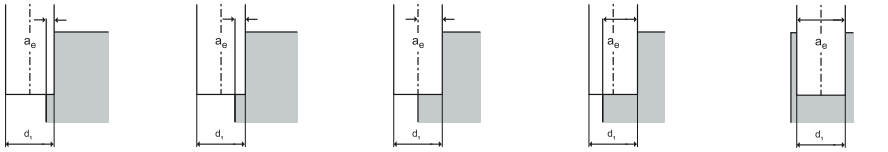
END MILLS

Professional
Cutting Tools

Cutting conditions for solid carbide end mills from groups 632, 633, 634 and 635.

				F_z (Feedrate per tooth) per diameter				
P	**Steel**	**Tensile str. / Hardness**	**V_c [m/min]**	**ø2 - 3**	**ø4 - 5**	**ø6 - 10**	**ø12 - 16**	**ø20**
1.1	Soft construction steel, magnetic steel	< 500 N/mm²	85 - 110	0,02	0,03	0,04	0,07	0,08
1.2	Free cutting steels, constructional steel	300 - 500 N/mm²	80 - 100	0,02	0,04	0,05	0,08	0,12
1.3	Constructional and carbon steel, low-alloy and cast steel	400 - 800 N/mm²	80 - 100	0,02	0,03	0,04	0,07	0,08
1.4	Alloyed steel, cold work tools steel	800 - 1.000 N/mm²	70 - 90	0,02	0,03	0,04	0,07	0,08
1.5	Tempered steel < 38 HRc	1.000 - 1.200 N/mm²	65 - 75	0,01	0,01	0,02	0,03	0,05
1.6	High alloyed steels (hardened) < 44 HRc	1.200 - 1.400 N/mm²	60 - 70	0,01	0,01	0,02	0,03	0,05
M	**Stainless steel**	**Tensile str. / Hardness**	**V_c [m/min]**	**ø2 - 3**	**ø4 - 5**	**ø6 - 10**	**ø12 - 16**	**ø20**
2.1	Ferritic & martensitic stainless steel	400 - 900 N/mm²	45 - 55	0,01	0,01	0,02	0,04	0,05
2.2	Austenitic stainless steel	500 - 900 N/mm²	45 - 55	0,01	0,01	0,02	0,04	0,05
2.3	Austenitic-ferritic stainless steel (Duplex)	500 - 1.200 N/mm²	35 - 45	0,01	0,01	0,02	0,04	0,05
K	**Cast iron**	**Tensile str. / Hardness**	**V_c [m/min]**	**ø2 - 3**	**ø4 - 5**	**ø6 - 10**	**ø12 - 16**	**ø20**
3.1	Grey cast iron	400 - 600 N/mm²	100 - 130	0,02	0,03	0,05	0,08	0,12
3.2	Malleable cast iron	400 - 800 N/mm²	80 - 100	0,01	0,02	0,04	0,07	0,08
3.3	Nodular cast iron	400 - 900 N/mm²	80 - 100	0,01	0,02	0,04	0,07	0,08
N	**NON FERROUS METALS - Aluminium (alloys)**	**Tensile str. / Hardness**	**V_c [m/min]**	**ø2 - 3**	**ø4 - 5**	**ø6 - 10**	**ø12 - 16**	**ø20**
4.1	Unalloyed aluminium	< 500 N/mm²	400 - 500	0,02	0,03	0,05	0,08	0,12
4.2	Aluminium alloys (Si < 7%)	< 700 N/mm²	350 - 450	0,02	0,03	0,05	0,08	0,12
4.3	Aluminium alloys (Si > 7%)	< 900 N/mm²	200 - 250	0,01	0,02	0,04	0,06	0,10
	Copper (alloys)	**Tensile str. / Hardness**	**V_c [m/min]**	**ø2 - 3**	**ø4 - 5**	**ø6 - 10**	**ø12 - 16**	**ø20**
4.4	Unalloyed copper	< 400 N/mm²	80 - 90	0,01	0,02	0,04	0,07	0,10
4.5	Copper- and znc alloys (brass, long chipping)	< 600 N/mm²	90 - 110	0,01	0,02	0,04	0,07	0,10
4.6	Copper- and zinc alloys (brass, short chipping)	< 600 N/mm²	90 - 110	0,01	0,02	0,04	0,07	0,10
4.7	Copper- and aluminium alloys (long chipping)	< 800 N/mm²	80 - 100	0,01	0,02	0,04	0,07	0,10
4.8	Copper- and tin alloys (long chipping)	< 800 N/mm²	80 - 100	0,01	0,02	0,04	0,07	0,10
4.9	Copper- and tin alloys (short chipping)	< 400 N/mm²	80 - 100	0,01	0,02	0,04	0,07	0,10
	Magnesium alloys	**Tensile str. / Hardness**	**V_c [m/min]**	**ø2 - 3**	**ø4 - 5**	**ø6 - 10**	**ø12 - 16**	**ø20**
4.10	Magnesium wrought alloys	< 400 N/mm²						
	Synthetics	**Tensile str. / Hardness**	**V_c [m/min]**	**ø2 - 3**	**ø4 - 5**	**ø6 - 10**	**ø12 - 16**	**ø20**
4.11	Duroplasts (short chipping)	-	105 - 130	0,01	0,02	0,03	0,05	0,07
4.12	Thermoplasts (long chipping)	-	100 - 120	0,01	0,02	0,03	0,05	0,07
4.13	Fibre reinforced plastics	-						
S	**EXOTIC MATERIALS - Titanium (alloys)**	**Tensile str. / Hardness**	**V_c [m/min]**	**ø2 - 3**	**ø4 - 5**	**ø6 - 10**	**ø12 - 16**	**ø20**
5.1	Unalloyed titanium	500 - 600 N/mm²	45 - 55	0,007	0,015	0,025	0,035	0,045
5.2	Titanium alloys	700 - 1.200 N/mm²	35 - 45	0,005	0,010	0,020	0,030	0,038
	Heat resistant materials	**Tensile str. / Hardness**	**V_c [m/min]**	**ø2 - 3**	**ø4 - 5**	**ø6 - 10**	**ø12 - 16**	**ø20**
5.3	Unalloyed nickel	< 600 N/mm²	20 - 25	0,01	0,01	0,02	0,04	0,05
5.4	Nickel alloys	< 1.400 N/mm²	15 - 20	0,01	0,01	0,02	0,03	0,04
H	**High strength steels, hardened steels, hard castings**	**Tensile str. / Hardness**	**V_c [m/min]**	**ø2 - 3**	**ø4 - 5**	**ø6 - 10**	**ø12 - 16**	**ø20**
6.1	Hard(ened) materials (<50 HRc)	< 50 HRc	50 - 60	0,02	0,04	0,05	0,07	0,15
6.2	Hard(ened) materials (<55 HRc)	< 55 HRc	45 - 55	0,02	0,04	0,05	0,07	0,15
6.3	Hard(ened) materials (<60 HRc)	< 60 HRc	35 - 40	0,02	0,04	0,05	0,07	0,15
6.4	Hard(ened) materials (<65 HRc)	< 65 HRc	25 - 30	0,02	0,04	0,05	0,07	0,15

Correction factor (F_x) as a result of milling width A_e with a milling depth (A_p) of 1 x d_1



A_e = 10% x d_1	A_e = 25% x d_1	A_e = 50% x d_1	A_e = 75% x d_1	A_e = 100% x d_1
↓	↓	↓	↓	↓
F_x = 1,0	F_x = 0,8	F_x = 0,7	F_x = 0,5	F_x = 0,4

Calculating the needed rpm:

$$n = \frac{V_c \times 1000}{3{,}14 \times d_1}$$

Calculating the needed feedrate:

$$F = \frac{V_c \times 1000 \times F_z \times Z \times F_x}{3{,}14 \times d_1} = n \times F_z \times F_x$$

V_c = Cutting speed in meters per minute
F_z = Feedrate per cutting edge in millimeters
Z = Number of cutting edges
F_z = Feedrate correction factor
d_1 = Diameter of end mill in millimeters

Example:
Milling free cutting steel with a solid carbide end mill, diameter 12, with 4 cutting edges and 6mm milling width:

$$F = \frac{90 \times 1000 \times 0{,}08 \times 4 \times 0{,}7}{3{,}14 \times 12} = 2.387 \times 4 \times 0{,}08 \times 0{,}7 = 535 \text{ mm/min}$$

DIMENSIONS

DIN 844

Standard defining the dimensions of end mills related to the cutting diameter.

MATERIALS

HSS-E

High-speed steel alloy with an extra element to increase material properties.

SC Ultra-Fine

Solid carbide, ultra fine grain for tougher and more wear resistant properties.

GEOMETRIES

N TYPE

Type N geometry; standard geometry for normal materials.

W TYPE

Type W geometry; sharper geometry for non-ferrous and softer materials.

HR TYPE

Type HR geometry; fine pitched roughing profile.

End mills with 2 cutting edges.

End mills with 3 cutting edges.

End mills with 4 or more cutting edges (depending on diameter)

SHANKS & DRIVES

DIN 1835-B

Standard defining place and dimensions of the weldon slot on a parallel shank.

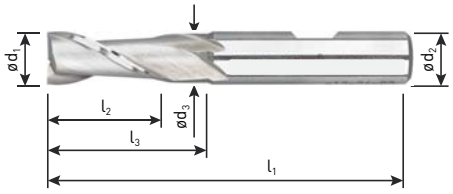
COATINGS

AlCrN

An extremely wear resistant coating with excellent hot hardness and thermal shock stability. In short: The universal coating for superb results in dry and wet machining at high cutting speeds.

HSS-E Slotting end mills, short, weldon

Execution: Short model according to DIN 844, type N, 30° helix angle, cylindrical shank with weldon according to DIN 1835-B.



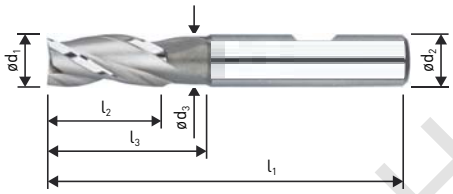
DIN 844 | DIN 1835-B | HSS-E | N TYPE | 30° HELIX | Z=2

ød1	l2	l3	ød3	l1	ød2	Z
1,5	7			51	6	2
2	7			51	6	2
2,5	8			52	6	2
3	8			52	6	2
3,5	10			54	6	2
4	11			55	6	2
4,5	13			57	6	2
5	13			57	6	2
5,5	13			57	6	2
6	13	21	5,5	57	6	2
6,5	16			60	8	2
7	16			60	8	2
7,5	19			63	8	2
8	19	33	7,5	69	8	2
8,5	19			69	10	2
9	19			69	10	2
9,5	22			72	10	2
10	22	32	9	72	10	2
11	22			79	12	2

ød1	l2	l3	ød3	l1	ød2	Z
12	26	38	11	83	12	2
13	26			83	12	2
14	26			83	12	2
15	32			92	16	2
16	32	44	15	92	16	2
17	32			92	16	2
18	32			92	16	2
19	38			104	20	2
20	38	54	19	104	20	2
21	38			104	20	2
22	38			104	20	2
24	45			121	25	2
25	45	65	24	121	25	2
28	45			121	25	2
30	45			121	25	2
32	53	73	31	133	32	2
36	53			133	32	2
40	63	85	39	155	40	2

HSS-E Slotting end mills, short, weldon, coated

Execution: Short model according to DIN 844, type N, 30° helix angle, cylindrical shank with weldon according to DIN 1835-B



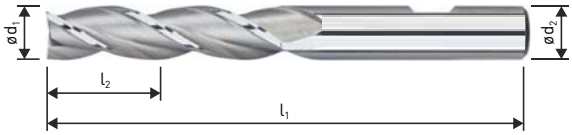
DIN 844 | DIN 1835-B | HSS-E | N TYPE | 30° HELIX | Z=2 | AlCrN

ød1	l2	l3	ød3	l1	ød2	Z
2	7			51	6	2
3	8			52	6	2
4	11			55	6	2
5	13			57	6	2
6	13	21	5,5	57	6	2
7	16			60	8	2
8	19	33	7,5	69	8	2
9	19			69	10	2
10	22	32	9	72	10	2

ød1	l2	l3	ød3	l1	ød2	Z
12	26	38	11	83	12	2
14	26			83	12	2
15	32			92	16	2
16	32	44	15	92	16	2
18	32			92	16	2
20	38	54	19	104	20	2
25	45	65	24	121	25	2
30	45			121	25	2

HSS-E Slotting end mills, long, weldon

Execution: Long model according to DIN 844, type N, 30° helix angle, cylindrical shank with weldon according to DIN 1835-B.



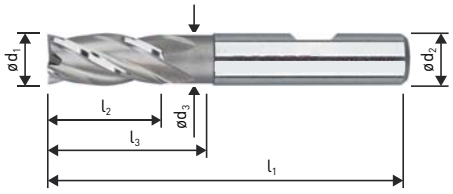
DIN 844 | DIN 1835-B | HSS-E | N TYPE | 30° HELIX | Z=2

ød$_1$	l$_2$	l$_1$	ød$_2$	Z
2,5	**8**	56	6	2
3	**8**	56	6	2
4	**11**	63	6	2
5	**13**	68	6	2
6	**13**	68	6	2
8	**19**	88	8	2
10	**22**	95	10	2

ød$_1$	l$_2$	l$_1$	ød$_2$	Z
12	**26**	110	12	2
14	**26**	110	12	2
16	**32**	123	16	2
18	**32**	123	16	2
20	**38**	141	20	2
24	**45**	166	25	2
25	**45**	166	25	2

HSS-E Universal end mills, short, weldon

Execution: Short model according to DIN 844, type N, 30° helix angle, cylindrical shank with weldon according to DIN 1835-B.



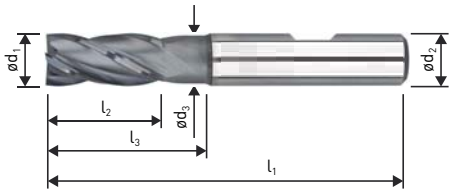
DIN 844 | DIN 1835-B | HSS-E | N TYPE | 30° HELIX | Z=3

ød1	l2	l3	ød3	l1	ød2	Z
1,5	7			51	6	3
2	7			51	6	3
2,5	8			52	6	3
3	8			52	6	3
3,5	10			54	6	3
4	11			55	6	3
4,5	13			57	6	3
5	13			57	6	3
5,5	13			57	6	3
6	13	21	5,5	57	6	3
6,5	16			60	8	3
7	16			60	8	3

ød1	l2	l3	ød3	l1	ød2	Z
8	19	33	7,5	69	8	3
9	19			69	10	3
10	22	32	9	72	10	3
12	26	38	11	83	12	3
14	26			83	12	3
15	32			92	16	3
16	32	44	15	92	16	3
18	32			92	16	3
20	38	54	19	104	20	3
22	38			104	20	3
24	45			121	25	3
25	45	65	24	121	25	3

HSS-E Universal end mills, short, weldon, coated

Execution: Short model according to DIN 844, type N, 30° helix angle, cylindrical shank with weldon according to DIN 1835-B



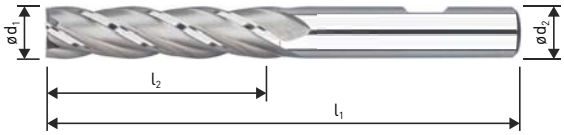
DIN 844 | DIN 1835-B | HSS-E | N TYPE | 30° HELIX | Z=3 | AlCrN

ød1	l2	l3	ød3	l1	ød2	Z
1,5	7			51	6	3
2	7			51	6	3
2,5	8			52	6	3
3	8			52	6	3
4	11			55	6	3
5	13			57	6	3
6	13	21	5,5	57	6	3
8	19	33	7,5	69	8	3

ød1	l2	l3	ød3	l1	ød2	Z
10	22	32	9	72	10	3
12	26	38	11	83	12	3
14	26			83	12	3
16	32	44	15	92	16	3
18	32			92	16	3
20	38	54	19	104	20	3
25	45	65	24	121	25	3

HSS-E Universal end mills, long, weldon

Execution: Long model according to DIN 844, type N, 30° helix angle, cylindrical shank with weldon according to DIN 1835-B.



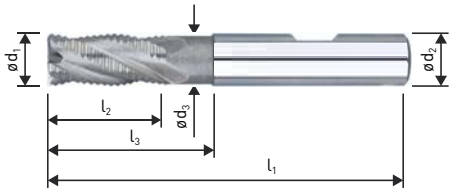
DIN 844 | DIN 1835-B | HSS-E | N TYPE | 30° HELIX | Z=3

ød1	l2	l1	ød2	Z
2	**10**	54	6	3
3	**12**	56	6	3
4	**19**	63	6	3
5	**24**	68	6	3
6	**24**	68	6	3
7	**30**	74	8	3
8	**38**	82	8	3
9	**38**	88	10	3

ød1	l2	l1	ød2	Z
10	**45**	95	10	3
11	**45**	102	12	3
12	**53**	110	12	3
14	**53**	110	12	3
16	**63**	123	16	3
18	**63**	123	16	3
20	**75**	141	20	3

HSS-E End mills, short, weldon

Execution: Short model according to DIN 844, type N, 30° helix angle, cylindrical shank with weldon according to DIN 1835-B.



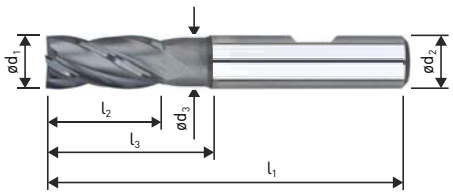
DIN 844 | DIN 1835-B | HSS-E | N TYPE | 30° HELIX | Z ≥ 4

ød1	l2	l3	ød3	l1	ød2	Z
2	7			51	6	4
3	8			52	6	4
4	11			55	6	4
5	13			57	6	4
6	13	21	5,5	57	6	4
7	16			60	8	4
8	19	33	7,5	69	8	4
9	19			69	10	4
10	22	32	9	72	10	4
11	22			79	12	4
12	26	38	11	83	12	4
13	26			83	12	4
14	26			83	12	4
15	32			92	16	4

ød1	l2	l3	ød3	l1	ød2	Z
16	32	44	15	92	16	4
17	32			92	16	4
18	32			92	16	4
19	38			104	20	4
20	38	54	19	104	20	4
22	38			104	20	5
24	45			121	25	5
25	45	65	24	121	25	5
26	45			121	25	6
28	45			121	25	6
30	45			121	25	6
32	53	73	31	133	32	6
36	53			133	32	6
40	63	85	39	155	40	6

HSS-E End mills, short, weldon, coated

Execution: Short model according to DIN 844, type N, 30° helix angle, cylindrical shank with weldon according to DIN 1835-B



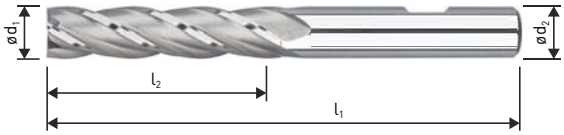
DIN 844 | DIN 1835-B | HSS-E | N TYPE | 30° HELIX | Z ≥ 4 | AlCrN

ød1	l2	l3	ød3	l1	ød2	Z
2	7			51	6	4
3	8			52	6	4
4	11			55	6	4
5	13			57	6	4
6	13	21	5,5	57	6	4
8	19	33	7,5	69	8	4
10	22	32	9	72	10	4
12	26	38	11	83	12	4

ød1	l2	l3	ød3	l1	ød2	Z
14	26			83	12	4
16	32	44	15	92	16	4
18	32			92	16	4
20	38	54	19	104	20	4
25	45	65	24	121	25	5
30	45			121	25	6
32	53	73	31	133	32	6

HSS-E End mills, long, weldon

Execution: Long model according to DIN 844, type N, 30° helix angle, cylindrical shank with weldon according to DIN 1835-B.



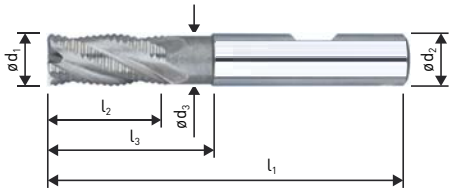
DIN 844 | DIN 1835-B | HSS-E | N TYPE | 30° HELIX | Z ≥ 4

ød1	l2	l1	ød2	Z
2	**10**	54	6	4
3	**12**	56	6	4
4	**19**	63	6	4
5	**24**	68	6	4
6	**24**	68	6	4
7	**30**	74	8	4
8	**38**	82	8	4
9	**38**	88	10	4
10	**45**	95	10	4
11	**45**	102	12	4
12	**53**	110	12	4

ød1	l2	l1	ød2	Z
14	**53**	110	12	4
16	**63**	123	16	4
18	**63**	123	16	4
20	**75**	141	20	4
22	**75**	141	20	5
25	**90**	166	25	6
30	**90**	166	25	6
32	**106**	186	32	6
36	**106**	186	32	6
40	**125**	217	40	6

HSS-E Roughing end mills, short, weldon

Execution: Short model according to DIN 844, fine pitched roughing profile type HR, 30° helix angle, cylindrical shank with weldon according to DIN 1835-B.



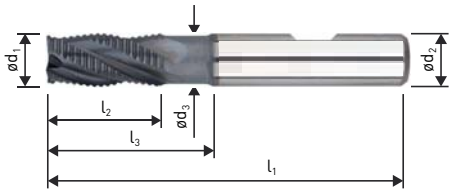
DIN 844 | DIN 1835-B | HSS-E | HR TYPE | 30° HELIX | Z ≥ 4

ød1	l2	l3	ød3	l1	ød2	Z
4	**11**			55	6	4
5	**13**			57	6	4
6	**13**	21	5,5	57	6	4
7	**16**			60	8	4
8	**19**	33	7,5	63	8	4
9	**19**			69	10	4
10	**22**	32	9	72	10	4
11	**22**			79	12	4
12	**26**	38	11	83	12	4
13	**26**			83	12	4
14	**26**			83	12	4
15	**32**			92	16	4

ød1	l2	l3	ød3	l1	ød2	Z
16	**32**	44	15	92	16	4
18	**32**			92	16	4
20	**38**	54	19	104	20	4
22	**38**			104	20	4
25	**45**	65	24	121	25	5
26	**45**			121	25	6
28	**45**			121	25	6
30	**45**			121	25	6
32	**53**	73	31	133	32	6
36	**53**			133	32	6
40	**63**	85	39	155	40	6

HSS-E Roughing end mills, short, weldon, coated

Execution: Short model according to DIN 844, fine pitched roughing profile type HR, 30° helix angle, cylindrical shank with weldon according to DIN 1835-B



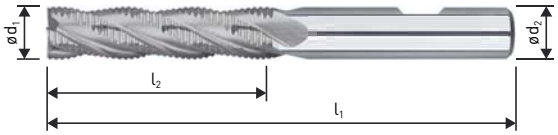
DIN 844 | DIN 1835-B | HSS-E | HR TYPE | 30° HELIX | Z ≥ 4 | AlCrN

ød1	l2	l3	ød3	l1	ød2	Z
4	**11**			55	6	4
5	**13**			57	6	4
6	**13**	21	5,5	57	6	4
8	**19**	33	7,5	63	8	4
10	**22**	32	9	72	10	4
12	**26**	38	11	83	12	4

ød1	l2	l3	ød3	l1	ød2	Z
14	**26**			83	12	4
16	**32**	44	15	92	16	4
18	**32**			92	16	4
20	**38**	54	19	104	20	4
25	**45**	65	24	121	25	5
32	**53**	73	31	133	32	6

HSS-E Roughing end mills, long, weldon

Execution: Long model according to DIN 844, fine pitched roughing profile type HR, 30° helix angle, cylindrical shank with weldon according to DIN 1835-B.



DIN 844 | DIN 1835-B | HSS-E | HR TYPE | 30° HELIX | Z ≥ 4

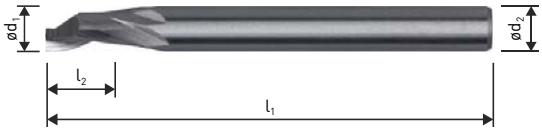
ød1	l2	l1	ød2	Z
6	**24**	68	6	4
8	**38**	88	8	4
10	**45**	95	10	4
12	**53**	110	12	4
14	**53**	110	12	4
16	**63**	123	16	4

ød1	l2	l1	ød2	Z
18	**63**	123	16	4
20	**75**	141	20	4
22	**75**	141	20	5
25	**90**	166	25	5
28	**90**	166	25	6
30	**90**	166	25	6

HSS-E Single fluted end mills

Execution: Single fluted end mills with cylindrical shank according to DIN 1835-A. Higher (sharper) cutting angle specifically for aluminium and plastics.

Application: Typically used in the plastic and aluminium working industry, for example for routing key-holes in aluminium door and window profiles.



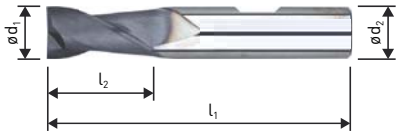
DIN 1835-A | HSS-E | W TYPE | 30° HELIX

ød1	l1	l2	ød2
4,0	60	12	8,0
5,0	60	12	8,0
5,0	80	18/35	8,0
6,0	60	14	8,0
6,0	90	16	8,0

ød1	l1	l2	ød2
8,0	80	14	8,0
8,0	100	14/68	8,0
10,0	80	14	8,0
10,0	80	14	10,0

Solid carbide slotting end mills

Execution: Solid carbide slotting end mills, short model, cylindrical shank with weldon according to DIN 6535-HB, with TiAlN-coating.



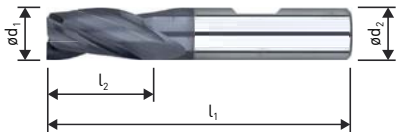
DIN 6535-HB | VHM UF | N TYPE | 30° HELIX | Z=2 | TiAlN

ød1	l2	l1	ød2	Z
1	5	50	6	2
2	6	50	6	2
3	6	50	6	2
4	8	50	6	2
5	8	50	6	2
6	16	50	6	2

ød1	l2	l1	ød2	Z
8	20	60	8	2
10	22	70	10	2
12	22	70	12	2
16	25	75	16	2
20	32	100	20	2

Solid carbide universal end mills

Execution: Solid carbide universal end mills, short model, cylindrical shank with weldon according to DIN 6535-HB, with TiAlN-coating.



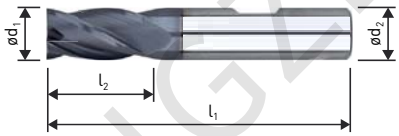
DIN 6535-HB | VHM UF | N TYPE | 30° HELIX | Z=3 | TiAlN

ød1	l2	l1	ød2	Z
1	5	50	6	3
2	6	50	6	3
3	6	50	6	3
4	8	50	6	3
5	8	50	6	3
6	16	50	6	3

ød1	l2	l1	ød2	Z
8	20	60	8	3
10	22	70	10	3
12	22	70	12	3
16	25	75	16	3
20	32	100	20	3

Solid carbide square end mills, short, coated

Execution: Solid carbide square end mills, short model, cylindrical shank with weldon according to DIN 6535-HB, with TiAlN-coating.



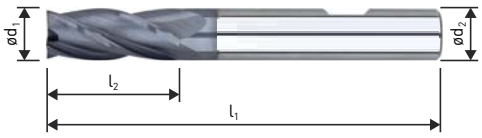
DIN 6535-HB | VHM UF | N TYPE | 30° HELIX | Z=4 | TiAlN

ød1	l2	l1	ød2	Z
1	5	50	6	4
2	7	50	6	4
3	8	50	6	4
4	11	50	6	4
5	13	50	6	4
6	16	50	6	4

ød1	l2	l1	ød2	Z
8	20	60	8	4
10	22	70	10	4
12	22	70	12	4
16	25	75	16	4
20	32	100	20	4

Solid carbide square end mills, long, coated

Execution: Solid carbide square end mills, long model, cylindrical shank with weldon according to DIN 6535-HB, with TiAlN-coating.



DIN 6535-HB | VHM UF | N TYPE | 30° HELIX | Z=4 | TiAlN

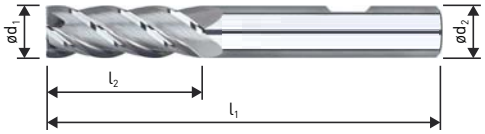
ød1	l2	l1	ød2	Z
3	12	50	6	4
4	15	50	6	4
5	20	60	6	4
6	20	60	6	4
8	25	70	8	4

ød1	l2	l1	ød2	Z
10	30	90	10	4
12	30	90	12	4
16	50	110	16	4
20	55	110	20	4

Solid carbide end mills for non-ferrous metals

Execution: Solid carbide end mills, cylindrical shank with weldon according to DIN 6535-HB. Special polished cutting geometry and an optimized helix angle (39°) for non-ferrous metals.

Application: Specific cutting geometry for non-ferrous metals such as aluminium and copper. The optimized helix angle ensures a smooth cut and a good chip evacuation.



DIN 6535-HB | VHM UF | W TYPE | 39° HELIX | Z=4

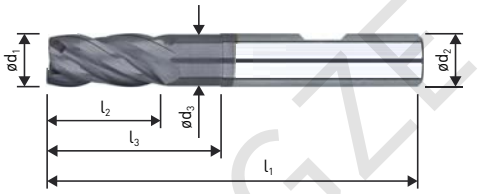
ød1	l2	l1	ød2	Z
4	15	50	6	4
5	20	60	6	4
6	20	60	6	4
8	25	70	8	4

ød1	l2	l1	ød2	Z
10	30	90	10	4
12	30	90	12	4
16	50	110	16	4
20	55	110	20	4

Solid carbide HPC end mills

Execution: Solid carbide end mills, cylindrical shank with weldon according DIN 6535-HB. Special DHC (Double helix cutter) geometry for high performance cutting (HPC) applications. Differential helixes (2 flutes with 35° and 2 flutes with 38°) and a TiAlN-coating for more tool life.

Application: The double helix design ensures a smooth and nearly vibration free cut allowing machining at very high metal removal rates and yet realising an excellent surface finish on the machined workpieces.



DIN 6535-HB | VHM UF | N TYPE | 35°/38° HELIX | Z=4 | TiAlN

ød1	l2	l3	ød3	l1	ød2	Z
3	11	21	2,6	57	6	4
4	11	21	3,6	57	6	4
5	13	21	4,6	57	6	4
6	13	21	5,5	57	6	4
8	19	27	7,5	63	8	4
10	22	32	9,5	72	10	4

ød1	l2	l3	ød3	l1	ød2	Z
12	26	38	11,5	83	12	4
14	26	42	13,5	83	14	4
16	32	44	15,5	92	16	4
18	32	50	17,5	92	18	4
20	38	54	19,5	104	20	4