

Our suppliers for MILLING TOOLS:

ATORN®

HHW



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												

Brand	HHW	HHW	HHW	HHW	HHW	HHW	HHW	HHW	HHW	HHW
										
Number of cutting edges	3	3	2	2	2	3	3	3	4	4
Diameter range mm	2 - 20	1,5 - 16	2 - 20	2 - 20	3 - 20	2 - 20	2 - 20	3 - 20	3 - 20	3 - 20
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	-	TiAN	-	TiAN	TiAN	-	TiAN	TiAN	TiAlCN	TiAN
Type	Short	Short	Short	Short	Long	Short	Short	Long	Short	Long
Type / profile	N	N	N	N	N	N	N	N	H	H
Catalogue page	16.32	16.32	16.33	16.33	16.33	16.34	16.34	16.34	16.35	16.35
Article number	16500	16502	16505	16507	16517	16522	16524	16532	16533	16534 1.. 16534 2..

Application recommendation

● = Well suited ○ = Limited suitability

Aluminium < 10% Si	○	○	○	○					●	●
Aluminium > 10% Si	○	○	○	○					●	●
Copper	○	○	○	○					●	●
Steel < 520N	●	●	●	●	●	●	●		●	●
Steel < 750N	●	●	●	●	●	●	●		●	●
Steel < 900N	●	●	●	●	●	●	●		●	●
Steel < 1100N	●	●	●	●	●	●	●		●	●
Steel < 1200N	●	●	●	●	●	●	●		●	●
Steel < 1400N	●	●	●	●	●	●	●	●	●	●
VA-steel < 900N	○	○	○	○	○	○	○	○	○	○
VA-steel > 900N	○	○	○	○	○	○	○	○	○	○
GG	●	●	●	●	●	●	●	●	●	●
GGG	●	●	●	●	●	●	●	●	●	●
Titanium									●	●
Titanium alloy									●	●
Nickel									●	●
< 55HRC										
< 60HRC										
< 67HRC										
Plastics	○	○	○	○	○	○	○			

Brand	HHW	HHW	HHW	ATORN®	HHW	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®
											
Number of cutting edges	4	4	4	3	4	2	2	2	3	2	2
Diameter range mm	4 - 20	4 - 20	6 - 20	3 - 20	4 - 20	0,5 - 4	0,5 - 4	0,5 - 4	3 - 20	3 - 20	3 - 20
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	TiAN	TiAN	TiAN	TiAN	TiAN	AlCrN	AlCrN	AlCrN	AlCrN	AlCrN	AlCrN
Type	Long	Long/released	Long with IK	Short	Long	Mini	Mini	Mini	Short	Short	Long
Type / profile	H	H	H/35°/38°	HPC	H/corner.	HPC	HPC	HPC	HPC	HPC	HPC
Catalogue page	16.35	16.36	16.36	16.37	16.37	16.38	16.38	16.39	16.40	16.40	16.41
Article number	16534 3..	16536	16538	16535	16540	16400	16401	16402	16403	16405	16407

Application recommendation

● = Well suited ○ = Limited suitability

Aluminium < 10% Si	●	●	●	●	●						
Aluminium > 10% Si	●	●	●	●	●						
Copper	●	●	●	●	●						
Steel < 520N	●	●	●	●	●	○	○	○	○	○	○
Steel < 750N	●	●	●	●	●	○	○	○	○	○	○
Steel < 900N	●	●	●	●	●	○	○	○	○	○	○
Steel < 1100N	●	●	●	●	●	○	○	○	○	○	○
Steel < 1200N	●	●	●	●	●	○	○	○	○	○	○
Steel < 1400N	●	●	●	●	●	○	○	○	○	○	○
VA-steel < 900N	○	○	○	○	○	○	○	○	○	○	○
VA-steel > 900N	○	○	○	○	○	○	○	○	○	○	○
GG	●	●	●	●	●						
GGG	●	●	●	●	●						
Titanium	●	●	●	●	●	●	●	●	●	●	●
Titanium alloy	●	●	●	●	●	●	●	●	●	●	●
Nickel	●	●	●	●	●	●	●	●	●	●	●
< 55HRC											
< 60HRC											
< 67HRC											
Plastics	○	○	○	○	○						

Brand	ATORN®	ATORN®	HHW	HHW	HHW	HHW	HHW	HHW	HHW	HHW	HHW
											
Number of cutting edges	4	4	4	4	4	4	4	4	4	4	6-8
Diameter range mm	4 - 20	4 - 20	2 - 20	2 - 20	4 - 16	4 - 20	3 - 20	3 - 20	3 - 12	3 - 12	6 - 20
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	AlCrN	AlCrN	-	TiAN	-	TiAN	-	TiAN	-	TiAN	TiAN
Type	Short	Short	Short	Short	Long	Long	Long	Long	Extra long	Extra long	Long
Type / profile	HPC	HPC	N	N	N	N	N	N	N	N	N
Catalogue page	16.41	16.42	16.43	16.43	16.43	16.43	16.44	16.44	16.44	16.44	16.45
Article number	16544	16550	16537	16539	16542	16543	16545	16547	16548	16549	16551

Application recommendation

● = Well suited ○ = Limited suitability

Aluminium < 10% Si	○	○	○	○	○	○	○	○	○	○	○
Aluminium > 10% Si	○	○	○	○	○	○	○	○	○	○	○
Copper	○	○	○	○	○	○	○	○	○	○	○
Steel < 520N	●	●	●	●	●	●	●	●	●	●	●
Steel < 750N	●	●	●	●	●	●	●	●	●	●	●
Steel < 900N	●	●	●	●	●	●	●	●	●	●	●
Steel < 1100N	●	●	●	●	●	●	●	●	●	●	●
Steel < 1200N	●	●	●	●	●	●	●	●	●	●	●
Steel < 1400N	●	●	●	●	●	●	●	●	●	●	●
VA-steel < 900N	○	○	○	○	○	○	○	○	○	○	○
VA-steel > 900N	○	○	○	○	○	○	○	○	○	○	○
GG	○	○	○	○	○	○	○	○	○	○	○
GGG	○	○	○	○	○	○	○	○	○	○	○
Titanium	○	○	○	○	○	○	○	○	○	○	○
Titanium alloy	○	○	○	○	○	○	○	○	○	○	○
Nickel	○	○	○	○	○	○	○	○	○	○	○
< 55HRC	○	○	○	○	○	○	○	○	○	○	○
< 60HRC	○	○	○	○	○	○	○	○	○	○	○
< 67HRC	○	○	○	○	○	○	○	○	○	○	○
Plastics	○	○	○	○	○	○	○	○	○	○	○

Brand	HHW	HHW	HHW	HHW	HHW	HHW	ATORN®	HHW	HHW	HHW	HHW
											
Number of cutting edges	6-8	2	2	4	4	4	4	3	1	4-6	4-6
Diameter range mm	6 - 20	3 - 20	2 - 20	3 - 20	5 - 20	3 - 20	6 - 20	6 - 16	3 - 6	4 - 20	4 - 20
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	TiAN	TiAN	TiAN	TiAN	TiAN	TiAN	TiAN	CALIDA Z	TiAN	-	TiAN
Type	Overlong	Short	Long	Short	Long	Long	Long with IK	Short	Short	Short	Short
Type / profile	N	Radius	Radius	Radius	NF	HR	HR / IKZ	HPC	N	90° Deburrer	90° Deburrer
Catalogue page	16.45	16.45	16.46	16.46	16.46	16.47	16.47	16.47	16.48	16.48	16.48
Article number	16553	16557	16559	16561	16565	16567	16569	16564	16575	16570	16571

Application recommendation

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Aluminium < 10% Si	○	○	○	○	○	○	○	○	○	○	○
Aluminium > 10% Si	○	○	○	○	○	○	○	○	○	○	○
Copper	○	○	○	○	○	○	○	○	○	○	○
Steel < 520N	●	●	●	●	●	●	●	●	●	●	●
Steel < 750N	●	●	●	●	●	●	●	●	●	●	●
Steel < 900N	●	●	●	●	●	●	●	●	●	●	●
Steel < 1100N	●	●	●	●	●	●	●	●	●	●	●
Steel < 1200N	●	●	●	●	●	●	●	●	●	●	●
Steel < 1400N	●	●	●	●	●	●	●	●	●	●	●
VA-steel < 900N	○	○	○	○	○	○	○	○	○	○	○
VA-steel > 900N	○	○	○	○	○	○	○	○	○	○	○
GG	○	○	○	○	○	○	○	○	○	○	○
GGG	○	○	○	○	○	○	○	○	○	○	○
Titanium	○	○	○	○	○	○	○	○	○	○	○
Titanium alloy	○	○	○	○	○	○	○	○	○	○	○
Nickel	○	○	○	○	○	○	○	○	○	○	○
< 55HRC	○	○	○	○	○	○	○	○	○	○	○
< 60HRC	○	○	○	○	○	○	○	○	○	○	○
< 67HRC	○	○	○	○	○	○	○	○	○	○	○
Plastics	○	○	○	○	○	○	○	○	○	○	○

Brand	HHW	HHW	HHW	HHW	ATORN®	HHW	ATORN®	HHW	ATORN®	HHW
										
Number of cutting edges	4 - 6	2	4	2	2	2	3	4	4	4
Diameter range mm	4 - 20	3 - 20	4 - 16	3 - 25	0,3 - 20	3 - 25	3 - 20	3 - 25	2 - 20	3 - 25
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	TiAN	-	TiAN	TiAN	TiAN Ultra	TiAN	TiAN Ultra	TiAN	TiAN Ultra	TiAN
Type	Short	Short	Long	Short	Depth of clearance	Long	Depth of clearance	Short	Short depth of clearance	Long
Type / profile	60° deburrer	Universal	Deburrer	HSC	HSC	HSC	HPC	HSC	HPC	HSC
Catalogue page	16.48	16.49	16.49	16.72	16.72	16.73	16.73	16.74	16.74	16.75
Article number	16573	16580	16583	16601	16603	16604	16607	16609	16110	16613

Application recommendation

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Aluminium < 10% Si	○	○	○							
Aluminium > 10% Si	○	○	○							
Copper	○	○	○							
Steel < 520N	●	●	●	●	●	●	●	●	●	●
Steel < 750N	●	●	●	●	●	●	●	●	●	●
Steel < 900N	●	●	●	●	●	●	●	●	●	●
Steel < 1100N	●	●	●	●	●	●	●	●	●	●
Steel < 1200N	●	●	●	●	●	●	●	●	●	●
Steel < 1400N	●	●	●	●	●	●	●	●	●	●
VA-steel < 900N	●	●	●							
VA-steel > 900N	●	●	●							
GG	●	●	●		●		●		●	
GGG	●	●	●		●		●		●	
Titanium	●	●	●	●	●		●		●	
Titanium alloy	●	●	●	●	●		●		●	
Nickel	●	●	●	●	●		●		●	
< 55HRC					○		○		○	
< 60HRC						○				○
< 67HRC										
Plastics	○	○	○							

Brand	ATORN®	HHW	HHW	HHW	HHW	HHW	HHW	HHW	HHW	HHW
										
Number of cutting edges	6 - 8	6	2	4	2	4	3 - 6	3 - 4	4	2 - 3
Diameter range mm	4 - 20	6 - 25	2 - 20	2 - 20	2 - 12	0,5 - 6,0	4 - 25	6 - 20	6 - 12	2 - 12
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	TiAN Ultra	TiAN	TiAN	TiAN	TiAN	TiAN	TiAN	TiAN	TiAN	Diamond
Type	Short depth of clearance	Extra long	Radius long	Radius long	Spheroid extra long	Long	Short	Long	Torus long	Finishing
Type / profile	HSC	HSC	HSC	HSC	H	Quarter circle	HR / HSC	HR / HSC	HSC	Graphite
Catalogue page	16.75	16.75	16.76	16.76	16.76	16.77	16.77	16.77	16.78	16.78
Article number	16616	16619	16621	16625	16655	16658	16650/651	16629	16637	16702

Application recommendation

● = Well suited ○ = Limited suitability

Aluminium < 10% Si						●		○		
Aluminium > 10% Si						●		○		
Copper						●		○		●
Steel < 520N	●	●	●	●	●	●	●	●	●	
Steel < 750N	●	●	●	●	●	●	●	●	●	
Steel < 900N	●	●	●	●	●	●	●	●	●	
Steel < 1100N	●	●	●	●	●	●	●	●	●	
Steel < 1200N	●	●	●	●	●	●	●	●	●	
Steel < 1400N	●	●	●	●	●	●	●	●	●	
VA-steel < 900N				●	●	●		●		
VA-steel > 900N				●	●	●		●		
GG	●					●	●	●		
GGG	●					●	●	●		
Titanium	●					●	●	●		
Titanium alloy	●		●			●	●	●		
Nickel	○		○			○		○		
< 55HRC										
< 60HRC										
< 67HRC										
Plastics										

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 been 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

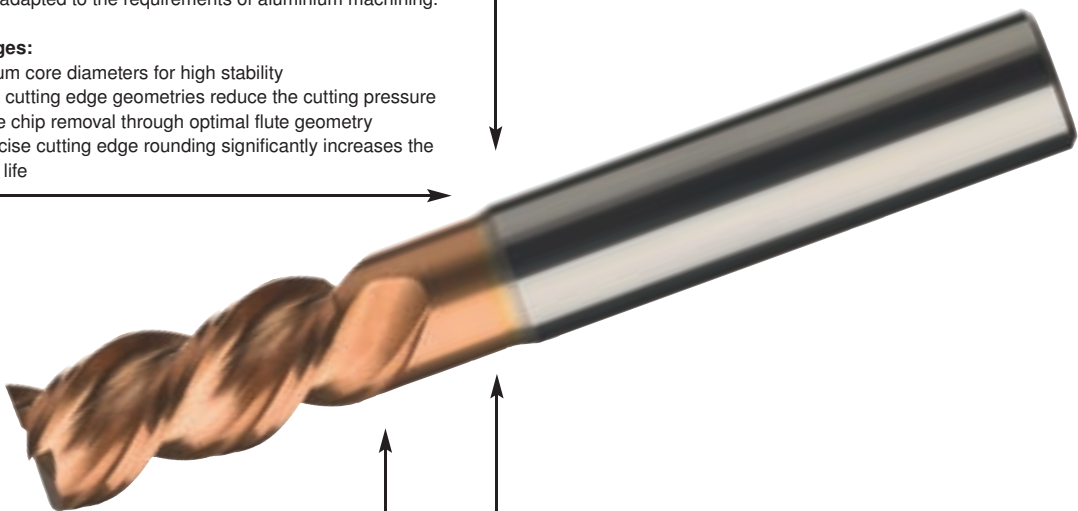
Precision generates quality - one reason why this new tool generation is manufactured with more precise tolerances. All shanks are manufactured in h5 quality and all cutters are manufactured in g7 quality.

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 ►

Brand	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®
										
Number of cutting edges	2	2	2	1	2	2	2	3	3	3
Diameter range mm	0,5 - 2,5	0,5 - 2,5	0,5 - 2,5	1,5 - 16	3 - 20	3 - 20	3 - 20	3 - 20	3 - 20	3 - 20
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	ULTRA-N	ULTRA-N	ULTRA-N	Polished	Polished	ULTRA-N	ULTRA-N	Polished	Polished	Polished
Type	Shank	Torus	Radius	Single-point	Shank	Shank	Shank	Shank	Shank	Shank
Type / profile	Mini	Mini	Mini	Short	Short	Short	Short	Short	Short	Short
Catalogue page	16.50	16.50	16.50	16.51	16.51	16.51	16.51	16.52	16.52	16.52
Article number	16710	16711	16712	16715	16717	16718	16719	16722	16724	16725

Application recommendation

● = Well suited ○ = Limited suitability

Aluminium < 10% Si	●	●	●	●	●	●	●	●	●	●
Aluminium > 10% Si	●	●	●	●	●	●	●	●	●	●
Copper	●	●	●	●	●	●	●	●	●	●
Steel < 520N										
Steel < 750N										
Steel < 900N										
Steel < 1100N										
Steel < 1200N										
Steel < 1400N										
VA-steel < 900N										
VA-steel > 900N										
GG										
GGG										
Titanium										
Titanium alloy										
Nickel										
< 55HRC										
< 60HRC										
< 67HRC										
Plastics	○	○	○	○	○	○	○	○	○	○

Brand	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®
										
Number of cutting edges	3	3	3	3	3	3	3	3	3	4
Diameter range mm	3 - 30	3 - 20	3 - 20	3 - 20	3 - 20	3 - 20	6 - 20	6 - 20	6 - 20	3 - 20
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	ULTRA-N	ULTRA-N	ULTRA-N	Polished	ULTRA-N	ULTRA-N	ULTRA-N	ULTRA-N	ULTRA-N	ULTRA-N
Type	Shank	Shank	Shank	Shank	Shank	Shank	Roughing	Roughing	Roughing with IK	Shank
Type / profile	Short	Short	Short	Medium	Medium	Medium	Short	Short	Short	Short
Catalogue page	16.52	16.52	16.53	16.53	16.53	16.53	16.54	16.54	16.54	16.54
Article number	16726	16727	16728	16729	16730	16731	16732	16734	16735	16737

Application recommendation

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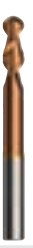
Aluminium < 10% Si	●	●	●	●	●	●	●	●	●	●
Aluminium > 10% Si	●	●	●	●	●	●	●	●	●	●
Copper	●	●	●	●	●	●	●	●	●	●
Steel < 520N										
Steel < 750N										
Steel < 900N										
Steel < 1100N										
Steel < 1200N										
Steel < 1400N										
VA-steel < 900N										
VA-steel > 900N										
GG										
GGG										
Titanium										
Titanium alloy										
Nickel										
< 55HRC										
< 60HRC										
< 67HRC										
Plastics	○	○	○	○	○	○	○	○	○	○

Brand	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®	ATORN®
										
Number of cutting edges	4	4	4	4	4	2	2	2	3	3
Diameter range mm	3 - 20	4 - 20	6 - 16	3 - 20	4 - 20	3 - 16	3 - 16	6 - 16	5 - 20	5 - 20
Cutting material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Coating	ULTRA-N	ULTRA-N	ULTRA-N	ULTRA-N	ULTRA-N	ULTRA-N	ULTRA-N	ULTRA-N	ULTRA-N	ULTRA-N
Type	Shank	Shank	Shank	Shank	Shank	Torus	Torus	Torus	Torus	Torus
Type / profile	Short	Medium	Long	Short	Medium	Short	Medium	Long	Short	Short
Catalogue page	16.54	16.55	16.55	16.55	16.55	16.56	16.56	16.57	16.57	16.57
Article number	16738	16739	16740	16741	16742	16745	16746	16747	16748	16749

Application recommendation

● = Well suited ○ = Limited suitability

Aluminium < 10% Si	●	●	●	●	●	●	●	●	●	●
Aluminium > 10% Si	●	●	●	●	●	●	●	●	●	●
Copper	●	●	●	●	●	●	●	●	●	●
Steel < 520N										
Steel < 750N										
Steel < 900N										
Steel < 1100N										
Steel < 1200N										
Steel < 1400N										
VA-steel < 900N										
VA-steel > 900N										
GG										
GGG										
Titanium										
Titanium alloy										
Nickel										
< 55HRC										
< 60HRC										
< 67HRC										
Plastics	○	○	○	○	○	○	○	○	○	○

Brand	ATORN®	ATORN®	ATORN®
			
Number of cutting edges	2	2	2
Diameter range mm	3 - 16	3 - 16	3 - 12
Cutting material	Solid carbide	Solid carbide	Solid carbide
Coating	ULTRA-N	ULTRA-N	ULTRA-N
Type	Radius	Radius	Radius
Type / profile	Short	Medium	Long
Catalogue page	16.58	16.58	16.58
Article number	16755	16756	16757

Application recommendation

● = Well suited ○ = Limited suitability

Aluminium < 10% Si	●	●	●
Aluminium > 10% Si	●	●	●
Copper	●	●	●
Steel < 520N			
Steel < 750N			
Steel < 900N			
Steel < 1100N			
Steel < 1200N			
Steel < 1400N			
VA-steel < 900N			
VA-steel > 900N			
GG			
GGG			
Titanium			
Titanium alloy			
Nickel			
< 55HRC			
< 60HRC			
< 67HRC			
Plastics	○	○	○



16505 - 16507

Solid Carbide Keyway Milling Cutters

Z 2

**HHW****Type**

Short, right-hand cut, **2 cutting edges**, right-hand helix approx. 30°, **centre cut**, with smooth straight shank in compliance with DIN 6535 HA.

16505**Quality**

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

16507**Quality**

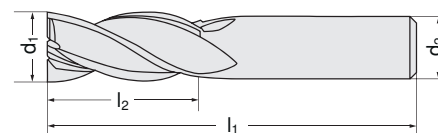
Universal carbide quality finest grit (P 20 - K 40)
TiAlN-coated.

VHM

16505

VHM
TiAlN

16507



d ₁ h10 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	Solid carbide		Solid carbide/TiAlN	
				16505	...	16507	...
2,0	8	32	2,0	101		101	
2,5	8	32	2,5	102		102	
3,0	12	32	3,0	103		103	
3,5	12	32	3,5	104		104	
4,0	12	40	4,0	105		105	
4,5	14	50	4,5	106		106	
5,0	14	50	5,0	107		107	
5,5	16	50	5,5	108		108	
6,0	16	50	6,0	109		109	
7,0	20	60	7,0	110		110	
8,0	20	60	8,0	111		111	
9,0	20	60	9,0	112		112	
10,0	22	70	10,0	113		113	
12,0	22	70	12,0	114		114	
14,0	25	75	14,0	115		115	
16,0	25	75	16,0	116		116	
20,0	32	100	20,0	117		117	

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
16505																	
180	160	140	120	100	90	80	70	60	-	-	-	-	80	60	-	85	-
16507																	
230	200	180	150	130	120	100	90	80	-	-	-	-	105	80	-	110	-

16517

Solid Carbide Keyway Milling Cutters

Z 2

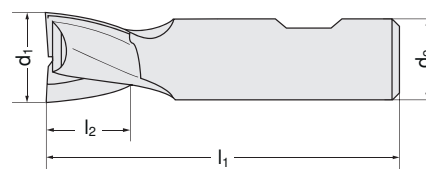
**HHW****Type**

Long, right-hand cut, **2 cutting edges**, right-hand helix approx. 30°, spiral flutes, **centre cut**, with driving face in compliance with DIN 6535 HB.

Quality

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

16517



d ₁ h10 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	Solid carbide/TiAlN	
				16517	...
3,0	7	57	6	101	
3,5	7	57	6	102	
4,0	8	57	6	103	
4,5	8	57	6	104	
5,0	10	57	6	105	
6,0	10	57	6	106	

d ₁ h10 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	Solid carbide/TiAlN	
				16517	...
8,0	16	63	8	108	
10,0	19	72	10	110	
12,0	22	83	12	111	
16,0	26	92	16	113	
20,0	32	104	20	115	

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
-	-	-	100	80	80	65	50	50	-	-	-	-	65	50	-	-	-



Solid Carbide Keyway Milling Cutters | Solid Carbide End Milling Cutters

16522 - 16524 Solid Carbide Keyway Milling Cutters

Z3



HHW

Type

Short, right-hand cut, 3 cutting edges, right-hand helix approx. 30°, spiral flutes, centre cut, with smooth straight shank in compliance with DIN 6535 HA.

16522

Quality

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

16524

Quality

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

VHM

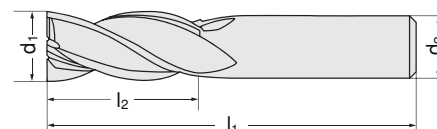


16522

VHM
TiAlN



16524



d ₁ h10 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	Solid carbide		Solid carbide/TiAlN	
				16522	...	16524	...
2,0	8	32	2		101		101
3,0	12	32	3		102		102
4,0	12	40	4		103		103
5,0	14	50	5		104		104
6,0	16	50	6		105		105
7,0	20	60	7		106		106
8,0	20	60	8		107		107

d ₁ h10 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	Solid carbide		Solid carbide/TiAlN	
				16522	...	16524	...
9,0	20	60	9,0		108		108
10,0	22	70	10,0		109		109
12,0	22	70	12,0		110		110
14,0	25	75	14,0		111		111
16,0	25	75	16,0		112		112
20,0	32	100	20,0		113		113

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
16522	-	-	120	100	90	80	70	60	-	-	-	-	-	-	-	85	-
16524	-	-	150	130	120	100	90	80	-	-	-	-	105	80	-	110	-

16532 Solid Carbide Keyway Milling Cutters

Z3



HHW

Type

Long, right-hand cut, 3 cutting edges, right-hand helix approx. 45°, spiral flutes, centre cut, straight shank with driving face in compliance with DIN 6535 HB.

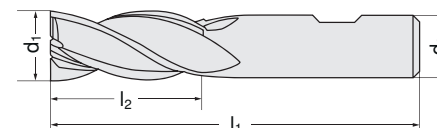
Quality

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

VHM
TiAlN



16532



d ₁ h10 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	16532	
				...	...
3,0	7	57	6		101
3,5	7	57	6		102
4,0	8	57	6		103
4,5	8	57	6		104
5,0	10	57	6		105
6,0	10	57	6		106
7,0	13	63	8		107
8,0	16	63	8		108

d ₁ h10 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	16532	
				...	...
9,0	16	72	10		109
10,0	19	72	10		110
12,0	22	83	12		111
14,0	22	83	14		112
16,0	26	92	16		113
18,0	26	92	18		114
20,0	32	104	20		115

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
230	200	180	150	130	120	100	90	80	-	-	-	-	105	80	40	110	-



Type

4 cutting edges, centre cut, right-hand helix, unequal pitch (35/38°). Optimised chip compartment. Up to 80% longer service life. Up to 60% better feed. Roughing and finishing with a single tool. Vibration-free.

Use

Unequal lead of helix causes, quite low-vibration operation and good surface quality. High machining capacity.

Quality

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

TiAlN-coated.

Type VA-steel: Nacro-coated.

Z4



16533



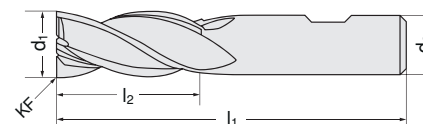
16534 103-120



16534 204-220



16534 304-320



short

short / 6535HB

d ₁ mm	l ₂ mm	l ₁ mm	d ₂ mm	KF mm	16533	...
3,0	6	54	6	0,10	103	
4,0	8	54	6	0,13	104	
5,0	9	54	6	0,18	105	
6,0	10	54	6	0,20	106	
7,0	12	58	8	0,20	107	
8,0	12	58	8	0,20	108	
9,0	14	66	10	0,30	109	
10,0	14	66	10	0,30	110	
11,0	16	73	12	0,30	111	
12,0	16	73	12	0,30	112	
14,0	18	75	14	0,30	114	
16,0	22	82	16	0,40	116	
18,0	24	84	18	0,40	118	
20,0	26	92	20	0,50	120	

long

long / 6535HB

VA-steel / 6535HB

long / 6535HA

d ₁ mm	l ₂ mm	l ₁ mm	d ₂ mm	KF mm	16534	...	16534	...	16534	...
3,0	8	57	6	0,10	103					
4,0	11	57	6	0,13	104		204		304	
5,0	13	57	6	0,18	105		205		305	
6,0	13	57	6	0,20	106		206		306	
7,0	19	63	8	0,20	107				307	
8,0	19	63	8	0,20	108		208		308	
9,0	22	72	10	0,30	109				309	
10,0	22	72	10	0,30	110		210		310	
11,0	26	83	12	0,30	111				311	
12,0	26	83	12	0,30	112		212		312	
14,0	26	83	14	0,30	114				314	
16,0	32	92	16	0,40	116		216		316	
18,0	32	92	18	0,40	118				318	
20,0	38	104	20	0,50	120		220		320	

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
Roughing																	
450	250	80-160	180-230	180-190	170-180	165-170	150-160	40-60	-	-	-	-	105-130	70-75	105-160	145-160	-
Finishing																	
600	400	140-250	300	220-235	210-220	190-210	180-190	50-80	-	-	-	-	130-160	80-90	130-200	-	-



Solid Carbide End Milling Cutters

16536

Solid carbide end milling cutter 35/38 ° HPC G2 with released shank



Type

long. With released straight shank with driving face in compliance with DIN 6535 HB. **4 cutting edges, centre cut, right-hand helix, uneven (35/38°).** Optimised chip compartment. Up to 80% longer service life. Up to 60% better feed. Roughing and finishing with a single tool.

Use

For materials up to HRC 52.

Unequal lead of helix causes, quite **low-vibration operation** and good surface quality.

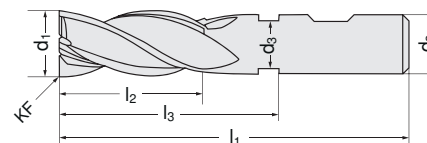
High machining performance.

Quality

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



16536



d ₁ mm	d ₃ mm	l ₂ mm	l ₁ mm	d ₂ mm	l ₃ mm	KF mm	16536	...
4,0	3,6	11	57	6	21	0,13		101
5,0	4,6	13	57	6	21	0,18		102
6,0	5,5	13	57	6	21	0,2		103
7,0	6,5	19	63	8	27	0,2		104
8,0	7,5	19	63	8	27	0,2		105
9,0	8,5	22	72	10	32	0,3		106
10,0	9,5	22	72	10	32	0,3		107

d ₁ mm	d ₃ mm	l ₂ mm	l ₁ mm	d ₂ mm	l ₃ mm	KF mm	16536	...
11,0	10,5	26	83	12	38	0,3		108
12,0	11,5	26	83	12	38	0,3		109
13,0	12,5	26	83	14	42	0,3		110
14,0	13,5	26	83	14	42	0,3		111
16,0	15,5	32	92	16	44	0,4		112
18,0	17,5	32	92	18	50	0,4		113
20,0	19,5	38	104	20	54	0,5		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
Roughing																	
450	250	80-160	180-230	180-190	170-180	165-170	150-160	40-60	-	-	-	-	105-130	70-75	105-160	145-160	-
Finishing																	
600	400	140-250	300	220-235	210-220	190-210	180-190	50-80	-	-	-	-	130-160	80-90	130-200	-	-

16538

Solid carbide end milling cutter 35/38 ° HPC with IKZ



Type

Type H, long. Straight shank with driving face in compliance with DIN 6535 HB. **4 cutting edges, centre cut, right-hand helix, uneven (35/38°).** Optimised chip compartment. Up to 80% longer service life. Up to 60% better feed. Roughing and finishing with a single tool.

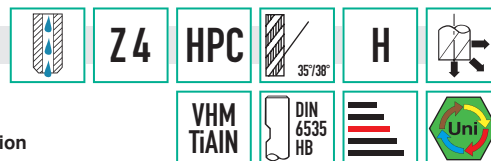
Use

For materials up to HRC 52.

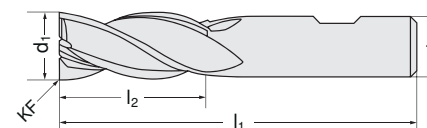
Unequal lead of helix causes, quite **low-vibration operation** and good surface quality. **High machining capacity.**

Quality

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



16538



d ₁ mm	l ₂ mm	l ₁ mm	d ₂ mm	KF mm	16538	...
6,0	13	57	6	0,2		106
8,0	19	63	8	0,2		108
10,0	22	72	10	0,3		110

d ₁ mm	l ₂ mm	l ₁ mm	d ₂ mm	KF mm	16538	...
12,0	26	83	12	0,3		112
16,0	32	92	16	0,4		116
20,0	38	104	20	0,5		120

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
Roughing																	
450	250	80-160	180-230	180-190	170-180	165-170	150-160	40-60	-	-	-	-	105-130	70-75	105-160	145-160	-
Finishing																	
600	400	140-250	300	220-235	210-220	190-210	180-190	50-80	-	-	-	-	130-160	80-90	130-200	-	-

16535

Solid carbide end milling cutter HPC 41/43/45°

ATORN®

Type

With micro corner protection.

Advantage:

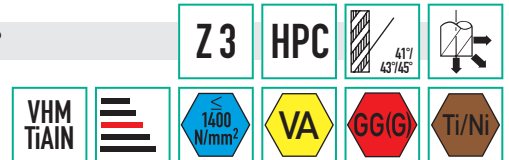
- Optimised chip removal
- Up to 60% higher feed rates
- Up to 4x the service life
- Optimum surface quality

Use

For roughing and finishing.

Quality

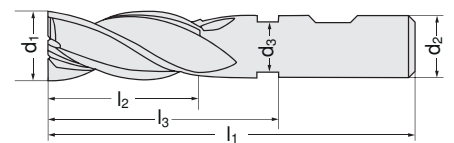
Universal carbide quality finest grit
(P 20 - K 40) TiAlN-coated.



16535 203-220



16535 303-320



d ₁ mm	l ₂ mm	l ₃ mm	l ₁ mm	d ₂ mm	d ₃ mm	6535HA 16535	...	6535HB 16535	...
3,0	8	15	57	6	2,7		203		303
4,0	11	18	57	6	3,7		204		304
5,0	13	18	57	6	4,7		205		305
6,0	13	21	57	6	5,7		206		306
8,0	19	27	63	8	7,5		208		308
10,0	22	32	72	10	9,2		210		310
12,0	26	38	83	12	11,0		212		312
16,0	32	44	92	16	15,0		216		316
20,0	38	54	104	20	19,0		220		320

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
Roughing	-	-	180-200	180-200	160-180	160-180	140-160	140-160	-	-	-	-	120-140	100-120	45-55	140-160	-
Finishing	-	-	260-280	260-280	200-220	200-220	180-200	180-200	-	-	-	-	130-160	100-130	55-70	160-180	-

16540

Solid carbide milling cutter 35/38° HPC G2 with corner radius

HHW

Type

Type H, long. Straight shank with driving face in compliance with DIN 6535 HB. 4 cutting edges, centre cut, right-hand helix, uneven (35/38°).

Optimised chip compartment.

Up to 80% longer service life.

Up to 60% better feed.

Roughing and finishing with a single tool.

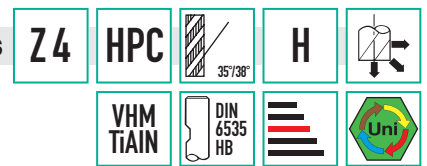
Use

For materials up to HRC 52.

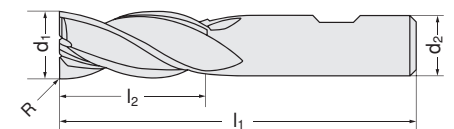
Unequal lead of helix causes, quite low-vibration operation and good surface quality. High machining performance.

Quality

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



16540



d ₁ mm	l ₂ mm	l ₁ mm	d ₂ mm	corner radius mm	16540	...
4,0	11	57	6	0,50		102
4,0	11	57	6	1,00		103
5,0	13	57	6	0,50		104
5,0	13	57	6	1,00		105
6,0	13	57	6	0,50		107
6,0	13	57	6	1,50		109
6,0	13	57	6	2,00		110
8,0	19	63	8	0,50		111
8,0	19	63	8	1,00		112
8,0	19	63	8	2,00		114

d ₁ mm	l ₂ mm	l ₁ mm	d ₂ mm	corner radius mm	16540	...
10,0	22	72	10	0,50		115
10,0	22	72	10	1,00		116
10,0	22	72	10	1,50		117
12,0	26	83	12	0,50		119
12,0	26	83	12	1,00		120
12,0	26	83	12	1,50		121
12,0	26	83	12	2,00		122
16,0	32	92	16	1,00		125
16,0	32	92	16	2,00		127
16,0	32	92	16	2,50		128
20,0	38	104	20	1,00		131
20,0	38	104	20	2,00		133

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
Roughing	450	250	80-160	180-230	180-190	170-180	165-170	150-160	40-60	-	-	-	105-130	70-75	105-160	145-160	-
Finishing	600	400	140-250	300	220-235	210-220	190-210	180-190	50-80	-	-	-	130-160	80-90	130-200	-	-



16400

Miniature End Milling Cutters Ultra MS

Z 2

HPC


ATORN®

Type

Solid carbide milling cutter with AlCrN coating.

Use

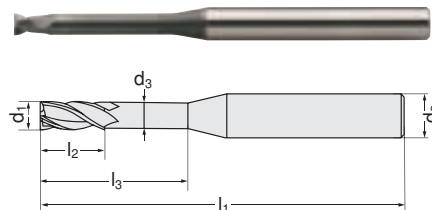
Particularly well-suited for machining rust-resistant and acid-resistant steels, titanium and nickel alloys, bronze brass and steel to 1300 N/mm².

Advantage:

Maximum machining capacity.

NEW


16400



d ₁ mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ mm	16400	...
0,5	0,7	50	2,0	0,45	4		101
0,5	0,7	50	4,0	0,45	4		102
0,5	0,7	50	6,0	0,45	4		103
0,5	0,7	50	8,0	0,45	4		104
0,8	1,2	50	4,0	0,75	4		105
0,8	1,2	50	6,0	0,75	4		106
0,8	1,2	50	8,0	0,75	4		107
0,8	1,2	50	10,0	0,75	4		108
0,8	1,2	50	12,0	0,75	4		109
1,0	1,5	50	6,0	0,95	4		110
1,0	1,5	50	8,0	0,95	4		111
1,0	1,5	50	10,0	0,95	4		112
1,0	1,5	50	12,0	0,95	4		113
1,0	1,5	50	16,0	0,95	4		114
1,2	1,8	50	6,0	1,15	4		115
1,2	1,8	50	8,0	1,15	4		116
1,2	1,8	50	10,0	1,15	4		117
1,2	1,8	50	12,0	1,15	4		118
1,5	2,3	50	6,0	1,45	4		119
1,5	2,3	50	8,0	1,45	4		120
1,5	2,3	50	10,0	1,45	4		121
1,5	2,3	50	12,0	1,45	4		122
1,5	2,3	50	16,0	1,45	4		123
1,5	2,3	60	20,0	1,45	4		124

d ₁ mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ mm	16400	...
2,0	3,0	50	6,0	1,95	4		125
2,0	3,0	50	8,0	1,95	4		126
2,0	3,0	50	10,0	1,95	4		127
2,0	3,0	50	12,0	1,95	4		128
2,0	3,0	50	16,0	1,95	4		129
2,0	3,0	60	20,0	1,95	4		130
2,0	3,0	75	25,0	1,95	4		131
2,5	3,7	50	8,0	2,40	4		132
2,5	3,7	50	10,0	2,40	4		133
2,5	3,7	50	12,0	2,40	4		134
2,5	3,7	50	16,0	2,40	4		135
2,5	3,7	50	20,0	2,40	4		136
2,5	3,7	60	25,0	2,40	4		137
3,0	4,5	50	8,0	2,85	6		138
3,0	4,5	50	10,0	2,85	6		139
3,0	4,5	50	12,0	2,85	6		140
3,0	4,5	60	16,0	2,85	6		141
3,0	4,5	60	20,0	2,85	6		142
3,0	4,5	75	25,0	2,85	6		143
4,0	4,5	60	20,0	3,85	6		144
4,0	4,5	75	25,0	3,85	6		145
4,0	4,5	75	30,0	3,85	6		146
4,0	4,5	75	40,0	3,85	6		147

Al<14%Si	Brass	Bronze	St<700N	St<900N	St<1000N	St<1300N	VA-steel<900N	VA-steel>900N	Ti<700N	Ti>700N	Ni-Co<700N	Ni-Co<1200N	Ni-basis alloy
-	-	-	40-130	40-130	40-130	40-80	20-60	20-60	25-80	20-40	25-80	20-40	20-30

16401

Miniature Torus Milling Cutters Ultra MS

Z 2

HPC


ATORN®

Type

Solid carbide torus milling cutter with AlCrN coating.

Use

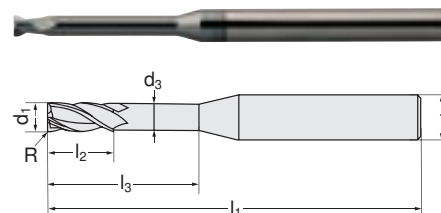
Particularly well-suited for machining rust-resistant and acid-resistant steels, titanium and nickel alloys, bronze brass and steel to 1300 N/mm².

Advantage:

Maximum machining capacity.

NEW


16401



Continuation ►

d ₁ mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ mm	R mm	16401	...
0,5	0,7	50	2,0	0,45	4	0,05		101
0,5	0,7	50	4,0	0,45	4	0,05		102
0,5	0,7	50	6,0	0,45	4	0,05		103
0,5	0,7	50	8,0	0,45	4	0,05		104
0,8	1,2	50	4,0	0,75	4	0,10		105
0,8	1,2	50	6,0	0,75	4	0,10		106
0,8	1,2	50	8,0	0,75	4	0,10		107
0,8	1,2	50	10,0	0,75	4	0,10		108
0,8	1,2	50	12,0	0,75	4	0,10		109
1,0	1,5	50	6,0	0,95	4	0,10		110
1,0	1,5	50	8,0	0,95	4	0,10		111
1,0	1,5	50	10,0	0,95	4	0,10		112
1,0	1,5	50	12,0	0,95	4	0,10		113
1,0	1,5	50	16,0	0,95	4	0,10		114
1,2	1,8	50	6,0	1,15	4	0,10		115
1,2	1,8	50	8,0	1,15	4	0,10		116
1,2	1,8	50	10,0	1,15	4	0,10		117
1,2	1,8	50	12,0	1,15	4	0,10		118
1,5	2,3	50	6,0	1,45	4	0,20		119
1,5	2,3	50	8,0	1,45	4	0,20		120
1,5	2,3	50	10,0	1,45	4	0,20		121
1,5	2,3	50	12,0	1,45	4	0,20		122
1,5	2,3	50	16,0	1,45	4	0,20		123
1,5	2,3	60	20,0	1,45	4	0,20		124

Al<14%Si	Brass	Bronze	St<700N	St<900N	St<1000N	St<1300N	VA-steel<900N	VA-steel>900N	Ti<700N	Ti>700N	Ni-Co<700N	Ni-Co<1200N	Ni-basis alloy
-	-	-	40-130	40-130	40-130	40-80	20-60	20-60	25-80	20-40	25-80	20-40	20-30

16402

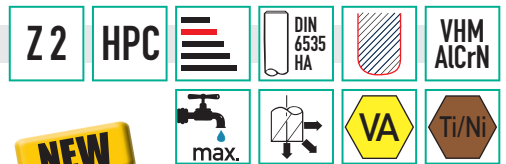
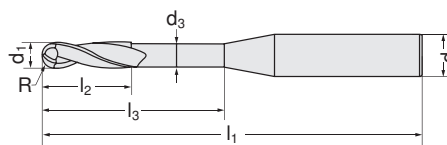
Miniature Radius Milling Cutter Ultra MS

ATORN®**Type**

Solid carbide radius milling cutter with AlCrN coating.

UseParticularly well-suited for machining rust-resistant and acid-resistant steels, titanium and nickel alloys, bronze brass and steel to 1300 N/mm².**Advantage:**

Maximum machining capacity.



16402

d ₁ mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ mm	R mm	16402	...
0,5	0,4	50	2,0	0,45	4	0,25		101
0,5	0,4	50	4,0	0,45	4	0,25		102
0,5	0,4	50	6,0	0,45	4	0,25		103
0,5	0,4	50	8,0	0,45	4	0,25		104
0,8	0,6	50	2,0	0,75	4	0,40		105
0,8	0,6	50	4,0	0,75	4	0,40		106
0,8	0,6	50	6,0	0,75	4	0,40		107
0,8	0,6	50	8,0	0,75	4	0,40		108
0,8	0,6	50	10,0	0,75	4	0,40		109
1,0	0,8	50	3,0	0,95	4	0,50		110
1,0	0,8	50	4,0	0,95	4	0,50		111
1,0	0,8	50	6,0	0,95	4	0,50		112
1,0	0,8	50	8,0	0,95	4	0,50		113
1,0	0,8	50	10,0	0,95	4	0,50		114
1,0	0,8	50	12,0	0,95	4	0,50		115
1,0	0,8	50	20,0	0,95	4	0,50		116
1,5	1,2	50	8,0	1,45	4	0,75		117
1,5	1,2	50	12,0	1,45	4	0,75		118
1,5	1,2	50	16,0	1,45	4	0,75		119
2,0	1,6	50	6,0	1,95	4	1,00		120

d ₁ mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ mm	R mm	16402	...
2,0	1,6	50	8,0	1,95	4	1,00		121
2,0	1,6	50	10,0	1,95	4	1,00		122
2,0	1,6	50	12,0	1,95	4	1,00		123
2,0	1,6	50	16,0	1,95	4	1,00		124
2,0	1,6	60	20,0	1,95	4	1,00		125
2,0	1,6	75	25,0	1,95	4	1,00		126
3,0	2,4	50	8,0	2,85	6	1,50		127
3,0	2,4	50	10,0	2,85	6	1,50		128
3,0	2,4	60	16,0	2,85	6	1,50		129
3,0	2,4	60	20,0	2,85	6	1,50		130
3,0	2,4	75	25,0	2,85	6	1,50		131
3,0	2,4	75	30,0	2,85	6	1,50		132
4,0	3,2	50	10,0	3,85	6	2,00		133
4,0	3,2	60	16,0	3,85	6	2,00		134
4,0	3,2	60	20,0	3,85	6	2,00		135
4,0	3,2	75	25,0	3,85	6	2,00		136
4,0	3,2	75	30,0	3,85	6	2,00		137
4,0	3,2	75	35,0	3,85	6	2,00		138
4,0	3,2	100	40,0	3,85	6	2,00		139
4,0	3,2	100	50,0	3,85	6	2,00		140

Al<14%Si	Brass	Bronze	St<700N	St<900N	St<1000N	St<1300N	VA-steel<900N	VA-steel>900N	Ti<700N	Ti>700N	Ni-Co<700N	Ni-Co<1200N	Ni-basis alloy
-	-	-	40-130	40-130	40-130	40-80	20-60	20-60	25-80	20-40	25-80	20-40	20-30

16403

Solid carbide keyway milling cutter Ultra MS

Z3

HPC

VHM
AlCrN**ATORN®**

Type

Solid carbide keyway milling cutter with AlCrN coating.

Use

Particularly well-suited for machining rust-resistant and acid-resistant steels, titanium and nickel alloys, bronze brass and steel to 1300 N/mm².

Advantage:

Maximum machining capacity.

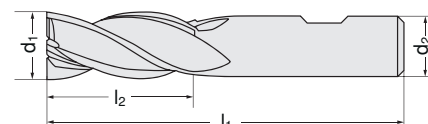
NEW



16403 101-109



16403 201-209



d ₁ mm	l ₂ mm	l ₁ mm	d ₂ mm	DIN 6535 HA		DIN 6535 HB	
				16403	...	16403	...
3,0	9	50	6		101		201
4,0	12	50	6		102		202
5,0	15	50	6		103		203
6,0	16	50	6		104		204
8,0	20	64	8		105		205
10,0	22	70	10		106		206
12,0	25	75	12		107		207
16,0	32	90	16		108		208
20,0	38	100	20		109		209

Al<14%Si	Brass	Bronze	St<700N	St<900N	St<1000N	St<1300N	VA-steel<900N	VA-steel>900N	Ti<700N	Ti>700N	Ni-Co<700N	Ni-Co<1200N	Ni-basis alloy
-	-	-	120-140	120-140	120-140	50-70	50-70	50-70	70-80	50-60	70-80	60-70	20-30

16405

Solid Carbide Radius Cutter, Short Ultra MS

Z2

HPC

VHM
AlCrN**ATORN®**

Type

Solid carbide radius milling cutter with AlCrN coating.

Use

Particularly well-suited for machining rust-resistant and acid-resistant steels, titanium and nickel alloys, bronze brass and steel to 1300 N/mm².

Advantage:

Maximum machining capacity.

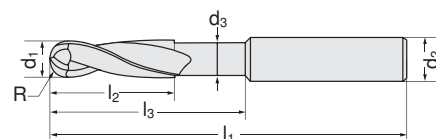
NEW



16405 101-109



16405 201-209



d ₁ mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ mm	R mm	DIN 6535 HA		DIN 6535 HB	
							16405	...	16405	...
3,0	5	57	20	2,8	6	1,5		101		201
4,0	6	57	20	3,7	6	2,0		102		202
5,0	7	57	20	4,6	6	2,5		103		203
6,0	8	57	20	5,5	6	3,0		104		204
8,0	10	64	25	7,4	8	4,0		105		205
10,0	12	75	35	9,2	10	5,0		106		206
12,0	14	75	35	11,0	12	6,0		107		207
16,0	18	90	45	15,0	16	8,0		108		208
20,0	20	100	50	19,0	20	10,0		109		209

Al<14%Si	Brass	Bronze	St<700N	St<900N	St<1000N	St<1300N	VA-steel<900N	VA-steel>900N	Ti<700N	Ti>700N	Ni-Co<700N	Ni-Co<1200N	Ni-basis alloy
-	-	-	120-140	120-140	120-140	50-70	50-70	50-70	70-80	50-60	70-80	60-70	20-30



16407

Solid Carbide Radius Milling Cutters Long Ultra MS

Z2

HPC

VHM
AlCrN

VA

Ti/Ni

ATORN®**Type**

Solid carbide radius milling cutter with AlCrN coating.

Use

Particularly well-suited for machining rust-resistant and acid-resistant steels, titanium and nickel alloys, bronze brass and steel to 1300 N/mm².

Advantage:

Maximum machining capacity.

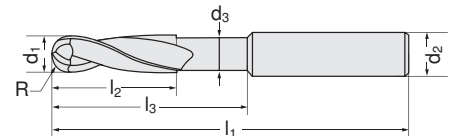
NEWDIN
6535
HA

16407 101-109

DIN
6535
HB

16407 201-209

d ₁ mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ mm	R mm	DIN 6535 HA		DIN 6535 HB	
							16407	...	16407	...
3,0	5,0	75	21	2,8	6	1,5		101		201
4,0	8,0	75	28	3,7	6	2,0		102		202
5,0	9,0	75	32	4,6	6	2,5		103		203
6,0	10,0	75	40	5,5	6	3,0		104		204
8,0	12,0	75	40	7,4	8	4,0		105		205
10,0	14,0	100	60	9,2	10	5,0		106		206
12,0	16,0	100	60	11,0	12	6,0		107		207
16,0	32,0	125	80	15,0	16	8,0		108		208
20,0	38,0	125	80	19,0	20	10,0		109		209



Al<14%Si	Brass	Bronze	St<700N	St<900N	St<1000N	St<1300N	VA-steel<900N	VA-steel>900N	Ti<700N	Ti>700N	Ni-Co<700N	Ni-Co<1200N	Ni-basis alloy
-	-	-	120-140	120-140	120-140	50-70	50-70	50-70	70-80	50-60	70-80	60-70	20-30

16544

Solid Carbide End Milling Cutters Ultra MS

Z4



HPC

VHM
AlCrN

VA

Ti/Ni

ATORN®**Type**

Solid carbide milling cutters for roughing and finishing with unequal pitch and unequal helix.

Use

Particularly well-suited for machining rust-resistant and acid-resistant steels, titanium and nickel alloys, bronze brass and steel to 1300 N/mm².

Advantage:

Maximum machining capacity with extremely quiet operation.

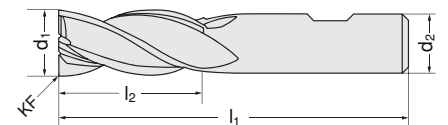
NEWDIN
6535
HA

16544 101-108

DIN
6535
HB

16544 201-208

d ₁ mm	KF mm	l ₁ mm	l ₂ mm	d ₂ mm	DIN 6535HA		DIN 6535HB	
					16544	...	16544	...
4	0,1	57	11	6		101		201
5	0,1	57	13	6		102		202
6	0,1	57	13	6		103		203
8	0,2	64	20	8		104		204
10	0,2	72	22	10		105		205
12	0,2	83	26	12		106		206
16	0,3	92	32	16		107		207
20	0,4	104	38	20		108		208



Al<14%Si	Brass	Bronze	St<700N	St<900N	St<1000N	St<1300N	VA-steel<900N	VA-steel>900N	Ti<700N	Ti>700N	Ni-Co<700N	Ni-Co<1200N	Ni-basis alloy
-	-	-	120-140	120-140	120-140	50-70	50-70	50-70	70-80	50-60	70-80	60-70	20-30



16550

Solid Carbide Torus Milling Cutters Ultra MS

Z 4



HPC



R

VHM
AlCrN

VA

Ti/Ni

ATORN®**Type**

Solid carbide torus milling cutter for roughing and finishing with unequal pitch and unequal helix.

Use

Particularly well-suited for machining rust-resistant and acid-resistant steels, titanium and nickel alloys, bronze brass and steel to 1300 N/mm².

Advantage:

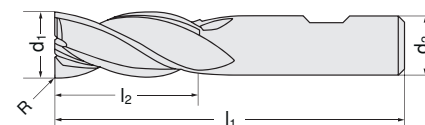
Maximum machining capacity with extremely quiet operation.

NEWDIN
6535
HA

16550 301-321

DIN
6535
HB

16550 401-421



d ₁ mm	R mm	l ₁ mm	l ₂ mm	d ₂ mm	DIN 6535HA		DIN 6535HB	
					16550	...	16550	...
4	0,3	57	11	6		301		401
4	0,5	57	11	6		302		402
5	0,3	57	13	6		303		403
5	0,5	57	13	6		304		404
6	0,3	57	13	6		305		405
6	0,5	57	13	6		306		406
6	1,0	57	13	6		307		407
8	0,5	64	20	8		308		408
8	1,0	64	20	8		309		409
10	0,5	72	22	10		310		410
10	1,0	72	22	10		311		411
12	0,5	83	26	12		312		412
12	1,0	83	26	12		313		413
12	2,0	83	26	12		314		414
12	3,0	83	26	12		315		415
16	1,0	92	32	16		316		416
16	2,0	92	32	16		317		417
16	3,0	92	32	16		318		418
20	1,0	104	38	20		319		419
20	2,0	104	38	20		320		420
20	3,0	104	38	20		321		421

Al<14%Si	Brass	Bronze	St<700N	St<900N	St<1000N	St<1300N	VA-steel<900N	VA-steel>900N	Ti<700N	Ti>700N	Ni-Co<700N	Ni-Co<1200N	Ni-basis alloy
-	-	-	120-140	120-140	120-140	50-70	50-70	50-70	70-80	50-60	70-80	60-70	20-30

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ATORN® Performance requires quality.



16537 - 16539

Solid Carbide Keyway Milling Cutters

Z4



HW

Type

Short, right-hand cut, 4 cutting edges, right-hand helix approx. 30°, centre cut, with smooth shank in compliance with DIN 6535 HA.

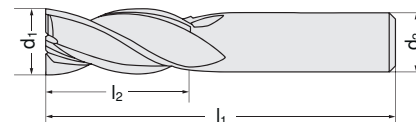
16537

VHM



16539

VHM TiAlN



d ₁ h10 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	Solid carbide		Solid carbide/TiAlN	
				16537	...	16539	...
2,0	8	32	2,0	101		101	
3,0	12	32	3,0	102		102	
4,0	12	40	4,0	103		103	
5,0	14	50	5,0	104		104	
6,0	16	50	6,0	105		105	
7,0	20	60	7,0	106		106	

d ₁ h10 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	Solid carbide		Solid carbide/TiAlN	
				16537	...	16539	...
8,0	20	60	8,0	107		107	
10,0	22	70	10,0	109		109	
12,0	22	70	12,0	110		110	
14,0	25	75	14,0	111		111	
16,0	25	75	16,0	112		112	
20,0	32	100	20,0	113		113	

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
16537																	
180	160	140	120	100	90	80	70	60	-	-	-	-	80	60	30	85	-
16539																	
230	200	180	150	130	120	100	90	80	-	-	-	-	105	80	40	110	-

16542 - 16543

Solid Carbide Keyway Milling Cutters

Z4



HW

Type

Long, right-hand cut, 4 cutting edges, right-hand helix approx. 30°, centre cut, with smooth shank in compliance with DIN 6535 HA.

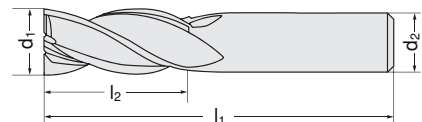
16542

VHM



16543

VHM TiAlN



d ₁ h10 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	Solid carbide		Solid carbide/TiAlN	
				16542	...	16543	...
4,0	10	50	4	102		102	
5,0	13	50	5	104		104	
6,0	13	57	6	106		106	
8,0	19	63	8	110		110	
10,0	22	72	10	114		114	

d ₁ h10 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	Solid carbide		Solid carbide/TiAlN	
				16542	...	16543	...
12,0	26	83	12	116		116	
14,0	26	83	14			118	
16,0	32	92	16	120		120	
18,0	32	92	18			121	
20,0	38	104	20			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)	Plastics
16542																	
180	160	140	120	100	90	80	70	60	-	-	-	-	80	60	30	85	-
16543																	
230	200	180	150	130	120	100	90	80	-	-	-	-	105	80	40	110	-



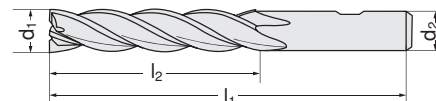
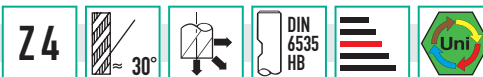
Solid Carbide Keyway Milling Cutters | Solid Carbide End Milling Cutters | Solid Carbide Radius Milling Cutters

16545 - 16547 Solid Carbide Keyway Milling Cutters



Type

Long, right-hand cut, **4 cutting edges**, right-hand helix approx. 30°, spiral flutes, **centre cut**, straight shank with driving face in compliance with DIN 6535 HB.



d ₁ h10 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	Solid carbide		Solid carbide/TiAlN	
				16545	...	16547	...
3,0	8	57	6		101		101
3,5	10	57	6		102		102
4,0	11	57	6		103		103
4,5	11	57	6				104
5,0	13	57	6		105		105
6,0	13	57	6		106		106
7,0	16	63	8				107

d ₁ h10 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	Solid carbide		Solid carbide/TiAlN	
				16545	...	16547	...
8,0	19	63	8		108		108
9,0	19	72	10				109
10,0	22	72	10		110		110
12,0	26	83	12		111		111
16,0	32	92	16		113		113
18,0	32	92	18				114
20,0	38	104	20		115		115

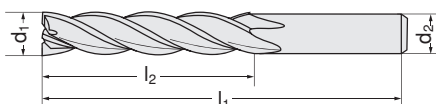
Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St<1400N	<45HRC	<55HRC	<60HRC	<67HRC	VA-steel<900N	VA-steel>900N	Ti-alloys	GG(G)	Plastics
16545																	
180	160	140	120	100	90	80	70	60	-	-	-	-	80	60	30	85	-
16547																	
230	200	180	150	130	120	100	90	80	-	-	-	-	105	80	40	110	-

16548 - 16549 Solid Carbide Keyway Milling Cutters



Type

Overlong, right-hand cut, **4 cutting edges**, right-hand helix approx. 30°, spiral flutes, **centre cut**, with smooth shank in compliance with DIN 6535 HA.



d ₁ h10 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	Solid carbide		Solid carbide/TiAlN	
				16548	...	16549	...
3,0	30	75	3		101		101
4,0	30	75	4		102		102
5,0	40	100	5		103		103
6,0	50	150	6		104		104

d ₁ h10 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	Solid carbide		Solid carbide/TiAlN	
				16548	...	16549	...
8,0	50	150	8		105		105
10,0	60	150	10		106		106
12,0	75	150	12		107		107

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
16548																	
100	80	70	80	60	60	50	40	40	-	-	-	-	50	40	30	60	-
16549																	
130	100	90	100	80	80	65	50	50	-	-	-	-	65	50	40	80	-



16551

Solid Carbide End Milling Cutters

Z 6-8



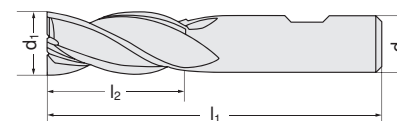
Type

- Right-hand cut
- Straight shank with driving face in compliance with DIN 6535 HB.
- Right-hand helix approx. 45°
- **6-8 cutting edges**

Use

For circumference milling as finishing working step for producing highest surface quality (face cutting only at low cutting depths).

16551



d ₁ e8 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	Z	16551	...
6,0	13	57	6	6		101
8,0	19	63	8	6		103
10,0	22	72	10	6		105
12,0	26	83	12	6		106

d ₁ e8 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	Z	16551	...
14,0	26	83	14	6		107
16,0	32	92	16	6		108
18,0	32	92	18	8		109
20,0	38	104	20	8		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
-	-	-	180	140	130	120	110	100	-	-	-	-	100	80	-	180	-

16553

Solid Carbide End Milling Cutters

Z 6-8



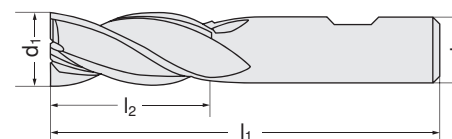
Type

- Right-hand cut
- Straight shank with driving face in compliance with DIN 6535 HB.
- Right-hand helix approx. 45°
- Eccentric relief for more stabile cutting edges
- **6-8 cutting edges**

Use

For circumference milling as the finishing working step for the production of a high quality surface. Especially suitable for machining deep and/or hard-to-reach places.

16553



d ₁ e8 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	Z	16553	...
6,0	18	62	6	6		201
8,0	24	68	8	6		203
10,0	30	80	10	6		205
12,0	36	93	12	6		206

d ₁ e8 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	Z	16553	...
14,0	42	99	14	6		207
16,0	48	108	16	6		208
18,0	54	114	18	8		209
20,0	60	126	20	8		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
-	-	-	180	140	130	120	110	100	-	-	-	-	100	80	-	180	-

16557

Solid Carbide Radius Milling Cutters

Z 2



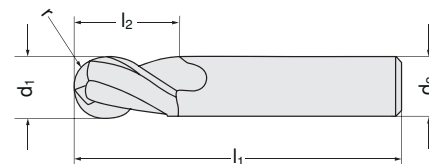
Type

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

Quality

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

16557



d ₁ e8 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	16557	...
3,0	4	48	6		101
4,0	6	50	6		102
5,0	7	51	6		103
6,0	7	51	6		104
8,0	9	59	8		105

d ₁ e8 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	16557	...
10,0	10	60	10		106
12,0	14	71	12		107
16,0	16	76	16		109
20,0	20	82	20		111

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
230	200	180	150	130	120	100	90	80	-	-	-	-	105	80	40	110	-



Solid Carbide Radius Milling Cutters | Solid Carbide Roughing/Finishing Cutters | Solid Carbide Roughing End Milling Cutters

16559

Solid Carbide Radius Milling Cutters

Z2

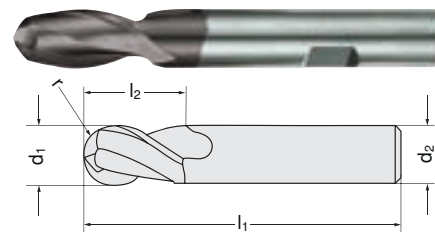


HHW

Type

Long, 2 cutting edges, centre cut, right-hand helix approx. 30°. With straight shank with driving face in compliance with DIN 6535 HB. Ø 2 mm with smooth straight shank in compliance with DIN 6535 HA.

16559



d ₁ e8 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	16559	...
2,0	6	38	3		201
3,0	7	57	6		202
4,0	8	57	6		203
5,0	10	57	6		204
6,0	10	57	6		205

d ₁ e8 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	16559	...
8,0	16	63	8		206
10,0	19	72	10		207
12,0	22	83	12		208
16,0	26	92	16		210
20,0	32	104	20		212

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
230	200	180	150	130	120	100	90	80	-	-	-	-	105	80	40	110	-

16561

Solid Carbide Radius Milling Cutters

Z4

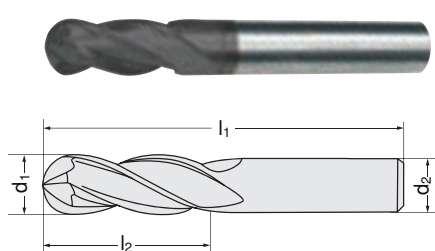


HHW

Type

Short, 4 cutting blades, centre cut, Right-hand helix 30°. With smooth shank in compliance with DIN 6535 HA.

16561



d ₁ e8 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	16561	...
3,0	4	48	6		101
4,0	6	50	6		102
5,0	7	51	6		103
6,0	7	51	6		104
8,0	9	59	8		105
10,0	10	60	10		106

d ₁ e8 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	16561	...
12,0	14	71	12		107
14,0	14	71	14		108
16,0	16	76	16		109
18,0	18	76	18		110
20,0	20	82	20		111

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
-	-	-	150	130	120	100	90	80	-	-	-	-	105	80	40	110	-

16565

Solid Carbide Roughing/Finishing Cutters

Z4



HHW

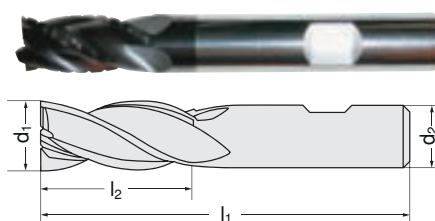
Type

With ground-in chip breakers, centre cut, 30° spiral for high roughing performance. With straight shank with driving face in compliance with DIN 6535 HB.

Use

For roughing and finishing steel with extreme feeds. Very smooth and quiet running due to the reduction of the cutting load by means of the special chip breakers.

16565



d ₁ h10 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	16565	...
5,0	15	57	6		101
6,0	16	57	6		102
8,0	22	63	8		103
10,0	25	72	10		104

d ₁ h10 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	16565	...
12,0	28	83	12		105
16,0	35	92	16		106
20,0	40	104	20		107

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	105	90	70	40-60	-	-	-	-	-	95	70	-	-	-

16567

Solid Carbide Roughing End Milling Cutters

Z 4



HR

**HHW**

Type

- Long
- 4 cutting edges
- Centre cut
- Right-hand helix 25°.
- Fine knurled profile
- Straight shank with driving face in compliance with DIN 6535 HB.

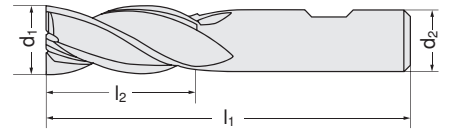
Use

For materials up to HRC 45.

Very good cutting performance thanks to roughing teeth. Universal use, also suitable for stainless steel, aluminium, non-ferrous metals and cast materials.



16567



d ₁ h10 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	16567	...
3,0	6	57	6	101	
4,0	8	57	6	102	
5,0	10	57	6	103	
6,0	13	57	6	104	
8,0	16	63	8	105	

d ₁ h10 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	16567	...
10,0	22	72	10	106	
12,0	26	83	12	107	
16,0	32	92	16	108	
20,0	38	104	20	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
300	220	-	120	105	90	70	40-60	-	-	-	-	-	70-90	50-70	30-60	80-100	-

16569

Solid carbide roughing end milling cutters with IKZ



Z 4

**HHW**

Type

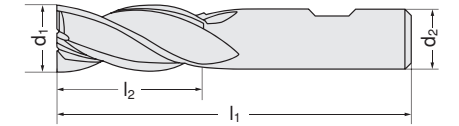
- Long
- Centre cut
- Right-hand helix 25°.
- With internal cooling in the flute
- Fine knurled profile
- Straight shank with driving face in compliance with DIN 6535 HB.

Use

For materials up to HRC 45. Universal implementation. The coolant is guided directly to the flutes. This results in long service life and complete removal of the chips. This is very important when milling into solid material or milling of pockets.



16569



d ₁ h10 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	16569	...
6,0	13	57	6	101	
8,0	16	63	8	102	
10,0	22	72	10	103	

d ₁ h10 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	16569	...
12,0	26	83	12	104	
16,0	32	92	16	105	
20,0	38	104	20	106	

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-alloy	GG(G)	Plastics
300	220	-	120	105	90	70	40-60	-	-	-	-	-	70-90	50-70	30-60	80-100	-

16564

Solid carbide 3D aluminium roughing end milling cutters

Z 3

**ATORN®**

Type

Centre cut, with undercut, defined edge rounding. With straight shank in accordance with DIN 6535 HA. **Advantages:** Through the optimised flute geometry (flat spirals of 7°, reinforced core, defined corner radius, chip crusher, for generating discontinuous chips, as well as defined edge rounding) in the range from Vc= 1000-1600 m/min can be achieved with this tool.

Use

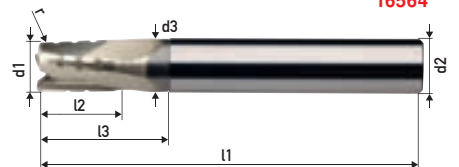
Especially for machining of NF metals. Suitable for roughing.

Quality

Multi-layer PVD-coating CALIDA Z (titanium-free).

Note:

Ensure stable machine conditions, fixed workpiece clamping, as well as adequate coolant supply.



16564

d ₁ ø8 mm	l ₂ mm	l ₃ mm	l ₁ mm	r mm	Z	d ₂ h5 mm	d ₃ mm	16564	...
6,0	8	21	57	0,6	3	6	5,7	106	
8,0	10	27	63	0,8	3	8	7,7	108	
10,0	12	32	72	1,0	3	10	9,7	110	
12,0	16	38	83	1,2	3	12	11,7	112	
16,0	20	44	92	1,6	3	16	15,7	116	

Al, Al-alloy.	Al-wrought alloy.	Al<10%Si	Al>10%Si	Mg-alloy.	CU low-alloy	Ms short sp.	Ms long sp.	Bronze short sp.	Bronze long sp.
700-730	850-890	300-330	200-240	200-240	200-230	290-315	200-240	290-315	200-240



Solid Carbide Engraver's Milling Cutters | Solid Carbide Deburrers | Solid Carbide Universal Milling Cutters | Solid carbide two-way deburrers

16575

Solid carbide engraver's milling cutter 60°

Z1



N

VHM TiAIN

DIN 6535 HA

Norm



HHW

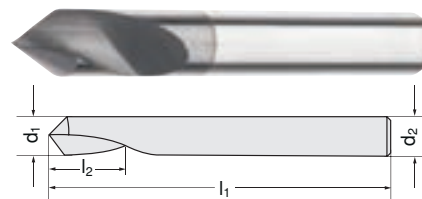
Type

1 cutting edge. With smooth straight shank in compliance with DIN 6535 HA.

Use

For engraving contours.

16575



d ₁ h6 mm	l ₂ mm	l ₁ mm	d ₂ h6 mm	16575	...
3,0	10	40	3		101
4,0	10	40	4		102
6,0	10	50	6		103

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-alloy	GG(G)	Plastics
220-240	170-200	140-160	120-140	100-120	80-100	70-80	60-70	50-60	-	-	-	-	60-70	60-70	-	120-140	200-240

16570 - 16571

Solid Carbide Deburrers 90°

Z4-6



DIN 6535 HA

DIN 6535 HB



ATORN®

Type

Short, 4-6 cutting edges. With reinforced straight shank with driving face in compliance with DIN 6535 HB (with Weldon). Ø 4 mm with smooth straight shank in compliance with DIN 6535 HA.

VHM

16570



VHM TiAIN

16571



d ₁ h10 mm	l ₁ mm	d ₂ h6 mm	Z	Solid carbide 16570	...	Solid carbide/TiAIN 16571	...
4,0	51	4	4		101		101
6,0	64	6	4		102		102
8,0	64	8	5		103		103
10,0	70	10	6		104		104

d ₁ h10 mm	l ₁ mm	d ₂ h6 mm	Z	Solid carbide 16570	...	Solid carbide/TiAIN 16571	...
12,0	78	12	6		105		105
16,0	92	16	6		106		106
20,0	104	20	6		107		107

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-alloy	GG(G)	Plastics
16570	140-160	100-120	100-120	90-120	60-80	55-60	50-55	40-50	-	-	-	-	50-60	40-50	30-60	60-80	-
16571	280-350	200-250	150-180	120-140	110-120	100-110	70-80	60-70	-	-	-	-	80-120	60-90	30-60	80-120	-

16573

Solid Carbide Deburrers 60°

Z4-6



VHM TiAIN

DIN 6535 HA

DIN 6535 HB



HHW

Type

Short, 4-6 cutting edges. With reinforced straight shank with driving face in compliance with DIN 6535 HB (with Weldon). Ø 4 mm with smooth straight shank in compliance with DIN 6535 HA.

16573



d ₁ h10 mm	l ₁ mm	d ₂ h6 mm	Z	Solid carbide/TiAIN 16573	...
4,0	54	4	4		101
6,0	57	6	4		102
8,0	63	8	5		103

d ₁ h10 mm	l ₁ mm	d ₂ h6 mm	Z	Solid carbide/TiAIN 16573	...
10,0	72	10	6		104
12,0	83	12	6		105
16,0	92	16	6		106

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
280-350	200-250	150-180	120-140	110-120	100-110	70-80	60-70	-	-	-	-	-	80-120	60-90	30-60	80-120	-

16580

Solid Carbide Universal Milling Cutters

Z2



N

VHM



Type

Short, 2 cutting edges, point angle $90^\circ (+/-1^\circ)$, 25° right-hand helix, straight shank shape A.

Use

A new concept of shank cutting tools with focus on versatility. Allows up to 8 processes with just one tool.

Quality

Solid carbide

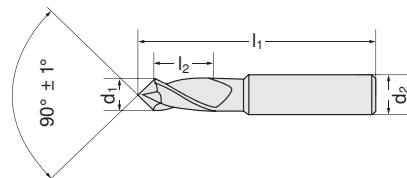
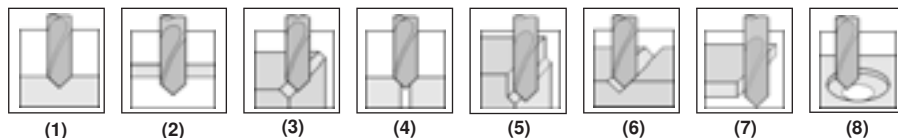
Note:

d_1 3-10 mm = h9,
 d_1 12-20 mm = d9.

- (1) = Centring,
 (2) = Drilling,
 (3) = Combined milling/chamfering,
 (4) = Countersinking,
 (5) = Landing,
 (6) = Milling of V-slots,
 (7) = Circumference milling,
 (8) = Face milling/Circular milling



16580



Solid carbide

d_1 mm	l_1 mm	l_2 mm	d_2 h6 mm	16580	...
3,0	57	6	4		101
4,0	57	8	5		102
5,0	57	10	6		103
6,0	70	12	8		104
8,0	80	16	10		105

Solid carbide

d_1 mm	l_1 mm	l_2 mm	d_2 h6 mm	16580	...
10,0	90	18	12		106
12,0	90	20	12		107
16,0	92	26	16		108
20,0	110	32	20		109

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
120-150	120-150	50-120	70-75	50-60	40-50	-	30-40	25-30	-	-	-	-	30-35	30-35	25-30	30-40	100-150

16583

Solid carbide two-way deburrers

Z4

VHM
TiAIN

Type

4 cutting edges, 45° . With smooth straight shank in compliance with DIN 6535 HA.

Use

For forward/reverse deburring and chamfering.



16583 101-102



16583 103-106



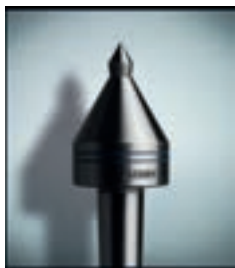
DIN 6535 HA

d_1 h10 mm	l_2 mm	l_1 mm	d_2 h6 mm	AP mm	16583	...
4,0	2	100	6	10		101
6,0	2	100	6	15		102
8,0	2	100	6	-		103

DIN 6535 HA

d_1 h10 mm	l_2 mm	l_1 mm	d_2 h6 mm	AP mm	16583	...
10,0	4	100	6	-		104
12,0	4	100	6	-		105
16,0	5	100	10	-		106

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	250	90-120	80-120	80-100	50-80	40-70	30-35	-	-	-	-	80-120	60-90	30-60	50-100	-



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Performance requires quality.

For example, with the revolving lathe centre from ATORN.

- Extended moving point
- True-running deviation, max. 0.005 mm
- Completely hardened and ground
- Protected against penetration of contamination and coolant

ATORN®
 Performance requires quality.



16710

Solid Carbide Miniature End Milling Cutters

ATORN®

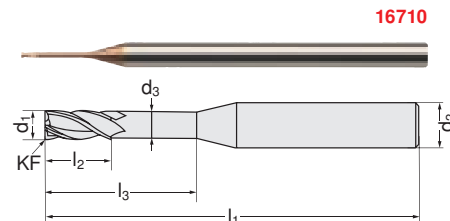
Type
- With edge chamfer

d ₁ (e8) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	KF mm	16710	...
0,5	0,9	55	4	0,48	4	0,05		101
0,5	0,9	65	6	0,48	4	0,05		102
0,5	0,9	65	10	0,48	4	0,05		103
1,0	1,5	55	5	0,95	4	0,10		104
1,0	1,5	65	10	0,95	4	0,10		105
1,0	1,5	65	15	0,95	4	0,10		106
1,5	1,8	55	8	1,44	4	0,10		107
1,5	1,8	65	15	1,44	4	0,10		108
1,5	1,8	65	20	1,44	4	0,10		109
2,0	2,0	55	10	1,92	4	0,10		110
2,0	2,0	65	20	1,92	4	0,10		111
2,5	2,5	55	12	2,40	4	0,10		112
2,5	2,5	65	20	2,40	4	0,10		113

Al<10%Si	Al>10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP, GRP
400-450	180-320	250-420	180-320	300-450	400-550	250-420

Z2

HSC



16710

16711

Solid Carbide Miniaturetorus Milling Cutters

ATORN®

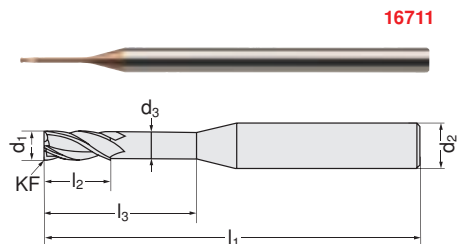
Type
Radius tolerance 0/-0,015

d ₁ (e8) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	R mm	16711	...
0,5	0,9	55	4	0,48	4	0,05		101
0,5	0,9	65	6	0,48	4	0,05		102
0,5	0,9	65	10	0,48	4	0,08		103
1,0	1,5	55	5	0,95	4	0,08		104
1,0	1,5	65	10	0,95	4	0,10		105
1,0	1,5	65	15	0,95	4	0,10		106
1,5	1,8	55	8	1,44	4	0,12		107
1,5	1,8	65	15	1,44	4	0,15		108
1,5	1,8	65	20	1,44	4	0,15		109
2,0	2,0	55	10	1,92	4	0,20		110
2,0	2,0	65	20	1,92	4	0,20		111
2,5	2,5	55	12	2,40	4	0,25		112
2,5	2,5	65	20	2,40	4	0,25		113

Al<10%Si	Al>10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP, GRP
400-450	180-320	250-420	180-320	300-450	400-550	250-420

Z2

HSC



16711

16712

Solid Carbide Miniature Radius Milling Cutters

ATORN®

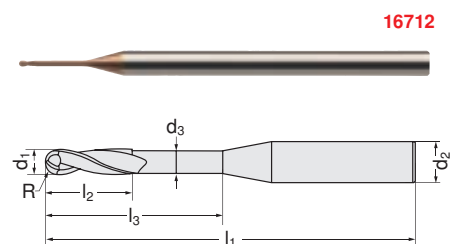
Type
Radius tolerance +/-0,01

d ₁ (h9) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	R mm	16712	...
0,5	0,9	55	4	0,48	4	0,25		101
0,5	0,9	65	6	0,48	4	0,25		102
0,5	0,9	65	10	0,48	4	0,25		103
1,0	1,5	55	5	0,95	4	0,50		104
1,0	1,5	65	10	0,95	4	0,50		105
1,0	1,5	65	15	0,95	4	0,50		106
1,5	1,8	55	8	1,44	4	0,75		107
1,5	1,8	65	15	1,44	4	0,75		108
1,5	1,8	65	20	1,44	4	0,75		109
2,0	2,0	55	10	1,92	4	1,00		110
2,0	2,0	65	20	1,92	4	1,00		111
2,5	2,5	55	12	2,40	4	1,75		112
2,5	2,5	65	20	2,40	4	1,75		113

Al<10%Si	Al>10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP, GRP
400-450	180-320	250-420	180-320	300-450	400-550	250-420

Z2

HSC



16712

16715

Solid Carbide Single-Tooth Milling Cutters

Z 1

HSC



DIN 6535 HA

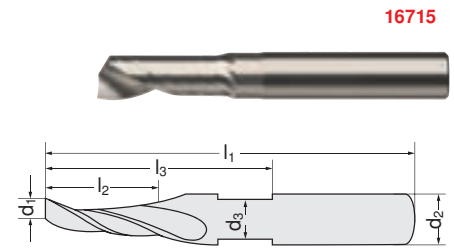


VHM poliert


ATORN®

d ₁ (h9) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	16715	...
1,5	6	50	22	1,45	3		101
2,0	8	50	22	1,80	3		102
3,0	12	50	22	2,80	3		103
4,0	15	57	29	3,80	4		104
5,0	17	60	32	4,80	5		105
6,0	20	64	28	5,80	6		106
8,0	24	64	28	7,80	8		107
10,0	25	73	33	9,70	10		108
12,0	32	84	39	11,70	12		109

Al<10%Si	Al >10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP, GRP
350-500	150-250	200-350	150-250	250-400	350-500	200-350



16717

Solid Carbide End Milling Cutters

Z 2

HSC



DIN 6535 HB



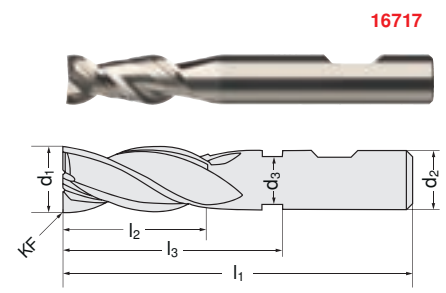
VHM poliert


ATORN®

 Type
 - With edge chamfer

d ₁ (h9) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	KF mm	16717	...
3,0	8	57	18	2,90	6	0,1		101
4,0	11	57	18	3,90	6	0,1		102
5,0	13	57	20	4,90	6	0,1		103
6,0	13	57	20	5,80	6	0,1		104
8,0	19	63	26	7,80	8	0,1		105
10,0	22	72	29	9,70	10	0,2		106
12,0	26	83	36	11,70	12	0,2		107
16,0	32	92	42	15,70	16	0,2		108
20,0	38	104	52	19,70	20	0,2		109

Al<10%Si	Al >10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP, GRP
300-400	120-200	160-300	120-200	200-250	300-400	160-300



16718 - 16719

Solid Carbide End Milling Cutters

Z 2

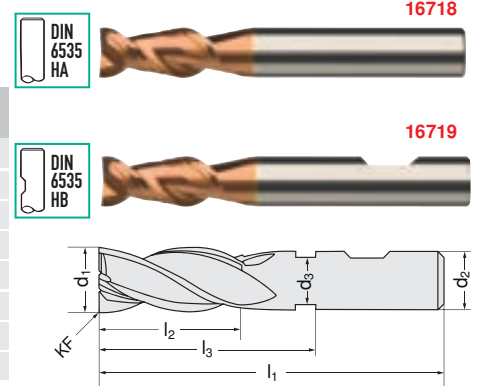
HSC

VHM ZrCN Ultra-ⁿ
ATORN®

 Type
 - With edge chamfer

d ₁ (h9) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	KF mm	16718	...	16719	...
3,0	8	57	18	2,9	6	0,1		101		101
4,0	11	57	18	3,9	6	0,1		102		102
5,0	13	57	20	4,9	6	0,1		103		103
6,0	13	57	20	5,8	6	0,1		104		104
8,0	19	63	26	7,8	8	0,1		105		105
10,0	22	72	29	9,7	10	0,2		106		106
12,0	26	83	36	11,7	12	0,2		107		107
16,0	32	92	42	15,7	16	0,2		108		108

Al<10%Si	Al >10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP, GRP
350-500	150-250	200-350	150-250	250-400	250-500	200-350



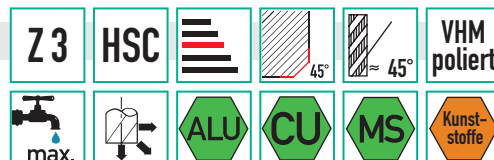
Solid Carbide End Milling Cutters

16722 - 16724

Solid Carbide End Milling Cutters

ATORN®

Type
- With edge chamfer

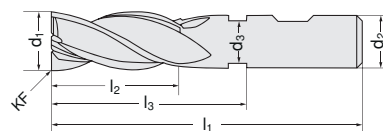


16722



16724

d ₁ (h9) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	KF mm	16722	...	16724	...
3,0	12	57	16	2,8	6	0,1		101		101
4,0	12	57	18	3,8	6	0,1		102		102
5,0	15	57	18	4,7	6	0,1		103		103
6,0	16	57	21	5,6	6	0,1		104		104
8,0	22	64	28	7,6	8	0,1		105		105
10,0	25	73	33	9,6	10	0,2		106		106
12,0	28	84	39	11,4	12	0,2		107		107
16,0	35	93	45	15,4	16	0,2		108		108
20,0	40	104	54	19,4	20	0,2		109		109



Al<10%Si	Al >10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP, GRP
300-450	125-200	175-300	175-300	200-350	300-450	175-300

16725

Solid Carbide End Milling Cutters

ATORN®

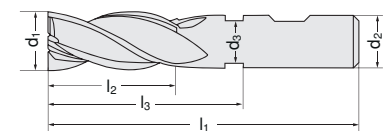
Type
- Sharp-edged



d ₁ (h9) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	16725	...
3,0	12	57	16	2,8	6		101
4,0	12	57	18	3,8	6		102
5,0	15	57	18	4,7	6		103
6,0	16	57	21	5,6	6		104
8,0	22	64	28	7,6	8		105
10,0	25	73	33	9,6	10		106
12,0	28	84	39	11,4	12		107
16,0	35	93	45	15,4	16		108
20,0	40	104	54	19,4	20		109



16725



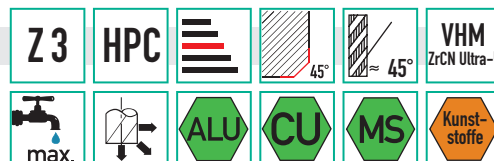
Al<10%Si	Al >10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP, GRP
300-450	125-200	175-300	175-300	200-350	300-450	175-300

16726 - 16727

Solid Carbide End Milling Cutters

ATORN®

Type
- With edge chamfer

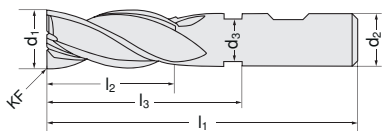


16726



16727

d ₁ (h9) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	KF mm	16726	...	16727	...
3,0	12	57	16	2,8	6	0,1		101		101
4,0	12	57	18	3,8	6	0,1		102		102
5,0	15	57	18	4,7	6	0,1		103		103
6,0	16	57	21	5,6	6	0,1		104		104
8,0	22	64	28	7,6	8	0,1		105		105
10,0	25	73	33	9,6	10	0,2		106		106
12,0	28	84	39	11,4	12	0,2		107		107
16,0	35	93	45	15,4	16	0,2		108		108
20,0	40	104	54	19,4	20	0,2		109		109



Al<10%Si	Al >10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP, GRP
350-500	150-250	200-350	150-250	250-400	350-500	200-350

16728

Solid Carbide End Milling Cutters

ATORN®Type
- Sharp-edged

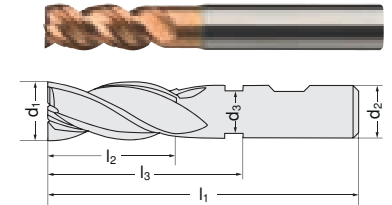
Z3

HPC



d ₁ (h9) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	16728	...
3,0	12	57	16	2,8	6		101
4,0	12	57	18	3,8	6		102
5,0	15	57	18	4,7	6		103
6,0	16	57	21	5,6	6		104
8,0	22	64	28	7,6	8		105
10,0	25	73	33	9,6	10		106
12,0	28	84	39	11,4	12		107
16,0	35	93	45	15,4	16		108
20,0	40	104	54	19,4	20		109

Al<10%Si	Al>10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP, GRP
350-500	150-250	200-350	150-250	250-400	350-500	200-350

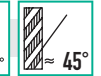


16729 - 16730

Solid Carbide End Milling Cutters

ATORN®Type
- With edge chamfer

Z3



HSC

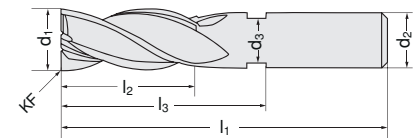
VHM
poliert

d ₁ (h9) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	KF mm	16729	...	16730	...
3,0	15	64	21	2,8	6	0,1		101		101
4,0	19	64	27	3,8	6	0,1		102		102
5,0	20	64	28	4,7	6	0,1		103		103
6,0	20	64	28	5,6	6	0,1		104		104
8,0	38	80	44	7,6	8	0,1		105		105
10,0	45	95	55	9,6	10	0,2		106		106
12,0	53	100	55	11,4	12	0,2		107		107
16,0	63	123	75	15,4	16	0,2		108		108
20,0	65	125	75	19,4	20	0,2		109		109

Al<10%Si	Al>10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP, GRP
300-450	125-200	175-300	175-300	200-350	300-450	175-300



HPC

VHM
ZrCN Ultra-N

16731

Solid Carbide End Milling Cutters

ATORN®Type
- Sharp-edged

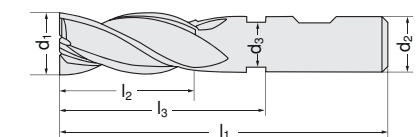
Z3

HPC



d ₁ (h9) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	16731	...
3,0	15	64	21	2,8	6		101
4,0	19	64	27	3,8	6		102
5,0	20	64	28	4,7	6		103
6,0	20	64	28	5,6	6		104
8,0	38	80	44	7,6	8		105
10,0	45	95	55	9,6	10		106
12,0	53	100	55	11,4	12		107
16,0	63	123	75	15,4	16		108
20,0	65	125	75	19,4	20		109

Al<10%Si	Al>10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP, GRP
350-500	150-250	200-350	150-250	250-400	350-500	200-350



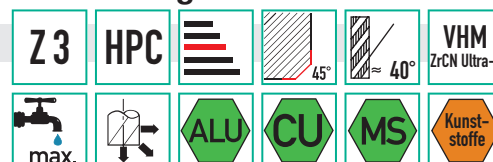
Solid Carbide Roughing End Milling Cutters | Solid Carbide End Milling Cutters

16732 - 16734

Solid Carbide Roughing End Milling Cutters

ATORN®

Type
- With edge chamfer

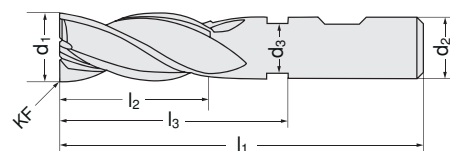


16732



16734

d ₁ (h9) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	KF mm	16732	...	16734	...
6,0	13	57	18	5,6	6	0,4		101		101
8,0	21	63	25	7,6	8	0,4		102		102
10,0	22	72	30	9,6	10	0,4		103		103
12,0	26	83	36	11,4	12	0,4		104		104
16,0	36	92	42	15,4	16	0,4		105		105
20,0	41	104	52	19,4	20	0,4		106		106



Al<10%Si	Al>10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP, GRP
350-500	150-250	200-350	150-250	250-400	350-500	200-350

16735

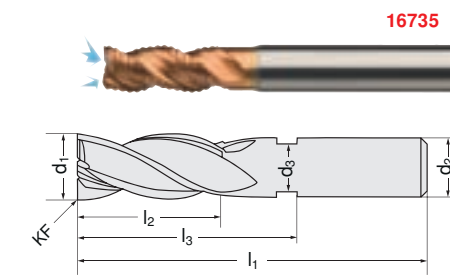
SC roughing end milling cutter with ICF

ATORN®

Type
- With edge chamfer



d ₁ (h9) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	KF mm	16735	...
6,0	13	57	18	5,6	6	0,4		101
8,0	21	63	25	7,6	8	0,4		102
10,0	22	72	30	9,6	10	0,4		103
12,0	26	83	36	11,4	12	0,4		104
16,0	36	92	42	15,4	16	0,4		105
20,0	41	104	52	19,4	20	0,4		106



16735

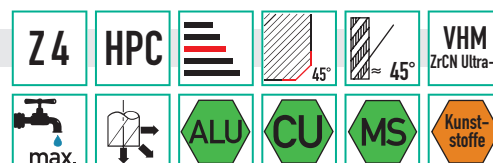
Al<10%Si	Al>10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP, GRP
350-500	150-250	200-350	150-250	250-400	350-500	200-350

16737 - 16738

Solid Carbide End Milling Cutters

ATORN®

Type
- With edge chamfer

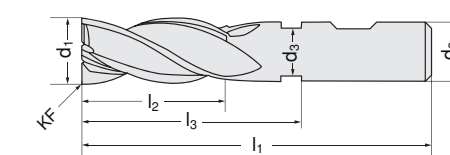


16737



16738

d ₁ (h9) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	KF mm	16737	...	16738	...
3,0	6	57	10	2,8	6	0,1		101		101
4,0	8	57	14	3,8	6	0,1		102		102
5,0	10	57	16	4,7	6	0,1		103		103
6,0	12	57	19	5,6	6	0,2		104		104
8,0	16	63	25	7,6	8	0,2		105		105
10,0	20	72	30	9,6	10	0,2		106		106
12,0	24	83	36	11,4	12	0,2		107		107
16,0	32	92	42	15,4	16	0,2		108		108
20,0	40	104	52	19,4	20	0,2		109		109



Al<10%Si	Al>10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP, GRP
350-500	150-250	200-350	150-250	250-400	350-500	200-350

16739

Solid Carbide End Milling Cutters

ATORN®Type
- With edge chamfer

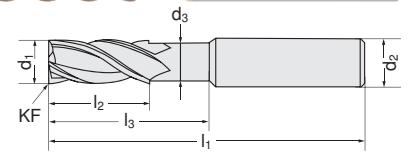
d ₁ (h9) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	KF mm	16739	...
4,0	16	62	22	3,8	6	0,1		101
5,0	17	62	24	4,7	6	0,1		102
6,0	18	62	24	5,6	6	0,2		103
8,0	24	72	30	7,6	8	0,2		104
10,0	30	80	38	9,6	10	0,2		105
12,0	36	93	46	11,4	12	0,2		106
16,0	48	108	58	15,4	16	0,2		107
Al<10%Si		Al >10%Si		Cu long-chipping		Cu short-chipping		
350-500		150-250		200-350		150-250		

Z4

HPC



16739



Thermosetting plastics	Thermoplastics	CFRP, GRP
250-400	350-500	200-350

16740

Solid Carbide End Milling Cutters

ATORN®Type
- With edge chamfer

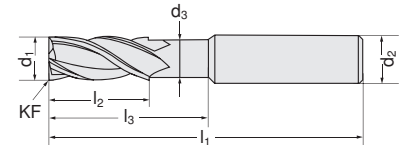
d ₁ (h9) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	KF mm	16740	...
6,0	12	80	42	5,6	6	0,2		101
8,0	16	100	58	7,6	8	0,2		102
10,0	20	100	62	9,6	10	0,2		103
12,0	24	120	75	11,4	12	0,2		104
16,0	32	150	100	15,4	16	0,2		105

Z4

HPC



16740



Al<10%Si	Al >10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP, GRP
300-450	125-200	175-300	125-200	225-350	300-450	175-300

16741

Solid Carbide End Milling Cutters HPC

ATORN®Type
- With edge chamfer

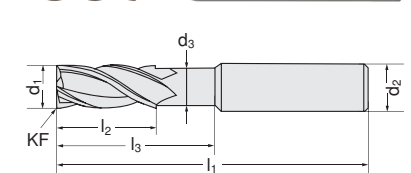
d ₁ (h9) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	KF mm	16741	...
3,0	6	57	10	2,8	6	0,1		101
4,0	8	57	14	3,8	6	0,1		102
5,0	10	57	16	4,7	6	0,1		103
6,0	12	57	19	5,6	6	0,2		104
8,0	16	63	25	7,6	8	0,2		105
10,0	20	72	30	9,6	10	0,2		106
12,0	24	83	36	11,4	12	0,2		107
16,0	32	92	42	15,4	16	0,2		108
20,0	40	104	52	19,4	20	0,2		109

Z4

HPC



16741



Al<10%Si	Al >10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP, GRP
350-500	150-250	200-350	150-250	250-400	350-500	200-350

16742

Solid Carbide End Milling Cutters HPC

ATORN®Type
- With edge chamfer

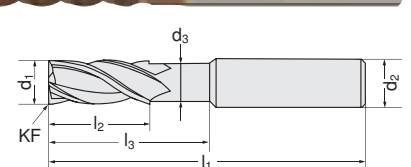
d ₁ (h9) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	KF mm	16742	...
4,0	16	62	22	3,8	6	0,1		101
5,0	17	62	24	4,7	6	0,1		102
6,0	18	62	24	5,6	6	0,2		103
8,0	24	68	30	7,6	8	0,2		104
10,0	30	80	38	9,6	10	0,2		105
12,0	36	93	46	11,4	12	0,2		106
16,0	48	108	58	15,4	16	0,2		107
20,0	60	126	74	19,4	20	0,2		108

Z4

HPC



16742



Al<10%Si	Al >10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP, GRP
350-500	150-250	200-350	150-250	250-400	350-500	200-350

Solid Carbide Torus Milling Cutters

16745

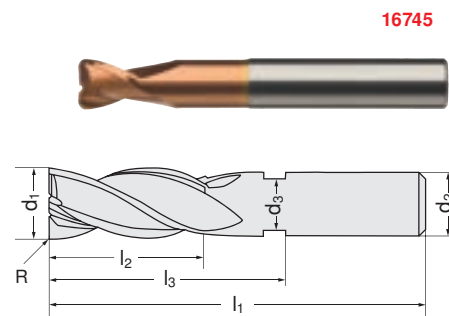
Solid Carbide Torus Milling Cutters

ATORN®

Type
Radius tolerance +/-0,015



d ₁ (e8) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	R mm	16745	...
3,0	4	50	14	2,9	3	0,3	101	
4,0	5	50	16	3,8	4	0,3	102	
5,0	6	54	18	4,8	5	0,3	103	
6,0	7	57	21	5,7	6	0,3	104	
6,0	7	57	21	5,7	6	1,0	105	
6,0	7	57	21	5,7	6	2,0	106	
8,0	9	63	27	7,7	8	0,3	107	
8,0	9	63	27	7,7	8	1,0	108	
8,0	9	63	27	7,7	8	2,0	109	
10,0	11	72	32	9,6	10	0,3	110	
10,0	11	72	32	9,6	10	1,5	111	
10,0	11	72	32	9,6	10	3,0	112	
12,0	12	83	38	11,6	12	1,5	113	
12,0	12	83	38	11,6	12	4,0	114	
16,0	16	92	44	15,5	16	2,0	115	
16,0	16	92	44	15,5	16	4,0	116	



Al<10%Si	Al>10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP, GRP
375-550	175-275	225-375	175-275	275-450	375-550	225-375

16746

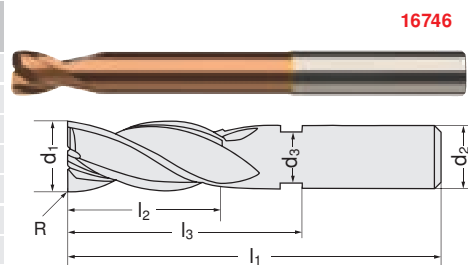
Solid Carbide Torus Milling Cutters

ATORN®

Type
Radius tolerance +/-0,015



d ₁ (e8) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	R mm	16746	...
3,0	4	75	32	2,80	3	0,3	101	
4,0	5	75	36	3,75	4	0,3	102	
5,0	6	75	40	4,70	5	0,3	103	
6,0	7	80	44	5,60	6	0,3	104	
6,0	7	80	44	5,60	6	1,0	105	
6,0	7	80	44	5,60	6	2,0	106	
8,0	9	100	54	7,60	8	0,3	107	
8,0	9	100	54	7,60	8	1,0	108	
8,0	9	100	54	7,60	8	2,0	109	
10,0	11	100	60	9,50	10	0,3	110	
10,0	11	100	60	9,50	10	1,5	111	
10,0	11	100	60	9,50	10	3,0	112	
12,0	12	120	75	11,50	12	1,5	113	
12,0	12	120	75	11,50	12	4,0	114	
16,0	16	150	92	15,50	16	2,0	115	
16,0	16	150	92	15,50	16	4,0	116	



Al<10%Si	Al>10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP, GRP
375-550	175-275	225-375	175-275	275-450	375-550	225-375



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Performance requires quality.

For example, with the diamond grinding wheels and CBN face wheels from ATORN.

- Longest service life with uniformly high stock removal rate
- Premium grinding wheels with vibration-damping body
- Universal implementation, wet grinding and dry grinding

ATORN®
Performance requires quality.

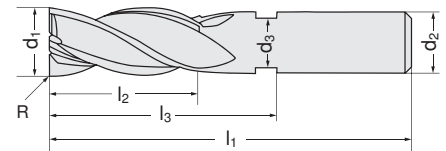
16747

Solid Carbide Torus Milling Cutters

ATORN®Type
Radius tolerance +/-0,015

16747

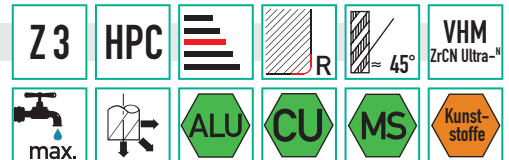
d ₁ (e8) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	R mm	16747	...
6,0	7	120	80	5,6	6	0,3		101
6,0	7	120	80	5,6	6	1,0		102
8,0	9	130	90	7,6	8	0,3		103
8,0	9	130	90	7,6	8	1,0		104
8,0	9	130	90	7,6	8	2,0		105
10,0	11	150	110	9,5	10	0,3		106
10,0	11	150	110	9,5	10	3,0		107
12,0	12	160	115	11,5	12	1,5		108
12,0	12	160	115	11,5	12	4,0		109
16,0	16	200	140	15,5	16	2,0		110



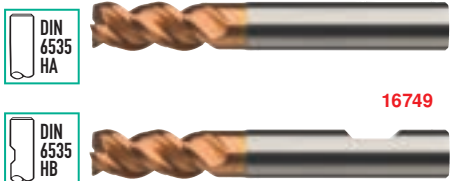
Al<10%Si	Al>10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP, GRP
350-500	150-250	200-350	150-250	250-400	350-500	200-350

16748 - 16749

Solid Carbide Torus Milling Cutters

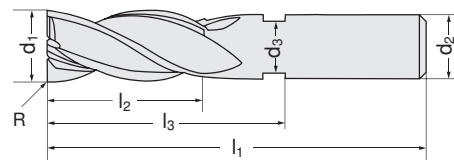
ATORN®Type
Radius tolerance +/-0,015

d ₁ (h9) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	R mm	16748	...	16749	...
5,0	13	57	18	4,7	6	0,5		101		101
5,0	13	57	18	4,7	6	1,0		102		102
6,0	13	57	18	5,6	6	0,5		103		103
6,0	13	57	18	5,6	6	1,0		104		104
8,0	21	63	25	7,6	8	0,5		105		105
8,0	21	63	25	7,6	8	1,0		106		106
10,0	22	72	30	9,6	10	0,5		107		107
10,0	22	72	30	9,6	10	1,0		108		108
12,0	26	83	36	11,4	12	0,5		109		109
12,0	26	83	36	11,4	12	1,0		110		110
16,0	36	92	42	15,4	16	2,0		111		111
16,0	36	92	42	15,4	16	4,0		112		112
20,0	41	104	52	19,4	20	4,0		113		113



16748

16749



Al<10%Si	Al>10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP GRP
375-550	175-275	225-375	175-275	275-450	375-550	225-375



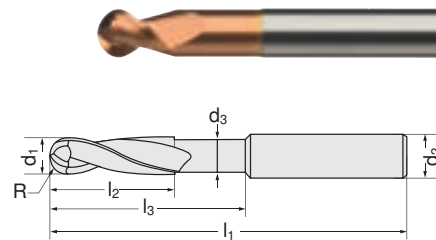
16755

Solid Carbide Radius Milling Cutters

ATORN®Type
Radius tolerance +/-0,015

16755

d ₁ (e8) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	R mm	16755	...
3,0	6	50	16	2,9	3	1,5		101
4,0	7	54	17	3,8	4	2,0		102
5,0	8	54	18	4,8	5	2,5		103
6,0	10	54	21	5,7	6	3,0		104
8,0	12	60	27	7,7	8	4,0		105
10,0	13	67	32	9,6	10	5,0		106
12,0	16	73	38	11,6	12	6,0		107
16,0	20	83	44	15,5	16	8,0		108



Al<10%Si	Al >10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP, GRP
400-550	180-320	250-420	180-320	300-450	400-550	250-420

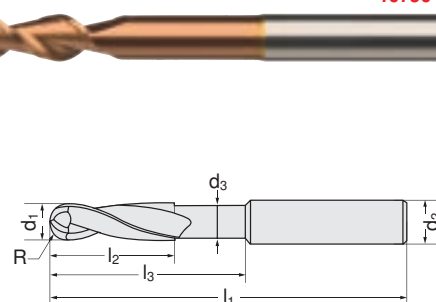
16756

Solid Carbide Radius Milling Cutters

ATORN®Type
Radius tolerance +/-0,015

16756

d ₁ (e8) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	R mm	16756	...
3,0	10	75	32	2,9	3	1,5		101
4,0	13	75	36	3,8	4	2,0		102
5,0	15	75	40	4,8	5	2,5		103
6,0	16	100	44	5,7	6	3,0		104
8,0	22	100	54	7,7	8	4,0		105
10,0	25	100	60	9,6	10	5,0		106
12,0	26	100	60	11,6	12	6,0		107
16,0	30	150	92	15,5	16	8,0		108



Al<10%Si	Al >10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP, GRP
400-550	180-320	250-420	180-320	300-450	400-550	250-420

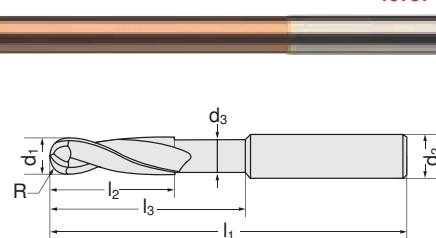
16757

Solid Carbide Radius Milling Cutters

ATORN®Type
Radius tolerance +/-0,015

16757

d ₁ (e8) mm	l ₂ mm	l ₁ mm	l ₃ mm	d ₃ mm	d ₂ (h5) mm	R mm	16757	...
3,0	10	125	82	2,80	3	1,5		101
4,0	13	125	86	3,75	4	2,0		102
6,0	16	150	94	5,60	6	3,0		103
8,0	22	150	104	7,60	8	4,0		104
10,0	25	150	110	9,60	10	5,0		105
12,0	26	150	110	11,40	12	6,0		106



Al<10%Si	Al >10%Si	Cu long-chipping	Cu short-chipping	Thermosetting plastics	Thermoplastics	CFRP, GRP
350-500	150-250	200-350	150-250	250-400	350-500	200-350