

65 HRC

16824 301-309

d_1 (e8) mm	l_2 mm	l_3 mm	l_1 mm	d_3 mm	d_2 (h6) mm	Z	RockTec 52 16824 ...	RockTec 65 16824 ...
3,0	8	20	50	2,8	6	6	101	301
4,0	11	20	50	3,7	6	6	102	302
5,0	13	20	50	4,6	6	6	103	303
6,0	15	20	50	5,5	6	6	104	304
8,0	20	30	64	7,4	8	6	105	305
10,0	22	32	70	9,2	10	6	106	306
12,0	25	37	75	11,0	12	6	107	307
16,0	30	46	90	15,0	16	8	108	308
20,0	38	58	100	19,0	20	8	109	309



Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St >1400N	>45HRC	< 52HRC	< 58HRC	< 65HRC	VA-steel<900N	VA-steel >900N	Ti	GG(G)	Plastics
Rocktec 52																	
-	-	-	140-160	140-160	130-150	130-150	120-140	100-120	80-100	60-80	-	-	-	-	-	-	-
Rocktec 65																	
-	-	-	-	-	-	-	-	160-200	120-140	100-120	80-100	80-90	-	-	-	-	-

16825 Solid carbide multiple teeth milling cutter

Z 6-8 | ≈ 50° | VHM RockTec | DIN 6535 HA

ATORN®

Type
- Long
- With undercut
- Right-hand cut
- 6-8 cutting edges
- Right-hand helix 50°
- With smooth straight shank in compliance with DIN 6535 HA.

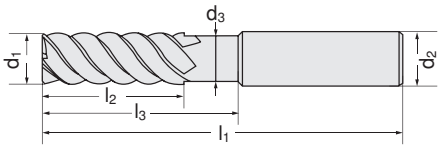
≤ 1600 N/mm² | 52 HRC

16825 101-109

65 HRC

16825 301-309

d_1 (e8) mm	l_2 mm	l_3 mm	l_1 mm	d_3 mm	d_2 (h6) mm	Z	RockTec 52 16825 ...	RockTec 65 16825 ...
3,0	19	30	75	2,8	6	6	101	301
4,0	19	32	75	3,7	6	6	102	302
5,0	19	32	75	4,6	6	6	103	303
6,0	31	40	75	5,5	6	6	104	304
8,0	31	40	75	7,4	8	6	105	305
10,0	45	60	100	9,2	10	6	106	306
12,0	50	60	100	11,0	12	6	107	307
16,0	57	85	125	15,0	16	8	108	308
20,0	57	85	125	19,0	20	8	109	309



Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St >1400N	>45HRC	< 52HRC	< 58HRC	< 65HRC	VA-steel<900N	VA-steel >900N	Ti	GG(G)	Plastics
Rocktec 52																	
-	-	-	120-140	120-140	110-130	110-130	100-120	80-100	70-80	50-70	-	-	-	-	-	-	-
Rocktec 65																	
-	-	-	-	-	-	-	-	140-160	100-130	90-100	80-90	70-80	-	-	-	-	-

16827 Solid Carbide Radius Milling Cutters

Z 2 | ≈ 30° | VHM RockTec | DIN 6535 HA

ATORN®

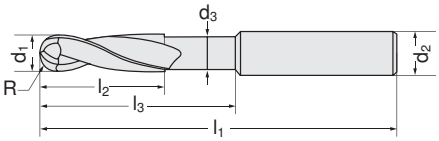
Type
- Short
- With undercut
- Right-hand cut
- 2 cutting edges
- Right-hand helix 30°
- With smooth straight shank in compliance with DIN 6535 HA.

≤ 1600 N/mm² | 52 HRC

16827 101-111

65 HRC

16827 301-311



							RockTec 52		RockTec 65	
d_1 mm	R mm	l_2 mm	l_3 mm	l_1 mm	d_3 mm	d_2 (h6) mm	16827	...	16827	...
2,0	1,00	4	8	40	1,95	4		101		301
2,5	1,25	4	10	40	2,4	4		102		302
3,0	1,50	5	14	50	2,8	4		103		303
4,0	2,00	8	20	50	3,7	4		104		304
5,0	2,50	9	20	50	4,6	6		105		305
6,0	3,00	10	20	50	5,5	6		106		306
8,0	4,00	12	30	64	7,4	8		107		307
10,0	5,00	14	32	70	9,2	10		108		308
12,0	6,00	16	38	75	11,0	12		109		309
16,0	8,00	32	46	90	15,0	16		110		310
20,0	10,00	38	58	100	19,0	20		111		311

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St >1400N	>45HRC	< 52HRC	< 58HRC	< 65HRC	VA-steel<900N	VA-steel >900N	Ti	GG(G)	Plastics
Rocktec 52																	
-	-	-	180-370	180-370	180-350	180-350	150-300	140-270	130-260	120-240	-	-	-	-	-	-	-
Rocktec 65																	
-	-	-	-	-	-	-	-	180-370	100-220	80-150	60-80	50-70	-	-	-	-	-

16828 Solid Carbide Radius Milling Cutters

Z 2 | ≈ 30° | VHM RockTec | DIN 6535 HA

ATORN®

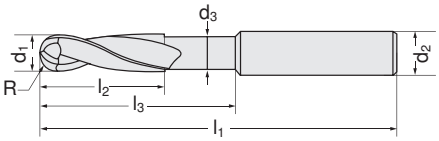
Type
- Long
- With undercut
- Right-hand cut
- 2 cutting edges
- Right-hand helix 30°
- With smooth straight shank in compliance with DIN 6535 HA.

≤ 1600 N/mm² | 52 HRC

16828 101-111

65 HRC

16828 301-311



							RockTec 52		RockTec 65	
d_1 (e8) mm	R mm	l_2 mm	l_3 mm	l_1 mm	d_3 mm	d_2 (h6) mm	16828	...	16828	...
2,0	1,00	4	14	75	1,95	6		101		301
2,5	1,25	4	18	75	2,4	6		102		302
3,0	1,50	5	21	75	2,8	6		103		303
4,0	2,00	8	28	75	3,7	6		104		304
5,0	2,50	9	32	75	4,6	6		105		305
6,0	3,00	10	40	75	5,5	6		106		306
8,0	4,00	12	40	75	7,4	8		107		307
10,0	5,00	14	60	100	9,2	10		108		308
12,0	6,00	16	60	100	11,0	12		109		309
16,0	8,00	32	80	125	15,0	16		110		310
20,0	10,00	38	80	125	19,0	20		111		311

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St >1400N	>45HRC	< 52HRC	< 58HRC	< 65HRC	VA-steel<900N	VA-steel >900N	Ti	GG(G)	Plastics
Rocktec 52																	
-	-	-	160-320	160-320	160-300	160-300	160-300	130-250	120-180	110-200	-	-	-	-	-	-	-
Rocktec 65																	
-	-	-	-	-	-	-	-	130-320	100-150	80-100	50-65	40-55	-	-	-	-	-

16829 Solid Carbide Radius Milling Cutters

Z 2 | ≈ 30° | VHM RockTec | DIN 6535 HA

ATORN®

Type
- Extra long
- With undercut
- Right-hand cut
- 2 cutting edges
- Right-hand helix 30°
- With smooth straight shank in compliance with DIN 6535 HA.

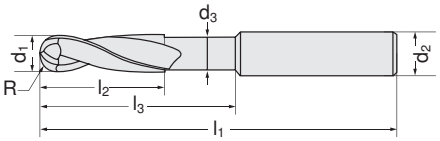
≤ 1600 N/mm² | 52 HRC

16829 101-111

65 HRC

16829 301-311

							RockTec 52		RockTec 65	
d_1 mm	R mm	l_2 mm	l_3 mm	l_1 mm	d_3 mm	d_2 (h6) mm	16829	...	16829	...
2,0	1,00	4	20	100	1,95	6		101		301
2,5	1,25	4	25	100	2,4	6		102		302
3,0	1,50	5	30	100	2,8	6		103		303
4,0	2,00	8	40	100	3,7	6		104		304
5,0	2,50	9	50	100	4,6	6		105		305
6,0	3,00	10	60	150	5,5	6		106		306
8,0	4,00	12	80	150	7,4	8		107		307
10,0	5,00	14	100	150	9,2	10		108		308
12,0	6,00	16	110	150	11,0	12		109		309
16,0	8,00	32	150	200	15,0	16		110		310
20,0	10,00	38	150	200	19,0	20		111		311



Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St >1400N	>45HRC	< 52HRC	< 58HRC	< 65HRC	VA-steel<900N	VA-steel >900N	Ti	GG(G)	Plastics
Rocktec 52																	
-	-	-	90-190	90-190	90-190	90-190	90-190	100-130	80-150	60-130	-	-	-	-	-	-	-
Rocktec 65																	
-	-	-	-	-	-	-	-	90-190	60-130	40-45	30-40	25-35	-	-	-	-	-

16830 Solid Carbide Radius Milling Cutters

Z 4 | ≈ 30° | VHM RockTec | DIN 6535 HA

ATORN®

Type
- Short
- With undercut
- Right-hand cut
- 4 cutting edges
- Right-hand helix 30°
- With smooth straight shank in compliance with DIN 6535 HA.

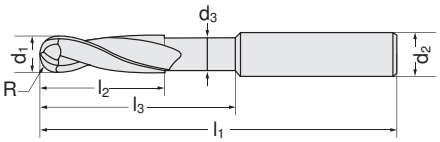
≤ 1600 N/mm² | 52 HRC

16830 103-111

65 HRC

16830 303-311

							RockTec 52		RockTec 65	
d_1 (e8) mm	R mm	l_2 mm	l_3 mm	l_1 mm	d_3 mm	d_2 (h6) mm	16830	...	16830	...
3,0	1,50	5	14	50	2,8	6		103		303
4,0	2,00	8	20	50	3,7	6		104		304
5,0	2,50	9	20	50	4,6	6		105		305
6,0	3,00	10	20	50	5,5	6		106		306
8,0	4,00	12	30	64	7,4	8		107		307
10,0	5,00	14	32	70	9,2	10		108		308
12,0	6,00	16	38	75	11,0	12		109		309
16,0	8,00	32	46	90	15,0	16		110		310
20,0	10,00	38	58	100	19,0	20		111		311



Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St >1400N	>45HRC	< 52HRC	< 58HRC	< 65HRC	VA-steel<900N	VA-steel >900N	Ti	GG(G)	Plastics
Rocktec 52																	
-	-	-	160-320	160-320	160-300	160-300	160-300	140-220	130-180	110-200	-	-	-	-	-	-	-
Rocktec 65																	
-	-	-	-	-	-	-	-	130-320	70-130	60-70	50-65	40-55	-	-	-	-	-

16831 Solid Carbide Radius Milling Cutters

Z 4 | ≈ 30° | VHM RockTec | DIN 6535 HA

ATORN®

Type

- Long

- With undercut
- Right-hand cut
- 4 cutting edges
- Right-hand helix 30°
- With smooth straight shank in compliance with DIN 6535 HA.

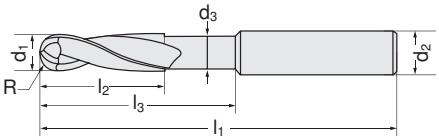
≤ 1600 N/mm² | 52 HRC

16831 103-111

65 HRC

16831 303-311

d_1 (e8) mm	R mm	l_2 mm	l_3 mm	l_1 mm	d_3 mm	d_2 (h6) mm	RockTec 52 16831 ...	RockTec 65 16831 ...
3,0	1,50	5	21	75	2,8	6	103	303
4,0	2,00	8	28	75	3,7	6	104	304
5,0	2,50	9	32	75	4,6	6	105	305
6,0	3,00	10	40	75	5,5	6	106	306
8,0	4,00	12	40	75	7,4	8	107	307
10,0	5,00	14	60	100	9,2	10	108	308
12,0	6,00	16	60	100	11,0	12	109	309
16,0	8,00	32	80	125	15,0	16	110	310
20,0	10,00	38	80	125	19,0	20	111	311



Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St >1400N	>45HRC	< 52HRC	< 58HRC	< 65HRC	VA-steel<900N	VA-steel >900N	Ti	GG(G)	Plastics
Rocktec 52																	
-	-	-	90-190	90-190	90-190	90-190	90-190	100-130	80-150	60-130	-	-	-	-	-	-	-
Rocktec 65																	
-	-	-	-	-	-	-	-	90-190	60-130	40-45	30-40	25-35	-	-	-	-	-

16832 Solid carbide high-speed cutter

Z 4-6 | R | VHM RockTec | DIN 6535 HA

ATORN®

Type

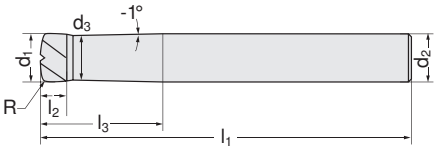
- 4 or 6 flute high feed-rate milling cutter with a TiSi-based PVD coating
- Short flutes for increased stability, longer service life, greater stock-removal capacity and higher feed-rates

Use

For roughing tasks in the area off tool construction and mould construction and in general machine construction, also for dry milling or with air cooling.

65 HRC

16832



d_1 (e8) mm	R mm	l_2 mm	l_3 mm	l_1 mm	d_3 mm	d_2 (h6) mm	Z	RockTec 65 16832 ...
4,0	0,4	1,5	8	57	3,7	6	4	101
4,0	0,4	1,5	15	57	3,7	6	4	102
5,0	0,5	2,0	10	57	4,6	6	4	103
5,0	0,5	2,0	21	57	4,6	6	4	104
6,0	0,6	2,5	12	57	5,5	6	4	105
6,0	0,6	2,5	26	57	5,5	6	4	106
8,0	0,8	3,0	16	63	7,4	8	6	107
8,0	0,8	3,0	31	63	7,4	8	6	108
10,0	1,0	3,5	20	72	9,2	10	6	109
10,0	1,0	3,5	36	72	9,2	10	6	110
12,0	1,2	4,0	24	83	11,0	12	6	111
12,0	1,2	4,0	41	83	11,0	12	6	112

Rocktec 65

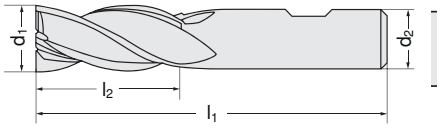
Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St<1400N	<45HRC	<55HRC	<60HRC	<67HRC	VA-steel<900N	VA-steel>900N	Ti	GG(G)	Plastics
-	-	-	-	-	-	-	-	160	160	150	140	120	-	-	-	-	-

16601 Solid Carbide End Milling Cutters

Z 2 | HSC | ≈ 30° | VHM TiAlN | DIN 6535 HB | 60 HRC

Type
Short, right-hand cut, 2 cutting edges, right-hand helix, **centre cut.** With clamping surface in accordance with DIN 6535 HB.

16601



d_1 e8 mm	l_2 mm	l_1 mm	d_2 h6 mm	16601 ...
3,0	8	45	6	101
4,0	11	45	6	103
5,0	13	50	6	105
6,0	13	50	6	107
6,5	16	60	8	108
8,0	19	60	8	111

d_1 e8 mm	l_2 mm	l_1 mm	d_2 h6 mm	16601 ...
10,0	22	70	10	115
12,0	26	75	12	119
16,0	32	100	16	121
20,0	38	105	20	123
25,0	45	120	25	124

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St<1400N	<50HRC	<55HRC	<60HRC	<67HRC	VA-steel<900N	VA-steel>900N	Ti-alloys	GG(G)	Plastics
-	-	-	150-190	140-170	130-160	100-120	90-110	60-90	55-65	50-55	40-55	-	-	-	-	-	-

16603 Solid carbide HSC end milling cutters

Z 2 | 45° | HSC | ≈ 30° | TiAlN Ultra | DIN 6535 HA | DIN 6535 HB | Uni

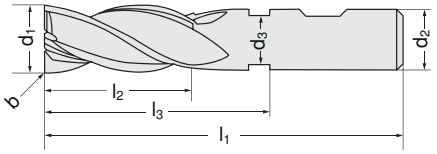
ATORN®

Type
With undercut. 2 cutting edges, 1 flute cutting over centre. 30° right-hand helix. Best chip removal thanks to extremely smooth surface.
Quality
solid carbide Ultra-finest grit/TiAlN-Ultra-coated.

16603 117-144

16603 101-116
Type
With smooth straight shank in compliance with DIN 6535 HA.

16603 117-144
Type
With clamping surface in accordance with DIN 6535 HB.



d_1 e8 mm	d_2 h5 mm	d_3 mm	l_1 mm	l_3 mm	l_2 mm	b x 45° mm	16603 ...
0,3	3	-	38	-	1	0,1	101
0,5	3	-	38	-	1,5	0,1	103
0,8	3	-	38	-	2	0,1	106
1,0	3	-	50	-	3	0,1	108
1,2	3	-	50	-	4	0,1	110
1,4	3	-	50	-	4	0,1	111
1,5	3	-	50	-	4	0,1	112
1,6	3	-	50	-	4	0,1	113
2,0	3	-	50	-	5	0,1	115
2,5	3	-	50	-	6	0,1	116
2,8	6	2,6	57	15	8	0,1	117
3,0	6	2,8	57	15	8	0,1	118
3,8	6	3,6	57	15	11	0,1	119
4,0	6	3,8	57	15	11	0,1	120
4,8	6	4,6	57	21	13	0,1	121
5,0	6	4,8	57	21	13	0,1	122
5,8	6	5,6	57	21	13	0,1	123

d_1 e8 mm	d_2 h5 mm	d_3 mm	l_1 mm	l_3 mm	l_2 mm	b x 45° mm	16603 ...
6,0	6	5,8	57	21	13	0,1	124
6,8	8	6,6	63	27	16	0,1	125
7,0	8	6,8	63	27	16	0,1	126
7,8	8	7,5	63	27	19	0,1	127
8,0	8	7,7	63	27	19	0,1	128
9,0	10	8,8	72	32	19	0,1	130
9,7	10	9,5	72	32	22	0,1	131
10,0	10	9,8	72	32	22	0,1	132
11,0	12	10,8	83	38	26	0,1	134
11,7	12	11,5	83	38	26	0,1	135
12,0	12	11,8	83	38	26	0,1	136
13,7	14	13,5	83	38	26	0,1	137
14,0	14	13,8	83	38	26	0,1	138
16,0	16	15,7	92	44	32	0,1	140
18,0	18	17,7	92	44	32	0,1	142
20,0	20	19,7	104	54	38	0,1	144

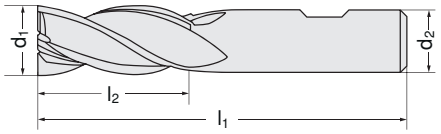
Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St<1400N	<50HRC	<55HRC	<60HRC	<67HRC	VA-steel<900N	VA-steel>900N	Ti-alloys	GG(G)	Plastics
400-500	200-400	100-140	110-160	90-140	80-120	80-100	80-90	-	-	-	-	-	70-80	55-70	20-50	90-155	-

16604 Solid Carbide End Milling Cutters

Z 2 | HSC | ≈ 30° | VHM TiAlN | DIN 6535 HB | 60 HRC

Type
Long, right-hand cut, 2 cutting edges, right-hand helix, centre cut.
Quality
Universal carbide quality finest grit (P 20 - K 40)
TiAlN-coated.

16604



d_1 e8 mm	l_2 mm	l_1 mm	d_2 h6 mm	16604 ...
3,0	12	50	6	101
4,0	15	50	6	102
5,0	20	60	6	103
6,0	20	60	6	104
8,0	25	70	8	105

d_1 e8 mm	l_2 mm	l_1 mm	d_2 h6 mm	16604 ...
10,0	30	90	10	106
12,0	30	90	12	107
16,0	50	110	16	108
20,0	55	110	20	109
25,0	75	140	25	110

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St<1400N	<50HRC	<55HRC	<60HRC	<67HRC	VA-steel<900N	VA-steel>900N	Ti alloys	GG(G)	plastics
-	-	-	150-190	140-170	130-160	100-120	90-110	60-90	55-65	50-55	40-55	-	-	-	-	-	-

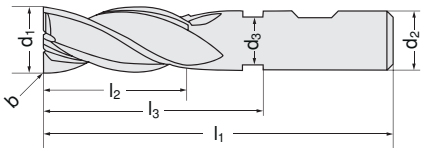
16607 Solid Carbide HSC End Milling Cutters

Z 3 | 45° | HPC | ≈ 45° | TiAlN Ultra | DIN 6535 HB | Uni

ATORN®

Type
With undercut. 3 cutting edges, 1 flute cutting over centre. 45° right-hand helix. With clamping surface in accordance with DIN 6535 HB. Best chip removal thanks to extremely smooth surface.
Quality
solid carbide Ultra-finest grit/TiAlN-Ultra-coated.

16607



d_1 e8 mm	d_2 h5 mm	d3 mm	l1 mm	l3 mm	l2 mm	b x 45° mm	16607 ...
3,0	6	2,8	57	15	8	0,1	101
3,5	6	3,3	57	15	11	0,1	102
4,0	6	3,8	57	15	11	0,1	103
4,5	6	4,3	57	21	13	0,1	104
5,0	6	4,8	57	21	13	0,1	105
5,5	6	5,3	57	21	13	0,1	106
6,0	6	5,8	57	21	13	0,1	107
6,5	8	6,3	63	27	16	0,1	108
7,0	8	6,8	63	27	16	0,1	109
7,5	8	7,3	63	27	19	0,1	110
8,0	8	7,7	63	27	21	0,1	111

d_1 e8 mm	d_2 h5 mm	d3 mm	l1 mm	l3 mm	l2 mm	b x 45° mm	16607 ...
8,5	10	8,3	72	32	21	0,1	112
9,0	10	8,8	72	32	21	0,1	113
9,5	10	9,3	72	32	22	0,1	114
10,0	10	9,8	72	32	22	0,1	115
11,0	12	10,8	83	32	26	0,1	116
12,0	12	11,8	83	38	26	0,1	117
14,0	14	13,8	83	38	26	0,1	118
16,0	16	15,7	92	44	36	0,1	119
18,0	18	17,7	92	44	36	0,1	120
20,0	20	19,7	104	54	41	0,1	121

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St<1400N	<50HRC	<55HRC	<60HRC	<67HRC	VA-steel<900N	VA-steel>900N	Ti alloys	GG(G)	plastics
400-500	200-400	100-140	110-160	90-140	80-120	80-100	80-90	-	-	-	-	-	70-80	55-70	20-50	90-155	-

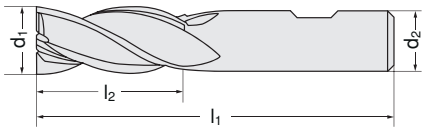
16609 Solid Carbide End Milling Cutters

Z 4 | HSC | ≈ 30° | VHM TiAlN | DIN 6535 HB | 60 HRC

HW

Type
Short, right-hand cut, **4 cutting edges,**
Right-hand helix, **centre cut.** With clamping surface in compliance with DIN 6535 HB.
Quality
Universal carbide quality finest grit (P 20 - K 40)
TiAlN-coated.

16609



d_1 e8 mm	l_2 mm	l_1 mm	d_2 h6 mm	16609 ...
3,0	8	45	6	103
3,5	10	45	6	104
4,0	11	45	6	105
4,5	11	45	6	106
5,0	13	50	6	107
5,5	13	50	6	108
6,0	13	50	6	109
8,0	19	60	8	113

d_1 e8 mm	l_2 mm	l_1 mm	d_2 h6 mm	16609 ...
9,0	19	70	10	115
10,0	22	70	10	117
12,0	26	75	12	121
14,0	26	85	14	122
16,0	32	100	16	123
20,0	38	105	20	125
25,0	45	120	25	126

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St<1400N	<45HRC	<55HRC	<60HRC	<67HRC	VA-steel<900N	VA-steel>900N	Ti-alloys	GG(G)	Plastics
400	300	250	300	250	200	180	160	140	80	60	40	-	120	100	60	180	-

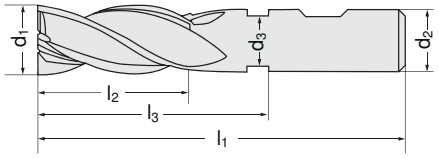
16610 Solid Carbide HSC End Milling Cutters

Z 4 | HPC | ≈ 30° | TiAlN Ultra | DIN 6535 HA | DIN 6535 HB | Uni

ATORN®

Type
Short with undercut, 4 cutting edges, 2 flutes cutting to the centre. 30° right-hand helix. Best chip removal thanks to extremely smooth surface.
Quality
solid carbide Ultra-finest grit/TiAlN-Ultra-coated.

16610



16610 102-104
Type
Without undercut, with smooth straight shank in compliance with DIN 6535 HA.

16610 105
Type
With undercut and smooth straight shank in compliance with DIN 6535 HA.

16610 106-120
Type
With undercut and clamping surface in compliance with DIN 6535 HB.

d_1 e8 mm	d_2 h5 mm	d_3 mm	l_1 mm	l_3 mm	l_2 mm	16610 ...
2,0	2	-	32	-	8	102
3,0	3	-	38	-	12	103
4,0	4	-	40	-	12	104
5,0	5	4,8	50	20	15	105
6,0	6	5,8	58	20	16	106
8,0	8	7,7	70	32	22	108
10,0	10	9,6	73	31	25	110
12,0	12	11,6	84	37	28	112
16,0	16	15,5	93	43	35	116
20,0	20	19,5	104	52	40	120

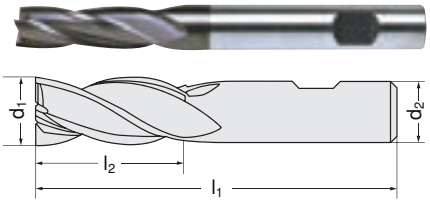
Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St<1400N	<50HRC	<55HRC	<60HRC	<67HRC	VA-steel<900N	VA-steel>900N	Ti alloys	GG(G)	plastics
400-500	200-400	100-140	110-160	90-140	80-120	80-100	80-90	-	-	-	-	-	70-80	55-70	20-50	90-155	-

16613 Solid Carbide End Milling Cutters

Z 4 | HSC | ≈ 30° | VHM TiAlN | DIN 6535 HB | 60 HRC

16613

Type
Long, centre cut.
Quality
Universal carbide quality finest grit
(P 20 - K 40) TiAlN-coated.



d_1 mm	l_2 mm	l_1 mm	d_2 mm	16613 ...
3,0	12	50	6	201
4,0	15	50	6	202
5,0	20	60	6	203
6,0	20	60	6	204
8,0	25	70	8	205

d_1 mm	l_2 mm	l_1 mm	d_2 mm	16613 ...
10,0	30	90	10	206
12,0	30	90	12	207
16,0	50	110	16	208
20,0	55	110	20	209
25,0	75	140	25	210

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St<1400N	<45HRC	<55HRC	<60HRC	<67HRC	VA-steel<900N	VA-steel>900N	Ti-alloys	GG(G)	Plastics
-	-	-	300	250	200	180	160	140	80	60	40	-	-	-	-	-	-

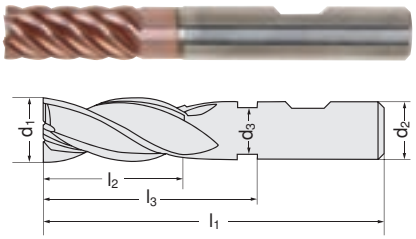
16616 Solid Carbide End Milling Cutters

Z 6-8 | HSC | ≈ 45° | TiAlN Ultra | DIN 6535 HB | Uni

ATORN®

16616

Type
Short, with undercut. 6-8 cutting edges, 2 flutes cutting to the centre. 45° right-hand helix. With clamping surface in accordance with DIN 6535 HB. Best chip removal thanks to extremely smooth surface.
Quality
Solid carbide Ultra-finest grit/TiAlN-Ultra-coated.



d_1 e8 mm	d_2 h5 mm	d_3 mm	l_1 mm	l_3 mm	l_2 mm	Z	16616 ...
4,0	6	3,7	57	19	11	6	201
5,0	6	4,7	57	19	13	6	202
6,0	6	5,7	57	19	13	6	203
8,0	8	7,7	63	25	19	6	204
10,0	10	9,7	72	30	22	6	205
12,0	12	11,5	83	36	26	6	206
16,0	16	15,5	92	42	32	6	208
18,0	18	17,5	92	42	32	8	209
20,0	20	19,5	104	52	38	8	210

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St<1300N	<50HRC	<55HRC	<60HRC	<67HRC	VA-steel<900N	VA-steel>900N	Ti alloys	GG(G)	plastics
-	-	-	130-180	110-170	130-140	120-130	110-120	90-100	-	-	-	-	80-110	80-110	-	130-220	-

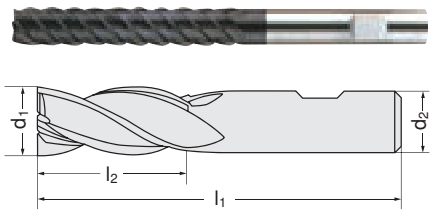
16619 Solid Carbide End Milling Cutters

Z 6 | HSC | ≈ 45° | VHM TiAlN | DIN 6535 HB | 60 HRC

16619

Type
Extra long, right-hand cut, **6 cutting edges.** Right-hand helix approx. 45°. With clamping surface in accordance with DIN 6535 HB.
Use
For circumference milling as finishing working step for producing highest surface quality (face cutting only at low cutting depths).

Quality
Universal carbide quality finest grit
(P 20 - K 40) TiAlN-coated.



d_1 e8 mm	l_2 mm	l_1 mm	d_2 h6 mm	16619 ...
6,0	26	70	6	201
8,0	36	90	8	202
10,0	46	100	10	203
12,0	56	110	12	204

d_1 e8 mm	l_2 mm	l_1 mm	d_2 h6 mm	16619 ...
16,0	66	130	16	205
20,0	76	140	20	206
25,0	92	180	25	207

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St<1400N	<45HRC	<55HRC	<60HRC	<67HRC	VA-steel<900N	VA-steel>900N	Ti-alloys	GG(G)	Plastics
-	-	-	300	250	200	180	160	140	80	60	40	-	-	-	-	-	-

= Sales are restricted to the packaging units mentioned in the catalogue. Purchase orders must be in units.

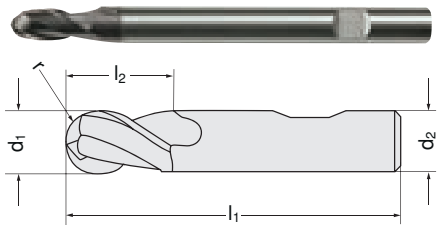
16621 Solid Carbide Radius Milling Cutters

Z 2 | HSC | ≈ 30° | VHM TiAlN | DIN 6535 HB | 60 HRC

Type
- Long
- Right-hand cut
- 2 cutting edges
- Right-hand helix
- Centre cut
- Radius tolerance +/– 0,02 mm.
- With clamping surface in accordance with DIN 6535 HB.

Quality
Universal carbide quality finest grit (P 20 - K 40) TiAlN-coated.

16621



d_1 e8 mm	l_2 mm	l_1 mm	d_2 h6 mm	16621 ...
2,0	5	50	6	203
3,0	8	60	6	204
4,0	8	70	6	205
5,0	10	80	6	206
6,0	12	90	6	207

d_1 e8 mm	l_2 mm	l_1 mm	d_2 h6 mm	16621 ...
8,0	14	100	8	209
10,0	18	100	10	211
12,0	22	110	12	212
16,0	30	140	16	214
20,0	38	160	20	216

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St<1400N	<45HRC	<55HRC	<60HRC	<67HRC	VA-steel<900N	VA-steel>900N	Ti-alloys	GG(G)	Plastics
-	-	-	300	250	200	180	160	140	80	60	40	-	120	100	60	180	-

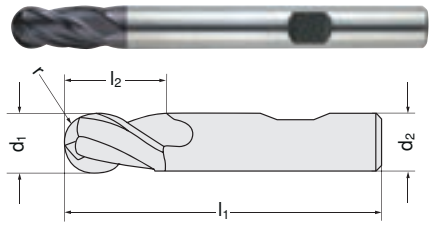
16625 Solid Carbide Radius Milling Cutters

Z 4 | HSC | ≈ 30° | VHM TiAlN | DIN 6535 HB | 60 HRC

Type
- Long
- Right-hand cut
- 4 cutting edges
- Right-hand helix
- Centre cut
- Radius tolerance +/– 0,02 mm.
- With clamping surface in accordance with DIN 6535 HB.

Quality
Universal carbide quality finest grit (P 20 - K 40) TiAlN-coated.

16625



d_1 e8 mm	l_2 mm	l_1 mm	d_2 mm	16625 ...
2,0	5	50	6	103
3,0	8	60	6	104
4,0	8	70	6	105
5,0	10	80	6	106
6,0	12	90	6	107
8,0	14	100	8	109

d_1 e8 mm	l_2 mm	l_1 mm	d_2 mm	16625 ...
10,0	18	100	10	111
12,0	22	110	12	112
14,0	26	110	14	113
16,0	30	140	16	114
18,0	34	140	18	115
20,0	38	160	20	116

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St<1400N	<45HRC	<55HRC	<60HRC	<67HRC	VA-steel<900N	VA-steel>900N	Ti-alloys	GG(G)	Plastics
-	-	-	300	250	200	180	160	140	80	60	40	-	-	-	-	-	-

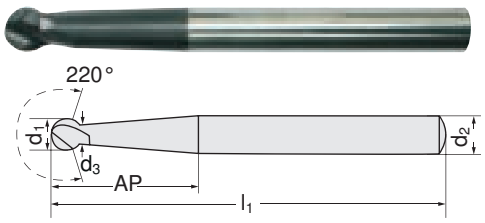
16655 SC ball-head milling cutter

Z 2 | H | VHM TiAlN | DIN 6535 HA | 65 HRC

Type
- Extra long
- 2 cutting edges
- Centre cut
- Spheroid to 220°
- Increased high-running accuracy
- With smooth straight shank in compliance with DIN 6535 HA.

Use
For heavy-duty machining, 3D profile milling of high-strength material, and for milling of hardened steel up to HRC 65.
Quality
Universal carbide quality finest grit (P 20 - K 40) TiAlN-coated.

16655



d_1 mm	d_2 mm	d_3 mm	AP mm	l_1 mm	16655 ...
2,0	6	1,8	10	80	102
3,0	6	2,8	15	80	103
4,0	6	3,8	20	80	104
5,0	6	4,7	25	90	105

d_1 mm	d_2 mm	d_3 mm	AP mm	l_1 mm	16655 ...
6,0	6	5,7	30	100	106
8,0	8	7,5	40	100	107
10,0	10	9,4	50	120	108
12,0	12	11,2	50	120	109

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St<1400N	<45HRC	<55HRC	<60HRC	<67HRC	VA-steel<900N	VA-steel>900N	Ti-alloys	GG(G)	Plastics
-	-	-	140-160	120-140	100-120	70-80	60-70	70	65	50	30	30	-	-	-	-	-

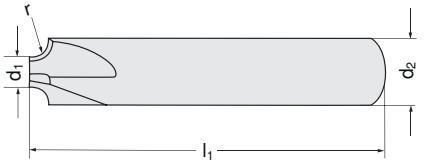
16658 Solid carbide quarter circle cutter

Z 4 | VHM TiAlN | DIN 6535 HA | 45 HRC | Uni

Type
4 cutting blades, straight flute.
With smooth straight shank in compliance with DIN 6535 HA. Radius tolerance +/– 0,01 mm.

Use
For materials up to HRC 45. For rounding and deburring of edges and contours. For high-strength materials as well as for aluminium and non-ferrous metals.
Quality
Universal carbide quality finest grit (P 20 - K 40)
TiAlN-coated.

16658



Radius	d_1 mm	l_1 mm	d_2 mm	16658 ...
0,5	7	70	8	105
1,0	6	70	8	110
1,5	7	75	10	115
2,0	6	75	10	120
2,5	7	75	12	125
3,0	6	75	12	130
3,5	9	80	16	135
4,0	8	80	16	140
4,5	7	80	16	145
5,0	10	80	20	150
6,0	8	80	20	160

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St<1400N	<45HRC	<55HRC	<60HRC	<67HRC	VA-steel<900N	VA-steel>900N	Ti-alloys	GG(G)	Plastics
120-600	100-400	80-250	60-150	50-120	50-100	40-90	40-80	30-70	55-75	-	-	-	30-80	20-70	20-60	60-130	-

16650 - 16651 Solid Carbide Roughing End Milling Cutters Quickmax

Z 3-6 | HSC | HR | VHM TiAlN | 50 HRC | Uni

Type
Short, 3 -6 cutting edges, centre cut. Right-hand helix 45°. Great cutting capacity. With protective chamfer, special roughing profile. Long service life. Quick chip removal. Extremely sturdy cutting edges. Great stability.
Use
Alloyed steels, stainless steel, titanium, Inconel.

Quality
Universal carbide quality finest grit (P 20 - K 40)
TiAlN-coated.

16650
With smooth straight shank in compliance with DIN 6535 HA.

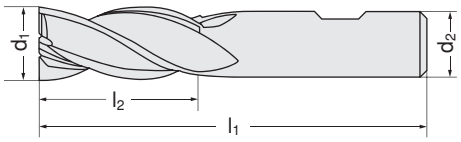
16651
With clamping surface in accordance with DIN 6535 HB.

16650

DIN 6535 HA

16651

DIN 6535 HB



					DIN 6535 HA		DIN 6535 HB	
d_1 mm	l_2 mm	l_1 mm	d_2 mm	Z	16650	...	16651	...
4,0	11	57	6	3	101		101	
6,0	16	57	6	4	102		102	
8,0	16	63	8	4	103		103	
10,0	22	72	10	4	104		104	
12,0	26	83	12	4	105		105	
16,0	32	92	16	5	106		106	
20,0	38	104	20	6	107		107	
25,0	45	121	25	6	108		108	

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St<1400N	<45HRC	<55HRC	<60HRC	<67HRC	VA-steel<900N	VA-steel>900N	Ti-alloys	GG(G)	Plastics
-	-	-	140-160	100-140	90-120	90	80	60	60	50	-	-	100	90	70	80	-

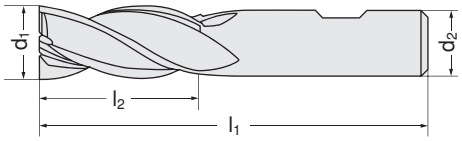
16629 Solid Carbide Roughing End Milling Cutters

Z 3-4 | HSC | HR | VHM TiAlN | DIN 6535 HB | 60 HRC | Uni

Type
Long, relief-ground, fine knurl profile, right-hand cut with **centre cut. 3-4 cutting edges.** With clamping surface in accordance with DIN 6535 HB.

Quality
Universal carbide quality finest grit (P 20 - K 40)
TiAlN-coated.

16629



d_1 e8 mm	l_2 mm	l_1 mm	d_2 h6 mm	Z	16629 ...
6,0	16	57	6	3	101
8,0	16	63	8	3	103
10,0	22	72	10	4	105
12,0	26	83	12	4	106
14,0	26	83	14	4	107
16,0	32	92	16	4	108
18,0	32	92	18	4	109
20,0	38	104	20	4	110

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St<1400N	<45HRC	<55HRC	<60HRC	<67HRC	VA-steel<900N	VA-steel>900N	Ti-alloys	GG(G)	Plastics
400	300	250	300	250	200	180	160	140	80	60	40	-	120	100	60	180	-

16637 Solid Carbide Torus Milling Cutters

Z 4 | HSC | VHM TiAlN | DIN 6535 HB | 65 HRC

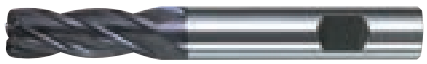
Type 16637

With clamping surface in accordance with DIN 6535 HB. **Long,** right-hand cut, **4 cutting edges with corer radius (1).**

Quality

Universal carbide quality finest grit (P 20 - K 40) TiAlN-coated.

(1)



d_1 e8 mm	l_2 mm	l_1 mm	d_2 mm	16637 ...
6 x R 0,5	20	60	6	101
6 x R 1	20	60	6	102
8 x R 0,5	25	70	8	103
8 x R 1	25	70	8	104
8 x R 1,5	25	70	8	105
8 x R 2	25	70	8	106
10 x R 0,5	30	90	10	107

d_1 e8 mm	l_2 mm	l_1 mm	d_2 mm	16637 ...
10 x R 1	30	90	10	108
10 x R 1,5	30	90	10	109
10 x R 2	30	90	10	110
12 x R 0,5	30	90	12	111
12 x R 1	30	90	12	112
12 x R 1,5	30	90	12	113
12 x R 2	30	90	12	114

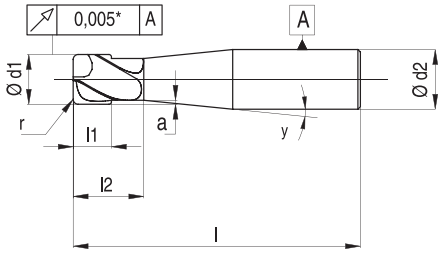
Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St<1400N	<45HRC	<55HRC	<60HRC	<67HRC	VA-steel<900N	VA-steel>900N	Ti-alloys	GG(G)	Plastics
400	300	250	300	250	200	180	160	140	80	60	40	-	120	100	60	180	-

16702 Solid Carbide End Milling Cutters for Graphite

Z 2-3 | VHM | DIN 6535 HA | Graphit

Type 16702

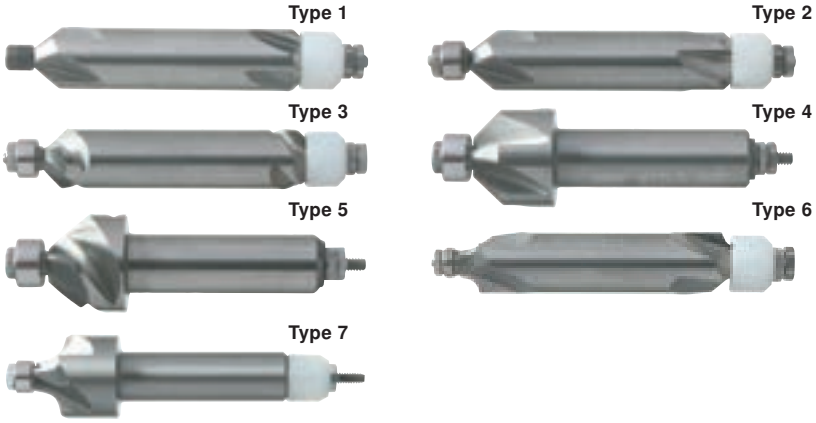
Long and extra long, right-hand cut,
2-3 cutting edges, right-hand helix approx. 40°,
centre cut, with smooth straight shank in compliance with DIN 6535 HA.



d_1 g7 mm	r mm	d_2 h5 mm	l mm	l_1 mm		y (°)	16702 ...
2,0	0,1	2	50	10	3	-	102
2,0	0,1	3	50	10	3	15	103
3,0	0,1	3	50	10	3	-	104
4,0	0,2	4	60	15	3	-	106
L 4,0	0,3	4	102	10	2	-	107
5,0	0,2	5	60	20	3	-	109
L 5,0	0,5	5	102	13	2	-	110
6,0	0,3	6	78	30	3	-	112
L 6,0	0,5	6	102	42	2	-	113
XL 6,0	0,5	6	150	26	2	-	114
8,0	0,3	8	78	30	3	-	116
L 8,0	0,5	8	150	41	2	-	117
10,0	0,3	10	78	30	3	-	119
L 10,0	0,5	10	150	42	2	-	120
12,0	0,3	12	89	30	3	-	122

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St<1400N	<45HRC	<55HRC	<60HRC	<67HRC	VA-steel<900N	VA-steel>900N	Ti alloys	GG(G)	graphite
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200

Type
Double flute (cat.-no. 16750 139-152 single flute).
Clamping shank 6 mm. Pilot hardened.
Use
For edge and contour deburring machines.
Rake angle 0° for short-chipping, hard materials.
Rake angle 6° for strength-hard materials.
Rake angle 12° for ductile up to soft materials.
Rake angle 30° for soft materials.
Quality
Universal carbide quality finest grit.



Type	Application / Type	D x L mm	Point angle/ Radius	Z	Rake angle	Coating	16750 ...
1	with synchronous rotation thrust pin (Ø 2.5 mm)	6 x 34	90°	4	0°	–	101
1	with synchronous rotation thrust pin (Ø 2.5 mm)	6 x 34	90°	4	0°	TiAlN	102
2	with ball bearing starter roller (Ø 3.0 mm)	6 x 34	90°	4	0°	–	103
2	with ball bearing starter roller (Ø 3.0 mm)	6 x 34	90 °	4	0°	TiAlN	104
2	with ball bearing starter roller (Ø 4.0 mm)	6 x 34	90 °	4	0°	TiAlN	106
1	with synchronous rotation thrust pin (Ø 2.5 mm)	6 x 34	90°	6	0°	–	107
1	with synchronous rotation thrust pin (Ø 2.5 mm)	6 x 34	90°	6	0°	TiAlN	108
2	with ball bearing starter roller (Ø 3.0 mm)	6 x 34	90°	6	0°	–	109
2	with ball bearing starter roller (Ø 3.0 mm)	6 x 34	90°	6	0°	TiAlN	110
2	with ball bearing starter roller (Ø 4.0 mm)	6 x 34	90°	6	0°	–	111
2	with ball bearing starter roller (Ø 4.0 mm)	6 x 34	90 °	6	0°	TiAlN	112
1	with synchronous rotation thrust pin (Ø 2.5 mm)	6 x 34	90°	4	6°	–	113
1	with synchronous rotation thrust pin (Ø 2.5 mm)	6 x 34	90°	4	6°	TiAlN	114
2	with ball bearing starter roller (Ø 3.0 mm)	6 x 34	90°	4	6°	–	115
2	with ball bearing starter roller (Ø 3.0 mm)	6 x 34	90 °	4	6°	TiAlN	116
2	with ball bearing starter roller (Ø 4.0 mm)	6 x 34	90°	4	6°	–	117
2	with ball bearing starter roller (Ø 4.0 mm)	6 x 34	90°	4	6°	TiAlN	118
1	with synchronous rotation thrust pin (Ø 2.5 mm)	6 x 34	90°	4	12°	–	119
1	with synchronous rotation thrust pin (Ø 2.5 mm)	6 x 34	90°	4	12°	TiAlN	120
1	with synchronous rotation thrust pin (Ø 2.5 mm)	6 x 34	90°	3	12°	TiAlN-ALU	121
2	with ball bearing starter roller (Ø 3.0 mm)	6 x 34	90°	4	12°	–	122
2	with ball bearing starter roller (Ø 3.0 mm)	6 x 34	90°	4	12°	TiAlN	123
2	with ball bearing starter roller (Ø 3.0 mm)	6 x 34	90°	3	12°	TiAlN-ALU	124
2	with ball bearing starter roller (Ø 4.0 mm)	6 x 34	90°	4	12°	–	125
2	with ball bearing starter roller (Ø 4,0 mm)	6 x 34	90°	4	12°	TiAlN	126
2	with ball bearing starter roller (Ø 4.0 mm)	6 x 34	90°	3	12°	TiAlN-ALU	127
3	with synchronous rotation thrust pin (Ø 2.5 mm)	6 x 34	90°	3	30°	–	128
3	with synchronous rotation thrust pin (Ø 2.5 mm)	6 x 34	90°	3	30°	TiAlN	129
3	with synchronous rotation thrust pin (Ø 2.5 mm)	6 x 34	90°	3	30°	TiAlN-ALU	130
3	with ball bearing starter roller (Ø 3.0 mm)	6 x 34	90°	3	30°	–	131
3	with ball bearing starter roller (Ø 3,0 mm)	6 x 34	90°	3	30°	TiAlN	132
3	with ball bearing starter roller (Ø 3.0 mm)	6 x 34	90°	3	30°	TiAlN-ALU	133
3	with ball bearing starter roller (Ø 4.0 mm)	6 x 34	90°	3	30°	–	134
3	with ball bearing starter roller (Ø 4.0 mm)	6 x 34	90°	3	30°	TiAlN	135
3	with ball bearing starter roller (Ø 4.0 mm)	6 x 34	90°	3	30°	TiAlN-ALU	136
4	with ball bearing starter roller (Ø 4.0 mm)	10 x 34	90°	6	0°	–	137
4	with ball bearing starter roller (Ø 4.0 mm)	10 x 34	90°	6	0°	TiAlN	138
4	with ball bearing starter roller (Ø 5.0 mm)	10 x 34	90°	6	0°	–	139
4	with ball bearing starter roller (Ø 5.0 mm)	10 x 34	90°	6	0°	TiAlN	140
4	with ball bearing starter roller (Ø 4.0 mm)	10 x 34	90°	3	6°	–	141
4	with ball bearing starter roller (Ø 4.0 mm)	10 x 34	90°	3	6°	TiAlN	142
4	with ball bearing starter roller (Ø 5.0 mm)	10 x 34	90°	3	6°	–	143
4	with ball bearing starter roller (Ø 5.0 mm)	10 x 34	90°	3	6°	TiAlN	144
5	with ball bearing starter roller (Ø 4.0 mm)	10 x 34	90°	3	30°	–	145
5	with ball bearing starter roller (Ø 4.0 mm)	10 x 34	90°	3	30°	TiAlN	146
5	with ball bearing starter roller (Ø 4.0 mm)	10 x 34	90°	3	30°	TiAlN-ALU	147
5	with ball bearing starter roller (Ø 5.0 mm)	10 x 34	90°	3	30°	–	148
5	with ball bearing starter roller (Ø 5.0 mm)	10 x 34	90°	3	30°	TiAlN	149
5	with ball bearing starter roller (Ø 5.0 mm)	10 x 34	90°	3	30°	TiAlN-ALU	150

Continuation ▶