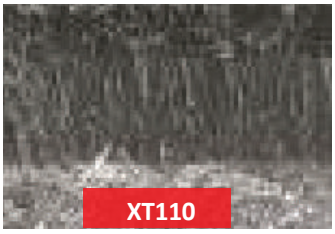
HI-FEED MILLING

- High-feed milling is a machining method that combines a shallow depth of cut with a high feed rate to remove a large amount of metal from a part in a short amount of time.
- Some benefits of high-feed milling include
  a. Increased productivity
  b. Reduced vibrations
  c. Low radial force
  d. Chip thinning
- XCUT has a very strong portfolio in Hi-Feed with products like XOGU/SDKW for Die/Mould and SPLX for Valve and Aerospace industries

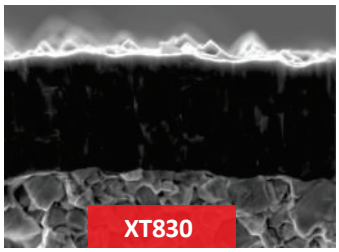
HI FEED MILLING INDEX

GRADE INFORMATION



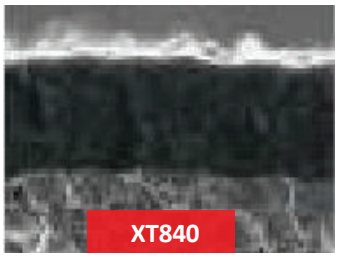
P05-P30 | M05-M20 | K05-K30

4 µ AlCrN PVD Coated, Combining with fine particles substrates with High-Toughness, suitable for all materials in light to medium load Machining. Suitable for Steels. Stainless Steel & Cast Iron.



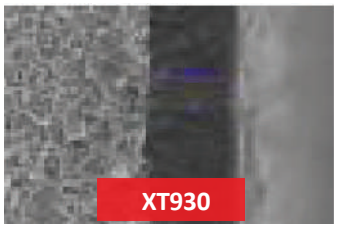
P05-P30 M05-M20 | K05-K20 | 505-515 |H05-H10

PVD coating with optimal thermal resistance & added strength. Tough carbide substrate designed for demanding application. Suitable for all materials from steels to superalloys



P10-P30 | K10-K25 | M10-M25

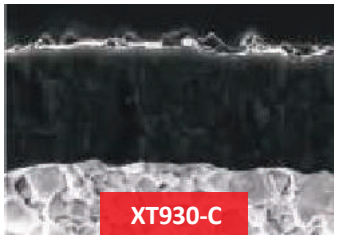
Composition: Co 10.5%; mixed carbides 2.0%; WC balance | Grain size: 1-2 µm | Hardness: HV30 1400 | Coating specification: PVD TIAIN variant.
First choice for dry machining of steels and CI at high cutting speeds.



M10-M35 | P10-P35 | S05-515

Composition: Co 10.0% other 1.5%; rest TC | Grain size: coarse Coating: PVD TIAITAN Particularly suitable for the machining of high-alloy steels, Stainless Steels and Superalloys (austenitic).

GRADE INFORMATION

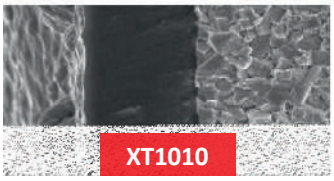


P15-P35 | M15-M35 | H05-H15

Ultra find grade with Nano coating for high heat resistance and toughness. Special AlTiMeN coating gives it a bronze shade and higher temperature resistance! The first choice for general-purpose machining of stainless steel. It can be used for supplementary machining of soft steels.

P05-P30 | M05-M20 |K05-K30

Composition: Co 10.0%; other 1.5%; rest TC | Grain size: coarse Coating: PVD TIAITN Particularly suitable for the machining of high-alloy steels, Stainless Steels and Superal-loys (austenitic).



H10-H20 | S05-S15

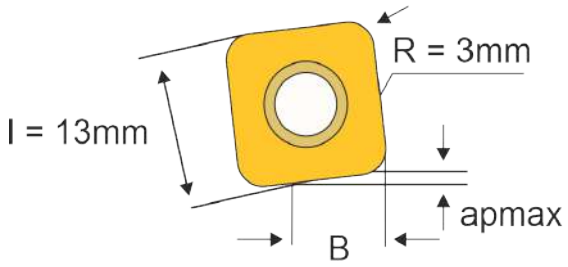
- Low cobalt, ultra-fine wear-resistant and heat-resistant grain structure.
- PVD high alumina coating to improve oxidation and wear resistance.
- Suitable for high feed milling of hardened materials & superalloys.

RECOMMENDED CUTTING CONDITIONS

ISO	Material Group	Relative Materials (DIN)	Hardness HB	Cutting speed (m/min)		
				XT 110	XT 830	XT 840
P	Non-alloy steel	9 SMn 28, C35C50, C40E, C45E, 49 CrMo 4	125 - 250	80 - 180	100 - 250	90 -250
	Low alloy steel	13 CrMo 44, 40NiCrM022, 58 CrV 4	200 - 350	80 - 150	100 - 200	80 -220
	High alloy steel	X 40 CrMoV 5 1, X100 CrMoV 5 1, S6-5-5	200 - 325	80 -130	80 - 130	80 -180
M	Ferritic/ martensitic Stainless steel	X6Cr13, X10CrA118, X20CrNi175	200 - 240	80 -180	130 - 190	
	Austenitic Stainless steel	X5 CrNi 18 9, X5 CrNiMo 17 13 3 X6 CrNiTi 18 9	180	60 -160	100 - 200	
K	Grey cast iron	GG15, GG20, GGG40, GG-35	180 - 260	90 - 200	160 - 200	
	Malleable castiron	GTS-35-10, GTS-35,GTS70-02, 20mN5	130 - 230	90 - 200	130 - 180	90 -240
S	Fe, Ni or Co based	X12 NICrAlTi 31 20, TiAl5Sn2	200 - 350		30 - 50	
	Titanium and Ti-alloy based	TiCu2, TiAl6V4, TiAl6V4ELI			35- 75	
H	Hardended steel	C 105 W1,75 CrMoNiW 6 7	55 - 60 HRc		55 - 65	
	Chilled cast iron	G-X 260 NiCr 4 2, X15 CrNiSi 25 20	400		45 - 55	
	Cast iron	G-X 300 CrMo 15 3	55 HRc		55 - 65	

ISO	Material Group	Relative Materials (DIN)	Hardness HB	XT 930	XT 930-C	XT 960	XT 1010
P	Non-alloy steel	9 SMn 28, C35C50, C40E, C45E, 49 CrMo 4	125 - 250		80 - 200		
	Low alloy steel	13 CrMo 44, 40NiCrM022, 58 CrV 4	200 - 350	80 -220	80 -180		
	High alloy steel	X 40 CrMoV 5 1, X100 CrMoV 5 1, S6-5-5	200 - 325	80 -180	60 -160		
M	Ferritic/ martensitic Stainless steel	X6Cr13, X10CrA118, X20CrNi175	200 - 240	80 -220	60 -220	80 -160	60 -140
	Austenitic Stainless steel	X5 CrNi 18 9, X5 CrNiMo 17 13 3 X6 CrNiTi 18 9	180	80 -200	60 -180		
K	Grey cast iron	GG15, GG20, GGG40, GG-35	180 - 260				
	Malleable castiron	GTS-35-10, GTS-35,GTS70-02, 20mN5	130 - 230				
S	Fe, Ni or Co based	X12 NICrAlTi 31 20, TiAl5Sn2	200 - 350	40 -120	40 -120	30 -90	30 -90
	Titanium and Ti-alloy based	TiCu2, TiAl6V4, TiAl6V4ELI		30 -100	30 -100		
H	Hardended steel	C 105 W1,75 CrMoNiW 6 7	55 - 60 HRc	30 -90	30 -120		30 -120
	Chilled cast iron	G-X 260 NiCr 4 2, X15 CrNiSi 25 20	400				
	Cast iron	G-X 300 CrMo 15 3	55 HRc				

SPLX



Application

1) Face milling

2) Angled milling

3) Helical plunging

4) Shoulder milling

5) Slot milling

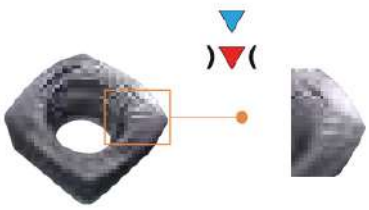
6) Peripheral milling

7) Trochoidal slot milling

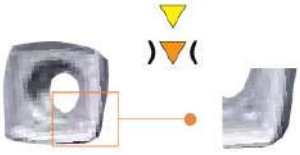
Customer Benefits

With feed rates up to 3 mm/ tooth and closely pitched tools, very high chip removal rates are achieved. Maximum tool life thanks to special coating. Maximised economy thanks to 4 cutting edges. Reduced machining noise and vibration. light cutting geometries.

Which Chipbreaker to use?



HP
Strong cutting edge for general steel applications and hard conditions milling.



SM
Sharp cutting edge for general stainless steel applications and for finishing in steels.

MILLING

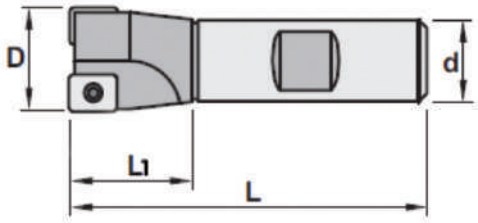
INSERTS

INSERT DESIGNATION	F_z(mm/t)	A_p(mm)	XT840	XT930	XT930-C	XT960	XT1010
SPLX070305HP	0.25-1.50	0.30-1.0	●				
SPLX070305SM	0.25-1.50	0.30-1.0		●	●	●	●
SPLX10T308HP	0.2-1.50	0.10-1.2	●				
SPLX10T308SM	0.2-1.50	0.10-1.2		●		○	
SPLX130410HP	0.10-1.30	0.10-1.7	●				
SPLX130410SM	0.10-1.30	0.10-1.7		●			

● STOCKABLE ○ NON STOCKABLE

CUTTER DETAILS - END MILL TYPE

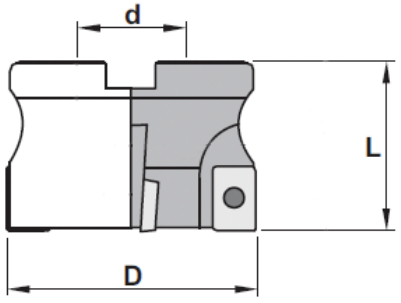
DESIGNATION	D	L1	D	L	Z	AVAILABILTY
XTFFC-1616-50FL-T2-SPLX07	16	50	16	200	2	●
XTFFC-2020-50FL-T3-SPLX07	20	50	20	200	3	●
XTFFC-2525-60FL-T4-SPLX07	25	60	25	200	4	●
XTFFC-3232-50FL-T4-SPLX07	32	50	32	200	4	●
XTFFC-2525-60FL-T2-SPLX10	25	60	25	200	2	●
XTFFC-3232-50FL-T3-SPLX10	32	50	32	200	3	●



● STOCKABLE ○ NON STOCKABLE

CUTTER DETAILS - SHELL MILL TYPE

DESIGNATION	D	D	L	Z	Availabilty
XTFFC-D40-A16-Z4-SPLX10	40	16	40	4	●
XTFFC-D50-A22-Z5-SPLX10	50	22	40	5	●
XTFFC-D63-A22-Z6-SPLX10	63	22	50	6	○
XTFFC-D50-A22-Z4-SPLX13	50	22	40	4	○
XTFFC-D63-A22-Z5-SPLX13	63	22	50	5	●
XTFFC-D80-A27-Z6-SPLX13	80	27	50	6	●
XTFFC-D100-A32-Z7-SPLX13	100	32	32	7	●
XTFFC-D125-A40-Z8-SPLX13	125	40	40	8	○



● STOCKABLE ○ NON STOCKABLE

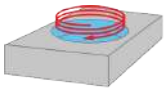
INSERT SIZE	SCREW SIZE
SPLX07	M2.5 X 5-T8
SPLX10	M3.5 X 8.6-T15
SPLX13	M4.5 X 10.5-T20

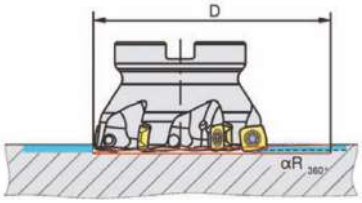
Thru-Coolant Bodies Available On Request!

SPLX Technical Information

Application data (angled ramping)

DESIGNATION	d_1[mm]	α_R [°]
XTFFC-1616-50FL-T2-SPLX07	16	5.9
XTFFC-2020-50FL-T3-SPLX07	20	3.2
XTFFC-2525-60FL-T4-SPLX07	25	2.0
XTFFC-2525-60FL-T2-SPLX10	25	3.6
XTFFC-D40-A16-Z4-SPLX10	40	1.2
XTFFC-D50-A22-Z5-SPLX10	50	0.9
XTFFC-D63-A22-Z6-SPLX10	63	0.8
XTFFC-D50-A22-Z4-SPLX13	50	1.5
XTFFC-D63-A22-Z5-SPLX13	63	1.1
XTFFC-D80-A27-Z6-SPLX13	80	1.3

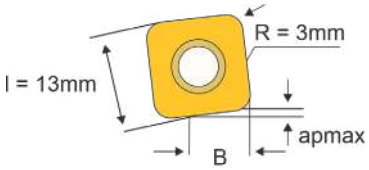


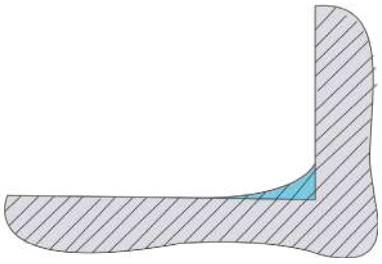


SPLX Technical Information

Depth of Cut and Remaining Material

DESIGNATION	l[mm]	R[mm]	B[mm]	r[mm]	$a_{p\ max}$ [mm]
SPLX07	7	1.2	4.3	0.5	0.8
SPLX10	10	2.0	0.8	0.8	1.0
SPLX13	13	3.0	1.0	1.0	2.0





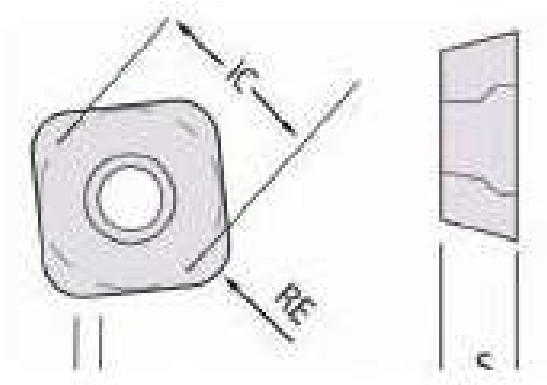
Recommended

$f_z \geq 0.5$ / tooth

R = programmed radius

MILLING

SDKW13



4 CORNER HIGH FEED INSERT
REDUCES TOOL PRESSURE AND RAKE ANGLES FOR SMOOTHER CUTTING

Industry Application

- Die & Mould
- General Engineering
- Valves
- Aerospace

Insert Details

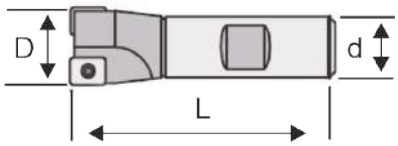
DESIGNATION	BS	IC	S	RE	FZ	AP MAX	XT830	XT930-C	XT960	XT1010
SDKW130420-HF	1.45	12.7	4.7	2	0.4-1.4	0.3-2	●	●	●	●

● STOCKABLE ○ NON STOCKABLE

Cutter Details

END MILL CUTTER

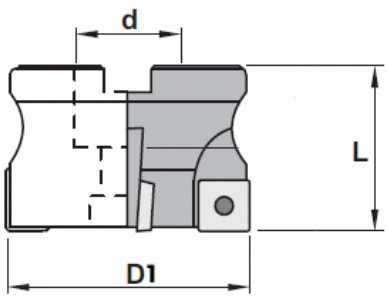
DESIGNATION	D	DE	D	L	Z	Availability
XTFFC-3232-50FL-T2-SDKW1304	32	-	32	200	3	●



SHELL MILL CUTTER

DESIGNATION	D	d	L	Z	Availability
XTFFC-D50-Z4-SDKW1304	50	22	40	4	●
XTFFC-D63-Z5-SDKW1304	63	22	40	5	●
XTFFC-D80-Z6-SDKW1304	80	27	50	6	●
XTFFC-D100-Z7-SDKW1304	100	32	63	7	●
XTFFC-D125-210-SDKW1304	125	40	63	10	○

- Through Coolant Cutters Available on Request

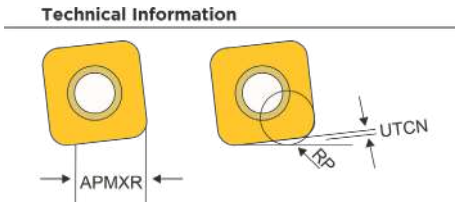


SPARES

SCREW CODE	T-KEY
SCREW M4 FOR SDKW 13	T15

Programming Radius Info

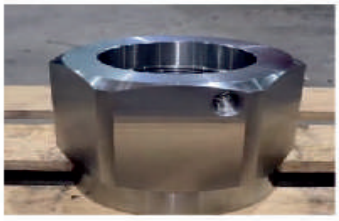
APMXR	RP	BS	OVERCUT
RADIAL AP MAX	PROGRAMMED CORNER R	UNCUT THICKNESS	
8,6	R2.5	1.16	0
	R3.0	1.06	0
	R3.5	0.97	0.03

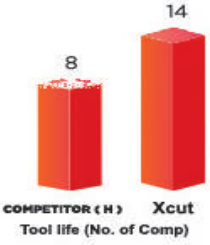


Trail Reports

MILLING (PRODUCTION)

PRODUCT DESCRIPTION	SDKW130420-HF-XT930-C	
MATERIALS & HARDNESS	STEEL/HEX NUT-35HRC	
PARAMETERS Depth of Cut	COMPETITOR (H)	XCUT
	1	1
Vc: m/min	144 (575)	163 (650)
Fz: mm/tooth	0.55/tooth	0.98/tooth
CPC Reduced by 52% ↓		



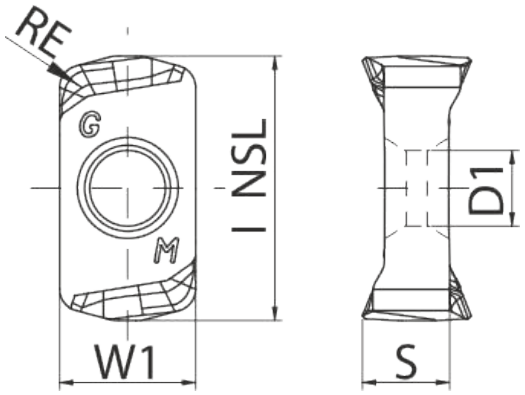


MILLING (DIE MOULD)

PRODUCT DESCRIPTION	SDKW130420-HF-XT1010	
MATERIALS & HARDNESS	Forging Die, 50 TO 55HRC	
PARAMETERS Depth of Cut	COMPETITOR (D)	XCUT
	0.5 mm	0.5 mm
Vc: m/min	62	86
Fz: mm/tooth	1200/0.75	1200/0.54
CPC Reduced by 40% ↓		

MILLING

XOGU11



Benefits

- Wide range of application.
- Good chip evacuation prevents chip-biting enabling trouble freeoperation.
- Multi-edge design allows for cost economy.
- Periphery ground inserts help for high efficiency machineing

1) Face milling

2) Angled milling

3) Helical plunging

4) Shoulder milling

5) Slot milling

6) Peripheral milling

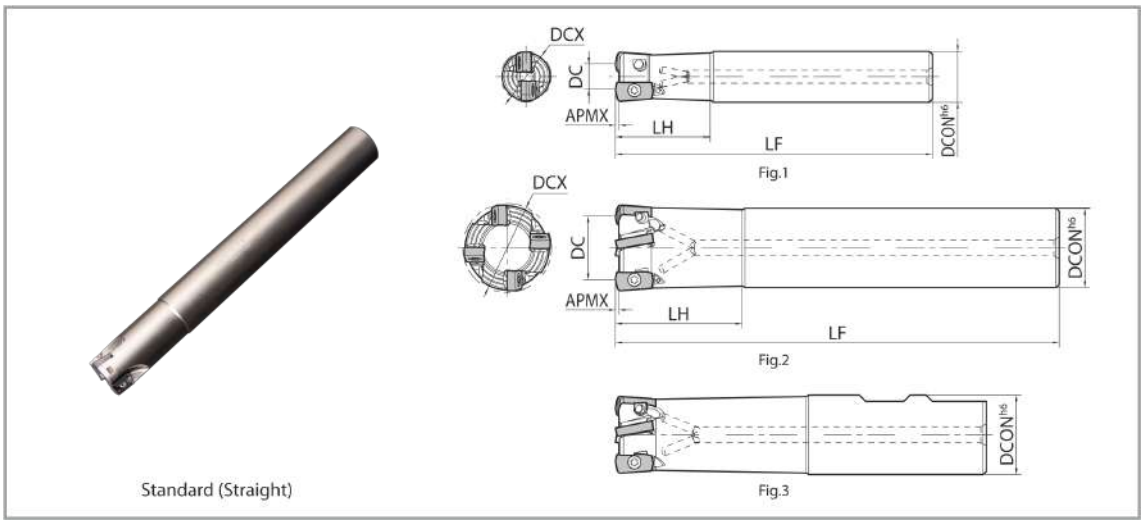
7) Trochoidal slot milling

HFL | Applicable inserts

DESIGNATION	DIMENSIONS (MM)								
	W1	S	D2	INSL	RE	XT830	XT930-C	XT960	XT1010
XOGU110310-GM	6.2	3.96	3.96	11.9	1.0	●	●	●	●

● STOCKABLE ○ NON STOCKABLE

HFL | End mill



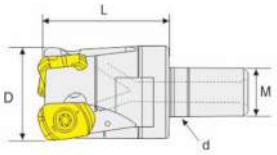
Toolholder Dimensions

DESIGNATION	DESIGNATION	NO OF INSERTS	D	DE	D	L	Availability
Standard (Straight)	HFL16-S16-03-2T-100L-XOGU11	2	16	16	30	100	●
	HFL20-S20-03-3T-130L-XOGU11	3	20	20	50	130	●
	HFL25-S25-03-4T-140L-XOGU11	4	25	25	50	140	●
	HFL32-S32-03-5T-150L-XOGU11	5	32	32	60	150	●
Arbour Type	HFL40R-A16-03-6T-XOGU11	6	40	16	-	-	●
	HFL50R-A22-03-8T-XOGU11	8	50	22			●

● STOCKABLE ○ NON STOCKABLE

MODULAR HEADS

*THRU-COOLANT CUTTER BODIES AVAILABLE.



Item Code	Stock	Teeth	Dimension				Coresponding Inserts	Acessories
			D	d	L	M		Locking Screw
XMH-XOGU11-16-M8-2T	●	2	16	8.5	30	M08	XOGU11	MS300E
XMH-XOGU11-20-M10-3T	●	2	20	10.5	35	M10		
XMH-XOGU11-25-M12-4T	●	3	25	12.5	35	M12		
XMH-XOGU11-32-M16-5T	●	3	32	17.0	40	M16		

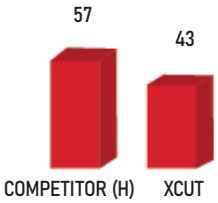
● STOCKABLE ○ NON STOCKABLE

Spare Parts and Applicable Inserts

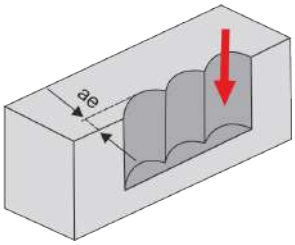
Description	RP	BS	APPLICABLE INSERTS
	INSERT SCREW	TORQUE	
			
HFL...-XOGU11-...	M3X7	T-8	XOGU110310-GM

Milling (Production)

PRODUCT DESCRIPTION	XOGU110310-HF-XT930-C	
MATERIALS & HARDNESS	Steel 40HRC	
PARAMETERS	COMPETITOR (H)	XCUT
Depth of Cut	0.5 mm	0.5 mm
Vc: m/min	125	157
Fz: mm/tooth	2500	3500
CPC Reduced by 25%		



Pluging



Description on	Maximum width of cut (ae)
HFL	3.5

Reduce feed rate to fz ≤ 0.2mm/t when plunging

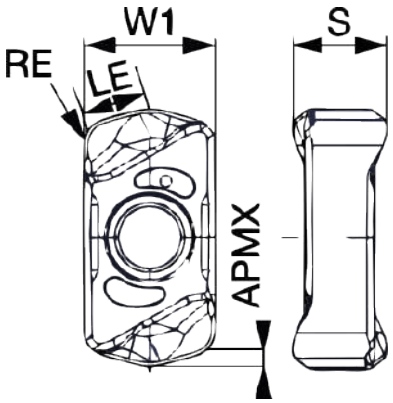
Approxiamate programming radius adjustment

HFL		
Programmable R. (mm)	Overcut Portion (mm)	Undercut Portion (mm
R1.6 (Recommended)	0	0.39
R2.0	0.09	0.39
R2.5	0.26	0.35
R3.0	0.46	0.17

Ramping reference data

Description	Cutter Dia (mm)	16	18	20	22	25	32	40	50
HFL	Max. ramping angle θ	2.8 °	2.1 °	1.7 °	1.4°	1.2 °	0.8 °	0.5 °	0.4 °
	Tan θ	0.049	0.037	0.030	0.024	0.021	0.014	0.009	0.007

ZNMU10



APPLICATION

1) Face milling 

2) Angled milling 

5) Slot milling 

6) Peripheral milling 

3) Helical plunging 

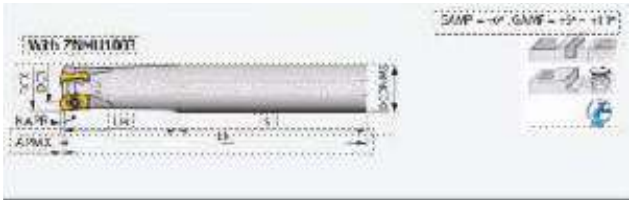
4) Shoulder milling 

7) Trochoidal slot milling 

4 CORNER HI-FEED INSERT

DESIGNATION	RE	APMX	IC	S	XT110	XT830	XT840	XT930-C
ZNMU 100312-HF	1.2	3.2	6	4.3	●	●	○	●

● STOCKABLE ○ NON STOCKABLE



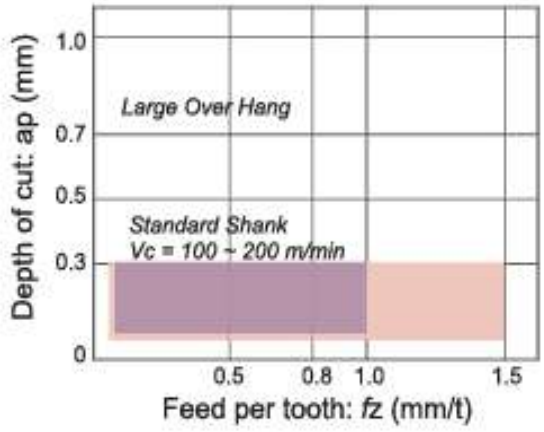
END MILL CUTTER

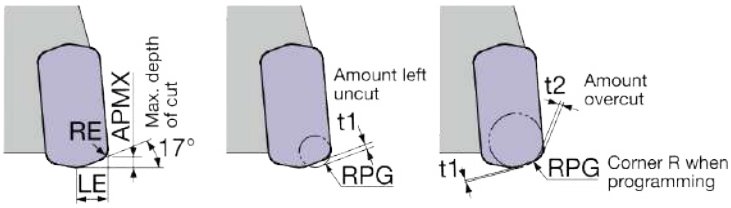
DESIGNATION	D	d	L1	L	Z	Availability
XTFFC-1616-30FL-T2-ZNMU100	16	16	60	200	2	●
XTFFC-1616-30FL-T2-ZNMU100	20	20	60	200	3	●
XTFFC-2525-40FL-T4-ZNMU100	25	25	60	200	4	●

● STOCKABLE ○ NON STOCKABLE

TOOL GEOMETRY ON PROGRAMMING:

The tool should be considered as radius cutter, when programming for CAM. The corner radius should be set as R = 1.5mm. If larger radius is used, overcutting will occur. The following table shows the amount left uncut (t1) and overcut (t2).



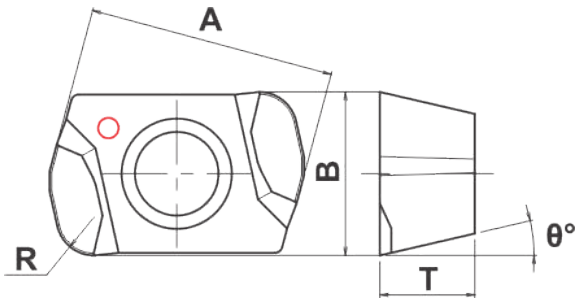


MAX.DEPT OF CUT APMX (MM)	CORNER RADIUS RE (MM)	LE (MM)	CORNER R WHEN PRO-GRAMMING RPG	AMOUNT LEFT UNCUT T1(MM)	AMOUNT LEFT UNCUT T2(MM)
1.0	1.2	3.0	1.0	0.6	-
1.0	1.2	3.0	1.5	0.5	-
1.0	1.2	3.0	2.0	0.25	0.08
1.0	1.2	3.0	2.5	0.14	0.26

SPARES

SCREW CODE	T-KEY
SCREW FOR ZNMU 10(M2.5 X 7-D6)	T-8

ZOMW06



2 CORNER HI FEED INSERT WITH CORNER RADIUS
3D GEOMETRY ALLOWS FOR LOWER CUTTING FORCE AND MULTI BLADE POSSIBILITY

DESIGNATION	DIMENSION (MM)					GRADE	
	A	T	B	R	E	XT930	XT930-C
ZOMW060210	6.5	2.5	4.3	1.0	1.3	●	●

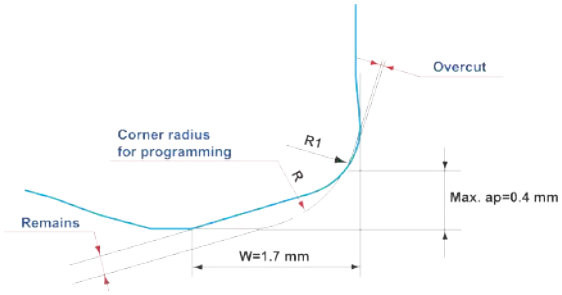
● STOCKABLE ○ NON STOCKABLE

END MILL CUTTER

Type	Item	No. of Inserts	Dimension (mm)					AVAILABILITY
		T	Dc	l2	ls	L	D	○
Regular	XTFFC-0808-25FL-T1- 75L-ZOMW06	1	8	25	50	75	8	○
	XTFFC-0908-25FL-T1- 75L-ZOMW06	1	9	25	50	75	8	○
	XTFFC-1010-25FL-T2- 80L-ZOMW06	2	10	25	55	80	10	●
	XTFFC-1110-25FL-T2- 80L-ZOMW06	2	11	25	55	80	10	○
	XTFFC-1212-30FL-T2- 100L-ZOMW06	2	12	30	70	100	12	●
	XTFFC-1312-30FL-T2- 100L-ZOMW06	2	13	30	70	100	12	○
	XTFFC-1414-30FL-T3- 110L-ZOMW06	3	14	30	80	110	14	●
Long Length	XTFFC-1010-75FL-T2- 135L-ZOMW06	2	10	75	60	135	10	○
	XTFFC-1212-80FL-T2- 140L-ZOMW06	2	12	80	60	140	12	○
	XTFFC-1414-85FL-T3- 150L-ZOMW06	3	14	85	65	150	14	○

● STOCKABLE ○ NON STOCKABLE

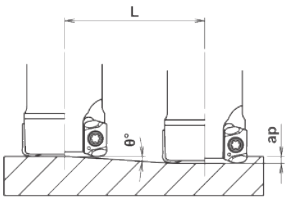
● Definition of Corner Radius for Programming



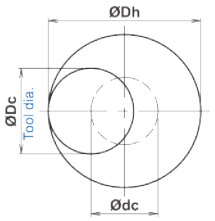
Corner Radius for Programming	Over Cut	Remains (mm)
R1.0 (Recommended)	0	0.17
R1.5	0.09	0.08
R2.0	0.30	0

Instructions for Profile Milling with "ZOMW06" Type Insert

Ramping



Helical Interpolation



- Calculation of Tool Pass Dia.

- Depth of cut per one circle should not exceed max. depth of cut ap.
- Down cutting is recommented, so tool pass rotation should becounterclockwise

			Ramping		Helical interplation	
Tool Dia.Dc (mm)	Effective cutting dia. (mm)	Max.Depth of Cut ap (mm)	Max.Ramping	Total Cutting Length L(mm) at max.ap	Min,bore dia. Dh min (mm)	Max.bore dia. Dh max (mm)
8	4.7	0.25	2 54'	5.5	11	14
9	5.7	0.25	2 36'	6.5	13	16
10	6.6	0.3	2 18'	7.5	15	18
11	7.6	0.3	1 54	9	17	20
12	8.5	0.3	1 36	10.7	19	22
13	9.5	0.3	1 24	12.3	21	24
14	10.5	0.3	1 18	13.2	23	26

In case of ramping and helical interpolation, apply 70% or less feed speed standard cutting condition table.

In case of drilling, apply 50% or less Z axis feed speed from standard cutting condition table.

SPARES

SCREW CODE	T-KEY
SCREW FOR ZOMW 06(M1.8 X 4-A)	T-6