

# MAXI-PUNCH

TN OR TiCN COATED PUNCHES  
CAN GIVE YOU UP TO SEVEN TIMES  
NORMAL LIFE EXPECTANCY OF STANDARD TOOLING



**AUSTRALIA'S LEADING  
PRECISION TOOL MANUFACTURER**

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# Section 'A'

# Tooling

*Manufactured by*

**F.M. TOOL & GAUGE PTY. LTD.**

A.B.N. 91 008 262 520

CUDLEE CREEK, SOUTH AUSTRALIA, 5232

PH. (08) 8389 2272 FAX. (08) 8389 2309 or (08) 8389 2478

Free Call 1800 882 993 E-mail - [sales@fmtool.com.au](mailto:sales@fmtool.com.au)

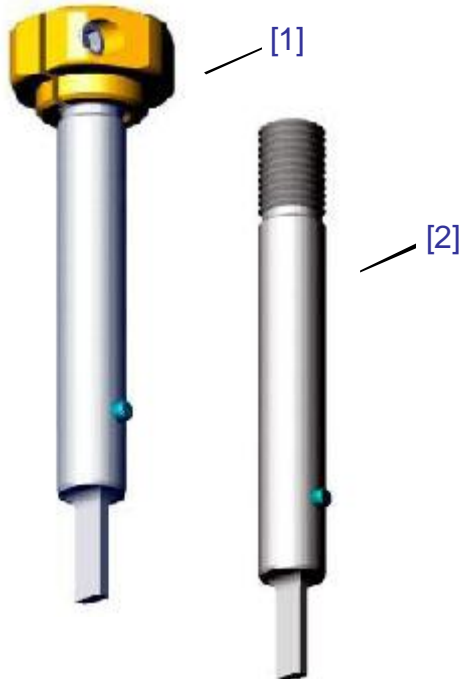
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# THIN TURRET

## 5/8" 'DROP IN' STYLE TOOLING

Maximum Tonnage - 9 ton

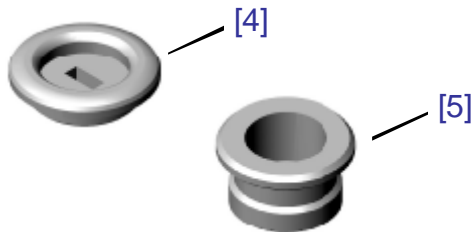


### Shapes

- [1] Punch & Head Assembly..... S200674-XXX
- [2] Punch ..... S200552-XXX
- [3] Die..... S49401-XXX
- Super Locking Head..... S200649-000

### Rounds

- [1] Punch & Head Assembly..... S200673-000
- [2] Punch ..... S200551-000
- [3] Die..... S48532-000
- Super Locking Head..... S200649-000



### Strippers

- [4] Strippit Style- Round ..... S61086-000
- Shaped ..... S61089-XXX
- [5] Wilson Style- Round..... S00165-000
- Shaped ..... S00169-XXX



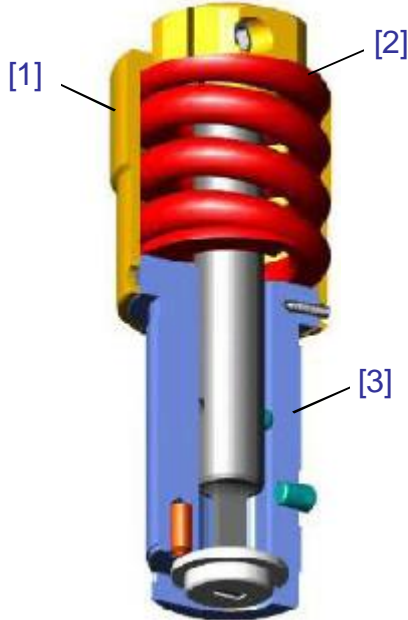
For **PRICING** and extended description of the tooling on this page log on to our web site at [www.fmtool.com.au](http://www.fmtool.com.au)

Select **TOOLING**; then under **THIN TURRET** click on **Tools for STRIPPIT**;  
then select the tooling you require

Pricing and description for all shapes, rounds and accessories for Thin Turret Tooling  
is available at this site

# THIN TURRET

## 5/8" TOOLING STRIPPING GUIDE ASSEMBLIES

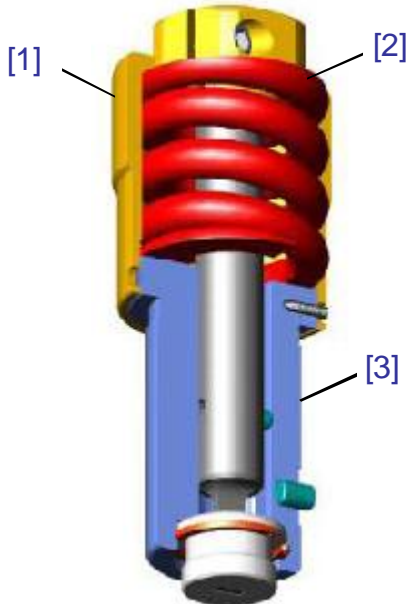


### Strippit Style

Punch Holder Complete ..... S200670-000  
*(punch, head & stripper button not included in assembly)*

### Assembly Parts

[1] Spring Retainer ..... S200648-000  
[2] Spring.....S48466-001  
[3] Hardened Guide Body ..... S200601-000



### Wilson Style

Punch Holder Complete ..... S00670-000  
*(punch, head & stripper button not included in assembly)*

### Assembly Parts

[1] Spring Retainer ..... S200648-000  
[2] Spring.....S48466-001  
[3] Hardened Guide Body.....S00601-000

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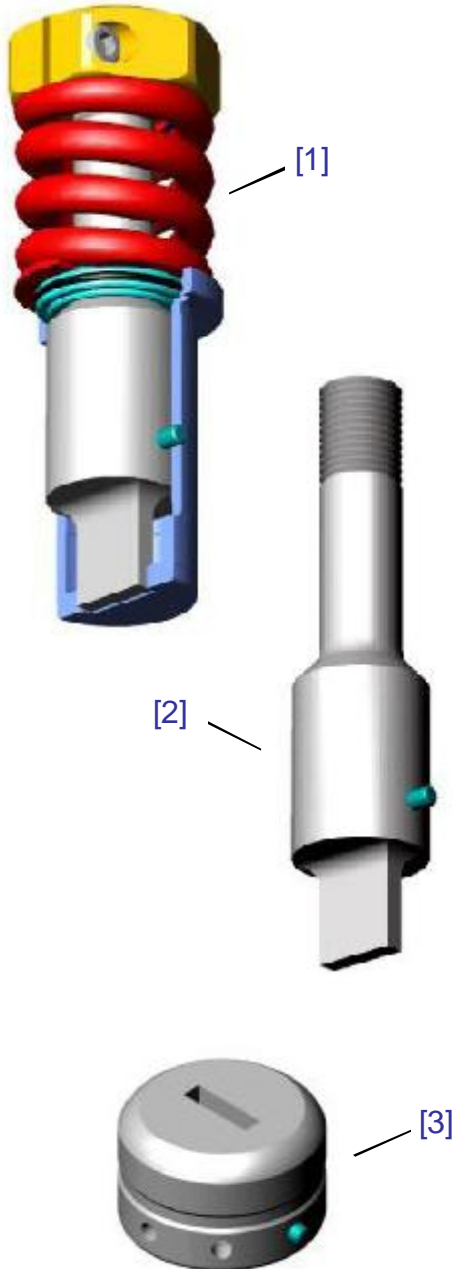
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# THIN TURRET

## 1 ¼" TOOLING

up to 31.75mm dia max.



### STANDARD TOOLING

for punching up to 4mm m/s - 2.5mm s/s

#### Shapes

[1] Punch & Guide Assembly .....	S49295-XXX
[2] Punch Only .....	S48534-XXX
Guide Only.....	S49292-XXX
[3] Die .....	S49401-XXX

#### Rounds

[1] Punch & Guide Assembly .....	S49704-000
[2] Punch Only .....	S48531-000
Guide Only.....	S48528-000
[3] Die .....	S48532-000

#### Assembly Parts

Super Locking Head .....	S200867-000
Stripping Spring .....	S48466-000
Punch Collar (new & shim 3mm) .....	S49669-000
Punch Collar (shim 1 & 2mm).....	S49669-1&2MM
O'Ring for Collars .....	S49669-001

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# THIN TURRET

## 1 ¼" TOOLING

### E. A. RANGE

Designed to allow for Easy Quick Adjustment  
(in seconds)  
of Standard 1 ¼" Punches

[1]



#### Shapes

[1] Complete Assembly (includes punch & guide) .....	EA49200-XXX
[2] Spring Pack (complete) .....	EA48400-000
Punch .....	S48534-XXX
Guide .....	S49292-XXX

#### Rounds

[1] Complete Assembly (includes punch & guide) .....	EA49200-000
[2] Spring Pack (complete) .....	EA48400-000
Punch .....	S48534-000
Guide .....	S49292-000



[2]

Standard 1 ¼" Dies are used with this style of tooling

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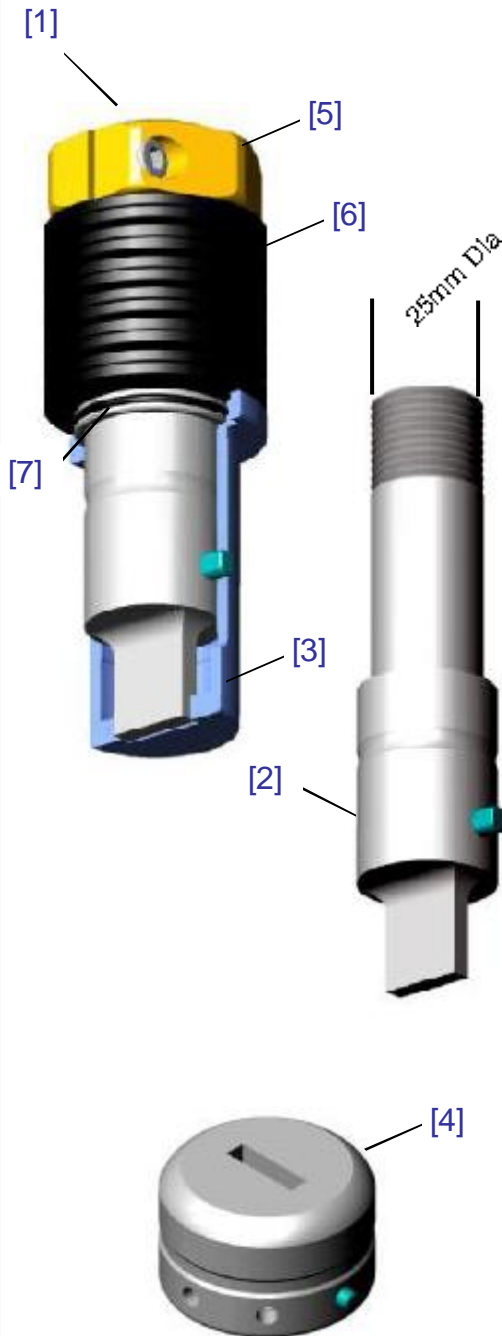
Pricing and description for all shapes, rounds and accessories for Thin Turret Tooling  
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# THIN TURRET

1 ¼" TOOLING

## HEAVY DUTY

for punching up to 6mm m/s - 4mm s/s



### Shapes

[1] Complete Assembly .....	S200252-XXX
[2] Punch Only .....	S200255-XXX
[3] Guide Only(Hardened) .....	S49292H-XXX
[4] Die .....	S200537-XXX

### Rounds

[1] Complete Assembly .....	S200332-000
[2] Punch Only .....	S200333-000
[3] Guide Only (Hardened) .....	S48528H-000
[4] Die .....	S200537-000

### Assembly Parts

[5] Super Locking Head .....	S200267-000
[6] Disc Springs ea.....	S11666-000
(12 per set)	
[7] Punch Collar .....	S200259-000
Punch Collar (shim 1mm).....	S200259-1mm
Punch Collar (shim 2mm).....	S200259-2mm
Punch Collar (shim 3mm).....	S200259-3mm

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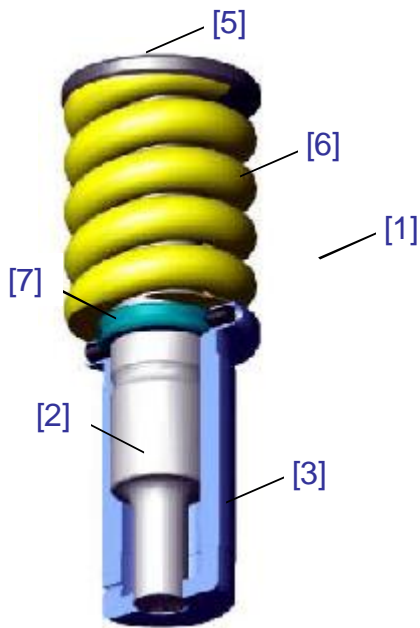
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# THIN TURRET

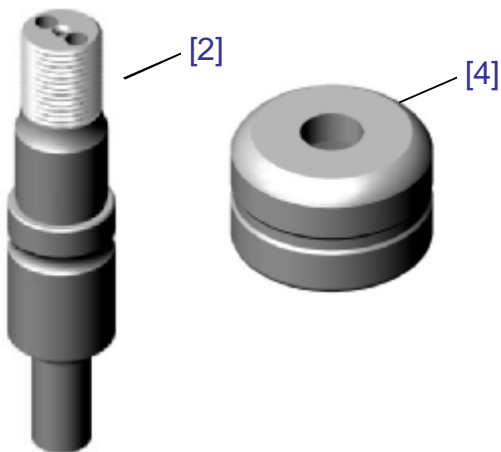
## ROUND NIBBLING TOOLS

Up to 25.4mm (1") Max. Dia.  
10, 13, 25mm Dia stock sizes



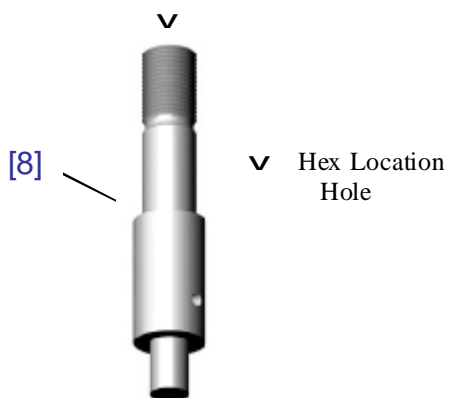
### Round Only

- [1] Punch & Guide Assembly ..... S00417-000
- [2] Punch ..... S00413-000
- [3] Guide ..... S00415-000
- [4] Die (manufactured in HSS) ..... S200538-000



### Assembly Parts

- [5] Adjustable Punch Head ..... S00418-000
- [6] Stripping Spring ..... S00418-001
- [7] Punch Collar ..... S00418-002
- Punch Collar (shim 1mm) ..... S00418-1mm
- Punch Collar (shim 2mm) ..... S00418-2mm
- Punch Collar (shim 3mm) ..... S00418-3mm



### Strippit Type for Open Guide

- [8] Punch ..... S200236-000

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# THIN TURRET

1 ¼" TOOLING

## ADJUSTABLE SPIGOT STYLE

for punching up to 2mm m/s - 1.6mm s/s

(Wilson Series 90 Compatible)

### Short Series

#### Shapes

[2] Complete Assembly .....	S49296-XXX
[3] Punch Only (61.3mm) .....	S48535-XXX
[4] Guide Only (Hardened) .....	S49292H-XXX
Die.....	S49401-XXX

#### Rounds

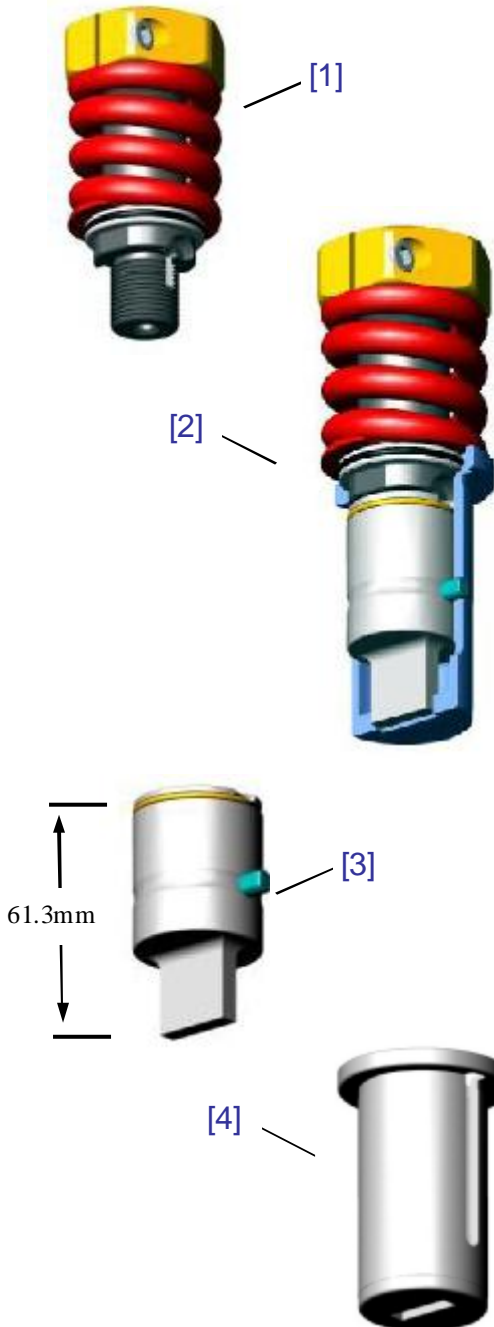
[2] Complete Assembly .....	S49296-000
[3] Punch Only (61.3mm) .....	S48530-000
[4] Guide Only (Hardened) .....	S48528H-000
Die.....	S48532-000

#### Stripping Units Complete

[1] S49280-000

#### Assembly Parts

Punch Head .....	S200267-000
Punch Driver .....	S48536-000
Stripping Spring.....	S48466-000
Punch Collar.....	S200259-000



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# THIN TURRET

## 1 ¼" TOOLING



### ADJUSTABLE SPIGOT STYLE

for punching up to 2mm m/s - 1.6mm s/s

(Wilson Series 90 Compatible)

### Long Series

#### Shapes

[2] Complete Assembly.....	S49297-XXX
[3] Punch Only (79mm).....	S48538-XXX
[4] Guide Only (Hardened) .....	S49290H-XXX
Die.....	S49401-XXX

#### Rounds

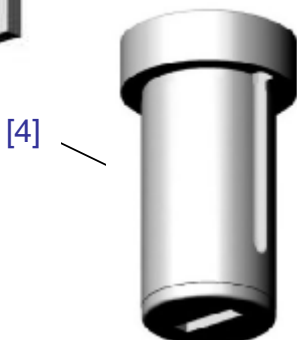
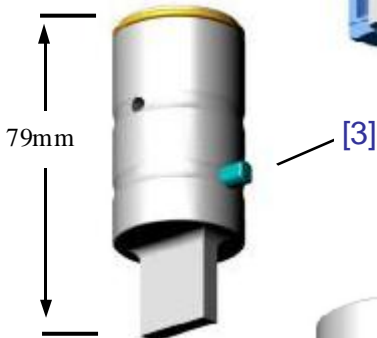
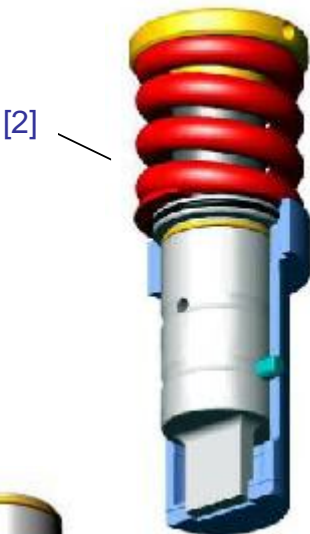
[2] Complete Assembly.....	S49297-000
[3] Punch Only (79mm).....	S48538-000
[4] Guide Only (Hardened) .....	S49290H-000
Die.....	S48532-000

#### Stripping Units Complete

[1] S49281-000

#### Assembly Parts

Punch Head.....	S49671-000
Punch Driver.....	S48537-000
Stripping Spring.....	S48466-000
Punch Collar.....	S49672-000



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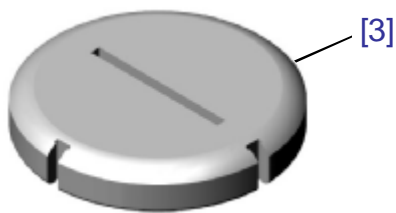
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# THIN TURRET

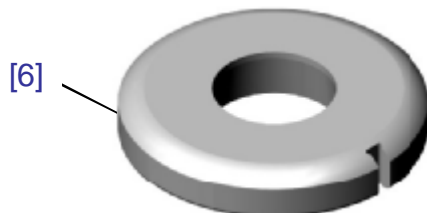
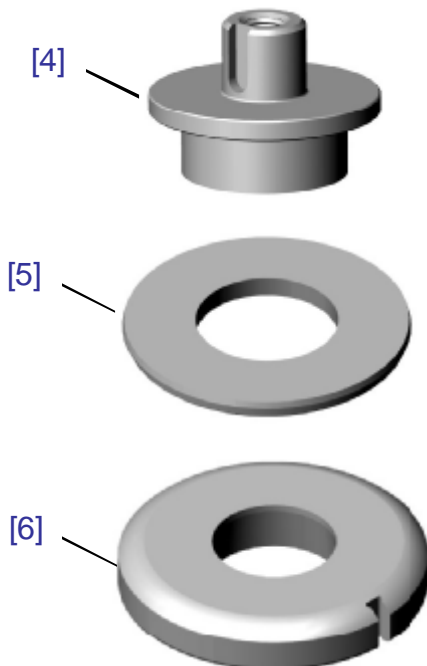
## 3 1/2" TOOLING



### Shapes

[1] Punches (31.8 to 60mm dia.) .....	S49076-XXX
Punches (60 to 88.9mm dia.) .....	S49077-XXX
[2] Stripper .....	S90913-XXX
[3] Die .....	S51713-XXX
Heavy Duty Die.....	S51713-XXXHD

### Rounds



Punches (31.8 to 45mm dia.) .....	S86717-000
[4] Punches (45 to 65mm dia.) .....	S86719-000
Punches (65 to 88.9mm dia.) .....	S86721-000
[5] Stripper .....	S90913-000
[6] Die .....	S51712-000
Heavy Duty Die.....	S51712-000HD

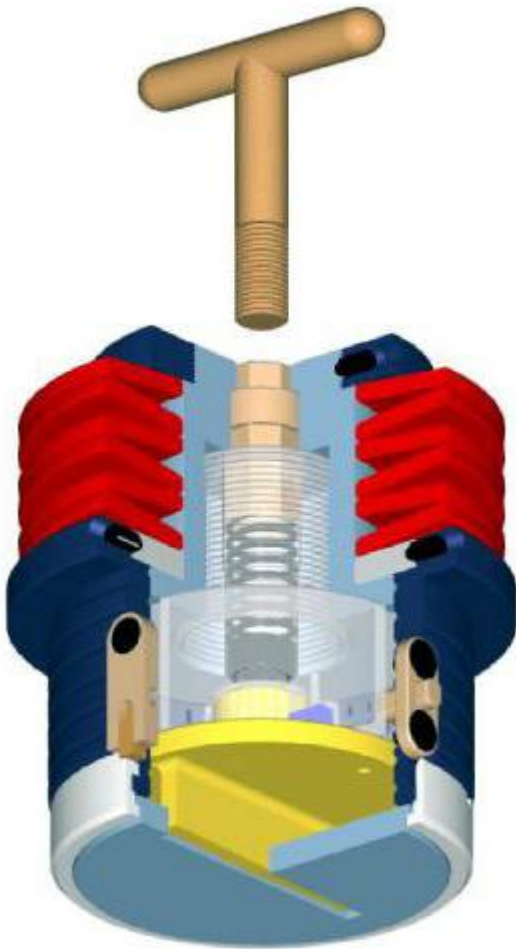
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# THIN TURRET

## 3 1/2" GUIDE ASSEMBLY



### PUSH BUTTON ADJUSTABLE GUIDE ASSEMBLY (No Shims Required)

Complete Assembly.....	S300810-000
Disc Spring (127 x 64 x 5) (6 off) .....	S1052-000
Guide Body .....	S300810-001
Spring Housing Collar .....	S300810-002
Locking Ring Key Housing.....	S300810-003
Locking Ring Key .....	S300810-004
Punch Driver Spigot.....	S300810-005
Guide Body Key.....	S300810-007
Spring Retaining Head .....	S300810-008
Spring Housing Spigot .....	S300810-009
Stripper Plate Locking Ring .....	S300810-011
Octagonal Indexing Button .....	AA952-002

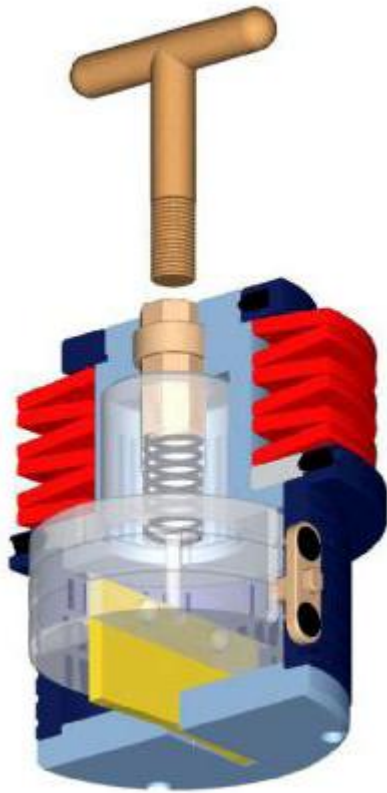
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# THIN TURRET

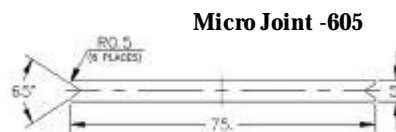
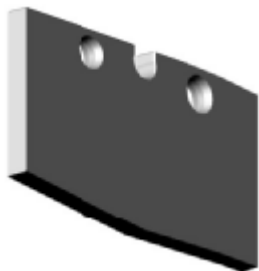
## 3 1/2" PARTING TOOL



### ADJUSTABLE PARTING GUIDE ASSEMBLY (No Shims Required)

- Complete Assembly ..... S300810-SLIT  
*(does not include insert or stripper)*
- Disc Spring (127 x 64 x 5) (6 off).....S1052-000
- Guide Body ..... S300810-001S
  
- Rectangle Parting Punch Insert.....S49070-300
- Micro Joint Parting Punch Insert ..... S49070-605
  
- Rectangle Stripper ..... S90910-300
- Micro Joint Stripper ..... S90910-605
  
- Rectangle Die ..... S51713-300
- Micro Joint Die ..... S51713-605
  
- Rectangle Heavy Duty Die..... S51713-300HD

**Stock Sizes 5 x 75mm & 5 x 80mm**



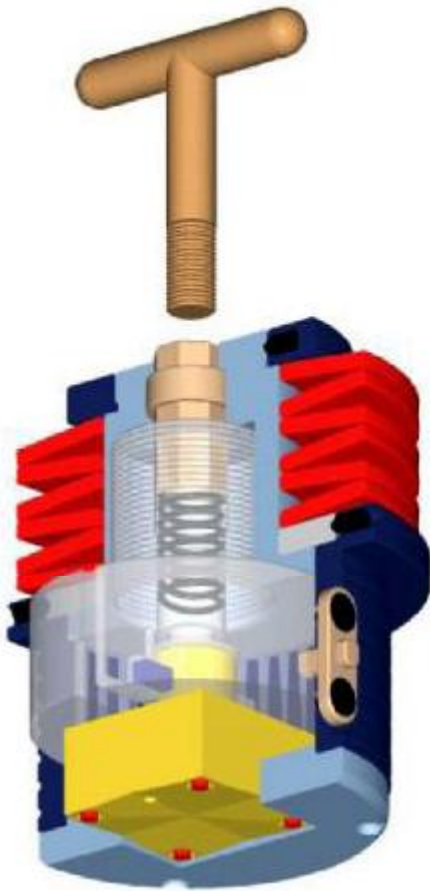
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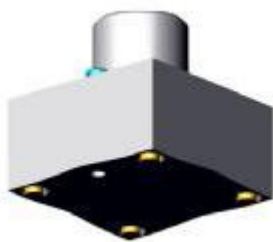
# THIN TURRET

## 3 1/2" NOTCHING TOOL



### ADJUSTABLE NOTCHING GUIDE ASSEMBLY (No Shims Required)

- Complete Assembly ..... S300810-NOTCH  
*(does not include punch or stripper)*
- Disc Spring (127 x 64 x 5) (6 off) ..... S1052-000
- Guide Body ..... S300810-001S
  
- Square Notching Punch ..... S200831-200
  
- Square Notching Stripper ..... S90910-200
  
- Square Die ..... S51713-200
- Square Heavy Duty Die ..... S51713-200HD



**Stock Size 50 x 50mm**

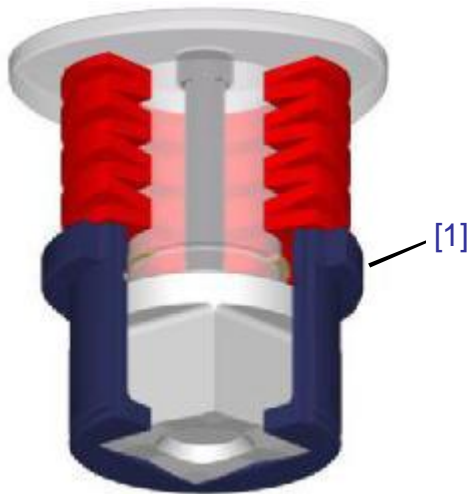
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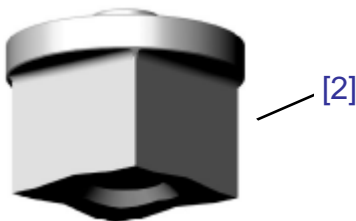
# THIN TURRET

# UNIVERSAL NOTCH



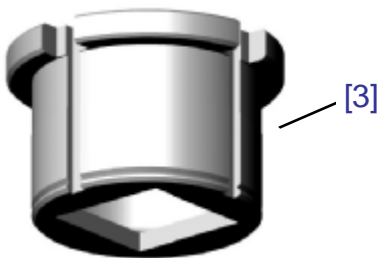
**2" Square**

- [1] Assembly Complete (*includes punch*)... S86665-200
- [2] Punch only..... S86670-200
- [3] Guide..... S86667-200
- [4] Die ..... S51713-200
- [5] Heavy Duty Die..... S51713-200HD



**50mm Square**

- [1] Assembly Complete (*includes punch*) .. S86665-250
- [2] Punch only..... S86670-250
- [3] Guide..... S86667-250
- [4] Die ..... S51713-200
- [5] Heavy Duty Die..... S51713-200HD



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## **THIN TURRET**

1/2" TOOLING  
SPLIT KEEPER TYPE



**Shape**

S200344-XXX

**Round**

S200330-000

Non Stock Item  
Made to Order

1/2" TOOLING  
SNAP APART TYPE



**Shape**

S00333-XXX

**Round**

S00195-000

Non Stock Item  
Made to Order

### **F.M. TOOL & GAUGE PTY. LTD.**

A.B.N. 91 008 262 520

CUDLEE CREEK, SOUTH AUSTRALIA

PH. (08) 8389 2272 FAX. (08) 8389 2309 or (08) 8389 2478

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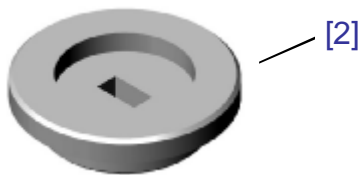
# THIN TURRET

## 8 STATION MULTI TOOLS



### Shapes

[1] Punch.....	S200715-XXX
[2] Stripper .....	S200743-XXX
[3] Die .....	S200721-XXX



### Rounds

[1] Punch.....	S200714-000
[2] Stripper .....	S200732-000
[3] Die .....	S200720-000



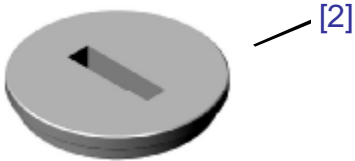
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# THIN TURRET

## 3 STATION MULTI TOOLS



### Shapes Only

[1] Punch.....	S200966-XXX
[2] Stripper .....	S202302-XXX
[3] Die .....	S202305-XXX

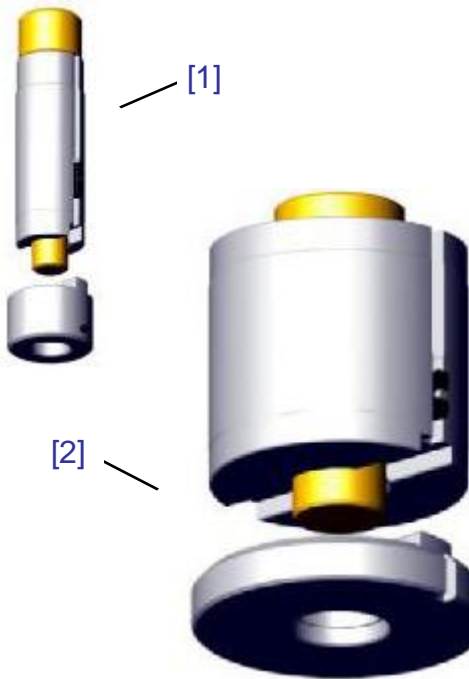
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*Pricing and description for all shapes, rounds and accessories for Thin Turret Tooling  
is available at this site*

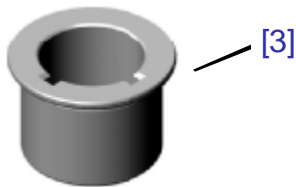
# THIN TURRET

## ACCESSORIES



### LINE UP TOOL KITS

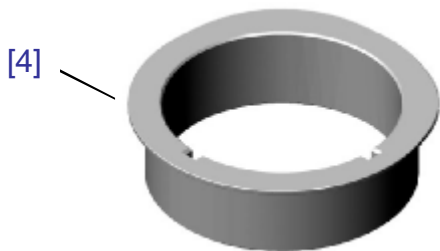
[1] 1 ¼" Station .....	S200293-000
[2] 3 ½" Station .....	S90692-000



### TURRET BUSHES

[3] 1 ¼" Station .....	S100230-000
[4] 3 ½" Station .....	S100734-000

*Standard Bush Keyed @ 0 & 90 Deg.  
Extra Keys requested will incur additional charge*



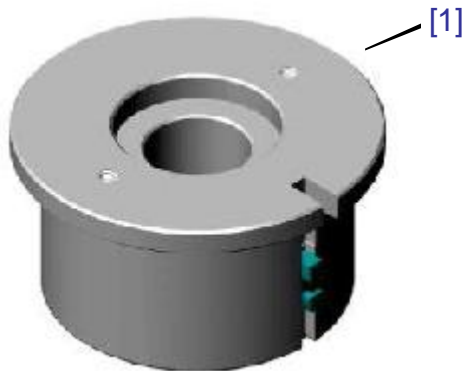
For **PRICING** and extended description of the tooling on this page log on to our web site at  
**[www.fmtool.com.au](http://www.fmtool.com.au)**

Select **TOOLING**; then under **THIN TURRET** click on **Tools for STRIPPIT**;  
then select the tooling you require

*Pricing and description for all shapes, rounds and accessories for Thin Turret Tooling  
is available at this site*

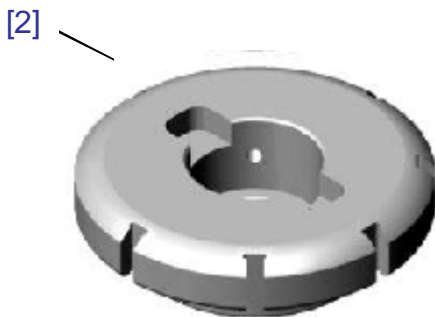
# **THIN TURRET**

ADAPTORS  
(3½" to 1¼")



**Guide Adaptor**

[1] S200650-000



**Die Adaptor**

[2] S200651-000

For **PRICING** and extended description of the tooling on this page log on to our web site at  
**[www.fmtool.com.au](http://www.fmtool.com.au)**

Select **TOOLING**; then under **THIN TURRET** click on **Tools for STRIPPIT**;  
then select the tooling you require

*Pricing and description for all shapes, rounds and accessories for Thin Turret Tooling  
is available at this site*

# Did it inspire us to choose Thyssen?

It will take a fearful pounding but is hard enough to hold its shape and resist wear. It can be belted time and again but will not chip or crack.

No, as much as we enjoy a round or two, we are not describing the perfect golf ball. We are talking about the new base material available for all FM Tool & Gauge Punch Press Tools - Thyssen FOR 821 ESR (Electro Slag Remelted) steel.

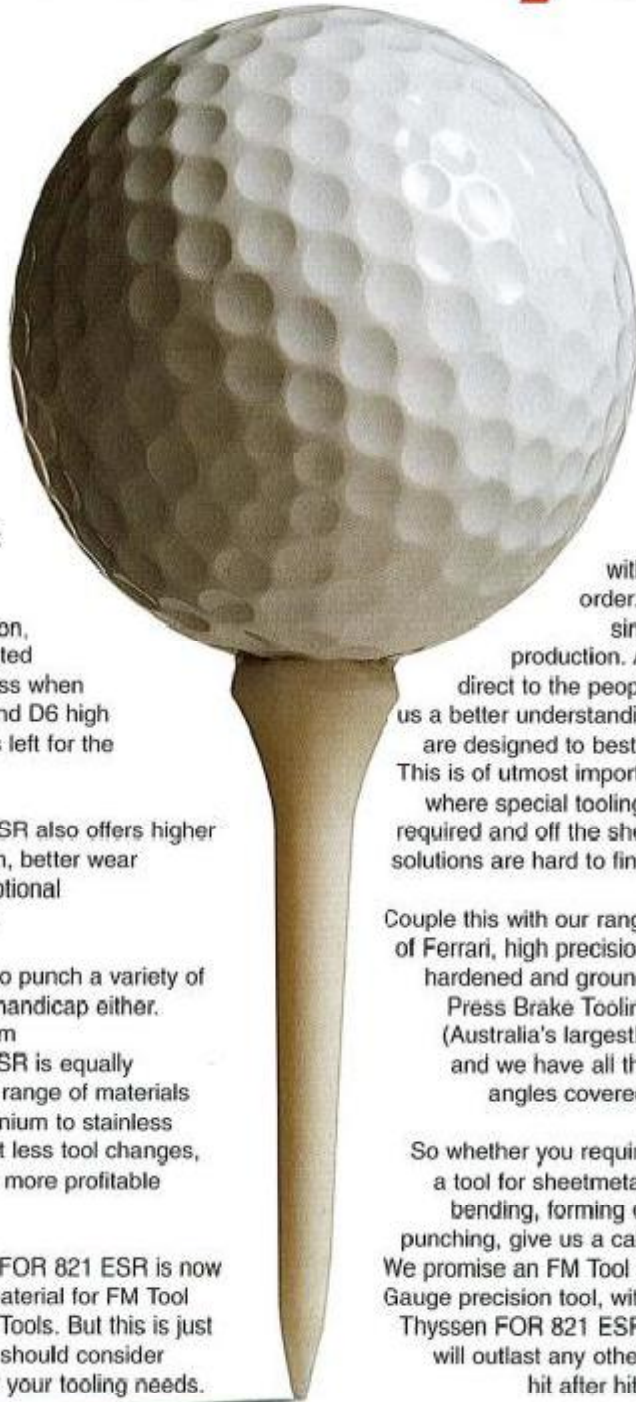
**This HIGH QUALITY GERMAN** manufactured steel is a new generation, cold work steel, developed and patented worldwide to provide greater toughness when compared to AISI types A2, D2, D3 and D6 high wear resistant steels. Any chipping is left for the golf course!



Thyssen FOR 821 ESR also offers higher compression strength, better wear resistance and exceptional dimensional stability.

If you require a tool to punch a variety of materials, that is no handicap either. An FM tool made from Thyssen FOR 821 ESR is equally adaptable for a wide range of materials from hardened aluminium to stainless steel. You can expect less tool changes, less downtime and a more profitable production line.

No wonder Thyssen FOR 821 ESR is now the preferred base material for FM Tool Gauge Punch Press Tools. But this is just one reason why you should consider FM Tool & Gauge for your tooling needs.



We are Australia's leading, dedicated manufacturer of Punch Press Tools.

All of our Punch Press Tools are designed and manufactured at Cudlee Creek in South Australia.

That means we can deliver to most places in Australia within 24 hours of receiving your order. A comforting thought when a single broken tool can stop your production. And, when you order, you talk direct to the people who make the tools, giving us a better understanding of your needs so our tools are designed to best fit your particular application.

This is of utmost importance where special tooling is required and off the shelf solutions are hard to find.

Couple this with our range of Ferrari, high precision, hardened and ground, Press Brake Tooling (Australia's largest!), and we have all the angles covered.

So whether you require a tool for sheetmetal, bending, forming or punching, give us a call. We promise an FM Tool & Gauge precision tool, with Thyssen FOR 821 ESR, will outlast any other, hit after hit!



**F.M. TOOL & GAUGE PTY LTD**

Redden Drive, Cudlee Creek, South Australia

Ph. int.: +61 8 8389 2272 Fax int.: +61 8 8389 2309 or +61 8 8389 2478

Free Call: 1800 882 993 e-mail: [sales@fmtool.com.au](mailto:sales@fmtool.com.au)

All Tooling PRICES can be found at our website

[www.fmtool.com.au](http://www.fmtool.com.au)

# Section 'B'

*Special Shapes &  
Technical Information*





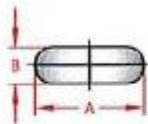
# F.M. Tool & Gauge Pty. Ltd.

## Category 'A' Tool Selection Guide

- 000



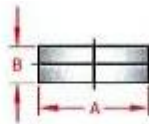
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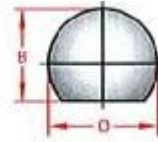
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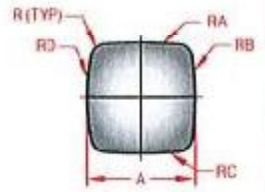
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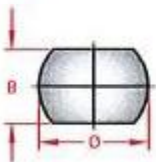
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- 412



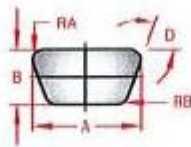
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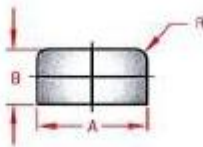
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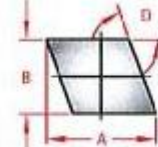
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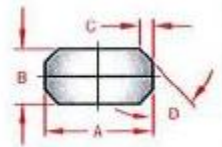
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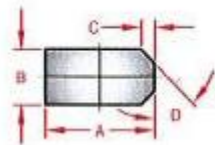
- 514



- 515



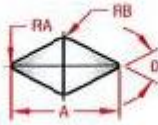
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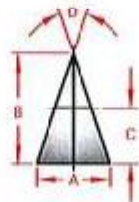
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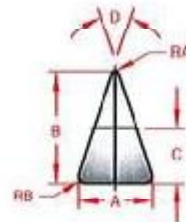
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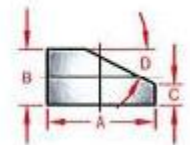
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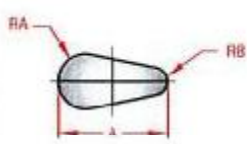
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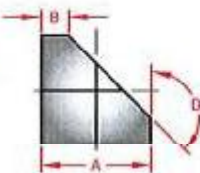
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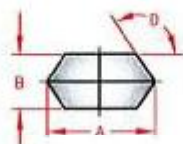
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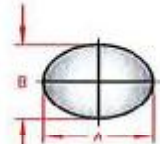
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- 539



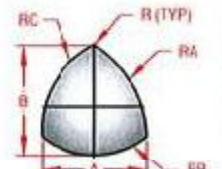
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- 545



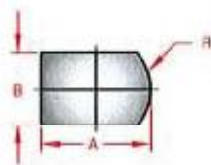
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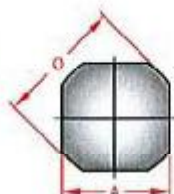
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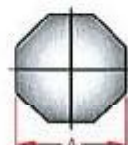
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- 665



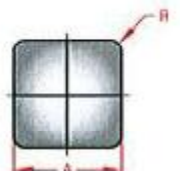
- 670



- 850



- 860



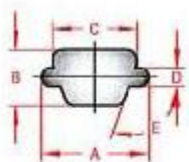




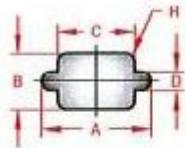
# F.M. Tool & Gauge Pty. Ltd.

## Category 'B' Tool Selection Guide

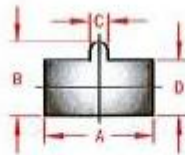
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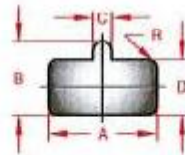
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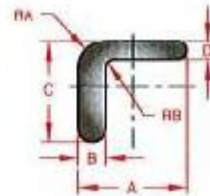
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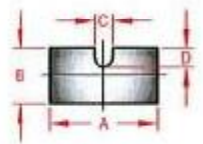
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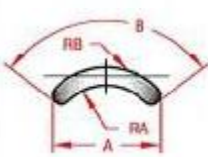
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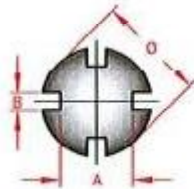
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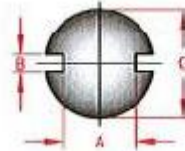
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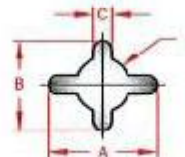
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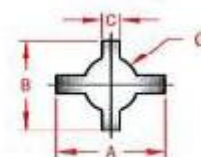
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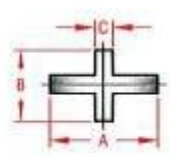
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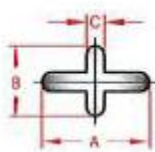
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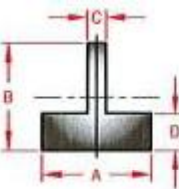
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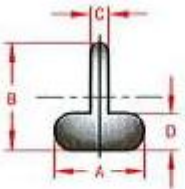
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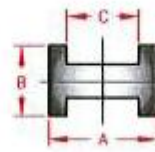
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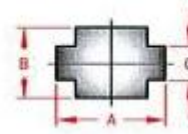
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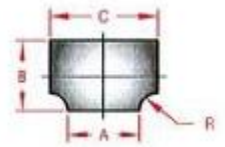
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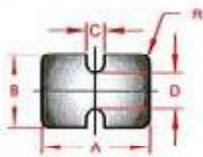
- 532



- 533



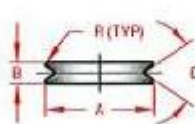
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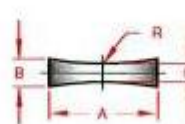
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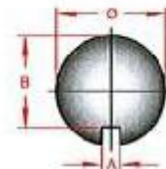
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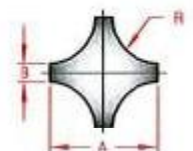
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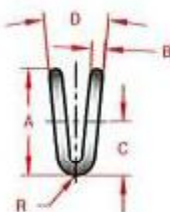
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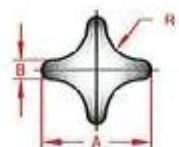
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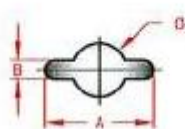
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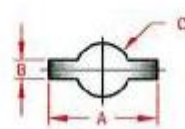
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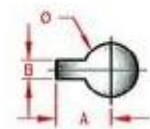
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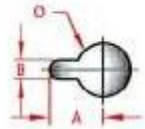
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- 780



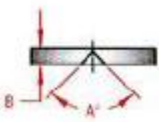
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# F.M. Tool & Gauge Pty. Ltd.

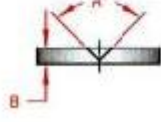
## Category 'C' Tool Selection Guide

- 240



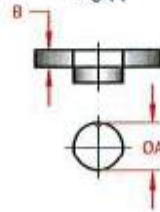
Centre Punch Up

- 241



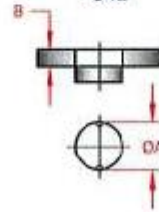
Centre Punch Down

- 541



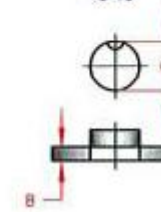
1 Tap K/Out Down

- 542



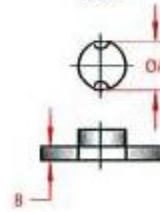
2 Tap K/Out Down

- 543



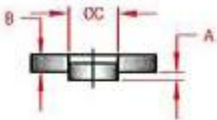
1 Tap K/Out Up

- 544



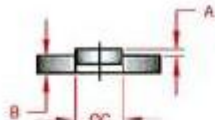
2 Tap K/Out Up

- 562



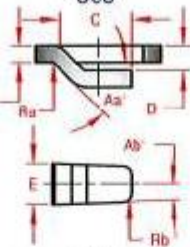
Part Shear Down

- 563



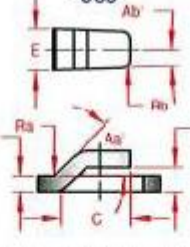
Part Shear Up

- 565



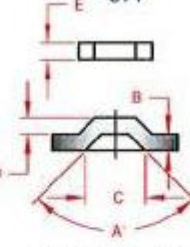
Lance & Form Down

- 566



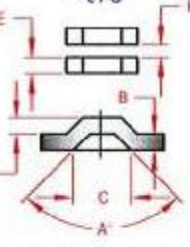
Lance & Form Up

- 577



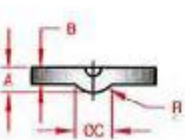
Bridge Tool Up

- 578



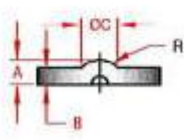
Twin Bridge Tool Up

- 645



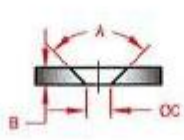
Dimple Down

- 646



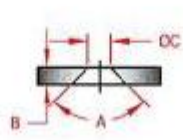
Dimple Up

- 653



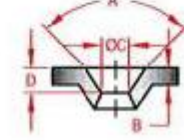
Coined C/Sink Down

- 654



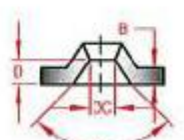
Coined C/Sink Up

- 655



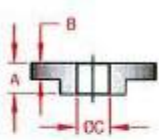
Formed C/Sink Down

- 656



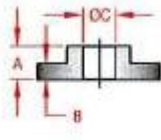
Formed C/Sink Up

- 675



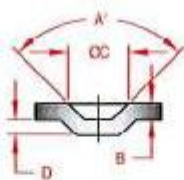
Extrusion Down

- 676



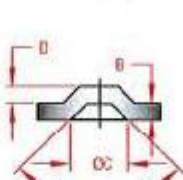
Extrusion Up

- 755



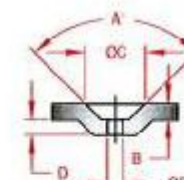
Emboss Down

- 756



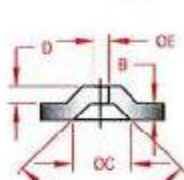
Emboss Up

- 757



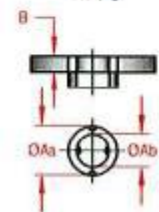
Pierced Emboss Down

- 758



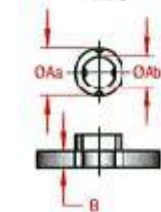
Pierced Emboss Up

- 775



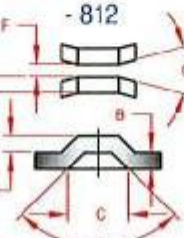
Double K/Out Down

- 776



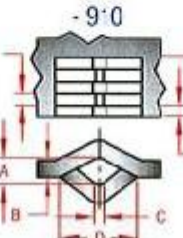
Double K/Out Up

- 812



Card Holder Tool Up

- 9'0



Edge Fix Tool

- 920



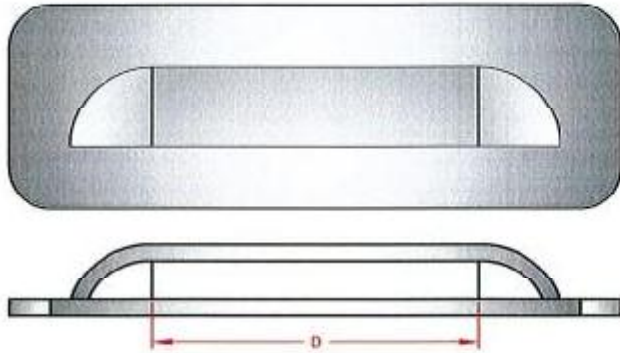
Thread Form

\*A = Thread Form & Pitch

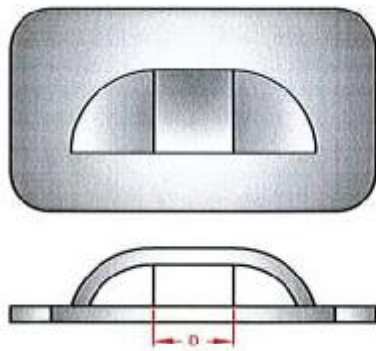
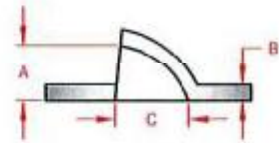


# F.M. Tool & Gauge Pty. Ltd.

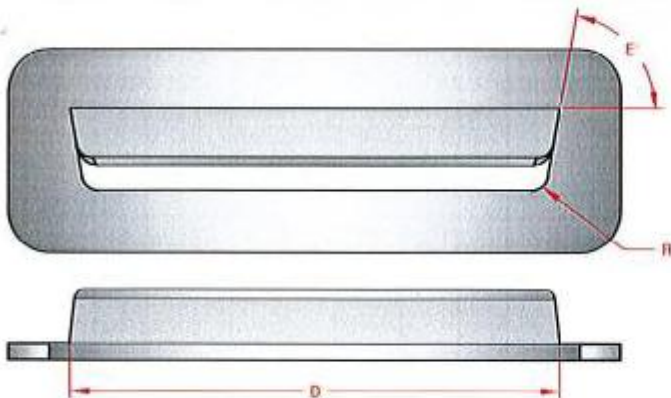
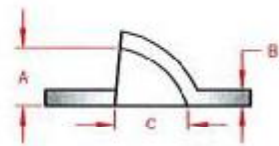
## Category 'C' Tool Selection Guide



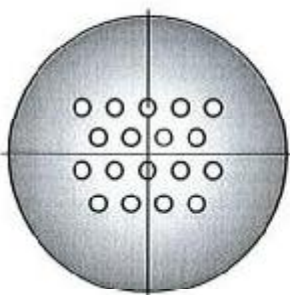
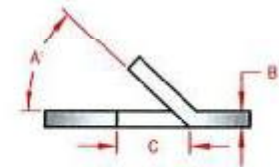
Louvre Tool Up  
-999



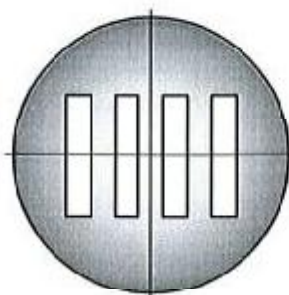
Nibble Louvre Tool Up  
-995



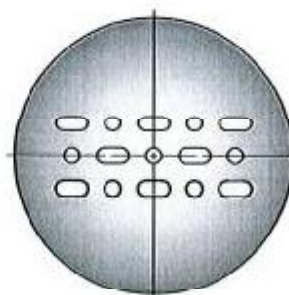
Air Louvre Tool Up  
-997



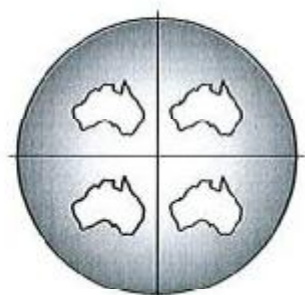
Pin Hole Cluster



Shaped Cluster



Multi Shaped Cluster



Special Shaped Cluster

## Material Multiplication Factor (F)

Material Description	Multiplier (F)	Material Description	Multiplier (F)
Aluminium - Soft Sheet	0.30	Steel - Mila	1.00
Aluminium - Half Hara	0.38	Steel - ASTM-A36	1.20
Aluminium - Hara	0.50	Steel - 50 Carbon	1.40
Brass - Soft Sheet	0.60	Steel - Cold Drawn	1.20
Brass - Half Hara	0.70	Steel - Stainless	1.40
Copper - Rolled	0.57	Spring Steel (Tempered)	4.00

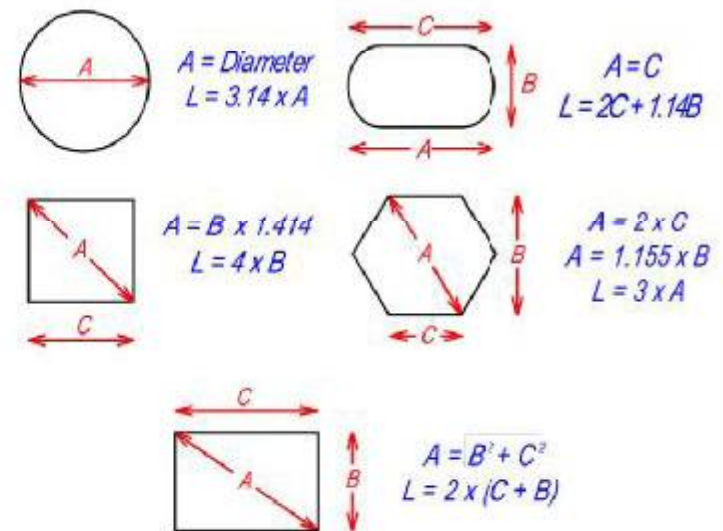
Based on Mild Steel Shear Strength of 50,000 P.S.I (345 MPa)

## Total Cutting Edge

In order to calculate the tonnage required to cut out a shape, it is necessary to work out the total length of the cutting edge, ("L").

ie. The perimeter of the shape to be cut.

**Example:**



## Tonnage Calculation

The tonnage required for punching any shape hole in a material is given by the following formula:

Required Tonnage =  $L \times G \times S$  where:-

"L" is the total length of the cutting edge

"G" is the material thickness

"S" is the shear strength of the material

Hence required tonnage.

**Example 1:** For a 50. mm square in 2. mm mild steel

$$L = 50 \times 4 = 200 \quad G = 2 \quad \& \quad S = 0.345$$

Hence required tonnage.

$$T = 200 \times 2 \times 0.345 = 137.95 \text{ KN}$$

### Punches with Shear

The tonnage required for punching with shear is given by the formula:-

$$T = L \times G \times S \times F$$

Where "F" is the shear factor (see "Calculating the effect of shear")

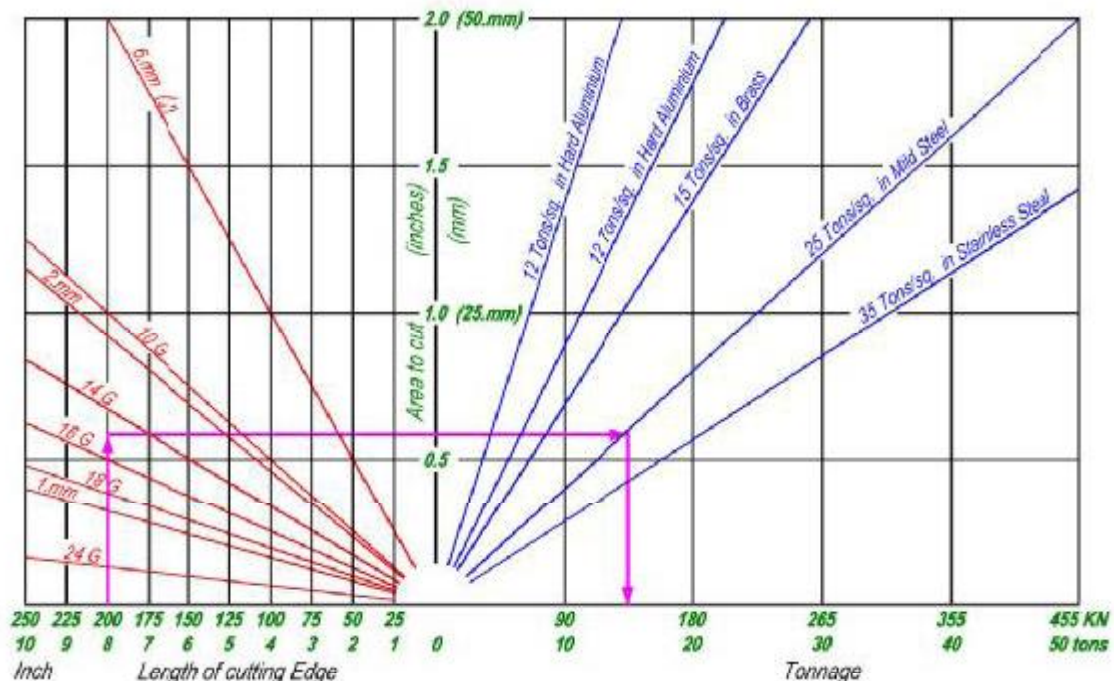
**Example 2:** For a 3/8" x 3" Slitting Tool with 3/16" Shear Cutting 1/4" Hard Aluminium

$$F = 0.63 \text{ (from graph below)}$$

$$L = 2 \left( \frac{3}{8} \times 3 \right) = 2.25 \quad G = 0.25 \quad S = 12 \quad F = 0.63$$

Hence required tonnage:

$$T = 2.25 \times 0.25 \times 12 \times 0.63 = 4.25 \text{ ton}$$



## Recommended Clearances

Total Clearance Calculated

Material	% of Material Thickness	Material Thickness					
		20G	18G	16G	14G	10G	¼'
		0.9	1.2	1.6	2.0	3.0	6.0
Aluminium	15%	0.14	0.18	0.24	0.3	0.45	0.9
Mild Steel	20%	0.18	0.24	0.32	0.4	0.6	1.2
Stainless Steel	25%	0.23	0.3	0.4	0.5	0.75	1.5

Please Note Measurements in mm

This is a recommended guide. If any problems or queries arise please contact F.M. Tool & Gauge for our expert advice.

Shear is used on punches to reduce tonnage and noise whilst punching.  
A full shear can reduce the tonnages by up to 50%.

### Rooftop Shear:

- Ideal when punching at high loads
- Avoid excessive side loading by Taking large cuts (over 75%)

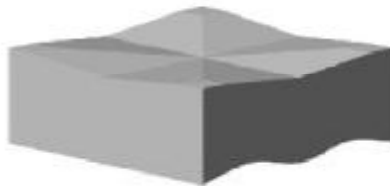


### Concave:

- Best for nibbling
- More difficult to regrind Than inverted rooftop

### Inverted Rooftop:

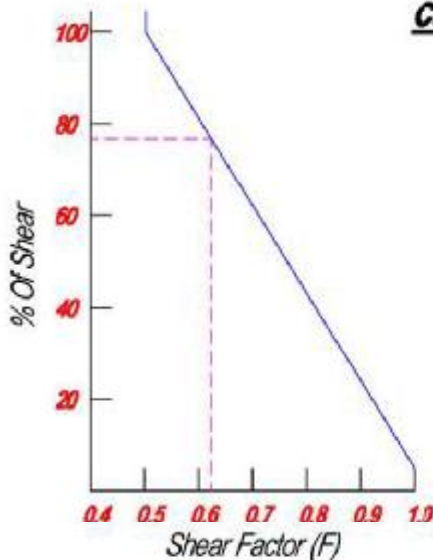
- Very effective
- Easy to produce and regrind
- Avoid sharp corner in the centre, as this provides a stress point, making the tool more susceptible



### Four Way Shear:

- Ideal for large squares
- always avoid sharp inside corners, as these encourage breakage

### Calculating The Effect Of Shear



$$\text{Shear Factor (F)} = \frac{104 - (\text{Shear \%} \times 0.54)}{100}$$

eg. 75% Shear = 0.63  
Shear Factor

$$\% \text{ Of Shear} = \frac{\text{Shear Depth} \times 100}{\text{Material Thickness}}$$

eg. ¼' Material with  
3/16' shear on tool

$$= \frac{0.1875 \times 100}{0.250}$$

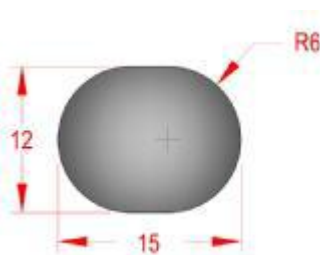
$$= 75\%$$

# “Handy Hints on Ordering”

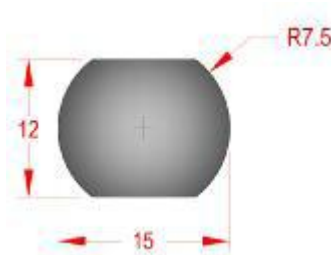
- ◆ When placing orders please give as much information as possible. The greater the information given, the less likely there is of a mistake or problem occurring with the order. (we will query you if we see a possible problem)
- ◆ All relevant dimensions are required. A very common problem can occur when requesting a round ended shape. **Eg: 15 x 12mm**. This can mean 1 of several shapes. (see example below)
- ◆ Using part numbers helps to eliminate misunderstandings.
- ◆ We suggest you advise material and gauge being punched.
- ◆ Show keyways and centre lines on special shapes.
- ◆ Standard practise is to put clearance on the die. Punch size will give you hole size and die size will give you slug size. (if you require the slug please advise)
- ◆ Solid or re-inforced dies can be supplied on request.
- ◆ On special shapes we recommend rads on any sharp corner, this will give added strength to your tool.
- ◆ **TROUBLESHOOTING**:- for problems such as slug pull please ring and ask, as each situation is different. **Good advise is cheap.**
- ◆ **Don't forget**—it is extremely easy to place orders direct from the internet—just remember [www.fmtool.com.au](http://www.fmtool.com.au)  
Please Note: First time users need to be registered with a password

**Example:** (from above)

12 x 15 Oblong



12 x 15 Double Dee



12 x 15 x R9 Doorlock

