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	■	■	■	■								

Overview - HSS-E PM (powder steel) milling cutters (I)

Brand	HW	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN	ATORN
Standard/DIN	Company standard	Company standard	Company standard	Company standard	Company standard	327D	327D	327D	327D
Number of cutting edges	1	3	3	3	3	2	2	2	2
Diameter range mm	3 - 10	1 - 20	1 - 12	2 - 10	2 - 8	1 - 40	1 - 25	2,5 - 25	2,5 - 20
Cutting material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
Coating	–	–	TiAN	–	TiAN	–	TiAN	–	TiAN
Type	Short	Short	Short	Long	Long	Short	Short	Long	Long
Type / profile	W	N	N	N	N	N	N	N	N
Catalogue page	16.15	16.16	16.16	16.16	16.16	16.17	16.17	16.17	16.17
Article number	16010	16020	16022	16030	16032	16060	16062	16073	16074

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	HW	ATORN	ATORN	ATORN	ATORN	HW	HW	HW
Standard/DIN	844B	844B	844B	844B	844B	844B	844B	844B	844B	844B
Number of cutting edges	3	3	3	3	3	4 - 6	4 - 6	4 - 6	4 - 6	4 - 6
Diameter range mm	1,5 - 30	1,5 - 30	4 - 20	2 - 20	2 - 20	2 - 40	2 - 32	5 - 30	6 - 25	6 - 25
Cutting material	HSS-E	HSS-E	PM	HSS-E	HSS-E	HSS-E	HSS-E	PM	PM	PM
Coating	–	TiAN	TiAN	–	TiAN	–	TiAN	TiAN	–	TiAN
Type	Short	Short	Short	Long	Long	Short	Short	Short	Medium	Medium
Type / profile	N	N	N	N	N	N	N	N	N	N
Catalogue page	16.18	16.18	16.18	16.19	16.19	16.20	16.20	16.20	16.21	16.21
Article number	16094	16096	16100	16104	16105	16120	16122	16131	16143	16144

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	○	○		○	○	○	○		○	

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

Overview - HSS-E PM (powder steel) milling cutters (II)

Brand	ATORN	ATORN	HW	HW	HW	HW	HW	HW	HW
Standard/DIN	844B	844B	Company standard	Company standard	844B	844B	844B	844B	Company standard
									
Number of cutting edges	4 - 6	4 - 5	4 - 6	4 - 6	6 - 8	2	3	3	2
Diameter range mm	2 - 32	2 - 25	6 - 25	6 - 25	30 - 50	2 - 22	3 - 20	3 - 20	2 - 20
Cutting material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
Coating	–	TiAN	–	TiAN	–	–	–	–	–
Type	Long	Long	Extra long	Extra long	Short	Short	Short	Long	Short
Type / profile	N	N	N	N	N	W	W	W	Radius
Catalogue page	16.21	16.21	16.22	16.22	16.22	16.22	16.23	16.23	16.23
Article number	16128	16129	16133	16134	16150	16153	16158	16161	16170
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	HW	HW	HW	HW	HW
Standard/DIN	Company standard	Company standard	844B	844B	844B	844B	844B	Company standard	Company standard
									
Number of cutting edges	2	2	3	3	4 - 6	4 - 6	4 - 6	4 - 5	4 - 5
Diameter range mm	2 - 30	2 - 20	6 - 25	6 - 25	10 - 40	10 - 40	8 - 36	10 - 25	6 - 25
Cutting material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
Coating	–	TiAN	–	TiAN	–	TiAN	–	–	TiAN
Type	Long	Long	Short	Short	Short	Short	Long	Special long	Overlong
Type / profile	Radius	Radius	NR	NR	NR	NR	NR	NR	NR
Catalogue page	16.24	16.24	16.24	16.24	16.25	16.25	16.25	16.26	16.26
Article number	16176	16177	16183	16185	16195	16198	16200	16207	16209
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	○		○		○	○	○	○	○

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Info

Overview - HSS-E PM (powder steel) milling cutters (III)

Brand	HHW	HHW	HHW	HHW	HHW	HHW	HHW	HHW	ATORN	HHW
Standard/DIN	844B	Company standard	844B	844B	844B	844B	844B	844B	844B	844B
										
Number of cutting edges	4 - 6	6 - 8	3	3	3	4 - 6	4 - 6	4 - 6	3 - 6	4 - 6
Diameter range mm	6 - 32	30 - 50	6 - 20	6 - 30	6 - 40	6 - 25	6 - 25	6 - 30	4 - 25	6 - 25
Cutting material	PM	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	PM	PM	PM
Coating	TiCN	–	–	–	TiAN	–	TiAN	TiAN	TiAN	TiAN
Type	Short	Short	Short	Short	Short	Short	Short	Short	Short	Medium
Type / profile	NR-Pro	NR	WR	NF	NF	HR	HR	HR	HPC	HR
Catalogue page	16.26	16.27	16.27	16.27	16.27	16.28	16.28	16.28	16.28	16.29
Article number	16203	16205	16210	16220	16223	16260	16262	16268	16270	16271
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	HHW	HHW	HHW	HHW
Standard/DIN	844B	844B	844B	851	850D	1833C	1833C	1833D	1833D	651B
										
Number of cutting edges	4 - 5	4 - 6	3 - 4	6 - 8	8 - 12	6 - 10	6 - 10	6 - 10	6 - 10	4
Diameter range mm	6 - 25	6 - 30	6 - 25	12,5 - 40	10,5 - 45,5	16 - 32	16 - 32	16 - 32	16 - 32	8 - 58
Cutting material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
Coating	–	TiALN	TiAN	–	–	–	–	–	–	–
Type	Long	Long	Short	Short	Short	Short	Short	Short	Short	Short
Type / profile	HR	HR	Radius	N	N	H	H	H	H	N
Catalogue page	16.29	16.29	16.29	16.30	16.30	16.31	16.31	16.31	16.31	16.31
Article number	16277	16278	16281	16370	16375	16380	16381	16382	16383	16385
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	○	○	○	○	○	○	○	○	○	○

83943 - 83944 SystemBoard (modular system)

Type
- Individual fitting through exchangeable inserts (Ø 3-40 mm)
- Frames are ideal for stacking, suitable for warehouse, order picking bins and transport bins.
- Assured protection against damage through extremely high impact-resistance and ductility.
- Excellent dimensional stability under heat (to 120 °C)
- Resistant to solvents, oils and greases

Use
Ideal for sorting, ordering and storing. Process optimisation, precise positioning for automation is possible. Order-based stocking for company-internal logistics processes or for external further processing (e.g. cleaning, coating and transport processes). Space-saving storage and provisioning of tools, turned parts or technical parts.

Quality
Polyamide (PA6)

83943 101
Frame
Use
For accommodation of socket inserts, see cat.-no. 83944.

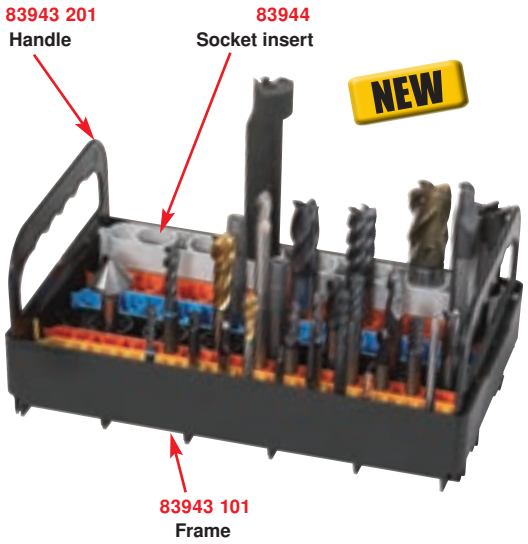
Note:
Optional handles, see cat.-no. 83943 201.

83943 201
Handle
Use
For frame, see cat.-no. 83943 101.

83944
Socket inserts
Type
- Variable height (25 mm or 40 mm) by simply turning

Use
For frame, see cat.-no. 83943 101.

Note:
Ø 3/4, 3/8, 1/2, 1/4 inch available on request.



Type	L x W x H mm	Carrying weight max. kg	Colour	83943 ...
Frame with base	300 x 185 x 57	-	Black	101
Handle	-	8	Black	201

Bore Ø mm	Number of bores per socket insert	Max. number of socket inserts per frame	83944 ...
3	13	12	101
4	13	12	102
5	13	12	103
6	13	12	104
7	13	12	105
8	13	12	106
9	13	12	107
10	13	12	108
11	13	12	109
12	13	12	110
13	7	6	111
14	7	6	112
15	7	6	113
16	7	6	114
17	7	6	115
18	7	6	116

Bore Ø mm	Number of bores per socket insert	Max. number of socket inserts per frame	83944 ...
19	7	6	117
20	7	6	118
21	7	6	119
22	7	6	120
23	7	6	121
24	7	6	122
25	7	6	123
26	7	6	124
28	5	4	125
30	5	4	126
32	5	4	127
34	5	4	128
36	5	4	129
38	5	4	130
40	5	4	131

Placement area L x W mm	Guidance height mm	Number of placement areas per socket insert	Max. number of socket inserts per frame	83944 ...
17 x 17	8,5	28	4	132

16005 End Milling Cutter Stands

Type
Stand body made of red injection plastics. **Stable, handy, good fit.** Tools with short clamping shank project out of the mounting hole, so that they are **easy to remove.** All holes are open at the bottom, **therefore no blockage, caused by, e.g. chips.** Slightly tapered holes for easy handling of milling cutters. Milling cutters not included.

16005 101
Type
Square (182 x 182 x 30 mm), **with 7 different shank receptacle bores** for accommodating 77 **different** shank milling cutters.

16005 102-108
Type
Rectangular (140 x 70 x 30 mm), **shank mounting boreholes** with the same diameter for storing **milling cutters** with same **shank diameter.**
Use
The different stand types can be completed to a stand storage system. Each stand element equipped with **dovetail couplings** on the sides. They provide an invisible connection, therefore combinations look like a one-piece unit.

16005 101

16005 102-108

Shanking mounting bore mm	Shank milling cutter capacity pcs.	16005 ...
6 - 25	77	101
6	72	102
8	50	103
10	32	104
12	21	105
16	18	106
20	10	107
25	8	108

16900 Cutting rate calculator

ATORN® HHW

Use
With the cutting rate calculator (German language) you can quickly and easily find the correct values **for all ATORN and HHW milling cutters and turning tools.**

16900

n min^{-1}	16900 ...
10 - 30.000	101

16010 Single-tooth milling cutter

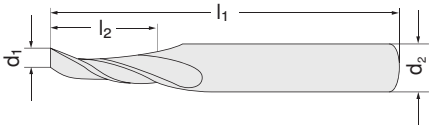
HHW

Type
Straight shank, **with only one cutting edge,** sidewise and face cutting.
Use
For milling slots in aluminium doors and windows on high-speed milling machines.

Quality
HSS-E (Co5)

Z1 | HSS Co5 | ALU

16010



d_1 js14 mm	l_2 mm	l_1 mm	d_2 h6 mm	16010 ...
3,0	12	60	8	101
4,0	12	60	8	102
5,0	13	60	8	103
L 5,0	16	80	8	107

d_1 js14 mm	l_2 mm	l_1 mm	d_2 h6 mm	16010 ...
6,0	16	60	8	104
8,0	16	80	8	105
L 8,0	30	100	8	108
10,0	15	80	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
70	60	60	50	40	30	-	-	-	-	-	-	-	-	-	-	-	-

16020 - 16022 Miniature Milling Cutters

Z 3 | ≈ 30° | DIN 1835 B | Uni

ATORN®

Type
Short, right-hand cut, right-hand helix 30°,
3 cutting edges, centre cut, straight shank with driving face in compliance with DIN 1835 B.

Note:
Regrinding milling cutters with low flute diameters is uneconomical. For that reason, it is cheaper to use the miniature milling cutters up to the wear limit and then to throw them away. You are always using brand new milling cutters and are reducing the risk of rejections.

16020
Quality
HSS-E (Co8).

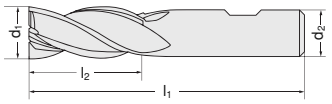
16022
Quality
HSS-E (Co8)/TiAlN-coated.

HSS-E

16020

HSS-E TiAlN

16022



d_1 e8 mm	l_2 mm	l_1 mm	d_2 h6 mm	HSS-E 16020	...	HSS-E/TiAlN 16022	...
1,0	2	34	6		201		201
1,5	3	34	6		202		202
1,8	3	34	6		203		203
2,0	4	35	6		204		204
2,5	5	36	6		206		206
2,8	5	36	6		207		207
3,0	5	36	6		208		208
3,5	6	37	6		210		210
3,8	7	38	6				211
4,0	7	38	6		212		212
4,5	7	38	6		214		214
4,8	8	39	6		215		215
5,0	8	39	6		216		216
5,5	8	39	6		217		217

d_1 e8 mm	l_2 mm	l_1 mm	d_2 h6 mm	HSS-E 16020	...	HSS-E/TiAlN 16022	...
5,75	8	39	6				218
6,0	8	39	6		219		219
6,5	10	42	8				220
7,0	10	42	8				221
7,5	10	42	8				222
8,0	11	43	8		223		223
8,5	11	48	10		224		224
9,0	11	48	10		225		225
9,5	11	48	10		226		226
10,0	13	50	10		227		227
12,0	16	58	12		228		228
16,0	19	64	16		229		
20,0	22	78	20		230		

	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
16020	70	60	60	50	40	40	30	20	-	-	-	-	-	20	15	10	40	-
16022	100	90	90	80	65	65	45	30	-	-	-	-	-	30	20	15	65	-

16030 - 16032 Miniature Milling Cutters

Z 3 | ≈ 30° | DIN 1835 B | Uni

ATORN®

Type
Long, right-hand cut, right-hand helix 30°,
3 cutting edges, centre cut, straight shank with driving face in compliance with DIN 1835 B.

Note:
Regrinding milling cutters with low flute diameters is uneconomical. For that reason, it is cheaper to use the miniature milling cutters up to the wear limit and then to throw them away. You are always using brand new milling cutters and are reducing the risk of rejections.

16030
Quality
HSS-E (Co8).

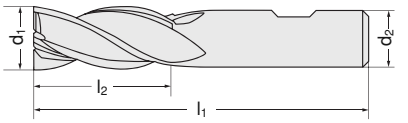
16032
Quality
HSS-E (Co8)/TiAlN-coated.

HSS-E

16030

HSS-E TiAlN

16032



d_1 e8 mm	l_2 mm	l_1 mm	d_2 h6 mm	HSS-E 16030	...	HSS-E/TiAlN 16032	...
2,0	7	38	6		201		201
2,5	8	39	6		202		202
3,0	8	39	6		203		203
3,5	10	41	6		204		204
4,0	11	42	6		205		205
4,5	11	42	6		206		206

d_1 e8 mm	l_2 mm	l_1 mm	d_2 h6 mm	HSS-E 16030	...	HSS-E/TiAlN 16032	...
5,0	13	44	6		207		207
5,5	13	44	6		208		
6,0	13	44	6		209		209
6,5	16	48	8		210		
8,0	19	51	8		212		212
10,0	22	59	10		215		

	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
16030	70	60	60	50	40	40	30	20	-	-	-	-	-	20	15	10	40	-
16032	100	90	90	80	65	65	45	30	-	-	-	-	-	30	20	-	65	-

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

16060 - 16062 Keyway Milling Cutters

Z 2 | DIN 327D | ≈ 30° | N | DIN 1835 B | Uni

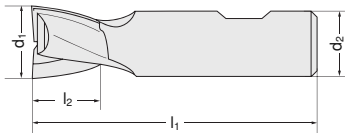
ATORN®

Type

Short, right-hand cut, straight shank with driving face in compliance with DIN 1835 B. Right-hand helix approx. 30°,**2 cutting edges, centre cut.**

16060
HSS-E (Co8).

16062
HSS-E (Co8)/TiAlN-coated.



HSS-E

HSS-E TiAlN

16060

16062

d1 e8 mm	l2 mm	l1 mm	d2 h6 mm	d3 mm	HSS-E 16060	...	HSS-E/TiAlN 16062	...
1,0	2,5	47	6	-		201		201
1,5	3	47	6	-		202		202
2,0	4	48	6	-		203		203
2,5	5	49	6	-		204		204
2,8	5	49	6	-		205		205
3,0	5	49	6	-		206		206
3,5	6	50	6	-		207		207
3,8	7	51	6	-				208
4,0	7	51	6	-		209		209
4,5	7	51	6	-		210		210
4,8	8	52	6	-		211		211
5,0	8	52	6	-		212		212
5,5	8	52	6	-		213		213
5,75	8	52	6	-		214		214
6,0	8	52	6	5,5		215		215
6,5	10	60	10	-		216		216
7,0	10	60	10	-		218		218
7,5	10	60	10	-		219		219
7,75	11	61	10	-		220		220
8,0	11	61	10	7,5		221		221
8,5	11	61	10	-		222		222
9,0	11	61	10	-		224		224

d1 e8 mm	l2 mm	l1 mm	d2 h6 mm	d3 mm	HSS-E 16060	...	HSS-E/TiAlN 16062	...
9,5	11	61	10	-		225		225
9,7	13	63	10	-				226
10,0	13	63	10	9,0		227		227
11,0	13	70	12	-		228		228
11,7	16	73	12	-		229		
12,0	16	73	12	11,0		230		230
13,0	16	73	12	-		231		231
14,0	16	73	12	-		233		233
15,0	16	73	12	-		234		234
16,0	19	79	16	15,0		236		236
17,0	19	79	16	-		237		237
18,0	19	79	16	-		239		239
19,0	19	79	16	-		240		
20,0	22	88	20	19,0		242		242
22,0	22	88	20	-		243		243
25,0	26	102	25	24,0		245		245
26,0	26	102	25	-		246		
28,0	26	102	25	-		247		
30,0	26	102	25	-		248		
32,0	32	112	32	31,0		249		
36,0	32	112	32	-		251		
40,0	38	130	40	39,0		252		

	Al<10% Si	Al>10%Si	Cu	St<520N	St<750 N	St<900N	St<1100 N	St<1200 N	St<1400 N	<50HRC	<55HRC	<60HRC	<67HRC	VA-steel<900N	VA-steel>900 N	Ti-alloy	GG(G)	Plastics
16060	70	60	60	50	50	50	30	20	-	-	-	-	-	20	15	10	40	-
16062	100	90	90	80	65	65	45	30	-	-	-	-	-	30	20	-	65	-

16073 - 16074 Keyway Milling Cutters

Z 2 | DIN 327D | ≈ 30° | N | DIN 1835 B | Uni

ATORN®

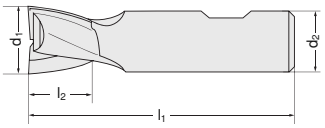
Type

Long, right-hand cut, right-hand helix approx. 30°, **2 cutting edges,** above 4,0 mm Ø **centre cut.** With eccentric relief, above Ø 10,0mm with double relief. Straight shank with driving face in compliance with DIN 1835 B.

Advantage:
No radially ground land, therefore better support and free cut.

16073
HSS-E (Co8).

16074
HSS-E (Co8)/TiAlN-coated.



HSS-E

HSS-E TiAlN

16073

16074

d1 e8 mm	l2 mm	l1 mm	d2 h6 mm	HSS-E 16073	...	HSS-E/TiAlN 16074	...
2,5	8	56	6		201		201
3,0	8	56	6		202		202
3,5	10	59	6		203		
4,0	11	63	6		204		204
4,5	11	63	6		205		
5,0	13	68	6		206		206
5,5	13	68	6		207		207
6,0	13	68	6		208		208
6,5	16	80	10		209		
7,0	16	80	10		210		210

d1 e8 mm	l2 mm	l1 mm	d2 h6 mm	HSS-E 16073	...	HSS-E/TiAlN 16074	...
8,0	19	88	10		211		211
10,0	22	95	10		214		214
12,0	26	110	12		215		215
14,0	26	110	12		216		216
16,0	32	123	16		217		217
18,0	32	123	16		218		218
20,0	38	141	20		219		219
22,0	38	141	20		220		
24,0	45	166	25		221		
25,0	45	166	25		222		

	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
16073	70	60	60	50	40	40	30	20	-	-	-	-	20	15	10	40	-	-
16074	100	90	90	80	65	65	45	30	-	-	-	-	-	30	20	-	65	-

Keyway Milling Cutters

16094 - 16100 Keyway Milling Cutters

Z 3 | DIN 844B | ≈ 30° | N | DIN 1835 B | Uni

Type
- Short
- Right-hand cut
- Right-hand helix approx. 30°
- 3 cutting edges
- Centre cut
- Straight shank with driving face in compliance with DIN 1835 B.

Advantage:
No radially ground land, therefore better support and free cut.

16094
ATORN®
Quality
HSS-E (Co8).

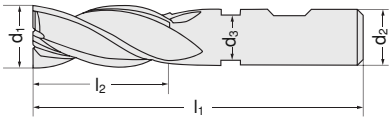
16096
ATORN®
Quality
HSS-E (Co8)/TiAlN-coated.

16100
HW
Use
Also suitable for dry machining.
Quality
HSS-E powder steel/TiAlN-coated.

16094
HSS-E

16096
HSS-E TiAlN

16100
HSS-E-PM TiAlN



					HSS-E		HSS-E/TiAlN		HSS-E-PM/TiAlN	
d_1 e8 mm	l_2 mm	l_1 mm	d_2 h6 mm	d_3 mm	16094	...	16096	...	16100	...
1,5	7	51	6	-		101		101		
2,0	7	51	6	-		102		102		
2,5	8	52	6	-		103		103		
3,0	8	52	6	-		104		104		
3,5	10	54	6	-		105		105		
4,0	11	55	6	-		106		106		201
4,5	11	55	6	-		107		107		
5,0	13	57	6	-		108		108		202
5,5	13	57	6	-		109		109		
6,0	13	57	6	5,5		110		110		203
6,5	16	66	10	-		111		111		
7,0	16	66	10	-		112		112		204
7,5	16	66	10	-		113		113		
8,0	19	69	10	7,5		114		114		205
8,5	19	69	10	-		115		115		
9,0	19	69	10	-		116		116		
10,0	22	72	10	9,0		117		117		206
12,0	26	83	12	11,0		118		118		207
14,0	26	83	12	-		119		119		208
16,0	32	92	16	15,0		120		120		209
18,0	32	92	16	-		121		121		210
20,0	38	104	20	19,0		122		122		211
22,0	38	104	20	-		123		123		
25,0	45	121	25	24,0		124		124		
28,0	45	121	25	-		125		125		
30,0	45	121	25	-		126		126		

	Al<10% Si	Al>10%Si	Cu	St<520N	St<750 N	St<900N	St<1100 N	St<1200 N	St<1400 N	<50HRC	<55HRC	<60HRC	<67HRC	VA-steel<900N	VA-steel>900 N	Ti-alloy	GG(G)	Plastics
16094	70	60	60	50	40	40	30	20	-	-	-	-	-	20	15	10	4	-
16096	100	90	90	80	65	65	45	30	-	-	-	-	-	30	20	-	65	-
16100	140-250	120-140	90-120	80-90	70-80	55-65	50-60	40-50	-	-	-	-	-	40-45	35-40	-	80-90	80-120

Z 3 | DIN 844B | ≈ 30° | N | DIN 1835 B | Uni

ATORN®

Type
- Long
- Right-hand cut
- Right-hand helix approx. 30°
- 3 cutting edges, centre cut
- Straight shank with driving face in compliance with DIN 1835 B.

16104
Quality
HSS-E (Co8).

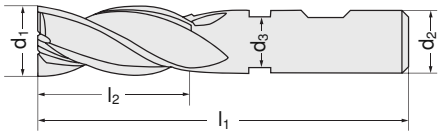
16105
Quality
HSS-E (Co8)/TiAlN-coated.

16104

HSS-E

16105

HSS-E TiAlN



d_1 e8 mm	l_2 mm	l_1 mm	d_2 h6 mm	d_3 mm	HSS-E 16104 ...	HSS-E/TiAlN 16105 ...
2,0	10	54	6	-	101	101
3,0	12	56	6	-	103	103
3,5	15	59	6	-	104	
4,0	19	63	6	-	105	105
4,5	19	63	6	-	106	
5,0	24	68	6	-	107	107
5,5	24	68	6	-	108	108
6,0	24	68	6	5,5	109	109
7,0	30	80	10	-	110	110
8,0	38	88	10	7,5	112	112
10,0	45	95	10	9,0	114	114
12,0	53	110	12	11,0	116	116
14,0	53	110	12	-	118	
16,0	63	123	16	15,0	120	120
18,0	63	123	16	-	122	
20,0	75	141	20	19,0	125	125

	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
16104	70	60	60	50	40	40	30	20	-	-	-	-	-	20	15	10	40	-
16105	100	90	90	80	65	65	45	30	-	-	-	-	-	30	20	-	65	-

Info The HHW colour-code system

With the **HHW** colour-code system you can identify the materials for which the tool is suitable at first glance. In most catalogue areas the **HHW** colour code system additionally informs you of the application data for the respective tool. The **HHW** colour code system is logically structured based on the Key to Steel. Thus you can find the appropriate tools before processing and save time and money.

St<1200N	St<1400N	<45HRC	<55HRC	<60HRC	<67HRC	VA-steel<900N	VA-steel>900N	Ti alloys	GG(G)	plastics
40-50	35-40	-	-	-	-	35-45	35-45	-	80-120	-

Use
Solid carbide types
Coating

P M K
H 42
coated

Designation	W±0,1 mm	R±0,05 mm		18674 ...
GTN-2	2,2	0,16	10 pcs.	113
GTN-3	3,1	0,20	10 pcs.	114

16120 - 16131 End Milling Cutters

Z 4-6 | DIN 844B | ≈ 35° | N | DIN 1835 B | Uni

Type
- Short
- Right-hand cut
- Right-hand helix approx. 35°
- 4-6 cutting edges, centre cut
- Straight shank with driving face in compliance with DIN 1835 B.

16120
ATORN®
Quality
HSS-E (Co8).

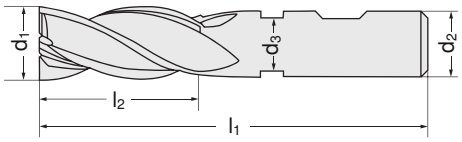
16122
ATORN®
Quality
HSS-E (Co8)/TiAlN-coated.

16131
HW
Use
Also suitable for dry machining.
Quality
HSS-E-PM/TiAlN-coated.

16120
HSS-E

16122
HSS-E TiAlN

16131
HSS-E-PM TiAlN



						HSS-E		HSS-E/TiAlN		HSS-E-PM/TiAlN	
d_1 k10 mm	l_2 mm	l_1 mm	d_2 h6 mm	d_3 mm	Z	16120	...	16122	...	16131	...
2,0	7	51	6	-	4		102		102		
2,5	8	52	6	-	4		103				
3,0	8	52	6	-	4		104		104		
3,5	10	54	6	-	4		105				
4,0	11	55	6	-	4		106		106		
4,5	11	55	6	-	4		107				
5,0	13	57	6	-	4		108		108		301
6,0	13	57	6	5,5	4		110		110		302
7,0	16	66	10	-	4		112		112		
8,0	19	69	10	7,5	4		113		113		304
9,0	19	69	10	-	4		114		114		
10,0	22	72	10	9,0	4		115		115		305
11,0	22	79	12	-	4		116		116		
12,0	26	83	12	11,0	4		117		117		306
13,0	26	83	12	-	4		118		118		
14,0	26	83	12	-	4		119		119		307
15,0	26	83	12	-	4		120		120		
16,0	32	92	16	15,0	4		121		121		308
18,0	32	92	16	-	4		123		123		309
19,0	32	92	16	-	4		124		124		
20,0	38	104	20	19,0	4		125		125		310
22,0	38	104	20	-	5		127		127		
24,0	45	121	25	-	5		129		129		
25,0	45	121	25	24,0	5		130		130		312
28,0	45	121	25	-	6		132		132		
30,0	45	121	25	-	6		133		133		314
32,0	53	133	32	31,0	6		134		134		
40,0	63	155	40	39,0	6		138				

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
16120																	
70-120	40-70	40-70	28-32	25-30	18-25	16-22	12-18	-	-	-	-	-	5-15	3-12	3-12	30-50	50-70
16122																	
70-200	40-150	40-150	75-85	45-55	40-60	20-50	12-40	-	-	-	-	-	5-28	3-25	-	40-70	80-10
16131																	
140-250	120-140	90-120	80-90	70-80	55-65	50-60	40-50		-	-	-	-	40-45	35-40	-	80-90	80-120

16143 - 16144 End Milling Cutters

Z 4-6 | DIN 844B | ≈ 40° | N | DIN 1835 B | Uni

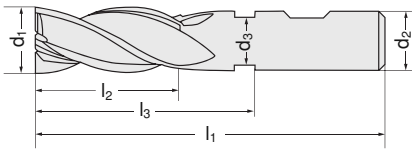
Type
- Medium long
- Right-hand cut
- Right-hand helix approx. 40°
- Centre cut
- 4-6 cutting edges
- With eccentric relief
- With released straight shank with driving face in compliance with DIN 1835 B.

16143
Quality
HSS-E-PM.

16144
Quality
HSS-E-PM/TiAlN-coated.

HSS-E PM — 16143

HSS-E-PM TiAlN — 16144



d_1 k10 mm	l_2 mm	l_3 mm	l_1 mm	d_2 h6 mm	d_3 mm	Z	HSS-E-PM 16143	...	HSS-E-PM/TiAlN 16144	...
6,0	19	27	63	6	5,5	4		104		104
8,0	28	38	78	10	7,5	4		106		106
10,0	35	44	84	10	9,5	4		108		108
12,0	40	52	97	12	11,5	4		110		110
16,0	48	60	108	16	15,5	5		112		112
20,0	60	72	122	20	19,5	6		114		114
25,0	68	92	144	25	24,5	6		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
16143																	
70-120	40-70	40-70	28-32	25-30	18-25	16-22	12-18	-	-	-	-	-	5-15	3-12	3-12	30-50	50-70
16144																	
70-200	40-150	40-150	75-85	45-55	40-60	20-50	12-40	-	-	-	-	-	5-28	3-25	-	40-70	80-100

16128 - 16129 End Milling Cutters

Z 4-6 | DIN 844B | ≈ 30° | N | DIN 1835 B | Uni

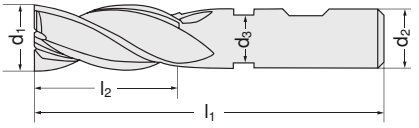
Type
- Long
- Right-hand cut
- Right-hand helix approx. 30°
- 4-6 cutting edges, centre cut
- Straight shank with driving face in compliance with DIN 1835 B
- Starting from 25 mm shank Ø with two driving faces

16128
Quality
HSS-E (Co8).

16129
Quality
HSS-E (Co8)/TiAlN-coated.

HSS-E — 16128

HSS-E TiAlN — 16129



d_1 mm	l_2 mm	l_1 mm	d_2 h6 mm	d_3 mm	Z	HSS-E 16128	...	HSS-E/TiAlN 16129	...
2,0	10	54	6	-	4		201		201
3,0	12	56	6	-	4		203		203
3,5	15	59	6	-	4		204		204
4,0	19	63	6	-	4		205		205
4,5	19	63	6	-	4		206		206
5,0	24	68	6	-	4		207		207
5,5	24	68	6	-	4		208		208
6,0	24	68	6	5,5	4		209		209
7,0	30	80	10	-	4		210		210
8,0	38	88	10	7,5	4		211		211
9,0	38	88	10	-	4		212		212
10,0	45	95	10	9,0	4		213		213

d_1 mm	l_2 mm	l_1 mm	d_2 h6 mm	d_3 mm	Z	HSS-E 16128	...	HSS-E/TiAlN 16129	...
11,0	45	102	12	-	4		214		214
12,0	53	110	12	11,0	4		215		215
14,0	53	110	12	-	4		217		217
16,0	63	123	16	15,0	4		219		219
18,0	63	123	16	-	4		221		221
20,0	75	141	20	19,0	4		223		223
22,0	75	141	20	-	5		224		224
25,0	90	166	25	24,0	5		226		226
28,0	90	166	25	-	6		228		
30,0	90	166	25	-	6		229		
32,0	106	186	32	31,0	6		230		

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
16128																	
70	60	60	50	40	40	30	20	-	-	-	-	-	20	15	10	40	-
16129																	
100	90	90	80	65	65	45	30	-	-	-	-	-	30	20	-	65	-

16133 - 16134 End Milling Cutters

Z 4-6 | ≈ 30° | N | DIN 1835 B | Uni | HSS-E | HSS-E TiAlN

Type
- Extra long
- Straight face
- Right-hand helix approx. 30°
- Straight shank with driving face in compliance with DIN 1835 B.

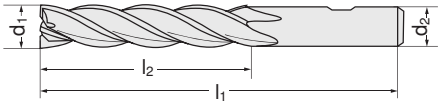
16133
Quality
HSS-E (Co5)

16134
Quality
HSS-E (Co5)/TiAlN-coated.

16133

16134

d_1 k10 mm	l_2 mm	l_1 mm	d_2 h6 mm	Z	HSS-E 16133 ...	HSS-E/TiAlN 16134 ...
6,0	56	100	6	4	206	206
8,0	70	115	10	4	208	208
10,0	75	121	10	4	210	210
12,0	85	130	12	4	212	212
16,0	90	145	16	4	216	216
20,0	110	180	20	5	220	220
25,0	125	200	25	6	225	225



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
16133																	
40-120	40-90	40-90	45-50	30-35	25-38	15-30	10-25	-	-	-	-	-	5-18	3-15	-	24-40	50-60
16134																	
110	85	90	65	55	50	36	28	22	-	-	-	-	18	13	-	38	-

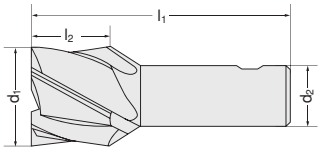
16150 End Milling Cutters

Z 6-8 | DIN 844B | ≈ 30° | N | HSS-E | DIN 1835 B | Uni

Type
Short type, 6-8 cutting edges. With eccentric relief. Straight shank with driving face in compliance with DIN 1835 B. Multi-fluted milling cutters, free in centre on face. Right-hand helix 30°.

Use
For normal to solid materials.
Quality
HSS-E (Co8).

16150



d_1 k10 mm	l_2 mm	l_1 mm	d_2 h6 mm	Z	16150 ...
30,0	30	90	20	6	101
35,0	30	90	20	6	102
40,0	32	95	25	8	103
50,0	36	100	32	8	104

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
70-120	40-70	40-70	28-32	25-30	18-25	16-22	12-18	-	-	-	-	-	5-15	3-12	3-12	30-50	50-70

16153 End Milling Cutters

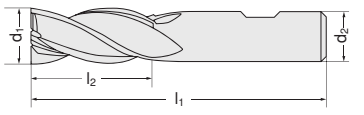
Z 2 | DIN 844B | ≈ 42° | W | HSS-E | DIN 1835 B | ALU

Type
- Short
- Right-hand helix approx. 42°
- 2 cutting edges, centre cut
- Straight shank with driving face in compliance with DIN 1835 B.

Use
For soft to ductile, long-chipping materials such as aluminium and copper alloys.

Quality
HSS-E (Co8).

16153



d_1 e8 mm	l_2 mm	l_1 mm	d_2 h6 mm	16153 ...
2,0	7,0	51	6	101
2,5	8,0	52	6	102
3,0	8,0	52	6	103
4,0	11,0	55	6	105
5,0	13,0	57	6	107
5,5	13,0	57	6	108
6,0	13,0	57	6	109
7,0	16,0	66	10	111

d_1 e8 mm	l_2 mm	l_1 mm	d_2 h6 mm	16153 ...
8,0	19,0	69	10	113
9,0	19,0	69	10	115
10,0	22,0	72	10	116
12,0	26,0	83	12	117
16,0	32,0	92	16	119
18,0	32,0	92	16	120
20,0	38,0	104	20	121
22,0	38,0	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
70	60	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

16158 - 16161 End Milling Cutters

Z 3 | DIN 844B | ≈ 35° | W | HSS-E | DIN 1835 B | ALU

HW

Type
- Right-hand cut
- Right-hand helix approx. 35°
- **3 cutting edges**
- **Centre cut**
- With eccentric relief
- **With released shank with driving face** in compliance with DIN 1835 B.

Use
For soft through ductile, long-chipping materials such as aluminium and copper alloys.

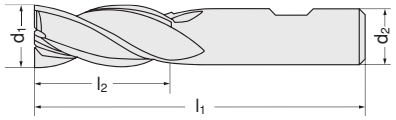
Quality
HSS-E (Co8).

16158
Short type.

16161
Long type.

16158

16161



		short		long		short		long	
d_1 e8 mm	d_2 h6 mm	l_2 mm	l_1 mm	l_2 mm	l_1 mm	16158	...	16161	...
3,0	6	8	52	12	56		201		201
4,0	6	11	55	19	63		202		202
5,0	6	13	57	24	68		203		203
6,0	6	13	57	24	68		204		204
8,0	10	19	69	38	88		205		205
10,0	10	22	72	45	95		206		206
12,0	12	26	83	53	110		207		207
14,0	12	26	83	53	110		208		208
16,0	16	32	92	63	123		210		209
18,0	16	32	92	63	123		211		210
20,0	20	38	104	75	141		212		211

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
60-70	50-60	50-60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60-100

16170 Radius Milling Cutters

Z 2 | ≈ 30° | HSS-E | DIN 1835 B | Uni

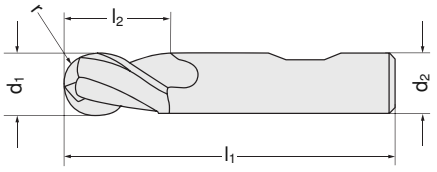
HW

Type
- **Short**
- With transverse radius
- Right-hand cut
- Right-hand helix to 6,0 mm Ø 40°, from 8,0 mm Ø 30°
- **2 cutting edges**
- **Centre cut**
- Radius tolerance +/– 0,04 mm.
- Straight shank with driving face in compliance with DIN 1835 B

Advantage:
No radially ground land, therefore better support and free cut.

Quality
HSS-E (Co8).

16170



d_1 h10 mm	radius mm	l_2 mm	l_1 mm	d_2 h6 mm	16170	...
2,0	1,0	4	48	6		201
3,0	1,5	5	49	6		202
4,0	2,0	7	51	6		203
5,0	2,5	8	52	6		204
6,0	3,0	8	52	6		205
8,0	4,0	11	61	10		206
10,0	5,0	13	63	10		207
12,0	6,0	16	73	12		208
16,0	8,0	19	79	16		210
20,0	10,0	22	88	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
70-120	40-70	40-70	28-32	25-30	18-25	16-22	12-18	-	-	-	-	-	5-15	3-12	3-12	30-50	50-70

16176 - 16177 Radius Milling Cutters

Z 2 | ≈ 30° | DIN 1835 B | Uni

ATORN®

Type
- Long
- With transverse radius
- Right-hand cut
- Right-hand helix approx. 30°
- 2 cutting edges
- Centre cut
- Radius tolerance +/– 0,04 mm.
- Straight shank with driving face in compliance with DIN 1835 B.

16176
Quality
HSS-E (Co8).

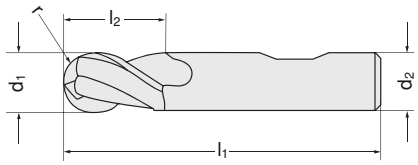
16177
Quality
HSS-E (Co8)/TiAlN-coated.

HSS-E

16176

HSS-E TiAlN

16177



d_1 e8 mm	l_2 mm	l_1 mm	d_2 h6 mm	HSS-E 16176	...	HSS-E/TiAlN 16177	...
2,0	10	54	6		201		201
3,0	12	56	6		202		202
4,0	19	63	6		203		203
5,0	24	68	6		204		204
6,0	24	68	6		205		205
8,0	38	88	10		207		207
10,0	45	95	10		209		209

d_1 e8 mm	l_2 mm	l_1 mm	d_2 h6 mm	HSS-E 16176	...	HSS-E/TiAlN 16177	...
12,0	53	110	12		211		211
16,0	63	123	16		215		215
18,0	69	123	16		217		
20,0	75	141	20		219		219
25,0	90	166	25		222		
30,0	90	166	25		225		

	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
16176																		
	70	60	60	50	40	40	30	20	-	-	-	-	-	20	15	-	40	-
16177																		
	100	90	90	80	65	65	45	30	-	-	-	-	-	30	20	-	65	-

16183 - 16185 Roughing End Milling Cutters

Z 3 | DIN 844B | ≈ 30° | NR | DIN 1835 B | Uni

ATORN®

Type
- Short
- 3 cutting edges
- Centre cut
- Right-hand helix approx. 30°
- Straight shank with driving face in compliance with DIN 1835 B.

16183
Quality
HSS-E (Co8).

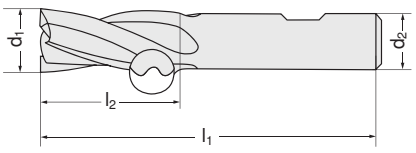
16185
Quality
HSS-E (Co8)/TiAlN-coated.

HSS-E

16183

HSS-E TiAlN

16185



d_1 js12 mm	l_2 mm	l_1 mm	d_2 h6 mm	HSS-E 16183	...	HSS-E/TiAlN 16185	...
6,0	13	57	6		201		201
7,0	16	66	10		202		202
8,0	19	69	10		203		203
9,0	19	69	10		204		204
10,0	22	72	10		205		205
12,0	26	83	12		206		206

d_1 js12 mm	l_2 mm	l_1 mm	d_2 h6 mm	HSS-E 16183	...	HSS-E/TiAlN 16185	...
14,0	26	83	12		207		207
16,0	32	92	16		208		208
18,0	32	92	16		209		209
20,0	38	104	20		210		210
25,0	45	121	25		212		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
16183																		
	70	60	60	50	40	40	30	20	-	-	-	-	-	20	15	10	40	-
16185																		
	100	90	90	80	65	65	45	30	-	-	-	-	-	30	20	-	65	-

16195 - 16198 Roughing End Milling Cutters

Z 4-6 | DIN 844B | ≈ 30° | NR | DIN 1835 B | Uni

Type
- Short
- Right-hand cut
- Right-hand helix approx. 30°
- 4-6 cutting edges
- Centre cut up to Ø 20 mm
above that free in centre
- Straight shank with driving face in compliance with DIN 1835 B
- With eccentric relief

16195
Quality
HSS-E (Co8).

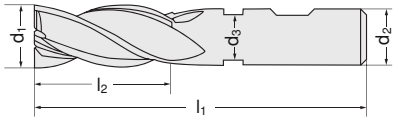
16198
Quality
HSS-E (Co8)/TiAlN-coated.

16195

HSS-E

16198

HSS-E TiAlN



d_1 js12 mm	l_2 mm	l_1 mm	d_2 h6 mm	d_3 mm	Z	HSS-E 16195	...	HSS-E/TiAlN 16198	...
10,0	22	72	10	9,0	4		105		105
11,0	22	79	12	-	4		106		106
12,0	26	83	12	11,0	4		107		107
13,0	26	83	12	-	4		108		108
14,0	26	83	12	-	4		109		109
15,0	26	83	12	-	4		110		110
16,0	32	92	16	15,0	4		111		111
17,0	32	92	16	-	4		112		112
18,0	32	92	16	-	4		113		113
20,0	38	104	20	19,0	4		116		116

d_1 js12 mm	l_2 mm	l_1 mm	d_2 h6 mm	d_3 mm	Z	HSS-E 16195	...	HSS-E/TiAlN 16198	...
22,0	38	104	20	-	5		117		117
24,0	45	121	25	-	5		119		
25,0	45	121	25	24,0	5		120		120
26,0	45	121	25	-	6		121		121
28,0	45	121	25	-	6		122		122
30,0	45	121	25	-	6		123		123
32,0	53	133	32	31,0	6		124		124
36,0	53	133	32	-	6		126		126
40,0	63	155	32	39,0	6		129		129

	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
16195	70	60	60	50	40	40	30	20	-	-	-	-	-	20	15	10	40	-
16198	100	90	90	80	65	65	45	30	-	-	-	-	-	30	20	-	65	-

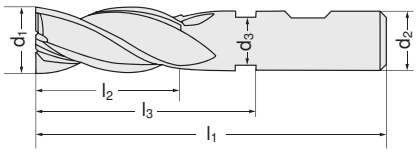
16200 Roughing End Milling Cutters

Z 4-6 | DIN 844B | ≈ 30° | NR | HSS-E | DIN 1835 B | Uni

Type
- Long
- Right-hand cut
- With roughing teeth
- Right-hand helix approx. 30°
- 4-6 cutting edges
- Centre cut to Ø 32 mm
- Straight shank with driving face in compliance with DIN 1835 B.
- With eccentric relief, above Ø 10,0 mm with double relief.

Quality
HSS-E (Co5)

16200



d_1 k12 mm	l_2 mm	l_3 mm	l_1 mm	d_2 h6 mm	d_3 mm	Z	16200	...
8,0	38	48	88	10	7,5	4		100
10,0	45	55	95	10	9,5	4		101
12,0	53	65	110	12	11,5	4		102
14,0	53	65	110	12	11,5	4		103
16,0	63	75	123	16	15,5	4		105
18,0	63	75	123	16	15,5	4		106

d_1 k12 mm	l_2 mm	l_3 mm	l_1 mm	d_2 h6 mm	d_3 mm	Z	16200	...
20,0	75	91	141	20	19,5	4		107
25,0	90	110	166	25	24,5	4		110
30,0	90	110	166	25	24,5	6		113
32,0	106	126	186	32	31,5	6		114
36,0	106	126	186	32	31,5	6		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
40-120	40-90	40-90	45-50	30-35	25-38	15-30	10-25	-	-	-	-	-	5-18	3-15	3-15	24-40	50-60

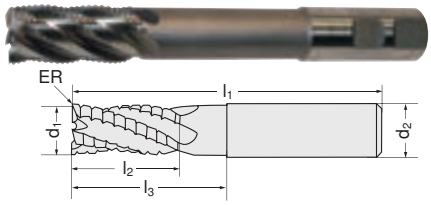
16207 Roughing End Milling Cutters

Z 4-5 | ≈ 35° | NR | HSS-E | DIN 1835 B | Uni

Type
- Special (Long Fellow)
- Right-hand cut
- Right-hand helix approx. 35°
- 4-5 cutting edges
- Centre cut
- Straight shank with driving face in compliance with DIN 1835 B.

Quality
HSS-E (Co8).

16207



d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm	d_3 mm	ER mm	Z	16207 ...
10,0	22	55	95	10	8	1,5	4	110
12,0	26	80	125	12	10	1,6	4	113
16,0	32	90	138	16	14	2,0	4	117

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2 mm	d_3 mm	ER mm	Z	16207 ...
20,0	40	100	150	20	18	2,5	4	121
20,0	40	135	185	20	18	2,5	4	122
25,0	50	140	196	25	23	2,5	5	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
70-120	40-70	40-70	28-32	25-30	18-25	16-22	-	-	-	-	-	-	5-15	3-12	3-12	30-50	50-70

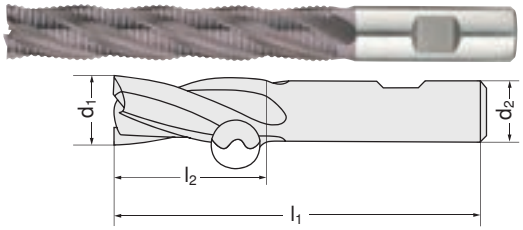
16209 Roughing End Milling Cutters

Z 4-5 | ≈ 30° | NR | HSS-E TiAlN | DIN 1835 B | Uni

Type
- Overlong
- Right-hand cut
- Right-hand helix approx. 30°
- 4-5 cutting edges
- Straight shank with driving face in compliance with DIN 1835 B.

Quality
HSS-E/TiAlN.

16209



d_1 mm	l_2 mm	l_1 mm	d_2 mm	Z	16209 ...
6,0	56	100	6	4	106
8,0	70	115	10	4	108
10,0	75	121	10	4	110
12,0	85	130	12	4	112

d_1 mm	l_2 mm	l_1 mm	d_2 mm	Z	16209 ...
16,0	90	145	16	4	116
20,0	110	180	20	4	120
25,0	125	200	25	5	125

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
70-200	40-150	40-150	75-85	45-55	40-60	20-50	12-40	-	-	-	-	-	5-28	3-25	-	40-70	80-100

16203 Roughing End Milling Cutters

Z 4-6 | DIN 844B | ≈ 30° | NR-Pro | HSS-E-PM TiCN | DIN 1835 B | ≤ 1200 N/mm² | ≤ 1200 N/mm² | Ti/Ni

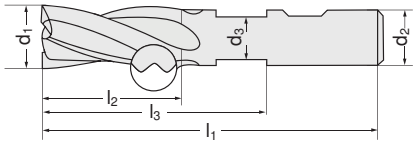
Type
- Short
- Right-hand cut
- Right-hand helix approx. 30°
- 4-6 cutting edges
- Centre cut
- With released shank with driving face in compliance with DIN 1835 B.

Use
For all stainless steels, normal steels **to 1200 N/mm²** strength, pure titanium, annealed titanium alloys, high-temperature alloys.

Quality
HSS-E-PM/TiCN-coated.

Note:
Optimised wear resistance thanks to an even distribution of forces at the knurl.

16203



d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2h6 mm	d_3 mm	Z	16203 ...
6,0	13	21	57	6	5,5	4	101
8,0	19	29	69	10	7,5	4	103
10,0	22	32	72	10	9,5	4	105
12,0	26	38	83	12	11,5	4	107
16,0	32	44	92	16	15,5	4	111

d_1 mm	l_2 mm	l_3 mm	l_1 mm	d_2h6 mm	d_3 mm	Z	16203 ...
18,0	32	44	92	16	15,5	4	113
20,0	38	54	104	20	19,5	4	115
25,0	45	65	121	25	24,5	5	118
32,0	53	73	133	32	31,5	6	125

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
-	-	-	85-90	75-80	70-85	30-35	24-28	-	-	-	-	-	24-28	18-22	8-12	45-50	-

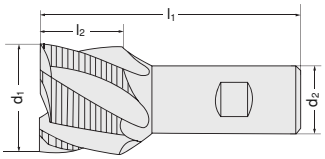
16205 Roughing End Milling Cutters

Z 6-8 | ≈ 35° | NR | HSS-E | DIN 1835 B | Uni

Type
Short, 6-8 cutting edges, straight shank with driving face in compliance with DIN 1835 B. Relief-ground knurl profile, right-hand helix 35°. Roughing teeth.

Quality
HSS-E (Co5)

16205



d_1 k12 mm	l_2 mm	l_1 mm	d_2 h6 mm	Z	16205	...
30,0	30	90	20	6		101
35,0	30	90	20	6		102
40,0	32	95	25	8		103
50,0	36	100	32	8		104

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
70-120	40-70	40-70	28-32	25-30	18-25	16-22	12-18	-	-	-	-	-	5-15	3-12	3-12	30-50	50-70

16210 Roughing End Milling Cutters

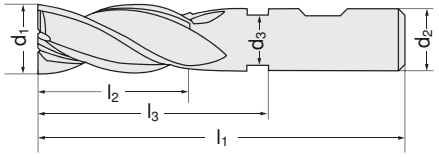
Z 3 | DIN 844B | ≈ 40° | WR | HSS-E | DIN 1835 B

Type
Short, right-hand cut, right-hand helix approx. 40°, **3 cutting edges, centre cut.** Straight shank with driving face in compliance with DIN 1835 B.

Use
For soft to ductile, long-chipping materials such as aluminium and copper alloys.
Quality
HSS-E (Co8).

16210

ALU



d_1 k12 mm	l_2 mm	l_3 mm	l_1 mm	d_2 h6 mm	d_3 mm	16210	...
6,0	13	21	57	6	5,5		101
8,0	19	29	69	10	7,5		102
10,0	22	32	72	10	9,5		103
12,0	26	38	83	12	11,5		104
16,0	32	44	92	16	15,5		106
20,0	38	54	104	20	19,5		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
110-130	70-110	45-60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60-100

16220 - 16223 Roughing/Finishing End Milling Cutters

Z 3 | DIN 844B | ≈ 30° | NF | DIN 1835 B

Type
- Short
- 3 cutting edges
- Right-hand cut
- Centre cut
- Right-hand helix approx. 30°
- Straight shank with driving face in compliance with DIN 1835 B.
- With eccentric relief, above Ø 10,0 mm with double relief.

16220
Quality
HSS-E (Co8).

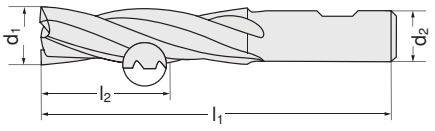
16223
Quality
HSS-E (Co8)/TiAlN-coated.

16220

HSS-E | Uni

16223

HSS-E TiAlN | Uni



d_1 k10 mm	l_2 mm	l_1 mm	d_2 h6 mm	HSS-E 16220	...	HSS-E/TiAlN 16223	...
6,0	13	57	6		101		101
8,0	19	69	10		102		102
10,0	22	72	10		103		103
12,0	26	83	12		104		104
14,0	26	83	12		105		105
16,0	32	92	16		106		106
18,0	32	92	16		107		107
20,0	38	104	20		108		108

d_1 k10 mm	l_2 mm	l_1 mm	d_2 h6 mm	HSS-E 16220	...	HSS-E/TiAlN 16223	...
22,0	38	104	20				109
25,0	45	121	25		110		110
28,0	45	121	25				111
30,0	45	121	25		112		112
32,0	53	133	32				113
36,0	53	133	32				114
40,0	63	155	32				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
16220																	
70	60	60	50	40	40	30	20	-	-	-	-	-	20	15	10	40	-
16223																	
100	90	90	80	65	65	45	30	-	-	-	-	-	30	20	15	65	-

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

16260 - 16268 Roughing End Milling Cutters

Z 4-6 | DIN 844B | ≈ 35° | HR | DIN 1835 B | Uni

Type
- Short
- 4-6 cutting edges
- With eccentric relief
- With released shank with driving face in compliance with DIN 1835 B.
- Fine roughing profile
- Right-hand cut with centre cut
- Right-hand helix approx. 35°

16260
Quality
HSS-E (Co8).

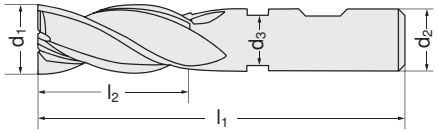
16262
Quality
HSS-E (Co8)/TiAlN-coated.

16268
Use
Also suitable for dry machining.
Quality
HSS-E-PM/TiAlN-coated.

16260
HSS-E

16262
HSS-E TiAlN

16268
HSS-E-PM TiAlN



d_1 k12 mm	l_2 mm	l_1 mm	d_2 h6 mm	d_3 mm	Z	HSS-E 16260 ...	HSS-E/TiAlN 16262 ...	HSS-E-PM/TiAlN 16268 ...
6,0	13	57	6	5,5	4	101	101	101
8,0	19	69	10	7,5	4	102	102	102
10,0	22	72	10	9,0	4	103	103	103
12,0	26	83	12	11,0	4	104	104	104
14,0	26	83	12	-	4	105	105	105
16,0	32	92	16	15,0	4	106	106	106
18,0	32	92	16	-	4	107	107	107
20,0	38	104	20	19,0	4	108	108	108
25,0	45	121	25	24,0	5	109	109	109
30,0	45	121	25	-	6			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
16260																	
70-120	40-70	40-70	28-32	25-30	18-25	16-22	12-18	-	-	-	-	-	5-15	3-12	3-12	30-50	50-70
16262																	
70-200	40-150	40-150	75-85	45-55	40-60	20-50	12-40	-	-	-	-	-	5-28	3-25	3-25	40-70	80-100
16268																	
140-250	120-140	90-120	80-90	70-80	55-65	50-60	40-50	-	-	-	-	-	40-45	35-40	-	60-90	80-120

16270 Roughing End Milling Cutters

Z 3-6 | HPC | DIN 844B | ≈ 45° | 45° | HR | DIN 1835 B | HSS-E-PM TiAlN | VA

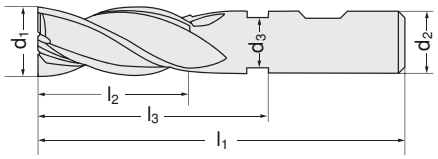
ATORN®

Type
- With high-performance roughing teeth

Use
For roughing applications where the most rigorous requirements are imposed on service life.

Quality
HSS-E-PM/TiAlN-coated.

16270



d_1 js12 mm	l_2 mm	l_3 mm	l_1 mm	d_2 h6 mm	d_3 mm	Z	16270 ...
4,0	11	19	55	6	3,8	3	204
5,0	13	21	57	6	4,8	4	205
6,0	16	21	57	6	5,5	4	206
8,0	16	27	63	8	7,5	4	208
10,0	22	32	72	10	9,5	4	210
12,0	25	38	83	12	11,5	4	212
16,0	32	44	92	16	15,5	5	216
20,0	38	54	104	20	19,5	6	220
25,0	45	65	121	25	24,5	6	225

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St<1300N	<45HRC	<55HRC	<60HRC	<67HRC	VA-steel<900N	VA-steel>900N	Ti-alloy	GG(G)	Plastics
200-450	120-140	60-80	80-90	70-80	50-70	40-50	30-40	30-35	-	-	-	-	40-45	40-45	16-30	-	-

16271 Roughing End Milling Cutters

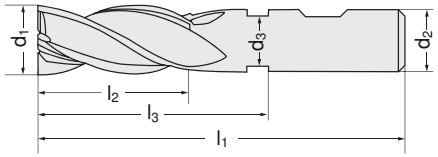
Z 4-6 | DIN 844B | ≈ 35° | HR | HSS-E-PM TiAlN | DIN 1835 B | Uni

Type
Medium length, 4-6 cutting edges, centre cut.
With eccentric relief. With released shank with driving face in compliance with DIN 1835 B, right-hand cut, right-hand helix 35°.

Quality
HSS-E-PM/TiAlN-coated.

16271

d_1 h10 mm	l_2 mm	l_3 mm	l_1 mm	d_2 h6 mm	d_3 mm	Z	16271 ...
6,0	19	27	63	6	5,5	4	104
8,0	28	38	78	10	7,5	4	106
10,0	35	44	84	10	9,5	4	108
12,0	40	52	97	12	11,5	4	110
16,0	48	60	108	16	15,5	5	112
20,0	60	72	122	20	19,5	5	114
25,0	68	88	144	25	24,5	6	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
80-150	70-80	50-70	50-55	40-50	30-40	30-35	25-30	-	-	-	-	-	25-27	20-25	-	35-55	50-70

16277 - 16278 Roughing End Milling Cutters

DIN 844B | ≈ 30° | HR | DIN 1835 B | Uni

Type
Long type, 3-6 cutting edges, centre cut up to Ø 20 mm; above that free in centre. Straight shank with driving face in compliance with DIN 1835 B, fine roughing profile, right-hand helix 30°.

16277
Quality
HSS-E (Co8).

HSS-E

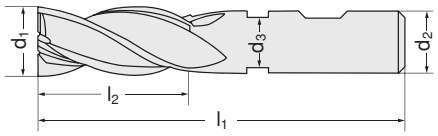
16277

16278
Quality
HSS-E (Co8)/TiAlN-coated.

HSS-E TiAlN

16278

						HSS-E		HSS-E/TiAlN	
d_1 js12 mm	l_2 mm	l_1 mm	d_2 h6 mm	d_3 mm	Z	16277	...	16278	...
6,0	24	68	6	5,5	3	101		101	
8,0	38	88	10	7,5	3	102		102	
10,0	45	95	10	9,0	4	103		103	
12,0	53	110	12	11,0	4	104		104	
14,0	53	110	12	-	4	105		105	
16,0	63	123	16	15,0	4	106		106	
18,0	63	123	16	-	4			107	
20,0	75	141	20	19,0	4	108		108	
22,0	75	141	20	-	5	109		109	
25,0	90	166	25	24,0	5	110		110	
28,0	90	166	25	-	6			111	
30,0	90	166	25	-	6			112	



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
16277																	
70-120	40-70	40-70	28-32	25-30	18-25	16-22	12-18	-	-	-	-	-	5-15	3-12	3-12	-	-
16278																	
70-200	40-150	40-150	75-85	45-55	40-60	20-50	12-40	-	-	-	-	-	5-28	3-25	-	40-70	80-100

16281 Roughing End Milling Cutters

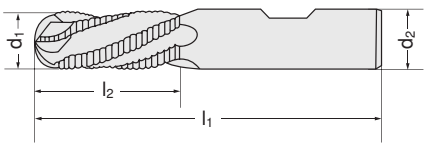
Z 3-4 | DIN 844B | ≈ 35° | HR | HSS-E TiAlN | DIN 1835 B | Uni

Type
Short type, 3 -4 cutting edges, centre cut.
Straight shank with driving face in compliance with DIN 1835 B, fine roughing profile, right-hand helix 35°.

Quality
HSS-E (Co8)/TiAlN-coated.

16281

d_1 js12 mm	l_2 mm	l_1 mm	d_2 h6 mm	Z	16281 ...
6,0	13	57	6	3	101
8,0	19	69	10	3	102
10,0	22	72	10	3	103
12,0	26	83	12	4	104
16,0	32	92	16	4	105
20,0	38	104	20	4	106
25,0	45	121	25	4	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
100	90	90	80	65	65	45	30	-	-	-	-	-	30	20	15	65	-

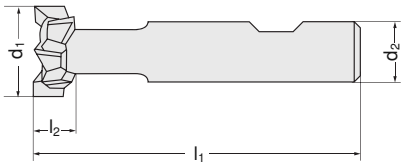
16370 T-Slot Milling Cutters

Z 6-8 | DIN 851 | N | HSS-E | DIN 1835 B | ≤ 1000 N/mm²

Type
- Type N
- 6-8 cutting edges
- Right-hand cut
- Cross-toothed
- Cuts on the perimeter and on the face
- Straight shank with driving face in compliance with DIN 1835 B.

Use
For milling T-slots in compliance with DIN 650.
Quality
HSS-E (Co5)

16370



For T-slots Nominal dimension	d_1 d11 mm	l_2 d11 mm	l_1 mm	d_2 h6 mm	Z	16370	...
6,0	12,5	6	57	10	6		201
8,0	16,0	8	62	10	6		202
10,0	18,0	8	70	12	6		203
10,0	19,0	9	71	12	6		204
12,0	21,0	9	74	12	6		205
12,0	22,0	10	75	12	6		206
14,0	25,0	11	82	16	6		207
16,0	28,0	12	85	16	6		208
18,0	32,0	14	90	16	8		209
20,0	36,0	16	103	25	8		210
22,0	40,0	18	108	25	8		211

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
75-150	30-75	30-45	40-45	30-35	28-30	25-28	-	-	-	-	-	-	20-23	18-20	10-20	22-35	60-120

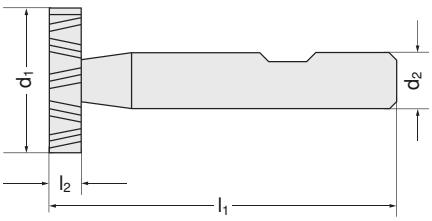
16375 Woodruff keyway milling cutters

Z 6-12 | DIN 850D | HSS-E | DIN 1835 B | ≤ 1000 N/mm²

Type
- 6-12 cutting edges
- Right-hand cut
- Cross-toothed
- Perimeter cutting
- Straight shank with driving face in compliance with DIN 1835 B.

Use
For milling grooves for woodruff keys in compliance with DIN 6888.
Quality
HSS-E (Co5)

16375



d_1 h12 x l_2 e8 mm	for Woodruff keys width x height mm	l_1 mm	d_2 h6 mm	Z	16375	...
10,5 x 2,0	2,0 x 3,7	50	6	8		104
10,5 x 2,5	2,5 x 3,7	50	6	8		105
10,5 x 3,0	3,0 x 3,7	50	6	6		106
13,5 x 3,0	3,0 x 5,0	56	10	6		107
***13,5 x 2,0**	-	56	10	6		125
13,5 x 4,0	4,0 x 5,0	56	10	6		108
16,5 x 3,0	3,0 x 6,5	56	10	6		109
16,5 x 4,0	4,0 x 6,5	56	10	6		110
16,5 x 5,0	5,0 x 6,5	56	10	6		111
19,5 x 4,0	4,0 x 7,5	63	10	8		112
***19,5 x 3,0**	-	63	10	8		126
19,5 x 5,0	5,0 x 7,5	63	10	8		113
19,5 x 6,0	6,0 x 7,5	63	10	8		114
22,5 x 5,0	5,0 x 9,0	63	10	8		115
***22,5 x 4,0**	-	63	10	8		127
22,5 x 6,0	6,0 x 9,0	63	10	8		116
22,5 x 8,0	8,0 x 9,0	63	10	8		117
25,5 x 6,0	6,0 x 10,0	63	10	10		118
***25,5 x 5,0**	-	63	10	10		128
28,5 x 6,0	6,0 x 11,0	63	10	10		119
28,5 x 8,0	8,0 x 11,0	63	10	10		120
28,5 x 10,0	10,0 x 11,0	71	12	10		121
32,5 x 8,0	8,0 x 13,0	71	12	12		122
***32,5 x 6,0**	-	71	12	10		129
32,5 x 10,0	10,0 x 13,0	71	12	12		123
***38,5 x 8,0**	-	71	12	10		130
45,5 x 10,0	10,0 x 16,0	71	12	12		124

*** not DIN 850**

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
75-150	30-75	30-45	40-45	30-35	28-30	25-28	-	-	-	-	-	-	20-23	18-20	10-20	22-35	60-120

16380 - 16383 Single-angle milling cutters

Z 10-12 | H | HSS-E | DIN 1835 B | ≤ 1000 N/mm²

Type
- Straight shank with driving face in compliance with DIN 1835 B.
- Right-hand cut
- **10-12 cutting edges**
- Angle tolerance +/-30°

Use
For milling angled slots (slide guides, etc.).

Quality
HSS-E (Co5)

16380
Type
- **Shape C**
- Flute taper in the direction of the shank
- Cuts on the perimeter and on the front face
- **a = 45°**

DIN 1833C

16381
Type
- **Shape C**
- Flute taper in the direction of the shank
- Cuts on the perimeter and on the face
- **a = 60°**

DIN 1833C

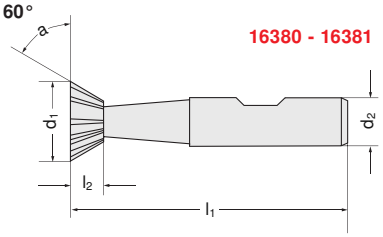
16382
Type
- **Shape D**
- Flute taper in the direction of the front face
- Only perimeter cutting
- **a = 45°**

DIN 1833D

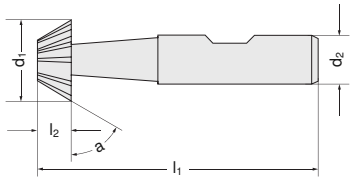
16383
Type
- **Shape D**
- Flute taper in the direction of the front face
- Only perimeter cutting
- **a = 60°**

DIN 1833D

16380 - 16381



16382 - 16383



	45°	60°				45° / C		60° / C		45° / D		60° / D	
d_1 mm	l_2 mm	l_2 mm	l_1 mm	d_2 h6 mm	Z	16380	...	16381	...	16382	...	16383	...
16,0	4,0	6,3	60	12	10		101		101		101		101
20,0	5,0	8,0	63	12	10		102		102		102		102
25,0	6,3	10,0	67	12	10		103		103		103		103
32,0	8,0	12,5	71	16	12		104		104		104		104

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
75-150	30-75	30-45	40-45	30-35	28-30	25-28	-	-	-	-	-	-	20-23	18-20	10-20	22-35	60-120

16385 Radius Milling Cutters

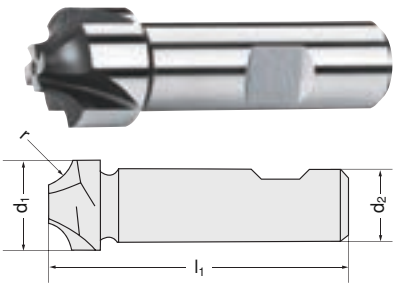
Z 4 | DIN 6518B | HSS-E | DIN 1835 B | ≤ 1000 N/mm²

Type
Concave (quarter circle cutter), straight shank with driving face in compliance with DIN 1835 B. Right-hand cut, **4 cutting edges.**

Use
For materials **to approx. 1000 N/mm²** strength.

Quality
HSS-E (Co5)

16385



r h11 mm	d_1 mm	d_3 js14 mm	l_1 mm	d_2 h6 mm	Z	16385	...
1,0	8	6	60	10	4		101
1,5	10	6	60	10	4		103
2,0	10	6	60	10	4		105
2,5	10	6	60	10	4		106
3,0	12	6	60	12	4		107
3,5	14	6	60	12	4		109
4,0	14	6	60	12	4		110
4,5	16	6	60	12	4		111
5,0	16	6	60	12	4		112

r h11 mm	d_1 mm	d_3 js14 mm	l_1 mm	d_2 h6 mm	Z	16385	...
6,0	21	8	67	16	4		114
8,0	24	8	71	16	4		118
10,0	28	8	85	25	4		119
12,0	35	10	90	25	4		121
14,0	42	16	100	25	4		124
16,0	48	16	100	25	4		126
18,0	54	16	112	32	4		127
20,0	58	16	112	32	4		128

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
75-150	30-75	30-45	40-45	30-35	28-30	25-28	-	-	-	-	-	-	20-23	18-20	10-20	22-35	60-120

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