MITSUBISHI
MITSUBISHI MATERIALS U.S.A.
TOOL NEWS
US001

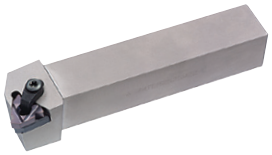
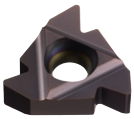
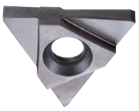
Threading

New Inserts
Pages 42-59

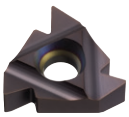
Precise and efficient threading products

CLASSIFICATION

EXTERNAL CUTTING

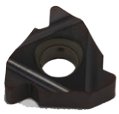
Name of Tool Holder	Insert Shape	Features
MMTE Holder 		● Various insert types. ● Precision class insert for precise thread forms. ● Available with a pressed breaker for chip control. ● Able to change lead angle by replacing the shim.
MTVO Holder 		● Multi-clamp type. ● Precision class insert. ● Positive insert produces a good finished surface. ● Holder is capable of performing both grooving and threading. ● Economical due to the use of 3 cutting edges.

INTERNAL CUTTING

Name of Tool Holder	Insert Shape	Features
MMTI 		● Minimum cutting diameter .500 inch. ● Various insert types. ● Precision class insert for precise thread forms. ● Available with a pressed breaker for chip control. ● Able to change lead angle by replacing the shim.
STHN/O 		● Screw-on type. ● Precision class insert. ● Positive insert produces a good finished surface. ● Holder is capable of performing both grooving and threading. ● Economical due to the use of 3 cutting edges.
FSLS **S-SLS** 		● Screw-on type. ● Precision class insert. ● Holder is capable of performing both grooving and threading. ● Maximum groove depth .118inch.
MICRO-MINI TWIN Boring Bars 	–	● Solid carbide type. ● Economical due to single holder with two cutting edges.
MICRO-MINI Boring Bars 	–	● Solid carbide type. ● Insert can be ground to suit the application.

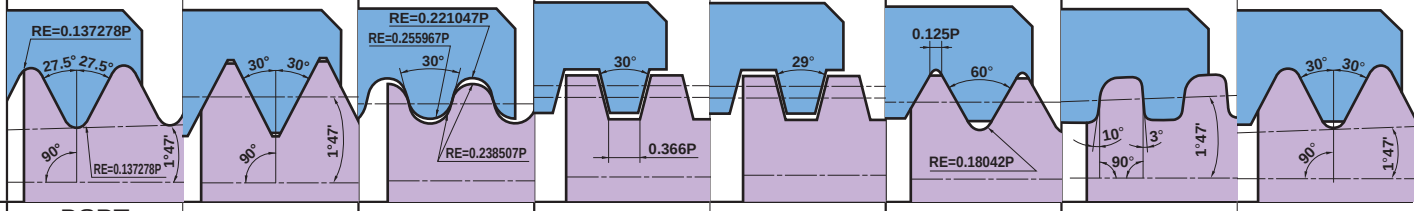
NEW

PIPE CUTTING INSERTS

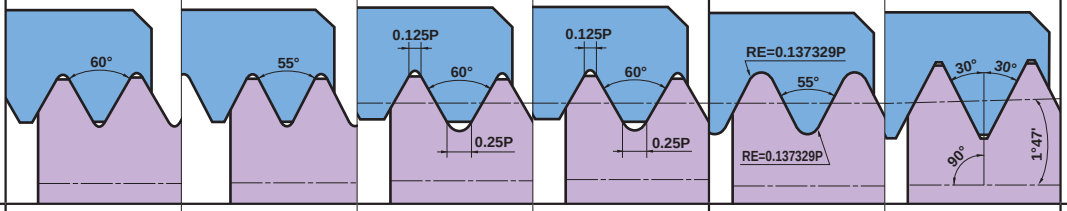
Name of Tool Holder	Insert Shape	Features
Threading inserts for specialty pipe threading ID/OD		● Chaser ● Laydown ● On Edge

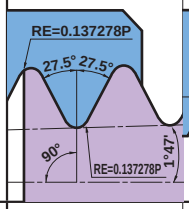
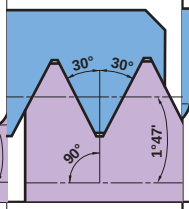
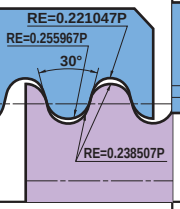
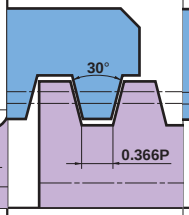
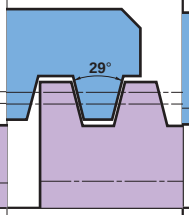
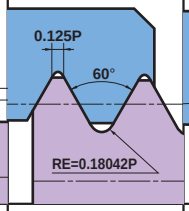
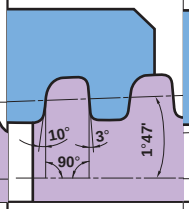
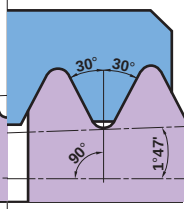
CROSS REFERENCE THREAD PITCH

Application		General machining				Pipe fittings and couplings for gas and water	
Type		Partial Profile 60°	Partial Profile 55°	ISO Metric	American UN	Parallel Pipe Thread Whitworth for BSW, BSP	American NPT
Symbol		M UNC UNF	W	M	UNC UNF	G(PF) W	NPT
Holder	Pitch	mm (thread/inch)	thread/inch	mm	thread/inch	thread/inch	thread/inch
MMT Holder 	Full form	–	–	0.5 2.5 0.75 3.0 1.0 3.5 1.25 4.0 1.5 4.5 1.75 5.0 2.0	32 12 28 11 24 10 20 9 18 8 16 7 14 6 13 5	28 11 26 10 20 9 19 8 18 7 16 6 14 5 12	27 18 14 11.5 8
		–	–				
	Partial form	0.5 –1.5(48–16) 1.75–3.0(14– 8) 0.5 –3.0(48– 8) 3.5 –5.0(07– 5)	48–16 14– 8 48– 8 7– 5	0.5 –1.5 1.75–3.0 0.5 –3.0 3.5 –5.0	48–16 14– 8 48– 8 7– 5	–	–
MTVO Holder 	Partial form	0.5–3.0 0.5–4.5 0.5–6.0	–	0.5–3.0 0.5–4.5 0.5–6.0	48–8 48–6 48–4	–	–

	Steam, gas and water pipes		Pipe couplings for food and fire fighting industries	Motion transmission		Aircraft and aerospace	Oil and gas	
	Taper Pipe Thread BSPT	American NPTF	Round DIN 405	ISO Trapezoidal 30°	American ACME	UNJ	API Buttress Casing	API Round Casing & Tubing
							
	BSPT R(PT) Rc(PS) Rp	NPTF	Rd	Tr (TM)	ACME (Tw)	UNJ	BCSG	CSG LCSG
	thread/inch	thread/inch	thread/inch	mm	thread/inch	thread/inch	thread/inch	thread/inch
	28 19 14 11	27 18 14 11.5 8	10 8 6 4	1.5 2.0 3.0 4.0 5.0	12 10 8 6 5	32 16 28 14 24 12 20 10 18 8	5	10 8
	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–

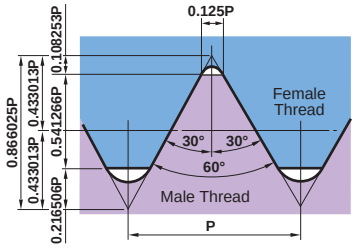
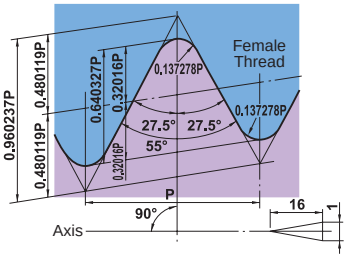
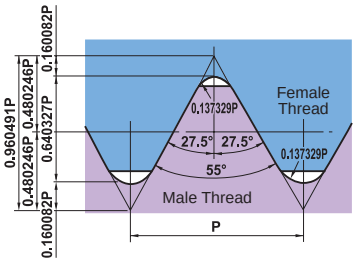
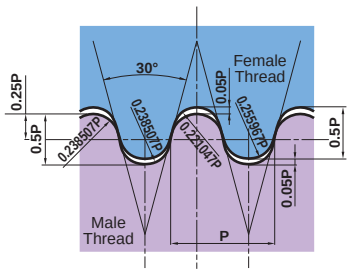
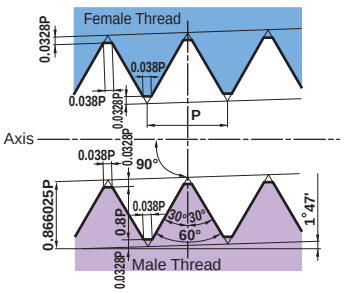
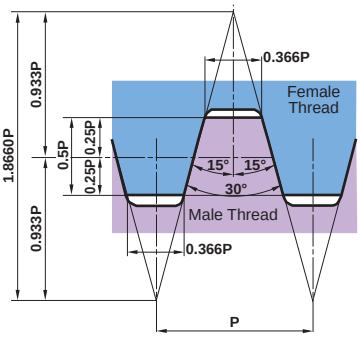
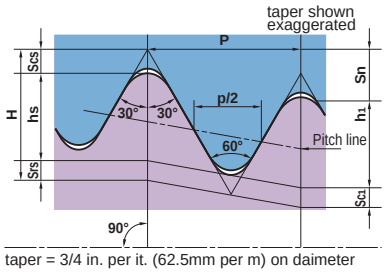
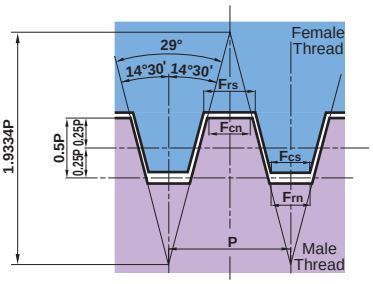
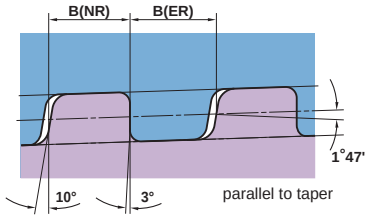
CROSS REFERENCE THREAD PITCH

Application		General machining				Pipe fittings and couplings for gas and water	
Type		Partial Profile 60°	Partial Profile 55°	ISO Metric	American UN	Parallel Pipe Thread Whitworth for BSW, BSP	American NPT
							
Symbol		M UNC UNF	W	M	UNC UNF	G(PF) W	NPT
Holder	Pitch	mm (thread/inch)	thread/inch	mm	thread/inch	thread/inch	thread/inch
MMT Boring Bars 	Full form	–	–	0.5 2.5 0.75 3.0 1.0 3.5 1.25 4.0 1.5 4.5 1.75 5.0 2.0	32 12 28 11 24 10 20 9 18 8 16 7 14 6 13 5	28 11 26 10 20 9 19 8 18 7 16 6 14 5 12	27 18 14 11.5 8
		–	–				
	Partial form	0.5 –1.5(48–16) 1.75–3.0(14– 8) 0.5 –3.0(48– 8) 3.5 –5.0(07– 5)	48–16 14– 8 48– 8 7– 5	0.5 –1.5 1.75–3.0 0.5 –3.0 3.5 –5.0	48–16 14– 8 48– 8 7– 5	–	–
STHN/O Boring Bars 	Partial form	0.5–3.0 0.5–4.5 0.5–6.0	–	0.5–3.0 0.5–4.5 0.5–6.0	48–8 48–6 48–4	–	–
FSL5 SL5N Boring Bars 	Partial form	1.5–2.0 1.5–2.5 1.5–3.5	–	1.5–2.0 1.5–2.5 1.5–3.5	48–13 48–11 48– 8	–	–
MICRO-MINI TWIN 	Partial form	0.5 –1.0 (36–24) 0.75–1.25(28–20) 0.75–1.5 (24–18) 0.75–1.75(24–16)	–	0.5 -1.0 0.75-1.25 0.75-1.5 0.75-1.75	36–24 28–20 24–18 24–16		

	Steam, gas and water pipes		Pipe couplings for food and fire fighting industries	Motion transmission		Aircraft and aerospace	Oil and gas	
	Taper Pipe Thread BSPT	American NPTF	Round DIN 405	ISO Trapezoidal 30°	American ACME	UNJ	API Buttress Casing	API Round Casing & Tubing
								
	BSPT R(PT) Rc(PS) Rp	NPTF	Rd	Tr (TM)	ACME (Tw)	UNJ	BCSG	CSG LCSG
	thread/inch	thread/inch	thread/inch	mm	thread/inch	thread/inch	thread/inch	thread/inch
	19 14 11	14 11.5 8	10 8 6 4	1.5 2.0 3.0 4.0 5.0	12 10 8 6 5	* – –	5	10 8
	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–

* When machining an internal UNJ thread, cut an internal hole with the appropriate diameter. Then machine with 60° American UN. In this case, a full form type insert cannot be used.

STANDARD THREAD AND CORRESPONDING INSERT

Thread Name	Standard Thread Type	Symbol	Thread Name	Standard Thread Type	Symbol
ISO Metric / American UN		M UNC UNF	BSPT		BSPT R (PT) Rc (PS) Rp
Parallel Pipe Thread Whitworth for BSW, BSP		W G (PF)	Round DIN405		Rd
American NPT		NPT	ISO Trapezoidal 30°		Tr (TM)
API Round Casing & Tubing		CSG LCSG	American ACME		ACME (Tw)
API Buttress Casing		BCSG			

PIPE THREADS AND TOOL SELECTION

Parallel Pipe Threads G(PF)

Thread Type	Number of threads	Standard internal diameter
G1/16	28	.258"
G1/8		.337"
G1/4	19	.451"
G3/8		.589"
G1/2	14	.734"
G5/8		.811"
G3/4		.949"
G7/8		1.098"
G1	11	1.193"
G1·1/8		1.376"
G1·1/4		1.534"

Note) Same as PF.

Taper Pipe Threads R(PT), Rc(PS)

Thread Type	Number of threads	Standard internal diameter
R1/16	28	.258"
R1/8		.337"
R1/4	19	.451"
R3/8		.589"
R1/2	14	.734"
–	–	–
R3/4	14	.949"
–	–	–
R1	11	1.193"
–	–	–
R1·1/4	11	1.534"

Note) Same as Rc and PT.

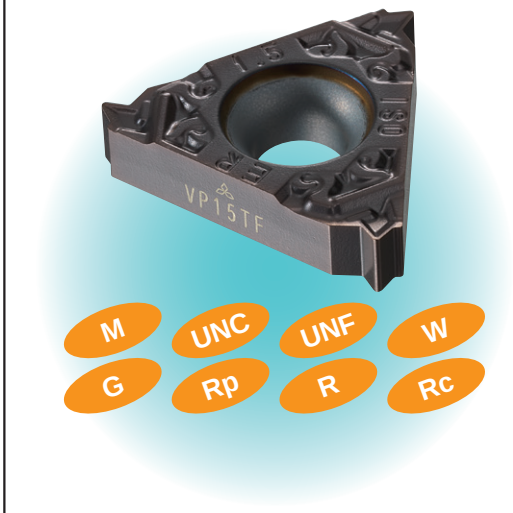
・The pitch is pre-determined for each nominal diameter. Note the minimum machining diameter especially when internal threading.

FEATURES OF MMT SERIES

A WIDE VARIETY OF CHOICES

Mitsubishi Miracle Threading (MMT) series contains 297 inserts and 23 holders.

M-CLASS INSERTS WITH 3-D CHIP BREAKERS



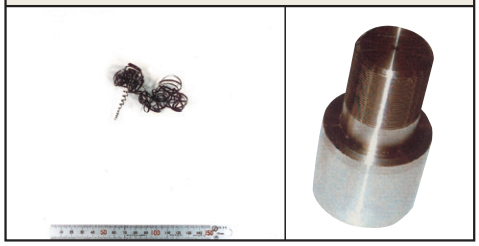
G-CLASS GROUND INSERTS

IDEAL CHIP CONTROL EVEN IN THE LATTER HALF OF PASSES WHEN CONTINUOUS CHIPS ARE USUALLY PRODUCED. (M-CLASS INSERTS WITH 3-D CHIP BREAKERS)

ISO metric external thread pitch 1.5mm Final pass (6th pass)

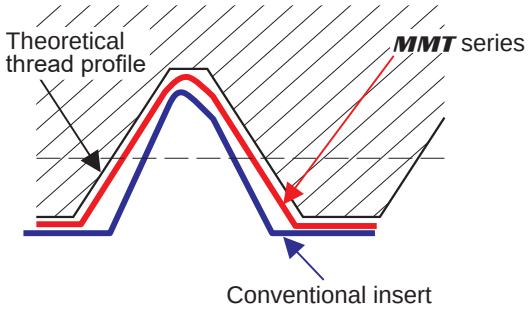
Competitor

MMT



<Cutting Conditions>
Workpiece : AISI 4140
Insert : MMT16ER150ISO-S
Grade : VP15TF
Cutting speed : 395SFM
Cutting method : Radial Infeed
Depth of cut : Fixed cut area
Pass : 6 times
Coolant : Wet

A HIGHER LEVEL OF PRECISION THAN CONVENTIONAL INSERTS (G-CLASS GROUND INSERTS)

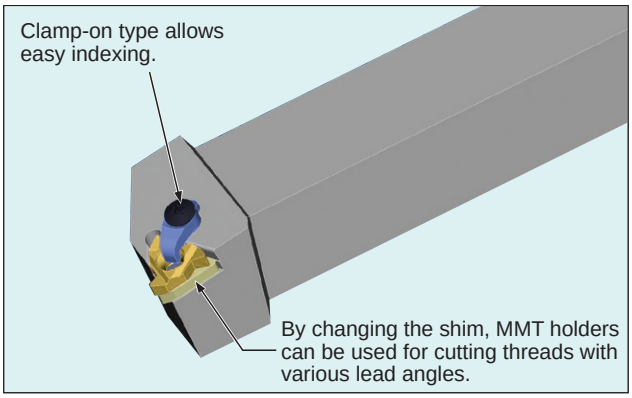


High precision threading can be achieved by using MMT inserts that feature a ground rake face and peripheral cutting edge.

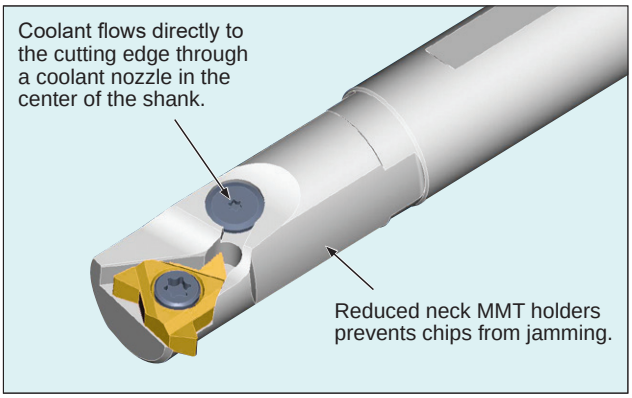
Thread Type	Threading Tolerance
ISO Metric	6g / 6H
American UN	2A / 2B
Whitworth for BSW, BSP	Medium Class A
BSPT	Standard BSPT
Round DIN 405	7h / 7H
ISO Trapezoidal 30°	7e / 7H
American ACME	3G
UNJ	3A
API Buttress Casing	Standard API
API Rounded Casing & Tubing	Standard API RD
American NPT	Standard NPT
American NPTF	Class2

HOLDER (With special surface treatment)

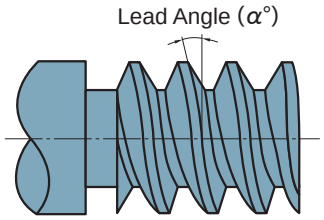
External

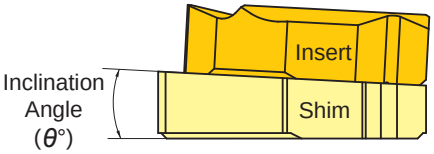


Internal



SUITABLE FOR THREADING WITH A LARGE LEAD ANGLE





By changing only the shim, MMT holders can be used for turning of threads with various lead angles as well as the turning of left hand threads.
(Please refer to page G022, page G025 and page G026)

Lead Angle (α°)	Inclination Angle (θ°)
−1.5°	−3°
−0.5°	−2°
0.5°	−1°
1.5°	0°
2.5°	1°
3.5°	2°
4.5°	3°

Delivered with the holder.

VP10MF (G-class ground inserts only)

- **Superior wear and plastic deformation resistance**
- **Suitable for continuous high precision machining with extensive tool life.**

• High wear and plastic deformation resistance for threading when maintaining the thread form is important.
• Effective in combination with G-class inserts for high precision threading.

VP15TF (G-class ground inserts, M-class inserts with 3-D chip breakers)

- **Wide versatility**
- **Able to withstand harsh conditions for long periods where conventional inserts would be liable to breakage.**

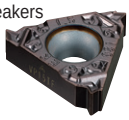
• High fracture resistance during low rigidity applications such as bar feed machining.
• Effective combination of high cost performance M-class inserts with 3-D chip breakers.

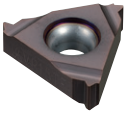
VP20RT (M-class inserts with 3-D chip breakers)

- **Excellent fracture resistance**

• Suitable for stainless steel boring and unstable machining where inserts are vulnerable to fracturing.
• Effective combination of high cost performance M-class inserts with 3-D chip breakers.

CHOOSING M-CLASS INSERTS WITH 3-D CHIP BREAKERS OR G-CLASS INSERTS

Insert	Chip control	Precise Threads
M-class inserts with 3-D chip breakers 	◎	○

Insert	Chip control	Precise Threads
G-class inserts 	○	◎

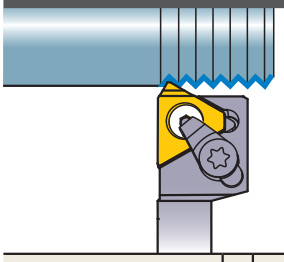
◎ : 1st recommendation
○ : 2nd recommendation

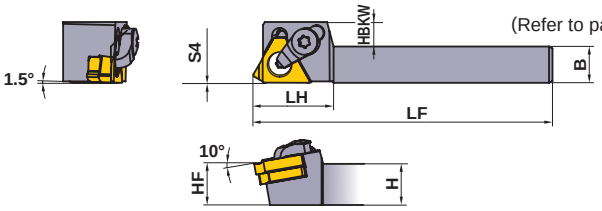
• For ideal chip control and a high cost performance ratio, M-class inserts with 3-D chip breakers are recommended.
• G-class inserts are recommended where highest precision is required.

MMTE HOLDER

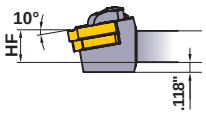
- Various insert types.
- Precision class insert for precise thread forms.
- Available with a pressed breaker for chip control.
- Able to change lead angle by replacing the shim.

MMTE (External threading)





Details of position **A**
(Refer to pages G014-G020 for size **PDX**, **PDY**)
Right hand tool holder only.



MMTER-063SM

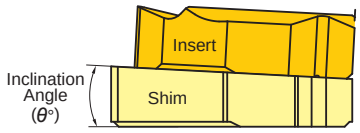
Order Number	Stock	Insert Number	Dimensions (inch)						Clamp Bridge	Clamp Screw ✶2 ①	Stop Ring	Shim Screw ✶2 ②	Shim ✶1	Wrench ①②
	R		H	B	LF	LH	HF	WF						
MMTER-063SM	●	MMT16ER ○○○○○	.375	.375	4.724	.875	.375	.625	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER-**083SM**	●		.500	.500	4.724	.875	.500	.625	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER-**083**	●		.500	.500	4.000	1.000	.500	.625	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER-**103**	●		.625	.625	4.000	1.000	.625	.750	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER-**123**	●		.750	.750	5.000	1.000	.750	1.000	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER-**163**	●		1.000	1.000	6.000	1.000	1.000	1.250	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER-124	●	MMT22ER ○○○○○	.750	.750	5.000	1.250	.750	1.000	SETK61	SETS61	CR5	HFC04010	CTE43TP15	①TKY20F ②HKY25R
MMTER-**164**	●		1.000	1.000	6.000	1.250	1.000	1.250	SETK61	SETS61	CR5	HFC04010	CTE43TP15	①TKY20F ②HKY25R
MMTER-**204**	●		1.250	1.250	6.000	1.250	1.250	1.500	SETK61	SETS61	CR5	HFC04010	CTE43TP15	①TKY20F ②HKY25R

✶1 Select and use an alternate shim from list below (sold separately), dependant on the lead angle.
✶2 Clamp Torgue (lbf-in) : SETS51=31, SETS61=44, HFC03008=13, HFC04010=19

SHIM

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
–1.5°	**CTE32TN15**	●	–3°	MMTER -○○3
–0.5°	CTE32T**N05**	●	–2°	
0.5°	CTE32T**P05**	●	–1°	
1.5°	CTE32T**P15**	●	0°	
2.5°	CTE32T**P25**	●	1°	
3.5°	CTE32T**P35**	●	2°	
4.5°	CTE32T**P45**	●	3°	

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
–1.5°	**CTE43TN15**	●	–3°	MMTER -○○4
–0.5°	CTE43T**N05**	●	–2°	
0.5°	CTE43T**P05**	●	–1°	
1.5°	CTE43T**P15**	●	0°	
2.5°	CTE43T**P25**	●	1°	
3.5°	CTE43T**P35**	●	2°	
4.5°	CTE43T**P45**	●	3°	



Standard shim delivered with the holder.
✶ See page G025 and page G026 for shim selection guide lines.

IDENTIFICATION

MMT E R 08 3 – SM

Designation	Application	Hand of Tool	Tool Size (inch) (Height and Width)				Insert Size		Tool Type	
	E External	R Right	06	.375	12	.750	3	MMT16	SM	Non-offset
			08	.500	16	1.000	4	MMT22		
			10	.625	20	1.250				

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	VP10MF	490 (230–755)
			VP15TF	330 (195–460)
			VP20RT	260 (195–330)
	Carbon Steel Alloy Steel	180–280HB	VP10MF	460 (260–655)
			VP15TF	330 (195–460)
			VP20RT	260 (195–330)
M	Stainless Steel	≤200HB	VP10MF	425 (260–590)
			VP15TF	260 (130–395)
			VP20RT	195 (130–260)

	Work Material	Hardness	Grade	Cutting Speed (SFM)
K	Cast Iron	Tensile Strength ≤350MPa	VP10MF	460 (260–655)
			VP15TF	295 (195–395)
S	Heat-Resistant Alloy	–	VP10MF	150 (50–230)
			VP15TF	100 (65–130)
	Titanium Alloy	–	VP10MF	195 (130–260)
			VP15TF	150 (80–210)
H	Hardened Steel	45–55HRC	VP10MF	165 (100–230)
			VP15TF	130 (65–195)

● : Inventory maintained.

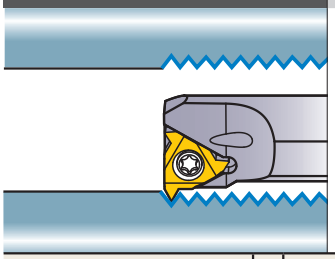
How to select a shim ➤ G025, G026

MMTI TYPE BORING BARS

- Minimum cutting diameter .500".
- Various insert types.
- Precision class insert for precise thread forms.
- Available with a pressed breaker for chip control.
- Able to change lead angle by replacing the shim.

MMTI

(Internal threading)



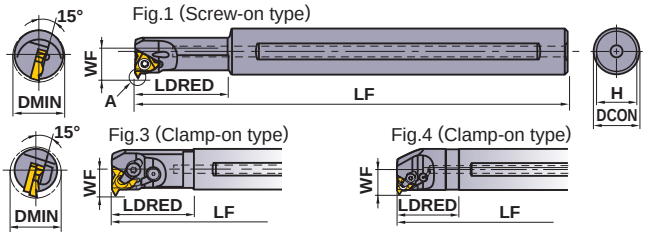


Fig.1 (Screw-on type)

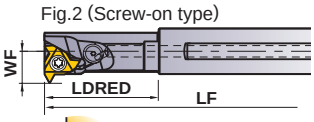
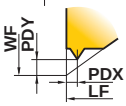


Fig.2 (Screw-on type)

Fig.3 (Clamp-on type)

Fig.4 (Clamp-on type)



Details of position **A** (Refer to pages G015 -G021 for size **PDX**, **PDY**)

Right hand tool holder only.

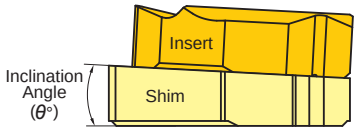
Order Number	Stock R	Insert Number	Lead Angle	Dimensions (inch) DCON	LF	LDRED	WF	H	DMIN	Clamp Bridge	Clamp Screw ★2 ①	Stop Ring	Shim Screw ★2 ②	Shim ★1	Wrench ① ②	Fig.
MMTIR102-0.50-1.5-C	●	MMT11IR ○○○○○	1.5°	.625	5.000	1.000	.340	.586	**.500**	–	TS25	–	–	–	①TKY08F	1
MMTIR**102-0.50-2.5-C**	●		2.5°	.625	5.000	1.000	.340	.586	**.500**	–	TS25	–	–	–	①TKY08F	1
MMTIR**102-0.60-1.5-C**	●		1.5°	.625	6.000	1.250	.380	.586	**.600**	–	TS25	–	–	–	①TKY08F	1
MMTIR**102-0.60-2.5-C**	●		2.5°	.625	6.000	1.250	.380	.586	**.600**	–	TS25	–	–	–	①TKY08F	1
MMTIR103-0.75-1.5-C	●	MMT16IR ○○○○○	1.5°	.625	6.000	1.500	.480	.586	**.750**	–	CS350860T	–	–	–	①TKY15F	2
MMTIR**103-0.75-2.5-C**	●		2.5°	.625	6.000	1.500	.480	.586	**.750**	–	CS350860T	–	–	–	①TKY15F	2
MMTIR**123-0.90-1.5-C**	●		1.5°	.750	7.000	1.500	.510	.711	**.900**	SETK51	SETS51	CR4	HFC03006	CTI32TP15	①TKY15F ②HKY20R	3
MMTIR**163-1.15-1.5-C**	●		1.5°	1.000	10.000	2.500	.660	.937	**1.150**	SETK51	SETS51	CR4	HFC03006	CTI32TP15	①TKY15F ②HKY20R	3
MMTIR**203-1.45-1.5-C**	●		1.5°	1.250	10.000	2.000	.810	1.187	**1.450**	SETK51	SETS51	CR4	HFC03006	CTI32TP15	①TKY15F ②HKY20R	4
MMTIR124-0.95-1.5-C	●	MMT22IR ○○○○○	1.5°	.750	7.000	2.000	.610	.711	**.950**	–	TS43	–	–	–	①TKY15F	2
MMTIR**124-0.95-2.5-C**	●		2.5°	.750	7.000	2.000	.610	.711	**.950**	–	TS43	–	–	–	①TKY15F	2
MMTIR**164-1.20-1.5-C**	●		1.5°	1.000	8.000	1.500	.700	.937	**1.200**	SETK61	SETS61	CR5	HFC04008	CTI43TP15	①TKY20F ②HKY25R	4
MMTIR**204-1.50-1.5-C**	●		1.5°	1.250	10.000	2.000	.860	1.187	**1.500**	SETK61	SETS61	CR5	HFC04008	CTI43TP15	①TKY20F ②HKY25R	4
MMTIR**244-1.75-1.5-C**	●		1.5°	1.500	12.000	2.500	.980	1.437	**1.750**	SETK61	SETS61	CR5	HFC04008	CTI43TP15	①TKY20F ②HKY25R	4

★1 Select and use an alternate shim from list below (sold separately), dependant on the lead angle.
★2 Clamp Torgue (lbf-in) : TS25=8.9, CS350860T=31, SETS51=31, TS43=31, SETS61=44, HFC03006=13, HFC04008=19
Note 1) The screw-on type has no shim. The holder has an in-built lead angle. Please select a holder with the appropriate lead angle.
Note 2) The minimum cutting diameter (DMIN) indicates the prepared hole diameter, not the nominal thread diameter.

SHIM

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
–1.5°	**CTI32TN15**	●	–3°	MMTIR ○○3-○○○ -○○-C
–0.5°	CTI32T**N05**	●	–2°	
0.5°	CTI32T**P05**	●	–1°	
1.5°	CTI32T**P15**	●	0°	
2.5°	CTI32T**P25**	●	1°	
3.5°	CTI32T**P35**	●	2°	
4.5°	CTI32T**P45**	●	3°	

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
–1.5°	**CTI43TN15**	●	–3°	MMTIR ○○4-○○○ -○○-C
–0.5°	CTI43T**N05**	●	–2°	
0.5°	CTI43T**P05**	●	–1°	
1.5°	CTI43T**P15**	●	0°	
2.5°	CTI43T**P25**	●	1°	
3.5°	CTI43T**P35**	●	2°	
4.5°	CTI43T**P45**	●	3°	



Standard shim delivered with the holder.
★ See page G025 and page G026 for shim selection guide lines.

IDENTIFICATION

MMT **I** **R** **10** **2** – **0.50** – **1.5** – **C**

Designation	Application	Hand of Tool	Shank Diameter (inch)	Insert Size	Min. Cutting Diameter (inch)	Lead Angle	Coolant
MMT	I Internal	R Right	10 .625 12 .750 16 1.000 20 1.250 24 1.500	2 MMT11 3 MMT16 4 MMT22	0.50 .500 1.15 1.150 0.60 .600 1.20 1.200 0.75 .750 1.45 1.450 0.90 .900 1.50 1.500 0.95 .950 1.75 1.750	1.5 1.5° 2.5 2.5°	C With

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	VP10MF	490 (230–755)
			VP15TF	330 (195–460)
			VP20RT	260 (195–330)
	Carbon Steel Alloy Steel	180–280HB	VP10MF	460 (260–655)
			VP15TF	330 (195–460)
			VP20RT	260 (195–330)
M	Stainless Steel	≤200HB	VP10MF	425 (260–590)
			VP15TF	260 (130–395)
			VP20RT	195 (130–260)

	Work Material	Hardness	Grade	Cutting Speed (SFM)
K	Cast Iron	Tensile Strength ≤350MPa	VP10MF	460 (260–655)
			VP15TF	295 (195–395)
S	Heat-Resistant Alloy	–	VP10MF	150 (50–230)
			VP15TF	100 (65–130)
	Titanium Alloy	–	VP10MF	195 (130–260)
			VP15TF	150 (80–210)
H	Hardened Steel	45–55HRC	VP10MF	165 (100–230)
			VP15TF	130 (65–195)

MMT M-CLASS INSERTS WITH 3-D CHIP BREAKERS

EXTERNAL THREADING INSERTS

Type	Order Number	Coated VP15TF	Coated VP20RT	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total depth of cut (mm)	Geometry
Partial Profile 60°	**MMT16ERA60-S**	●		0.5—1.5	48—16	9.525	3.44	0.8	0.9	0.06	—	Partial form 60°
	MMT**16ERG60-S**	●		1.75—3.0	14—8	9.525	3.44	1.2	1.7	0.23	—	
Partial Profile 55°	**MMT16ERA55-S**	★			48—16	9.525	3.44	0.8	0.9	0.07	—	Partial form 55°
	MMT**16ERG55-S**	★			14—8	9.525	3.44	1.2	1.7	0.23	—	
ISO Metric	**MMT16ER100ISO-S**	●	★	1.0		9.525	3.44	0.7	0.7	0.13	0.61	Full form 60°
	MMT**16ER125ISO-S**	●	★	1.25		9.525	3.44	0.8	0.9	0.16	0.77	
	MMT**16ER150ISO-S**	●	★	1.5		9.525	3.44	0.8	1.0	0.20	0.92	
	MMT**16ER175ISO-S**	●	★	1.75		9.525	3.44	0.9	1.2	0.22	1.07	
	MMT**16ER200ISO-S**	●	★	2.0		9.525	3.44	1.0	1.3	0.26	1.23	
	MMT**16ER250ISO-S**	●	★	2.5		9.525	3.44	1.1	1.5	0.33	1.53	
	MMT**16ER300ISO-S**	●	★	3.0		9.525	3.44	1.2	1.6	0.40	1.84	
American UN	**MMT16ER160UN-S**	●			16	9.525	3.44	0.9	1.1	0.23	0.97	Full form 60°
	MMT**16ER140UN-S**	●			14	9.525	3.44	1.0	1.2	0.26	1.11	
	MMT**16ER120UN-S**	●			12	9.525	3.44	1.1	1.4	0.30	1.30	
Whitworth for BSW, BSP	**MMT16ER190W-S**	★			19	9.525	3.44	0.8	1.0	0.18	0.86	Full form 55°
	MMT**16ER140W-S**	★			14	9.525	3.44	1.0	1.2	0.25	1.16	
	MMT**16ER110W-S**	★			11	9.525	3.44	1.1	1.5	0.32	1.48	
BSPT	**MMT16ER190BSPT-S**	★			19	9.525	3.44	0.8	0.9	0.18	0.86	Full form 55°
	MMT**16ER140BSPT-S**	★			14	9.525	3.44	1.0	1.2	0.25	1.16	
	MMT**16ER110BSPT-S**	★			11	9.525	3.44	1.1	1.5	0.32	1.48	

IDENTIFICATION

MMT **16** **E** **R** **100** **ISO** – **S**

S M-class inserts with 3-D chip breakers

Designation

Diameter of Inscribed Circle (mm)

11	6.35
16	9.525

Application

E	External
I	Internal

Hand of Tool

R	Right

Pitch

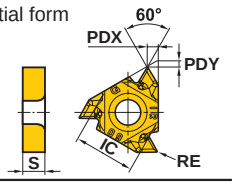
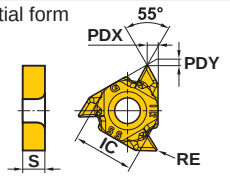
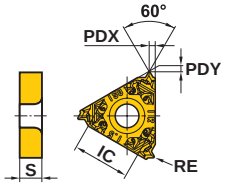
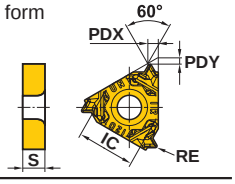
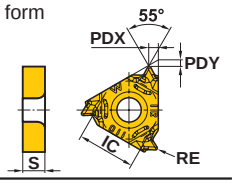
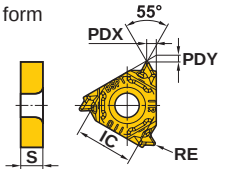
100	1.0mm	A	0.5—1.5mm or 48—16 thread/inch
125	1.25mm		
150	1.5mm	G	1.75—3.0mm or 14—8 thread/inch
175	1.75mm		
200	2.0mm		
250	2.5mm		
300	3.0mm		

Threading Type

60	Partial Profile 60°
55	Partial Profile 55°
ISO	ISO Metric
W	Whitworth for BSW, BSP
BSPT	BSPT
UN	American UN

● : Inventory maintained. ★ : Inventory maintained in Japan.
<5 inserts in one case>

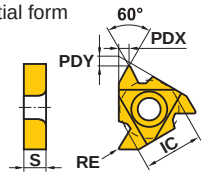
INTERNAL THREADING INSERTS

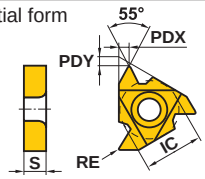
Type	Order Number	Coated VP15TF	Coated VP20RT	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total depth of cut (mm)	Geometry
Partial Profile 60°	**MMT11IRA60-S**	★		0.5—1.5	48—16	6.35	3.04	0.8	0.9	0.03	—	Partial form 
	MMT**16IRA60-S**	●		0.5—1.5	48—16	9.525	3.44	0.8	0.9	0.03	—	
	MMT**16IRG60-S**	●		1.75—3.0	14—8	9.525	3.44	1.2	1.7	0.11	—	
Partial Profile 55°	**MMT11IRA55-S**	★			48—16	6.35	3.04	0.8	0.9	0.07	—	Partial form 
	MMT**16IRA55-S**	★			48—16	9.525	3.44	0.8	0.9	0.07	—	
	MMT**16IRG55-S**	★			14—8	9.525	3.44	1.2	1.7	0.21	—	
ISO Metric	**MMT11IR100ISO-S**	★		1.0		6.35	3.04	0.6	0.7	0.06	0.58	Full form 
	MMT**11IR125ISO-S**	★		1.25		6.35	3.04	0.8	0.9	0.08	0.72	
	MMT**11IR150ISO-S**	★		1.5		6.35	3.04	0.8	1.0	0.10	0.87	
	MMT**16IR100ISO-S**	●	★	1.0		9.525	3.44	0.6	0.7	0.06	0.58	
	MMT**16IR125ISO-S**	●	★	1.25		9.525	3.44	0.8	0.9	0.08	0.72	
	MMT**16IR150ISO-S**	●	★	1.5		9.525	3.44	0.8	1.0	0.10	0.87	
	MMT**16IR175ISO-S**	●	★	1.75		9.525	3.44	0.9	1.2	0.11	1.01	
	MMT**16IR200ISO-S**	●	★	2.0		9.525	3.44	1.0	1.3	0.13	1.15	
	MMT**16IR250ISO-S**	●	★	2.5		9.525	3.44	1.1	1.5	0.17	1.44	
	MMT**16IR300ISO-S**	●	★	3.0		9.525	3.44	1.1	1.5	0.20	1.73	
American UN	**MMT16IR160UN-S**	●			16	9.525	3.44	0.9	1.1	0.11	0.92	Full form 
	MMT**16IR140UN-S**	●			14	9.525	3.44	0.9	1.2	0.12	1.05	
	MMT**16IR120UN-S**	●			12	9.525	3.44	1.1	1.4	0.14	1.22	
Whitworth for BSW, BSP	**MMT16IR190W-S**	★			19	9.525	3.44	0.8	1.0	0.18	0.86	Full form 
	MMT**16IR140W-S**	★			14	9.525	3.44	1.0	1.2	0.25	1.16	
	MMT**16IR110W-S**	★			11	9.525	3.44	1.1	1.5	0.32	1.48	
BSPT	**MMT16IR190BSPT-S**	★			19	9.525	3.44	0.8	0.9	0.18	0.86	Full form 
	MMT**16IR140BSPT-S**	★			14	9.525	3.44	1.0	1.2	0.25	1.16	
	MMT**16IR110BSPT-S**	★			11	9.525	3.44	1.1	1.5	0.32	1.48	

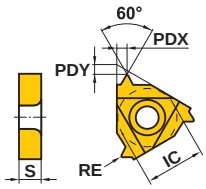
MMT G-CLASS GROUND INSERTS

EXTERNAL THREADING INSERTS

Type	Thread Tolerance	Order Number	Coated VP10MF	Coated VP15TF	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total depth of cut (mm)	Geometry
Partial Profile 60°	—	MMT16ERA60	★	★	0.5—1.5	48—16	9.525	3.44	0.8	0.9	0.05	—	Partial form
		MMT16ERG60	★	★	1.75—3.0	14—8	9.525	3.44	1.2	1.7	0.27	—	
		MMT16ERAG60	★		0.5—3.0	48—8	9.525	3.44	1.2	1.7	0.08	—	
		MMT22ERN60	★		3.5—5.0	7—5	12.7	4.64	1.7	2.5	0.53	—	
Partial Profile 55°	—	MMT16ERA55	★	★		48—16	9.525	3.44	0.8	0.9	0.05	—	Partial form
		MMT16ERG55	★	★		14—8	9.525	3.44	1.2	1.7	0.21	—	
		MMT16ERAG55	★			48—8	9.525	3.44	1.2	1.7	0.07	—	
		MMT22ERN55	★			7—5	12.7	4.64	1.7	2.5	0.44	—	
ISO Metric	6g	MMT16ER050ISO	●		0.5		9.525	3.44	0.6	0.4	0.06	0.31	Full form
		MMT16ER075ISO	●		0.75		9.525	3.44	0.6	0.6	0.10	0.46	
		MMT16ER100ISO	●	★	1.0		9.525	3.44	0.7	0.7	0.16	0.61	
		MMT16ER125ISO	●	★	1.25		9.525	3.44	0.8	0.9	0.19	0.77	
		MMT16ER150ISO	●	★	1.5		9.525	3.44	0.8	1.0	0.23	0.92	
		MMT16ER175ISO	●	★	1.75		9.525	3.44	0.9	1.2	0.21	1.07	
		MMT16ER200ISO	●	★	2.0		9.525	3.44	1.0	1.3	0.31	1.23	
		MMT16ER250ISO	●	★	2.5		9.525	3.44	1.1	1.5	0.32	1.53	
		MMT16ER300ISO	●	★	3.0		9.525	3.44	1.2	1.6	0.46	1.84	
		MMT22ER350ISO	★		3.5		12.7	4.64	1.6	2.3	0.45	2.15	
		MMT22ER400ISO	★		4.0		12.7	4.64	1.6	2.3	0.52	2.45	
		MMT22ER450ISO	★		4.5		12.7	4.64	1.7	2.4	0.58	2.76	
		MMT22ER500ISO	★		5.0		12.7	4.64	1.7	2.5	0.63	3.07	







IDENTIFICATION

MMT **16** **E** **R** **050** **ISO**

Designation

Diameter of Inscribed Circle (mm)	
11	6.35
16	9.525
22	12.7

Application	
E	External
I	Internal

Hand of Tool	
R	Right

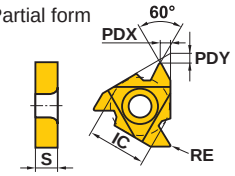
Pitch			
050	0.5mm	A	0.5—1.5mm or 48—16 thread/inch
075	0.75mm		
100	1.0mm		
125	1.25mm	G	1.75—3.0mm or 14—8 thread/inch
150	1.5mm		
175	1.75mm		
200	2.0mm	AG	0.5—3.0mm or 48—8 thread/inch
250	2.5mm		
300	3.0mm		
350	3.5mm		
400	4.0mm	N	3.5—5.0mm or 7—5 thread/inch
450	4.5mm		
500	5.0mm		

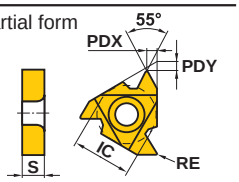
Threading Type	
60	Partial Profile 60°
55	Partial Profile 55°
ISO	ISO Metric
W	Whitworth for BSW, BSP
BSPT	BSPT
UN	American UN
RD	Round DIN 405
TR	ISO Trapezoidal 30°
ACME	American ACME
UNJ	UNJ
APBU	API Buttress Casing
APRD	API Round Casing &Tubing
NPT	NPT
NPTF	NPTF

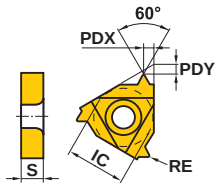
● : Inventory maintained. ★ : Inventory maintained in Japan.
<5 inserts in one case>

INTERNAL THREADING INSERTS

Type	Thread Tolerance	Order Number	Coated VP10MF	Coated VP15TF	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total depth of cut (mm)	Geometry
Partial Profile 60°	–	**MMT11IRA60**	★	★	0.5–1.5	48–16	6.35	3.04	0.8	0.9	0.05	–	Partial form
		MMT**16IRA60**	★	★	0.5–1.5	48–16	9.525	3.44	0.8	0.9	0.05	–	
		MMT**16IRG60**	★	★	1.75–3.0	14–8	9.525	3.44	1.2	1.7	0.16	–	
		MMT**16IRAG60**	★		0.5–3.0	48–8	9.525	3.44	1.2	1.7	0.05	–	
		MMT**22IRN60**	★		3.5–5.0	7–5	12.7	4.64	1.7	2.5	0.30	–	
Partial Profile 55°	–	**MMT11IRA55**	★	★		48–16	6.35	3.04	0.8	0.9	0.05	–	Partial form
		MMT**16IRA55**	★	★		48–16	9.525	3.44	0.8	0.9	0.05	–	
		MMT**16IRG55**	★	★		14–8	9.525	3.44	1.2	1.7	0.21	–	
		MMT**16IRAG55**	★			48–8	9.525	3.44	1.2	1.7	0.07	–	
		MMT**22IRN55**	★			7–5	12.7	4.64	1.7	2.5	0.44	–	
ISO Metric	6H	**MMT11IR050ISO**	★		0.5		6.35	3.04	0.6	0.4	0.03	0.29	Full form
		MMT**11IR075ISO**	★		0.75		6.35	3.04	0.6	0.6	0.04	0.43	
		MMT**11IR100ISO**	★	★	1.0		6.35	3.04	0.6	0.7	0.10	0.58	
		MMT**11IR125ISO**	★	★	1.25		6.35	3.04	0.8	0.9	0.12	0.72	
		MMT**11IR150ISO**	★	★	1.5		6.35	3.04	0.8	1.0	0.14	0.87	
		MMT**11IR175ISO**	★		1.75		6.35	3.04	0.9	1.1	0.10	1.01	
		MMT**11IR200ISO**	★		2.0		6.35	3.04	0.9	1.1	0.18	1.15	
		MMT**16IR050ISO**	★		0.5		9.525	3.44	0.6	0.4	0.03	0.29	
		MMT**16IR075ISO**	★		0.75		9.525	3.44	0.6	0.6	0.04	0.43	
		MMT**16IR100ISO**	●	★	1.0		9.525	3.44	0.6	0.7	0.10	0.58	
		MMT**16IR125ISO**	●	★	1.25		9.525	3.44	0.8	0.9	0.12	0.72	
		MMT**16IR150ISO**	●	★	1.5		9.525	3.44	0.8	1.0	0.14	0.87	
		MMT**16IR175ISO**	●	★	1.75		9.525	3.44	0.9	1.2	0.10	1.01	
		MMT**16IR200ISO**	●	★	2.0		9.525	3.44	1.0	1.3	0.18	1.15	
		MMT**16IR250ISO**	●	★	2.5		9.525	3.44	1.1	1.5	0.15	1.44	
		MMT**16IR300ISO**	●	★	3.0		9.525	3.44	1.1	1.5	0.26	1.73	
		MMT**22IR350ISO**	★		3.5		12.7	4.64	1.6	2.3	0.22	2.02	
		MMT**22IR400ISO**	★		4.0		12.7	4.64	1.6	2.3	0.25	2.31	
		MMT**22IR450ISO**	★		4.5		12.7	4.64	1.6	2.4	0.28	2.60	
		MMT**22IR500ISO**	★		5.0		12.7	4.64	1.6	2.3	0.32	2.89	







IDENTIFICATION

MMT | **16** | **E** | **R** | **050** | **ISO**

Designation

Diameter of Inscribed Circle (mm)

11	6.35
16	9.525
22	12.7

Application

E	External
I	Internal

Hand of Tool

R	Right

Pitch

050	0.5mm	**A**	0.5–1.5mm or 48–16 thread/inch
075	0.75mm		
100	1.0mm	**G**	1.75–3.0mm or 14–8 thread/inch
125	1.25mm		
150	1.5mm		
175	1.75mm		
200	2.0mm	**AG**	0.5–3.0mm or 48–8 thread/inch
250	2.5mm		
300	3.0mm		
350	3.5mm		
400	4.0mm	**N**	3.5–5.0mm or 7–5 thread/inch
450	4.5mm		
500	5.0mm		

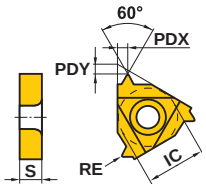
Threading Type

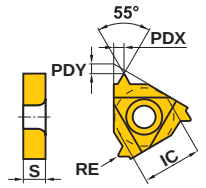
60	Partial Profile 60°
55	Partial Profile 55°
ISO	ISO Metric
W	Whitworth for BSW, BSP
BSPT	BSPT
UN	American UN
RD	Round DIN 405
TR	ISO Trapezoidal 30°
ACME	American ACME
UNJ	UNJ
APBU	API Buttress Casing
APRD	API Round Casing &Tubing
NPT	NPT
NPTF	NPTF

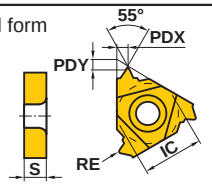
MMT G-CLASS GROUND INSERTS

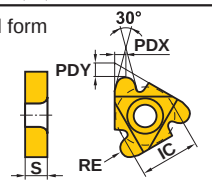
EXTERNAL THREADING INSERTS

Type	Thread Tolerance	Order Number	Coated VP10MF	Coated VP15TF	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total depth of cut (mm)	Geometry
American UN	2A	MMT16ER320UN	●			32	9.525	3.44	0.6	0.6	0.09	0.49	Full form
		MMT16ER280UN	●			28	9.525	3.44	0.6	0.7	0.10	0.56	
		MMT16ER240UN	●			24	9.525	3.44	0.7	0.8	0.16	0.65	
		MMT16ER200UN	●			20	9.525	3.44	0.8	0.9	0.19	0.78	
		MMT16ER180UN	●			18	9.525	3.44	0.8	1.0	0.21	0.87	
		MMT16ER160UN	●	★		16	9.525	3.44	0.9	1.1	0.24	0.97	
		MMT16ER140UN	●	★		14	9.525	3.44	1.0	1.2	0.22	1.11	
		MMT16ER130UN	●			13	9.525	3.44	1.0	1.3	0.24	1.20	
		MMT16ER120UN	●	★		12	9.525	3.44	1.1	1.4	0.32	1.30	
		MMT16ER110UN	●			11	9.525	3.44	1.1	1.5	0.29	1.42	
		MMT16ER100UN	●			10	9.525	3.44	1.1	1.5	0.32	1.56	
		MMT16ER090UN	●			9	9.525	3.44	1.2	1.7	0.35	1.73	
		MMT16ER080UN	●			8	9.525	3.44	1.2	1.6	0.48	1.95	
		MMT22ER070UN	★			7	12.7	4.64	1.6	2.3	0.47	2.22	
		MMT22ER060UN	★			6	12.7	4.64	1.6	2.3	0.53	2.60	
		MMT22ER050UN	★			5	12.7	4.64	1.7	2.5	0.64	3.12	
Whitworth for BSW, BSP	Medium Class A	MMT16ER280W	★			28	9.525	3.44	0.6	0.7	0.09	0.58	Full form
		MMT16ER260W	★			26	9.525	3.44	0.7	0.8	0.10	0.63	
		MMT16ER200W	★			20	9.525	3.44	0.8	0.9	0.18	0.81	
		MMT16ER190W	★	★		19	9.525	3.44	0.8	1.0	0.19	0.86	
		MMT16ER180W	★			18	9.525	3.44	0.8	1.0	0.20	0.90	
		MMT16ER160W	★			16	9.525	3.44	0.9	1.1	0.23	1.02	
		MMT16ER140W	★	★		14	9.525	3.44	1.0	1.2	0.26	1.16	
		MMT16ER120W	★			12	9.525	3.44	1.1	1.4	0.30	1.36	
		MMT16ER110W	★	★		11	9.525	3.44	1.1	1.5	0.33	1.48	
		MMT16ER100W	★			10	9.525	3.44	1.1	1.5	0.37	1.63	
		MMT16ER090W	★			9	9.525	3.44	1.2	1.7	0.34	1.81	
		MMT16ER080W	★			8	9.525	3.44	1.2	1.5	0.39	2.03	
		MMT22ER070W	★			7	12.7	4.64	1.6	2.3	0.46	2.32	
		MMT22ER060W	★			6	12.7	4.64	1.6	2.3	0.53	2.71	
		MMT22ER050W	★			5	12.7	4.64	1.7	2.4	0.66	3.25	
BSPT	Standard BSPT	MMT16ER280BSPT	★			28	9.525	3.44	0.6	0.6	0.09	0.58	Full form
		MMT16ER190BSPT	★	★		19	9.525	3.44	0.8	0.9	0.14	0.86	
		MMT16ER140BSPT	★	★		14	9.525	3.44	1.0	1.2	0.26	1.16	
		MMT16ER110BSPT	★	★		11	9.525	3.44	1.1	1.5	0.33	1.48	
Round DIN 405	7h	MMT16ER100RD	★			10	9.525	3.44	1.1	1.2	0.60	1.27	Full form
		MMT16ER080RD	★			8	9.525	3.44	1.4	1.3	0.75	1.59	
		MMT16ER060RD	★			6	9.525	3.44	1.5	1.7	1.00	2.12	
		MMT22ER040RD	★			4	9.525	3.44	2.2	2.3	1.51	3.18	





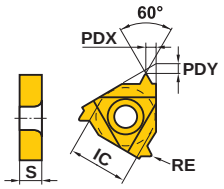


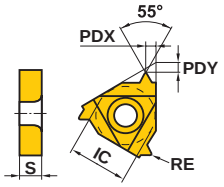


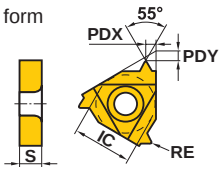
● : Inventory maintained. ★ : Inventory maintained in Japan.
<5 inserts in one case>

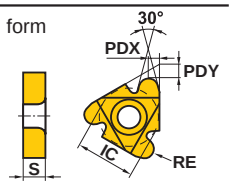
INTERNAL THREADING INSERTS

Type	Thread Tolerance	Order Number	Coated VP10MF	Coated VP15TF	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total depth of cut (mm)	Geometry
American UN	2B	**MMT11IR320UN**	★			32	6.35	3.04	0.6	0.6	0.04	0.46	Full form
		MMT**11IR280UN**	★			28	6.35	3.04	0.6	0.7	0.05	0.52	
		MMT**11IR240UN**	★			24	6.35	3.04	0.7	0.8	0.09	0.61	
		MMT**11IR200UN**	★			20	6.35	3.04	0.8	0.9	0.11	0.73	
		MMT**11IR180UN**	★			18	6.35	3.04	0.8	1.0	0.12	0.81	
		MMT**11IR160UN**	★			16	6.35	3.04	0.9	1.1	0.14	0.92	
		MMT**11IR140UN**	★			14	6.35	3.04	0.9	1.1	0.11	1.05	
		MMT**16IR320UN**	●			32	9.525	3.44	0.6	0.6	0.04	0.46	
		MMT**16IR280UN**	●			28	9.525	3.44	0.6	0.7	0.05	0.52	
		MMT**16IR240UN**	●			24	9.525	3.44	0.7	0.8	0.09	0.61	
		MMT**16IR200UN**	●			20	9.525	3.44	0.8	0.9	0.11	0.73	
		MMT**16IR180UN**	●			18	9.525	3.44	0.8	1.0	0.12	0.81	
		MMT**16IR160UN**	●	★		16	9.525	3.44	0.9	1.1	0.14	0.92	
		MMT**16IR140UN**	●	★		14	9.525	3.44	0.9	1.2	0.11	1.05	
		MMT**16IR130UN**	●			13	9.525	3.44	1.0	1.3	0.10	1.13	
		MMT**16IR120UN**	●	★		12	9.525	3.44	1.1	1.4	0.18	1.22	
		MMT**16IR110UN**	●			11	9.525	3.44	1.1	1.5	0.13	1.33	
		MMT**16IR100UN**	●			10	9.525	3.44	1.1	1.5	0.15	1.47	
		MMT**16IR090UN**	●			9	9.525	3.44	1.2	1.7	0.17	1.63	
		MMT**16IR080UN**	●			8	9.525	3.44	1.1	1.5	0.27	1.83	
		MMT**22IR070UN**	★			7	12.7	4.64	1.6	2.3	0.23	2.09	
		MMT**22IR060UN**	★			6	12.7	4.64	1.6	2.3	0.26	2.44	
		MMT**22IR050UN**	★			5	12.7	4.64	1.6	2.3	0.32	2.93	
Whitworth for BSW, BSP	Medium Class A	**MMT11IR190W**	★			19	6.35	3.04	0.8	1.0	0.19	0.86	Full form
		MMT**11IR140W**	★			14	6.35	3.04	0.9	1.1	0.26	1.16	
		MMT**16IR280W**	★			28	9.525	3.44	0.6	0.7	0.09	0.58	
		MMT**16IR260W**	★			26	9.525	3.44	0.7	0.8	0.10	0.63	
		MMT**16IR200W**	★			20	9.525	3.44	0.8	0.9	0.18	0.81	
		MMT**16IR190W**	★	★		19	9.525	3.44	0.8	1.0	0.19	0.86	
		MMT**16IR180W**	★			18	9.525	3.44	0.8	1.0	0.20	0.90	
		MMT**16IR160W**	★			16	9.525	3.44	0.9	1.1	0.23	1.02	
		MMT**16IR140W**	★	★		14	9.525	3.44	1.0	1.2	0.26	1.16	
		MMT**16IR120W**	★			12	9.525	3.44	1.1	1.4	0.30	1.36	
		MMT**16IR110W**	★	★		11	9.525	3.44	1.1	1.5	0.33	1.48	
		MMT**16IR100W**	★			10	9.525	3.44	1.1	1.5	0.37	1.63	
		MMT**16IR090W**	★			9	9.525	3.44	1.2	1.7	0.34	1.81	
		MMT**16IR080W**	★			8	9.525	3.44	1.2	1.5	0.39	2.03	
		MMT**22IR070W**	★			7	12.7	4.64	1.6	2.3	0.46	2.32	
		MMT**22IR060W**	★			6	12.7	4.64	1.6	2.3	0.53	2.71	
		MMT**22IR050W**	★			5	12.7	4.64	1.7	2.4	0.66	3.25	
BSPT	Standard BSPT	**MMT11IR190BSPT**	★			19	6.35	3.04	0.8	0.9	0.14	0.86	Full form
		MMT**11IR140BSPT**	★			14	6.35	3.04	0.9	1.0	0.26	1.16	
		MMT**16IR190BSPT**	★	★		19	9.525	3.44	0.8	0.9	0.14	0.86	
		MMT**16IR140BSPT**	★	★		14	9.525	3.44	1.0	1.2	0.26	1.16	
		MMT**16IR110BSPT**	★	★		11	9.525	3.44	1.1	1.5	0.33	1.48	
Round DIN 405	7H	**MMT16IR100RD**	★			10	9.525	3.44	1.1	1.2	0.55	1.27	Full form
		MMT**16IR080RD**	★			8	9.525	3.44	1.4	1.4	0.70	1.59	
		MMT**16IR060RD**	★			6	9.525	3.44	1.4	1.5	0.93	2.12	
		MMT**22IR040RD**	★			4	12.7	4.64	2.2	2.3	1.40	3.18	





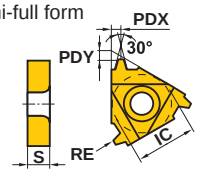


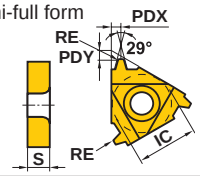


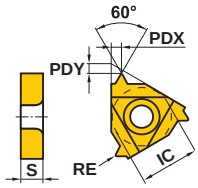
MMT G-CLASS GROUND INSERTS

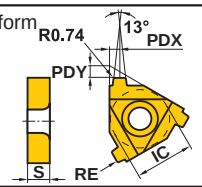
EXTERNAL THREADING INSERTS

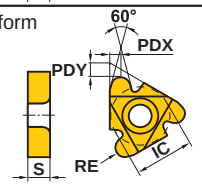
Type	Thread Tolerance	Order Number	Coated VP10MF		Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total depth of cut (mm)	Geometry
ISO Trapezoidal 30°	7e	**MMT16ER150TR**	★		1.5		9.525	3.44	1.0	1.1	0.08	0.90	Semi-full form
		MMT**16ER200TR**	★		2.0		9.525	3.44	1.1	1.3	0.15	1.25	
		MMT**16ER300TR**	★		3.0		9.525	3.44	1.3	1.5	0.15	1.75	
		MMT**22ER400TR**	★		4.0		12.7	4.64	1.7	1.9	0.15	2.25	
		MMT**22ER500TR**	★		5.0		12.7	4.64	2.1	2.5	0.15	2.75	
American ACME	3G	**MMT16ER120ACME**	●			12	9.525	3.44	1.1	1.2	0.08	1.19	Semi-full form
		MMT**16ER100ACME**	●			10	9.525	3.44	1.3	1.4	0.08	1.52	
		MMT**16ER080ACME**	●			8	9.525	3.44	1.4	1.5	0.10	1.84	
		MMT**22ER060ACME**	●			6	12.7	4.64	1.8	2.1	0.10	2.37	
		MMT**22ER050ACME**	●			5	12.7	4.64	2.0	2.3	0.10	2.79	
UNJ	3A	**MMT16ER320UNJ**	★			32	9.525	3.44	0.6	0.7	0.13	0.46	Full form
		MMT**16ER280UNJ**	★			28	9.525	3.44	0.7	0.7	0.14	0.52	
		MMT**16ER240UNJ**	★			24	9.525	3.44	0.7	0.8	0.17	0.61	
		MMT**16ER200UNJ**	★			20	9.525	3.44	0.8	0.9	0.20	0.73	
		MMT**16ER180UNJ**	★			18	9.525	3.44	0.8	1.0	0.22	0.81	
		MMT**16ER160UNJ**	★			16	9.525	3.44	0.9	1.1	0.25	0.92	
		MMT**16ER140UNJ**	★			14	9.525	3.44	1.0	1.2	0.29	1.05	
		MMT**16ER120UNJ**	★			12	9.525	3.44	1.1	1.3	0.33	1.22	
		MMT**16ER100UNJ**	★			10	9.525	3.44	1.2	1.5	0.40	1.47	
		MMT**16ER080UNJ**	★			8	9.525	3.44	1.2	1.6	0.51	1.83	
API Buttress Casing	Standard API	**MMT22ER050APBU**	★			5	12.7	4.64	3.1	1.9	0.18	1.55	Full form
API Round Casing & Tubing	Standard API RD	**MMT16ER100APRD**	●			10	9.525	3.44	1.2	1.4	0.34	1.41	Full form
		MMT**16ER080APRD**	●			8	9.525	3.44	1.3	1.5	0.41	1.81	
American NPT	Standard NPT	**MMT16ER270NPT**	●			27	9.525	3.44	0.7	0.8	0.04	0.66	Full form
		MMT**16ER180NPT**	●			18	9.525	3.44	0.8	1.0	0.08	1.01	
		MMT**16ER140NPT**	●			14	9.525	3.44	0.9	1.2	0.09	1.33	
		MMT**16ER115NPT**	●			11.5	9.525	3.44	1.1	1.5	0.11	1.64	
		MMT**16ER080NPT**	●			8	9.525	3.44	1.3	1.8	0.14	2.42	
American NPTF	Class 2	**MMT16ER270NPTF**	★			27	9.525	3.44	0.7	0.8	0.04	0.64	Full form
		MMT**16ER180NPTF**	★			18	9.525	3.44	0.8	1.0	0.04	1.00	
		MMT**16ER140NPTF**	★			14	9.525	3.44	0.9	1.2	0.04	1.35	
		MMT**16ER115NPTF**	★			11.5	9.525	3.44	1.1	1.5	0.04	1.63	
		MMT**16ER080NPTF**	★			8	9.525	3.44	1.3	1.8	0.04	2.38	

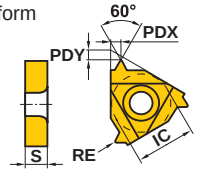


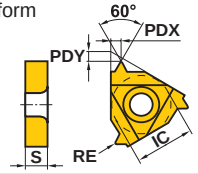






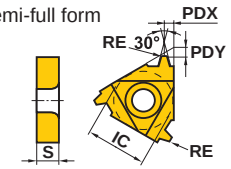
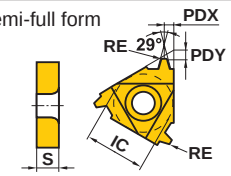
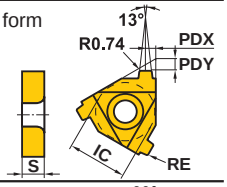
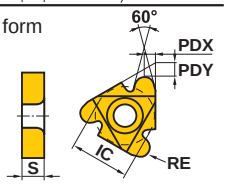
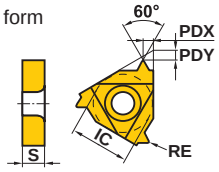
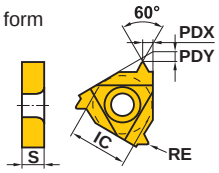




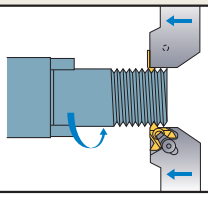
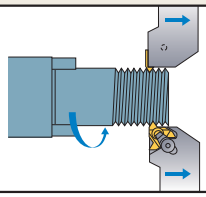
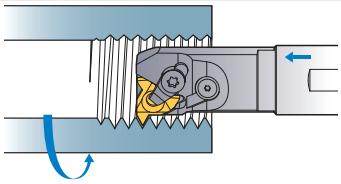
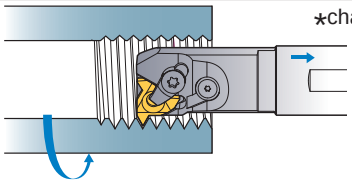


● : Inventory maintained. ★ : Inventory maintained in Japan.
<5 inserts in one case>

INTERNAL THREADING INSERTS

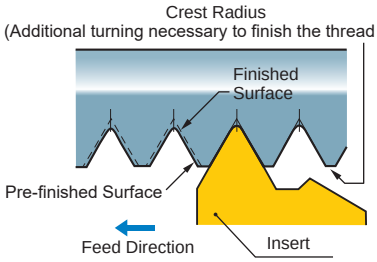
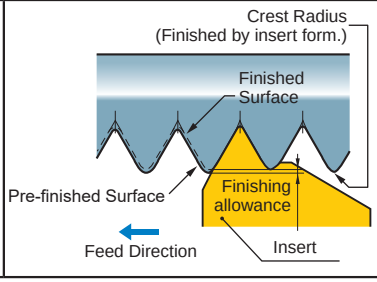
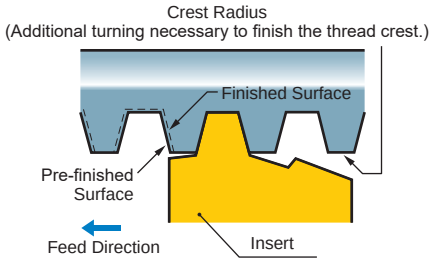
Type	Thread Tolerance	Order Number	Coated VP10MF		Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total depth of cut (mm)	Geometry
ISO Trapezoidal 30°	7H	**MMT16IR150TR**	★		1.5		9.525	3.44	1.0	1.1	0.08	0.90	Semi-full form 
		MMT**16IR200TR**	★		2.0		9.525	3.44	1.1	1.3	0.15	1.25	
		MMT**16IR300TR**	★		3.0		9.525	3.44	1.3	1.5	0.15	1.75	
		MMT**22IR400TR**	★		4.0		12.7	4.64	1.7	1.9	0.15	2.25	
		MMT**22IR500TR**	★		5.0		12.7	4.64	2.1	2.5	0.15	2.75	
American ACME	3G	**MMT16IR120ACME**	●			12	9.525	3.44	1.2	1.3	0.05	1.19	Semi-full form 
		MMT**16IR100ACME**	●			10	9.525	3.44	1.2	1.3	0.08	1.52	
		MMT**16IR080ACME**	●			8	9.525	3.44	1.4	1.5	0.10	1.84	
		MMT**22IR060ACME**	●			6	12.7	4.64	1.8	2.1	0.10	2.37	
		MMT**22IR050ACME**	●			5	12.7	4.64	2.0	2.3	0.10	2.79	
UNJ		When machining an internal UNJ thread, cut an internal hole with the appropriate diameter. Then machine with 60° American UN. In this case, a full form type insert cannot be used.											
API Buttress Casing	Standard API	**MMT22IR050APBU**	★			5	12.7	4.64	2.8	1.9	0.18	1.55	Full form 
API Round Casing & Tubing	Standard API RD	**MMT16IR100APRD**	●			10	9.525	3.44	1.2	1.4	0.34	1.41	Full form 
		MMT**16IR080APRD**	●			8	9.525	3.44	1.3	1.5	0.41	1.81	
American NPT	Standard NPT	**MMT16IR270NPT**	●			27	9.525	3.44	0.7	0.8	0.04	0.66	Full form 
		MMT**16IR180NPT**	●			18	9.525	3.44	0.8	1.0	0.08	1.01	
		MMT**16IR140NPT**	●			14	9.525	3.44	0.9	1.2	0.09	1.33	
		MMT**16IR115NPT**	●			11.5	9.525	3.44	1.1	1.5	0.11	1.64	
		MMT**16IR080NPT**	●			8	9.525	3.44	1.3	1.8	0.14	2.42	
American NPTF	Class 2	**MMT16IR140NPTF**	★			14	9.525	3.44	0.9	1.2	0.04	1.35	Full form 
		MMT**16IR115NPTF**	★			11.5	9.525	3.44	1.1	1.5	0.04	1.63	
		MMT**16IR080NPTF**	★			8	9.525	3.44	1.3	1.8	0.04	2.38	

THREADING METHODS

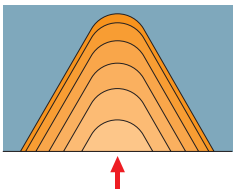
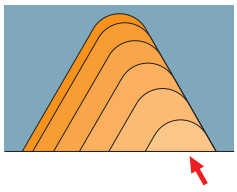
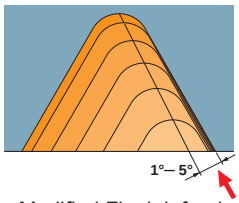
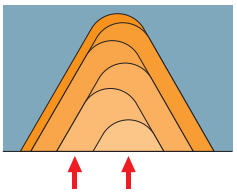
	Right Hand Thread	Left Hand Thread
EXTERNAL		 ⁎change the shim
INTERNAL		 ⁎change the shim

· Usually, threads are cut feeding the insert towards the chuck.
· When machining left hand threads, note that clamping rigidity is lowered due the application of back turning.
· When machining left hand threads, the lead angle is negative. Ensure an appropriate lead angle by changing the shim.

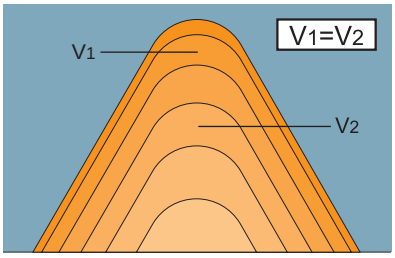
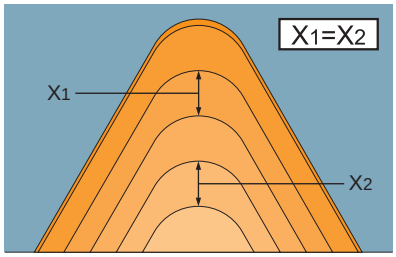
INSERT TYPES

Partial Form	Full Form	Semi Full Form (Trapezoidal threads only)
● The same insert can be used for a range of pitches. ● Shorter tool life because the nose radius of the insert is smaller than that of a full form insert. ● Finishing with another operation may be necessary.	● No deburring needed after threading. ● Requires specific insert for each thread form and pitch.	● No de-burring needed after threading. ● Requires specific insert for each thread form and pitch. ● Finishing with another operation may be necessary.
		

INFEED METHODS

		Radial Infeed	Flank Infeed	Modified Flank Infeed	Incremental Infeed
					
Features	Advantages	● Easiest to use. (Standard program for threading) ● Wide application. (Cutting conditions easy to change.) ● Uniform wear of the right and left sides of the cutting edge.	● Relatively easy to use. (Semi-standard program for threading.) ● Reduced cutting force. ● Suitable for large pitch threads or materials that peel easily. ● Good chip discharge.	● Preventing flank wear on the right side of the cutting edge. ● Reduced cutting force. ● Good for large pitch or materials that peel easily. ● Good chip discharge.	● Uniform wear of the right and left sides of the cutting edge. ● Reduced cutting force. ● Good for large pitch or materials that peel easily.
	Disadvantages	● Difficult chip control. ● Subject to vibration in the later passes due to long cutting edge in contact with workpiece. ● Ineffective for large pitch threading. ● Heavy load on the nose radius.	● Large flank wear of the right side of a cutting edge. ● Relatively difficult to change cutting depth. (Re-programming necessary)	● Complex machining programming. ● Difficult to change cutting depth. (NC programming necessary)	● Complex machining programming. ● Difficult to change cutting depth. (Re-programming necessary) ● Chip control is difficult.

THREADING DEPTH

	Features	
	Advantages	Disadvantages
 Fixed cut area	· Easy to use. (Standard program for threading.) · Superior resistance to vibration. (Constant cutting force.)	· Long chips generated during the final pass. · Complex calculation of cutting depth when changing the number of passes.
 Fixed cutting depth	· Reduced load on nose radius during the first half of the passes. · Easy chip control. (Optional setting of chip thickness) · Easy to calculate cutting depth when changing the number of passes. · Good chip control.	· Subject to vibration in the later stages of cutting. (Increased cutting force) · In some cases, changing the NC program is necessary.

* It is recommended to set the depth of cut of the final pass to 0.05mm–0.025mm.
Large cutting depths can cause vibration, leading to a poor surface finish.

Formulas

Formulas to calculate infeed for each pass in a reduced series.

$$\triangle ap_n = \frac{ap}{\sqrt{n_{ap}-1}} \times \sqrt{b}$$

$\triangle ap_n$: Depth of cut
n : Actual pass
ap : Total depth of cut
n_{ap} : Number of passes
b : 1st pass 0.3
2nd pass 2–1=1
3rd pass 3–1=2
·
·
nth pass

Example) External threading (ISO metric)
Pitch : 1.0mm
ap : 0.6mm
n_{ap} : 5

1st pass $\triangle ap_1 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{0.3} = 0.16 \rightarrow$ **0.16** ($\triangle ap_1$)

2nd pass $\triangle ap_2 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{2-1} = 0.3 \rightarrow$ **0.14** ($\triangle ap_2 - \triangle ap_1$)

3rd pass $\triangle ap_3 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{3-1} = 0.42 \rightarrow$ **0.12** ($\triangle ap_3 - \triangle ap_2$)

4th pass $\triangle ap_4 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{4-1} = 0.52 \rightarrow$ **0.1** ($\triangle ap_4 - \triangle ap_3$)

5th pass $\triangle ap_5 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{5-1} = 0.6 \rightarrow$ **0.08** ($\triangle ap_5 - \triangle ap_4$)

NC Program for Modified Flank Infeed

Example:- M12×1.0 5 passes modified 1°-3°

(mm)

External Threading	Internal Treading
G00 Z = 5.0 X = 14.0 G92 U–4.34 Z–13.0 F1.0 G00 W–0.07 G92 U–4.64 Z–13.0 F1.0 G00 W–0.06 G92 U–4.88 Z–13.0 F1.0 G00 W–0.05 G92 U–5.08 Z–13.0 F1.0 G00 W–0.03 G92 U–5.20 Z–13.0 F1.0 G00	G00 Z = 5.0 X = 10.0 G92 U4.34 Z–13.0 F1.0 G00 W–0.07 G92 U4.64 Z–13.0 F1.0 G00 W–0.05 G92 U4.84 Z–13.0 F1.0 G00 W–0.04 G92 U5.02 Z–13.0 F1.0 G00 W–0.03 G92 U5.14 Z–13.0 F1.0 G00

RECOMMENDED CUTTING METHODS AND CONDITIONS

Selecting Cutting Conditions

		Priority					
		Tool life	Cutting force	Surface finish	Precision of thread	Chips discharge	Efficiency (Reduced passes)
Threading methods	Radial	○		○	○		○
	Flank	(△ : Modified)	○	(△ : Modified)		○	
Cutting depth	Fixed cutting depth					○	
	Fixed cut area	○	○	○	○		○

Note) ・Tool life and surface finish accuracy can be increased by changing the threading method from flank infeed to modified flank infeed.
・Chip control can be improved by increasing the cutting depth in the later half of passes.

Cutting depth and the number of passes

Selection of the appropriate cutting depth and the right number of passes is vital for threading.

・For most threading, use a "threading cycle program," which has originally been installed on machines, and specify "total cutting depth" and "cutting depth in the first or final pass."

・Cutting depth and the number of passes are easy to change for the radial infeed method, thus making it easy to determine the appropriate cutting conditions.

Feature and benefits of Mitsubishi products

・Insert grades, specially produced for threading tools, ensure highly efficient cutting by enabling high-speed machining and a reduced number of passes.

Machining Cost Reduction

Advice on improved threading

Increasing tool life

・To prevent damage to the nose radius - Recommended method - Modified flank infeed.

・To have uniform flank wear on both sides of a cutting edge - Recommended method - Radial infeed

・To prevent crater wear - Recommended method - Flank infeed

Preventing chip problems

・Change to flank or modified infeed.

・During radial infeed cutting, use an inverted holder and change the coolant supply to a downward direction.

・When using the radial infeed method, set the minimum cutting depth at around .008 inch to make the chips thicker.

・Tangled chips during internal threading can damage the insert. In these cases, pause slightly away from the start point and clear the chips with coolant before every pass.

・Change to M-class inserts with a 3-D chip breaker.

To achieve highly efficient machining

・Increase cutting speed. (Dependant on the maximum revolution and rigidity of the machine.)

・Reduce the number of passes. (Reduce by 30-40%.)

・A reduced number of passes can improve chip discharge because of the thicker chips generated.

Preventing vibration

・Change to flank or modified infeed.

・When using radial infeed, reduce cutting depth in the later half of passes and lower the cutting speed.

Increased surface finish accuracy

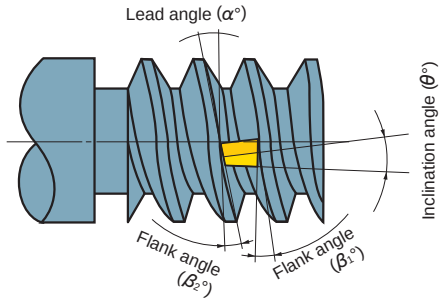
・A final pass should be performed at the same depth of cut as the last regular pass.

・When using the flank infeed method, change to radial infeed only during the final pass.

Selecting a Shim for the MMT Series

Flank angle and lead angle

Lead angle (α) depends on a combination of thread diameter and pitch.
Select a shim so that the lead angle of the thread can coincide with the flank angles of the thread and insert (β_1, β_2). When threading with a small diameter or large pitch, change the shim depending on the lead angle, referring to the table and graph below. When threading left hand threads, change to a shim with a negative inclination angle.



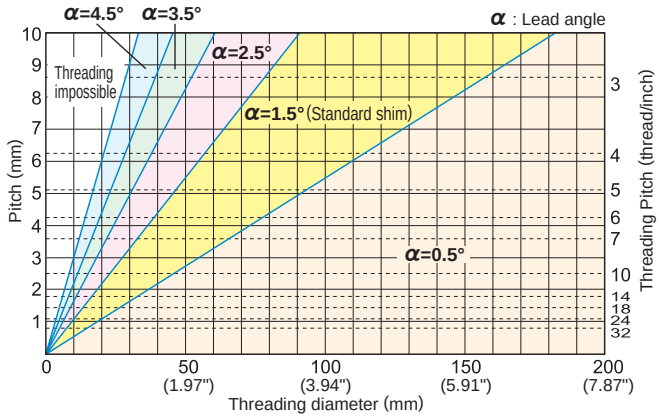
Shim reference table (Threading diameter–Thread angle 60° and 55°)

Lead Angle / Pitch (mm)	Right Hand Thread (mm)						Left Hand Thread (mm)		
	Threading impossible	4.5°	3.5°	2.5°	1.5°	0.5°	Threading impossible	−1.5°	−0.5°
0.5	≤ϕ1.7	ϕ1.7 – ϕ2.3	ϕ2.3 – ϕ3.0	ϕ3.0 – ϕ4.6	ϕ4.6 – ϕ9.1	≥ϕ9.1	≤ϕ3.6	ϕ3.6 – ϕ9.1	≥ϕ9.1
0.75	≤ϕ2.5	ϕ2.5 – ϕ3.4	ϕ3.4 – ϕ4.6	ϕ4.6 – ϕ6.8	ϕ6.8 – ϕ13.7	≥ϕ13.7	≤ϕ5.5	ϕ5.5 – ϕ13.7	≥ϕ13.7
1	≤ϕ3.3	ϕ3.3 – ϕ4.6	ϕ4.6 – ϕ6.1	ϕ6.1 – ϕ9.1	ϕ9.1 – ϕ18.2	≥ϕ18.2	≤ϕ7.3	ϕ7.3 – ϕ18.2	≥ϕ18.2
1.25	≤ϕ4.1	ϕ4.1 – ϕ5.7	ϕ5.7 – ϕ7.6	ϕ7.6 – ϕ11.4	ϕ11.4 – ϕ22.8	≥ϕ22.8	≤ϕ9.1	ϕ9.1 – ϕ22.8	≥ϕ22.8
1.5	≤ϕ5.0	ϕ5.0 – ϕ6.8	ϕ6.8 – ϕ9.1	ϕ9.1 – ϕ13.7	ϕ13.7 – ϕ27.4	≥ϕ27.4	≤ϕ10.9	ϕ10.9 – ϕ27.4	≥ϕ27.4
1.75	≤ϕ5.8	ϕ5.8 – ϕ8.0	ϕ8.0 – ϕ10.6	ϕ10.6 – ϕ16.0	ϕ16.0 – ϕ31.9	≥ϕ31.9	≤ϕ12.8	ϕ12.8 – ϕ31.9	≥ϕ31.9
2	≤ϕ6.6	ϕ6.6 – ϕ9.1	ϕ9.1 – ϕ12.1	ϕ12.1 – ϕ18.2	ϕ18.2 – ϕ36.5	≥ϕ36.5	≤ϕ14.6	ϕ14.6 – ϕ36.5	≥ϕ36.5
2.5	≤ϕ8.3	ϕ8.3 – ϕ11.4	ϕ11.4 – ϕ15.2	ϕ15.2 – ϕ22.8	ϕ22.8 – ϕ45.6	≥ϕ45.6	≤ϕ18.2	ϕ18.2 – ϕ45.6	≥ϕ45.6
3	≤ϕ9.9	ϕ9.9 – ϕ13.7	ϕ13.7 – ϕ18.2	ϕ18.2 – ϕ27.3	ϕ27.3 – ϕ54.7	≥ϕ54.7	≤ϕ21.9	ϕ21.9 – ϕ54.7	≥ϕ54.7
3.5	≤ϕ11.6	ϕ11.6 – ϕ15.9	ϕ15.9 – ϕ21.3	ϕ21.3 – ϕ31.9	ϕ31.9 – ϕ63.8	≥ϕ63.8	≤ϕ25.5	ϕ25.5 – ϕ63.8	≥ϕ63.8
4	≤ϕ13.2	ϕ13.2 – ϕ18.2	ϕ18.2 – ϕ24.3	ϕ24.3 – ϕ36.5	ϕ36.5 – ϕ72.9	≥ϕ72.9	≤ϕ29.2	ϕ29.2 – ϕ72.9	≥ϕ72.9
4.5	≤ϕ14.9	ϕ14.9 – ϕ20.5	ϕ20.5 – ϕ27.3	ϕ27.3 – ϕ41.0	ϕ41.0 – ϕ82.1	≥ϕ82.1	≤ϕ32.8	ϕ32.8 – ϕ82.1	≥ϕ82.1
5	≤ϕ16.5	ϕ16.5 – ϕ22.8	ϕ22.8 – ϕ30.4	ϕ30.4 – ϕ45.6	ϕ45.6 – ϕ91.2	≥ϕ91.2	≤ϕ36.5	ϕ36.5 – ϕ91.2	≥ϕ91.2

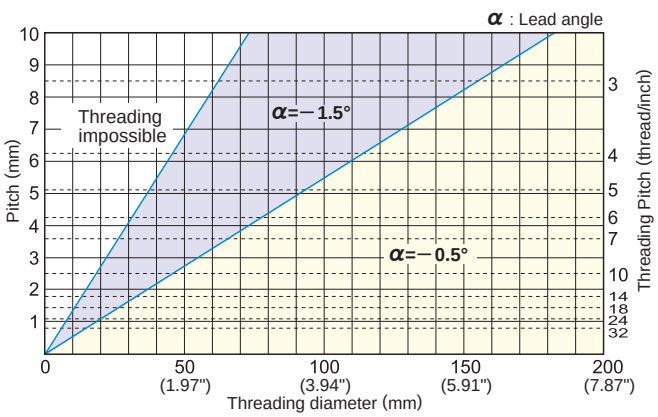
(Note) Back turning in the case of left hand threads.

Shim reference graph(Thread angle 60° and 55°)

Right Hand Thread



Left Hand Thread



Note) When a thread lead angle ≤ the tool flank angle, change the shim to prevent side interference with the insert.
(Refer to the table below for the calculation of thread lead angle and tool flank angle.)

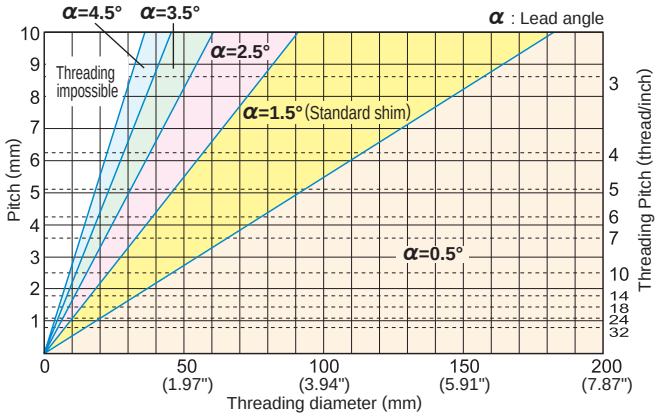
Shim reference table (Threading diameter–Thread angle 30° and 29°)

Lead Angle / Pitch (mm)	Right Hand Thread (mm)						Left Hand Thread (mm)		
	Threading impossible	4.5°	3.5°	2.5°	1.5°	0.5°	Threading impossible	−1.5°	−0.5°
0.5	≤ϕ1.8	ϕ1.8 – ϕ2.3	ϕ2.3 – ϕ3.0	ϕ3.0 – ϕ4.6	ϕ4.6 – ϕ9.1	≥ϕ9.1	≤ϕ4.6	ϕ4.6 – ϕ9.1	≥ϕ9.1
0.75	≤ϕ2.7	ϕ2.7 – ϕ3.4	ϕ3.4 – ϕ4.6	ϕ4.6 – ϕ6.8	ϕ6.8 – ϕ13.7	≥ϕ13.7	≤ϕ6.8	ϕ6.8 – ϕ13.7	≥ϕ13.7
1	≤ϕ3.6	ϕ3.6 – ϕ4.6	ϕ4.6 – ϕ6.1	ϕ6.1 – ϕ9.1	ϕ9.1 – ϕ18.2	≥ϕ18.2	≤ϕ9.1	ϕ9.1 – ϕ18.2	≥ϕ18.2
1.25	≤ϕ4.5	ϕ4.5 – ϕ5.7	ϕ5.7 – ϕ7.6	ϕ7.6 – ϕ11.4	ϕ11.4 – ϕ22.8	≥ϕ22.8	≤ϕ11.4	ϕ11.4 – ϕ22.8	≥ϕ22.8
1.5	≤ϕ5.5	ϕ5.5 – ϕ6.8	ϕ6.8 – ϕ9.1	ϕ9.1 – ϕ13.7	ϕ13.7 – ϕ27.4	≥ϕ27.4	≤ϕ13.7	ϕ13.7 – ϕ27.4	≥ϕ27.4
1.75	≤ϕ6.4	ϕ6.4 – ϕ8.0	ϕ8.0 – ϕ10.6	ϕ10.6 – ϕ16.0	ϕ16.0 – ϕ31.9	≥ϕ31.9	≤ϕ16.0	ϕ16.0 – ϕ31.9	≥ϕ31.9
2	≤ϕ7.3	ϕ7.3 – ϕ9.1	ϕ9.1 – ϕ12.1	ϕ12.1 – ϕ18.2	ϕ18.2 – ϕ36.5	≥ϕ36.5	≤ϕ18.2	ϕ18.2 – ϕ36.5	≥ϕ36.5
2.5	≤ϕ9.1	ϕ9.1 – ϕ11.4	ϕ11.4 – ϕ15.2	ϕ15.2 – ϕ22.8	ϕ22.8 – ϕ45.6	≥ϕ45.6	≤ϕ22.8	ϕ22.8 – ϕ45.6	≥ϕ45.6
3	≤ϕ10.9	ϕ10.9 – ϕ13.7	ϕ13.7 – ϕ18.2	ϕ18.2 – ϕ27.3	ϕ27.3 – ϕ54.7	≥ϕ54.7	≤ϕ27.3	ϕ27.3 – ϕ54.7	≥ϕ54.7
3.5	≤ϕ12.7	ϕ12.7 – ϕ15.9	ϕ15.9 – ϕ21.3	ϕ21.3 – ϕ31.9	ϕ31.9 – ϕ63.8	≥ϕ63.8	≤ϕ31.9	ϕ31.9 – ϕ63.8	≥ϕ63.8
4	≤ϕ14.6	ϕ14.6 – ϕ18.2	ϕ18.2 – ϕ24.3	ϕ24.3 – ϕ36.5	ϕ36.5 – ϕ72.9	≥ϕ72.9	≤ϕ36.5	ϕ36.5 – ϕ72.9	≥ϕ72.9
4.5	≤ϕ16.4	ϕ16.4 – ϕ20.5	ϕ20.5 – ϕ27.3	ϕ27.3 – ϕ41.0	ϕ41.0 – ϕ82.1	≥ϕ82.1	≤ϕ41.0	ϕ41.0 – ϕ82.1	≥ϕ82.1
5	≤ϕ18.2	ϕ18.2 – ϕ22.8	ϕ22.8 – ϕ30.4	ϕ30.4 – ϕ45.6	ϕ45.6 – ϕ91.2	≥ϕ91.2	≤ϕ45.6	ϕ45.6 – ϕ91.2	≥ϕ91.2

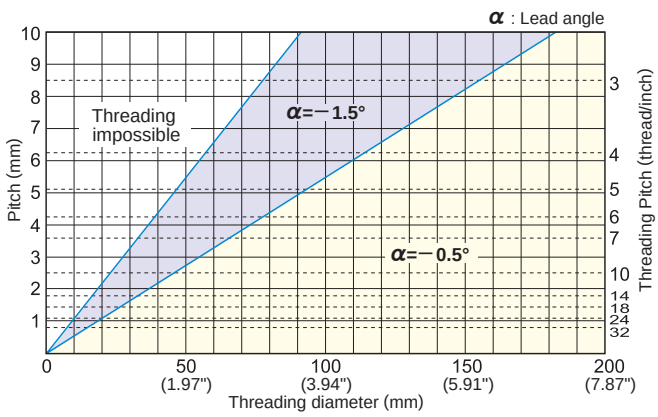
(Note) Back turning in the case of left hand threads.

Shim reference graph (Thread angle 30° and 29°)

Right Hand Thread



Left Hand Thread



Note) When a thread lead angle ≤ the tool flank angle, change the shim to prevent side interference with the insert.
(Refer to the table below for the calculation of thread lead angle and tool flank angle.)

Shim selection table

Lead angle	Threading angle 60°/55° Right Hand Thread		Threading angle 60°/55° Left Hand Thread		Threading angle 30°/29° Right Hand Thread		Threading angle 30°/29° Left Hand Thread	
0	P05	P05	N05	N05	P05	P05	N05	N05
0.5	P05	P05	N05	N05	P05	P05	N05	N05
1	P15	P15	N15	N15	P15	P15	N15	N15
1.5	P15	P15	N15	N15	P15	P15	N15	N15
2	P25	P25	N15	N15	P25	P25	Not Available	Not Available
2.5	P25	P25	Not Available	Not Available	P25	P25	Not Available	Not Available
3	P35	P35	Not Available	Not Available	P35	P35	Not Available	Not Available
3.5	P35	P35	Not Available	Not Available	P35	P35	Not Available	Not Available
4	P45	P45	Not Available	Not Available	P45	P45	Not Available	Not Available
4.5	P45	P45	Not Available	Not Available	P45	P45	Not Available	Not Available
5	P45	P45	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
5.5	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available

(Note) Back turning in the case of left hand threads.

When replacing a shim, check if the difference between the thread lead angle and shim inclination angle is within:2.5 ° - 0.5 ° where thread angle is 60 ° (55 °) 2 ° - 1° where thread angle is 30° (29°)
*** Inclination angle of a standard shim is 0°.**
*** The holder has a 1.5 ° lead angle.**

Calculation of thread lead angle

$$\tan\alpha = \frac{l}{\pi d} = \frac{nP}{\pi d}$$

α : Lead angle
l : Lead
n : Number of thread starts
P : Pitch
d : Pitch diameter of thread

Example of selecting a shim

・When the thread lead angle is 2.2°
①In the case when the thread angle is 60°
(2.2° lead angle) – (2.5° - 0.5°) = –0.3° - 1.7° shim inclination angle is appropriate. Threading with a standard shim (0° inclination angle) is possible. But, replacing with a shim with a 1° inclination angle is recommended, refer to Standard Shim List on pages G012 and G013.
②In the case when the thread angle is 30°
(2.2° lead angle) – (2° - 1°) = 0.2° - 1.2° shim inclination angle is appropriate. Replacing with a shim with a 1° inclination angle is recommended, referring to Standard Shim List on pages G012 and G013.

Relief angle of an insert set on a holder

Thread helix angle	Internal relief angle	External relief angle
60°	8.8°	5.8°
55°	7.9°	5.2°
30°	4.1°	2.7°
29°	4°	2.6°

・Relief angles (β_2, β_1) of an insert become small when the thread helix angle of a trapezoidal, round, or other thread is small. Take care when selecting a shim.

Standard of Depth of Cut (External Threading)

EXTERNAL (RADIAL INFEED)

ISO Metric

(mm)

Pitch (mm)	Total Cutting Depth	Number of Passes														Insert Type	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts	M-class inserts with 3-D chip breakers
0.5	0.31	0.10	0.08	0.07	0.06											MMT16ER050ISO	–
0.75	0.46	0.16	0.14	0.10	0.06											MMT16ER075ISO	–
1.0	0.61	0.18	0.15	0.12	0.10	0.06										MMT16ER100ISO	MMT16ER100ISO-S
1.25	0.77	0.19	0.17	0.14	0.11	0.10	0.06									MMT16ER125ISO	MMT16ER125ISO-S
1.5	0.92	0.22	0.21	0.17	0.14	0.12	0.06									MMT16ER150ISO	MMT16ER150ISO-S
1.75	1.07	0.22	0.21	0.16	0.13	0.11	0.09	0.09	0.06							MMT16ER175ISO	MMT16ER175ISO-S
2.0	1.23	0.24	0.23	0.17	0.16	0.14	0.12	0.11	0.06							MMT16ER200ISO	MMT16ER200ISO-S
2.5	1.53	0.26	0.23	0.19	0.17	0.15	0.13	0.12	0.11	0.11	0.06					MMT16ER250ISO	MMT16ER250ISO-S
3.0	1.84	0.27	0.25	0.20	0.18	0.16	0.14	0.13	0.12	0.12	0.11	0.10	0.06			MMT16ER300ISO	MMT16ER300ISO-S
3.5	2.15	0.33	0.30	0.24	0.21	0.18	0.17	0.15	0.14	0.14	0.12	0.11	0.06			MMT22ER350ISO	–
4.0	2.45	0.34	0.31	0.24	0.22	0.19	0.17	0.16	0.14	0.14	0.13	0.12	0.12	0.11	0.06	MMT22ER400ISO	–
4.5	2.76	0.38	0.34	0.28	0.24	0.22	0.20	0.18	0.16	0.16	0.15	0.14	0.13	0.12	0.06	MMT22ER450ISO	–
5.0	3.07	0.42	0.38	0.32	0.27	0.24	0.22	0.20	0.18	0.18	0.17	0.16	0.15	0.12	0.06	MMT22ER500ISO	–

American UN

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts	M-class inserts with 3-D chip breakers
32	.019	.007	.006	.004	.002											MMT16ER320UN	–
28	.022	.007	.006	.004	.003	.002										MMT16ER280UN	–
24	.026	.007	.006	.006	.005	.002										MMT16ER240UN	–
20	.031	.008	.007	.005	.005	.004	.002									MMT16ER200UN	–
18	.034	.009	.008	.006	.005	.004	.002									MMT16ER180UN	–
16	.038	.009	.008	.006	.005	.004	.004	.002								MMT16ER160UN	MMT16ER160UN-S
14	.044	.009	.008	.006	.005	.005	.005	.004	.002							MMT16ER140UN	MMT16ER140UN-S
13	.047	.010	.009	.007	.006	.005	.005	.003	.002							MMT16ER130UN	–
12	.051	.011	.009	.007	.006	.006	.005	.005	.002							MMT16ER120UN	MMT16ER120UN-S
11	.056	.011	.009	.007	.006	.006	.006	.005	.004	.002						MMT16ER110UN	–
10	.061	.011	.009	.007	.006	.006	.006	.005	.005	.004	.002					MMT16ER100UN	–
9	.068	.013	.011	.009	.007	.006	.006	.005	.005	.004	.002					MMT16ER090UN	–
8	.077	.014	.012	.009	.007	.006	.006	.006	.006	.005	.004	.002				MMT16ER080UN	–
7	.087	.015	.013	.011	.009	.008	.007	.006	.006	.005	.005	.002				MMT22ER070UN	–
6	.102	.017	.014	.011	.010	.008	.007	.007	.006	.006	.005	.005	.004	.002		MMT22ER060UN	–
5	.123	.017	.015	.012	.011	.009	.009	.008	.007	.007	.007	.007	.006	.006	.002	MMT22ER050UN	–

Whitworth for BSW, BSP

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts	M-class inserts with 3-D chip breakers
28	.023	.007	.006	.004	.004	.002										MMT16ER280W	–
26	.025	.007	.006	.005	.005	.002										MMT16ER260W	–
20	.032	.008	.007	.006	.005	.004	.002									MMT16ER200W	–
19	.034	.008	.007	.006	.006	.005	.002									MMT16ER190W	MMT16ER190W-S
18	.035	.010	.007	.006	.005	.005	.002									MMT16ER180W	–
16	.040	.008	.007	.006	.005	.004	.004	.004	.002							MMT16ER160W	–
14	.046	.009	.008	.007	.006	.005	.005	.004	.002							MMT16ER140W	MMT16ER140W-S
12	.054	.011	.010	.008	.006	.006	.006	.005	.002							MMT16ER120W	–
11	.058	.011	.009	.008	.007	.006	.006	.005	.005	.002						MMT16ER110W	MMT16ER110W-S
10	.064	.011	.010	.008	.007	.006	.006	.005	.005	.004	.002					MMT16ER100W	–
9	.071	.011	.010	.008	.007	.006	.006	.006	.005	.005	.005	.002				MMT16ER090W	–
8	.080	.012	.011	.009	.007	.007	.006	.006	.006	.005	.005	.004	.002			MMT16ER080W	–
7	.091	.013	.013	.010	.009	.008	.007	.007	.006	.006	.006	.004	.002			MMT22ER070W	–
6	.107	.014	.013	.011	.009	.008	.008	.007	.007	.006	.006	.006	.005	.005	.002	MMT22ER060W	–
5	.128	.017	.016	.014	.011	.010	.009	.009	.008	.007	.007	.007	.006	.005	.002	MMT22ER050W	–

(Note) · Set the finishing allowance on a diameter at approx. .004 inch when using a full form insert.
· Please note the cutting depth and the number of passes when a nose radius of a partial or semi-full form insert or of an internal threading insert is small to prevent damage to the insert nose.
· Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

Standard of Depth of Cut (External Threading)

EXTERNAL (RADIAL INFEED)

BSPT

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes												Insert Type	
		1	2	3	4	5	6	7	8	9				G-class ground inserts	M-class inserts with 3-D chip breakers
28	.023	.007	.006	.004	.004	.002								MMT16ER280BSPT	–
19	.034	.009	.007	.006	.005	.005	.002							MMT16ER190BSPT	MMT16ER190BSPT-S
14	.046	.009	.008	.007	.006	.005	.005	.004	.002					MMT16ER140BSPT	MMT16ER140BSPT-S
11	.058	.010	.009	.008	.007	.006	.006	.005	.005	.002				MMT16ER110BSPT	MMT16ER110BSPT-S

Round DIN 405

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts
10	.050	.009	.008	.008	.007	.006	.005	.005	.002							MMT16ER100RD
8	.063	.009	.008	.008	.007	.007	.006	.006	.005	.005	.002					MMT16ER080RD
6	.083	.010	.010	.009	.009	.008	.007	.007	.006	.006	.005	.004	.002			MMT16ER060RD
4	.125	.013	.013	.013	.012	.011	.010	.009	.009	.008	.007	.007	.006	.005	.002	MMT22ER040RD

ISO Trapezoidal 30°

(mm)

Pitch (mm)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts
1.5	0.90	0.23	0.21	0.16	0.13	0.11	0.06									MMT16ER150TR
2.0	1.25	0.29	0.26	0.21	0.17	0.14	0.12	0.06								MMT16ER200TR
3.0	1.75	0.32	0.31	0.24	0.19	0.18	0.17	0.15	0.13	0.06						MMT16ER300TR
4.0	2.25	0.33	0.32	0.24	0.22	0.21	0.17	0.16	0.15	0.14	0.13	0.12	0.06			MMT22ER400TR
5.0	2.75	0.35	0.32	0.26	0.24	0.22	0.21	0.19	0.19	0.17	0.15	0.14	0.13	0.12	0.06	MMT22ER500TR

American ACME

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts
12	.047	.011	.009	.008	.007	.006	.004	.002								MMT16ER120ACME
10	.060	.011	.010	.008	.007	.006	.006	.005	.005	.002						MMT16ER100ACME
8	.072	.012	.010	.009	.007	.006	.006	.006	.005	.005	.004	.002				MMT16ER080ACME
6	.093	.013	.012	.011	.009	.008	.007	.006	.006	.005	.005	.004	.005	.002		MMT22ER060ACME
5	.110	.014	.013	.012	.010	.009	.008	.007	.007	.006	.006	.006	.005	.005	.002	MMT22ER050ACME

UNJ

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11				G-class ground inserts
32	.018	.006	.006	.004	.002											MMT16ER320UNJ
28	.020	.006	.005	.004	.003	.002										MMT16ER280UNJ
24	.024	.007	.006	.006	.003	.002										MMT16ER240UNJ
20	.029	.007	.006	.005	.005	.004	.002									MMT16ER200UNJ
18	.032	.009	.007	.006	.004	.004	.002									MMT16ER180UNJ
16	.036	.010	.008	.006	.005	.004	.003									MMT16ER160UNJ
14	.041	.010	.009	.007	.005	.004	.004	.002								MMT16ER140UNJ
12	.048	.011	.011	.008	.007	.005	.004	.002								MMT16ER120UNJ
10	.058	.012	.011	.008	.006	.005	.005	.005	.004	.002						MMT16ER100UNJ
8	.072	.012	.012	.009	.007	.006	.006	.005	.005	.004	.004	.002				MMT16ER080UNJ

API Buttress Casing

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11				G-class ground inserts
5	.061	.010	.009	.007	.006	.005	.005	.005	.004	.004	.004	.002				MMT22ER050APBU

(Note) · Set the finishing allowance on a diameter at approx. .004 inch when using a full form insert.
· Please note the cutting depth and the number of passes when a nose radius of a partial or semi-full form insert or of an internal threading insert is small to prevent damage to the insert nose.
· Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

API Round Casing & Tubing

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12				G-class ground inserts
10	.056	.010	.009	.006	.006	.005	.005	.005	.004	.004	.002						MMT16ER100APRD
8	.071	.010	.009	.007	.006	.006	.006	.005	.005	.005	.005	.005	.002				MMT16ER080APRD

American NPT

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	G-class ground inserts
27	.026	.006	.005	.005	.004	.004	.002										MMT16ER270NPT
18	.040	.008	.006	.006	.005	.005	.004	.004	.002								MMT16ER180NPT
14	.052	.009	.007	.006	.006	.005	.005	.004	.004	.004	.002						MMT16ER140NPT
11.5	.065	.009	.007	.007	.006	.006	.005	.005	.005	.005	.004	.004	.002				MMT16ER115NPT
8	.095	.013	.011	.009	.008	.007	.006	.006	.006	.005	.005	.005	.004	.004	.004	.002	MMT16ER080NPT

American NPTF

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	G-class ground inserts
27	.025	.006	.006	.004	.004	.003	.002										MMT16ER270NPTF
18	.039	.007	.006	.006	.005	.005	.004	.004	.002								MMT16ER180NPTF
14	.053	.009	.008	.006	.006	.005	.005	.004	.004	.004	.002						MMT16ER140NPTF
11.5	.064	.009	.009	.007	.006	.005	.005	.005	.004	.004	.004	.004	.002				MMT16ER115NPTF
8	.094	.013	.011	.009	.007	.007	.006	.006	.006	.005	.005	.005	.004	.004	.004	.002	MMT16ER080NPTF

(Note) · Set the finishing allowance on a diameter at approx. .004 inch when using a full form insert.
· Please note the cutting depth and the number of passes when a nose radius of a partial or semi-full form insert or of an internal threading insert is small to prevent damage to the insert nose.
· Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

Standard of Depth of Cut (Internal Threading)

INTERNAL (RADIAL INFEED)

ISO Metric

(mm)

Pitch (mm)	Total Cutting Depth	Number of Passes														Insert Type			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts		M-class inserts with 3-D chip breakers	
0.5	0.29	0.09	0.07	0.07	0.06											MMT11IR050ISO	MMT16IR050ISO	–	–
0.75	0.43	0.15	0.13	0.09	0.06											MMT11IR075ISO	MMT16IR075ISO	–	–
1.0	0.58	0.17	0.15	0.11	0.09	0.06										MMT11IR100ISO	MMT16IR100ISO	MMT11IR100ISO-S	MMT16IR100ISO-S
1.25	0.72	0.18	0.16	0.12	0.11	0.09	0.06									MMT11IR125ISO	MMT16IR125ISO	MMT11IR125ISO-S	MMT16IR125ISO-S
1.5	0.87	0.21	0.20	0.16	0.13	0.11	0.06									MMT11IR150ISO	MMT16IR150ISO	MMT11IR150ISO-S	MMT16IR150ISO-S
1.75	1.01	0.21	0.20	0.15	0.12	0.10	0.09	0.08	0.06							MMT11IR175ISO	MMT16IR175ISO	–	MMT16IR175ISO-S
2.0	1.15	0.24	0.22	0.18	0.14	0.12	0.10	0.09	0.06							MMT11IR200ISO	MMT16IR200ISO	–	MMT16IR200ISO-S
2.5	1.44	0.25	0.24	0.21	0.15	0.13	0.12	0.10	0.09	0.09	0.06					–	MMT16IR250ISO	–	MMT16IR250ISO-S
3.0	1.73	0.26	0.25	0.22	0.17	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.06			–	MMT16IR300ISO	–	MMT16IR300ISO-S
3.5	2.02	0.32	0.30	0.23	0.19	0.17	0.15	0.14	0.13	0.12	0.11	0.10	0.06			–	MMT22IR350ISO	–	–
4.0	2.31	0.33	0.31	0.24	0.22	0.18	0.15	0.14	0.13	0.12	0.12	0.11	0.10	0.10	0.06	–	MMT22IR400ISO	–	–
4.5	2.60	0.36	0.33	0.28	0.24	0.21	0.19	0.16	0.15	0.14	0.13	0.12	0.12	0.11	0.06	–	MMT22IR450ISO	–	–
5.0	2.89	0.41	0.38	0.32	0.27	0.24	0.21	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.06	–	MMT22IR500ISO	–	–

American UN

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts		M-class inserts with 3-D chip breakers	
32	.018	.006	.006	.004	.002											MMT11IR320UN	MMT16IR320UN	–	
28	.020	.006	.005	.004	.003	.002										MMT11IR280UN	MMT16IR280UN	–	
24	.024	.007	.006	.005	.004	.002										MMT11IR240UN	MMT16IR240UN	–	
20	.029	.007	.006	.005	.005	.004	.002									MMT11IR200UN	MMT16IR200UN	–	
18	.032	.008	.007	.006	.005	.004	.002									MMT11IR180UN	MMT16IR180UN	–	
16	.036	.008	.007	.006	.005	.004	.004	.002								MMT11IR160UN	MMT16IR160UN	MMT16IR160UN-S	
14	.041	.008	.007	.006	.005	.005	.004	.004	.002							MMT11IR140UN	MMT16IR140UN	MMT16IR140UN-S	
13	.044	.009	.007	.006	.006	.005	.005	.004	.002							–	MMT16IR130UN	–	
12	.048	.009	.009	.007	.006	.005	.005	.005	.002							–	MMT16IR120UN	MMT16IR120UN-S	
11	.052	.009	.009	.008	.006	.005	.005	.004	.004	.002						–	MMT16IR110UN	–	
10	.058	.010	.009	.008	.006	.005	.005	.005	.004	.004	.002					–	MMT16IR100UN	–	
9	.064	.012	.009	.008	.007	.006	.006	.005	.005	.004	.002					–	MMT16IR090UN	–	
8	.072	.012	.010	.008	.007	.006	.006	.006	.005	.005	.005	.002				–	MMT16IR080UN	–	
7	.082	.014	.012	.009	.008	.007	.007	.006	.006	.006	.005	.002				–	MMT22IR070UN	–	
6	.096	.016	.013	.010	.009	.007	.007	.006	.006	.006	.005	.005	.004	.002		–	MMT22IR060UN	–	
5	.115	.016	.014	.012	.010	.009	.008	.008	.007	.007	.006	.006	.005	.005	.002	–	MMT22IR050UN	–	

Whitworth for BSW, BSP

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts		M-class inserts with 3-D chip breakers	
28	.023	.007	.006	.004	.004	.002										–	MMT16IR280W	–	
26	.025	.007	.006	.005	.005	.002										–	MMT16IR260W	–	
20	.032	.008	.007	.006	.005	.004	.002									–	MMT16IR200W	–	
19	.034	.008	.007	.006	.006	.005	.002									MMT11IR190W	MMT16IR190W	MMT16IR190W-S	
18	.035	.010	.007	.006	.005	.005	.002									–	MMT16IR180W	–	
16	.040	.008	.007	.006	.005	.004	.004	.004	.002							–	MMT16IR160W	–	
14	.046	.009	.008	.007	.006	.005	.005	.004	.002							MMT11IR140W	MMT16IR140W	MMT16IR140W-S	
12	.054	.011	.010	.008	.006	.006	.006	.005	.002							–	MMT16IR120W	MMT16IR120W-S	
11	.058	.011	.009	.008	.007	.006	.006	.005	.004	.002						–	MMT16IR110W	–	
10	.064	.011	.010	.008	.007	.006	.006	.005	.005	.004	.002					–	MMT16IR100W	–	
9	.071	.011	.010	.008	.007	.006	.006	.006	.005	.005	.005	.002				–	MMT16IR090W	–	
8	.080	.012	.011	.009	.007	.007	.006	.006	.006	.005	.005	.004	.002			–	MMT16IR080W	–	
7	.091	.013	.013	.010	.009	.008	.007	.007	.006	.006	.006	.004	.002			–	MMT22IR070W	–	
6	.107	.014	.013	.011	.009	.008	.008	.007	.007	.006	.006	.006	.005	.005	.002	–	MMT22IR060W	–	
5	.128	.017	.016	.014	.011	.010	.009	.009	.008	.007	.007	.007	.006	.005	.002	–	MMT22IR050W	–	

(Note) · Set the finishing allowance on a diameter at approx. .004 inch when using a full form insert.
· Please note the cutting depth and the number of passes when a nose radius of a partial or semi-full form insert or of an internal threading insert is small to prevent damage to the insert nose.
· Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

BSPT

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes									Insert Type		
		1	2	3	4	5	6	7	8	9	G-class ground inserts		M-class inserts with 3-D chip breakers
19	.034	.009	.007	.006	.005	.005	.002				MMT11IR190BSPT	MMT16IR190BSPT	MMT16IR190BSPT-S
14	.046	.009	.008	.007	.006	.005	.005	.004	.002		MMT11IR140BSPT	MMT16IR140BSPT	MMT16IR140BSPT-S
11	.058	.010	.009	.008	.007	.006	.006	.005	.005	.002	–	MMT16IR110BSPT	MMT16IR110BSPT-S

Round DIN 405

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts
10	.050	.009	.008	.008	.007	.006	.005	.005	.002							MMT16IR100RD
8	.063	.009	.008	.008	.007	.007	.006	.006	.005	.005	.002					MMT16IR080RD
6	.083	.010	.010	.009	.009	.008	.007	.007	.006	.006	.005	.004	.002			MMT16IR060RD
4	.125	.013	.013	.013	.012	.011	.010	.009	.009	.008	.007	.007	.006	.005	.002	MMT22IR040RD

ISO Trapezoidal 30°

(mm)

Pitch (mm)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts
1.5	0.90	0.23	0.21	0.16	0.13	0.11	0.06									MMT16IR150TR
2	1.25	0.29	0.26	0.21	0.17	0.14	0.12	0.06								MMT16IR200TR
3	1.75	0.32	0.31	0.24	0.19	0.18	0.17	0.15	0.13	0.06						MMT16IR300TR
4	2.25	0.33	0.32	0.24	0.22	0.21	0.17	0.16	0.15	0.14	0.13	0.12	0.06			MMT22IR400TR
5	2.75	0.35	0.32	0.26	0.24	0.22	0.21	0.19	0.19	0.17	0.15	0.14	0.13	0.12	0.06	MMT22IR500TR

American ACME

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts
12	.047	.011	.009	.008	.007	.006	.004	.002								MMT16IR120ACME
10	.060	.011	.010	.008	.007	.006	.006	.005	.005	.002						MMT16IR100ACME
8	.072	.012	.010	.009	.007	.006	.006	.006	.005	.005	.004	.002				MMT16IR080ACME
6	.093	.013	.012	.011	.009	.008	.007	.006	.006	.005	.005	.005	.004	.002		MMT22IR060ACME
5	.110	.014	.013	.012	.010	.009	.008	.007	.007	.006	.006	.006	.005	.005	.002	MMT22IR050ACME

API Buttress Casing

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes											Insert Type
		1	2	3	4	5	6	7	8	9	10	11	G-class ground inserts
5	.061	.010	.009	.007	.006	.005	.005	.005	.004	.004	.004	.002	MMT22IR050APBU

API Round Casing & Tubing

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes												Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	G-class ground inserts
10	.056	.010	.009	.006	.006	.005	.005	.005	.004	.004	.002			MMT16IR100APRD
8	.071	.010	.009	.007	.006	.006	.006	.005	.005	.005	.005	.005	.002	MMT16IR080APRD

(Note) · Set the finishing allowance on a diameter at approx. .004 inch when using a full form insert.
· Please note the cutting depth and the number of passes when a nose radius of a partial or semi-full form insert or of an internal threading insert is small to prevent damage to the insert nose.
· Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

Standard of Depth of Cut (Internal Threading)

INTERNAL (RADIAL INFEED)

American NPT

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	G-class ground inserts
27	.026	.006	.005	.005	.004	.004	.002										MMT16IR270NPT
18	.040	.008	.006	.006	.005	.005	.004	.004	.002								MMT16IR180NPT
14	.052	.009	.007	.006	.006	.005	.005	.004	.004	.004	.002						MMT16IR140NPT
11.5	.065	.009	.007	.007	.006	.006	.005	.005	.005	.005	.004	.004	.002				MMT16IR115NPT
8	.095	.013	.011	.009	.008	.007	.006	.006	.006	.005	.005	.005	.004	.004	.004	.002	MMT16IR080NPT

American NPTF

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	G-class ground inserts
14	.053	.009	.008	.006	.006	.005	.005	.004	.004	.004	.002						MMT16IR140NPTF
11.5	.064	.009	.009	.007	.006	.005	.005	.005	.004	.004	.004	.004	.002				MMT16IR115NPTF
8	.094	.013	.011	.009	.007	.007	.006	.006	.006	.005	.005	.005	.004	.004	.004	.002	MMT16IR080NPTF

(Note) · Set the finishing allowance on a diameter at approx. .004 inch when using a full form insert.
· Please note the cutting depth and the number of passes when a nose radius of a partial or semi-full form insert or of an internal threading insert is small to prevent damage to the insert nose.
· Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

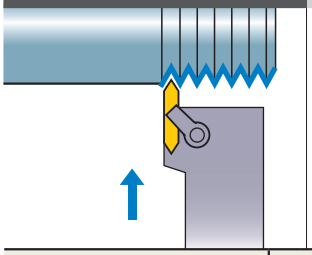
TROUBLE SHOOTING

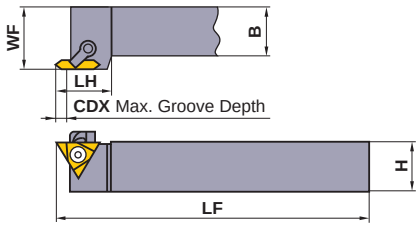
Problems	Observation	Causes	Solutions
Low thread precision.	Threads do not mesh with each other.	Incorrect tool installation.	Set the insert center height at 0".
			Check holder inclination (Lateral).
	Shallow thread.	Incorrect depth of cut.	Modify the depth of cut.
		Lack of insert wear or plastic deformation resistance.	Refer to "Quickly generated flank wear." and "Large plastic deformation." below.
Poor surface finish.	Surface damage.	Chips wrap around or clog the work pieces.	Change to flank infeed and control the chip discharge direction.
			Change to an M-class insert with a 3-D chip breaker.
		The side of the insert cutting edge interferes with the workpiece.	Check the lead angle and select an appropriate shim.
	Surface tears.	Built-up edge (Welding).	Increase cutting speed.
			Increase coolant pressure and volume.
		Cutting resistance too high.	Decrease depth of cut per pass.
	Surface vibrations.	Cutting speed too high.	Decrease the cutting speed.
		Insufficient work piece or tool clamping.	Re-check work piece and tool clamping. (Chuck pressure, clamping allowance)
		Incorrect tool installation.	Set the insert center height at 0".
Short tool life.	Flank wear quickly generated.	Cutting speed too high.	Decrease the cutting speed.
		Too many passes causes abrasive wear.	Reduce the number of passes.
		Small depth of cut for the finishing pass.	Do not re-cut at 0" depth of cut. Depth of cut larger than .002" is recommended.
	Non-uniform wear of the right and left sides of the cutting edge.	The work piece lead angle and the tool lead angle do not match.	Check the work piece lead angle and select an appropriate shim.
	Chipping and fracture.	Cutting speed too low.	Increase cutting speed.
		Cutting resistance too high.	Increase the number of passes and decrease the cutting resistance per pass.
		Unstable clamping.	Check work piece deflection.
			Shorten tool overhang.
			Recheck work piece and tool clamping. (Chuck pressure, clamping allowance)
		Chip packing.	Increase coolant pressure to blow away chips.
			Change the tool pass to control chips. (Lengthen each pass to allow the coolant to clear the chips.
			Change from standard internal cutting to back turning to prevent chip jamming.
		Non-chamfered work pieces causes high resistance at the start of each pass.	Chamfer the workpiece entry and exit faces .
	Large plastic deformation.	High cutting speed and large heat generation.	Decrease the cutting speed.
		Lack of coolant supply.	Check coolant is supply is sufficient.
			Increase coolant pressure and volume.
		Cutting resistance too high.	Increase the number of passes and decrease the cutting resistance per pass.

MTVO HOLDER

- Multi-clamp type.
- Precision class insert.
- Positive insert produces a good finished surface.
- Holder is capable of performing both grooving and threading.
- Economical due to the use of 3 cutting edges.

MTVO External grooving, Threading





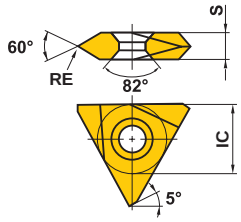
Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (inch)						Insert Screw	Clamp Screw	Clamp
	R	L			H	B	LF	LH	WF	CDX			
MTVOR/L-8-3B	●	●	TNMC	32◌	.500	.500	4.500	1.000	.750	.057 / .156	GTS1	XNS35	CL6
MTVOR/L-**10-3B**	●	●		32◌	.625	.625	4.500	1.000	.875	.057 / .156	GTS1	XNS35	CL6
MTVOR/L-**12-3B**	●	●		32◌	.750	.750	4.500	1.000	1.000	.057 / .156	GTS1	XNS35	CL6
MTVOR/L-**12-4B**	●	●		43◌	.750	.750	4.500	1.063	1.000	.156 / .234	GTS2	XNS36	CL6
MTVOR/L-**16-4D**	●	●		43◌	1.000	1.000	6.000	1.063	1.250	.156 / .234	GTS2	XNS36	CL6
MTVOR/L-**16-5D**	●	●		54◌	1.000	1.000	6.000	1.250	1.250	.297	GTS3	XNS36	CL6
MTVOR/L-**20-4D**	●	●		43◌	1.250	1.250	6.000	1.063	1.500	.156 / .234	GTS2	XNS36	CL6

(Note) Please use right hand insert for right hand holder and left hand insert for left hand holder.

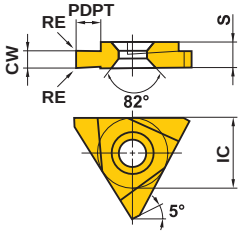
INSERTS (THREADING)

Order Number	Class	Stock		Min. Pitch (T.P.I)	Dimensions (inch)			Geometry
		Coated	Carbide		IC	S	RE	
		UP20M	UTi20T					
TNMC32NV	E	●	●	8	.375	.125	.004	
TNMC**43NV**	E	●	●	6	.500	.187	.004	
TNMC**54NV**	E	●	●	4	.625	.250	.004	



INSERTS (GROOVING)

Order Number	Class	Stock		Dimensions (inch)					Geometry
		Coated	Carbide	CW	IC	S	PDPT	RE	
		UP20M	UTi20T						
TNMC32NGR032	E	●	●	.032	.375	.125	.057	≦.003	
TNMC**32NGL032**	E	●	●	.032	.375	.125	.057	≦.003	
TNMC**32NGR063**	E	●	●	.063	.375	.125	.156	≦.003	
TNMC**32NGL063**	E	●	●	.063	.375	.125	.156	≦.003	
TNMC**43NGR063**	E	●	●	.063	.500	.188	.156	≦.003	
TNMC**43NGL063**	E	●	●	.063	.500	.188	.156	≦.003	
TNMC**43NGR094**	E	●	●	.094	.500	.188	.156	≦.003	
TNMC**43NGL094**	E	●	●	.094	.500	.188	.156	≦.003	
TNMC**43NGR125**	E	●	●	.125	.500	.188	.234	≦.003	
TNMC**43NGL125**	E	●	●	.125	.500	.188	.234	≦.003	
TNMC**43NGR156**	E	●	●	.156	.500	.188	.234	≦.003	
TNMC**43NGL156**	E	●	●	.156	.500	.188	.234	≦.003	
TNMC**54NGR187**	E	●	●	.187	.625	.250	.297	≦.003	
TNMC**54NGL187**	E	●	●	.187	.625	.250	.297	≦.003	



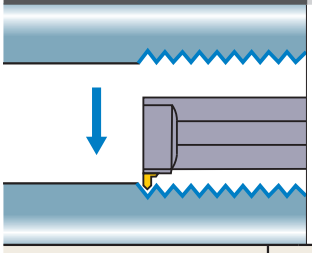
Right hand insert shown.

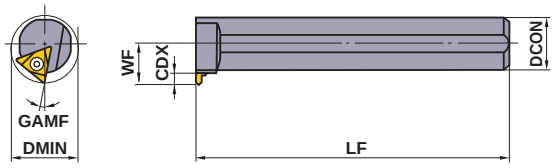
● : Inventory maintained.

STHN/O TYPE

- Multi-clamp type.
- Precision class insert.
- Positive insert produces a good finished surface.
- Holder is capable of performing both grooving and threading.
- Economical due to the use of 3 cutting edges.

S-STHN/O Internal grooving, Threading, Boring





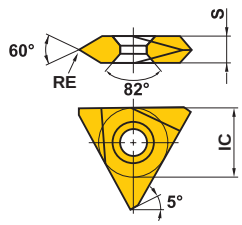
Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (inch)							
	R	L			DCON	LF	WF	GAMF	DMIN	CDX	Clamp Screw	Wrench
S16-STHNR/L-3	●	●	TNMC	32◌	1.000	10.000	.656	10°	**1.250**	.060 / .156	GTS1	TKY10F
S20-STHNR/L-4	●	●		43◌	1.250	12.000	.843	10°	**1.750**	.156 / .234	GTS2	TKY20F
S24-STHNR/L-4	●	●		43◌	1.500	14.000	.968	10°	**2.250**	.156 / .234	GTS2	TKY20F
S32-STHNR/L-4	●	●		43◌	2.000	14.000	1.218	10°	**3.000**	.156 / .234	GTS2	TKY20F
S32-STHOR/L-5	●	●		54◌	2.000	14.000	1.250	0	**4.000**	.297	GTS3	TKY20F

(Note) Please use left hand insert for right hand holder and right hand insert for left hand holder.

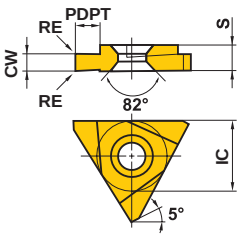
INSERTS (THREADING)

Order Number	Class	Stock		Min. Pitch (T.P.I)	Dimensions (inch)			Geometry
		Coated	Carbide		IC	S	RE	
		UP20M	UTi20T					
TNMC32NV	E	●	●	8	.375	.125	.004	
TNMC43NV	E	●	●	6	.500	.187	.004	
TNMC54NV	E	●	●	4	.625	.250	.004	



INSERTS (GROOVING)

Order Number	Class	Stock		Dimensions (inch)					Geometry
		Coated	Carbide	CW	IC	S	PDPT	RE	
		UP20M	UTi20T						
TNMC32NGR032	E	●	●	.032	.375	.125	.057	≤.003	
TNMC32NGL032	E	●	●	.032	.375	.125	.057	≤.003	
TNMC32NGR063	E	●	●	.063	.375	.125	.156	≤.003	
TNMC32NGL063	E	●	●	.063	.375	.125	.156	≤.003	
TNMC43NGR063	E	●	●	.063	.500	.188	.156	≤.003	
TNMC43NGL063	E	●	●	.063	.500	.188	.156	≤.003	
TNMC43NGR094	E	●	●	.094	.500	.188	.156	≤.003	
TNMC43NGL094	E	●	●	.094	.500	.188	.156	≤.003	
TNMC43NGR125	E	●	●	.125	.500	.188	.234	≤.003	
TNMC43NGL125	E	●	●	.125	.500	.188	.234	≤.003	
TNMC43NGR156	E	●	●	.156	.500	.188	.234	≤.003	
TNMC43NGL156	E	●	●	.156	.500	.188	.234	≤.003	
TNMC54NGR187	E	●	●	.187	.625	.250	.297	≤.003	
TNMC54NGL187	E	●	●	.187	.625	.250	.297	≤.003	

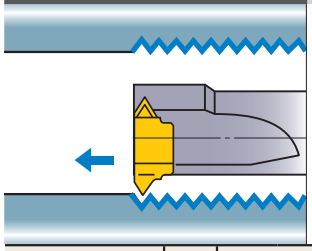


Right hand insert shown.

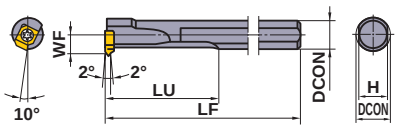
F TYPE

- Min. cutting diameter 10mm.
- Screw-on type.
- Usable for various applications.
- Max. groove depth: 3mm.

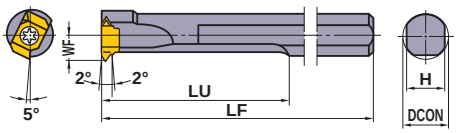
FSL51 Internal grooving, Threading



1 Corner type (FSL5108R,5110R)



2 Corner type (FSL5112R,5114R,5116R)



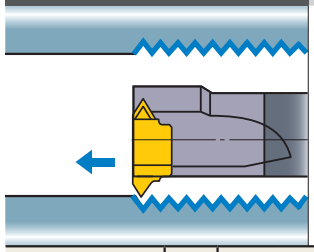
Metric Standard

Right hand tool holder only.

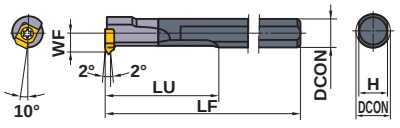
Order Number	Stock	Insert Number				Dimensions (mm)							Max. Groove Depth (mm)	Clamp Screw	Wrench
	R	Grooving		Threading		DCON	H	LF	LU	WF	CW*2	DMIN*1			
FSL5108R	★	MLG	10□□L	MLT	1001L	8	7	125	30	4.8	1.2 1.5 2.0	**10**	1.0	TS25	TKY08F
FSL5110R	★	MLG	10□□L	MLT	1001L	10	9	150	40	5.8		**12**	1.0	TS25	TKY08F
FSL5112R	★	MLG	14□□L	MLT	1401L	12	10.8	180	50	6.8	1.5 2.0 3.0	**14**	2.0	TS32	TKY08F
FSL5114R	★	MLG	14□□L	MLT	1401L	14	12.4	180	60	7.8		**16**	2.0	TS32	TKY08F
FSL5116R	★	MLG	20□□L	MLT	2001L	16	14	200	70	9.7	2.0 3.0 4.0	**20**	3.0	TS43	TKY15F

★1 DMIN : Min. Cutting Diameter
★2 CW : Please refer to page G038.

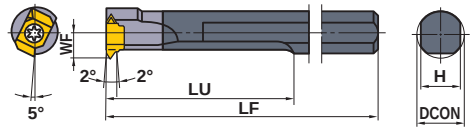
FSL52 Carbide shank



1 Corner type (FSL5208R,5210R)



2 Corner type (FSL5212R,5214R,5216R)



Metric Standard

Right hand tool holder only.

Order Number	Stock	Insert Number				Dimensions (mm)							Max. Groove Depth (mm)	Clamp Screw	Wrench
	R	Grooving		Threading		DCON	H	LF	LU	WF	CW*2	DMIN*1			
FSL5208R	★	MLG	10□□L	MLT	1001L	8	7	125	60	4.8	1.2 1.5 2.0	**10**	1.0	TS25	TKY08F
FSL5210R	★	MLG	10□□L	MLT	1001L	10	9	150	70	5.8		**12**	1.0	TS25	TKY08F
FSL5212R	★	MLG	14□□L	MLT	1401L	12	10.8	180	80	6.8	1.5 2.0 3.0	**14**	2.0	TS32	TKY08F
FSL5214R	★	MLG	14□□L	MLT	1401L	14	12.4	180	85	7.8		**16**	2.0	TS32	TKY08F
FSL5216R	★	MLG	20□□L	MLT	2001L	16	14	200	115	9.7	2.0 3.0 4.0	**20**	3.0	TS43	TKY15F

★1 DMIN : Min. Cutting Diameter
★2 CW : Please refer to page G038.

RECOMMENDED CUTTING CONDITIONS

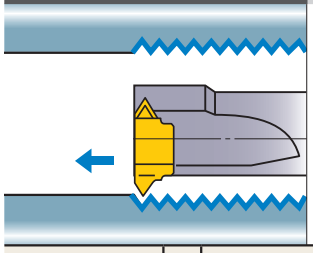
Work Material		Hardness	Grade	Cutting Speed (SFM)	Feed (inch/rev)
P	Carbon Steel Alloy Steel	180—280HB	**UP20M ▪ UTi20T**	295 (195—390)	.002 (.0008—.003)
		280—350HB	**UP20M ▪ UTi20T**	260 (165—330)	.001 (.0008—.0015)

● : Inventory maintained. ★ : Inventory maintained in Japan.

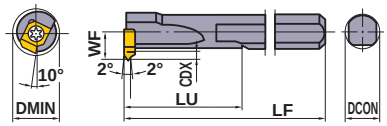
F TYPE

- Min. cutting diameter .390inch.
- Screw-on type.
- Usable for various applications.
- Max. groove depth: .118inch.

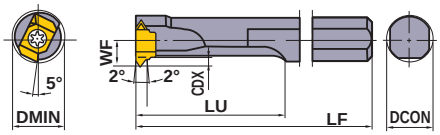
S-SL5N Internal grooving, Threading



1 Corner type (S-SL5NR05 / 06)



2 Corner type (S-SL5NR08 / 10 / 12)



Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (inch)							Clamp Screw	Wrench
	R	Grooving	Threading	DCON	LF	LU	WF	CW*2	DMIN*1	CDX		
S-SL5NR05	●	MLG10W○○○L	MLT1001L	.313	5.000	1.250	.188	.062 .094	.390	.039	TS25	TKY08F
S-SL5NR**06**	●	MLG10W○○○L	MLT1001L	.375	6.000	1.500	.219		.449	.039	TS25	TKY08F
S-SL5NR**08**	●	MLG14W○○○L	MLT1401L	.500	7.000	2.000	.281	.062 .094 .125	.579	.079	TS32	TKY08F
S-SL5NR**10**	●	MLG20W○○○L	MLT2001L	.625	8.000	3.000	.375	.094 .125 .156	.791	.118	TS43	TKY15F
S-SL5NR**12**	●	MLG20W○○○L	MLT2001L	.750	10.000	4.000	.438		.902	.118	TS43	TKY15F

*1 DMIN : Min. Cutting Diameter
*2 CW : Please refer to page G038.

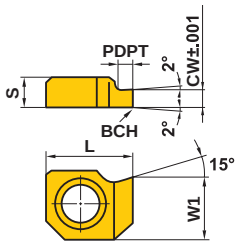
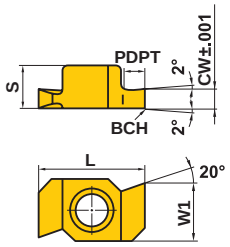
RECOMMENDED CUTTING CONDITIONS

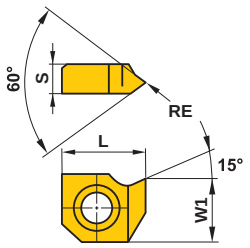
Work Material		Hardness	Grade	Cutting Speed (SFM)	Feed (inch/rev)
P	Carbon Steel Alloy Steel	180—280HB	**UP20M ▪ UTi20T**	295 (195—390)	.002 (.0008—.003)
		280—350HB	**UP20M ▪ UTi20T**	260 (165—330)	.001 (.0008—.0015)

F TYPE

- Min. cutting diameter .390inch.
- Screw-on type.
- Usable for various applications.
- Max. groove depth: .118inch.

INSERTS

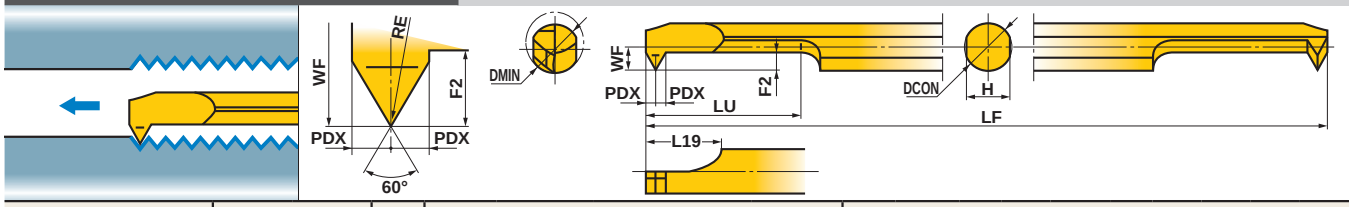
Application		CW (inch)	Order Number	Carbide UTi20T	Carbide HTi10	L	W1	PDPT	S	BCH	Geometry
Grooving	Inch	.062	**MLG10W062L**		●	.276	.197	.039	.094	.004	**MLG...L (1 Corner type)** 
	Metric	.047 (1.2mm)	**MLG1012L**	●		.276	.197	.039	.094	.004	
		.059 (1.5mm)	**MLG1015L**	●		.276	.197	.039	.094	.004	
		.079 (2.0mm)	**MLG1020L**	●		.276	.197	.039	.094	.004	
	Inch	.062	**MLG14W062L**		▲	.465	.256	.079	.187	.004	**MLG...L (2 Corner type)** 
	Metric	.059 (1.5mm)	**MLG1415L**	●		.465	.256	.079	.187	.004	
		.079 (2.0mm)	**MLG1420L**	●		.465	.256	.079	.187	.004	
		.118 (3.0mm)	**MLG1430L**	●		.465	.256	.079	.187	.004	
		.079 (2.0mm)	**MLG2020L**	●		.661	.356	.118	.250	.004	
		.118 (3.0mm)	**MLG2030L**	●		.661	.356	.118	.250	.004	
		.157 (4.0mm)	**MLG2040L**	●		.661	.356	.118	.250	.004	

Application	Min.Pitch	Order Number	Coated UP20M	Carbide UTi20T	L	W1	S	RE	Geometry
Threading	13T.P.I	**MLT1001L**	●	●	.276	.197	.094	.004	**MLT1001L (1 Corner type)**  **MLT1401L /2001L (2 Corner type)**
	11T.P.I	**MLT1401L**	●	●	.465	.256	.187	.004	
	8T.P.I	**MLT2001L**	●	●	.661	.356	.250	.004	

● : Inventory maintained.
▲ : This item to be discontinued within two years.

MICRO-MINI TWIN

CT — Internal threading



Order Number	Stock		Breaker	Threads				Dimensions (mm)									
	Micro Grain Carbide	Coated		Metric Screw		Unified Screw											
	TF15	VP15TF		Thread	Pitch (mm)	Thread	Pitch (thread/inch)	DMIN	RE	DCON	LF	LU	L19	WF	PDX	F2	H
CT0305RS-M4	●	●	Without	≧M4	0.5–1.0	≧NO.8–32UNC ≧NO.8–36UNF	36–24	**3**	0.03	3	50	5.2	6	1.3	0.6	1.2	2.7
CT03RS-M4	●	●	Without	≧M4	0.5–1.0		36–24	**3**	0.03	3	50	10.2	6	1.3	0.6	1.2	2.7
CT03RS-M4B	●	●	With	≧M4	0.5–1.0		36–24	**3**	0.03	3	50	10.2	6	1.3	0.6	1.2	2.7
CT0407RS-M6	●	●	Without	≧M6	0.75–1.25	≧1/4–20UNC ≧1/4–28UNF	28–20	**4.5**	0.05	4	60	7.6	7	1.8	0.8	1.7	3.6
CT04RS-M6	●	●	Without	≧M6	0.75–1.25		28–20	**4.5**	0.05	4	60	15.6	7	1.8	0.8	1.7	3.6
CT04RS-M6B	●	●	With	≧M6	0.75–1.25		28–20	**4.5**	0.05	4	60	15.6	7	1.8	0.8	1.7	3.6
CT0511RS-M8	●	●	Without	≧M8	0.75–1.5	≧5/16–18UNC ≧5/16–24UNF	24–18	**6**	0.05	5	70	11	8	2.3	1	2.2	4.5
CT05RS-M8	●	●	Without	≧M8	0.75–1.5		24–18	**6**	0.05	5	70	21	8	2.3	1	2.2	4.5
CT05RS-M8B	●	●	With	≧M8	0.75–1.5		24–18	**6**	0.05	5	70	21	8	2.3	1	2.2	4.5
CT0611RS-M10	●	●	Without	≧M10	0.75–1.75	≧3/8–16UNC ≧3/8–24UNF	24–16	**7**	0.05	6	75	11	8	2.8	1	2.2	5.4
CT06RS-M10	●	●	Without	≧M10	0.75–1.75		24–16	**7**	0.05	6	75	21	8	2.8	1	2.2	5.4
CT06RS-M10B	●	●	With	≧M10	0.75–1.75		24–16	**7**	0.05	6	75	21	8	2.8	1	2.2	5.4

THREAD PITCH FOR THE CT TYPE

Order Number	Metric Thread P (mm)								Unified Thread P (thread/inch)						
	0.50	0.70	0.75	0.80	1.00	1.25	1.50	1.75	36	32	28	24	20	18	16
CT03RS-M4/M4B	○	○	○	○	○	–	–	–	○	○	○	○	–	–	–
CT04RS-M6/M6B	–	–	○	–	○	○	–	–	–	–	○	○	○	–	–
CT05RS-M8/M8B	–	–	○	–	○	○	○	–	–	–	–	○	○	○	–
CT06RS-M10/M10B	–	–	○	–	○	○	○	○	–	–	–	○	○	○	○

(Note) For internal threads that are larger than the minimum diameter of the Micro Mini Twin (CT type) it is possible to machining the above thread pitches. For the minimum diameter please refer to the standards.

DEPTH OF CUT FOR THE CT TYPE

●Metric Thread

	P (pitch)	0.5	0.7	0.75		0.8	1		1.25	1.5	1.75
	D.O.C. (mm)	0.3	0.43	0.46	0.44	0.49	0.62	0.6	0.76	0.92	1.09
	Re* (Corner radius)	0.03	0.03	0.03	0.05	0.03	0.03	0.05	0.05	0.05	0.05
Number of Passes	1	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07
	2	0.05	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07
	3	0.05	0.06	0.06	0.05	0.06	0.06	0.06	0.07	0.07	0.07
	4	0.04	0.05	0.05	0.05	0.05	0.06	0.06	0.07	0.07	0.07
	5	0.04	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.07	0.07
	6	0.03	0.04	0.04	0.04	0.04	0.05	0.05	0.06	0.06	0.07
	7	0.03	0.04	0.04	0.04	0.04	0.05	0.05	0.06	0.06	0.06
	8		0.04	0.04	0.03	0.04	0.04	0.04	0.05	0.06	0.06
	9		0.03	0.03	0.03	0.03	0.04	0.04	0.05	0.05	0.06
	10			0.03	0.03	0.03	0.04	0.04	0.05	0.05	0.06
	11					0.03	0.03	0.03	0.04	0.05	0.05
	12						0.03	0.03	0.04	0.05	0.05
	13						0.03		0.04	0.04	0.05
	14								0.03	0.04	0.05
	15									0.04	0.04
	16									0.04	0.04
	17									0.03	0.04
	18										0.04
	19										0.04
	20										0.03

●Unified Thread

	P (thread/inch)	36	32	28		24		20	18	16
	D.O.C. (inch)	.0169	.0193	.0220	.0213	.0260	.0252	.0307	.0343	.0386
	Re* (Corner radius)	.0012	.0012	.0012	.0020	.0012	.0020	.0020	.0020	.0020
Number of Passes	1	.0024	.0024	.0028	.0024	.0028	.0028	.0028	.0028	.0028
	2	.0024	.0024	.0024	.0024	.0028	.0028	.0028	.0028	.0028
	3	.0024	.0024	.0024	.0024	.0024	.0024	.0028	.0028	.0028
	4	.0020	.0020	.0024	.0020	.0024	.0024	.0024	.0028	.0028
	5	.0020	.0020	.0020	.0020	.0024	.0024	.0024	.0028	.0028
	6	.0016	.0016	.0020	.0020	.0020	.0020	.0024	.0024	.0024
	7	.0016	.0016	.0016	.0016	.0020	.0020	.0024	.0024	.0024
	8	.0016	.0016	.0016	.0016	.0016	.0020	.0020	.0024	.0024
	9	.0012	.0012	.0016	.0016	.0016	.0016	.0020	.0020	.0024
	10		.0012	.0012	.0012	.0016	.0016	.0020	.0020	.0024
	11		.0012	.0012	.0012	.0012	.0012	.0016	.0020	.0020
	12			.0012	.0012	.0012	.0012	.0016	.0020	.0020
	13					.0012	.0012	.0016	.0016	.0020
	14					.0012		.0012	.0016	.0016
	15							.0012	.0012	.0016
	16								.0012	.0016
	17									.0012
	18									.0012
	19									
	20									

* Even though the pitch maybe the same, the depth of cut varies according to the corner radius. For the Micro Mini Twin CT type CT03RS-M4, and CT03RS-M4B the corner radius is 0.03mm(.0012inch), for other types it is 0.05mm(.0020inch). For further details please refer to the standards section.

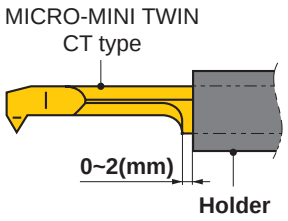
HOLDER

HOLDER CROSS REFERENCE LIST OF INCH SHANK STANDARD

Holder			MICRO-MINI TWIN	Machine Makers
Type		Order Number	CT	
Round Type Holder ϕ.625inch	ID : Metric Type	**RBH10189A**	0305RS-M4, 03RS-M4(B)	Citizen Precision Machinery Co., Ltd. NC lathes
		RBH**10252A**	0407RS-M6, 04RS-M6(B)	
		RBH**10315A**	0511RS-M8, 05RS-M8(B)	
		RBH**10378A**	0611RS-M10, 06RS-M10(B)	
		RBH**10441A**	–	
Round Type Holder ϕ.750inch	ID : Metric Type	**RBH19030N**	0305RS-M4, 03RS-M4(B)	Citizen Precision Machinery Co., Ltd.
		RBH**19040N**	0407RS-M6, 04RS-M6(B)	
		RBH**19050N**	0511RS-M8, 05RS-M8(B)	
		RBH**19060N**	0611RS-M10, 06RS-M10(B)	
		RBH**19070N**	–	
Round Type Holder ϕ1.000inch	ID : Metric Type	**RBH16189A**	0305RS-M4, 03RS-M4(B)	Citizen Precision Machinery Co., Ltd. NC lathes
		RBH**16252A**	0407RS-M6, 04RS-M6(B)	
		RBH**16315A**	0511RS-M8, 05RS-M8(B)	
		RBH**16378A**	0611RS-M10, 06RS-M10(B)	
		RBH**16441A**	–	

∗ Mitsubishi Materials obtained the makers' approval before entering their names in the list.

RECOMMENDED TOOL OVERHANG



(Note) For LU, refer to page G039(CTtype).

RECOMMENDED CUTTING CONDITIONS

Work Material		Cutting Speed (SFM)
P	General Steel	100—260
M	Stainless Steel	100—260
K	Cast Iron	100—260
N	Non Ferrous Materials	165—330

(Note 1) Recommend wet machining.
(Note 2) Please remember when machining small diameters and high speeds there is the possibility that the machine can not keep up with the set feed.

HOLDER CROSS REFERENCE LIST OF METRIC SHANK STANDARD

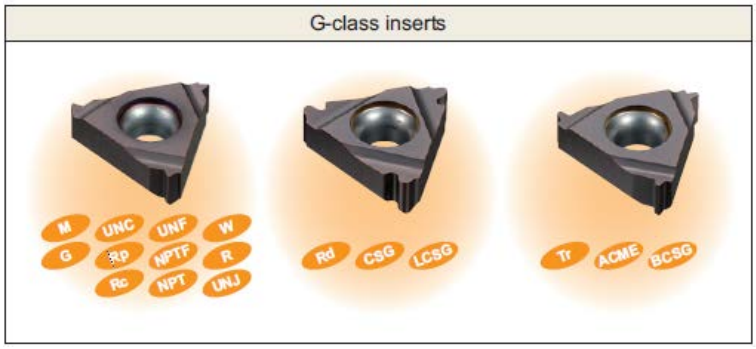
Holder		MICRO-MINI TWIN	Machine Makers
Type	Order Number	CT	
Round Type Holder ϕ16mm	**RBH1630N**	0305RS-M4, 03RS-M4(B)	MIYANO MACHINERY JAPAN INC. NC lathes
	RBH**1640N**	0407RS-M6, 04RS-M6(B)	
	RBH**1650N**	0511RS-M8, 05RS-M8(B)	
	RBH**1660N**	0611RS-M10, 06RS-M10(B)	
	RBH**1670N**	–	
Round Type Holder ϕ20mm	**RBH2030N**	0305RS-M4, 03RS-M4(B)	Citizen Precision Machinery Co., Ltd. Tsugami Corporation MIYANO MACHINERY JAPAN INC. NC lathes
	RBH**2040N**	0407RS-M6, 04RS-M6(B)	
	RBH**2050N**	0511RS-M8, 05RS-M8(B)	
	RBH**2060N**	0611RS-M10, 06RS-M10(B)	
	RBH**2070N**	–	
Round Type Holder ϕ22mm	**RBH2230N**	0305RS-M4, 03RS-M4(B)	STAR MICRONICS CO., LTD.
	RBH**2240N**	0407RS-M6, 04RS-M6(B)	
	RBH**2250N**	0511RS-M8, 05RS-M8(B)	
	RBH**2260N**	0611RS-M10, 06RS-M10(B)	
	RBH**2270N**	–	
Round Type Holder ϕ25mm	**RBH2530N**	0305RS-M4, 03RS-M4(B)	Tsugami Corporation MIYANO MACHINERY JAPAN INC. NC lathes
	RBH**2540N**	0407RS-M6, 04RS-M6(B)	
	RBH**2550N**	0511RS-M8, 05RS-M8(B)	
	RBH**2560N**	0611RS-M10, 06RS-M10(B)	
	RBH**2570N**	–	
Square Type Holder □10mm	**SBH1030R**	0305RS-M4, 03RS-M4(B)	NC lathes
	SBH**1040R**	0407RS-M6, 04RS-M6(B)	
	SBH**1050R**	0511RS-M8, 05RS-M8(B)	
	SBH**1060R**	0611RS-M10, 06RS-M10(B)	
	SBH**1070R**	–	

✶ Mitsubishi Materials obtained the makers' approval before entering their names in the list.

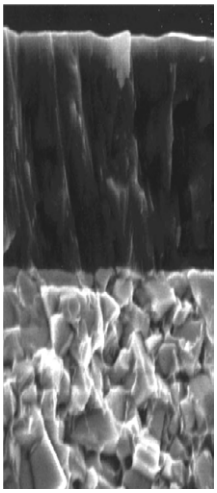
NEW THREAD PROFILES AVAILABLE

API ROUND API BUTTRESS API H90 API ROTARY ACME STUB ACME

- **Mitsubishi Threading series contains 144 new on-edge, 104 new lay down and 10 new thread chaser profiles.**
- **This insert series will allow for the threading of a wide range of work materials, from alloy steels to some HRSA's.**
- **Can be used across a broad range of industries including Oil and Gas, Automotive, and Aerospace.**



Features of the CP1025 grade



MIRACLE coating (Al,Ti)N

Micro-grain cemented carbide

MIRACLE coating

MIRACLE coating plus a special multi-purpose base carbide is suited for machining a wide verity metal materials.

High fracture resistance during low rigidity applications such as bar feed machining. Able to withstand harsh conditions for long periods where conventional inserts would be liable to breakage.

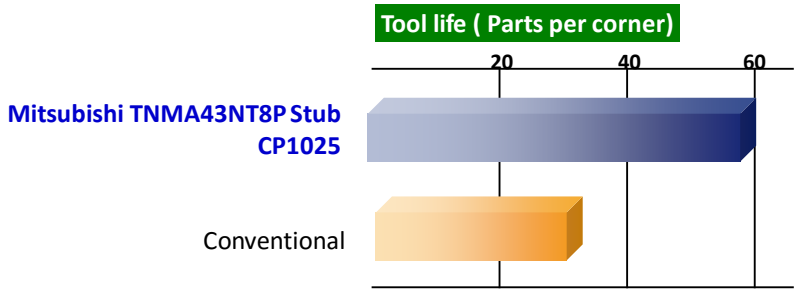
APPLICATIONS

Part Name	7' Outer Barrel			Machining				
Holder	Metric A32S-DCLNR12			Inch 2.5" Steel Bar				
Insert	Metric CNMG120408-LP			Inch TNMA 43 NT 8P Stub			Grade	CP1025
Work Material	Alloy steel	JIS	ISO	ASTM P110			Work Hardness	32HRC
Cutting Speed (vc)	[M] 154 m/min	[U] 504 SFM		Main Axis Spindle Speed (n)		min-1		
Feed per Revolution (f)	[M] 3.1750 mm/rev	[U] .1250 IPR		Depth of cut (ap)	[M] .102 mm	[U] .004 Inch		
Coolant	External Flood			Coolant Pressure	[M] Mpa	[U] PSI		
Machine	CNC Lathe							

[M]- - Metric system **[U]**- - U.S.customary unit

Key Point on Machining

- CP1025 showed excellent flank wear resistance.
- CP1025 can greatly extend tool life as VP coating prevents flank wear more readily.



Tool life 60 parts/corner

93.5% increase in tool life

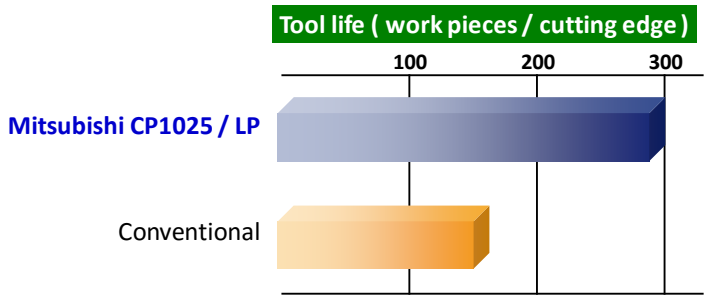
Tool life 31 parts/corner

Part Name	Drill Pipe			Machining	Turning			
Holder	Metric			Inch				
Insert	Metric			Inch			Grade	CP1025
Work Material	Alloy steel	JIS	ISO	ASTM			Work Hardness	
Cutting Speed (vc)	[M] m/min	[U] SFM		Main Axis Spindle Speed (n)		min-1		
Feed per Revolution (f)	[M] mm/rev	[U] IPR		Depth of cut (ap)	[M] mm	[U] Inch		
Coolant	Wet			Coolant Pressure	[M] Mpa	[U] PSI		
Machine								

[M]- - Metric system **[U]**- - U.S.customary unit

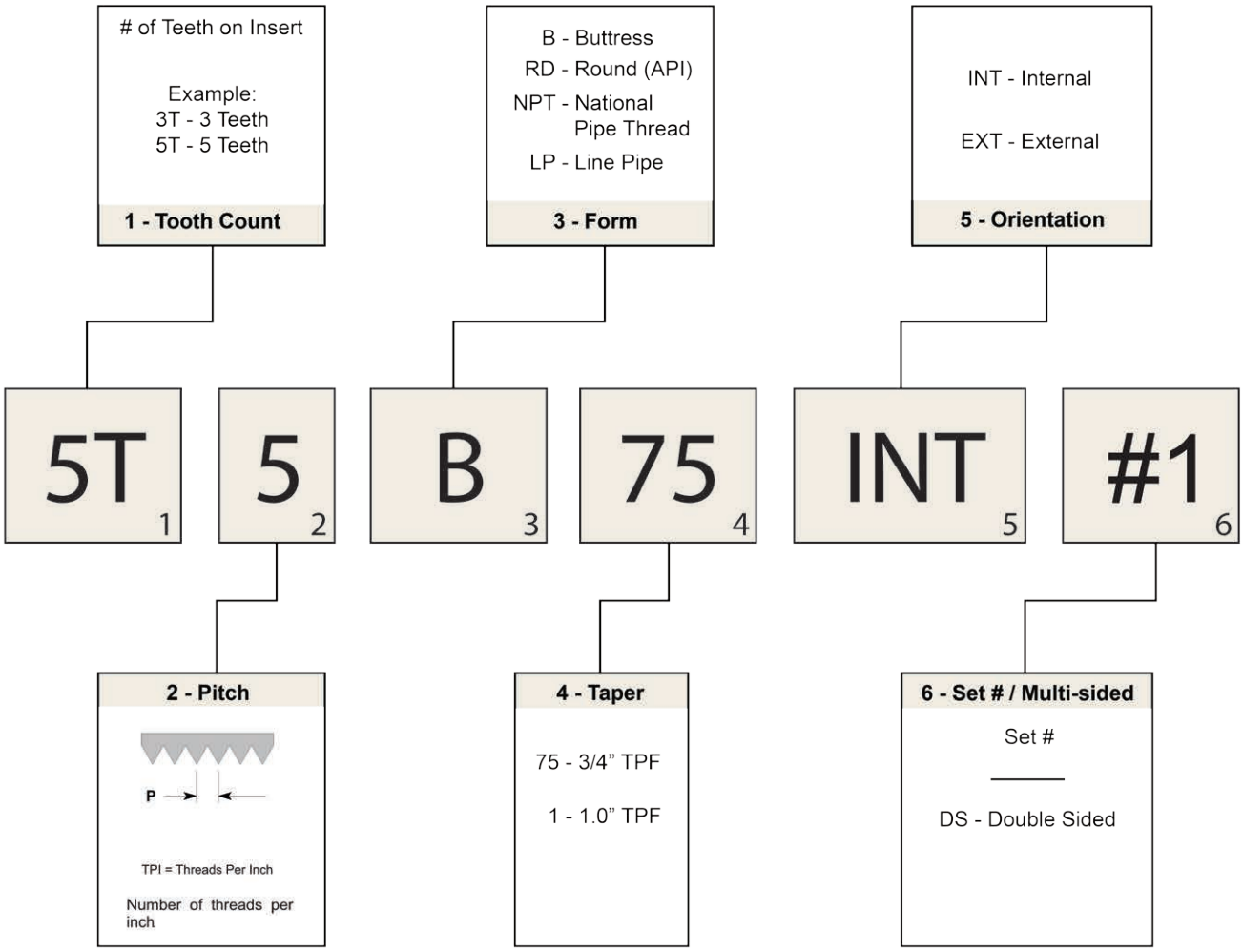
Key Point on Machining

- CP1025 showed stable tool life by excellent fracture resistance.
- CP1025 can greatly extend the machining amount, because the VB wear is still small.

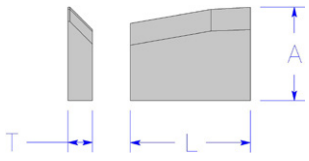


IDENTIFICATION

■ Chaser Inserts

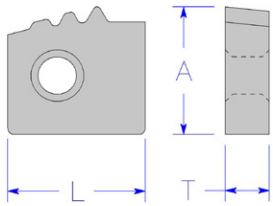
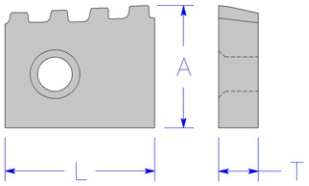
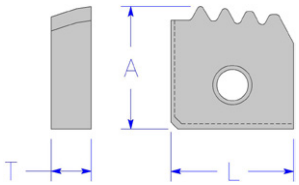
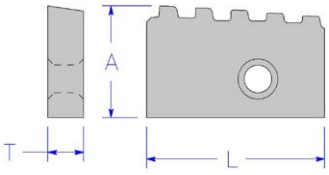


● Chipbreakers

Geometry	DESCRIPTION	Stock CP102	ANGLE	L	T	A	USED WITH
CP102 Breaker 	**5/8 EXTERNAL**	●	**3º**	**5/8**	**.125**	**.480**	
	5/8 EXTERNAL MOD	●	**3º X 10º**	**5/8**	**.125**	**.480**	
	3/4 EXTERNAL	●	**3º**	**4/5**	**.125**	**.500**	
	5/8 INTERNAL	●	**3º**	**5/8**	**.125**	**.470**	
	1 INCH INTERNAL	●	**3º**	**1**	**.125**	**.470**	
	5/8 NEUTRAL	●	**0º**	**5/8**	**.125**	**.420**	**SPECIALS**

● : Inverntory maintained

CHASER INSERTS

Geometry	DESCRIPTION	Stock CP1025	No. of Teeth	PITCH	TPF	L	T	A
EXTERNAL ROUND 	**3T8RD75E**	●	**3**	**8**	**3/4**	**.625**	**.204**	**.595**
	3T10RD75E	●	**3**	**10**	**3/4**	**.625**	**.204**	**.625**
EXTERNAL BUTTRESS 	**4T5B75E**	●	**4**	**5**	**3/4**	**.750**	**.204**	**.625**
	4T5B1E	●	**4**	**5**	**1**	**.750**	**.204**	**.625**
INTERNAL ROUND 	**4T8RD75I**	●	**4**	**8**	**3/4**	**.625**	**.204**	**.625**
	7T8RD75I	●	**7**	**8**	**3/4**	**1.000**	**.204**	**.625**
	3T10RD75I	●	**3**	**10**	**3/4**	**.625**	**.204**	**.625**
INTERNAL BUTTRESS 	**2T5B75I**	●	**2**	**5**	**3/4**	**.625**	**.204**	**.625**
	5T5B75I	●	**5**	**5**	**3/4**	**1.000**	**.204**	**.625**
	5T5B1I	●	**5**	**5**	**1**	**1.000**	**.204**	**.625**

● : Inverntory maintained

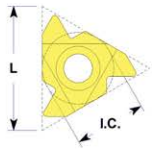
IDENTIFICATION

NEW

■ LAYDOWN THREADING

1 - Insert I.C. Size

L (mm) I.C. (inch)



16 - 3/8 I.C.
22 - 1/2 I.C.
27 - 5/8 I.C.

3 - Hand of Insert

L - Left Hand
R - Right Hand

5 - Pitch (TPI)

-API-
428
425
530
435
438

60° V

6 - Thread Type

ACME - Acme Thread
STUB - Stub Acme Thread
B - Buttress Thread
ISO - ISO Thread
NPT - National Pipe Thread
RD - API Round Thread
UN - Unified Thread
UNJ - Unified Thread
V0.055 - MT Thread
H902 - Hughes API 2TPF
H903 - Hughes API 3TPF
H90S - Hughes API Slimline

16	E	R	AG	5	B	75
1	2	3	4	5	6	7

2 - Internal / External

E - External I - Internal

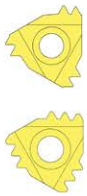
4 - Groove / Thread Form

A - 60° V-Thread (16P - 48P)
AG - 60° V-Thread (8P - 48P)
G - 60° V-Thread (8P - 14P)
N - 60° V-Thread (5P - 7P)

7 - Taper Per Foot / Multi-Tooth

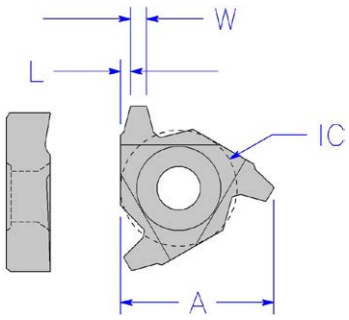
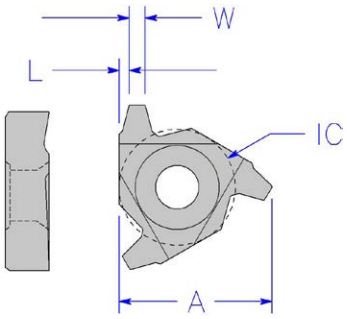
75 - 3/4" TPF
1 - 1" TPF
1.25 - 1 1/4" TPF
1.5 - 1 1/2" TPF

2T - 2 Tooth
3T - 3 Tooth



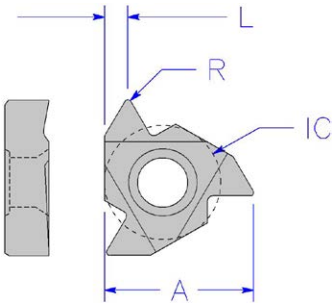
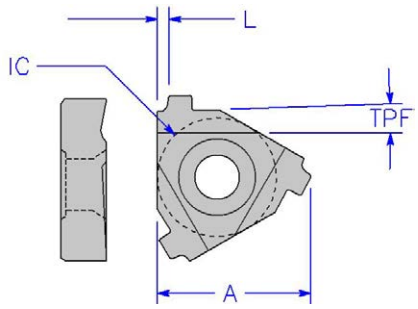
* Not all options are applicable to all thread forms. If you have any questions please feel free to give us a call at 800-486-2341

LAYDOWN THREADING

Geometry	DESCRIPTION	Stock CP1025	Pitch	Width	IC	A	L
LAYDOWN ACME THREADING 	**16ER 16P ACME**	●	16	.0206	.375	.491	.036
	16ER 14P ACME	●	14	.0239	.375	.491	.036
	16ER 12P ACME	●	12	.0283	.375	.491	.036
	16ER 10P ACME	●	10	.0319	.375	.491	.036
	16ER 8P ACME	●	8	.0411	.375	.491	.036
	22ER 6P ACME	●	6	.0566	.500	.657	.043
	22ER 5P ACME	●	5	.0689	.500	.657	.043
	27ER 4P ACME	●	4	.0875	.625	.833	.050
	16NR 16P ACME	●	16	.0206	.375	.491	.036
	16NR 14P ACME	●	14	.0239	.375	.491	.036
	16NR 12P ACME	●	12	.0283	.375	.491	.036
	16NR 10P ACME	●	10	.0319	.375	.491	.036
	16NR 8P ACME	●	8	.0411	.375	.491	.036
	22NR 6P ACME	●	6	.0566	.500	.657	.043
	22NR 5P ACME	●	5	.0689	.500	.657	.043
	27NR 4P ACME	●	4	.0875	.625	.833	.050
LAYDOWN STUB ACME THREADING 	**16ER 16P STUB**	●	16	.0238	.375	.4 91	.036
	16ER 14P STUB	●	14	.0276	.375	.491	.036
	16ER 12P STUB	●	12	.0326	.375	.491	.036
	16ER 10P STUB	●	10	.0370	.375	.491	.036
	16ER 8P STUB	●	8	.0476	.375	.491	.036
	22ER 6P STUB	●	6	.0652	.500	.657	.043
	22ER 5P STUB	●	5	.0793	.500	.657	.043
	27ER 4P STUB	●	4	.1004	.625	.833	.050
	16NR 16P STUB	●	16	.0238	.375	.491	.036
	16NR 14P STUB	●	14	.0276	.375	.491	.036
	16NR 12P STUB	●	12	.0326	.375	.491	.036
	16NR 10P STUB	●	10	.0370	.375	.491	.036
	16NR 8P STUB	●	8	.0476	.375	.491	.036
	22NR 6P STUB	●	6	.0652	.500	.657	.043
	22NR 5P STUB	●	5	.0793	.500	.657	.043
	27NR 4P STUB	●	4	.1004	.625	.833	.050

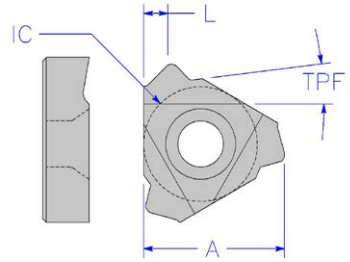
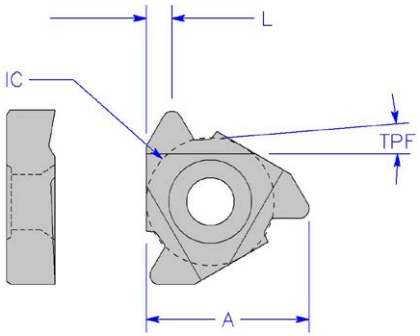
● : Inverntory maintained

LAYDOWN THREADING

Geometry	DESCRIPTION	Stock CP1025	PITCH	R	IC	A	L
LAYDOWN 60° THREADING 	16ER A60	35402	16-48	.003	.375	.517	.040
	16ER AG60	35412	8-48	.003	.375	.492	.060
	16ER G60	35422	8-14	.007	.375	.485	.070
	22ER N60	35432	5-7	.015	.500	.641	.100
	27ER K60	35442	4.5-4	.028	.625	.817	.110
	16NR A60	35501	16-48	.003	.375	.517	.040
	16NR AG60	35511	8-48	.003	.375	.492	.060
	16NR G60	35521	8-14	.007	.375	.485	.070
	22NR N60	35531	5-7	.010	.500	.641	.100
	27NR K60	35541	4-4.5	.015	.625	.815	.110
LAYDOWN API ROTARY THREADING 	16ER 8B75	59482	8	0.75	.375	.458	.069
	22ER 8B75	35602	8	0.75	.500	.649	.069
	22ER 5B75	58012	5	0.75	.500	.645	.048
	22ER 5B1	69842	5	1	.500	.645	.048
	16NR 8B75	59491	8	0.75	.375	.458	.069
	22NR 8B75	35611	8	0.75	.500	.649	.069
	22NR 5B75	59471	5	0.75	.500	.644	.040
	22NR 5B1	69881	5	1	.500	.644	.040

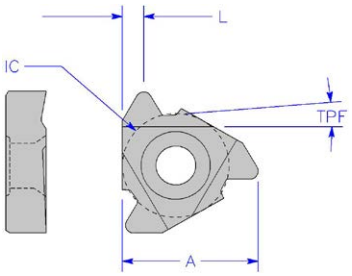
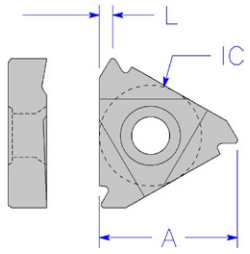
● : Inverntory maintained

LAYDOWN THREADING

Geometry	Description	Stock CP1025	Pitch	TPF	IC	A	L
LAYDOWN API HUGHES THREADING 	**27ER H902**	●	**3.5**	**2**	**.625**	**.775**	**.134**
	27ER H903	●	**3.5**	**3**	**.625**	**.775**	**.134**
	27ER H90S	●	**3**	**1.25**	**.625**	**.765**	**.114**
	27NR H902	●	**3.5**	**2**	**.625**	**.775**	**.134**
	27NR H903	●	**3.5**	**3**	**.625**	**.775**	**.134**
	27NR H90S	●	**3**	**1.25**	**.625**	**.765**	**.114**
LAYDOWN API ROTARY THREADING 	**22ER 425**	●	**4**	**2**	**.500**	**.635**	**.110**
	22ER 428	●	**4**	**2**	**.500**	**.635**	**.110**
	22ER 435	●	**4**	**3**	**.500**	**.635**	**.110**
	22ER 438	●	**4**	**3**	**.500**	**.635**	**.110**
	22ER 530	●	**5**	**3**	**.500**	**.635**	**.100**
	22ER PAC	●	**4**	**1.5**	**.500**	**.624**	**.100**
	22NR 425	●	**4**	**2**	**.500**	**.635**	**.110**
	22NR 428	●	**4**	**2**	**.500**	**.635**	**.110**
	22NR 435	●	**4**	**3**	**.500**	**.635**	**.110**
	22NR 438	●	**4**	**3**	**.500**	**.635**	**.110**
	22NR 530	●	**5**	**3**	**.500**	**.635**	**.100**
	22NR PAC	●	**4**	**1.5**	**.500**	**.624**	**.100**

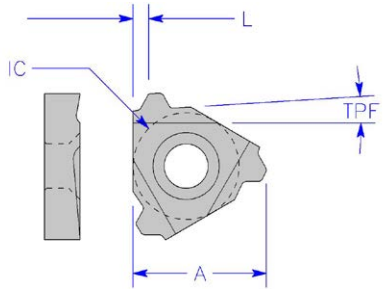
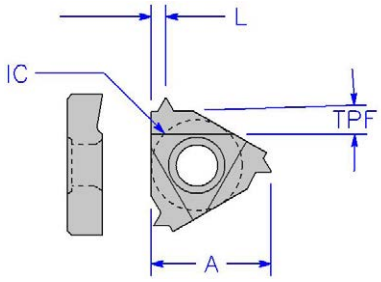
● : Inverntory maintained

LAYDOWN THREADING

Geometry	Description	Stock CP1025	Pitch	TPF	IC	A	L
LAYDOWN API ROTARY THREADING 	**27ER 425**	●	**4**	**2**	**.625**	**.775**	**.126**
	27ER 428	●	**4**	**2**	**.625**	**.775**	**.126**
	27ER 435	●	**4**	**3**	**.625**	**.775**	**.126**
	27ER 438	●	**4**	**3**	**.625**	**.775**	**.126**
	27ER 530	●	**5**	**3**	**.625**	**.775**	**.126**
	27ER PAC	●	**4**	**1.5**	**.625**	**.809**	**.100**
	27NR 425	●	**4**	**2**	**.625**	**.775**	**.126**
	27NR 428	●	**4**	**2**	**.625**	**.775**	**.126**
	27NR 435	●	**4**	**3**	**.625**	**.775**	**.126**
	27NR 438	●	**4**	**3**	**.625**	**.775**	**.126**
	27NR 530	●	**5**	**3**	**.625**	**.775**	**.126**
	27NR PAC	●	**4**	**1.5**	**.625**	**.809**	**.100**
LAYDOWN API ROUND THREADING 	**16ER 8RD**	●	**8**	**0.75**	**.375**	**.487**	**.060**
	16ER 10RD	●	**10**	**0.75**	**.375**	**.487**	**.060**
	16NR 8RD	●	**8**	**0.75**	**.375**	**.487**	**.060**
	16NR 10RD	●	**10**	**0.75**	**.375**	**.487**	**.060**
	22ER 8RD	●	**8**	**0.75**	**.500**	**.676**	**.065**
	22ER 10RD	●	**10**	**0.75**	**.500**	**.676**	**.065**
	22NR 8RD	●	**8**	**0.75**	**.500**	**.676**	**.065**
	22NR 10RD	●	**10**	**0.75**	**.500**	**.676**	**.065**
	27ER 8RD	●	**8**	**0.75**	**.625**	**.843**	**.060**
	27ER 10RD	●	**10**	**0.75**	**.625**	**.843**	**.060**
	27NR 8RD	●	**8**	**0.75**	**.625**	**.843**	**.060**
	27NR 10RD	●	**10**	**0.75**	**.625**	**.843**	**.060**

● : Inverntory maintained

LAYDOWN THREADING

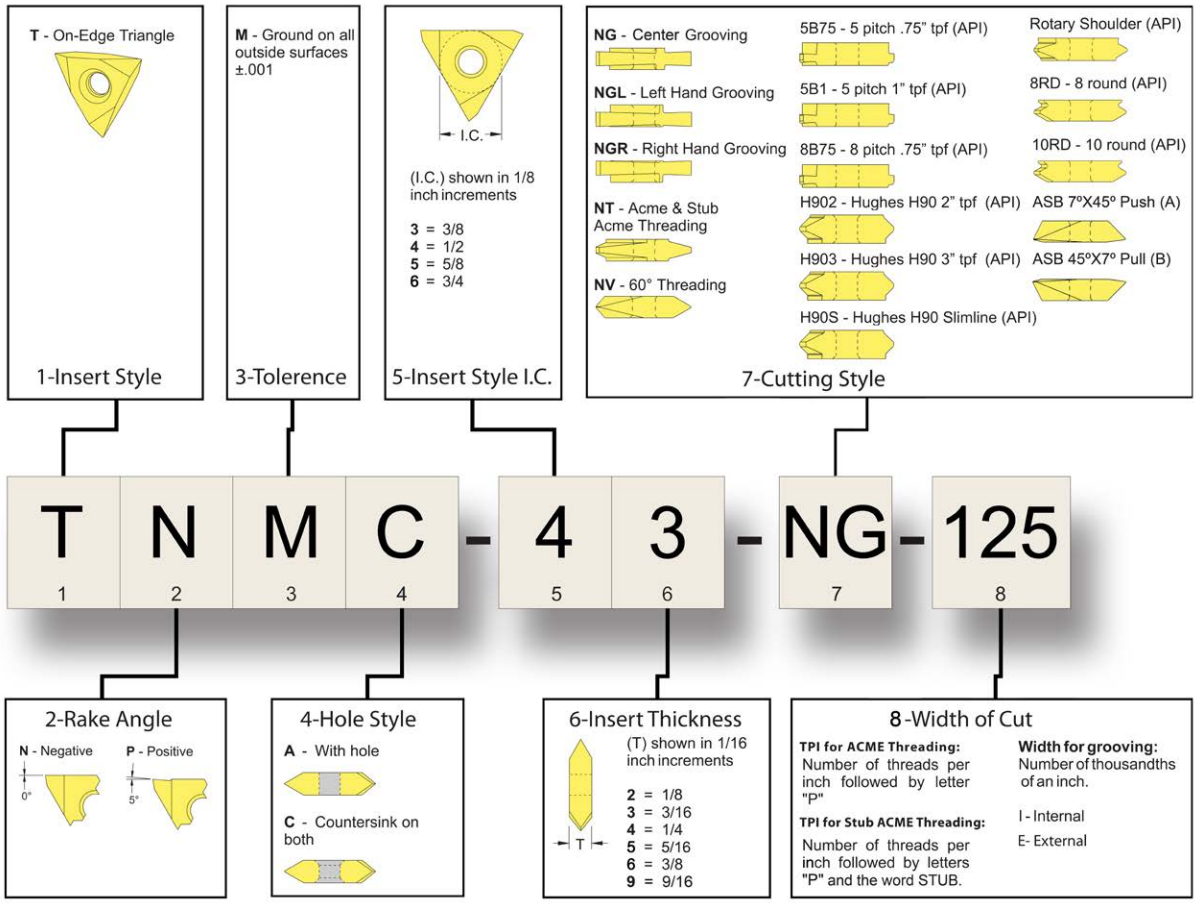
Geometry	Description	Stock CP1025	Pitch	TPF	IC	A	L
LAYDOWN V055 THREADING 	**16ER V0.055**	●	**6**	**1.5**	**.375**	**.472**	**.055**
	22ER V0.055	●	**6**	**1.5**	**.500**	**.660**	**.055**
	16NR V0.055	●	**6**	**1.5**	**.375**	**.472**	**.055**
	22NR V0.055	●	**6**	**1.5**	**.500**	**.660**	**.055**
LAYDOWN NPT THREADING 	**16ER 18NPT**	●	**18**	**.750**	**.375**	**.523**	**.031**
	16ER 14NPT	●	**14**	**.750**	**.375**	**.494**	**.060**
	16ER 11.5NPT	●	**11.5**	**.750**	**.375**	**.494**	**.060**
	16ER 8NPT	●	**8**	**.750**	**.375**	**.487**	**.068**
	16NR 18NPT	●	**18**	**.750**	**.375**	**.523**	**.031**
	16NR 14NPT	●	**14**	**.750**	**.375**	**.494**	**.060**
	16NR 11.5NPT	●	**11.5**	**.750**	**.375**	**.494**	**.060**
	16NR 8NPT	●	**8**	**.750**	**.375**	**.487**	**.068**

● : Inverntory maintained

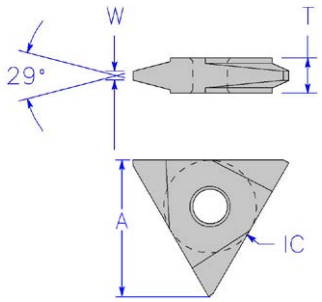
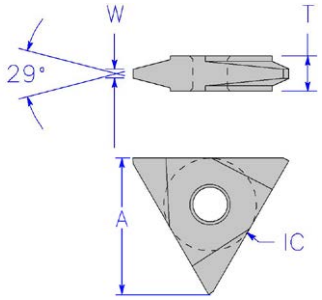
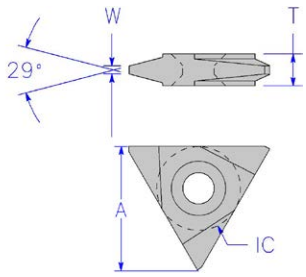
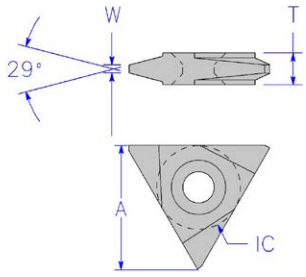
IDENTIFICATION

NEW

■ On Edge

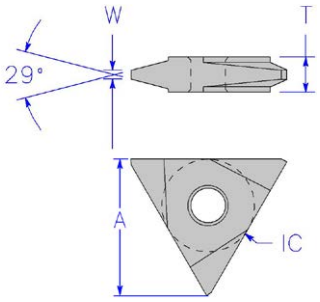
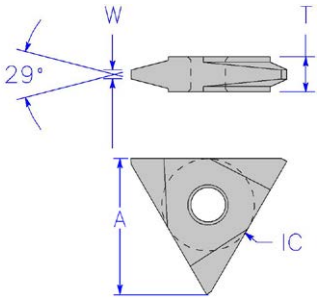


ON EDGE

Geometry	Description	Stock CP1025	Pitch	Width	IC	T	A
TNMA 32 ACME 	**TNMA 32 NT 6P**	●	6	.0566	.375	.127	.550
	TNMA 32 NT 8P	●	8	.0411	.375	.127	.550
	TNMA 32 NT 10P	●	10	.0319	.375	.127	.550
	TNMA 32 NT 12P	●	12	.0283	.375	.127	.550
	TNMA 32 NT 14P	●	14	.0239	.375	.127	.550
	TNMA 32 NT 16P	●	16	.0206	.375	.127	.550
TNMA 32 STUB ACME 	**TNMA 32 NT 6P STUB**	●	6	.0652	.375	.127	.550
	TNMA 32 NT 8P STUB	●	8	.0476	.375	.127	.550
	TNMA 32 NT 10P STUB	●	10	.037	.375	.127	.550
	TNMA 32 NT 12P STUB	●	12	.0326	.375	.127	.550
	TNMA 32 NT 14P STUB	●	14	.0276	.375	.127	.550
	TNMA 32 NT 16P STUB	●	16	.0238	.375	.127	.550
TNMC 32 ACME 	**TNMC 32 NT 6P**	●	6	.0566	.375	.127	.550
	TNMC 32 NT 8P	●	8	.0411	.375	.127	.550
	TNMC 32 NT 10P	●	10	.0319	.375	.127	.550
	TNMC 32 NT 12P	●	12	.0283	.375	.127	.550
	TNMC 32 NT 14P	●	14	.0239	.375	.127	.550
	TNMC 32 NT 16P	●	16	.0206	.375	.127	.550
TNMC 32 STUB ACME 	**TNMC 32 NT 6P STUB**	●	6	.0652	.375	.127	.550
	TNMC 32 NT 8P STUB	●	8	.0476	.375	.127	.550
	TNMC 32 NT 10P STUB	●	10	.037	.375	.127	.550
	TNMC 32 NT 12P STUB	●	12	.0326	.375	.127	.550
	TNMC 32 NT 14P STUB	●	14	.0276	.375	.127	.550
	TNMC 32 NT 16P STUB	●	16	.0238	.375	.127	.550

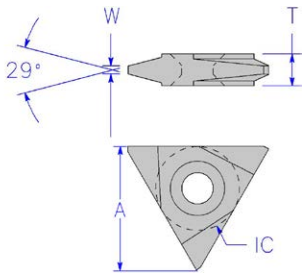
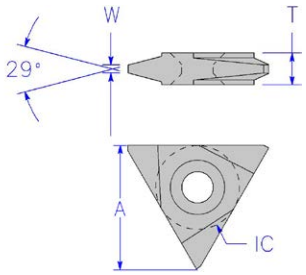
● : Inverntory maintained

ON EDGE

Geometry	Description	Stock CP1025	Pitch	Width	IC	T	A
TNMA 43 ACME 	**TNMA 43 NT 4P**	●	4	.0875	.500	.190	.737
	TNMA 43 NT 5P	●	5	.0689	.500	.190	.737
	TNMA 43 NT 6P	●	6	.0566	.500	.190	.737
	TNMA 43 NT 8P	●	8	.0411	.500	.190	.737
	TNMA 43 NT 10P	●	10	.0319	.500	.190	.737
	TNMA 43 NT 12P	●	12	.0283	.500	.190	.737
	TNMA 43 NT 14P	●	14	.0239	.500	.190	.737
	TNMA 43 NT 16P	●	16	.0206	.500	.190	.737
TNMA 43 STUB ACME 	**TNMA 43 NT 4P STUB**	●	4	.1004	.500	.190	.737
	TNMA 43 NT 5P STUB	●	5	.0793	.500	.190	.737
	TNMA 43 NT 6P STUB	●	6	.0652	.500	.190	.737
	TNMA 43 NT 8P STUB	●	8	.0476	.500	.190	.737
	TNMA 43 NT 10P STUB	●	10	.037	.500	.190	.737
	TNMA 43 NT 12P STUB	●	12	.0326	.500	.190	.737
	TNMA 43 NT 14P STUB	●	14	.0276	.500	.190	.737
	TNMA 43 NT 16P STUB	●	16	.0238	.500	.190	.737

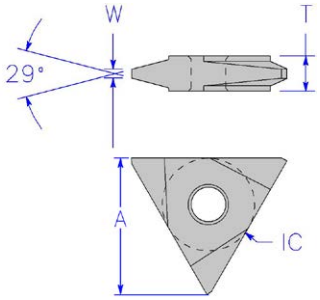
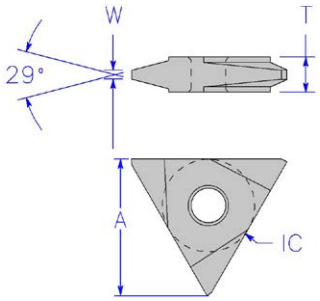
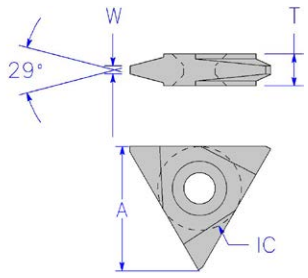
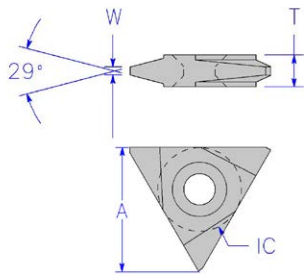
● : Inverntory maintained

ON EDGE

Geometry	Description	Stock CP1025	Pitch	Width	IC	T	A
TNMC 43 ACME 	**TNMC 43 NT 4P**	●	**4**	**.0875**	**.500**	**.190**	**.737**
	TNMC 43 NT 5P	●	**5**	**.0689**	**.500**	**.190**	**.737**
	TNMC 43 NT 6P	●	**6**	**.0566**	**.500**	**.190**	**.737**
	TNMC 43 NT 8P	●	**8**	**.0411**	**.500**	**.190**	**.737**
	TNMC 43 NT 10P	●	**10**	**.0319**	**.500**	**.190**	**.737**
	TNMC 43 NT 12P	●	**12**	**.0283**	**.500**	**.190**	**.737**
	TNMC 43 NT 14P	●	**14**	**.0239**	**.500**	**.190**	**.737**
	TNMC 43 NT 16P	●	**16**	**.0206**	**.500**	**.190**	**.737**
TNMC 43 STUB ACME 	**TNMC 43 NT 4P STUB**	●	**4**	**.1004**	**.500**	**.190**	**.737**
	TNMC 43 NT 5P STUB	●	**5**	**.0793**	**.500**	**.190**	**.737**
	TNMC 43 NT 6P STUB	●	**6**	**.0652**	**.500**	**.190**	**.737**
	TNMC 43 NT 8P STUB	●	**8**	**.0476**	**.500**	**.190**	**.737**
	TNMC 43 NT 10P STUB	●	**10**	**.037**	**.500**	**.190**	**.737**
	TNMC 43 NT 12P STUB	●	**12**	**.0326**	**.500**	**.190**	**.737**
	TNMC 43 NT 14P STUB	●	**14**	**.0276**	**.500**	**.190**	**.737**
	TNMC 43 NT 16P STUB	●	**16**	**.0238**	**.500**	**.190**	**.737**

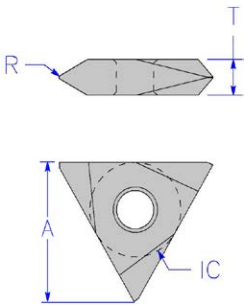
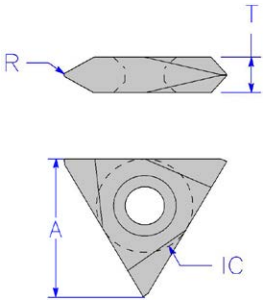
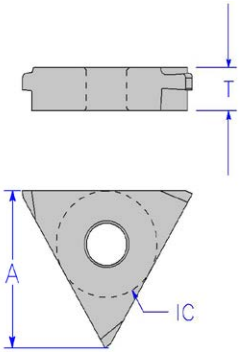
● : Inverntory maintained

ON EDGE

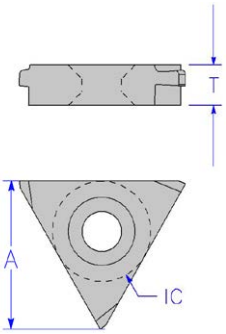
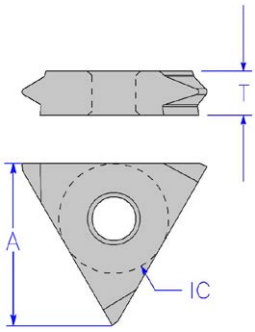
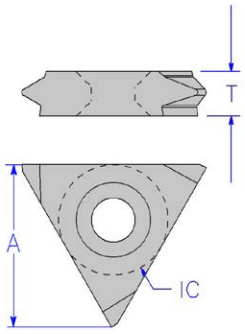
Geometry	Description	Stock CP1025	Pitch	Width	IC	T	A
TNMA 54 ACME 	**TNMA 54 NT 3P**	●	3	.1184	.625	.252	.925
	TNMA 54 NT 3.5P	●	3.5	.1007	.625	.252	.925
	TNMA 54 NT 4P	●	4	.0875	.625	.252	.925
	TNMA 54 NT 5P	●	5	.0689	.625	.252	.925
	TNMA 54 NT 6P	●	6	.0566	.625	.252	.925
	TNMA 54 NT 8P	●	8	.0411	.625	.252	.925
TNMA 54 STUB ACME 	**TNMA 54 NT 3P STUB**	●	3	.1356	.625	.252	.925
	TNMA 54 NT 3.5P STUB	●	3.5	.1155	.625	.252	.925
	TNMA 54 NT 4P STUB	●	4	.1004	.625	.252	.925
	TNMA 54 NT 5P STUB	●	5	.0793	.625	.252	.925
	TNMA 54 NT 6P STUB	●	6	.0652	.625	.252	.925
	TNMA 54 NT 8P STUB	●	8	.0476	.625	.252	.925
TNMC 54 ACME 	**TNMC 54 NT 3P**	●	3	.1184	.625	.252	.925
	TNMC 54 NT 3.5P	●	3.5	.1007	.625	.252	.925
	TNMC 54 NT 4P	●	4	.0875	.625	.252	.925
	TNMC 54 NT 5P	●	5	.0689	.625	.252	.925
	TNMC 54 NT 6P	●	6	.0566	.625	.252	.925
	TNMC 54 NT 8P	●	8	.0411	.625	.252	.925
TNMC 54 STUB ACME 	**TNMC 54 NT 3P STUB**	●	3	.1356	.625	.252	.925
	TNMC 54 NT 3.5P STUB	●	3.5	.1155	.625	.252	.925
	TNMC 54 NT 4P STUB	●	4	.1004	.625	.252	.925
	TNMC 54 NT 5P STUB	●	5	.0793	.625	.252	.925
	TNMC 54 NT 6P STUB	●	6	.0652	.625	.252	.925
	TNMC 54 NT 8P STUB	●	8	.0476	.625	.252	.925

● : Inverntory maintained

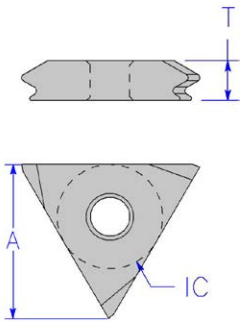
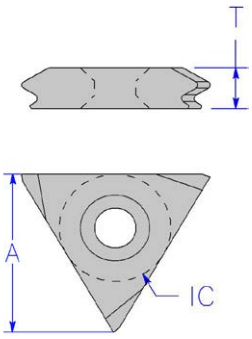
ON EDGE

Geometry	Description	Stock CP1025	Pitch	R	IC	T	A
TNMA NV 60° V-THREADING 	TNMA 32 NV	●	8-36	.003	.375	.127	.550
	TNMA 43 NV	●	5-24	.004	.500	.190	.737
	TNMA 43 NV .010R	●	4-20	.010	.500	.190	.737
	TNMA 54 NV	●	4-20	.008	.625	.252	.925
	TNMA 54 NV .010R	●	4-20	.010	.625	.252	.925
	TNMA 54 NV .020R	●	4-12	.020	.625	.252	.925
	TNMA 54 NV .025R	●	4-8	.025	.625	.252	.925
	TNMA 54 NV .038R	●	4-6	.038	.625	.252	.925
TNMC NV 60° V-THREADING 	TNMC 32 NV	●	8-36	.003	.375	.127	.550
	TNMC 43 NV	●	5-24	.004	.500	.190	.737
	TNMC 43 NV .010R	●	4-20	.010	.500	.190	.737
	TNMC 54 NV	●	4-20	.008	.625	.252	.925
	TNMC 54 NV .010R	●	4-20	.010	.625	.252	.925
	TNMC 54 NV .020R	●	4-12	.020	.625	.252	.925
	TNMC 54 NV .025R	●	4-8	.025	.625	.252	.925
	TNMC 54 NV .038R	●	4-6	.038	.625	.252	.925
TNMA API BUTTRESS 	TNMA 43 8B75 INT	●	8	3/4	.500	.190	.737
	TNMA 43 8B75 EXT	●	8	3/4	.500	.190	.737
	TNMA 54 5B75 INT	●	5	3/4	.625	.252	.925
	TNMA 54 5B75 EXT	●	5	3/4	.625	.252	.925
	TNMA 54 5B1 INT	●	5	1	.625	.252	.925
	TNMA 54 5B1 EXT	●	5	1	.625	.252	.925

ON EDGE

Geometry	Description	Stock CP1025	PITCH	TPF	IC	T	A
TNMC API BUTTRESS 	TNMC 43 8B75 INT	●	8	3/4	.500	.190	.737
	TNMC 43 8B75 EXT	●	8	3/4	.500	.190	.737
	TNMC 54 5B75 INT	●	5	3/4	.625	.252	.925
	TNMC 54 5B75 EXT	●	5	3/4	.625	.252	.925
	TNMC 54 5B1 INT	●	5	1	.625	.252	.925
	TNMC 54 5B1 EXT	●	5	1	.625	.252	.925
TNMA API THREADING 	TNMA 54 530 INT	●	5	3	.625	.252	.925
	TNMA 54 530 EXT	●	5	3	.625	.252	.925
	TNMA 55 425 INT	●	4	2	.625	.315	.925
	TNMA 55 425 EXT	●	4	2	.625	.315	.925
	TNMA 55 428 INT	●	4	2	.625	.315	.925
	TNMA 55 428 EXT	●	4	2	.625	.315	.925
	TNMA 55 435 INT	●	4	3	.625	.315	.925
	TNMA 55 435 EXT	●	4	3	.625	.315	.925
	TNMA 55 438 INT	●	4	3	.625	.315	.925
	TNMA 55 438 EXT	●	4	3	.625	.315	.925
TNMC API THREADING 	TNMC 54 530 INT	●	5	3	.625	.252	.925
	TNMC 54 530 EXT	●	5	3	.625	.252	.925
	TNMC 55 425 INT	●	4	2	.625	.315	.925
	TNMC 55 425 EXT	●	4	2	.625	.315	.925
	TNMC 55 428 INT	●	4	2	.625	.315	.925
	TNMC 55 428 EXT	●	4	2	.625	.315	.925
	TNMC 55 435 INT	●	4	3	.625	.315	.925
	TNMC 55 435 EXT	●	4	3	.625	.315	.925
	TNMC 55 438 INT	●	4	3	.625	.315	.925
	TNMC 55 438 EXT	●	4	3	.625	.315	.925

ON EDGE

Geometry	Description	Stock CP1025	PITCH	TPF	IC	T	A
TNMA API ROUND THREADING 	**TNMA 43 8RD INT**	●	8	3/4	.500	.190	.737
	TNMA 43 8RD EXT	●	8	3/4	.500	.190	.737
	TNMA 43 10RD INT	●	10	3/4	.500	.190	.737
	TNMA 43 10RD EXT	●	10	3/4	.500	.190	.737
	TNMA 54 8RD INT	●	8	3/4	.625	.252	.925
	TNMA 54 8RD EXT	●	8	3/4	.625	.252	.925
	TNMA 54 10RD INT	●	10	3/4	.625	.252	.925
TNMC API ROUND THREADING 	**TNMC 43 8RD INT**	●	8	3/4	.500	.190	.737
	TNMC 43 8RD EXT	●	8	3/4	.500	.190	.737
	TNMC 43 10RD INT	●	10	3/4	.500	.190	.737
	TNMC 43 10RD EXT	●	10	3/4	.500	.190	.737
	TNMC 54 8RD INT	●	8	3/4	.625	.252	.925
	TNMC 54 8RD EXT	●	8	3/4	.625	.252	.925
	TNMC 54 10RD INT	●	10	3/4	.625	.252	.925
	TNMC 54 10RD EXT	●	10	3/4	.625	.252	.925

THREADING

For your safety
●Don't touch breakers and chips without gloves. ●Please machine within recommended application range, and exchange expired tools with new parts in advance. ●Please use safety cover and wear safety glasses. ●When using compounded cutting oils, please take fire prevention. ●When attaching chips or spare parts, please use the attached wrench or driver. ●When using tools in revolution machining, please make a trial run to check run-out, vibration, abnormal sounds etc.

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