

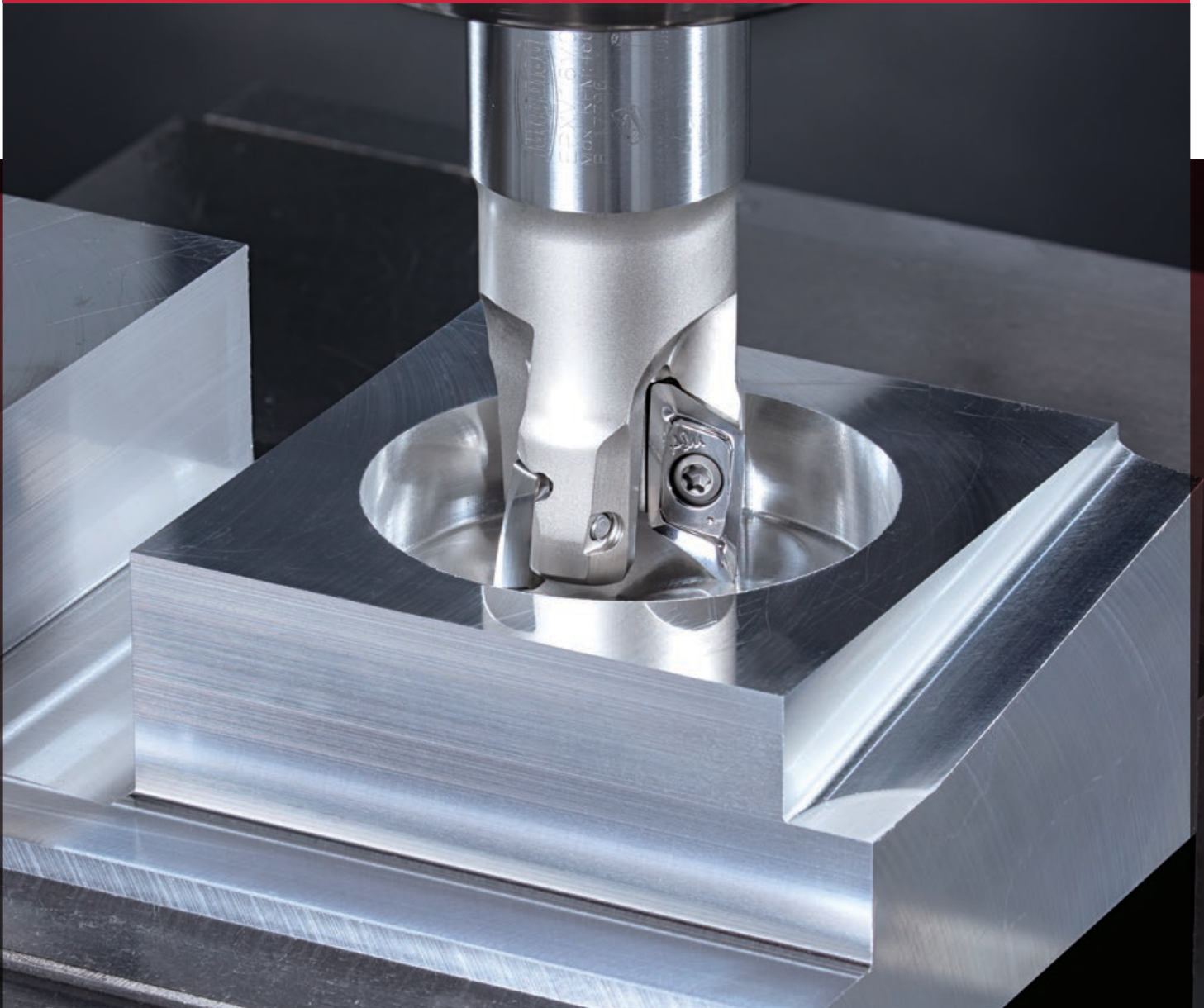


High speed milling cutter

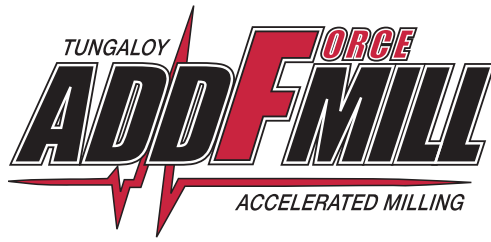
TUNGALUMILL

Tungaloy Report No. 429-US

Upgraded aluminum milling cutters for
high efficiency in all non-ferrous applications







TUNGALU^{LU}MILL



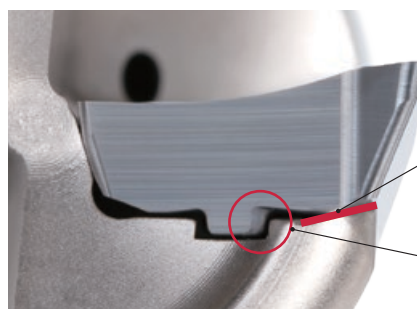
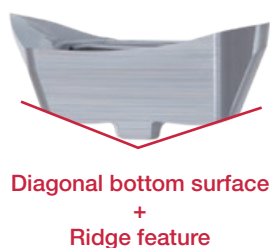
Maximum productivity and reliability
for your aluminum and non-ferrous applications

Optimized geometry for maximum efficiency in aluminum and other non-ferrous applications

New

■ Upgraded insert and pocket seat designs for safer and higher efficiency machining

Allows approx. 30% increase of the max. RPM.



TPXV/EPXV cutter + XVCT-AM insert

■ Improvements of max RPMs and cutting speeds

	New Upgraded designs		Conventional designs	
Tool diameter DC (in)	ø1.00	ø2.00	ø1.00	ø2.00
Max. RPM (min ⁻¹)	52,000	36,800	38,000	27,000
Max. cutting speed Vc (sfm)	13,399	18,963	9,793	13,914

Note: Make sure to check the recommended cutting data and max. RPM (n [min⁻¹]) of the machine spindle to be applied in the list on **P.10 - 11** before using the cutter.

Machining at increased cutting data is possible with the upgraded tools.

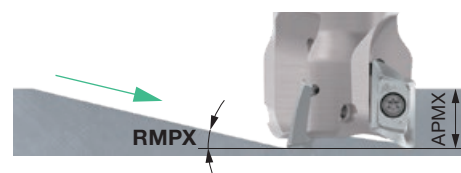
■ Excellent cutting edge geometry for aluminium and non-ferrous materials

- High-precision ground flank face
- The rake face features a mirror finish that provides the cutting edge with built-up edge resistance
- Helical cutting edge and high positive rake angle



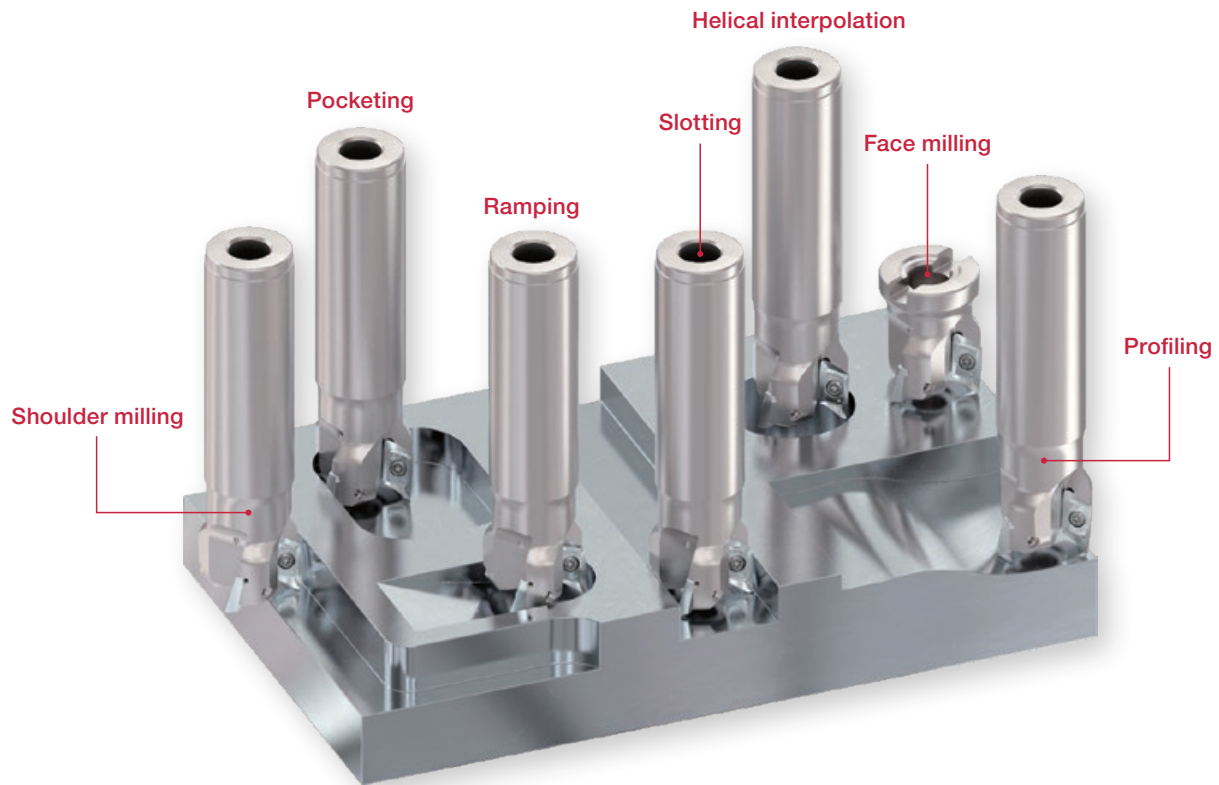
■ Comparison of maximum ramping angle

Tool diameter DC = 1.50"	TUNGALUMILL	Competitor		
		A	B	C
Max. ramping angle RMPX	11.5°	11°	9°	9°



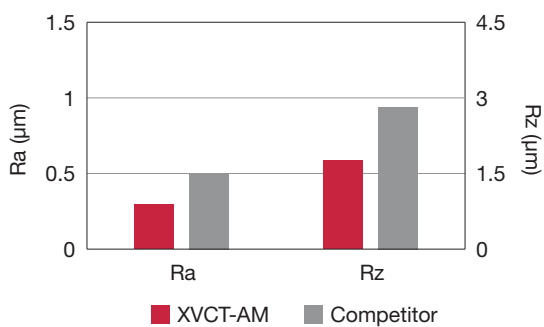
■ Applicable for a wide range of machining

- Unmatched machining efficiency in aluminium and other non-ferrous alloy applications
- The inserts are available with ten standard nose radius (RE) options, ranging from 0.016" to 0.197"

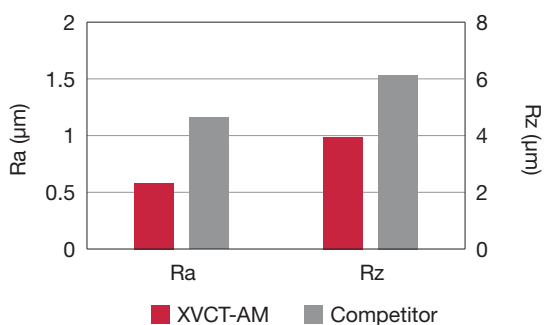


■ CUTTING PERFORMANCE

■ Comparison of surface roughness



N Cutter : TPXV16U2.00B0.75R04 (DC = 2.00", CICT = 4)
 Insert : XVCT160508PEFR-AM TH10
 Workpiece material : A5052
 Cutting speed : $V_c = 3281$ sfm
 Feed per tooth : $f_z = 0.006$ ipt
 Depth of cut : $a_p = 0.020$ "
 Width of cut : $a_e = 1.38$ "
 Coolant : Wet
 Machine : Vertical M/C, BT50



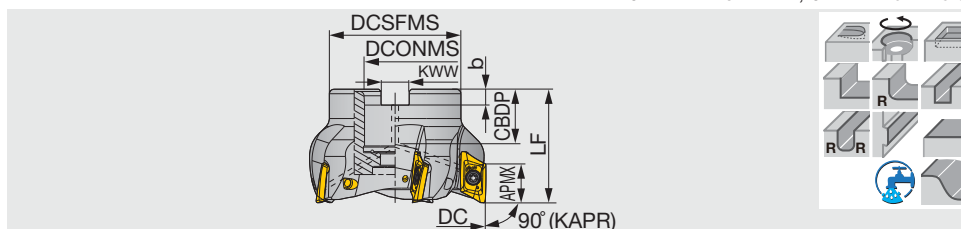
N Cutter : EPXV16U1.25W1.25R03 (DC = 1.25", CICT = 3)
 Insert : XVCT160524PEFR-AM TH10
 Workpiece material : ADC12
 Cutting speed : $V_c = 3789$ sfm
 Feed per tooth : $f_z = 0.007$ ipt
 Depth of cut : $a_p = 0.118$ "
 Width of cut : $a_e = 0.866$ "
 Coolant : Wet
 Machine : Vertical M/C, BT50

New

TPXV16

90° shoulder mill for aluminum machining, with screw clamp system

GAMP = +10° ~ +11°, GAMF = -9° ~ -5.5°

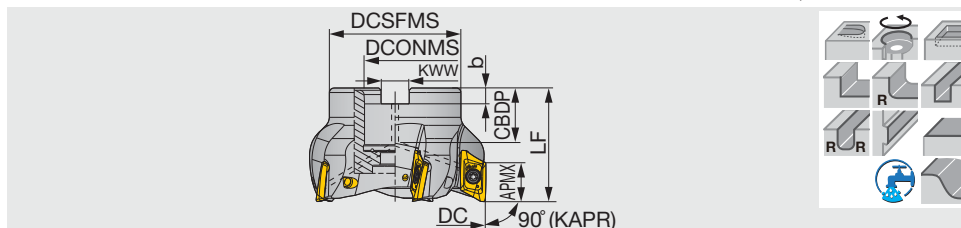


Designation	DC	CICT	DCSFMS	DCONMS	CDDP	LF	b	KWW	WT(lb)	Air hole	Max. RPM (min ⁻¹)	Insert
TPXV16U1.50B0.75R03	1.50	3	1.421	0.750	0.750	2.00	0.170	0.315	0.440	With	42,000	XVCT16**-AM
TPXV16U2.00B0.75R04	2.00	4	1.890	0.750	0.750	2.00	0.170	0.315	0.890	With	36,400	XVCT16**-AM
TPXV16U2.50B1.00R05	2.50	5	2.165	1.00	0.750	2.00	0.197	0.375	1.340	With	32,500	XVCT16**-AM
TPXV16U3.00B1.00R05	3.00	5	2.362	1.00	0.750	2.00	0.197	0.375	1.920	With	29,700	XVCT16**-AM
TPXV16U4.00B1.50R06	4.00	6	3.150	1.50	1.059	2.50	0.319	0.625	4.280	With	25,700	XVCT16**-AM
TPXV16U5.00B1.50R07	5.00	7	3.740	1.50	1.059	2.50	0.319	0.625	6.700	With	23,000	XVCT16**-AM

TPV16 (to be discontinued)

90° shoulder mill for aluminum machining, with screw clamp system

GAMP = +10° ~ +11°, GAMF = -9° ~ -5.5°



Designation	DC	CICT	DCSFMS	DCONMS	CDDP	LF	b	KWW	WT(lb)	Air hole	Max. RPM (min ⁻¹)	Insert
TPV16R150U0075A03	1.500	3	1.421	0.750	0.750	2.000	0.315	0.170	0.440	With	30,000	XVCT1605...
TPV16R200U0075A04	2.000	4	1.890	0.750	0.750	2.000	0.315	0.170	0.890	With	27,000	XVCT1605...
TPV16R250U0100A05	2.500	5	2.165	1.000	0.750	2.000	0.375	0.197	1.340	With	24,000	XVCT1605...
TPV16R300U0100A05	3.000	5	2.362	1.000	0.750	2.000	0.375	0.197	1.920	With	21,000	XVCT1605...
TPV16R400U0150A06	4.000	6	3.150	1.500	1.059	2.500	0.625	0.319	4.280	With	19,000	XVCT1605...
TPV16R500U0150A07	5.000	7	3.740	1.500	1.059	2.500	0.625	0.319	6.700	With	17,000	XVCT1605...

SPARE PARTS

Designation	Clamping screw	Grip	Shell locking bolt	Torx bit
TPXV16M040.../TPV16R040...	TS40093I/HG	H-TBS	SHM8X1.25X35-C	BT15S
TPXV16M050.../TPV16R050... TPXV16M063.../TPV16R063...	TS40093I/HG	H-TBS	SHM10X1.5X30-C	BT15S
TPXV16M080.../TPV16R080...	TS40093I/HG	H-TBS	LHM12X1.75X30-C	BT15S
TPXV16M100.../TPV16R100...	TS40093I/HG	H-TBS	SHM16X2X35-C	BT15S
TPXV16M125.../TPV16R125...	TS40093I/HG	H-TBS	SHM20X2.5X40-C	BT15S

Recommended clamping torque: 4.5 N·m

Notes: (See Illustration on P.10)

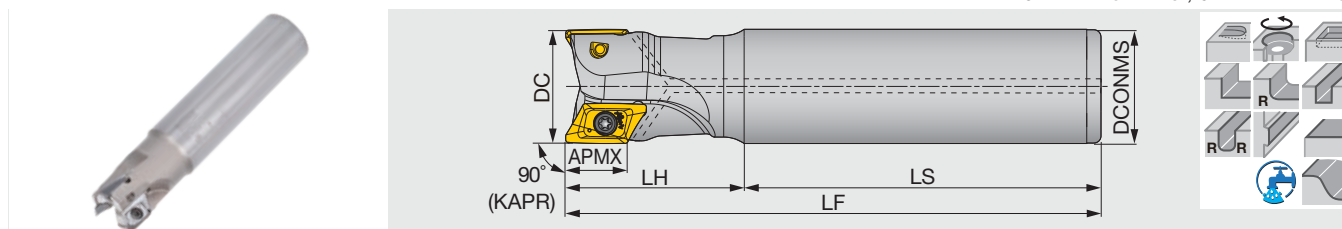
- XVCT-AM (the new version) inserts can be used either with a TPXV/EPXV (new design) cutter or conventional TPV/EPV cutter.
- DO NOT use XVCT-AJ (conventional design) inserts with a new TPXV/EPXV cutter. This may cause tool and machine damage.

New

EPXV16

90° shoulder endmill for aluminum machining, shank type, with screw clamp system

GAMP = +6° ~ +10°, GAMF = -12° ~ -9°

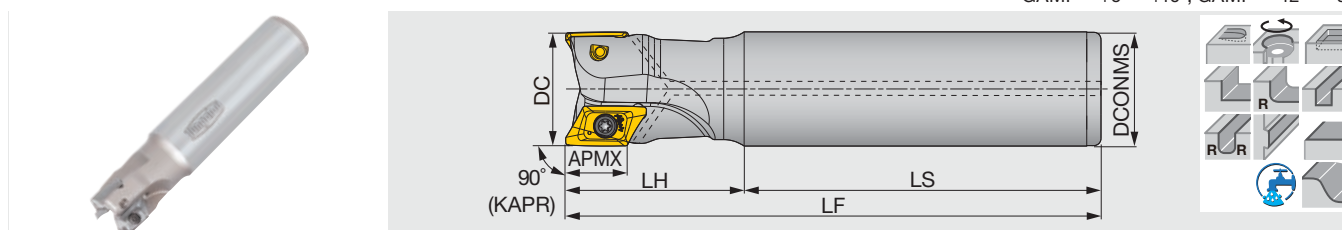


Designation	DC	CICT	DCONMS	LS	LH	LF	WT(lb)	Air hole	Max. RPM (min ⁻¹)	Insert
EPXV16U1.00W1.00R02	1.00	2	1.00	3.00	2.00	5.00	0.820	With	51,400	XVCT16**-AM
EPXV16U1.00W1.00R02L	1.00	2	1.00	4.00	3.00	7.00	1.170	With	51,400	XVCT16**-AM
EPXV16U1.25W1.25R03	1.25	3	1.25	4.00	2.00	6.00	1.680	With	46,000	XVCT16**-AM
EPXV16U1.25W1.25R03L	1.25	3	1.25	5.00	3.00	8.00	2.270	With	46,000	XVCT16**-AM
EPXV16U1.50W1.25R03	1.50	3	1.25	5.00	2.00	7.00	2.080	With	42,000	XVCT16**-AM

EPV16 (to be discontinued)

90° shoulder endmill for aluminum machining, shank type, with screw clamp system

GAMP = +6° ~ +10°, GAMF = -12° ~ -9°



Designation	DC	CICT	DCONMS	LS	LH	LF	WT(lb)	Air hole	Max. RPM (min ⁻¹)	Insert
EPV16R100U0100W02	1.000	2	1.000	3.000	2.000	5.000	0.820	With	38,000	XVCT1605...
EPV16R100U0100W02L	1.000	2	1.000	4.000	3.000	7.000	1.170	With	38,000	XVCT1605...
EPV16R125U0125W02	1.250	2	1.250	4.000	2.000	6.000	1.690	With	34,000	XVCT1605...
EPV16R125U0125W02L	1.250	2	1.250	5.000	3.000	8.000	2.280	With	34,000	XVCT1605...
EPV16R125U0125W03	1.250	3	1.250	4.000	2.000	6.000	1.680	With	34,000	XVCT1605...
EPV16R125U0125W03L	1.250	3	1.250	5.000	3.000	8.000	2.270	With	34,000	XVCT1605...
EPV16R150U0125W03	1.500	3	1.250	5.000	2.000	7.000	2.080	With	30,000	XVCT1605...
EPV16R150U0125W03L	1.500	3	1.250	8.000	2.000	10.000	3.140	With	30,000	XVCT1605...

SPARE PARTS

Designation	Clamping screw	Grip	Torx bit
EPXV16M025.../EPV16R025...	TS40085I/HG	H-TBS	BT15S
EPXV16M032.../EPV16R032... EPXV16M040.../EPV16R040...	TS40093I/HG	H-TBS	BT15S

Recommended clamping torque: 4.5 N·m

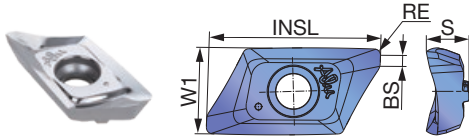
Notes: (See Illustration on P.10)

- XVCT-AM (the new version) inserts can be used either with a TPXV/EPXV (new design) cutter or conventional TPV/EPV cutter.
- DO NOT use XVCT-AJ (conventional design) inserts with a new TPXV/EPXV cutter. This may cause tool and machine damage.

INSERT

New

XVCT16-AM



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

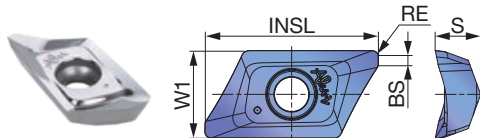
★ : First choice

Designation	RE	APMX	Uncoated										INSL	W1	S	BS
			TH10													
XVCT160504PEFR-AM	0.016	0.630	●										0.874	0.441	0.217	0.059
XVCT160508PEFR-AM	0.031	0.630	●										0.874	0.441	0.217	0.043
XVCT160512PEFR-AM	0.047	0.630	●										0.858	0.441	0.217	0.043
XVCT160516PEFR-AM	0.063	0.630	●										0.835	0.441	0.217	0.043
XVCT160520PEFR-AM	0.079	0.610	●										0.819	0.441	0.213	0.043
XVCT160525PEFR-AM	0.098	0.571	●										0.795	0.441	0.209	0.043
XVCT160530PEFR-AM	0.118	0.571	●										0.772	0.441	0.205	0.039
XVCT160532PEFR-AM	0.126	0.571	●										0.756	0.441	0.205	0.043
XVCT160540PEFR-AM	0.157	0.571	●										0.728	0.441	0.205	0.059
XVCT160550PEFR-AM	0.197	0.571	●										0.720	0.441	0.201	0.024

When using inserts with corner radius $RE \geq 0.126''$, standard cutter body has to be modified with "R". "R" = $RE - 0.012''$

● : Line up

XVCT16-AJ (to be discontinued)



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

★ : First choice

Designation	RE	APMX	Uncoated										INSL	W1	S	BS
			TH10													
XVCT160504R-AJ	0.016	0.630	●										0.874	0.441	0.232	0.051
XVCT160508R-AJ	0.031	0.630	●										0.874	0.441	0.232	0.039
XVCT160512R-AJ	0.047	0.610	●										0.858	0.441	0.228	0.039
XVCT160516R-AJ	0.063	0.591	●										0.835	0.441	0.226	0.039
XVCT160520R-AJ	0.079	0.571	●										0.819	0.441	0.226	0.039
XVCT160525R-AJ	0.098	0.551	●										0.795	0.441	0.224	0.039
XVCT160530R-AJ	0.118	0.551	●										0.772	0.441	0.220	0.039
XVCT160532R-AJ	0.126	0.551	●										0.756	0.441	0.220	0.039
XVCT160540R-AJ	0.157	0.512	●										0.728	0.441	0.217	0.047
XVCT160550R-AJ	0.197	0.512	●										0.720	0.441	0.213	0.016

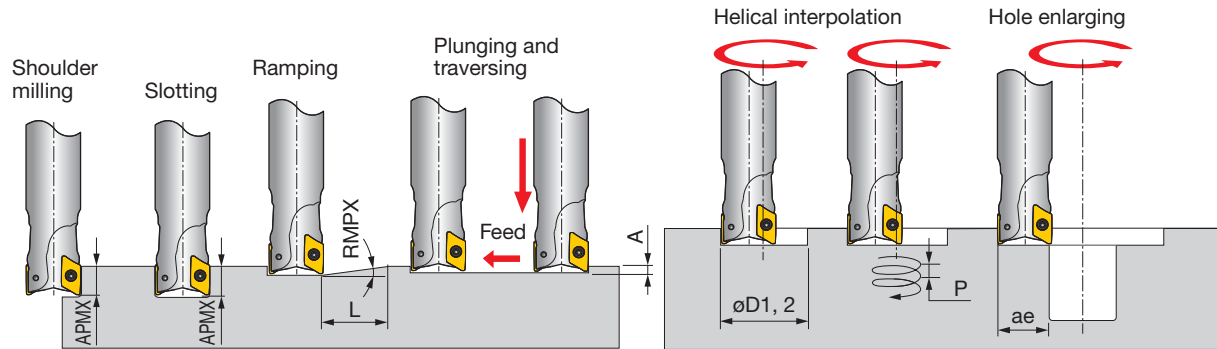
When using inserts with corner radius $RE \geq 0.126''$, standard cutter body has to be modified with "R". "R" = $RE - 0.012''$

● : Line up

Notes: (See Illustration on P.10)

- XVCT-AM (the new version) inserts can be used either with a TPXV/EPXV (new design) cutter or conventional TPV/EPV cutter.
- DO NOT use XVCT-AJ (conventional design) inserts with a new TPXV/EPXV cutter. This may cause tool and machine damage.

APPLICATION RANGE



Designation	Tool	Straight ramp down				Step down		Helical ramp down			Hole enlarging
		Corner radius	Max. depth of cut	Max. ramping angle	Min. length	Max. plunging depth	Min. machining	Max. pitch/rev	Max. machining	Max. pitch/rev	
Inch	DC	RE	APMX	RMPX	L	A	$\phi D1$	P	$\phi D2$	P	ae
EPXV16U1.00...	1.000	0.016, 0.031	0.630	22°	1.570	0.166	1.150	0.173	1.970	0.535	0.886
EPXV16U1.00...	1.000	0.047	0.610	22°	1.570	0.166	1.150	0.173	1.970	0.535	0.886
EPXV16U1.00...	1.000	0.063	0.591	22°	1.500	0.146	1.150	0.173	1.970	0.520	0.886
EPXV16U1.00...	1.000	0.079	0.571	22°	1.500	0.146	1.150	0.173	1.970	0.520	0.886
EPXV16U1.00...	1.000	0.118, 0.126	0.551	21°	1.500	0.098	1.150	0.165	1.970	0.484	0.886
EPXV16U1.00...	1.000	0.157, 0.197	0.512	18.5°	1.570	0.090	1.150	0.146	1.970	0.484	0.886
EPXV16U1.25...	1.250	0.016, 0.031	0.630	16.5°	2.130	0.158	1.690	0.346	2.520	0.535	1.134
EPXV16U1.25...	1.250	0.047	0.610	16.5°	2.130	0.158	1.690	0.346	2.520	0.535	1.134
EPXV16U1.25...	1.250	0.063	0.591	16°	2.130	0.138	1.690	0.335	2.520	0.520	1.134
EPXV16U1.25...	1.250	0.079	0.571	16°	2.130	0.138	1.690	0.335	2.520	0.520	1.134
EPXV16U1.25...	1.250	0.118, 0.126	0.551	15°	2.130	0.118	1.700	0.311	2.520	0.484	1.134
EPXV16U1.25...	1.250	0.157, 0.197	0.512	13.5°	2.200	0.098	1.700	0.280	2.520	0.484	1.134
T/EPXV16U1.50...	1.500	0.016, 0.031	0.630	11.5°	3.110	0.158	2.330	0.409	3.150	0.535	1.417
T/EPXV16U1.50...	1.500	0.047	0.610	11.5°	3.110	0.158	2.330	0.409	3.150	0.535	1.417
T/EPXV16U1.50...	1.500	0.063	0.591	11°	3.150	0.138	2.330	0.390	3.150	0.520	1.417
T/EPXV16U1.50...	1.500	0.079	0.571	11°	3.150	0.138	2.330	0.390	3.150	0.520	1.417
T/EPXV16U1.50...	1.500	0.118, 0.126	0.551	10°	3.230	0.118	2.330	0.354	3.150	0.484	1.417
T/EPXV16U1.50...	1.500	0.157, 0.197	0.512	8.5°	3.540	0.098	2.330	0.299	3.150	0.484	1.417
TPXV16U2.00...	2.000	0.016, 0.031	0.630	9.5°	3.780	0.158	3.110	0.512	3.940	0.535	1.772
TPXV16U2.00...	2.000	0.047	0.610	9.5°	3.780	0.158	3.110	0.512	3.940	0.535	1.772
TPXV16U2.00...	2.000	0.063	0.591	9°	3.860	0.138	3.110	0.484	3.940	0.520	1.772
TPXV16U2.00...	2.000	0.079	0.571	9°	3.860	0.138	3.110	0.484	3.940	0.520	1.772
TPXV16U2.00...	2.000	0.118, 0.126	0.551	8°	4.060	0.118	3.110	0.429	3.940	0.484	1.772
TPXV16U2.00...	2.000	0.157, 0.197	0.512	7°	4.330	0.098	3.110	0.374	3.940	0.484	1.772
TPXV16U2.50...	2.500	0.016, 0.031	0.630	7°	5.120	0.158	4.130	0.535	4.960	0.535	2.232
TPXV16U2.50...	2.500	0.047	0.610	7°	5.120	0.158	4.130	0.535	4.960	0.535	2.232
TPXV16U2.50...	2.500	0.063	0.591	6.5°	5.350	0.138	4.130	0.504	4.960	0.520	2.232
TPXV16U2.50...	2.500	0.079	0.571	6.5°	5.350	0.138	4.130	0.504	4.960	0.520	2.232
TPXV16U2.50...	2.500	0.118, 0.126	0.551	6°	5.350	0.118	4.140	0.465	4.960	0.484	2.232
TPXV16U2.50...	2.500	0.157, 0.197	0.512	5.5°	5.510	0.098	4.140	0.425	4.960	0.484	2.232
TPXV16U3.00...	3.000	0.016, 0.031	0.630	5°	7.200	0.158	5.470	0.535	6.300	0.535	2.835
TPXV16U3.00...	3.000	0.047	0.610	5°	7.200	0.158	5.470	0.535	6.300	0.535	2.835
TPXV16U3.00...	3.000	0.063	0.591	4.5°	7.760	0.138	5.470	0.488	6.300	0.520	2.835
TPXV16U3.00...	3.000	0.079	0.571	4.5°	7.760	0.138	5.470	0.488	6.300	0.520	2.835
TPXV16U3.00...	3.000	0.118, 0.126	0.551	4°	8.150	0.118	5.480	0.433	6.300	0.484	2.835
TPXV16U3.00...	3.000	0.157, 0.197	0.512	3.5°	8.700	0.098	5.480	0.378	6.300	0.484	2.835
TPXV16U4.00...	4.000	0.016, 0.031	0.630	3.5°	10.310	0.158	7.040	0.508	7.870	0.535	3.543
TPXV16U4.00...	4.000	0.047	0.610	3.5°	10.310	0.158	7.040	0.508	7.870	0.535	3.543
TPXV16U4.00...	4.000	0.063	0.591	3°	11.650	0.138	7.040	0.437	7.870	0.520	3.543
TPXV16U4.00...	4.000	0.079	0.571	3°	11.650	0.138	7.040	0.437	7.870	0.520	3.543
TPXV16U4.00...	4.000	0.118, 0.126	0.551	2.5°	13.070	0.118	7.050	0.362	7.870	0.484	3.543
TPXV16U4.00...	4.000	0.157, 0.197	0.512	2.5°	12.170	0.098	7.050	0.362	7.870	0.457	3.543
TPXV16U5.00...	5.000	0.016, 0.031	0.630	2.5°	14.450	0.158	9.020	0.476	9.840	0.535	4.429
TPXV16U5.00...	5.000	0.047	0.610	2.5°	14.450	0.158	9.020	0.476	9.840	0.535	4.429
TPXV16U5.00...	5.000	0.063	0.591	2°	17.480	0.138	9.020	0.382	9.840	0.520	4.429
TPXV16U5.00...	5.000	0.079	0.571	2°	17.480	0.138	9.020	0.382	9.840	0.520	4.429
TPXV16U5.00...	5.000	0.118, 0.126	0.551	1.5°	21.810	0.118	9.020	0.287	9.840	0.343	4.429
TPXV16U5.00...	5.000	0.157, 0.197	0.512	1.5°	20.310	0.098	9.020	0.287	9.840	0.343	4.429

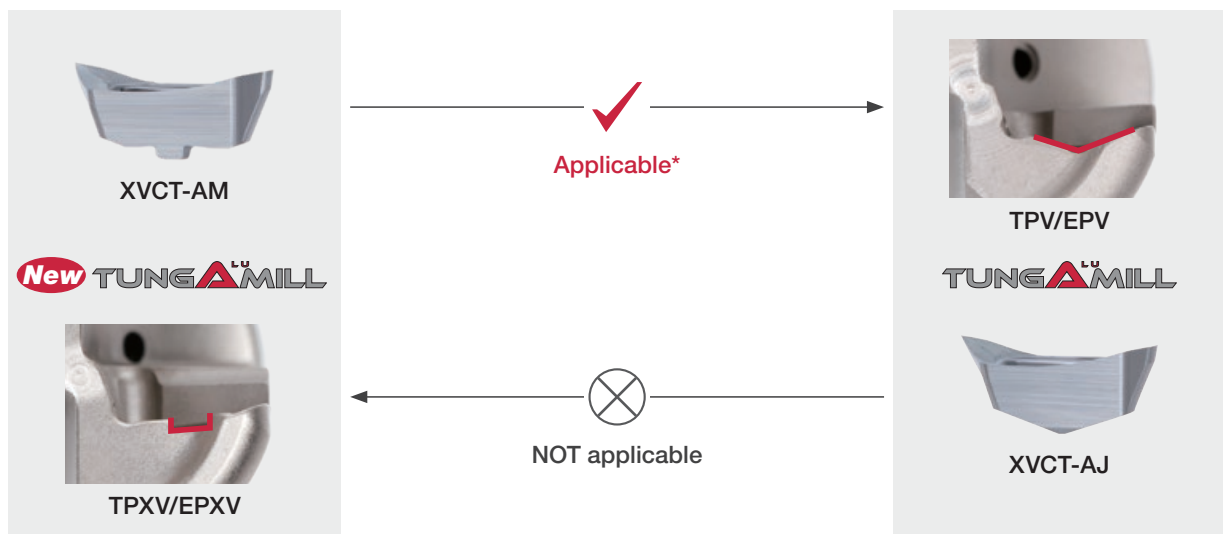
STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Hardness HB	Grade	Chipbreaker	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
N	Aluminum alloy	60	TH10	AM	984 - 16,404	0.006 - 0.014
		100	TH10	AM	656 - 6,562	0.004 - 0.010
	Cast aluminum alloy Si ≤ 12%	75	TH10	AM	656 - 6,562	0.006 - 0.012
		90	TH10	AM	656 - 4,921	0.004 - 0.010
	Cast aluminum alloy Si > 12%	130	TH10	AM	656 - 3281	0.028 - 0.006
	Copper alloys Pb > 1%	110	TH10	AM	656 - 2625	0.028 - 0.006
	Copper alloys	90	TH10	AM	984 - 3281	0.004 - 0.006
		100	TH10	AM	984 - 2625	0.004 - 0.006
	Duroplastics, fiber plastics	-	TH10	AM	328 - 1640	0.004 - 0.006
	Hard rubber	-	TH10	AM	328 - 984	0.004 - 0.006

Safety guidelines

1. Use only the original inserts, cutters and spare parts.
2. Insert pocket must be cleaned before clamping the insert.
3. Clamp torque of screw should be 4.5 N·m.
4. For safety reasons, use a new screw when changing the insert.
5. Maximum RPM values are determined based on the burst test. Using RPM beyond maximum values may cause insert breakage, machine damage or personal injury.
6. XVCT insert has sharp cutting edges. Always wear gloves for protection from injury when handling.

Interchangeability of the new designs and conventional designs

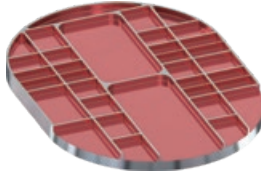
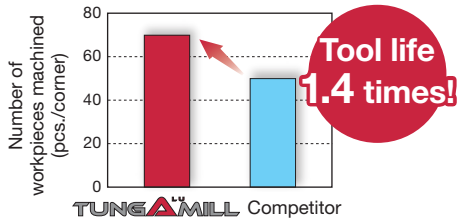


*Note: DO NOT mix the XVCT-AM and XVCT-AJ inserts on the same cutter. The difference of the insert weights will deteriorate the dynamic balance of the tool, resulting in poor surface finish.

Tool dia.: DC (in), Number of revolutions: n (min⁻¹), Feed speed: V_f (ipm), Depth of cut: $a_p = 0.079"$, Number of inserts: CICT

ø1.00"		ø1.25"				ø1.50"		ø2.00"		ø2.50"		ø3.00"		ø4.00"		ø5.00"	
CICT = 2		CICT = 2		CICT = 3		CICT = 3		CICT = 4		CICT = 5		CICT = 5		CICT = 6		CICT = 7	
<i>n</i>	<i>Vf</i>	<i>n</i>	<i>Vf</i>	<i>n</i>	<i>Vf</i>	<i>n</i>	<i>Vf</i>	<i>n</i>	<i>Vf</i>	<i>n</i>	<i>Vf</i>	<i>n</i>	<i>Vf</i>	<i>n</i>	<i>Vf</i>	<i>n</i>	<i>Vf</i>
19100	378	14900	295	14900	441	11900	350	9500	374	7600	374	6000	295	4800	283	3800	264
Vc = 4921 sfm, fz = 0.010 ipt																	
12700	201	9900	157	9900	232	8000	189	6400	201	5100	201	4000	157	3200	150	2500	138
Vc = 3281 sfm, fz = 0.008 ipt																	
12700	201	9900	157	9900	232	8000	189	6400	201	5100	201	4000	157	3200	150	2500	138
Vc = 3281 sfm, fz = 0.008 ipt																	
10200	122	8000	94	8000	142	6400	114	5100	122	4000	118	3200	94	2500	91	2000	83
Vc = 2625 sfm, fz = 0.006 ipt																	
7600	59	6000	47	6000	71	4800	55	3800	59	3000	59	2400	47	1900	43	1500	43
Vc = 1969 sfm, fz = 0.004 ipt																	
6400	51	5000	39	5000	59	4000	47	3200	51	2500	51	2000	39	1600	39	1300	35
Vc = 1640 sfm, fz = 0.004 ipt																	
7600	71	6000	55	6000	87	4800	67	3800	71	3000	71	2400	55	1900	55	1500	51
Vc = 1969 sfm, fz = 0.005 ipt																	
6400	59	5000	47	5000	71	4000	55	3200	59	2500	59	2000	47	1600	47	1300	43
Vc = 1640 sfm, fz = 0.005 ipt																	
3800	35	3000	28	3000	43	2400	35	1900	35	1500	35	1200	28	1000	28	800	28
Vc = 984 sfm, fz = 0.005 ipt																	
2500	24	2000	20	2000	28	1600	24	1300	24	1000	24	800	20	600	16	500	16
Vc = 656 sfm, fz = 0.005 ipt																	

PRACTICAL EXAMPLES

Workpiece type		Airplane part
Cutter	EPXV16U1.25W1.25R03 (DC = 1.25", CICT = 3)	
Insert	XVCT160530PEFR-AM	
Grade	TH10	
Workpiece material	A7050 / AlZn5.5MgCu	
	 	
Cutting conditions	Cutting speed: Vc (sfm)	3117
	Feed per tooth: fz (ipt)	0.006
	Depth of cut : ap (in)	0.098
	Width of cut : ae (in)	0.709
	Machining	Pocketing
	Coolant	Wet
	Machine	Vertical M/C, BT50
Results		 A sharp cutting edge has drastically reduced cutting forces, achieving longer tool life.



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