



TOP-AUTOMATION GUN DRILLING AND MILLING MACHINE

MF 1650 /SP EVO

Gundrilling and milling machine for large size molds, up to 30/40/50 tons depending on the chosen table.

Tilting ram with dual spindle configuration:

- Gun Drilling Spindle: 15 kW / 4200 rpm. Drilling depth in single operation up to 1650 mm, optimal diameter 4-50 mm solid.
- ISO50 Milling Spindle 45 kW / 4500 rpm. The milling spindle is located on the same ram but on independent axis. No operator intervention to switch between the operations.

Automatic **Gun Grill Changer** with 5 gun drill cassettes;

Automatic ISO50-tool changer for the milling spindle with different capacity [Option].

Top rigidity thanks to Gantry style column.

4-sides machining concept:

- Long transversal movements and translating table increase the approach to workpiece, with a strong improvement in managing the mold.
- Advanced RTCP for compound angle machining
- Single origin to manage the two spindles for the 4 workpiece faces.

Deep Drilling Capabilities

Deep drilling method: gun drilling. Optimal drilling diameter range: 5-50 mm solid without pre-hole, with brazed carbide gun drills and indexable-insert gundrills.

Liquid-cooled 15 kW, 4.200 rpm Gun Drilling Spindle.

Drilling depth in single operation: up to 1.650 mm.

3 Steadyrests for drill-guide, moving on linear ways with self-adjusting device "IMSAUTOFOCUS" for optimal drill-guiding condition during the whole drilling operation.

Automatic **Gun Drill Changer** with 5 gun drill cassettes.

Oil temperature, pressure and cleanliness are fundamental to ensure continuous trouble-free gun drilling operations. Accurate oil control thanks to:

- Two different high-pressure pumps managed by inverter and pressure managing system;
- Automatic multi-stage oil filtering system integrated into machine enclosures;
- Heat exchanger for oil cooling.

HEIDENHAIN CNC. Specific IMSA functions control the deep drilling process.

Chip conveyor, floor pans and total machine enclosure as standard.

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YouTube Shorts about
MF 1650/5P EVO



IMSA Gun Drill Changer

IMSA's Gun Drill Changer system provides for the interchange of the entire tool cassette. Each cassette contains all the elements necessary for deep drilling:

- chip box with nose-cone bushing
- self-distancing "autofocus" steady rests
- ISO 50 taper to lock the gun drill tool

Our Gun Drill Changer is now based on axial cassette sliding movement along the ram. This system, in use by IMSA since 2016, replaces our previous one with lateral exchange (2009-2013).



Look at the story of IMSA Gun Drill Changer in this short video:

<https://youtu.be/NRo0BGjnx5Q>

IMSA most recent system has two important advantages:

- **Complete protection against dirt**, as the cassette inserted in the ram remains completely protected by the casings.
- The axial workload in drilling does not generate any additional effort to the cassette clamping system, on the contrary the pressure exerted by the drill bushing towards the block to be drilled will **contribute positively to block the cassette itself**.



High Performance in Milling

Besides ensuring high productivity in gun drilling operations, MF1650 /5P EVO is expressly designed to be a heavy-duty metal cutting machine, with a strong structure and large-designed transmissions.

Our ISO50 machining head is positioned on the tilting headstock, next to, yet independent from, the gundrilling axis. This independent-axes system, distinctive feature of IMSA machines, provides the means for switching from deep drilling to milling and vice versa in just 8 seconds and **does not require operator intervention.**

The complete headstock has a workpiece-approach movement of 600 mm (W axis) and the milling quill has an additional independent of 500 mm (Z axis) for a total useable movement of 1.100 mm. The headstock table overlap facilitates 4-size machining.

45 kW, 4.500 rpm, 430 Nm, ISO50 milling head.

The milling spindle is liquid-cooled with probes to avoid thermal expansion.

BIG-PLUS® tool/spindle interface.

The high-pressure oil passage inside the milling spindle enables to use spade drills (for example). Air passage inside the tools is also available, besides the classic external air and oil hoses.

Different capacity ISO50 automatic tool changers are available in option.



The Machine Structure

Movable column has a gantry design (i.e. double-guided with low front guide and up/back guide): IMSA vertical gantry structure results in much greater stiffness in respect to a traditional machine configuration with single lower guide. This extreme structure rigidity withstands the forces **in every position of the vertical axis** and enables latest-generation gundrills with chip-breaking inserts to be used, resulting in higher drilling speed.

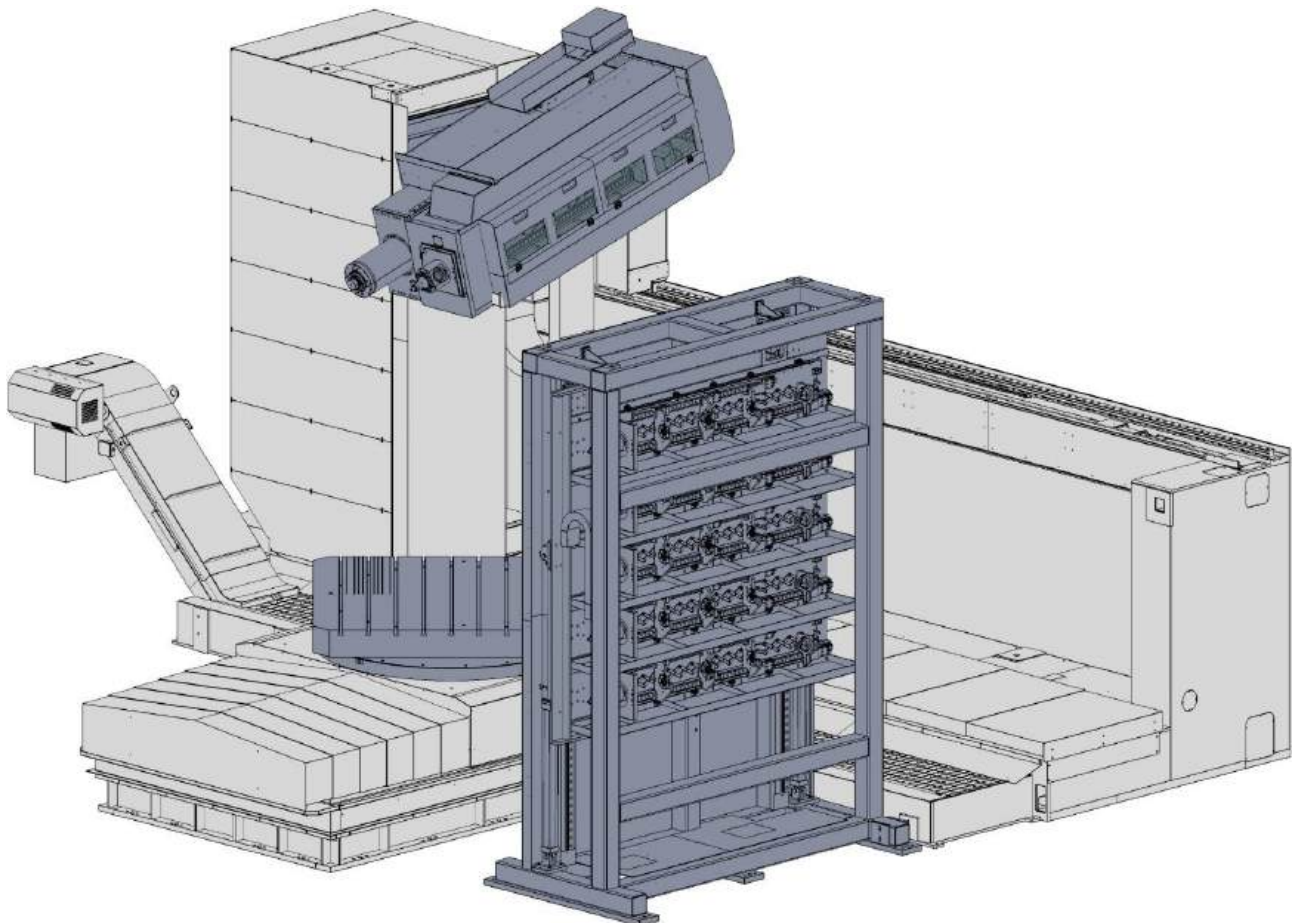
A master/slave system of inductive scales provides top-level accuracy and repeatability of the axes X and Y movements. Also, the angular positioning of the table (B-axis) and of the tilting headstock (A-axis) are controlled by state-of-the-art inductive measuring systems.

With the aim of maximizing the useable vertical travel when the headstock is angled, the A-axis rotation center is forward in respect to the table; moreover the positioning of A-axis has been equipped with a new transmission with zero-backlash hypoid-gearing right-angle gearbox.

Standard rotary/translating table loads workpieces up to 30 tonnes. The optional tables offer higher loading capacities. The table is equipped with 3 hydromechanical brake clamps, specific to contrast the forces of deep drilling machining.

The translation (U-axis) moves the table backward and toward the headstock, and this makes it possible to **setup the workpiece onto the table once**, and then manage its position for 4-size machining (depending on mold size and shape).

A modern coverage encloses the whole machine, so that oil is contained inside the machine and cleanliness of the workshop area is ensured. The large doors ensure spacious loading access for work piece loading with hall crane or fork lift.



MAIN TECHNICAL DATA - MF 1650 /5P EVO

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Axes Movements

Maximum drilling depth, in single operation
Column horizontal total travel
Column horizontal usable travel
Headstock vertical movement
Approach stroke of drill slide
Independent stroke of milling quill
Total milling stroke
Headstock tilting angle (infinite position)
Translation movement of the table
Table radial resolution
Axes feed rate, max.

V axis	1.650 mm
X axis	4.700 mm
X axis	3.000 mm
Y axis	2.000 mm
W axis	600 mm
Z axis	500 mm
Z+W axes	1.100 mm
A axis	+ 20° ... - 20°
U axis	1.200 mm
B axis	360.000 pos./rev. 20.000 mm/min

Drilling Spindle

Optimal drilling dia., solid, min-max
Drilling spindle speed, adjustable
Drilling spindle motor power
Spindle motor cooling
Driver type for gundrills $\varnothing < 6$ mm
Driver type for gundrills $6 < \varnothing < 50$ mm
Internal oil passage
Self-regulated oil flow
Oil temperature adjusted to
Filtration degree

	5 - 50 mm
	1 - 4.200 rpm
	15 (S1) kW
	water and glycol
	$\varnothing 10 \times L40$ mm
	$\varnothing 25 \times 70$ mm or $\varnothing 40 \times L70$ Weldon
	up to 120 bar
	5 - 150 l/min
	25 - 32 °C
	16 micron

ISO 50 Milling Spindle

Diameter of spindle quill
Milling spindle speed, adjustable
Milling spindle motor power
Milling spindle nominal torque
Spindle motor cooling
Internal oil passage
Internal air passage

	270 mm
	0 - 4.500 rpm
	45 (S1) kW
	430 Nm
	water and glycol
	up to 50 bar
	6 bar

[Options] Storages For Iso 50 Tools

Tool capacity, according to option chosen
Max. tool length in tool storage with 40 / 60 / 80 positions
Max. tool diameter
Max. tool weight

	40 / 60 / 80 / 120 / 180 tools
	L500mm
	$\varnothing 100$ mm
	15 kg

Rotary Traversing Table

Translation movement of the table (all versions)
Table radial resolution (all versions)
Standard T-slots on table surface (all versions)

U axis	1.200 mm
B axis	360.000 pos./rev. 22 mm

Standard table size and load in rotation
[OPTION] Table size and load in rotation
[OPTION] Table size and load in rotation
[OPTION] Table size and load in rotation

	1.600 x 1.800 mm, 30.000 kg
	2.000 x 2.000 mm, 40.000 kg
	2.000 x 2.500 mm, 40.000 kg
	2.200 x 2.200 mm, 50.000 kg

Machine Size And Weight

Machine size, net
Total machine weight (approx. - depending on version)

	8820 x 8650 x H5730 mm
	80 tons

We can assist you in determining the most appropriate customized solution for your drilling needs.

Technical data can be modified for improvements without notice.



Specialists in Precision Gundrilling

I.M.S.A. srl - Via Don G. Dell'Acqua, 2/D - 23890 Barzago (Lecco) - Italy
Tel. +39 031 860444 - info@imsaitaly.com - www.imsaitaly.com