



tooling for punch presses TRUMPF®

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JOSEPMUNTAL

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COMPANY PROFILE

A dynamic team

Matrix' products, the result of our highly qualified technicians' competence which constantly deal with problems connected to production cycles as well as specific customer's requirements.

The customer, a unique partner

Each customer deserves special care, that's why Matrix doesn't simply offer a product but also a specialized consulting service and technical support, in order to reach the high competitive level required by the market.

Punches and dies born to last

The high reliability and life lasting which characterize Matrix' products, are the result of experience, devotion, constant research and use of superior quality raw materials.

Innovative technologies for high performances

Matrix invests on the best technologies: from designing software to the most modern planning techniques, from cutting edge machineries to sophisticated control systems.

Energies oriented to the maximum accuracy

The constant investments in machineries for our production is a must in order to keep the elevate standard level required by processing.







OUR PRODUCTS

Punches

Manufactured in accordance with the most modern techniques and machineries, produced with a unique type of steel (M2), hardened with the first quality heat treatments.



Dies

Full automatic production and control cycles guarantee to our dies a maximum level standard quality. Manufactured with high performing steels (D2) and hardened with equal value treatments for the best structural tension and endurance, we pay great attention to the dies geometry.



Adaptors

Manufactured with steels resistant to wearing and high stress and produced with the proper clearance in order to guarantee a precise fitting on the punching machine and accurate positioning of the die.



Special tools

The constant demand of special tools specific for particular processing, requires alternative and innovative solutions and reduced delivery times. Each special tool is coded for its reproduction and controlled on all production phases, from designing to testing.



WHAT'S NEW?

New offer of multitool 5 and 10 stations, which increases the actual range of punches and dies types 4,5,6 and 10 positions. Besides the classic style tools, now we can also offer ITS series with interchangeable inserts, for a shape rotation of 45° and 90° without using specific accessories.

Quick delivery times for the most common forming tools, thanks to a wide range of predefined configurations available. All this, together with the high and well known quality which has been always characterizing Matrix' products. For any tools model, our products can satisfy any requirement as far as quality, performing and innovation.

STANDARD

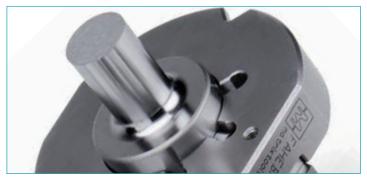
IThe most used system on the market for this tipe of punching machines, manufactured with our high quality, tipical of Matrix products as well as quick deliveries. For this most common and used system, we offer plan punches either with standard or enlarged length, both adapt to the most recent punching machines.



ITS

High performance system, economic tools handling. Reduction of set up timing and connected problems, tool life increased thanks to 6 mm grinding.

We offer plan punches either with standard or enlarged length



MULTITOOL

System for a more flexible tools handling, available on 5 and 10 positions models.

This multitool is extremely advantageous in case of numerous different punching with small dimensions, thanks to the time reduction for tool change. The line is completed by punches and dies for multitool 4,5,6 and 10 positions.





Maximum precision and a consequent less tool wear, peculiar characteristics of our rotating multitool.

This tool is the ideal solution for processes which require to perform a great number of small punching.

The use of a multitool allows to increase the number of tools available as well as reducing the timing for tool change.

Matrix offers multitool 5 and 10 stations, that is the most recent introduced on the market.

Quick delivery service for punches and dies.

	NUMBER OF TOOLS	MAX Ø SIZE	MAX THICKNESS (RECOMMENDED)
MULTITRUMPF 5	5	mm 16	mm 3 mild steel - mm 2 stainless steel
MULTITRUMPF 10	10	mm 10,5	mm 3 mild steel - mm 2 stainless steel

COMMON FORMING

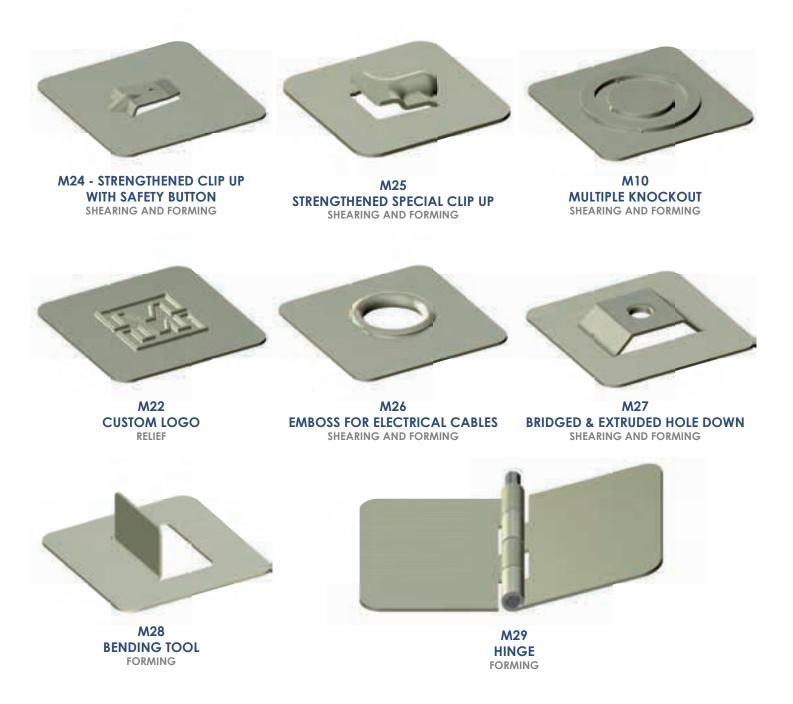
The most common formings are embosses, countersinks, engravings, logos, louvers and many others.

The great diffusion of these forming allows to handle a wide offer of standardized products, reducing drastically delivery times. This type of formings is continuously growing, so please contact our sales department for assistance.



SPECIAL FORMING

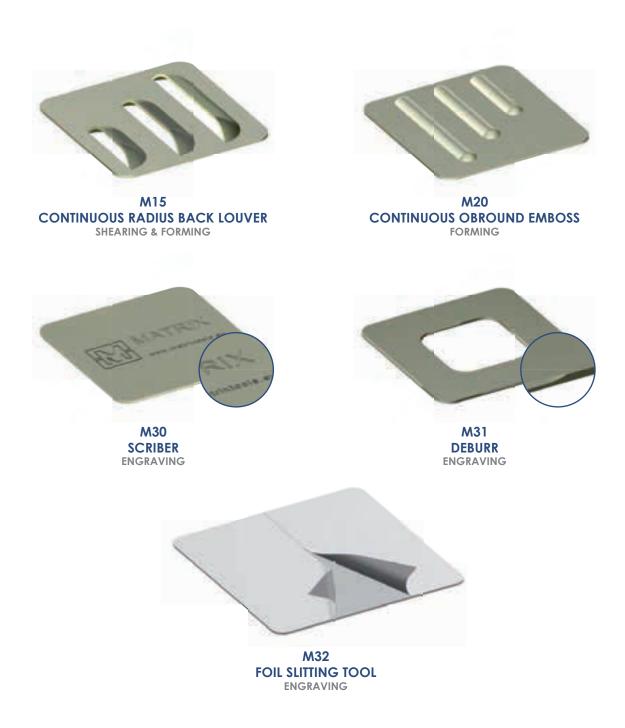
Our technical department is available to develop the best solutions for our customer's requirements. Thanks to this versatility we have no limits to satisfy the most complex requirements. The constant research of new solutions extends the possibility on the forming field, adding to normal engraving also tridimensional images.



CONTINUOUS FORMING AND SPECIAL APPLICATIONS

The most recent technical solutions implemented on the modern punching machines for **much better tools control** than in the past, gives great impulse to new applications. New special tools have been developed to shear the protecting film laid on the sheet metal or continuous embosses or to deburr sheared parts.

These are only some examples of what you could get from your punching machine just using Matrix products.



CLUSTER TOOL

Punching of cluster holes is easier with cluster tools which grants great accuracy of final result.

This particular type of tools can be manufactured either as integral tool or with interchangeable inserts for a $considerable \ saving \ {\it already} \ on \ the \ medium \ use.$

As for all our specials, our cluster tools - round and shaped - are followed up to testing by mean of coding and electronic filing of all particulars, for a quick and precise availability.

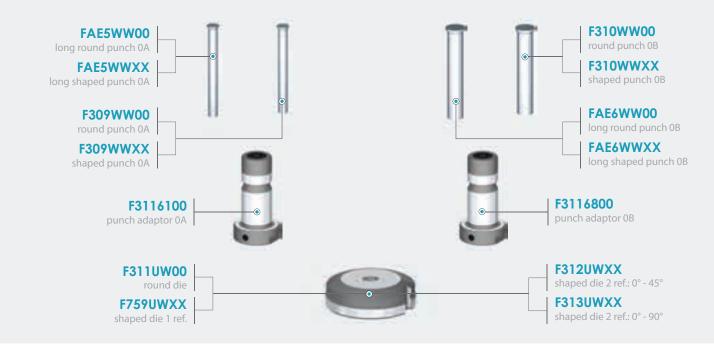








R SERIES - Size OA - MAX $\varnothing \bowtie$ = mm 6,0 - Size OB - MAX $\varnothing \bowtie$ = mm 10,5



OPTIONS AND NOTES



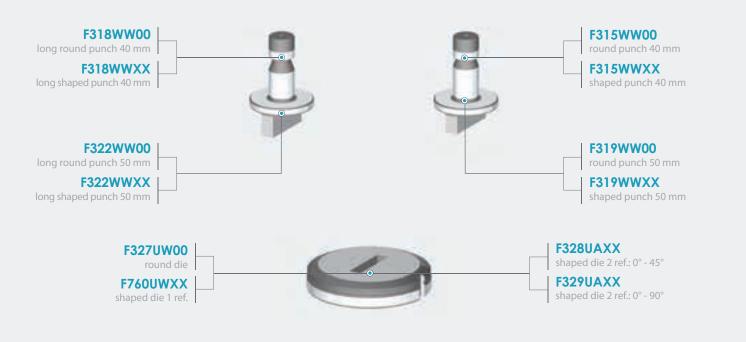
SERIES 30 - Size I - MAX Ø Ø = mm 30,0







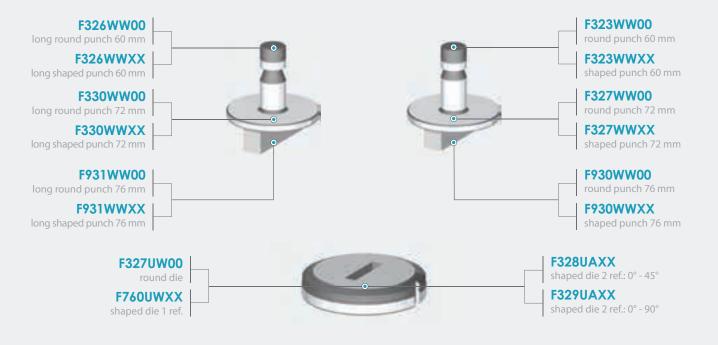
SERIES 40/50 - Size II - MAX $\emptyset \bowtie$ = mm 40,0 / mm 50,0



OPTIONS AND NOTES

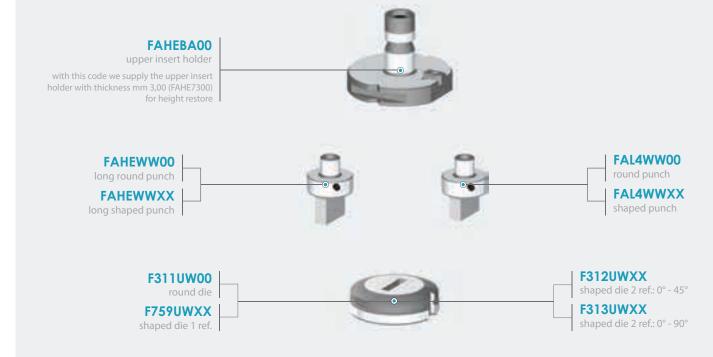


SERIES 60/72/76- Size II - MAX $\emptyset \square = mm 60,0 / mm 72,0 / mm 76,0$





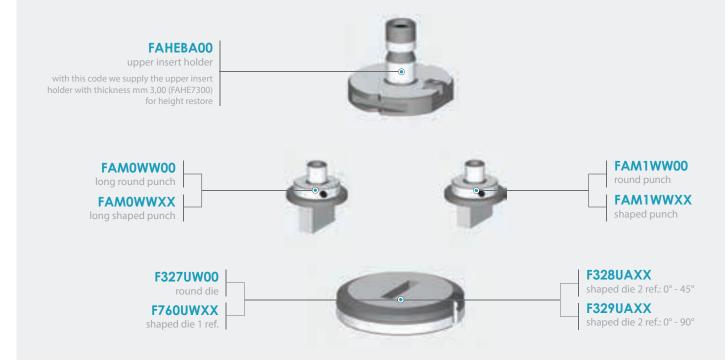
ITS SERIES 30 - MAX Ø Ø = mm 30,0



OPTIONS AND NOTES

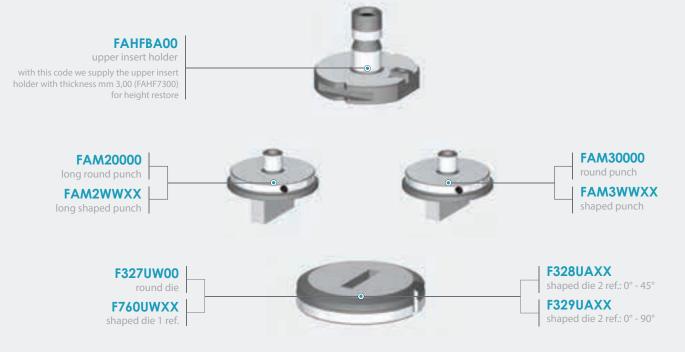


ITS SERIES 40 - MAX Ø Ø = mm 40,0





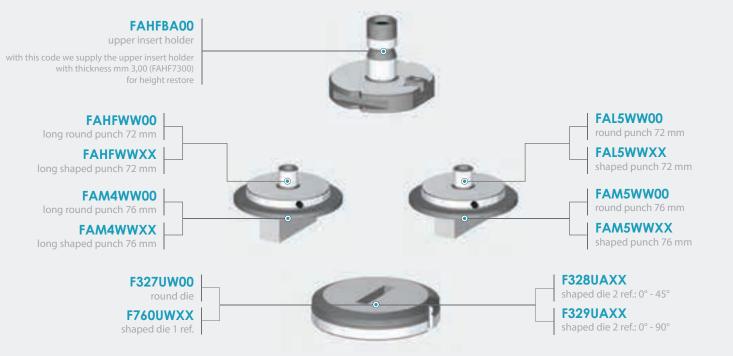
ITS SERIES 60 - MAX Ø Ø = mm 60,0



OPTIONS AND NOTES



ITS SERIES 72/76 - MAX Ø Ø = mm 72,0 / mm 76,0





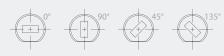
MULTITOOL SERIES 5 - 5 x MAX Ø Ø = mm 16,0



TOOLING FOR MULTITOOL SERIES 5



Punch orientation



Die orientation



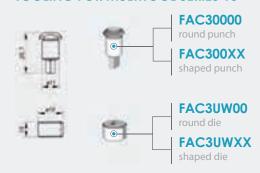
OPTIONS AND NOTES



MULTITOOL SERIES 10 - 10 x MAX Ø = mm 10,5



TOOLING FOR MULTITOOL SERIES 10



Punch orientation



Die orientation





OTHER TOOLING

TOOLING FOR MULTITOOL SERIES 4

 $MAX \varnothing \square = mm 16,0$



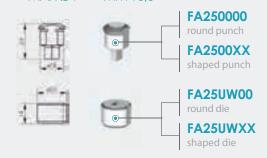
Punch orientation



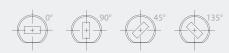
Die orientation



TOOLING FOR MULTITOOL SERIES 6 MAX \varnothing \square = mm 10,5



Punch orientation



Die orientation









SHEARING TOOLS

Replaceable shearing inserts systems which preserves the support elements, designed specifically for an economical and advantageous use of the most common punching tool.





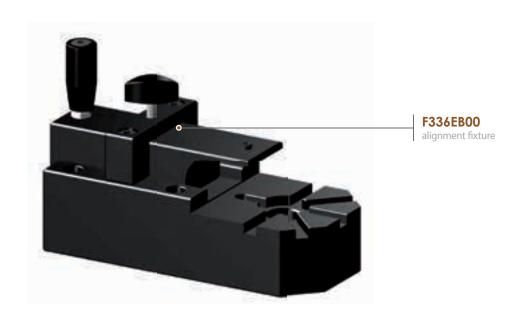
DIES ADAPTORS - Size || / |||

Two models of dies adaptors either for Size I on machines with die housing for Size II, or Size I and Size II on machines with housing for Size III.



ALIGNMENT FIXTURE

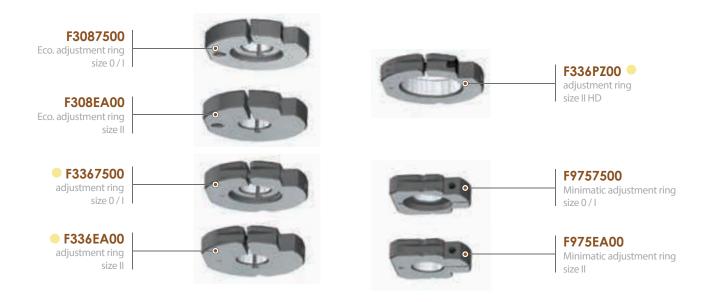
Designed for aligning the punch to its adjusting ring and for orienting the punch shape, with a quick and economical preparation of the tool to be used.



ADJUSTMENT RINGS

One of the main components of Trumpf® tools system, for a correct orientation of the punch.

On machines equipped with automatic tools change, the adjustment rings are necessary to keep the punch on the cartridge and to grant the correct machine functioning.



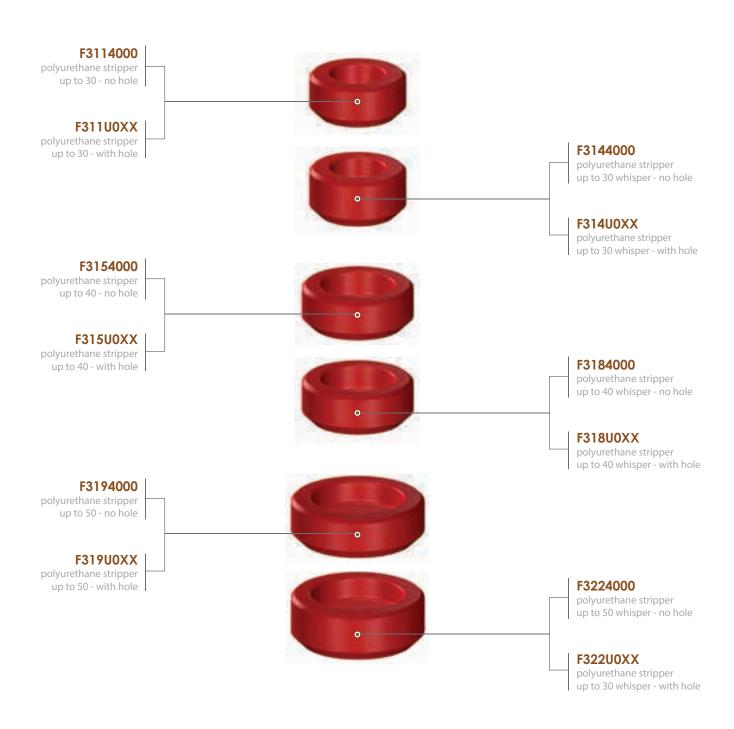
MECHANICAL STRIPPERS

Mechanical strippers are used for several functions according to the type of punching machine used. When possible or according to the machine functions, the mechanical stripper, by touching the sheet metal and pushing the die, helps to pull up the punch, improving this way the quality of processing and the positioning precision.



POLYURETHANE STRIPPERS

The polyurethane strippers by stopping the sheet metal from moving while punching, reduce to minimum the scratches left on the sheet metal and foster working processes less noisy



THICK TURRET ADAPTOR - MAX Ø = mm 76,2

For Trumpf® tools to be used on Thick Turret D station. For standard and sharpened tools, standard strippers. After sharpening, for a longer life the tools height is restored by step adjustment and without modifying the punch press stroke. Quick tools replacement, tools oriented from 0° to 360° with 45° steps. All this, for great performances.



LUBRICATION: A MUST

It is the first rule to apply; being punching a shearing and extrusion processing, the shearing area lubrication is a must to obtain a good result. Lubrication is very important on punching machines and particularly on punching stamps.

When a punch shears the sheet, small quantities of material lays on the punch surface.

A lubricant with proper characteristics creates a barrier between punch and material, reducing significantly either friction or stratification of material on the punch surface, improving therefore the punch life.

If for some reasons lubrication is a problem, Titanium coating on punches could help.

Matrix offers lubricants adapt to different working requirements as well as volatile oils whenever oil residual must be avoided.

GRINDING: THE IMPORTANCE OF MAINTENANCE

Professional maintenances and grinding grant constant and more durable performances to the punching tools.

To the first wearing sign it is recommended to grind the tools considering that the material removal will be minimum:

wearing grows progressively, reducing the total number of hits performable with one single tool.

After sharpening it is recommended to demagnetize the tools to avoid scraps pulling and it is furthermore necessary to restore the punch height, in case it is adjustable or, otherways, the machine stroke.

All this can be done by machine operators with grinding machines and accessories for an easy, quick and economical operation.

Matrix can satisfy these requirements with a range of machines, accessories, lubricants and instructions. Specific documentation available on demand.





OPTIONS

SURFACE COATINGS (PVD)

In order to improve working characteristics, the surface of all punches can be coated; this treatment gives to the tool surface a considerably greater hardness and self-lubrication. MATRIX uses two types of coatings, Type A (Titanium Nitrite) and type B (Titanium-Aluminum Nitrite). Type A coating yellow-gold coloured, provides to the punch a higher surface

hardness up to four times the initial one and an optimal self-lubrication capability with a friction coefficient equal to 0,44. It's recommended for exacting working processes, without lubrication or with dough materials difficult to be pulled, such as copper or aluminum alloys.

Type B coating grey-blue coloured, is an evolution of the previous one which, besides

imparting a higher hardness on tool surface, is more solid and its endurance increases; this coating resists to higher temperature, little lower than 900°.

Thanks to these characteristics, it's recommended in case of high speed punching machines (500:1000 strokes per minute) and it's also excellent for STAINLESS STEEL processing.

SHEAR SHARPENING

For punch shear sharpening we mean various geometry of their faces which grants several benefits such as:

- Noise Reduction
- Reduction of vibration and counterstrokes of all machine components
- Slug pulling reduction
- Tonnage reduction
- Easy pulling

On the other hand, tools with special shear provides punch holders springs a harder functioning.

Shear types most commonly offered are:

- DVS for shearing tools and high thicknesses
- DWP for balanced loadings and high thicknesses
- DWNT for thin thicknesses nibbling processes with big shapes
- WNT for thin thicknesses nibbling processes with small shapes
- WN for thin thicknesses nibbling processes with small shapes





PUNCH GRINDING EFFECTS ON TONNAGE

Find here below an illustrative table concerning tonnage reduction, considering DWP shear with standard depth.

Material thickness in mm	1	1,5	2	2,5	3	4	5	6
Tonnage reduction in %	60	50	40	35	25	20	15	10

TONNAGE GENERAL FORMULA

P x S x K 28,3 P = shape perimeter
S = material thickness
K = material coefficient

Material	K material
Aluminum	0.6
Copper	0.6
Brass	0.6
Mild steel	1
Stainless steel	1.5

Exemple:

40 (square perimeter of mm 10 edge) x 2 (material thickness in mm) x 1,5 (K stainless steel) = 4,2

= **4,24** (tonnage)

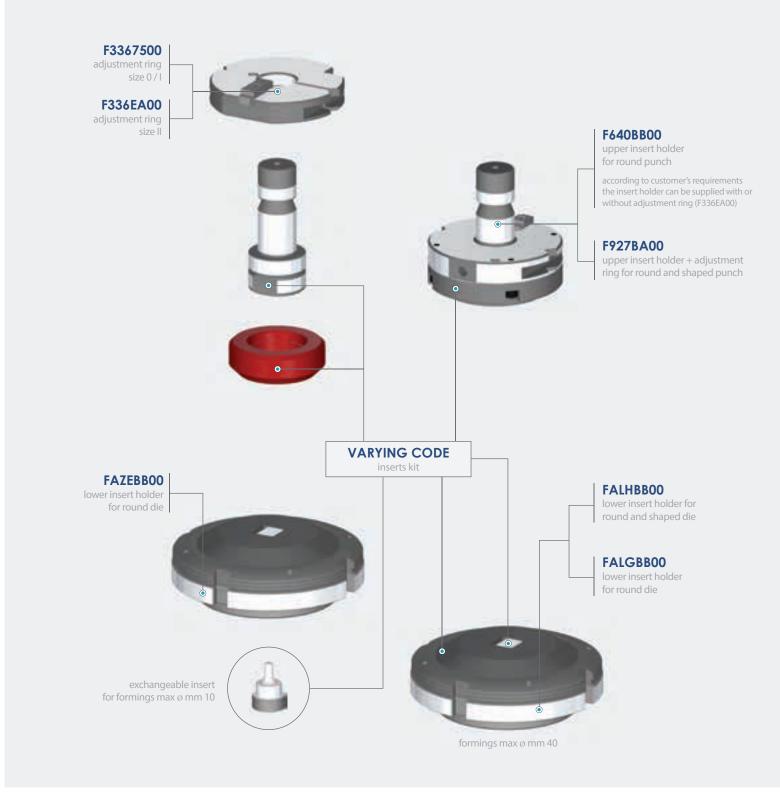
DIES TOLERANCE IN PERCENTAGE TO THICKNESS

Material	Thick	ness Range	Minimum or Blanking*	Standard	Maximum
Aluminum	Up to	mm 2	8%	10%	12%
Copper Brass	From to	mm 2 mm 4	10%	12%	15%
20÷25% Kg/mm ²	Over	mm 4	12%	15%	20%
Mild	Up to	mm 2,5	15%	18%	20%
steel	From to	mm 2,5 mm 5	18%	22%	25%
30÷40% Kg/mm ²	Over	mm 5	20%	25%	30%
Stainless	Up to	mm 1,5	15%	20%	22%
steel	From to	mm 1,5 mm 3	18%	22%	25%
60÷80% Kg/mm ²	Over	mm 3	20%	25%	28%

^{*} Blanking: when the scrap is the requested part.



TRUMPF® - FORMING - SIZE II



Forming is a procedure to modify the sheet metal planarity. The possible forming are several and can combine shearing, extrusion or embossing. For this tool we can also offer a lower insert holder just for round.

TRUMPF® - RADIUS BACK LOUVER - SIZE II



Tools for the most common formings, with quick deliveries. Our sales department is at your complete disposal to provide you with updated list.

NOTES



MATRIX SHAPE CODING

			<u> </u>		
A0A	AOB	A0C	A0D	A01	A02
	10	Ħ,	4 <u>—</u>	E	· · · · · · · · · · · · · · · · · · ·
A03	A04	A05	A06	B01	B02
B03	B04	B05	B06	C01	C02
w	C PB		B.	500	
C03	C04	C05	C06	C07	C08
			D C	The same of the sa	G.R.O
C09	C10	C11	C12	C13	C14
C15	C16	D01	D02	D03	D04
D05	D06	E01	E02	E03	E04
- A -	- A -	- 1-1	102	_ A_2	→ ^{gA} →
			m	-	
E05	E06	F01	F02	G01	H01
H02	H03	H04	H05	H06	H07
1102	1100	1104	1103	+ 100	1107
	H09	H10	H11	H12	H13
H08					

OPTION LEGEND



DWP Sharpening

for balanced loadings and high thicknesses (pag. 26)



WN Sharpening

for high thicknesses - very rigid and fast punching machines (pag. 26)



DVS Sharpening

for shearing tools and high thicknesses (pag. 26)



DWNT Sharpening

for thin thicknesses - nibbling processes with big shapes (pag. 26)



WNT Sharpening

for thin thicknesses - nibbling processes with small shapes (pag. 26)



Surface coatings (PVD)

In order to improve working characteristics, the surface of all punches can be coated.
5 extra working days required (pag. 26)



Punches with rotated shapes



Dies with rotated shapes



Punches with small dim. shapes ≥1,5 mm

 \geq 1,5 mm < 4,0 mm

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GUIDE TO PRODUCT CODES

MATRIX CODING

CODE BREAKDOWN						
F	219	ww	XX	.YYY		
TYPE OF ARTICLE	TOOLS FAMILIY	TOOLS AND OPTIONS	SHAPE	DIMENSIONS		

Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
F	finished	219	punch B station	00	punch	00	round	000	ø 3 mm
Α	purchase	223	die B station	20	die	01	obround	001	ø 3,5 mm
	blank untempered	236	thick turret D	40	stripper	02	square	002	ø 4 mm
S		FB11	Jetform C stat.	60	round punch guide	03	rectangle	003	ø 4,5 mm
	blank tempered	250	MultiMatrix	63	die adaptor	A1	A01 special	004	ø 5 mm
Т		AJ4	Jetform B stat.	68	punch adaptor	B1	B01 special	005	ø 5,5 mm
		F254	Multimt	AF	punch guide	C1	C01 special	006	ø 6 mm
		AAW	Jetform D stat.	EF	die holder	CA	C10 special	007	ø 6,5 mm
		ALP	6/24 R MMX	В0	punch coat. "A"	D1	D01 special	800	ø 7 mm
		311	Trumpf®	LO	DWP punch	E1	E01 special	018	ø 12 mm
		[]	[]	[]	[]	[]	[]	[]	[]

MACHINE TRUMPF® TABLE

Trumpf® machines are divided into homogenous groups according to functioning characteristics and type of tools. The below table shows these groups, extremely important to correctly individuate the necessary tools for the own punching machine.

GROUPS	Α	В	С	D	E	F	G	Н	I	S
	CN 700	CN 901E	CN 1200A	20	150K	150W	20aW	190R	1000R	100
	CN 701	CN 902	CN 1200S	20A	151K	152W	202W	200R	2000R	120R
	CN 900	CS 75	CS 15	202M	152K	180W	300W	500R	2010R	160
	CN 901	CS 75.2	CS 20		180K	180.2W	300LW	600L	2020R	
			CS 20A		180.2K	180R	300PW		3000R	
			MP 25		180KD	180LW	300top		3000L	
			MP 25D		180LK	180.2LW	400W		5000R	
					180.2LK	ELX/SWIFT			6000L	
					202K	185			TruPunch 1000	
					225K	240			TruPunch 2020	
					235K	240R			TruPunch 3000	
					300K	250			TruPunch 5000	
					300LK	260R			TruMatic 3000	
					300PK				TruMatic 6000	
					400				TruMatic 7000	
					400 K					

The most recent punching machines belongs to groups H and I and this catalogue is focused on the tools used. The below table gathers some useful information related to the punching machines of these two groups. Colors shown on the table refers to the types of adjusting rings and mechanical strippers used, as shown at page 22.

GROUPS	MACHINE	ADJUST. RING	MECHAN. STRIPPERS	LONG FLAT PUNCH	SHORT FLAT PUNCH	WHISPER PUNCH	DIES WITH 1 ref.	MULTITOOL	MAX. Ø SIZE
	190R			×	✓	\checkmark	/	4 - 6	76,2
	200R			×	✓	\checkmark	✓	4 - 6	76,2
Н	500R			×	\checkmark	\checkmark	✓	4 - 6	76,2
	600L			×	\checkmark	\checkmark	✓	4 - 6	76,2
	1000R			✓	×	\checkmark	/	5 - 10	76,2
	2000R			\checkmark	×	/	✓	5 - 10	76,2
	2010R			\checkmark	×	\checkmark	/	5 - 10	76,2
	2020R			\checkmark	×	/	✓	5 - 10	76,2
	3000R			\checkmark	×	\checkmark	✓	5 - 10	76,2
	3000L			✓	×	\checkmark	✓	5 - 10	76,2
	5000R			✓	×	\checkmark	✓	5 - 10	76,2
	6000L			✓	×	\checkmark	✓	5 - 10	76,2
	TruPunch 1000			\checkmark	×	\checkmark	\checkmark	5 - 10	76,2
	TruPunch 2020			\checkmark	×	\checkmark	\checkmark	5 - 10	76,2
	TruPunch 3000			\checkmark	×	\checkmark	✓	5 - 10	76,2
	TruPunch 5000			✓	×	✓	✓	5 - 10	76,2
	TruMatic 3000			✓	×	✓	✓	5 - 10	76,2
	TruMatic 6000			\checkmark	×	\checkmark	✓	5 - 10	76,2
	TruMatic 7000			\checkmark	×	\checkmark	✓	5 - 10	76,2





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