MORSE
CUTTING TOOLS

CATALOG 2022

Metric Version

About us

MORSE Cutting Tools is a cutting tools engineering and production company. **MORSE** offers a high level of expertise in manufacturing special and standard cutting tools, and produces superior endmills and drills. **MORSE** provides you with the right cutter for your specific application, assuring that you, our client, will save time and money.

MORSE Cutting Tools manufactures top quality cutting tools for all milling metal working industries such as aerospace, die and mold, automotive, medical, general engineering, etc.

Our tools

MORSE Cutting Tools superior products contribute to our clients' success over their competitors. **MORSE**'s cutters are made of submicron grain size cobalt and are coated with modern high abrasive and temperature resistance finishes.

MORSE Cutting Tools offers a wide range of milling products.
Manufactured in its new facilities, equipment and technologies allow customers to benefit at an even higher level.

RESEARCH & DEVELOPMENT

Research & development is an integral part of **MORSE Cutting Tools**. Our team of engineers work together to examine and select the best solution for the customer's requirements.
Many resources are dedicated to employee training and participation in international professional exhibitions, making certain that the engineering staff stays at the forefront of world technology.

MORSE Cutting Tools R&D department is always exploring new, more efficient and cost-effective manufacturing procedures and processes. Improvements in computerization, data flow and quality assurance are constantly being implemented.

SPECIAL-TOOLS

MORSE Cutting Tools also designs special tools, step drills, tapered tools and reamers, designing all solid carbide profile types up to 5 micron accuracy with optic protocol measurement according to the customer's specifications.
With this information, **MORSE Cutting Tools** engineers can design and produce a product that conforms exactly to the customer's specifications, to give the best solution for their application requirement.

MORSE Cutting Tools manufactures and regrinds top quality cutting tools for all milling metal working industries such as aerospace, die and mold, automotive, medical, general engineering, etc.

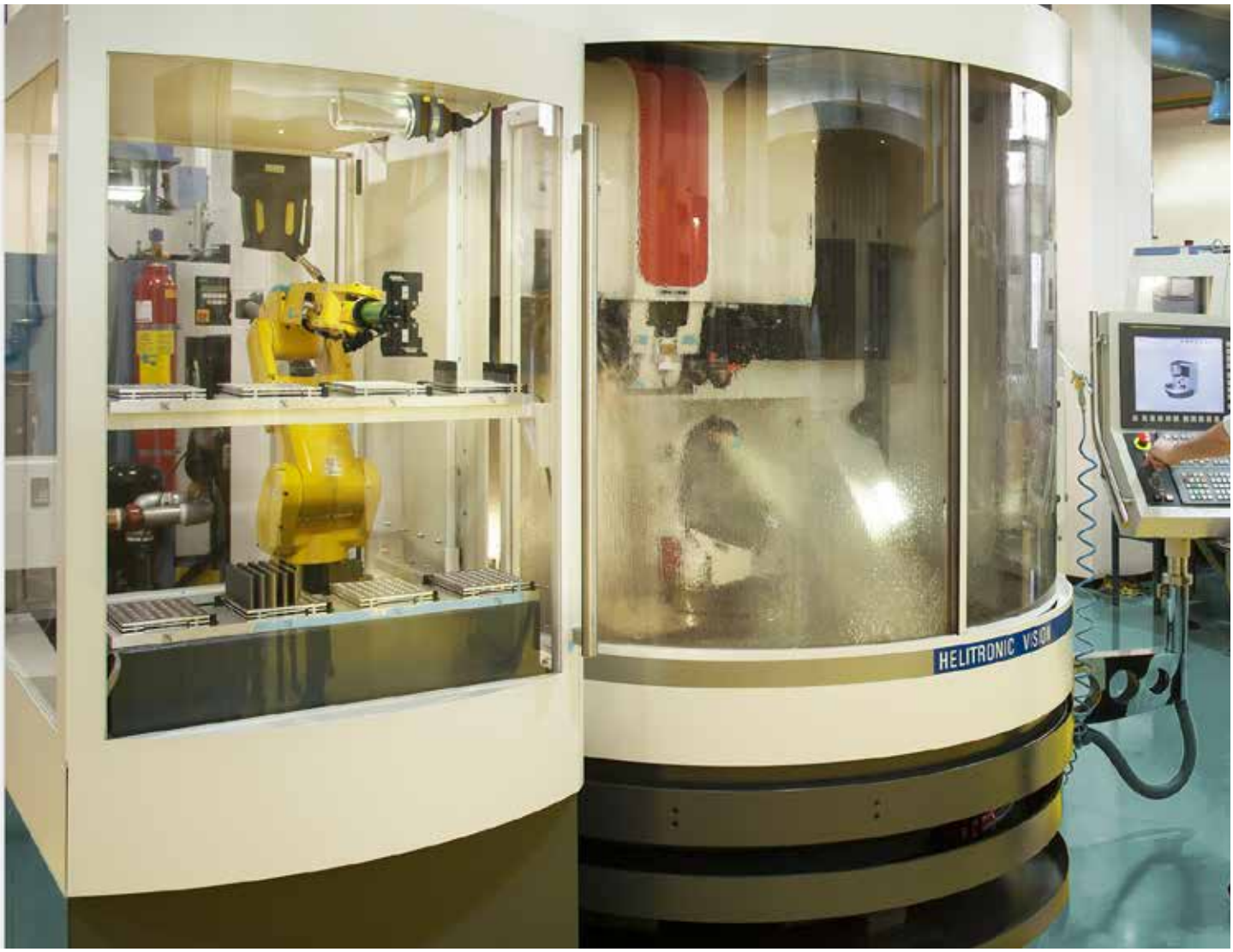
SOLID CARBIDE ENDMILLS

MORSE Cutting Tools department for special tools is entirely dedicated to the design and manufacture of special milling solutions for high demanding operations and focused manufacturing. Unique advantages, such as **PVD** high quality coating facilities **(AlTiN ,AlTiCrSiN)** on solid carbide tools and capabilities for a wide range of diameters (0.3 to 32 mm), places the company as the preferred solution for high quality and specific application special tools.

MORSE also specializes in other solutions, including:
Profile tools

- Tapered tools
- Endmills
- Roughers
- Drills
- Step drills
- Router
- Counter bores
- Coating

MORSE guarantees consistent high accuracy and performance with exceptional tool life.



MANUFACTURING FACILITIES

MORSE Cutting Tools unique state-of-the-art production facility is situated in a new and spotlessly clean factory and includes modern CNC machines, from leading European CNC grinding machineries.

TECHNICAL SUPPORT

MORSE's engineers are available for technical support from the design stages to the production line and give full advice for the correct cutting parameters in order to achieve maximum performance from the tools.

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SOLID CARBIDE ENDMILLS

WORKPIECE MATERIAL	ISO
STEEL	P
STAINLESS STEEL	M
CAST IRON	K
ALUMINUM / NON FERROUS MATERIALS	N
SUPERALLOYS / TITANIUM	S
HARD STEELS	H

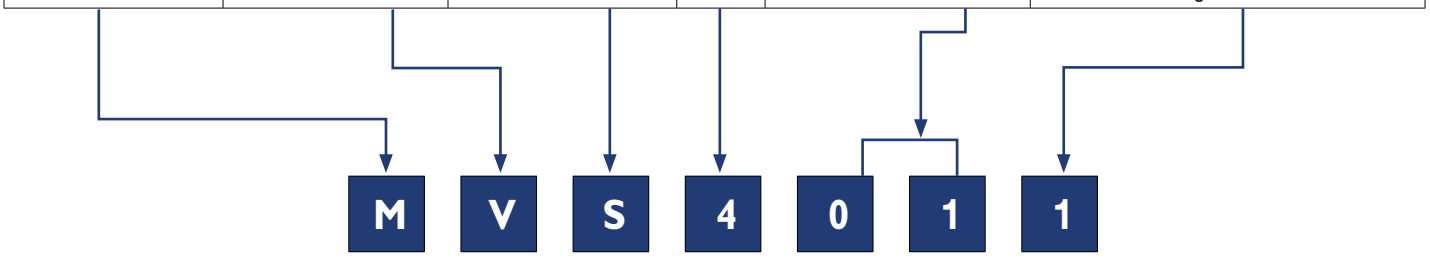
	Designation	Cutting Diameter	No. of Flutes	Length of Cut	Neck Relief	P	M	K	S	H	Page
	MVS 4001 MVS 4005	6-20	4	1xD	-	✔	✔✔	✔	✔	✔	10-12
	MVM 4001 MVL 4001	3-20	4	2xD	+	✔	✔✔	✔	✔	✔	10-12
	MVM 5021	6-20	5	2xD	+	✔	✔✔	✔	✔	✔	13
	MPL 4001	1-25	4	2xD	+	✔✔	✔	✔	✔	✔	14-15
	MPM 5001	6-20	5	2xD	+	✔✔	✔	✔	✔		16-17
	MVT 4021	4-20	4	2xD	-				✔✔		18-19
	REL 3001/4001	5-20	3, 4	2xD	+		✔		✔		20-21
	RVL 7002	6-20	7	2xD	-		✔✔		✔		22-23
	RFL 202/402	1-16	2, 4		+	✔✔	✔	✔	✔	✔	24-25
	MPL 4B02	3-16	4	2xD	+	✔	✔	✔	✔	✔✔	26-27
	RBS / RBL RBM 4001/7001	5-20	4-7	2xD	+	✔✔	✔	✔			28-30
	RBM 4001/6001	6-25	4, 6	2xD	-	✔			✔	✔✔	30
	REL 3001/4001	4-20	4, 6	2xD	+	✔✔		✔			31
	FVM 7002	2-20	7	2xD	-	✔✔	✔	✔	✔	✔	32-34
	MVT 7021	6-16	7, 9	2xD	-				✔		36-37
	FBM 6001/6003	6-20	6	2xD	-	✔	✔	✔	✔		38-39
	FBL 4001/6001	6-20	4, 6	2xD	-	✔	✔	✔	✔		40
	FBM FEM/FEL/FAM	1-20	3	2xD	-	✔	✔	✔	✔		42-45

SOLID CARBIDE ENDMILLS

	Designation	Cutting Diameter	No. of Flutes	Length of Cut	Neck Relief	P	M	K	S	H	Page
	FAMC FEMC	2-20	2-4	1.5xD 2xD	-	✔	✔	✔	✔		46
	FBM FAM	2-20	4	2xD	-	✔	✔	✔			48-51
	FAM 3B01/4B01	1-25	2-4	1.5xD 2xD	+	✔	✔	✔	✔		52-53
	FAL 2004/2054	0.5-12	2	1.5xD	+	✔	✔	✔	✔	✔✔	54-55
	FAL FAM	0.4-6	2	1.5xD	+	✔	✔	✔	✔		56-61
	FAL 2B04	0.1-4	2	0.8xD	+	✔	✔	✔	✔	✔✔	62-63
	FAM 2B00 FAL 2B03	0.4-6	2	1.5xD	+	✔	✔	✔	✔		64-70
	FFM 4001	4-12	4	-	-	✔	✔	✔	✔	✔	70-71
	FDM 2001	3-12	2	-	-	✔	✔	✔	✔	✔	71
	RAM 1002	1.6-12	6-12	2xD	-						85

	Designation	Cutting Diameter	No. of Flutes	Length of Cut	Neck Relief	N	Page
	MVL 3000	1-25	3	1.5xD 2xD	+	✔	72-73
	FVL 4020	6-25	4	1.5xD 2xD	+	✔	74-75
	FBM 2000	4-20	2	2xD	-	✔	81
	FBM 3020	4-20	3	2xD	-	✔	81
	RBL 3020	6-20	3	2xD	+	✔	76-77
	REL 3020	6-25	3	2xD	+	✔	78-79
	FBL2B00	1-6	2	1xD	+	✔	83

Type of Operation	Helix Angle	Langth Of Cut / Relief	Number Of Teeth	Different Radius Corners	Blank & Coating
M- Roughing&Finishing	**A** - 30°	**S**- Short / Stub	2-10	**B**- Ball nose	**0**- Uncoated 10% Submicron Carbide
F- Finish	**E** - 38°	**M**- Medium		**O**- No Corner Radius	**1**-AlTiN Coating 10% Submicron Carbide
R- ROUGHING	**B** - 45°	**L**- Long Length Cut / Relief		**1**- 10 Different Radius Corners	**2**-AlTiN Coating 9% Ultrafine Carbide
	F - High Feed				**3**-AlTiN Coating 12% Ultrafine Carbide
	P - Variable Pitch				**4**-AlTiCrSiN 9% Ultrafine Carbide
	V - Variable Helix & Pitch				**5**-AlTiCrSiN Coating 10% Submicron Carbide



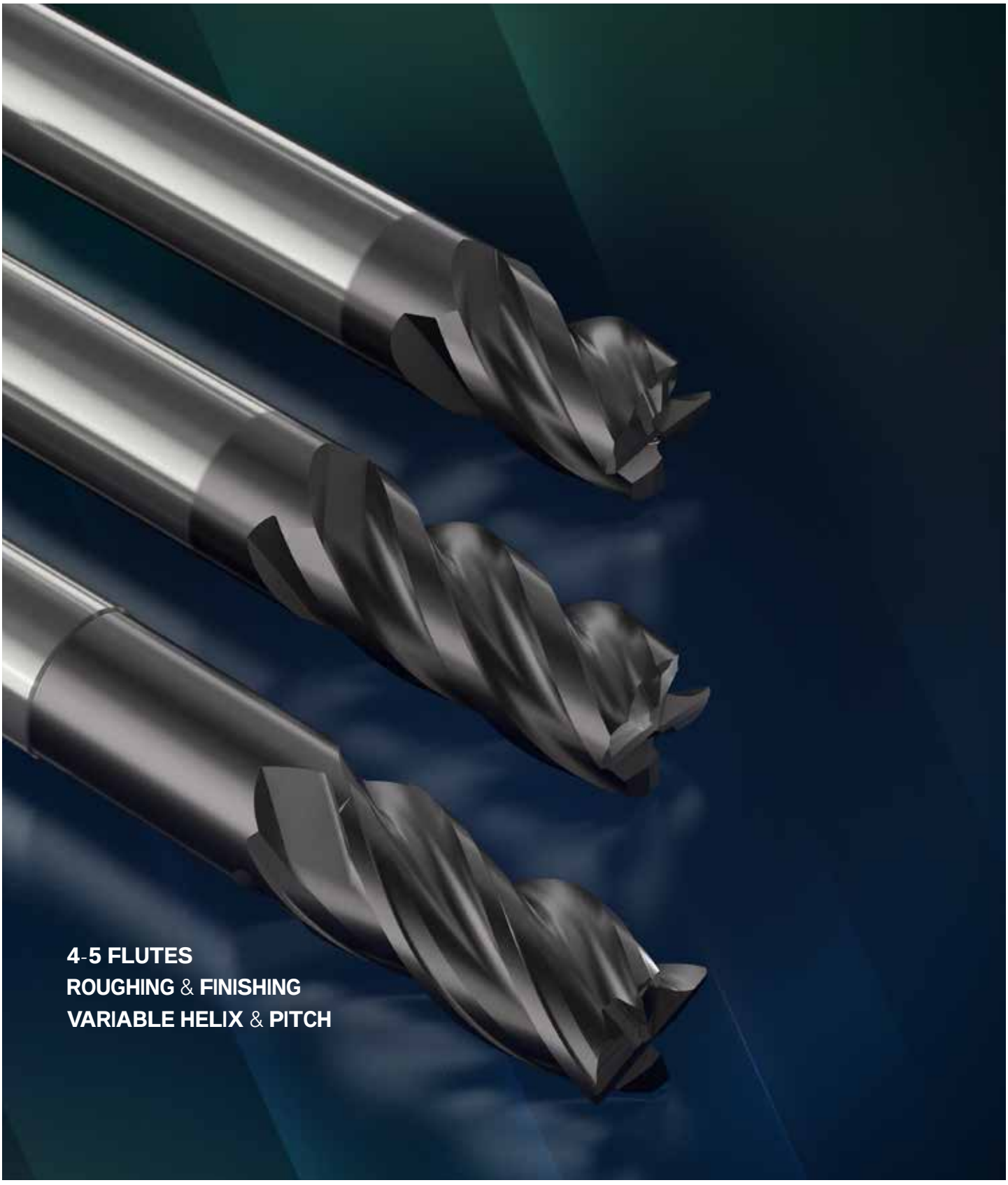
Holder Type

C - Cylindrical shank

W - Weldon shank

SERIES
MVS / MVM / MVL

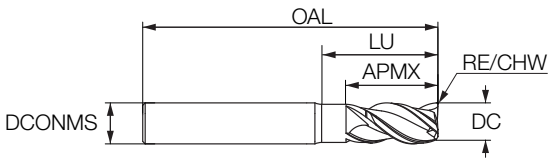
ROUGHING



MORSE EVH

SERIES
MVS / MVM / MVL

- Roughing & Finishing
- Variable Helix & Pitch



4 Flutes

V° Helix

P M K S H

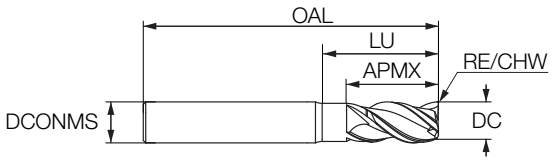
DC	APMX	LU	DCONMS	NOF	OAL	RE	CHW	Shank	AlTiN Coating	AlTiCrSiN Coating
3	6	9	6	4	57	0.15		C	3403108	
3	6	9	6	4	57	0.15		W	3408146	
4	8	12	6	4	57	0.2		C	3403109	
4	8	12	6	4	57	0.2		W	3408147	
5	10	15	6	4	57	0.2		C	3403110	
5	10	15	6	4	57	0.2		W	3408148	
6	6		6	4	50		0.25	C	3401651	3403111
6	6		6	4	50		0.25	W	3406329	
6	6		6	4	50	0.2		C	3402523	3402524
6	12		6	4	57		0.25	C	3403001	
6	12		6	4	57		0.25	W	3403002	
6	12		6	4	57	0.2		C	3402444	
6	12		6	4	57	0.2		W	3402445	
6	12	20	6	4	57	0.2		C	3402455	
6	12	20	6	4	57	0.2		W	3402456	
8	8		8	4	63		0.3	C	3401653	3403112
8	8		8	4	63		0.3	W	3401676	
8	8		8	4	63	0.4		C	3406330	3402525
8	16		8	4	63		0.3	C	3403003	
8	16		8	4	63		0.3	W	3403004	
8	16		8	4	63	0.4		C	3401805	
8	16		8	4	63	0.4		W	3402446	
8	16	26	8	4	63	0.4		C	3402457	
8	16	26	8	4	63	0.4		W	3402458	
10	10		10	4	66		0.4	C	3401677	3403368
10	10		10	4	66	0.5		C	3402526	
10	10		10	4	66		0.4	W	3401678	3403113
10	20		10	4	72		0.4	C	3403005	
10	20		10	4	72		0.4	W	3403006	
10	20		10	4	72	0.5		C	3401806	
10	20		10	4	72	0.5		W	3402447	
10	20	32	10	4	72	0.5		C	3406518	
10	20	32	10	4	72	0.5		W	3401787	
12	12		12	4	73		0.5	C	3401679	3403114
12	12		12	4	73		0.5	W	3401680	3403115
12	12		12	4	73	0.6		C	3406370	
12	24		12	4	83		0.5	C	3403007	
12	24		12	4	83		0.5	W	3403008	
12	24		12	4	83	0.6		C	3402448	
12	24		12	4	83	0.6		W	3402449	

• For technical data see pages: 123-142

MORSE EVH

SERIES
MVS / MVM / MVL (CONT.)

- Roughing & Finishing
- Variable Helix & Pitch

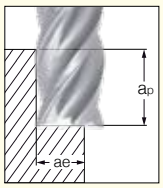


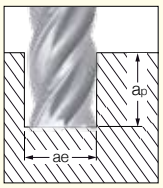
4 Flutes

V° Helix

P M K S H

DC	APMX	LU	DCONMS	NOF	OAL	RE	CHW	Shank	AlTiN Coating	AlTiCrSiN Coating
12	24	38	12	4	83	0.6		C	3402460	
12	24	38	12	4	83	0.6		W	3402461	
16	16		16	4	82		0.6	C	3401681	3401682
16	16		16	4	82		0.6	W	3406331	3403116
16	32		16	4	92		0.6	C	3403009	
16	32		16	4	92		0.6	W	3403010	
16	32		16	4	92	0.8		C	3402451	
16	32		16	4	92	0.8		W	3402452	
16	32	50	16	4	92	0.8		C	3402462	
16	32	50	16	4	92	0.8		W	3402463	
20	40		20	4	104		0.6	C	3403011	
20	40		20	4	104		0.6	W	3403012	
20	40		20	4	104	1		C	3402453	
20	40		20	4	104	1		W	3402454	
20	40	60	20	4	104	1		C	3402464	
20	40	60	20	4	104	1		W	3402465	

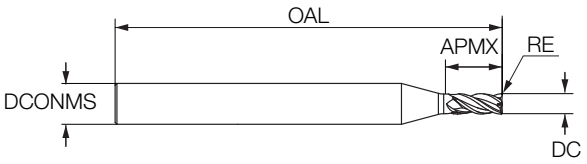




	Side Milling							Slotting					
	Side Milling			Fz mm/t				Sotting			Fz mm/t		
	Vc (m/min)	ap	ae	Ø 3-5	Ø 6-8	Ø 10-12	Ø16-20	Vc (m/min)	ap	ae	Ø 6-8	Ø 10-12	Ø16-20
Steel up to 45 HRC	150-200	2D	0.4xD	0.005-0.025	0.030-0.060	0.06-0.070	0.070-0.080	150-200	2D	D	0.025-0.035	0.030-0.055	0.040-0.055
Hardened Steel 45-55 HRC	60-120	2D	0.4xD		0.015-0.040	0.04-0.050	0.050-0.060	60-120	D	D	0.010-0.015	0.025-0.045	0.030-0.045
Stainless Steels	70-110	2D	0.4xD	0.005-0.025	0.025-0.045	0.04-0.050	0.050-0.065	70-110	2D	D	0.025-0.035	0.035-0.045	0.045-0.050
Titanium	50-70	2D	0.4xD		0.020-0.040	0.04-0.050	0.050-0.060	50-70	1D	D	0.010-0.015	0.030-0.045	0.030-0.045
Inconel	15-25	2D	0.4xD		0.010-0.030	0.03-0.050	0.030-0.050	15-25	1D	D	0.010-0.016	0.030-0.045	0.030-0.045
Cast Iron	150-200	2D	0.4xD	0.005-0.025	0.035-0.050	0.06-0.065	0.065-0.070	150-200	2D	D	0.030-0.040	0.040-0.045	0.040-0.045

SERIES
MVM5021 - MVM5101

- Roughing & Finishing
- Variable Helix & Pitch
- AlTiN Coating 10% Submicron Carbide

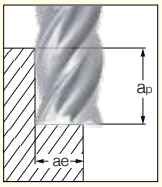


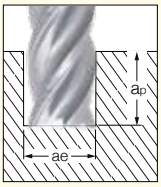
5 Flutes

V° Helix

P M K S H

DC	APMX	DCONMS	NOF	OAL	RE	Shank	EDP Number
4	9	6	5	57	0.2	C	3402477
5	11	6	5	57	0.2	C	3402478
6	13	6	5	57	0.2	C	3402479
8	19	8	5	63	0.4	C	3401808
10	22	10	5	72	0.5	C	3401809
12	26	12	5	83	0.6	C	3402480
12	26	12	5	83	0.6	W	3402481
16	32	16	5	92	0.8	C	3402482
16	32	16	5	92	0.9	W	3402483
20	38	20	5	104	1.0	C	3402484

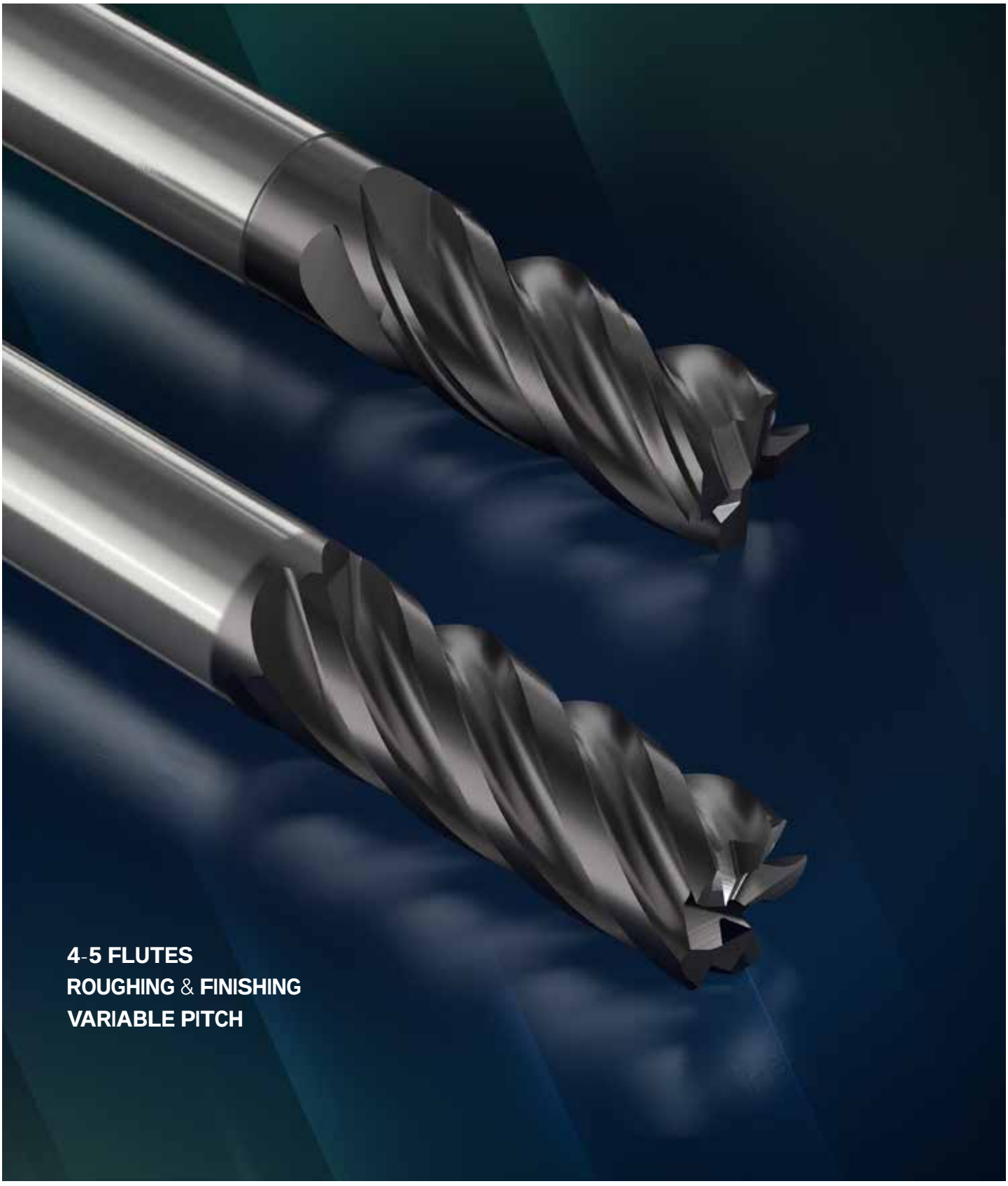




	Side Milling						Slotting					
	Side Milling			Fz mm/t			Sotting			Fz mm/t		
	Vc (m/min)	ap	ae	Ø 6-8	Ø 10-12	Ø16-20	Vc (m/min)	ap	ae	Ø 6-8	Ø 10-12	Ø16-20
Steel up to 45 HRC	150-200	2D	0.4xD	0.030-0.060	0.06-0.070	0.070-0.080	150-200	D	D	0.025-0.035	0.030-0.055	0.040-0.055
Hardened Steel 45-55 HRC	60-120	2D	0.4xD	0.015-0.040	0.04-0.050	0.050-0.060	60-120	D	D	0.010-0.015	0.025-0.045	0.030-0.045
Stainless Steels	70-110	2D	0.4xD	0.025-0.045	0.04-0.050	0.050-0.065	70-110	D	D	0.025-0.035	0.035-0.045	0.045-0.050
Titanium	50-70	2D	0.4xD	0.020-0.040	0.04-0.050	0.050-0.060	50-70	D	D	0.010-0.015	0.030-0.045	0.030-0.045
Inconel	15-25	2D	0.4xD	0.010-0.030	0.03-0.050	0.030-0.050	15-25	D	D	0.010-0.016	0.030-0.045	0.030-0.045
Cast Iron	150-200	2D	0.4xD	0.035-0.050	0.06-0.065	0.065-0.070	150-200	D	D	0.030-0.040	0.040-0.045	0.040-0.045

SERIES
MPL4001 / MPL4005
MPM5001

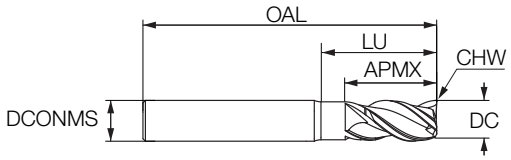
ROUGHING



MORSE EVP

SERIES
MPL4001 / MPL4005

- Roughing & Finishing
- Variable Pitch

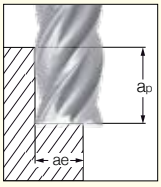


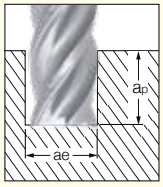
4 Flutes

38° Helix

P M K S H

DC	APMX	LU	DCONMS	NOF	OAL	CHW	Shank	AlTiN Coating	AlTiCrSiN Coating
1.0	2.2	4	4	4	50	0.04	C	3403104	
2.0	4.3	6.1	4	4	50	0.08	C	3403105	
3.0	8	11	6	4	57	0.1	C	3402349	3403032
4.0	10	14	6	4	57	0.15	C	3402350	3403033
5.0	12	17	6	4	57	0.18	C	3402351	3403034
6.0	14	20	6	4	57	0.25	C	3402325	3403035
6.0	14	20	6	4	57	0.25	W	3402326	
8.0	18	26	8	4	63	0.3	C	3420654	3403036
8.0	18	26	8	4	63	-	C	3402327	
8.0	18	26	8	4	63	0.3	W	3402328	
10.0	22	32	10	4	72	0.4	C	3420651	3403037
10.0	22	32	10	4	72	-	C	3402329	
10.0	22	32	10	4	72	0.4	W	3402330	
12.0	26	38	12	4	83	0.5	C	3420652	3403038
12.0	26	38	12	4	83	-	C	3402331	
12.0	26	38	12	4	83	0.5	W	3402332	
16.0	34	50	16	4	100	0.6	C	3402333	3403039
16.0	34	50	16	4	100	0.6	W	3402334	3403040
20.0	42	60	20	4	110	0.6	C	3402335	
20.0	42	60	20	4	110	0.6	W		3402336
25.0	50	65	25	4	121	0.6	C		3402368
25.0	50	65	25	4	121	0.6	W		3402369

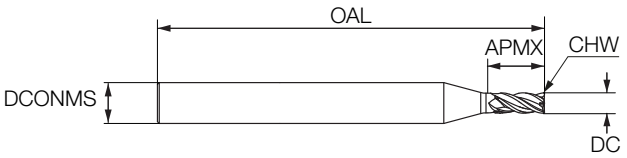




	Side Milling							Slotting					
	Side Milling			Fz mm/t				Sotting			Fz mm/t		
	Vc (m/min)	ap	ae	Ø 1-5	Ø 6-8	Ø 10-12	Ø16-25	Vc (m/min)	ap	ae	Ø 6-8	Ø 10-12	Ø16-25
Steel up to 45 HRC	150-200	2D	0.4xD	0.005-0.020	0.025-0.050	0.050-0.065	0.060-0.07	150-200	2D	D	0.02-0.030	0.030-0.045	0.03-0.045
Hardened Steel 45-55 HRC	60-120	2D	0.4xD		0.015-0.040	0.030-0.040	0.040-0.06	60-120	D	D	0.01-0.015	0.025-0.045	0.03-0.045
Stainless Steels	70-110	2D	0.4xD	0.005-0.020	0.025-0.035	0.035-0.040	0.040-0.06	70-110	2D	D	0.02-0.030	0.035-0.040	0.04-0.045
Titanium	50-70	2D	0.4xD		0.020-0.040	0.040-0.050	0.050-0.06	50-70	2D	D	0.01-0.015	0.030-0.045	0.03-0.040
Inconel	15-25	2D	0.4xD		0.010-0.030	0.030-0.040	0.030-0.05	15-25	1D	D	0.01-0.016	0.030-0.045	0.03-0.040
Cast Iron	150-200	2D	0.4xD	0.005-0.025	0.035-0.050	0.060-0.065	0.065-0.07	150-200	2D	D	0.03-0.040	0.040-0.045	0.04-0.045

SERIES
MPM5001

- Roughing & Finishing
- Variable Pitch
- AlTiN Coating 10% Submicron Carbide

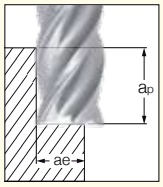


5 Flutes

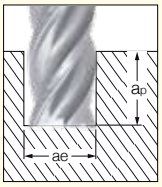
38° Helix

P M K S H

DC	APMX	DCONMS	NOF	OAL	CHW	Shank	EDP Number
6.0	15	6	5	57	0.2	C	3402342
8.0	20	8	5	63	0.25	C	3402343
8.0	20	8	5	63	0.25	C	3403376
10.0	25	10	5	72	0.3	C	3402344
10.0	25	10	5	72	0.3	C	3403377
12.0	30	12	5	83	0.4	C	3402345
12.0	30	12	5	83	0.4	C	3403378
16.0	40	16	5	100	0.5	C	3402346
16.0	40	16	5	100	0.5	C	3403379
20.0	50	20	5	125	0.5	C	3402347
20.0	50	20	5	125	0.5	C	3403380



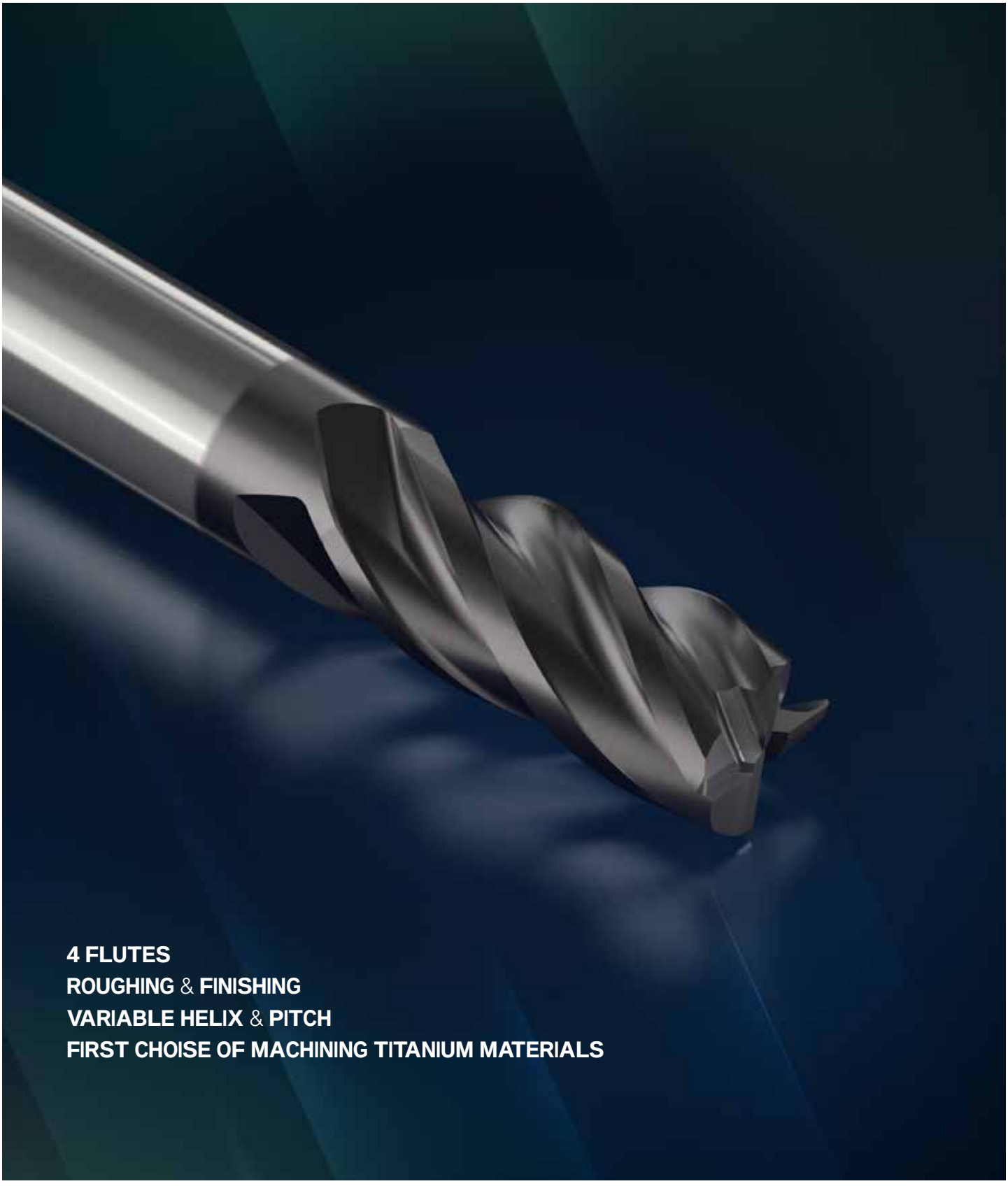
	Side Milling					
	Side Milling			Fz mm/t		
	Vc (m/min)	ap	ae	Ø 6-8	Ø 10-12	Ø16-20
Steel up to 45 HRC	150-200	2D	0.4xD	0.025-0.050	0.050-0.065	0.060-0.07
Hardened Steel 45-55 HRC	60-120	2D	0.4xD	0.015-0.040	0.030-0.040	0.040-0.06
Stainless Steels	70-110	2D	0.4xD	0.025-0.035	0.035-0.040	0.040-0.06
Titanium	50-70	2D	0.4xD	0.020-0.040	0.040-0.050	0.050-0.06
Inconel	15-25	2D	0.4xD	0.010-0.030	0.030-0.040	0.030-0.05
Cast Iron	150-200	2D	0.4xD	0.035-0.050	0.060-0.065	0.065-0.07



	Slotting					
	Slotting			Fz mm/t		
	Vc (m/min)	ap	ae	Ø 6-8	Ø 10-12	Ø16-20
Steel up to 45 HRC	150-200	D	D	0.02-0.030	0.030-0.045	0.03-0.045
Hardened Steel 45-55 HRC	60-120	D	D	0.01-0.015	0.025-0.045	0.03-0.045
Stainless Steels	70-110	D	D	0.02-0.030	0.035-0.040	0.04-0.045
Titanium	50-70	D	D	0.01-0.015	0.030-0.045	0.03-0.040
Inconel	15-25	D	D	0.01-0.016	0.030-0.045	0.03-0.040
Cast Iron	150-200	D	D	0.03-0.040	0.040-0.045	0.04-0.045

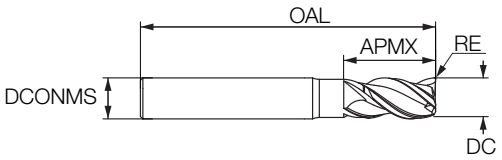
SERIES
MVT4021 - MVT4081

ROUGHING



SERIES
MVT4021 - MVT4081

- Roughing & Finishing
- Variable Helix & Pitch
- First Choise for Titanium
- AlTiN Coating 10% Submicron Carbide

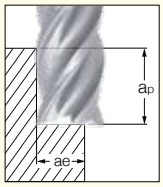


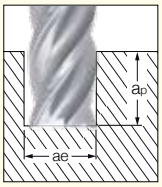
4 Flutes

V° Helix

S

DC	APMX	DCONMS	NOF	OAL	RE	Shank	EDP Number
4.0	8	6	4	57	0.2	C	3402960
5.0	10	6	4	57	0.2	C	3402961
6.0	12	6	4	57	0.2	C	3403382
8.0	16	8	4	63	0.4	C	3420653
8.0	16	8	4	63	0.4	W	3402962
10.0	20	10	4	72	0.5	C	3402963
12.0	24	12	4	83	0.6	C	3403383
12.0	24	12	4	83	0.6	W	3402964
16.0	32	16	4	92	0.8	C	3403384
16.0	32	16	4	92	0.8	W	3402965





	Side Milling						Slotting					
	Side Milling			Fz mm/t			Slotting			Fz mm/t		
	Vc (m/min)	ap	ae	Ø 6-8	Ø 10-12	Ø16	Vc (m/min)	ap	ae	Ø 6-8	Ø 10-12	Ø16
Titanium	50-70	2D	0.4xD	0.03-0.045	0.06-0.08	0.065-0.08	50-70	2D	D	0.025-0.03	0.04-0.05	0.04-0.06
Inconel	15-30	2D	0.4xD	0.02-0.04	0.02-0.045	0.05-0.07	15-30	D	D	0.01-0.015	0.03-0.04	0.03-0.045

MORSE EVH
MORSE EGE

SERIES
REL3001 / REL4001
RVL7001 - RVL7402

ROUGHING

SERIES
REL3001 / REL4001

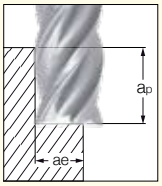
- Roughing
- Chip-Splitter Pitch
- AlTiN Coating 10% Submicron Carbide

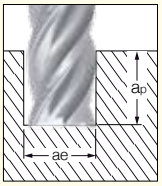
3-4 Flutes

38° Helix

M S

DC	APMX	LU	DCONMS	OAL	CHW	Shank	3 Flutes	4 Flutes
5.0	12	17	6	57	0.2	C	3402286	3402298
5.0	12	17	6	57	0.2	W	3402285	3402297
6.0	14	20	6	57	0.3	C	3402288	3402300
6.0	14	20	6	57	0.3	W	3402287	3402299
8.0	18	26	8	63	0.4	C	3402290	3402302
8.0	18	26	8	63	0.4	W	3402289	3402301
10.0	22	32	10	72	0.4	C	3402292	3402304
10.0	22	32	10	72	0.4	W	3402291	3402303
12.0	26	38	12	83	0.4	C	3402294	3402306
12.0	26	38	12	83	0.4	W	3402293	3402305
14.0	30	44	14	100	0.5	C	-	3402308
14.0	30	44	14	100	0.5	W	-	3402307
16.0	34	50	16	100	0.5	C	3402296	3402310
16.0	34	50	16	100	0.5	W	3402295	3402309
20.0	42	62	20	125	0.5	C	-	3402312
20.0	42	62	20	125	0.5	W	-	3402311

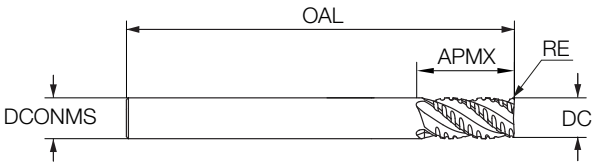




	Side Milling						Slotting					
	Side Milling			Fz mm/t			Side Milling			Fz mm/t		
	Vc (m/min)	ap	ae	Ø 6-8	Ø 10-12	Ø16-25	Vc (m/min)	ap	ae	Ø 6-8	Ø 10-12	Ø16-25
Stainless Steels	70-110	2D	0.4xD	0.025-0.045	0.04-0.050	0.050-0.065	70-110	D	D	0.025-0.035	0.035-0.045	0.045-0.050
Titanium	50-70	2D	0.4xD	0.020-0.040	0.04-0.050	0.050-0.060	50-70	D	D	0.010-0.015	0.030-0.045	0.030-0.045
Inconel	15-25	2D	0.4xD	0.010-0.030	0.03-0.050	0.030-0.050	15-25	D	D	0.010-0.016	0.030-0.045	0.030-0.045

SERIES
RVL7002 - RVL7402

- Roughing
- Variable Helix & Pitch
- Chip Splitter Pitch
- Long Cutting Length
- AlTiN Coating 9% Ultrafine Carbide



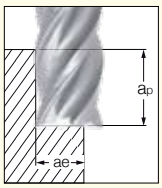
7 Flutes

V° Helix

M S

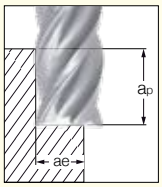
DC	APMX	DCONMS	NOF	OAL	Shank	Square	R0.5	R0.6	R0.8	R1.0	R1.6
6.0	18	6	7	65	C	3401717					
6.0	24	6	7	70	C	3401723					
6.0	36	6	7	90	C	3401729					
8.0	24	8	7	90	C	3401718					
8.0	32	8	7	90	C	3401724					
8.0	48	8	7	110	C	3401730					
10.0	30	10	7	85	C	3401719	3401736				3401737
10.0	40	10	7	100	C	3401725	3401741				3401742
10.0	60	10	7	130	C	3401731	3401746			3401747	
12.0	36	12	7	95	C	3401720		3401748			3401749
12.0	48	12	7	110	C	3401726		3401754			3401755
12.0	72	12	7	140	C	3401732				3401760	
16.0	48	16	7	110	C	3401721			3401761		3401762
16.0	64	16	7	131	C	3401727			3401767		3401768
16.0	96	16	7	175	C	3401733				3401773	
20.0	60	20	7	140	C	3401722				3401774	
20.0	80	20	7	140	C	3401728				3401779	

DC	APMX	DCONMS	NOF	OAL	Shank	Square	R2.0	R2.5	R3.0	R4.0
6.0	18	6	7	65	C	3401717				
6.0	24	6	7	70	C	3401723				
6.0	36	6	7	90	C	3401729				
8.0	24	8	7	90	C	3401718				
8.0	32	8	7	90	C	3401724				
8.0	48	8	7	110	C	3401730				
10.0	30	10	7	85	C	3401719	3401738	3401739	3401740	
10.0	40	10	7	100	C	3401725	3401743	3401744	3401745	
10.0	60	10	7	130	C	3401731				
12.0	36	12	7	95	C	3401720	3401750	3401751	3401752	3401753
12.0	48	12	7	110	C	3401726	3401756	3401757	3401758	3401759
12.0	72	12	7	140	C	3401732				
16.0	48	16	7	110	C	3401721	3401763	3401764	3401765	3401766
16.0	64	16	7	131	C	3401727	3401769	3401770	3401771	3401772
16.0	96	16	7	175	C	3401733				
20.0	60	20	7	140	C	3401722	3401775	3401776	3401777	3401778
20.0	80	20	7	140	C	3401728				



	Side Milling					
	Side Milling			Fz mm/t		
	Vc (m/min)	ap	ae	Ø 6-8	Ø 10-12	Ø16-20
Stainless Steels	70-110	3D	0.1xD	0.025-0.040	0.03-0.045	0.05-0.065
Titanium	50-70	3D	0.1xD	0.020-0.040	0.04-0.050	0.050-0.060
Inconel	15-25	3D	0.1xD	0.010-0.030	0.03-0.050	0.030-0.050

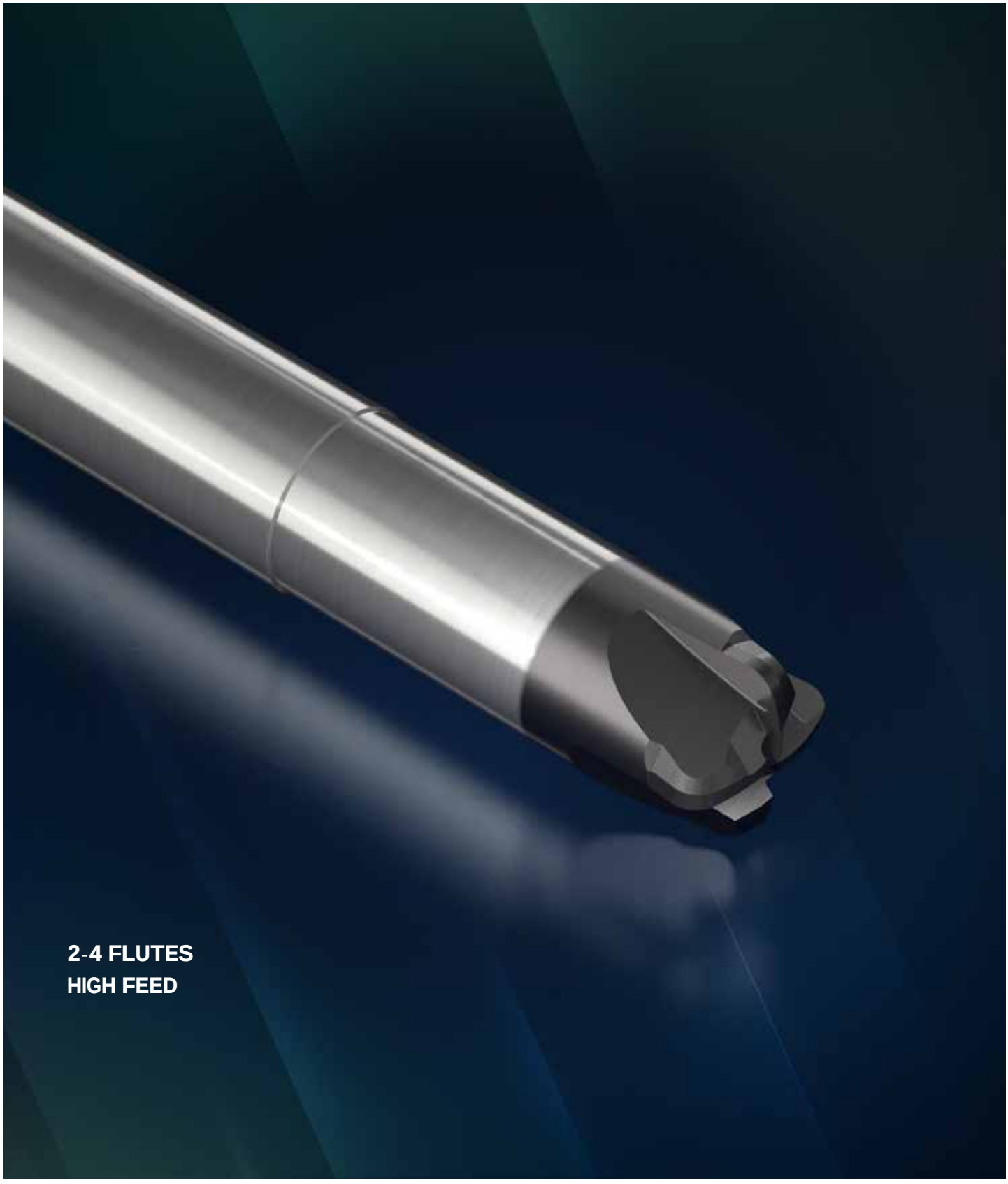
HIGH SPEED MACHINING



	Side Milling					
	Side Milling			Fz mm/t		
	Vc (m/min)	ap	ae	Ø 6-8	Ø 10-12	Ø16-20
Stainless Steels	70-110	3D	0.05xD	0.035-0.050	0.04-0.060	0.050-0.08
Titanium	70-100	3D	0.05xD	0.035-0.050	0.04-0.060	0.050-0.08
Inconel	20-40	3D	0.05xD	0.015-0.025	0.03-0.045	0.030-0.045

SERIES
RFL202 / RFL402

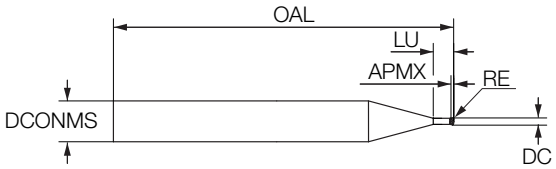
ROUGHING



MORSE EHF

SERIES
RFL202 / RFL402

- High Feed
- AlTiN Coating 12% Ultrafine Carbide



2-4 Flutes

P M K N S H

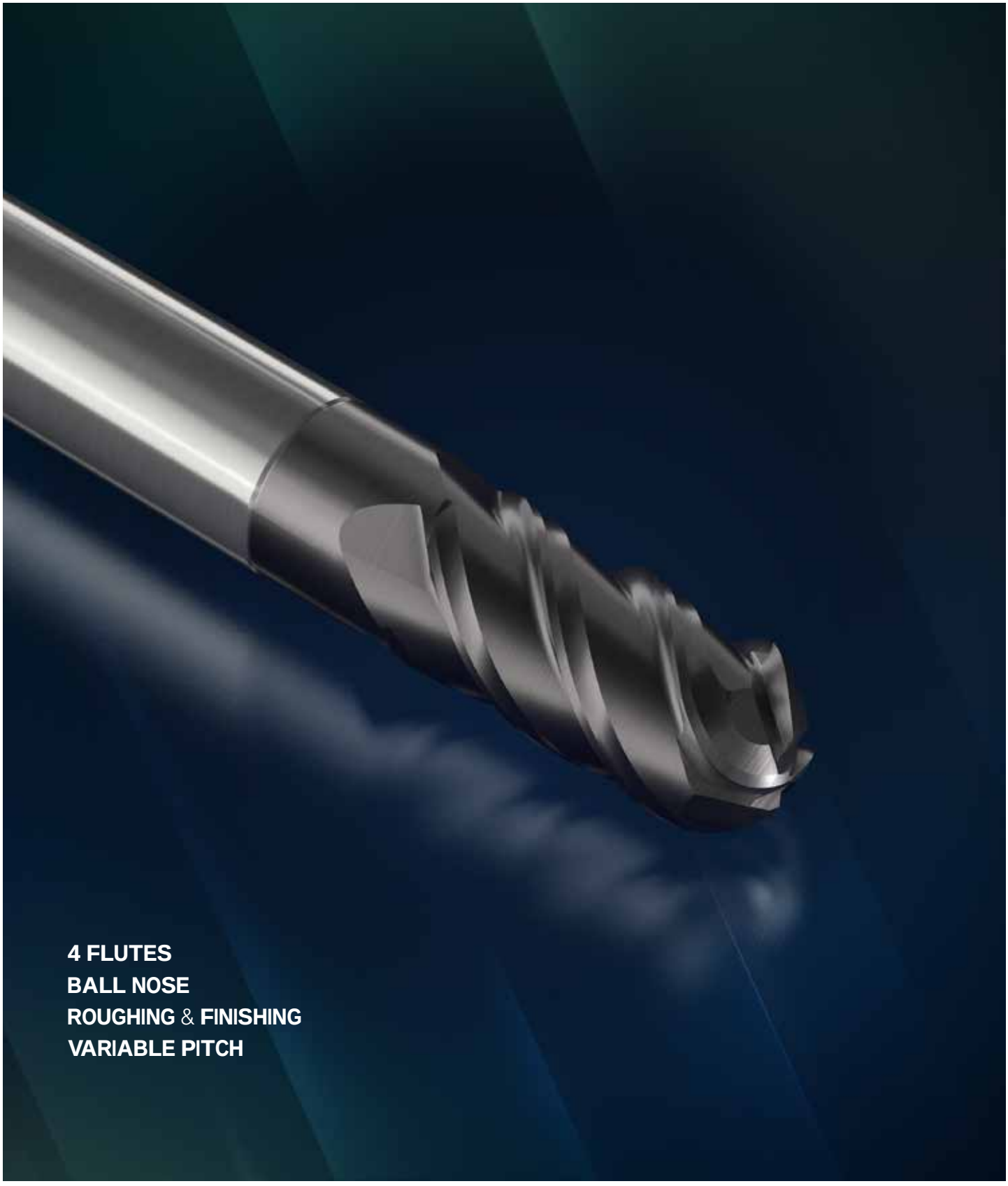
DC	APMX	LU	DCONMS	NOF	OAL	RE	Shank	EDP Number
1.0	0.06	3	6	2	50	0.15	C	3402489
2.0	0.12	6	6	2	50	0.3	C	3402490
3.0	0.2	9	6	2	50	0.5	C	3402491
4.0	0.2	14	6	4	57	0.7	C	3402492
5.0	0.3	17	6	4	57	0.9	C	3402493
6.0	0.3	20	6	4	57	1.23	C	3402337
8.0	0.4	26	8	4	63	1.62	C	3402338
10.0	0.5	30	10	4	72	2.01	C	3402339
12.0	0.6	34	12	4	83	2.47	C	3402340
16.0	0.8	42	16	4	92	3.25	C	3402341

R are used for porgraming

	Side Milling							Slotting						
	Side Milling			Fz mm/t				Sotting			Fz mm/t			
	Vc (m/min)	ap	ae	Ø 1-3	Ø 3-6	Ø 6-10	Ø12-16	Vc (m/min)	ap	ae	Ø 1-3	Ø 3-6	Ø 6-10	Ø12-16
Steel up to 45 HRC	150-200	0.05D	0.4xD	0.02-0.03	0.025-0.10	0.10-0.30	0.15-0.50	150-200	0.05D	D	0.015-0.04	0.02-0.08	0.080-0.25	0.10-0.40
Hardened Steel 45-55 HRC	60-120	0.05D	0.4xD	0.01-0.02	0.050-0.08	0.05-0.08	0.08-0.30	60-120	0.05D	D	0.008-0.02	0.04-0.07	0.05-0.08	0.08-0.30
Stainless Steels	70-110	0.05D	0.4xD	0.02-0.05	0.050-0.10	0.10-0.30	0.15-0.50	70-110	0.05D	D	0.015-0.04	0.02-0.08	0.080-0.25	0.10-0.40
Titanium	50-70	0.05D	0.4xD	0.02-0.05	0.050-0.10	0.10-0.30	0.15-0.50	50-70	0.05D	D	0.015-0.04	0.02-0.08	0.080-0.25	0.10-0.40
Inconel	15-25	0.05D	0.4xD	0.01-0.02	0.020-0.05	0.05-0.08	0.05-0.10	15-25	0.05D	D	0.008-0.02	0.01-0.04	0.04-0.06	0.05-0.10
Cast Iron	150-200	0.05D	0.4xD	0.02-0.05	0.050-0.10	0.10-0.30	0.15-0.50	150-200	0.05D	D	0.015-0.04	0.02-0.08	0.080-0.25	0.10-0.40

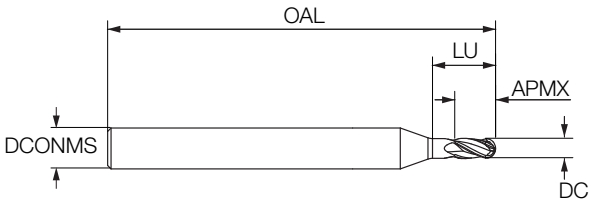
SERIES
MPL4B02

ROUGHING



SERIES
MPL4B02

- Ball Nose
- Roughing & Finishing
- Variable Pitch
- AlTiN Coating 9% Ultrafine Carbide

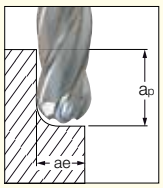


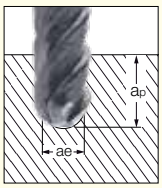
4 Flutes

38° Helix

P M K S H

DCC	APMX	LU	DCONMS	NOF	OAL	Shank	EDP Number
3.0	6	9	6	4	57	C	3403013
4.0	8	12	6	4	57	C	3403014
5.0	10	15	6	4	57	C	3403015
6.0	12	18	6	4	57	C	3403016
8.0	16	24	8	4	63	C	3403017
10.0	20	30	10	4	72	C	3403018
12.0	24	36	12	4	83	C	3403019
16.0	32	48	16	4	92	C	3403020

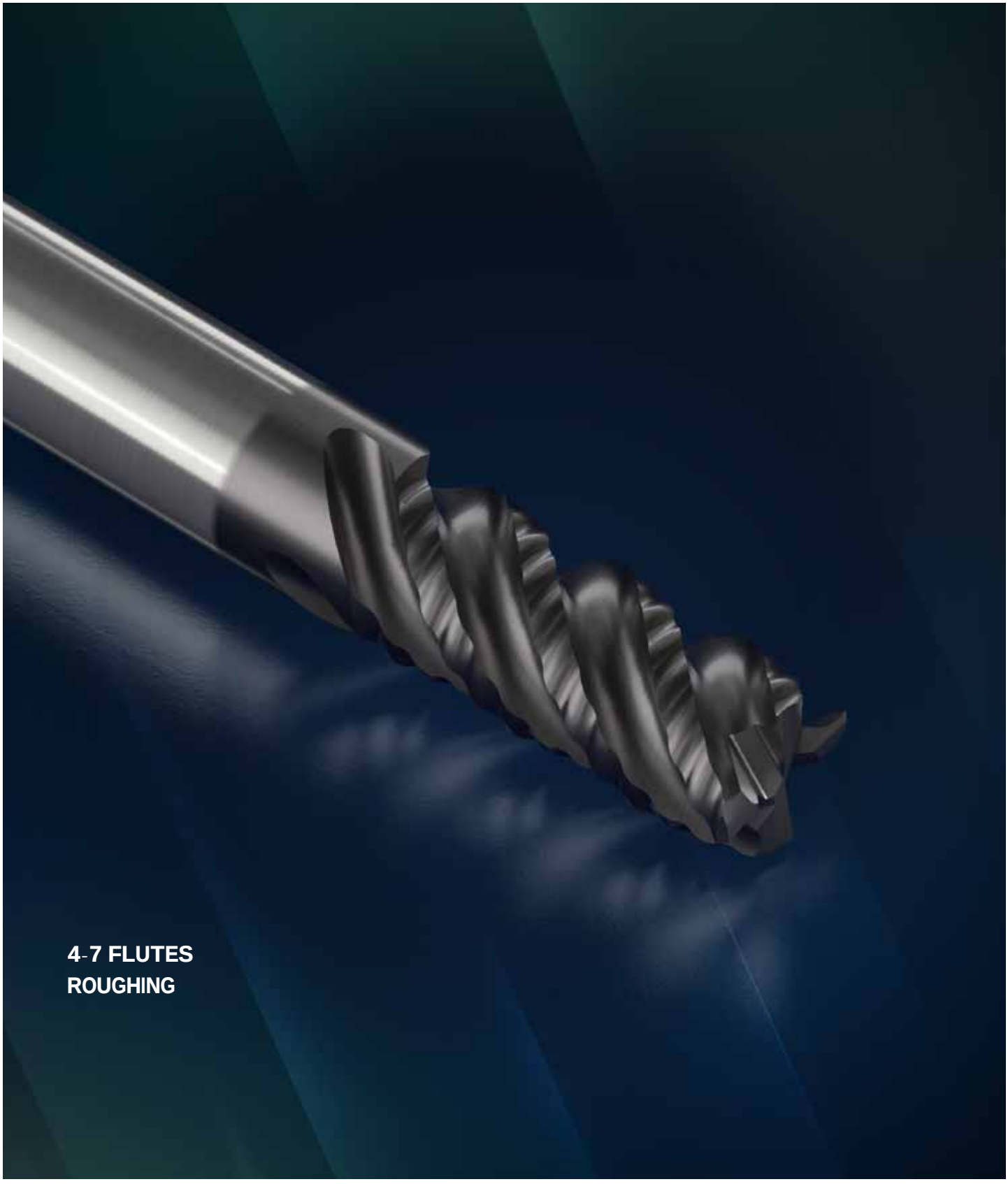




	Side Milling							Slotting					
	Side Milling			Fz mm/t				Sotting			Fz mm/t		
	Vc (m/min)	ap	ae	Ø 3-5	Ø 6-8	Ø 10-12	Ø16	Vc (m/min)	ap	ae	Ø 6-8	Ø 10-12	Ø16
Steel up to 45 HRC	150-200	2D	0.4xD	0.005-0.025	0.030-0.060	0.06-0.070	0.070-0.080	150-200	2D	D	0.025-0.035	0.030-0.055	0.040-0.055
Hardened Steel 45-55 HRC	60-120	2D	0.4xD	0.005-0.020	0.015-0.040	0.04-0.050	0.050-0.060	60-120	D	D	0.010-0.015	0.025-0.045	0.030-0.045
Stainless Steels	70-110	2D	0.4xD	0.005-0.020	0.025-0.045	0.04-0.050	0.050-0.065	70-110	2D	D	0.025-0.035	0.035-0.045	0.045-0.050
Titanium	50-70	2D	0.4xD	0.005-0.020	0.020-0.040	0.04-0.050	0.050-0.060	50-70	1D	D	0.010-0.015	0.030-0.045	0.030-0.045
Inconel	15-25	2D	0.4xD	0.005-0.015	0.010-0.030	0.03-0.050	0.030-0.050	15-25	1D	D	0.010-0.016	0.030-0.045	0.030-0.045
Cast Iron	150-200	2D	0.4xD	0.005-0.025	0.035-0.050	0.06-0.065	0.065-0.070	150-200	2D	D	0.030-0.040	0.040-0.045	0.040-0.045

SERIES
RBS / RBM / RBL

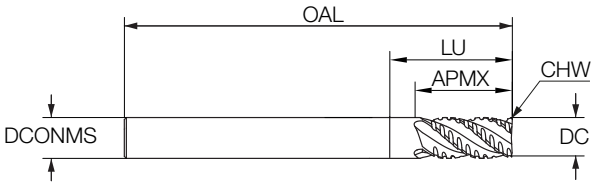
ROUGHING



MORSE EGE

SERIES
RBS / RBM / RBL

- Roughing
- Medium Pitch
- AlTiN Coating 10% Submicron Carbide



4-7 Flutes

45° Helix

P M K

DC	APMX	LU	DCONMS	NOF	OAL	CHW	Shank	EDP Number
5.0	5	10	6	4	57	0.2	C	3402189
5.0	5	10	6	4	57	0.2	W	3402163
5.0	10	-	6	4	57	0.2	C	3402194
5.0	10	-	6	4	57	0.2	W	3402167
6.0	6	-	6	4	57	0.25	C	3402190
6.0	6	-	6	4	57	0.25	W	3402164
6.0	12	-	6	4	57	0.25	C	3402195
6.0	12	-	6	4	57	0.25	W	3402168
6.0	12	18	6	4	57	0.25	C	3402202
6.0	12	18	6	4	57	0.25	W	3402174
7.0	7	-	8	4	63	0.25	C	3403122
8.0	8	-	8	4	63	0.25	C	3402191
8.0	8	-	8	4	63	0.25	W	3402188
8.0	16	-	8	4	63	0.25	C	3402196
8.0	16	-	8	4	63	0.25	W	3402169
8.0	16	24	8	4	63	0.25	C	3402203
8.0	16	24	8	4	63	0.25	W	3402175
8.0	12	32	8	4	68	0.25	C	3402208
8.0	12	32	8	4	68	0.25	W	3402180
10.0	10	-	10	4	72	0.3	C	3402192
10.0	10	-	10	4	72	0.3	W	3402165
10.0	20	-	10	4	72	0.3	C	3402197
10.0	20	-	10	4	72	0.3	W	3402170
10.0	20	30	10	4	72	0.3	C	3402204
10.0	20	30	10	4	72	0.3	W	3402176
10.0	15	40	10	4	80	0.3	C	3402209
10.0	15	40	10	4	80	0.3	W	3402181
12.0	12	-	12	4	83	0.35	C	3402193
12.0	12	-	12	4	83	0.35	W	3402166
12.0	24	-	12	4	83	0.35	C	3402198
12.0	24	-	12	4	83	0.35	W	3402171
12.0	24	36	12	4	83	0.35	C	3402205
12.0	24	36	12	4	83	0.35	W	3402177
12.0	18	48	12	4	100	0.35	C	3402210
12.0	18	48	12	4	100	0.35	W	3402182
16.0	32	-	16	5	92	0.4	C	3402200
16.0	32	-	16	5	92	0.4	W	3402172
16.0	32	48	16	5	100	0.4	C	3402206
16.0	32	48	16	5	100	0.4	W	3402178

SERIES
RBS / RBM / RBL (CONT.)

- Roughing
- Medium Pitch
- AlTiN Coating 10% Submicron Carbide

4-7 Flutes

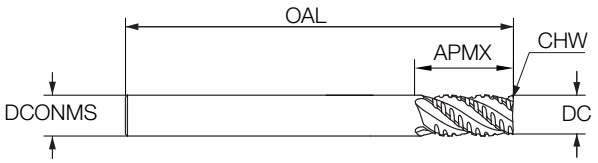
45° Helix

P M K

DC	APMX	LU	DCONMS	NOF	OAL	CHW	Shank	EDP Number
16.0	24	64	16	5	115	0.4	C	3402211
16.0	24	64	16	5	115	0.4	W	3402183
20.0	40	-	20	7	104	0.4	C	3402201
20.0	40	-	20	7	104	0.4	W	3402173
20.0	40	60	20	7	110	0.4	C	3402207
20.0	40	60	20	7	110	0.4	W	3402179

SERIES
RBM4001 - RBM6001

- Roughing
- Shallow Pitch
- AlTiN Coating 10% Submicron Carbide



4-6 Flutes

45° Helix

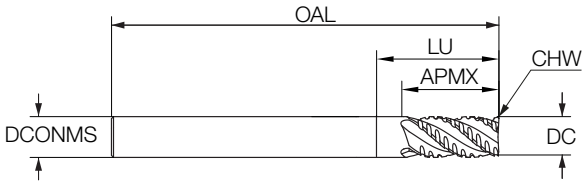
P S H

DC	APMX	DCONMS	NOF	OAL	CHW	Shank	EDP Number
6.0	14	6	4	57	0.25	C	3402269
6.0	14	6	4	57	0.25	W	3402270
8.0	18	8	4	63	0.3	C	3402271
8.0	18	8	4	63	0.3	W	3402272
10.0	22	10	4	72	0.3	C	3402273
10.0	22	10	4	72	0.3	W	3402274
12.0	26	12	4	83	0.4	C	3402275
12.0	26	12	4	83	0.4	W	3402276
14.0	30	14	4	83	0.4	C	3402277
16.0	34	16	6	92	0.5	C	3402278
16.0	34	16	6	92	0.5	W	3402279
20.0	42	20	6	104	0.7	C	3402280
20.0	42	20	6	104	0.7	W	3402281
25.0	52	25	6	121	0.9	W	3402282

MORSE EGE

SERIES
REL3001 - REL4001

- Roughing
- Shellow Pitch
- AlTiN Coating 10% Submicron Carbide

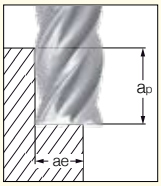


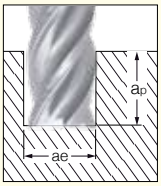
3-4 Flutes

38° Helix

P K

DC	APMX	LU	DCONMS	NOF	OAL	CHW	Shank	EDP Number
4.0	8	13	6	3	57	0.25	C	3402144
5.0	10	17	6	3	57	0.3	C	3402143
6.0	13	21	6	3	57	0.3	C	3402151
6.0	13	21	6	3	57	0.3	W	3401957
7.0	20	26	8	3	63	0.3	C	3403119
8.0	20	28	8	3	63	0.3	C	3402152
8.0	20	28	8	3	63	0.3	W	3401958
9.0	22	30	10	4	72	0.3	C	3403120
10.0	22	30	10	4	72	0.3	C	3402153
10.0	22	30	10	4	72	0.3	W	3401959
11.0	25	31	12	4	83	0.3	C	3403121
12.0	25	37	12	4	83	0.4	C	3403127
12.0	25	37	12	4	83	0.4	W	3401960
14.0	25	37	14	4	83	0.5	C	3402160
14.0	25	37	14	4	83	0.5	W	3401961
16.0	32	44	16	4	92	0.5	C	3402154
16.0	32	44	16	4	92	0.5	W	3401962
18.0	32	44	18	4	92	0.5	W	3401963
20.0	38	55	20	4	104	0.6	C	3402161
20.0	38	55	20	4	104	0.6	W	3401964

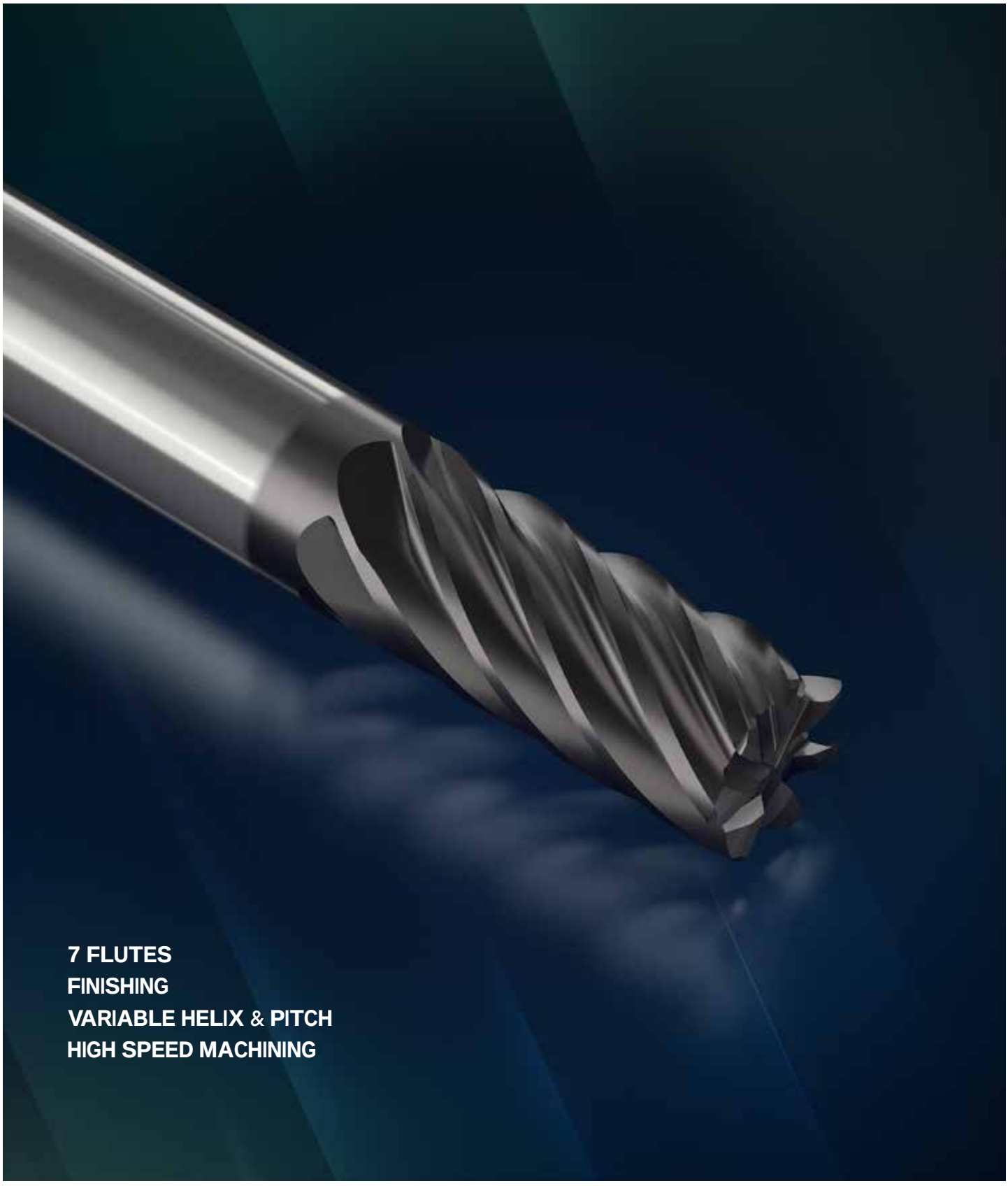




	Side Milling						Slotting					
	Side Milling			Fz mm/t			Slotting			Fz mm/t		
	Vc (m/min)	ap	ae	Ø 6-8	Ø 10-12	Ø16-25	Vc (m/min)	ap	ae	Ø 6-8	Ø 10-12	Ø16-25
Steel up to 45 HRC	150-200	2D	0.4xD	0.030-0.060	0.06-0.070	0.070-0.080	150-200	D	D	0.025-0.035	0.030-0.055	0.040-0.055
Hardened Steel 45-55 HRC	60-120	2D	0.4xD	0.015-0.040	0.04-0.050	0.050-0.060	60-120	D	D	0.010-0.015	0.025-0.045	0.030-0.045
Stainless Steels	70-110	2D	0.4xD	0.025-0.045	0.04-0.050	0.050-0.065	70-110	D	D	0.025-0.035	0.035-0.045	0.045-0.050
Titanium	50-70	2D	0.4xD	0.020-0.040	0.04-0.050	0.050-0.060	50-70	D	D	0.010-0.015	0.030-0.045	0.030-0.045
Inconel	15-25	2D	0.4xD	0.010-0.030	0.03-0.050	0.030-0.050	15-25	D	D	0.010-0.016	0.030-0.045	0.030-0.045
Cast Iron	150-200	2D	0.4xD	0.035-0.050	0.06-0.065	0.065-0.070	150-200	D	D	0.030-0.040	0.040-0.045	0.040-0.045

SERIES
FVM7002

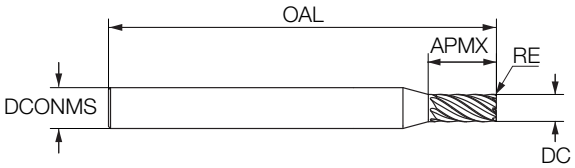
FINISHING



MORSE EVH

SERIES
FVM7002

- Finishing
- Variable Helix & Pitch
- High Speed Machining
- AlTiN Coating 9% Ultrafine Carbide

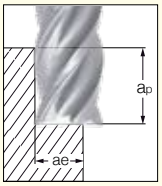


7 Flutes

V° Helix

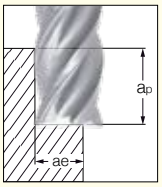
P M K S H

DC	APMX	DCONMS	NOF	OAL	RE	Shank	EDP Number
2.0	4	6	7	57	-	C	3403027
3.0	6	6	7	57	-	C	3403028
4.0	8	6	7	57	-	C	3403029
5.0	10	6	7	57	-	C	3406328
6.0	12	6	7	57	-	C	3401697
6.0	12	6	7	57	0.2	C	3403369
6.0	24	6	7	70	-	C	3403021
6.0	36	6	7	90	-	C	3401692
8.0	16	8	7	63	-	C	3402519
8.0	16	8	7	63	0.4	C	3401698
8.0	24	8	7	90	-	C	3401712
8.0	32	8	7	90	-	C	3403022
8.0	48	8	7	110	-	C	3401693
10.0	20	10	7	72	-	C	3401699
10.0	30	10	7	100	-	C	3401713
10.0	30	10	7	85	0.5	C	3403372
10.0	40	10	7	100	-	C	3403023
10.0	60	10	7	130	-	C	3401694
12.0	24	12	7	83	-	C	3401700
12.0	24	12	7	83	0.6	C	3403371
12.0	24	12	7	83	1.6	C	3401734
12.0	24	12	7	83	-	W	3403030
12.0	36	12	7	110	-	C	3401714
12.0	36	12	7	95	0.6	C	3403373
12.0	48	12	7	110	-	C	3403024
12.0	72	12	7	140	-	C	3401695
16.0	32	16	7	92	-	C	3402520
16.0	32	16	7	92	0.8	C	3401701
16.0	32	16	7	92	-	W	3403031
16.0	48	16	7	131	-	C	3401715
16.0	64	16	7	131	-	C	3403025
16.0	96	16	7	175	-	C	3401696
20.0	40	20	7	104	-	C	3402521
20.0	40	20	7	104	1.0	C	3401702
20.0	60	20	7	140	-	C	3401716
20.0	80	20	7	140	-	C	3403026
20.0	80	20	7	140	1.0	C	3401735



	Side Milling			Fz mm/t		
	Vc (m/min)	ap	ae	Ø 6-8	Ø 10-12	Ø16-20
Steel up to 45 HRC	150-200	2D	0.1xD	0.030-0.060	0.06-0.070	0.070-0.080
Hardened Steel 45-55 HRC	60-120	2D	0.1xD	0.015-0.040	0.04-0.050	0.050-0.060
Stainless Steels	70-110	2D	0.1xD	0.025-0.045	0.04-0.050	0.050-0.065
Titanium	50-70	2D	0.1xD	0.020-0.040	0.04-0.050	0.050-0.060
Inconel	15-25	2D	0.1xD	0.010-0.030	0.03-0.050	0.030-0.050
Cast Iron	150-200	2D	0.1xD	0.035-0.050	0.06-0.065	0.065-0.070

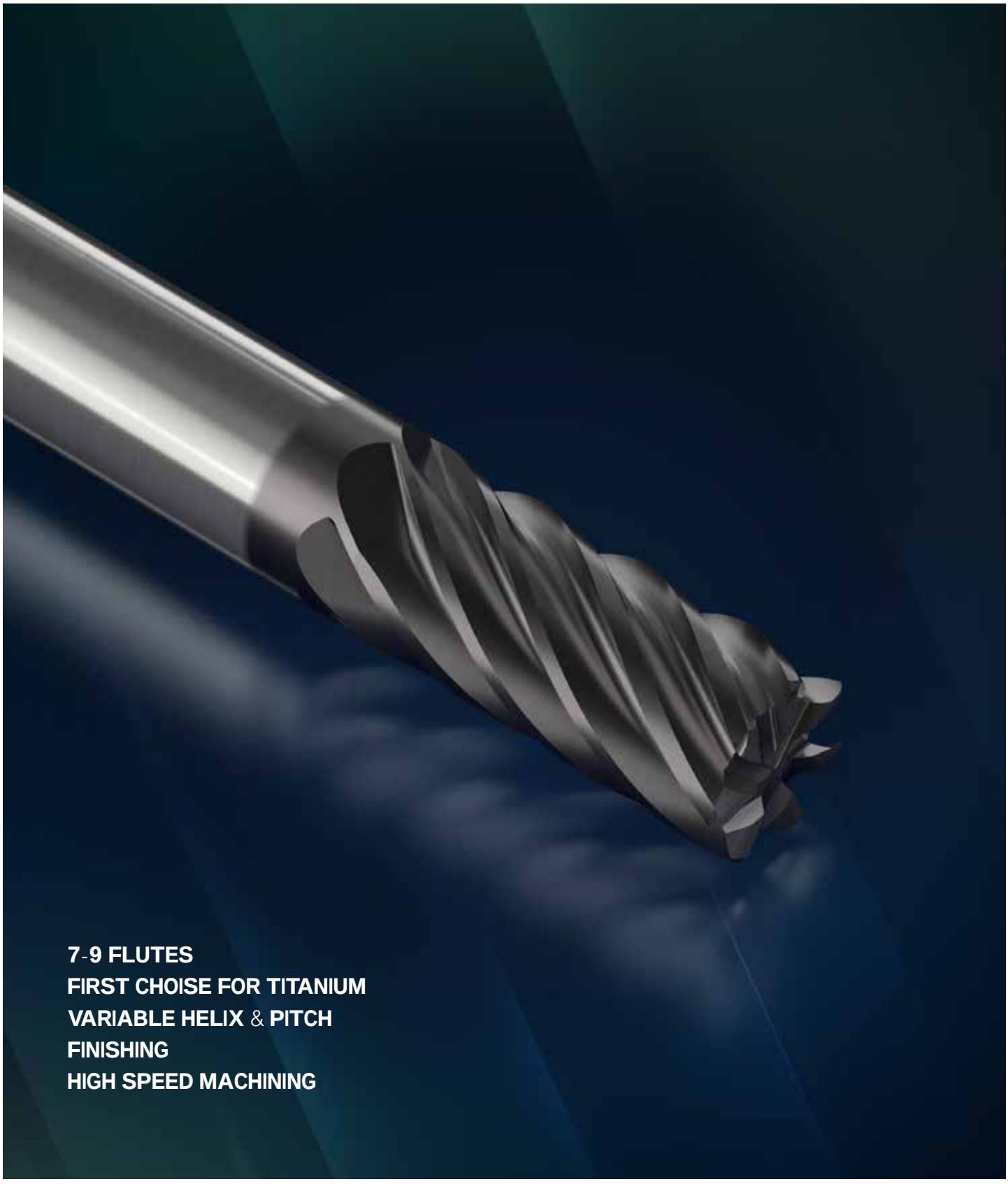
CUTTING DATA FOR HIGH SPEED MACHINING



	Side Milling			Fz mm/t		
	Vc (m/min)	ap	ae	Ø 6-8	Ø 10-12	Ø16-20
Steel up to 45 HRC	200-300	2D	0.05xD	0.04-0.07	0.06-0.08	0.08-0.012
Hardened Steel 45-55 HRC	60-120	2D	0.05xD	0.02-0.04	0.04-0.05	0.05-0.060
Stainless Steels	100-150	2D	0.05xD	0.04-0.07	0.06-0.08	0.08-0.012
Titanium	70-120	2D	0.05xD	0.04-0.07	0.06-0.08	0.08-0.012
Inconel	25-40	2D	0.05xD	0.01-0.03	0.03-0.05	0.03-0.050
Cast Iron	200-300	2D	0.05xD	0.04-0.07	0.06-0.08	0.08-0.012

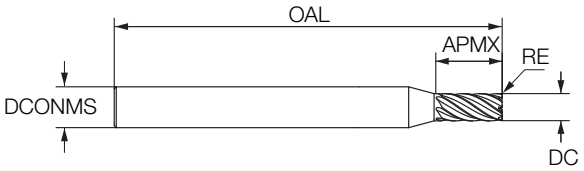
SERIES
FVT7021 - FVT9081

FINISHING



SERIES
FVT 7021 - FVT 9081

- First Choise for Titanium
- Variable Helix & Pitch
- Finishing
- High Speed Machining
- AlTiN Coating 10% Submicron Carbide

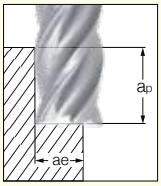


7-9 Flutes

V° Helix

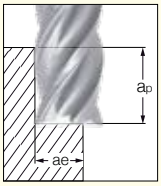
S

DC	APMX	DCONMS	NOF	OAL	RE	Shank	EDP Number
6.0	13	6	7	57	0.2	C	3402485
8.0	19	8	7	63	0.4	C	3401810
10.0	22	10	7	72	0.5	C	3401811
12.0	26	12	7	83	0.6	C	3402486
12.0	26	12	7	83	0.6	W	3402487
16.0	32	16	9	92	0.8	C	3402488



	Side Milling					
	Side Milling			Fz mm/t		
	Vc (m/min)	ap	ae	Ø 6-8	Ø 10-12	Ø16
Titanium	50-70	2D	0.4xD	0.03-0.045	0.06-0.08	0.065-0.08
Inconel	15-30	2D	0.4xD	0.02-0.040	0.02-0.045	0.05-0.07

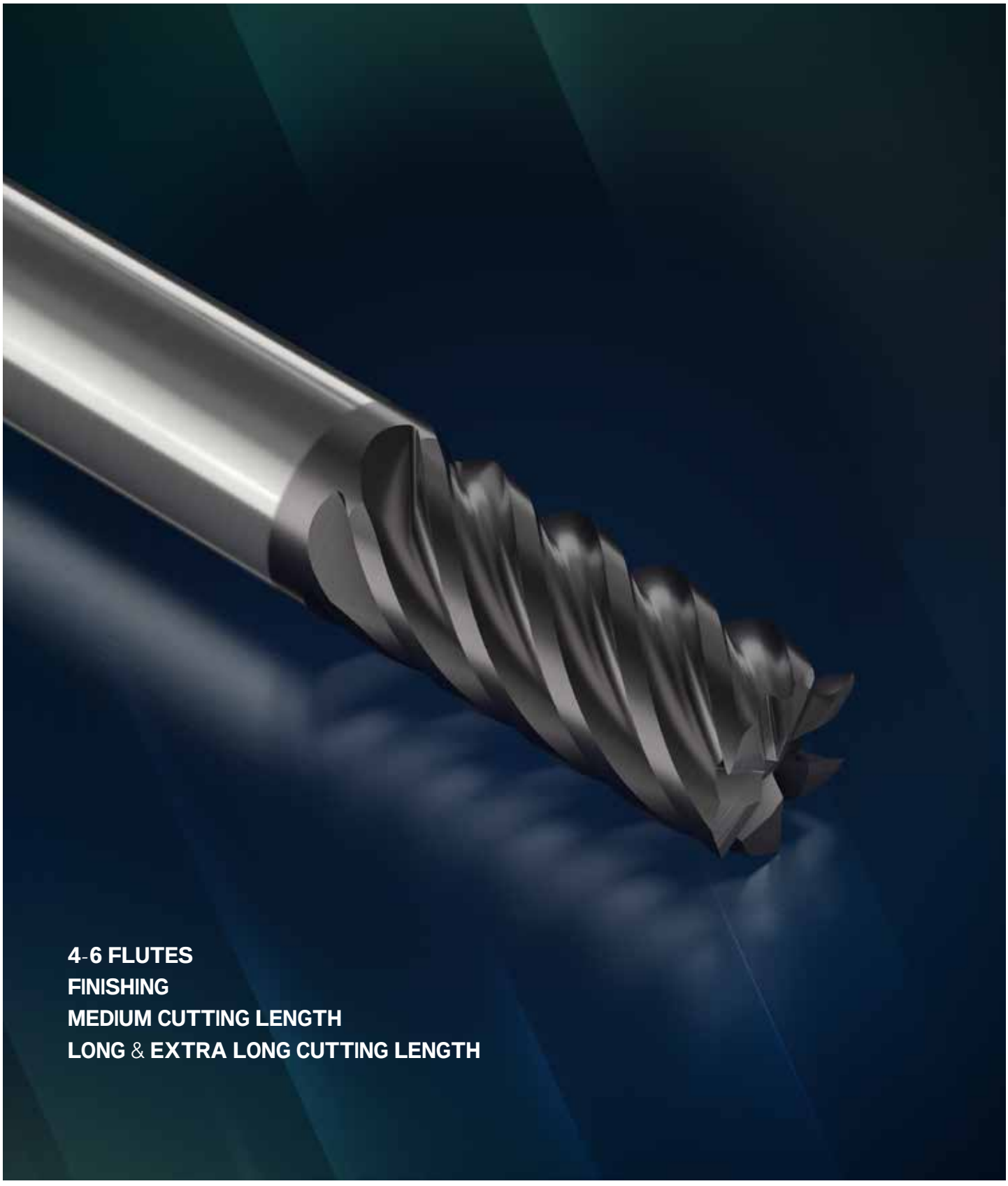
CUTTING DATA FOR HIGH SPEED MACHINING



	Side Milling					
	Side Milling			Fz mm/t		
	Vc (m/min)	ap	ae	Ø 6-8	Ø 10-12	Ø16
Titanium	70-110	2D	0.1xD	0.04-0.08	0.04-0.05	0.04-0.06
Inconel	25-50	D	0.1xD	0.03-0.06	0.05-0.08	0.05-0.09

SERIES
FBM6001 / FBM6003
FBL4001 / FBL6001

GENERAL

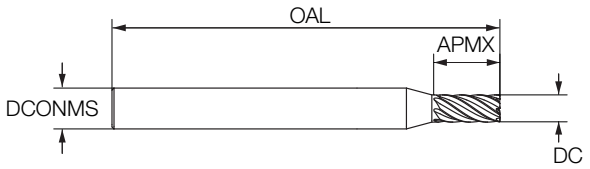


4-6 FLUTES
FINISHING
MEDIUM CUTTING LENGTH
LONG & EXTRA LONG CUTTING LENGTH

MORSE EGE

SERIES
FBM6001 / FBM6003

- Finishing
- Medium Cutting Length



6 Flutes

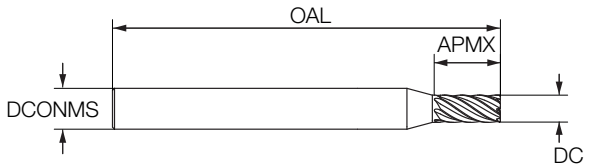
45° Helix

P M K S

DC	APMX	DCONMS	NOF	OAL	Shank	AlTiN Submicron	AlTiN Ultrafine Micron
6.0	16	6	6	57	C	3401965	3419148
6.0	16	6	6	57	W	3402130	
8.0	20	8	6	63	C		3402235
8.0	20	8	6	63	W	3402131	
10.0	22	10	6	72	C	3401967	3402225
10.0	22	10	6	72	W	3402132	
12.0	25	12	6	83	C	3401968	3402236
12.0	25	12	6	83	W	3402133	
16.0	32	16	6	92	C	3401969	3402237
16.0	32	16	6	92	W	3402134	
20.0	38	20	6	104	C	3401970	3402238
20.0	38	20	6	104	W	3402135	

SERIES
FBL4001 / FBL6001

- Finishing
- Long & Extra Long Cutting Length
- AlTiN Coating 10% Submicron Carbide



6 Flutes

45° Helix

P M K S

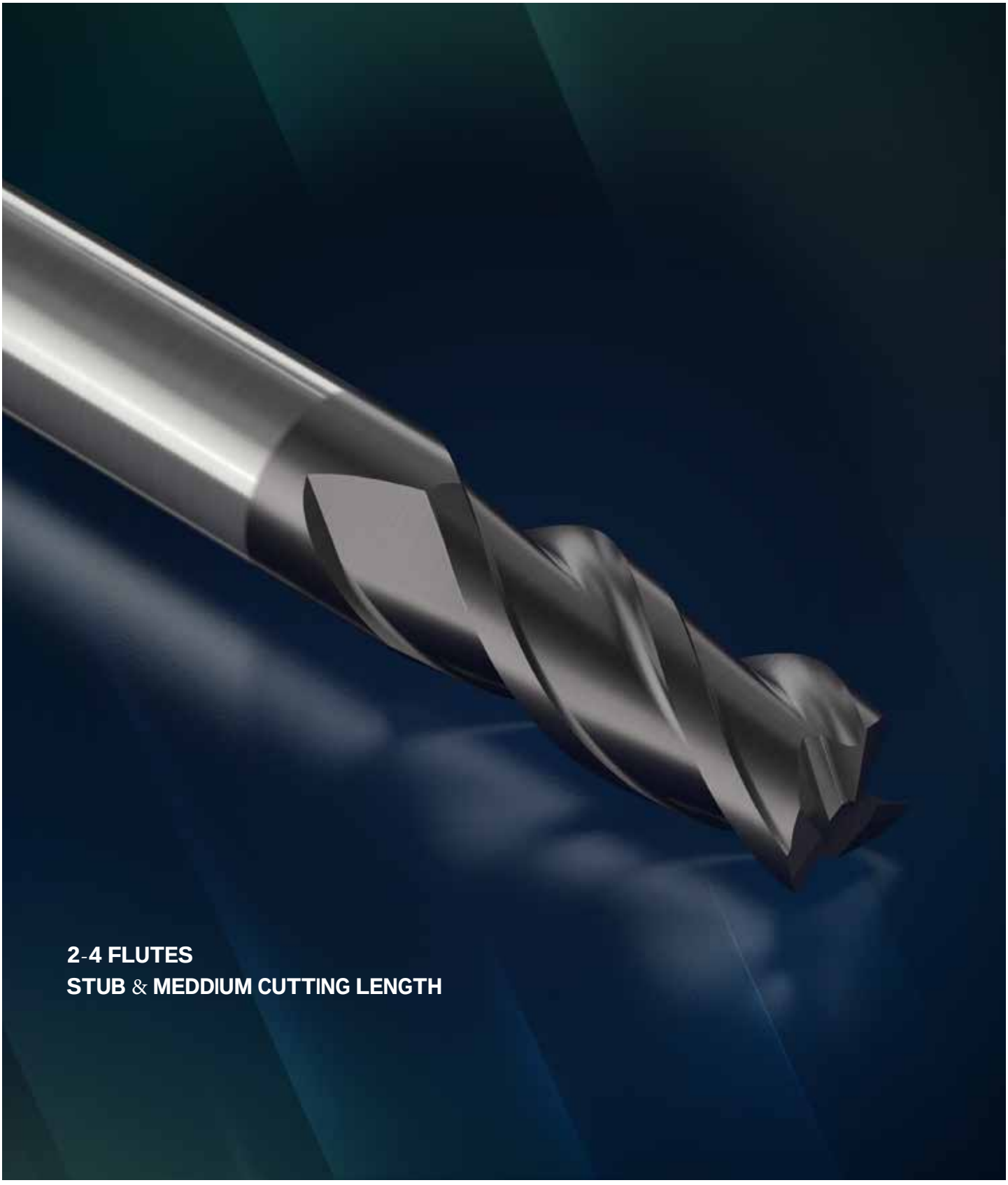
DC	APMX	DCONMS	NOF	OAL	Shank	EDP Number
6.0	24	6	4	65	C	3401919
6.0	24	6	4	65	W	3402122
8.0	32	8	4	79	C	3401920
8.0	32	8	4	79	W	3402123
10.0	40	10	4	100	C	3401921
10.0	40	10	4	100	W	3402124
10.0	60	10	4	112	C	3402030
10.0	60	10	4	112	W	3402128
12.0	48	12	4	100	C	3401922
12.0	48	12	4	100	W	3402125
12.0	72	12	4	150	C	3402031
14.0	50	14	4	100	C	3401923
16.0	56	16	6	115	C	3401924
16.0	56	16	6	115	W	3402126
16.0	80	16	6	150	C	3402032
16.0	80	16	6	150	W	3402129
20.0	60	20	6	125	C	3401925
20.0	60	20	6	125	W	3402127
20.0	80	20	6	150	C	3402033

CUTTING DATA

Material	Cutting Speed m/min	Ø 3-6	Ø 8-10	Ø 12-16	Ø 16-20
Low Alloy Steel <25Hrc	80-200	0.020-0.040	0.030-0.060	0.030-0.070	0.040-0.100
High Alloy Steel >25Hrc	60-110	0.015-0.030	0.025-0.050	0.030-0.060	0.040-0.080
Hardened Steel	20-50	0.015-0.030	0.020-0.040	0.030-0.050	0.030-0.050
Stainless Steel	40-100	0.020-0.040	0.030-0.050	0.030-0.060	0.030-0.080
Cast Iron (GGG)	65-150	0.020-0.040	0.030-0.050	0.030-0.060	0.030-0.080
Cast Iron (GG)	80-200	0.020-0.045	0.030-0.055	0.035-0.055	0.040-0.090
Titanium	30-60	0.020-0.040	0.030-0.050	0.030-0.060	0.030-0.080
Inconel	15-40	0.015-0.030	0.025-0.040	0.030-0.045	0.030-0.050
Aluminium	270-600	0.040-0.060	0.050-0.100	0.06-0.120	0.080-0.250

FBM / FEL / FEM / FAM

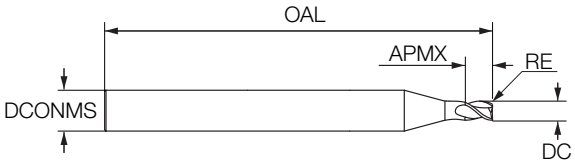
GENERAL



MORSE EGE

SERIES
FBM3001 - FBM3301

- Medium Cutting Length
- Square & Verity of R
- AlTiN Coating 10% Submicron Carbide



3 Flutes

45° Helix

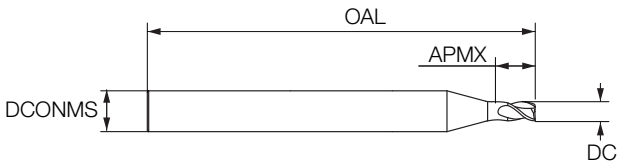
P M K S

DC	APMX	DCONMS	NOF	OAL	Shank	Square	R0.5	R1.	R1.5	R2	R3
2.0	7	3	3	38	C	3401994					
2.0	7	6	3	57	C	3401998					
2.5	7	3	3	38	C	3401823					
3.0	10	3	3	38	C	3401973					
3.0	10	6	3	57	C	3402006					
4.0	12	4	3	50	C	3401974					
4.0	12	6	3	57	C	3402007					
5.0	14	5	3	50	C	3401975					
5.0	14	6	3	57	C	3402008					
6.0	13	6	3	57	C		3402090	3402091			
6.0	16	6	3	57	C	3401972					
6.0	16	6	3	57	W	3401976					
7.0	16	7	3	60	C	3402009					
8.0	20	8	3	63	C	3401977	3403123	3402092	3402093	3402094	
8.0	20	8	3	63	W	3401895					
9.0	20	9	3	67	C	3402010					
10.0	22	10	3	72	C	3401978	3402095	3402096	3402097	3403126	3402098
10.0	22	10	3	72	W	3401894					
12.0	25	12	3	83	C	3402058	3402099	3402100	3402101	3402102	3402103
12.0	25	12	3	83	W	3401896					
16.0	32	16	3	92	C	3402049	3402104	3402105		3402106	3402107
16.0	32	16	3	92	W	3401990					
18.0	32	18	3	92	C	3401926					
20.0	38	20	3	104	C	3401927		3402108		3402109	3402110
20.0	38	20	3	104	W	3402111					

MORSE EGE

SERIES
FEM3001

- Medium Cutting Length
- Roughing and Semi Finishing
- AlTiN Coating 10% Submicron Carbide



3 Flutes

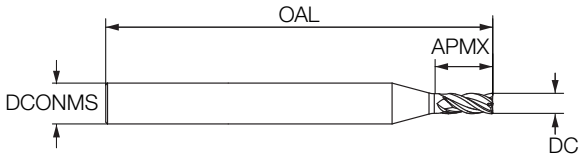
38° Helix

P M K

DC	APMX	DCONMS	NOF	OAL	Shank	EDP Number
1.0	2.5	3	3	38	C	3402060
1.5	4	4	3	50	C	3401843
2.5	7	3	3	38	C	3401995
2.8	4	6	3	57	W	3401897
3.0	10	3	3	38	C	3401865
3.0	10	6	3	57	C	3401999
3.5	12	4	3	50	C	3401980
3.8	5	6	3	57	W	3401898
4.0	12	4	3	50	C	3401867
4.0	12	6	3	57	C	3402000
4.5	14	6	3	57	C	3401981
4.8	6	6	3	57	W	3401859
5.0	14	5	3	50	C	3401869
5.0	14	6	3	57	C	3402001
5.0	14	6	3	57	W	3402352
5.7	7	6	3	57	W	3401899
6.0	16	6	3	57	C	3401871
6.0	16	6	3	57	W	3402119
6.7	8	8	3	63	W	3401900
7.0	20	7	3	60	C	3401996
7.7	9	8	3	63	W	3401901
8.0	20	8	3	63	C	3401873
8.0	20	8	3	63	W	3403131
9.7	11	10	3	72	W	3401902
10.0	22	10	3	72	C	3401875
10.0	22	10	3	72	W	3401885
11.7	12	12	3	73	W	3401903
12.0	25	12	3	83	C	3401877
12.0	25	12	3	83	W	3401888
13.7	14	14	3	83	W	3401904
14.0	25	14	3	83	C	3402146
15.7	16	16	3	92	W	3401905
16.0	32	16	3	92	C	3402147
16.0	32	16	3	92	W	3401889
18.0	32	18	3	92	C	3402148
20.0	38	20	3	104	C	3401982

SERIES
FEL3001

- Stub Cutting Length
- Roughing & Semi Finishing
- AlTiN Coating 10% Submicron Carbide



3 Flutes

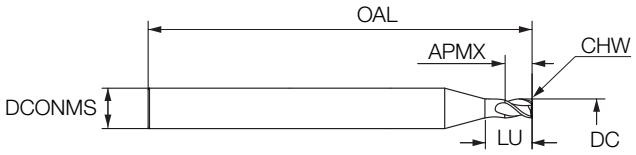
38° Helix

P M K

DC	APMX	LU	DCONMS	NOF	OAL	Shank	EDP Number
2.0	3	8	6	3	57	W	3401906
2.5	3	8	6	3	57	W	3401907
3.0	4	9	6	3	57	W	3401908
3.5	4	12	6	3	57	W	3401909
4.0	5	13	6	3	57	W	3401918
5.0	6	14	6	3	57	W	3401910

SERIES
FEL3001

- Stub Cutting Length
- Chamfer Corner
- AlTiN Coating 10% Submicron Carbide



3 Flutes

38° Helix

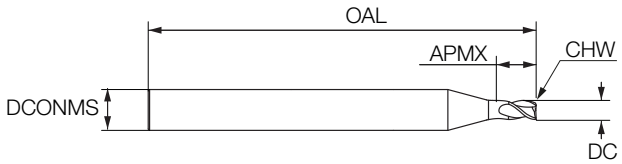
P M K S

DC	APMX	LU	DCONMS	NOF	OAL	CHW	Shank	EDP Number
6.0	7	15	6	3	57	0.15	W	3401911
7.0	8	20	8	3	63	0.15	W	3401912
8.0	9	21	8	3	63	0.15	W	3401913
9.0	10	22	10	3	72	0.15	W	3401914
10.0	11	23	10	3	72	0.25	W	3401915
12.0	12	24	12	3	83	0.25	W	3401916

SERIES

FAMC2001 / FAMC4001 / FEMC3001

- Medium Cutting Length
- Chamfer Corner
- AlTiN Coating 10% Submicron Carbide



2-4 Flutes

30-38° Helix

P M K S

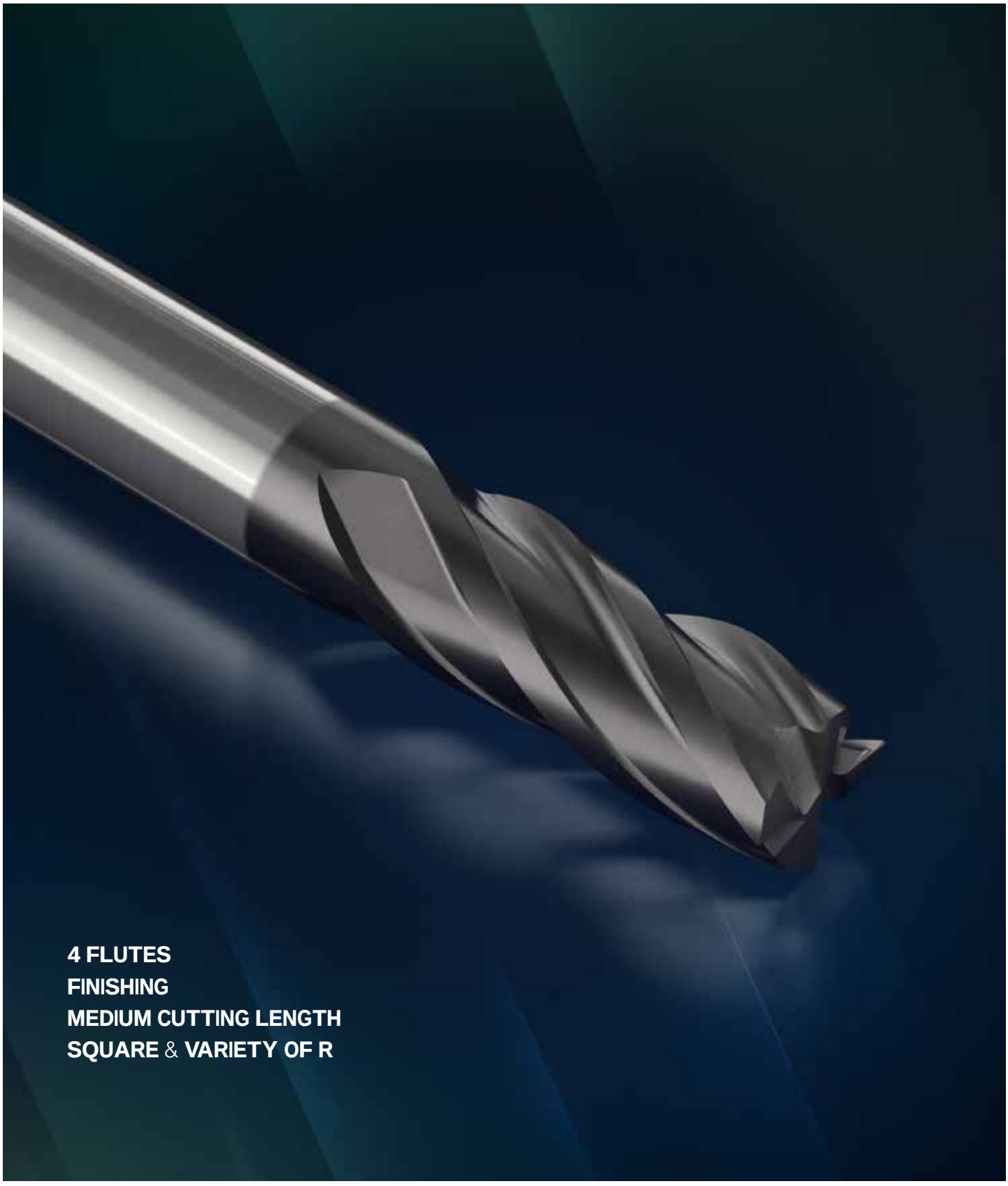
DC	APMX	DCONMS	OAL	CHW	Shank	2 Flutes	3 Flutes	4 Flutes
2.0	7	3	38	0.1	C	3402184		3401863
2.5	7	3	38	0.1	C			3401838
3.0	10	3	38	0.1	C	3401828	3401844	3401829
3.5	12	4	50	0.1	C		3401979	3401836
4.0	12	4	50	0.15	C	3401879	3401880	3401837
5.0	14	5	50	0.15	C	3401830	3401881	3401831
6.0	16	6	57	0.15	C	3401832	3401845	3401833
6.0	16	6	57	0.15	W		3402136	
8.0	20	8	63	0.15	C	3401857	3401858	3401839
8.0	20	8	63	0.15	W		3401884	3401864
10.0	22	10	72	0.25	C	3401834		
10.0	22	10	72	0.25	C		3401846	3401835
10.0	22	10	72	0.25	W			3401886
12.0	25	12	83	0.25	C	3401882	3401883	3401840
12.0	25	12	83	0.25	W		3401887	3403129
16.0	32	16	92	0.25	C	3401847	3401848	3401841
16.0	32	16	92	0.25	W		3403130	3403133
20.0	38	20	104	0.25	C			3401842

CUTTING DATA

Material	Cutting Speed m/min	Ø <3	Ø 3-6	Ø 8-10	Ø 12-16	Ø 16-20
Low Alloy Steel <25Hrc	80-200	0.010-0.030	0.020-0.040	0.030-0.060	0.030-0.070	0.040-0.100
High Alloy Steel >25Hrc	60-110	0.010-0.025	0.015-0.030	0.025-0.050	0.030-0.060	0.040-0.080
Hardened Steel	20-50	0.010-0.020	0.015-0.030	0.020-0.040	0.030-0.050	0.030-0.050
Stainless Steel	40-100	0.010-0.020	0.020-0.040	0.030-0.050	0.030-0.060	0.030-0.080
Cast Iron (GGG)	65-150	0.010-0.020	0.020-0.040	0.030-0.050	0.030-0.060	0.030-0.080
Cast Iron (GG)	80-200	0.010-0.025	0.020-0.045	0.030-0.055	0.035-0.055	0.040-0.090
Titanium	30-60	0.010-0.020	0.020-0.040	0.030-0.050	0.030-0.060	0.030-0.080
Inconel	15-40	0.010-0.020	0.015-0.030	0.025-0.040	0.030-0.045	0.030-0.050
Aluminium	270-600	0.030-0.050	0.040-0.060	0.050-0.100	0.06-0.120	0.080-0.250

SERIES
FBM4001 - FBM4501

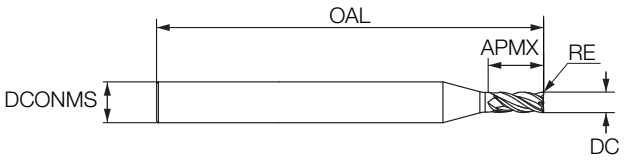
GENERAL



MORSE EGE

SERIES
FBM4001 - FBM4501

- Finishing
- Medium Cutting Length
- Square & Variety of R
- AlTiN Coating 10% Submicron Carbide



4 Flutes

45° Helix

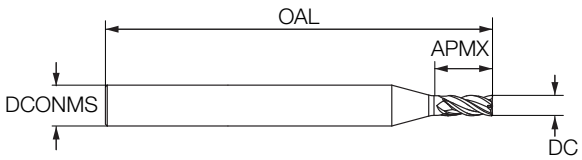
P M K S

DC	APMX	DCONMS	NOF	OAL	Shank	Square	R0.5	R1.	R1.5	R2.	R2.5	R3.	R4.	R5.
2.0	7	3	4	38	C	3401862								
2.0	7	6	4	57	C	3402002								
3.0	10	3	4	38	C	3402011								
3.0	10	6	4	57	C	3402012								
4.0	12	6	4	57	C	3402013								
5.0	14	6	4	57	C	3402014								
6.0	16	6	4	57	C	3402015	3402062	3402063						
6.0	16	6	4	57	W	3402121								
7.0	16	7	4	60	C	3402016								
8.0	20	8	4	63	C	3402017	3402064	3402065	3402066	3402067				
8.0	20	8	4	63	W	3402025								
9.0	20	9	4	67	C	3402018								
10.0	22	10	4	72	C	3402019	3402068	3402069	3402070	3402071		3403118		
10.0	22	10	4	72	W	3402026								
12.0	25	12	4	83	C	3402020	3402072	3402073	3402074	3402075		3402076		
12.0	25	12	4	83	W	3402027								
14.0	25	14	4	83	C	3402021								
16.0	32	16	4	92	C	3402022	3402077	3402078	3402079	3402080	3402081	3402082		
16.0	32	16	4	92	W	3402028								
18.0	32	18	4	92	C	3402023								
20.0	38	20	4	104	C	3402024	3402083	3402084	3402085	3402086	3402087	3402088	3403117	3402089
20.0	38	20	4	104	W	3402029								

MORSE EGE

SERIES
FAM4000 - FAM4001 / FAM4003

- Finishing
- Medium Cutting Length



4 Flutes

30° Helix

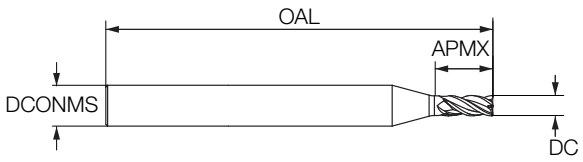
P M K S

DC	APMX	DCONMS	OAL	Shank	Uncoated	AlTiN Submicron Coating	AlTiN Ultrafine Micron Coating
2.0	8	2	32	C	3402969	3403124	
2.0	6	6	50	C			3402802
2.5	8	6	50	C			3402803
2.5	8	2.5	32	C	3402970	3403125	
3.0	12	3	38	C	3402971	3402882	
3.0	30	3	75	C	3402763	3402934	
3.0	8	6	50	C			3402804
3.5	10	6	50	C			3402805
4.0	12	4	50	C	3402757	3402883	
4.0	30	4	75	C	3402764	3402935	
4.0	11	6	50	C			3402806
4.5	11	6	50	C			3402807
5.0	14	5	50	C	3402758	3402866	
5.0	40	5	100	C	3402765	3402936	
5.0	13	6	50	C			3402808
5.5	13	6	50	C			3402809
5.5	16	5.5	50	C	3402946		
6.0	16	6	50	C	3402759	3402884	
6.0	50	6	150	C	3402766	3402937	
6.0	13	6	50	C			3402810
6.5	16	8	63	C			3402811
7.0	20	7	60	C	3402947		
7.0	16	8	63	C			3402812
7.5	16	8	63	C			3402813
8.0	20	8	63	C	3402760	3402885	
8.0	50	8	150	C	3402767	3402938	
8.0	19	8	63	C			3402814
8.5	19	10	72	C			3402815
9.0	20	9	60	C	3402945		
9.0	19	10	72	C			3402816
9.5	19	10	70	C			3402817
10.0	22	10	70	C	3402761	3402886	
10.0	60	10	150	C	3402972	3402939	
10.0	22	10	72	C			3402818
10.5	22	12	75	C			3402819
11.0	22	12	75	C			3402820
12.0	22	12	73	C	3402762	3402887	
12.0	75	12	150	C	3402768	3402940	
12.0	26	12	73	C	3402821		3402821

SERIES

FAM4000 - FAM4001 / FAM4003 (CONT.)

- Finishing
- Medium Cutting Length



4 Flutes

30° Helix

P M K S

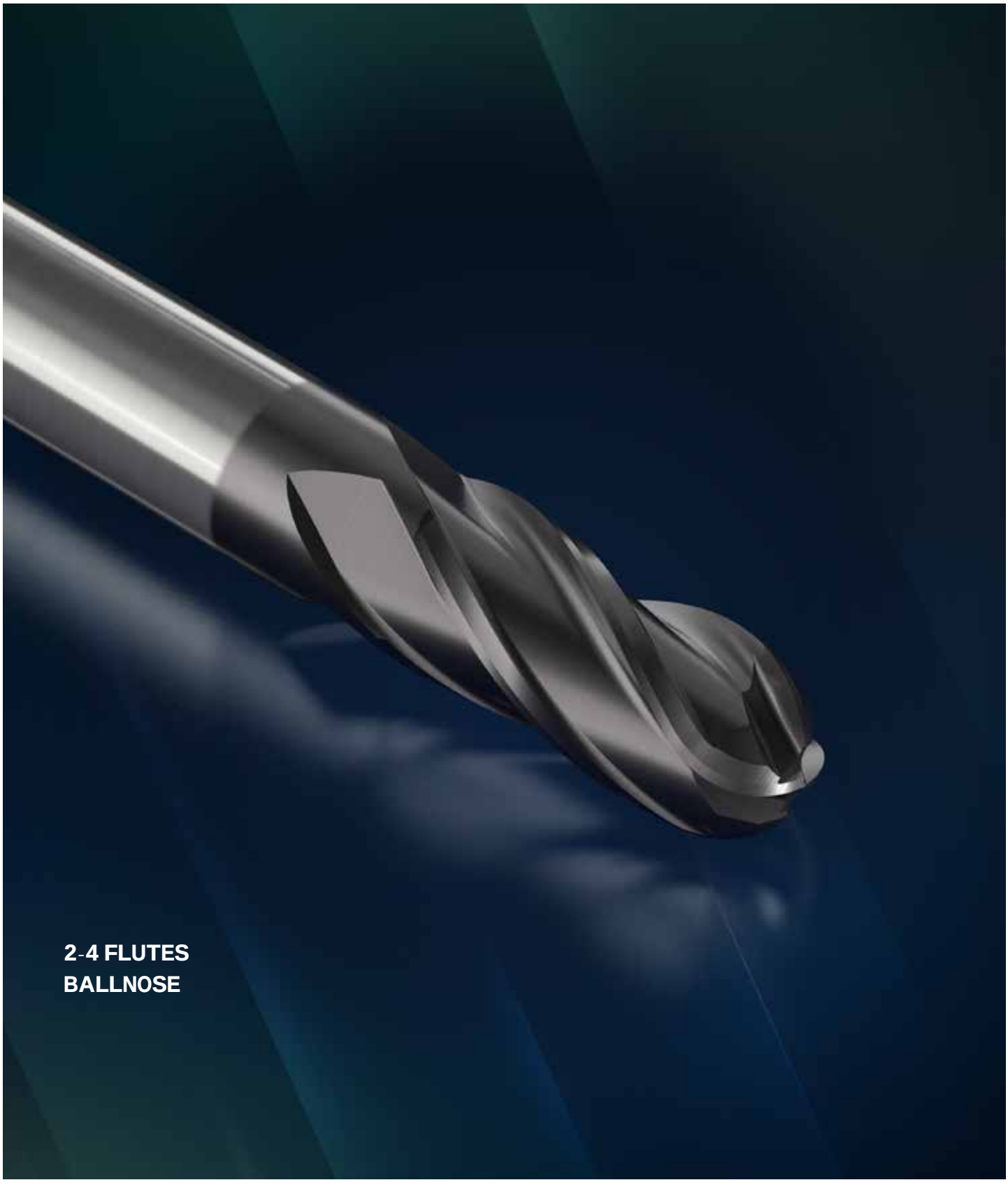
DC	APMX	DCONMS	OAL	Shank	Uncoated	AlTiN Submicron Coating	AlTiN Ultrafine Micron Coating
13.0	26	12	85	C	3402822		3402822
14.0	25	14	83	C	3402867		
14.0	65	14	150	C		3402941	
14.0	26	12	85	C			3402824
14.0	26	14	83	C			3402823
15.0	26	16	92	C			3402825
16.0	25	16	82	C	3402850	3402995	
16.0	65	16	150	C	3402981	3402942	
16.0	32	16	92	C			3402826
17.0	32	16	100	C			3402827
18.0	65	18	150	C	3402943		
18.0	32	18	100	C			3402828
20.0	32	20	104	C	3402868		
20.0	65	20	150	C	3402982		
20.0	65	20	150	C		3402944	
20.0	38	20	104	C			3402829
22.0	38	20	105	C			3402830
24.0	45	25	120	C			3402831
25.0	45	25	120	C			3402832

Material	Cutting Speed m/min	Ø <3	Ø 3-6	Ø 8-10	Ø 12-16	Ø 16-20
Low Alloy Steel <25Hrc	80-200	0.010-0.030	0.020-0.040	0.030-0.060	0.030-0.070	0.040-0.100
High Alloy Steel >25Hrc	60-110	0.010-0.025	0.015-0.030	0.025-0.050	0.030-0.060	0.040-0.080
Hardened Steel	20-50	0.010-0.020	0.015-0.030	0.020-0.040	0.030-0.050	0.030-0.050
Stainless Steel	40-100	0.010-0.020	0.020-0.040	0.030-0.050	0.030-0.060	0.030-0.080
Cast Iron (GGG)	65-150	0.010-0.020	0.020-0.040	0.030-0.050	0.030-0.060	0.030-0.080
Cast Iron (GG)	80-200	0.010-0.025	0.020-0.045	0.030-0.055	0.035-0.055	0.040-0.090
Titanium	30-60	0.010-0.020	0.020-0.040	0.030-0.050	0.030-0.060	0.030-0.080
Inconel	15-40	0.010-0.020	0.015-0.030	0.025-0.040	0.030-0.045	0.030-0.050
Aluminium	270-600	0.030-0.050	0.040-0.060	0.050-0.100	0.06-0.120	0.080-0.250

SERIES

FAM3B01 - FAM4B01 / FAL4B01

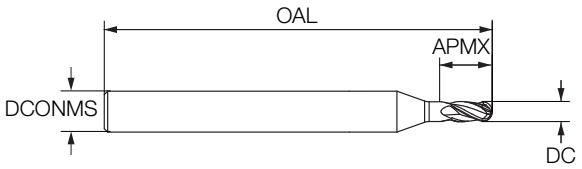
GENERAL



MORSE EBL

SERIES
FAM3B01 - FAM4B01

- Ballnose
- Stub Cutting Length
- AlTiN Coating 10% Submicron Carbide

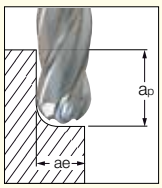


3-4 Flutes

30° Helix

P M K S

DC	APMX	DCONMS	OAL	Shank	3 Flutes	4 Flutes
1.6	2	3	38	C	3401971	
3.0	5	3	38	C	3402053	3401988
3.0	5	6	57	C	3401939	3401928
3.0	8	4	50	C		3402042
4.0	7	4	50	C	3402054	3401989
4.0	7	6	57	C	3401940	3401929
4.0	12	4	50	C		3402051
4.0	12	4	80	C		3401946
5.0	8	5	50	C	3402055	
5.0	8	6	57	C	3401941	3401930
5.0	14	5	50	C		3402043
6.0	8	6	57	C	3401942	3401931
6.0	16	6	57	C		3401826
6.0	16	6	100	C		3401860
7.0	16	7	100	C		3402056
8.0	11	8	63	C	3401943	3401932
8.0	20	8	63	C		3401827
8.0	20	8	100	C		3401861
9.0	11	9	67	C		3401933
10.0	13	10	72	C	3401944	3401934
10.0	22	10	100	C		3401947
10.0	22	10	72	C		3402044
12.0	14	12	83	C	3401945	3401935
12.0	25	12	83	C		3402045
12.0	25	12	100	C		3401948
14.0	14	14	83	C		3401936
16.0	16	16	92	C		3401937
16.0	32	16	92	C		3402046
20.0	20	20	104	C		3401938
20.0	38	20	104	C		3402047



	Side Milling			Fz mm/t			
	Vc (m/min)	ap	ae	Ø 3-5	Ø 6-8	Ø 10-12	Ø16-20
Steel up to 45 HRC	150-200	2D	0.2xD	0.005-0.025	0.030-0.060	0.06-0.070	0.070-0.080
Hardened Steel 45-55 HRC	60-120	2D	0.2xD	0.005-0.020	0.015-0.040	0.04-0.050	0.050-0.060
Stainless Steels	70-110	2D	0.2xD	0.005-0.020	0.025-0.045	0.04-0.050	0.050-0.065
Titanium	50-70	2D	0.2xD	0.005-0.020	0.020-0.040	0.04-0.050	0.050-0.060
Inconel	15-25	2D	0.2xD	0.005-0.015	0.010-0.030	0.03-0.050	0.030-0.050
Cast Iron	150-200	2D	0.2xD	0.005-0.025	0.035-0.050	0.06-0.065	0.065-0.070

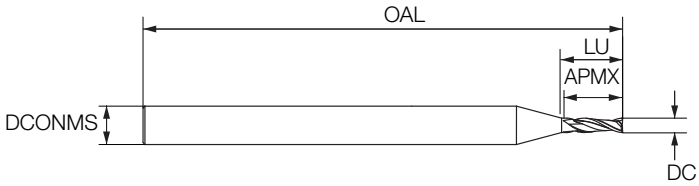
SERIES
FAL2004 - FAL2054

GENERAL

MORSE EGE

SERIES
FAL2004 - FAL2054

- Square & Varity of R
- Hard PVD Coating
- Rib Processing
- AlTiCrSiN 9% Ultrafine Carbide



2 Flutes

30° Helix

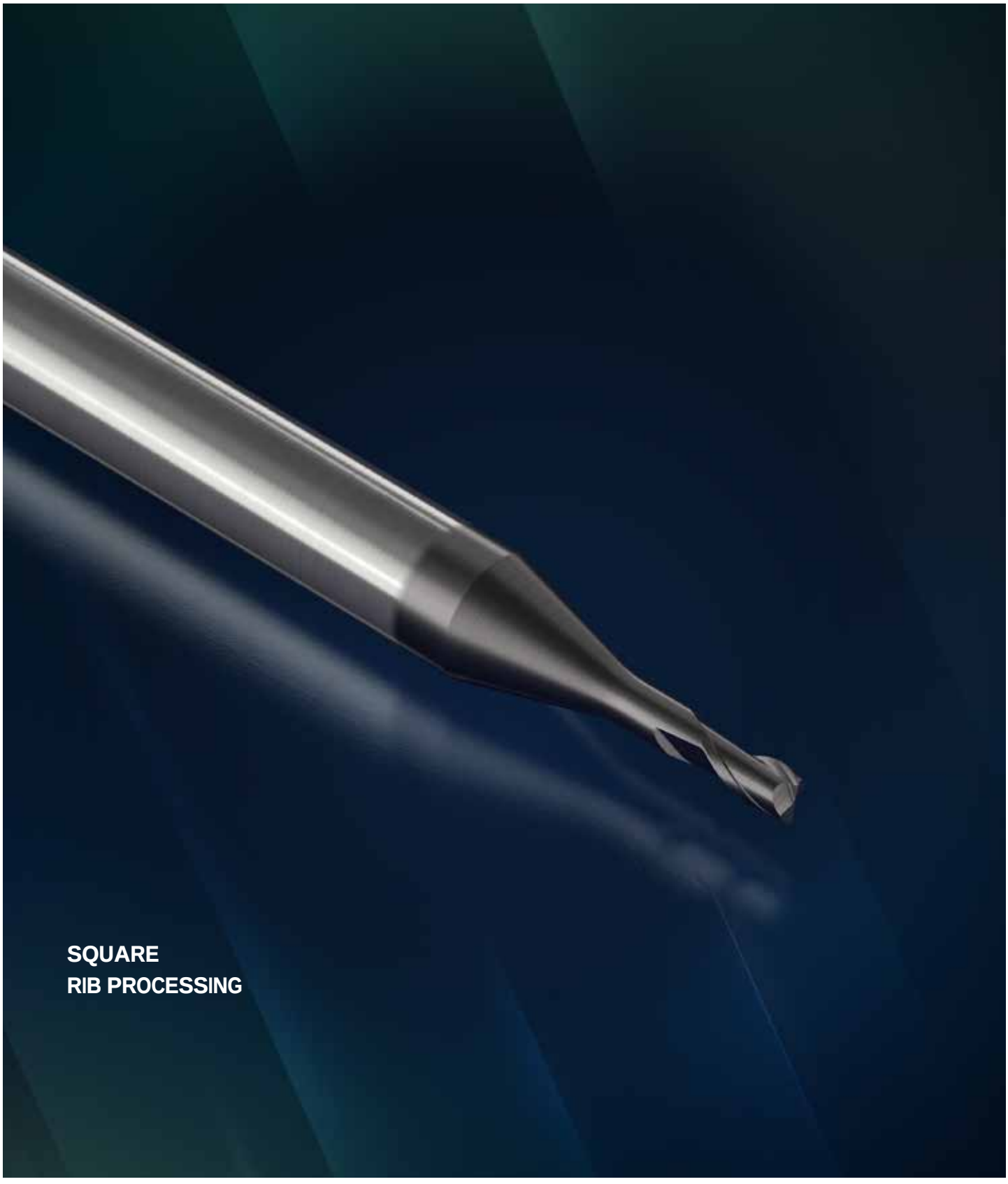
P M K N S H

DC	APMX	LU	DCONMS	NOF	OAL	Shank	Square	R0.05	R0.1	R0.2	R0.3	R0.5
0.3	0.45	1	4	2	45	C	3403059					
0.4	0.6	2	4	2	45	C	3403060					
0.5	0.7	2	4	2	45	C	3403061					
0.5	0.7	1.5	4	2	45	C		3403072				
0.8	1.2	4	4	2	45	C	3403062		3403073			
1.0	1.5	4	4	2	45	C	3403063					
1.0	1.5	6	4	2	45	C	3403064					
1.0	1.5	8	4	2	45	C	3403065					
1.0	1.5	4	6	2	50	C			3403074	3403075		
1.5	2.3	6	4	2	45	C	3403066					
1.5	2.5	10	6	2	50	C				3403080		
1.5	2.5	4	6	2	50	C				3403078		
1.5	2.5	6	6	2	50	C				3403079	3403077	
1.5	2.5	8	6	2	50	C				3403076		
2.0	3	6	4	2	45	C	3403067					
2.0	3	10	6	2	55	C				3403085		3403081
2.0	3	6	6	2	50	C				3403082	3403083	3403084
3.0	4	10	6	2	55	C				3403088		3403090
3.0	4	12	6	2	55	C				3403089		
3.0	4	16	6	2	55	C						3403086
3.0	4	20	6	2	55	C						3403087
3.0	4.5	12	6	2	45	C	3403068					
3.0	4.5	16	6	2	55	C	3403069					
3.0	4.5	20	6	2	60	C	3403070					
3.0	4.5	25	6	2	65	C	3403071					
4.0	5	10	6	2	55	C					3403092	
4.0	5	12	6	2	55	C						3403093
4.0	5	16	6	2	55	C						3403094
4.0	5	20	6	2	55	C						3403091
6.0	7	20	6	2	60	C						3403095

• For technical data see page: 61

SERIES
FAL2003
FAM2000 - FAM2003

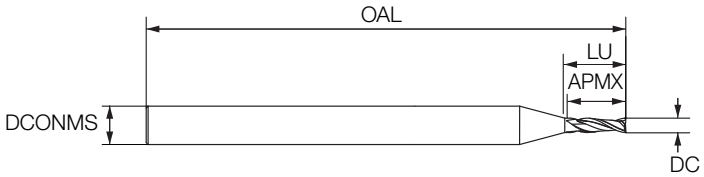
GENERAL



MORSE EGE

SERIES
FAL2003
FAM2003

- Square
- Rib Processing
- AlTiN Coating 12% Ultrafine Carbide



2 Flutes

30° Helix

P M K S

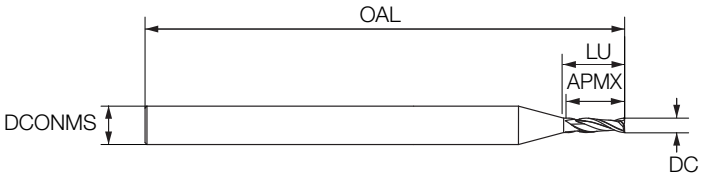
DC	APMX	LU	DCONMS	NOF	OAL	Shank	EDP Number
0.4	0.6	2	4	2	45	C	3402575
0.5	0.7	2	4	2	45	C	3402576
0.5	0.7	4	4	2	45	C	3402577
0.5	0.7	6	4	2	45	C	3402578
0.5	0.7	8	4	2	45	C	3402579
0.6	0.9	2	4	2	45	C	3402580
0.6	0.9	4	4	2	45	C	3402581
0.6	0.9	8	4	2	45	C	3402582
0.7	1	2	4	2	45	C	3402583
0.7	1	8	4	2	45	C	3402584
0.8	1.2	4	4	2	45	C	3402585
0.8	1.2	6	4	2	45	C	3402586
0.8	1.2	8	4	2	45	C	3402587
0.9	1.3	6	4	2	45	C	3402588
1.0	1.5	4	4	2	45	C	3402589
1.0	1.5	6	4	2	45	C	3402590
1.0	1.5	8	4	2	45	C	3402591
1.0	1.5	10	4	2	45	C	3402592
1.0	1.5	12	4	2	45	C	3402593
1.0	1.5	16	4	2	50	C	3402594
1.0	1.5	20	4	2	55	C	3402595
1.0	2.5	-	6	2	40	C	3402979
1.2	1.8	6	4	2	45	C	3402596
1.2	1.8	8	4	2	45	C	3402597
1.2	1.8	10	4	2	45	C	3402598
1.4	2.1	6	4	2	45	C	3402599
1.4	2.1	8	4	2	45	C	3402600
1.4	2.1	10	4	2	45	C	3402601
1.5	2.3	6	4	2	45	C	3402602
1.5	2.3	8	4	2	45	C	3402603
1.5	2.3	10	4	2	45	C	3402605
1.5	2.3	12	4	2	45	C	3402606
1.5	2.3	14	4	2	50	C	3402607
1.5	2.3	16	4	2	50	C	3402608
1.5	2.3	20	4	2	55	C	3402609
1.5	4	-	6	2	40	C	3402980
1.6	2.4	6	4	2	45	C	3402610
1.6	2.4	8	4	2	45	C	3402611
1.8	2.7	6	4	2	45	C	3402612
1.8	2.7	8	4	2	45	C	3402613
1.8	2.7	10	4	2	45	C	3402614
1.8	2.7	12	4	2	45	C	3402615

• For technical data see page: 61

MORSE EGE

SERIES
FAL2003
FAM2003

- Square
- Rib Processing
- AlTiN Coating 12% Ultrafine Carbide



2 Flutes

30° Helix

P M K S

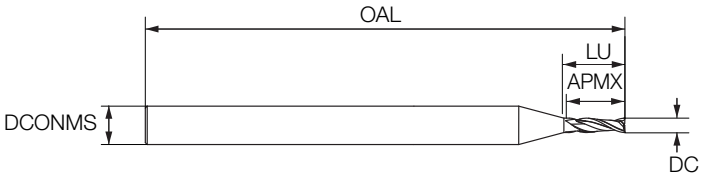
DC	APMX	LU	DCONMS	NOF	OAL	Shank	EDP Number
2.0	3	6	4	2	45	C	3402616
2.0	3	8	4	2	45	C	3402617
2.0	3	10	4	2	45	C	3402618
2.0	3	12	4	2	45	C	3402619
2.0	3	14	4	2	50	C	3402620
2.0	3	16	4	2	50	C	3402621
2.0	3	18	4	2	55	C	3402622
2.0	3	20	4	2	55	C	3402623
2.0	3	25	4	2	60	C	3402624
2.0	3	30	4	2	70	C	3402625
2.0	6	-	6	2	40	C	3402785
2.5	3.7	8	4	2	45	C	3402626
2.5	3.7	10	4	2	45	C	3402627
2.5	3.7	12	4	2	45	C	3402628
2.5	3.7	14	4	2	50	C	3402629
2.5	3.7	16	4	2	55	C	3402630
2.5	3.7	18	4	2	55	C	3402631
2.5	3.7	20	4	2	60	C	3402632
2.5	3.7	25	4	2	70	C	3402633
2.5	3.7	30	4	2	80	C	3402634
2.5	8.0	-	6	2	40	C	3402786
3.0	4.5	8	6	2	45	C	3402635
3.0	4.5	10	6	2	45	C	3402636
3.0	4.5	12	6	2	45	C	3402637
3.0	4.5	14	6	2	50	C	3402638
3.0	4.5	16	6	2	55	C	3402639
3.0	4.5	18	6	2	55	C	3402640
3.0	4.5	20	6	2	60	C	3402641
3.0	4.5	25	6	2	65	C	3402642
3.0	4.5	30	6	2	70	C	3402643
3.0	4.5	35	6	2	80	C	3402644
3.0	4.5	40	6	2	90	C	3402645
3.0	8	-	6	2	45	C	3402787
3.50	10	-	6	2	45	C	3402788
4.0	6	12	6	2	50	C	3402646
4.0	6	16	6	2	60	C	3402647
4.0	6	20	6	2	60	C	3402648
4.0	6	25	6	2	70	C	3402649
4.0	6	30	6	2	70	C	3402650
4.0	6	35	6	2	80	C	3402651
4.0	6	40	6	2	90	C	3402652
4.0	6	45	6	2	90	C	3402653

• For technical data see page: 61

SERIES

FAL2003
FAM2003 (CONT.)

- Square
- Rib Processing
- AlTiN Coating 12% Ultrafine Carbide



2 Flutes

30° Helix

P M K S

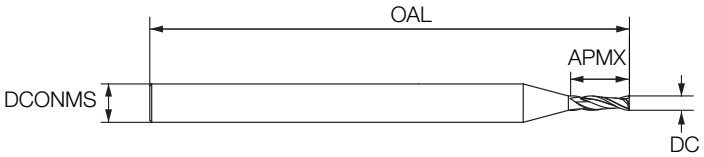
DC	APMX	LU	DCONMS	NOF	OAL	Shank	EDP Number
4.0	6	50	6	2	100	C	3402654
4.0	11	-	6	2	45	C	3402789
5.0	7.5	16	6	2	60	C	3402655
5.0	7.5	25	6	2	70	C	3402656
5.0	7.5	30	6	2	80	C	3402657
5.0	7.5	35	6	2	80	C	3402658
5.0	7.5	40	6	2	80	C	3402659
5.0	7.5	50	6	2	110	C	3402660
5.0	13		6	2	50	C	3402790
6.0	9	20	6	2	80	C	3402661
6.0	9	30	6	2	90	C	3402662
6.0	9	40	6	2	100	C	3402663
6.0	9	50	6	2	110	C	3402664
6.0	13	-	6	2	50	C	3402791
6.5	16	-	8	2	60	C	3402792
7.0	16	-	8	2	60	C	3402793
7.5	16	-	8	2	60	C	3402794
8.0	19	-	8	2	60	C	3402795
9.5	19	-	10	2	70	C	3402796
10.0	22	-	10	2	70	C	3402797
11.0	22	-	12	2	75	C	3402798
12.0	26	-	12	2	75	C	3402799
12.0	26	-	12	2	85	C	3403395

• For technical data see page: 61

MORSE EGE

SERIES
FAM2000
FAM2001

- Finishing
- Medium Cutting Length



2 Flutes

30° Helix

P M K

DC	APMX	DCONMS	NOF	OAL	Shank	Uncoated	AlTiN Coating Submicron
1.0	3	4	2	50	C	3402721	3402889
1.5	4.5	4	2	50	C	3402722	3402890
2.0	8	2	2	32	C	3402723	3402891
2.5	8	2.5	2	32	C	3402724	3402892
3.0	12	3	2	38	C	3402725	3402983
3.0	30	3	2	75	C	3402734	
3.50	12	3.5	2	32	C	3402893	3402893
4.0	12	4	2	50	C	3402726	3402984
4.0	30	4	2	75	C	3402735	3402897
5.0	14	5	2	50	C	3402727	3402894
5.0	40	5	2	100	C	3402736	3402898
5.5	16	5.5	2	50	C	3402728	
6.0	16	6	2	50	C	3402729	3402852
6.0	50	6	2	150	C	3402737	3402899
7.0	20	7	2	60	C	3402730	3402895
8.0	20	8	2	60	C	3402731	3402985
8.0	50	8	2	150	C	3402738	3402900
9.0	20	9	2	60	C		3402896
10.0	22	10	2	72	C	3402732	3402986
10.0	60	10	2	150	C	3402739	3402901
12.0	22	12	2	70	C	3402733	3402987
12.0	75	12	2	150	C	3402740	
14.0	25	14	2	75	C		3402988
14.0	65	14	2	150	C	3402842	
16.0	25	16	2	75	C		3402989
16.0	65	16	2	150	C	3402843	3402902
20.0	32	20	2	100	C	3402841	3402990

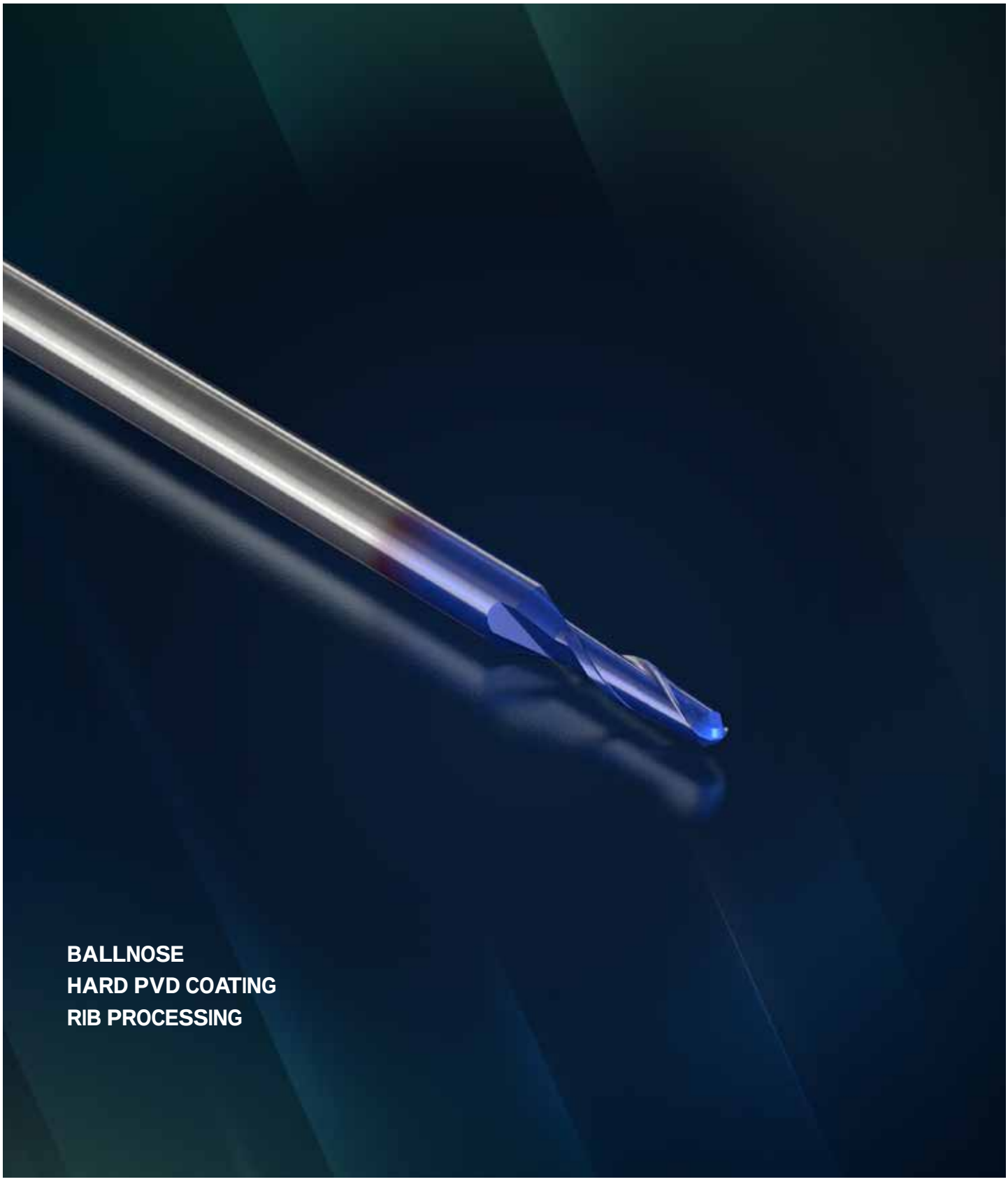
• For technical data see page: 61

CUTTING DATA

Material	Cutting Speed m/min	Ø <3	Ø 3-6	Ø 8-10	Ø 12-16	Ø 16-20
Low Alloy Steel <25Hrc	80-200	0.010-0.030	0.020-0.040	0.030-0.060	0.030-0.070	0.040-0.100
High Alloy Steel >25Hrc	60-110	0.010-0.025	0.015-0.030	0.025-0.050	0.030-0.060	0.040-0.080
Hardened Steel	20-50	0.010-0.020	0.015-0.030	0.020-0.040	0.030-0.050	0.030-0.050
Stainless Steel	40-100	0.010-0.020	0.020-0.040	0.030-0.050	0.030-0.060	0.030-0.080
Cast Iron (GGG)	65-150	0.010-0.020	0.020-0.040	0.030-0.050	0.030-0.060	0.030-0.080
Cast Iron (GG)	80-200	0.010-0.025	0.020-0.045	0.030-0.055	0.035-0.055	0.040-0.090
Titanium	30-60	0.010-0.020	0.020-0.040	0.030-0.050	0.030-0.060	0.030-0.080
Inconel	15-40	0.010-0.020	0.015-0.030	0.025-0.040	0.030-0.045	0.030-0.050
Aluminium	270-600	0.030-0.050	0.040-0.060	0.050-0.100	0.06-0.120	0.080-0.250

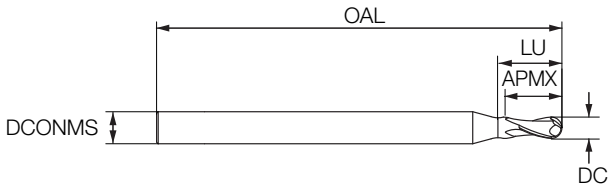
SERIES
FAL2B04

GENERAL



SERIES
FAL2B04

- Ballnose
- Hard PVD Coating
- Rib Processing
- AlTiCrSiN 9% Ultrafine Carbide



2 Flutes

30° Helix

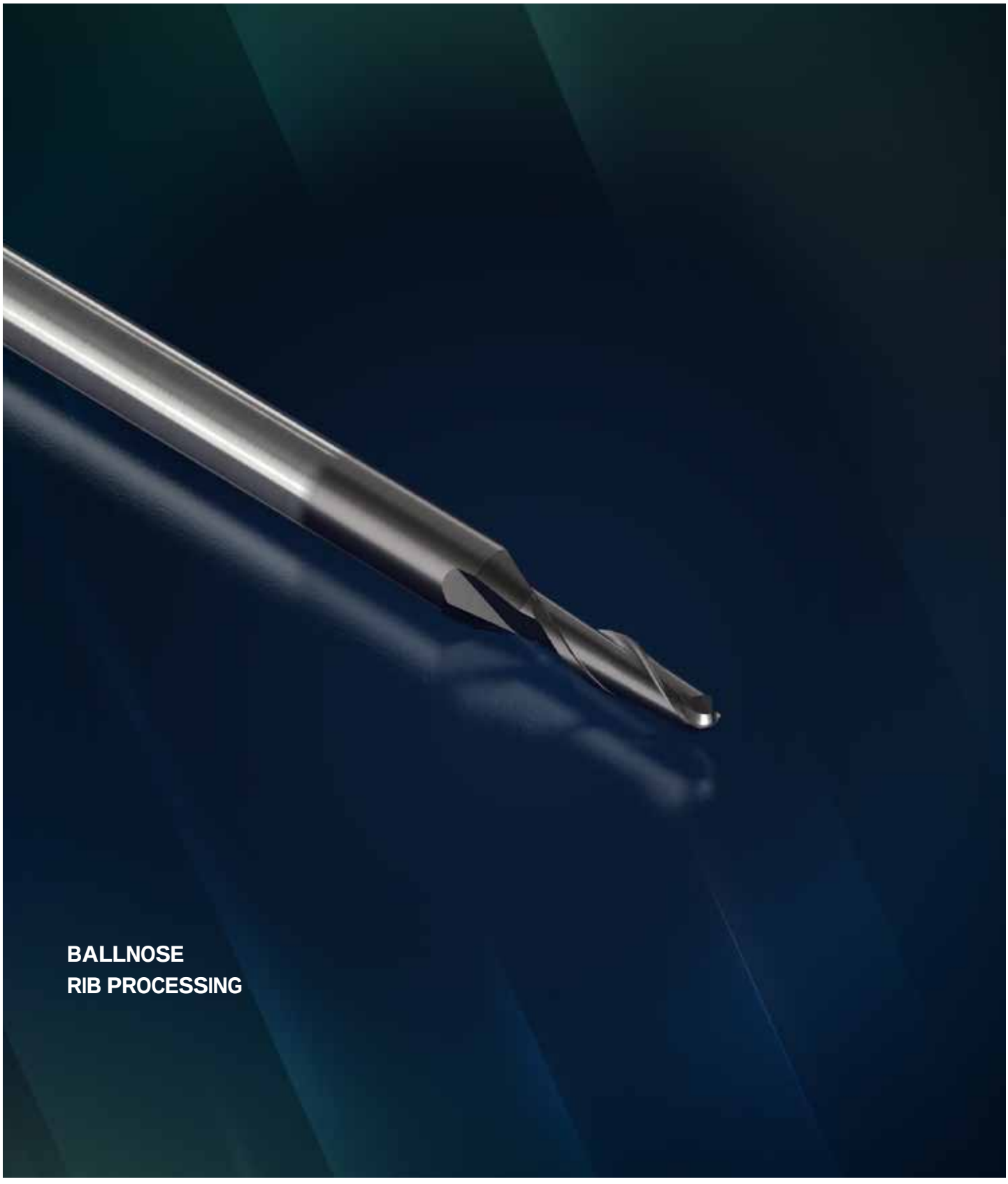
P M K S H

DC	APMX	LU	DCONMS	NOF	OAL	Shank	EDP Number
0.4	0.4	3	4	2	45	C	3403041
0.6	0.5	4	4	2	45	C	3403042
0.8	0.6	2	4	2	45	C	3403043
1.0	0.8	3	4	2	45	C	3403044
1.0	0.8	4	4	2	45	C	3403045
1.0	0.8	6	4	2	45	C	3403046
1.0	0.8	8	4	2	45	C	3403047
1.0	0.8	10	4	2	45	C	3403048
1.5	1.2	6	4	2	45	C	3403049
2.0	1.6	4	4	2	45	C	3403050
2.0	1.6	6	4	2	45	C	3403051
2.0	1.6	10	4	2	45	C	3403052
2.0	1.6	12	4	2	50	C	3403053
2.0	1.6	14	4	2	50	C	3400760
2.0	1.6	16	4	2	50	C	3400754
2.0	1.6	20	4	2	55	C	3400755
2.0	1.6	25	4	2	60	C	3403054
3.0	2.4	12	6	2	50	C	3403055
3.0	2.4	20	6	2	60	C	3403056
4.0	3.2	16	6	2	60	C	3403057
4.0	3.2	20	6	2	65	C	3403058

• For technical data see page: 69

SERIES
FAM2B00 - FAM2B01
FAM2B03 / FAL2B03

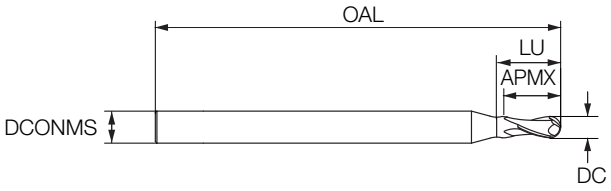
GENERAL



MORSE EBL

SERIES
FAM2B00 - FAM2B01
FAM2B03 /FAL2B03

- Ballnose
- Rib Processing



2 Flutes

30° Helix

P M K S

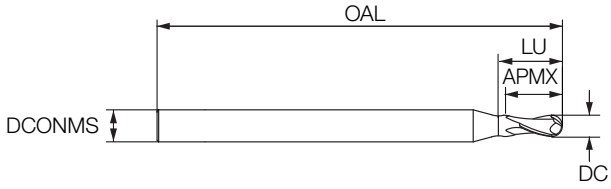
DC	APMX	LU	DCONMS	NOF	OAL	Shank	AlTiN Ultrafine Micron	AlTiN Ultrafine Micron	AlTiN Submicron
0.4	0.8	-	3	2	38	C			3401949
0.4	0.6	1	4	2	45	C	3402665		
0.4	0.6	2	4	2	45	C	3402666		
0.5	1	-	3	2	38	C			3401950
0.5	0.7	2	4	2	45	C	3402667		
0.5	0.7	4	4	2	45	C	3402668		
0.5	0.7	6	4	2	45	C	3402669		
0.6	1.2	-	3	2	38	C			3401951
0.6	0.9	2	4	2	45	C	3402670		
0.6	0.9	4	4	2	45	C	3402671		
0.8	1.6	-	3	2	38	C			3401952
0.8	1.2	2	4	2	45	C	3402672		
0.8	1.2	4	4	2	45	C	3402673		
0.8	1.2	6	4	2	45	C	3402674		
0.8	1.2	10	4	2	45	C	3402675		
1.0	2.5	-	4	2	50	C			3401953
1.0	1	2.2	4	2	50	C	3403387		
1.0	1	2.2	4	2	50	C	3403508		
1.0	1	2.2	6	2	50	C	3402552		
1.0	2	23	6	2	60	C	3402541		
1.0	2	42	6	2	80	C	3402544		
1.0	2	23	6	2	60	C	3403385		
1.0	1.5	3	4	2	45	C	3402676		
1.0	1.5	4	4	2	45	C	3402677		
1.0	1.5	5	4	2	45	C	3402678		
1.0	1.5	6	4	2	45	C	3402679		
1.0	1.5	8	4	2	45	C	3402680		
1.0	1.5	10	4	2	45	C	3402681		
1.0	1.5	12	4	2	45	C	3402682		
1.0	1.5	16	4	2	50	C	3402683		
1.0	1.5	20	4	2	55	C	3402684		
1.2	3	-	4	2	50	C			3401954
1.2	1.2	2.6	4	2	50	C	3402564		
1.2	1.8	8	4	2	45	C	3402685		
1.5	1.5	3	4	2	50	C	3402562		
1.5	2.3	6	4	2	45	C	3402686		
1.5	2.3	8	4	2	45	C	3402687		
1.5	2.3	10	4	2	45	C	3402688		
1.5	2.3	12	4	2	45	C	3402689		
1.5	2.3	20	4	2	55	C	3402690		
1.6	4	-	4	2	50	C			3401955

• For technical data see page: 69

MORSE EBL

SERIES
FAM2B00 - FAM2B01
FAM2B03 /FAL2B03 (CONT.)

- Ballnose
- Rib Processing



2 Flutes

30° Helix

P M K S

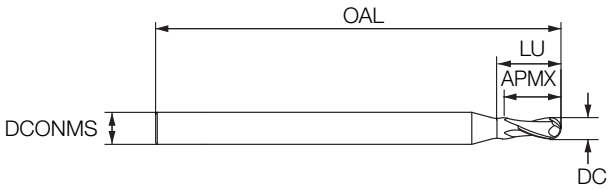
DC	APMX	LU	DCONMS	NOF	OAL	Shank	AlTiN Ultrafine Micron	AlTiN Ultrafine Micron	AlTiN Submicron
1.6	2.4	8	4	2	45	C	3402691		
1.6	2.4	12	4	2	45	C	3402692		
1.8	2.7	8	4	2	45	C	3402693		
2.0	2	4	6	2	50	C	3403388		
2.0	2	4	6	2	50	C	3402553		
2.0	4	23	6	2	60	C	3402546		
2.0	4	41	6	2	80	C	3402547		
2.0	4	23	6	2	60	C	3403386		
2.0	6	-	4	2	50	C			3401956
2.0	4	-	3	2	38	C			3402059
2.0	6	-	3	2	80	C		3402534	
2.0	4	-	3	2	38	C		3402239	
2.0	3	4	4	2	45	C	3402694		
2.0	3	6	4	2	45	C	3402966		
2.0	3	10	4	2	45	C	3402695		
2.0	3	12	4	2	50	C	3402696		
2.0	3	14	4	2	50	C	3402697		
2.0	3	16	4	2	50	C	3402967		
2.0	3	20	4	2	55	C	3402698		
2.0	3	25	4	2	60	C	3402699		
2.0	3	30	4	2	70	C	3402700		
2.5	2.5	5	6	2	60	C	3402554		
3.0	3	6	6	2	60	C	3403389		
3.0	3	6	6	2	60	C	3402555		
3.0	5	-	6	2	57	C		3402240	
3.0	5	-	3	2	38	C			3401985
3.0	5	-	6	2	57	C			3401854
3.0	6	52	6	2	90	C	3402549		
3.0	6	32	6	2	70	C	3402548		
3.0	8	-	3	2	100	C		3402535	
3.0	8	-	6	2	70	C		3402527	
3.0	4.5	8	6	2	50	C	3402701		
3.0	4.5	10	6	2	50	C	3402702		
3.0	4.5	12	6	2	50	C	3402703		
3.0	4.5	16	6	2	55	C	3402704		
3.0	4.5	20	6	2	60	C	3402705		
3.0	4.5	25	6	2	65	C	3402706		
3.0	4.5	30	6	2	70	C	3402707		
3.0	4.5	35	6	2	80	C	3402708		
4.0	4	8	6	2	70	C	3403390		
4.0	4	8	6	2	70	C	3402556		

• For technical data see page: 69

MORSE EBL

SERIES
FAM2B00 - FAM2B01
FAM2B03 /FAL2B03 (CONT.)

- Ballnose
- Rib Processing



2 Flutes

30° Helix

P M K S

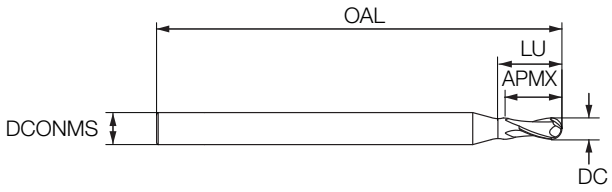
DC	APMX	LU	DCONMS	NOF	OAL	Shank	AlTiN Ultrafine Micron	AlTiN Ultrafine Micron	AlTiN Submicron
4.0	8	49	6	2	90	C	3402542		
4.0	8	28	6	2	70	C	3402550		
4.0	7	-	6	2	57	C		3402241	
4.0	7	-	4	2	50	C			3401986
4.0	7	-	6	2	57	C			3401849
4.0	8	-	4	2	100	C		3402536	
4.0	8	-	6	2	70	C		3402528	
4.0	6	10	6	2	60	C	3402709		
4.0	6	12	6	2	60	C	3402710		
4.0	6	16	6	2	60	C	3402711		
4.0	6	20	6	2	65	C	3402712		
4.0	6	25	6	2	70	C	3402713		
4.0	6	30	6	2	70	C	3402840		
4.0	6	35	6	2	80	C	3402714		
4.0	6	45	6	2	90	C	3402715		
5.0	5	10	6	2	80	C	3403391		
5.0	5	10	6	2	80	C	3402557		
5.0	8	-	6	2	57	C		3402242	
5.0	8	-	5	2	50	C			3401987
5.0	8	-	6	2	57	C			3401850
5.0	12	-	6	2	80	C		3402529	
5.0	7.5	20	6	2	60	C	3402716		
5.0	7.5	25	6	2	70	C	3402717		
6.0	6	12	6	2	90	C	3403392		
6.0	6	12	6	2	90	C	3402558		
6.0	8	-	6	2	57	C		3402243	
6.0	10	-	6	2	120	C		3402537	
6.0	8	-	6	2	57	C			3401851
6.0	12	53	8	2	110	C	3402545		
6.0	12	34	8	2	90	C	3402543		
6.0	12	22	6	2	80	C	3402530		
6.0	9	20	6	2	80	C	3402718		
6.0	9	30	6	2	90	C	3402719		
6.0	9	40	6	2	100	C	3402720		
7.0	7	14	8	2	90	C	3402563		
8.0	11	-	8	2	63	C			3401852
8.0	8	16	8	2	100	C	3403393		
8.0	8	16	8	2	100	C	3402559		
8.0	14	27	8	2	90	C	3402531		
8.0	11	-	8	2	63	C		3402244	
8.0	14	-	8	2	140	C		3402538	

- For technical data see page: 69

SERIES

FAM2B00 - FAM2B01
FAM2B03 /FAL2B03 (CONT.)

- Ballnose
- Rib Processing



2 Flutes

30° Helix

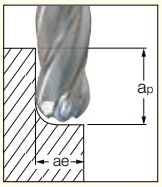
P M K S

DC	APMX	LU	DCONMS	NOF	OAL	Shank	AlTiN Ultrafine Micron	AlTiN Ultrafine Micron	AlTiN Submicron
9.0	9	18	10	2	100	C	3402560		
10.0	13	-	10	2	72				3401853
10.0	10	20	10	2	100	C	3403394		
10.0	10	20	10	2	100	C	3402561		
10.0	18	31	10	2	100	C	3402532		
10.0	13	-	10	2	72	C		3402245	
10.0	18	-	10	2	180	C		3402539	
12.0	14	-	12	2	83	C			3401856
12.0	14	-	12	2	83	C		3402246	
12.0	22	35	12	2	110	C	3402533		
12.0	22	-	12	2	200	C		3402540	
16.0	16	-	16	2	92	C			3401855
3.0*	2	30	6	2	80	C	3402565		
4.0*	3	30	6	2	80	C	3402566		
5.0*	4	38	6	2	80	C	3402567		
6.0*	5	28	6	2	100	C	3402568		
10.0*	8	40	10	2	100	C	3402569		
5.0*	4	38	6	4	80	C	3402570		
6.0*	5	28	6	4	100	C	3402571		
8.0*	6	33	8	4	100	C	3402572		
10.0*	8	40	10	4	100	C	3402573		
12.0*	10	49	12	4	100	C	3402574		

• For technical data see page: 69

* Spherical

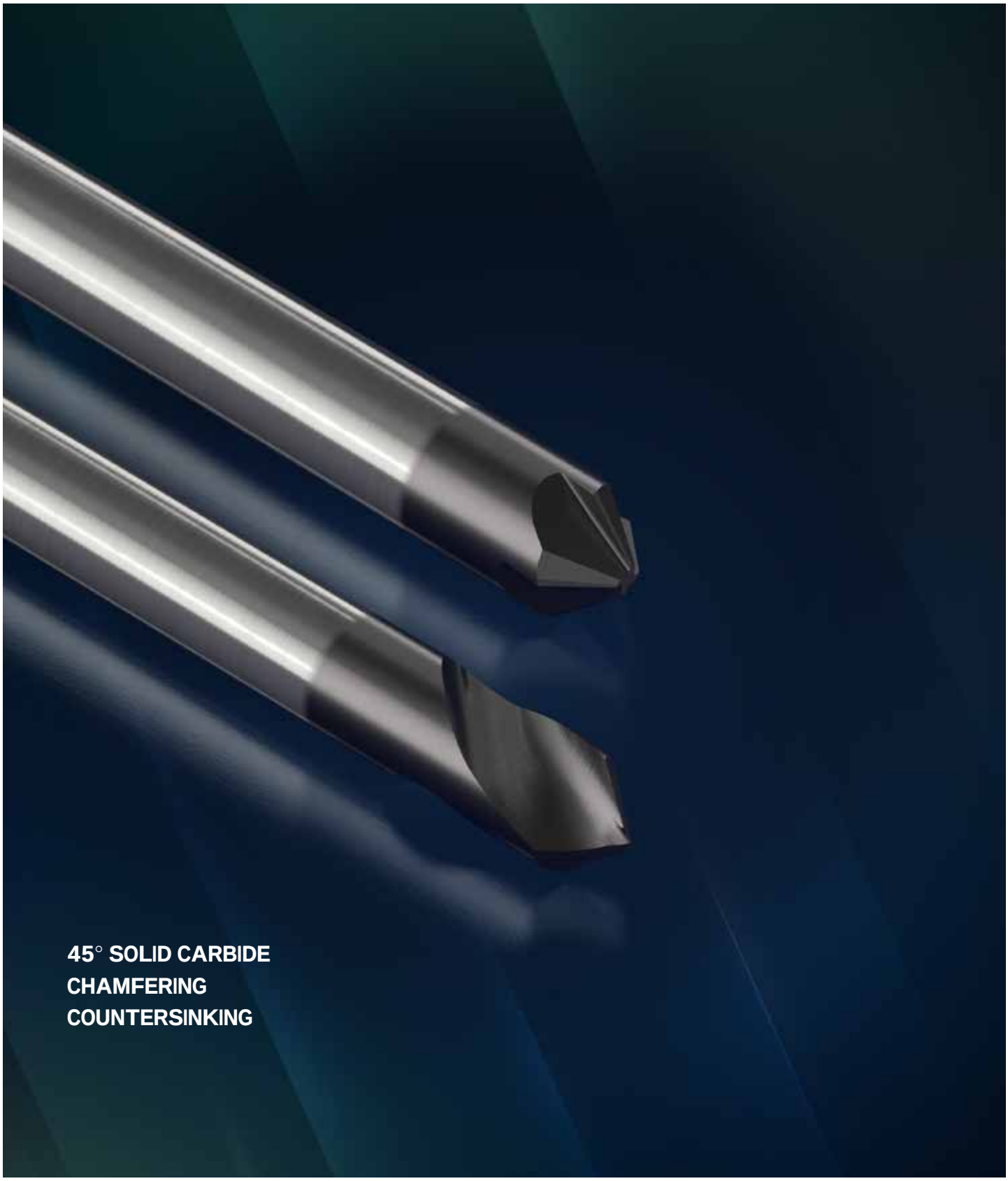
CUTTING DATA



	Side Milling						
	Side Milling			Fz mm/t			
	Vc (m/min)	ap	ae	Ø 0.4-2	Ø 2-6	Ø 6-8	Ø10-12
Steel up to 45 Hrc	150-200	D	D	0.005-0.025	0.030-0.060	0.06-0.070	0.070-0.080
Hardened Steel 45-55 Hrc	60-120	D	D	0.005-0.020	0.015-0.040	0.04-0.050	0.050-0.060
Stainless Steel	70-110	D	D	0.005-0.020	0.025-0.045	0.04-0.050	0.050-0.065
Titanium	50-70	D	D	0.005-0.020	0.020-0.040	0.04-0.050	0.050-0.060
Inconel	15-25	D	D	0.005-0.015	0.010-0.030	0.03-0.050	0.030-0.050
Cast Iron	150-200	D	D	0.005-0.025	0.035-0.050	0.06-0.065	0.065-0.070

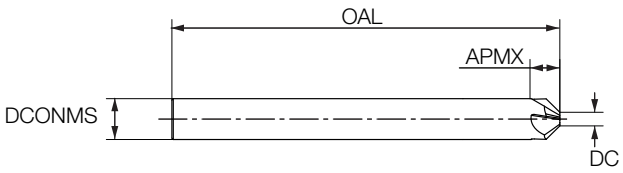
SERIES
FFM4001
FDM2001

GENERAL



SERIES
FFM4001

- 45° Solid Carbide
- Chamfering
- Countersinking
- AlTiN Coating 10% Submicron Carbide



4 Flutes

P M K N S H

DC	APMX	DCONMS	NOF	OAL	Shank	EDP Number
1.5	1.5	4	4	50	C	3402115
2.0	2	6	4	57	C	3402212
3.0	3	8	4	63	C	3402112
4.0	4	10	4	72	C	3402113
5.0	5	12	4	83	C	3402114

SERIES
FDM2001

- 45° Solid Carbide
- Spot Drilling
- Chamfering
- Countersinking
- AlTiN Coating 10% Submicron Carbide

2 Flutes

P M K N S H

DC	APMX	DCONMS	NOF	OAL	Shank	EDP Number
3.0	1.37	3	2	38	C	3402497
3.0	1.37	3	2	38	C	3402504
4.0	1.79	4	2	50	C	3402498
4.0	1.79	4	2	50	C	3402505
5.0	2.24	5	2	50	C	3402499
5.0	2.24	5	2	50	C	3402506
6.0	2.71	6	2	57	C	3402500
6.0	2.71	6	2	57	C	3402507
8.0	3.63	8	2	63	C	3402501
8.0	3.63	8	2	63	C	3402508
10.0	4.55	10	2	72	C	3402502
10.0	4.55	10	2	72	C	3402509
12.0	5.47	12	2	73	C	3402503
12.0	5.47	12	2	73	C	3402510

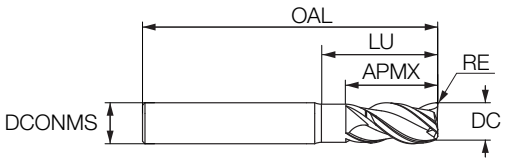
SERIES
MVL3010 - MVL3500

ALUMINIUM

MORSE EVH

SERIES
MVL3000 - MVL3500

- Roughing & Finishing
- Variable Helix & Pitch
- Veritey of R
- Uncoated 10% Submicron Carbide

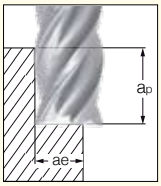


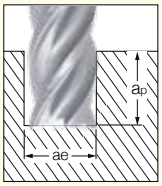
3 Flutes

V° Helix

N

DC	APMX	LU	DCONMS	NOF	OAL	Shank	R0.05-0.1	R0.2	R0.4	R0.8	R1.6	R2.0	R2.5	R3.0	R4.0	R5.
1.0	4	6	6	3	57	C	3401710									
1.5	4	6	6	3	57	C	3401691									
2.0	5	8	6	3	57	C	3401683									
2.5	5	8	6	3	57	C	3402522									
3.0	7	12	6	3	57	C	3402434									
4.0	10	16	6	3	57	C		3402435								
5.0	12	20	6	3	57	C		3402436								
6.0	9	18	6	3	57	C		3402376	3402389	3402402						
6.0	9	30	6	3	65	C		3402370	3402383	3402396						
6.0	14	24	6	3	60	C		3402437								
8.0	12	24	8	3	63	C		3402377	3402390	3402403				3401709		
8.0	12	40	8	3	79	C		3402371	3402384	3402397						
8.0	18	32	8	3	68	C		3402438								
10.0	15	30	10	3	72	C		3402378	3402391	3402404				3401685		
10.0	15	50	10	3	92	C		3402372	3402385	3402398	3402407	3401690		3401684		
10.0	22	40	10	3	80	C		3402439						3401686		
12.0	18	36	12	3	83	C		3402379	3402392	3402405	3402410	3402414	3402999	3401687		
12.0	18	60	12	3	100	C		3402373	3402386	3402399	3402408	3402412		3401688		
12.0	26	48	12	3	93	C		3402440								
16.0	24	48	16	3	92	C		3402380	3402393	3402406	3402411	3402415	3403000	3401689	3402421	3402423
16.0	24	80	16	3	128	C		3402374	3402387	3402400	3402409	3402413	35790027	3406332	3402419	3402422
16.0	34	64	16	3	115	C		3402441								
20.0	30	100	20	3	150	C		3402375								
20.0	30	100	20	3	150	C			3402388	3403381						
20.0	30	60	20	3	110	C		3402381	3402394	3402401		3402416			3402420	3402424
20.0	42	80	20	3	130	C		3402442								
25.0	38	75	25	3	130	C		3402382	3402395							
25.0	38	75	25	3	130	C										
25.0	52	100	25	3	156	C		3402443								

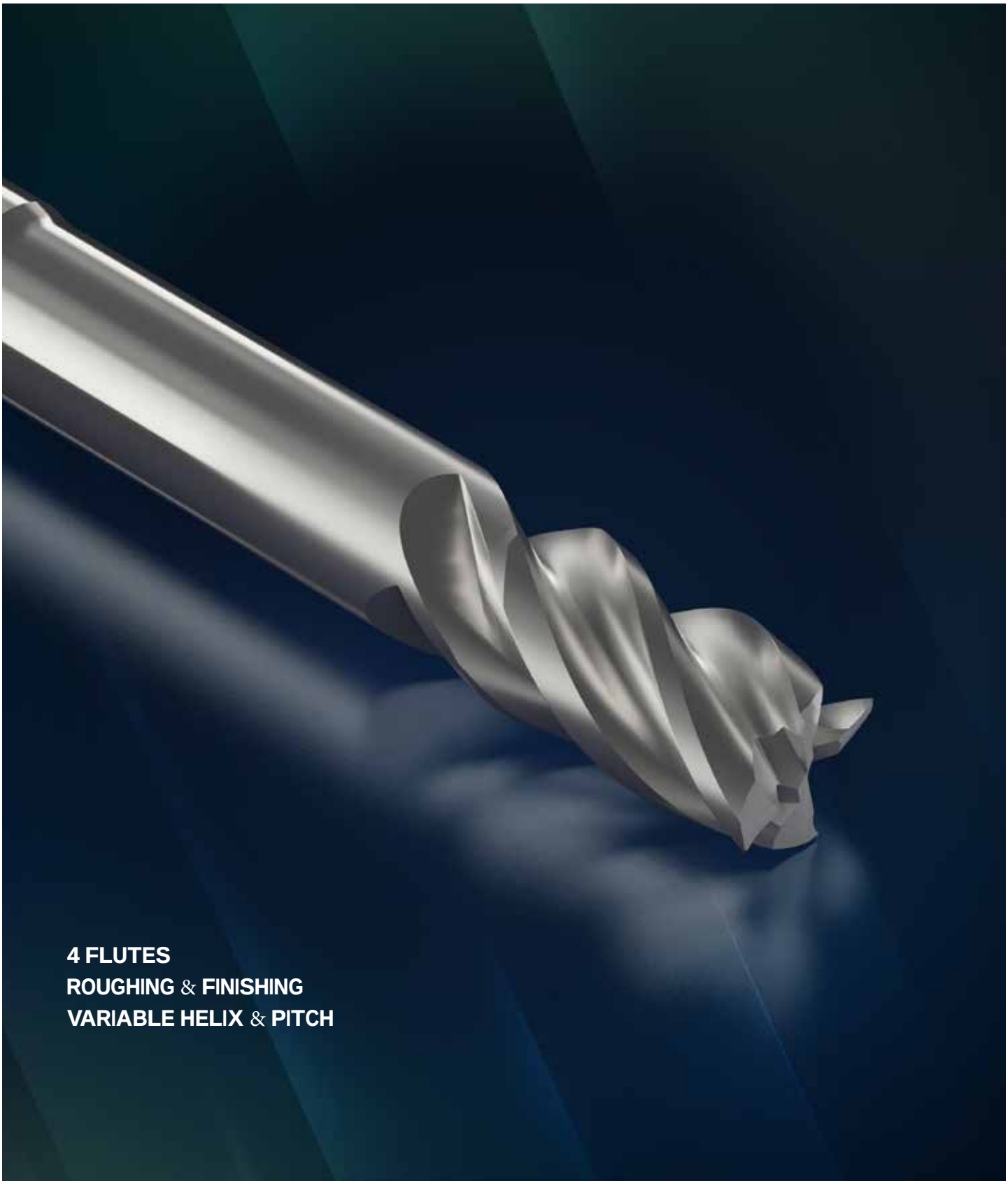




	Side Milling							Slotting					
	Side Milling			Fz mm/t				Side Milling			Fz mm/t		
Aluminum	Vc (m/min)	ap	ae	Ø 1-5	Ø 6-8	Ø 10-12	Ø16-20	Vc (m/min)	ap	ae	Ø 6-8	Ø 10-12	Ø16-20
Al <12%Si	500-800	1.5D	0.4xD	0.02-0.07	0.045-0.07	0.07-0.10	0.08-0.15	500-800	1.5D	D	0.040-0.060	0.060-0.10	0.08-0.15
Al >12%Si	400-450	1.5D	0.4xD	0.02-0.03	0.035-0.06	0.04-0.07	0.06-0.10	400-450	1.5D	D	0.030-0.055	0.030-0.07	0.05-0.10
Copper Alloyes	350-380	1.5D	0.4xD	0.02-0.04	0.030-0.06	0.03-0.07	0.06-0.10	350-380	1.5D	D	0.025-0.050	0.030-0.07	0.05-0.10
Non-Metalic	350-500	1.5D	0.4xD	0.02-0.07	0.045-0.07	0.07-0.10	0.08-0.15	350-500	1.5D	D	0.040-0.060	0.060-0.10	0.08-0.15

SERIES
FVL4020

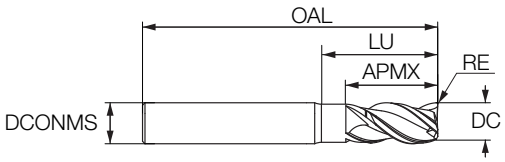
ALUMINIUM



MORSE EVH

SERIES
FVL4020

- Roughing & Finishing
- Variable Helix & Pitch
- Uncoated 10% Submicron Carbide

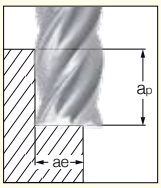


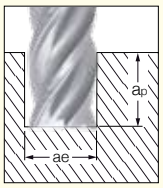
4 Flutes

V° Helix

N

DC	APMX	LU	DCONMS	NOF	OAL	Corner Radius	Shank	EDP Number
6.0	9	30	6	4	65	0.2	C	3402494
6.0	12	18	6	4	57	0.2	C	3402513
8.0	12	40	8	4	79	0.2	C	3402495
8.0	16	24	8	4	63	0.2	C	3402514
10.0	15	50	10	4	92	0.2	C	3402496
10.0	20	30	10	4	72	0.2	C	3402515
12.0	18	60	12	4	100	0.2	C	3402511
12.0	24	36	12	4	83	0.2	C	3402516
16.0	24	80	16	4	128	0.2	C	3402512
16.0	32	48	16	4	100	0.2	C	3402517
20.0	40	60	20	4	110	0.2	C	3402518

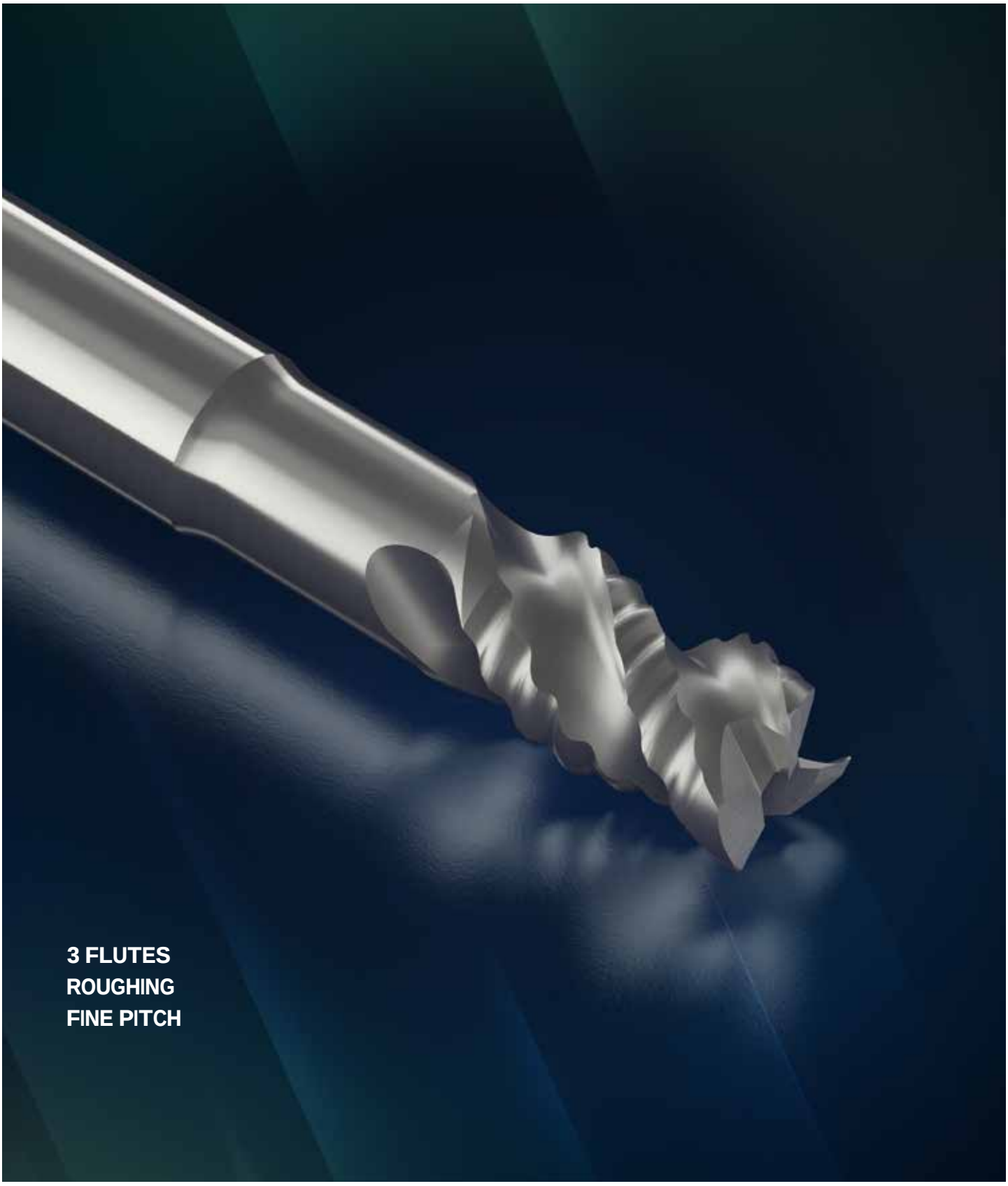




	Side Milling						Slotting					
	Side Milling			Fz mm/t			Side Milling			Fz mm/t		
Aluminum	Vc (m/min)	ap	ae	Ø 6-8	Ø 10-12	Ø16-20	Vc (m/min)	ap	ae	Ø 6-8	Ø 10-12	Ø16-20
Al <12%Si	500-800	2D	0.4xD	0.045-0.07	0.07-0.10	0.08-0.15	500-800	D	D	0.040-0.060	0.060-0.10	0.08-0.15
Al >12%Si	400-450	2D	0.4xD	0.035-0.06	0.04-0.07	0.06-0.10	400-450	D	D	0.030-0.055	0.030-0.07	0.05-0.10
Copper Alloyes	350-380	2D	0.4xD	0.030-0.06	0.03-0.07	0.06-0.10	350-380	D	D	0.025-0.050	0.030-0.07	0.05-0.10
Non-Metalic	350-500	2D	0.4xD	0.045-0.07	0.07-0.10	0.08-0.15	350-500	D	D	0.040-0.060	0.060-0.10	0.08-0.15

SERIES
RBL3020

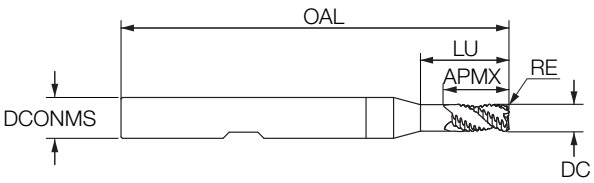
ALUMINIUM



MORSE EAL

SERIES
RBL3020

- Roughing
- Fine Pitch
- Uncoated 10% Submicron Carbide



3 Flutes

45° Helix

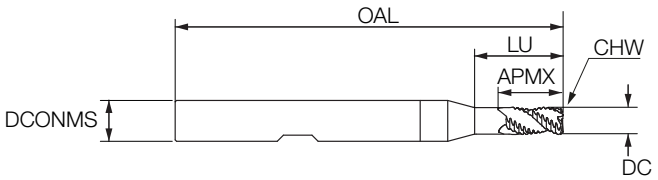
N

DC	APMX	LU	DCONMS	NOF	OAL	RE	Shank	EDP Number
6.0	9	21	6	3	57	0.2	C	3402213
6.0	9	21	6	3	57	0.2	W	3402219
6.0	9	30	6	3	65	0.2	C	3402247
8.0	12	27	8	3	63	0.2	C	3402214
8.0	12	27	8	3	63	0.2	W	3402220
8.0	12	40	8	3	78	0.2	C	3402248
10.0	12	31	10	3	72	0.2	C	3402215
10.0	12	31	10	3	72	0.2	W	3402221
10.0	12	50	10	3	100	0.2	C	3402249
12.0	12	37	12	3	83	0.2	C	3402216
12.0	12	37	12	3	83	0.2	W	3402222
12.0	14	55	12	3	100	0.2	C	3402250
12.0	14	55	12	3	100	0.2	W	3402251
16.0	14	43	16	3	92	0.2	C	3402217
16.0	14	43	16	3	92	0.2	W	3402223
16.0	18	80	16	3	150	0.2	C	3402252
16.0	18	80	16	3	150	0.2	W	3402253
20.0	17	53	20	3	104	0.2	C	3402218
20.0	17	53	20	3	104	0.2	W	3402224
20.0	22	80	20	3	150	0.2	C	3402254

MORSE EAL

SERIES
REL3020

- Roughing
- Corse Pitch
- Uncoated 10% Submicron Carbide



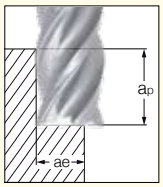
3 Flutes

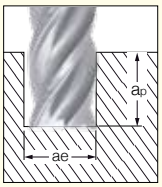
38° Helix

N

DC	APMX	LU	DCONMS	NOF	OAL	CHW	Shank	EDP Number
6.0	13	21	6	3	57	0.5	C	3402155
6.0	13	21	6	3	57	0.5	W	3402137
8.0	20	28	8	3	63	0.5	C	3402156
8.0	20	28	8	3	63	0.5	W	3402138
10.0	22	30	10	3	72	0.6	C	3402157
10.0	22	30	10	3	72	0.6	W	3402139
12.0	25	37	12	3	83	0.6	C	3402158
12.0	25	37	12	3	83	0.6	W	3402140
16.0	32	44	16	3	92	0.6	C	3402159
16.0	32	44	16	3	92	0.6	W	3402141
20.0	38	55	20	3	104	0.7	C	3402162
20.0	38	55	20	3	104	0.7	W	3402142

CUTTING DATA

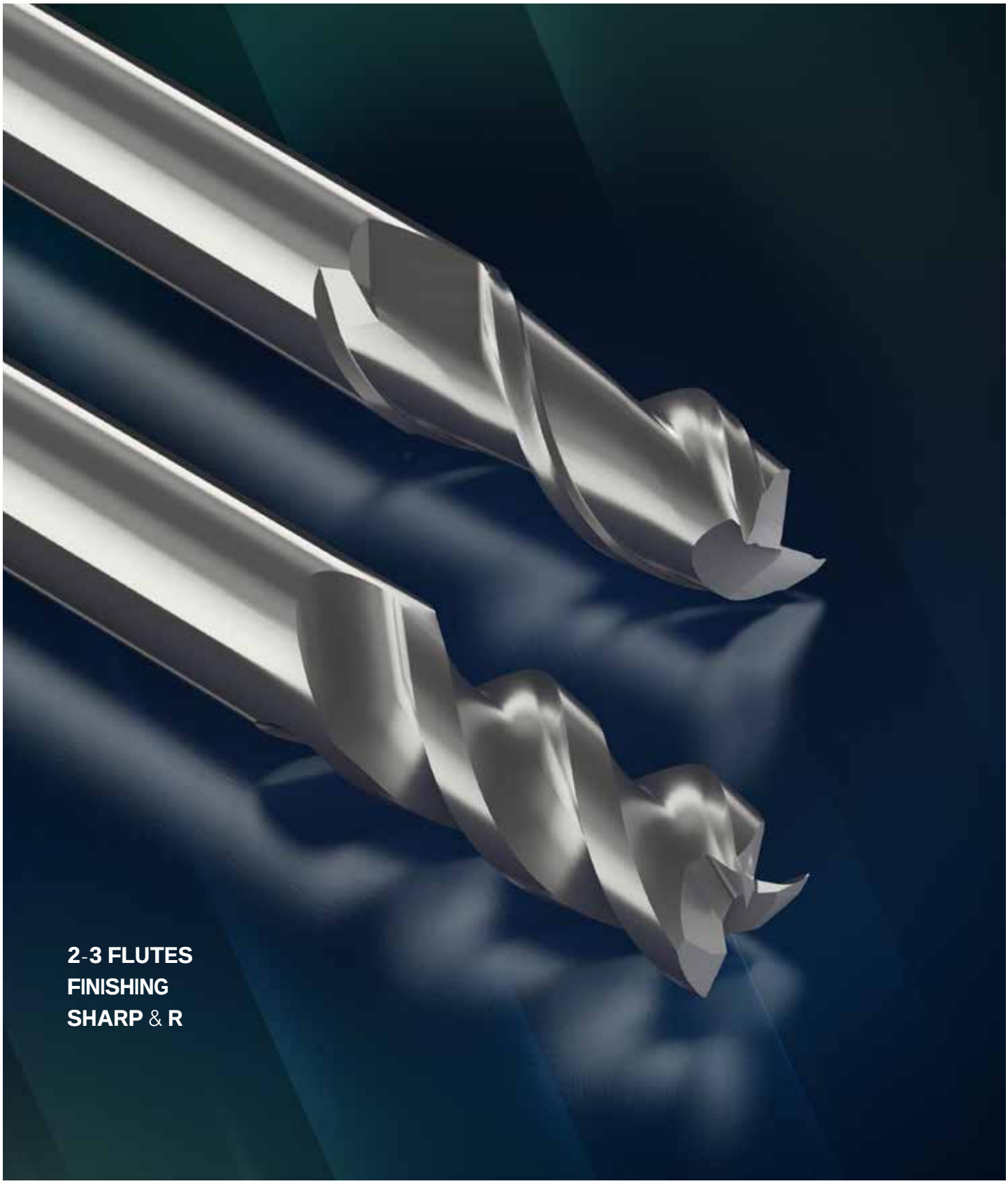




	Side Milling						Slotting					
	Side Milling			Fz mm/t			Side Milling			Fz mm/t		
Aluminum	**Vc (m/min)**	**ap**	**ae**	**Ø 6-8**	**Ø 10-12**	**Ø16-20**	**Vc (m/min)**	**ap**	**ae**	**Ø 6-8**	**Ø 10-12**	**Ø16-20**
Al <12%Si	500-800	2D	0.4xD	0.03-0.050	0.045-0.055	0.05-0.10	500-800	D	D	0.03-0.050	0.045-0.055	0.05-0.10
Al >12%Si	400-450	2D	0.4xD	0.03-0.045	0.030-0.060	0.05-0.08	400-450	D	D	0.03-0.045	0.030-0.060	0.05-0.08
Copper Alloyes	350-380	2D	0.4xD	0.03-0.045	0.030-0.060	0.05-0.08	350-380	D	D	0.03-0.045	0.030-0.060	0.05-0.08
Non-Metalic	350-500	2D	0.4xD	0.03-0.050	0.045-0.055	0.05-0.10	350-500	D	D	0.03-0.050	0.045-0.055	0.05-0.10

SERIES
FBM2000 / FBM3020

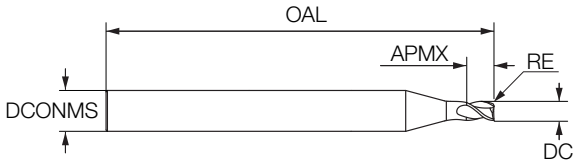
ALUMINIUM



MORSE EAL

SERIES
FBM2000 / FBM3020

- Finishing
- Sharp & R
- Uncoated 10% Submicron Carbide

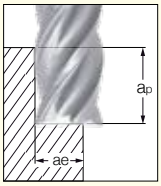


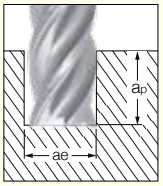
2-3 Flutes

45° Helix

N

DC	APMX	DCONMS	NOF	OAL	RE	Shank	EDP Number
4.0	12	6	2	57	-	C	3402034
5.0	14	6	2	57	-	C	3402035
6.0	16	6	2	57	-	C	3402036
8.0	20	8	2	63	-	C	3402037
10.0	22	10	2	72	-	C	3402038
12.0	25	12	2	83	-	C	3402039
16.0	32	16	2	92	-	C	3402040
20.0	38	20	2	104	-	C	3402041
4.0	12	6	3	57	0.1	C	3402226
5.0	14	6	3	57	0.2	C	3402227
6.0	16	6	3	57	0.2	C	3402228
8.0	20	8	3	63	0.2	C	3402229
10.0	22	10	3	72	0.2	C	3402230
12.0	25	12	3	83	0.2	C	3402231
14.0	30	14	3	83	0.2	C	3402232
16.0	32	16	3	92	0.2	C	3402233
20.0	38	20	3	104	0.2	C	3402234

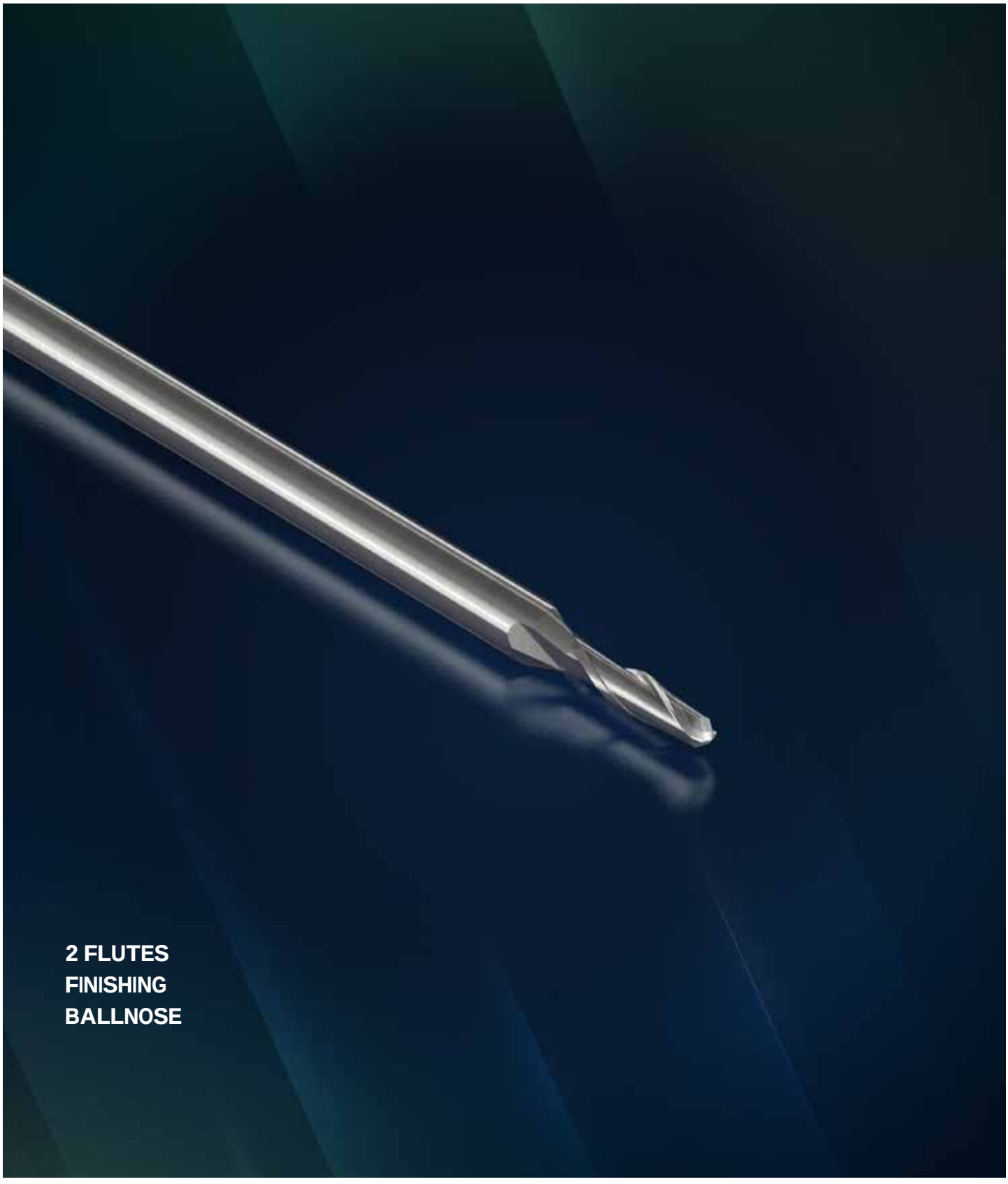




	Side Milling						Slotting					
	Side Milling			Fz mm/t			Side Milling			Fz mm/t		
Aluminum	Vc (m/min)	ap	ae	Ø 6-8	Ø 10-12	Ø16-20	Vc (m/min)	ap	ae	Ø 6-8	Ø 10-12	Ø16-20
Al <12%Si	500-800	2D	0.4xD	0.03-0.050	0.045-0.055	0.05-0.10	500-800	1.5D	D	0.03-0.050	0.045-0.055	0.05-0.10
Al >12%Si	400-450	2D	0.4xD	0.03-0.045	0.030-0.060	0.05-0.08	400-450	1.5D	D	0.03-0.045	0.030-0.060	0.05-0.08
Copper Alloyes	350-380	2D	0.4xD	0.03-0.045	0.030-0.060	0.05-0.08	350-380	1.5D	D	0.03-0.045	0.030-0.060	0.05-0.08
Non-Metalic	350-500	2D	0.4xD	0.03-0.050	0.045-0.055	0.05-0.10	350-500	1.5D	D	0.03-0.050	0.045-0.055	0.05-0.10

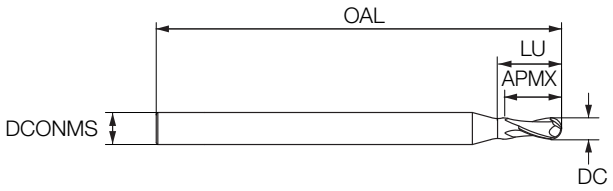
SERIES
FBL2B00

ALUMINIUM



SERIES
FBL2B00

- Finishing
- Ballnose
- Uncoated 10% Submicron Carbide

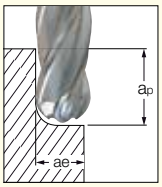


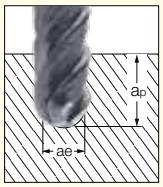
2 Flutes

45° Helix

N

DC	APMX	LU	DCONMS	NOF	OAL	Shank	EDP Number
1.0	1	2	6	2	57	C	3401703
2.0	2	4	6	2	57	C	3401704
3.0	3	6	6	2	57	C	3401705
4.0	4	8	6	2	57	C	3401706
5.0	5	10	6	2	57	C	3401707
6.0	6	12	6	2	57	C	3401708

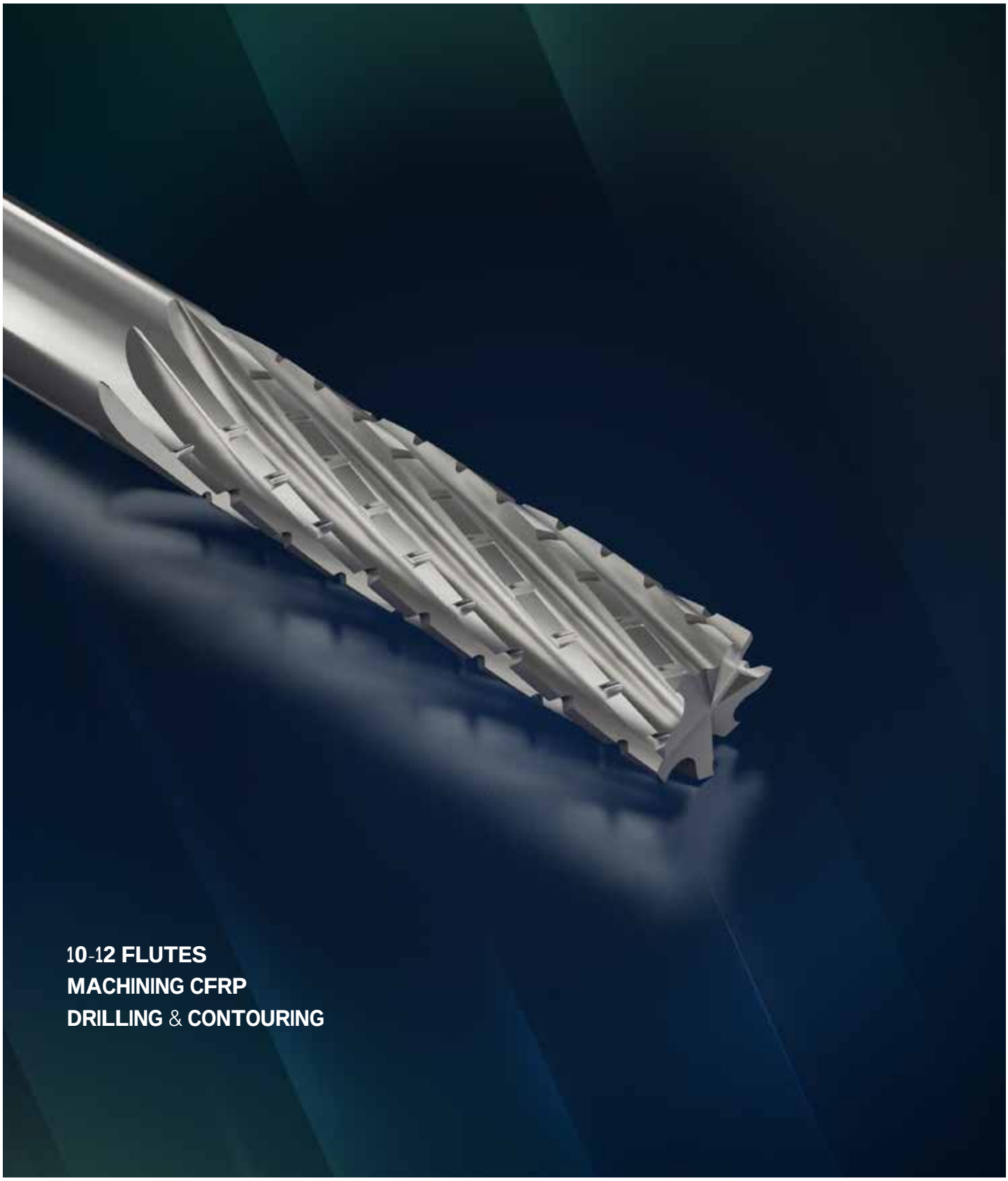




	Side Milling					Slotting				
	Side Milling			Fz mm/t		Side Milling			Fz mm/t	
Aluminum	Vc (m/min)	ap	ae	Ø 1-3	Ø 4-6	Vc (m/min)	ap	ae	Ø 1-3	Ø 4-6
Al <12%Si	500-800	D	0.4xD	0.03-0.050	0.045-0.055	500-800	D	D	0.015-0.030	0.030-0.060
Al >12%Si	400-450	D	0.4xD	0.03-0.045	0.030-0.060	400-450	D	D	0.015-0.025	0.025-0.055
Copper Alloyes	350-380	D	0.4xD	0.03-0.045	0.030-0.060	350-380	D	D	0.015-0.030	0.030-0.060
Non-Metalic	350-500	D	0.4xD	0.03-0.050	0.045-0.055	350-500	D	D	0.015-0.030	0.045-0.055

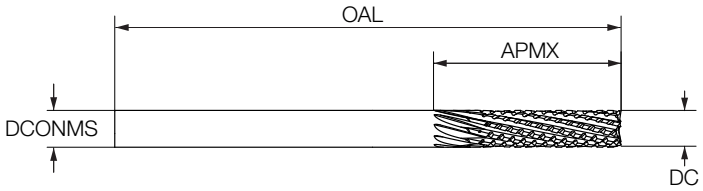
SERIES
RAM1002

COMPOSITE



SERIES
RAM1002

- Machining CFRP
- Uncoated 10% Submicron Carbide



10-12 Flutes

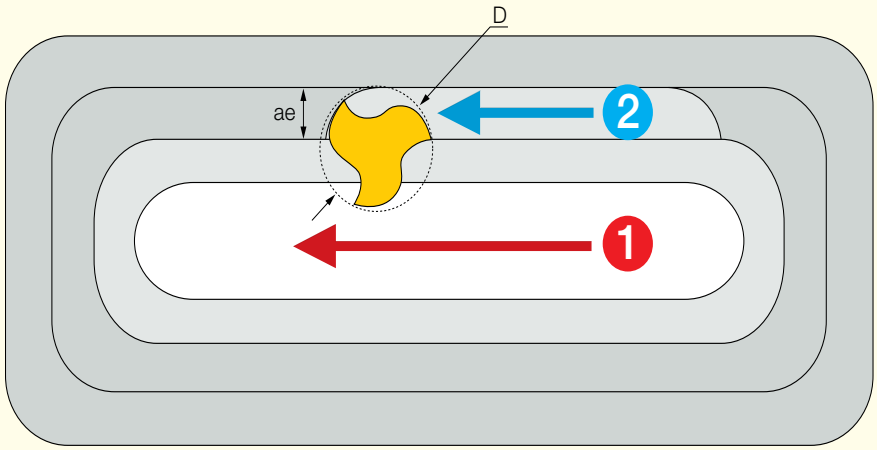
DC	APMX	DCONMS	NOF	OAL	Shank	EDP Number
3.0	12	3	10	55	C	3402427
4.0	16	4	10	55	C	3402428
6.0	19	6	10	57	C	3402430
8.0	25	8	12	63	C	3402431
10.0	25	10	12	72	C	3402432
12.0	25	12	12	83	C	3402433

Recommendations for Popular Applications

1 Recommended Method
Open the pocket in the middle

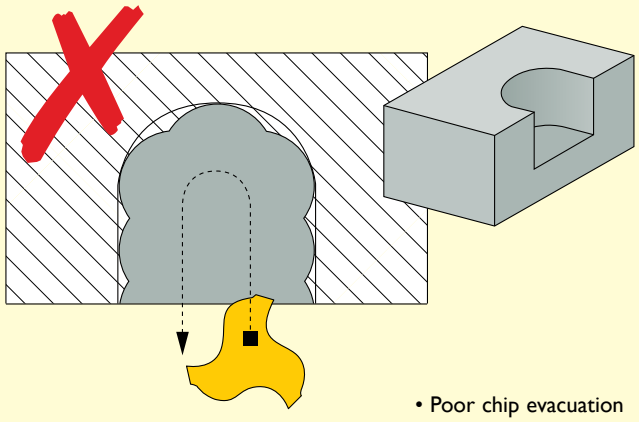
2 Proceed with shoulder milling
Width of cut ae = 40-60% x D

Features
- Better chip evacuation
- No mismatch in the corners
- Constant operation
- Less vibration
- Longer tool life



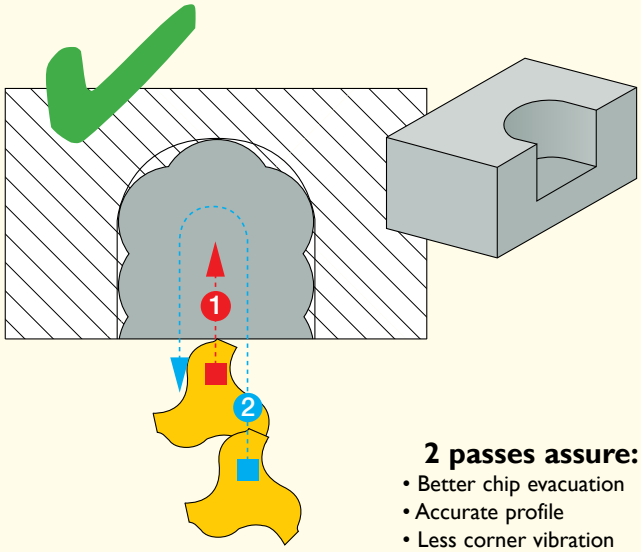
Roughing Side Pockets

Conventional Method



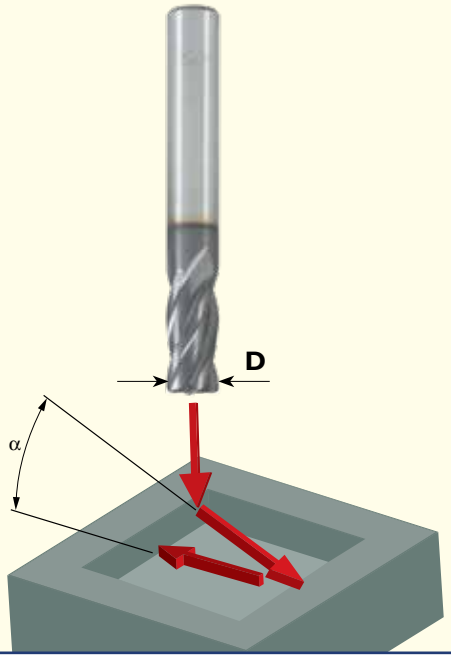
- Poor chip evacuation
- May cause chipping

Alternative Recommended Method



2 passes assure:
- Better chip evacuation
- Accurate profile
- Less corner vibration

Recommended Rampdown Angle

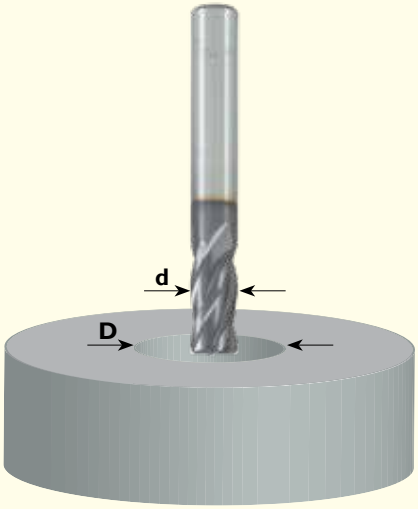


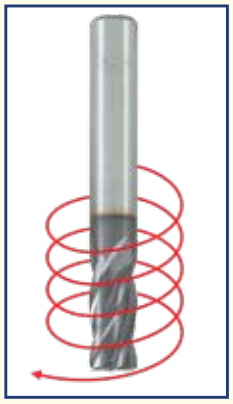
A D ≤ 10 mm a= 5°-10°

B D > 10 mm a= 3°-7°

Helical Milling

Recommended for
Faster and Better Chip Evacuation





Dmin= d + 1 mm
Dmax= (dx2) -1 mm

SOLID CARBIDE DRILLS

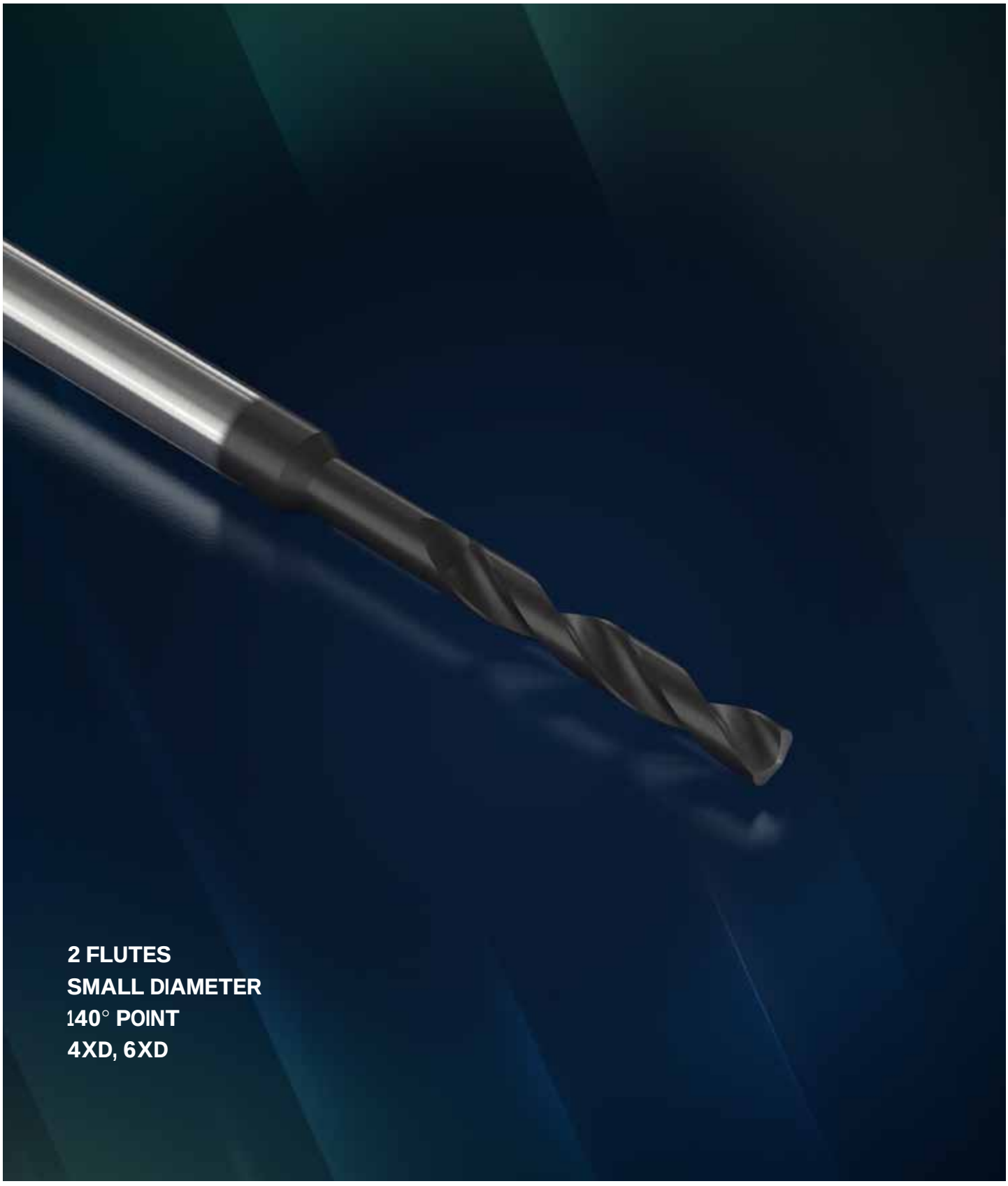
MORSE CUTTING TOOLS

WORKPIECE MATERIAL	ISO
STEEL	P
STAINLESS STEEL	M
CAST IRON	K
ALUMINUM / NON FERROUS MATERIALS	N
SUPERALLOYS / TITANIUM	S
HARD STEELS	H

	Designation	Cutting Diameter	No. of Flutes	Length of Cut	Coolant	P	M	K	S	H	N	Page
	DBN21	0.8-2.9	2	4xD 6xD		✔	✔	✔	✔	✔	✔	90-91
	DBN21	3-12	2	3xD 5xD		✔	✔	✔	✔	✔	✔	92-95
	DBC21	3-12	2	3xD 5xD	✔	✔	✔	✔	✔	✔	✔	96-99

Drill	Spiral Flute	**C-** Coolant Thru **N-** No Coolant Thru	Number of Flutes	**1**- AlTiN Coating 10% Submicron Carbide
D	B	C	2	1

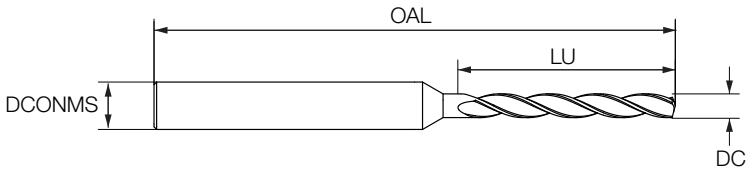
SERIES
DBN21



MORSE DRS

SERIES
DBN21

- Small Diameter
- 140° Point
- 4xD, 6xD
- AlTiN Coating 10% Submicron Carbide



2 Flutes

30° Helix

P M K S H

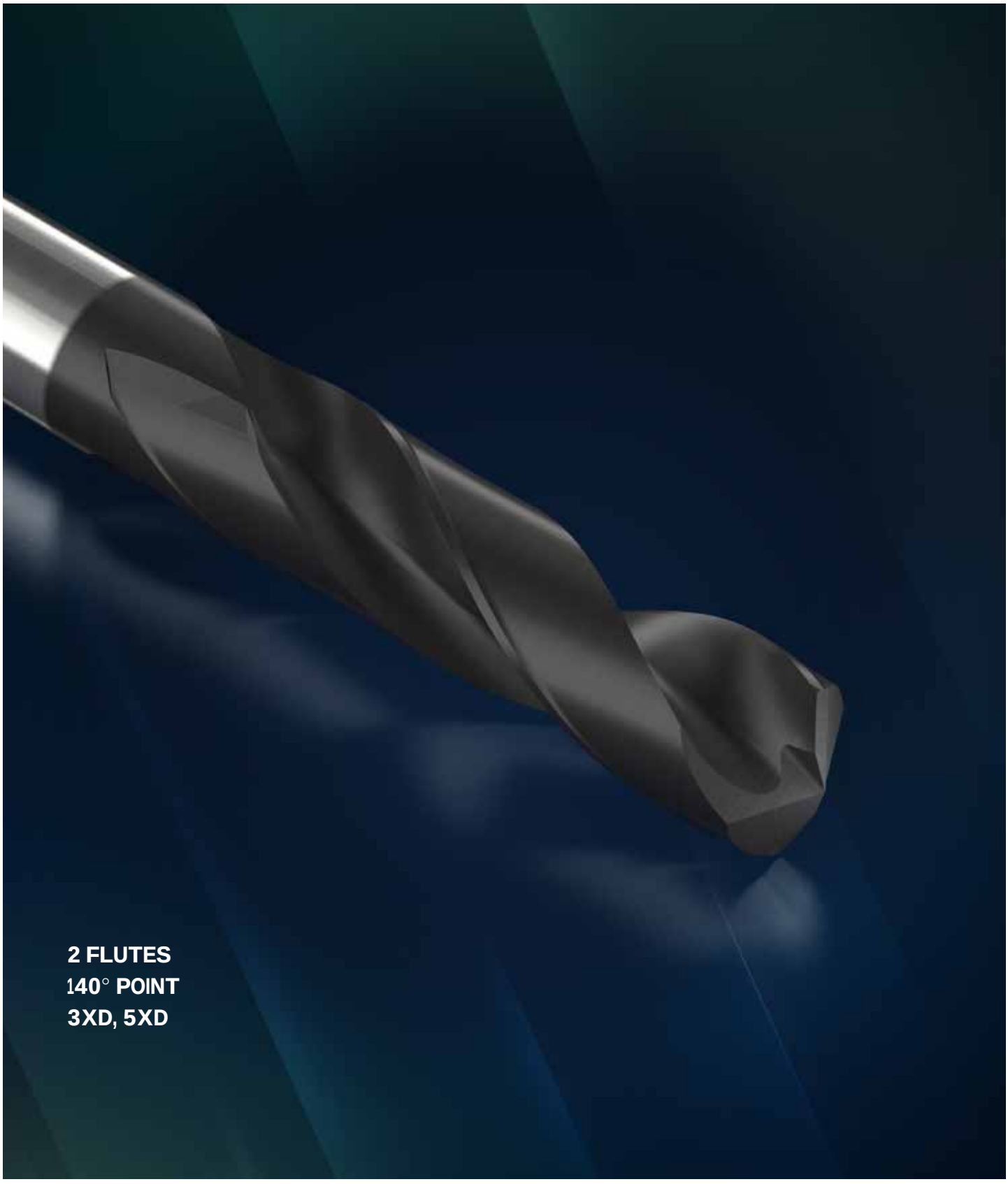
DC	DCONMS	4xD			6xD		
		LU	OAL	EDP Number	LU	OAL	EDP Number
0.8	3	3.2	46	3411217	4.8	46	3411239
0.9	3	3.6	46	3411218	5.4	46	3411240
1.0	3	4	46	3411219	6	46	3411241
1.1	3	4.4	46	3411220	6.6	46	3411242
1.2	3	4.8	46	3411221	7.2	46	3411243
1.3	3	5.2	46	3411222	7.8	46	3411244
1.4	3	5.6	46	3411223	8.4	46	3411245
1.5	3	6	46	3411224	9	46	3411246
1.6	3	6.4	46	3411225	9.6	46	3411247
1.7	3	6.8	46	3411226	10.2	60	3411248
1.8	3	7.2	46	3411227	10.8	60	3411249
1.9	3	7.6	46	3411228	11.4	60	3411250
2.0	3	8	60	3411229	12	60	3411251
2.1	3	8.4	60	3411230	12.6	60	3411252
2.2	3	8.8	60	3411231	13.2	60	3411253
2.3	3	9.2	60	3411232	13.8	60	3411254
2.4	3	9.6	60	3411233	14.4	60	3411255
2.5	3	10	60	3411234	15	60	3411256
2.6	3	10.4	60	3411235	15.6	60	3411257
2.7	3	10.8	60	3411236	16.2	60	3411258
2.8	3	11.2	60	3411237	16.8	60	3411259
2.9	3	11.6	60	3411238	17.4	60	3411260

• For technical data see pages: 100-105

CUTTING DATA FOR SMALL DIAMETERS

Material	Cutting Speed M/Min	Feed Per Tooth (mm/rev)			
		Ø 0.8-1.5	Ø1.5-2	Ø2-2.5	Ø 2.5-3
Low Alloy Steel <25Hrc	40-100	0.02-0.07	0.04-0.10	0.07-0.12	0.08-0.15
High Alloy Steel >25Hrc	30-85	0.02-0.07	0.04-0.10	0.07-0.12	0.08-0.15
Hardened Steel 50-60Hrc	10-20	0.01-0.02	0.01-0.02	0.02-0.03	0.02-0.03
Stainless Steel	20-35	0.02-0.07	0.05-0.10	0.07-0.12	0.08-0.15
Cast Iron (GGG)	40-95	0.02-0.07	0.05-0.10	0.07-0.12	0.08-0.15
Cast Iron (GG)	40-70	0.02-0.07	0.05-0.10	0.07-0.12	0.08-0.15
Titanium	10-20	0.02-0.04	0.03-0.06	0.03-0.06	0.04-0.06
Inconel	10-20	0.02-0.03	0.03-0.05	0.03-0.06	0.04-0.06
Aluminium	80-150	0.03-0.10	0.05-0.12	0.07-0.15	0.07-0.15

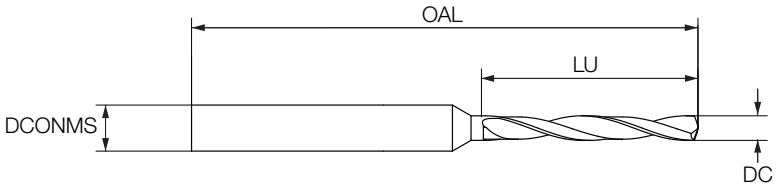
SERIES
DBN21



MORSE DR

SERIES
DBN21

- 140° Point
- 3xD, 5xD
- AlTiN Coating 10% Submicron Carbide



2 Flutes

30° Helix

P M K S H

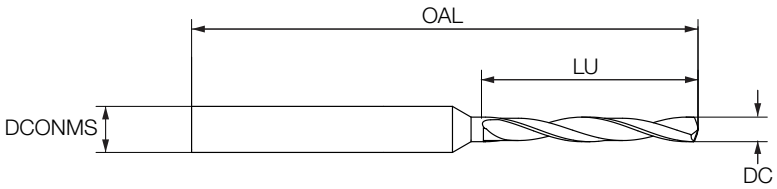
DC	DCONMS	3xD			5xD		
		LU	OAL	EDP Number	LU	OAL	EDP Number
3.0	6	14	62	3410827	23	66	3410918
3.1	6	14	62	3410828	23	66	3410919
3.2	6	14	62	3410829	23	66	3410920
3.3	6	14	62	3410830	23	66	3410921
3.4	6	14	62	3410831	23	66	3410922
3.5	6	14	62	3410832	23	66	3410923
3.6	6	14	62	3410833	23	66	3410924
3.7	6	14	62	3410834	23	66	3410925
3.8	6	17	66	3410835	29	74	3410926
3.9	6	17	66	3410836	29	74	3410927
4.0	6	17	66	3410837	29	74	3410928
4.1	6	17	66	3410838	29	74	3410929
4.2	6	17	66	3410839	29	74	3410930
4.3	6	17	66	3410840	29	74	3410931
4.4	6	17	66	3410841	29	74	3410932
4.5	6	17	66	3410842	29	74	3410933
4.6	6	17	66	3410843	29	74	3410934
4.7	6	17	66	3410844	29	74	3410935
4.8	6	20	66	3410845	35	74	3410936
4.9	6	20	66	3410846	35	82	3410937
5.0	6	20	66	3410847	35	82	3410938
5.1	6	20	66	3410848	35	82	3410939
5.2	6	20	66	3410849	35	82	3410940
5.3	6	20	66	3410850	35	82	3410941
5.4	6	20	66	3410851	35	82	3410942
5.5	6	20	66	3410852	35	82	3410943
5.6	6	20	66	3410853	35	82	3410944
5.7	6	20	66	3410854	35	82	3410945
5.8	6	20	66	3410855	35	82	3410946
5.9	6	20	66	3410856	35	82	3410947
6.0	6	20	66	3410857	35	82	3410948
6.1	8	24	79	3410858	43	91	3410949
6.2	8	24	79	3410859	43	91	3410950
6.3	8	24	79	3410860	43	91	3410951
6.4	8	24	79	3410861	43	91	3410952
6.5	8	24	79	3410862	43	91	3410953
6.6	8	24	79	3410863	43	91	3410954
6.7	8	24	79	3410864	43	91	3410955
6.8	8	24	79	3410865	43	91	3410956
6.9	8	24	79	3410866	43	91	3410957

• For technical data see pages: 100-105

MORSE DR

SERIES
DBN21 (CONT.)

- 140° Point
- 3xD, 5xD
- AlTiN Coating 10% Submicron Carbide



2 Flutes

30° Helix

P M K S H

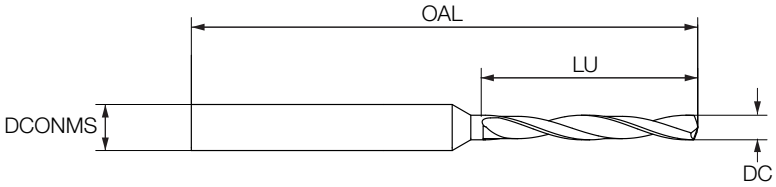
DC	DCONMS	3xD			5xD		
		LU	OAL	EDP Number	LU	OAL	EDP Number
7.0	8	24	79	3410867	43	91	3410958
7.1	8	29	79	3410868	43	91	3410959
7.2	8	29	79	3410869	43	91	3410960
7.3	8	29	79	3410870	43	91	3410961
7.4	8	29	79	3410871	43	91	3410962
7.5	8	29	79	3410872	43	91	3410963
7.6	8	29	79	3410873	43	91	3410964
7.7	8	29	79	3410874	43	91	3410965
7.8	8	29	79	3410875	43	91	3410966
7.9	8	29	79	3410876	43	91	3410967
8.0	8	29	79	3410877	43	91	3410968
8.1	10	35	89	3410878	49	103	3410969
8.2	10	35	89	3410879	49	103	3410970
8.3	10	35	89	3410880	49	103	3410971
8.4	10	35	89	3410881	49	103	3410972
8.5	10	35	89	3410882	49	103	3410973
8.6	10	35	89	3410883	49	103	3410974
8.7	10	35	89	3410884	49	103	3410975
8.8	10	35	89	3410885	49	103	3410976
8.9	10	35	89	3410886	49	103	3410977
9.0	10	35	89	3410887	49	103	3410978
9.1	10	35	89	3410888	49	103	3410979
9.2	10	35	89	3410889	49	103	3410980
9.3	10	35	89	3410890	49	103	3410981
9.4	10	35	89	3410891	49	103	3410982
9.5	10	35	89	3410892	49	103	3410983
9.6	10	35	89	3410893	49	103	3410984
9.7	10	35	89	3410894	49	103	3410985
9.8	10	35	89	3410895	49	103	3410986
9.9	10	35	89	3410896	49	103	3410987
10.0	10	35	89	3410897	49	103	3410988
10.1	12	40	101	3410898	56	118	3410989
10.2	12	40	101	3410899	56	118	3410990
10.3	12	40	101	3410900	56	118	3410991
10.4	12	40	101	3410901	56	118	3410992
10.5	12	40	101	3410902	56	118	3410993
10.6	12	40	101	3410903	56	118	3410994
10.7	12	40	101	3410904	56	118	3410995
10.8	12	40	101	3410905	56	118	3410996
10.9	12	40	101	3410906	56	118	3410997

• For technical data see pages: 100-105

MORSE DR

SERIES
DBN21 (CONT.)

- 140° Point
- 3xD, 5xD
- AlTiN Coating 10% Submicron Carbide



2 Flutes

30° Helix

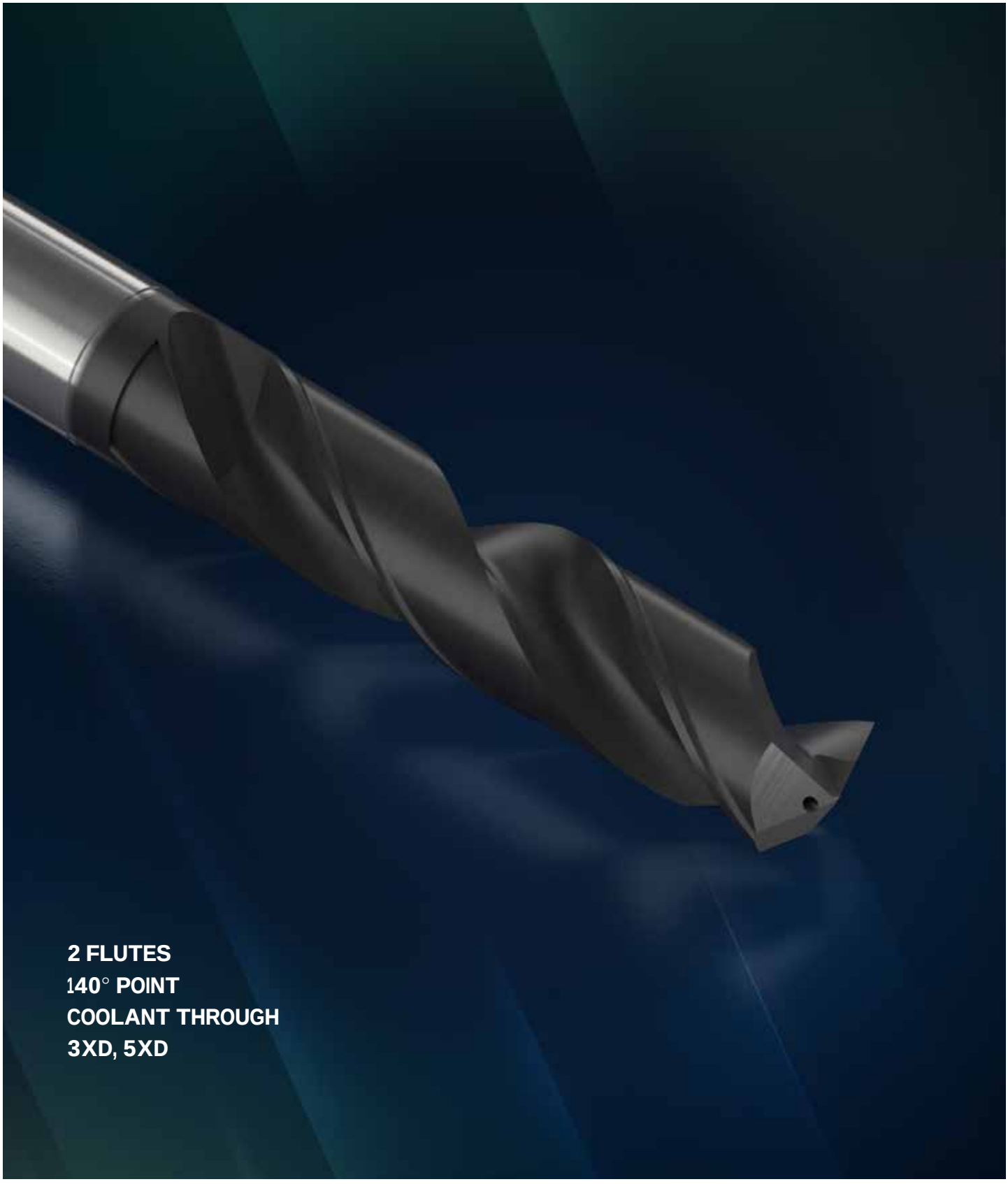
P M K S H

DC	DCONMS	3xD			5xD		
		LU	OAL	EDP Number	LU	OAL	EDP Number
11.0	12	40	101	3410907	56	118	3410998
11.1	12	40	101	3410908	56	118	3410999
11.2	12	40	101	3410909	56	118	3411000
11.3	12	40	101	3410910	56	118	3411001
11.4	12	40	101	3410911	56	118	3411002
11.5	12	40	101	3410912	56	118	3411003
11.6	12	40	101	3410913	56	118	3411004
11.7	12	40	101	3410914	56	118	3411005
11.8	12	40	101	3410915	56	118	3411006
11.9	12	40	101	3410916	56	118	3411007
12.0	12	40	101	3410917	56	118	3411008

• For technical data see pages: 100-105

Material	Cutting Speed M/Min	Feed Per Tooth (mm/rev)					
		Ø 3-5	Ø 5-8	Ø 8-10	Ø10-12	Ø 12-16	Ø16-20
Low Alloy Steel <25Hrc	80-120	0.05-0.12	0.07-0.15	0.15-0.25	0.15-0.25	0.2-0.35	0.25-0.35
High Alloy Steel >25Hrc	25-80	0.04-0.1	0.05-0.12	0.05-0.15	0.08-0.17	0.07-0.2	0.1-0.2
Hardened Steel	20-50	0.04-0.08	0.05-0.1	0.07-0.12	0.07-0.15	0.1-0.15	0.12-0.18
Stainless Steel	25-80	0.04-0.1	0.05-0.12	0.05-0.15	0.08-0.17	0.07-0.2	0.1-0.2
Cast Iron (GGG)	65-80	0.08-0.15	0.1-0.2	0.15-0.3	0.18-0.35	0.18-0.4	0.2-0.45
Cast Iron (GG)	80-100	0.08-0.2	0.1-0.25	0.15-0.35	0.18-0.4	0.18-0.45	0.2-0.5
Titanium	15-30	0.02-0.04	0.04-0.08	0.06-0.1	0.06-0.12	0.08-0.12	0.08-0.18
Inconel	15-30	0.02-0.04	0.04-0.08	0.06-0.1	0.06-0.12	0.08-0.12	0.08-0.18
Aluminium	70-280	0.07-0.25	0.08-0.35	0.1-0.35	0.12-0.4	0.15-0.5	0.2-0.55

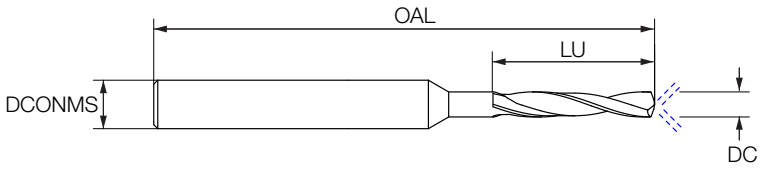
SERIES
DBC21



MORSE DRC

SERIES
DBC21

- 140° Point
- Coolant Through
- 3xD, 5xD
- AlTiN Coating 10% Submicron Carbide



2 Flutes

30° Helix

P M K S H

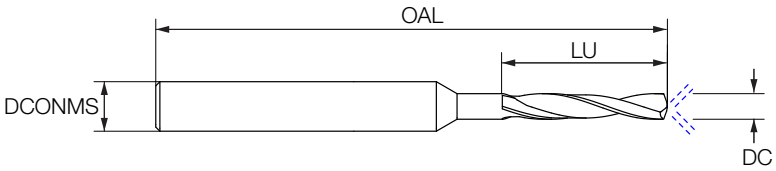
DC	DCONMS	3xD			5xD		
		LU	OAL	EDP Number	LU	OAL	EDP Number
3.0	6	14	62	3410588	23	66	3410678
3.1	6	14	62	3410589	23	66	3410679
3.2	6	14	62	3410590	23	66	3410680
3.3	6	14	62	3410591	23	66	3410681
3.4	6	14	62	3410592	23	66	3410682
3.5	6	14	62	3410593	23	66	3410683
3.6	6	14	62	3410594	23	66	3410684
3.7	6	14	62	3410595	23	66	3410685
3.8	6	17	66	3410596	29	74	3410686
3.9	6	17	66	3410597	29	74	3410687
4.0	6	17	66	3410598	29	74	3410688
4.1	6	17	66	3410599	29	74	3410689
4.2	6	17	66	3410600	29	74	3410690
4.3	6	17	66	3410601	29	74	3410691
4.4	6	17	66	3410602	29	74	3410692
4.5	6	17	66	3410603	29	74	3410693
4.6	6	17	66	3410604	29	74	3410694
4.7	6	17	66	3410605	29	74	3410695
4.8	6	20	66	3410606	35	82	3410696
4.9	6	20	66	3410607	35	82	3410697
5.0	6	20	66	3410608	35	82	3410698
5.1	6	20	66	3410609	35	82	3410699
5.2	6	20	66	3410610	35	82	3410700
5.3	6	20	66	3410611	35	82	3410701
5.4	6	20	66	3410612	35	82	3410702
5.5	6	20	66	3410613	35	82	3410703
5.6	6	20	66	3410614	35	82	3410704
5.7	6	20	66	3410615	35	82	3410705
5.8	6	20	66	3410616	35	82	3410706
5.9	6	20	66	3410617	35	82	3410707
6.0	6	20	66	3410618	35	82	3410708
6.1	8	24	79	3410619	43	91	3410709
6.2	8	24	79	3410620	43	91	3410710
6.3	8	24	79	3410621	43	91	3410711
6.4	8	24	79	3410622	43	91	3410712
6.5	8	24	79	3410623	43	91	3410713
6.6	8	24	79	3410624	43	91	3410714
6.7	8	24	79	3410625	43	91	3410715
6.8	8	24	79	3410626	43	91	3410716
6.9	8	24	79	3410627	43	91	3410717

• For technical data see pages: 100-105

MORSE DRC

SERIES
DBC21 [CONT.]

- 140° Point
- Coolant Through
- 3xD, 5xD
- AlTiN Coating 10% Submicron Carbide



2 Flutes

30° Helix

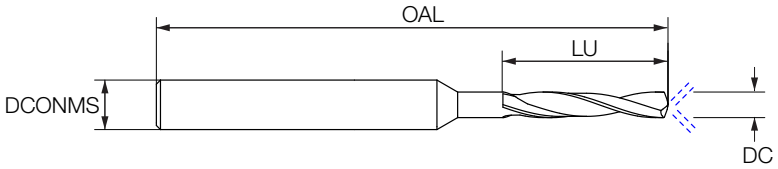
P M K S H

DC	DCONMS	3xD			5xD		
		LU	OAL	EDP Number	LU	OAL	EDP Number
7.0	8	24	79	3410628	43	91	3410718
7.1	8	29	79	3410629	43	91	3410719
7.2	8	29	79	3410630	43	91	3410720
7.3	8	29	79	3410631	43	91	3410721
7.4	8	29	79	3410632	43	91	3410722
7.5	8	29	79	3410633	43	91	3410723
7.6	8	29	79	3410634	43	91	3410724
7.7	8	29	79	3410635	43	91	3410725
7.8	8	29	79	3410636	43	91	3410726
7.9	8	29	79	3410637	43	91	3410727
8.0	8	29	79	3410638	43	91	3410728
8.1	10	35	89	3410639	49	103	3410729
8.2	10	35	89	3410640	49	103	3410730
8.3	10	35	89	3410641	49	103	3410731
8.4	10	35	89	3410642	49	103	3410732
8.5	10	35	89	3410643	49	103	3410733
8.6	10	35	89	3410644	49	103	3410734
8.7	10	35	89	3410645	49	103	3410735
8.8	10	35	89	3410646	49	103	3410736
8.9	10	35	89	3410647	49	103	3410737
9.0	10	35	89	3410648	49	103	3410738
9.1	10	35	89	3410649	49	103	3410739
9.2	10	35	89	3410650	49	103	3410740
9.3	10	35	89	3410651	49	103	3410741
9.4	10	35	89	3410652	49	103	3410742
9.5	10	35	89	3410653	49	103	3410743
9.6	10	35	89	3410654	49	103	3410744
9.7	10	35	89	3410655	49	103	3410745
9.8	10	35	89	3410656	49	103	3410746
9.9	10	35	89	3410657	49	103	3410747
10.0	10	35	89	3410658	49	103	3410748
10.1	12	40	102	3410659	56	118	3410749
10.2	12	40	102	3410660	56	118	3410750
10.3	12	40	102	3410661	56	118	3410751
10.4	12	40	102	3410662	56	118	3410752
10.5	12	40	102	3410663	56	118	3410753
10.6	12	40	102	3410664	56	118	3410754
10.7	12	40	102	#N/A	56	118	3410755
10.8	12	40	102	3410665	56	118	3410756
10.9	12	40	102	3410666	56	118	3410757

• For technical data see pages: 100-105

SERIES
DBC21 [CONT.]

- 140° Point
- Coolant Through
- 3xD, 5xD
- AlTiN Coating 10% Submicron Carbide



2 Flutes

30° Helix

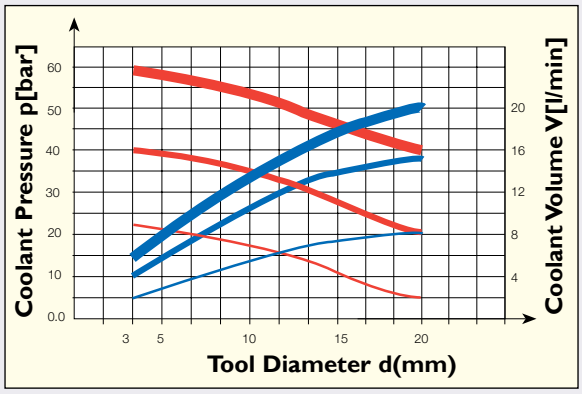
P M K S H

DC	DCONMS	3xD			5xD		
		LU	OAL	EDP Number	LU	OAL	EDP Number
11.0	12	40	102	3410667	56	118	3410758
11.1	12	40	102	3410668	56	118	3410759
11.2	12	40	102	3410669	56	118	3410760
11.3	12	40	102	3410670	56	118	3410761
11.4	12	40	102	3410671	56	118	3410762
11.5	12	40	102	3410672	56	118	3410763
11.6	12	40	102	3410673	56	118	3410764
11.7	12	40	102	3410674	56	118	3410765
11.8	12	40	102	3410675	56	118	3410766
11.9	12	40	102	3410676	56	118	3410767
12.0	12	40	102	3410677	56	118	3410768

• For technical data see pages: 100-105

Material	Cutting Speed M/Min	Feed Per Tooth (mm/rev)					
		Ø 3-5	Ø 5-8	Ø 8-10	Ø10-12	Ø 12-16	Ø16-20
Low Alloy Steel <25Hrc	80-120	0.05-0.12	0.07-0.15	0.15-0.25	0.15-0.25	0.2-0.35	0.25-0.35
High Alloy Steel >25Hrc	25-80	0.04-0.1	0.05-0.12	0.05-0.15	0.08-0.17	0.07-0.2	0.1-0.2
Hardened Steel	20-50	0.04-0.08	0.05-0.1	0.07-0.12	0.07-0.15	0.1-0.15	0.12-0.18
Stainless Steel	25-80	0.04-0.1	0.05-0.12	0.05-0.15	0.08-0.17	0.07-0.2	0.1-0.2
Cast Iron (GGG)	65-80	0.08-0.15	0.1-0.2	0.15-0.3	0.18-0.35	0.18-0.4	0.2-0.45
Cast Iron (GG)	80-100	0.08-0.2	0.1-0.25	0.15-0.35	0.18-0.4	0.18-0.45	0.2-0.5
Titanium	15-30	0.02-0.04	0.04-0.08	0.06-0.1	0.06-0.12	0.08-0.12	0.08-0.18
Inconel	15-30	0.02-0.04	0.04-0.08	0.06-0.1	0.06-0.12	0.08-0.12	0.08-0.18
Aluminium	70-280	0.07-0.25	0.08-0.35	0.1-0.35	0.12-0.4	0.15-0.5	0.2-0.55

Coolant Pressure and Volume Recommendations

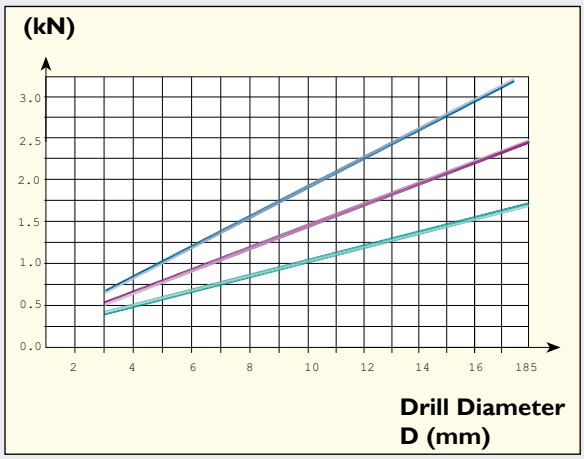


Required Coolant Pressure
Optimum pressure
Good pressure
Minimum pressure

Required Coolant Volume
Optimum volume
Good volume
Minimum volume

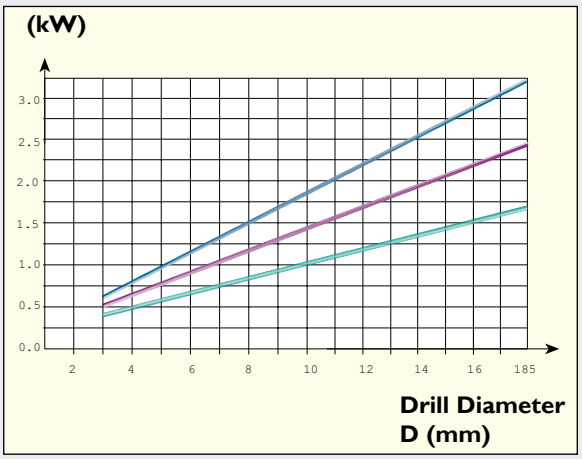
Required coolant pressure and volume for 2 flute drills with internal coolant spiral nozzles.

Force and Power Characteristics
Feed Force



f=0.30 mm/rev
f=0.25 mm/rev
f=0.20 mm/rev

Net Power Consumption



f=0.30 mm/rev
f=0.25 mm/rev
f=0.20 mm/rev

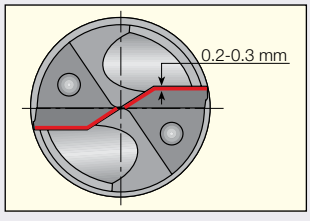
Material: SAE 4340
Speed: 100 m/min
Values may change for different materials and drilling conditions.

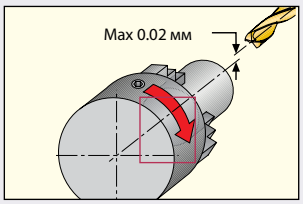
Stability

The stability of the application volume is important in order to obtain the very best tool life and hole accuracy. Check the condition of the machine spindle, fixture and fixturing of the component to secure maximum stability and rigidity. Unstable conditions can cause tool breakage.

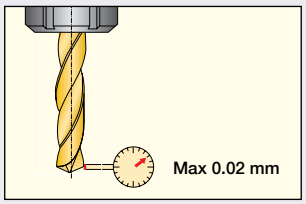
Tool Life

Drills should not be used with flank wear exceeding 0.2-0.3 mm.

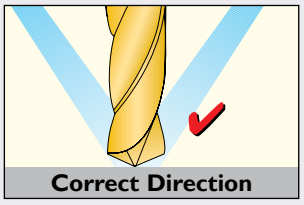




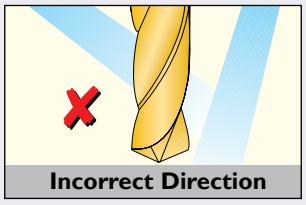
Stationary Drill



Rotating Drill

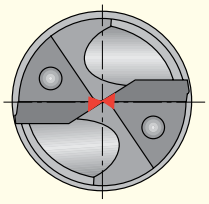
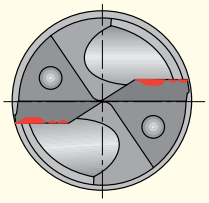
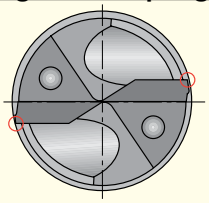
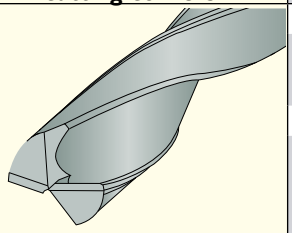
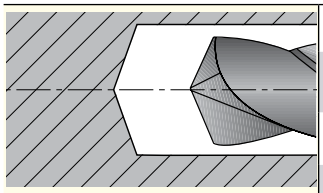
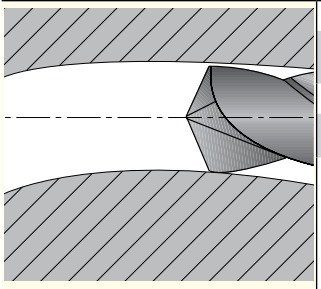


External Coolant

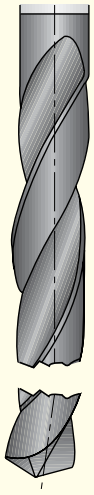
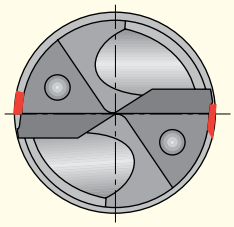


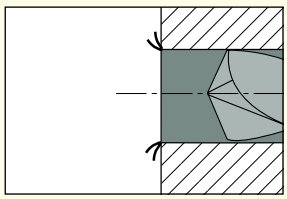
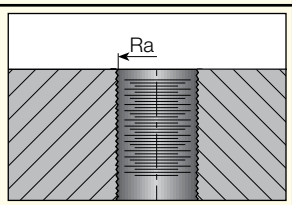
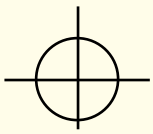
External Coolant

Troubleshooting

Problem	Cause	Solution
 **Chipping on the chisel edge**	• Poor clamping of the chuck	• Check the clamping. Use hydraulic clamping chuck, maxin power chuck or a shrink system.
	• Unsuitable cutting conditions	• Decrease feed, increase coolant pressure.
	• Chisel runout	• Check or replace the clamping adaptation.
	• Workpiece movement	• Increase workpiece chucking force.
 **Chipping on the cutting edges / built-up edge**	• Poor clamping of the chuck	• Check the clamping. Use hydraulic clamping chuck, maxin power chuck or a shrink system.
	• Unsuitable cutting conditions	• Increase cutting speed, reduce feed rate.
	• Insufficient coolant	• Check cooling lubricant. Increase coolant pressure. In the case of external coolant supply, improve jet direction and add cooling jets.
	• Rough application	• Reduce feed rate by 30-50% during entry and exiting.
 **Excessive wear on the cutting corners**	• Insufficient coolant	• Check cooling lubricant. Increase coolant pressure. In the case of external coolant supply, improve jet direction and add coolant jets.
	• Large runout	• Check if the runout is within 0.02 mm T.I.R. (radial & axial)
	• Unsuitable cutting conditions	• Reduce cutting speed, increase feed.
	• Rough application	• Reduce feed rate by 30-50% during entry and exit.
	• Poor clamping of the chuck	• Check the clamping. Use hydraulic clamping chuck, maxin power chuck or a shrink system.
 **Chipping on the lands**	• Workpiece movement	• Increase workpiece chucking force.
	• Insufficient coolant	• Check cooling lubricant. Increase coolant pressure. In the case of external coolant supply, improve jet direction and add coolant jets.
	• Wrong drill	• Check drill type, drilling depth, cooling system and workpiece material.
	• Unsuitable cutting conditions	• Increase feed. When spot drilling, reduce feed.
 **Hole diameter out of tolerance**	• Unsuitable cutting conditions	• If hole size is too large, increase cutting speed or reduce feed. If hole size is too small, reduce cutting speed or increase feed.
	• Poor clamping of the chuck	• Check the clamping. Use hydraulic clamping chuck, maxin power chuck or a shrink system.
	• Large runout	• Make sure that the drill's runout is within 0.02 mm (radial & axial).
	• Worn out center point (chisel)	• Regrind cutting edge or replace the drill.
 **Hole not straight**	• Insufficient chip evacuation	• Use pecking cycle.
	• Poor clamping of the chuck	• Check the clamping. Use hydraulic clamping chuck, maxin power chuck or a shrink system.
	• Workpiece rigidity	• Increase workpiece chucking force.
	• Worn out drill center point (chisel)	• Regrind cutting edge.
	• Unsuitable cutting conditions	• Increase feed. When spot drilling, reduce feed.

Troubleshooting

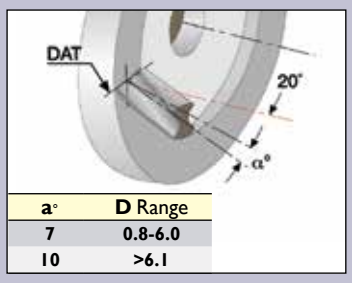
Problem	Cause	Solution
 **Drill breakage**	• Poor clamping of the chuck	• Check the clamping. Use hydraulic clamping chuck, maxin power chuck or a shrink system.
	• Workpiece movement	• Increase workpiece chucking force.
	• Wrong drill	• Check drill type and drilling depth, cooling system and workpiece material.
	• Insufficient coolant	• Check cooling lubricant. Increase coolant pressure. In the case of external coolant supply, improve jet direction and add cooling jets.
	• Unsuitable cutting conditions	• Reduce feed.
	• Worn out drill center point (chisel)	• Regrind cutting edge.
	• Insufficient chip evacuation	• Use pecking cycle.
 **Chipping on the cutting corners**	• Poor clamping of the chuck	• Check the clamping and adaptation. Use hydraulic clamping chuck, maxin power chuck or a shrink system.
	• Workpiece movement	• Increase workpiece chucking force.
	• Wrong drill	• Check drill type and drilling depth, cooling system and workpiece material. Possibly use longer drill.
	• Insufficient coolant	• Check cooling lubricant. Increase coolant pressure. In the case of external coolant supply, improve jet direction and add cooling jets.
	• Unsuitable cutting conditions	• Check cutting parameters, and possibly reduce feed.
	• Worn out or broken cutting corner	• Replace drill or regrind cutting edge.

Problem	Cause	Solution
 **Burrs on exit**	• Unsuitable cutting conditions	• Reduce feed by 30-50% during exit.
	• Worn out drill	• Replace drill.
 **Rough surface finish**	• Unsuitable cutting conditions	• Adjust feed to improve chip flow.
	• Large runout	• Make sure that the drill's runout is within 0.02 mm (radial & axial).
	• Chip jamming	• Reduce cutting speed.
		• Increase coolant pressure.
		• Apply pecking procedure.
 **Deviation of hole position**	• Large runout	• Make sure that the drill runout is within 0.02 mm (radial & axial).
	• Poor stability	• Check and improve drill and workpiece clamping rigidity.
	• Rough application	• When drilling hard materials or sloped surfaces, reduce feed by 30-50% during entrance.
		• Use a short pilot drill with 140° point angle.

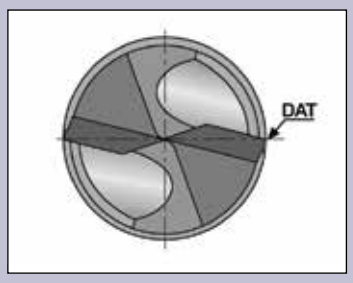
Regrinding Instructions for Coolant Hole Geometries

For each grinding operation, rotate the drill 180° and repeat the grinding procedure.

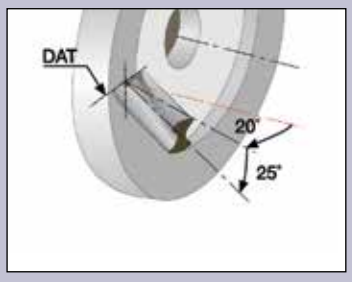
1 Primary Clearance

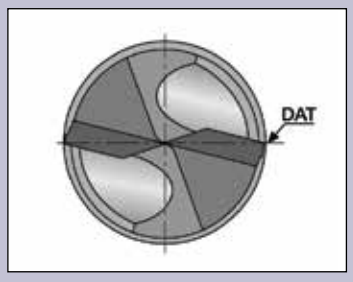


a°	D Range
7	0.8-6.0
10	>6.1

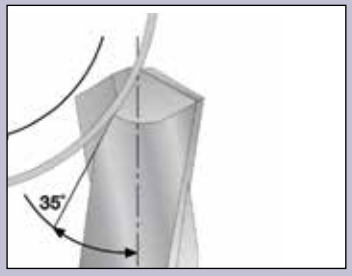


2 Secondary Clearance

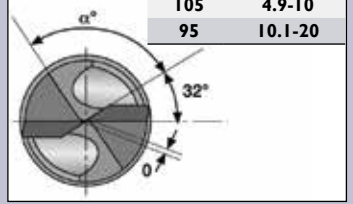




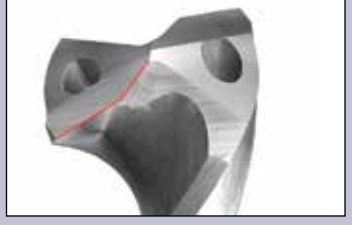
3 Chisel

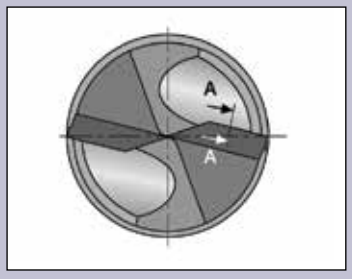


a°	D Range
100	3.0-4.8
105	4.9-10
95	10.1-20

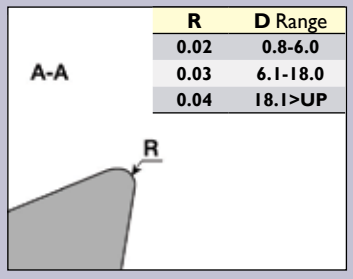


4 Edge Preparation





R	D Range
0.02	0.8-6.0
0.03	6.1-18.0
0.04	18.1>UP



Grinding Wheel Recommended Specifications:

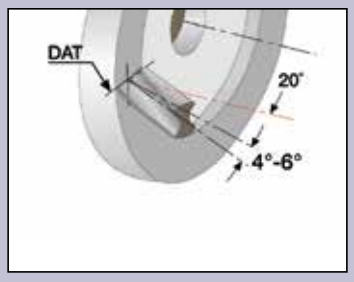
1. Diameter grinding wheel: GA2
2. Grinding wheel bond: synthetic resin
3. Grit size: 325/400 mesh (45/38µ)
4. Diamond concentration: C-75 (3.3 carat/cm3)
5. Cutting fluid emulsion 3%

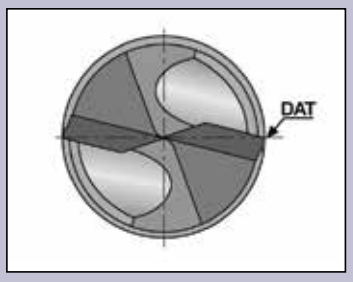
Regrinding Instructions for 2 Flutes Without Coolnat Geometry

For each grinding operation, rotate the drill 180° and repeat the grinding procedure.

1

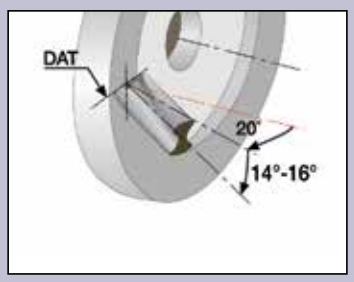
Primary Clearance

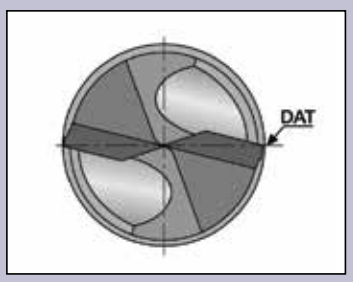




2

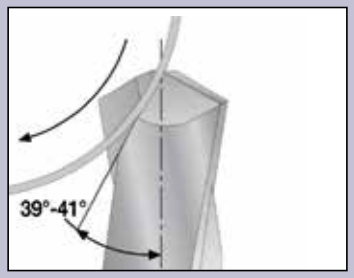
Secondary Clearance

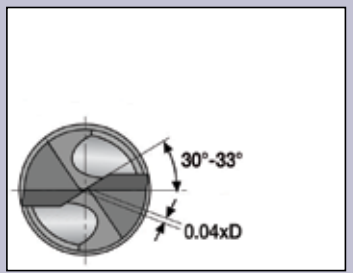




3

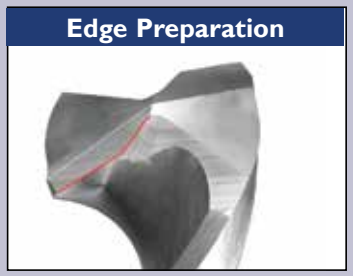
Chisel

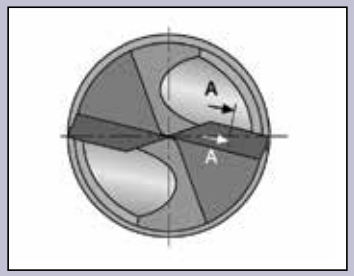


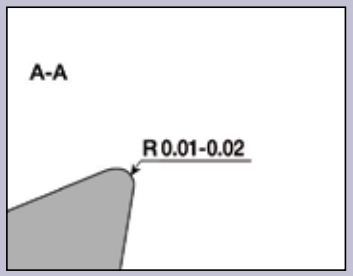


4

Edge Preparation







Grinding Wheel Recommended Specifications:

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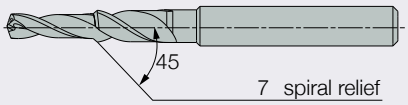
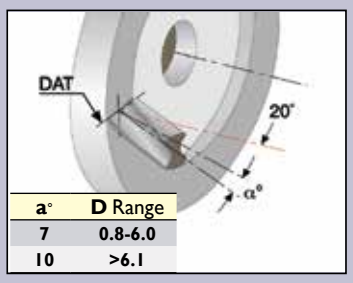
3. Grit size: 325/400 mesh (45/38µ)
4. Diamond concentration: C-75 (3.3 carat/cm3)
5. Cutting fluid emulsion 3%

Regrinding Instructions for DBC21 / DBICT21 Pre-Thread Solid Drills

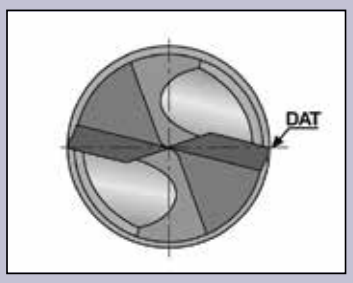
For each grinding operation, rotate the drill 180° and repeat the grinding procedure.



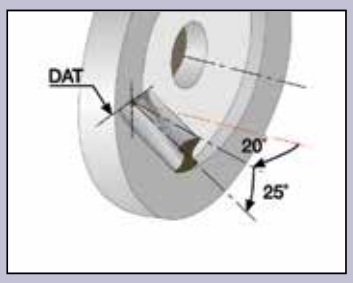
1 Primary Clearance

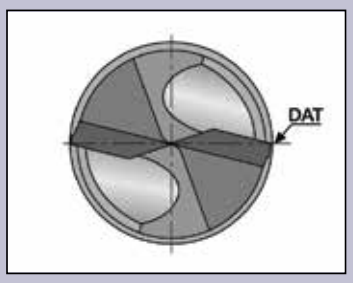


a°	D Range
7	0.8-6.0
10	>6.1

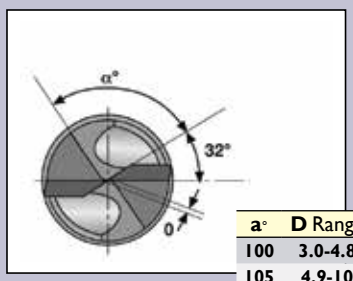


2 Secondary Clearance



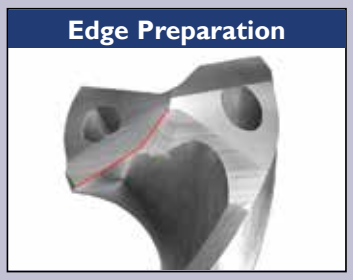


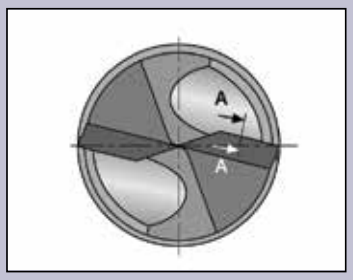
3 Chisel

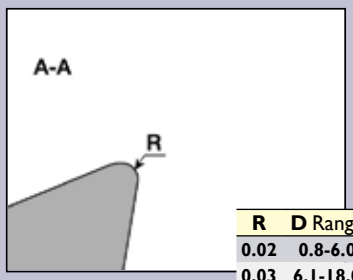


a°	D Range
100	3.0-4.8
105	4.9-10
95	10.1-20

4 Edge Preparation







R	D Range
0.02	0.8-6.0
0.03	6.1-18.0
0.04	18.1>UP

Grinding Wheel Recommended Specifications:

1. Diameter grinding wheel: GA2
2. Grinding wheel bond: synthetic resin
3. Grit size: 325/400 mesh (45/38µ)
4. Diamond concentration: C-75 (3.3 carat/cm3)
5. Cutting fluid emulsion 3%

MILL THREAD

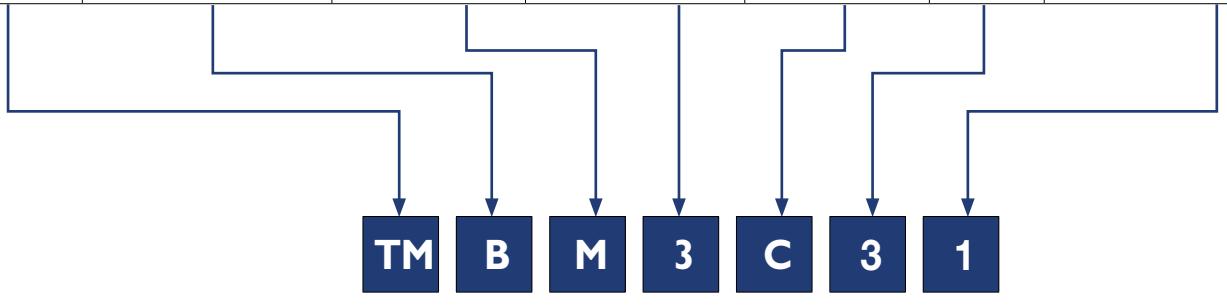
MORSE CUTTING TOOLS

SOLID CARBIDE THREAD MILLS

WORKPIECE MATERIAL	ISO
STEEL	P
STAINLESS STEEL	M
CAST IRON	K
ALUMINUM / NON FERROUS MATERIALS	N
SUPERALLOYS / TITANIUM	S
HARD STEELS	H

	Length of Cut	Thread Prfoile	No. of Flutes	Neck Relief	Coolant	Page
	Stub	BSP / BSF MJ UNJ UNF / UNC ISO	3-5	✔		108-111
	Medium	BSP BSPT NPT / NPTF UNF / UNC / UNEF ISO	3-6			112-115
	Medium	BSP / BSF NPTF UNF / UNC ISO	3-5		✔	116-119
	Medium	BSP NPT UNF / UNC ISO	3-6		✔	120-123
	Stub Left Hand Cut	UNF / UNC ISO	3-4	✔		124-126
	Stub Left Hand Cut	ISO	3-4	✔	✔	127
	Single Point	60° Partial Profile ISO	3-5	✔	✔	128-129
	Medium External Thread	UN ISO	3-5			130-131

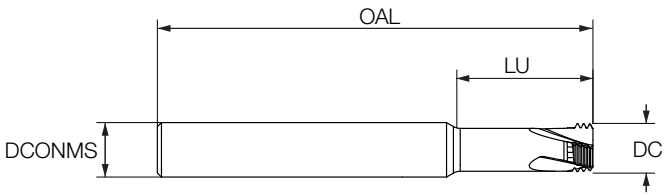
Thread Mill	Type of Thread	Length of cut	N. of Coolnat Through	Coolant Through	N. of flutes	Coating Type
TM	B- BSP / BSF	S- Stub	1-6	C- Coolant Through		1-AlTiN Coating 10% Submicron Carbide
	N- NPT / NPTF	M- Medium				3-AlTiN Coating 12% Ultrafine Carbide
	U- UNC /UNF /UNEF /UNJ	L- Length of relief				
	J- MJ	E- External Thread				
	I- ISO					



SERIES
STUB CUTTING LENGTH

SERIES
TMBS31 - TMBS41

- BSP/BSF Thread Profile
- Stub Cutting Length
- AlTiN Coating 10% Submicron Carbide

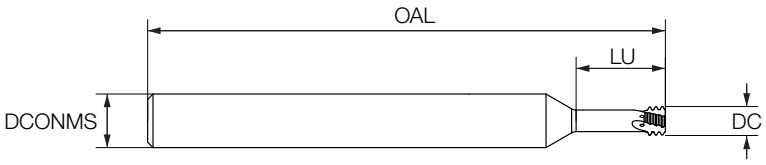


THREAD	DC	LU	DCONMS	NOF	OAL	Shank	EDP Number
G 1/8	7.80	19.50	8.00	3	64.00	C	3410375
G 1/4-3/8	10.00	30.00	10.00	4	73.00	C	3410376
G 1/2-7/8	12.00	37.00	12.00	4	84.00	C	3410377
G>1	16.00	44.00	16.00	4	105.00	C	3410378

• For technical data see pages: 169-170

SERIES
TMJS31

- MJ Thread Profile
- Stub Cutting Length
- AlTiN Coating 10% Submicron Carbide

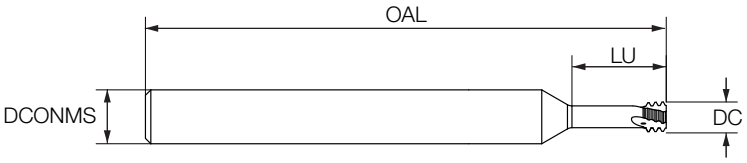


THREAD	DC	LU	DCONMS	NOF	OAL	Shank	EDP Number
MJ4x0.7	3.20	10.00	6.00	3	58.00	C	3410351
MJ5x0.8	3.90	12.50	6.00	3	58.00	C	3410352
MJ6x1	4.80	15.00	6.00	3	58.00	C	3410353
MJ8x1.25	6.10	20.00	8.00	3	64.00	C	3410354
MJ10x1.5	8.00	25.00	8.00	3	64.00	C	3410355
MJ12x1.75	9.20	30.00	10.00	3	73.00	C	3410356
MJ14x2	10.00	35.00	10.00	3	73.00	C	3410357

• For technical data see pages: 169-170

SERIES
TMUS31

- UNJ Thread Profile
- Stub Cutting Length
- AlTiN Coating 10% Submicron Carbide



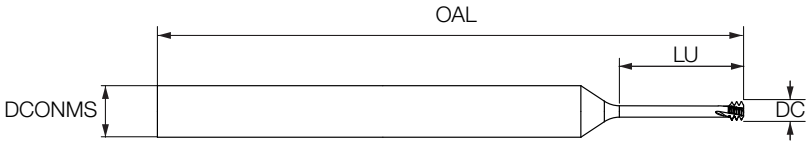
THREAD		DC	LU	DCONMS	NOF	OAL	Shank	EDP Number
8-32 UNJC		3.30	10.50	6.00	3	58.00	C	3410358
1/4-20 UNJC		4.90	16.00	6.00	3	58.00	C	3410361
	1/4-28 UNJF	5.10	16.00	8.00	3	64.00	C	3410359
5/16-18 UNJC		6.15	20.00	8.00	3	64.00	C	3410363
	5/16,3/8-24 UNJF	6.70	20.00	8.00	3	64.00	C	3410360
3/8-16 UNJC		6.90	24.00	8.00	3	64.00	C	3410364
	7/16-20 UNJF	8.00	28.00	8.00	3	64.00	C	3410362
1/2-13 UNJC		9.40	27.50	10.00	3	73.00	C	3410365

• For technical data see pages: 169-170

MORSE MTI

SERIES
TMUS31 - TMUS41

- UN Thread Profile
- Stub Cutting Length
- AlTiN Coating 10% Submicron Carbide



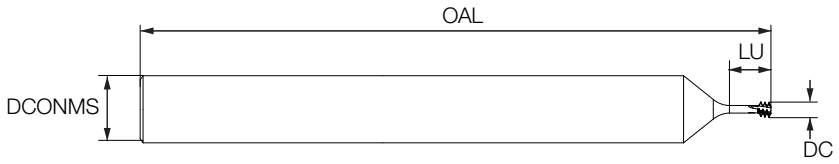
THREAD		DC	LU	DCONMS	NOF	OAL	Shank	EDP Number
UNF	UNC							
0-80 UNF		1.15	8.00	3.00	3	39.00	C	3410302
1-72 UNF		1.45	6.00	3.00	3	39.00	C	3410292
	2-56 UNC	1.65	4.40	6.00	3	58.00	C	3410271
	2-56 UNC	1.65	6.60	3.00	3	39.00	C	3410296
	2-56 UNC	1.65	6.60	6.00	3	58.00	C	3410297
	2-56 UNC	1.65	9.20	3.00	3	39.00	C	3410300
	2-56 UNC	1.65	11.40	3.00	3	39.00	C	3410303
	3-48 UNC	1.90	5.20	6.00	3	58.00	C	3410272
	4-40 UNC	2.10	6.30	6.00	3	58.00	C	3410273
	4-40 UNC	2.10	8.00	6.00	3	58.00	C	3410298
	4-40 UNC	2.10	12.00	3.00	3	39.00	C	3410301
	4-40 UNC	2.10	8.00	3.00	3	39.00	C	3410304
	5-40 UNC	2.45	9.60	6.00	3	58.00	C	3410280
	6-32 UNC	2.55	7.10	6.00	3	58.00	C	3410275
	6-32 UNC	2.55	10.50	6.00	3	58.00	C	3410299
	8-32 UNC	3.20	9.50	6.00	3	58.00	C	3410276
	8-32 UNC	3.20	12.50	6.00	3	58.00	C	3410281
8-36 UNF		3.30	9.00	6.00	3	58.00	C	3410274
	10,20-24 UNC	3.50	15.50	6.00	3	58.00	C	3410305
10-32 UNF		3.70	15.00	6.00	3	58.00	C	3410285
10-32 UNF		3.70	10.50	6.00	3	58.00	C	3410286
10-32 UNF		3.70	15.00	6.00	3	101.00	C	3410285
	1/4-20 UNC	4.75	14.00	6.00	3	58.00	C	3410279
	1/4-20 UNC	4.75	19.00	6.00	3	58.00	C	3410284
	1/4-20 UNC	4.75	19.00	6.00	3	100.00	C	3410284
1/4-28 UNF		5.00	14.50	6.00	3	58.00	C	3410277
1/4-28 UNF		5.00	19.00	6.00	3	58.00	C	3410282
	5/16-18 UNC	6.00	17.00	6.00	3	58.00	C	3410287
	5/16-18 UNC	6.00	23.00	6.00	3	58.00	C	3410293
5/16-24 UNF		6.60	17.00	8.00	3	64.00	C	3410278
5/16-24 UNF		6.60	24.00	8.00	3	64.00	C	3410283
	3/8-16 UNC	6.70	22.00	8.00	3	64.00	C	3410288
	3/8-16 UNC	6.70	30.20	8.00	3	64.00	C	3410308
	7/16-14 UNC	7.70	25.00	8.00	3	64.00	C	3410289
	7/16-14 UNC	7.70	35.20	8.00	3	64.00	C	3410309
7/16-20 UNF		8.00	25.00	8.00	3	64.00	C	3410294
7/16-20 UNF		8.00	34.60	8.00	3	64.00	C	3410306
	1/2-13 UNC	9.20	27.50	10.00	3	73.00	C	3410290
	5/8-11 UNC	11.40	34.50	12.00	3	84.00	C	3410291
	5/8-11 UNC	11.40	50.00	12.00	3	101.00	C	3410310
5/8-18 UNF		12.00	35.00	12.00	4	84.00	C	3410295
5/8-18 UNF		12.00	49.00	12.00	4	101.00	C	3410307

• For technical data see pages: 169-170

MORSE MTI

SERIES
TMIS31 - TMIS51

- ISO Thread Profile
- Stub Cutting Length
- AlTiN Coating 10% Submicron Carbide



THREAD	DC	LU	DCONMS	NOF	OAL	Shank	EDP Number
M1x0.25	0.72	2.50	3.00	3	39.00	C	3410462
M1.2x0.25	0.90	3.00	3.00	3	39.00	C	3410463
M1.4x0.3	1.05	4.00	3.00	3	39.00	C	3410461
M1.6x0.35	1.20	4.80	3.00	3	39.00	C	3410476
M2x0.4	1.53	4.50	6.00	3	58.00	C	3410444
M2x0.4	1.53	6.00	3.00	3	39.00	C	3410477
M2.2x0.45	1.65	5.00	6.00	3	58.00	C	3410445
M2.5x0.45	1.95	5.50	6.00	3	58.00	C	3410446
M2.5x0.45	1.95	7.50	6.00	3	58.00	C	3410451
M2.5x0.45	1.95	5.50	6.00	3	101.00	C	3410446
M2.2x0.45	1.65	7.00	3.00	3	39.00	C	3410466
M3x0.5	2.37	6.50	6.00	3	58.00	C	3410447
M3x0.5	2.37	9.50	6.00	3	58.00	C	3410452
M3x0.5	2.37	9.50	6.00	3	101.00	C	3410452
M3x0.5	2.40	12.50	3.00	3	39.00	C	3410470
M3x0.5	2.40	15.50	3.00	3	39.00	C	3410474
M6x0.5	5.35	20.00	6.00	4	58.00	C	3410475
M3.5x0.6	2.75	7.50	6.00	3	58.00	C	3410448
M3.5x0.6	2.75	10.50	6.00	3	58.00	C	3410465
M4x0.7	3.10	9.00	6.00	3	58.00	C	3410442
M4x0.7	3.10	12.50	6.00	3	58.00	C	3410453
M4x0.7	3.10	12.50	6.00	3	101.00	C	3410453
M4x0.7	3.10	16.70	6.00	3	58.00	C	3410471
M10x0.75	8.00	25.00	8.00	4	64.00	C	3410464
M5x0.8	3.80	12.50	6.00	3	58.00	C	3410449
M5x0.8	3.80	16.00	6.00	3	58.00	C	3410454
M5x0.8	3.80	16.00	6.00	3	101.00	C	3410454
M5x0.8	4.00	20.80	6.00	3	58.00	C	3410472
M6x1	4.65	14.00	6.00	3	58.00	C	3410450
M6x1	4.65	20.00	6.00	3	58.00	C	3410455
M6x1	4.65	20.00	6.00	3	101.00	C	3410455
M6x1	4.80	25.00	6.00	3	58.00	C	3410473
M8x1.25	6.00	18.00	6.00	3	58.00	C	3410443
M8x1.25	6.00	24.00	6.00	3	58.00	C	3410456
M10x1.5	7.80	23.00	8.00	3	64.00	C	3410457
M10x1.5	7.80	31.50	8.00	3	64.00	C	3410467
M12x1.75	9.00	26.00	10.00	3	73.00	C	3410458
M12x1.75	9.00	37.80	10.00	3	73.00	C	3410468
M16x2	11.80	35.00	12.00	4	84.00	C	3410459
M16x2	11.80	50.00	12.00	4	100.00	C	3410469
M20x2.5	15.00	43.00	16.00	5	100.00	C	3410460

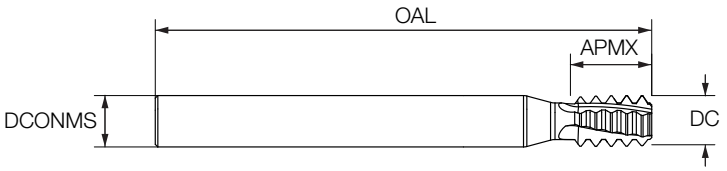
• For technical data see pages: 169-170

SERIES
MEDIUM CUTIING LENGTH

MORSE MTI

SERIES
TMBM31 - TMBM61

- BSP Thread Profile
- Medium Cutting Length
- AlTiN Coating 10% Submicron Carbide

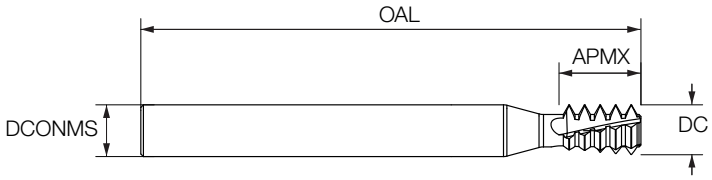


THREAD	DC	APMX	DCONMS	NOF	OAL	Shank	EDP Number
G1/8	6.00	9.50	6.00	3	58.00	C	3410379
G1/4,3/8	8.00	14.00	8.00	3	64.00	C	3410380
G1/2,7/8	12.00	19.30	12.00	4	84.00	C	3410381
G1/2,7/8	12.00	26.30	12.00	4	84.00	C	3410382
G1,1-1/2	12.00	24.20	12.00	3	84.00	C	3410383
G1,3	16.00	38.10	16.00	4	101.00	C	3410384

• For technical data see pages: 169-170

SERIES
TMBM31 -TMBM41

- BSPT Thread Profile
- Medium Cutting Length
- AlTiN Coating 10% Submicron Carbide

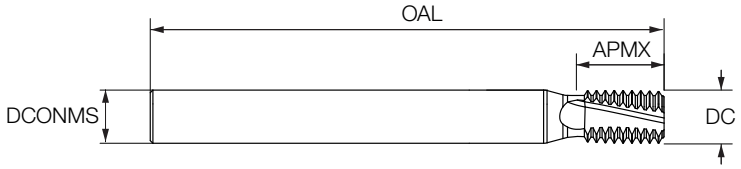


THREAD	DC	APMX	DCONMS	NOF	OAL	Shank	EDP Number
RC1/4,3/8	7.16	12.03	8.00	3	64.00	C	3410406
RC1/2,7/8	10.88	16.33	12.00	4	84.00	C	3410407
RC1,2	14.17	25.40	16.00	4	101.00	C	3410408

• For technical data see pages: 169-170

SERIES
TMNM31 - TMNM41

- NPT/NPTF Thread Profile
- Medium Cutting Length
- AlTiN Coating 10% Submicron Carbide



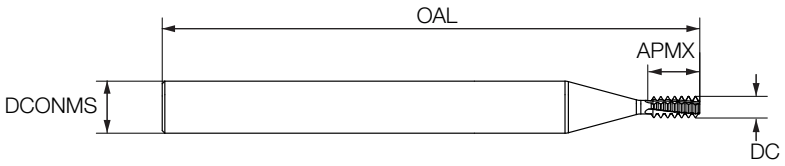
THREAD	DC	APMX	DCONMS	NOF	OAL	Shank	EDP Number
1/16,1/8-27 NPT	5.36	9.90	6.00	3	58.00	C	3410409
1/4,3/8-18 NPT	7.12	14.80	8.00	3	64.00	C	3410410
1/2,3/4-14 NPT	10.77	20.90	12.00	4	84.00	C	3410411
1,2-11.5 NPT	14.24	27.60	16.00	4	101.00	C	3410412
2 1/2-8 NPT	20.00	39.70	20.00	4	105.00	C	3410413
1/16,1/8-27 NPTF	6.00	9.90	6.00	3	58.00	C	3410414
1/4,3/8-18 NPTF	8.00	14.80	8.00	3	64.00	C	3410415
1/2,3/4-14 NPTF	12.00	20.90	12.00	4	84.00	C	3410416

• For technical data see pages: 169-170

MORSE MTI

SERIES
TMUM31 - TMUM51

- UN Thread Profile
- Medium Cutting Length
- AlTiN Coating 10% Submicron Carbide



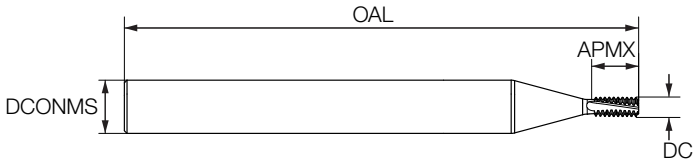
THREAD			DC	APMX	DCONMS	NOF	OAL	Shank	EDP Number
UNF	UNC	UNEF							
	5-40 UNC		2.50	6.00	6.00	3	58.00	C	3410405
	8-32 UNC		3.20	6.80	6.00	3	58.00	C	3410385
7/16,1/2-28 UNF			4.00	11.30	6.00	3	58.00	C	3410386
1/4-20 UNC	1/4-20 UNC		4.50	12.10	6.00	3	58.00	C	3410389
5/16-24 UNF			5.00	14.30	6.00	3	58.00	C	3410387
	5/16-18 UNC		5.00	14.80	6.00	3	58.00	C	3410392
	3/8-16 UNC		6.00	16.70	6.00	3	58.00	C	3410394
		7/16,1/2-28 UNEF	6.00	14.50	6.00	3	58.00	C	3410404
3/8-24 UNF			7.00	20.00	8.00	3	64.00	C	3410388
7/16,1/2-20 UNF			7.00	20.00	8.00	3	64.00	C	3410390
	1/2-13 UNC		8.00	22.50	8.00	3	64.00	C	3410397
9/16,5/8-18 UNF			10.00	26.10	10.00	4	73.00	C	3410393
	9/16-12 UNC		10.00	26.50	10.00	3	73.00	C	3410398
	5/8-11 UNC		10.00	28.90	10.00	3	73.00	C	3410400
		3/4,1-20 UNEF	12.00	27.30	12.00	5	84.00	C	3410391
3/4-16 UNF			12.00	30.00	12.00	4	84.00	C	3410395
	3/4-10 UNC		12.00	34.30	12.00	3	84.00	C	3410401
7/8-14 UNF			15.00	37.20	16.00	5	100.00	C	3410396
	7/8-9 UNC		15.00	38.10	16.00	3	100.00	C	3410402
1,1-1/2-14 UNF			16.00	41.30	16.00	5	100.00	C	3410399
	1-8 UNC		16.00	42.90	16.00	3	100.00	C	3410403

• For technical data see pages: 169-170

MORSE MTI

SERIES
TMIM31 - TMIM61

- ISO Thread Profile
- Medium Cutting Length
- AlTiN Coating 10% Submicron Carbide



THREAD	DC	APMX	DCONMS	NOF	OAL	Shank	EDP Number
M3x0.5	2.20	5.30	6.00	3	58.00	C	3410538
M4.5x0.5	3.80	10.30	6.00	3	58.00	C	3410539
M4x0.7	3.10	7.40	6.00	3	58.00	C	3410540
M6x0.75	4.50	10.00	6.00	3	58.00	C	3410541
M5x0.8	3.60	9.20	6.00	3	58.00	C	3410542
M6x1	4.00	10.50	6.00	3	58.00	C	3410543
M6x1	4.00	14.50	6.00	3	58.00	C	3410544
M9x1	6.00	12.50	6.00	3	58.00	C	3410545
M10x1	8.00	16.50	8.00	4	64.00	C	3410546
M8x1.25	5.00	14.40	6.00	3	58.00	C	3410547
M8x1.25	5.00	19.40	6.00	3	58.00	C	3410548
M10x1.5	7.00	17.30	8.00	3	64.00	C	3410549
M10x1.5	7.00	24.80	8.00	3	76.00	C	3410550
M14x1.5	10.00	21.80	10.00	4	73.00	C	3410551
M20x1.5	16.00	33.80	16.00	6	100.00	C	3410552
M12x1.75	8.00	20.10	8.00	3	64.00	C	3410553
M12x1.75	8.00	28.90	8.00	3	76.00	C	3410554
M16x2	10.00	27.00	10.00	3	73.00	C	3410555
M16x2	10.00	39.00	10.00	3	100.00	C	3410556
M18x2	12.00	27.00	12.00	4	84.00	C	3410557
M27x2	20.00	41.00	20.00	6	105.00	C	3410558
M20x2.5	14.00	33.80	14.00	4	84.00	C	3410559
M20x2.5	14.00	48.80	14.00	4	107.00	C	3410560
M24x3	16.00	40.50	16.00	3	100.00	C	3410561
M24x3	16.00	58.50	16.00	3	120.00	C	3410562

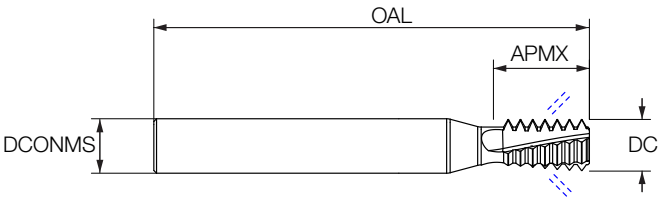
• For technical data see pages: 169-170

SERIES

MEDIUM CUTTING LENGTH COOLANT THROUGH FLUTE

SERIES
TMBM3C31 - TMBM4C51

- BSP/BSF Thread Profile
- Medium Cutting Length
- Coolant Through Flute
- AlTiN Coating 10% Submicron Carbide

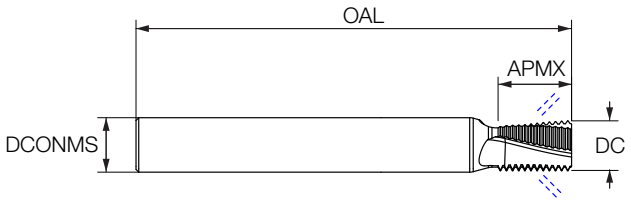


THREAD	DC	APMX	DCONMS	NOF	OAL	Shank	EDP Number
G1/8	7.80	14.10	8.00	3	64.00	C	3410341
G1/4-3/8	10.00	16.70	10.00	4	73.00	C	3410342
G1/2-7/8	16.00	26.30	16.00	5	101.00	C	3410343

• For technical data see pages: 169-170

SERIES
TMN3C31 - TMN4C41

- NPTF Thread Profile
- Medium Cutting Length
- Coolant Through Flute
- AlTiN Coating 10% Submicron Carbide

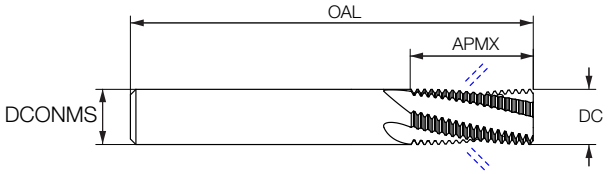


THREAD	DC	APMX	DCONMS	NOF	OAL	Shank	EDP Number
1/8-27 NPTF	7.60	10.80	8.00	3	64.00	C	3410349
1/4,3/8-18 NPTF	10.00	16.20	10.00	4	73.00	C	3410350

• For technical data see pages: 169-170

SERIES
TMUM3C31 - TMUM4C41

- UN Thread Profile
- Medium Cutting Length
- Coolant Through Flute
- AlTiN Coating 10% Submicron Carbide

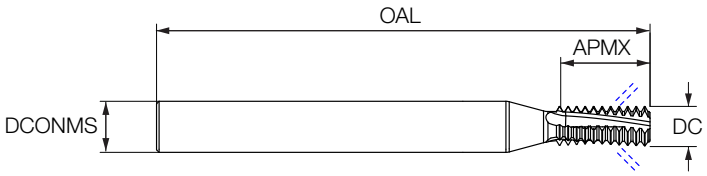


THREAD		DC	APMX	DCONMS	NOF	OAL	Shank	EDP Number
UNF	UNC							
	3/8-16 UNC	6.70	16.70	8.00	3	64.00	C	3410347
1/2-20 UNF		10.00	22.30	10.00	4	73.00	C	3410345
9/16-18 UNF		11.30	26.10	12.00	4	84.00	C	3410346
	3/4-10 UNC	14.40	34.30	16.00	4	101.00	C	3410348

• For technical data see pages: 169-170

SERIES
TMIM3C31 - TMIM5C51

- ISO Thread Profile
- Medium Cutting Length
- Coolant Through Flutes
- AlTiN Coating 10% Submicron Carbide



THREAD	DC	APMX	DCONMS	NOF	OAL	Shank	EDP Number
M6x1	4.80	10.50	6.00	3	58.00	C	3410507
M8x1.25	6.00	14.40	6.00	3	58.00	C	3410509
M8x1.25	6.00	19.40	6.00	3	58.00	C	3410510
M10x1	8.00	16.50	8.00	4	64.00	C	3410508
M10x1.5	7.80	17.00	8.00	3	64.00	C	3410511
M12x1.75	9.00	28.90	10.00	3	73.00	C	3410515
M14x1.5	10.00	21.80	10.00	4	73.00	C	3410512
M14x2	10.00	27.00	10.00	3	73.00	C	3410516
M16x2	11.80	27.00	12.00	4	84.00	C	3410517
M16x1.5	12.00	26.30	12.00	4	84.00	C	3410513
M20x1.5	16.00	33.80	16.00	5	101.00	C	3410514

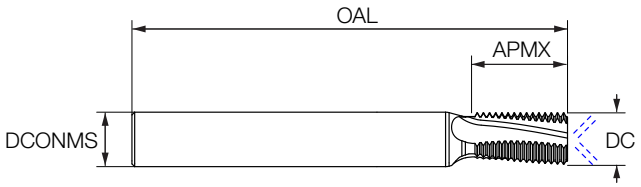
• For technical data see pages: 169-170

SERIES

MEDIUM CUTTING LENGTH COOLANT THROUGH CENTER

SERIES
TMBM1C31 - TMBM1C51

- BSP Thread Profile
- Medium Cutting Length
- Coolant Through Center
- AlTiN Coating 10% Submicron Carbide

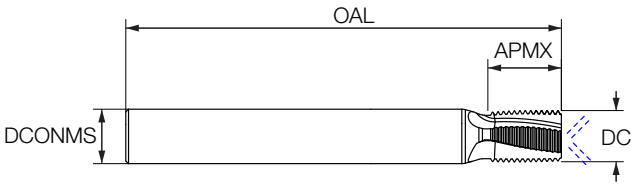


THREAD	DC	APMX	DCONMS	NOF	OAL	Shank	EDP Number
G1/8	7.80	14.10	8.00	3	64.00	C	3410437
G1/4-3/8	10.00	16.70	10.00	4	73.00	C	3410438
G1/2-7/8	16.00	26.30	16.00	5	105.00	C	3410439
G>1	16.00	38.10	16.00	4	105.00	C	3410440
G>1	20.00	47.30	20.00	5	105.00	C	3410441

• For technical data see pages: 169-170

SERIES
TMNM1C31 - TMNM1C41

- NPT Thread Profile
- Medium Cutting Length
- Coolant Through Center
- AlTiN Coating 10% Submicron Carbide

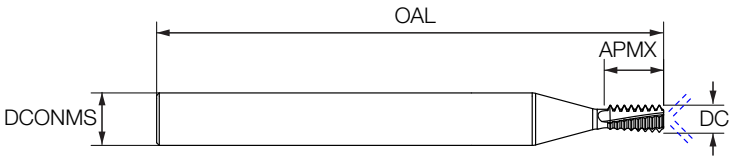


THREAD	DC	APMX	DCONMS	NOF	OAL	Shank	EDP Number
1/8-27 NPT	7.60	10.80	8.00	3	64.00	C	3410434
1/4,3/8-18 NPT	10.00	16.20	10.00	4	73.00	C	3410435
1/2,3/4-14 NPT	15.50	22.70	16.00	4	105.00	C	3410436

• For technical data see pages: 169-170

SERIES
TMUM1C31 - TMUM1C51

- UN Thread Profile
- Medium Cutting Length
- Coolant Through Center
- AlTiN Coating 10% Submicron Carbide

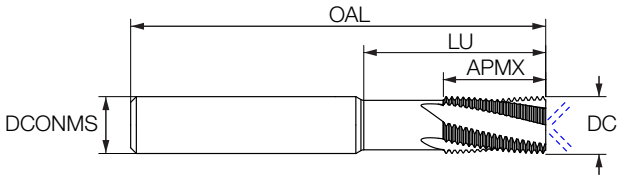


THREAD		DC	APMX	DCONMS	NOF	OAL	Shank	EDP Number
UNF	UNC							
	8-32 UNC	3.20	6.80	6.00	3	58.00	C	3410417
1/4-28 UNF		5.00	11.30	6.00	3	58.00	C	3410418
	5/16-18 UNC	5.60	14.80	6.00	3	58.00	C	3410423
7/16-32 UNEF		6.00	16.00	6.00	3	58.00	C	3410432
5/16-24 UNF		6.60	14.30	8.00	3	64.00	C	3410419
	3/8-16 UNC	6.70	16.70	8.00	3	64.00	C	3410425
9/16-24 UNEF		8.00	20.60	8.00	4	64.00	C	3410420
7/16-20 UNF		8.00	21.00	8.00	3	64.00	C	3410421
3/8-32 UNEF		8.00	18.70	8.00	4	64.00	C	3410433
	1/2-13 UNC	9.20	22.50	10.00	3	73.00	C	3410428
1/2-20 UNF		10.00	22.30	10.00	4	73.00	C	3410422
9/16-18 UNF		11.30	26.10	12.00	4	84.00	C	3410424
	5/8-11 UNC	11.40	28.90	12.00	3	84.00	C	3410429
3/4-16 UNF		12.00	31.00	12.00	4	84.00	C	3410426
	3/4-10 UNC	14.40	34.30	16.00	4	105.00	C	3410430
7/8-14 UNF		16.00	37.20	16.00	5	105.00	C	3410427
	1-8 UNC	19.50	42.90	20.00	4	105.00	C	3410431

• For technical data see pages: 169-170

SERIES
TMIL1C41 - TMIL1C61

- ISO Thread Profile
- Medium Cutting Length
- Coolant Through Center
- Neck Reduce
- AlTiN Coating 10% Submicron Carbide



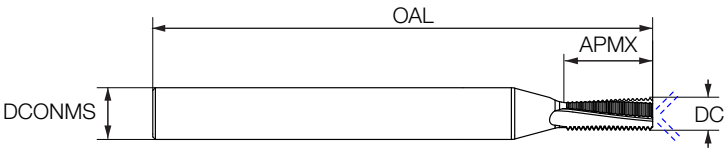
THREAD	DC	APMX	LU	DCONMS	NOF	OAL	Shank	EDP Number
M12x1	10.00	18.00	32.00	10.00	4	73.00	C	3410518
M14x1	12.00	21.00	38.00	12.00	4	84.00	C	3410519
M14x1.5	10.00	18.00	30.00	10.00	4	73.00	C	3410520
M18x2	12.00	36.00	42.00	12.00	4	84.00	C	3410522

• For technical data see pages: 169-170

MORSE MTI

SERIES
TMIM1C31 - TMIM1C61

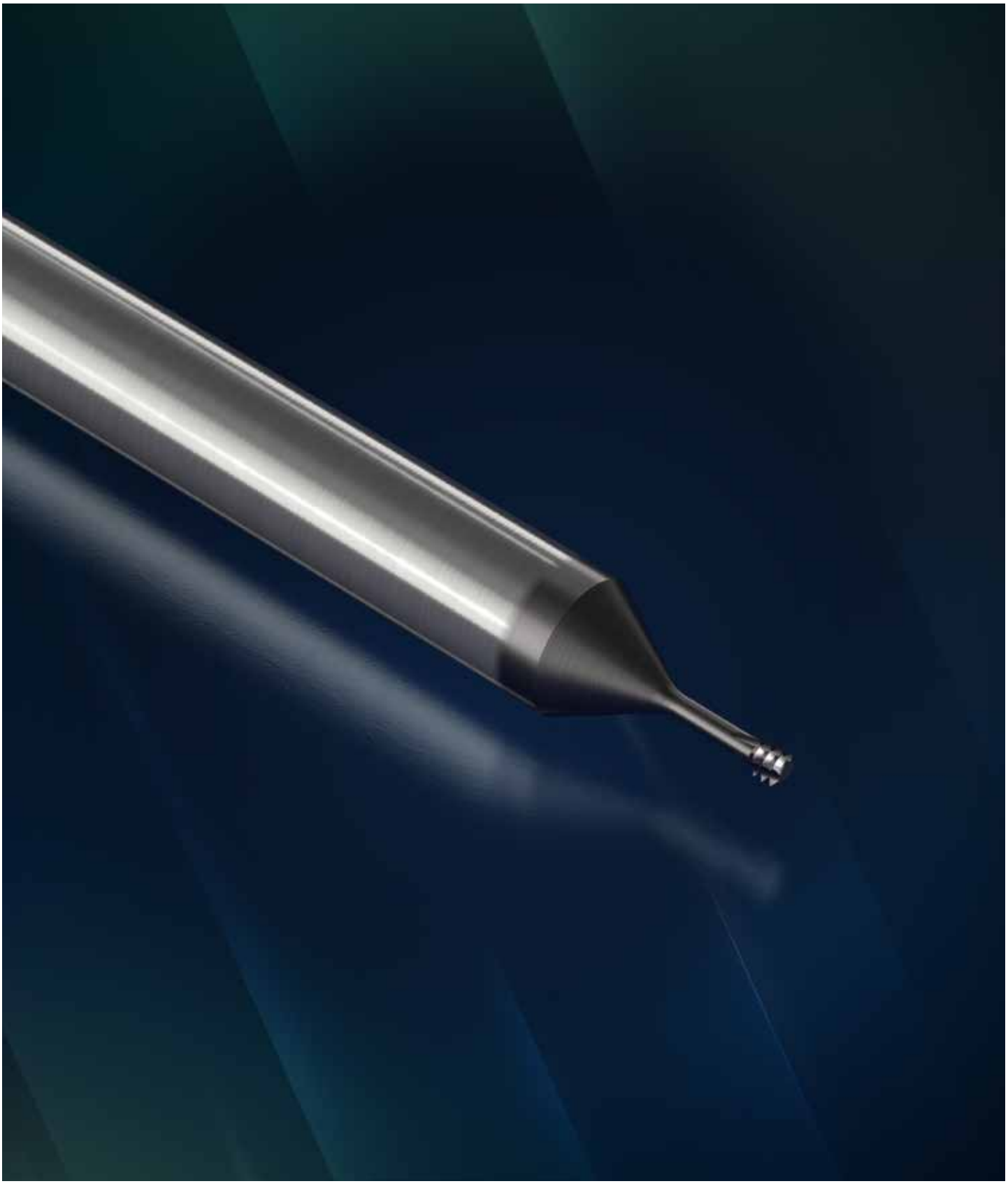
- ISO Thread Profile
- Medium Cutting Length
- Coolant Through Center
- AlTiN Coating 10% Submicron Carbide



THREAD	DC	APMX	DCONMS	NOF	OAL	Shank	EDP Number
M4x0.7	3.10	7.40	6.00	3	58.00	C	3410569
M5x0.5	3.80	10.30	6.00	3	58.00	C	3410568
M5x0.8	3.80	9.20	6.00	3	58.00	C	3410571
M6x0.75	4.50	10.10	6.00	3	58.00	C	3410570
M6x1	4.60	10.50	6.00	3	58.00	C	3410563
M6x1	4.60	14.50	6.00	3	58.00	C	3410572
M8x1.25	6.00	14.40	6.00	3	58.00	C	3410564
M8x1.25	6.00	19.40	6.00	3	58.00	C	3410575
M9x1	6.00	12.50	6.00	3	58.00	C	3410573
M10x1	8.00	16.50	8.00	4	64.00	C	3410574
M10x1.5	7.80	17.00	8.00	3	64.00	C	3410565
M10x1.5	7.80	24.80	8.00	3	76.00	C	3410576
M12x0.75	10.00	24.40	10.00	4	73.00	C	3410587
M12x1	10.00	24.50	10.00	4	73.00	C	3410586
M12x1.75	9.00	20.10	10.00	3	73.00	C	3410566
M12x1.75	9.00	28.90	10.00	3	73.00	C	3410579
M14x1.5	10.00	21.80	10.00	4	73.00	C	3410577
M14x2	10.00	27.00	10.00	3	73.00	C	3410580
M16x1.5	12.00	26.30	12.00	4	84.00	C	3410582
M16x2	11.80	27.00	12.00	4	84.00	C	3410567
M16x2	11.80	39.00	12.00	4	105.00	C	3410581
M20x1.5	16.00	33.80	16.00	6	105.00	C	3410578
M20x2.5	15.00	33.80	16.00	5	105.00	C	3410583
M20x2.5	15.00	48.80	16.00	5	105.00	C	3410584
M24x3	18.00	58.50	20.00	4	120.00	C	3410585

• For technical data see pages: 169-170

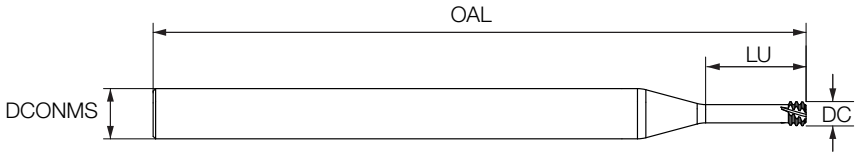
SERIES
STUB LENGTH
LEFT HAND CUT M04



MORSE MTI

SERIES
TMCUS33

- UN Thread Profile
- Stub Cutting Length
- **Left Hand** Cut M04
- AlTiN Coating 12% Ultrafine Carbide



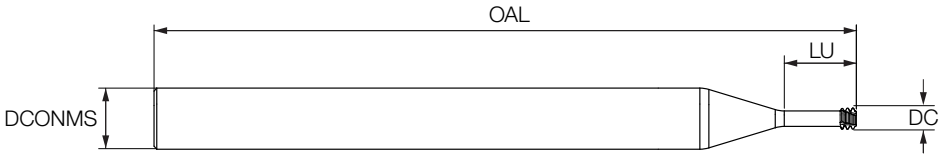
THREAD		DC	LU	DCONMS	NOF	OAL	Shank	EDP Number
UNF	UNC							
0-80 UNF		1.15	4.00	6.00	3	58.00	C	3410332
1-72 UNF		1.45	6.00	3.00	3	39.00	C	3410335
	2-56 UNC	1.65	6.60	6.00	3	58.00	C	3410336
	3-48 UNC	1.90	5.20	6.00	3	58.00	C	3410311
	4-40 UNC	2.10	6.30	6.00	3	58.00	C	3410312
	4-40 UNC	2.10	8.00	6.00	3	58.00	C	3410337
	5-40 UNC	2.45	7.00	6.00	3	58.00	C	3410313
	5-40 UNC	2.45	9.60	6.00	3	58.00	C	3410325
	6-32 UNC	2.55	10.50	6.00	3	58.00	C	3410338
	8-32 UNC	3.20	9.50	6.00	3	58.00	C	3410314
	8-32 UNC	3.20	12.50	6.00	3	58.00	C	3410326
	10,12-24 UNC	3.50	10.60	6.00	3	58.00	C	3410318
10-32 UNF		3.70	10.50	6.00	3	58.00	C	3410315
10-32 UNF		3.70	15.00	6.00	3	58.00	C	3410327
12-28 UNF		4.20	11.00	6.00	3	58.00	C	3410316
	1/4-20 UNC	4.75	14.00	6.00	3	58.00	C	3410320
	1/4-20 UNC	4.75	19.00	6.00	3	58.00	C	3410330
1/4-28 UNF		5.00	14.50	6.00	3	58.00	C	3410317
1/4-28 UNF		5.00	19.00	6.00	3	58.00	C	3410328
	5/16-18 UNC	6.00	17.00	6.00	3	58.00	C	3410321
	5/16-18 UNC	6.00	23.00	6.00	3	58.00	C	3410331
5/16-24 UNF		6.60	17.00	8.00	3	64.00	C	3410319
5/16-24 UNF		6.60	24.00	8.00	3	64.00	C	3410329
	3/8-16 UNC	6.70	22.00	8.00	3	64.00	C	3410322
	7/16-14 UNC	7.70	25.00	8.00	3	64.00	C	3410323
7/16-20 UNF		8.00	25.00	8.00	3	64.00	C	3410333
	1/2-13 UNC	9.20	27.50	10.00	3	73.00	C	3410324
	5/8-11 UNC	11.40	34.50	12.00	3	84.00	C	3410334

• For technical data see pages: 169-170

MORSE MTI

SERIES
TMIS33 - TMIS43

- ISO Thread Profile
- Stub Cutting Length
- **Left-hand** Cut M04
- AlTiN Coating 12% Ultrafine Carbide

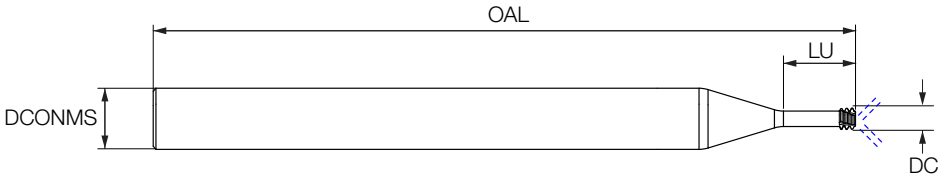


THREAD	DC	LU	DCONMS	NOF	OAL	Shank	EDP Number
M1.4x0.3	1.05	4.00	3.00	3	39.00	C	3410495
M1.6x0.35	1.20	4.80	3.00	3	39.00	C	3410496
M2.2x0.45	1.65	5.00	6.00	3	58.00	C	3410479
M2.5x0.45	1.95	5.50	6.00	3	58.00	C	3410480
M2.5x0.45	1.95	7.50	6.00	3	58.00	C	3410489
M2x0.4	1.55	4.50	6.00	3	58.00	C	3410478
M2x0.4	1.55	6.00	3.00	3	39.00	C	3410497
M3.5x0.6	2.75	7.50	6.00	3	58.00	C	3410482
M3.5x0.6	2.75	10.00	6.00	3	58.00	C	3410499
M3x0.5	2.35	6.50	6.00	3	58.00	C	3410481
M3x0.5	2.35	9.50	6.00	3	58.00	C	3410490
M4x0.7	3.10	9.00	6.00	3	58.00	C	3410483
M4x0.7	3.10	12.50	6.00	3	58.00	C	3410491
M5x0.8	3.80	12.50	6.00	3	58.00	C	3410484
M5x0.8	3.80	16.00	6.00	3	58.00	C	3410492
M6x1	4.65	14.00	6.00	3	58.00	C	3410485
M6x1	4.65	20.00	6.00	3	58.00	C	3410493
M8x1.25	5.95	18.00	6.00	3	58.00	C	3410486
M8x1.25	5.95	24.00	6.00	3	58.00	C	3410494
M10x1.5	7.80	23.00	8.00	3	64.00	C	3410487
M12x1.75	9.00	26.00	10.00	3	73.00	C	3410488
M16x2	11.80	35.00	12.00	4	84.00	C	3410498

• For technical data see pages: 169-170

SERIES
TMISD31 - TMISD41

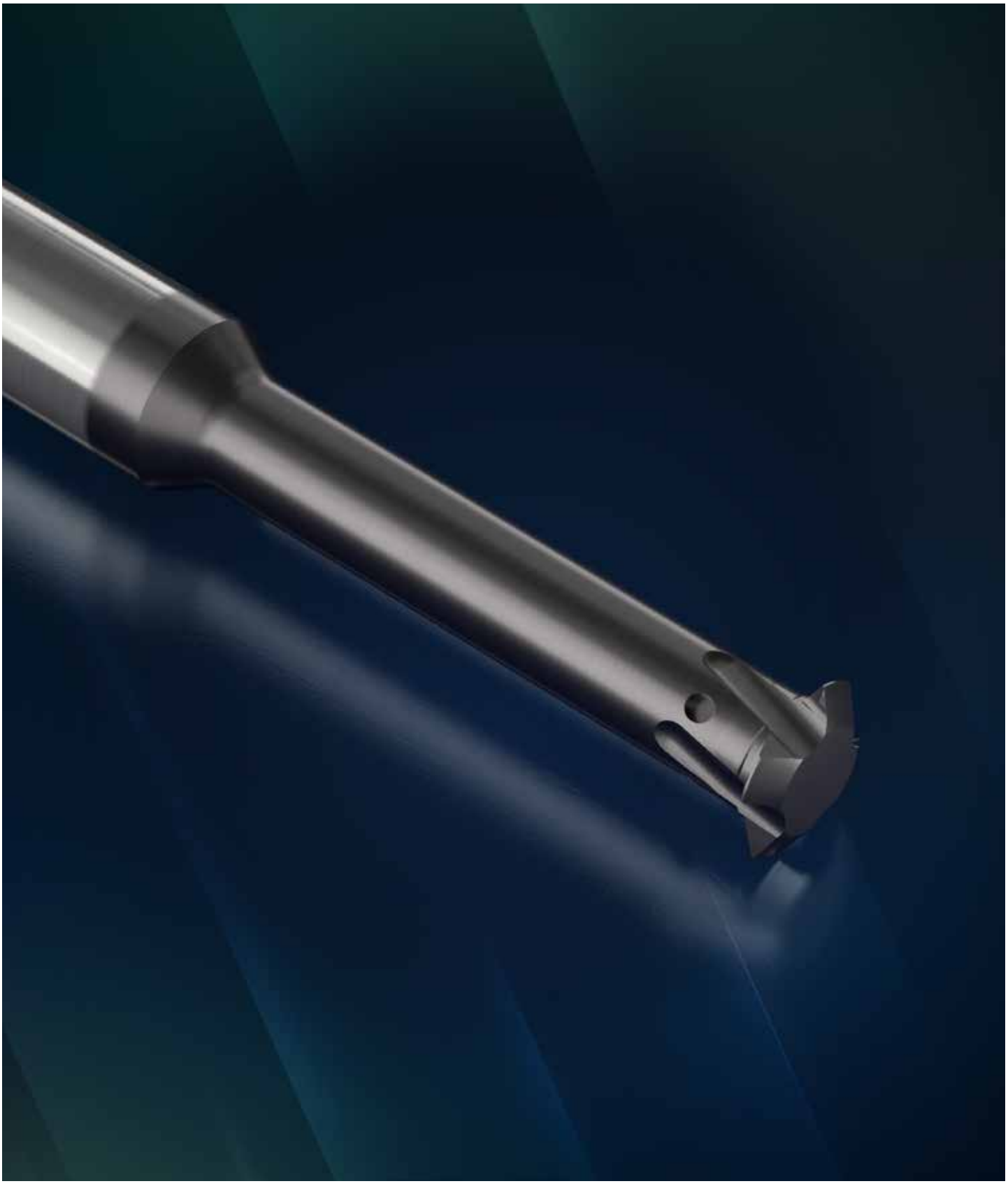
- ISO Thread Profile
- Stub Cutting Length
- **Left-hand** Cut M04
- For Drilling&Chamfering&Threading
- Coolant Through Center
- AlTiN Coating 10% Submicron Carbide



THREAD	DC	LU	DCONMS	NOF	OAL	Shank	EDP Number
M4x0.7	3.15	11.60	6.00	3	58.00	C	3410530
M5x0.8	4.00	14.40	6.00	3	58.00	C	3410531
M6x1	4.70	14.00	8.00	3	64.00	C	3410525
M8x1.25	6.10	18.00	8.00	4	64.00	C	3410526
M10x1.5	7.80	23.00	8.00	4	64.00	C	3410527
M12x1.75	9.00	26.00	10.00	4	73.00	C	3410528
M16x2	11.80	35.00	12.00	4	84.00	C	3410529

• For technical data see pages: 169-170

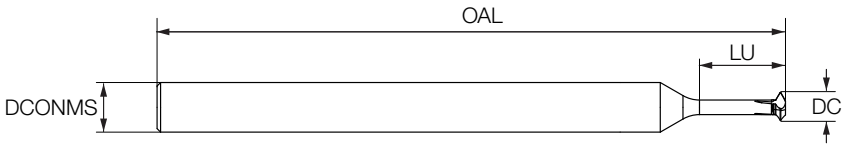
SERIES
SINGLE POINT



MORSE MTI

SERIES
TM32 - TM52

- 60° Partial Profile Single Point
- Neck Reduced
- AlTiN Coating 9% Ultrafine Carbide

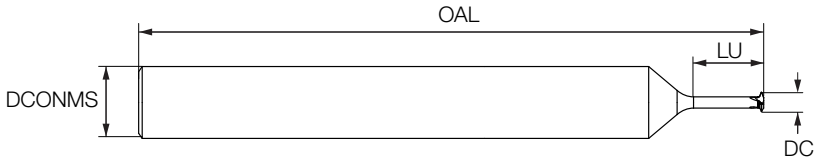


THREAD				DC	LU	DCONMS	NOF	OAL	Shank	EDP Number
Interal Pitch	External Pitch	Interal TPI	External TPI							
0.35-0.60		72-40		1.90	5.20	3.00	3	39.00	C	3410366
0.50-1.00		48-24		3.20	9.50	6.00	3	57.00	C	3410367
0.50-1.00		48-24		4.00	12.50	6.00	3	58.00	C	3410368
0.50-0.80	0.4-0.8	56-28	64-32	5.00	20.00	6.00	4	58.00	C	3410369
0.50-0.80	0.4-0.8	56-28	64-32	8.00	28.00	8.00	4	64.00	C	3410370
1.00-1.75	0.8-1.5	28-14	32-16	8.00	30.00	8.00	4	64.00	C	3410371
1.00-1.75	0.8-1.5	28-14	32-16	10.00	35.00	10.00	4	73.00	C	3410372
2.0-3.0	1.75-2.5	13-8	15-10	12.00	40.00	12.00	5	84.00	C	3410373
2.0-3.0	1.75-2.5	13-8	15-10	16.00	50.00	16.00	5	101.00	C	3410374

• For technical data see pages: 169-170

SERIES
TMIS32

- ISO Thread Profile
- Single Point
- Neck Reduced
- AlTiN Coating 9% Ultrafine Carbide



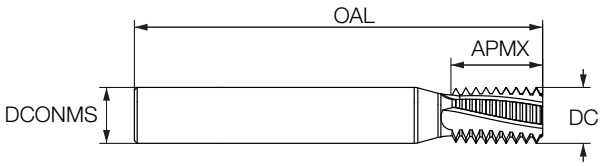
THREAD	DC	LU	DCONMS	NOF	OAL	Shank	EDP Number
M1X0.25	0.72	3.60	3.00	3	39.00	C	3410533
M1.2X0.25	0.90	4.30	3.00	3	39.00	C	3410534
M1.4X0.3	1.05	5.00	3.00	3	39.00	C	3410535
M1.6X0.35	1.20	5.70	3.00	3	39.00	C	3410536
M2X0.4	1.55	7.10	3.00	3	39.00	C	3410532
M3X0.5	2.37	10.60	3.00	3	39.00	C	3410537

• For technical data see pages: 169-170

SERIES
EXTERNAL THREAD

SERIES
TMUE41 - TMUE51

- UN Thread Profile
- **External** Threading
- AlTiN Coating 10% Submicron Carbide

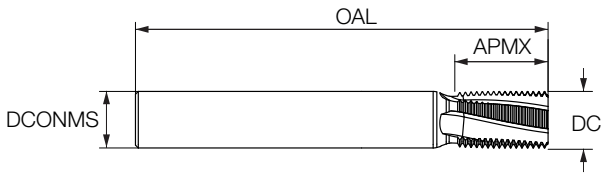


THREAD	DC	APMX	DCONMS	NOF	OAL	Shank	EDP Number
24UN	10.00	16.40	10.00	4	73.00	C	3410339
20UN	12.00	21.00	12.00	5	84.00	C	3410340

• For technical data see pages: 169-170

SERIES
TMIEM31 - TMIEM41

- ISO Thread Profile
- **External** Threading
- AlTiN Coating 10% Submicron Carbide



THREAD	DC	APMX	DCONMS	NOF	OAL	Shank	EDP Number
M12x1	10.00	16.50	10.00	4	73.00	C	3410500
M12x1.25	10.00	16.90	10.00	4	73.00	C	3410506
M12x1.5	10.00	15.80	10.00	4	73.00	C	3410501
M12X2	10.00	17.00	10.00	3	73.00	C	3410504
M14x1.5	12.00	20.30	12.00	4	84.00	C	3410502
M14x1.75	12.00	20.10	12.00	4	84.00	C	3410503
M14x2	12.00	21.00	12.00	4	84.00	C	3410505

• For technical data see pages: 169-170

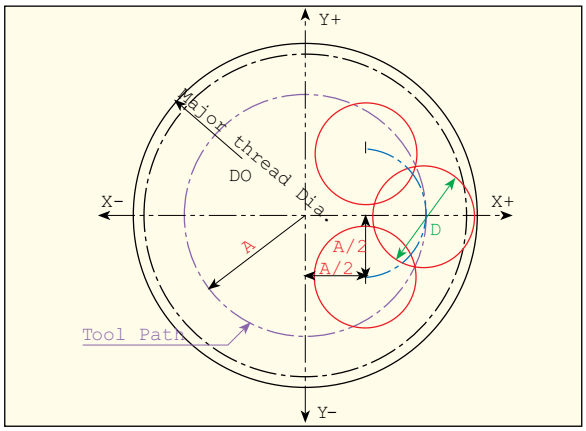
Material	Cutting Speed M/Min	Feed Per Tooth (Mm/t)						
		Ø <3	Ø<4.5	Ø <6	Ø <8	Ø <10	Ø<12	Ø <16
Low Alloy Steel <25Hrc	100-180	0.02-0.03	0.03-0.04	0.03-0.06	0.05-0.07	0.06-0.08	0.07-0.1	0.1-0.12
High Alloy Steel >25Hrc	80- 150	0.02-0.03	0.02-0.03	0.03-0.04	0.025-0.05	0.03-0.06	0.05-0.07	0.07-0.1
Stainless Steel	60-100	0.02-0.03	0.02-0.03	0.03-0.04	0.035-0.05	0.035-0.06	0.05-0.08	0.08-0.11
Cast Iron (GGG)	100-150	0.03-0.04	0.03-0.04	0.03-0.05	0.035-0.05	0.035-0.06	0.05-0.08	0.08-0.11
Cast Iron (GG)	80-140	0.03-0.04	0.03-0.04	0.03-0.05	0.035-0.05	0.03-0.06	0.05-0.07	0.07-0.1
Titanium	20-50	0.01-0.02	0.01-0.02	0.03-0.04	0.025-0.05	0.03-0.06	0.05-0.07	0.07-0.1
Inconel	20-40	0.01-0.02	0.01-0.02	0.03-0.04	0.025-0.05	0.03-0.06	0.05-0.07	0.07-0.1
Aluminium	160-300	0.02-0.03	0.02-0.04	0.03-0.06	0.05-0.07	0.05-0.08	0.07-0.1	0.1-.12
Brass	100-250	0.02-0.03	0.02-0.04	0.03-0.06	0.05-0.07	0.05-0.08	0.07-0.1	0.1-.12
Bronze	100-250	0.02-0.03	0.02-0.04	0.03-0.06	0.05-0.07	0.05-0.08	0.07-0.1	0.1-.12

Thread Milling CNC Program for Internal Thread

Right-hand thread (climb milling) from bottom up.
Program is based on tool center.
This method of programming needs no tool radius compensation value, other than an offset for wear.

$$A = \frac{Do - D}{2}$$

A = Radius of tool path
Do = Major threaD
D = Cutting diameter

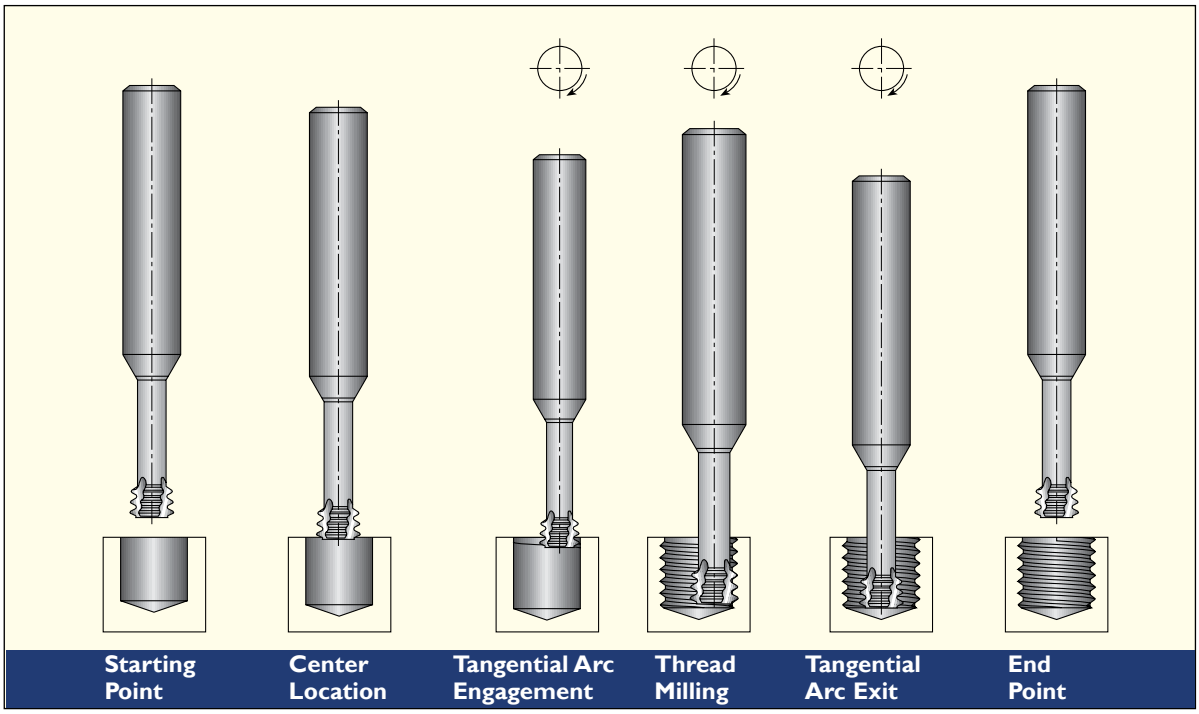


General Program

G90	G00 G54 G43 H1X0 Y0 Z10 S...
G00	Z-(to thread depth)
G01	G91 G41 D1 X(A/2) Y-(A/2) Z0 F...
G03	X(A/2) Y(A/2) R(A/2) Z(1/8 pitch)
G03	X0 Y0 I-(A) J0 Z(pitch)
G03	X-(A/2) Y(A/2) R(A/2) Z(1/8 pitch)
G01	G40 X-(A/2) Y-(A/2) Z0
G90	X0 Y0 Z0

Small Diameter, Short Solid Carbide Thread Mills

Thread Milling - Recommended Procedure



NOTES

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MORSE
CUTTING TOOLS