MECO MACHINES

eurecat

ISF MACHINES
Incremental Sheet Forming

Numerically controlled dieless production of 3D sheet forms

MEC-ISF-3000x2100
Advanced engineering at the service of ISF technology

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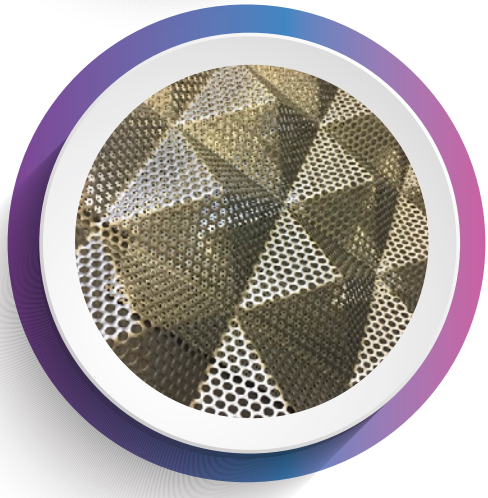
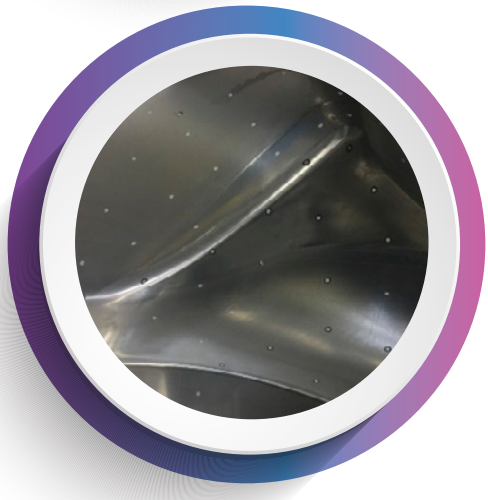
watch video

It is now possible to produce complex 3D sheet metal parts without a die





Thanks to the 3D ISF technology it is now possible to manufacture sheet metal parts with complex shapes for prototypes or limited production runs, breaking the paradigm of the need for high investment in expensive moulds or dies for the forming of sheet metal through stamping or deep drawing processes.

This technology, although it has been around for a long time, is now gaining in popularity and potential since it is perfectly in line with current and future market trends which demand the manufacture of products with limited production runs, products with a high degree of customization to adapt to the specific needs of each client, or the launch of pilot series to assess market acceptance.

It is also possible to use ISF to make moulds for limited production runs of parts that are made with composites or by rotational moulding, for example.

Who is ISF technology for?

ISF technology is an excellent solution for companies that manufacture products for the **automotive**, **aeronautics**, **rail**, **architecture**, **interior design**, **civil engineering**, **machinery**, **capital goods** and **domestic appliance sectors**, as it is applicable to any product that requires complex sheet metal parts and limited production, or that require constant design changes to adapt the product to the customer's needs.

ISF technology takes on special significance during the processes of design and development of products to be manufactured in sheet metal, since it allows the manufacturing of prototypes which are very similar to the final product manufactured by means of stamping or deep drawing. In this case, simply bear in mind that there are areas where the sheet will lose some of its thickness since it will be stretched rather than deep drawn.

The ISF manufacturing process

ISF technology is based on the numerically controlled 3D incremental forming of sheet metal. It is not necessary to manufacture costly moulds, just a simple counterform or mould for more complex designs. They can be manufactured in wood, master paste or metal, and some forms can even be manufactured without tooling.

1

CAD-CAM design

2

Loading the mould if necessary

3

Sheet loading

4

Start of the forming process

5

End of the forming process

6

Removing the piece

7

Cutting and finishing

Introducing the new generation of ISF machines

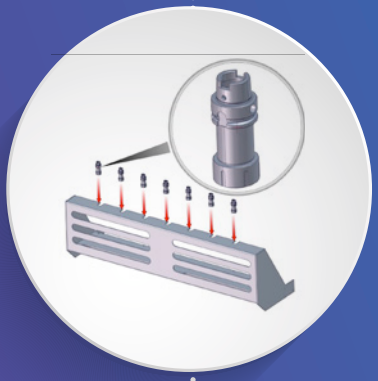
Eurecat and **Meco** have created a new generation of machines to boost the implementation of ISF technology in the industry, for which the Eurecat has contributed its experience in the application of ISF technology to different products and sectors and Meco has contributed all its know-how as a renowned machine manufacturer.

The first model resulting from this collaboration is the MEC-ISF-3000-2100, which provides the flexibility of being able to manufacture both small and large pieces, using sheet metal up to 3000 x 2100 mm in size, with a maximum mould size of 2800 x 1900 x 500 mm (length x width x height).

This model includes an automatic tool changer, which significantly increases the design possibilities of the parts being manufactured.

All our ISF machines are accompanied by a process of training and knowledge transfer of ISF technology, so that the company's team will be totally self-sufficient from day one.

Solutions tailored to the technology

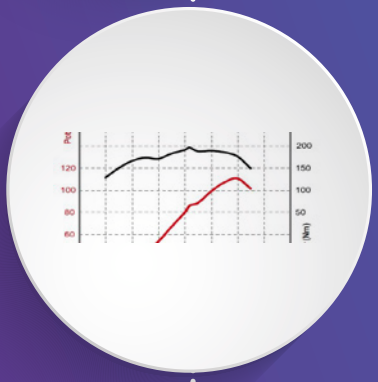


Automatic tool changer
Attached on one side of the table, it has 7 housings for BT-40 type tools with presence detector to be able to supply them to the workhead.

"Point 0" centring system
Attached to the work table, it has 8 anchoring points distributed symmetrically creating 2 rectangular work zones. These perform the function of anchoring and automatic centring of the moulds.

The optionally supplied elements ensure an alignment of 0.05 mm/m.

Latest generation CNC
The mechanical system designed by MECO is combined with MITSUBISHI M80 technology to create a high performance system.



TORQUE LIMIT system
This system consists of limiting the maximum torque in a simple way, so that the user can limit the maximum force that the machine will apply during the entire forming process.

TORQUE CONTROL system
This system consists in permanently controlling the pressure that is being exerted on the part, so that it regulates the position of the part in height through a fourth working axis.

Dimensions and materials

Dimensions of MEC-ISF-3000x2100 model
Machine width: 4830 mm
Machine length: 10,337 mm
Machine height: 4,695 mm
Machine weight: 28,500 kg

Maximum working dimensions of MEC-ISF-3000x2100 model
Maximum sheet length: 3,000 mm
Maximum sheet width: 2,100 mm
Maximum mould length: 2,800 mm
Maximum mould width: 1,900 mm
Maximum mould height: 500 mm

ISF technology enables working with a wide range of standard materials on the market, such as::

	Material	Re [MPa]	Rm [MPa]	Thickness [mm]
Mild steel	St. 2 (1.0330)	300	400	0,5-2,5
	St. 4 (1.0338)	250	350	0,5-2,5
Galvanized steel	DX54D+Z100	300	400	0,5-2,5
High strength steel	DP450	450	600	1
	DP600	600	800	1,5
	DP750	750	1.000	1
Stainless steel	AISI 304	300	700	0,5-2
	AISI 316	350	650	0,5-2
Aluminium	1050	100	150	0,5-2
	5052	175	250	0,5-2
	5754	185	250	0,5-2
Aluminium	CP4	280	350	1

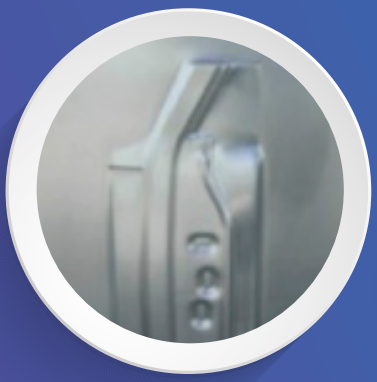
General specifications

Overall dimensions (Length, width, height)	10.33 x 4.81x 4.69 m
Machine weight	28,500 kg
Machine type	Bridge with single arch
Installation requires foundations	Yes
Dimensions of the work table	3000 x 2100 mm
Dimensions from the work table to the bridge	1050 mm
Maximum load on work table	3000 kg
Overall dimensions of the shaping ring. (W axis)	3000 x 2100 mm
Interior dimensions of shaping ring	2800x1900 mm
Tool loader	7 positions
Type of cone	BT-40
Type of tool clamp	Conical clamp
Cutting fluid system	Yes (15l/min)
Cutting fluid minimum level sensor	Yes
Maximum working viscosity	According to study
Maximum pressure	5 bar
Programmable through M codes in the CNC	Yes
Flow regulation	Manual
Oil filtration	Yes
Degree of filtration	0.2 mm
Machine floor provided with oil collection tray	Yes
Machine light	1200 Lumen in 4 points
Useful stroke "X" axis	3300 mm
Maximum travelling speed (G0)	15 m/min
Servomotor power	10 kW
Final power	40 kN
Positioning accuracy	0.07 mm
Repeatability of positioning	0.02 mm
Useful stroke "Y" axis	2100 mm
Maximum travelling speed (G0)	15 m/min
Servomotor power	4.5 kW
Final power	18.24 kN

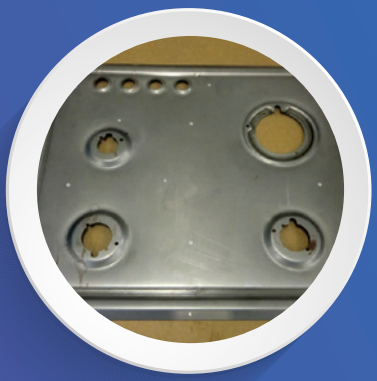
Positioning accuracy	0.07 mm
Repeatability of positioning	0.02 mm
Useful stroke "Z" axis	1000 mm
Maximum travelling speed (G0)	15 m/min
Servomotor power	4.5 kW
Effective torque	18.24 Kn/m
Positioning accuracy	0.07 mm
Repeatability of positioning	0.02 mm
Useful stroke "W" axis	675 mm
Maximum travelling speed (G0)	2.3m/min
Servomotor power	4.5 kW
Maximum force	2100 kg
Positioning accuracy	0.07 mm
Repeatability of positioning	0.02 mm
CNC model incorporated in machine	Mitsubishi M80
Interpolation tolerance at F 4500 mm/min	0.02 mm
Interpolation tolerance at F 10000 mm/min	0.05 mm
Connectivity to LAN networks	Yes
Transfer and management of programs from SD card	Yes
Transfer and management of programs from PC	Yes
ETHERNET network machine connection	Optional
Transfer and management of programs through NCExplorer	Optional
Maximum storage capacity in the CNC	64000 Steps
Display of power consumption of each axis on the screen	No
Effective torque limitation on each axis by the user	No
Maximum working speed (G1)	9000 mm/min
Safe speed with open doors	150 mm/min
Web-CAM display of area to local network (not linked to CNC)	Optional
"Point 0" centring system	Optional

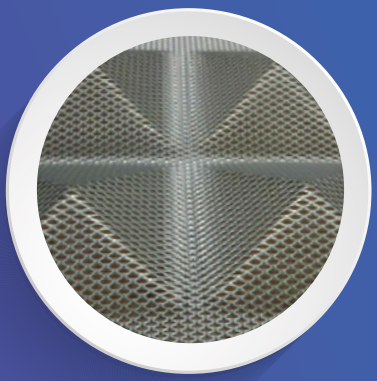
Examples of parts manufactured using ISF technology

Complex shapes



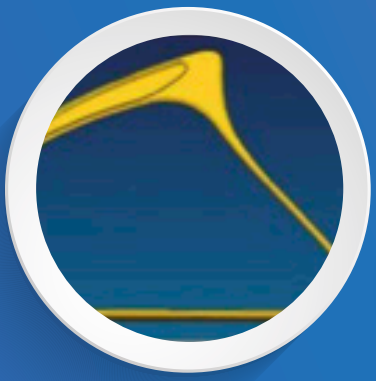


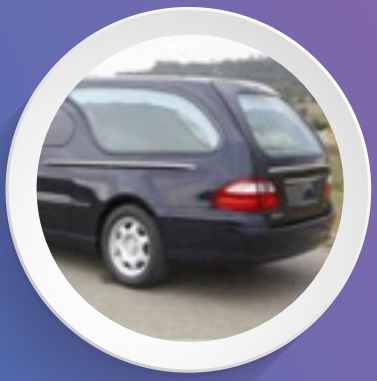
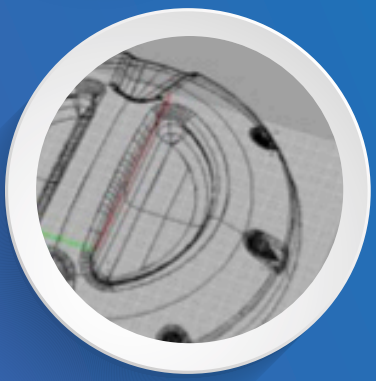



Functional prototypes



Limited production runs



ISF technology experts

MECÁNICA COMERCIAL MECO, with an accumulated experience of more than 30 years, is a company headed by the Peirón family that is dedicated to the development of advanced mechanical engineering projects with both designs based on customer needs or innovations and its own creations. In these more than three decades, MECO has also become the most reliable partner for the industrial maintenance of the most important factories in its area of influence.
In 2000, MECO developed an innovative keyseating or broaching machine, a revolution in the sector thanks to its high precision, speed and ease of use. It is a patented system developed entirely by the MECO team that has already been successfully introduced in more than 20 countries around the world. Currently, in addition to the sale of various types of machine tools and its industrial maintenance service, MECO is in the development phase of new set of revolutionary machines, such as the multi-drill for large matrices with 36 heads.

Eurecat, the Technological Centre of Catalonia (member of Tecnio), brings together the experience of more than 650 professionals generating a turnover of 51 million euros per year and serving more than 1,500 companies. Applied R&D, technological services, highly specialized training, technology consulting and professional events are some of the services that Eurecat offers for both large and small and medium-sized companies in all sectors. With facilities in Barcelona, Canet de Mar, Cerdanyola del Vallès, Girona, Lleida, Manresa, Mataró, Reus, Tarragona, Amposta and Vila-seca, it participates in 160 major national and international R&D&I consortium projects of high strategic value and it has 81 patents and 7 spin-offs. The added value provided by Eurecat boosts innovation, decreases spending on scientific and technological infrastructures, reduces risks and provides specialized knowledge tailored to each company.

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Do not hesitate to contact us. Our technical sales team will advise you on the suitability of applying ISF technology to the needs of your company.

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