



*Solutions for Metalworking*  
[www.tcpunzones.com](http://www.tcpunzones.com)



## **Goiti<sup>®</sup> - Danobat<sup>®</sup> system**

**TC PUNZONES Y MATRICES**  
[www.tcpunzones.com](http://www.tcpunzones.com)  
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## GOITI A

Grupo Estándar <i>Standard Group</i> . . . . .	pág. 3
Grupo de Recuperación de afilado <i>Sharpening Recovery Group</i> . . . . .	pág. 4
Porta Punzón Intercambiable <i>Interchangeable Punch Holder</i> . . . . .	pág. 5

## GOITI B

Grupo Estándar <i>Standard Group</i> . . . . .	pág. 6
Grupo con Bellevilles <i>Bellevilles Group</i> . . . . .	pág. 7
Grupo de Recuperación de afilado <i>Sharpening Recovery Group</i> . . . . .	pág. 8
Grupo Múltiples <i>Cluster Group</i> . . . . .	pág. 9

## GOITI D

Grupo Estándar <i>Standard Group</i> . . . . .	pág. 12
Porta Cuchilla <i>Blade Holder</i> . . . . .	pág. 14
Matriz Porta Insertos <i>Insert Holder Die</i> . . . . .	pág. 15
Grupo Múltiples <i>Cluster Group</i> . . . . .	pág. 16
Grupo Múltiples versión Reforzada <i>Cluster Group Heavy Duty version</i> . . . . .	pág. 18

## GOITI C

Grupo Estándar <i>Standard Group</i> . . . . .	pág. 20
Grupo Múltiples <i>Cluster Group</i> . . . . .	pág. 22
Grupo Múltiples versión Reforzada <i>Cluster Group Heavy Duty version</i> . . . . .	pág. 24

## Embutidores Emboss Group

Grupo Goiti A <i>Goiti A Group</i> . . . . .	pág. 26
Grupo Goiti B <i>Goiti B Group</i> . . . . .	pág. 28
Grupo Goiti B Logos <i>Logo Emboss Group</i> . . . . .	pág. 30
Grupos Goiti B Rollers <i>Rollers Groups</i> . . . . .	pág. 32
Grupo Goiti D <i>Goiti D Group</i> . . . . .	pág. 34
Grupo Goiti C <i>Goiti C Group</i> . . . . .	pág. 36
Grupo Goiti C Logos <i>Logo Emboss Group</i> . . . . .	pág. 38

## Accesorios Accessories

MT-3B / MT-8 . . . . .	pág. 39
Reductoras <i>Adapters</i> . . . . .	pág. 40
Porta Estación <i>Station Holder</i> . . . . .	pág. 41

## Información Técnica Tecnic Information

Figuras Especiales <i>Special Shapes</i> . . . . .	pág. 42
Embuticiones <i>Forming Tools</i> . . . . .	pág. 45
Múltiples <i>Clusters</i> . . . . .	pág. 47
Tolerancia y Tonelaje <i>Clearance &amp; Tonnage</i> . . . . .	pág. 49
Tipo de Rectificado <i>Grinding type</i> . . . . .	pág. 50
Tratamientos Superficiales <i>Coating Solutions</i> . . . . .	pág. 51
Mantenimiento <i>Maintenance</i> . . . . .	pág. 52
Servicio <b>TC</b> <i>TC Service</i> . . . . .	pág. 53



**Tuerca**

Head nut



**Muelle**

Spring



**Arandela**

Retainer



**Camisa**

Punch Guide



**Punzón**

Punch

- **Figura máxima inscrita en Ø16mm**

- *Maximum shape inscribed in Ø16mm*

- **Suplementos de matriz de espesor**

- *Die supplement Ring*

**0,3 - 0,5 - 1mm**

**Sufridera**  
*Head*



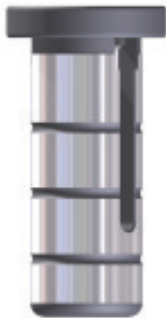
**Muelle**  
*Spring*



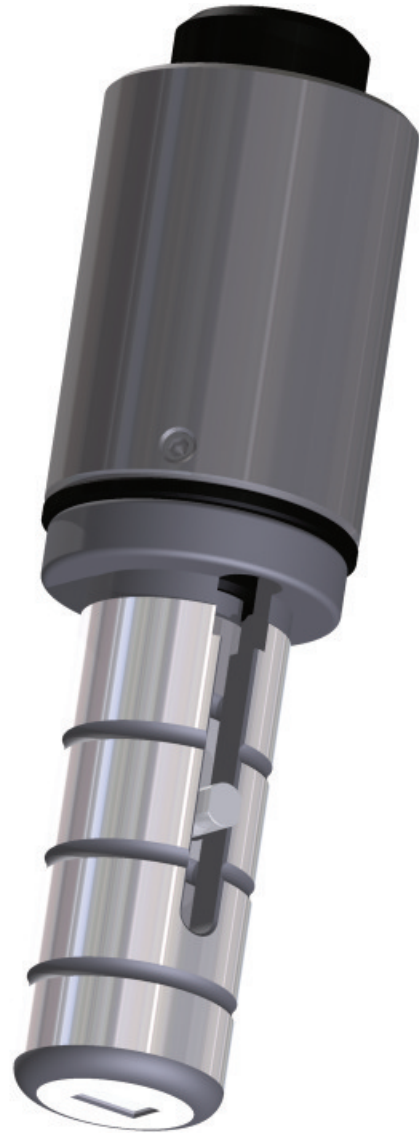
**Cilindro de Recuperación**  
*Recovery Cylinder*



**Camisa**  
*Punch Guide*



**Punzón**  
*Punch*



- **Figura máxima inscrita en Ø16mm**  
*- Maximum shape inscribed in Ø16mm*
- **Suplementos de matriz de espesor**  
*- Die supplement Ring*
- **0,3 - 0,5 - 1mm**

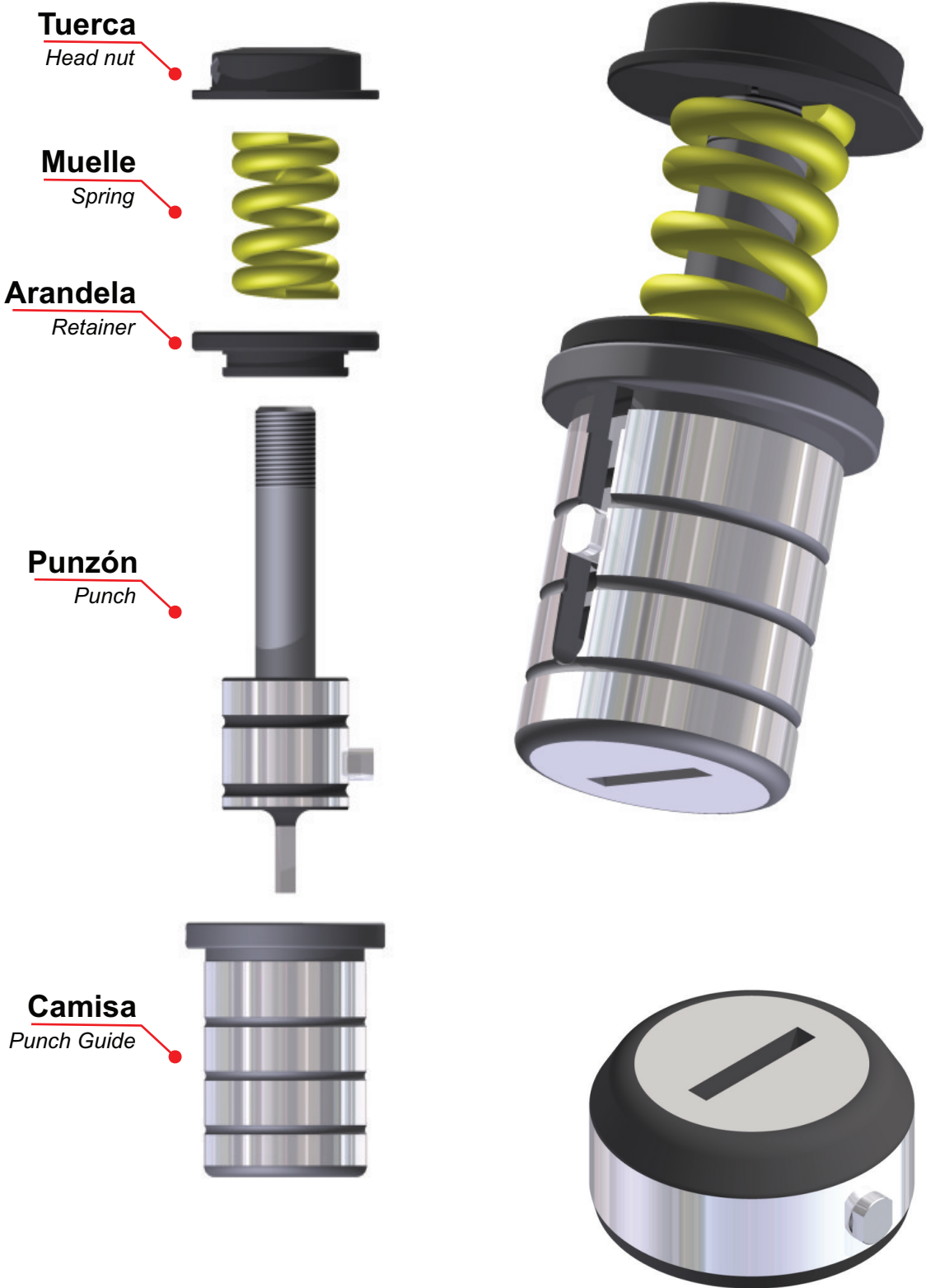


**Porta Punzón**  
*Punch Holder*

**Punzón Intercambiable Max. Ø6**  
*Interchangeable Punch  
Ø6 Max.*

**Casquillo**  
*Punch Holder  
Cap*

**- Figura máxima inscrita en Ø6mm**  
*- Maximum shape inscribed in Ø6mm*



- **Figura máxima inscrita en Ø42mm\***

- *Maximum shape incirbed in Ø42mm\**

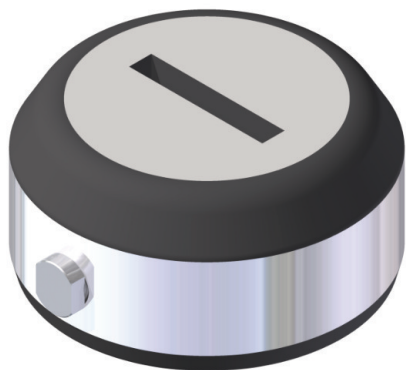
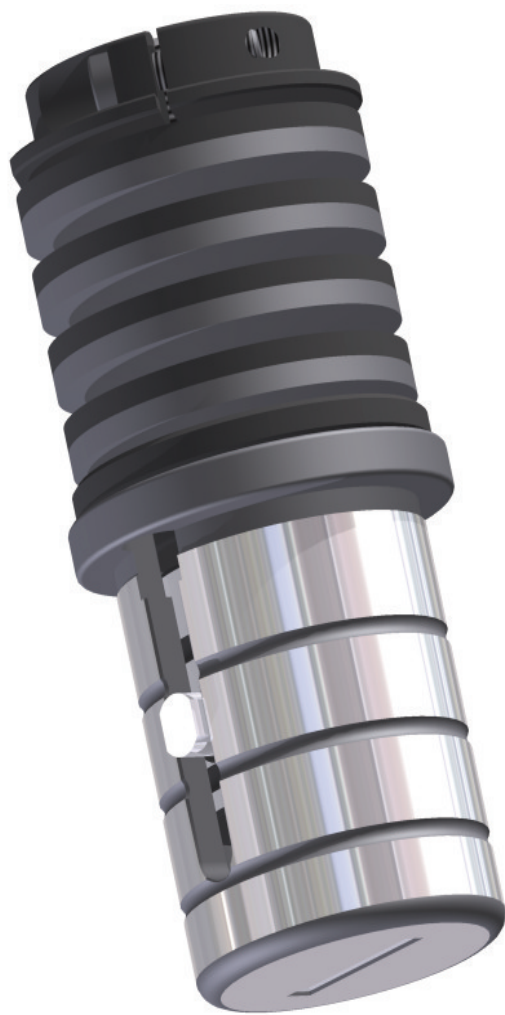
- **Suplementos de matriz de espesor**

- *Die supplement Ring*

**0,3 - 0,5 - 1mm**

\* Ø45mm con estudio previo

\* Ø45mm with previus study



\* Ø45mm con estudio previo  
\* Ø45mm with previous study

- **Figura máxima inscrita en Ø42mm\***  
- *Maximum shape inscribed in Ø42mm\**  
- **Suplementos de matriz de espesor**  
- *Die supplement Ring*  
**0,3 - 0,5 - 1mm**

# Goiti - Danobat B



- **Figura máxima inscrita en  $\varnothing 42\text{mm}$**   
- *Maximum shape inscribed in  $\varnothing 42\text{mm}$*
- **Suplementos de matriz de espesor**  
- *Die supplement Ring*  
**0,3 - 0,5 - 1mm**





**Sufridera**  
Head



**Bellevilles**  
Belleville



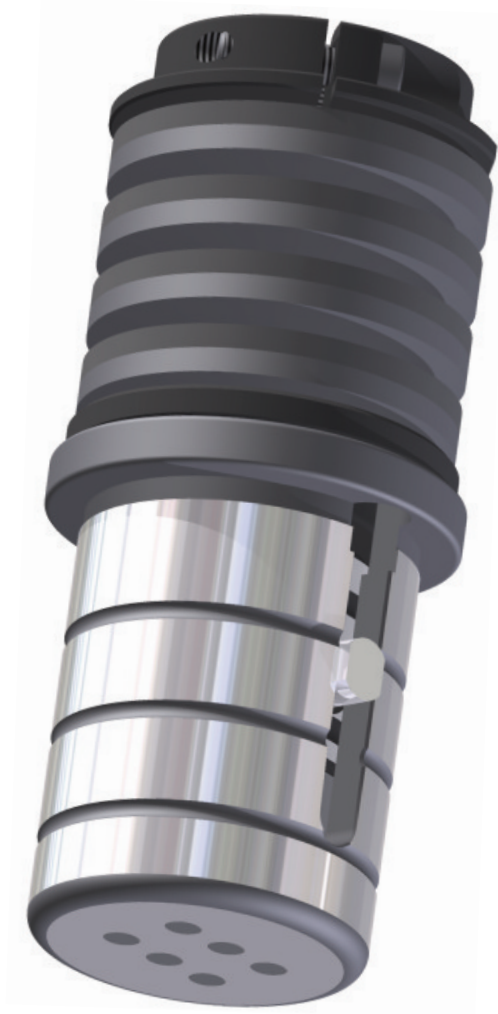
**Punzón Reforzado**  
Heavy Duty Punch



**Camisa**  
Punch Guide

\* Ø45mm con estudio previo  
\* Ø45mm with previous study

- **Figura máxima inscrita en Ø42mm\***  
- *Maximum shape inscribed in Ø42mm\**  
- **Suplementos de matriz de espesor**  
- *Die supplement Ring*  
**0,3 - 0,5 - 1mm**



- **Figura máxima inscrita en Ø42mm\***

- *Maximum shape inscribed in Ø42mm\**

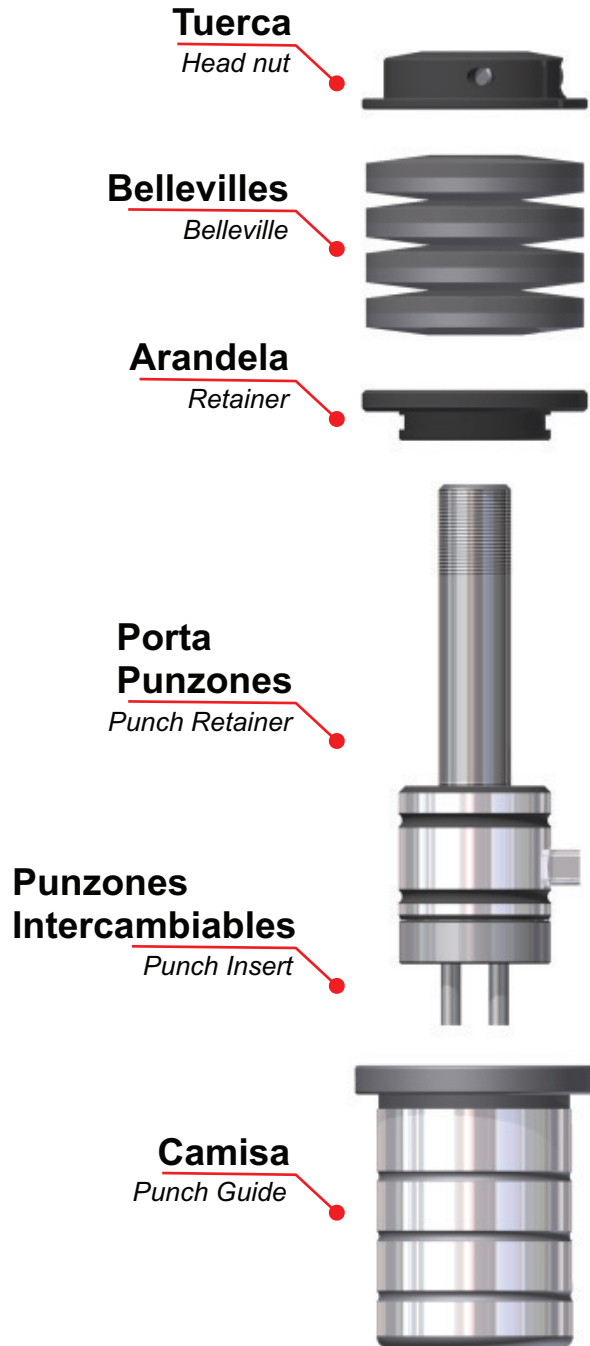
- **Suplementos de matriz de espesor**

- *Die supplement Ring*

**0,3 - 0,5 - 1mm**

\* Ø45mm con estudio previo

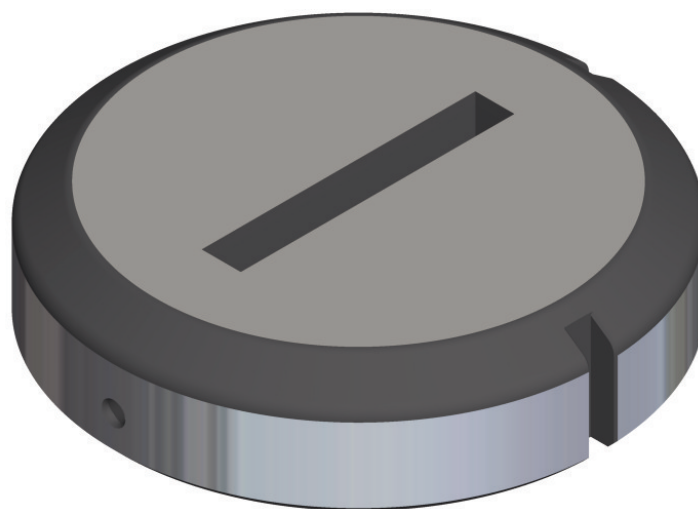
\* Ø45mm with previous study





**Altura  
Matriz**  
*Die Height*

21,5mm  
27,5mm  
30mm



- **Figura máxima inscrita en Ø89,4mm**

- *Maximum shape inscribed in Ø89,4mm*

- **Suplementos de matriz de espesor**

- *Die supplement Ring*

**0,3 - 0,5 - 1mm**

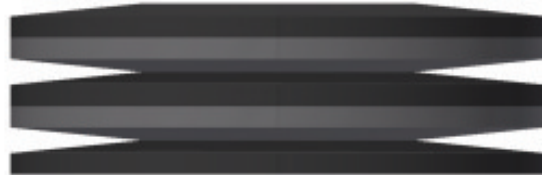
**Tuerca de Golpeo**

*Head Nut*



**Bellevilles**

*Belleville*



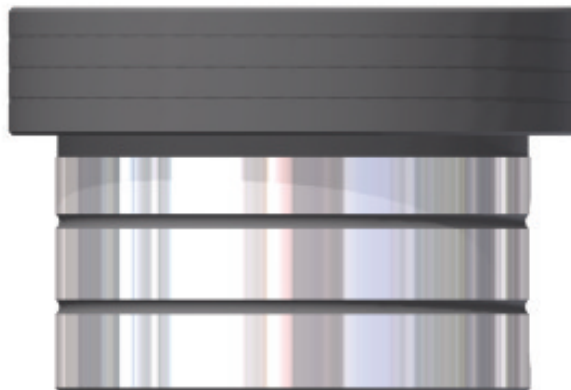
**Vástago Porta Punzón**

*Punch Retainer Stem*



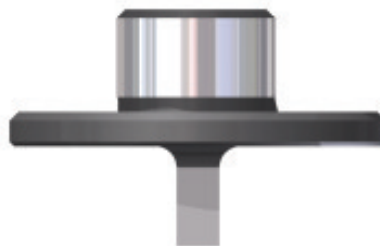
**Camisa**

*Punch Guide*



**Punzón**

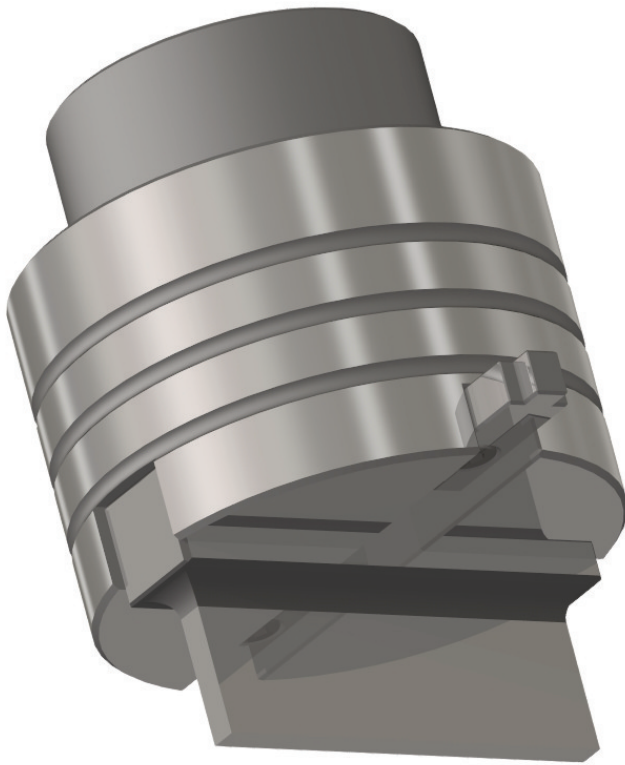
*Punch*



**Pisador**

*Stripper*





**Tornillo**  
Screw



**Porta Cuchillas**  
Blade Holder



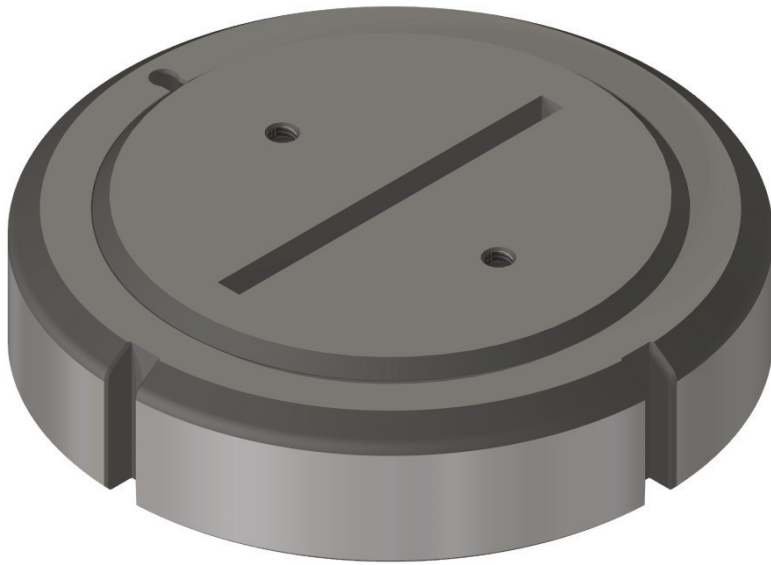
**Chavetas**  
Guide Keys



**Cuchilla**  
Blade



- Cuchilla Estándar 75x5  
- 75x5 Standard Blade



**Inserto**

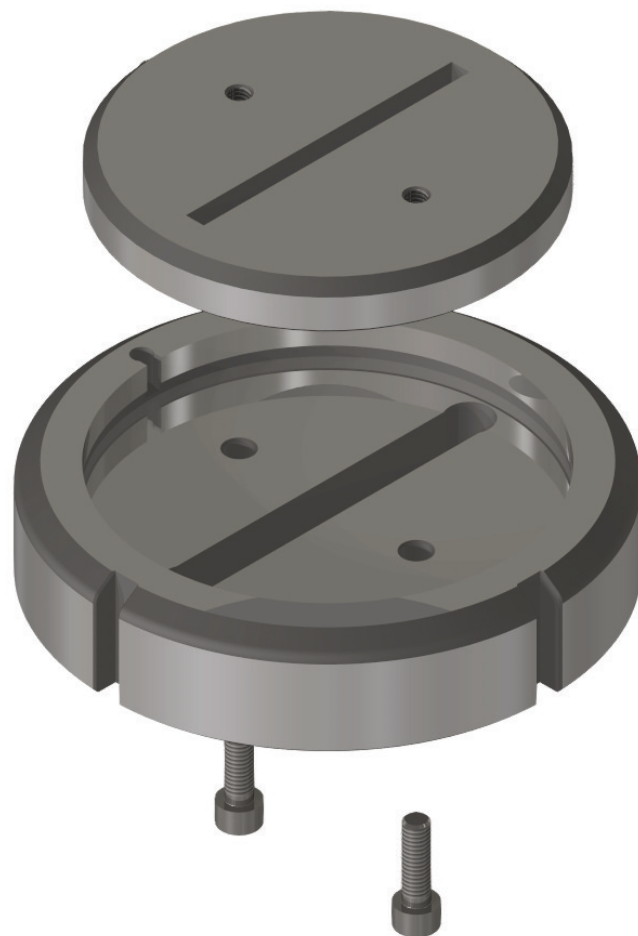
*Insert*

**Matriz Porta  
Insertos**

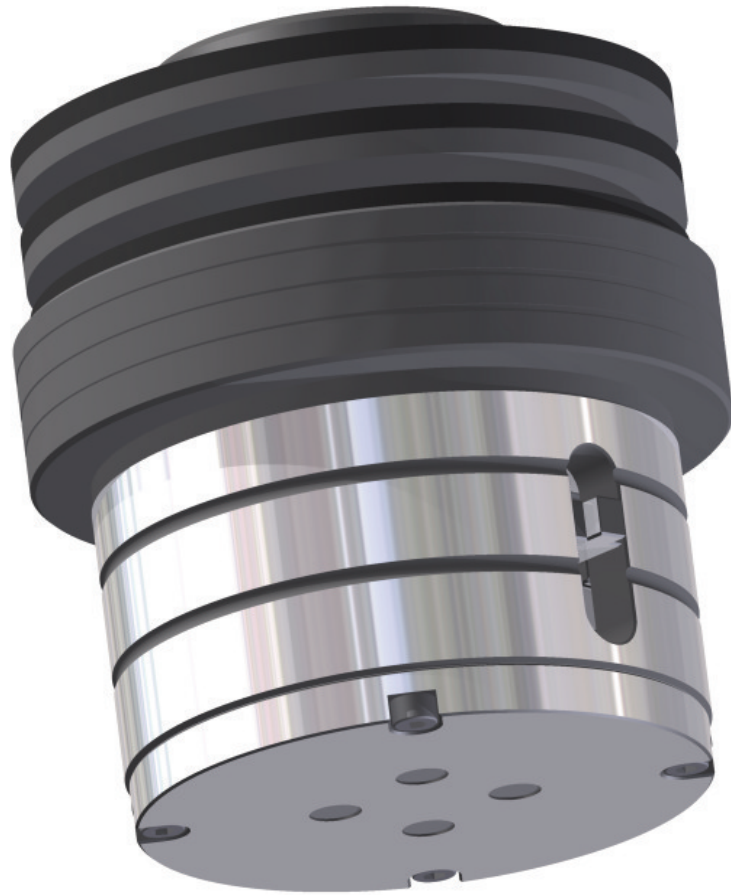
*Insert Holder Die*

**Tornillos**

*Screws*

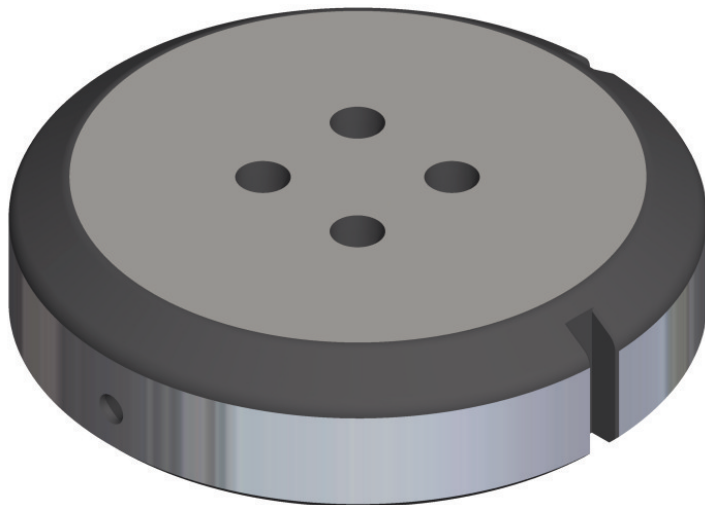


- **Suplementos de matriz de espesor**  
- *Die supplement Ring*  
**0,3 - 0,5 - 1mm**



Altura  
Matriz  
*Die Height*

21,5mm  
27,5mm  
30mm



- **Figura máxima inscrita en Ø89,4mm**

- *Maximum shape inscribed in Ø89,4mm*

- **Suplementos de matriz de espesor**

- *Die supplement Ring*

**0,3 - 0,5 - 1mm**



**Tuerca de Golpeo**

*Head Nut*



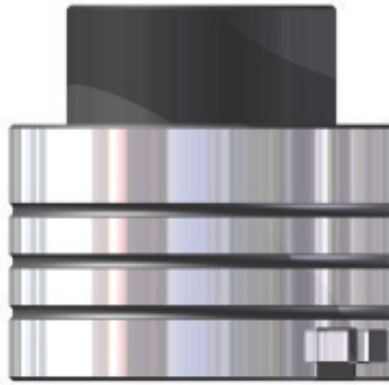
**Bellevilles**

*Belleville*



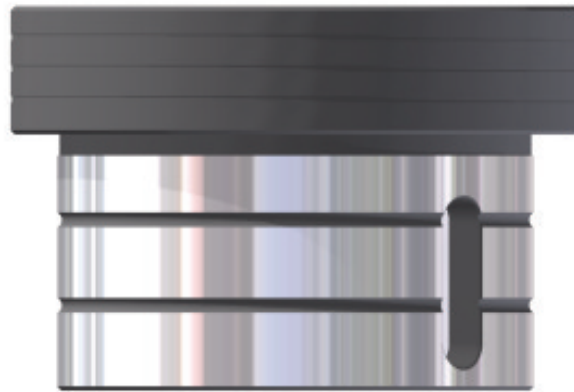
**Vástago Porta Punzón**

*Punch Retainer Stem*



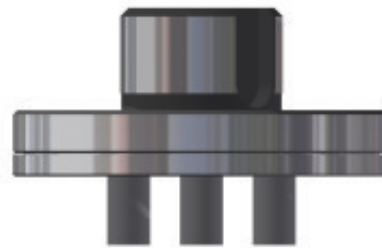
**Camisa**

*Punch Guide*



**Porta Punzones**

*Punch Retainer*



**Punzones Intercambiables**

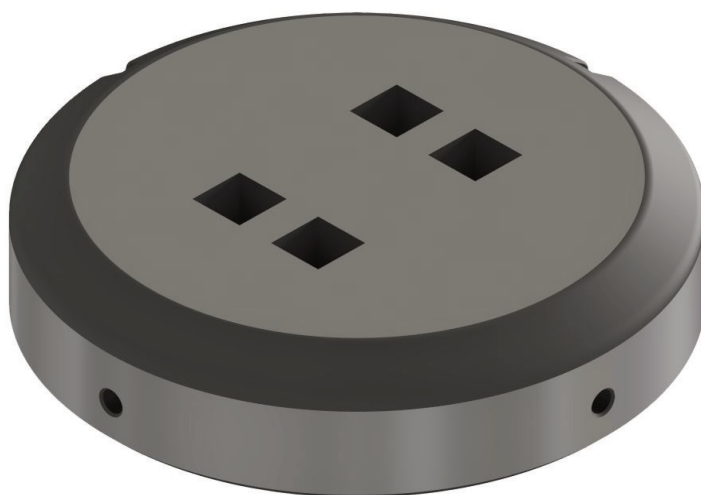
*Punch Insert*



**Pisador**

*Stripper*

# Goiti - Danobat D



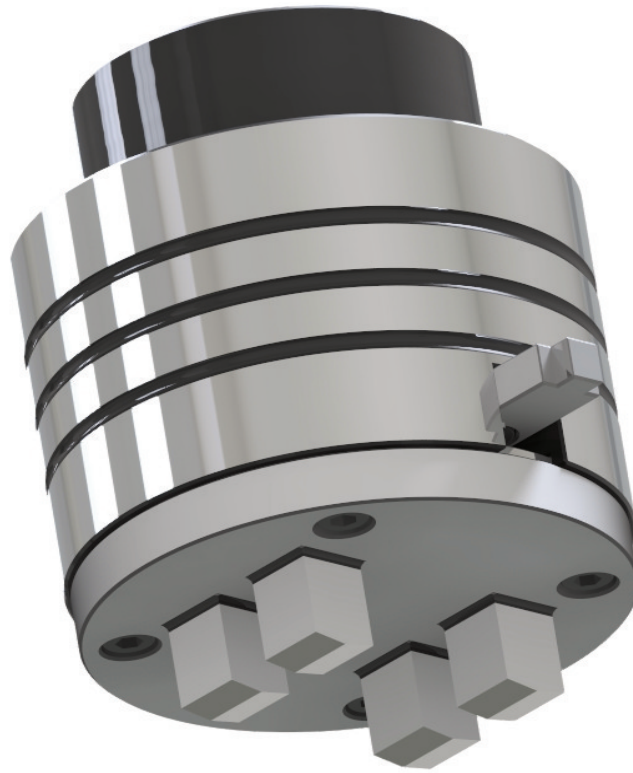
- **Figura máxima inscrita en  $\text{Ø}89,4\text{mm}$**

- *Maximum shape inscribed in  $\text{Ø}89,4\text{mm}$*

- **Suplementos de matriz de espesor**

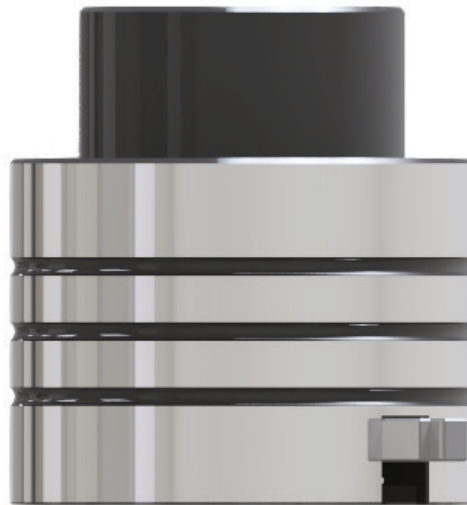
- *Die supplement Ring*

**0,3 - 0,5 - 1mm**



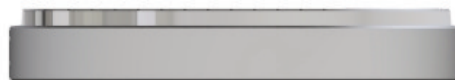
**Vástago  
Porta Punzón  
Reforzado**

*Heavy Duty  
Punch Retainer  
Stem*



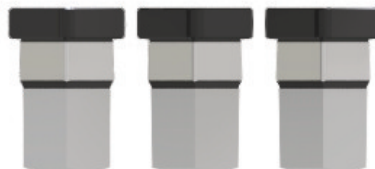
**Placa  
Porta Punzón  
Reforzada**

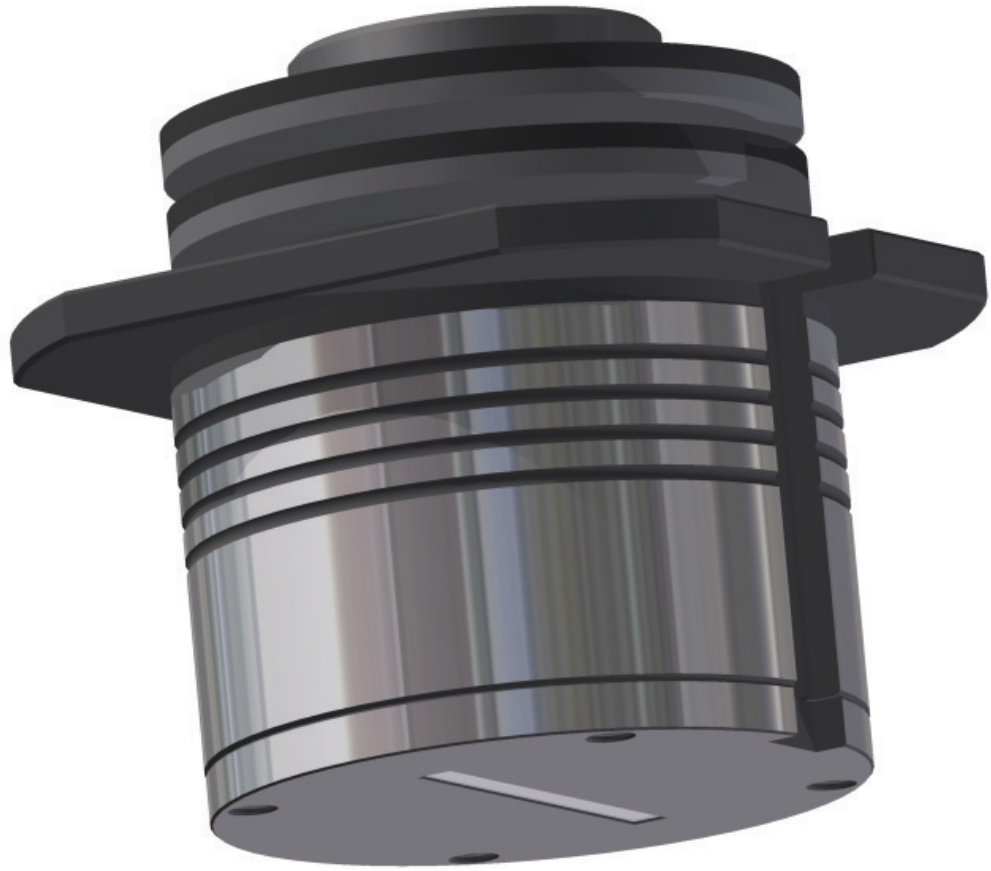
*Heavy Duty  
Punch Retainer  
Plate*



**Punzones  
Intercambiables  
Reforzados**

*Heavy Duty  
Punch Insert*





- **Figura máxima inscrita en Ø100mm**
- *Maximum shape inscribed in Ø100mm*
- **Suplementos de matriz de espesor**
- *Die supplement Ring*
- 0,3 - 0,5 - 1mm**

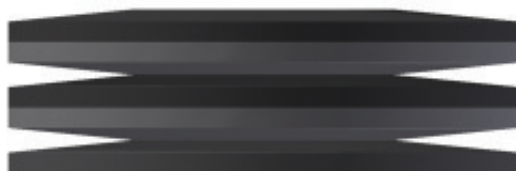
**Tuerca de Golpeo**

*Head Nut*



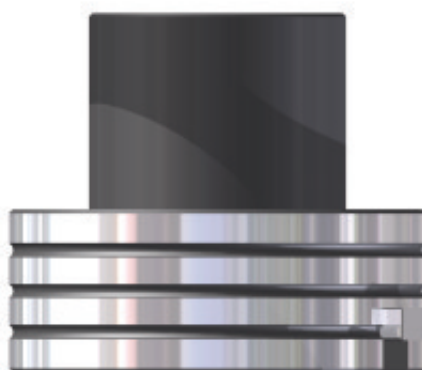
**Bellevilles**

*Belleville*



**Vástago Porta Punzón**

*Punch Retainer Stem*



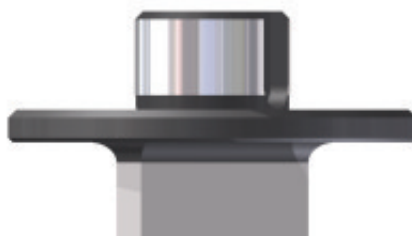
**Camisa**

*Punch Guide*



**Punzón**

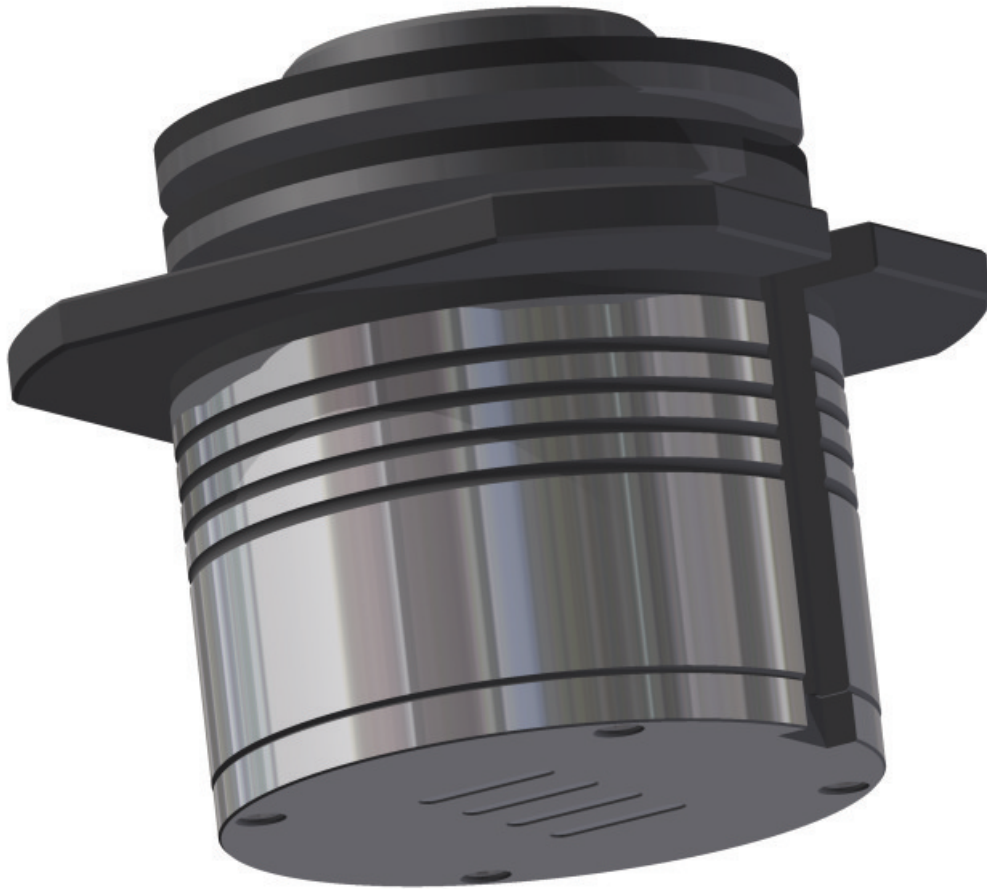
*Punch*



**Pisador**

*Stripper*





- **Figura máxima inscrita en Ø100mm**
- *Maximum shape inscribed in Ø100mm*
- **Suplementos de matriz de espesor**
- *Die supplement Ring*
- 0,3 - 0,5 - 1mm**

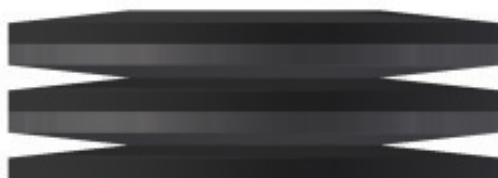
**Tuerca de Golpeo**

*Head Nut*



**Bellevilles**

*Belleville*



**Vástago Porta Punzón**

*Punch Retainer Stem*



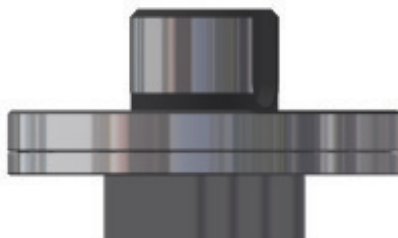
**Camisa**

*Punch Guide*



**Porta Punzones**

*Punch Retainer*



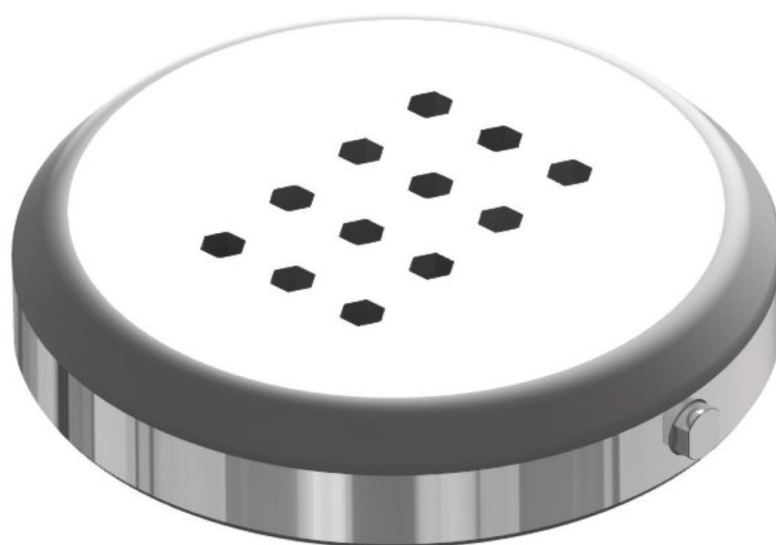
**Punzones Intercambiables**

*Punch Insert*



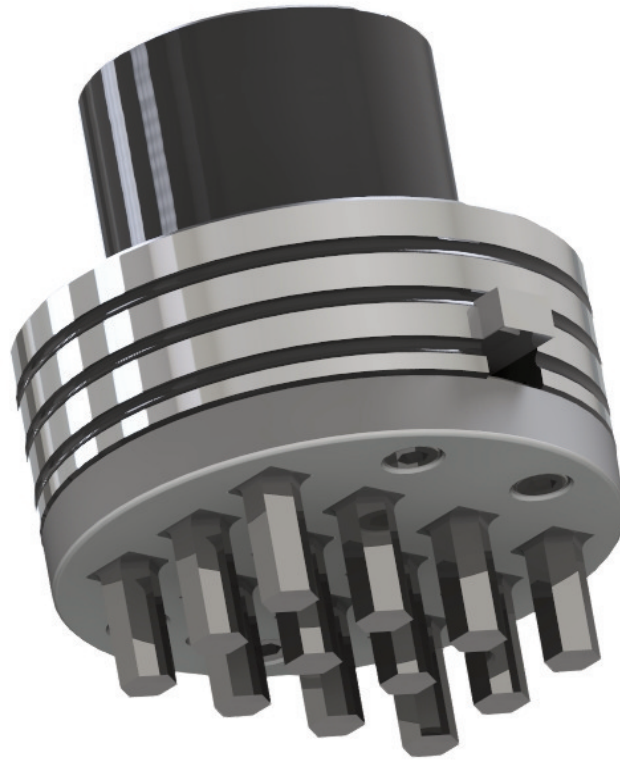
**Pisador**

*Stripper*



- **Figura máxima inscrita en  $\varnothing 100\text{mm}$**
- *Maximum shape inscribed in  $\varnothing 100\text{mm}$*
- **Suplementos de matriz de espesor**
- *Die supplement Ring*
- 0,3 - 0,5 - 1mm**





**Vástago  
Porta Punzón  
Reforzado**

*Heavy Duty  
Punch Retainer  
Stem*



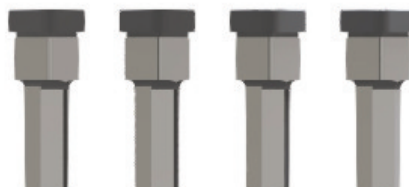
**Placa  
Porta Punzón  
Reforzada**

*Heavy Duty  
Punch Retainer  
Plate*



**Punzones  
Intercambiables  
Reforzados**

*Heavy Duty  
Punch Insert*



- Figura máxima inscrita en Ø100mm  
- Maximum shape inscribed in Ø100mm



**\*La imagen mostrada es un ejemplo de embutidor, para otras soluciones, consultar.**

*\*The image show is an example of emboss, for other solutions, consult.*

**Tuerca**  
Head nut



**Muelle**  
Spring



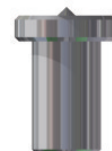
**Tapeta Expulsora**  
Die Expulsor



**Arandela**  
Retainer



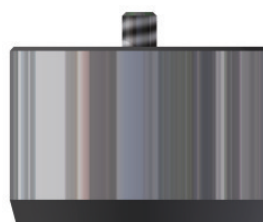
**Punzón Embutidor**  
Emboss Punch



**Muelle**  
Spring

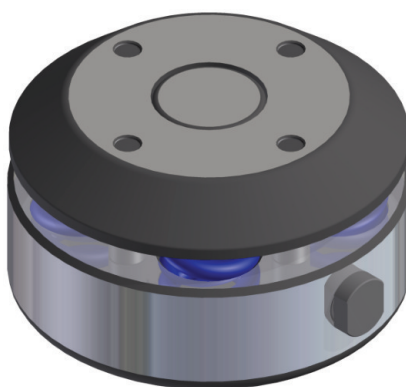


**Base Matriz**  
Die Base



**Cuerpo Macizo**  
Solid Body





**\*La imagen mostrada es un ejemplo de embutidor, para otras soluciones, consultar.**

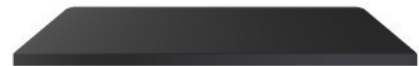
*\*The image show is an example of emboss, for other solutions, consult.*

**Cabeza de Golpeo Regulable**  
**± 0,15mm**

Head With  
±0,15mm  
Regulation



**Tapeta Expulsora**  
Die Expulsor



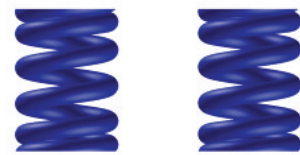
**Punzón Embutidor**  
Emboss Punch



**Vástago**  
Stem



**Muelle**  
Spring



**Muelle**  
Spring



**Base Matriz**  
Die Base



**Expulsor**  
Expulsor

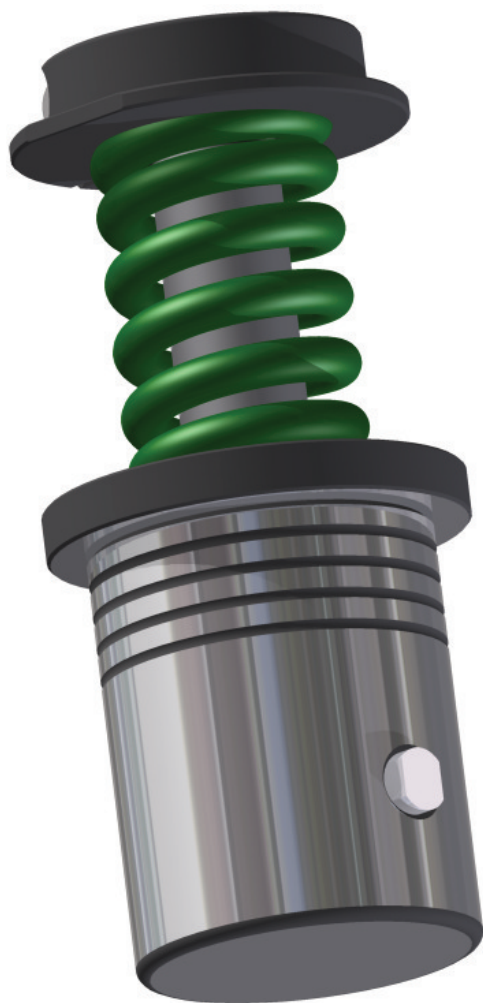


**Guías**  
Guide



**Tapeta Intercambiable**  
Interchangeable  
Insert





**\*La imagen mostrada es un ejemplo de embutidor, para otras soluciones, consultar.**

*\*The image show is an example of emboss, for other solutions, consult.*

**Tuerca**  
Head nut



**Muelle**  
Spring



**Arandela**  
Retainer



**Cuerpo  
Macizo**  
Solid Body





**\*\*Las embuticiones con técnica roller, necesitan de un software específico y la máquina estar habilitada para este tipo de útiles. En caso de dudas consultar con fabricantes de estos.**

*\*\* Roller embossing techniques require software specific and the machine will be enabled for this type of tool. In case of doubts, consult with manufacturers of these.*

**\*La imagen mostrada es un ejemplo de roller, para otras soluciones, consultar.**

*\*The image show is an example of roller, for other solutions, consult.*





**\*\*Las embuticiones con técnica roller, necesitan de un software específico y la máquina estar habilitada para este tipo de útiles.**

**En caso de dudas consultar con fabricantes de estos.**

*\*\* Roller embossing techniques require software specific and the machine will be enabled for this type of tool. In case of doubts, consult with manufacturers of these.*

### ESPEORES

*Thickness*

**Mín. 0,76mm**

**Máx.**

**Hierro / Fe**  
*Mild Steel*

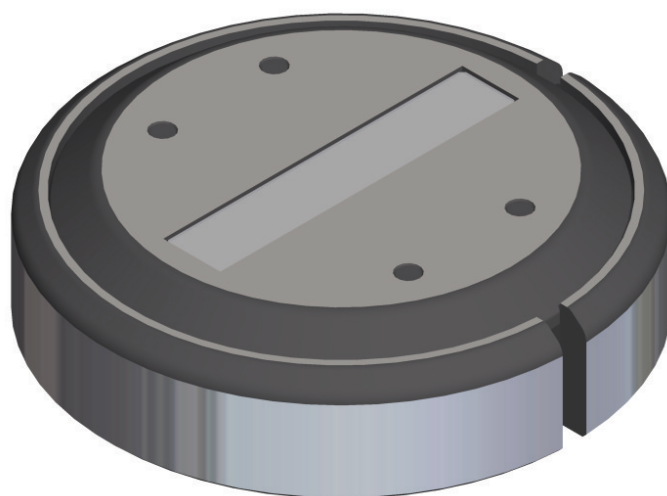
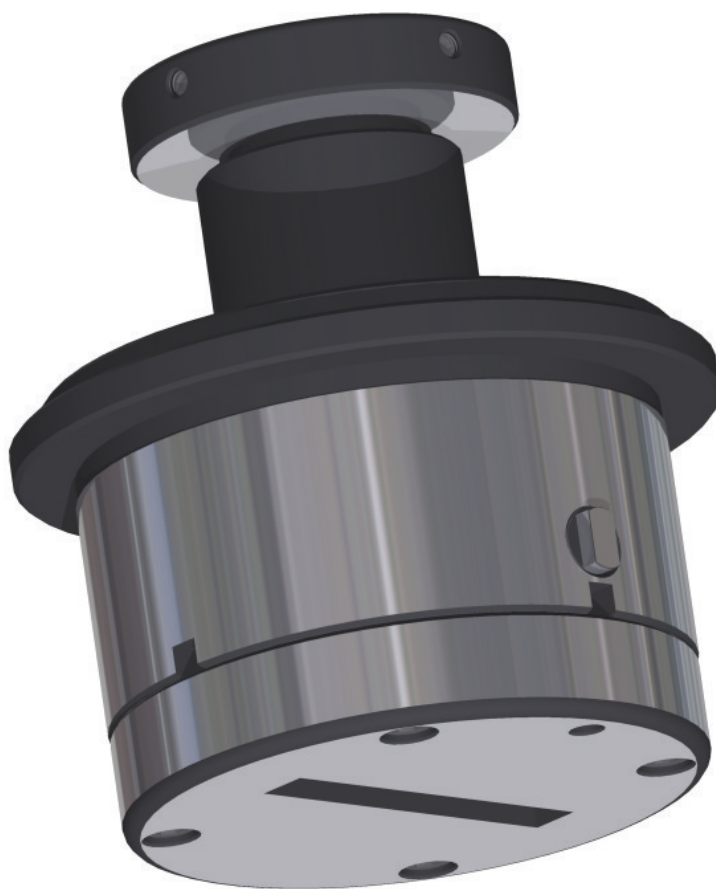
**2mm**

**Ac. Inox**  
*Stainless Steel*

**1,5mm**

**Aluminio**  
*Aluminium*

**2,5mm**



**\*La imagen mostrada es un ejemplo de embutidor, para otras soluciones, consultar.**

*\*The image show is an example of emboss, for other solutions, consult.*

**Cabeza de Golpeo Regulable**

*Head With Regulation*

**Vástago**

*Stem*

**Tapeta Intercambiable**

*Interchangeable Insert*

**Tapeta Expulsora**

*Die Expulsor*

**Punzón Embutidor**

*Emboss Punch*

**Muelle**

*Spring*

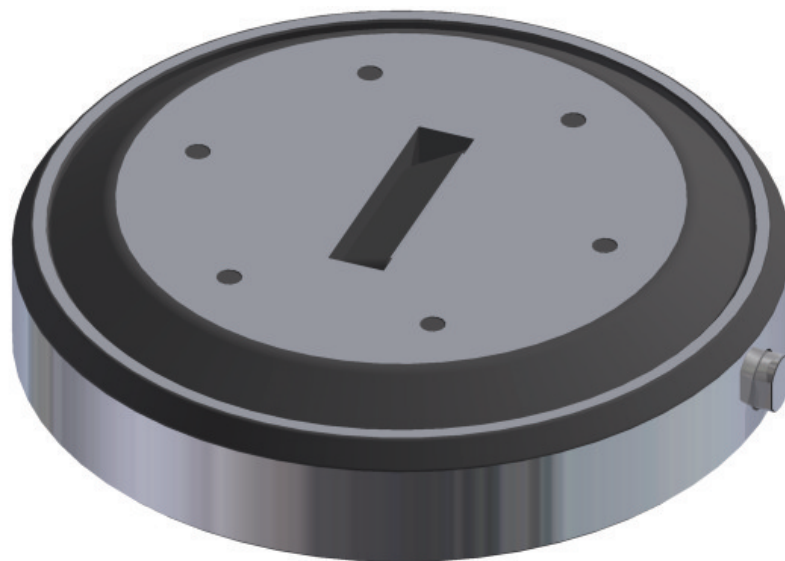
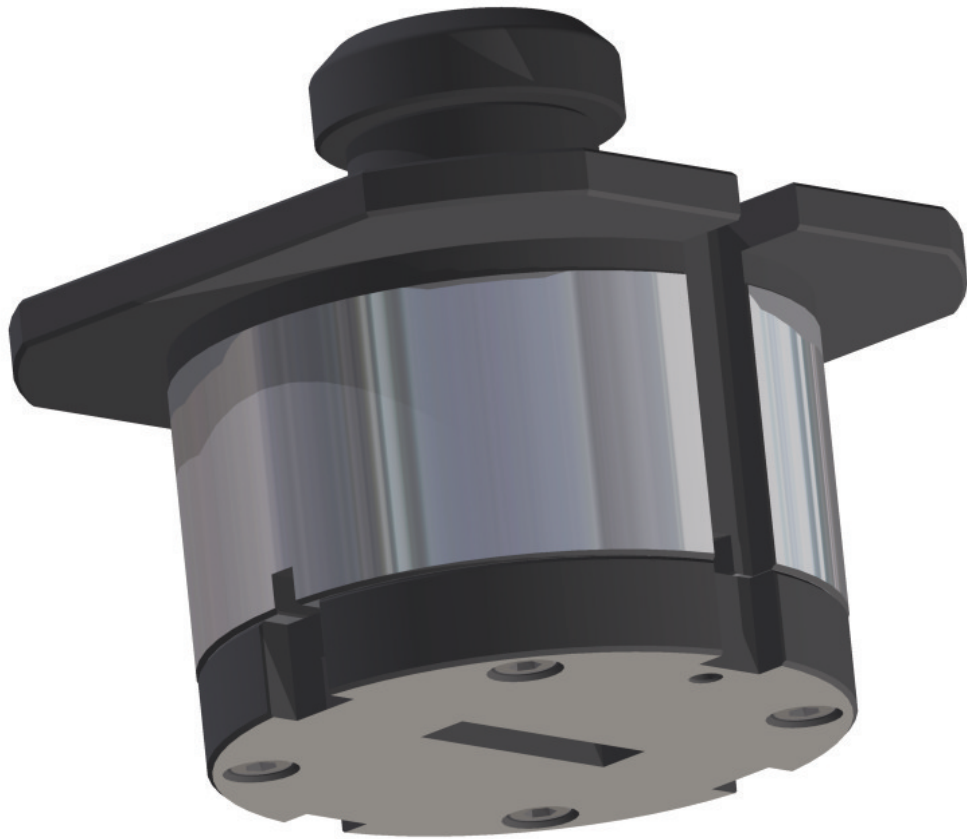
**Base Matriz**

*Die Base*

**Guías**

*Guide*





**\*La imagen mostrada es un ejemplo de embutidor, para otras soluciones, consultar.**

*\*The image show is an example of emboss, for other solutions, consult.*

**Cabeza de Golpeo Regulable**

*Head With Regulation*



**Vástago**

*Stem*



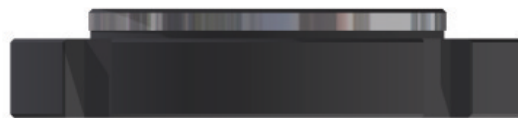
**Camisa**

*Punch Guide*



**Tapeta Intercambiable**

*Interchangeable Insert*



**Tapeta Expulsora**

*Die Expulsor*



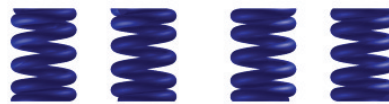
**Punzón Embutidor**

*Emboss Punch*



**Muelle**

*Spring*



**Base Matriz**

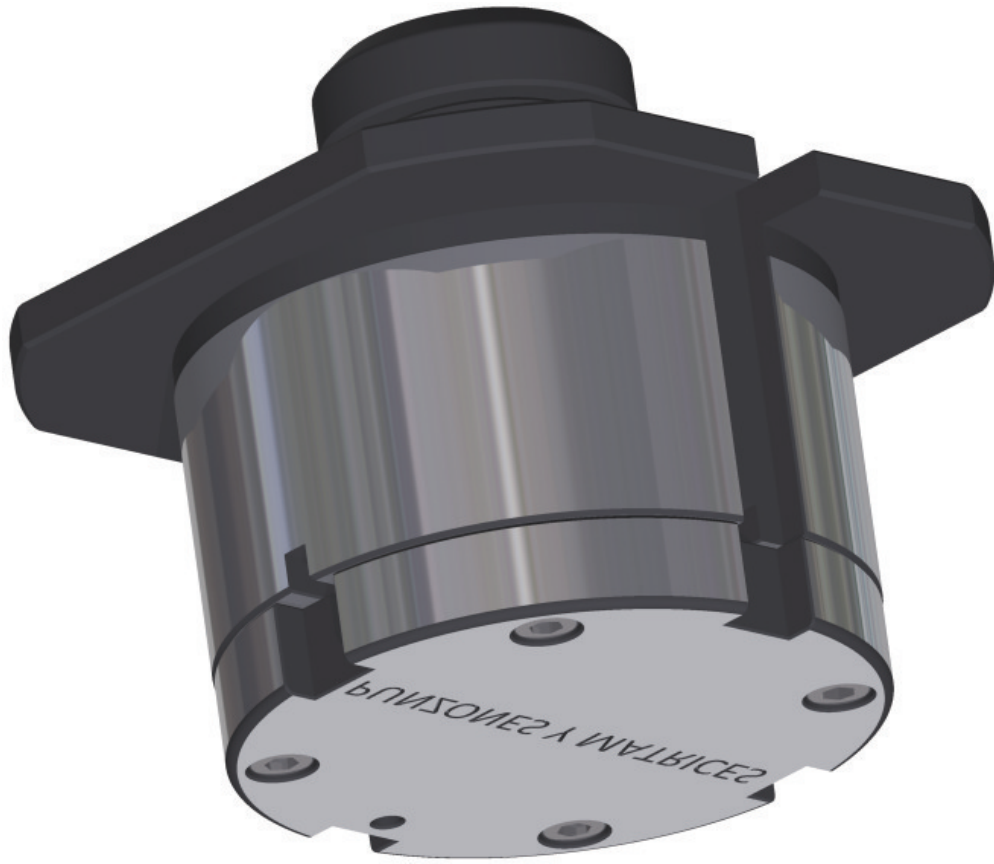
*Die Base*



**Guias**

*Guide*





**\*La imagen mostrada es un ejemplo de embutidor, para otras soluciones, consultar.**

*\*The image show is an example of emboss, for other solutions, consult.*

**Cabeza de Golpeo Regulable**

*Head With Regulation*



**Vástago**

*Stem*



**Camisa**

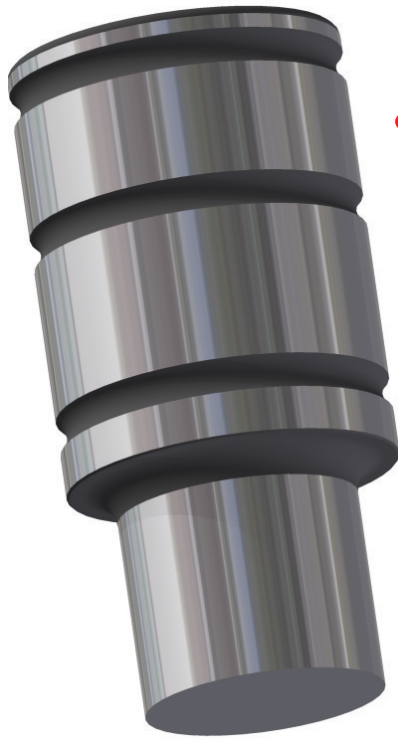
*Punch Guide*



**Tapeta Intercambiable**

*Interchangeable Insert*



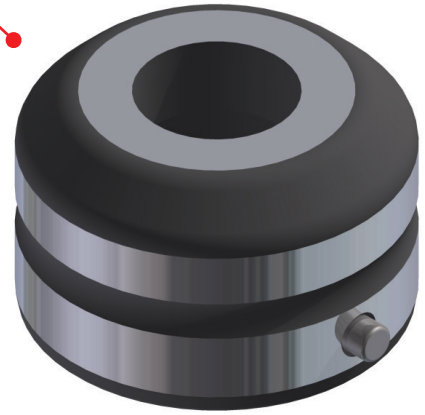


**Punzón MT-3B**

*MT-3B Punch*

**Matriz MT-3B**

*MT-3B Die*



- **Figura máxima inscrita en Ø31.7mm**
- *Maximum shape incirbed in Ø16mm*
- **Suplementos de matriz de espesor**
- *Die supplement Ring*
- 0,3 - 0,5 - 1mm**



**Punzón MT-8**

*MT-8 Punch*

**Matriz MT-8**

*MT-8 Die*



- **Figura máxima inscrita en Ø13mm**
- *Maximum shape incirbed in Ø16mm*
- **Suplementos de matriz de espesor**
- *Die supplement Ring*
- 0,3 - 0,5 - 1mm**



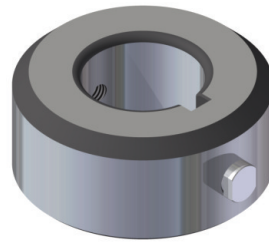
**Reductora Camisa B-A**

*B-A Guide Punch Adapter*



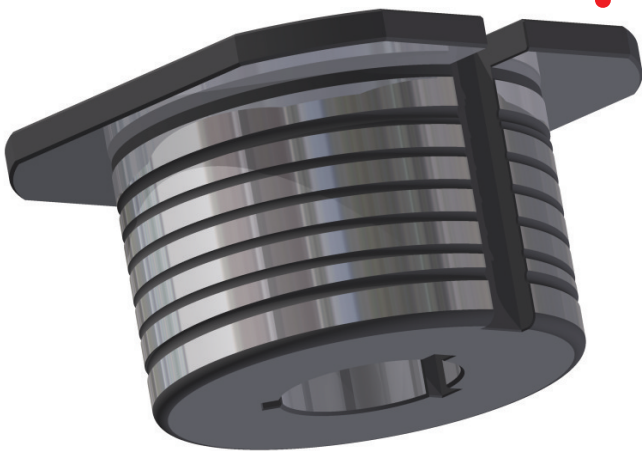
**Reductora Matriz B-A**

*B-A Guide Punch Adapter*



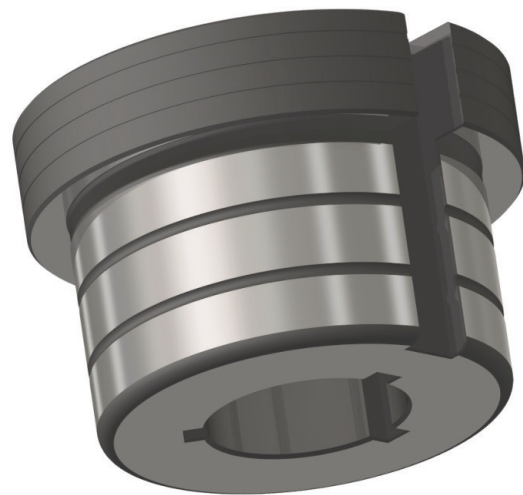
**Reductora Camisa C-B**

*C-B Guide Punch Adapter*



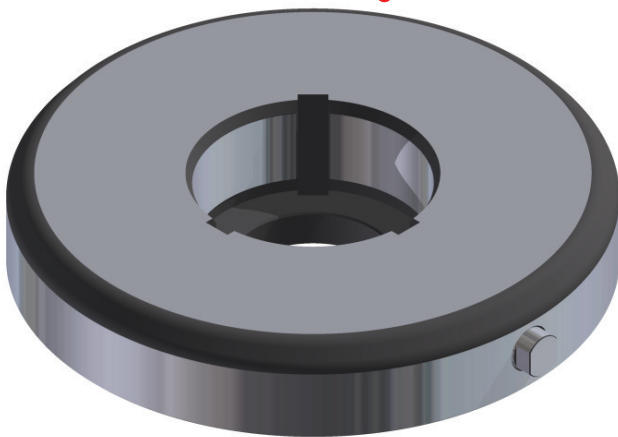
**Reductora Camisa D-B**

*D-B Punch Guide Adapter*



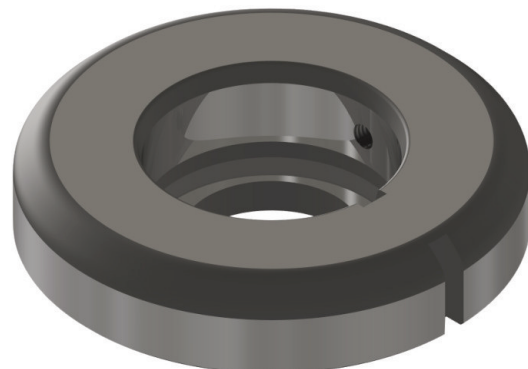
**Reductora Matriz C-B**

*C-B Die Adapter*



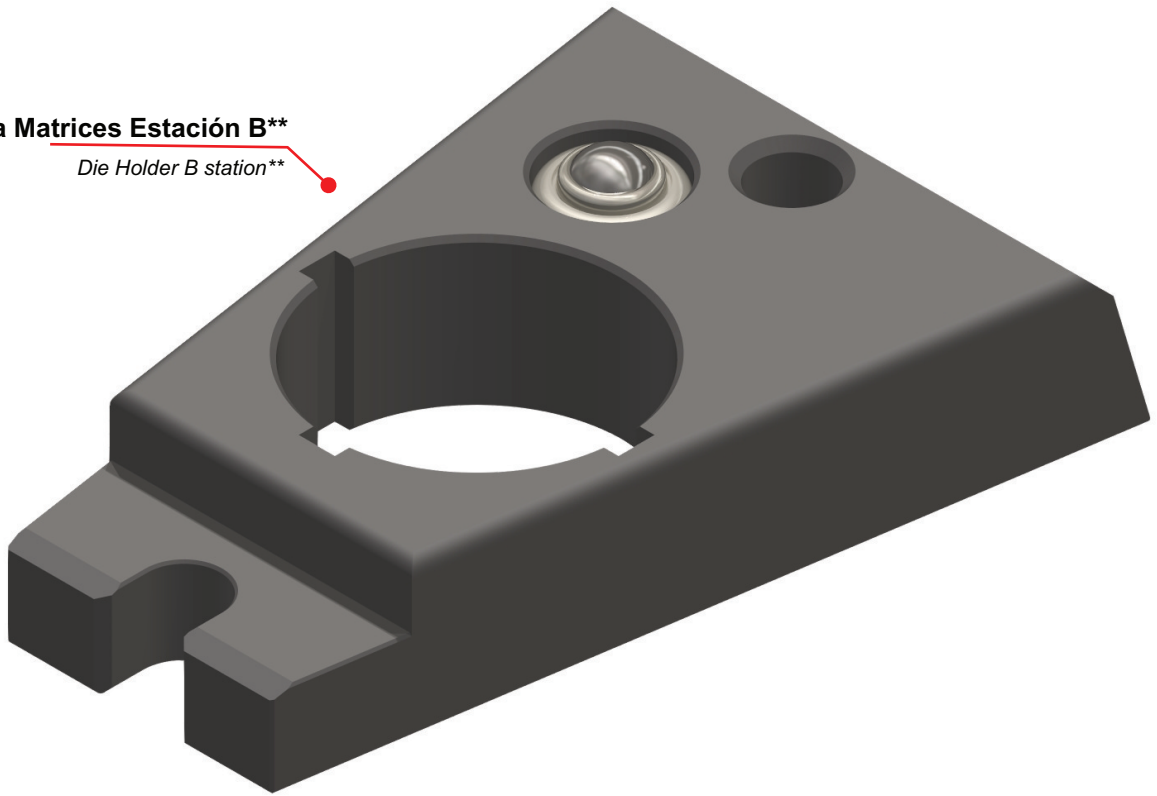
**Reductora Matriz D-B**

*D-B Die Adapter*



**Porta Matrices Estación B\*\***

*Die Holder B station\*\**



**Rodamiento Bola\***

*Ball Roller\**



**Porta Grupo Superior Estación B\*\***

*Upper Group Holder B Station\*\**

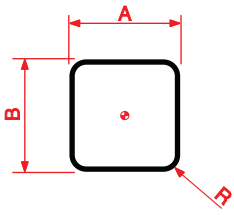


**\*\*Consultar para otras estaciones.**

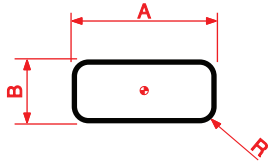
*\*\*Consult for other stations.*

**\*Valido para todas las estaciones.**

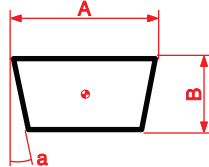
*\*Valid for all stations.*



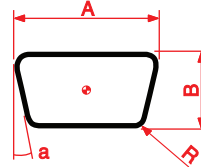
B1



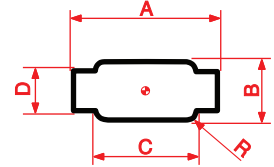
B2



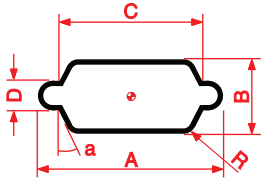
B3



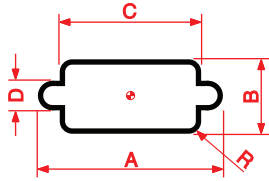
B4



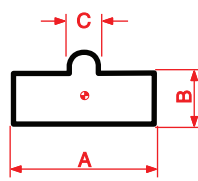
B5



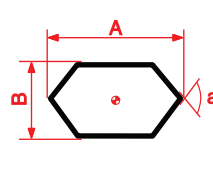
B6



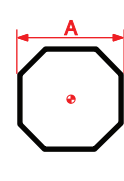
B7



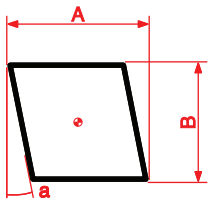
B8



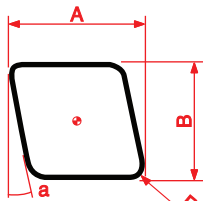
B9



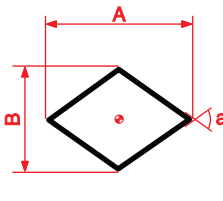
B10



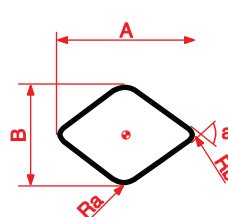
B11



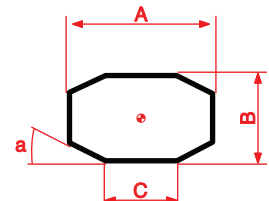
B12



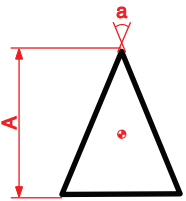
B13



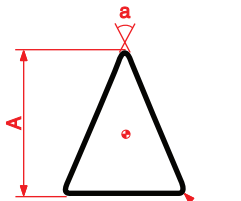
B14



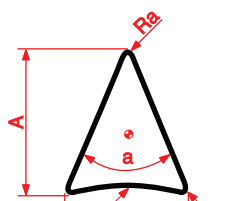
B15



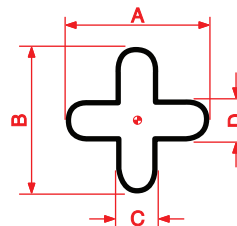
B16



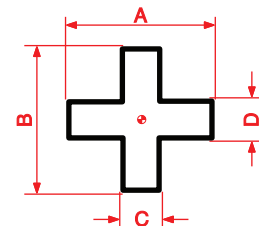
B17



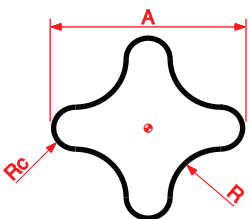
B18



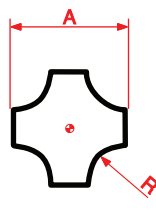
B19



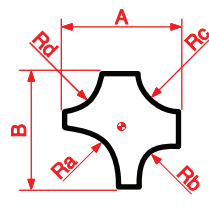
B20



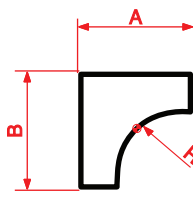
B21



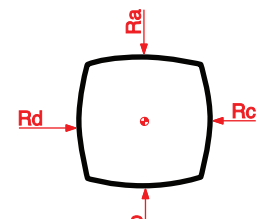
B22



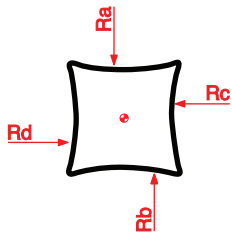
B23



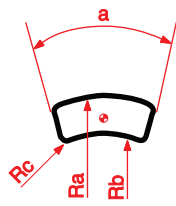
B24



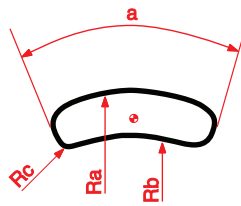
B25



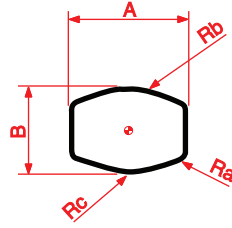
B26



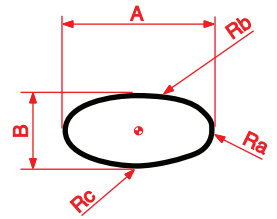
B27



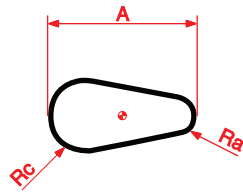
B28



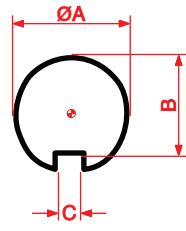
B29



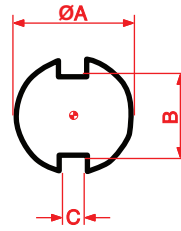
B30



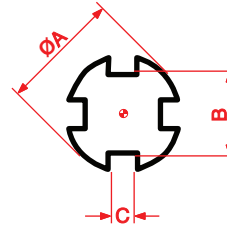
B31



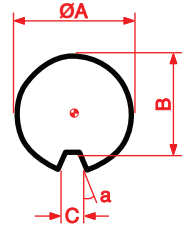
B32



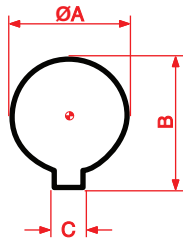
B33



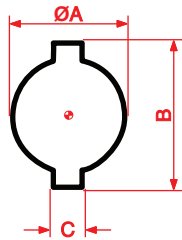
B34



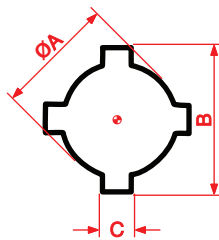
B35



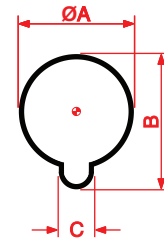
B36



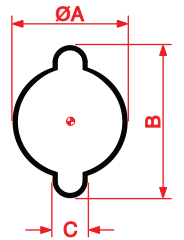
B37



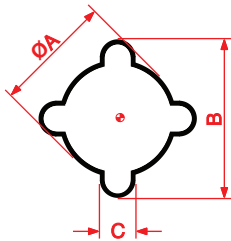
B38



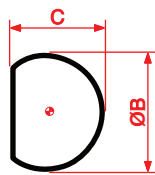
B39



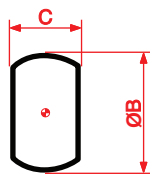
B40



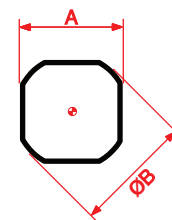
B41



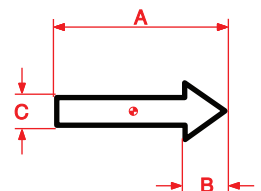
B42



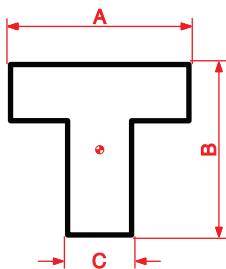
B43



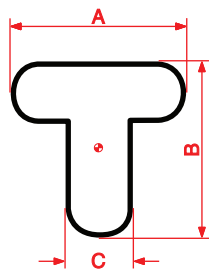
B44



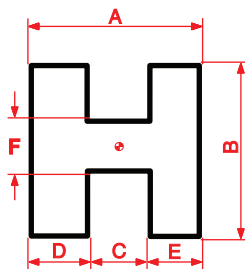
B45



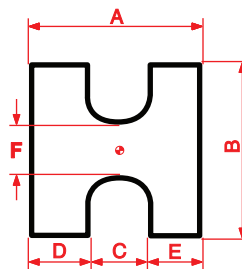
B46



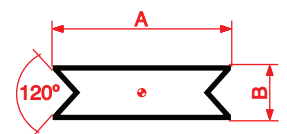
B47



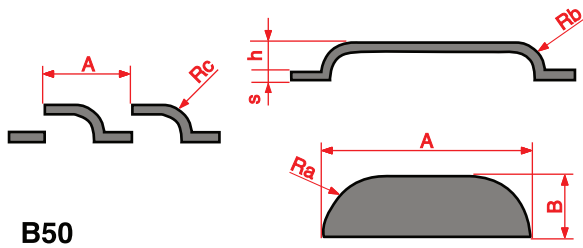
B48



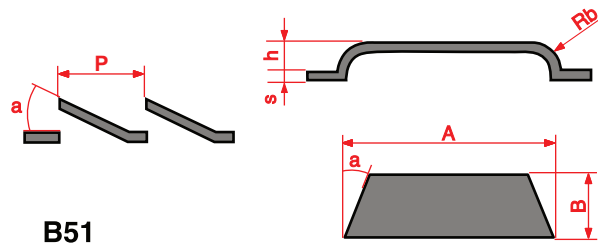
B49



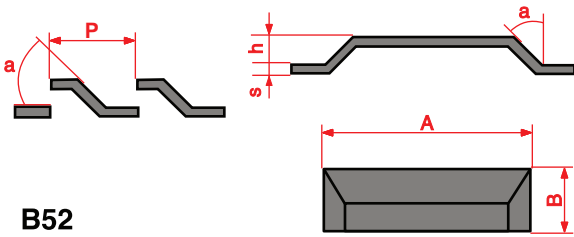
B49-A



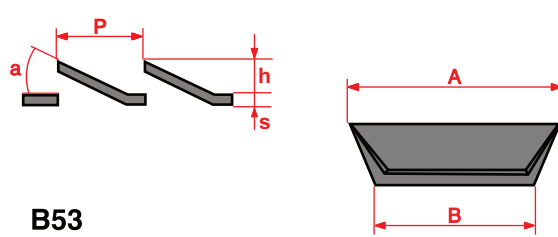
B50



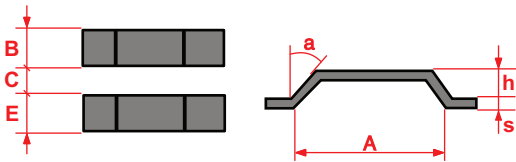
B51



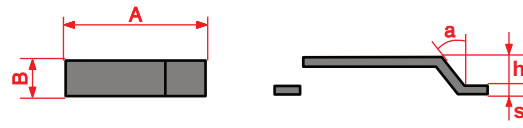
B52



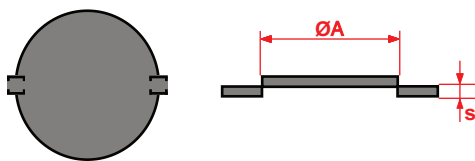
B53



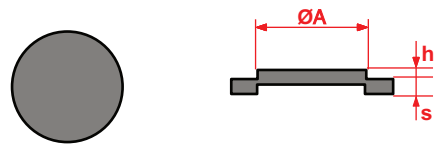
B54



B55

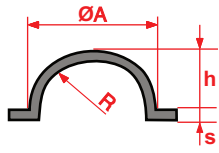
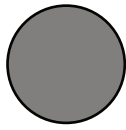


B56\*

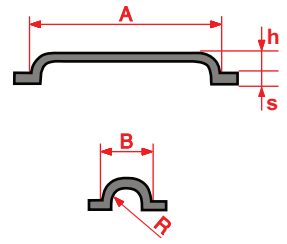


B57

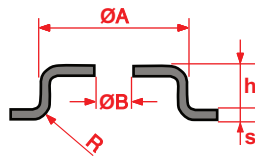
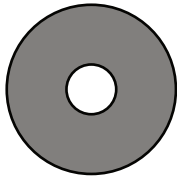
**\*Simple o Doble**  
\*Single or double



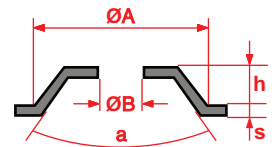
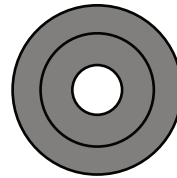
B58



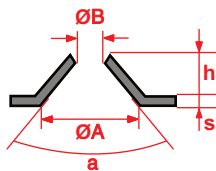
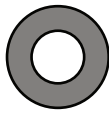
B59



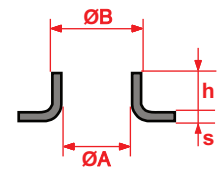
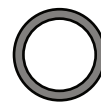
B60



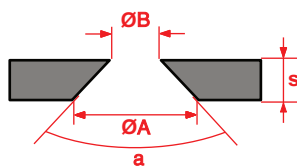
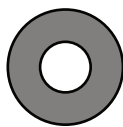
B61



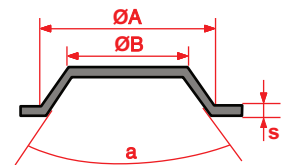
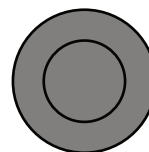
B62



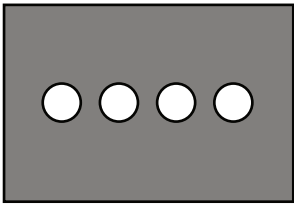
B63



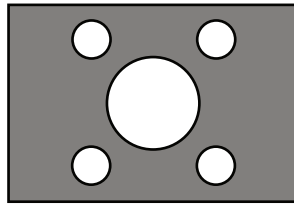
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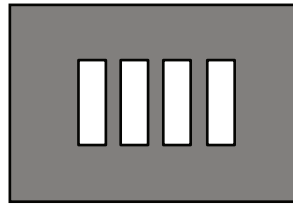
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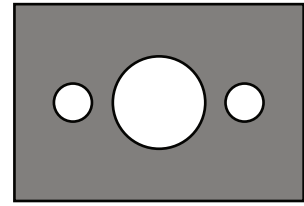
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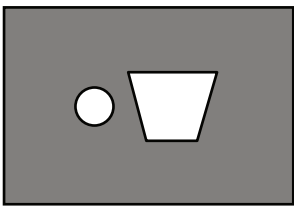
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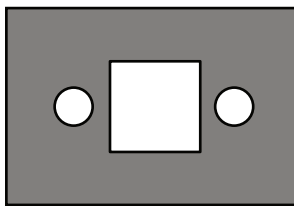
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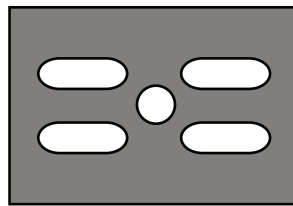
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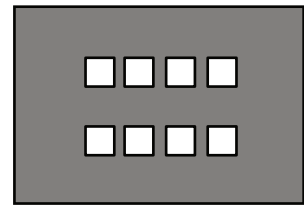
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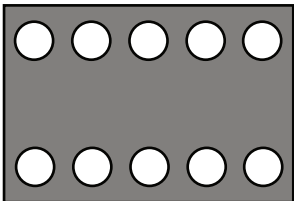
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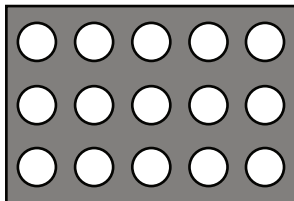
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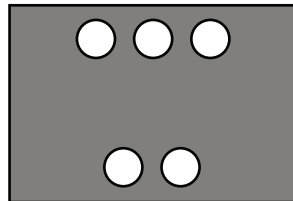
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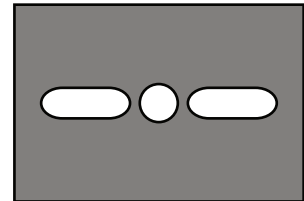
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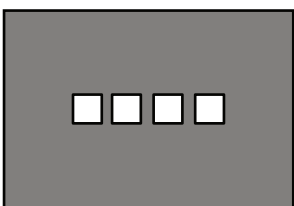
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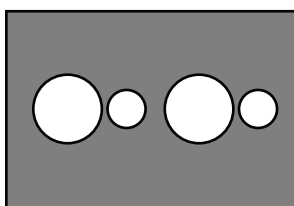
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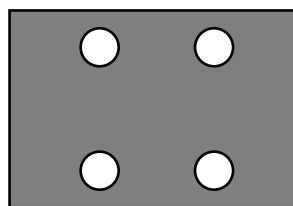
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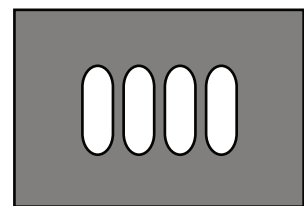
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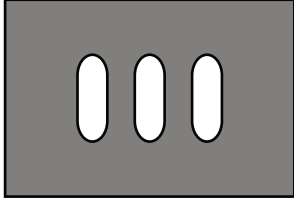
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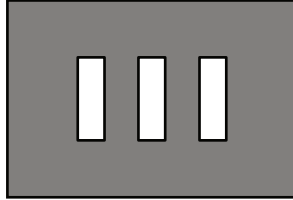
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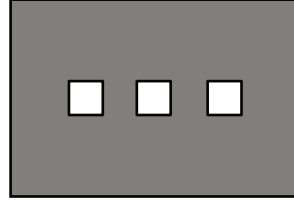
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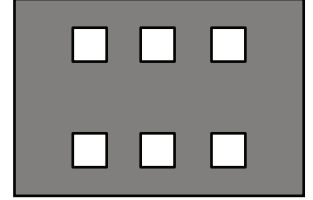
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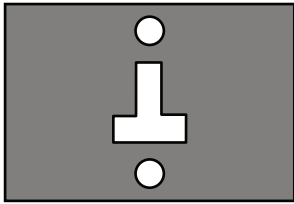
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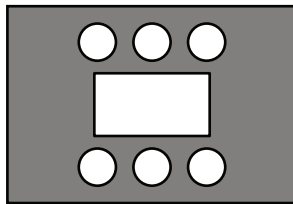
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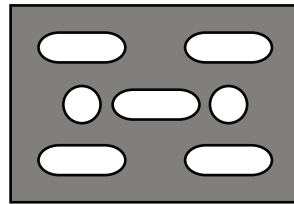
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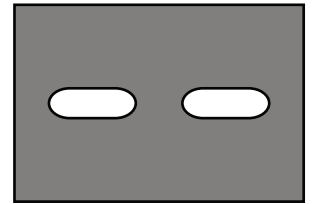
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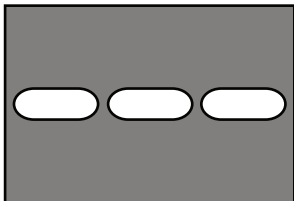
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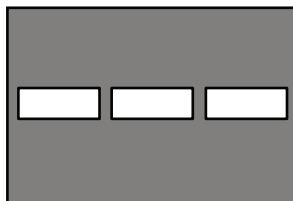
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B123



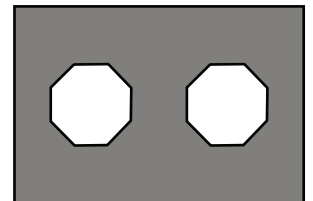
B124



B125



B126



B127



TOLERANCIAS (mm) entre PUNZÓN y MATRIZ CLEARANCE (mm) between PUNCH & DIE								
Espesores en mm. Thickness in mm	Hierro / Fe Mild Steel		Ac. Inox Stainless Steel		Aluminio Aluminium		Cobre / Latón Copper / Brass	
	Tolerancia Clearance	R	Tolerancia Clearance	R	Tolerancia Clearance	R	Tolerancia Clearance	R
0,5 - 0,6	0,08 - 0,10	0,10	0,10 - 0,12	0,12	0,06 - 0,08	0,08	0,05 - 0,06	0,06
0,8	0,14 - 0,15	0,15	0,15 - 0,20	0,20	0,10 - 0,14	0,10	0,08 - 0,10	0,08
1,0	0,16 - 0,20	0,20	0,18 - 0,24	0,24	0,12 - 0,16	0,14	0,10 - 0,14	0,12
1,2	0,20 - 0,24	0,24	0,25 - 0,30	0,26	0,15 - 0,20	0,16	0,12 - 0,15	0,14
1,5	0,25 - 0,30	0,30	0,27 - 0,35	0,34	0,18 - 0,24	0,22	0,15 - 0,20	0,18
2,0	0,34 - 0,40	0,40	0,36 - 0,45	0,45	0,24 - 0,30	0,26	0,20 - 0,25	0,24
2,5	0,45 - 0,50	0,50	0,46 - 0,55	0,55	0,32 - 0,35	0,35	0,25 - 0,30	0,28
3,0	0,50 - 0,60	0,60	0,60 - 0,70	0,65	0,35 - 0,45	0,40	0,30 - 0,40	0,36
4,0	0,65 - 0,80	0,80	0,70 - 0,95	0,90	0,45 - 0,60	0,55	0,40 - 0,50	0,48
5,0	0,85 - 1,00	1,00	0,90 - 1,15	1,10	0,60 - 0,80	0,70	0,55 - 0,65	0,60
6,0	0,95 - 1,20	1,20	1,10 - 1,40	1,35	0,75 - 0,95	0,85	0,70 - 0,85	0,72

R Recomendable  
Recommended

RESISTENCIA AL CORTE TENSILE STRENGTH Kg x mm <sup>2</sup>					
Hierro Fe Mild Steel	Hierro Fe Mild Steel	Acero Inox. Stainless Steel	Aluminio Aluminium	Cobre Copper	Latón Brass
40 (0,1 % C)	50 (0,2 % C)	70	20	32	40

FÓRMULA PARA EL CÁLCULO DE TONELAJE (T)  
TONNAGE CALCULATION FORMULA (T)

$$\frac{P * n * t * Rc}{1000}$$

P = Perímetro (mm)  
Perimeter (mm)

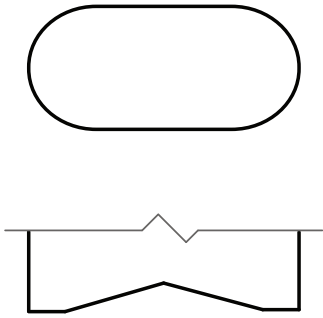
n = Número de punzones  
Number of punches

t = Espesor de chapa (mm)  
Sheet Thickness (mm)

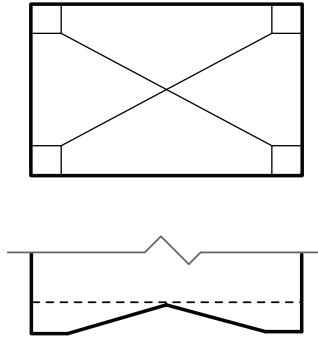
Rc = Resistencia al Corte (Kgxmm<sup>2</sup>)  
Tensile strength (Kgxmm<sup>2</sup>)

## Rectificado de Punzón

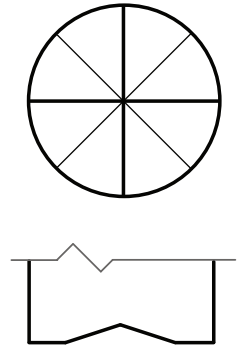
**A**



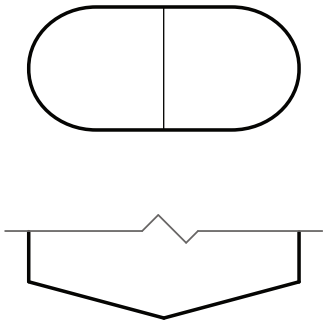
**B**



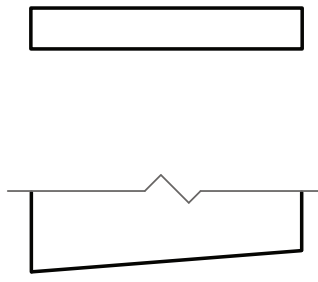
**C**



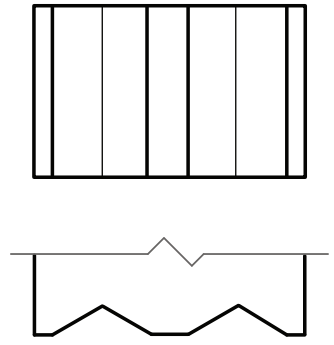
**D**



**E**

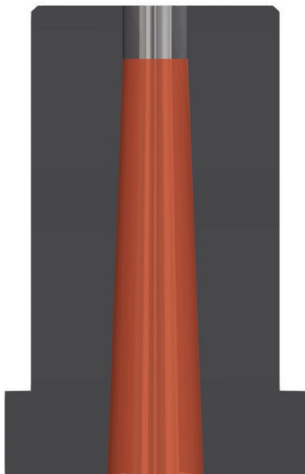


**F**



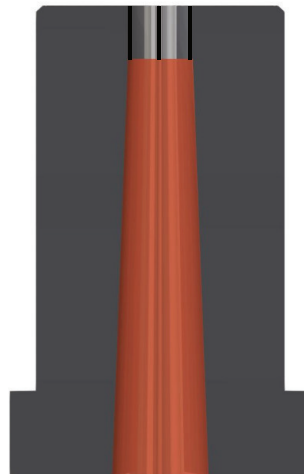
## Tipo de Matriz

**RR**

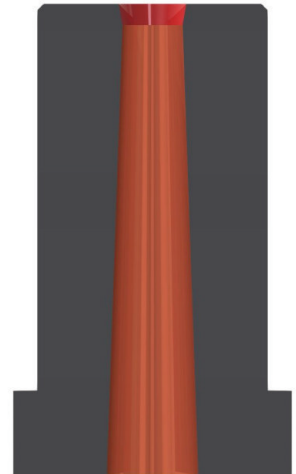


Matriz Estándar

**R2C**



Matriz de Retención  
por Filamentos



Matriz de Retención  
por Dos Conos



## **DUR-TiN**

- COLOR / COLOR: Amarillo oro / *Yellow gold*
- APLICACIONES / APPLICATIONS: General / *General*
- PROPIEDADES / PROPERTIES: Reduce el desgaste por abrasión y adhesión.  
*Reduces wear by abrasion and adhesion.*

## **DUR-ALUM**

- COLOR / COLOUR: Gris negro / *Black grey*
- APLICACIONES / APPLICATIONS: Aluminios, latón y derivados / *Aluminium, brass and derivative*
- PROPIEDADES / PROPERTIES: Reduce el desgaste por adhesión.  
*Reduces wear by adhesion.*  
Bajo coeficiente de fricción.  
*Low coefficient of friction.*  
Buenas propiedades de deslizamiento.  
*Good slip properties.*

## **DUR-INOX**

- COLOR / COLOUR: Gris violeta / *Purple grey*
- APLICACIONES / APPLICATIONS: Fe, galvanizados, Ac. inoxidables / *Fe, Fe. galvanized and stainless steel*
- PROPIEDADES / PROPERTIES: Relación optimizada entre dureza y tensión residual compresiva.  
*Optimized ratio between hardness and compressive residual stress.*  
Desgaste uniforme.  
*Uniform wear.*  
Buenas propiedades de deslizamiento.  
*Good slip properties.*

## **DUR-EXTREM**

- COLOR / COLOUR: Gris azulado / *Bluish grey*
- APLICACIONES / APPLICATIONS: General; recomendado para Ac. Inoxidable.  
*General; recommended to stainless steel.*
- PROPIEDADES / PROPERTIES: Resistencia al desgaste muy elevada y excelente dureza en caliente.  
*Very high wear resistance and excellent hot hardness.*  
Muy buena estabilidad al choque térmico.  
*Very good stability to thermal shock.*  
Velocidad de corte notablemente más altas.  
*Higher cutting speed.*

## **DUR-EXTREM PLUS**

- COLOR / COLOUR: Cromo / *Chrome*
- APLICACIONES / APPLICATIONS: General; especialmente indicado para Ac. Inoxidable.  
*General; especially suitable to stainless steel.*
- PROPIEDADES / PROPERTIES: La mayor dureza superficial.  
*The higher surface hardness.*  
Menor tendencia al calor.  
*Less heat tendency.*  
Mayor protección especialmente en los bordes contra el inicio y propagación de grietas.  
*Increased protection especially in the edges against the beginning and propagation of cracks.*  
Puede prolongar la vida útil del punzón hasta un 100%  
*Can prolong punch life up to 100%.*

## **AFILADO DE LOS PUNZONES**

Como norma general, no se debería permitir que los punzones llegasen a necesitar un afilado mayor de 0,10 mm. Y sería óptimo rectificar en pasadas suaves (Z) de entre 0,01 y 0,02 mm. Estos parámetros indicarían un correcto mantenimiento de los punzones.

Para punzones con recubrimientos especiales: DUR-TiN, DUR-ALUM, DUR-INOX, DUR-EXTREM y DUR-EXTREM PLUS emplear los mismos indicadores; y dependiendo de la máquina que se utilice, rectificar con las más altas revoluciones de muela posibles y con avances entre 2.500 y 4.000 mm/min.

Una vez hecho el afilado del punzón, comprobar que la zona perimetral del corte ha quedado completamente limpia y no presenta gripado por adhesión de partículas del material punzonado, en caso de estas, limpiar esa zona con papel de lija fino hasta dejarla pulida.

## **SHARPENED OF PUNCHES**

As general norm, it's not recommended sharpening punches more than 0,10mm. The correct form to sharp is doing it with smooth feeds (z) about 0,01 and 0,02mm. It will be the correct maintenance of the punches.

For punches with special coatings: DUR-TiN, DUR-ALUM, DUR-INOX, DUR-EXTREM and DUR-EXTREM PLUS, use the same indicators; using the highest revolutions of the grinding wheel for shapening, with feed rates between 2.500 and 4.000 mm/min.

Once realised the sharpened of the punch, verify that the peripheral zone of the cut is completely clean and if it's necessary polish the surface with a lightly stone.

*Important: to avoid the heating of the pieces during the sharpening, always use a suitable coolant.*

## **AFILADO DE MATRICES**

Manteniendo las matrices en corte vivo, alargará la vida de los punzones, pues éstos no tendrán que embutir la chapa antes de ser cortada, se evitarán rebabas, ruido excesivo y se dejará una calidad correcta en el corte.

Sirven los mismos parámetros de muela, avances y pasadas tanto en el punzón como en la matriz; y antes de dar por bueno el afilado de la matriz, comprobar que en la parte interior del perímetro de corte, no han quedado restos de partículas de chapa adheridas, que vayan a friccionar con el puzón al iniciar de nuevo el trabajo.

Evitar el calentamiento de las piezas, usando siempre un refrigerante adecuado o taladrinas.

La energía producida por la fricción de la muela con los aceros, hará que estos hayan quedado ligeramente imantados; desmagnetizar las herramientas antes de iniciar el trabajo.

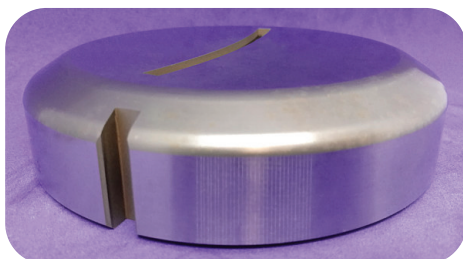
## **SHARPENED OF DIES**

The correct maintenance of the dies will extend the life of punches, because these will not emboss the sheet before being cut, it will avoid burrs and excessive noise, and it give a correct quality of the cut.

For sharpening dies used the same procedures that with punches, feed rates and griding wheel, verify that the cut zone is completely clean of burrs and if it is necessary polish it to assure the correct work of the punch.

To avoid the heating of the pieces, always use a suitable coolant.

Demagnetize the resharpened tools before to start works.



## Servicio y Reparación

El servicio de reparación y ajuste de TC consiste en la comprobación, reparación, ajuste o modificación de cualquier componente fijo, móvil y/o accesorios de todo tipo de grupos de punzonado, matricería e incluso componentes de máquina sin importar marca y modelo.

### Comprobación

Revisión de todos los elementos, comprobación de los mismos (medidas, chavetas, tornillo, etc.)

### Reparación

Sustitución de cualquier elemento que interfiera en el buen funcionamiento del grupo, tanto por desgaste como por rotura.

### Ajuste

Ajustamos los grupos para su correcto funcionamiento modificando alturas, recorridos, etc.

### Modificación

Estudiamos la posibilidad de modificaciones y cambios en grupos de punzonado y matricería, realizando elementos nuevos y/o modificando los ya existentes.

## Service & Repair

Tc's adjustment and repair consist of checking, repairing, adjusting, or modifying any fixed and mobile component and / or accessories of all types of punch groups, dies and even machine components of all brands.

### Verification

Review all elements, checking them ( measurements, keys, screws, ...).

### Repair

Replacement of any element that interferes with the proper fuction of group for breakage and / or attrition.

### Adjustement

We adjust the groups for their correct operation by modifying heights, courses, ...

### Modification

We study the possibility of modifications and changes of punch groups and tooling, making new elements and / or modifying existing ones.





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