HOW TO READ THE STANDARD OF THREADING

●How this section page is organised

①Classified according to external or internal applications.
②Sub-classified according to product series.
(Refer to the index on the next page.)

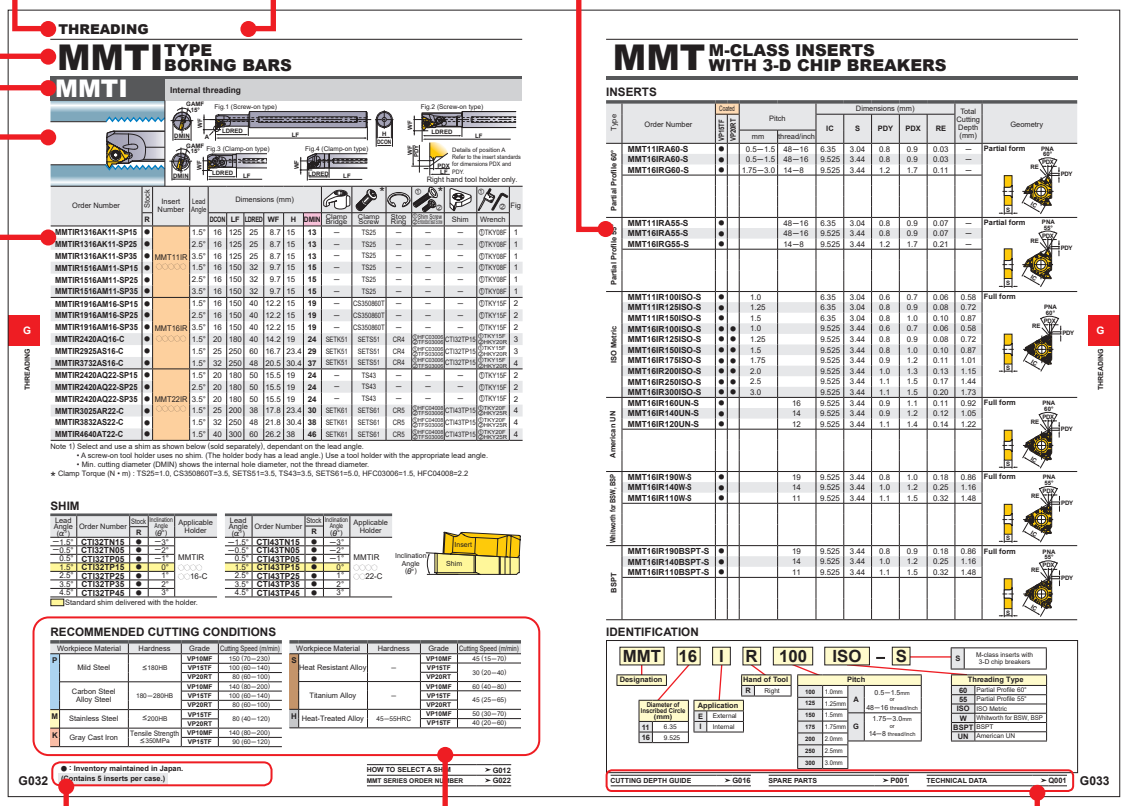
FIGURE SHOWING THE TOOLING APPLICATION
uses illustrations and arrows to depict the available machining applications, such as external and internal threading.

TYPE OF TOOL HOLDER
indicates the initial letters for the order number and cutting applications.

TITLE OF PRODUCT
PRODUCT SECTION

INDICATION OF EXTERNAL /INTERNAL APPLICATION

STANDARDS FOR APPLICABLE INSERTS
indicates stock status, dimensions, etc. for applicable inserts.



LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

PAGE REFERENCE ·SPARE PARTS
indicates reference pages, including the above, on the right hand page of each double-page spread.

PRODUCT STANDARDS
indicates order numbers, stock status (per right/left hand), applicable inserts, holder dimensions, and spare parts.

RECOMMENDED CUTTING CONDITIONS
for each workpiece material classification, indicates recommended cutting conditions according to the ISO categories for cutting grades, P, M, K, S, and H.

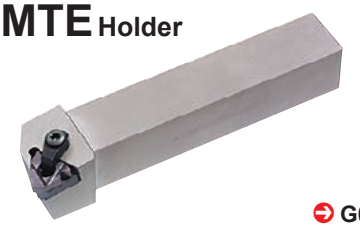
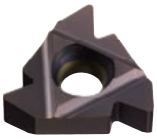
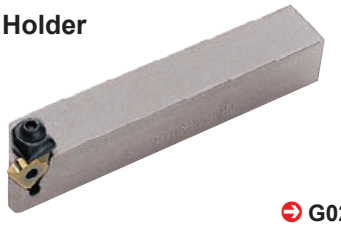
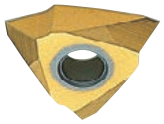
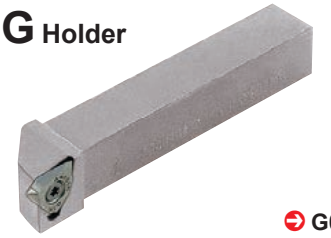
●To Order : For holder, please specify ①order number and hand of tool (right/left).
For insert, please specify ①insert number and ②grade.

TURNING TOOLS

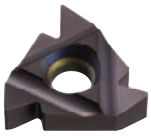
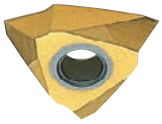
THREADING

*Arranged by Alphabetical order

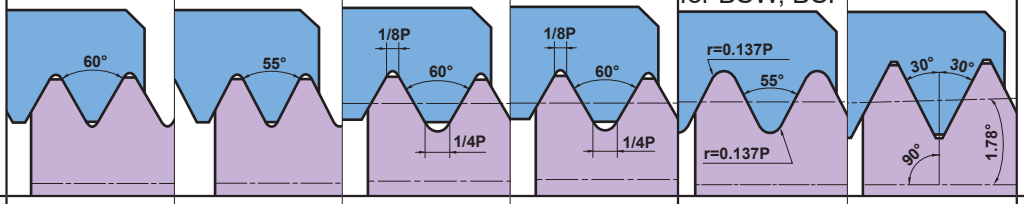
CLASSIFICATION (EXTERNAL THREADING)

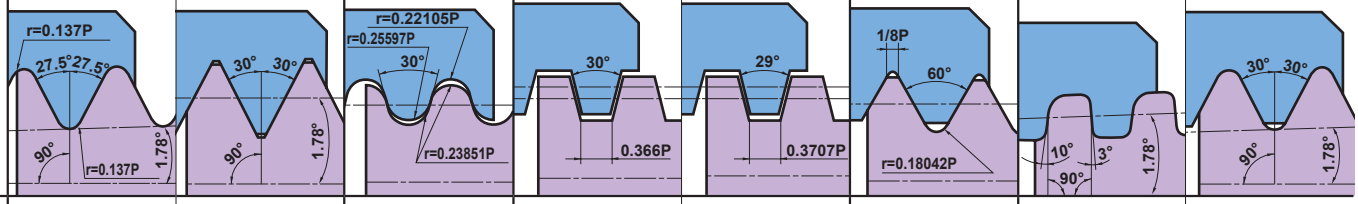
Name of Tool Holder	Insert Shape	Features	Shank Size (H x W x L) (mm)
MMTE Holder  G023		●Various insert types. ●M-class 3-D breaker inserts and G-class ground inserts available. ●Available with a wiper cutting edge to provide a precise thread geometry. ●Able to change lead angle by replacing shim.	12 x 12 x 100 16 x 16 x 100 20 x 20 x 125 25 x 25 x 150 32 x 32 x 170
MT Holder  G028		●Clamp-on type. ●Precision class insert. ●Positive insert suffers from negligible chattering and thus produces good finished surface.	16 x 16 x 100 20 x 20 x 125 25 x 25 x 150 32 x 32 x 170
SMG Holder  G030		●Screw-on type. ●Precision class insert. ●Positive insert suffers from negligible chattering and thus produces good finished surface. ●Holder is capable of performing both threading and grooving.	10 x 10 x 70 12 x 12 x 80 16 x 16 x 100 20 x 20 x 125 25 x 25 x 150
SMALL TOOLS **TTAH**  D024		●Tools to be equipped on Gang type tool posts. ●Small Shank: 8mm—16mm ●High rigidity due to designing of vertical insert. ●The screw designed for common use on front and back enables back clamping. ●Most suitable for threading diameters of 2 mm or smaller. ●Screw-on type.	8 x 10 x 120 10 x 10 x 120 12 x 12 x 120 16 x 16 x 120
CSVH  D027		●Tools to be equipped on Cam type tool posts. ●Small Shank: 7mm—12mm ●Single holder for front turning, back turning, grooving, threading and cutting off operations. ●The most suitable for machining of small parts with work diameter 5mm or less. ●Screw-on type.	7 x 7 x 140 8 x 8 x 140 9.5 x 9.5 x 140 10 x 10 x 140 12 x 12 x 140

CLASSIFICATION (INTERNAL THREADING)

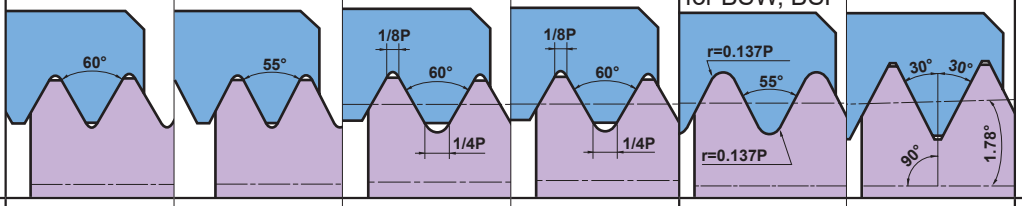
Name of Tool Holder	Insert Shape	Features	Shank Size (Dia. x L x Min. Cutting Dia.) (mm)
MMTI  ➔ G032		●Minimum cutting diameter 13mm. ●Various insert types. ●M-class 3-D breaker inserts and G-class ground inserts available. ●Available with a wiper cutting edge to provide a precise thread geometry. ●Able to change lead angle by replacing shim.	16 x 125 x 13 16 x 150 x 15 20 x 170 x 24 25 x 200 x 29 32 x 250 x 37 40 x 300 x 46
FSL5  ➔ G040		●Minimum cutting diameter 10mm. ●Screw-on type. ●Precision class insert. ●Applicable for threading, grooving and boring. ●Available with a carbide shank to prevent vibration when machining deep holes.	8 x 125 x 10 10 x 150 x 12 12 x 180 x 14 14 x 180 x 16 16 x 200 x 20
DPT2  ➔ G042		●Minimum cutting diameter 40mm. ●Pin lock type. ●Precision class insert. ●Exchangeable head type.	32 x 300 x 40 40 x 360 x 50
MICRO-MINI TWIN Boring Bars  ➔ G037	–	●Minimum cutting diameter 3mm. ●Solid carbide type. ●Economical two cutting edge type.	3 x 50 x 3 4 x 60 x 4.5 5 x 70 x 6 6 x 75 x 7
MICRO-MINI Boring Bars  ➔ E030	–	●Minimum cutting diameter 3.2mm. ●Solid carbide type. ●Insert can be ground to suit the application.	3 x 80 x 3.2 4 x 80 x 4.2 5 x 100 x 5.2

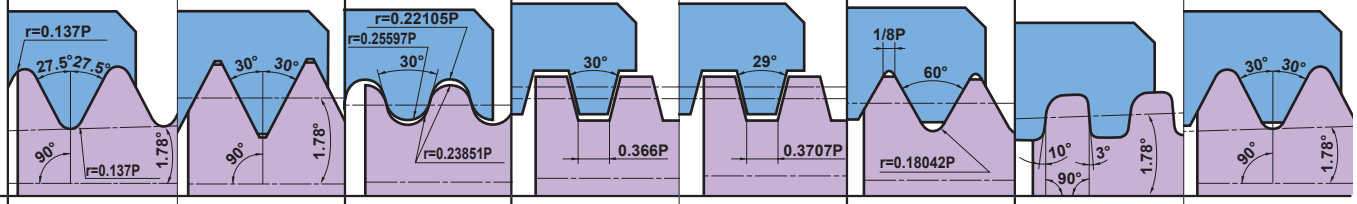
CROSS REFERENCE OF THREAD PITCHS (EXTERNAL)

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) Rp(PS) W	NPT	
Holder	Pitch	mm (thread/inch)	thread/inch	mm	thread/inch	thread/inch	thread/inch	
MMT Holder  G023	Full form	–	–	0.5—5.0	32—5	28—5	27, 18, 14 11.5, 8	
	Partial form	0.5—5.0 (48—5)	48—5	0.5—5.0	48—5	–	–	
MT Holder  G028	Partial form	0.25—4.5 (64—6)	20—9	0.25—4.5	64—6	–	–	
SMG Holder  G030	Partial form	0.25—2.0 (48—13)	–	0.25—2.0	48—13	–	–	

	Steam, gas and water line pipes		Pipe couplings for food and fire fighting industries	Motion transmissions		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
							
	R(PT) Rc(PT) 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 3, 4, 5	12, 10 8, 6, 5	32—8	5	10, 8
	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–

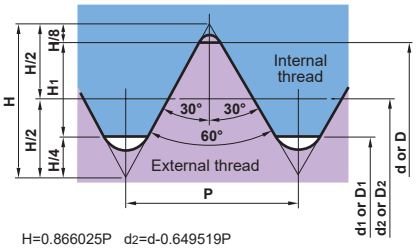
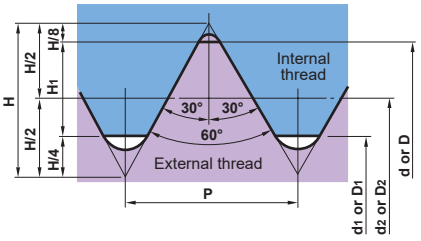
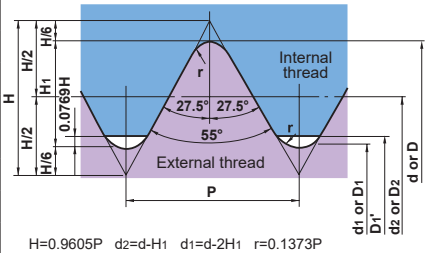
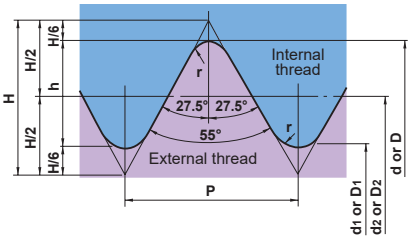
CROSS REFERENCE OF THREAD PITCHS (INTERNAL)

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) Rp(PS) W	NPT	
Holder	Pitch	mm (thread/inch)	thread/inch	mm	thread/inch	thread/inch	thread/inch	
MMT **Boring Bars**  G032	Full form	—	—	0.5—5.0	32—5	28—5	27, 18, 14 11.5, 8	
	Partial form	0.5—5.0 (48—5)	48—5	0.5—5.0	48—5	—	—	
FSL5 **Boring Bars**  G040	Partial form	1.5—3.5 (16—8)	—	1.5—3.5	16—8	—	—	
DPT2 **Boring Head**  G042	Partial form	1.0—3.5	—	1.0—3.5	—	—	—	
MICRO-MINI TWIN  G037	Partial form	0.5—1.75 (36—16)	—	0.5—1.75	36—16	—	—	

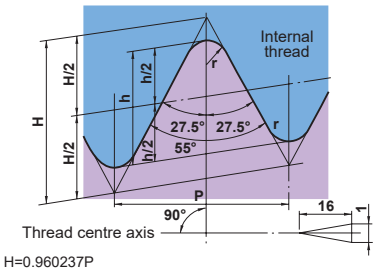
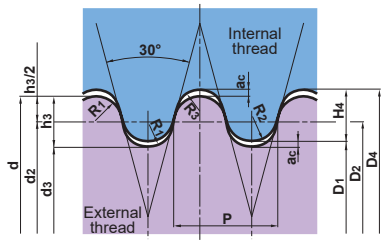
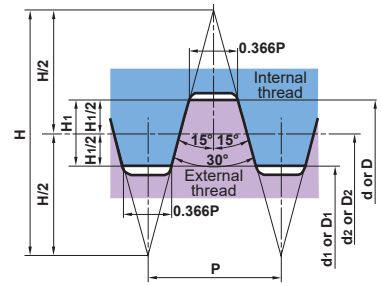
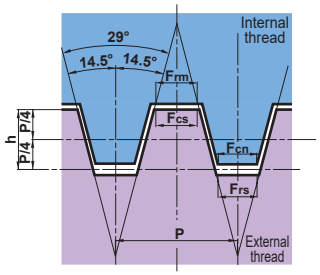
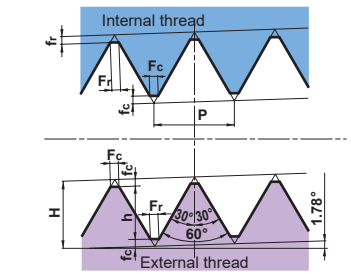
	Steam, gas and water line pipes		Pipe couplings for food and fire fighting industries	Motion transmissions		Aircraft and aerospace	Oil and gas	
	Taper Pipe Thread BSPT	American NPTF	Round DIN 405	ISO Trapezoidal 30°	American ACME	UNJ	API Buttress Casing	API Round Casing&Tubing
							
	R(PT) Rc(PT) Rp	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 3, 4, 5	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 / HOLDER

Thread Name	Standard Thread Type	Type	Ext./Int.	Insert Number	Wiper/ General	Tool Holder	Page
ISO Metric	 H=0.866025P d2=d-0.649519P H1=0.541266P d1=d-1.082532P D=d D2=d2 D1=d1	M	Ext.	MMT○○ER○○○ISO	Wiper	MMTER○○○○○-C	G023
				MMT○○ER○○○ISO-S	Wiper		
				MMT○○ER○○○60	General		
				MMT○○ER○○○60-S	General		
				SMTTR/L160360○○	General	SMGHR/L○○○○16	G030
				MTTR/L4360○○	General	MTHR/L○○○○○4 MT1R/L○○○○○4	G028
			Int.	MMT○○IR○○○ISO	Wiper	MMTIR○○A○○○-SP○ MMTIR○○A○16-C	G032
				MMT○○IR○○○ISO-S	Wiper		
				MMT○○IR○○○60	General		
				MMT○○IR○○○60-S	General		
				MTTR/L4360○○	General	DPT2○○○R	G042
American UN	 H=0.866025P d2=d-0.649519P H1=0.541266P d1=d-1.082532P D=d D2=d2 D1=d1 P=25.4/thread	UNC UNF	Ext.	MMT○○ER○○○UN	Wiper	MMTER○○○○○-C	G023
				MMT○○ER○○○UN-S	Wiper		
				MMT○○ER○○○60	General		
				MMT○○ER○○○60-S	General		
				SMTTR/L160360○○	General	SMGHR/L○○○○16	G030
				MTTR/L4360○○	General	MTHR/L○○○○○4 MT1R/L○○○○○4	G028
			Int.	MMT○○IR○○○UN	Wiper	MMTIR○○A○○○-SP○ MMTIR○○A○16-C	G032
				MMT○○IR○○○UN-S	Wiper		
				MMT○○IR○○○60	General		
				MMT○○IR○○○60-S	General		
				MTTR/L4360○○	General	DPT2○○○R	G042
Whitworth for BSW, BSP	 H=0.9605P d2=d-H1 d1=d-2H1 r=0.1373P H1=0.6403P D1'=d1+2×0.0769H D=d D2=d2 D1=d1 P=25.4/thread	W	Ext.	MMT○○ER○○○W	Wiper	MMTER○○○○○-C	G023
				MMT○○ER○○○W-S	Wiper		
				MMT○○ER○○○55	General		
				MMT○○ER○○○55-S	General		
				MTTR/L4355○○	General	MTHR/L○○○○○4 MT1R/L○○○○○4	G028
			Int.	MMT○○IR○○○W	Wiper	MMTIR○○A○○○-SP○ MMTIR○○A○16-C	G032
				MMT○○IR○○○W-S	Wiper		
				MMT○○IR○○○55	General		
				MMT○○IR○○○55-S	General		
				MTTR/L4355○○	General	DPT2○○○R	G042
Parallel Pipe Thread	 H=0.960491P d2=d-h d1=d-2h r=0.137329P h=0.640327P D=d D2=d2 D1=d1 P=25.4/thread	PF G Rp	Ext.	MMT○○ER○○○W	Wiper	MMTER○○○○○-C	G023
				MMT○○ER○○○W-S	Wiper		
			Int.	MMT○○IR○○○W	Wiper	MMTIR○○A○○○-SP○ MMTIR○○A○16-C	G032
				MMT○○IR○○○W-S	Wiper		

Wiper : Insert order number is determined by selected pitch.
General : An insert is applicable to several pitch types.

Thread Name	Standard Thread Type	Type	Ext./Int.	Insert Number	Wiper/ General	Tool Holder	Page
BSPT	 H=0.960237P h=0.640327P r=0.137278P P=25.4/thread	BSPT	Ext.	MMT○○ER○○○BSPT	Wiper	MMTER○○○○○-C	G023
				MMT○○ER○○○BSPT-S	Wiper		
			Int.	MMT○○IR○○○BSPT	Wiper	MMTIR○○A○○○-SP○ MMTIR○○A○16-C	G032
				MMT○○IR○○○BSPT-S	Wiper		
Round DIN 405	 ac=0.05P h3=H4=0.5P R1=0.238507P R2=0.255967P R3=0.221047P P=25.4/thread	Rd	Ext.	MMT○○ER○○○RD	Wiper	MMTER○○○○○-C	G023
			Int.	MMT○○IR○○○RD	Wiper	MMTIR○○A○○○-SP○ MMTIR○○A○16-C	G032
ISO Trapezoidal 30°	 H=1.866P d2=d-0.5P d1=d-P H1=0.5P D=d D2=d2 D1=d1	Tr	Ext.	MMT○○ER○○○TR	Wiper	MMTER○○○○○-C	G023
			Int.	MMT○○IR○○○TR	Wiper	MMTIR○○A○○○-SP○ MMTIR○○A○16-C	G032
American ACME		ACME	Ext.	MMT○○ER○○○ACME	Wiper	MMTER○○○○○-C	G023
			Int.	MMT○○IR○○○TACME	Wiper	MMTIR○○A○○○-SP○ MMTIR○○A○16-C	G032
American NPT	 H=0.866025P h=0.800000p	NPT	Ext.	MMT○○ER○○○NPT	Wiper	MMTER○○○○○-C	G023
			Int.	MMT○○IR○○○NPT	Wiper	MMTIR○○A○○○-SP○ MMTIR○○A○16-C	G032

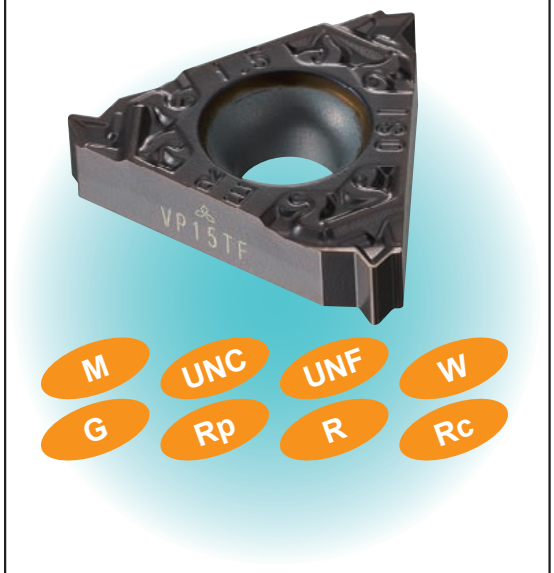
Wiper : Insert order number is determined by selected pitch.
General : An insert is applicable to several pitch types.

FEATURES OF MMT SERIES

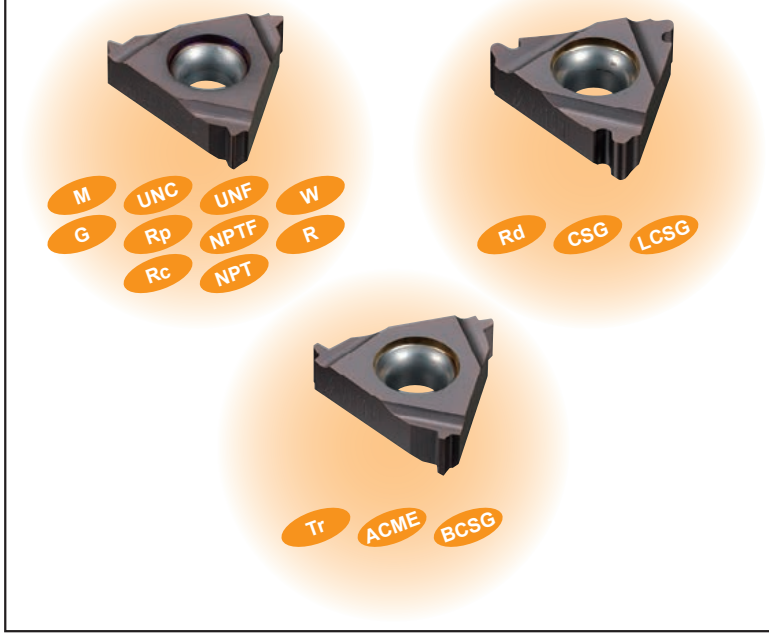
■A WIDE VARIETY OF PRODUCTS

Mitsubishi Miracle Threading (MMT) series. 283 inserts and 26 holders.

M-CLASS INSERTS WITH 3-D CHIP BREAKERS



G-CLASS GROUND INSERTS

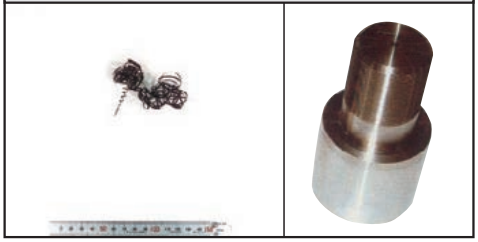


■IDEAL CHIP CONTROL EVEN IN THE LATTER HALF OF PASSES WHEN CONTINUOUS CHIPS ARE USUALLY PRODUCED. (M-CLASS INSERTS WITH 3-D CHIP BREAKERS)

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

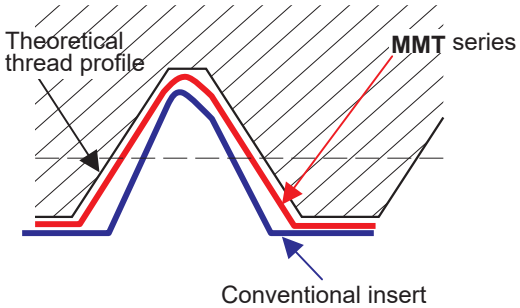
Conventional insert

MMT



<Cutting Conditions>
Workpiece : JIS SCM440
Insert : MMT16ER150ISO-S
Grade : VP15TF
Cutting speed : 120m/min
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)

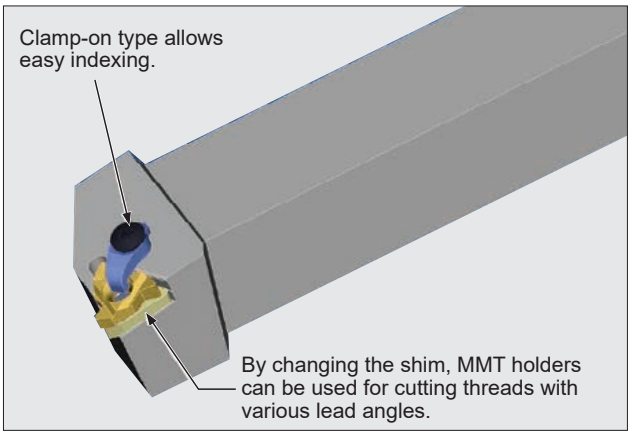


High precision threading can be achieved by using MMT inserts that feature a ground rake face and peripheral cutting edge.

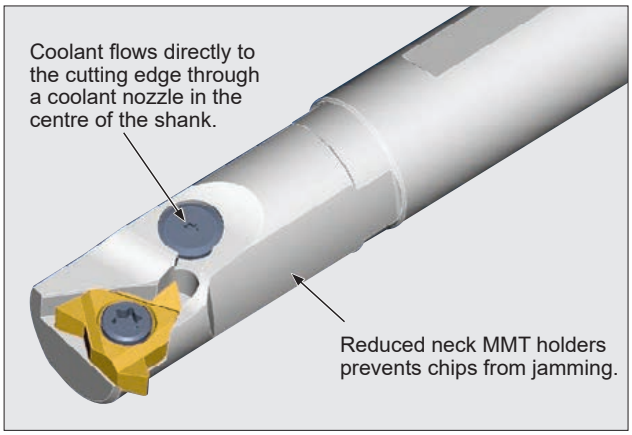
Thread Type	Threading Tolerance
ISO Metric	6g / 6H
American UN	2A / 2B
Whitworth for BSW, BSP	Medium Class A
BSPT	Standard BSPT
Round DIN 405	7h / 7H
ISO Trapezoidal 30°	7e / 7H
American ACME	3G
UNJ	3A
API Buttress Casing	Standard API
API Rounded Casing & Tubing	Standard API RD
American NPT	Standard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

■HOLDER (Use of special surface treatment)

External

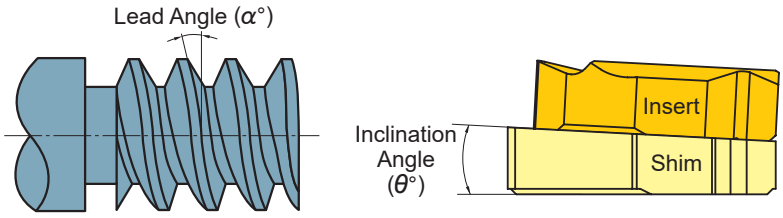


Internal



* Order number of coolant guide screw: TFS03006
(Except MMTIR1316/MMTIR1516)

■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.

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°

Standard shim delivered with the holder.

■GRADE

VP10MF (G-class ground insert only)

●Superior wear and plastic deformation resistance

- High wear and plastic deformation resistance for threading when maintaining the thread form is important. Suitable for continuous high precision machining with extensive tool life.
- Effective in combination with G-class inserts for high precision threading.

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

●Wide versatility

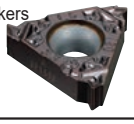
- High fracture resistance during low rigidity applications such as bar feed machining. Able to withstand harsh conditions for long periods where conventional inserts would be liable to breakage.
- Effective combination of high cost performance M-class inserts with 3-D chip breakers.

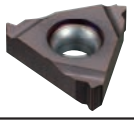
VP20RT (M-class insert with 3-D chip breakers)

●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	Precision of thread
M-class inserts with 3-D chip breakers 	◎	○

Insert	Chip control	Precision of thread
G-class inserts 	○	◎

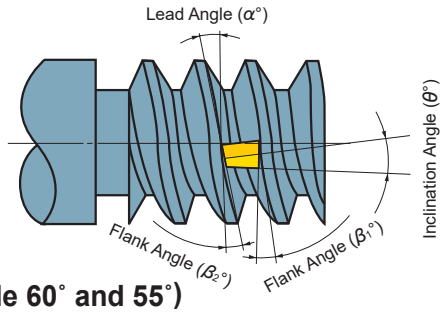
- For ideal chip control and a high cost performance ratio, M-class inserts with 3-D chip breakers are recommended.
- G-class inserts are recommended where higher precision is required.

CUTTING CONDITIONS OF MMT SERIES

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). No need to change a shim for general threading with an MMT holder. 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.



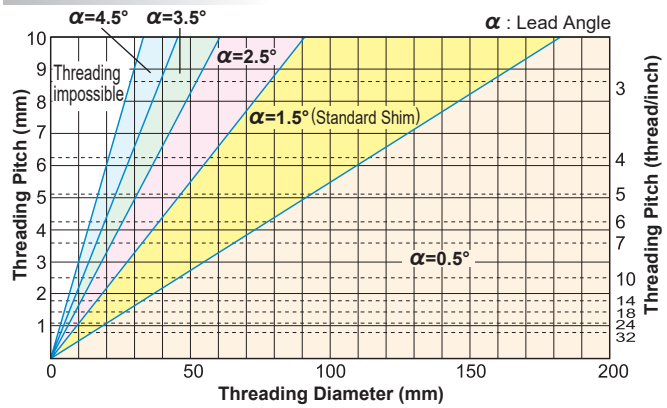
■ SHIM REFERENCE TABLE (THREADING DIAMETER) (Thread angle 60˚ and 55˚)

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

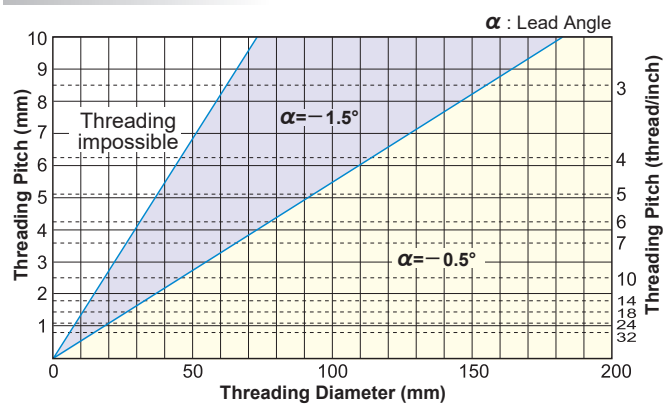
* Back turning in the case of left hand threads.

■ SHIM REFERENCE GRAPH (Thread angle 60˚ and 55˚)

Right Hand Thread



Left Hand Thread



Note 1) When a thread lead angle ≤ the tool flank angle, change the shim to prevent side interference with the insert.
(Refer to the table on page G013 for the calculation of thread lead angle and tool flank angle.)

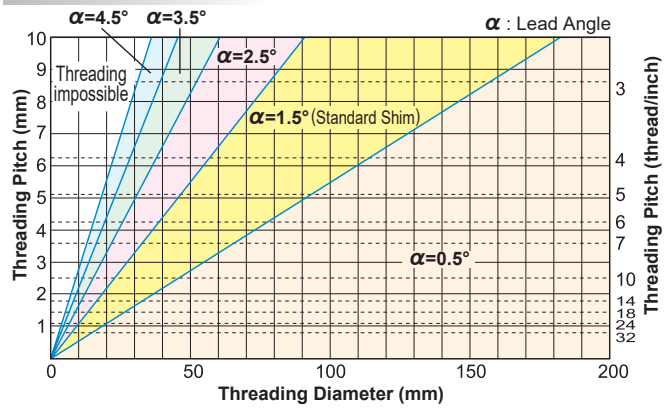
■ SHIM REFERENCE TABLE (THREADING DIAMETER) (Thread angle 30˚ and 29˚)

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

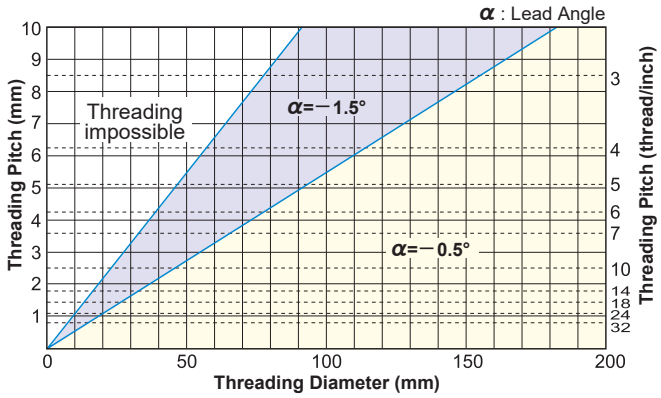
* Back turning in the case of left hand threads.

■ SHIM REFERENCE GRAPH (Thread angle 30˚ and 29˚)

Right Hand Thread



Left Hand Thread



Note 1) 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.)

■ Selection table

Lead Angle	Opening angle 60°/55° Right Hand Thread		Opening angle 60°/55°* Left Hand Thread		Opening angle 30°/29° Right Hand Thread		Opening 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	Compatible	Compatible
2.5	P25	P25	Compatible	Compatible	P25	P25	Compatible	Compatible
3	P35	P35	Compatible	Compatible	P35	P35	Compatible	Compatible
3.5	P35	P35	Compatible	Compatible	P35	P35	Compatible	Compatible
4	P45	P45	Compatible	Compatible	P45	P45	Compatible	Compatible
4.5	P45	P45	Compatible	Compatible	P45	P45	Compatible	Compatible
5	P45	P45	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible
5.5	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible

* 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 helix angle is 60° (55°)
2°−1° where thread helix 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 threads
P : Pitch
d : Effective diameter of thread

■ EXAMPLE OF SELECTING A SHIM

• When the thread lead angle is 2.2°
①In the case when the thread helix 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 G023 and G032.
②In the case when the thread helix 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 G023 and G032.

■ 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.

*** Please refer to the "Calculation of Thread Lead Angle" on the website from given QR Code.**

https://www.mitsubishicarbide.com/index.php?cID=2884

MMT STANDARD OF DEPTH OF CUT EXTERNAL (RADIAL INFEED)

■ ISO Metric

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

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	0.49	0.17	0.15	0.11	0.06											MMT16ER320UN	—
28	0.56	0.17	0.14	0.10	0.09	0.06										MMT16ER280UN	—
24	0.65	0.18	0.16	0.14	0.11	0.06										MMT16ER240UN	—
20	0.78	0.20	0.18	0.13	0.11	0.10	0.06									MMT16ER200UN	—
18	0.87	0.22	0.20	0.15	0.13	0.11	0.06									MMT16ER180UN	—
16	0.97	0.22	0.20	0.15	0.12	0.11	0.11	0.06								MMT16ER160UN	MMT16ER160UN-S
14	1.11	0.23	0.21	0.16	0.13	0.11	0.11	0.10	0.06							MMT16ER140UN	MMT16ER140UN-S
13	1.20	0.25	0.22	0.17	0.14	0.13	0.12	0.11	0.06							MMT16ER130UN	—
12	1.30	0.28	0.23	0.18	0.16	0.14	0.13	0.12	0.06							MMT16ER120UN	MMT16ER120UN-S
11	1.42	0.28	0.23	0.19	0.16	0.14	0.13	0.12	0.11	0.06						MMT16ER110UN	—
10	1.56	0.28	0.24	0.19	0.16	0.14	0.13	0.13	0.12	0.11	0.06					MMT16ER100UN	—
9	1.73	0.34	0.29	0.22	0.17	0.15	0.14	0.13	0.12	0.11	0.06					MMT16ER090UN	—
8	1.95	0.35	0.30	0.24	0.19	0.16	0.15	0.14	0.13	0.12	0.11	0.06				MMT16ER080UN	—
7	2.22	0.37	0.33	0.28	0.24	0.20	0.17	0.16	0.15	0.14	0.12	0.06				MMT22ER070UN	—
6	2.60	0.42	0.35	0.29	0.25	0.21	0.18	0.17	0.16	0.15	0.13	0.12	0.11	0.06		MMT22ER060UN	—
5	3.12	0.43	0.39	0.31	0.27	0.24	0.22	0.20	0.19	0.19	0.18	0.17	0.15	0.12	0.06	MMT22ER050UN	—

■ Whitworth for BSW, BSP

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	0.58	0.17	0.14	0.11	0.10	0.06										MMT16ER280W	—
26	0.63	0.18	0.15	0.13	0.11	0.06										MMT16ER260W	—
20	0.81	0.20	0.18	0.14	0.12	0.11	0.06									MMT16ER200W	—
19	0.86	0.21	0.19	0.15	0.13	0.12	0.06									MMT16ER190W	MMT16ER190W-S
18	0.90	0.25	0.19	0.15	0.13	0.12	0.06									MMT16ER180W	—
16	1.02	0.21	0.18	0.15	0.13	0.11	0.09	0.09	0.06							MMT16ER160W	—
14	1.16	0.23	0.21	0.17	0.14	0.12	0.12	0.11	0.06							MMT16ER140W	MMT16ER140W-S
12	1.36	0.27	0.25	0.20	0.16	0.15	0.14	0.13	0.06							MMT16ER120W	—
11	1.48	0.27	0.24	0.20	0.17	0.15	0.14	0.13	0.12	0.06						MMT16ER110W	MMT16ER110W-S
10	1.63	0.27	0.25	0.20	0.17	0.15	0.15	0.13	0.13	0.12	0.06					MMT16ER100W	—
9	1.81	0.28	0.26	0.21	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.06				MMT16ER090W	—
8	2.03	0.30	0.27	0.22	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.12	0.06			MMT16ER080W	—
7	2.32	0.34	0.32	0.26	0.22	0.20	0.18	0.17	0.16	0.15	0.14	0.12	0.06			MMT22ER070W	—
6	2.71	0.35	0.33	0.27	0.23	0.21	0.20	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.06	MMT22ER060W	—
5	3.25	0.42	0.40	0.35	0.29	0.26	0.24	0.22	0.20	0.19	0.18	0.17	0.15	0.12	0.06	MMT22ER050W	—

■ BSPT

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	0.58	0.17	0.14	0.11	0.10	0.06										MMT16ER280BSPT	—
19	0.86	0.22	0.19	0.15	0.12	0.12	0.06									MMT16ER190BSPT	MMT16ER190BSPT-S
14	1.16	0.24	0.20	0.17	0.14	0.12	0.12	0.11	0.06							MMT16ER140BSPT	MMT16ER140BSPT-S
11	1.48	0.25	0.23	0.21	0.18	0.16	0.14	0.13	0.12	0.06						MMT16ER110BSPT	MMT16ER110BSPT-S

Note 1) • Set the finishing allowance on a diameter at approx. 0.1mm when using a full form insert.
• Please note the cutting depth and the number of passes when a corner radius of a partial form insert or of an internal threading insert is small to prevent damage to the insert corner.
• 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.

MMT STANDARD OF DEPTH OF CUT EXTERNAL (RADIAL INFEED)

■ Round DIN 405

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		
10	1.27	0.23	0.21	0.20	0.19	0.16	0.12	0.10	0.06								MMT16ER100RD
8	1.59	0.23	0.21	0.20	0.19	0.18	0.16	0.14	0.12	0.10	0.06						MMT16ER080RD
6	2.12	0.26	0.25	0.24	0.22	0.21	0.19	0.17	0.16	0.14	0.12	0.10	0.06				MMT16ER060RD
4	3.18	0.34	0.33	0.32	0.30	0.28	0.26	0.24	0.22	0.20	0.19	0.17	0.15	0.12	0.06		MMT22ER040RD

■ ISO Trapezoidal 30°

Pitch (mm)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		
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

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		
12	1.19	0.27	0.23	0.20	0.17	0.14	0.12	0.06									MMT16ER120ACME
10	1.52	0.29	0.25	0.21	0.18	0.16	0.14	0.12	0.11	0.06							MMT16ER100ACME
8	1.84	0.30	0.26	0.22	0.19	0.16	0.15	0.14	0.13	0.12	0.11	0.06					MMT16ER080ACME
6	2.37	0.34	0.30	0.27	0.24	0.21	0.19	0.16	0.14	0.12	0.12	0.11	0.11	0.06			MMT22ER060ACME
5	2.79	0.36	0.33	0.30	0.26	0.23	0.20	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.06		MMT22ER050ACME

■ UNJ

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11					
32	0.46	0.16	0.14	0.10	0.06												MMT16ER320UNJ
28	0.52	0.16	0.12	0.09	0.09	0.06											MMT16ER280UNJ
24	0.61	0.17	0.14	0.14	0.10	0.06											MMT16ER240UNJ
20	0.73	0.19	0.16	0.13	0.10	0.09	0.06										MMT16ER200UNJ
18	0.81	0.23	0.18	0.14	0.10	0.10	0.06										MMT16ER180UNJ
16	0.92	0.26	0.21	0.14	0.12	0.10	0.09										MMT16ER160UNJ
14	1.05	0.26	0.23	0.17	0.12	0.11	0.10	0.06									MMT16ER140UNJ
12	1.22	0.28	0.27	0.20	0.17	0.13	0.11	0.06									MMT16ER120UNJ
10	1.47	0.30	0.29	0.21	0.15	0.13	0.12	0.11	0.10	0.06							MMT16ER100UNJ
8	1.83	0.31	0.30	0.23	0.18	0.15	0.14	0.13	0.12	0.11	0.10	0.06					MMT16ER080UNJ

■ API Buttress Casing

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11					
5	1.55	0.25	0.23	0.17	0.15	0.13	0.12	0.12	0.11	0.11	0.10	0.06					MMT22ER050APBU

■ API Round Casing&Tubing

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12				
10	1.41	0.25	0.23	0.16	0.14	0.12	0.12	0.12	0.11	0.10	0.06						MMT16ER100APRD
8	1.81	0.25	0.24	0.19	0.16	0.14	0.14	0.13	0.13	0.13	0.13	0.11	0.06				MMT16ER080APRD

■ American NPT

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	
27	0.66	0.15	0.13	0.12	0.11	0.09	0.06										MMT16ER270NPT
18	1.01	0.20	0.16	0.14	0.13	0.12	0.11	0.09	0.06								MMT16ER180NPT
14	1.33	0.23	0.19	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.06						MMT16ER140NPT
11.5	1.64	0.24	0.19	0.17	0.15	0.15	0.13	0.13	0.12	0.11	0.10	0.09	0.06				MMT16ER115NPT
8	2.42	0.33	0.28	0.23	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.11	0.11	0.10	0.06	MMT16ER080NPT

■ American NPTF

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	
27	0.64	0.16	0.14	0.11	0.09	0.08	0.06										MMT16ER270NPTF
18	1.00	0.19	0.16	0.14	0.13	0.12	0.11	0.09	0.06								MMT16ER180NPTF
14	1.35	0.23	0.21	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.06						MMT16ER140NPTF
11.5	1.63	0.24	0.23	0.19	0.15	0.13	0.11	0.11	0.11	0.10	0.10	0.10	0.06				MMT16ER115NPTF
8	2.38	0.32	0.27	0.23	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.12	0.11	0.11	0.10	0.06	MMT16ER080NPTF

Note 1) • Set the finishing allowance on a diameter at approx. 0.1mm when using a full form insert.
• Please note the cutting depth and the number of passes when a corner radius of a partial form insert or of an internal threading insert is small to prevent damage to the insert corner.
• 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.

MMT STANDARD OF DEPTH OF CUT INTERNAL (RADIAL INFEED)

■ISO Metric

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

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	0.46	0.16	0.14	0.10	0.06											MMT11IR320UN	MMT16IR320UN	—
28	0.52	0.16	0.13	0.09	0.08	0.06										MMT11IR280UN	MMT16IR280UN	—
24	0.61	0.17	0.15	0.13	0.10	0.06										MMT11IR240UN	MMT16IR240UN	—
20	0.73	0.18	0.15	0.13	0.11	0.10	0.06									MMT11IR200UN	MMT16IR200UN	—
18	0.81	0.20	0.18	0.14	0.12	0.11	0.06									MMT11IR180UN	MMT16IR180UN	—
16	0.92	0.20	0.18	0.15	0.12	0.11	0.10	0.06								MMT11IR160UN	MMT16IR160UN	MMT16IR160UN-S
14	1.05	0.21	0.18	0.15	0.13	0.11	0.11	0.10	0.06							MMT11IR140UN	MMT16IR140UN	MMT16IR140UN-S
13	1.13	0.22	0.19	0.16	0.14	0.13	0.12	0.11	0.06							—	MMT16IR130UN	—
12	1.22	0.24	0.22	0.18	0.16	0.13	0.12	0.11	0.06							—	MMT16IR120UN	MMT16IR120UN-S
11	1.33	0.24	0.22	0.20	0.15	0.12	0.12	0.11	0.11	0.06						—	MMT16IR110UN	—
10	1.47	0.25	0.22	0.21	0.14	0.13	0.12	0.12	0.11	0.11	0.06					—	MMT16IR100UN	—
9	1.63	0.31	0.23	0.21	0.17	0.15	0.14	0.13	0.12	0.11	0.06					—	MMT16IR090UN	—
8	1.83	0.31	0.26	0.21	0.18	0.16	0.15	0.14	0.13	0.12	0.11	0.06				—	MMT16IR080UN	—
7	2.09	0.36	0.30	0.24	0.21	0.18	0.17	0.16	0.15	0.14	0.12	0.06				—	MMT22IR070UN	—
6	2.44	0.40	0.33	0.25	0.23	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.11	0.06		—	MMT22IR060UN	—
5	2.93	0.41	0.35	0.31	0.26	0.23	0.21	0.20	0.19	0.17	0.15	0.14	0.13	0.12	0.06	—	MMT22IR050UN	—

■Whitworth for BSW, BSP

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	0.58	0.17	0.14	0.11	0.10	0.06										—	MMT16IR280W	—
26	0.63	0.18	0.15	0.13	0.11	0.06										—	MMT16IR260W	—
20	0.81	0.20	0.18	0.14	0.12	0.11	0.06									—	MMT16IR200W	—
19	0.86	0.21	0.19	0.15	0.13	0.12	0.06									MMT11IR190W	MMT16IR190W	MMT16IR190W-S
18	0.90	0.25	0.19	0.15	0.13	0.12	0.06									—	MMT16IR180W	—
16	1.02	0.21	0.18	0.15	0.13	0.11	0.09	0.09	0.06							—	MMT16IR160W	—
14	1.16	0.23	0.21	0.17	0.14	0.12	0.12	0.11	0.06							MMT11IR140W	MMT16IR140W	MMT16IR140W-S
12	1.36	0.27	0.25	0.20	0.16	0.15	0.14	0.13	0.06							—	MMT16IR120W	MMT16IR120W-S
11	1.48	0.27	0.24	0.20	0.17	0.15	0.14	0.13	0.12	0.06						—	MMT16IR110W	—
10	1.63	0.27	0.25	0.20	0.17	0.15	0.15	0.13	0.13	0.12	0.06					—	MMT16IR100W	—
9	1.81	0.28	0.26	0.21	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.06				—	MMT16IR090W	—
8	2.03	0.30	0.27	0.22	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.12	0.06			—	MMT16IR080W	—
7	2.32	0.34	0.32	0.26	0.22	0.20	0.18	0.17	0.16	0.15	0.14	0.12	0.06			—	MMT22IR070W	—
6	2.71	0.35	0.33	0.27	0.23	0.21	0.20	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.06	—	MMT22IR060W	—
5	3.25	0.42	0.40	0.35	0.29	0.26	0.24	0.22	0.20	0.19	0.18	0.17	0.15	0.12	0.06	—	MMT22IR050W	—

Note 1) • Set the finishing allowance on a diameter at approx. 0.1mm when using a full form insert.
• Please note the cutting depth and the number of passes when a corner radius of a partial form insert or of an internal threading insert is small to prevent damage to the insert corner.
• 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.

MMT STANDARD OF DEPTH OF CUT INTERNAL (RADIAL INFEED)

■ BSPT

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	0.86	0.22	0.19	0.15	0.12	0.12	0.06									MMT11IR190BSPT	MMT16IR190BSPT	MMT16IR190BSPT-S
14	1.16	0.24	0.20	0.17	0.14	0.12	0.12	0.11	0.06							MMT11IR140BSPT	MMT16IR140BSPT	MMT16IR140BSPT-S
11	1.48	0.25	0.23	0.21	0.18	0.16	0.14	0.13	0.12	0.06						—	MMT16IR110BSPT	MMT16IR110BSPT-S

■ Round DIN 405

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	
10	1.27	0.23	0.21	0.20	0.19	0.16	0.12	0.10	0.06							MMT16IR100RD
8	1.59	0.23	0.21	0.20	0.19	0.18	0.16	0.14	0.12	0.10	0.06					MMT16IR080RD
6	2.12	0.26	0.25	0.24	0.22	0.21	0.19	0.17	0.16	0.14	0.12	0.10	0.06			MMT16IR060RD
4	3.18	0.34	0.33	0.32	0.30	0.28	0.26	0.24	0.22	0.20	0.19	0.17	0.15	0.12	0.06	MMT22IR040RD

■ ISO Trapezoidal 30°

Pitch (mm)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	
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

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	
12	1.19	0.27	0.23	0.20	0.17	0.14	0.12	0.06								MMT16IR120ACME
10	1.52	0.29	0.25	0.21	0.18	0.16	0.14	0.12	0.11	0.06						MMT16IR100ACME
8	1.84	0.30	0.26	0.22	0.19	0.16	0.15	0.14	0.13	0.12	0.11	0.06				MMT16IR080ACME
6	2.37	0.34	0.30	0.27	0.24	0.21	0.19	0.16	0.14	0.12	0.12	0.11	0.11	0.06		MMT22IR060ACME
5	2.79	0.36	0.33	0.30	0.26	0.23	0.20	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.06	MMT22IR050ACME

■ API Buttress Casing

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11				
5	1.55	0.25	0.23	0.17	0.15	0.13	0.12	0.12	0.11	0.11	0.10	0.06				MMT22IR050APBU

■ API Round Casing&Tubing

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12			
10	1.41	0.25	0.23	0.16	0.14	0.12	0.12	0.12	0.11	0.10	0.06					MMT16IR100APRD
8	1.81	0.25	0.24	0.19	0.16	0.14	0.14	0.13	0.13	0.13	0.13	0.11	0.06			MMT16IR080APRD

■ American NPT

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	
27	0.66	0.15	0.13	0.12	0.11	0.09	0.06										MMT16IR270NPT
18	1.01	0.20	0.16	0.14	0.13	0.12	0.11	0.09	0.06								MMT16IR180NPT
14	1.33	0.23	0.19	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.06						MMT16IR140NPT
11.5	1.64	0.24	0.19	0.17	0.15	0.15	0.13	0.13	0.12	0.11	0.10	0.09	0.06				MMT16IR115NPT
8	2.42	0.33	0.28	0.23	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.11	0.11	0.10	0.06	MMT16IR080NPT

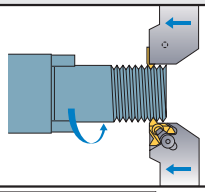
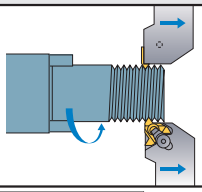
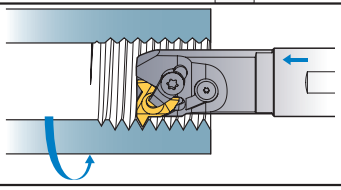
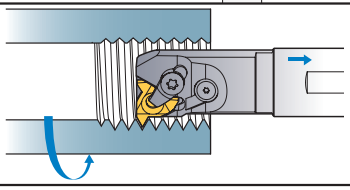
■ American NPTF

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	
14	1.35	0.23	0.21	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.06						MMT16IR140NPTF
11.5	1.63	0.24	0.23	0.19	0.15	0.13	0.11	0.11	0.11	0.10	0.10	0.10	0.06				MMT16IR115NPTF
8	2.38	0.32	0.27	0.23	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.12	0.11	0.11	0.10	0.06	MMT16IR080NPTF

Note 1) • Set the finishing allowance on a diameter at approx. 0.1mm when using a full form insert.
• Please note the cutting depth and the number of passes when a corner radius of a partial form insert or of an internal threading insert is small to prevent damage to the insert corner.
• 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.

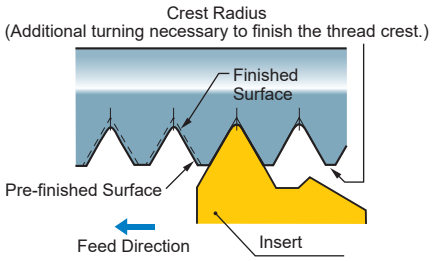
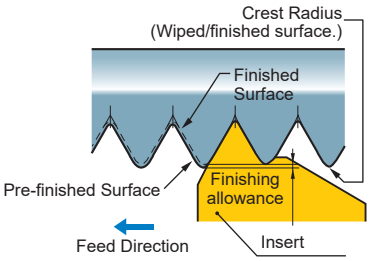
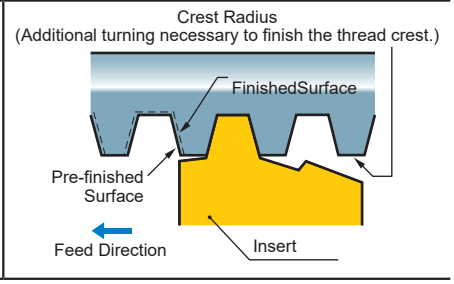
THREADING METHODS

THREADING METHODS

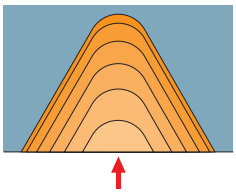
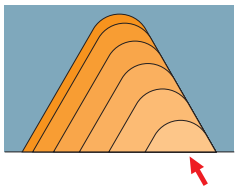
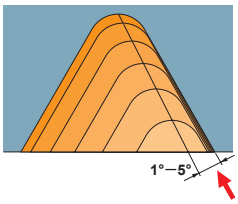
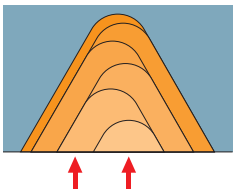
	Right Hand Thread	Left Hand Thread
EXTERNAL	 Holder Reversed	 Holder Reversed
INTERNAL		

- Usually, threads are cut with the feed 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.

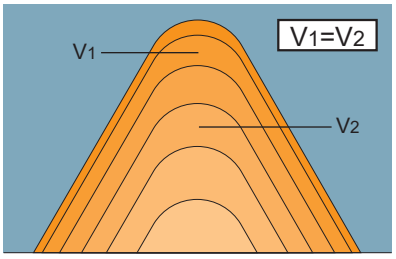
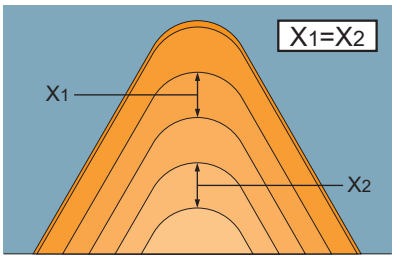
INSERT TYPES

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 corner radius of the insert is smaller than that of the full form insert. ● Finishing with another operation is necessary.	● No deburring needed after threading. ● Requires different threading inserts.	● No deburring needed after threading. ● Requires different threading inserts. ● Finishing with another operation is necessary.
		

INFEED METHODS

Features		Radial Infeed	Flank Infeed	Modified Flank Infeed	Incremental Infeed
					
	Advantages	● Easiest to use. (Standard programme 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 programme 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. ● Suitable for large pitch threads or materials that peel easily. ● Good chip discharge.	● Uniform flank wear of the right and left sides of the cutting edge. ● Reduced cutting force. ● Suitable for large pitch threads or materials that peel easily.
	Disadvantages	● Difficult chip control. ● Subject to vibration in the later in stages of cutting. ● Ineffective for large pitch threading. ● Heavy load on the corner radius.	● Large flank wear on the right side of the cutting edge. ● Relatively difficult to change cutting depth. (Re-programming necessary)	● Complex machining programming. ● Difficult to change cutting depth. (Re-programming necessary)	● Complex machining programming. ● Difficult to change cutting depth. (Re-programming necessary) ● Difficult chip control.

THREADING DEPTH

	Features	
	Advantages	Disadvantages
 Fixed cut area	● Easy to use. (Standard programme 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 corner 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 programme is necessary.

Note 1) 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.

■ FORMULAE

● Formulae 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 n—1

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

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

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

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

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

5st 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 PROGRAMME FOR MODIFIED FLANK INFEED

● Example) M12×1.0 5 passes modified 5°

External Threading	Internal Threading
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

THREADING METHODS

SELECTING CUTTING CONDITIONS

		Priority					
		Tool Life	Cutting Force	Surface Finish	Precision of Thread	Chip Discharge	Efficiency (Reduced Passes)
Threading Methods	Radial	○		○	○		○
	Flank	(△ : Modified)	○	(△ : Modified)		○	
Cutting Depth	Fixed Cutting Depth					○	
	Fixed Cut Area	○	○	○	○		○

Note 1) 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 programme," 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.

FEATURES AND BENEFITS OF MITSUBISHI PRODUCTS

- Insert grades with high wear and plastic deformation resistance, 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 corner 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 0.2mm to make the chips thicker.

● 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 wiping 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.

Pipe Threads and Tool Selection

■Parallel Pipe Thread G(PF)

min	Thread	Number of Threads	Standard Internal Diameter
—	G 1/16	28	6.561
1min	G 1/8		8.556
2min	G 1/4	19	11.445
3min	G 3/8		14.950
4min	G 1/2	14	18.631
5min	G 5/8		20.587
6min	G 3/4		24.117
7min	G 7/8		27.877
8min	G 1	11	30.291
9min	G 1 1/8		34.939
10min	G 1 1/4		38.952

Note 1) Same as PF.

■Taper Pipe Thread R, Rc(PT)

min	Thread	Number of Threads	Standard Internal Diameter
—	R 1/16	28	6.561
1min	R 1/8		8.556
2min	R 1/4	19	11.445
3min	R 3/8		14.950
4min	R 1/2	14	18.631
5min	—	—	—
6min	R 3/4	14	24.117
7min	—	—	—
8min	R 1	11	30.291
9min	—	—	—
10min	R 1 1/4	11	38.952

Note 1) Same as Rc, PT.

- Please note that as part of industry practice, pipe screws are sometimes referred to as "minutes" in inch conversion units.
- One "minute" equals 1/8 inch (1 inch= 25.4mm)
- 1 1/4 inches are sometimes referred to as "inch 2 minutes" (1/4= 2/8= 2 minutes).
- The pitch is pre-determined for each nominal diameter. Note the minimum machining diameter especially when internal threading.

MMT SERIES ORDER NUMBER

HOLDERS

EXTERNAL

MMT E R 12 12 H 16 – C

Designation

Application

E	External

Hand of Tool

R	Right

Tool Size (mm) (Height and Width)

12	12
16	16
20	20
25	25
32	32

Tool Length (mm)

H	100
K	125
M	150
P	170

Insert Size (mm)

16	9.525
22	12.7

Method of Holding

C	Clamp-on

INTERNAL

MMT I R 13 16 A K 11 – S P15

Designation

Application

I	Internal

Hand of Tool

R	Right

Min.Cutting Diameter (mm)

Shank Diameter (mm)

Shank Material

A	Steel Shank with Coolant Hole

Tool Length (mm)

K	125	R	200
M	150	S	250
Q	180	T	300

Insert Size (mm)

11	6.35
16	9.525
22	12.7

Method of Holding

S	Screw-on
C	Clamp-on

Lead Angle

P15	1.5°
P25	2.5°
P35	3.5°

INSERTS

M-CLASS

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

G-CLASS

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		

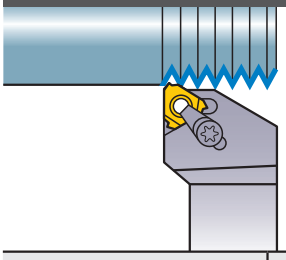
Threading Type

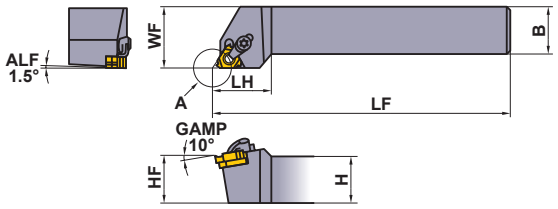
60	Partial Profile 60°
55	Partial Profile 55°
ISO	ISO Metric
W	Whitworth for BSW, BSP
BSPT	BSPT
UN	American UN
RD	Round DIN 405
TR	ISO Trapezoidal 30°
ACME	American ACME
UNJ	UNJ
APBU	API Buttress Casing
APRD	API Round Casing&Tubing
NPT	NPT
NPTF	NPTF

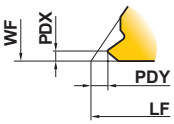
MMTE HOLDER

MMTE

External threading







Details of position A
Refer to the insert standards for dimensions PDX and PDY.

Right hand tool holder only.

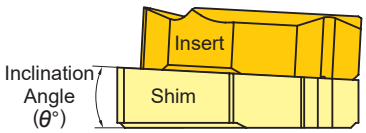
Order Number	Stock	Insert Number	Dimensions (mm)						Clamp Bridge	Clamp Screw *	Stop Ring	Shim Screw *	Shim	Wrench
	R		H	B	LF	LH	HF	WF						
MMTER1212H16-C	●	MMT16ER ○○○○○	12	12	100	25	12	16	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER1616H16-C	●		16	16	100	25	16	20	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER2020K16-C	●		20	20	125	26	20	25	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER2525M16-C	●		25	25	150	28	25	32	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER3232P16-C	●		32	32	170	32	32	40	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER2525M22-C	●	MMT22ER ○○○○○	25	25	150	32	25	32	SETK61	SETS61	CR5	HFC04010	CTE43TP15	①TKY20F ②HKY25R
MMTER3232P22-C	●		32	32	170	32	32	40	SETK61	SETS61	CR5	HFC04010	CTE43TP15	①TKY20F ②HKY25R

Note 1) Select and use a shim as shown below (sold separately), dependant on the lead angle.
∗ Clamp Torque (N • m) : SETS51=3.5, SETS61=5.0, HFC03008=1.5, HFC04010=2.2

SHIM

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
−1.5°	**CTE32TN15**	●	−3°	MMTER ○○○○○ 16-C
−0.5°	**CTE32TN05**	●	−2°	
0.5°	**CTE32TP05**	●	−1°	
1.5°	**CTE32TP15**	●	0°	
2.5°	**CTE32TP25**	●	1°	
3.5°	**CTE32TP35**	●	2°	
4.5°	**CTE32TP45**	●	3°	

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
−1.5°	**CTE43TN15**	●	−3°	MMTER ○○○○○ 22-C
−0.5°	**CTE43TN05**	●	−2°	
0.5°	**CTE43TP05**	●	−1°	
1.5°	**CTE43TP15**	●	0°	
2.5°	**CTE43TP25**	●	1°	
3.5°	**CTE43TP35**	●	2°	
4.5°	**CTE43TP45**	●	3°	



Standard shim delivered with the holder.

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
P	Mild Steel	≤180HB	**VP10MF**	150 (70—230)
			VP15TF	100 (60—140)
			VP20RT	80 (60—100)
	Carbon Steel Alloy Steel	180—280HB	**VP10MF**	140 (80—200)
			VP15TF	100 (60—140)
			VP20RT	80 (60—100)
M	Stainless Steel	≤200HB	**VP15TF**	80 (40—120)
			VP20RT	
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP10MF**	140 (80—200)
			VP15TF	90 (60—120)

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
S	Heat Resistant Alloy	—	**VP10MF**	45 (15—70)
			VP15TF	30 (20—40)
			VP20RT	
	Titanium Alloy	—	**VP10MF**	60 (40—80)
			VP15TF	45 (25—65)
			VP20RT	
H	Heat-Treated Alloy	45—55HRC	**VP10MF**	50 (30—70)
			VP15TF	40 (20—60)

● : Inventory maintained in Japan.

HOW TO SELECT A SHIM ➤ G012
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

MMT M-CLASS INSERTS WITH 3-D CHIP BREAKERS

INSERTS

Type	Order Number	Coated VP15TF	Coated VP20RT	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total Cutting Depth (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 PNA 60°
	MMT16ERG60-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 PNA 55°
	MMT16ERG55-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 PNA 60°
	MMT16ER125ISO-S	●	●	1.25		9.525	3.44	0.8	0.9	0.16	0.77	
	MMT16ER150ISO-S	●	●	1.5		9.525	3.44	0.8	1.0	0.20	0.92	
	MMT16ER175ISO-S	●	●	1.75		9.525	3.44	0.9	1.2	0.22	1.07	
	MMT16ER200ISO-S	●	●	2.0		9.525	3.44	1.0	1.3	0.26	1.23	
	MMT16ER250ISO-S	●	●	2.5		9.525	3.44	1.1	1.5	0.33	1.53	
	MMT16ER300ISO-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 PNA 60°
	MMT16ER140UN-S	●			14	9.525	3.44	1.0	1.2	0.26	1.11	
	MMT16ER120UN-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 PNA 55°
	MMT16ER140W-S	●			14	9.525	3.44	1.0	1.2	0.25	1.16	
	MMT16ER110W-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 PNA 55°
	MMT16ER140BSPT-S	●			14	9.525	3.44	1.0	1.2	0.25	1.16	
	MMT16ER110BSPT-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		

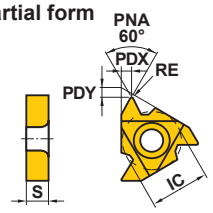
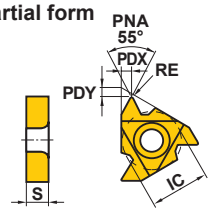
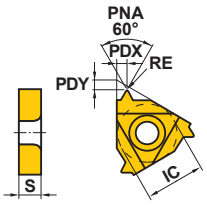
Threading Type

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

● : Inventory maintained in Japan.
(Contains 5 inserts per case.)

MMT G-CLASS GROUND INSERTS

INSERTS

Type	Thread Tolerance	Order Number	Coated VP10MF	Coated VP15TF	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total Cutting Depth (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	N	3.5—5.0mm or 7—5 thread/inch
400	4.0mm		
450	4.5mm		
500	5.0mm		

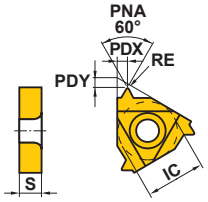
Threading Type

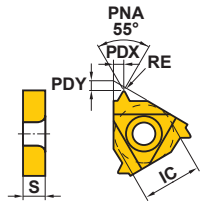
60	Partial Profile 60°
55	Partial Profile 55°
ISO	ISO Metric
W	Whitworth for BSW, BSP
BSPT	BSPT
UN	American UN
RD	Round DIN 405
TR	ISO Trapezoidal 30°
ACME	American ACME
UNJ	UNJ
APBU	API Buttress Casing
APRD	API Round Casing&Tubing
NPT	NPT
NPTF	NPTF

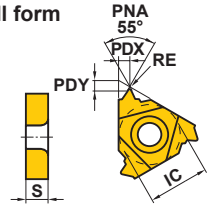
MMT G-CLASS GROUND INSERTS

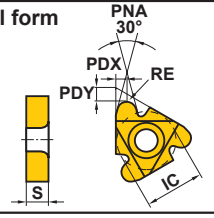
INSERTS

Type	Thread Tolerance	Order Number	Coated VP10MF	Coated VP15TF	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total Cutting Depth (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	12.7	4.64	2.2	2.3	1.51	3.18	

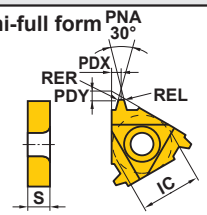
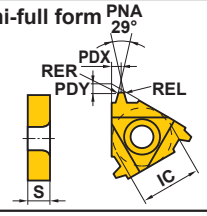
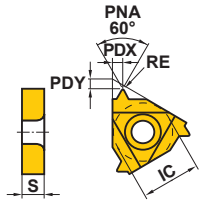
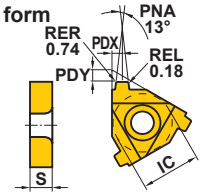
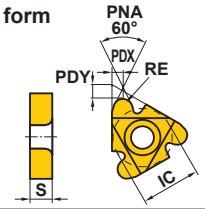
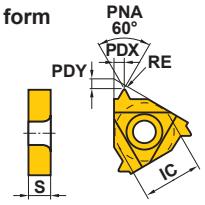
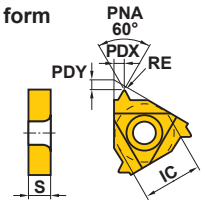








● : Inventory maintained in Japan.
(Contains 5 inserts per case.)

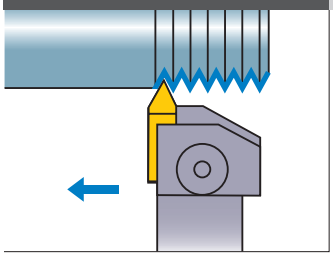
Type	Thread Tolerance	Order Number	Coated VP10MF	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE RER/L	Total Cutting Depth (mm)	Geometry
ISO Trapezoidal 30°	7e	MMT16ER150TR	●	1.5		9.525	3.44	1.0	1.1	0.08	0.90	Semi-full form 
		MMT16ER200TR	●	2.0		9.525	3.44	1.1	1.3	0.15	1.25	
		MMT16ER300TR	●	3.0		9.525	3.44	1.3	1.5	0.15	1.75	
		MMT22ER400TR	●	4.0		12.7	4.64	1.7	1.9	0.15	2.25	
		MMT22ER500TR	●	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 
		MMT16ER100ACME	●		10	9.525	3.44	1.3	1.4	0.08	1.52	
		MMT16ER080ACME	●		8	9.525	3.44	1.4	1.5	0.10	1.84	
		MMT22ER060ACME	●		6	12.7	4.64	1.8	2.1	0.10	2.37	
		MMT22ER050ACME	●		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 
		MMT16ER280UNJ	●		28	9.525	3.44	0.7	0.7	0.14	0.52	
		MMT16ER240UNJ	●		24	9.525	3.44	0.7	0.8	0.17	0.61	
		MMT16ER200UNJ	●		20	9.525	3.44	0.8	0.9	0.20	0.73	
		MMT16ER180UNJ	●		18	9.525	3.44	0.8	1.0	0.22	0.81	
		MMT16ER160UNJ	●		16	9.525	3.44	0.9	1.1	0.25	0.92	
		MMT16ER140UNJ	●		14	9.525	3.44	1.0	1.2	0.29	1.05	
		MMT16ER120UNJ	●		12	9.525	3.44	1.1	1.3	0.33	1.22	
		MMT16ER100UNJ	●		10	9.525	3.44	1.2	1.5	0.40	1.47	
		MMT16ER080UNJ	●		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	0.74/0.18	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 
		MMT16ER080APRD	●		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 
		MMT16ER180NPT	●		18	9.525	3.44	0.8	1.0	0.08	1.01	
		MMT16ER140NPT	●		14	9.525	3.44	0.9	1.2	0.09	1.33	
		MMT16ER115NPT	●		11.5	9.525	3.44	1.1	1.5	0.11	1.64	
		MMT16ER080NPT	●		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 
		MMT16ER180NPTF	●		18	9.525	3.44	0.8	1.0	0.04	1.00	
		MMT16ER140NPTF	●		14	9.525	3.44	0.9	1.2	0.04	1.35	
		MMT16ER115NPTF	●		11.5	9.525	3.44	1.1	1.5	0.04	1.63	
		MMT16ER080NPTF	●		8	9.525	3.44	1.3	1.8	0.04	2.38	

MT HOLDER

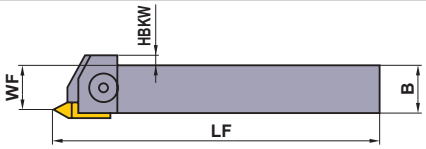
- Clamp-on type.
- Positive insert suffers from negligible chattering and thus produces good finished surfaces.
- Thread pitch ≤4.5mm.

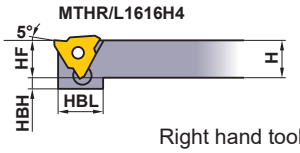
MTH

External threading



Note 1) Cutting in the opposite direction is not possible.





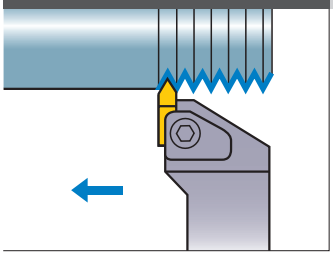
Right hand tool holder shown.

Order Number	Stock		Insert Number	Dimensions (mm)								Clamp Bridge	Clamp Screw *	Spring	Wrench
	R	L		H	B	LF	HF	HBH	HBL	WF	HBKW				
MTHR/L1616H4	●	●	MTTR/L43○○○○	16	16	100	16	3	21	13.8	3	MTK1R/L	HBH06020	MES3	HKY40R
MTHR/L2020K4	●	●		20	20	125	20	—	—	17.8	—	MTK1R/L	HBH06020	MES3	HKY40R
MTHR/L2525M4	●	●		25	25	150	25	—	—	22.8	—	MTK1R/L	HBH06020	MES3	HKY40R

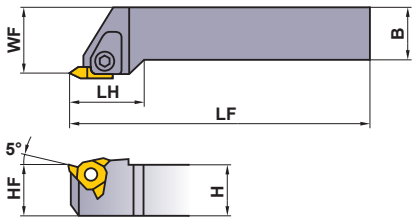
∗ Clamp Torque (N • m) : HBH06020=7.0

MT1

External threading



Note 1) Cutting in the opposite direction is not possible.



Right hand tool holder shown.

Order Number	Stock		Insert Number	Dimensions (mm)						Clamp Bridge	Clamp Screw *	Spring	Wrench
	R	L		H	B	LF	LH	HF	WF				
MT1R/L2020K4	●	●	MTTR/L43○○○○	20	20	125	30	20	25	MTK1R/L	HBH06020	MES3	HKY40R
MT1R/L2525M4	●	●		25	25	150	30	25	32	MTK1R/L	HBH06020	MES3	HKY40R
MT1R/L3232P4	●	●		32	32	170	30	32	40	MTK1R/L	HBH06020	MES3	HKY40R

∗ Clamp Torque (N • m) : HBH06020=7.0

RECOMMENDED CUTTING CONDITIONS

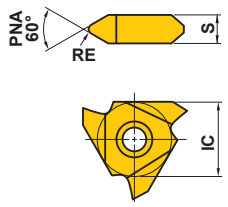
	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
P	Mild Steel	≤180HB	**UP20M**	140 (100—180)
			NX2525	200 (150—250)
			UTi20T	120 (100—150)
	Carbon Steel Alloy Steel	180—280HB	**UP20M**	120 (100—150)
			NX2525	170 (150—200)
			UTi20T	100 (70—120)

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
M	Stainless Steel	≤200HB	**UP20M**	120 (80—150)
			UTi20T	100 (70—130)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**UP20M**	80 (60—100)
			UTi20T	80 (60—100)
			HTi10	100 (70—130)

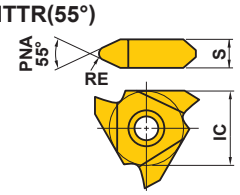
● : **Inventory maintained in Japan.**
(Contains 10 inserts per case.)

INSERTS

Type	Order Number	Class	Coated	Cermet		Carbide		ISO Pitch mm (thread/inch)	Dimensions (mm)			Geometry
			UP20M	NX2525		UTi20T	HTi10		IC	S	RE	
Partial Profile 60°	**MTTR436000**	G		●		●		−0.8	12.7	4.76	0	**MTTR/L(60°)**
	MTTR436001	G	●	●		●	●	1.0−1.75	12.7	4.76	0.1	
	MTTL436001	G	●			●	●	1.0−1.75	12.7	4.76	0.1	
	MTTR436002	G	●	●		●	●	2.0−2.5	12.7	4.76	0.2	
	MTTL436002	G		●		●		2.0−2.5	12.7	4.76	0.2	
	MTTR436003	G	●	●		●	●	3.0−3.5	12.7	4.76	0.3	
	MTTL436003	G		●		●		3.0−3.5	12.7	4.76	0.3	
	MTTR436004	G		●		●		4.0−4.5	12.7	4.76	0.4	
Partial Profile 55°	**MTTR435501**	G		●		●		(28−10)	12.7	4.76	0.1	**MTTR(55°)**
	MTTR435502	G		●		●		(16−8)	12.7	4.76	0.2	
	MTTR435503	G		●		●		(11−8)	12.7	4.76	0.3	



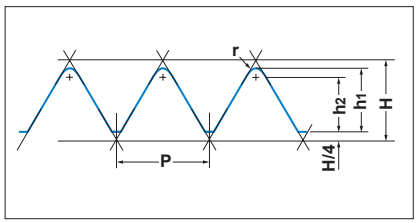
Right hand insert shown.



Right hand insert only.

■STANDARD OF DEPTH OF CUT

- The chart on the right shows the cutting depths when machining external ISO metric screw threads.
- When you use cermet grades or cut stainless steel, please increase the number of passes by 2−3 times.



●METRIC SCREW THREAD

P (Pitch)		0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50	4.00	4.50
h_1		0.46	0.61	0.77	0.92	1.07	1.23	1.53	1.84	2.15	2.45	2.76
h_2		0.35	0.47	0.59	0.70	0.82	0.94	1.17	1.41	1.65	1.87	2.11
r (Corner Radius)		0.11	0.14	0.18	0.22	0.25	0.29	0.36	0.43	0.50	0.58	0.65
Number of Passes	1	0.18	0.20	0.20	0.25	0.25	0.25	0.30	0.30	0.35	0.35	0.40
	2	0.13	0.15	0.18	0.20	0.20	0.25	0.25	0.25	0.30	0.30	0.35
	3	0.10	0.10	0.12	0.15	0.20	0.20	0.20	0.25	0.25	0.25	0.30
	4	0.05	0.10	0.12	0.15	0.15	0.15	0.20	0.20	0.20	0.25	0.25
	5		0.06	0.10	0.10	0.12	0.15	0.15	0.20	0.20	0.25	0.25
	6			0.05	0.07	0.10	0.10	0.10	0.15	0.20	0.20	0.20
	7					0.05	0.08	0.10	0.15	0.15	0.20	0.20
	8						0.05	0.10	0.10	0.15	0.15	0.15
	9							0.08	0.10	0.10	0.15	0.15
	10							0.05	0.09	0.10	0.10	0.15
	11								0.05	0.10	0.10	0.10
	12									0.05	0.10	0.10
	13										0.05	0.10
	14											0.06

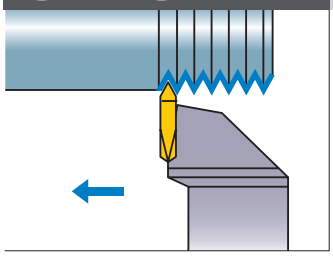
Note 1) The first pass causes a high load on the cutting edge. In order to avoid damage, keep the depth of cut to 0.4−0.5mm maximum.

SMG HOLDER

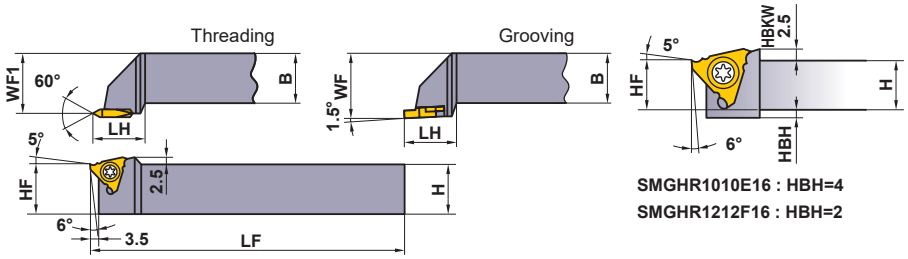
- Screw-on type.
- Positive insert suffers from negligible chattering.
- Suitable for narrow grooving and threading.
- Thread pitch ≤2.0 mm.

SMGH

External threading, Grooving



Note 1) Cutting in the opposite direction is not possible.



SMGHR1010E16 : HBH=4
SMGHR1212F16 : HBH=2

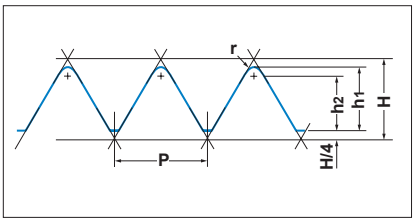
Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (mm)							*	
	R	Threading	Grooving	H	B	LF	LH	HF	WF1	WF2	Clamp Screw	Wrench
SMGHR1010E16	●	SMTTR160360◌◌	SMGTR16X2◌◌◌ SMGTR16X2◌◌◌C	10	10	70	16.5	10	11.7	12	FC400890T	TKY10F
SMGHR1212F16	●			12	12	80	16.5	12	15.7	16	FC400890T	TKY10F
SMGHR1616H16	●			16	16	100	20	16	19.7	20	FC400890T	TKY10F
SMGHR2020K16	●			20	20	125	20	20	24.7	25	FC400890T	TKY10F
SMGHR2525M16	●			25	25	150	20	25	31.7	32	FC400890T	TKY10F

∗ Clamp Torque (N • m) : FC400890T=2.5

■STANDARD OF DEPTH OF CUT

- The chart on the right shows the cutting depths when machining external ISO metric screw threads.
- When you use cermet grades or cut stainless steel, please increase the number of passes by 2—3 times.



●METRIC SCREW THREAD

P (Pitch)		0.75	1.00	1.25	1.50	1.75	2.00
h1		0.46	0.61	0.77	0.92	1.07	1.23
h2		0.35	0.47	0.59	0.70	0.82	0.94
r (Corner Radius)		0.11	0.14	0.18	0.22	0.25	0.29
Number of Passes	1	0.18	0.20	0.20	0.25	0.25	0.25
	2	0.13	0.15	0.18	0.20	0.20	0.25
	3	0.10	0.10	0.12	0.15	0.20	0.20
	4	0.05	0.10	0.12	0.15	0.15	0.15
	5		0.06	0.10	0.10	0.12	0.15
	6			0.05	0.07	0.10	0.10
	7					0.05	0.08
	8						0.05
	9						

Note 1) The first pass causes a high load on the cutting edge. In order to avoid damage, keep the depth of cut to 0.4—0.5mm maximum.

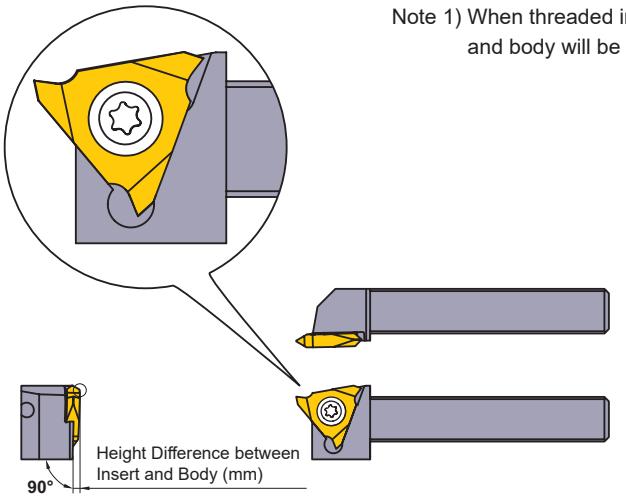
RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
P	Mild Steel	≤180HB	**NX2525**	200 (150—250)
			UTi20T	120 (100—150)
	Carbon Steel Alloy Steel	180—280HB	**NX2525**	170 (150—200)
			UTi20T	100 (70—120)

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
M	Stainless Steel	≤200HB	**UTi20T**	100 (70—130)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**UTi20T**	80 (60—100)
			HTi10	100 (70—130)

● : **Inventory maintained in Japan.**
(Contains 10 inserts per case.)

Conditions when Inserts are Installed



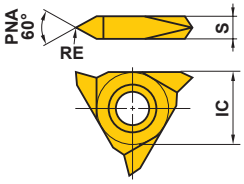
Note 1) When threaded inserts are installed on the body, the height difference between the insert and body will be as shown in the following table.

Height Difference between Insert and Body (mm)

Threading	Grooving
1.23	0.05

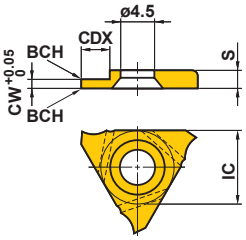
SMT INSERTS (Threading)

Order Number	Carbide	Thread Pitch (mm)	Dimensions (mm)			Geometry
	UTi20T		IC	S	RE	
SMTTR16036001	●	1.0—1.5	9.525	3.18	0.1	
SMTTR16036002	●	1.75—2.0	9.525	3.18	0.2	



SMG INSERTS (Grooving)

Order Number	Cermet	Carbide		Dimensions (mm)					Geometry
	NX2525	UTi20T	HTi10	CW	CDX	IC	S	BCH	
SMGTR16X2050			●	0.5	1.5	9.525	2	—	
SMGTR16X2060	●	●	●	0.6	1.5	9.525	2	—	
SMGTR16X2050C	●	●	●	0.5	1.5	9.525	2	0.05	
SMGTR16X2060C	●	●	●	0.6	1.5	9.525	2	0.05	
SMGTR16X2070C	●	●	●	0.7	2	9.525	2	0.05	
SMGTR16X2075C	●	●	●	0.75	2	9.525	2	0.05	
SMGTR16X2080C	●	●	●	0.8	2	9.525	2	0.1	
SMGTR16X2090C	●	●	●	0.9	2	9.525	2	0.1	
SMGTR16X2095C	●	●	●	0.95	2	9.525	2	0.1	
SMGTR16X2100C	●	●	●	1	2.5	9.525	2	0.1	
SMGTR16X2110C	●	●	●	1.1	2.5	9.525	2	0.1	
SMGTR16X2120C	●	●	●	1.2	2.5	9.525	2	0.1	
SMGTR16X2130C	●	●	●	1.3	2.5	9.525	2	0.1	



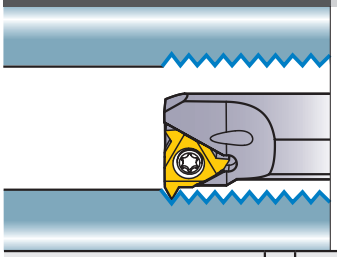
Note 1) Please refer to the page F138 for cutting conditions of grooving.

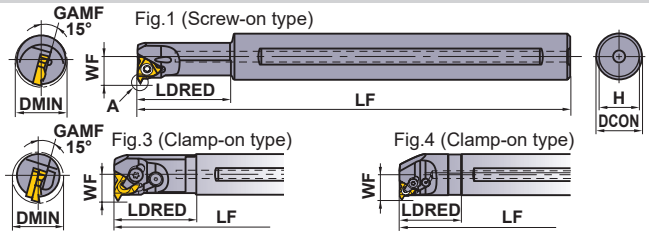
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

MMTI TYPE BORING BARS

MMTI

Internal threading





Right hand tool holder only.

Order Number	Stock R	Insert Number	Lead Angle	Dimensions (mm) DCON	LF	LDRED	WF	H	DMIN	Clamp Bridge	Clamp Screw *	Stop Ring	①Shim Screw ②Embedded Seat Screw *	Shim	Wrench ①/②	Fig
MMTIR1316AK11-SP15	●	MMT11IR	1.5°	16	125	25	8.7	15	**13**	—	TS25	—	—	—	①TKY08F	1
MMTIR1316AK11-SP25	●		2.5°	16	125	25	8.7	15	**13**	—	TS25	—	—	—	①TKY08F	1
MMTIR1316AK11-SP35	●		3.5°	16	125	25	8.7	15	**13**	—	TS25	—	—	—	①TKY08F	1
MMTIR1516AM11-SP15	●	○○○○○	1.5°	16	150	32	9.7	15	**15**	—	TS25	—	—	—	①TKY08F	1
MMTIR1516AM11-SP25	●		2.5°	16	150	32	9.7	15	**15**	—	TS25	—	—	—	①TKY08F	1
MMTIR1516AM11-SP35	●		3.5°	16	150	32	9.7	15	**15**	—	TS25	—	—	—	①TKY08F	1
MMTIR1916AM16-SP15	●	MMT16IR	1.5°	16	150	40	12.2	15	**19**	—	CS350860T	—	—	—	①TKY15F	2
MMTIR1916AM16-SP25	●		2.5°	16	150	40	12.2	15	**19**	—	CS350860T	—	—	—	①TKY15F	2
MMTIR1916AM16-SP35	●		3.5°	16	150	40	12.2	15	**19**	—	CS350860T	—	—	—	①TKY15F	2
MMTIR2420AQ16-C	●	○○○○○	1.5°	20	180	40	14.2	19	**24**	SETK51	SETS51	CR4	①HFC03006 ②TFS03006	CTI32TP15	①TKY15F ②HKY20R	3
MMTIR2925AS16-C	●		1.5°	25	250	60	16.7	23.4	**29**	SETK51	SETS51	CR4	①HFC03006 ②TFS03006	CTI32TP15	①TKY15F ②HKY20R	3
MMTIR3732AS16-C	●		1.5°	32	250	48	20.5	30.4	**37**	SETK51	SETS51	CR4	①HFC03006 ②TFS03006	CTI32TP15	①TKY15F ②HKY20R	4
MMTIR2420AQ22-SP15	●	MMT22IR	1.5°	20	180	50	15.5	19	**24**	—	TS43	—	—	—	①TKY15F	2
MMTIR2420AQ22-SP25	●		2.5°	20	180	50	15.5	19	**24**	—	TS43	—	—	—	①TKY15F	2
MMTIR2420AQ22-SP35	●		3.5°	20	180	50	15.5	19	**24**	—	TS43	—	—	—	①TKY15F	2
MMTIR3025AR22-C	●	○○○○○	1.5°	25	200	38	17.8	23.4	**30**	SETK61	SETS61	CR5	①HFC04008 ②TFS03006	CTI43TP15	①TKY20F ②HKY25R	4
MMTIR3832AS22-C	●		1.5°	32	250	48	21.8	30.4	**38**	SETK61	SETS61	CR5	①HFC04008 ②TFS03006	CTI43TP15	①TKY20F ②HKY25R	4
MMTIR4640AT22-C	●		1.5°	40	300	60	26.2	38	**46**	SETK61	SETS61	CR5	①HFC04008 ②TFS03006	CTI43TP15	①TKY20F ②HKY25R	4

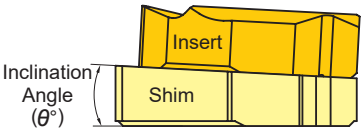
Note 1) Select and use a shim as shown below (sold separately), dependant on the lead angle.
- A screw-on tool holder uses no shim. (The holder body has a lead angle.) Use a tool holder with the appropriate lead angle.
- Min. cutting diameter (DMIN) shows the internal hole diameter, not the thread diameter.

* Clamp Torque (N • m) : TS25=1.0, CS350860T=3.5, SETS51=3.5, TS43=3.5, SETS61=5.0, HFC03006=1.5, HFC04008=2.2

SHIM

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
−1.5°	**CTI32TN15**	●	−3°	MMTIR ○○○○ ○○16-C
−0.5°	**CTI32TN05**	●	−2°	
0.5°	**CTI32TP05**	●	−1°	
1.5°	**CTI32TP15**	●	0°	
2.5°	**CTI32TP25**	●	1°	
3.5°	**CTI32TP35**	●	2°	
4.5°	**CTI32TP45**	●	3°	

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
−1.5°	**CTI43TN15**	●	−3°	MMTIR ○○○○ ○○22-C
−0.5°	**CTI43TN05**	●	−2°	
0.5°	**CTI43TP05**	●	−1°	
1.5°	**CTI43TP15**	●	0°	
2.5°	**CTI43TP25**	●	1°	
3.5°	**CTI43TP35**	●	2°	
4.5°	**CTI43TP45**	●	3°	



Standard shim delivered with the holder.

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
P	Mild Steel	≤180HB	**VP10MF**	150 (70—230)
			VP15TF	100 (60—140)
			VP20RT	80 (60—100)
	Carbon Steel Alloy Steel	180—280HB	**VP10MF**	140 (80—200)
			VP15TF	100 (60—140)
			VP20RT	80 (60—100)
M	Stainless Steel	≤200HB	**VP15TF**	80 (40—120)
			VP20RT	
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP10MF**	140 (80—200)
			VP15TF	90 (60—120)

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
S	Heat Resistant Alloy	—	**VP10MF**	45 (15—70)
			VP15TF	30 (20—40)
			VP20RT	
	Titanium Alloy	—	**VP10MF**	60 (40—80)
			VP15TF	45 (25—65)
			VP20RT	
H	Heat-Treated Alloy	45—55HRC	**VP10MF**	50 (30—70)
			VP15TF	40 (20—60)

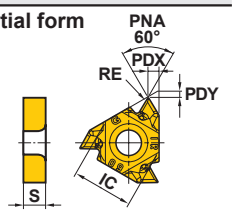
● : Inventory maintained in Japan.
(Contains 5 inserts per case.)

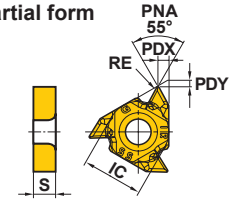
HOW TO SELECT A SHIM ➤ G012
MMT SERIES ORDER NUMBER ➤ G022

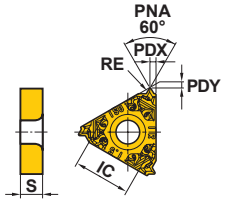
MMT M-CLASS INSERTS WITH 3-D CHIP BREAKERS

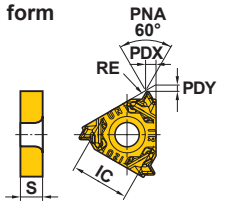
INSERTS

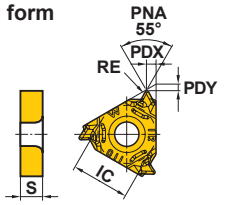
Type	Order Number	Coated VP15TF	Coated VP20RT	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total Cutting Depth (mm)	Geometry
Partial Profile 60°	MMT11IRA60-S	●		0.5—1.5	48—16	6.35	3.04	0.8	0.9	0.03	—	Partial form
	MMT16IRA60-S	●		0.5—1.5	48—16	9.525	3.44	0.8	0.9	0.03	—	
	MMT16IRG60-S	●		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
	MMT16IRA55-S	●			48—16	9.525	3.44	0.8	0.9	0.07	—	
	MMT16IRG55-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
	MMT11IR125ISO-S	●		1.25		6.35	3.04	0.8	0.9	0.08	0.72	
	MMT11IR150ISO-S	●		1.5		6.35	3.04	0.8	1.0	0.10	0.87	
	MMT16IR100ISO-S	●	●	1.0		9.525	3.44	0.6	0.7	0.06	0.58	
	MMT16IR125ISO-S	●	●	1.25		9.525	3.44	0.8	0.9	0.08	0.72	
	MMT16IR150ISO-S	●	●	1.5		9.525	3.44	0.8	1.0	0.10	0.87	
	MMT16IR175ISO-S	●	●	1.75		9.525	3.44	0.9	1.2	0.11	1.01	
	MMT16IR200ISO-S	●	●	2.0		9.525	3.44	1.0	1.3	0.13	1.15	
	MMT16IR250ISO-S	●	●	2.5		9.525	3.44	1.1	1.5	0.17	1.44	
	MMT16IR300ISO-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
	MMT16IR140UN-S	●			14	9.525	3.44	0.9	1.2	0.12	1.05	
	MMT16IR120UN-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
	MMT16IR140W-S	●			14	9.525	3.44	1.0	1.2	0.25	1.16	
	MMT16IR110W-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
	MMT16IR140BSPT-S	●			14	9.525	3.44	1.0	1.2	0.25	1.16	
	MMT16IR110BSPT-S	●			11	9.525	3.44	1.1	1.5	0.32	1.48	

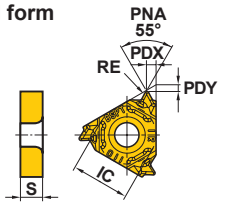












IDENTIFICATION

MMT | **16** | **I** | **R** | **100** | **ISO** – **S**

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

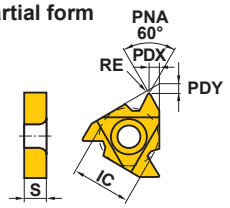
60	Partial Profile 60°
55	Partial Profile 55°
ISO	ISO Metric
W	Whitworth for BSW, BSP
BSPT	BSPT
UN	American UN

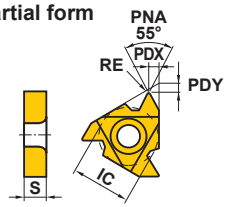
S	M-class inserts with 3-D chip breakers

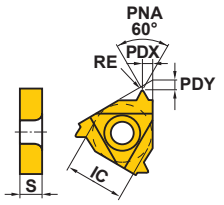
MMT G-CLASS GROUND INSERTS

INSERTS

Type	Thread Tolerance	Order Number	Coated VP10MF	Coated VP15TF	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total Cutting Depth (mm)	Geometry
Partial Profile 60°	—	MMT11IRA60	●	●	0.5—1.5	48—16	6.35	3.04	0.8	0.9	0.05	—	Partial form
		MMT16IRA60	●	●	0.5—1.5	48—16	9.525	3.44	0.8	0.9	0.05	—	
		MMT16IRG60	●	●	1.75—3.0	14—8	9.525	3.44	1.2	1.7	0.16	—	
		MMT16IRAG60	●		0.5—3.0	48—8	9.525	3.44	1.2	1.7	0.05	—	
		MMT22IRN60	●		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
		MMT16IRA55	●	●		48—16	9.525	3.44	0.8	0.9	0.05	—	
		MMT16IRG55	●	●		14—8	9.525	3.44	1.2	1.7	0.21	—	
		MMT16IRAG55	●			48—8	9.525	3.44	1.2	1.7	0.07	—	
		MMT22IRN55	●			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
		MMT11IR075ISO	●		0.75		6.35	3.04	0.6	0.6	0.04	0.43	
		MMT11IR100ISO	●	●	1.0		6.35	3.04	0.6	0.7	0.10	0.58	
		MMT11IR125ISO	●	●	1.25		6.35	3.04	0.8	0.9	0.12	0.72	
		MMT11IR150ISO	●	●	1.5		6.35	3.04	0.8	1.0	0.14	0.87	
		MMT11IR175ISO	●		1.75		6.35	3.04	0.9	1.1	0.10	1.01	
		MMT11IR200ISO	●		2.0		6.35	3.04	0.9	1.1	0.18	1.15	
		MMT16IR050ISO	●		0.5		9.525	3.44	0.6	0.4	0.03	0.29	
		MMT16IR075ISO	●		0.75		9.525	3.44	0.6	0.6	0.04	0.43	
		MMT16IR100ISO	●	●	1.0		9.525	3.44	0.6	0.7	0.10	0.58	
		MMT16IR125ISO	●	●	1.25		9.525	3.44	0.8	0.9	0.12	0.72	
		MMT16IR150ISO	●	●	1.5		9.525	3.44	0.8	1.0	0.14	0.87	
		MMT16IR175ISO	●	●	1.75		9.525	3.44	0.9	1.2	0.10	1.01	
		MMT16IR200ISO	●	●	2.0		9.525	3.44	1.0	1.3	0.18	1.15	
		MMT16IR250ISO	●	●	2.5		9.525	3.44	1.1	1.5	0.15	1.44	
		MMT16IR300ISO	●	●	3.0		9.525	3.44	1.1	1.5	0.26	1.73	
		MMT22IR350ISO	●		3.5		12.7	4.64	1.6	2.3	0.22	2.02	
		MMT22IR400ISO	●		4.0		12.7	4.64	1.6	2.3	0.25	2.31	
		MMT22IR450ISO	●		4.5		12.7	4.64	1.6	2.4	0.28	2.60	
		MMT22IR500ISO	●		5.0		12.7	4.64	1.6	2.3	0.32	2.89	







IDENTIFICATION

MMT **16** **I** **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

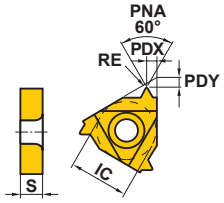
050	0.5mm	A	0.5—1.5mm or 48—16 thread/inch
075	0.75mm		
100	1.0mm		
125	1.25mm	G	1.75—3.0mm or 14—8 thread/inch
150	1.5mm		
175	1.75mm		
200	2.0mm	AG	0.5—3.0mm or 48—8 thread/inch
250	2.5mm		
300	3.0mm		
350	3.5mm	N	3.5—5.0mm or 7—5 thread/inch
400	4.0mm		
450	4.5mm		
500	5.0mm		

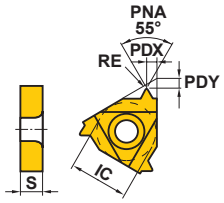
Threading Type

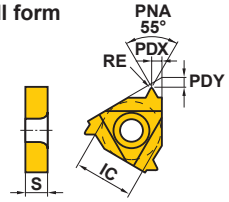
60	Partial Profile 60°
55	Partial Profile 55°
ISO	ISO Metric
W	Whitworth for BSW, BSP
BSPT	BSPT
UN	American UN
RD	Round DIN 405
TR	ISO Trapezoidal 30°
ACME	American ACME
UNJ	UNJ
APBU	API Buttress Casing
APRD	API Round Casing&Tubing
NPT	NPT
NPTF	NPTF

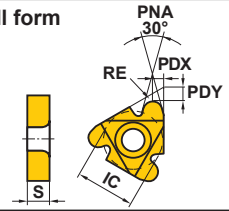
● : Inventory maintained in Japan.
(Contains 5 inserts per case.)

Type	Thread Tolerance	Order Number	Coated		Pitch		Dimensions (mm)					Total Cutting Depth (mm)	Geometry
			VP10MF	VP15TF	mm	thread/inch	IC	S	PDY	PDX	RE		
American UN	2B	MMT11IR320UN	●			32	6.35	3.04	0.6	0.6	0.04	0.46	Full form
		MMT11IR280UN	●			28	6.35	3.04	0.6	0.7	0.05	0.52	
		MMT11IR240UN	●			24	6.35	3.04	0.7	0.8	0.09	0.61	
		MMT11IR200UN	●			20	6.35	3.04	0.8	0.9	0.11	0.73	
		MMT11IR180UN	●			18	6.35	3.04	0.8	1.0	0.12	0.81	
		MMT11IR160UN	●			16	6.35	3.04	0.9	1.1	0.14	0.92	
		MMT11IR140UN	●			14	6.35	3.04	0.9	1.1	0.11	1.05	
		MMT16IR320UN	●			32	9.525	3.44	0.6	0.6	0.04	0.46	
		MMT16IR280UN	●			28	9.525	3.44	0.6	0.7	0.05	0.52	
		MMT16IR240UN	●			24	9.525	3.44	0.7	0.8	0.09	0.61	
		MMT16IR200UN	●			20	9.525	3.44	0.8	0.9	0.11	0.73	
		MMT16IR180UN	●			18	9.525	3.44	0.8	1.0	0.12	0.81	
		MMT16IR160UN	●	●		16	9.525	3.44	0.9	1.1	0.14	0.92	
		MMT16IR140UN	●	●		14	9.525	3.44	0.9	1.2	0.11	1.05	
		MMT16IR130UN	●			13	9.525	3.44	1.0	1.3	0.10	1.13	
		MMT16IR120UN	●	●		12	9.525	3.44	1.1	1.4	0.18	1.22	
		MMT16IR110UN	●			11	9.525	3.44	1.1	1.5	0.13	1.33	
		MMT16IR100UN	●			10	9.525	3.44	1.1	1.5	0.15	1.47	
		MMT16IR090UN	●			9	9.525	3.44	1.2	1.7	0.17	1.63	
		MMT16IR080UN	●			8	9.525	3.44	1.1	1.5	0.27	1.83	
		MMT22IR070UN	●			7	12.7	4.64	1.6	2.3	0.23	2.09	
		MMT22IR060UN	●			6	12.7	4.64	1.6	2.3	0.26	2.44	
		MMT22IR050UN	●			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
		MMT11IR140W	●			14	6.35	3.04	0.9	1.1	0.26	1.16	
		MMT16IR280W	●			28	9.525	3.44	0.6	0.7	0.09	0.58	
		MMT16IR260W	●			26	9.525	3.44	0.7	0.8	0.10	0.63	
		MMT16IR200W	●			20	9.525	3.44	0.8	0.9	0.18	0.81	
		MMT16IR190W	●	●		19	9.525	3.44	0.8	1.0	0.19	0.86	
		MMT16IR180W	●			18	9.525	3.44	0.8	1.0	0.20	0.90	
		MMT16IR160W	●			16	9.525	3.44	0.9	1.1	0.23	1.02	
		MMT16IR140W	●	●		14	9.525	3.44	1.0	1.2	0.26	1.16	
		MMT16IR120W	●			12	9.525	3.44	1.1	1.4	0.30	1.36	
		MMT16IR110W	●	●		11	9.525	3.44	1.1	1.5	0.33	1.48	
		MMT16IR100W	●			10	9.525	3.44	1.1	1.5	0.37	1.63	
		MMT16IR090W	●			9	9.525	3.44	1.2	1.7	0.34	1.81	
		MMT16IR080W	●			8	9.525	3.44	1.2	1.5	0.39	2.03	
		MMT22IR070W	●			7	12.7	4.64	1.6	2.3	0.46	2.32	
		MMT22IR060W	●			6	12.7	4.64	1.6	2.3	0.53	2.71	
		MMT22IR050W	●			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
		MMT11IR140BSPT	●			14	6.35	3.04	0.9	1.0	0.26	1.16	
		MMT16IR190BSPT	●	●		19	9.525	3.44	0.8	0.9	0.14	0.86	
		MMT16IR140BSPT	●	●		14	9.525	3.44	1.0	1.2	0.26	1.16	
		MMT16IR110BSPT	●	●		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
		MMT16IR080RD	●			8	9.525	3.44	1.4	1.4	0.70	1.59	
		MMT16IR060RD	●			6	9.525	3.44	1.4	1.5	0.93	2.12	
		MMT22IR040RD	●			4	12.7	4.64	2.2	2.3	1.40	3.18	





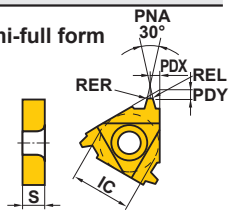


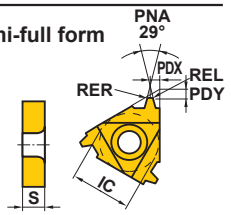


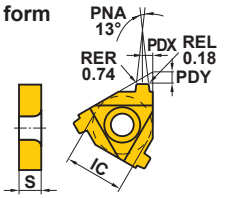
MMT G-CLASS GROUND INSERTS

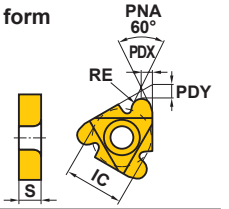
INSERTS

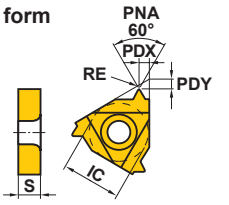
Type	Thread Tolerance	Order Number	Coated VP10MF	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE RER/L	Total Cutting Depth (mm)	Geometry
ISO Trapezoidal 30°	7H	MMT16IR150TR	●	1.5		9.525	3.44	1.0	1.1	0.08	0.90	Semi-full form
		MMT16IR200TR	●	2.0		9.525	3.44	1.1	1.3	0.15	1.25	
		MMT16IR300TR	●	3.0		9.525	3.44	1.3	1.5	0.15	1.75	
		MMT22IR400TR	●	4.0		12.7	4.64	1.7	1.9	0.15	2.25	
		MMT22IR500TR	●	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
		MMT16IR100ACME	●		10	9.525	3.44	1.2	1.3	0.08	1.52	
		MMT16IR080ACME	●		8	9.525	3.44	1.4	1.5	0.10	1.84	
		MMT22IR060ACME	●		6	12.7	4.64	1.8	2.1	0.10	2.37	
		MMT22IR050ACME	●		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	0.74/0.18	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
		MMT16IR080APRD	●		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
		MMT16IR180NPT	●		18	9.525	3.44	0.8	1.0	0.08	1.01	
		MMT16IR140NPT	●		14	9.525	3.44	0.9	1.2	0.09	1.33	
		MMT16IR115NPT	●		11.5	9.525	3.44	1.1	1.5	0.11	1.64	
		MMT16IR080NPT	●		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
		MMT16IR115NPTF	●		11.5	9.525	3.44	1.1	1.5	0.04	1.63	
		MMT16IR080NPTF	●		8	9.525	3.44	1.3	1.8	0.04	2.38	

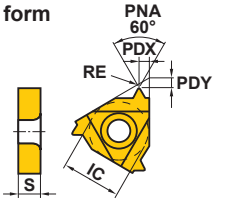










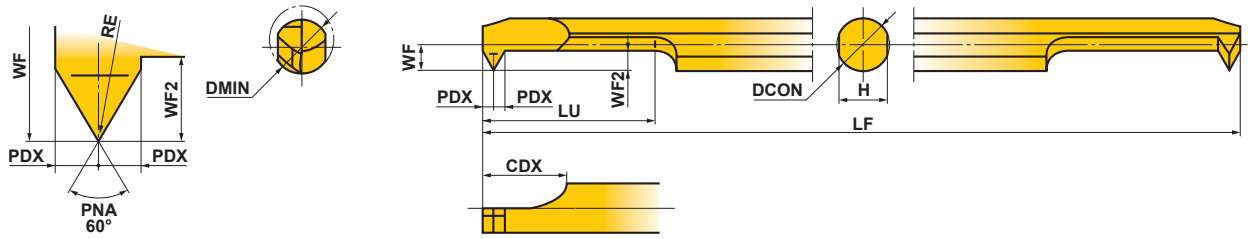


● : Inventory maintained in Japan.
(Contains 5 inserts per case.)

CUTTING DEPTH GUIDE ➤ G016

MICRO-MINI TWIN

■CT STANDARD



Order Number	Stock		Breaker	Threads				Dimensions (mm)									
	Micro-Grain Carbide	Coated		Metric Screw		Unified Coarse Screw											
	TF15	VP15TF		Thread	Pitch (mm)	Thread	Pitch (thread/inch)	DMIN	RE	DCON	LF	LU	CDX	WF	PDX	WF2	H
CT0305RS-M4	●	●	Without	≥M4	0.5—1.0	≥NO.8-32UNC	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	≥NO.8-36UNF	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	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	≥1/4-28UNF	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	24—18	**6**	0.05	5	70	11	8	2.3	1	2.2	4.5
CT05RS-M8	●	●	Without	≥M8	0.75—1.5	≥5/16-24UNF	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	24—16	**7**	0.05	6	75	11	8	2.8	1	2.2	5.4
CT06RS-M10	●	●	Without	≥M10	0.75—1.75	≥3/8-24UNF	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

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Cutting Speed (m/min)	Recommended Tool Overhang (mm)
P	Carbon Steel Alloy Steel	50 (30—80)	Micro-Mini Twin CT, LU+2(mm), Holder
M	Stainless Steel	50 (30—80)	
K	Cast Iron	50 (30—80)	
N	Non-Ferrous Metal	80 (50—100)	

Note 1) Wet cutting is recommended.
Note 2) Pay special attention to machining of small diameters at high revolutions as the feed rate cannot keep up with the speed.

■STANDARD OF DEPTH OF CUT

●The chart on the right shows the cutting depths when machining external ISO metric screw threads.

● Metric

(mm)

P(Pitch)		0.50	0.75	1.00	1.25	1.50	1.75
Total Cutting Depth		**0.29**	**0.43**	**0.58**	**0.72**	**0.87**	**1.01**
Number of Passes	1	0.06	0.06	0.07	0.07	0.07	0.07
	2	0.05	0.06	0.06	0.07	0.07	0.07
	3	0.05	0.05	0.06	0.07	0.07	0.07
	4	0.04	0.05	0.05	0.07	0.07	0.07
	5	0.03	0.04	0.05	0.06	0.06	0.07
	6	0.03	0.04	0.05	0.06	0.06	0.06
	7	0.02	0.04	0.04	0.05	0.06	0.06
	8	0.01	0.03	0.04	0.05	0.06	0.06
	9	—	0.03	0.04	0.05	0.05	0.06
	10	—	0.02	0.03	0.04	0.05	0.05
	11	—	0.01	0.03	0.04	0.05	0.05
	12	—	—	0.03	0.03	0.04	0.05
	13	—	—	0.02	0.03	0.04	0.04
	14	—	—	0.01	0.02	0.03	0.04
	15	—	—	—	0.01	0.03	0.04
	16	—	—	—	—	0.03	0.03
	17	—	—	—	—	0.02	0.03
	18	—	—	—	—	0.01	0.03
	19	—	—	—	—	—	0.03
	20	—	—	—	—	—	0.02
	21	—	—	—	—	—	0.01

● : Inventory maintained in Japan.
(MICRO-MINI TWIN is available in 1 piece in one pack.)

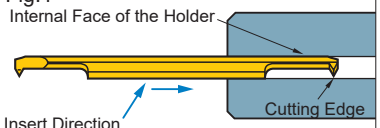
SPARE PARTS ➤P001
TECHNICAL DATA ➤Q001

■ PRECAUTIONS WHEN USING THE MICRO-MINI TWIN

●When using a holder for general purpose / small automatic lathe:

1 To avoid chipping of the 2nd cutting edge take care when inserting the boring bar into the holder. Refer to fig.1. If the 2nd edge contacts the internal face of the holder there is a possibility that it may chip.

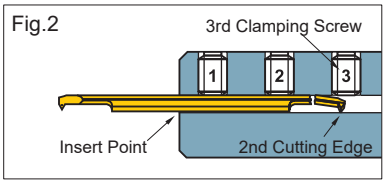
Fig.1



2 When using this type of holder, there is a possibility that damage to the shank and the 2nd cutting edge can occur. Make sure that the clamping screws are tightened to the set torque value. Additionally make sure that there is no clamping screw near the 2nd cutting edge as this can break the boring bar.

◎When using Mitsubishi holders
When using holders with a tool overhang of recommended quantity, ensure that the 3rd clamping screw is removed prior to machining. The set torque value for clamping screw is 2.0 N • m.

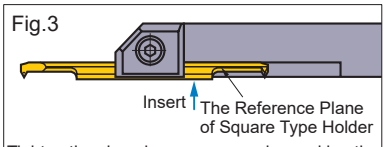
Fig.2



●When using a square type holder:

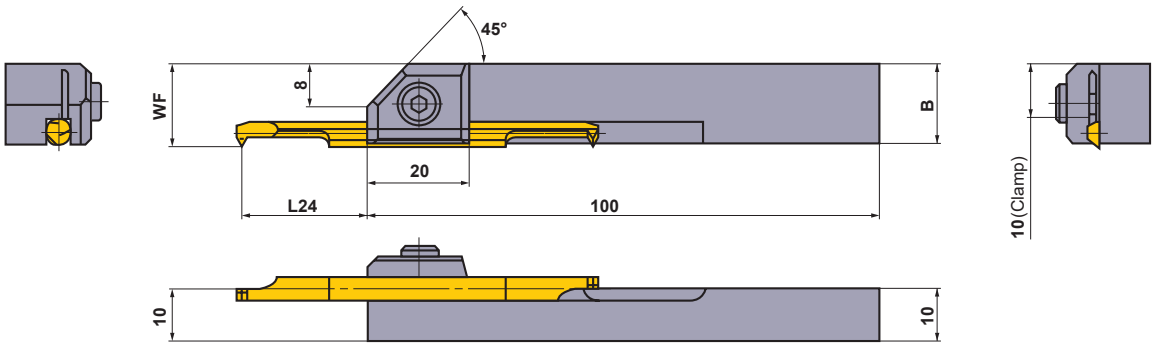
1 When installing the boring bar into the holder, tighten the clamp screws after ensuring the flats on the tool holder are parallel to the reference flats on the micro-mini bar. Refer to fig.3.
2 Make sure that the clamping screws are tightened to the recommended values.
3 Do not tighten the clamp screw without a bar in place, otherwise the bridge will be deformed.

Fig.3



Tighten the clamping screw ensuring making the micro-mini twin boring bars in contact with the reference plane of square type holder.

SQUARE TYPE HOLDER

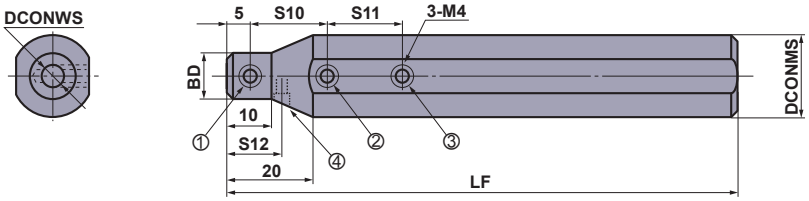


Order Number	Stock	Dimensions (mm) Micro-Mini Twin **CT** B	WF	* L24	Micro-Mini Twin **CT**	Clamp Screw	Wrench	Torque (N•m)
SBH1030R	●	13.8	13.8	13—17.5(14)	0305RS-M4, 03RS-M4(B)	HSC05012	HKY40R	9.5
SBH1040R	●	14.7	14.8	18.5—22(19.5)	0407RS-M6, 04RS-M6(B)	HSC05012	HKY40R	9.5
SBH1050R	●	15.6	15.8	24—26.5(25)	0511RS-M8, 05RS-M8(B)	HSC05012	HKY40R	9.5
SBH1060R	●	16.5	16.8	24—31.5(25)	0611RS-M10, 06RS-M10(B)	HSC05012	HKY40R	9.5

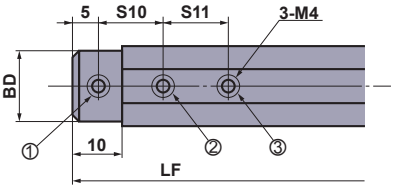
* L24 is the length of overhang for sufficient clamping, and ( ) is the recommended length for machining of carbon and alloy steel.

● : **Inventory maintained in Japan.**

ROUND TYPE HOLDER



RBH22□□N has a temporary set screw for different machine specifications.
(Represented by number 4)



RBH158□□N, RBH16□□N,
RBH190□□N

Order Number	Stock	Dimensions (mm)							Micro-Mini Twin CT	∗1 Clamp Screw				Wrench	Torque (N•m)
		DCONMS	DCONWS	BD	LF	S10	S11	S12		①	②	③	④		
RBH15830N	●	15.875	3	15	100	10	10	—	0305RS-M4, 03RS-M4(B)	A	A	A	—	HKY20F	2.0
RBH15840N	●	15.875	4	15	100	15	15	—	0407RS-M6, 04RS-M6(B)	A	A	A	—	HKY20F	2.0
RBH15850N	●	15.875	5	15	100	15	15	—	0511RS-M8, 05RS-M8(B)	A	A	A	—	HKY20F	2.0
RBH15860N	●	15.875	6	15	100	15	15	—	0611RS-M10, 06RS-M10(B)	A	A	A	—	HKY20F	2.0
RBH1630N	●	16	3	15	100	10	10	—	0305RS-M4, 03RS-M4(B)	A	A	A	—	HKY20F	2.0
RBH1640N	●	16	4	15	100	15	15	—	0407RS-M6, 04RS-M6(B)	A	A	A	—	HKY20F	2.0
RBH1650N	●	16	5	15	100	15	15	—	0511RS-M8, 05RS-M8(B)	A	A	A	—	HKY20F	2.0
RBH1660N	●	16	6	15	100	15	15	—	0611RS-M10, 06RS-M10(B)	A	A	A	—	HKY20F	2.0
∗2 RBH19030N	●	19.05	3	18	125	10	10	—	0305RS-M4, 03RS-M4(B)	B	B	B	—	HKY20F	2.0
∗2 RBH19040N	●	19.05	4	18	125	15	15	—	0407RS-M6, 04RS-M6(B)	B	B	B	—	HKY20F	2.0
∗2 RBH19050N	●	19.05	5	18	125	15	15	—	0511RS-M8, 05RS-M8(B)	B	B	B	—	HKY20F	2.0
∗2 RBH19060N	●	19.05	6	18	125	15	15	—	0611RS-M10, 06RS-M10(B)	B	B	B	—	HKY20F	2.0
RBH2030N	●	20	3	12	125	10	10	—	0305RS-M4, 03RS-M4(B)	A	A	B	—	HKY20F	2.0
RBH2040N	●	20	4	13	125	15	15	—	0407RS-M6, 04RS-M6(B)	A	B	B	—	HKY20F	2.0
RBH2050N	●	20	5	14	125	15	15	—	0511RS-M8, 05RS-M8(B)	A	B	B	—	HKY20F	2.0
RBH2060N	●	20	6	15	125	15	15	—	0611RS-M10, 06RS-M10(B)	A	B	B	—	HKY20F	2.0
RBH2230N	●	22	3	12	125	10	10	10	0305RS-M4, 03RS-M4(B)	A	B	C	A	HKY20F	2.0
RBH2240N	●	22	4	13	125	15	15	12.5	0407RS-M6, 04RS-M6(B)	A	B	B	A	HKY20F	2.0
RBH2250N	●	22	5	14	125	15	15	12.5	0511RS-M8, 05RS-M8(B)	A	B	B	A	HKY20F	2.0
RBH2260N	●	22	6	15	125	15	15	15	0611RS-M10, 06RS-M10(B)	A	B	B	A	HKY20F	2.0
RBH2530N	●	25	3	12	150	10	10	—	0305RS-M4, 03RS-M4(B)	A	B	C	—	HKY20F	2.0
RBH2540N	●	25	4	13	150	15	15	—	0407RS-M6, 04RS-M6(B)	A	C	C	—	HKY20F	2.0
RBH2550N	●	25	5	14	150	15	15	—	0511RS-M8, 05RS-M8(B)	A	C	C	—	HKY20F	2.0
RBH2560N	●	25	6	15	150	15	15	—	0611RS-M10, 06RS-M10(B)	A	C	C	—	HKY20F	2.0
RBH25430N	●	25.4	3	12	150	10	10	—	0305RS-M4, 03RS-M4(B)	A	B	C	—	HKY20F	2.0
RBH25440N	●	25.4	4	13	150	15	15	—	0407RS-M6, 04RS-M6(B)	A	C	C	—	HKY20F	2.0
RBH25450N	●	25.4	5	14	150	15	15	—	0511RS-M8, 05RS-M8(B)	A	C	C	—	HKY20F	2.0
RBH25460N	●	25.4	6	15	150	15	15	—	0611RS-M10, 06RS-M10(B)	A	C	C	—	HKY20F	2.0

∗1 Order number of clamp screw A=HSS04004, B=HSS04006, C=HSS04008
∗2 Revised order number.

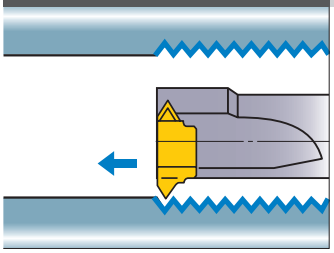
Conventional Order Number	Revised Order Number
RBH1930N	RBH19030N
RBH1940N	RBH19040N
RBH1950N	RBH19050N
RBH1960N	RBH19060N

F TYPE BORING BARS

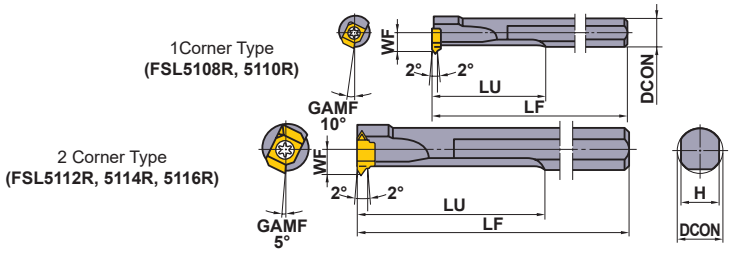
- Minimum cutting diameter 10mm.
- Screw-on type.
- Applicable to threading, grooving.
- Thread pitch 1.5—3.5mm.

FSL51

Internal threading, Grooving



Note 1) Cutting in the opposite direction is not possible.



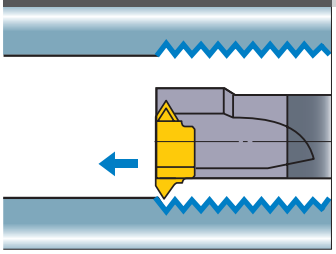
Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (mm)						*2	
	R	Threading	Grooving	DCON	LF	LU	WF	H	DMIN*1	Clamp Screw	Wrench
FSL5108R	●	MLT1001L	MLG10○○L	8	125	30	4.8	7	**10**	TS25	TKY08F
FSL5110R	●	MLT1001L	MLG10○○L	10	150	40	5.8	9	**12**	TS25	TKY08F
FSL5112R	●	MLT1401L	MLG14○○L	12	180	50	6.8	10.8	**14**	TS32	TKY08F
FSL5114R	●	MLT1401L	MLG14○○L	14	180	60	7.8	12.4	**16**	TS32	TKY08F
FSL5116R	●	MLT2001L	MLG20○○L	16	200	70	9.7	14	**20**	TS43	TKY15F

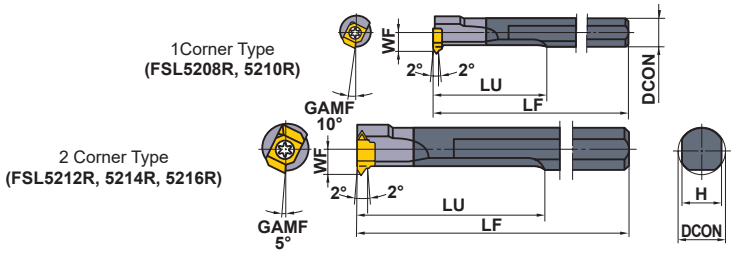
*1 DMIN : Min.Cutting Diameter
*2 Clamp Torque (N • m) : TS25=1.0, TS32=1.0, TS43=3.5

FSL52

(Carbide shank) Internal threading, Grooving



Note 1) Cutting in the opposite direction is not possible.



Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (mm)						*2	
	R	Threading	Grooving	DCON	LF	LU	WF	H	DMIN*1	Clamp Screw	Wrench
FSL5208R	●	MLT1001L	MLG10○○L	8	125	60	4.8	7	**10**	TS25	TKY08F
FSL5210R	●	MLT1001L	MLG10○○L	10	150	70	5.8	9	**12**	TS25	TKY08F
FSL5212R	●	MLT1401L	MLG14○○L	12	180	80	6.8	11	**14**	TS32	TKY08F
FSL5214R	●	MLT1401L	MLG14○○L	14	180	85	7.8	12	**16**	TS32	TKY08F
FSL5216R	●	MLT2001L	MLG20○○L	16	200	115	9.7	14	**20**	TS43	TKY15F

*1 DMIN : Min.Cutting Diameter
*2 Clamp Torque (N • m) : TS25=1.0, TS32=1.0, TS43=3.5

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
P	Mild Steel	≤180HB	**UP20M**	140 (100—180)
			UTi20T	120 (100—150)
	Carbon Steel Alloy Steel	180—280HB	**UP20M**	120 (100—150)
			UTi20T	100 (70—120)

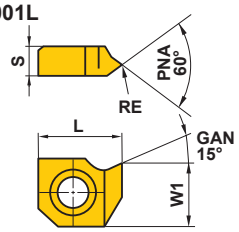
	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
M	Stainless Steel	≤200HB	**UP20M**	120 (80—150)
			UTi20T	100 (70—130)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**UP20M**	80 (60—100)
			UTi20T	80 (60—100)

● : **Inventory maintained in Japan.**
(Contains 10 inserts per case.)

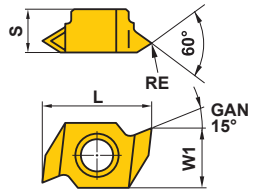
INSERTS

Type	Order Number	Coated UP20M	Carbide UTi20T	Pitch and CW (mm)	Dimensions (mm) L	W1	CDX	S	BCH	RE	Geometry
Threading	**MLT1001L**	●	●	Pitch 1.5—2.0	7	5	—	2.38	—	0.1	**MLT**
	MLT1401L	●	●	Pitch 1.5—2.5	11.8	6.5	—	4.76	—	0.1	
	MLT2001L	●	●	Pitch 1.5—3.5	16.8	9.03	—	6.35	—	0.1	
Grooving	**MLG1012L**		●	1.2	7	5	1.0	2.38	0.1	—	**MLG...L**
	MLG1015L		●	1.5	7	5	1.0	2.38	0.1	—	
	MLG1020L		●	2	7	5	1.0	2.38	0.1	—	
	MLG1415L		●	1.5	11.8	6.5	2.0	4.76	0.1	—	**MLG...L**
	MLG1420L		●	2	11.8	6.5	2.0	4.76	0.1	—	
	MLG1430L		●	3	11.8	6.5	2.0	4.76	0.1	—	
	MLG2020L		●	2	16.8	9.03	3.0	6.35	0.1	—	
	MLG2030L		●	3	16.8	9.03	3.0	6.35	0.1	—	
	MLG2040L		●	4	16.8	9.03	3.0	6.35	0.1	—	

MLT1001L



MLT1401L/2001L



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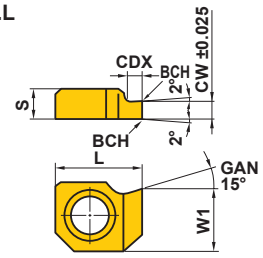
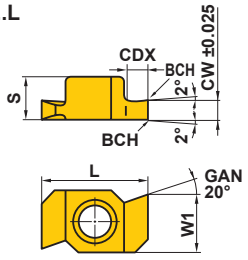


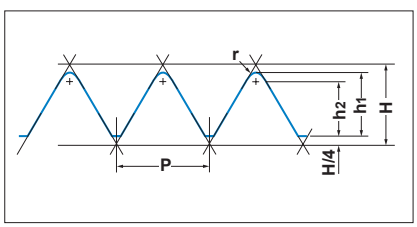
MLG...L



Note 1) Please refer to the page F145 for cutting conditions of grooving.

■STANDARD OF DEPTH OF CUT

- The chart on the right shows the cutting depths when machining external ISO metric screw threads.
- When you use cermet grades or cut stainless steel, please increase the number of passes by 2—3 times.



●METRIC SCREW THREAD

P (Pitch)		0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50
h_1		0.43	0.58	0.72	0.87	1.01	1.15	1.44	1.73	2.02
h_2		0.38	0.51	0.63	0.76	0.88	1.01	1.21	1.51	1.77
r (Corner Radius)		0.05	0.07	0.09	0.11	0.13	0.14	0.18	0.22	0.25
Number of Passes	1	0.10	0.15	0.18	0.20	0.23	0.25	0.25	0.25	0.30
	2	0.10	0.13	0.15	0.20	0.20	0.20	0.22	0.25	0.25
	3	0.10	0.10	0.12	0.15	0.20	0.15	0.20	0.22	0.22
	4	0.08	0.10	0.12	0.15	0.15	0.15	0.20	0.20	0.20
	5	0.05	0.05	0.10	0.10	0.10	0.15	0.15	0.20	0.20
	6		0.05	0.05	0.07	0.08	0.10	0.10	0.15	0.20
	7					0.05	0.10	0.10	0.12	0.15
	8						0.05	0.10	0.10	0.15
	9							0.07	0.10	0.10
	10							0.05	0.09	0.10
	11								0.05	0.10
	12									0.05

Note 1) The first pass causes a high load on the cutting edge. In order to avoid damage, keep the depth of cut to 0.4—0.5mm maximum.

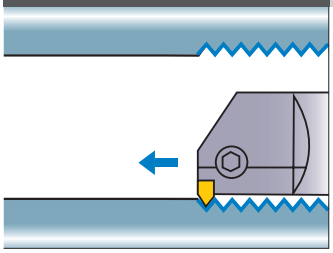
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

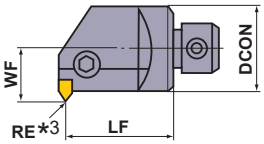
D TYPE BORING HEAD

- Minimum cutting diameter 40mm.
- Pin lock type.
- Exchangeable head type.
- Thread pitch ≤4.5mm.

DPT2

Internal threading





Right hand tool holder only.

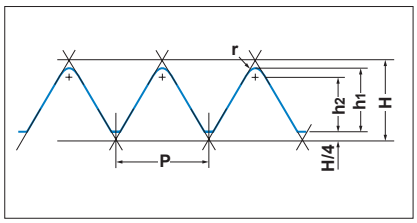
Order Number	Stock R	Insert Number	Dimensions (mm) DCON	LF	WF	DMIN*2	RE*3	Lock Pin	Lock Screw *1	Stop Ring	Wrench
DPT2132R	●	MTTL4360◌◌	32	40	20	**40**	0.1	P21S	HSP08014	E01	HKY40R
DPT2140R	●		40	50	25	**50**	0.1	P21S	HSP08014	E01	HKY40R

*1 Clamp Torque (N • m) : HSP08014=7.0
*2 DMIN : Min.Cutting Diameter
*3 Dimensions shown for insert corner RE 0.1.

G
THREADING

■STANDARD OF DEPTH OF CUT

- The chart on the right shows the cutting depths when machining external ISO metric screw threads.
- When you use cermet grades or cut stainless steel, please increase the number of passes by 2—3 times.



●METRIC SCREW THREAD

P (Pitch)		0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50	4.00	4.50
h1		0.43	0.58	0.72	0.87	1.01	1.15	1.44	1.73	2.02	2.31	2.60
h2		0.38	0.51	0.63	0.76	0.88	1.01	1.21	1.51	1.77	2.02	2.28
r (Corner Radius)		0.05	0.07	0.09	0.11	0.13	0.14	0.18	0.22	0.25	0.29	0.32
Number of Passes	1	0.10	0.15	0.18	0.20	0.23	0.25	0.25	0.25	0.30	0.30	0.35
	2	0.10	0.13	0.15	0.20	0.20	0.20	0.22	0.25	0.25	0.25	0.30
	3	0.10	0.10	0.12	0.15	0.20	0.15	0.20	0.22	0.22	0.25	0.25
	4	0.08	0.10	0.12	0.15	0.15	0.15	0.20	0.20	0.20	0.25	0.25
	5	0.05	0.05	0.10	0.10	0.10	0.15	0.15	0.20	0.20	0.23	0.25
	6		0.05	0.05	0.07	0.08	0.10	0.10	0.15	0.20	0.20	0.20
	7					0.05	0.10	0.10	0.12	0.15	0.20	0.20
	8						0.05	0.10	0.10	0.15	0.15	0.15
	9							0.07	0.10	0.10	0.15	0.15
	10							0.05	0.09	0.10	0.10	0.15
	11								0.05	0.10	0.10	0.10
	12									0.05	0.08	0.10
	13										0.05	0.10
	14											0.05

Note 1) The first pass causes a high load on the cutting edge. In order to avoid damage, keep the depth of cut to 0.4—0.5mm maximum.

RECOMMENDED CUTTING CONDITIONS

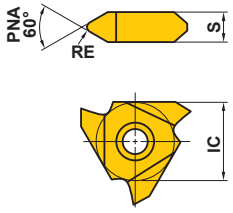
	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
P	Mild Steel	≤180HB	**UP20M**	140 (100—180)
			NX2525	200 (150—250)
			UTi20T	120 (100—150)
	Carbon Steel Alloy Steel	180—280HB	**UP20M**	120 (100—150)
			NX2525	170 (150—200)
			UTi20T	100 (70—120)

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
M	Stainless Steel	≤200HB	**UP20M**	120 (80—150)
			UTi20T	100 (70—130)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**UP20M**	80 (60—100)
			UTi20T	80 (60—100)
			HTi10	100 (70—130)

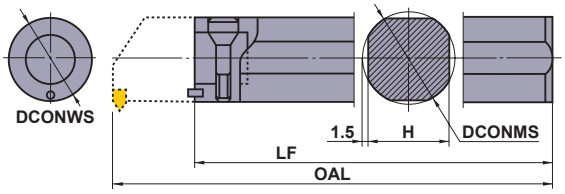
● : **Inventory maintained in Japan.**
(Contains 10 inserts per case.)

INSERTS

Type	Order Number	Class	Coated	Cermet		Carbide		ISO Pitch mm	Dimensions (mm)			Geometry
			UP20M	NX2525		UTi20T	HTi10		IC	S	RE	
Partial Profile 60°	**MTTL436001**	G	●			●	●	1.0—1.75	12.7	4.76	0.1	**MTTL(60°)**
	MTTL436002	G		●		●		2.0—2.5	12.7	4.76	0.2	
	MTTL436003	G		●		●		3.0—3.5	12.7	4.76	0.3	

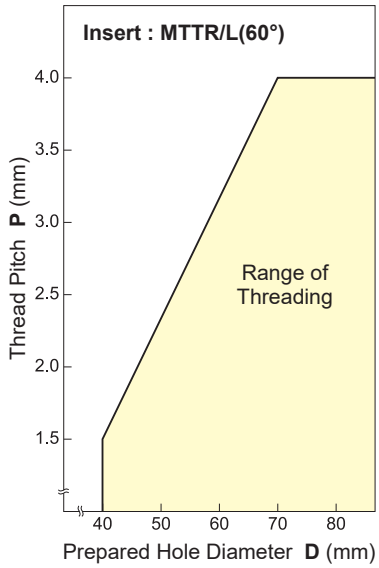


STANDARD ARBOR FOR D TYPE BORING HEAD



Order Number	Stock	Dimensions (mm)					Set Bolt	Wrench	Head
		DCONWS	DCONMS	LF	H	OAL			
B13232	●	32	32	260	29	300	SD32	HKY60R	DPT2132R
B14040	●	40	40	310	37	360	SD40	HKY60R	DPT2140R

■RANGE OF MACHINING



SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001