The Alu-XP range:
Exceptional performance and reliability.

ISO 13399 is an international technical standard for the representation and exchange of data about cutting tools and toolholders, which simplifies the data transfer between different software systems. We are working towards providing information for all our tools to this standard, making the interchange of tooling information more straightforward. Further details regarding this standard will be available in our main catalogues.

Alu-XP tools with “mirror polished” flutes allow for smooth chip evacuation, giving better surface finish and wear resistance. Cutting edges are optimised to minimise vibration, and 3-flute tools have a tight diameter tolerance giving excellent process reliability.

All tools are also available to order with optional NX coating, which maintains the sharpness of the cutting edge whilst giving exceptional tool life.

The tools in this catalogue are suitable for Aluminium and some for Copper and Acrylic. Please refer to our other catalogues for different materials.

ALU-XP

Material Group Examples

▸ EMG = Europa Material Group. VDI = VDI 3323 material group

10. Steel **P**	EMG	Magnetic soft steels	11	Structural steels	12	Plain carbon steels	13	Alloy steels	14
	VDI		1, 2		3, 4		5		6-9
		EN1 EN2 OSOA12 230Mo7		EN3A, 4, 5, 6, 7, 8 060A35 040A10 EN32 210M15		EN9, 10 EN43 070M20 060A62 080M46		EN16, 17, 19 BO1 BO2 D2 D3	
10. Hardened Steel **H**	EMG	Alloy/Tempered steels	15	Hardened steels	16				
	VDI		10, 11		38, 39				
		S95, 98, 99 EN24T BH11 BH13 830M31		>45 HRc Hardox400 Hardox500 P20					
20. Stainless Steel **M**	EMG	Free machining	21	Austenitic	22	Martensitic/Ferritic	23		
	VDI		12		14		13		
		EN56, 58 303S21 304S15		EN58J 316S 321S17 420S37		Duplex, Super Duplex 15-5PH 17-4 PH S130			
30. Cast Iron **K**	EMG	Grey cast iron soft	31	Grey cast iron hard	32	Nodular graphite	33	Nodular graphite	34
	VDI		15		16		17, 18		19, 20
		GG10 GG20 GG30 GG40		GG25 GG35 GF150		GGG40 GGG50 SG Iron		GGG70 GGG80 Meehanite	
40. Titanium **S**	EMG	Titanium unalloyed	41	Titanium alloys	42	Titanium alloys	43		
	VDI		36		37		37		
		Pure Titanium TA1 - 9 Ti99.0		Ti6Al4V Ti6Al2Sn4Zr2Mo Ti4Al4Mo2Sn0.5Si		Ti10Al2Fe3Al Ti5Al5V5Mo3Cr Ti7Al4Mo Ti3Al8V6Cr4Zr4Mo Ti6Al6V6Sn Ti15V3 Cr3Sn3Al			
50. Nickel **S**	EMG	Nickel unalloyed	51	Heat resisting alloys	52	Heat resisting alloys	53		
	VDI		31, 32		33		34, 35		
		NA11 NA12 Nickel 200		Nimonic 75 Hastelloy C Inconel 601, 617, 625 Incoloy 800, 825 Monel 400		Nimonic 80 Rene 41 Inconel 718, 750-X Incoloy 925 Monel K-500 Waspaloy			
60. Copper **N**	EMG	Copper unalloyed	61	Short chip alloys	62	Long chip alloys	63	Cu - Al - Fe alloys	64
	VDI		26		26		27		28
		Commercially pure C101		CZ120 PB104 G-CuSn5ZnPb		CZ106 CZ108 CuZn37		Ampco18 Ampco20 Ampco26	
70. Aluminium **N**	EMG	Aluminium, unalloyed	71	Aluminium, Si <0.5%	72	Aluminium, Si 0.5-10%	73	Aluminium, Si >10%	74
	VDI		21		22		23, 24		25
		Al99.5H Al99.9 Al99.9Mg0.5		AlMn1 AlMn1Mg0.5 LM5, 10, 12 6061		HE9, 30 LM2, 4, 16, 18, 21-27 6082 6063		G-AlSi10Mg G-AlSi12 G-MgAl6 LM6, 12, 13, 20, 28-30	
80. Synthetics **O**	EMG	Thermoplastics	81	Thermosetting plastics	82	Reinforced plastics	83	Graphite	84
	VDI		30		29		29		
		Nylon Acetal		Tufnol		CFRP, GFRP Circuit Board Kevlar		Synthetic Graphite	

▸ For full material group tables, refer to main catalogues

ALU-XP

Optional NX Coating: High performance for Aluminium.

All the tools in this catalogue are available with optional NX coating. It has a smooth coating surface with consistently sharp tool edges, even on smaller diameters - the sharper the edge and smoother the surface equals more efficient manufacturing and longer tool life.

- Single layer coating: 0.5 - 1.5µm
- High coating hardness: >5000HV
- Hot hardness: >500°C.
- MQL and dry machining possible.
- Low tendency to adhesion.

N O

Icon guide

MG HM	FHA 30°	ZEFP 3	KCH 45°	RE
Material Micro-grain Carbide	Helix Angle	Number of Flutes	Chamfer Angle	Radius
NECK		DIN 6535HA	DIN 6535HB	ALU
Neck Relief	Machining Direction	Shank Type Plain DIN6535-HA	Shank Type Flat DIN6535-HB	Knuckle Form

Trochoidal Milling	Side Milling	Slotting
Corner Radius	Planing	Profiling

APPLICATION GUIDE

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N								O				MACHINING GUIDE						
61	62	63	64	71	72	73	74	81	82	83	84							
																SINGLE FLUTE ROUTER		
															Series (TSYC)	Item	Description	Page No.
				•	•	•	•	•	•						**135303**		Long Length 2.0mm - 12.0mm	**P.6**
																2 FLUTE		
				•	•	•	•								**152303**		Short Length 45º Helix ø3.0mm - 20.0mm	**P.7**
				•	•	•	•								**151303**		Long Length 45º Helix ø1.0mm - 20.0mm	**P.8**
				•	•	•	•								**154303**		Long Series 45º Helix ø1.0mm - 20.0mm	**P.9**
				•	•	•	•								**155303**		Extended Neck 30º Helix Corner Radius ø4.0mm - 20.0mm	**P.10**
o	o	o	o	•	•	•	•								**112303**		Extended Neck 50º Helix Ball Nose ø6.0mm - 20.0mm	**P.11**
																3 FLUTE		
				•	•	•	•								**143303**		Long Length 45º Helix ø3.0mm - 20.0mm	**P.12**
				•	•	•	•								**142303**		Long Length 45º Helix Corner Radius ø3.0mm - 20.0mm	**P.14-15**
				•	•	•	•								**144303**		Long Series 45º Helix ø3.0mm - 20.0mm	**P.16-17**
				•	•	•	•								**153303**		Extended Neck 45º Helix ø3.0mm - 20.0mm	**P.18-19**
				•	•	•	•								**156303**		Extended Neck 45º Helix Corner radius ø6.0mm - 20.0mm	**P.20-21**
o	o	o	o	•	•	•	•								**116303**		Extended Neck 40º Helix Ball Nose ø2.0mm - 16.0mm	**P.13**
				•	•	•	•								**125103** **125303**		Long Length 3 Flute 30º Helix ø6.0mm - 20.0mm	**P.22**
				•	•	•	•								**126103** **126303**		Extended Neck 3 Flute 30º Helix ø6.0mm - 20.0mm	**P.23**
																	Cutting Data	**P.24-27**
																	Troubleshooting	**P.28**

●: Excellent **O**: Good

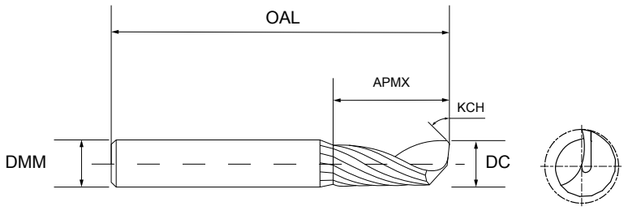
ALU-XP

MG HM | ZEFP 1 | KCH 45° | FHA 30° | DIN 6535HA

Series No. 135303

▸ cutting conditions: page 24

Designed for aluminium and non-ferrous materials such as acrylic.
1 flute allows for excellent chip evacuation.



EUROPA CODE **ORDCODE**	DIAMETER **DC**	SHANK DIAMETER **DMM**	LENGTH OF CUT **APMX**	OVERALL LENGTH **OAL**	CHAMFER WIDTH **CHW**
1353030200	**2.0**	3	8.0	50	0.04
1353030300	**3.0**	3	12.0	50	0.05
1353030400	**4.0**	4	15.0	60	0.07
1353030500	**5.0**	5	17.0	60	0.09
1353030600	**6.0**	6	20.0	65	0.10
1353030800	**8.0**	8	22.0	65	0.14
1353031000	**10.0**	10	25.0	75	0.14
1353031200	**12.0**	12	30.0	80	0.14

Mill Dia. Tolerance **TCDC**(mm)	Shank Dia. Tolerance **TCDMM**
0.00 / -0.03	h6

●: Excellent **O**: Good

P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
														●	●
13	14	16	23		33	34	51	52	53	71	72	73	74	83	84
										●	●	●	●		

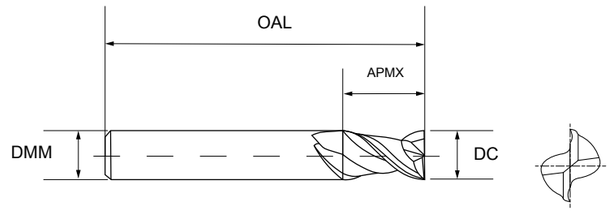
ALU-XP

MG HM | ZEFP 2 | FHA 45° | DIN 6535HA

Series No. 152303

▸ cutting conditions: page 26

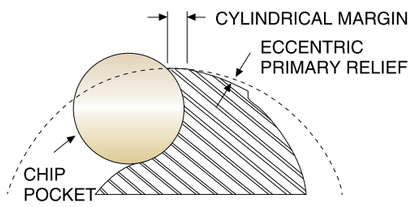
Suitable for high speed machining of aluminium and other non-ferrous materials.
Excellent surface finishes, superior chip removal.
Corner protected.
Mirror polished flutes.

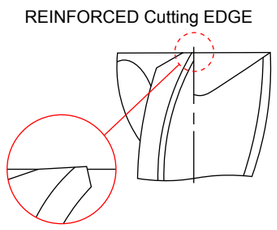


EUROPA CODE **ORDCODE**	DIAMETER **DC**	SHANK DIAMETER **DMM**	LENGTH OF CUT **APMX**	OVERALL LENGTH **OAL**
1523030300	**3.0**	6	5.0	50
1523030400	**4.0**	6	8.0	54
1523030500	**5.0**	6	9.0	54
1523030600	**6.0**	6	10.0	54
1523030800	**8.0**	8	12.0	58
1523031000	**10.0**	10	14.0	66
1523031200	**12.0**	12	16.0	73
1523031400	**14.0**	14	18.0	75
1523031600	**16.0**	16	22.0	82
1523031800	**18.0**	18	24.0	84
1523032000	**20.0**	20	26.0	92

▸ To order NX coated use code 152325, followed by diameter code.

Mill Dia. Tolerance **TCDC**(mm)	Shank Dia. Tolerance **TCDMM**
0.00 / -0.015	h6





●: Excellent **O**: Good

P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
13	14	16	23		33	34	51	52	53	71	72	73	74	83	84
										●	●	●	●		

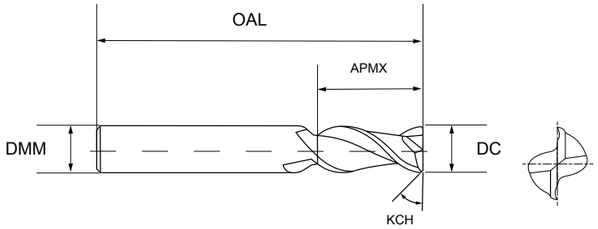
ALU-XP

MG HM | ZEFP 2 | KCH 45° | FHA 45° | DIN 6535HA

Series No. 151303

▸ cutting conditions: page 26

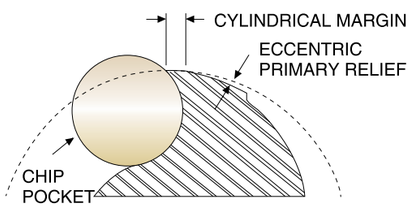
Suitable for high speed machining of aluminium and other non-ferrous materials.
Excellent surface finishes, superior chip removal.
Corner protected.
Mirror polished flutes.

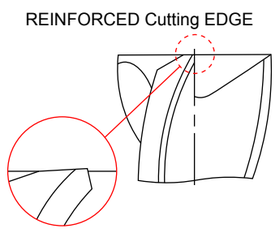


EUROPA CODE **ORDCODE**	DIAMETER **DC**	SHANK DIAMETER **DMM**	LENGTH OF CUT **APMX**	OVERALL LENGTH **OAL**	CHAMFER WIDTH **CHW**
1513030100	**1.0**	6	3.0	50	0.04
1513030150	**1.5**	6	5.0	50	0.04
1513030200	**2.0**	6	6.0	50	0.04
1513030250	**2.5**	6	8.0	55	0.04
1513030300	**3.0**	6	8.0	57	0.05
1513030400	**4.0**	6	11.0	57	0.05
1513030500	**5.0**	6	13.0	57	0.05
1513030600	**6.0**	6	13.0	57	0.05
1513030800	**8.0**	8	19.0	63	0.05
1513031000	**10.0**	10	22.0	72	0.10
1513031200	**12.0**	12	26.0	83	0.10
1513031400	**14.0**	14	26.0	83	0.10
1513031600	**16.0**	16	32.0	92	0.10
1513031800	**18.0**	18	32.0	92	0.10
1513032000	**20.0**	20	38.0	104	0.10

▸ To order NX coated use code 151325, followed by diameter code.

Mill Dia. Tolerance **TCDC**(mm)	Shank Dia. Tolerance **TCDMM**
0.00 / -0.015	h6





●: Excellent **O**: Good

P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
13	14	16	23		33	34	51	52	53	71	72	73	74	83	84
										●	●	●	●		

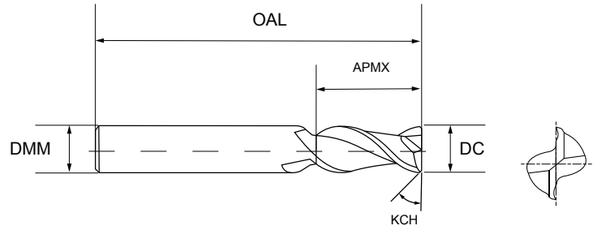
ALU-XP

MG HM | ZEFP 2 | KCH 45° | FHA 45° | DIN 6535HA

Series No. 154303

▸ cutting conditions: page 26

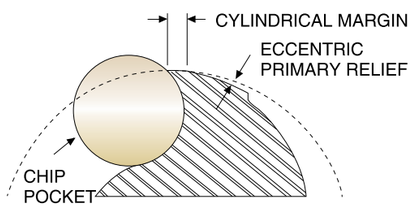
Suitable for high speed machining of aluminium and other non-ferrous materials.
Excellent surface finishes, superior chip removal.
Long series. Corner protected.
Mirror polished flutes.

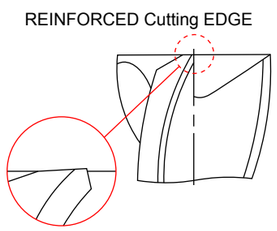


EUROPA CODE **ORDCODE**	DIAMETER **DC**	SHANK DIAMETER **DMM**	LENGTH OF CUT **APMX**	OVERALL LENGTH **OAL**	CHAMFER WIDTH **CHW**
1543030100	**1.0**	6	6.0	60	0.04
1543030150	**1.5**	6	8.0	60	0.04
1543030200	**2.0**	6	10.0	60	0.04
1543030300	**3.0**	6	15.0	75	0.05
1543030400	**4.0**	6	20.0	75	0.05
1543030500	**5.0**	6	25.0	75	0.05
1543030600	**6.0**	6	25.0	75	0.05
1543030800	**8.0**	8	30.0	80	0.05
1543031000	**10.0**	10	40.0	100	0.10
1543031200	**12.0**	12	50.0	100	0.10
1543031400	**14.0**	14	50.0	100	0.10
1543031600	**16.0**	16	70.0	125	0.10
1543031800	**18.0**	18	70.0	125	0.10
1543032000	**20.0**	20	75.0	150	0.10

▸ To order NX coated use code 154325, followed by diameter code.

Mill Dia. Tolerance **TCDC**(mm)	Shank Dia. Tolerance **TCDMM**
0.00 / -0.015	h6





●: Excellent **O**: Good

P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
13	14	16	23		33	34	51	52	53	71	72	73	74	83	84
										●	●	●	●		

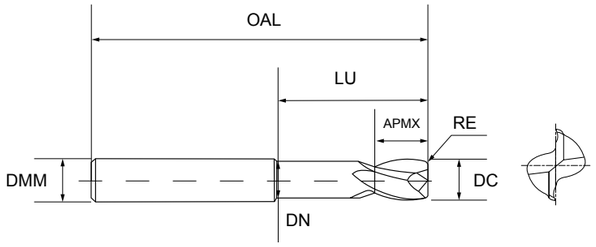
ALU-XP

MG HM | ZEFP 2 | RE | FHA 30° | DIN 6535HA | NECK

Series No. 155303

▸ cutting conditions: page 27

Suitable for high speed machining of aluminium and other non-ferrous materials.
Excellent surface finishes, superior chip removal.
Corner radius. Neck relief.
Mirror polished flutes.



EUROPA CODE **ORDCODE**	DIAMETER **DC**	CORNER RADIUS **RE**	SHANK DIAMETER **DMM**	LENGTH OF CUT **APMX**	EFFECTIVE LENGTH **LU**	OVERALL LENGTH **OAL**	NECK DIAMETER **DN**
1553030400	**4.0**	0.3	6	5.0	10.0	50	3.6
1553030600	**6.0**	0.5	6	8.0	20.0	64	5.4
1553030800	**8.0**	0.6	8	10.0	30.0	64	7.2
1553031000	**10.0**	0.8	10	12.0	36.0	70	9.0
1553031200	**12.0**	1.0	12	14.0	40.0	76	11.0
1553031600	**16.0**	1.3	16	18.0	45.0	90	14.5
1553032000	**20.0**	1.6	20	24.0	45.0	100	18.0

▸ To order NX coated use code 155325, followed by diameter code.

Mill Dia. Tolerance **TCDC**(mm)	Radius Tolerance (mm)		Shank Dia. Tolerance **TCDMM**
	RETOLL	**RETOLU**	
0.00 / -0.03	-0.03	+0.03	h6

●: Excellent **O**: Good

P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
										O	O	O	O		
13	14	16	23		33	34	51	52	53	71	72	73	74	83	84
										●	●	●	●		

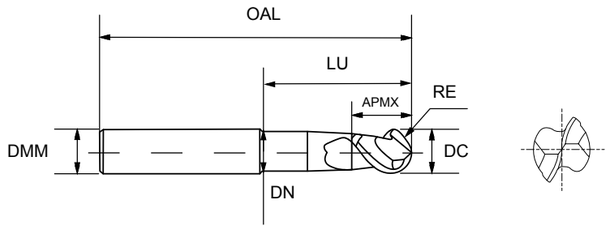
ALU-XP

MG HM | ZEFP 2 | FHA 50° | DIN 6535HA | NECK

Series No. 112303

▸ cutting conditions: page 24

Suitable for high speed machining of aluminium and other non-ferrous materials.
Excellent surface finishes, superior chip removal.
Neck relief.
Mirror polished flutes.



EUROPA CODE **ORDCODE**	DIAMETER **DC**	RADIUS **RE**	SHANK DIAMETER **DMM**	LENGTH OF CUT **APMX**	EFFECTIVE LENGTH **LU**	OVERALL LENGTH **OAL**	NECK DIAMETER **DN**
1123030600	**6.0**	3.0	6	5.5	25.0	55	5.4
1123030800	**8.0**	4.0	8	7.0	30.0	65	7.2
1123031000	**10.0**	5.0	10	8.5	35.0	75	9.0
1123031200	**12.0**	6.0	12	10.5	40.0	75	11.0
1123031600	**16.0**	8.0	16	14.0	50.0	90	14.5
1123032000	**20.0**	10.0	20	17.0	50.0	100	18.0

▸ To order NX coated use code 112325, followed by diameter code.

Mill Dia. Tolerance **TCDC**(mm)	Radius Tolerance (mm)		Shank Dia. Tolerance **TCDMM**
	RETOLL	**RETOLU**	
±0.02	-0.01	+0.01	h6

●: Excellent **O**: Good

P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
										O	O	O	O		
13	14	16	23		33	34	51	52	53	71	72	73	74	83	84
										●	●	●	●		

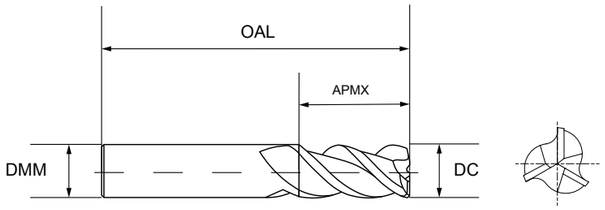
ALU-XP

MG HM | ZEFP 3 | FHA 45° | DIN 6535HA

Series No. 143303

▸ cutting conditions: page 25

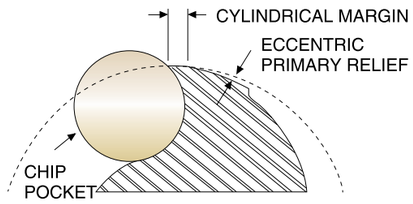
Suitable for high speed machining of aluminium and other non-ferrous materials.
Excellent surface finishes, superior chip removal.
Corner protected.
Mirror polished flutes.

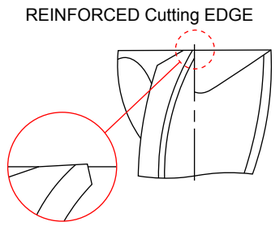


EUROPA CODE **ORDCODE**	DIAMETER **DC**	SHANK DIAMETER **DMM**	LENGTH OF CUT **APMX**	OVERALL LENGTH **OAL**
1433030300	**3.0**	6	12.0	57
1433030400	**4.0**	6	15.0	57
1433030500	**5.0**	6	20.0	57
1433030600	**6.0**	6	20.0	65
1433030800	**8.0**	8	22.0	65
1433031000	**10.0**	10	25.0	70
1433031200	**12.0**	12	25.0	75
1433031600	**16.0**	16	35.0	90
1433032000	**20.0**	20	40.0	100

▸ To order NX coated use code 143325, followed by diameter code.

Mill Dia. Tolerance **TCDC**(mm)	Shank Dia. Tolerance **TCDMM**
0.00 / -0.015	h6





●: Excellent **O**: Good

P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
13	14	16	23		33	34	51	52	53	71	72	73	74	83	84
										●	●	●	●		

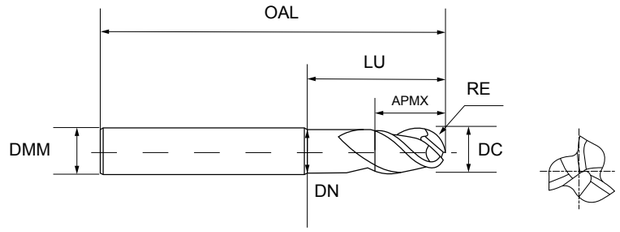
ALU-XP

MG HM | ZEFP 3 | FHA 40° | DIN 6535HA | NECK

Series No. 116303

▸ cutting conditions: page 27

Suitable for high speed machining of aluminium and other non-ferrous materials.
Excellent surface finishes, superior chip removal.
Neck relief.
Mirror polished flutes.



EUROPA CODE **ORDCODE**	DIAMETER **DC**	RADIUS **RE**	SHANK DIAMETER **DMM**	LENGTH OF CUT **APMX**	EFFECTIVE LENGTH **LU**	OVERALL LENGTH **OAL**	NECK DIAMETER **DN**
1163030200	**2.0**	1.0	6	3.0	5.0	60	1.9
1163030250	**2.5**	1.25	6	4.0	6.0	60	2.4
1163030300	**3.0**	1.5	6	4.5	6.5	60	2.8
1163030350	**3.5**	1.75	6	5.0	7.0	65	3.2
1163030400	**4.0**	2.0	6	6.0	8.0	65	3.7
1163030500	**5.0**	2.5	6	7.5	10.0	65	4.6
1163030600	**6.0**	3.0	6	9.0	12.0	75	5.6
1163030800	**8.0**	4.0	8	12.0	25.0	75	7.4
1163031000	**10.0**	5.0	10	15.0	30.0	80	9.4
1163031200	**12.0**	6.0	12	18.0	36.0	90	11.4
1163031600	**16.0**	8.0	16	24.0	40.0	100	15.4

▸ To order NX coated use code 116325, followed by diameter code.

Mill Dia. Tolerance **TCDC**(mm)	Radius Tolerance (mm)		Shank Dia. Tolerance **TCDMM**
	RETOLL	**RETOLU**	
0.00 / -0.03	-0.01	+0.01	h6

●: Excellent **O**: Good

P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
										O	O	O	O		
13	14	16	23		33	34	51	52	53	71	72	73	74	83	84
										●	●	●	●		

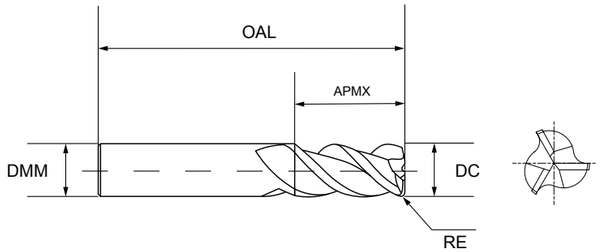
ALU-XP

MG HM | ZEFP 3 | RE | FHA 45° | DIN 6535HA

Series No. 142303

▸ cutting conditions: page 25

Suitable for high speed machining of aluminium and other non-ferrous materials.
Excellent surface finishes, superior chip removal.
Corner protected.
Mirror polished flutes.



EUROPA CODE **ORDCODE**	DIAMETER **DC**	CORNER RADIUS **RE**	SHANK DIAMETER **DMM**	LENGTH OF CUT **APMX**	OVERALL LENGTH **OAL**
1423030300	**3.0**	0.5	6	12.0	57
1423030901		1.0	6	12.0	57
1423030400	**4.0**	0.5	6	15.0	57
1423030902		1.0	6	15.0	57
1423030500	**5.0**	0.5	6	20.0	57
1423030903		1.0	6	20.0	57
1423030600	**6.0**	0.5	6	20.0	65
1423030904		1.0	6	20.0	65
1423030800	**8.0**	0.5	8	22.0	65
1423030905		1.0	8	22.0	65
1423030914		2.0	8	22.0	65
1423030915		3.0	8	22.0	65
1423031000	**10.0**	0.5	10	25.0	70
1423030906		1.0	10	25.0	70
1423030907		2.0	10	25.0	70
1423030916		3.0	10	25.0	70
1423031200	**12.0**	0.5	12	25.0	75
1423030908		1.0	12	25.0	75
1423030909		2.0	12	25.0	75
1423030917		3.0	12	25.0	75
1423030918		4.0	12	25.0	75

▸ To order NX coated use code 142325, followed by diameter code.

Mill Dia. Tolerance **TCDC**(mm)	Radius Tolerance (mm)		Shank Dia. Tolerance **TCDMM**
	RETOLL	**RETOLU**	
0.00 / -0.015	-0.03	+0.03	h6

●: Excellent **O**: Good

P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
13	14	16	23		33	34	51	52	53	71	72	73	74	83	84
										●	●	●	●		

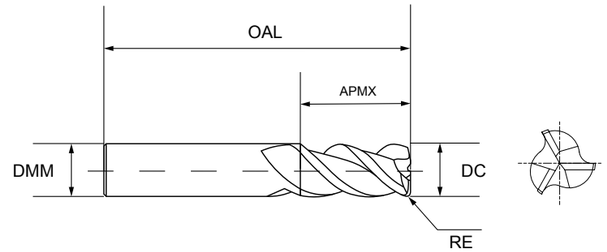
ALU-XP

MG HM | ZEFP 3 | RE | FHA 45° | DIN 6535HA

Series No. 142303

▸ cutting conditions: page 25

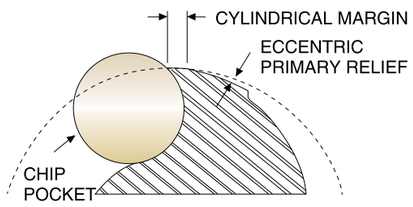
Suitable for high speed machining of aluminium and other non-ferrous materials.
Excellent surface finishes, superior chip removal.
Mirror polished flutes.



EUROPA CODE **ORDCODE**	DIAMETER **DC**	CORNER RADIUS **RE**	SHANK DIAMETER **DMM**	LENGTH OF CUT **APMX**	OVERALL LENGTH **OAL**
1423031600	**16.0**	0.5	16	35.0	90
1423030910		1.0	16	35.0	90
1423030911		2.0	16	35.0	90
1423030919		3.0	16	35.0	90
1423030920		4.0	16	35.0	90
1423030921		5.0	16	35.0	90
1423032000	**20.0**	0.5	20	40.0	100
1423039012		1.0	20	40.0	100
1423039013		2.0	20	40.0	100
1423030922		3.0	20	40.0	100
1423030923		4.0	20	40.0	100
1423030924		5.0	20	40.0	100

▸ To order NX coated use code 142325, followed by diameter code.

Mill Dia. Tolerance **TCDC**(mm)	Radius Tolerance (mm)		Shank Dia. Tolerance **TCDMM**
	RETOLL	**RETOLU**	
0.00 / -0.015	-0.03	+0.03	h6



●: Excellent **O**: Good

P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
13	14	16	23		33	34	51	52	53	71	72	73	74	83	84
										●	●	●	●		

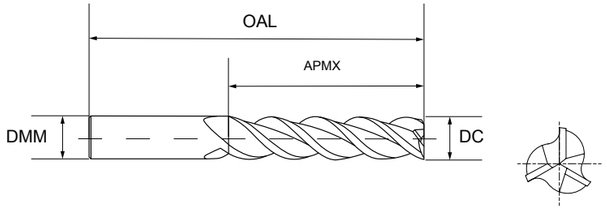
ALU-XP

MG HM | ZEFP 3 | FHA 45° | DIN 6535HA

Series No. 144303

▸ cutting conditions: page 25

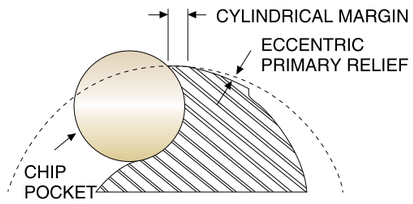
Suitable for high speed machining of aluminium and other non-ferrous materials.
Excellent surface finishes, superior chip removal.
Long series. Corner protected.
Mirror polished flutes.

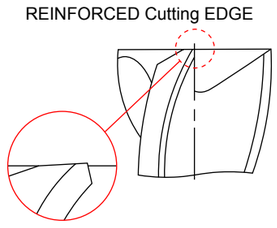


EUROPA CODE **ORDCODE**	DIAMETER **DC**	SHANK DIAMETER **DMM**	LENGTH OF CUT **APMX**	OVERALL LENGTH **OAL**
1443030300	**3.0**	6	15.0	75
1443030301		6	30.0	80
1443030400	**4.0**	6	20.0	75
1443030401		6	30.0	80
1443030500	**5.0**	6	25.0	75
1443030501		6	45.0	90
1443030600	**6.0**	6	25.0	75
1443030601		6	50.0	100
1443030800	**8.0**	8	30.0	80
1443030801		8	45.0	95
1443030802		8	65.0	110
1443031000	**10.0**	10	40.0	100
1443031001		10	55.0	110
1443031002		10	65.0	120

▸ To order NX coated use code 144325, followed by diameter code.

Mill Dia. Tolerance **TCDC**(mm)	Shank Dia. Tolerance **TCDMM**
0.00 / -0.015	h6





●: Excellent **O**: Good

P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
13	14	16	23		33	34	51	52	53	71	72	73	74	83	84
										●	●	●	●		

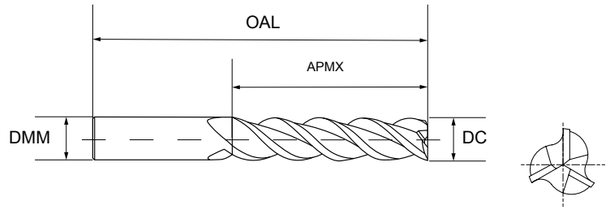
ALU-XP

MG HM | ZEFP 3 | FHA 45° | DIN 6535HA

Series No. 144303

▸ cutting conditions: page 25

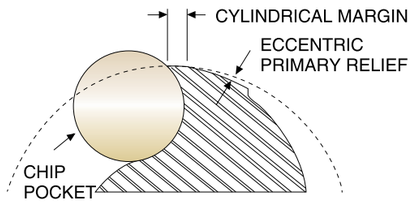
Suitable for high speed machining of aluminium and other non-ferrous materials.
Excellent surface finishes, superior chip removal.
Long series. Corner protected.
Mirror polished flutes.

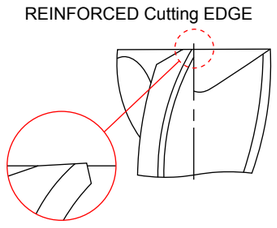


EUROPA CODE **ORDCODE**	DIAMETER **DC**	SHANK DIAMETER **DMM**	LENGTH OF CUT **APMX**	OVERALL LENGTH **OAL**
1443031200	**12.0**	12	50.0	100
1443031201		12	65.0	125
1443031202		12	75.0	135
1443031600	**16.0**	16	70.0	125
1443031601		16	75.0	150
1443031602		16	95.0	180
1443031603		16	115.0	200
1443032000	**20.0**	20	75.0	150
1443032001		20	95.0	180
1443032002		20	115.0	200
1443032003		20	125.0	220

▸ To order NX coated use code 144325, followed by diameter code.

Mill Dia. Tolerance **TCDC**(mm)	Shank Dia. Tolerance **TCDMM**
0.00 / -0.015	h6





●: Excellent **O**: Good

P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
13	14	16	23		33	34	51	52	53	71	72	73	74	83	84
										●	●	●	●		

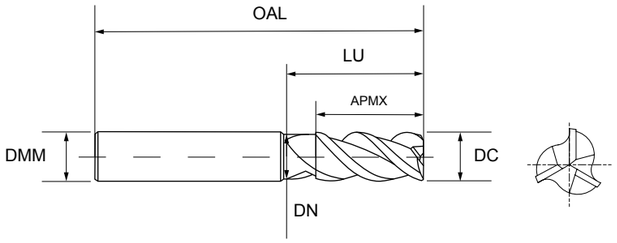
ALU-XP

MG HM | ZEFP 3 | FHA 45° | DIN 6535HA | NECK

Series No. 153303

▸ cutting conditions: page 25

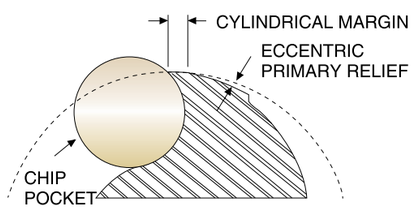
Suitable for high speed machining of aluminium and other non-ferrous materials.
Excellent surface finishes, superior chip removal.
Long series. Corner protected.
Mirror polished flutes.

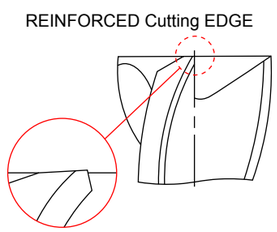


EUROPA CODE **ORDCODE**	DIAMETER **DC**	SHANK DIAMETER **DMM**	LENGTH OF CUT **APMX**	EFFECTIVE LENGTH **LU**	OVERALL LENGTH **OAL**	NECK DIAMETER **DN**
1533030300	**3.0**	6	8.0	12.0	57	2.7
1533030301		6	8.0	20.0	60	2.7
1533030302		6	8.0	30.0	80	2.7
1533030400	**4.0**	6	11.0	18.0	57	3.7
1533030401		6	10.0	26.0	70	3.7
1533030402		6	10.0	30.0	80	3.7
1533030500	**5.0**	6	13.0	18.0	57	4.7
1533030600	**6.0**	6	13.0	18.0	57	5.7
1533030601		6	15.0	35.0	90	5.7
1533030602		6	15.0	45.0	90	5.7
1533030800	**8.0**	8	21.0	25.0	63	7.4
1533030801		8	20.0	40.0	100	7.4
1533030802		8	20.0	50.0	100	7.4

▸ To order NX coated use code 153325, followed by diameter code.

Mill Dia. Tolerance **TCDC**(mm)	Shank Dia. Tolerance **TCDMM**
0.00 / -0.015	h6





●: Excellent **O**: Good

P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
13	14	16	23		33	34	51	52	53	71	72	73	74	83	84
										●	●	●	●		

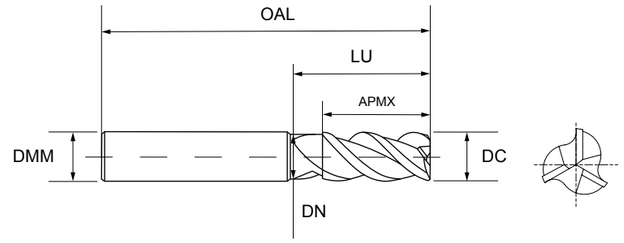
ALU-XP

MG HM | ZEFP 3 | FHA 45° | DIN 6535HA | NECK

Series No. 153303

▸ cutting conditions: page 25

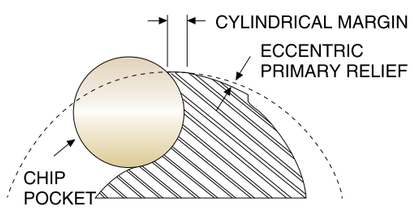
Suitable for high speed machining of aluminium and other non-ferrous materials.
Excellent surface finishes, superior chip removal.
Long series. Corner protected.
Mirror polished flutes.

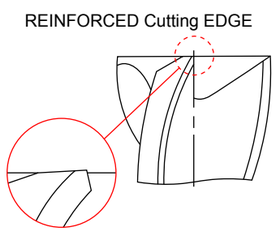


EUROPA CODE **ORDCODE**	DIAMETER **DC**	SHANK DIAMETER **DMM**	LENGTH OF CUT **APMX**	EFFECTIVE LENGTH **LU**	OVERALL LENGTH **OAL**	NECK DIAMETER **DN**
1533031000	**10.0**	10	22.0	30.0	72	9.2
1533031001		10	25.0	45.0	100	9.2
1533031002		10	25.0	55.0	100	9.0
1533031200	**12.0**	12	26.0	36.0	83	11.0
1533031201		12	30.0	50.0	110	11.0
1533031202		12	30.0	60.0	110	11.0
1533031600	**16.0**	16	36.0	42.0	92	15.0
1533031601		16	25.0	50.0	130	15.0
1533032000	**20.0**	20	41.0	52.0	104	19.0
1533032001		20	30.0	60.0	150	19.0

▸ To order NX coated use code 153325, followed by diameter code.

Mill Dia. Tolerance **TCDC**(mm)	Shank Dia. Tolerance **TCDMM**
0.00 / -0.015	h6





●: Excellent **O**: Good

P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
13	14	16	23		33	34	51	52	53	71	72	73	74	83	84
										●	●	●	●		

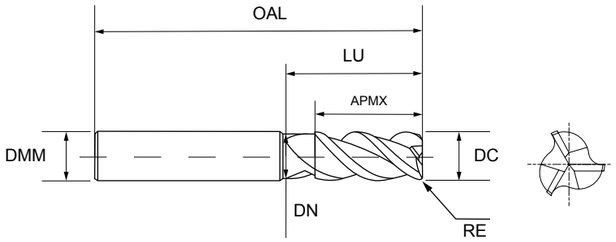
ALU-XP

MG HM | ZEFP 3 | RE | FHA 45° | DIN 6535HA | NECK

Series No. 156303

▸ cutting conditions: page 25

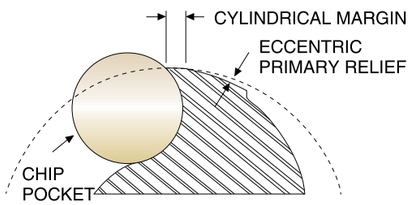
Suitable for high speed machining of aluminium and other non-ferrous materials.
Excellent surface finishes, superior chip removal.
Corner radius. Neck relief.
Mirror polished flutes.



EUROPA CODE **ORDCODE**	DIAMETER **DC**	CORNER RADIUS **RE**	SHANK DIAMETER **DMM**	LENGTH OF CUT **APMX**	EFFECTIVE LENGTH **LU**	OVERALL LENGTH **OAL**	NECK DIAMETER **DN**
1563030600	**6.0**	0.5	6	10.0	20.0	70	5.7
1563030601		1.0	6	10.0	20.0	70	5.7
1563030800	**8.0**	0.5	8	12.0	25.0	80	7.4
1563030801		1.0	8	12.0	25.0	80	7.4
1563030802		2.0	8	12.0	25.0	80	7.4
1563030803		3.0	8	12.0	25.0	80	7.4
1563031000	**10.0**	0.5	10	15.0	30.0	100	9.2
1563031001		1.0	10	15.0	30.0	100	9.2
1563031002		2.0	10	15.0	30.0	100	9.2
1563031003		3.0	10	15.0	30.0	100	9.2
1563031200	**12.0**	0.5	12	20.0	35.0	110	11.0
1563031201		1.0	12	20.0	35.0	110	11.0
1563031202		2.0	12	20.0	35.0	110	11.0
1563031203		3.0	12	20.0	35.0	110	11.0
1563031204		4.0	12	20.0	35.0	110	11.0

▸ To order NX coated use code 156325, followed by diameter code.

Mill Dia. Tolerance **TCDC**(mm)	Radius Tolerance (mm)		Shank Dia. Tolerance **TCDMM**
	RETOLL	**RETOLU**	
0.00 / -0.015	-0.03	+0.03	h6



●: Excellent **O**: Good

P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
13	14	16	23		33	34	51	52	53	71	72	73	74	83	84
										●	●	●	●		

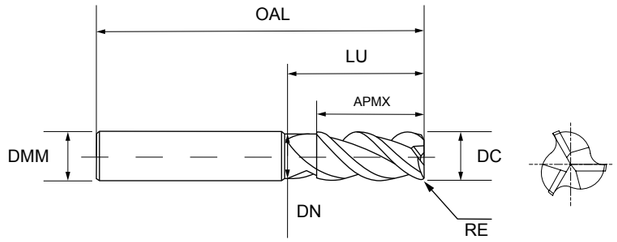
ALU-XP

MG HM | ZEFP 3 | RE | FHA 45° | DIN 6535HA | NECK

Series No. 156303

▸ cutting conditions: page 25

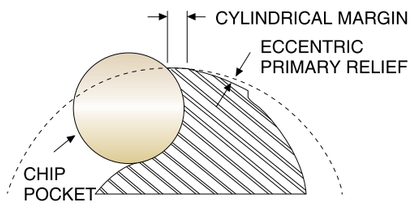
Suitable for high speed machining of aluminium and other non-ferrous materials.
Excellent surface finishes, superior chip removal.
Corner radius. Neck relief.
Mirror polished flutes.



EUROPA CODE **ORDCODE**	DIAMETER **DC**	CORNER RADIUS **RE**	SHANK DIAMETER **DMM**	LENGTH OF CUT **APMX**	EFFECTIVE LENGTH **LU**	OVERALL LENGTH **OAL**	NECK DIAMETER **DN**
1563031600	**16.0**	1.0	16	25.0	50.0	130	15.0
1563031601		2.0	16	25.0	50.0	130	15.0
1563031602		3.0	16	25.0	50.0	130	15.0
1563031603		4.0	16	25.0	50.0	130	15.0
1563031604		5.0	16	25.0	50.0	130	15.0
1563032000	**20.0**	1.0	20	30.0	60.0	150	19.0
1563032001		2.0	20	30.0	60.0	150	19.0
1563032002		3.0	20	30.0	60.0	150	19.0
1563032003		4.0	20	30.0	60.0	150	19.0
1563032004		5.0	20	30.0	60.0	150	19.0

▸ To order NX coated use code 156325, followed by diameter code.

Mill Dia. Tolerance **TCDC**(mm)	Radius Tolerance (mm)		Shank Dia. Tolerance **TCDMM**
	RETOLL	**RETOLU**	
0.00 / -0.015	-0.03	+0.03	h6



●: Excellent **O**: Good

P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
13	14	16	23		33	34	51	52	53	71	72	73	74	83	84
										●	●	●	●		

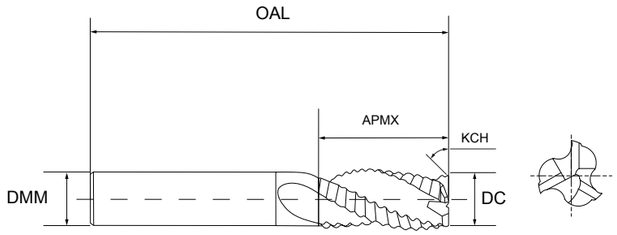
ALU-XP

MG HM | ZEFP 3 | KCH 45° | FHA 30° | DIN 6535HA | DIN 6535HB | ALU

Series No. 125103, 125303

▸ cutting conditions: page 26

Suitable for high speed machining of aluminium and other non-ferrous materials.
Excellent surface finishes, superior chip removal.
Corner protected.



DIN 6535HB ORDCODE	DIN 6535HA ORDCODE	DIAMETER DC	SHANK DIAMETER DMM	LENGTH OF CUT APMX	OVERALL LENGTH OAL	CHAMFER WIDTH CHW
1251030600	**1253030600**	**6.0**	6	16.0	57	0.60
1251030800	**1253030800**	**8.0**	8	16.0	63	0.60
1251031000	**1253031000**	**10.0**	10	22.0	72	0.60
1251031200	**1253031200**	**12.0**	12	26.0	83	0.60
1251031400	**1253031400**	**14.0**	14	26.0	83	0.91
1251031600	**1253031600**	**16.0**	16	32.0	92	0.91
1251032000	**1253032000**	**20.0**	20	38.0	104	0.91

▸ To order NX coated use code 125125 or 125325, followed by diameter code.

Mill Dia. **DC**	Mill Dia. Tolerance **TCDC**(mm)	Shank Dia. Tolerance **TCDMM**
6.0, 8.0, 10.0	0.00 / -0.058	h6
12.0, 14.0, 16.0	0.00 / -0.070	
20.0	0.00 / -0.084	

●: Excellent **O**: Good

P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
13	14	16	23		33	34	51	52	53	71	72	73	74	83	84
										●	●	●	●		

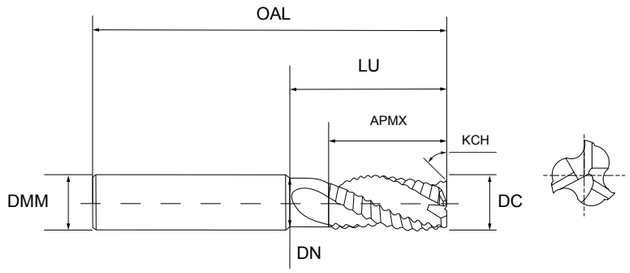
ALU-XP

MG HM | ZEFP 3 | KCH 45° | FHA 30° | DIN 6535HA | DIN 6535HB | NECK | ALU

Series No.126103, 126303

▸ cutting conditions: pages 26

Suitable for high speed machining of aluminium and other non-ferrous materials.
Excellent surface finishes, superior chip removal.
Corner protected. Neck relief.



DIN 6535HB ORDCODE	DIN 6535HA ORDCODE	DIAMETER DC	SHANK DIAMETER DMM	LENGTH OF CUT APMX	EFFECTIVE LENGTH LU	OVERALL LENGTH OAL	NECK DIAMETER DN	CHAMFER WIDTH CHW
1261030600	**1263030600**	**6.0**	6	16.0	20.0	57	5.0	0.60
1261030800	**1263030800**	**8.0**	8	16.0	25.0	63	7.0	0.60
1261031000	**1263031000**	**10.0**	10	22.0	30.0	72	9.0	0.60
1261031200	**1263031200**	**12.0**	12	26.0	36.0	83	10.5	0.60
1261031600	**1263031600**	**16.0**	16	32.0	42.0	92	14.5	0.91
1261032000	**1263032000**	**20.0**	20	38.0	52.0	104	18.5	0.91

▸ To order NX coated use code 126125 or 126325, followed by diameter code.

Mill Dia. **DC**	Mill Dia. Tolerance **TCDC**(mm)	Shank Dia. Tolerance **TCDMM**
6.0, 8.0, 10.0	0.00 / -0.058	h6
12.0, 16.0	0.00 / -0.070	
20.0	0.00 / -0.084	

●: Excellent **O**: Good

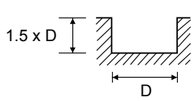
P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
13	14	16	23		33	34	51	52	53	71	72	73	74	83	84
										●	●	●	●		

ALU-XP

CUTTING CONDITIONS

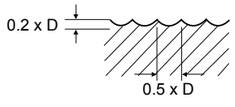
135303 (1 Flute Router)

MATERIAL GROUP			Type of cut		Size (mm)							
					2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0
N	71 72 73 74	Aluminium and Aluminium alloys		v_c (m/min)	145	170	190	190	190	195	190	190
				n	23000	18000	15000	12000	10000	8000	6000	5000
				f_z	0.065	0.094	0.12	0.15	0.18	0.244	0.333	0.44
				f (mm/min)	1500	1700	1800	1800	1800	1900	2000	2200
O	81 82	Thermoplastics, Thermosetting plastics, Acrylics		v_c (m/min)	200	235	250	235	255	250	250	255
				n	32000	25000	20000	15000	13500	10000	8000	6700
				f_z	0.069	0.096	0.12	0.147	0.17	0.24	0.3	0.343
				f (mm/min)	2200	2400	2400	2200	2300	2400	2400	2300



112303 (2 Flute 50º Helix, Ball Nose)

MATERIAL GROUP			Type of cut		Size (mm)					
					6.0	8.0	10.0	12.0	16.0	20.0
N	61 62 63 64	Copper and Copper alloys		v_c (m/min)	85	85	105	125	135	105
				n	4400	3360	3360	3360	2640	1680
				f_z	0.04	0.06	0.069	0.089	0.101	0.131
				f (mm/min)	350	400	465	600	535	440
	71 72 73 74	Aluminium and Aluminium alloys		v_c (m/min)	270	280	350	420	440	350
				n	14400	11200	11200	11200	8800	5600
				f_z	0.049	0.071	0..084	0.07	0.123	0.157
				f (mm/min)	1400	1600	1880	2400	2160	1760



Recommended cutting depths are **maximum** depths, and **speeds and feeds are a starting point** based on these depths.
All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up.
For long series and long necked tools it may be necessary to reduce feed rate by up to 50%.

v_c - cutting speed (m/min)
n - RPM (rev/min)
f_z - feed per tooth (mm)
f - feed rate (mm/min)
a_p - axial depth of cut
a_e - radial depth of cut

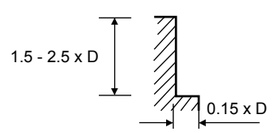
ALU-XP

CUTTING CONDITIONS

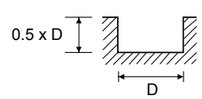
143303, 144303, 153303 (3 Flute 45º Helix, Long, Necked & Long Series)

MATERIAL GROUP			Type of cut		Size (mm)								
					3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
N	71 72 73 74	Aluminium and Aluminium alloys		v_c (m/min)	65	90	110	130	140	175	210	210	175
				n	7000	7000	7000	7000	5600	5600	5600	4200	2800
				f_z	0.045	0.055	0.065	0.075	0.113	0.131	0.163	0.2	0.238
				f (mm/min)	940	1150	1360	1580	1900	2200	2740	2520	2000
				v_c (m/min)	65	90	110	130	140	175	210	210	175
				n	7000	7000	7000	7000	5600	5600	5600	4200	2800
				f_z	0.035	0.045	0.05	0.06	0.088	0.106	0.131	0.158	0.2
				f (mm/min)	730	940	1050	1250	1470	1780	2200	1990	1680

SIDE CUTTING



SLOTTING

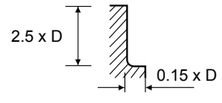


- The feed rate for long series and long necked tools should be reduced by up to 50%

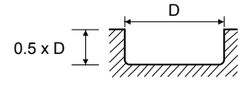
142303, 156303 (3 Flute 45º Helix, Corner Radius & Necked Corner Radius)

MATERIAL GROUP			Type of cut		Size (mm)								
					3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
N	71 72 73 74	Aluminium and Aluminium alloys		v_c (m/min)	95	125	155	190	200	250	300	300	250
				n	10000	10000	10000	10000	8000	8000	8000	6000	4000
				f_z	0.05	0.061	0.072	0.083	0.125	0.145	0.179	0.22	0.262
				f (mm/min)	1490	1820	2150	2480	3000	3470	4290	3960	3140
				v_c (m/min)	95	125	155	190	200	250	300	300	250
				n	10000	10000	10000	10000	8000	8000	8000	6000	4000
				f_z	0.039	0.05	0.055	0.066	0.096	0.117	0.145	0.174	0.22
				f (mm/min)	1160	1490	1650	1980	2310	2810	3470	3140	2640

SIDE CUTTING



SLOTTING

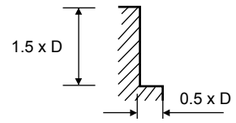


- The feed rate for long series and long necked tools should be reduced by up to 50%

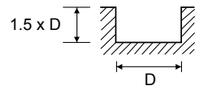
125103, 125303, 126103, 126303 (3 Flute Roughing)

MATERIAL GROUP			Type of cut		Size (mm)					
					6.0	**8.0**	**10.0**	**12.0**	**16.0**	**20.0**
N	71 72 73 74	Aluminium and Aluminium alloys		v_c (m/min)	200	200	205	320	322	320
				n	13500	10500	8500	8500	6400	5100
				f_z	0.168	0.167	0.169	0.167	0.167	0.165
				f (mm/min)	5300	4000	3500	3200	2400	1900
				v_c (m/min)	200	200	205	320	322	320
				n	13500	10500	8500	8500	6400	5100
				f_z	0.168	0.168	0.169	0.165	00.167	0.163
				f (mm/min)	6800	5300	4300	4200	3200	2500

SIDE CUTTING



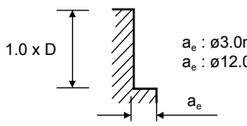
SLOTTING



151303, 152303, 154303 (2 Flute 45º Helix, Short, Long & Long Series)

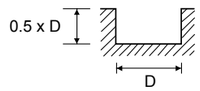
MATERIAL GROUP			Type of cut		Size (mm)								
					3.0	**4.0**	**5.0**	**6.0**	**8.0**	**10.0**	**12.0**	**16.0**	**20.0**
N	71 72 73 74	Aluminium and Aluminium alloys		v_c (m/min)	95	125	155	190	200	250	300	300	250
				n	10000	10000	10000	10000	8000	8000	8000	6000	4000
				f_z	0.045	0.055	0.065	0.075	0.113	0.131	0.163	0.2	0.238
				f (mm/min)	900	1100	1300	1500	1800	2100	1600	2400	1900
				v_c (m/min)	95	125	155	190	200	250	300	300	250
				n	10000	10000	10000	10000	8000	8000	8000	6000	4000
				f_z	0.035	0.045	0.05	0.06	0.088	0.106	0.131	0.158	0.2
				f (mm/min)	700	900	1000	1200	1400	1700	2100	1900	1600

SIDE CUTTING



a_e : ø3.0mm - ø10.0mm = 0.25 x D
a_e : ø12.0mm - ø20.0mm = 0.15x D

SLOTTING

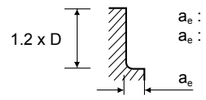


- The feed rate for long & long series tools should be reduced by up to 50%

155303 (2 Flute Corner Radius)

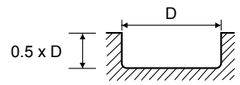
MATERIAL GROUP			Type of cut		Size (mm)						
					4.0	**6.0**	**8.0**	**10.0**	**12.0**	**16.0**	**20.0**
N	71 72 73 74	Aluminium and Aluminium alloys		v_c (m/min)	130	195	200	250	300	320	250
				n	10400	10400	8000	8000	8000	6400	4000
				f_z	0.054	0.077	0.115	0.135	0.17	0.194	0.25
				f (mm/min)	1120	1600	1840	2160	2720	2480	2000
				v_c (m/min)	130	195	200	250	300	320	250
				n	10400	10400	8000	8000	8000	6400	4000
				f_z	0.046	0.058	0.09	0.110	0.135	0.156	0.2
				f (mm/min)	960	1200	1440	1760	2160	2000	1600

SIDE CUTTING



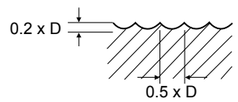
a_e : ø4.0mm - ø10.0mm = 0.25 x D
a_e : ø12.0mm - ø20.0mm = 0.5x D

SLOTTING



116303 (3 Flute 40º Helix, Ball Nose)

MATERIAL GROUP			Type of cut		Size (mm)								
					2.0	**3.0**	**4.0**	**5.0**	**6.0**	**8.0**	**10.0**	**12.0**	**16.0**
N	61 62 63 64	Copper and Copper alloys		v_c (m/min)	40	40	55	70	85	85	105	125	135
				n	6400	4400	4400	4400	4400	3360	3360	3360	2640
				f_z	0.015	0.022	0.028	0.031	0.04	0.06	0.069	0.089	0.101
				f (mm/min)	190	190	250	270	350	400	465	600	535
	71 72 73 74	Aluminium and Aluminium alloys		v_c (m/min)	135	135	180	225	270	280	350	420	440
				n	21600	14400	14400	14400	14400	11200	11200	11200	8800
				f_z	0.018	0.026	0.035	0.038	0.049	0.071	0.084	0.107	0.123
				f (mm/min)	760	760	1000	1080	1400	1600	1880	2400	2160



Problem	Instance of problem	Solution options
Tool breaks	At start or end of cut	Reduce overhang Use shorter tool Use lower feed rate
	During cutting	Check tool for wear and replace sooner Check toolholder for wear and replace Reduce overhang Use shorter tool Use lower feed rate Check coolant flow
	Changing direction	Check tool for wear and replace sooner Check toolholder for wear and replace Use lower feed rate when changing direction Use circular interpolation if possible
Cutting edge breaks	Corner chipping	Reduce overhang Use shorter tool Use climb milling
	Break at depth of cut	Use climb milling Use lower cutting speed
	Centre chipping	Use larger tool if possible Use higher cutting speed If noisy during cutting, use higher feed rate Check coolant flow Check toolholder for wear and replace
	Break of cutting edge	Use larger tool if possible Use lower feed rate Use lower cutting speed Check toolholder for wear and replace Check coolant flow
Heavy tool wear		Use lower cutting speed Use conventional milling Use higher feed rate Check coolant flow
Poor surface finish	Good finish but rough	Use lower feed rate Check coolant flow
	Chip welding	Use higher cutting speed Use higher feed rate Use conventional milling Check coolant flow
	Scoring	Use climb milling Check coolant flow
	Excessive cut marks	Use smaller radial depth of cut for finishing Use higher cutting speed Use lower feed rate
Poor accuracy	Undersize	Use conventional milling Use smaller radial depth of cut for finishing Check toolholder for wear and replace Reduce overhang Use higher cutting speed
	Not perpendicular	Use smaller radial depth of cut for finishing Check toolholder for wear and replace Reduce overhang Use higher cutting speed Use lower feed rate Check tool for wear and replace sooner
Chattering		Use higher or lower cutting speed Use higher feed rate Check toolholder for wear and replace Reduce overhang Use climb milling