Member IMC Group Tungaloy

MillLine

For more information

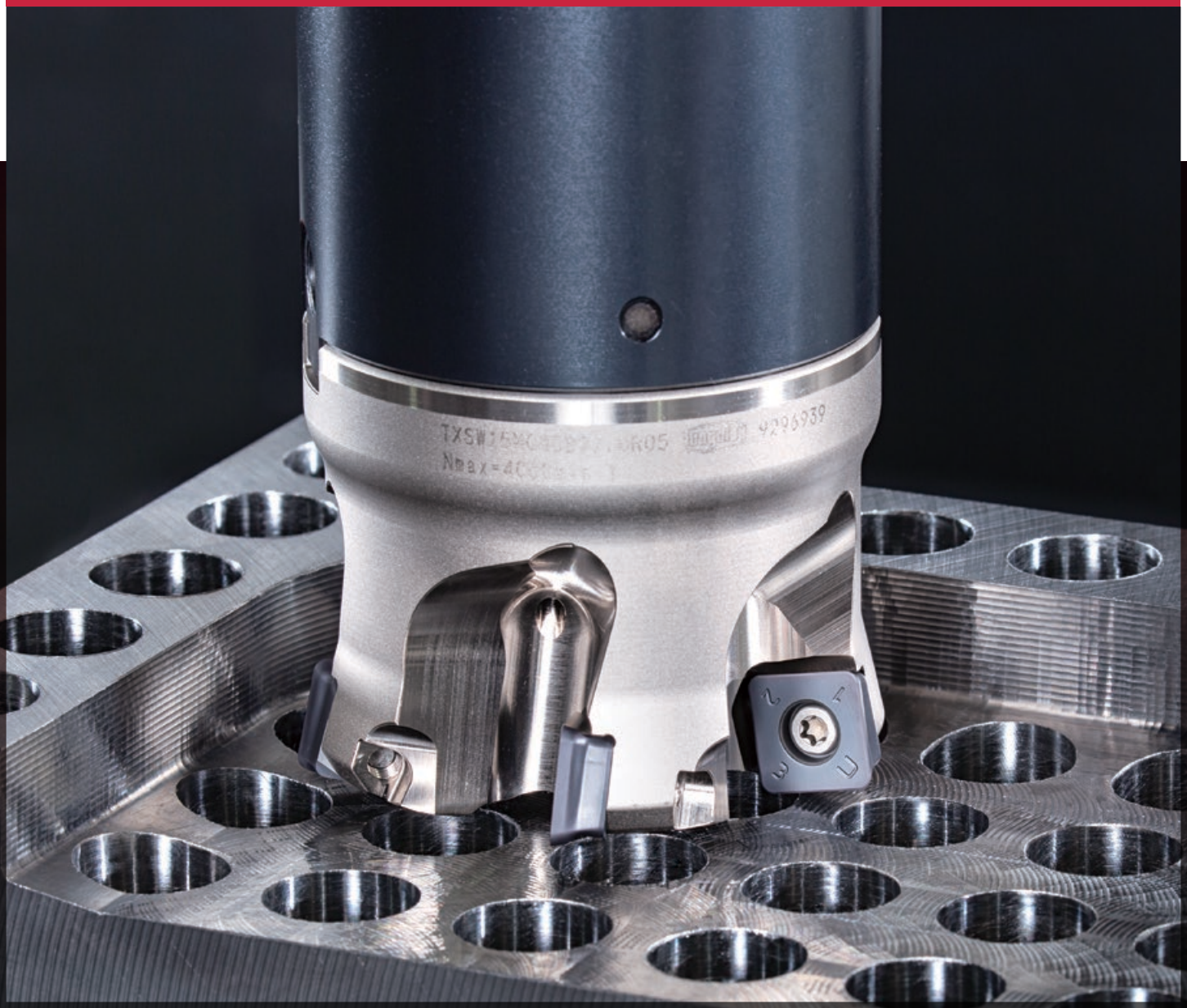
High-feed milling cutter

MILLQFEED UAD

Tungaloy Report No. 502-US

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

New flat top inserts for increased fracture resistance



TUNGALOY ADDFORCE ACCELERATED LINES

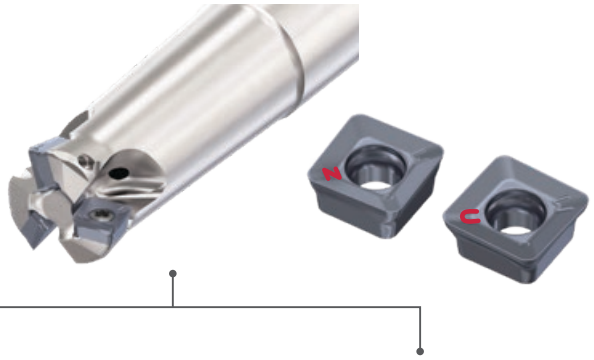
TUNGALOY ADDFORCE MILL
ACCELERATED MILLING

MILLQUAD FEED

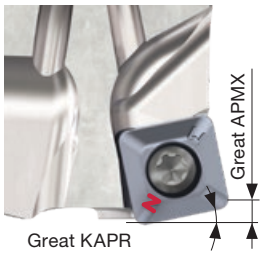
The unique insert design **allows for changing entry angles**.
The optimal depth of cut (D.O.C.) can be selected when machining various work materials.

HFM cutter with **maximum versatility and efficiency**

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

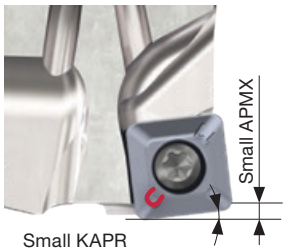


Versatile Z type



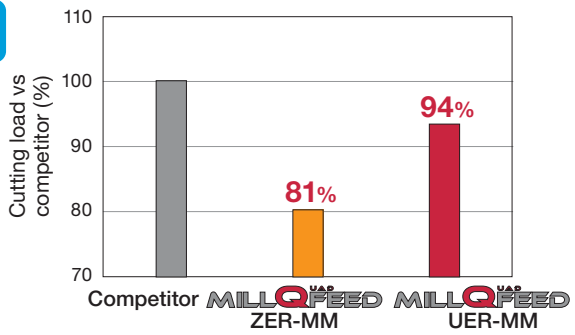
- Versatile geometry
- Low cutting force
- Various depths of cut

U type with small entry angle



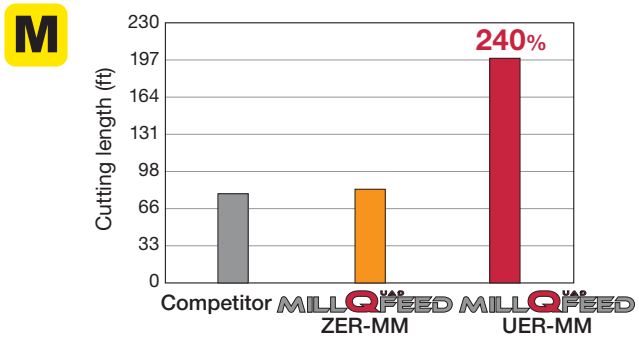
- Long tool life
- Chip thinning effect ideal for machining stainless steel and other difficult-to-cut materials
- Minimizes chatter in long overhang applications

Low cutting force - Z type



Cutter	: TXSW09U2.00B0.75R07 (ø = 2", z = 7)
Insert	: SWMT0904ZER-MM AH3135, SWMT0904UER-MM AH3135
Workpiece material	: S55C / C55 (180HB)
Cutting speed	: *Vc* = 492 sfm
Feed per tooth	: *fz* = 0.059 ipt
Depth of cut	: *ap* = 0.031"
Depth of width	: *ae* = 1.260"
Number of teeth	: 7
Coolant	: Dry
Machine	: Vertical M/C, BT50

Long tool life - U type



Cutter	: TXSW09U2.00B0.75R07 (ø = 2", z = 7)
Insert	: SWMT0904ZER-MM AH3135, SWMT0904UER-MM AH3135
Workpiece material	: SUS630 / X5CrNiCuNb16-4 (40HRC)
Cutting speed	: *Vc* = 328 sfm
Feed per tooth	: *fz* = 0.024 ipt
Depth of cut	: *ap* = 0.031"
Depth of width	: *ae* = 1.260"
Number of teeth	: 7
Coolant	: Wet
Machine	: Vertical M/C, BT50

Superior chatter stability

O.K
Chatter

Tool diameter	Number of teeth	*fz* (ipt) 0.039	0.047	0.059
MILLQUADFEED	7			
Competitor	7			
Competitor	5			

Cutter	: TXSW09U2.00B0.75R07 (ø = 2", z = 7)
Insert	: SWMT0904UER-MM
Workpiece material	: S55C / C55
Cutting speed	: *Vc* = 394 sfm
Depth of cut	: *ap* = 0.020"
Depth of width	: *ae* = 1.26"
Number of teeth	: 7
Coolant	: Dry
Machine	: Vertical M/C, BT50

Stable operation is possible due to the UER-MM geometry, which provides a small entry angle, even with 7 cutting edges in an 8xD tool length

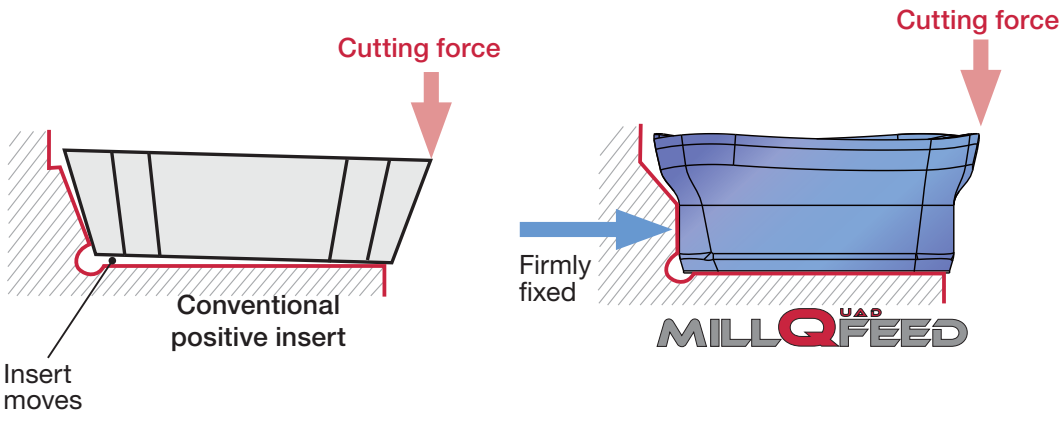
Close-pitch design for high efficiency

Tool diameter	MILLQUADFEED	A leading competitor	MillQuadFeed's insert density vs competitor
ø1"	**3** flutes	2 flutes	**150** %
ø1.25"	**4** flutes	3 flutes	**133** %
ø1.50"	**5** flutes	4 flutes	**125** %
ø2"	**7** flutes	5 flutes	**140** %

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

The insert's straight sides secure it in the pocket against cutting forces

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



MILLQUADFEED

Flat top inserts with high load resistant cutting edges

New

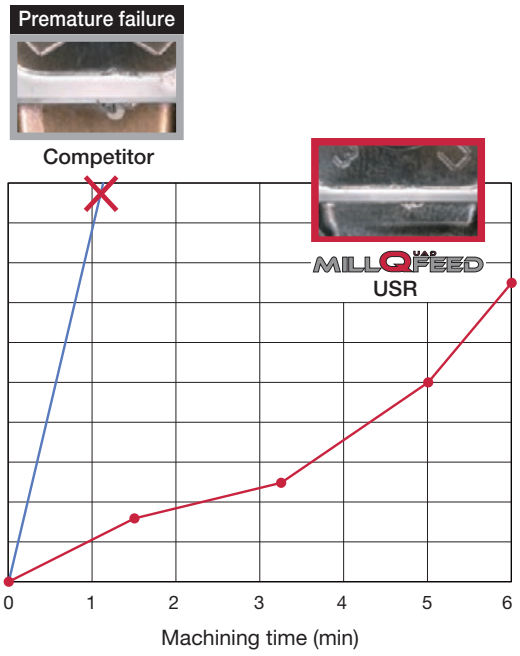
■ Enhanced cutting edge preparations

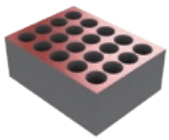
Conventional
(ZER/UER-MM)

New
Flat top
(ZSR/USR)

Nose radii & main cutting-edge with increased fracture resistance and extended tool life.

■ Excellent defect resistance

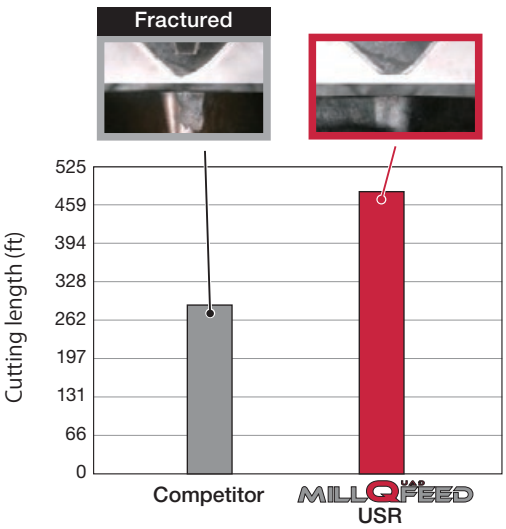


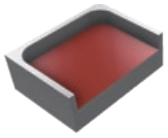


P

Cutter : TXSW15U3.00B1.00R05 (ø = 3", z = 5)
Insert : SWMW1506USR AH3225
Workpiece material : NAK80 (43.5HRC)
Cutting speed : *Vc* = 262 sfm
Feed per tooth : *fz* = 0.059 ipt
Depth of cut : *ap* = 0.059"
Depth of width : *ae* = 1.97"
Overhang length : L/D = 3.3
Number of teeth : 5
Coolant : Dry
Machine : Vertical M/C, BT50

5 times tool life increase was achieved during heavy interrupted cutting of pre-hardened steel





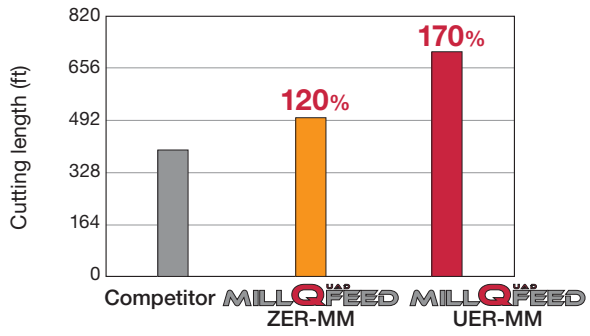
P

Cutter : TXSW15U3.00B1.00R05 (ø = 3", z = 5)
Insert : SWMW1506USR AH3225
Workpiece material : SCM440 / 42CrMo4 (270HB)
Cutting speed : *Vc* = 492 sfm
Feed per tooth : *fz* = 0.059 ipt
Depth of cut : *ap* = 0.059"
Depth of width : *ae* = 1.969"
Overhang length : L/D = 3.3
Number of teeth : 5
Coolant : Dry
Machine : Vertical M/C, BT50

In wall processing, there are no sudden defects due to chip entrapment. Achieves tool life 1.6 times longer than competitor products.

TOOL LIFE

09 Insert

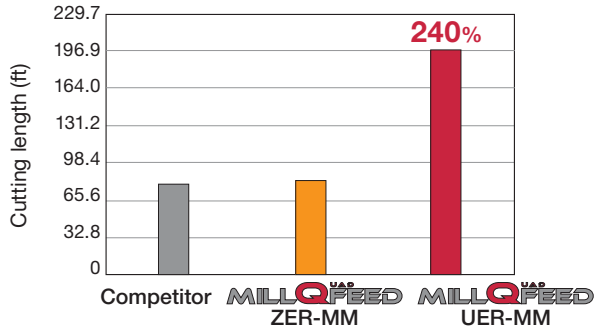


P

Cutter : EXSW09U1.00C1.00R03 (ø = 1", z = 3)
Insert : SWMT0904ZER-MM AH3135
: SWMT0904UER-MM AH3135
Workpiece material : S55C / C55 (180HB)
Cutting speed : *Vc* = 492 sfm
Feed per tooth : *fz* = 0.059 ipt
Depth of cut : *ap* = 0.031"
Depth of width : *ae* = 0.354"
Number of teeth : 3
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

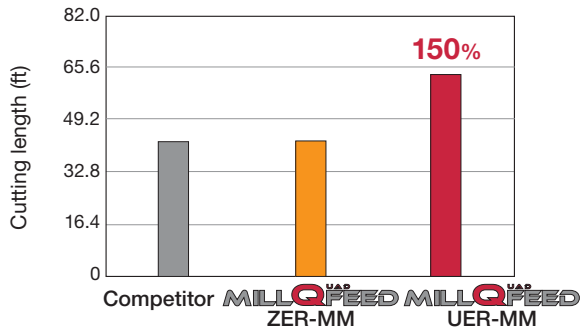


M

Cutter : TXSW09U2.00B0.75R07 (ø = 2", z = 7)
Insert : SWMT0904ZER-MM AH3135
: SWMT0904UER-MM AH3135
Workpiece material : SUS630 / X5CrNi18-9 (40HRC)
Cutting speed : *Vc* = 328 sfm
Feed per tooth : *fz* = 0.024 ipt
Depth of cut : *ap* = 0.031"
Depth of width : *ae* = 1.26"
Number of teeth : 7
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

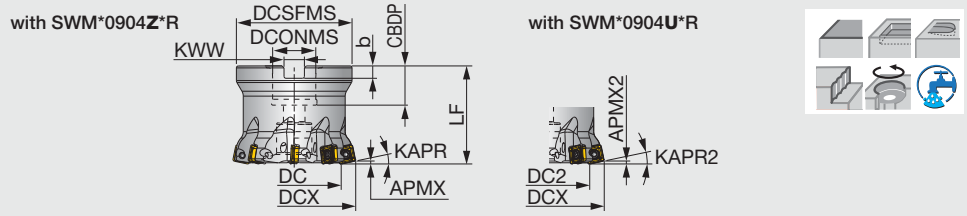
Cutter : TXSW15U3.00B1.00R05 (ø = 3", z = 5)
Insert : SWMT1506ZER-MM AH3135
: SWMT1506UER-MM AH3135
Workpiece material : SUS630 / X5CrNi18-9 (40HRC)
Cutting speed : *Vc* = 328 sfm
Feed per tooth : *fz* = 0.024 ipt
Depth of cut : *ap* = 0.039"
Depth of width : *ae* = 1.77"
Number of teeth : 5
Coolant : 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

TXSW09

High feed milling, bore type cutter with screw-on system

GAMP = +3.8°, GAMF = -3.5°

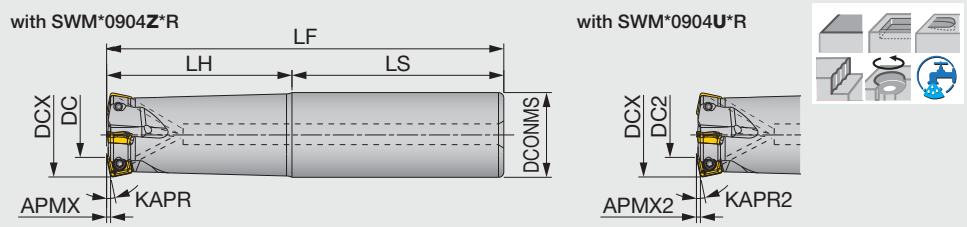


Inch	APMX	APMX2	DCX	CICT	DC	DC2	DCSFMS	DCONMS	CBDP	LF	KWW	b	KAPR	KAPR2	WT(lb)	Air hole	Insert
TXSW09U1.50B0.50R04	0.059	0.039	1.500	4	0.909	0.870	1.378	0.500	0.630	1.575	0.258	0.157	12°	7°	0.40	With	SWMT09...
TXSW09U1.50B0.50R05	0.059	0.039	1.500	5	0.909	0.870	1.378	0.500	0.630	1.575	0.258	0.157	12°	7°	0.40	With	SWMT09...
TXSW09U2.00B0.75R05	0.059	0.039	2.000	5	1.406	1.366	1.772	0.750	0.750	1.969	0.315	0.197	12°	7°	0.82	With	SWMT09...
TXSW09U2.00B0.75R07	0.059	0.039	2.000	7	1.406	1.366	1.772	0.750	0.750	1.969	0.315	0.197	12°	7°	0.84	With	SWMT09...
TXSW09U2.50B0.75R06	0.059	0.039	2.500	6	1.906	1.866	2.323	0.750	0.750	1.969	0.315	0.197	12°	7°	1.59	With	SWMT09...
TXSW09U2.50B0.75R08	0.059	0.039	2.500	8	1.906	1.866	2.323	0.750	0.750	1.969	0.315	0.197	12°	7°	1.61	With	SWMT09...
TXSW09U3.00B1.00R07	0.059	0.039	3.000	7	2.406	2.366	2.835	1.000	1.024	2.480	0.374	0.236	12°	7°	3.00	With	SWMT09...
TXSW09U3.00B1.00R10	0.059	0.039	3.000	10	2.406	2.366	2.835	1.000	1.024	2.480	0.374	0.236	12°	7°	3.06	With	SWMT09...
TXSW09U4.00B1.50R08	0.059	0.039	4.000	8	3.406	3.366	3.819	1.500	1.181	2.480	0.626	0.394	12°	7°	4.67	With	SWMT09...

EXSW09

High feed mill for 4-corner, single sided inserts

GAMP = +3.9°, GAMF = -3.5°

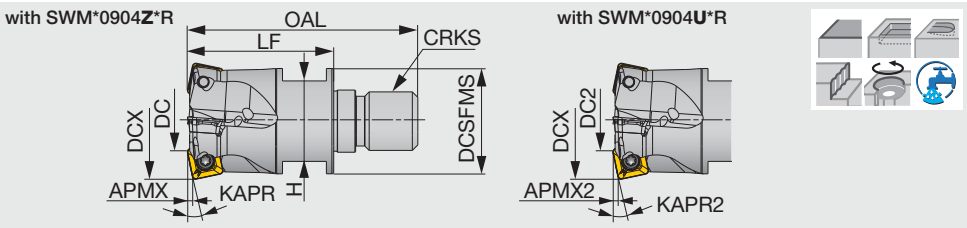


Designation	APMX	APMX2	DCX	CICT	DC	DC2	DCONMS	LF	LH	LS	KAPR	KAPR2	WT(lb)	Air hole	Insert
EXSW09U1.00C1.00R03	0.059	0.039	1	3	0.409	0.370	1	5.5	2.5	3	12°	7°	1.014	With	SWM*09...
EXSW09U1.00C1.00R03L	0.059	0.039	1	3	0.409	0.370	1	7.0	4.0	3	12°	7°	1.279	With	SWM*09...
EXSW09U1.25C1.25R04	0.059	0.039	1.25	4	0.658	0.618	1.25	6.0	3.0	3	12°	7°	1.786	With	SWM*09...
EXSW09U1.25C1.25R04L	0.059	0.039	1.25	4	0.658	0.618	1.25	8.0	5.0	3	12°	7°	2.359	With	SWM*09...

HXSW09 (Metric Only)

High feed mill, modular type, for 4-corner single sided inserts

GAMP = +3.8°, GAMF = -3.5°



Designation	APMX (mm)	APMX2 (mm)	DCX (mm)	CICT #	DC (mm)	DC2 (mm)	OAL (mm)	LF (mm)	H (mm)	DCSFMS (mm)	KAPR	KAPR2	CRKS	WT (kg)	Air hole	Insert
HXSW09M025M12R03	1.5	1	25	3	10	9	57	35	17	20.8	12°	7°	M12	0.09	With	SWM*09...
HXSW09M032M16R04	1.5	1	32	4	17	16	63	40	22	28.8	12°	7°	M16	0.18	With	SWM*09...

SPARE PARTS

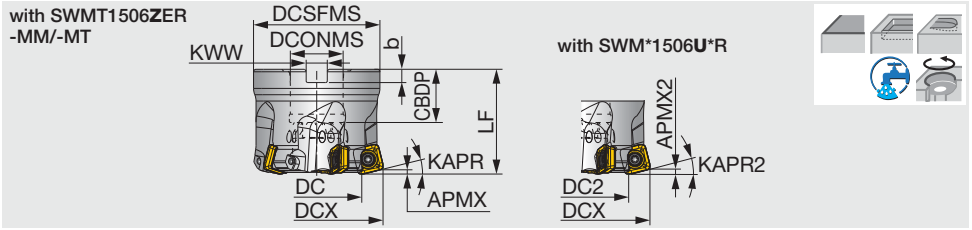
Designation	Clamping screw	Grip	Mono block wrench	Lubricant	Shell locking bolt	Torx bit
TXSW09U1.50...	CSPD-3	H-TB2W	-	M-1000	(SR UNF 1/4X3/4 B18.3)	BLDIP10/S7
TXSW09U2.00...	CSPD-3	H-TB2W	-	M-1000	(C0.375X1.125H)	BLDIP10/S7
TXSW09U2.50...	CSPD-3	H-TB2W	-	M-1000	(C0.375X1.125H)	BLDIP10/S7
TXSW09U3.00...	CSPD-3	H-TB2W	-	M-1000	(C0.500X1.375H)	BLDIP10/S7
TXSW09U4.00...	CSPD-3	H-TB2W	-	M-1000	(TMBA-0.750H)	BLDIP10/S7
EXSW09..., HXSW09...	CSPD-3	-	IP-10D	-	-	-

Recommended clamping torque: CSPD-3 = 1.84 lbs ft

TXSW15

High feed mill for 4-corner, single sided inserts

GAMP = +5°, GAMF = 0°



Designation	APMX	APMX2	DCX	CICT	DC	DC2	DCSFMS	LF	DCONMS	CBDP	KWW	b	KAPR	KAPR2	WT(lb)	Air hole	Insert
TXSW15U2.00B0.75R03	0.098	0.079	2	3	0.929	0.905	1.850	1.969	0.750	0.750	0.315	0.197	14°	10°	0.950	With	SWMT*15...
TXSW15U2.50B0.75R04	0.098	0.079	2.5	4	1.48	1.405	2.323	1.969	0.750	0.750	0.315	0.197	14°	10°	1.520	With	SWMT*15...
TXSW15U3.00B1.00R05	0.098	0.079	3	5	1.98	1.905	2.835	2.480	1.000	1.024	0.374	0.236	14°	10°	2.710	With	SWMT*15...
TXSW15U4.00B1.50R06	0.098	0.079	4	6	2.98	2.905	3.819	2.480	1.500	1.063	0.626	0.394	14°	10°	4.870	With	SWMT*15...
TXSW15U5.00B1.50R07	0.098	0.079	5	7	3.98	3.905	3.819	2.480	1.500	1.614	0.626	0.394	14°	10°	6.370	With	SWMT*15...
TXSW15U6.00B2.00R08	0.098	0.079	6	8	4.98	4.905	4.331	2.480	2.000	1.496	0.748	0.433	14°	10°	8.290	With	SWMT*15...

SPARE PARTS






Designation	Clamping screw	Grip	Lubricant	Shell locking bolt 1	Shell locking bolt 2	Torx bit
TXSW15U2.00B0.75R03	TS50115I	H-TB2W	M-1000	-	SR 5/16-32UNEF_3/8-2	BT20S
TXSW15U2.50B0.75R04	TS50115I	H-TB2W	M-1000	(C0.375X1.125H)	-	BT20S
TXSW15U3.00B1.00R05	TS50115I	H-TB2W	M-1000	(C0.500x1.375H)	-	BT20S
TXSW15U4.00B1.50R06	TS50115I	H-TB2W	M-1000	(TMBA-0.750H)	-	BT20S
TXSW15U5.00B1.50R07	TS50115I	H-TB2W	M-1000	(TMBA-0.750H)	-	BT20M
TXSW15U6.00B2.00R08	TS50115I	H-TB2W	M-1000	-	-	BT20M

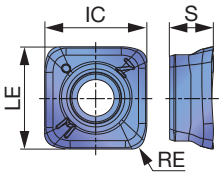
*Recommended clamping torque: TS50115I = 3.69 lbs ft

When installing TXSW15U2.00B0.75R03 on the arbor

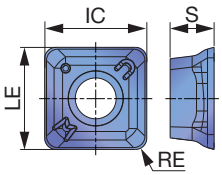
- Always use the dedicated shell locking bolt (part code: SR 5/16-32UNEF_3/8-2) included in the package.
- Thoroughly read the installation manual included in the package before installation.

INSERTS

SWMT09/15ZER-MM

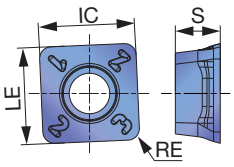


SWMT09/15UER-MM



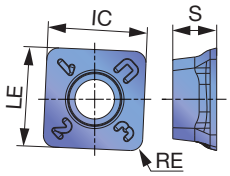
New

SWMW09ZSR

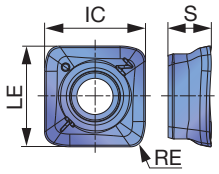


New

SWMW09/15USR



SWMT15ZER-MT



P	Steel		☆	★		
M	Stainless	★	☆	☆		
K	Cast iron		☆	☆	★	
N	Non-ferrous					
S	Titanium	★	☆			
S	Heat resistant alloy				☆	★
H	Hard materials			☆	☆	★

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated AH130	AH3135	AH3225	AH120	AH8015	LE	IC	S
SWMT0904ZER-MM	0.0393	0.059	●	●	●	●	●	0.339	0.339	0.157
SWMT0904UER-MM	0.0393	0.039	●	●	●	●	●	0.356	0.356	0.157
New SWMW0904ZSR	0.0393	0.059			●		●	0.339	0.339	0.157
New SWMW0904USR	0.0393	0.039			●		●	0.356	0.356	0.157
SWMT1506ZER-MM	0.0787	0.098		●		●		0.630	0.630	0.268
SWMT1506UER-MM	0.0787	0.079		●				0.641	0.641	0.268
New SWMW1506USR	0.0787	0.079			●		●	0.635	0.635	0.268
SWMT1506ZER-MT	0.0787	0.098		●		●		0.627	0.627	0.268

●: New product
●: Line up

STANDARD CUTTING CONDITIONS

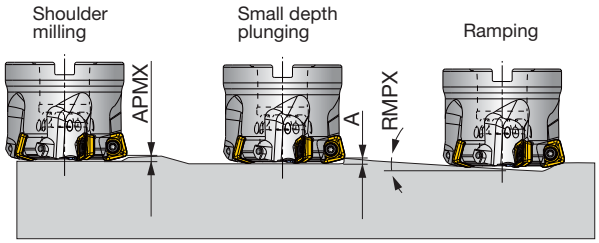
09 type

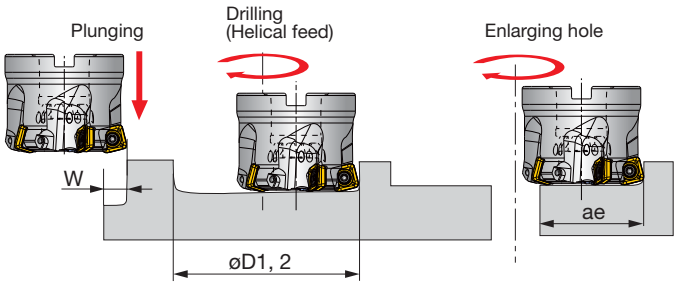
ISO	Workpiece material		Hardness	Priority	Insert type	Grade	Chip-breaker	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	Carbon steel S45C, S55C, etc. C45, C55, etc.		- 300HB	First choice	ZER	AH3225	MM	328 - 984	0.020 - 0.059
				Fracture resistance	ZSR	AH3225	Flat top	328 - 984	0.020 - 0.059
				Wear resistance	UER	AH3225	MM	328 - 984	0.020 - 0.059
	Alloy steel SCM440, etc. 42CrMo4, etc.		- 300HB	First choice	ZER	AH3225	MM	328 - 656	0.020 - 0.059
				Fracture resistance	ZSR	AH3235	Flat top	328 - 656	0.020 - 0.059
				Wear resistance	UER	AH3225	MM	328 - 656	0.020 - 0.059
	Prehardened steel NAK80, PX5, etc.		30 - 40HRC	First choice	ZER	AH3225	MM	328 - 656	0.020 - 0.047
				Fracture resistance	ZSR	AH3235	Flat top	328 - 656	0.020 - 0.047
				Wear resistance	USR	AH3225	Flat top	328 - 656	0.020 - 0.047
M	Austenitic stainless steel SUS304, etc. X5CrNi18-9, etc.		- 200HB	First choice	UER	AH3135	MM	328 - 492	0.020 - 0.047
				Fracture resistance	UER	AH130	MM	328 - 492	0.020 - 0.047
				Low cutting force	ZER	AH3135	MM	328 - 492	0.020 - 0.047
	Precipitation hardening stainless steel SUS630, etc. X20CrNiCuNb-16-4, etc.		28HRC - (H1150)	First choice	UER	AH3135	MM	262-492	0.012 - 0.047
				Fracture resistance	UER	AH130	MM	262-492	0.012 - 0.047
				Low cutting force	ZER	AH3135	MM	262-492	0.012 - 0.047
			40HRC - (H900)	First choice	UER	AH3135	MM	262-394	0.012 - 0.031
				Fracture resistance	UER	AH130	MM	262-394	0.012 - 0.031
				Low cutting force	ZER	AH3135	MM	262-394	0.012 - 0.031
K	Gray cast iron FC250, FC300, etc., 250, 300, etc.		150 - 250HB	First choice	ZSR	AH8015	Flat top	328-984	0.020 - 0.079
				Fracture resistance	ZSR	AH3225	Flat top	328-984	0.020 - 0.079
	Ductile cast iron FCD600, etc., 600-3, etc.		150 - 250HB	First choice	ZSR	AH8015	Flat top	262 - 656	0.020 - 0.079
				Fracture resistance	ZSR	AH3225	Flat top	262 - 656	0.020 - 0.079
S	Titanium alloys Ti-6Al-4V, etc.		- 40HRC	First choice	UER	AH130	MM	98 - 197	0.012 - 0.028
				Wear resistance	UER	AH8015	MM	98 - 197	0.012 - 0.028
				Low cutting force	ZER	AH130	MM	98 - 197	0.012 - 0.028
	Heat-resistant alloys Inconel, Hastelloy, etc.		- 40HRC	First choice	UER	AH8015	MM	66 - 164	0.004 - 0.012
				Fracture resistance	USR	AH8015	Flat top	66 - 164	0.004 - 0.012
				Low cutting force	ZER	AH8015	MM	66 - 164	0.004 - 0.012
H	Hardened steel	SKD61, etc. X40CrMoV5-1, etc.	40 - 50HRC	First choice	USR	AH8015	Flat top	262 - 427	0.004 - 0.012
				Fracture resistance	USR	AH3225	Flat top	262 - 427	0.004 - 0.012
				Low cutting force	ZSR	AH8015	Flat top	262 - 427	0.004 - 0.012
		SKD11, etc. X153CrMoV12, etc.	50 - 60HRC	First choice	USR	AH8015	Flat top	164 - 230	0.002 - 0.008

15 type

ISO	Workpiece material		Hardness	Priority	Insert type	Grade	Chip-breaker	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	Carbon steel S45C, S55C, etc. C45, C55, etc.		- 300HB	First choice	ZER	AH3135	MM	328 - 984	0.020 - 0.059
				Wear resistance	ZER	AH120	MM	328 - 984	0.020 - 0.059
				Fracture resistance	USR	AH3225	Flat top	328 - 984	0.020 - 0.079
	Alloy steel SCM440, etc. 42CrMo4, etc.		- 300HB	First choice	ZER	AH3135	MM	328 - 656	0.020 - 0.059
				Wear resistance	ZER	AH120	MM	328 - 656	0.020 - 0.059
				Fracture resistance	USR	AH3225	Flat top	328 - 656	0.020 - 0.079
	Prehardened steel NAK80, PX5, etc.		30 - 40HRC	First choice	ZER	AH3135	MM	328 - 656	0.020 - 0.047
				Wear resistance	ZER	AH120	MM	328 - 656	0.020 - 0.047
				Fracture resistance	USR	AH3225	Flat top	328 - 656	0.020 - 0.059
M	Austenitic stainless steel SUS304, etc., X5CrNi18-9, etc.		- 200HB	First choice	UER	AH3135	MM	328 - 492	0.020 - 0.047
				Low cutting force	ZER	AH3135	MM	328 - 492	0.020 - 0.047
	Precipitation hardening stainless steel SUS630, etc. X20CrNiCuNb-16-4, etc.		28HRC - (H1150)	First choice	UER	AH3135	MM	262 - 492	0.012 - 0.047
				Low cutting force	ZER	AH3135	MM	262 - 492	0.012 - 0.047
			40HRC - (H900)	First choice	UER	AH3135	MM	262 - 394	0.012 - 0.031
				Low cutting force	ZER	AH3135	MM	262 - 394	0.012 - 0.031
K	Gray cast iron FC250, FC300, etc. 250, 300, etc.		150 - 250HB	First choice	ZER	AH120	MT	328 - 984	0.020 - 0.079
				Fracture resistance	USR	AH3225	Flat top	328 - 984	0.020 - 0.079
				Low cutting force	ZER	AH120	MM	328 - 984	0.020 - 0.059
	Ductile cast iron FCD600, etc. 600-3, etc.		150 - 250HB	First choice	ZER	AH120	MT	262 - 656	0.020 - 0.079
				Fracture resistance	USR	AH3225	Flat top	262 - 656	0.020 - 0.079
				Low cutting force	ZER	AH120	MM	262 - 656	0.020 - 0.059
S	Titanium alloys Ti-6Al-4V, etc.		- 40HRC	First choice	UER	AH3135	MM	98 - 197	0.012 - 0.028
				Low cutting force	ZER	AH3135	MM	98 - 197	0.012 - 0.028
				Fracture resistance	USR	AH3225	Flat top	98 - 197	0.012 - 0.028
	Heat-resistant alloys Inconel, Hastelloy, etc.		- 40HRC	First choice	UER	AH3135	MM	66 - 164	0.004 - 0.012
				Wear resistance	ZER	AH120	MM	66 - 164	0.004 - 0.012
H	Hardened steel	SKD61, etc. X40CrMoV5-1, etc.	40 - 50HRC	First choice	USR	AH3225	Flat top	262 - 427	0.004 - 0.012
				Wear resistance	USR	AH8015	Flat top	262 - 427	0.004 - 0.012
		SKD11, etc. X153CrMoV12, etc.	50 - 60HRC	First choice	USR	AH8015	Flat top	164 - 230	0.002 - 0.008

APPLICATION RANGE





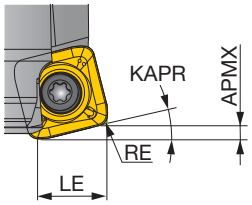
09 Insert

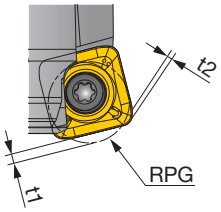
Designation	Tool dia. DCX	Max. depth of cut APMX		Max. plunging depth A	Max. ramping angle RMPX		Max. cutting width in plunging W		Min. machining dia. øD1		Max. machining dia. øD2		Max. cutting width in enlarging ae	
		SWM* 0904Z*R	SWM* 0904U*R		SWM* 0904Z*R	SWM* 0904U*R	SWM* 0904Z*R	SWM* 0904U*R	SWM* 0904Z*R	SWM* 0904U*R	SWM* 0904Z*R	SWM* 0904U*R	SWM* 0904Z*R	SWM* 0904U*R
EXSW09U1.00...	1.00	0.059	0.039	0.012	4.6	5.8	0.275	0.295	1.370	1.331	1.881	1.881	0.665	0.645
EXSW09U1.25...	1.25	0.059	0.039	0.012	2.7	3.2	0.275	0.295	1.870	1.831	2.381	2.381	0.914	0.894
TXSW09U1.50B0.50R04	1.50	0.059	0.039	0.012	1.9	2.2	0.275	0.295	2.370	2.331	2.881	2.881	1.165	1.146
TXSW09U2.00B0.75R05	2.00	0.059	0.039	0.012	1.2	1.4	0.275	0.295	3.370	3.331	3.881	3.881	1.665	1.646
TXSW09U2.50B0.75R06	2.50	0.059	0.039	0.012	0.9	0.9	0.275	0.295	4.370	4.331	4.882	4.882	2.165	2.146
TXSW09U2.50B0.75R08	2.50	0.059	0.039	0.012	0.9	0.9	0.275	0.295	4.370	4.331	4.882	4.882	2.165	2.146
TXSW09U3.00B1.00R07	3.00	0.059	0.039	0.012	0.7	0.8	0.275	0.295	5.370	5.331	5.882	5.882	2.665	2.646
TXSW09U3.00B1.00R10	3.00	0.059	0.039	0.012	0.4	0.6	0.275	0.295	5.370	5.331	5.882	5.882	2.665	2.646
TXSW09U4.00B1.50R08	4.00	0.059	0.039	0.012	0.5	0.6	0.275	0.295	7.370	7.331	7.882	7.882	3.665	3.646

15 Insert

Designation	Tool dia. DCX	Max. depth of cut APMX		Max. plunging depth A	Max. ramping angle RMPX	Max. cutting width in plunging W		Min. machining dia. øD1	Max. machining dia. øD2	Max. cutting width in enlarging ae	
		SWMT 1506ZER	SWM* 1506U*R			SWMT 1506ZER	SWM* 1506U*R			SWMT 1506ZER	SWM* 1506U*R
TXSW15U2.00B...	2.00	0.098	0.079	0.028	4.6°	0.591	0.630	2.787	3.772	1.433	1.393
TXSW15U2.50B...	2.50	0.098	0.079	0.028	2.9°	0.591	0.630	3.819	4.803	1.949	1.909
TXSW15U3.00B...	3.00	0.098	0.079	0.028	2.1°	0.591	0.630	4.819	5.803	2.449	2.409
TXSW15U4.00B...	4.00	0.098	0.079	0.028	1.4°	0.591	0.630	6.819	7.803	3.449	3.409
TXSW15U5.00B...	5.00	0.098	0.079	0.028	1.0°	0.591	0.630	8.819	9.803	4.449	4.409
TXSW15U6.00B...	6.00	0.098	0.079	0.028	0.8°	0.591	0.630	10.819	11.803	5.449	5.409

TOOL GEOMETRY ON PROGRAM





09 type

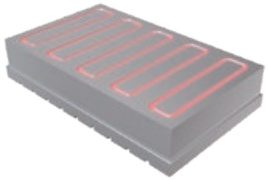
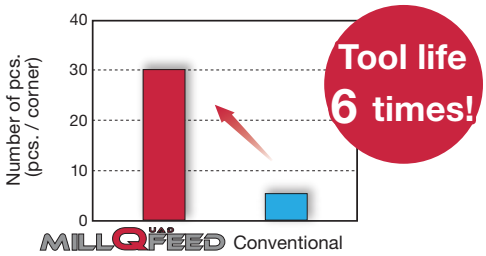
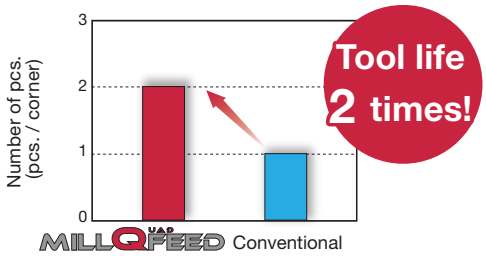
APMX (inch)		Actual corner radius	LE (inch)		KAPR		Programmed corner radius	Uncut amount: t1 (inch)		Overcut amount: t2 (inch)	
SWM* 0904Z*R	SWM* 0904U*R	RE (inch)	SWM* 0904Z*R	SWM* 0904U*R	SWM* 0904Z*R	SWM* 0904U*R	RPG	SWM* 0904Z*R	SWM* 0904U*R	SWM* 0904Z*R	SWM* 0904U*R
0.059	0.039	0.039	0.291	0.311	12°	7°	0.039	0.054	0.033	-	-
0.059	0.039	0.039	0.291	0.311	12°	7°	0.059	0.049	0.031	-	-
0.059	0.039	0.039	0.291	0.311	12°	7°	0.079	0.045	0.028	-	0.0002
0.059	0.039	0.039	0.291	0.311	12°	7°	0.098	0.040	0.025	0.001	0.006
0.059	0.039	0.039	0.291	0.311	12°	7°	0.118	0.036	0.022	0.006	0.015

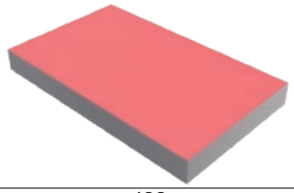
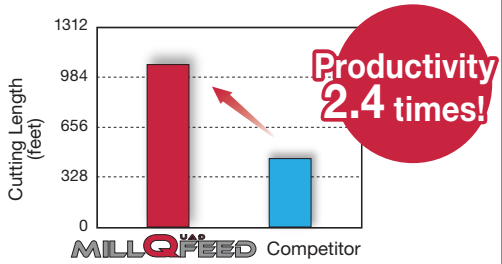
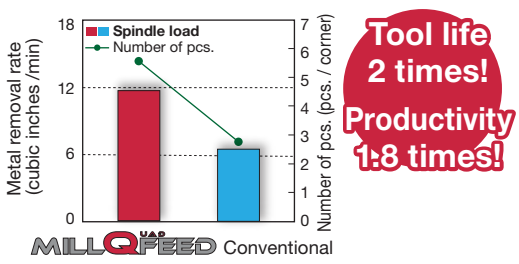
15 type

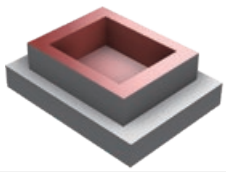
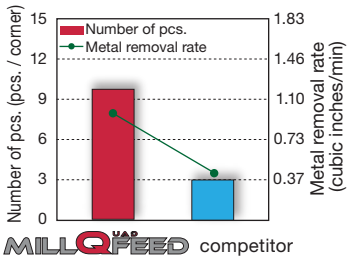
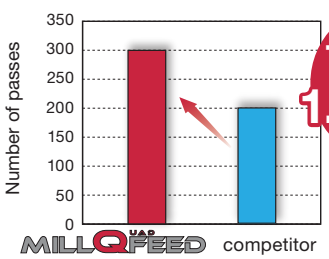
APMX (inch)		Actual corner radius	LE (inch)		KAPR		Programmed corner radius	Uncut amount: t1 (inch)		Overcut amount: t2 (inch)	
SWMT 1506ZER	SWM* 1506U*R	RE (inch)	SWMT 1506ZER	SWM* 1506U*R	SWMT 1506ZER	SWM* 1506U*R	RPG	SWMT 1506ZER	SWM* 1506U*R	SWMT 1506ZER	SWM* 1506U*R
0.098	0.079	0.079	0.500	0.543	14°	10°	0.138	0.083	0.073	-	-
0.098	0.079	0.079	0.500	0.543	14°	10°	0.157	0.078	0.070	-	-
0.098	0.079	0.079	0.500	0.543	14°	10°	0.177	0.074	0.067	-	0.001
0.098	0.079	0.079	0.500	0.543	14°	10°	0.197	0.070	0.063	0.0003	0.005

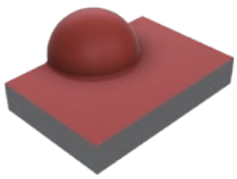
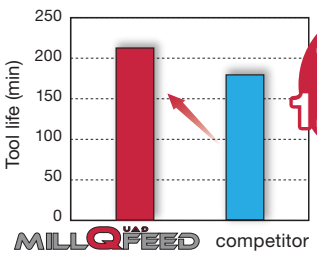
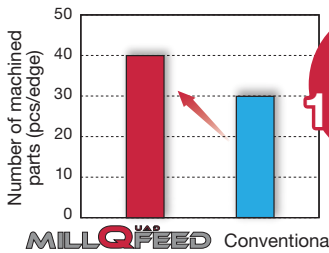
The above table shows the uncut (t1) and overcut (t2) amounts for the programmed corner radius.

PRACTICAL EXAMPLES

Workpiece type		Rod end bearing part	Magnetic chuck
Cutter		EXSW09U1.25C1.25R04 (ø1.25", z=4)	EXSW09U1.00C1.00R03 (ø1", 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* (sfm)	656	840
	Feed per tooth : *fz* (ipt)	0.03	0.033
	Depth of cut : *ap* (in)	0.024	0.028
	Width of cut : *ae* (in)	0.5	1.0
	Machining	Face milling	Grooving
	Coolant	Wet	Wet
	Machine	Multi task machine	Horizontal M/C, BT50
Results		 **UER-MM** has provided 6x the tool life in difficult-to-cut material over the competitor's insert.	 The competitor's tool chattered when machining corners. The **UER-MM** eliminated chatter while doubling tool life in long reach areas.

Workpiece type		Joint for thermal power part	Plate
Cutter		TXSW15U4.00B1.50R06 (ø4", z = 6)	TXSW15U5.00B1.50R07 (ø5", z=7)
Insert		SWMT1506ZER-MT	SWMT1506UER-MM
Grade		AH3135	AH3135
Workpiece material		High chrominum steel	SUS304 / X5CrNi18-9
		 P	 M
Cutting conditions	Cutting speed : *Vc* (sfm)	394 (Competitor: *Vc* = 328)	492
	Feed per tooth : *fz* (ipt)	0.039	0.047
	Depth of cut : *ap* (in)	90 (Competitor: *ap* = 75)	0.02
	Width of cut : *ae* (in)	2.8	3.9
	Machining	Face milling	Face milling
	Coolant	Air	Dry
	Machine	Vertical M/C, BT40	Vertical M/C, BT50, 22kW
Results		 Outstanding cutting performance of **MillQuadFeed** allows depth of cut to be increased even in high-feed machining.	 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		Power generation seals	Hot forging die
Cutter		TXSW09U2.50B0.75R08 (ø2.5, z = 8, competitor: ø2.5, z = 7)	TXSW15U3.00B1.00R05 (ø3, z = 5, competitor: ø3, z = 5)
Insert		SWMT0904UER-MM	SWMW1506USR
Grade		AH8015	AH3225
Workpiece material		Hastelloy X	SKT4 (HRC50)
		 S	 H
Cutting conditions	Cutting speed : *Vc* (sfm)	131 (competitor: Vc = 108)	410
	Feed per tooth : *fz* (ipt)	0.016 (competitor: fz = 0.006)	0.071
	Depth of cut : *ap* (in)	0.024 (competitor: ap = 0.047)	0.031
	Width of cut : *ae* (in)	1.57	2.17
	Machining	Face milling	Face and pocket milling
	Coolant	Wet	Dry
	Machine	Vertical M/C, BT40	Vertical M/C, BT50
Results		 Tool life 3.3 times! Productivity 2 times!	 Tool life 1.5 times!
		UER inserts featured a small entry angle that created chip-thinning effect, reducing the cutting load to the cutting edge. As the result, 3.3 times tool life and double M.R.R. were achieved.	**MQF** provided a 1.5 times increase in tool life when machining the as-forged surface with varying D.O.C., while the competitor's square positive inserts fractured prematurely, unable to complete the operation.

Workpiece type		Plastic injection mold	Housing
Cutter		TXSW15U3.00B1.00R05 (ø3, z = 5, competitor: ø3, z = 5)	TXSW09U2.00B0.75R05 (ø2, z = 5, competitor: ø2, z = 5)
Insert		SWMW1506USR	SWMW0904ZSR
Grade		AH8015	AH8015
Workpiece material		Pre-hardened steel (HRC40)	FCD500 / 500-7
		 P	 K
Cutting conditions	Cutting speed : *Vc* (sfm)	394	515
	Feed per tooth : *fz* (ipt)	0.087	0.055
	Depth of cut : *ap* (in)	0.039	0.039
	Width of cut : *ae* (in)	2.17	0.394
	Machining	Waterline milling	Face and helical interpolation milling
	Coolant	Dry	Dry
	Machine	Horizontal M/C, BT50	Vertical M/C, BT40
Results		 Tool life 1.2 times!	 Tool life 1.3 times!
		With high load resistant cutting edges, new **MQF** flat top inserts demonstrated little edge chipping. As the result, tool life increased by 1.2 times over the competitor square positive inserts.	With high load-resistant cutting edges, the new **MQF** flat-top inserts provided a 1.3 times increase in tool life during the machining of uneven, as-cast surfaces. The conventional inserts fractured pre-maturely, unable to complete the operation.

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