

A new generation of high feed milling cutter with **versatility and long life**





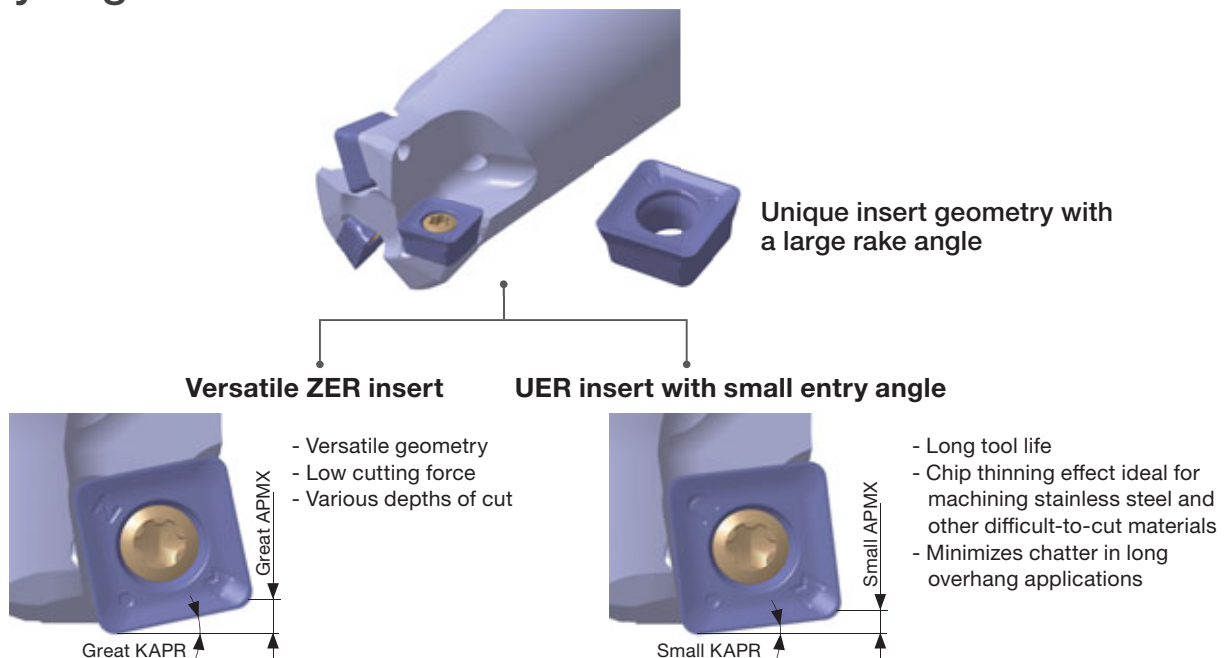
ACCELERATED MACHINING



The unique insert design **allows changing entry angles!** Optimal D.O.C. can be selected in machining various work materials!

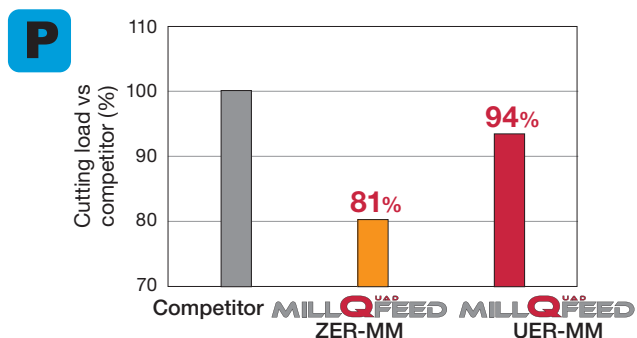
HFM cutter with **maximum versatility and efficiency**

2 types of inserts can fit one cutter body providing two different entry angles



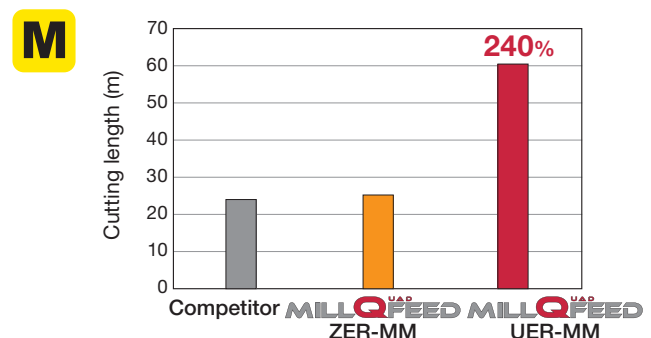
• ZER and UER types cannot be used together in machining.

Comparison of cutting resistance



Cutter: TXSW09M050B22.0R07 ($\phi = 50$ mm, $z = 7$),
Insert: SWMT0904ZER-MM AH3135, SWMT0904UER-MM AH3135, Workpiece material: S55C / C55 (180HB), Cutting speed: $V_c = 150$ m/min, Feed per tooth: $f_z = 1.5$ mm/t, Depth of cut: $a_p = 0.8$ mm, Depth of width: $a_e = 32$ mm, Number of teeth : 1, Coolant: Dry, Machine: Vertical M/C, BT50

Comparison of tool life



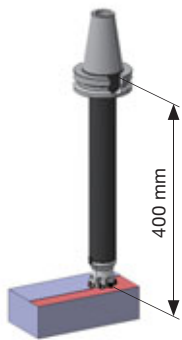
Cutter: TXSW09M050B22.0R07 ($\phi = 50$ mm, $z = 7$),
Insert: SWMT0904ZER-MM AH3135, SWMT0904UER-MM AH3135, Workpiece material: SUS630 / X5CrNiCuNb16-4 (40HRC), Cutting speed: $V_c = 100$ m/min, Feed per tooth: $f_z = 0.6$ mm/t, Depth of cut: $a_p = 0.8$ mm, Depth of width: $a_e = 32$ mm, Number of teeth : 1, Coolant: Wet, Machine: Vertical M/C, BT50

Close-pitch design for high efficiency

Tool diameter	MILLQ ^{UAP} FEED	A leading competitor	MillQuadFeed's insert density vs competitor
ø25	3 flutes	2 flutes	150 %
ø32	4 flutes	3 flutes	133 %
ø40	5 flutes	4 flutes	125 %
ø50	7 flutes	5 flutes	140 %



Superior chatter stability



Tool diameter	Number of teeth	fz (mm/t)		
		1	1.2	1.5
MILLQ ^{UAP} FEED	7	OK	OK	OK
Competitor	7	Chatter	Chatter	OK
Competitor	5	Chatter	Chatter	OK

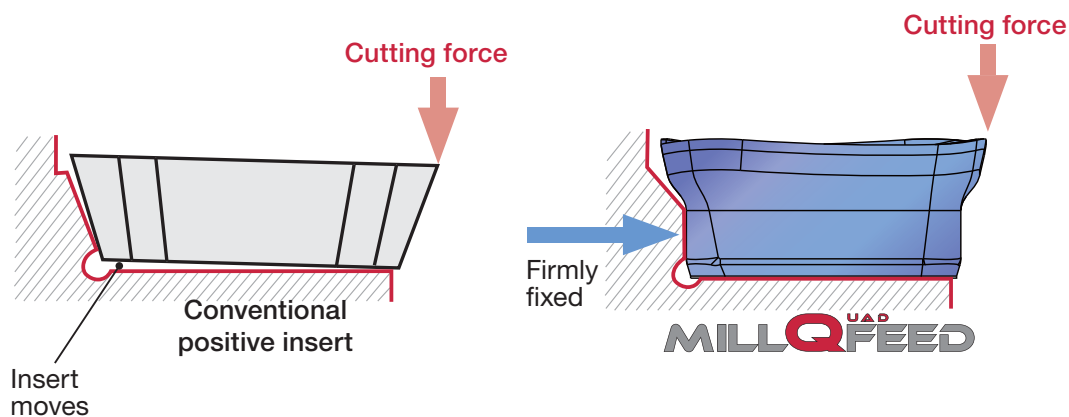
Cutter : TXSW09M050B22.0R07
 (ø = 50 mm, z = 7)
 Insert : SWMT0904UER-MM
 Workpiece material : S55C / C55
 Cutting speed : Vc = 120 m/min
 Depth of cut : ap = 0.5 mm
 Depth of width : ae = 32 mm
 Number of teeth : 7
 Coolant : Dry
 Machine : Vertical M/C, BT50

A stable operation is possible due to UER-MM geometry providing a small entry angle, despite using 7 cutting edges in an 8xD tool length

A hybrid positive+negative configuration enables low cutting force and high insert rigidity

The insert's straight sides secure the insert on the pocket against cutting force

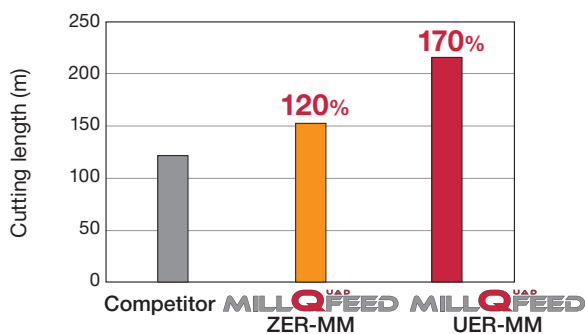
- Ensures reliability in heavy machining
- Replaces top clamp with simple screw clamping



CUTTING PERFORMANCE

Comparisons of tool life

09 Insert

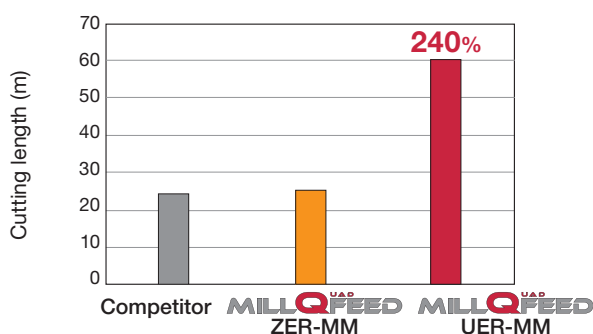


P

Cutter : EXSW09M025C25.0R03 ($\phi = 25$ mm, $z = 3$)
 Insert : SWMT0904ZER-MM AH3135
 : SWMT0904UER-MM AH3135
 Workpiece material : S55C / C55 (180HB)
 Cutting speed : $V_c = 150$ m/min
 Feed per tooth : $f_z = 1.5$ mm/t
 Depth of cut : $a_p = 0.8$ mm
 Depth of width : $a_e = 9$ mm
 Number of teeth : 1
 Coolant : Dry
 Machine : Vertical M/C, BT50

Wear-resistant MM geometry with sharp cutting edges has increased the tool life by 1.7x

09 Insert

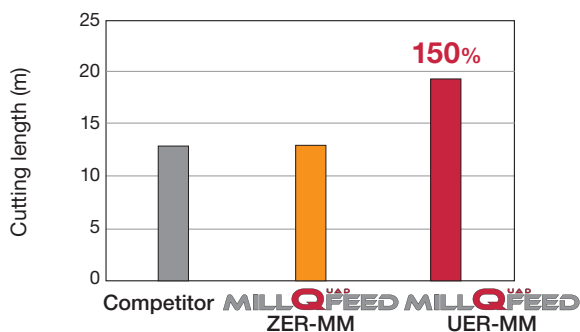


M

Cutter : TXSW09M050B22.0R07 ($\phi = 50$ mm, $z = 7$)
 Insert : SWMT0904ZER-MM AH3135
 : SWMT0904UER-MM AH3135
 Workpiece material : SUS630 / X5CrNi18-9 (40HRC)
 Cutting speed : $V_c = 100$ m/min
 Feed per tooth : $f_z = 0.6$ mm/t
 Depth of cut : $a_p = 0.8$ mm
 Depth of width : $a_e = 32$ mm
 Number of teeth : 1
 Coolant : Wet
 Machine : Vertical M/C, BT50

UER-MM geometry extends insert life by 2.4x thanks to low cutting temperatures generated by a small entry angle

15 Insert



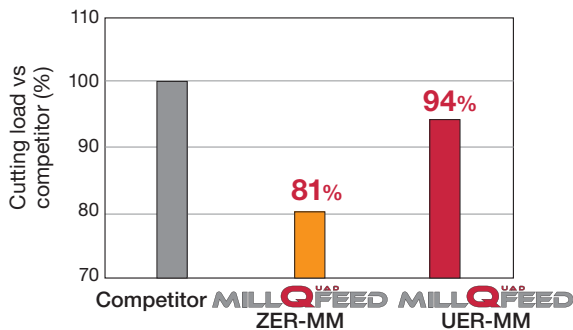
M

Cutter : TXSW15J080B31.7R05 ($\phi = 80$ mm, $z = 5$)
 Insert : SWMT1506ZER-MM AH3135
 : SWMT1506UER-MM AH3135
 Workpiece material : SUS630 / X5CrNi18-9 (40HRC)
 Cutting speed : $V_c = 100$ m/min
 Feed per tooth : $f_z = 0.6$ mm/t
 Depth of cut : $a_p = 1$ mm
 Depth of width : $a_e = 45$ mm
 Number of teeth : 1
 Coolant : Wet
 Machine : Vertical M/C, BT50

UER-MM geometry extends insert life by 1.5x thanks to its small entry angle generating low cutting temperatures

Comparisons of cutting loads

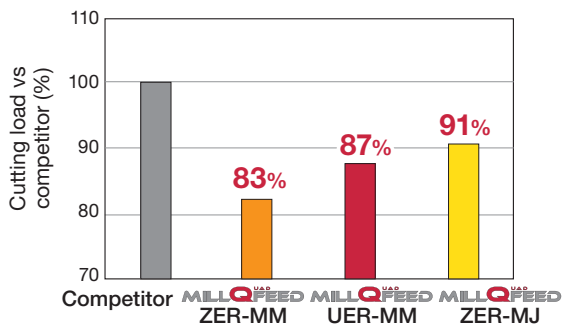
09 Insert



Cutter : TSW09M050B22.0R07 ($\phi = 50$ mm, $z = 7$)
 Insert : SWMT0904ZER-MM AH3135
 : SWMT0904UER-MM AH3135
 Workpiece material : S55C / C55 (180HB)
 Cutting speed : $V_c = 150$ m/min
 Feed per tooth : $f_z = 1.5$ mm/t
 Depth of cut : $a_p = 0.8$ mm
 Depth of width : $a_e = 32$ mm
 Number of teeth : 1
 Coolant : Dry
 Machine : Vertical M/C, BT50

Optimized chipbreaker geometry reduces cutting load by nearly 20%

15 Insert



Cutter : TSW15J080B31.7R05 ($\phi = 80$ mm, $z = 5$)
 Insert : SWMT1506ZER-MM AH3135
 : SWMT1506UER-MM AH3135
 Workpiece material : S55C / C55 (180HB)
 Cutting speed : $V_c = 150$ m/min
 Feed per tooth : $f_z = 2$ mm/t
 Depth of cut : $a_p = 2$ mm
 Depth of width : $a_e = 50$ mm
 Number of teeth : 1
 Coolant : Dry
 Machine : Vertical M/C, BT50

Cutting load has been reduced by nearly 20% due to optimal chipbreaker geometry

Choice of tools: MillQuadFeed and DoFeed

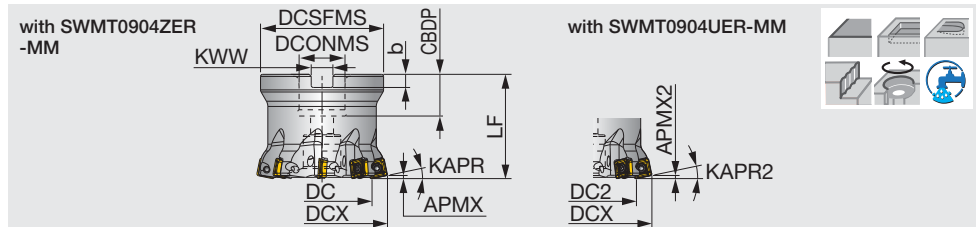
⊙: First choice
○: Supplementary

Series	MILLQ^{UAD}FEED	DOFEED
Tool image		
Tool diameter (mm)	ø25 - ø160	ø16 - ø200
Max. depth of cut (mm)	1, 1.5, 2, 2.5	1, 1.5
No. of edges per insert	4	4
Efficiency (density)	○	⊙
Tool life	⊙	○
Light cutting	○	⊙
Chip evacuation	○	⊙
Ramping	⊙	○
Corner radius deviation	○	⊙
Long overhang applications	⊙	○

New**TXSW09**

High feed mill for 4-corner, single sided inserts

GAMP = +3.8°, GAMF = -3.5°



Designation	APMX	APMX2	DCX	CICT	DC	DC2	DCSFMS	DCONMS	CBDP	LF	KWW	b	KAPR	KAPR2	WT(kg)	Air hole	Insert
TXSW09M040B16.0R05	1.5	1	40	5	25	24	38	16	18	40	8.4	5.6	12°	7°	0.2	With	SWMT09...
TXSW09M050B22.0R07	1.5	1	50	7	35	34	47	22	20	50	10.4	6.3	12°	7°	0.38	With	SWMT09...

SPARE PARTS

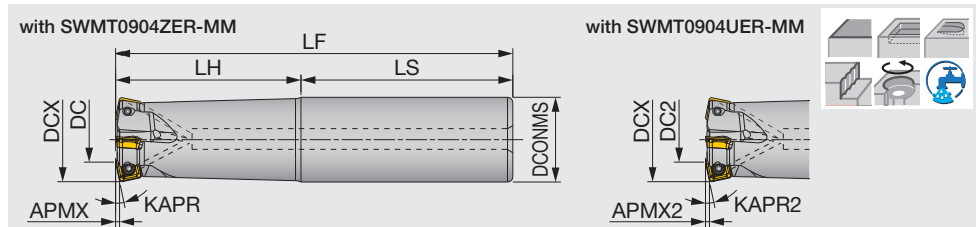
Designation	Clamping screw	Torx bit	Grip	Shell locking bolt	Lubricant
TXSW09...	CSPD-3	BLDIP10/S7	H-TB2W	CM10X30H	M-1000

• Recommended clamping torque (N·m): CSPD-3=2.5

New**EXSW09**

High feed mill for 4-corner, single sided inserts

GAMP = +3.9°, GAMF = -3.5°



Designation	APMX	APMX2	DCX	CICT	DC	DC2	DCONMS	LF	LH	LS	KAPR	KAPR2	WT(kg)	Air hole	Insert
EXSW09M025C25.0R03	1.5	1.0	25	3	10	9	25	140	60	80	12°	7°	0.45	With	SWMT09...
EXSW09M025C25.0R03L	1.5	1.0	25	3	10	9	25	180	100	80	12°	7°	0.57	With	SWMT09...
EXSW09M032C32.0R04	1.5	1.0	32	4	17	16	32	150	70	80	12°	7°	0.81	With	SWMT09...
EXSW09M032C32.0R04L	1.5	1.0	32	4	17	16	32	200	120	80	12°	7°	1.07	With	SWMT09...

SPARE PARTS

Designation	Clamping screw	Wrench	Lubricant
EXSW09...	CSPD-3	IP-10D	M-1000

• Recommended clamping torque (N·m): CSPD-3=2.5

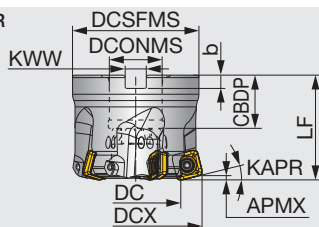
TXSW15

High feed mill for 4-corner, single sided inserts

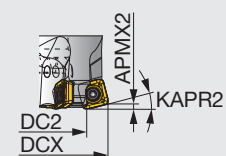
GAMP = +5°, GAMF = 0°



with SWMT1506ZER
-MM/-MJ



with SWMT1506UER-MM



Designation	APMX	APMX2	DCX	CICT	DC	DC2	DCSFMS	LF	DCONMS	CBDP	KWW	b	KAPR	KAPR2	WT(kg)	Air hole	Insert
TXSW15M050B22.0R03	2.5	2	50	3	24.1	22.2	47	50	22	20	10.4	6.3	14°	10°	0.4	With	SWMT15...
TXSW15M063B22.0R04	2.5	2	63	4	37.1	35.2	59	50	22	20	10.4	6.3	14°	10°	0.66	With	SWMT15...
TXSW15J080B31.7R05	2.5	2	80	5	54.1	52.2	76	63	31.75	32	12.7	8	14°	10°	1.31	With	SWMT15...
TXSW15M080B27.0R05	2.5	2	80	5	54.1	52.2	76	63	27	22	12.4	7	14°	10°	1.41	With	SWMT15...
TXSW15J100B31.7R06	2.5	2	100	6	74.1	72.2	96	63	31.75	32	12.7	8	14°	10°	2.25	With	SWMT15...
TXSW15M100B32.0R06	2.5	2	100	6	74.1	72.2	96	63	32	25	14.4	8	14°	10°	2.26	With	SWMT15...
TXSW15J125B38.1R07	2.5	2	125	7	99.1	97.2	100	63	38.1	43	15.9	10	14°	10°	2.91	With	SWMT15...
TXSW15M125B40.0R07	2.5	2	125	7	99.1	97.2	100	63	40	37	16.4	9	14°	10°	2.83	With	SWMT15...
TXSW15J160B50.8R08	2.5	2	160	8	134.1	132.2	100	63	50.8	46	19	11	14°	10°	3.93	With	SWMT15...
TXSW15M160B40.0R08	2.5	2	160	8	134.1	132.2	100	63	40	37	16.4	9	14°	10°	4.23	With	SWMT15...

SPARE PARTS

Designation	Clamping screw	Grip	Lubricant	Shell locking bolt 1	Shell locking bolt 2	Shell locking bolt 3	Torx bit
TXSW15M050B22.0R03	TS50115I	H-TB2W	M-1000	-	-	SRPS118-0273	BT20S
TXSW15M063B22.0R04	TS50115I	H-TB2W	M-1000	-	FSHM10-40H	-	BT20S
TXSW15J080B31.7R05	TS50115I	H-TB2W	M-1000	-	CM16X40H	-	BT20S
TXSW15M080B27.0R05	TS50115I	H-TB2W	M-1000	-	CM12X30H	-	BT20S
TXSW15*100B...	TS50115I	H-TB2W	M-1000	-	CM16X40H	-	BT20S
TXSW15*125B...	TS50115I	H-TB2W	M-1000	TMBA-M20H	-	-	BT20M
TXSW15J160B50.8R08	TS50115I	H-TB2W	M-1000	TMBA-M24H	-	-	BT20M
TXSW15M160B40.0R08	TS50115I	H-TB2W	M-1000	TMBA-M20H	-	-	BT20M

*Recommended clamping torque (N·m): TS50115I=5

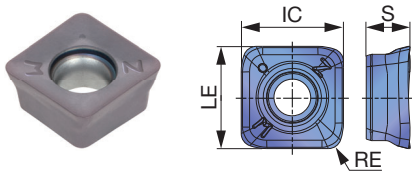
When installing TXSM15M050B22.0R03 on the arbor

- Always use the dedicated shell locking bolt (part code: SRPS118-0273) included in the package.
- Thoroughly read the installation manual included in the package before installation.

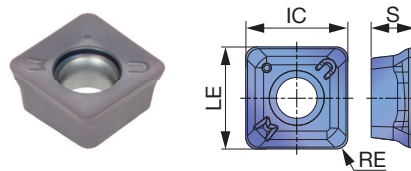


INSERTS

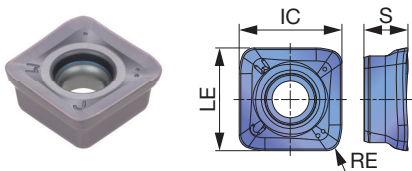
SWMT09/15ZER-MM



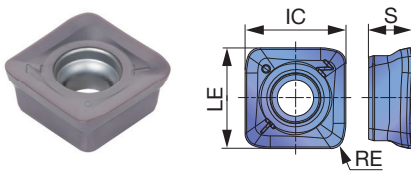
SWMT09/15UER-MM



SWMT15ZER-MJ



SWMT15ZER-MT



P	Steel	☆	★	
M	Stainless		★	
K	Cast iron	★		
N	Non-ferrous			
S	Superalloys	★	☆	
H	Hard materials	★	★	

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated		LE	IC	S
			AH120	AH3135			
SWMT0904ZER-MM	1	1.5	●	●	8.605	8.605	4
SWMT0904UER-MM	1	1	●	●	9.05	9.05	4
SWMT1506ZER-MM	2	2.5	●	●	16.01	16.01	6.8
SWMT1506UER-MM	2	2	●	●	16.27	16.27	6.8
SWMT1506ZER-MJ*	2	2.5	▲	▲	15.925	15.925	6.8
SWMT1506ZER-MT	2	2.5	●	●	15.925	15.925	6.8

*SWMT15...-MJ inserts will be replaced with SWMT15....-MT inserts as soon as the existing stocks are consumed. Insert description and ID inscriptions on the insert will be updated accordingly. This change will not adversely affect insert performance.

● : Line up
▲ : To be discontinued

STANDARD CUTTING CONDITIONS

09 type

ISO	Workpiece material	Hardness	Priority	Entry angle symbol	Chip-breaker	Grade	Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)
P	Carbon steel S45C, S55C, etc., C45, C55, etc.	- 300HB	First choice	ZER	MM	AH3135	100 - 300	0.5 - 1.5
			for wear resistance	UER	MM	AH3135	100 - 300	0.5 - 1.5
	Alloy steel SCM440, etc., 42CrMo4, 17Cr3, etc.	- 300HB	First choice	ZER	MM	AH3135	100 - 200	0.5 - 1.5
			for wear resistance	UER	MM	AH3135	100 - 200	0.5 - 1.5
	Prehardened steel NAK80, PX5, etc.	30 - 40HRC	First choice	ZER	MM	AH3135	100 - 200	0.5 - 1.2
			for wear resistance	UER	MM	AH3135	100 - 200	0.5 - 1.2
M	Austenitic stainless steel SUS304, X5CrNi18-9, etc.	- 200HB	First choice	UER	MM	AH3135	100 - 150	0.5 - 1.2
			Low cutting load	ZER	MM	AH3135	100 - 150	0.5 - 1.2
	Precipitation hardening stainless steel SUS630, X20CrNiCuNb-16-4, etc.	28HRC - (H1150)	First choice	UER	MM	AH3135	80 - 150	0.3 - 1.2
			Low cutting load	ZER	MM	AH3135	80 - 150	0.3 - 1.2
		40HRC - (H900)	First choice	UER	MM	AH3135	80 - 120	0.3 - 0.8
			Low cutting load	ZER	MM	AH3135	80 - 120	0.3 - 0.8
K	Gray cast iron FC250, FC300, etc. 250, 300, etc., GG25, GG30, etc.	150 - 250HB	First choice	ZER	MM	AH3135	100 - 300	0.5 - 2
	Ductile cast iron FCD600, etc., 600-3, etc., GGG40, etc.	150 - 250HB	First choice	ZER	MM	AH3135	80 - 200	0.5 - 2
S	Titanium alloys Ti-6Al-4V, etc.	- 40HRC	First choice	UER	MM	AH3135	30 - 60	0.3 - 0.7
			Low cutting load	ZER	MM	AH3135	30 - 60	0.3 - 0.7
	Heat-resistance alloys Inconel, Hastelloy, etc.	- 40HRC	First choice	UER	MM	AH3135	20 - 50	0.1 - 0.3
			for wear resistance	ZER	MM	AH3135	20 - 50	0.1 - 0.3
H	Hardened steel SKD61, etc. X40CrMoV5-1, etc.	40 - 50HRC	First choice	ZER	MM	AH3135	80 - 130	0.1 - 0.3

Tool dia.: DC (mm), Number of revolutions: n (min^{-1}), Feed speed: V_f (mm/min), Number of inserts: z

$\varnothing 25, z = 3$		$\varnothing 32, z = 4$		$\varnothing 40, z = 5$		$\varnothing 50, z = 7$	
n	V_f	n	V_f	n	V_f	n	V_f
2,550	7,650	1,990	7,960	1,590	7,950	1,270	8,890
			$V_c = 200 \text{ m/min}, fz = 1.0 \text{ mm/t}$				
1,910	5,730	1,490	5,960	1,190	5,950	960	6,720
			$V_c = 150 \text{ m/min}, fz = 1.0 \text{ mm/t}$				
1,910	4,580	1,490	4,770	1,190	4,760	960	5,380
			$V_c = 150 \text{ m/min}, fz = 0.8 \text{ mm/t}$				
1,530	3,670	1,190	3,810	960	3,840	760	4,260
			$V_c = 120 \text{ m/min}, fz = 0.8 \text{ mm/t}$				
1,530	3,670	1,190	3,810	960	3,840	760	4,260
			$V_c = 120 \text{ m/min}, fz = 0.8 \text{ mm/t}$				
1,270	2,290	1,000	2,400	800	2,400	640	2,690
			$V_c = 100 \text{ m/min}, fz = 0.6 \text{ mm/t}$				
2,550	9,180	1,990	9,550	1,590	9,540	1,270	10,670
			$V_c = 200 \text{ m/min}, fz = 1.2 \text{ mm/t}$				
1,910	6,880	1,490	7,150	1,190	7,140	1,270	10,670
			$V_c = 150 \text{ m/min}, fz = 1.2 \text{ mm/t}$				
510	770	400	800	320	800	250	880
			$V_c = 40 \text{ m/min}, fz = 0.5 \text{ mm/t}$				
380	230	300	240	240	240	190	270
			$V_c = 30 \text{ m/min}, fz = 0.2 \text{ mm/t}$				
1,270	760	1,000	800	800	800	640	900
			$V_c = 100 \text{ m/min}, fz = 0.2 \text{ mm/t}$				

STANDARD CUTTING CONDITIONS

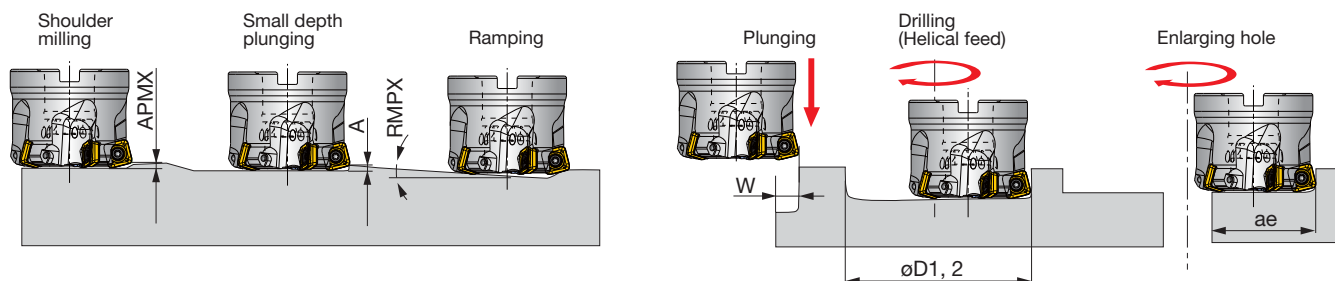
15 type

ISO	Workpiece material		Hardness	Priority	Entry angle symbol	Chip-breaker	Grade	Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)	
P	Carbon steel S45C, S55C, etc. C45, C55, etc.		- 300HB	First choice	ZER	MM	AH3135	100 - 300	0.5 - 1.5	
				for wear resistance	ZER	MM	AH120	100 - 300	0.5 - 1.5	
				for impact resistance	ZER	MT	AH3135	100 - 300	0.5 - 2.0	
	Alloy steel SCM440, etc. 42CrMo4, 17Cr3, etc.		- 300HB	First choice	ZER	MM	AH3135	100 - 200	0.5 - 1.5	
				for wear resistance	ZER	MM	AH120	100 - 200	0.5 - 1.5	
				for impact resistance	ZER	MT	AH3135	100 - 200	0.5 - 2.0	
	Prehardened steel NAK80, PX5, etc.		30 - 40HRC	First choice	ZER	MM	AH3135	100 - 200	0.5 - 1.2	
				for wear resistance	ZER	MM	AH120	100 - 200	0.5 - 1.2	
				for impact resistance	ZER	MT	AH3135	100 - 200	0.5 - 1.5	
M	Austenitic stainless steel SUS304, X5CrNi18-9, etc.		- 200HB	First choice	UER	MM	AH3135	100 - 150	0.5 - 1.2	
				Low cutting load	ZER	MM	AH3135	100 - 150	0.5 - 1.2	
	Precipitation hardening stainless steel SUS630, X20CrNiCuNb-16-4, etc.		28HRC - (H1150)	First choice	UER	MM	AH3135	80 - 150	0.3 - 1.2	
				Low cutting load	ZER	MM	AH3135	80 - 150	0.3 - 1.2	
			40HRC - (H900)		First choice	UER	MM	AH3135	80 - 120	0.3 - 0.8
					Low cutting load	ZER	MM	AH3135	80 - 120	0.3 - 0.8
K	Gray cast iron FC250, FC300, etc. 250, 300, etc. GG25, GG30, etc.		150 - 250HB	First choice	ZER	MT	AH120	100 - 300	0.5 - 2.0	
				for impact resistance	ZER	MT	AH3135	100 - 300	0.5 - 2.0	
				Low cutting load	ZER	MM	AH120	100 - 300	0.5 - 1.5	
	Ductile cast iron FCD600, etc. 600-3, etc. GGG40, etc.		150 - 250HB	First choice	ZER	MT	AH120	80 - 200	0.5 - 2.0	
				for impact resistance	ZER	MT	AH3135	80 - 200	0.5 - 2.0	
				Low cutting load	ZER	MM	AH120	80 - 200	0.5 - 1.5	
S	Titanium alloys Ti-6Al-4V, etc.		- 40HRC	First choice	UER	MM	AH3135	30 - 60	0.3 - 0.7	
				Low cutting load	ZER	MM	AH3135	30 - 60	0.3 - 0.7	
				for impact resistance	ZER	MT	AH3135	30 - 60	0.3 - 0.7	
	Heat-resistance alloys Inconel, Hastelloy, etc.		- 40HRC	First choice	UER	MM	AH3135	20 - 50	0.1 - 0.3	
				for wear resistance	ZER	MM	AH120	20 - 50	0.1 - 0.3	
H	Hardened steel	SKD61, etc. X40CrMoV5-1, etc.	40 - 50HRC	First choice	ZER	MT	AH3135	80 - 130	0.1 - 0.3	
				for wear resistance	ZER	MT	AH120	80 - 130	0.1 - 0.3	
			SKD11, etc. X153CrMoV12, etc.	50 - 60HRC	First choice	ZER	MT	AH120	50 - 70	0.05 - 0.2

Tool dia.: DC (mm), Number of revolutions: n (min⁻¹), Feed speed: V_f (mm/min), Number of inserts: z

ø50, z = 3		ø63, z = 4		ø80, z = 5		ø100, z = 6		ø125, z = 7		ø160, z = 8	
n	V_f	n	V_f	n	V_f	n	V_f	n	V_f	n	V_f
1,270	3,810	1,010	4,040	800	4,000	640	3,840	510	3,570	400	3,200
$V_c = 200$ m/min, $f_z = 1.0$ mm/t											
1,270	4,570	1,010	4,850	800	4,800	640	4,610	510	4,280	400	3,840
$V_c = 200$ m/min, $f_z = 1.2$ mm/t											
960	2,880	760	3,040	600	3,000	480	2,880	380	2,660	300	2,400
$V_c = 150$ m/min, $f_z = 1.0$ mm/t											
960	3,460	760	3,650	600	3,600	480	3,460	380	3,190	300	2,880
$V_c = 150$ m/min, $f_z = 1.2$ mm/t											
960	2,300	760	2,430	600	2,400	480	2,300	380	2,130	300	1,920
$V_c = 150$ m/min, $f_z = 0.8$ mm/t											
960	2,880	760	3,040	600	3,000	480	2,880	380	2,660	300	2,400
$V_c = 150$ m/min, $f_z = 1.0$ mm/t											
760	1,820	610	1,950	480	1,920	380	1,820	310	1,740	240	1,540
$V_c = 120$ m/min, $f_z = 0.8$ mm/t											
760	1,820	610	1,950	480	1,920	380	1,820	310	1,740	240	1,540
$V_c = 120$ m/min, $f_z = 0.8$ mm/t											
640	1,150	510	1,220	400	1,200	320	1,150	250	1,050	200	960
$V_c = 100$ m/min, $f_z = 0.6$ mm/t											
1,270	4,570	1,010	4,850	800	4,800	640	4,610	510	4,280	400	3,840
$V_c = 200$ m/min, $f_z = 1.2$ mm/t											
1,270	3,810	1,010	4,040	800	4,000	640	3,840	510	3,570	400	3,200
$V_c = 200$ m/min, $f_z = 1.0$ mm/t											
960	3,460	760	3,650	600	3,600	480	3,460	380	3,190	300	2,880
$V_c = 150$ m/min, $f_z = 1.2$ mm/t											
960	2,880	760	3,040	600	3,000	480	2,880	380	2,660	300	2,400
$V_c = 150$ m/min, $f_z = 1.0$ mm/t											
250	380	200	400	160	400	130	390	100	350	80	320
$V_c = 40$ m/min, $f_z = 0.5$ mm/t											
200	120	150	120	120	120	100	120	80	110	60	100
$V_c = 30$ m/min, $f_z = 0.2$ mm/t											
640	380	510	410	400	400	320	380	250	350	200	320
$V_c = 100$ m/min, $f_z = 0.2$ mm/t											
380	140	300	140	240	140	190	140	150	130	120	120
$V_c = 60$ m/min, $f_z = 0.12$ mm/t											

APPLICATION RANGE



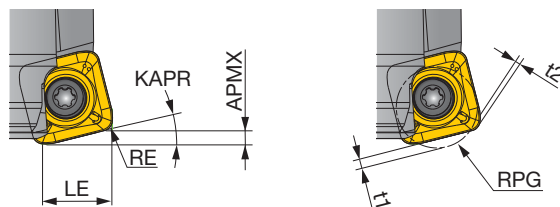
09 type

Designation	Tool dia. DCX	Max. depth of cut		Max. plunging depth	Max. ramping angle	Max. cutting width in plunging		Min. machining dia.	Max. machining dia.	Max. cutting width in enlarging				
		APMX		A	RMPX		W		øD1		øD2		ae	
		SWMT 09**ZER	SWMT 09**UER		SWMT 09**ZER	SWMT 09**UER	SWMT 09**ZER	SWMT 09**UER	SWMT 09**ZER	SWMT 09**UER	SWMT 09**ZER	SWMT 09**UER	SWMT 09**ZER	SWMT 09**UER
EXSW09M025...	25	1.5	1	0.3	4.8	6	7	7.5	34	33	47	47	16.5	16
EXSW09M032...	32	1.5	1	0.3	2.7	3.2	7	7.5	48	47	61	61	23.5	23
TXSW09M040...	40	1.5	1	0.3	1.8	2.1	7	7.5	64	63	77	77	31.5	31
TXSW09M050...	50	1.5	1	0.3	1.2	1.4	7	7.5	84	83	97	97	41.5	41

15 type

Designation	Tool dia. DCX	Max. depth of cut		Max. plunging depth	Max. ramping angle	Max. cutting width in plunging		Min. machining dia.	Max. machining dia.	Max. cutting width in enlarging	
		APMX		A	RMPX	W		øD1	øD2	ae	
		SWMT 15**ZER	SWMT 15**UER			SWMT 15**ZER	SWMT 15**UER	SWMT 15**ZER	SWMT 15**UER	SWMT 15**ZER	SWMT 15**UER
TXSW15M050B...	50	2.5	2	0.7	4.8°	12.5	13.5	70	95	36	35
TXSW15M063B...	63	2.5	2	0.7	2.9°	12.5	13.5	96	121	49	48
TXSW15J, M080B...	80	2.5	2	0.7	2°	12.5	13.5	130	155	66	65
TXSW15J, M100B...	100	2.5	2	0.7	1.4°	12.5	13.5	170	195	86	85
TXSW15J, M125B...	125	2.5	2	0.7	1°	12.5	13.5	220	245	111	110
TXSW15J, M160B...	160	2.5	2	0.7	0.7°	12.5	13.5	290	315	146	145

TOOL GEOMETRY ON PROGRAM



09 type

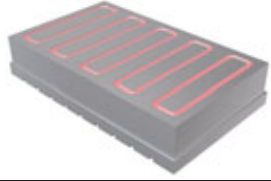
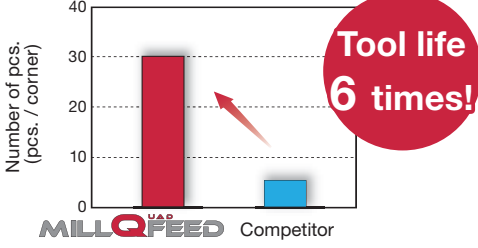
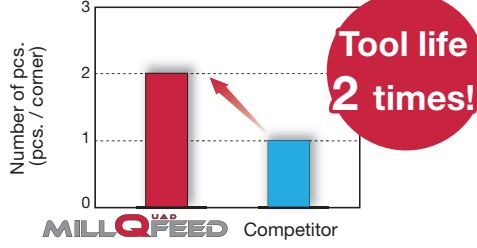
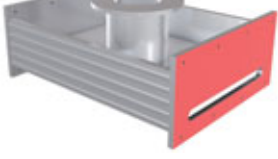
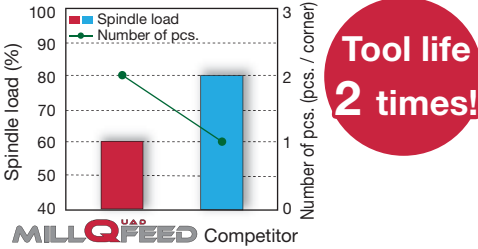
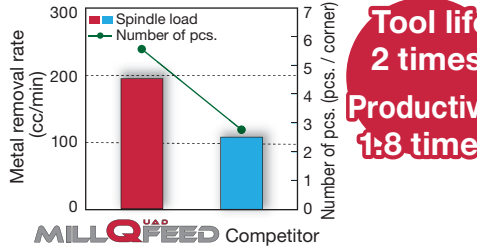
APMX (mm)		Actual corner radius RE (mm)	LE (mm)		KAPR		Programmed corner radius RPG	Uncut amount: t1 (mm)		Overcut amount: t2 (mm)	
SWMT 09**ZER	SWMT 09**UER		SWMT 09**ZER	SWMT 09**UER	SWMT 09**ZER	SWMT 09**UER		SWMT 09**ZER	SWMT 09**UER	SWMT 09**ZER	SWMT 09**UER
1.5	1	1	7.4	7.9	12°	7°	1	1.3	0.81	-	-
1.5	1	1	7.4	7.9	12°	7°	1.5	1.21	0.76	-	-
1.5	1	1	7.4	7.9	12°	7°	2	1.12	0.7	-	0.02
1.5	1	1	7.4	7.9	12°	7°	2.5	1.03	0.65	0.01	0.15
1.5	1	1	7.4	7.9	12°	7°	3	0.94	0.59	0.11	0.33

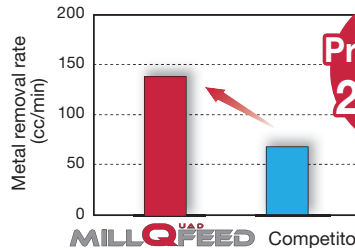
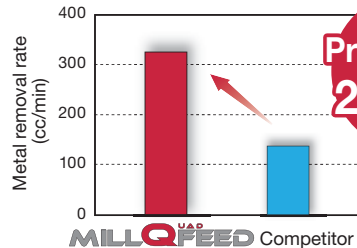
15 type

APMX (mm)		Actual corner radius RE (mm)	LE (mm)		KAPR		Programmed corner radius RPG	Uncut amount: t1 (mm)		Overcut amount: t2 (mm)	
SWMT 15**ZER	SWMT 15**UER		SWMT 15**ZER	SWMT 15**UER	SWMT 15**ZER	SWMT 15**UER		SWMT 15**ZER	SWMT 15**UER	SWMT 15**ZER	SWMT 15**UER
2.5	2	2	12.7	13.8	14°	10°	3.5	2.1	1.85	-	-
2.5	2	2	12.7	13.8	14°	10°	4	1.99	1.77	-	-
2.5	2	2	12.7	13.8	14°	10°	4.5	1.88	1.69	-	0.03
2.5	2	2	12.7	13.8	14°	10°	5	1.78	1.61	0.01	0.13

The above table shows the uncut (t1) and overcut (t2) amounts for the programmed corner radius.

PRACTICAL EXAMPLES

Workpiece type		Rod end bearing part	Magnetic chuck
Cutter		EXSW09M032C32.0R04 (ø32, z=4)	EXSW09M025C25.0R03 (ø25, z=3)
Insert		SWMT0904UER-MM	SWMT0904UER-MM
Grade		AH3135	AH3135
Workpiece material		17-4PH (PH stainless steel, 38HRC)	SS400 / E275A
		 M	 P
Cutting conditions	Cutting speed : Vc (m/min)	200	274
	Feed per tooth : fz (mm/t)	0.75	0.83
	Depth of cut : ap (mm)	0.6	0.7
	Width of cut : ae (mm)	13	25
	Machining	Face milling	Grooving
	Coolant	Wet	Wet
Machine		Multi task machine	Horizontal M/C, BT50
Results		 Tool life 6 times!	 Tool life 2 times!
		UER-MM has provided 6x the tool life in difficult-to-cut material over the competitor's insert.	Competitor's tool had chattered when machining corners. UER-MM eliminated chatter while doubling the tool life in long reach areas.
Workpiece type		Chamber	Plate
Cutter		TXSW15J160B50.8R08 (ø160, z=8)	TXSW15J125B38.1R07 (ø125, z=7)
Insert		SWMT1506ZER-MM	SWMT1506UER-MM
Grade		AH3135	AH3135
Workpiece material		SUS304 / X5CrNi18-9	SUS304 / X5CrNi18-9
		 M	 M
Cutting conditions	Cutting speed : Vc (m/min)	150	150
	Feed per tooth : fz (mm/t)	1	1.2
	Depth of cut : ap (mm)	1	0.5
	Width of cut : ae (mm)	130	97
	Machining	Face milling	Face milling
	Coolant	Dry	Dry
Machine		Horizontal M/C, BT50, 22kW	Vertical M/C, BT50, 22kW
Results		 Tool life 2 times!	 Tool life 2 times! Productivity 1:8 times!
		Free-cutting ZER-MM geometry could reduce spindle load by 20% while doubling the tool life thanks to reduced cutting temperatures.	Thanks to UER-MM's chip thinning effect and low cutting temperature generation, MRR has increased by 1.8x with less thermal deflection of the workpiece. Tool life has also doubled.

Workpiece type		Casting mold	Joint for thermal power part
Cutter		TXSW15J100B31.7R06 ($\phi 100$, $z = 6$)	TXSW15J100B31.7R06 ($\phi 100$, $z = 6$)
Insert		SWMT1506ZER-MJ	SWMT1506ZER-MJ
Grade		AH3135	AH3135
Workpiece material		SKT4 (35HRC)	High chromium steel
			
Cutting conditions	Cutting speed : V_c (m/min)	100	120 (Competitor: $V_c = 100$)
	Feed per tooth : f_z (mm/t)	0.4 (Competitor: $f_z = 0.33$)	1
	Feed speed : V_f (m/min)	763 (Competitor: $V_f = 600$)	2280 (Competitor: $V_f = 1920$)
	Depth of cut : a_p (mm)	2.5 (Competitor: $a_p = 1.5$)	2 (Competitor: $a_p = 1$)
	Width of cut : a_e (mm)	70	70
	Machining	Face milling (Re-sinking)	Face milling
	Coolant	Dry	Air
Machine		Vertical M/C, BT50	Vertical M/C, BT40
Results		 Productivity 2.1 times! Ability to machine large depth at high-feed improves productivity in mold machining.	 Productivity 2.4 times! Outstanding cutting performance of MillQuadFeed allows depth of cut to be increased even in high-feed machining.

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