



# TORNEADO

# ROSCADO

|                                                    |      |
|----------------------------------------------------|------|
| CLASIFICACION (ROSCADO EXTERIOR) .....             | G002 |
| CLASIFICACION (ROSCADO INTERNO) .....              | G003 |
| CROSS REFERENCE PARA PASOS DE ROSCA                |      |
| EXTERNA .....                                      | G004 |
| INTERNA .....                                      | G006 |
| ROSCA ESTANDAR Y PORTA INSERTO CORRESPONDIENTE ... | G008 |
| ROSCA PARA TUBO Y SELECCIÓN DE LA HERRAMIENTA ...  | G009 |

## HERRAMIENTAS PARA ROSCADO ESTÁNDAR

### SERIE MMT

|                                  |      |
|----------------------------------|------|
| CARACTERISTICAS .....            | G010 |
| CONDICIONES DE CORTE .....       | G012 |
| PROFUNDIDAD DE CORTE ESTANDAR... | G014 |

### ROSCADO EXTERIOR

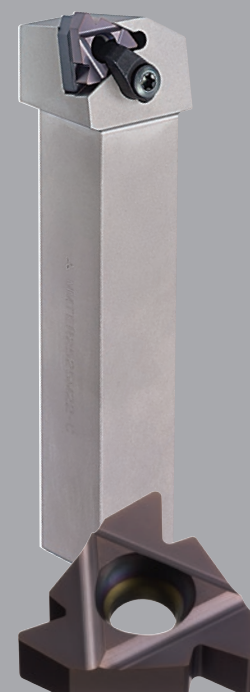
|                                    |      |
|------------------------------------|------|
| PORTAHERRAMIENTA <b>MMTE</b> ..... | G021 |
|------------------------------------|------|

### ROSCADO INTERNO

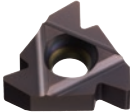
|                                            |      |
|--------------------------------------------|------|
| BARRA TIPO <b>MMTI</b> .....               | G026 |
| BARRA TIPO <b>FSL5</b> .....               | G031 |
| BARRA TIPO <b>SL5N</b> .....               | G032 |
| MICRO-MINI TWIN(CT) BARRA DE MANDRINAR ... | G034 |

\*Organizado por orden alfabetico.

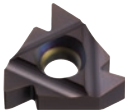
|      |                         |
|------|-------------------------|
| G034 | CT                      |
| G031 | FSL51                   |
| G031 | FSL52                   |
| G033 | MLG (INSERTOS INTERNOS) |
| G033 | MLT (INSERTOS INTERNOS) |
| G022 | MMT (INSERTOS EXTERIOR) |
| G027 | MMT (INSERTOS INTERNOS) |
| G021 | MMTE                    |
| G026 | MMTI                    |
| G032 | S-SL5N                  |



# CLASIFICACION (ROSCADO EXTERIOR)

| Nombre del Portaherramienta                                                                                                                                                                                         | Tipo del Inserto                                                                  | Características                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Portaherramienta <b>MMTE</b></p>  <p> G021</p> |  | <ul style="list-style-type: none"><li>● Existen varios tipos de insertos.</li><li>● Inserto de precisión para roscas precisas.</li><li>● Disponible con un rompevirutas para el control de la viruta.</li><li>● Posibilidad de cambiar el ángulo de ataque reemplazando el asiento.</li></ul> |

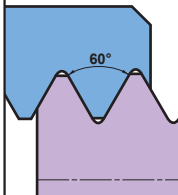
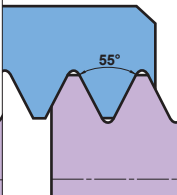
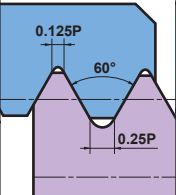
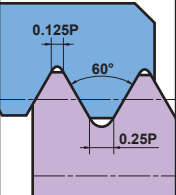
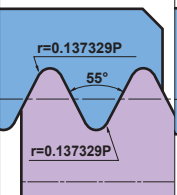
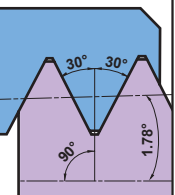
# CLASIFICACION (ROSCADO INTERNO)

| Nombre de la barra                                                                                                                                                                                                                                                                                                   | Tipo del Inserto | Características                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>MMTI</b><br><b>MICRO-MINI TWIN</b><br><br><br>                 |                  | <ul style="list-style-type: none"> <li>● Mínimo diámetro de corte .500 plgs.</li> <li>● Existen varios tipos de insertos.</li> <li>● Inserto de precisión para roscas precisas.</li> <li>● Disponible con un rompevirutas para el control de la viruta.</li> <li>● Posibilidad de cambiar el ángulo de ataque remplazando el asiento.</li> </ul> |
| <b>FSL5</b><br><b>S-SL5</b><br><b>MICRO-MINI TWIN</b><br><br><br> |                  | <ul style="list-style-type: none"> <li>● Tipo de sujeción con tornillo.</li> <li>● Inserto de precisión.</li> <li>● El portaherramienta es capaz de realizar copiado, ranurado y roscado.</li> <li>● Máxima Profundidad de Ranura .118 plgs.</li> </ul>                                                                                          |
| <b>Barras de Roscado</b><br><b>MICRO-MINI TWIN</b><br><br>                                                                                      | —                | <ul style="list-style-type: none"> <li>● Tipo de Carburo Sólido.</li> <li>● Económico debido a que es un portaherramienta con dos filos de corte.</li> </ul>                                                                                                                                                                                     |
| <b>Barra de Mandrinado/Roscado</b><br><b>MICRO-MINI</b><br><br>                                                                                | —                | <ul style="list-style-type: none"> <li>● Tipo de Carburo Sólido.</li> <li>● El filo de corte puede ser afilado de acuerdo con la aplicación.</li> </ul>                                                                                                                                                                                          |

G

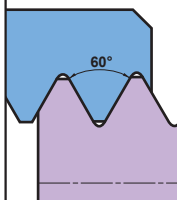
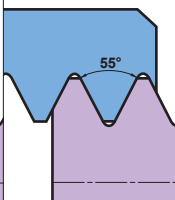
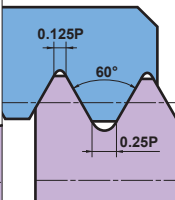
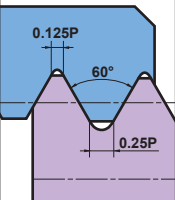
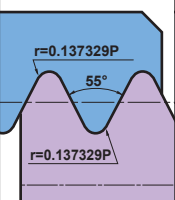
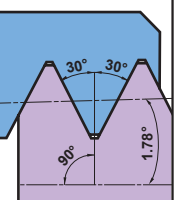
ROSCADO

CROSS REFERENCE PARA PASOS DE ROSCA (EXTERNA)

| Aplicación                                                                                                                                               |                | Maquinado general                                                                 |                                                                                   |                                                                                    |                                                                                     | Ajuste de tubos y coples para gas y agua                                            |                                                                                     |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
| Tipo                                                                                                                                                     |                | Perfil parcial a 60°                                                              | Perfil parcial a 55°                                                              | ISO Métrica                                                                        | Americana UN                                                                        | Rosca paralela para tubo Whitworth para BSW y BSP                                   | Americana NPT                                                                       |  |
|                                                                                                                                                          |                |  |  |  |  |  |  |  |
| Símbolo                                                                                                                                                  |                | M<br>UNC<br>UNF                                                                   | W                                                                                 | M                                                                                  | UNC<br>UNF                                                                          | G(PF)<br>W                                                                          | NPT                                                                                 |  |
| Paso                                                                                                                                                     |                | mm<br>(hilos/plg)                                                                 | hilos/plg                                                                         | mm                                                                                 | hilos/plg                                                                           | hilos/plg                                                                           | hilos/plg                                                                           |  |
| Portaherramienta                                                                                                                                         |                |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |  |
| <div>Portaherramienta<br/><b>MMT</b></div> <div></div> <div>G021</div> | Forma completa | —                                                                                 | —                                                                                 | 0.5 2.5<br>0.75 3.0<br>1.0 3.5<br>1.25 4.0<br>1.5 4.5<br>1.75 5.0<br>2.0           | 32 12<br>28 11<br>24 10<br>20 9<br>18 8<br>16 7<br>14 6<br>13 5                     | 28 11<br>26 10<br>20 9<br>19 8<br>18 7<br>16 6<br>14 5<br>12                        | 27<br>18<br>14<br>11.5<br>8                                                         |  |
|                                                                                                                                                          | Forma parcial  | 0.5 –1.5(48–16)<br>1.75–3.0(14– 8)<br>0.5 –3.0(48– 8)<br>3.5 –5.0(07– 5)          | 48–16<br>14– 8<br>48– 8<br>7– 5                                                   | 0.5 –1.5<br>1.75–3.0<br>0.5 –3.0<br>3.5 –5.0                                       | 48–16<br>14– 8<br>48– 8<br>7– 5                                                     | —                                                                                   | —                                                                                   |  |

| Tubos de rocío,<br>gas y agua       |                             | Acoplamiento de<br>tubos para la industria<br>alimenticia y de bomberos | Transmisión del movimiento      |                         | Aeroespacial                             | Gas y aceite                       |                                          |
|-------------------------------------|-----------------------------|-------------------------------------------------------------------------|---------------------------------|-------------------------|------------------------------------------|------------------------------------|------------------------------------------|
| Roscas para<br>tubo cónicas<br>BSPT | Americana<br>NPTF           | Redondo norma<br>DIN 405                                                | Trapezoidal<br>30° norma<br>ISO | Americana<br>ACME       | UNJ                                      | Cuerda para<br>carcasa tipo<br>API | Cuerda redonda<br>para carcasa y<br>tubo |
|                                     |                             |                                                                         |                                 |                         |                                          |                                    |                                          |
| BSPT<br>R(PT)<br>Rc(PS)<br>Rp       | NPTF                        | Rd                                                                      | Tr<br>(TM)                      | ACME<br>(Tw)            | UNJ                                      | BCSG                               | CSG<br>LCSG                              |
| hilos/plg                           | hilos/plg                   | hilos/plg                                                               | mm                              | hilos/plg               | hilos/plg                                | hilos/plg                          | hilos/plg                                |
| 28<br>19<br>14<br>11                | 27<br>18<br>14<br>11.5<br>8 | 10<br>8<br>6<br>4                                                       | 1.5<br>2.0<br>3.0<br>4.0<br>5.0 | 12<br>10<br>8<br>6<br>5 | 32 16<br>28 14<br>24 12<br>20 10<br>18 8 | 5                                  | 10<br>8                                  |
| —                                   | —                           | —                                                                       | —                               | —                       | —                                        | —                                  | —                                        |

# CROSS REFERENCE PARA PASOS DE ROSCA (INTERNA)

| Aplicación                                                                                                                                                                                                                 |                | Maquinado general                                                                 |                                                                                   |                                                                                   |                                                                                     | Ajuste de tubos y coples para gas y agua                                            |                                                                                     |   |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---|--|
| Tipo                                                                                                                                                                                                                       |                | Perfil parcial a 60°                                                              | Perfil parcial a 55°                                                              | ISO Métrica                                                                       | Americana UN                                                                        | Rosca paralela para tubo Whitworth para BSW y BSP                                   | Americana NPT                                                                       |   |  |
|                                                                                                                                                                                                                            |                |  |  |  |  |  |  |   |  |
| Símbolo                                                                                                                                                                                                                    |                | M<br>UNC<br>UNF                                                                   | W                                                                                 | M                                                                                 | UNC<br>UNF                                                                          | G(PF)<br>W                                                                          | NPT                                                                                 |   |  |
| Paso                                                                                                                                                                                                                       |                | mm<br>(hilos/plg)                                                                 | hilos/plg                                                                         | mm                                                                                | hilos/plg                                                                           | hilos/plg                                                                           | hilos/plg                                                                           |   |  |
| <div>Portaherramienta</div> <div>Barras de mandrinado</div> <div><b>MMT</b></div> <div></div> <div><b>G026</b></div>                     | Forma completa | —                                                                                 | —                                                                                 | 0.5 2.5<br>0.75 3.0<br>1.0 3.5<br>1.25 4.0<br>1.5 4.5<br>1.75 5.0<br>2.0          | 32 12<br>28 11<br>24 10<br>20 9<br>18 8<br>16 7<br>14 6<br>13 5                     | 28 11<br>26 10<br>20 9<br>19 8<br>18 7<br>16 6<br>14 5<br>12                        | 27<br>18<br>14<br>11.5<br>8                                                         |   |  |
|                                                                                                                                                                                                                            | Forma parcial  | 0.5 -1.5(48-16)<br>1.75-3.0(14- 8)<br>0.5 -3.0(48- 8)<br>3.5 -5.0(07- 5)          | 48-16<br>14- 8<br>48- 8<br>7- 5                                                   | 0.5 -1.5<br>1.75-3.0<br>0.5 -3.0<br>3.5 -5.0                                      | 48-16<br>14- 8<br>48- 8<br>7- 5                                                     | —                                                                                   | —                                                                                   |   |  |
| <div>Barras de mandrinado</div> <div><b>FSL5</b></div> <div><b>SL5N</b></div> <div></div> <div><b>G031</b></div> <div><b>G032</b></div> |                | Forma parcial                                                                     | 1.5-2.0(16-13)<br>1.5-2.5(16-11)<br>1.5-3.5(16- 7)                                | —                                                                                 | 1.5-2.0<br>1.5-2.5<br>1.5-3.5                                                       | 16-13<br>16-11<br>16- 7                                                             | —                                                                                   | — |  |
| <div><b>MICRO-MINI TWIN</b></div> <div></div> <div><b>G034</b></div>                                                                    |                | Forma parcial                                                                     | 0.5 -1.0 (36-24)<br>0.75-1.25(28-20)<br>0.75-1.5 (24-18)<br>0.75-1.75(24-16)      | —                                                                                 | 0.5 -1.0<br>0.75-1.25<br>0.75-1.5<br>0.75-1.75                                      | 36-24<br>28-20<br>24-18<br>24-16                                                    |                                                                                     |   |  |

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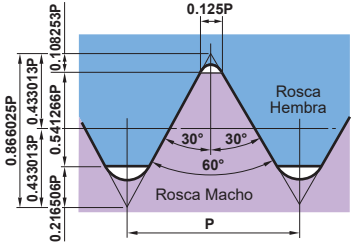
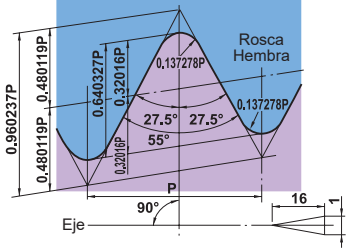
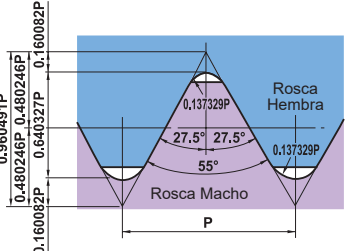
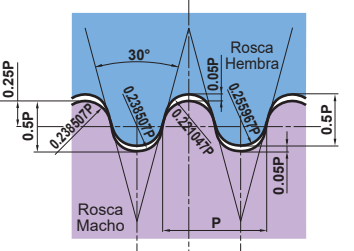
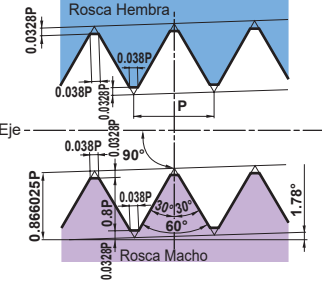
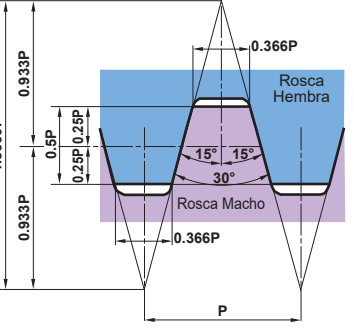
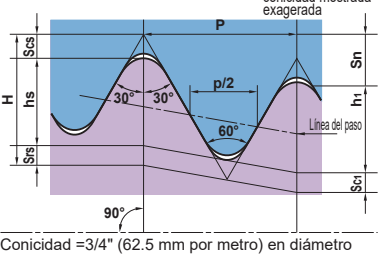
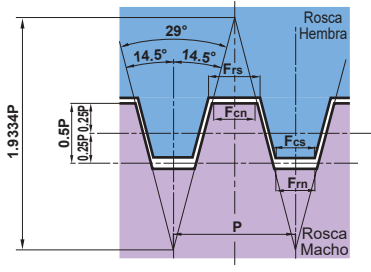
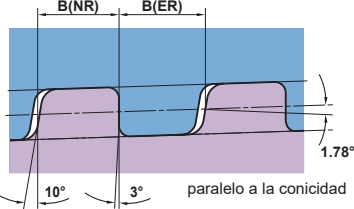
ROSCADO

| Tubos de rocío,<br>gas y agua       |                   | Acoplamiento de<br>tubos para la industria<br>alimenticia y de bomberos | Transmisión del movimiento      |                         | Aeroespacial | Gas y aceite                       |                                          |
|-------------------------------------|-------------------|-------------------------------------------------------------------------|---------------------------------|-------------------------|--------------|------------------------------------|------------------------------------------|
| Roscas para<br>tubo cónicas<br>BSPT | Americana<br>NPTF | Redondo norma<br>DIN 405                                                | Trapezoidal<br>30° norma<br>ISO | Americana<br>ACME       | UNJ          | Cuerda para<br>carcasa tipo<br>API | Cuerda redonda<br>para carcasa y<br>tubo |
|                                     |                   |                                                                         |                                 |                         |              |                                    |                                          |
| BSPT<br>R(PT)<br>Rc(PS)<br>Rp       | NPTF              | Rd                                                                      | Tr<br>(TM)                      | ACME<br>(Tw)            | UNJ          | BCSG                               | CSG<br>LCSG                              |
| hilos/plg                           | hilos/plg         | hilos/plg                                                               | mm                              | hilos/plg               | hilos/plg    | hilos/plg                          | hilos/plg                                |
| 19<br>14<br>11                      | 14<br>11.5<br>8   | 10<br>8<br>6<br>4                                                       | 1.5<br>2.0<br>3.0<br>4.0<br>5.0 | 12<br>10<br>8<br>6<br>5 | *<br><br>—   | 5                                  | 10<br>8                                  |
| —                                   | —                 | —                                                                       | —                               | —                       | —            | —                                  | —                                        |
| —                                   | —                 | —                                                                       | —                               | —                       | —            | —                                  | —                                        |
| —                                   | —                 | —                                                                       | —                               | —                       | —            | —                                  | —                                        |

\* Cuando maquina una cuerda interna UNJ, Realice un barrenado interno de diámetro apropiado y después machine una cuerda UN a 60°. Aquí un inserto de forma completa no puede ser utilizado.



# INSERTO CORRESPONDIENTE PARA ROSCA ESTANDAR

| Nombre de la cuerda                            | Tipo de rosca estándar                                                              | Símbolo         | Nombre de la cuerda       | Tipo de rosca estándar                                                               | Símbolo                               |
|------------------------------------------------|-------------------------------------------------------------------------------------|-----------------|---------------------------|--------------------------------------------------------------------------------------|---------------------------------------|
| ISO en mm / Cuerda UN                          |    | M<br>UNC<br>UNF | BSPT                      |    | BSPT<br>R<br>(PT)<br>Rc<br>(PS)<br>Rp |
| Rosca cilíndrica paralela Para Cuerda BSW, BSP |    | W<br>G<br>(PF)  | Redondo norma DIN 405     |    | Rd                                    |
| Cuerda NPT                                     |  | NPT             | Trapezoidal 30° norma ISO |   | Tr<br>(TM)                            |
| Cuerda redonda para carcasa y tubo             |  | CSG<br>LCSG     | Cuerda ACME               |  | ACME<br>(Tw)                          |
| Cuerda para carcasa tipo API                   |  | BCSG            |                           |                                                                                      |                                       |

# ROSCAS PARA TUBO Y SELECCION DE HERRAMIENTA

## ● Roscas para tubo cónicas G (PF)

| Tipo de Rosca | Número de hilos | Diámetro interno estándar |
|---------------|-----------------|---------------------------|
| G1/16         | 28              | .258"                     |
| G1/8          |                 | .337"                     |
| G1/4          | 19              | .451"                     |
| G3/8          |                 | .589"                     |
| G1/2          | 14              | .734"                     |
| G5/8          |                 | .811"                     |
| G3/4          |                 | .949"                     |
| G7/8          |                 | 1.098"                    |
| G1            | 11              | 1.193"                    |
| G1-1/8        |                 | 1.376"                    |
| G1-1/4        |                 | 1.534"                    |

Nota 1) Igual como PF

## ● Roscas para tubo cónicas R(PT), Rc(PS)

| Tipo de Rosca | Número de hilos | Diámetro interno estándar |
|---------------|-----------------|---------------------------|
| R1/16         | 28              | .258"                     |
| R1/8          |                 | .337"                     |
| R1/4          | 19              | .451"                     |
| R3/8          |                 | .589"                     |
| R1/2          | 14              | .734"                     |
| —             | —               | —                         |
| R3/4          | 14              | .949"                     |
| —             | —               | —                         |
| R1            | 11              | 1.193"                    |
| —             | —               | —                         |
| R1-1/4        | 11              | 1.534"                    |

Nota 1) Iguales que PT y Rc

· El paso es predeterminado para cada diámetro nominal. Observe el diámetro mínimo de maquinado especialmente cuando el roscado es interno

G

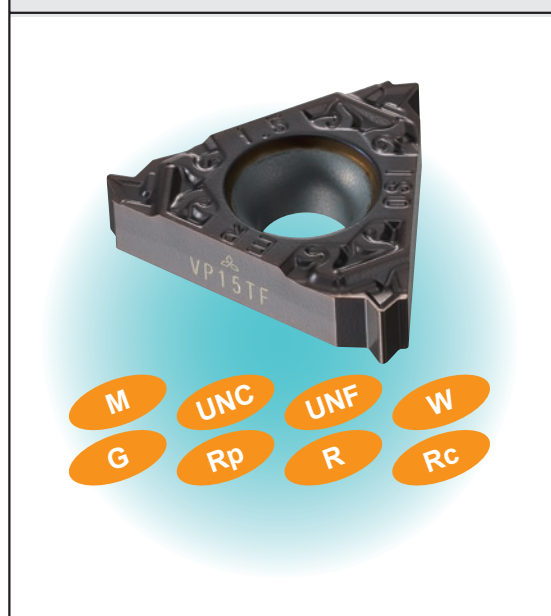
ROSCADO

# CARACTERISTICAS DE LA SERIE MMT

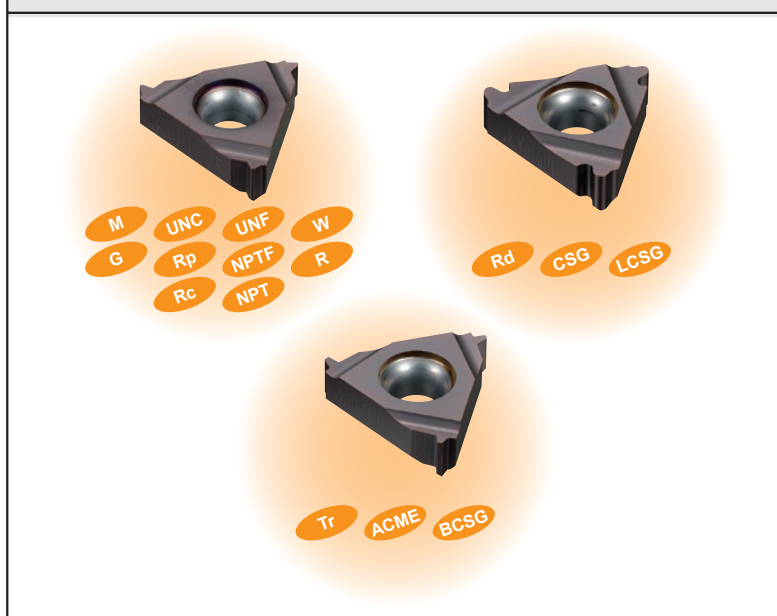
## ■ UNA AMPLIA VARIEDAD DE OPCIONES

La serie Mitsubishi Miracle tiene 297 insertos y 23 porta insertos

### INSERTO CLASE M CON ROMPEVIRUTAS 3-D

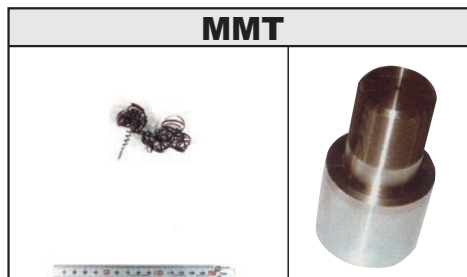
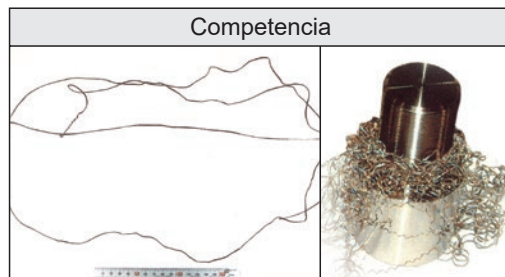


### INSERTOS CLASE G PARA ROSCADO



## ■ CONTROL DE VIRUTA IDEAL INCLUSO EN LA ULTIMA MITAD DE LAS PASADAS CUANDO NORMALMENTE SE PRODUCEN VIRUTAS CONTINUAS. (INSERTO CLASE M CON ROMPEVIRUTAS 3-D)

Paso externo métrico de 1.5 mm de la rosca ISO Pasada final (6 ta pasada)



<Condiciones de Corte>

Material : AISI 4140

Inserto : MMT16ER150ISO-S

Grado : VP15TF

Velocidad de Corte : 395 SFM

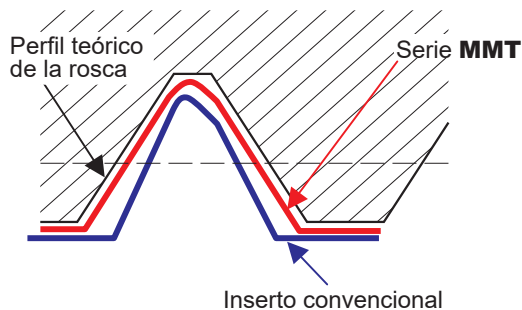
Método de corte : Avance radial

Prof de Corte : Area de corte fija

Pasada : 6 veces

Refrigerante : Con refrigerante

## ■ UN NIVEL DE PRECISION MAYOR A LOS INSERTOS CONVENCIONALES (INSERTOS CLASE G PARA ROSCADO)

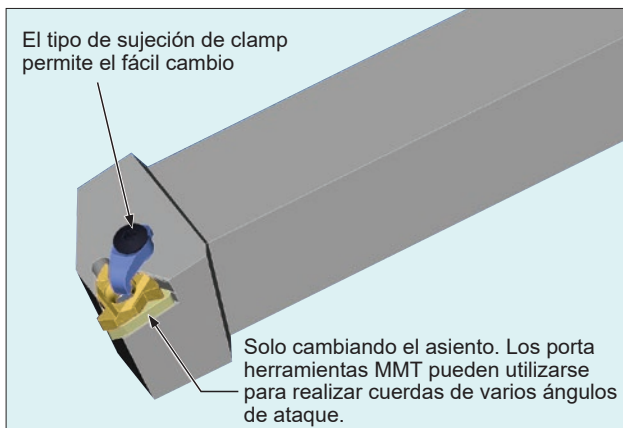


Se puede alcanzar un roscado de alta precisión utilizando insertos MMT los cuales tienen una cara positiva y un filo de corte periférico.

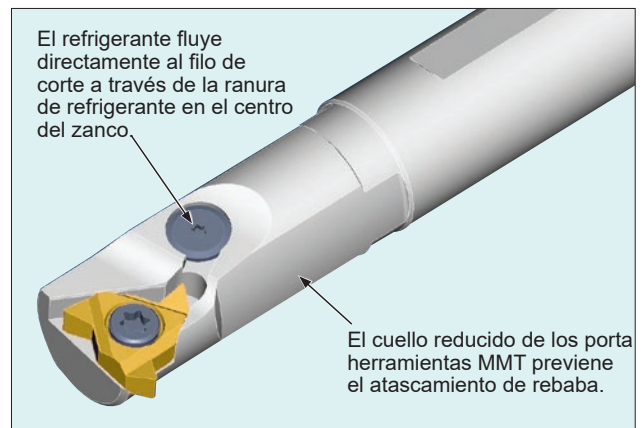
| Tipo de Rosca                      | Tolerancia de roscado |
|------------------------------------|-----------------------|
| ISO en mm                          | 6g / 6H               |
| Cuerda UN                          | 2A / 2B               |
| Para Cuerda BSW, BSP               | Clase media A         |
| BSPT                               | Estándar norma BSPT   |
| Redondo norma DIN 405              | 7h / 7H               |
| Trapezoidal 30° norma ISO          | 7e / 7H               |
| Cuerda ACME                        | 3G                    |
| UNJ                                | 3A                    |
| Cuerda para carcasa tipo API       | Estándar norma API    |
| Cuerda redanda para carcasa y tubo | Estándar norma API RD |
| Cuerda NPT                         | Estándar norma NPT    |
| Cuerda NPTF                        | Clase 2               |

## ■ PORTAHERRMIENTA (Con tratamiento superficial especial)

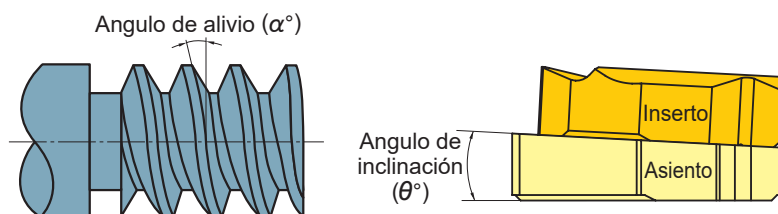
### Exterior



### Interno



## ■ RECOMENDADO PARA ROSCAS CON ANGULOS DE ENTRADA LARGOS



Solo cambiando el asiento. Los porta herramientas MMT pueden utilizarse para torneado o roscado con varios ángulos de ataque incluso el torneado de roscas izquierdas.

| Angulo de alivio ( $\alpha^\circ$ ) | Angulo de inclinación ( $\theta^\circ$ ) |
|-------------------------------------|------------------------------------------|
| -1.5°                               | -3°                                      |
| -0.5°                               | -2°                                      |
| 0.5°                                | -1°                                      |
| 1.5°                                | 0°                                       |
| 2.5°                                | 1°                                       |
| 3.5°                                | 2°                                       |
| 4.5°                                | 3°                                       |

El asiento se entrega con el porta inserto.

## ■ GRADO

### VP10MF (Únicamente inserto con filo clase-G)

#### ● Resistencia superior al desgaste y a la deformación plástica

- Alta resistencia al desgaste y a la deformación plástica para el roscado cuando es importante conservar la forma de la cuerda. Recomendado para maquinados continuos de alta precisión con una vida de corte larga.
- Efectivo en combinación con insertos clase G para un roscado de alta precisión.

### VP15TF (MMT insertos clase G para roscado, Insertos clase M con rompeviruta 3-D)

#### ● Amplia versatilidad

- Alta resistencia a la fractura durante aplicaciones de baja rigidez tales como en el maquinado de una barra. Capaz de soportar condiciones severas durante largos periodos donde insertos convencionales son susceptibles a la ruptura.
- Combinación efectiva de insertos clase M de alto desempeño con rompe virutas 3-D.

### VP20RT (Insertos clase M con rompeviruta 3-D)

#### ● Excelente resistencia a la fractura

- Recomendado para el mandrinado de aceros inoxidables y maquinados inestables donde los insertos son vulnerables a la fractura.
- Combinación efectiva de insertos clase M de alto desempeño con rompe virutas 3-D.

## ■ ELIGIENDO INSERTOS CLASE M CON ROMPE VIRUTAS 3-D O INSERTOS CLASE G

| Inserto                             | Control de viruta. | Precisión de Rosca |
|-------------------------------------|--------------------|--------------------|
| Inserto clase M con rompeviruta 3-D | ○                  | ○                  |

| Inserto         | Control de viruta. | Precisión de Rosca |
|-----------------|--------------------|--------------------|
| Inserto clase-G | ○                  | ○                  |

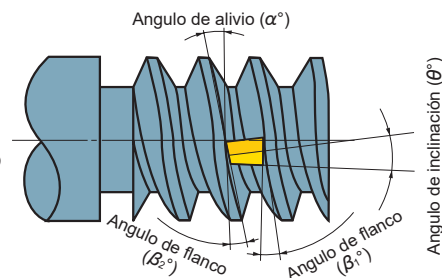
- Para un control de viruta ideal y un alto desempeño, se recomienda el uso de insertos clase M con rompevirutas 3-D
- Se recomiendan insertos clase- G cuando se requiera una precisión mas alta

# CONDICIONES DE CORTE RECOMENDADAS PARA LA SERIE MMT

## SELECCIÓN DEL ASIENTO PARA LA SERIE MMT

### ■ ANGULO DE FLANCO Y ÁNGULO DE ALIVIO

El ángulo de alivio ( $\alpha$ ) depende de una combinación de diámetro y paso de la rosca. Seleccione un asiento de tal manera que el ángulo de alivio de la rosca coincida con el ángulo de flanco de la rosca y del inserto ( $\beta_1, \beta_2$ ). No es necesario reemplazar un asiento para roscado general en un portaherramienta MMT. Cuando se hace una rosca en un diámetro pequeño o con paso grande, cambie el asiento dependiendo del ángulo de alivio, consultando la siguiente tabla y gráfica. Cuando se maquinen cuerdas izquierdas, utilice un asiento con ángulo de inclinación negativo.



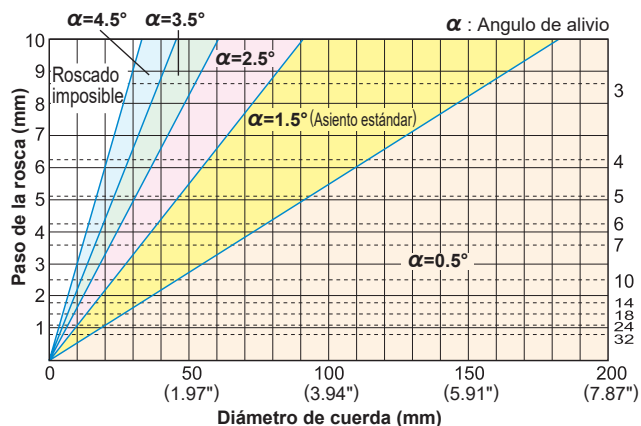
### ■ TABLA DE REFERENCIA DEL ASIENTO (DIÁMETRO DE ROSCADO) (Ángulo de roscado 60° y 55°)

| Ángulo de alivio | Rosca derecha (mm) |                         |                         |                         |                         |                  | Rosca izquierda (mm) * |                         |                  |
|------------------|--------------------|-------------------------|-------------------------|-------------------------|-------------------------|------------------|------------------------|-------------------------|------------------|
|                  | Roscado imposible  | 4.5°                    | 3.5°                    | 2.5°                    | 1.5°                    | 0.5°             | Roscado imposible      | -1.5°                   | -0.5°            |
| Paso (mm)        |                    |                         |                         |                         |                         |                  |                        |                         |                  |
| 0.5              | $\leq \phi 1.7$    | $\phi 1.7 - \phi 2.3$   | $\phi 2.3 - \phi 3.0$   | $\phi 3.0 - \phi 4.6$   | $\phi 4.6 - \phi 9.1$   | $\geq \phi 9.1$  | $\leq \phi 3.6$        | $\phi 3.6 - \phi 9.1$   | $\geq \phi 9.1$  |
| 0.75             | $\leq \phi 2.5$    | $\phi 2.5 - \phi 3.4$   | $\phi 3.4 - \phi 4.6$   | $\phi 4.6 - \phi 6.8$   | $\phi 6.8 - \phi 13.7$  | $\geq \phi 13.7$ | $\leq \phi 5.5$        | $\phi 5.5 - \phi 13.7$  | $\geq \phi 13.7$ |
| 1                | $\leq \phi 3.3$    | $\phi 3.3 - \phi 4.6$   | $\phi 4.6 - \phi 6.1$   | $\phi 6.1 - \phi 9.1$   | $\phi 9.1 - \phi 18.2$  | $\geq \phi 18.2$ | $\leq \phi 7.3$        | $\phi 7.3 - \phi 18.2$  | $\geq \phi 18.2$ |
| 1.25             | $\leq \phi 4.1$    | $\phi 4.1 - \phi 5.7$   | $\phi 5.7 - \phi 7.6$   | $\phi 7.6 - \phi 11.4$  | $\phi 11.4 - \phi 22.8$ | $\geq \phi 22.8$ | $\leq \phi 9.1$        | $\phi 9.1 - \phi 22.8$  | $\geq \phi 22.8$ |
| 1.5              | $\leq \phi 5.0$    | $\phi 5.0 - \phi 6.8$   | $\phi 6.8 - \phi 9.1$   | $\phi 9.1 - \phi 13.7$  | $\phi 13.7 - \phi 27.4$ | $\geq \phi 27.4$ | $\leq \phi 10.9$       | $\phi 10.9 - \phi 27.4$ | $\geq \phi 27.4$ |
| 1.75             | $\leq \phi 5.8$    | $\phi 5.8 - \phi 8.0$   | $\phi 8.0 - \phi 10.6$  | $\phi 10.6 - \phi 16.0$ | $\phi 16.0 - \phi 31.9$ | $\geq \phi 31.9$ | $\leq \phi 12.8$       | $\phi 12.8 - \phi 31.9$ | $\geq \phi 31.9$ |
| 2                | $\leq \phi 6.6$    | $\phi 6.6 - \phi 9.1$   | $\phi 9.1 - \phi 12.1$  | $\phi 12.1 - \phi 18.2$ | $\phi 18.2 - \phi 36.5$ | $\geq \phi 36.5$ | $\leq \phi 14.6$       | $\phi 14.6 - \phi 36.5$ | $\geq \phi 36.5$ |
| 2.5              | $\leq \phi 8.3$    | $\phi 8.3 - \phi 11.4$  | $\phi 11.4 - \phi 15.2$ | $\phi 15.2 - \phi 22.8$ | $\phi 22.8 - \phi 45.6$ | $\geq \phi 45.6$ | $\leq \phi 18.2$       | $\phi 18.2 - \phi 45.6$ | $\geq \phi 45.6$ |
| 3                | $\leq \phi 9.9$    | $\phi 9.9 - \phi 13.7$  | $\phi 13.7 - \phi 18.2$ | $\phi 18.2 - \phi 27.3$ | $\phi 27.3 - \phi 54.7$ | $\geq \phi 54.7$ | $\leq \phi 21.9$       | $\phi 21.9 - \phi 54.7$ | $\geq \phi 54.7$ |
| 3.5              | $\leq \phi 11.6$   | $\phi 11.6 - \phi 15.9$ | $\phi 15.9 - \phi 21.3$ | $\phi 21.3 - \phi 31.9$ | $\phi 31.9 - \phi 63.8$ | $\geq \phi 63.8$ | $\leq \phi 25.5$       | $\phi 25.5 - \phi 63.8$ | $\geq \phi 63.8$ |
| 4                | $\leq \phi 13.2$   | $\phi 13.2 - \phi 18.2$ | $\phi 18.2 - \phi 24.3$ | $\phi 24.3 - \phi 36.5$ | $\phi 36.5 - \phi 72.9$ | $\geq \phi 72.9$ | $\leq \phi 29.2$       | $\phi 29.2 - \phi 72.9$ | $\geq \phi 72.9$ |
| 4.5              | $\leq \phi 14.9$   | $\phi 14.9 - \phi 20.5$ | $\phi 20.5 - \phi 27.3$ | $\phi 27.3 - \phi 41.0$ | $\phi 41.0 - \phi 82.1$ | $\geq \phi 82.1$ | $\leq \phi 32.8$       | $\phi 32.8 - \phi 82.1$ | $\geq \phi 82.1$ |
| 5                | $\leq \phi 16.5$   | $\phi 16.5 - \phi 22.8$ | $\phi 22.8 - \phi 30.4$ | $\phi 30.4 - \phi 45.6$ | $\phi 45.6 - \phi 91.2$ | $\geq \phi 91.2$ | $\leq \phi 36.5$       | $\phi 36.5 - \phi 91.2$ | $\geq \phi 91.2$ |

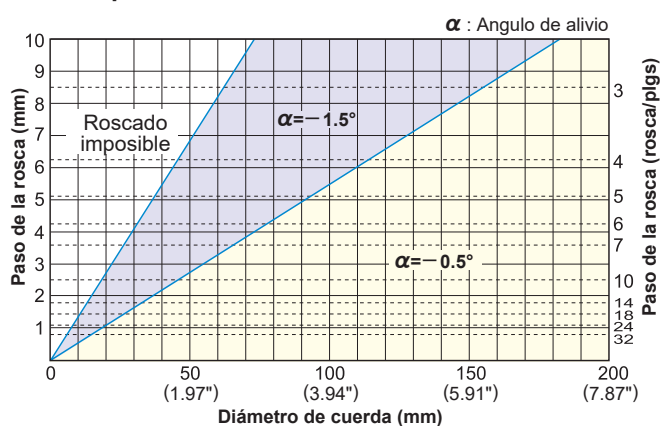
\* En caso de cuerdas izquierdas utilice torneado contrario

### ■ GRAFICA DE REFERENCIA PARA EL ASIENTO (Ángulo de roscado 60° y 55°)

#### Rosca derecha



#### Rosca izquierda



Nota 1) Cuando el ángulo de entrada del ángulo es menor al ángulo del flanco de la herramienta, cambie el asiento para prevenir interferencia lateral con el inserto. (Consulte la tabla de la página G013 para calcular el ángulo de alivio de la rosca y el ángulo de flanco de la herramienta)

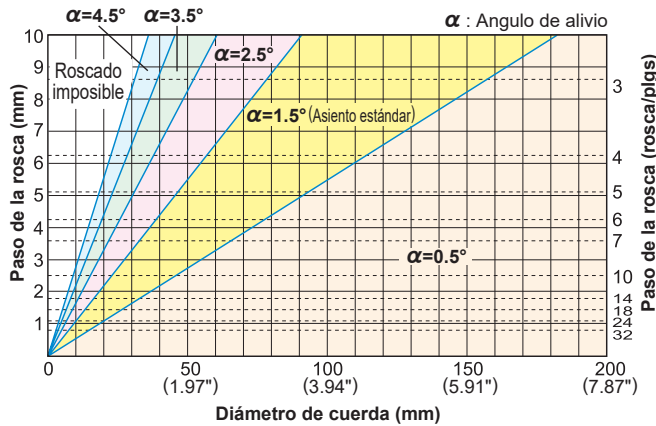
### ■ TABLA DE REFERENCIA DEL ASIENTO (DIÁMETRO DE ROSCADO) (Ángulo de roscado 30° y 29°)

| Ángulo de alivio | Rosca derecha (mm) |                         |                         |                         |                         |                  | Rosca izquierda (mm) * |                         |                  |
|------------------|--------------------|-------------------------|-------------------------|-------------------------|-------------------------|------------------|------------------------|-------------------------|------------------|
|                  | Roscado imposible  | 4.5°                    | 3.5°                    | 2.5°                    | 1.5°                    | 0.5°             | Roscado imposible      | -1.5°                   | -0.5°            |
| Paso (mm)        |                    |                         |                         |                         |                         |                  |                        |                         |                  |
| 0.5              | $\leq \phi 1.8$    | $\phi 1.8 - \phi 2.3$   | $\phi 2.3 - \phi 3.0$   | $\phi 3.0 - \phi 4.6$   | $\phi 4.6 - \phi 9.1$   | $\geq \phi 9.1$  | $\leq \phi 4.6$        | $\phi 4.6 - \phi 9.1$   | $\geq \phi 9.1$  |
| 0.75             | $\leq \phi 2.7$    | $\phi 2.7 - \phi 3.4$   | $\phi 3.4 - \phi 4.6$   | $\phi 4.6 - \phi 6.8$   | $\phi 6.8 - \phi 13.7$  | $\geq \phi 13.7$ | $\leq \phi 6.8$        | $\phi 6.8 - \phi 13.7$  | $\geq \phi 13.7$ |
| 1                | $\leq \phi 3.6$    | $\phi 3.6 - \phi 4.6$   | $\phi 4.6 - \phi 6.1$   | $\phi 6.1 - \phi 9.1$   | $\phi 9.1 - \phi 18.2$  | $\geq \phi 18.2$ | $\leq \phi 9.1$        | $\phi 9.1 - \phi 18.2$  | $\geq \phi 18.2$ |
| 1.25             | $\leq \phi 4.5$    | $\phi 4.5 - \phi 5.7$   | $\phi 5.7 - \phi 7.6$   | $\phi 7.6 - \phi 11.4$  | $\phi 11.4 - \phi 22.8$ | $\geq \phi 22.8$ | $\leq \phi 11.4$       | $\phi 11.4 - \phi 22.8$ | $\geq \phi 22.8$ |
| 1.5              | $\leq \phi 5.5$    | $\phi 5.5 - \phi 6.8$   | $\phi 6.8 - \phi 9.1$   | $\phi 9.1 - \phi 13.7$  | $\phi 13.7 - \phi 27.4$ | $\geq \phi 27.4$ | $\leq \phi 13.7$       | $\phi 13.7 - \phi 27.4$ | $\geq \phi 27.4$ |
| 1.75             | $\leq \phi 6.4$    | $\phi 6.4 - \phi 8.0$   | $\phi 8.0 - \phi 10.6$  | $\phi 10.6 - \phi 16.0$ | $\phi 16.0 - \phi 31.9$ | $\geq \phi 31.9$ | $\leq \phi 16.0$       | $\phi 16.0 - \phi 31.9$ | $\geq \phi 31.9$ |
| 2                | $\leq \phi 7.3$    | $\phi 7.3 - \phi 9.1$   | $\phi 9.1 - \phi 12.1$  | $\phi 12.1 - \phi 18.2$ | $\phi 18.2 - \phi 36.5$ | $\geq \phi 36.5$ | $\leq \phi 18.2$       | $\phi 18.2 - \phi 36.5$ | $\geq \phi 36.5$ |
| 2.5              | $\leq \phi 9.1$    | $\phi 9.1 - \phi 11.4$  | $\phi 11.4 - \phi 15.2$ | $\phi 15.2 - \phi 22.8$ | $\phi 22.8 - \phi 45.6$ | $\geq \phi 45.6$ | $\leq \phi 22.8$       | $\phi 22.8 - \phi 45.6$ | $\geq \phi 45.6$ |
| 3                | $\leq \phi 10.9$   | $\phi 10.9 - \phi 13.7$ | $\phi 13.7 - \phi 18.2$ | $\phi 18.2 - \phi 27.3$ | $\phi 27.3 - \phi 54.7$ | $\geq \phi 54.7$ | $\leq \phi 27.3$       | $\phi 27.3 - \phi 54.7$ | $\geq \phi 54.7$ |
| 3.5              | $\leq \phi 12.7$   | $\phi 12.7 - \phi 15.9$ | $\phi 15.9 - \phi 21.3$ | $\phi 21.3 - \phi 31.9$ | $\phi 31.9 - \phi 63.8$ | $\geq \phi 63.8$ | $\leq \phi 31.9$       | $\phi 31.9 - \phi 63.8$ | $\geq \phi 63.8$ |
| 4                | $\leq \phi 14.6$   | $\phi 14.6 - \phi 18.2$ | $\phi 18.2 - \phi 24.3$ | $\phi 24.3 - \phi 36.5$ | $\phi 36.5 - \phi 72.9$ | $\geq \phi 72.9$ | $\leq \phi 36.5$       | $\phi 36.5 - \phi 72.9$ | $\geq \phi 72.9$ |
| 4.5              | $\leq \phi 16.4$   | $\phi 16.4 - \phi 20.5$ | $\phi 20.5 - \phi 27.3$ | $\phi 27.3 - \phi 41.0$ | $\phi 41.0 - \phi 82.1$ | $\geq \phi 82.1$ | $\leq \phi 41.0$       | $\phi 41.0 - \phi 82.1$ | $\geq \phi 82.1$ |
| 5                | $\leq \phi 18.2$   | $\phi 18.2 - \phi 22.8$ | $\phi 22.8 - \phi 30.4$ | $\phi 30.4 - \phi 45.6$ | $\phi 45.6 - \phi 91.2$ | $\geq \phi 91.2$ | $\leq \phi 45.6$       | $\phi 45.6 - \phi 91.2$ | $\geq \phi 91.2$ |

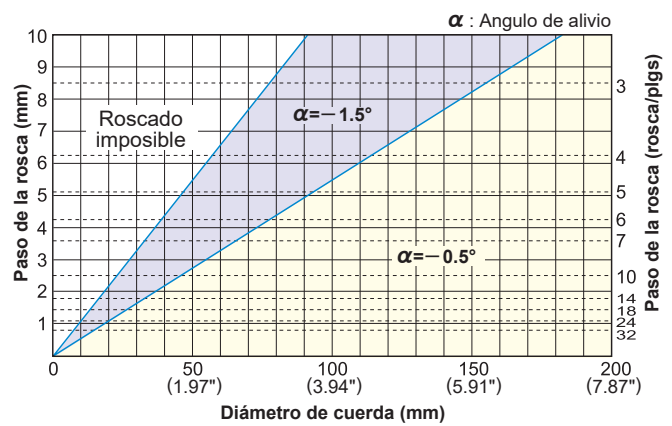
\* En caso de cuerdas izquierdas utilice torneado contrario

## ■ GRAFICA DE REFERENCIA PARA EL ASIENTO (Angulo de roscado 30° y 29°)

### Rosca derecha



### Rosca izquierda



Nota 1) Cuando el ángulo de entrada del ángulo es menor al ángulo del flanco de la herramienta, cambie el asiento para prevenir interferencia lateral con el inserto.  
(Consulte la tabla siguiente para el cálculo del ángulo de ataque de la cuerda y el ángulo de herramienta de flanco)

## ■ Tabla de selección

| Angulo de alivio | Angulo de roscado 60°/55°<br>Rosca derecha |               | Angulo de roscado 60°/55° *<br>Rosca derecha |               | Angulo de roscado 30°/29°<br>Rosca derecha |               | Angulo de roscado 30°/29° *<br>Rosca derecha |               |
|------------------|--------------------------------------------|---------------|----------------------------------------------|---------------|--------------------------------------------|---------------|----------------------------------------------|---------------|
| 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           | No disponible                                | No disponible |
| 2.5              | P25                                        | P25           | No disponible                                | No disponible | P25                                        | P25           | No disponible                                | No disponible |
| 3                | P35                                        | P35           | No disponible                                | No disponible | P35                                        | P35           | No disponible                                | No disponible |
| 3.5              | P35                                        | P35           | No disponible                                | No disponible | P35                                        | P35           | No disponible                                | No disponible |
| 4                | P45                                        | P45           | No disponible                                | No disponible | P45                                        | P45           | No disponible                                | No disponible |
| 4.5              | P45                                        | P45           | No disponible                                | No disponible | P45                                        | P45           | No disponible                                | No disponible |
| 5                | P45                                        | P45           | No disponible                                | No disponible | No disponible                              | No disponible | No disponible                                | No disponible |
| 5.5              | No disponible                              | No disponible | No disponible                                | No disponible | No disponible                              | No disponible | No disponible                                | No disponible |

\* En caso de cuerdas izquierdas utilice torneado contrario

Al reemplazar el asiento, revise si la diferencia entre el ángulo de entrada de la cuerda y el ángulo de inclinación del asiento es entre: 2.5°—0.5° donde el ángulo de la cuerda es 60° (55°), 2° y 1° donde el ángulo de la cuerda es 30° (29°)

\* El ángulo de inclinación de un asiento estándar es 0°.

\* El portaherramienta tiene un ángulo de entrada de 1.5°.

## ■ CÁLCULO DEL ÁNGULO DE ATAQUE DE LA CUERDA

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

α : Angulo de alivio  
l : Longitud de la flauta  
n : Número de hilos  
P : Paso  
d : Diámetro efectivo de rosca

## ■ EJEMPLO PARA SELECCIONAR EL ASIENTO

- Cuando el ángulo de entrada de la rosca es de 2.2°

- ① En caso que el ángulo de la cuerda es de 60°

(ángulo de salida 2.2°) — (2.5—0.5°) = -0.3°—1.7° de inclinación en el asiento es apropiada.

El roscado con un asiento estándar (0° de ángulo de inclinación) es posible.

Pero se recomienda reemplazarlo con un asiento de un ángulo de inclinación de 1°, consulte la lista de Asientos estándar en las páginas G021 y G026.

- ② En caso que el ángulo de la cuerda es de 30°

(ángulo de salida 2.2°) — (2—1°) = -0.2°—1.2° de inclinación en el asiento es apropiada.

Se recomienda reemplazarla con un asiento de 1° de inclinación, consulte la lista de Asientos estándar en las páginas G021 y G026.

## ■ ÁNGULO DE SALIDA DEL AJUSTE DEL INSERTO EN UN PORTA HERRAMIENTAS

| Angulo de la hélice de la rosca | Angulo de alivio interno | Angulo de alivio externo |
|---------------------------------|--------------------------|--------------------------|
| 60°                             | 8.8°                     | 5.8°                     |
| 55°                             | 7.9°                     | 5.2°                     |
| 30°                             | 4.1°                     | 2.7°                     |
| 29°                             | 4°                       | 2.6°                     |

- Los ángulos de salida (β<sub>2</sub>, β<sub>1</sub>) de un inserto se vuelven más pequeños cuando el ángulo de la cuerda de una cuerda trapezoidal, redondo o alguna otra es pequeño. Tenga cuidado al seleccionar un asiento.



## PROFUNDIDAD DE CORTE ESTÁNDAR MMT EXTERIOR (AVANCE RADIAL)

### ISO en mm

(mm)

| Paso (mm) | Profundidad de corte total | Número de pasadas |      |      |      |      |      |      |      |      |      |      |      |      |      | Tipo de Inserto            |                                      |
|-----------|----------------------------|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------------------------|--------------------------------------|
|           |                            | 1                 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | Inserto rectificad clase-G | Inserto clase-M con rompe viruta 3-D |
| 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              | —                                    |

### Cuerda UN

(plgs)

| Paso (hilos/plgs) | Profundidad de corte total | Número de pasadas |      |      |      |      |      |      |      |      |      |      |      |      |      | Tipo de Inserto            |                                      |
|-------------------|----------------------------|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------------------------|--------------------------------------|
|                   |                            | 1                 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | Inserto rectificad clase-G | Inserto clase-M con rompe viruta 3-D |
| 32                | .019                       | .007              | .006 | .004 | .002 |      |      |      |      |      |      |      |      |      |      | MMT16ER320UN               | —                                    |
| 28                | .022                       | .007              | .006 | .004 | .003 | .002 |      |      |      |      |      |      |      |      |      | MMT16ER280UN               | —                                    |
| 24                | .026                       | .007              | .006 | .006 | .005 | .002 |      |      |      |      |      |      |      |      |      | MMT16ER240UN               | —                                    |
| 20                | .031                       | .008              | .007 | .005 | .005 | .004 | .002 |      |      |      |      |      |      |      |      | MMT16ER200UN               | —                                    |
| 18                | .034                       | .009              | .008 | .006 | .005 | .004 | .002 |      |      |      |      |      |      |      |      | MMT16ER180UN               | —                                    |
| 16                | .038                       | .009              | .008 | .006 | .005 | .004 | .004 | .002 |      |      |      |      |      |      |      | MMT16ER160UN               | MMT16ER160UN-S                       |
| 14                | .044                       | .009              | .008 | .006 | .005 | .005 | .005 | .004 | .002 |      |      |      |      |      |      | MMT16ER140UN               | MMT16ER140UN-S                       |
| 13                | .047                       | .010              | .009 | .007 | .006 | .005 | .005 | .003 | .002 |      |      |      |      |      |      | MMT16ER130UN               | —                                    |
| 12                | .051                       | .011              | .009 | .007 | .006 | .006 | .005 | .005 | .002 |      |      |      |      |      |      | MMT16ER120UN               | MMT16ER120UN-S                       |
| 11                | .056                       | .011              | .009 | .007 | .006 | .006 | .006 | .005 | .004 | .002 |      |      |      |      |      | MMT16ER110UN               | —                                    |
| 10                | .061                       | .011              | .009 | .007 | .006 | .006 | .006 | .005 | .005 | .004 | .002 |      |      |      |      | MMT16ER100UN               | —                                    |
| 9                 | .068                       | .013              | .011 | .009 | .007 | .006 | .006 | .005 | .005 | .004 | .002 |      |      |      |      | MMT16ER090UN               | —                                    |
| 8                 | .077                       | .014              | .012 | .009 | .007 | .006 | .006 | .006 | .006 | .005 | .004 | .002 |      |      |      | MMT16ER080UN               | —                                    |
| 7                 | .087                       | .015              | .013 | .011 | .009 | .008 | .007 | .006 | .006 | .005 | .005 | .002 |      |      |      | MMT22ER070UN               | —                                    |
| 6                 | .102                       | .017              | .014 | .011 | .010 | .008 | .007 | .007 | .006 | .006 | .005 | .005 | .004 | .002 |      | MMT22ER060UN               | —                                    |
| 5                 | .123                       | .017              | .015 | .012 | .011 | .009 | .009 | .008 | .007 | .007 | .007 | .007 | .006 | .006 | .002 | MMT22ER050UN               | —                                    |

### Para Cuerda BSW, BSP

(plgs)

| Paso (hilos/plgs) | Profundidad de corte total | Número de pasadas |      |      |      |      |      |      |      |      |      |      |      |      |      | Tipo de Inserto            |                                      |
|-------------------|----------------------------|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------------------------|--------------------------------------|
|                   |                            | 1                 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | Inserto rectificad clase-G | Inserto clase-M con rompe viruta 3-D |
| 28                | .023                       | .007              | .006 | .004 | .004 | .002 |      |      |      |      |      |      |      |      |      | MMT16ER280W                | —                                    |
| 26                | .025                       | .007              | .006 | .005 | .005 | .002 |      |      |      |      |      |      |      |      |      | MMT16ER260W                | —                                    |
| 20                | .032                       | .008              | .007 | .006 | .005 | .004 | .002 |      |      |      |      |      |      |      |      | MMT16ER200W                | —                                    |
| 19                | .034                       | .008              | .007 | .006 | .006 | .005 | .002 |      |      |      |      |      |      |      |      | MMT16ER190W                | MMT16ER190W-S                        |
| 18                | .035                       | .010              | .007 | .006 | .005 | .005 | .002 |      |      |      |      |      |      |      |      | MMT16ER180W                | —                                    |
| 16                | .040                       | .008              | .007 | .006 | .005 | .004 | .004 | .004 | .002 |      |      |      |      |      |      | MMT16ER160W                | —                                    |
| 14                | .046                       | .009              | .008 | .007 | .006 | .005 | .005 | .004 | .002 |      |      |      |      |      |      | MMT16ER140W                | MMT16ER140W-S                        |
| 12                | .054                       | .011              | .010 | .008 | .006 | .006 | .006 | .005 | .002 |      |      |      |      |      |      | MMT16ER120W                | —                                    |
| 11                | .058                       | .011              | .009 | .008 | .007 | .006 | .006 | .005 | .005 | .002 |      |      |      |      |      | MMT16ER110W                | MMT16ER110W-S                        |
| 10                | .064                       | .011              | .010 | .008 | .007 | .006 | .006 | .005 | .005 | .004 | .002 |      |      |      |      | MMT16ER100W                | —                                    |
| 9                 | .071                       | .011              | .010 | .008 | .007 | .006 | .006 | .006 | .005 | .005 | .005 | .002 |      |      |      | MMT16ER090W                | —                                    |
| 8                 | .080                       | .012              | .011 | .009 | .007 | .007 | .006 | .006 | .006 | .005 | .005 | .004 | .002 |      |      | MMT16ER080W                | —                                    |
| 7                 | .091                       | .013              | .013 | .010 | .009 | .008 | .007 | .007 | .006 | .006 | .006 | .004 | .002 |      |      | MMT22ER070W                | —                                    |
| 6                 | .107                       | .014              | .013 | .011 | .009 | .008 | .008 | .007 | .007 | .006 | .006 | .006 | .005 | .005 | .002 | MMT22ER060W                | —                                    |
| 5                 | .128                       | .017              | .016 | .014 | .011 | .010 | .009 | .009 | .008 | .007 | .007 | .007 | .006 | .005 | .002 | MMT22ER050W                | —                                    |

- Nota 1) · Ajuste la profundidad del acabado en un diámetro aproximado de .004 plgs al utilizar un inserto de forma completo.  
 · Verifique cuando número de pasadas y la profundidad de corte es pequeña para prevenir daños en el inserto al hacer un radio en punta de un inserto de forma parcial o semi completo o de un inserto de roscado interno.  
 · Ajuste la profundidad de corte lo suficientemente profunda en materiales tales como el acero endurecido o acero inoxidable austenítico para ayudar a prevenir desgaste prematuro y despostillamiento causados por la capa externa del material.

## BSPT

(plgs)

| Paso<br>(hilos/<br>plgs) | Profundidad<br>de corte<br>total | Número de pasadas |      |      |      |      |      |      |      |      |  |  | Tipo de Inserto             |                                         |
|--------------------------|----------------------------------|-------------------|------|------|------|------|------|------|------|------|--|--|-----------------------------|-----------------------------------------|
|                          |                                  | 1                 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    |  |  | Inserto rectificado clase-G | Inserto clase-M con<br>rompe viruta 3-D |
| 28                       | .023                             | .007              | .006 | .004 | .004 | .002 |      |      |      |      |  |  | MMT16ER280BSPT              | —                                       |
| 19                       | .034                             | .009              | .007 | .006 | .005 | .005 | .002 |      |      |      |  |  | MMT16ER190BSPT              | MMT16ER190BSPT-S                        |
| 14                       | .046                             | .009              | .008 | .007 | .006 | .005 | .005 | .004 | .002 |      |  |  | MMT16ER140BSPT              | MMT16ER140BSPT-S                        |
| 11                       | .058                             | .010              | .009 | .008 | .007 | .006 | .006 | .005 | .005 | .002 |  |  | MMT16ER110BSPT              | MMT16ER110BSPT-S                        |

## Redondo norma DIN 405

(plgs)

| Paso<br>(hilos/<br>plgs) | Profundidad<br>de corte<br>total | Número de pasadas |      |      |      |      |      |      |      |      |      |      |      |      |      | Tipo de Inserto             |  |
|--------------------------|----------------------------------|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------------------------|--|
|                          |                                  | 1                 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | Inserto rectificado clase-G |  |
| 10                       | .050                             | .009              | .008 | .008 | .007 | .006 | .005 | .005 | .002 |      |      |      |      |      |      | MMT16ER100RD                |  |
| 8                        | .063                             | .009              | .008 | .008 | .007 | .007 | .006 | .006 | .005 | .005 | .002 |      |      |      |      | MMT16ER080RD                |  |
| 6                        | .083                             | .010              | .010 | .009 | .009 | .008 | .007 | .007 | .006 | .006 | .005 | .004 | .002 |      |      | MMT16ER060RD                |  |
| 4                        | .125                             | .013              | .013 | .013 | .012 | .011 | .010 | .009 | .009 | .008 | .007 | .007 | .006 | .005 | .002 | MMT22ER040RD                |  |

## Trapezoidal 30° norma ISO

(mm)

| Paso<br>(mm) | Profundidad<br>de corte<br>total | Número de pasadas |      |      |      |      |      |      |      |      |      |      |      |      |      | Tipo de Inserto             |  |
|--------------|----------------------------------|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------------------------|--|
|              |                                  | 1                 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | Inserto rectificado clase-G |  |
| 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                |  |

## Cuerda ACME

(plgs)

| Paso<br>(hilos/<br>plgs) | Profundidad<br>de corte<br>total | Número de pasadas |      |      |      |      |      |      |      |      |      |      |      |      |      | Tipo de Inserto             |  |
|--------------------------|----------------------------------|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------------------------|--|
|                          |                                  | 1                 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | Inserto rectificado clase-G |  |
| 12                       | .047                             | .011              | .009 | .008 | .007 | .006 | .004 | .002 |      |      |      |      |      |      |      | MMT16ER120ACME              |  |
| 10                       | .060                             | .011              | .010 | .008 | .007 | .006 | .006 | .005 | .005 | .002 |      |      |      |      |      | MMT16ER100ACME              |  |
| 8                        | .072                             | .012              | .010 | .009 | .007 | .006 | .006 | .006 | .005 | .005 | .004 | .002 |      |      |      | MMT16ER080ACME              |  |
| 6                        | .093                             | .013              | .012 | .011 | .009 | .008 | .007 | .006 | .006 | .005 | .005 | .004 | .005 | .002 |      | MMT22ER060ACME              |  |
| 5                        | .110                             | .014              | .013 | .012 | .010 | .009 | .008 | .007 | .007 | .006 | .006 | .006 | .005 | .005 | .002 | MMT22ER050ACME              |  |

## UNJ

(plgs)

| Paso<br>(hilos/<br>plgs) | Profundidad<br>de corte<br>total | Número de pasadas |      |      |      |      |      |      |      |      |      |      |  |  |  | Tipo de Inserto             |  |
|--------------------------|----------------------------------|-------------------|------|------|------|------|------|------|------|------|------|------|--|--|--|-----------------------------|--|
|                          |                                  | 1                 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   |  |  |  | Inserto rectificado clase-G |  |
| 32                       | .018                             | .006              | .006 | .004 | .002 |      |      |      |      |      |      |      |  |  |  | MMT16ER320UNJ               |  |
| 28                       | .020                             | .006              | .005 | .004 | .003 | .002 |      |      |      |      |      |      |  |  |  | MMT16ER280UNJ               |  |
| 24                       | .024                             | .007              | .006 | .006 | .003 | .002 |      |      |      |      |      |      |  |  |  | MMT16ER240UNJ               |  |
| 20                       | .029                             | .007              | .006 | .005 | .005 | .004 | .002 |      |      |      |      |      |  |  |  | MMT16ER200UNJ               |  |
| 18                       | .032                             | .009              | .007 | .006 | .004 | .004 | .002 |      |      |      |      |      |  |  |  | MMT16ER180UNJ               |  |
| 16                       | .036                             | .010              | .008 | .006 | .005 | .004 | .003 |      |      |      |      |      |  |  |  | MMT16ER160UNJ               |  |
| 14                       | .041                             | .010              | .009 | .007 | .005 | .004 | .004 | .002 |      |      |      |      |  |  |  | MMT16ER140UNJ               |  |
| 12                       | .048                             | .011              | .011 | .008 | .007 | .005 | .004 | .002 |      |      |      |      |  |  |  | MMT16ER120UNJ               |  |
| 10                       | .058                             | .012              | .011 | .008 | .006 | .005 | .005 | .005 | .004 | .002 |      |      |  |  |  | MMT16ER100UNJ               |  |
| 8                        | .072                             | .012              | .012 | .009 | .007 | .006 | .006 | .005 | .005 | .004 | .004 | .002 |  |  |  | MMT16ER080UNJ               |  |

## Cuerda para carcasa tipo API

(plgs)

| Paso<br>(hilos/<br>plgs) | Profundidad<br>de corte<br>total | Número de pasadas |      |      |      |      |      |      |      |      |      |      |  |  |  | Tipo de Inserto             |  |
|--------------------------|----------------------------------|-------------------|------|------|------|------|------|------|------|------|------|------|--|--|--|-----------------------------|--|
|                          |                                  | 1                 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   |  |  |  | Inserto rectificado clase-G |  |
| 5                        | .061                             | .010              | .009 | .007 | .006 | .005 | .005 | .005 | .004 | .004 | .004 | .002 |  |  |  | MMT22ER050APBU              |  |

- Nota 1) · Ajuste la profundidad del acabado en un diámetro aproximado de .004 plgs al utilizar un inserto de forma completo.  
 · Verifique cuando número de pasadas y la profundidad de corte es pequeña para prevenir daños en el inserto al hacer un radio en punta de un inserto de forma parcial o semi completo o de un inserto de roscado interno.  
 · Ajuste la profundidad de corte lo suficientemente profunda en materiales tales como el acero endurecido o acero inoxidable austenítico para ayudar a prevenir desgaste prematuro y despostillamiento causados por la capa externa del material.

G

ROSCADO



## PROFUNDIDAD DE CORTE ESTÁNDAR MMT EXTERIOR (AVANCE RADIAL)

### Cuerda redonda para carcasa y tubo

(plgs)

| Paso<br>(hilos/<br>plgs) | Profundidad<br>de corte<br>total | Número de pasadas |      |      |      |      |      |      |      |      |      |      |      |  |  | Tipo de Inserto |
|--------------------------|----------------------------------|-------------------|------|------|------|------|------|------|------|------|------|------|------|--|--|-----------------|
|                          |                                  | 1                 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   |  |  |                 |
| 10                       | .056                             | .010              | .009 | .006 | .006 | .005 | .005 | .005 | .004 | .004 | .002 |      |      |  |  | MMT16ER100APRD  |
| 8                        | .071                             | .010              | .009 | .007 | .006 | .006 | .006 | .005 | .005 | .005 | .005 | .005 | .002 |  |  | MMT16ER080APRD  |

### Cuerda NPT

(plgs)

| Paso<br>(hilos/<br>plgs) | Profundidad<br>de corte<br>total | Número de pasadas |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Tipo de Inserto |
|--------------------------|----------------------------------|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------------|
|                          |                                  | 1                 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   |                 |
| 27                       | .026                             | .006              | .005 | .005 | .004 | .004 | .002 |      |      |      |      |      |      |      |      |      | MMT16ER270NPT   |
| 18                       | .040                             | .008              | .006 | .006 | .005 | .005 | .004 | .004 | .002 |      |      |      |      |      |      |      | MMT16ER180NPT   |
| 14                       | .052                             | .009              | .007 | .006 | .006 | .005 | .005 | .004 | .004 | .004 | .002 |      |      |      |      |      | MMT16ER140NPT   |
| 11.5                     | .065                             | .009              | .007 | .007 | .006 | .006 | .005 | .005 | .005 | .005 | .004 | .004 | .002 |      |      |      | MMT16ER115NPT   |
| 8                        | .095                             | .013              | .011 | .009 | .008 | .007 | .006 | .006 | .006 | .005 | .005 | .005 | .004 | .004 | .004 | .002 | MMT16ER080NPT   |

### Cuerda NPTF

(plgs)

| Paso<br>(hilos/<br>plgs) | Profundidad<br>de corte<br>total | Número de pasadas |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Tipo de Inserto |
|--------------------------|----------------------------------|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------------|
|                          |                                  | 1                 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   |                 |
| 27                       | .025                             | .006              | .006 | .004 | .004 | .003 | .002 |      |      |      |      |      |      |      |      |      | MMT16ER270NPTF  |
| 18                       | .039                             | .007              | .006 | .006 | .005 | .005 | .004 | .004 | .002 |      |      |      |      |      |      |      | MMT16ER180NPTF  |
| 14                       | .053                             | .009              | .008 | .006 | .006 | .005 | .005 | .004 | .004 | .004 | .002 |      |      |      |      |      | MMT16ER140NPTF  |
| 11.5                     | .064                             | .009              | .009 | .007 | .006 | .005 | .005 | .005 | .004 | .004 | .004 | .004 | .002 |      |      |      | MMT16ER115NPTF  |
| 8                        | .094                             | .013              | .011 | .009 | .007 | .007 | .006 | .006 | .006 | .005 | .005 | .005 | .004 | .004 | .004 | .002 | MMT16ER080NPTF  |

- Nota 1) · Ajuste la profundidad del acabado en un diámetro aproximado de .004 plgs al utilizar un inserto de forma completo.  
 · Verifique cuando número de pasadas y la profundidad de corte es pequeña para prevenir daños en el inserto al hacer un radio en punta de un inserto de forma parcial o semi completo o de un inserto de roscado interno.  
 · Ajuste la profundidad de corte lo suficientemente profunda en materiales tales como el acero endurecido o acero inoxidable austenítico para ayudar a prevenir desgaste prematuro y despostillamiento causados por la capa externa del material.

## PROFUNDIDAD DE CORTE ESTÁNDAR MMT INTERNO (AVANCE RADIAL)

### ISO en mm

(mm)

| Paso (mm) | Profundidad de corte total | Número de pasadas |      |      |      |      |      |      |      |      |      |      |      |      |      | Tipo de Inserto             |               |                                      |                 |
|-----------|----------------------------|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------------------------|---------------|--------------------------------------|-----------------|
|           |                            | 1                 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | Inserto rectificado clase-G |               | Inserto clase-M con rompe viruta 3-D |                 |
| 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 | —                                    | —               |

### Cuerda UN

(plgs)

| Paso (hilos/plgs) | Profundidad de corte total | Número de pasadas |      |      |      |      |      |      |      |      |      |      |      |      |      | Tipo de Inserto             |              |                                      |   |
|-------------------|----------------------------|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------------------------|--------------|--------------------------------------|---|
|                   |                            | 1                 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | Inserto rectificado clase-G |              | Inserto clase-M con rompe viruta 3-D |   |
| 32                | .018                       | .006              | .006 | .004 | .002 |      |      |      |      |      |      |      |      |      |      | MMT11IR320UN                | MMT16IR320UN | —                                    | — |
| 28                | .020                       | .006              | .005 | .004 | .003 | .002 |      |      |      |      |      |      |      |      |      | MMT11IR280UN                | MMT16IR280UN | —                                    | — |
| 24                | .024                       | .007              | .006 | .005 | .004 | .002 |      |      |      |      |      |      |      |      |      | MMT11IR240UN                | MMT16IR240UN | —                                    | — |
| 20                | .029                       | .007              | .006 | .005 | .005 | .004 | .002 |      |      |      |      |      |      |      |      | MMT11IR200UN                | MMT16IR200UN | —                                    | — |
| 18                | .032                       | .008              | .007 | .006 | .005 | .004 | .002 |      |      |      |      |      |      |      |      | MMT11IR180UN                | MMT16IR180UN | —                                    | — |
| 16                | .036                       | .008              | .007 | .006 | .005 | .004 | .004 | .002 |      |      |      |      |      |      |      | MMT11IR160UN                | MMT16IR160UN | MMT16IR160UN-S                       | — |
| 14                | .041                       | .008              | .007 | .006 | .005 | .005 | .004 | .004 | .002 |      |      |      |      |      |      | MMT11IR140UN                | MMT16IR140UN | MMT16IR140UN-S                       | — |
| 13                | .044                       | .009              | .007 | .006 | .006 | .005 | .005 | .004 | .002 |      |      |      |      |      |      | —                           | MMT16IR130UN | —                                    | — |
| 12                | .048                       | .009              | .009 | .007 | .006 | .005 | .005 | .005 | .002 |      |      |      |      |      |      | —                           | MMT16IR120UN | MMT16IR120UN-S                       | — |
| 11                | .052                       | .009              | .009 | .008 | .006 | .005 | .005 | .004 | .004 | .002 |      |      |      |      |      | —                           | MMT16IR110UN | —                                    | — |
| 10                | .058                       | .010              | .009 | .008 | .006 | .005 | .005 | .005 | .004 | .004 | .002 |      |      |      |      | —                           | MMT16IR100UN | —                                    | — |
| 9                 | .064                       | .012              | .009 | .008 | .007 | .006 | .006 | .005 | .005 | .004 | .002 |      |      |      |      | —                           | MMT16IR090UN | —                                    | — |
| 8                 | .072                       | .012              | .010 | .008 | .007 | .006 | .006 | .006 | .005 | .005 | .005 | .002 |      |      |      | —                           | MMT16IR080UN | —                                    | — |
| 7                 | .082                       | .014              | .012 | .009 | .008 | .007 | .007 | .006 | .006 | .006 | .005 | .002 |      |      |      | —                           | MMT22IR070UN | —                                    | — |
| 6                 | .096                       | .016              | .013 | .010 | .009 | .007 | .007 | .006 | .006 | .006 | .005 | .005 | .004 | .002 |      | —                           | MMT22IR060UN | —                                    | — |
| 5                 | .115                       | .016              | .014 | .012 | .010 | .009 | .008 | .008 | .007 | .007 | .006 | .006 | .005 | .005 | .002 | —                           | MMT22IR050UN | —                                    | — |

### Para Cuerda BSW, BSP

(plgs)

| Paso (hilos/plgs) | Profundidad de corte total | Número de pasadas |      |      |      |      |      |      |      |      |      |      |      |      |      | Tipo de Inserto             |             |                                      |   |
|-------------------|----------------------------|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------------------------|-------------|--------------------------------------|---|
|                   |                            | 1                 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | Inserto rectificado clase-G |             | Inserto clase-M con rompe viruta 3-D |   |
| 28                | .023                       | .007              | .006 | .004 | .004 | .002 |      |      |      |      |      |      |      |      |      | —                           | MMT16IR280W | —                                    | — |
| 26                | .025                       | .007              | .006 | .005 | .005 | .002 |      |      |      |      |      |      |      |      |      | —                           | MMT16IR260W | —                                    | — |
| 20                | .032                       | .008              | .007 | .006 | .005 | .004 | .002 |      |      |      |      |      |      |      |      | —                           | MMT16IR200W | —                                    | — |
| 19                | .034                       | .008              | .007 | .006 | .006 | .005 | .002 |      |      |      |      |      |      |      |      | MMT11IR190W                 | MMT16IR190W | MMT16IR190W-S                        | — |
| 18                | .035                       | .010              | .007 | .006 | .005 | .005 | .002 |      |      |      |      |      |      |      |      | —                           | MMT16IR180W | —                                    | — |
| 16                | .040                       | .008              | .007 | .006 | .005 | .004 | .004 | .004 | .002 |      |      |      |      |      |      | —                           | MMT16IR160W | —                                    | — |
| 14                | .046                       | .009              | .008 | .007 | .006 | .005 | .005 | .004 | .002 |      |      |      |      |      |      | MMT11IR140W                 | MMT16IR140W | MMT16IR140W-S                        | — |
| 12                | .054                       | .011              | .010 | .008 | .006 | .006 | .006 | .005 | .002 |      |      |      |      |      |      | —                           | MMT16IR120W | MMT16IR120W-S                        | — |
| 11                | .058                       | .011              | .009 | .008 | .007 | .006 | .006 | .005 | .004 | .002 |      |      |      |      |      | —                           | MMT16IR110W | —                                    | — |
| 10                | .064                       | .011              | .010 | .008 | .007 | .006 | .006 | .005 | .005 | .004 | .002 |      |      |      |      | —                           | MMT16IR100W | —                                    | — |
| 9                 | .071                       | .011              | .010 | .008 | .007 | .006 | .006 | .006 | .005 | .005 | .005 | .002 |      |      |      | —                           | MMT16IR090W | —                                    | — |
| 8                 | .080                       | .012              | .011 | .009 | .007 | .007 | .006 | .006 | .006 | .005 | .005 | .004 | .002 |      |      | —                           | MMT16IR080W | —                                    | — |
| 7                 | .091                       | .013              | .013 | .010 | .009 | .008 | .007 | .007 | .006 | .006 | .006 | .004 | .002 |      |      | —                           | MMT22IR070W | —                                    | — |
| 6                 | .107                       | .014              | .013 | .011 | .009 | .008 | .008 | .007 | .007 | .006 | .006 | .006 | .005 | .005 | .002 | —                           | MMT22IR060W | —                                    | — |
| 5                 | .128                       | .017              | .016 | .014 | .011 | .010 | .009 | .009 | .008 | .007 | .007 | .007 | .006 | .005 | .002 | —                           | MMT22IR050W | —                                    | — |

Nota 1) · Ajuste la profundidad del acabado en un diámetro aproximado de .004 plgs al utilizar un inserto de forma completo.  
 · Verifique cuando número de pasadas y la profundidad de corte es pequeña para prevenir daños en el inserto al hacer un radio en punta de un inserto de forma parcial o semi completo o de un inserto de roscado interno.  
 · Ajuste la profundidad de corte lo suficientemente profunda en materiales tales como el acero endurecido o acero inoxidable austenítico para ayudar a prevenir desgaste prematuro y despostillamiento causados por la capa externa del material.

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ROSCADO

## PROFUNDIDAD DE CORTE ESTÁNDAR MMT INTERNO (AVANCE RADIAL)

### ■ BSPT

(plgs)

| Paso<br>(hilos/<br>plgs) | Profundidad<br>de corte<br>total | Número de pasadas |      |      |      |      |      |      |      |      |  |  |  |  |  | Tipo de Inserto             |                                         |
|--------------------------|----------------------------------|-------------------|------|------|------|------|------|------|------|------|--|--|--|--|--|-----------------------------|-----------------------------------------|
|                          |                                  | 1                 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    |  |  |  |  |  | Inserto rectificado clase-G | Inserto clase-M con<br>rompe viruta 3-D |
| 19                       | .034                             | .009              | .007 | .006 | .005 | .005 | .002 |      |      |      |  |  |  |  |  | MMT11IR190BSPT              | MMT16IR190BSPT                          |
| 14                       | .046                             | .009              | .008 | .007 | .006 | .005 | .005 | .004 | .002 |      |  |  |  |  |  | MMT11IR140BSPT              | MMT16IR140BSPT                          |
| 11                       | .058                             | .010              | .009 | .008 | .007 | .006 | .006 | .005 | .005 | .002 |  |  |  |  |  | —                           | MMT16IR110BSPT                          |

### ■ Redondo norma DIN 405

(plgs)

| Paso<br>(hilos/<br>plgs) | Profundidad<br>de corte<br>total | Número de pasadas |      |      |      |      |      |      |      |      |      |      |      |      |      | Tipo de Inserto             |  |
|--------------------------|----------------------------------|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------------------------|--|
|                          |                                  | 1                 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | Inserto rectificado clase-G |  |
| 10                       | .050                             | .009              | .008 | .008 | .007 | .006 | .005 | .005 | .002 |      |      |      |      |      |      | MMT16IR100RD                |  |
| 8                        | .063                             | .009              | .008 | .008 | .007 | .007 | .006 | .006 | .005 | .005 | .002 |      |      |      |      | MMT16IR080RD                |  |
| 6                        | .083                             | .010              | .010 | .009 | .009 | .008 | .007 | .007 | .006 | .006 | .005 | .004 | .002 |      |      | MMT16IR060RD                |  |
| 4                        | .125                             | .013              | .013 | .013 | .012 | .011 | .010 | .009 | .009 | .008 | .007 | .007 | .006 | .005 | .002 | MMT22IR040RD                |  |

### ■ Trapezoidal 30° norma ISO

(mm)

| Paso<br>(mm) | Profundidad<br>de corte<br>total | Número de pasadas |      |      |      |      |      |      |      |      |      |      |      |      |      | Tipo de Inserto             |  |
|--------------|----------------------------------|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------------------------|--|
|              |                                  | 1                 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | Inserto rectificado clase-G |  |
| 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                |  |

### ■ Cuerda ACME

(plgs)

| Paso<br>(hilos/<br>plgs) | Profundidad<br>de corte<br>total | Número de pasadas |      |      |      |      |      |      |      |      |      |      |      |      |      | Tipo de Inserto             |  |
|--------------------------|----------------------------------|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------------------------|--|
|                          |                                  | 1                 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | Inserto rectificado clase-G |  |
| 12                       | .047                             | .011              | .009 | .008 | .007 | .006 | .004 | .002 |      |      |      |      |      |      |      | MMT16IR120ACME              |  |
| 10                       | .060                             | .011              | .010 | .008 | .007 | .006 | .006 | .005 | .005 | .002 |      |      |      |      |      | MMT16IR100ACME              |  |
| 8                        | .072                             | .012              | .010 | .009 | .007 | .006 | .006 | .006 | .005 | .005 | .004 | .002 |      |      |      | MMT16IR080ACME              |  |
| 6                        | .093                             | .013              | .012 | .011 | .009 | .008 | .007 | .006 | .006 | .005 | .005 | .005 | .004 | .002 |      | MMT22IR060ACME              |  |
| 5                        | .110                             | .014              | .013 | .012 | .010 | .009 | .008 | .007 | .007 | .006 | .006 | .006 | .005 | .005 | .002 | MMT22IR050ACME              |  |

### ■ Cuerda para carcasa tipo API

(plgs)

| Paso<br>(hilos/<br>plgs) | Profundidad<br>de corte<br>total | Número de pasadas |      |      |      |      |      |      |      |      |      |      |  |  |  | Tipo de Inserto             |  |
|--------------------------|----------------------------------|-------------------|------|------|------|------|------|------|------|------|------|------|--|--|--|-----------------------------|--|
|                          |                                  | 1                 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   |  |  |  | Inserto rectificado clase-G |  |
| 5                        | .061                             | .010              | .009 | .007 | .006 | .005 | .005 | .005 | .004 | .004 | .004 | .002 |  |  |  | MMT22IR050APBU              |  |

### ■ Cuerda redonda para carcasa y tubo

(plgs)

| Paso<br>(hilos/<br>plgs) | Profundidad<br>de corte<br>total | Número de pasadas |      |      |      |      |      |      |      |      |      |      |      |  |  | Tipo de Inserto             |  |
|--------------------------|----------------------------------|-------------------|------|------|------|------|------|------|------|------|------|------|------|--|--|-----------------------------|--|
|                          |                                  | 1                 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   |  |  | Inserto rectificado clase-G |  |
| 10                       | .056                             | .010              | .009 | .006 | .006 | .005 | .005 | .005 | .004 | .004 | .002 |      |      |  |  | MMT16IR100APRD              |  |
| 8                        | .071                             | .010              | .009 | .007 | .006 | .006 | .006 | .005 | .005 | .005 | .005 | .005 | .002 |  |  | MMT16IR080APRD              |  |

- Nota 1) · Ajuste la profundidad del acabado en un diámetro aproximado de .004 plgs al utilizar un inserto de forma completo.  
· Verifique cuando número de pasadas y la profundidad de corte es pequeña para prevenir daños en el inserto al hacer un radio en punta de un inserto de forma parcial o semi completo o de un inserto de roscado interno.  
· Ajuste la profundidad de corte lo suficientemente profunda en materiales tales como el acero endurecido o acero inoxidable austenítico para ayudar a prevenir desgaste prematuro y despostillamiento causados por la capa externa del material.

## Cuerda NPT

(plgs)

| Paso<br>(hilos/<br>plgs) | Profundidad<br>de corte<br>total | Número de pasadas |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Tipo de Inserto             |
|--------------------------|----------------------------------|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------------------------|
|                          |                                  | 1                 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   |                             |
|                          |                                  |                   |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Inserto rectificado clase-G |
| 27                       | .026                             | .006              | .005 | .005 | .004 | .004 | .002 |      |      |      |      |      |      |      |      |      | MMT16IR270NPT               |
| 18                       | .040                             | .008              | .006 | .006 | .005 | .005 | .004 | .004 | .002 |      |      |      |      |      |      |      | MMT16IR180NPT               |
| 14                       | .052                             | .009              | .007 | .006 | .006 | .005 | .005 | .004 | .004 | .004 | .002 |      |      |      |      |      | MMT16IR140NPT               |
| 11.5                     | .065                             | .009              | .007 | .007 | .006 | .006 | .005 | .005 | .005 | .005 | .004 | .004 | .002 |      |      |      | MMT16IR115NPT               |
| 8                        | .095                             | .013              | .011 | .009 | .008 | .007 | .006 | .006 | .006 | .005 | .005 | .005 | .004 | .004 | .004 | .002 | MMT16IR080NPT               |

## Cuerda NPTF

(plgs)

| Paso<br>(hilos/<br>plgs) | Profundidad<br>de corte<br>total | Número de pasadas |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Tipo de Inserto             |
|--------------------------|----------------------------------|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------------------------|
|                          |                                  | 1                 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   |                             |
|                          |                                  |                   |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Inserto rectificado clase-G |
| 14                       | .053                             | .009              | .008 | .006 | .006 | .005 | .005 | .004 | .004 | .004 | .002 |      |      |      |      |      | MMT16IR140NPTF              |
| 11.5                     | .064                             | .009              | .009 | .007 | .006 | .005 | .005 | .005 | .004 | .004 | .004 | .004 | .002 |      |      |      | MMT16IR115NPTF              |
| 8                        | .094                             | .013              | .011 | .009 | .007 | .007 | .006 | .006 | .006 | .005 | .005 | .005 | .004 | .004 | .004 | .002 | MMT16IR080NPTF              |

- Nota 1) · Ajuste la profundidad del acabado en un diámetro aproximado de .004 plgs al utilizar un inserto de forma completo.  
 · Verifique cuando número de pasadas y la profundidad de corte es pequeña para prevenir daños en el inserto al hacer un radio en punta de un inserto de forma parcial o semi completo o de un inserto de roscado interno.  
 · Ajuste la profundidad de corte lo suficientemente profunda en materiales tales como el acero endurecido o acero inoxidable austenítico para ayudar a prevenir desgaste prematuro y despostillamiento causados por la capa externa del material.

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ROSCADO

# NOMENCLATURA DE LA SERIE MMT

## PORTA-HERRAMIENTAS

### EXTERIOR

| MMT E R 08 3 - SM |            |                           |                          |      |                    |                  |
|-------------------|------------|---------------------------|--------------------------|------|--------------------|------------------|
| Referencia        | Aplicación | Sentido de la herramienta | Tamaño de la Hta. (plgs) |      | Tamaño del Inserto | Tipo Herramienta |
|                   | E Exterior | R Derecha                 | (altura y ancho)         |      | 3 MMT16            | SM No-compensar  |
|                   |            |                           | 06                       | .375 | 12                 | .750             |
|                   |            |                           | 08                       | .500 | 16                 | 1.000            |
|                   |            |                           | 10                       | .625 | 20                 | 1.250            |

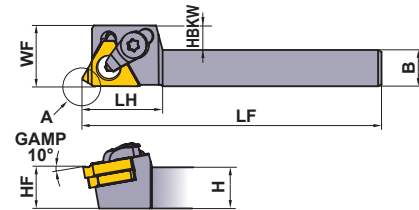
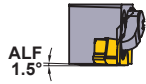
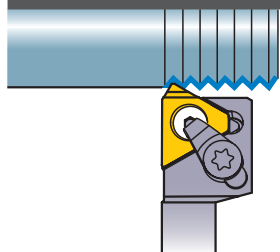
### INTERIOR

| MMT I R 10 2 - 0.50 - 1.5 - C |                           |                           |       |                    |                                 |      |                       |       |              |
|-------------------------------|---------------------------|---------------------------|-------|--------------------|---------------------------------|------|-----------------------|-------|--------------|
| Referencia                    | Aplicación                | Diámetro del Zanco (plgs) |       | Tamaño del Inserto | Mínimo diámetro de corte (plgs) |      | Ángulo de inclinación |       | Refrigerante |
|                               | I Interno                 | 10                        | .625  | 2 MMT11            | 0.50                            | .500 | 1.15                  | 1.150 | 1.5 1.5°     |
|                               |                           | 12                        | .750  | 3 MMT16            | 0.60                            | .600 | 1.20                  | 1.200 | 2.5 2.5°     |
|                               | Sentido de la herramienta | 16                        | 1.000 | 4 MMT22            | 0.75                            | .750 | 1.45                  | 1.450 |              |
|                               | R Derecha                 | 20                        | 1.250 |                    | 0.90                            | .900 | 1.50                  | 1.500 |              |
|                               |                           | 24                        | 1.500 |                    | 0.95                            | .950 | 1.75                  | 1.750 |              |

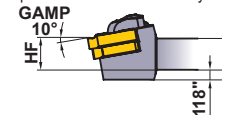
- Existen varios tipos de insertos
- Inserto de precisión para roscas precisas.
- Disponible con un rompevirutas para el control de la viruta.
- Posibilidad de cambiar el ángulo de ataque remplaceando el asiento.

## MMTE

### Roscado exterior



Detalles de posición A  
Consulte las especificaciones del inserto  
para las dimensiones PDX y PDY



**MMTER-063SM**

Solo a derecha

| Descripción | Existencia | Tipos de Inserto                                                                             | Dimensiones (plgs) |       |       |       |       |       |      |  |  * |  |  * |  |  |
|-------------|------------|----------------------------------------------------------------------------------------------|--------------------|-------|-------|-------|-------|-------|------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|             | R          |                                                                                              | H                  | B     | LF    | LH    | HF    | WF    | HBKW | Mordaza                                                                            | Tornillo Mordaza                                                                      | Seguro                                                                              | Tornillo de Asiento                                                                   | Asiento                                                                             | Llave                                                                               |
| MMTER-063SM | ●          | MMT16ER<br> | .375               | .375  | 4.724 | .875  | .375  | .625  | .250 | SETK51                                                                             | SETS51                                                                                | CR4                                                                                 | HFC03008                                                                              | CTE32TP15                                                                           | ①TKY15F<br>②HKY20R                                                                  |
| MMTER-083SM | ●          |                                                                                              | .500               | .500  | 4.724 | .875  | .500  | .625  | .125 | SETK51                                                                             | SETS51                                                                                | CR4                                                                                 | HFC03008                                                                              | CTE32TP15                                                                           | ①TKY15F<br>②HKY20R                                                                  |
| MMTER-083   | ●          |                                                                                              | .500               | .500  | 4.000 | 1.000 | .500  | .625  | —    | SETK51                                                                             | SETS51                                                                                | CR4                                                                                 | HFC03008                                                                              | CTE32TP15                                                                           | ①TKY15F<br>②HKY20R                                                                  |
| MMTER-103   | ●          |                                                                                              | .625               | .625  | 4.000 | 1.000 | .625  | .750  | —    | SETK51                                                                             | SETS51                                                                                | CR4                                                                                 | HFC03008                                                                              | CTE32TP15                                                                           | ①TKY15F<br>②HKY20R                                                                  |
| MMTER-123   | ●          |                                                                                              | .750               | .750  | 5.000 | 1.000 | .750  | 1.000 | —    | SETK51                                                                             | SETS51                                                                                | CR4                                                                                 | HFC03008                                                                              | CTE32TP15                                                                           | ①TKY15F<br>②HKY20R                                                                  |
| MMTER-163   | ●          |                                                                                              | 1.000              | 1.000 | 6.000 | 1.000 | 1.000 | 1.250 | —    | SETK51                                                                             | SETS51                                                                                | CR4                                                                                 | HFC03008                                                                              | CTE32TP15                                                                           | ①TKY15F<br>②HKY20R                                                                  |
| MMTER-124   | ●          | MMT22ER<br> | .750               | .750  | 5.000 | 1.250 | .750  | 1.000 | —    | SETK61                                                                             | SETS61                                                                                | CR5                                                                                 | HFC04010                                                                              | CTE43TP15                                                                           | ①TKY20F<br>②HKY25R                                                                  |
| MMTER-164   | ●          |                                                                                              | 1.000              | 1.000 | 6.000 | 1.250 | 1.000 | 1.250 | —    | SETK61                                                                             | SETS61                                                                                | CR5                                                                                 | HFC04010                                                                              | CTE43TP15                                                                           | ①TKY20F<br>②HKY25R                                                                  |
| MMTER-204   | ●          |                                                                                              | 1.250              | 1.250 | 6.000 | 1.250 | 1.250 | 1.500 | —    | SETK61                                                                             | SETS61                                                                                | CR5                                                                                 | HFC04010                                                                              | CTE43TP15                                                                           | ①TKY20F<br>②HKY25R                                                                  |

Nota 1) Seleccione y utilice un asiento alternativo de la siguiente lista (vendido por separado), dependiendo del ángulo de entrada.

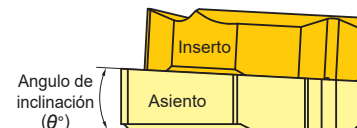
\* Torque sujecion (lbf-plgs) : SETS51=31, SETS61=44, HFC03008=13, HFC04010=19

## ASIENTO

| Angulo de alivio (α°) | Descripción      | Existencia<br>R | Angulo de inclinación (θ°) | Tipo porta herramienta |
|-----------------------|------------------|-----------------|----------------------------|------------------------|
| -1.5°                 | <b>CTE32TN15</b> | ●               | -3°                        | MMTER<br>-003          |
| -0.5°                 | <b>CTE32TN05</b> | ●               | -2°                        |                        |
| 0.5°                  | <b>CTE32TP05</b> | ●               | -1°                        |                        |
| 1.5°                  | <b>CTE32TP15</b> | ●               | 0°                         |                        |
| 2.5°                  | <b>CTE32TP25</b> | ●               | 1°                         |                        |
| 3.5°                  | <b>CTE32TP35</b> | ●               | 2°                         |                        |
| 4.5°                  | <b>CTE32TP45</b> | ●               | 3°                         |                        |

El asiento se entrega con el porta inserto.

| Angulo de alivio (α°) | Descripción      | Existencia<br>R | Angulo de inclinación (θ°) | Tipo porta herramienta |
|-----------------------|------------------|-----------------|----------------------------|------------------------|
| -1.5°                 | <b>CTE43TN15</b> | ●               | -3°                        | MMTER<br>-004          |
| -0.5°                 | <b>CTE43TN05</b> | ●               | -2°                        |                        |
| 0.5°                  | <b>CTE43TP05</b> | ●               | -1°                        |                        |
| 1.5°                  | <b>CTE43TP15</b> | ●               | 0°                         |                        |
| 2.5°                  | <b>CTE43TP25</b> | ●               | 1°                         |                        |
| 3.5°                  | <b>CTE43TP35</b> | ●               | 2°                         |                        |
| 4.5°                  | <b>CTE43TP45</b> | ●               | 3°                         |                        |



## CONDICIONES DE CORTE RECOMENDADAS

|          | Material                         | Dureza                               | Grado         | Velocidad de corte (SFM) |
|----------|----------------------------------|--------------------------------------|---------------|--------------------------|
| <b>P</b> | Acero Dulce                      | ≤180HB                               | <b>VP10MF</b> | 490 (230—755)            |
|          |                                  |                                      | <b>VP15TF</b> | 330 (195—460)            |
|          |                                  |                                      | <b>VP20RT</b> | 260 (195—330)            |
|          | Acero al carbono<br>Acero aleado | 180—280HB                            | <b>VP10MF</b> | 460 (260—655)            |
|          |                                  |                                      | <b>VP15TF</b> | 330 (195—460)            |
| <b>M</b> | Acero Inoxidable                 | ≤200HB                               | <b>VP20RT</b> | 260 (195—330)            |
|          |                                  |                                      | <b>VP15TF</b> | 260 (130—395)            |
| <b>K</b> | Fundición gris                   | Resistencia a la tracción<br>≤350MPa | <b>VP10MF</b> | 460 (260—655)            |
|          |                                  |                                      | <b>VP15TF</b> | 295 (195—395)            |

| Material |                                     | Dureza   | Grado  | Velocidad de corte (SFM) |
|----------|-------------------------------------|----------|--------|--------------------------|
| S        | Aleación con<br>tratamiento térmico | —        | VP10MF | 150 (50—230)             |
|          |                                     |          | VP15TF | 100 (65—130)             |
|          |                                     |          | VP20RT |                          |
|          | Aleación de titanio                 | —        | VP10MF | 195 (130—260)            |
|          |                                     |          | VP15TF | 150 (80—210)             |
|          |                                     |          | VP20RT |                          |
| H        | Aleación tratada                    | 45—55HRC | VP10MF | 165 (100—230)            |
|          |                                     |          | VP15TF | 130 (65—195)             |

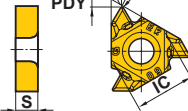
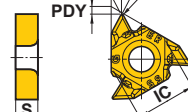
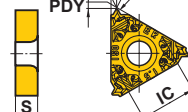
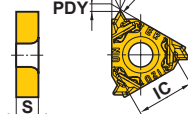
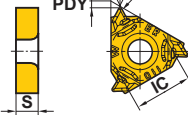
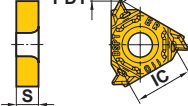
COMO SELECCIONAR EL ASIENTO ➤ G012  
REFACCIONES ➤ N001  
INFORMACION TECNICA ➤ P001

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ROSCADO

# MMT INSERTOS CLASE M CON ROMPEVIRUTA 3-D

## INSERTOS

| Tipo                 | Descripción      | Recubierto |        | Paso     |            | Dimensiones (mm) |      |     |     |      | Profundidad de Corte (mm) | Geometría                                                                                                                  |
|----------------------|------------------|------------|--------|----------|------------|------------------|------|-----|-----|------|---------------------------|----------------------------------------------------------------------------------------------------------------------------|
|                      |                  | VP15TF     | VP20RT |          |            | IC               | S    | PDY | PDX | RE   |                           |                                                                                                                            |
|                      |                  |            |        | mm       | rosca/plgs |                  |      |     |     |      |                           |                                                                                                                            |
| Rosca a 60°          | MMT16ERA60-S     | ●          |        | 0.5—1.5  | 48—16      | 9.525            | 3.44 | 0.8 | 0.9 | 0.06 | —                         | <div>Forma Parcial</div> <div></div>    |
|                      | MMT16ERG60-S     | ●          |        | 1.75—3.0 | 14—8       | 9.525            | 3.44 | 1.2 | 1.7 | 0.23 | —                         |                                                                                                                            |
|                      |                  |            |        |          |            |                  |      |     |     |      |                           |                                                                                                                            |
| Rosca a 55°          | MMT16ERA55-S     | ★          |        |          | 48—16      | 9.525            | 3.44 | 0.8 | 0.9 | 0.07 | —                         | <div>Forma Parcial</div> <div></div>    |
|                      | MMT16ERG55-S     | ★          |        |          | 14—8       | 9.525            | 3.44 | 1.2 | 1.7 | 0.23 | —                         |                                                                                                                            |
|                      |                  |            |        |          |            |                  |      |     |     |      |                           |                                                                                                                            |
| ISO en mm            | MMT16ER100ISO-S  | ●          | ★      | 1.0      |            | 9.525            | 3.44 | 0.7 | 0.7 | 0.13 | 0.61                      | <div>Forma Completa</div> <div></div>   |
|                      | 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                      |                                                                                                                            |
| Cuerda UN            | MMT16ER160UN-S   | ●          |        |          | 16         | 9.525            | 3.44 | 0.9 | 1.1 | 0.23 | 0.97                      | <div>Forma Completa</div> <div></div> |
|                      | 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                      |                                                                                                                            |
| Para Cuerda BSW, BSP | MMT16ER190W-S    | ★          |        |          | 19         | 9.525            | 3.44 | 0.8 | 1.0 | 0.18 | 0.86                      | <div>Forma Completa</div> <div></div> |
|                      | 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                      | <div>Forma Completa</div> <div></div> |
|                      | 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                      |                                                                                                                            |
|                      |                  |            |        |          |            |                  |      |     |     |      |                           |                                                                                                                            |

## IDENTIFICACION

|            |                                    |                          |                           |                                                                                                  |                                                                                                          |          |          |                                      |
|------------|------------------------------------|--------------------------|---------------------------|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|----------|----------|--------------------------------------|
| <b>MMT</b> | <b>16</b>                          | <b>E</b>                 | <b>R</b>                  | <b>100</b>                                                                                       | <b>ISO</b>                                                                                               | <b>-</b> | <b>S</b> | Insertos clase M con rompeviruta 3-D |
| Referencia | Diámetro del Círculo Inscrito (mm) | Aplicación               | Sentido de la herramienta | Paso                                                                                             | Tipo de Rosca                                                                                            |          |          |                                      |
|            | 11 6.35<br>16 9.525                | E Exterior<br>I Interior | R Derecha                 | 100 1.0 mm<br>125 1.25 mm<br>150 1.5 mm<br>175 1.75 mm<br>200 2.0 mm<br>250 2.5 mm<br>300 3.0 mm | 60 Rosca a 60°<br>55 Rosca a 55°<br>ISO ISO en mm<br>W Para Cuerda BSW, BSP<br>BSPT BSPT<br>UN Cuerda UN |          |          |                                      |
|            |                                    |                          |                           | A 0.5—1.5 mm<br>o<br>48—16 rosca/plgs<br>G 1.75—3.0 mm<br>o<br>14—8 rosca/plgs                   |                                                                                                          |          |          |                                      |

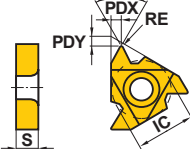
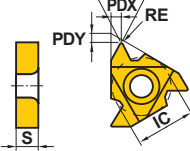
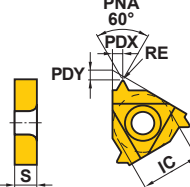
● : Existencia en EUA ★ : Stock en Japón

&lt;5 insertos por caja&gt;



# MMT INSERTOS CLASE G PARA ROSCADO

## INSERTOS

| Tipo        | Tolerancia de la Rosca | Descripción   | Recubierto |        | Paso     |            | Dimensiones (mm) |      |     |     |      | Profundidad de Corte (mm) | Geometría                                                                                                                 |
|-------------|------------------------|---------------|------------|--------|----------|------------|------------------|------|-----|-----|------|---------------------------|---------------------------------------------------------------------------------------------------------------------------|
|             |                        |               | VP10MF     | VP15TF |          |            | IC               | S    | PDY | PDX | RE   |                           |                                                                                                                           |
|             |                        |               |            |        | mm       | rosca/plgs |                  |      |     |     |      |                           |                                                                                                                           |
| Rosca a 60° | —                      | MMT16ERA60    | ★          | ★      | 0.5—1.5  | 48—16      | 9.525            | 3.44 | 0.8 | 0.9 | 0.05 | —                         | <div>Forma Parcial</div> <div></div>   |
|             |                        | 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 | —                         |                                                                                                                           |
|             |                        |               |            |        |          |            |                  |      |     |     |      |                           |                                                                                                                           |
| Rosca a 55° | —                      | MMT16ERA55    | ★          | ★      |          | 48—16      | 9.525            | 3.44 | 0.8 | 0.9 | 0.05 | —                         | <div>Forma Parcial</div> <div></div>   |
|             |                        | 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 en mm   | 6g                     | MMT16ER050ISO | ●          |        | 0.5      |            | 9.525            | 3.44 | 0.6 | 0.4 | 0.06 | 0.31                      | <div>Forma Completa</div> <div></div> |
|             |                        | 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                      |                                                                                                                           |

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ROSCADO

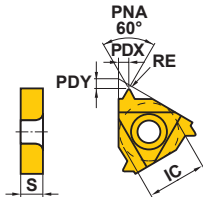
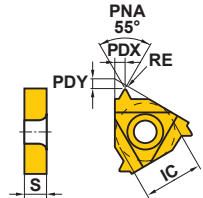
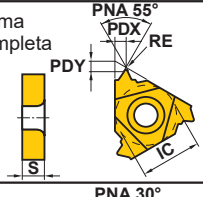
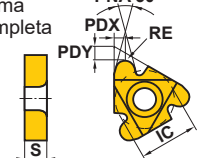
## IDENTIFICACION

|            |                                    |            |                           |             |                                         |
|------------|------------------------------------|------------|---------------------------|-------------|-----------------------------------------|
| <b>MMT</b> | <b>16</b>                          | <b>E</b>   | <b>R</b>                  | <b>050</b>  | <b>ISO</b>                              |
| Referencia |                                    |            | Sentido de la herramienta | Paso        | Tipo de Rosca                           |
|            | Diámetro del Círculo Inscrito (mm) | Aplicación | R Derecha                 |             |                                         |
|            | 11 6.35                            | E Exterior |                           | 050 0.5 mm  | 60 Rosca a 60°                          |
|            | 16 9.525                           | I Interno  |                           | 075 0.75 mm | 55 Rosca a 55°                          |
|            | 22 12.7                            |            |                           | 100 1.0 mm  | ISO ISO en mm                           |
|            |                                    |            |                           | 125 1.25 mm | W Para Cuerda BSW, BSP                  |
|            |                                    |            |                           | 150 1.5 mm  | BSPT BSPT                               |
|            |                                    |            |                           | 175 1.75 mm | UN Cuerda UN                            |
|            |                                    |            |                           | 200 2.0 mm  | RD Redondo norma DIN 405                |
|            |                                    |            |                           | 250 2.5 mm  | TR Trapezoidal 30° norma ISO            |
|            |                                    |            |                           | 300 3.0 mm  | ACME Cuerda ACME                        |
|            |                                    |            |                           | 350 3.5 mm  | UNJ UNJ                                 |
|            |                                    |            |                           | 400 4.0 mm  | APBU Cuerda para carcasa tipo API       |
|            |                                    |            |                           | 450 4.5 mm  | APRD Cuerda redanda para carcasa y tubo |
|            |                                    |            |                           | 500 5.0 mm  | NPT NPT                                 |
|            |                                    |            |                           |             | NPTF NPTF                               |



# MMT INSERTOS CLASE G PARA ROSCADO

## INSERTOS

| Tipo                  | Tolerancia de la Rosca | Descripción    | Recubierto |        | Paso |            | Dimensiones (mm) |      |     |     |      | Profundidad de Corte (mm) | Geometría                                                                                                       |
|-----------------------|------------------------|----------------|------------|--------|------|------------|------------------|------|-----|-----|------|---------------------------|-----------------------------------------------------------------------------------------------------------------|
|                       |                        |                | VP10MF     | VP15TF |      |            | IC               | S    | PDY | PDX | RE   |                           |                                                                                                                 |
|                       |                        |                |            |        | mm   | rosca/plgs |                  |      |     |     |      |                           |                                                                                                                 |
| Cuerda UN             | 2A                     | MMT16ER320UN   | ●          |        |      | 32         | 9.525            | 3.44 | 0.6 | 0.6 | 0.09 | 0.49                      | <div>Forma Completa</div>    |
|                       |                        | 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                      |                                                                                                                 |
| Para Cuerda BSW, BSP  | Clase media A          | MMT16ER280W    | ★          |        |      | 28         | 9.525            | 3.44 | 0.6 | 0.7 | 0.09 | 0.58                      | <div>Forma Completa</div>  |
|                       |                        | 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                  | Estandar norma BSPT    | MMT16ER280BSPT | ★          |        |      | 28         | 9.525            | 3.44 | 0.6 | 0.6 | 0.09 | 0.58                      | <div>Forma Completa</div>  |
|                       |                        | 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                      |                                                                                                                 |
|                       |                        |                |            |        |      |            |                  |      |     |     |      |                           |                                                                                                                 |
| Redondo norma DIN 405 | 7h                     | MMT16ER100RD   | ★          |        |      | 10         | 9.525            | 3.44 | 1.1 | 1.2 | 0.60 | 1.27                      | <div>Forma Completa</div>  |
|                       |                        | MMT16ER080RD   | ★          |        |      | 8          | 9.525            | 3.44 | 1.4 | 1.3 | 0.75 | 1.59                      |                                                                                                                 |
|                       |                        | MMT16ER060RD   | ★          |        |      | 6          | 9.525            | 3.44 | 1.5 | 1.7 | 1.00 | 2.12                      |                                                                                                                 |
|                       |                        | MMT22ER040RD   | ★          |        |      | 4          | 9.525            | 3.44 | 2.2 | 2.3 | 1.51 | 3.18                      |                                                                                                                 |

● : Existencia en EUA ★ : Stock en Japón

| Tipo                               | Tolerancia de la Rosca | Descripción    | Recubierto |  | Paso |            | Dimensiones (mm) |      |     |     |      | Profundidad de Corte (mm) | Geometría |
|------------------------------------|------------------------|----------------|------------|--|------|------------|------------------|------|-----|-----|------|---------------------------|-----------|
|                                    |                        |                | VP10MF     |  |      |            | IC               | S    | PDY | PDX | RE   |                           |           |
|                                    |                        |                |            |  | mm   | rosca/plgs |                  |      |     |     |      |                           |           |
| Trapezoidal 30° norma ISO          | 7e                     | MMT16ER150TR   | ★          |  | 1.5  |            | 9.525            | 3.44 | 1.0 | 1.1 | 0.08 | 0.90                      |           |
|                                    |                        | 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                      |           |
| Cuerda ACME                        | 3G                     | MMT16ER120ACME | ●          |  |      | 12         | 9.525            | 3.44 | 1.1 | 1.2 | 0.08 | 1.19                      |           |
|                                    |                        | 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                      |           |
|                                    |                        | 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                      |           |
| Cuerda para carcasa tipo API       | Estandar norma API     | MMT22ER050APBU | ★          |  |      | 5          | 12.7             | 4.64 | 3.1 | 1.9 | 0.18 | 1.55                      |           |
|                                    |                        |                |            |  |      |            |                  |      |     |     |      |                           |           |
| Cuerda redanda para carcasa y tubo | Estandar norma API RD  | MMT16ER100APRD | ●          |  |      | 10         | 9.525            | 3.44 | 1.2 | 1.4 | 0.34 | 1.41                      |           |
|                                    |                        | MMT16ER080APRD | ●          |  |      | 8          | 9.525            | 3.44 | 1.3 | 1.5 | 0.41 | 1.81                      |           |
| Cuerda NPT                         | Estandar norma NPT     | MMT16ER270NPT  | ●          |  |      | 27         | 9.525            | 3.44 | 0.7 | 0.8 | 0.04 | 0.66                      |           |
|                                    |                        | 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                      |           |
| Cuerda NPTF                        | Clase 2                | MMT16ER270NPTF | ★          |  |      | 27         | 9.525            | 3.44 | 0.7 | 0.8 | 0.04 | 0.64                      |           |
|                                    |                        | 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                      |           |
|                                    |                        |                |            |  |      |            |                  |      |     |     |      |                           |           |

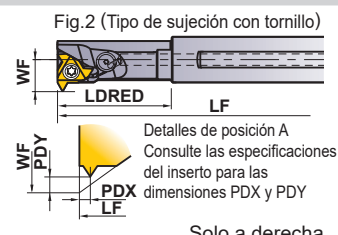
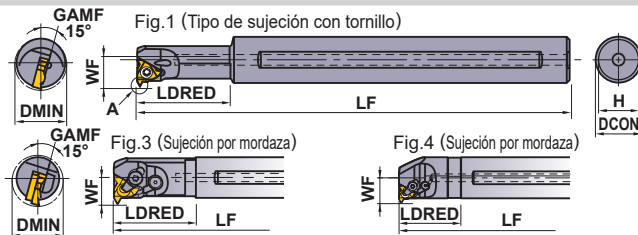
# BARRA TIPO MMTI

- Mínimo diámetro de corte .500".
- Existen varios tipos de insertos
- Inserto de precisión para roscas precisas.

- Disponible con un rompevirutas para el control de la viruta.
- Posibilidad de cambiar el ángulo de ataque reemplazando el asiento.

## MMTI

### Roscado interno



Solo a derecha

| Descripción         | Existencia | Tipos de Inserto | Angulo de alivio | Dimensiones (plgs) |        |       |      |       |       | Mordaza | Tornillo Mordaza | Seguro | Tornillo de Asiento | Asiento   | Llave              | Fig. |
|---------------------|------------|------------------|------------------|--------------------|--------|-------|------|-------|-------|---------|------------------|--------|---------------------|-----------|--------------------|------|
|                     |            |                  |                  | DCON               | LF     | LDRED | WF   | H     | DMIN  |         |                  |        |                     |           |                    |      |
| MMTIR102-0.50-1.5-C | ●          | MMT11IR          | 1.5°             | .625               | 5.000  | 1.000 | .340 | .586  | .500  | —       | TS25             | —      | —                   | —         | ①TKY08F            | 1    |
| MMTIR102-0.50-2.5-C | ●          |                  | 2.5°             | .625               | 5.000  | 1.000 | .340 | .586  | .500  | —       | TS25             | —      | —                   | —         | ①TKY08F            | 1    |
| MMTIR102-0.60-1.5-C | ●          |                  | 1.5°             | .625               | 6.000  | 1.250 | .380 | .586  | .600  | —       | TS25             | —      | —                   | —         | ①TKY08F            | 1    |
| MMTIR102-0.60-2.5-C | ●          |                  | 2.5°             | .625               | 6.000  | 1.250 | .380 | .586  | .600  | —       | TS25             | —      | —                   | —         | ①TKY08F            | 1    |
| MMTIR103-0.75-1.5-C | ●          | MMT16IR          | 1.5°             | .625               | 6.000  | 1.500 | .480 | .586  | .750  | —       | CS350860T        | —      | —                   | —         | ①TKY15F            | 2    |
| MMTIR103-0.75-2.5-C | ●          |                  | 2.5°             | .625               | 6.000  | 1.500 | .480 | .586  | .750  | —       | CS350860T        | —      | —                   | —         | ①TKY15F            | 2    |
| MMTIR123-0.90-1.5-C | ●          |                  | 1.5°             | .750               | 7.000  | 1.500 | .510 | .711  | .900  | SETK51  | SETS51           | CR4    | HFC03006            | CTI32TP15 | ①TKY15F<br>②HKY20R | 3    |
| MMTIR163-1.15-1.5-C | ●          |                  | 1.5°             | 1.000              | 10.000 | 2.500 | .660 | .937  | 1.150 | SETK51  | SETS51           | CR4    | HFC03006            | CTI32TP15 | ①TKY15F<br>②HKY20R | 3    |
| MMTIR203-1.45-1.5-C | ●          | MMT22IR          | 1.5°             | 1.250              | 10.000 | 2.000 | .810 | 1.187 | 1.450 | SETK51  | SETS51           | CR4    | HFC03006            | CTI32TP15 | ①TKY15F<br>②HKY20R | 4    |
| MMTIR124-0.95-1.5-C | ●          |                  | 1.5°             | .750               | 7.000  | 2.000 | .610 | .711  | .950  | —       | TS43             | —      | —                   | —         | ①TKY15F            | 2    |
| MMTIR124-0.95-2.5-C | ●          |                  | 2.5°             | .750               | 7.000  | 2.000 | .610 | .711  | .950  | —       | TS43             | —      | —                   | —         | ①TKY15F            | 2    |
| MMTIR164-1.20-1.5-C | ●          |                  | 1.5°             | 1.000              | 8.000  | 1.500 | .700 | .937  | 1.200 | SETK61  | SETS61           | CR5    | HFC04008            | CTI43TP15 | ①TKY20F<br>②HKY25R | 4    |
| MMTIR204-1.50-1.5-C | ●          |                  | 1.5°             | 1.250              | 10.000 | 2.000 | .860 | 1.187 | 1.500 | SETK61  | SETS61           | CR5    | HFC04008            | CTI43TP15 | ①TKY20F<br>②HKY25R | 4    |
| MMTIR244-1.75-1.5-C | ●          |                  | 1.5°             | 1.500              | 12.000 | 2.500 | .980 | 1.437 | 1.750 | SETK61  | SETS61           | CR5    | HFC04008            | CTI43TP15 | ①TKY20F<br>②HKY25R | 4    |

Nota 1) Seleccione y utilice un asiento alternativo de la siguiente lista (vendido por separado), dependiendo del ángulo de entrada.

- El tipo de sujeción por tornillo no tiene asiento. El portaherramientas ya cuenta con un ángulo de entrada. Seleccione un portaherramientas con el ángulo de entrada apropiado.
- El diámetro mínimo de corte (DMIN) indica el diámetro del barreno preparado, no el diámetro nominal de la rosca.

\* Torque sujecion (lbf-plgs) : TS25=8.9, CS350860T=31, SETS51=31, TS43=31, SETS61=44, HFC03006=13, HFC04008=19

### ASIENTO

| Angulo de alivio (α°) | Descripción | Existencia | Angulo de inclinación (θ°) | Barra                  |
|-----------------------|-------------|------------|----------------------------|------------------------|
| -1.5°                 | CTI32TN15   | ●          | -3°                        | MMTIR<br>④③-④④<br>④④-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°                         |                        |

| Angulo de alivio (α°) | Descripción | Existencia | Angulo de inclinación (θ°) | Barra                  |
|-----------------------|-------------|------------|----------------------------|------------------------|
| -1.5°                 | CTI43TN15   | ●          | -3°                        | MMTIR<br>④④-④④<br>④④-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°                         |                        |



El asiento se entrega con el porta inserto.

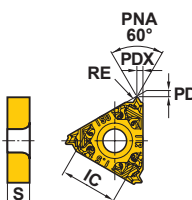
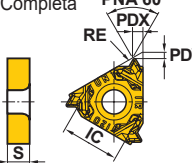
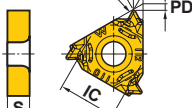
### CONDICIONES DE CORTE RECOMENDADAS

|   | Material                         | Dureza                               | Grado  | Velocidad de corte (SFM) |
|---|----------------------------------|--------------------------------------|--------|--------------------------|
| P | Acero Dulce                      | ≤180HB                               | VP10MF | 490 (230—755)            |
|   |                                  |                                      | VP15TF | 330 (195—460)            |
|   |                                  |                                      | VP20RT | 260 (195—330)            |
|   | Acero al carbono<br>Acero aleado | 180—280HB                            | VP10MF | 460 (260—655)            |
|   |                                  |                                      | VP15TF | 330 (195—460)            |
|   |                                  |                                      | VP20RT | 260 (195—330)            |
| M | Acero Inoxidable                 | ≤200HB                               | VP15TF | 260 (130—395)            |
| K | Fundición gris                   | Resistencia a la tracción<br>≤350MPa | VP10MF | 460 (260—655)            |
|   |                                  |                                      | VP15TF | 295 (195—395)            |

|   | Material                            | Dureza   | Grado  | Velocidad de corte (SFM) |
|---|-------------------------------------|----------|--------|--------------------------|
| S | Aleación con<br>tratamiento térmico | —        | VP10MF | 150 (50—230)             |
|   |                                     |          | VP15TF | 100 (65—130)             |
|   |                                     |          | VP20RT |                          |
| H | Aleación de titanio                 | —        | VP10MF | 195 (130—260)            |
|   |                                     |          | VP15TF | 150 (80—210)             |
|   |                                     |          | VP20RT |                          |
| H | Aleación tratada                    | 45—55HRC | VP10MF | 165 (100—230)            |
|   |                                     |          | VP15TF | 130 (65—195)             |

# MMT INSERTOS CLASE M CON ROMPEVIRUTA 3-D

## INSERTOS

| Tipo                 | Descripción      | Recubierta |        | Paso     |            | Dimensiones (mm) |      |     |     |      | Profundidad de Corte (mm) | Geometría                                                                             |
|----------------------|------------------|------------|--------|----------|------------|------------------|------|-----|-----|------|---------------------------|---------------------------------------------------------------------------------------|
|                      |                  | VP15TF     | VP20RT |          |            | IC               | S    | PDY | PDX | RE   |                           |                                                                                       |
|                      |                  |            |        | mm       | rosca/plgs |                  |      |     |     |      |                           |                                                                                       |
| Rosca a 60°          | MMT11IRA60-S     | ★          |        | 0.5—1.5  | 48—16      | 6.35             | 3.04 | 0.8 | 0.9 | 0.03 | —                         |    |
|                      | 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 | —                         |                                                                                       |
|                      |                  |            |        |          |            |                  |      |     |     |      |                           |                                                                                       |
| Rosca a 55°          | MMT11IRA55-S     | ★          |        |          | 48—16      | 6.35             | 3.04 | 0.8 | 0.9 | 0.07 | —                         |    |
|                      | 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 en mm            | MMT11IR100ISO-S  | ★          |        | 1.0      |            | 6.35             | 3.04 | 0.6 | 0.7 | 0.06 | 0.58                      |    |
|                      | 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                      |                                                                                       |
| Cuerda UN            | MMT16IR160UN-S   | ●          |        |          | 16         | 9.525            | 3.44 | 0.9 | 1.1 | 0.11 | 0.92                      |  |
|                      | 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                      |                                                                                       |
|                      |                  |            |        |          |            |                  |      |     |     |      |                           |                                                                                       |
| Para Cuerda BSW, BSP | MMT16IR190W-S    | ★          |        |          | 19         | 9.525            | 3.44 | 0.8 | 1.0 | 0.18 | 0.86                      |  |
|                      | 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                      |  |
|                      | 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                      |                                                                                       |
|                      |                  |            |        |          |            |                  |      |     |     |      |                           |                                                                                       |

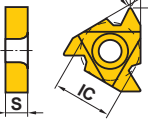
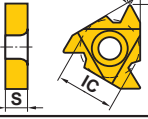
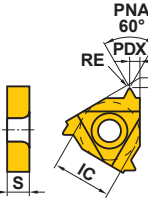
G  
ROSCADO

## IDENTIFICACION

|            |                                    |                          |                           |                                                                                                  |                                                                                                          |          |          |                                      |
|------------|------------------------------------|--------------------------|---------------------------|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|----------|----------|--------------------------------------|
| <b>MMT</b> | <b>16</b>                          | <b>I</b>                 | <b>R</b>                  | <b>100</b>                                                                                       | <b>ISO</b>                                                                                               | <b>-</b> | <b>S</b> | Insertos clase M con rompeviruta 3-D |
| Referencia | Diámetro del Círculo Inscrito (mm) | Aplicación               | Sentido de la herramienta | Paso                                                                                             | Tipo de Rosca                                                                                            |          |          |                                      |
|            | 11 6.35<br>16 9.525                | E Exterior<br>I Interior | R Derecha                 | 100 1.0 mm<br>125 1.25 mm<br>150 1.5 mm<br>175 1.75 mm<br>200 2.0 mm<br>250 2.5 mm<br>300 3.0 mm | 60 Rosca a 60°<br>55 Rosca a 55°<br>ISO ISO en mm<br>W Para Cuerda BSW, BSP<br>BSPT BSPT<br>UN Cuerda UN |          |          |                                      |
|            |                                    |                          |                           | A 0.5–1.5 mm<br>o<br>48–16 rosca/plgs<br>G 1.75–3.0 mm<br>o<br>14–8 rosca/plgs                   |                                                                                                          |          |          |                                      |

# MMT INSERTOS CLASE G PARA ROSCADO

## INSERTOS

| Tipo        | Tolerancia de la Rosca | Descripción   | Recubierto |        | Paso     |            | Dimensiones (mm) |      |     |     |      | Profundidad de Corte (mm) | Geometría                                                                            |
|-------------|------------------------|---------------|------------|--------|----------|------------|------------------|------|-----|-----|------|---------------------------|--------------------------------------------------------------------------------------|
|             |                        |               | VP10MF     | VP15TF |          |            | IC               | S    | PDY | PDX | RE   |                           |                                                                                      |
|             |                        |               |            |        | mm       | rosca/plgs |                  |      |     |     |      |                           |                                                                                      |
| Rosca a 60° | —                      | MMT11IRA60    | ★          | ★      | 0.5—1.5  | 48—16      | 6.35             | 3.04 | 0.8 | 0.9 | 0.05 | —                         |   |
|             |                        | 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 | —                         |                                                                                      |
|             |                        |               |            |        |          |            |                  |      |     |     |      |                           |                                                                                      |
| Rosca a 55° | —                      | MMT11IRA55    | ★          | ★      |          | 48—16      | 6.35             | 3.04 | 0.8 | 0.9 | 0.05 | —                         |   |
|             |                        | 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 en mm   | 6H                     | MMT11IR050ISO | ★          |        | 0.5      |            | 6.35             | 3.04 | 0.6 | 0.4 | 0.03 | 0.29                      |  |
|             |                        | 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                      |                                                                                      |

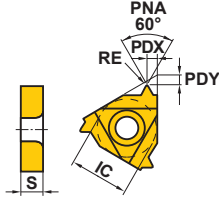
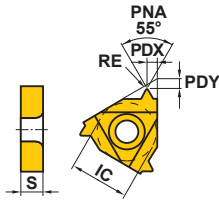
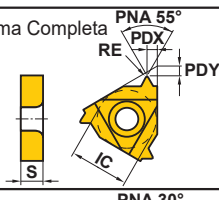
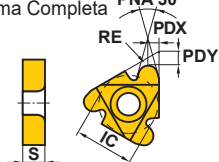
## IDENTIFICACION

|            |                                    |            |                           |             |                                         |
|------------|------------------------------------|------------|---------------------------|-------------|-----------------------------------------|
| <b>MMT</b> | <b>16</b>                          | <b>I</b>   | <b>R</b>                  | <b>050</b>  | <b>ISO</b>                              |
| Referencia |                                    |            |                           |             |                                         |
|            | Diámetro del Círculo Inscrito (mm) | Aplicación | Sentido de la herramienta | Paso        | Tipo de Rosca                           |
|            | 11 6.35                            | E Exterior | R Derecha                 | 050 0.5 mm  | 60 Rosca a 60°                          |
|            | 16 9.525                           | I Interno  |                           | 075 0.75 mm | 55 Rosca a 55°                          |
|            | 22 12.7                            |            |                           | 100 1.0 mm  | ISO ISO en mm                           |
|            |                                    |            |                           | 125 1.25 mm | W Para Cuerda BSW, BSP                  |
|            |                                    |            |                           | 150 1.5 mm  | BSPT BSPT                               |
|            |                                    |            |                           | 175 1.75 mm | UN Cuerda UN                            |
|            |                                    |            |                           | 200 2.0 mm  | RD Redondo norma DIN 405                |
|            |                                    |            |                           | 250 2.5 mm  | TR Trapezoidal 30° norma ISO            |
|            |                                    |            |                           | 300 3.0 mm  | ACME Cuerda ACME                        |
|            |                                    |            |                           | 350 3.5 mm  | UNJ UNJ                                 |
|            |                                    |            |                           | 400 4.0 mm  | APBU Cuerda para carcasa tipo API       |
|            |                                    |            |                           | 450 4.5 mm  | APRD Cuerda redanda para carcasa y tubo |
|            |                                    |            |                           | 500 5.0 mm  | NPT NPT                                 |
|            |                                    |            |                           |             | NPTF NPTF                               |

● : Existencia en EUA ★ : Stock en Japón

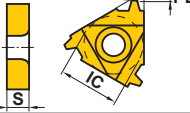
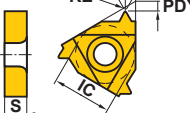
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| Tipo                  | Tolerancia de la Rosca | Descripción    | Recubierto |            | Paso |    | Dimensiones (mm) |      |     |     |      | Profundidad de Corte (mm) | Geometría                                                                                                       |
|-----------------------|------------------------|----------------|------------|------------|------|----|------------------|------|-----|-----|------|---------------------------|-----------------------------------------------------------------------------------------------------------------|
|                       |                        |                | VP10MF     | VP15TF     |      |    | IC               | S    | PDY | PDX | RE   |                           |                                                                                                                 |
|                       |                        |                | mm         | rosca/plgs |      |    |                  |      |     |     |      |                           |                                                                                                                 |
| Cuerda UN             | 2B                     | MMT11IR320UN   | ●          |            |      | 32 | 6.35             | 3.04 | 0.6 | 0.6 | 0.04 | 0.46                      | <div>Forma Completa</div>    |
|                       |                        | 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                      |                                                                                                                 |
| Para Cuerda BSW, BSP  | Clase media A          | MMT11IR190W    | ★          |            |      | 19 | 6.35             | 3.04 | 0.8 | 1.0 | 0.19 | 0.86                      | <div>Forma Completa</div>  |
|                       |                        | 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                  | Estandar norma BSPT    | MMT11IR190BSPT | ★          |            |      | 19 | 6.35             | 3.04 | 0.8 | 0.9 | 0.14 | 0.86                      | <div>Forma Completa</div>  |
|                       |                        | 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                      |                                                                                                                 |
| Redondo norma DIN 405 | 7H                     | MMT16IR100RD   | ★          |            |      | 10 | 9.525            | 3.44 | 1.1 | 1.2 | 0.55 | 1.27                      | <div>Forma Completa</div>  |
|                       |                        | 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 INSERTOS CLASE G PARA ROSCADO

## INSERTOS

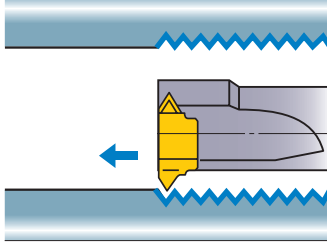
| Tipo                               | Tolerancia de la Rosca | Descripción                                                                                                                                                                                                  | Recubierto |  | Paso |            | Dimensiones (mm) |      |     |      |          | Profundidad de Corte (mm) | Geometría                                                                                                          |
|------------------------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--|------|------------|------------------|------|-----|------|----------|---------------------------|--------------------------------------------------------------------------------------------------------------------|
|                                    |                        |                                                                                                                                                                                                              | VP10MF     |  |      |            | IC               | S    | PDY | PDX  | RE RER/L |                           |                                                                                                                    |
|                                    |                        |                                                                                                                                                                                                              |            |  | mm   | rosca/plgs |                  |      |     |      |          |                           |                                                                                                                    |
| Trapezoidal 30° norma ISO          | 7H                     | MMT16IR150TR                                                                                                                                                                                                 | ★          |  | 1.5  |            | 9.525            | 3.44 | 1.0 | 1.1  | 0.08     | 0.90                      | <div>Forma semi-completa</div>  |
|                                    |                        | 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                      |                                                                                                                    |
| Cuerda ACME                        | 3G                     | MMT16IR120ACME                                                                                                                                                                                               | ●          |  |      | 12         | 9.525            | 3.44 | 1.2 | 1.3  | 0.05     | 1.19                      | <div>Forma semi-completa</div>  |
|                                    |                        | 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                                |                        | <div>Quando machine una cuerda interna UNJ,<br/>Realice un barrenado previo de diámetro apropiado y después machine una cuerda UN a 60°.<br/>Aquí un inserto de forma completa no puede ser utilizado.</div> |            |  |      |            |                  |      |     |      |          |                           |                                                                                                                    |
|                                    |                        |                                                                                                                                                                                                              |            |  |      |            |                  |      |     |      |          |                           |                                                                                                                    |
| Cuerda para carcasa tipo API       | Estandar norma API     | MMT22IR050APBU                                                                                                                                                                                               | ★          |  |      | 5          | 12.7             | 4.64 | 2.8 | 1.9  | 0.74/0.8 | 1.55                      | <div>Forma Completa</div>     |
| Cuerda redonda para carcasa y tubo | Estandar norma API RD  | MMT16IR100APRD                                                                                                                                                                                               | ●          |  |      | 10         | 9.525            | 3.44 | 1.2 | 1.4  | 0.34     | 1.41                      | <div>Forma Completa</div>     |
|                                    |                        | MMT16IR080APRD                                                                                                                                                                                               | ●          |  |      | 8          | 9.525            | 3.44 | 1.3 | 1.5  | 0.41     | 1.81                      |                                                                                                                    |
| Cuerda NPT                         | Estandar norma NPT     | MMT16IR270NPT                                                                                                                                                                                                | ●          |  |      | 27         | 9.525            | 3.44 | 0.7 | 0.8  | 0.04     | 0.66                      | <div>Forma Completa</div>     |
|                                    |                        | 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     |                           |                                                                                                                    |
| Cuerda NPTF                        | Clase 2                | MMT16IR140NPTF                                                                                                                                                                                               | ★          |  |      | 14         | 9.525            | 3.44 | 0.9 | 1.2  | 0.04     | 1.35                      | <div>Forma Completa</div>     |
|                                    |                        | 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     |                           |                                                                                                                    |

# BARRA TIPO F

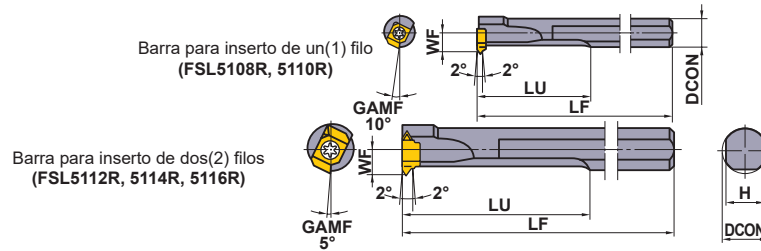
- Mínimo diámetro de corte 10 mm.
- Tipo de sujeción con tornillo.
- Aplicable para roscado, ranurado.
- Paso de rosca 1.5—3.5 mm.

## FSL51

### Roscado Interno, Ranurado



Nota 1) No es posible maquinarse en la dirección opuesta



Solo a derecha

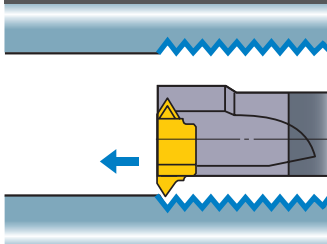
| Descripción | Existencia | Tipos de Inserto |                  | Dimensiones (mm) |     |    |     |      |        | *2   |        |
|-------------|------------|------------------|------------------|------------------|-----|----|-----|------|--------|------|--------|
|             | R          | Roscado          | Portaherramienta | DCON             | LF  | LU | WF  | H    | DMIN*1 |      |        |
| FSL5108R    | ★          | MLT1001L         | MLG1000L         | 8                | 125 | 30 | 4.8 | 7    | 10     | TS25 | TKY08F |
| FSL5110R    | ★          | MLT1001L         | MLG1000L         | 10               | 150 | 40 | 5.8 | 9    | 12     | TS25 | TKY08F |
| FSL5112R    | ★          | MLT1401L         | MLG1400L         | 12               | 180 | 50 | 6.8 | 10.8 | 14     | TS32 | TKY08F |
| FSL5114R    | ★          | MLT1401L         | MLG1400L         | 14               | 180 | 60 | 7.8 | 12.4 | 16     | TS32 | TKY08F |
| FSL5116R    | ★          | MLT2001L         | MLG2000L         | 16               | 200 | 70 | 9.7 | 14   | 20     | TS43 | TKY15F |

\*1 DMIN : Diámetro mínimo de corte

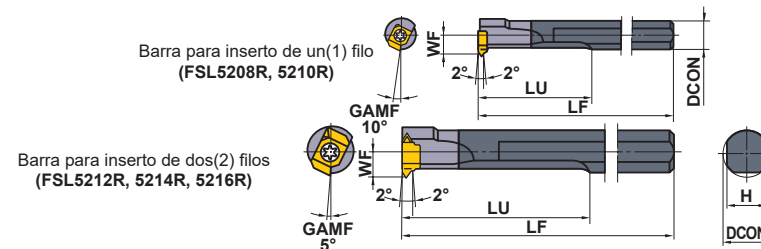
\*2 Torque sujecion (lbf-plgs) : TS25=8.9, TS32=18, TS43=31

## FSL52

### (Zanco de carburo) Roscado Interno, Ranurado



Nota 1) No es posible maquinarse en la dirección opuesta



Solo a derecha

| Descripción | Existencia | Tipos de Inserto |                  | Dimensiones (mm) |     |     |     |    |        | *2   |        |
|-------------|------------|------------------|------------------|------------------|-----|-----|-----|----|--------|------|--------|
|             | R          | Roscado          | Portaherramienta | DCON             | LF  | LU  | WF  | H  | DMIN*1 |      |        |
| FSL5208R    | ★          | MLT1001L         | MLG1000L         | 8                | 125 | 60  | 4.8 | 7  | 10     | TS25 | TKY08F |
| FSL5210R    | ★          | MLT1001L         | MLG1000L         | 10               | 150 | 70  | 5.8 | 9  | 12     | TS25 | TKY08F |
| FSL5212R    | ★          | MLT1401L         | MLG1400L         | 12               | 180 | 80  | 6.8 | 11 | 14     | TS32 | TKY08F |
| FSL5214R    | ★          | MLT1401L         | MLG1400L         | 14               | 180 | 85  | 7.8 | 12 | 16     | TS32 | TKY08F |
| FSL5216R    | ★          | MLT2001L         | MLG2000L         | 16               | 200 | 115 | 9.7 | 14 | 20     | TS43 | TKY15F |

\*1 DMIN : Diámetro mínimo de corte

\*2 Torque sujecion (lbf-plgs) : TS25=8.9, TS32=18, TS43=31

## CONDICIONES DE CORTE RECOMENDADAS

| Pieza | Dureza                          | Grado  | Velocidad de Corte (SFM) |
|-------|---------------------------------|--------|--------------------------|
| P     | Aceros Blandos                  | UP20M  | 460 (330—590)            |
|       |                                 | UTi20T | 395 (330—490)            |
|       | Acero al Carbón<br>Acero Aleado | UP20M  | 395 (330—490)            |
|       |                                 | UTi20T | 330 (230—395)            |

| Pieza | Dureza           | Grado  | Velocidad de Corte (SFM) |
|-------|------------------|--------|--------------------------|
| M     | Acero Inoxidable | UP20M  | 395 (260—490)            |
|       |                  | UTi20T | 330 (230—425)            |
| K     | Fundición Gris   | UP20M  | 260 (195—330)            |
|       |                  | UTi20T | 260 (195—330)            |

INSERTOS ➤ G033

REFACCIONES ➤ N001  
INFORMACION TECNICA ➤ P001

G031

G  
ROSCADO



# ROSCADO

## BARRA TIPO F

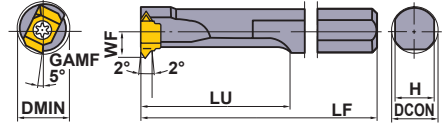
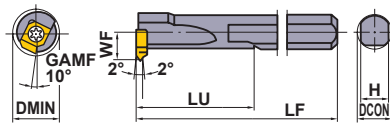
- Mínimo diámetro de corte .390 plgs.
- Tipo de sujeción con tornillo.
- Para varias aplicaciones.
- Máx. profundidad de la ranura: .118 plgs.

### S-SL5N

#### Roscado Interno, Ranurado

Barra para inserto de un(1) filo (S-SL5NR05 / 06)

Barra para inserto de dos(2) filos (S-SL5NR08 / 10 / 12)



Solo a derecha

| Descripción | Existencia | Tipos de Inserto |         | Dimensiones (plgs) |      |        |       |      |      | *2  |  |                        |
|-------------|------------|------------------|---------|--------------------|------|--------|-------|------|------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------|
|             |            | R                | Roscado | Portaherramienta   | DCON | LF     | LU    | WF   | H    | DMIN*1                                                                                 |                                                                                     | Tornillo de la Mordaza |
| S-SL5NR05   | ●          | MLT1001L         | MLG10W  | ○○○○L              | .313 | 5.000  | 1.250 | .188 | .283 | .390                                                                                   | TS25                                                                                | TKY08F                 |
| S-SL5NR06   | ●          | MLT1001L         | MLG10W  | ○○○○L              | .375 | 6.000  | 1.500 | .219 | .340 | .449                                                                                   | TS25                                                                                | TKY08F                 |
| S-SL5NR08   | ●          | MLT1401L         | MLG14W  | ○○○○L              | .500 | 7.000  | 2.000 | .281 | .460 | .579                                                                                   | TS32                                                                                | TKY08F                 |
| S-SL5NR10   | ●          | MLT2001L         | MLG20W  | ○○○○L              | .625 | 8.000  | 3.000 | .375 | .560 | .791                                                                                   | TS43                                                                                | TKY15F                 |
| S-SL5NR12   | ●          | MLT2001L         | MLG20W  | ○○○○L              | .750 | 10.000 | 4.000 | .438 | .700 | .902                                                                                   | TS43                                                                                | TKY15F                 |

\*1 DMIN : Diámetro mínimo de corte

\*2 Torque sujecion (lbf-plgs) : TS25=8.9, TS32=18, TS43=31

## CONDICIONES DE CORTE RECOMENDADAS

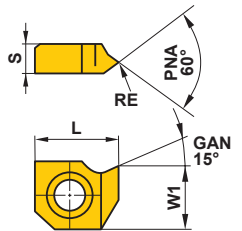
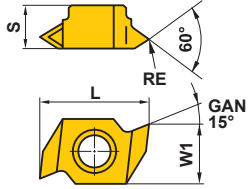
| Pieza |                                 | Dureza    | Grado  | Velocidad de Corte (SFM) |
|-------|---------------------------------|-----------|--------|--------------------------|
| P     | Aceros Blandos                  | ≤180HB    | UP20M  | 460 (330—590)            |
|       |                                 |           | UTi20T | 395 (330—490)            |
|       | Acero al Carbón<br>Acero Aleado | 180—280HB | UP20M  | 395 (330—490)            |
|       |                                 |           | UTi20T | 330 (230—395)            |

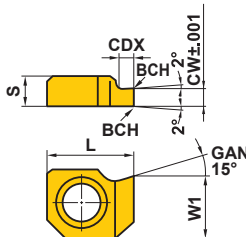
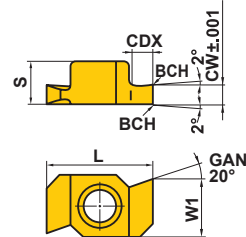
| Pieza |                  | Dureza                              | Grado  | Velocidad de Corte (SFM) |
|-------|------------------|-------------------------------------|--------|--------------------------|
| M     | Acero Inoxidable | ≤200HB                              | UP20M  | 395 (260—490)            |
|       |                  |                                     | UTi20T | 330 (230—425)            |
| K     | Fundición Gris   | Resistencia a la tensión<br>≤350MPa | UP20M  | 260 (195—330)            |
|       |                  |                                     | UTi20T | 260 (195—330)            |

● : Existencia en EUA

<10 insertos por caja>

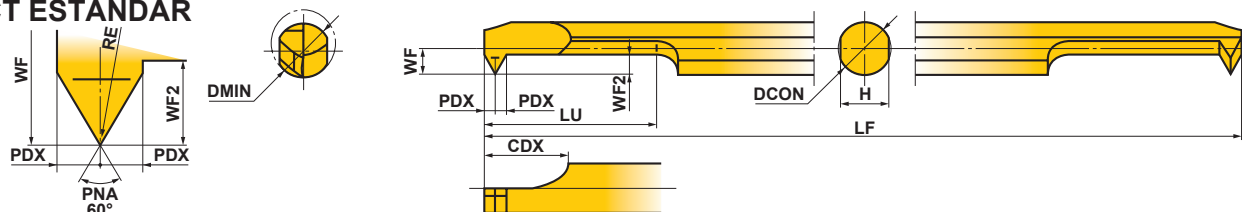
## INSERTOS

| Aplicación | Descripción | Recubierto | Carburo | Paso (plgs) | Dimensiones (plgs) |      |      |      | Geometría                                                                                                                                              |
|------------|-------------|------------|---------|-------------|--------------------|------|------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
|            |             | UP20M      | UTi20T  |             | L                  | W1   | S    | RE   |                                                                                                                                                        |
| Roscado    | MLT1001L    | ●          | ●       | .059—.079   | .276               | .197 | .094 | .004 | <b>MLT1001L</b> (Barra para inserto de un(1) filo)<br>              |
|            | MLT1401L    | ●          | ●       | .059—.098   | .465               | .256 | .187 | .004 |                                                                                                                                                        |
|            | MLT2001L    | ●          | ●       | .059—.138   | .661               | .356 | .250 | .004 |                                                                                                                                                        |
|            |             |            |         |             |                    |      |      |      |                                                                                                                                                        |
|            |             |            |         |             |                    |      |      |      | <b>MLT1401L /2001L</b><br>(Barra para inserto de dos(2) fillos)<br> |

| Aplicación       | Descripción | Carburo |               | CW<br>(plgs) | Dimensiones (plgs) |      |      |      |      | Geometría |                                                                                                                                               |
|------------------|-------------|---------|---------------|--------------|--------------------|------|------|------|------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------|
|                  |             | UTi20T  | HTi10         |              | L                  | W1   | CDX  | S    | BCH  |           |                                                                                                                                               |
| Portaherramienta | MLG10W062L  |         | ●             | Pulgadas     | .062               | .276 | .197 | .039 | .094 | .004      | <b>MLG...L</b> (Barra para inserto de un(1) filo)<br>    |
|                  |             |         |               |              |                    |      |      |      |      |           |                                                                                                                                               |
|                  | MLG1012L    | ●       |               | Métrico      | .047 (1.2 mm)      | .276 | .197 | .039 | .094 | .004      |                                                                                                                                               |
|                  | MLG1015L    | ●       |               |              | .059 (1.5 mm)      | .276 | .197 | .039 | .094 | .004      |                                                                                                                                               |
|                  | MLG1020L    | ●       |               |              | .079 (2.0 mm)      | .276 | .197 | .039 | .094 | .004      |                                                                                                                                               |
|                  |             |         |               |              |                    |      |      |      |      |           |                                                                                                                                               |
|                  | MLG1415L    | ●       |               | Métrico      | .059 (1.5 mm)      | .465 | .256 | .079 | .187 | .004      | <b>MLG...L</b> (Barra para inserto de dos(2) fillos)<br> |
|                  | MLG1420L    | ●       |               |              | .079 (2.0 mm)      | .465 | .256 | .079 | .187 | .004      |                                                                                                                                               |
|                  | MLG1430L    | ●       |               |              | .118 (3.0 mm)      | .465 | .256 | .079 | .187 | .004      |                                                                                                                                               |
|                  | MLG2020L    | ●       |               |              | .079 (2.0 mm)      | .661 | .356 | .118 | .250 | .004      |                                                                                                                                               |
|                  | MLG2030L    | ●       |               |              | .118 (3.0 mm)      | .661 | .356 | .118 | .250 | .004      |                                                                                                                                               |
| MLG2040L         | ●           |         | .157 (4.0 mm) |              | .661               | .356 | .118 | .250 | .004 |           |                                                                                                                                               |

# MICRO-MINI TWIN

## CT ESTÁNDAR



| Descripción  | Existencia             |            | Rompeviruta | Roscado       |           |                 |                   | Dimensiones (mm) |      |      |    |      |     |     |     |     |     |
|--------------|------------------------|------------|-------------|---------------|-----------|-----------------|-------------------|------------------|------|------|----|------|-----|-----|-----|-----|-----|
|              | Micro Grano de Carburo | Recubierto |             | Rosca Métrica |           | Rosca Unificada |                   | DMIN             | RE   | DCON | LF | LU   | CDX | WF  | PDX | WF2 | H   |
|              | TF15                   | VP15TF     |             | Roscado       | Paso (mm) | Roscado         | Paso (hilos/plgs) |                  |      |      |    |      |     |     |     |     |     |
| CT0305RS-M4  | ●                      | ●          | Sin         | ≥ 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    | ●                      | ●          | Sin         | ≥ 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   | ●                      | ●          | Con         | ≥ 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 |
| CT0407RS-M6  | ●                      | ●          | Sin         | ≥ 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    | ●                      | ●          | Sin         | ≥ M6          | 0.75-1.25 | ≥ 1/4-20UNC     | 28-20             | 4.5              | 0.05 | 4    | 60 | 15.6 | 7   | 1.8 | 0.8 | 1.7 | 3.6 |
| CT04RS-M6B   | ●                      | ●          | Con         | ≥ 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 |
| CT0511RS-M8  | ●                      | ●          | Sin         | ≥ 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    | ●                      | ●          | Sin         | ≥ 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   | ●                      | ●          | Con         | ≥ M8          | 0.75-1.5  | ≥ 5/16-24UNF    | 24-18             | 6                | 0.05 | 5    | 70 | 21   | 8   | 2.3 | 1   | 2.2 | 4.5 |
| CT0611RS-M10 | ●                      | ●          | Sin         | ≥ 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   | ●                      | ●          | Sin         | ≥ M10         | 0.75-1.75 | ≥ 3/8-16UNC     | 24-16             | 7                | 0.05 | 6    | 75 | 21   | 8   | 2.8 | 1   | 2.2 | 5.4 |
| CT06RS-M10B  | ●                      | ●          | Con         | ≥ M10         | 0.75-1.75 | ≥ 3/8-24UNF     | 24-16             | 7                | 0.05 | 6    | 75 | 21   | 8   | 2.8 | 1   | 2.2 | 5.4 |

## PASO DE LA ROSCA PARA EL TIPO CT

| Descripción     | Rosca Métrica |      |      |      |      |      |      |      | Rosca Unificada  |    |    |    |    |    |    |
|-----------------|---------------|------|------|------|------|------|------|------|------------------|----|----|----|----|----|----|
|                 | P (mm)        |      |      |      |      |      |      |      | P (roscado/plgs) |    |    |    |    |    |    |
|                 | 0.50          | 0.70 | 0.75 | 0.80 | 1.00 | 1.25 | 1.50 | 1.75 | 36               | 32 | 28 | 24 | 20 | 18 | 16 |
| CT03RS-M4/M4B   | ○             | ○    | ○    | ○    | ○    | —    | —    | —    | ○                | ○  | ○  | ○  | —  | —  | —  |
| CT04RS-M6/M6B   | —             | —    | ○    | —    | ○    | ○    | —    | —    | —                | —  | ○  | ○  | ○  | —  | —  |
| CT05RS-M8/M8B   | —             | —    | ○    | —    | ○    | ○    | ○    | —    | —                | —  | —  | ○  | ○  | ○  | —  |
| CT06RS-M10/M10B | —             | —    | ○    | —    | ○    | ○    | ○    | ○    | —                | —  | —  | ○  | ○  | ○  | ○  |

Nota 1) Para roscas internas que son mas largas que el diámetro mínimo de Micro Mini Twin (Tipo CT) es posible maquinar el paso de la rosca de arriba. Para el diámetro mínimo, por favor refiérase a lo estándar.

## PROFUNDIDAD DE CORTE PARA EL TIPO CT

### ● Roscado Métrico

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

### ● Roscado Unificado

| Procedimiento de cálculo |       |       |       |       |       |       |       |       |       |
|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| P (hilos/plgs)           | 36    | 32    | 28    |       | 24    |       | 20    | 18    | 16    |
| D.O.C. (plgs)            | .0169 | .0193 | .0220 | .0213 | .0260 | .0252 | .0307 | .0343 | .0386 |
| Re* (Radio)              | .0012 | .0012 | .0012 | .0020 | .0012 | .0020 | .0020 | .0020 | .0020 |
| Número de pasadas        | 1     | .0024 | .0024 | .0028 | .0024 | .0028 | .0028 | .0028 | .0028 |
|                          | 2     | .0024 | .0024 | .0024 | .0024 | .0028 | .0028 | .0028 | .0028 |
|                          | 3     | .0024 | .0024 | .0024 | .0024 | .0024 | .0024 | .0028 | .0028 |
|                          | 4     | .0020 | .0020 | .0024 | .0020 | .0024 | .0024 | .0024 | .0028 |
|                          | 5     | .0020 | .0020 | .0020 | .0020 | .0024 | .0024 | .0024 | .0028 |
|                          | 6     | .0016 | .0016 | .0020 | .0020 | .0020 | .0020 | .0024 | .0024 |
|                          | 7     | .0016 | .0016 | .0016 | .0016 | .0020 | .0020 | .0024 | .0024 |
|                          | 8     | .0016 | .0016 | .0016 | .0016 | .0016 | .0020 | .0020 | .0024 |
|                          | 9     | .0012 | .0012 | .0016 | .0016 | .0016 | .0016 | .0020 | .0020 |
|                          | 10    |       | .0012 | .0012 | .0012 | .0016 | .0016 | .0020 | .0020 |
|                          | 11    |       | .0012 | .0012 | .0012 | .0012 | .0012 | .0016 | .0020 |
|                          | 12    |       |       | .0012 | .0012 | .0012 | .0012 | .0016 | .0020 |
|                          | 13    |       |       |       |       | .0012 | .0012 | .0016 | .0016 |
|                          | 14    |       |       |       |       | .0012 |       | .0012 | .0016 |
|                          | 15    |       |       |       |       |       |       | .0012 | .0012 |
|                          | 16    |       |       |       |       |       |       |       | .0012 |
|                          | 17    |       |       |       |       |       |       |       |       |
|                          | 18    |       |       |       |       |       |       |       |       |
|                          | 19    |       |       |       |       |       |       |       |       |
|                          | 20    |       |       |       |       |       |       |       |       |

\* Aunque el paso sea igual, la profundidad de corte varia de acuerdo al radio del inserto. Para el tipo Micro Mini Twin CT03RS-M4 de CT y CT03RS-M4B el radio es 0.03 mm(.0012 plgs), para otros tipos es 0.05 mm(.0020 plgs). Para mayor detalle referirse a la sección de estándares.

● : Existencia en EUA

# ADAPTADOR

## LISTA DE REFERENCIA CRUZADA DE ADAPTADORES ESTANDAR EN PULGADAS

| Adaptador                             |                      | Existencia | MICRO-MINI TWIN         | Fabricantes de Maquinas                            |
|---------------------------------------|----------------------|------------|-------------------------|----------------------------------------------------|
| Tipo                                  | Descripción *1       |            | CT                      |                                                    |
| Adaptador Tipo Redondo<br>ø.625 plgs  | ID : Tipo Milímetros |            |                         |                                                    |
|                                       | RBH10189A            | ●          | 0305RS-M4, 03RS-M4(B)   | Citizen Precision Machinery Co., Ltd.<br>Tornos NC |
|                                       | RBH10252A            | ●          | 0407RS-M6, 04RS-M6(B)   |                                                    |
|                                       | RBH10315A            | ●          | 0511RS-M8, 05RS-M8(B)   |                                                    |
|                                       | RBH10378A            | ●          | 0611RS-M10, 06RS-M10(B) |                                                    |
| Adaptador Tipo Redondo<br>ø.750 plgs  | ID : Tipo Milímetros |            |                         |                                                    |
|                                       | RBH19030N            | ●          | 0305RS-M4, 03RS-M4(B)   | Citizen Precision Machinery Co., Ltd.              |
|                                       | RBH19040N            | ●          | 0407RS-M6, 04RS-M6(B)   |                                                    |
|                                       | RBH19050N            | ●          | 0511RS-M8, 05RS-M8(B)   |                                                    |
|                                       | RBH19060N            | ●          | 0611RS-M10, 06RS-M10(B) |                                                    |
| Adaptador Tipo Redondo<br>ø1.000 plgs | ID : Tipo Milímetros |            |                         |                                                    |
|                                       | RBH16189A            | ●          | 0305RS-M4, 03RS-M4(B)   | Citizen Precision Machinery Co., Ltd.<br>Tornos NC |
|                                       | RBH16252A            | ●          | 0407RS-M6, 04RS-M6(B)   |                                                    |
|                                       | RBH16315A            | ●          | 0511RS-M8, 05RS-M8(B)   |                                                    |
|                                       | RBH16378A            | ●          | 0611RS-M10, 06RS-M10(B) |                                                    |

\*1 Para detalles del portaherramientas, consulte la sección de barras de mandrinado Paginas E034—E038.

Nota 1) Mitsubishi Materials obtuvo la aprobación de los fabricantes antes de publicar esta lista

## CONDICIONES DE CORTE RECOMENDADAS

| Pieza                                    | Velocidad de Corte (SFM) | Volado recomendado (mm) |
|------------------------------------------|--------------------------|-------------------------|
| <b>P</b> Acero al Carbón<br>Acero Aleado | 100—260                  |                         |
| <b>M</b> Acero Inoxidable                | 100—260                  |                         |
| <b>K</b> Fundición                       | 100—260                  |                         |
| <b>N</b> Material No-Ferroso             | 165—330                  |                         |

Nota 1) Se recomienda usar refrigerante.

Nota 2) Preste especial atención al maquinado de diámetros pequeños a altas revoluciones, debido a que el avance no se puede mantener con la velocidad.

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**LISTA DE REFERENCIA CRUZADA DE ADAPTADORES ESTANDAR EN METRICO**

| Adaptador                         |                 | Existencia | MICRO-MINI TWIN         | Fabricantes de Maquinas                                                                                  |
|-----------------------------------|-----------------|------------|-------------------------|----------------------------------------------------------------------------------------------------------|
| Tipo                              | Descripción *1  |            | CT                      |                                                                                                          |
| Adaptador Tipo Redondo<br>ø16 mm  | <b>RBH1630N</b> | ●          | 0305RS-M4, 03RS-M4(B)   | MIYANO MACHINERY JAPAN INC.<br>Tornos NC                                                                 |
|                                   | <b>RBH1640N</b> | ●          | 0407RS-M6, 04RS-M6(B)   |                                                                                                          |
|                                   | <b>RBH1650N</b> | ●          | 0511RS-M8, 05RS-M8(B)   |                                                                                                          |
|                                   | <b>RBH1660N</b> | ●          | 0611RS-M10, 06RS-M10(B) |                                                                                                          |
| Adaptador Tipo Redondo<br>ø20 mm  | <b>RBH2030N</b> | ●          | 0305RS-M4, 03RS-M4(B)   | Citizen Precision Machinery Co., Ltd.<br>Tsugami Corporation<br>MIYANO MACHINERY JAPAN INC.<br>Tornos NC |
|                                   | <b>RBH2040N</b> | ●          | 0407RS-M6, 04RS-M6(B)   |                                                                                                          |
|                                   | <b>RBH2050N</b> | ●          | 0511RS-M8, 05RS-M8(B)   |                                                                                                          |
|                                   | <b>RBH2060N</b> | ●          | 0611RS-M10, 06RS-M10(B) |                                                                                                          |
| Adaptador Tipo Redondo<br>ø22 mm  | <b>RBH2230N</b> | ●          | 0305RS-M4, 03RS-M4(B)   | STAR MICRONICS CO., LTD.                                                                                 |
|                                   | <b>RBH2240N</b> | ●          | 0407RS-M6, 04RS-M6(B)   |                                                                                                          |
|                                   | <b>RBH2250N</b> | ●          | 0511RS-M8, 05RS-M8(B)   |                                                                                                          |
|                                   | <b>RBH2260N</b> | ●          | 0611RS-M10, 06RS-M10(B) |                                                                                                          |
| Adaptador Tipo Cuadrado<br>ø25 mm | <b>RBH2530N</b> | ●          | 0305RS-M4, 03RS-M4(B)   | Tsugami Corporation<br>MIYANO MACHINERY JAPAN INC.<br>Tornos NC                                          |
|                                   | <b>RBH2540N</b> | ●          | 0407RS-M6, 04RS-M6(B)   |                                                                                                          |
|                                   | <b>RBH2550N</b> | ●          | 0511RS-M8, 05RS-M8(B)   |                                                                                                          |
|                                   | <b>RBH2560N</b> | ●          | 0611RS-M10, 06RS-M10(B) |                                                                                                          |
| Adaptador Tipo Redondo<br>□10 mm  | <b>SBH1030R</b> | ★          | 0305RS-M4, 03RS-M4(B)   | Tornos NC                                                                                                |
|                                   | <b>SBH1040R</b> | ★          | 0407RS-M6, 04RS-M6(B)   |                                                                                                          |
|                                   | <b>SBH1050R</b> | ★          | 0511RS-M8, 05RS-M8(B)   |                                                                                                          |
|                                   | <b>SBH1060R</b> | ★          | 0611RS-M10, 06RS-M10(B) |                                                                                                          |

Nota 1) Mitsubishi Materials obtuvo la aprobación de los fabricantes antes de publicar esta lista

\*1 Para detalles del portaherramienta, consulte la sección de barras de mandrinado Páginas E034—E038.

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## This image shows a full page of a handwriting practice worksheet. It consists of multiple sets of three horizontal dashed lines spaced evenly down the page, providing a guide for letter height and placement. The background is plain white, and there are no other markings or text present.