

# ITALIAN MACHINE TOOLS, ROBOTICS & AUTOMATION INDUSTRY ~ NEWS

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PIATTAFORMA INDIA PROJECT

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UCIMU-SISTEMI PER PRODURRE



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## **MCM SPA | SECONDO MONA CASE HISTORY**

The solution that ensures flexibility for different materials to be machined and reliability on complex and extremely precise aerospace components.

**MCM-Machining Centers Manufacturing S.P.A.** is a historic Italian company, with important references all over the world, specialized in the design and manufacture of machining centres and flexible production lines with innovative process solutions. Over the years, diversification into various market segments has been a driving force of continuous innovation for MCM, and today the company is an international benchmark in the Aerospace industry. Small and medium-sized companies and large OEMs recognise the top-level know-how of MCM, now branched out into a wide and structured range which allows to offer advanced, high-performance and reliable solutions for every production need.



**Secondo Mona** is a historic Italian company, owned by the same family since 1903 and based in Somma Lombardo. Following the intuition of its founder, Mr. Secondo Mona, who was fascinated by the first biplane flights on the fields of what is now Malpensa airport, in 1913 the company began to offer its mechanical skills to the aeronautical sector - which was taking its first steps at the time - with the overhaul of the first aero-engines, and from 1923 with the construction of on-board equipment of its own design.

Nowadays, Secondo Mona is a world-renowned and appreciated company in this sector, in particular for the design, development and manufacture of fuel systems for fixed-wing, rotary-wing and UAV (Unmanned Aerial Vehicle, the so-called drones) aircraft, but also for the production of other equipment such as actuators and manifolds, as well as landing gear equipment and sub-assemblies for large commercial civil aircraft, and aircraft engine components.

The company directly supplies civil and military aircraft and helicopter manufacturers all over the world, as well as aircraft engine manufacturers or large aircraft system builders.



### Successful collaboration

The cooperation between the two companies dates back to 2005, with the purchase of a first MCM machine - a Clock 700 machining centre in bi-pallet version - that allowed the customer to machine complex and high-precision aeronautical components, even in unmanned mode.

The excellent results led Secondo Mona to decide to remodulate the Clock 700 with the adoption of an 18-position multi-pallet and, as a result of its proven reliability, to purchase a second machine, a Clock 1200 MP10. The collaboration strengthened over time with the installation of other MCM stand-alone machining centres, also equipped with multi-pallets: first a 5-axis Concept 600 MP18, then a Clock 1200 MP10 and another 5-axis Concept 600 MP18.

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Ten years after the beginning of the partnership, after successfully testing the possibility of machining small batches with multi-pallet stand-alone plants, Secondo Mona requested a first large FMS: a line consisting of two 5-axis Tank 1300 machining centres with tilting head, equipped with pallet magazine featuring 28 storage places and a centralised Mirror tool magazine with 599 HSK-A100 places. Shared tool management between two machines, one in right-hand version and the other in left-hand version - as MCM allows - offers a number of optimizations and benefits thanks to the possibility to exchange twin tools between the two machining centres.



Therefore the presence of two identical tools in both magazines, serving the relevant machines, is no longer required, but one tool in the shared magazine is sufficient to meet the needs of both machines.

This benefit also applies to tooling dedicated to special machining operations, valuable and expensive tools very used in the Aerospace sector, which no longer need to be duplicated, as they can be shared between the two machines.



## Needs and solutions

The partnership between Secondo Mona and MCM is further strengthened with the order of a new FMS consisting of Clock 800 EVO machining centres, newly designed machines smaller than Tanks 1300, coupled and interfaced through a Mirror tool magazine for 900 tools. This flexible manufacturing system consists of two 5-axis machines with roto-tilting table equipped with torque motor, i.e. with high torque, enabling the machining of extremely tough materials, together with HSK-A63 spindles with maximum speed of 14,000 rpm. Thanks to the restyling made by MCM, now the machine has compact overall dimensions on the floor while maintaining a large working area and excellent performance such as high dynamics, outstanding stiffness and precision. The new ergonomic push-button panels with touch screen make human-machine interaction more practical and, thanks to the complete digital equipment, the machines meet Industry 4.0 principles.

One of Secondo Mona's requirements for this new order, in addition to the saturation of working hours on three shifts, was the possibility to handle different materials on the same line. Therefore, a universal spindle has been implemented, which allows machining at different speeds depending on the material processed, together with several chip management features, as aluminium chips behave differently from titanium chips. In fact, the machines are equipped with filtering and removal systems suitable to handle the different materials. The possibility of having a high number of tools is again an essential matter, as the machines also process high-toughness alloys, resulting in increased tool wear. Tool sharing between the two coupled machines also allows the supervisor to send any workpiece to production on either machine, increasing hourly occupancy and cell efficiency. The machine management part is remarkable: in the customer's Aerospace applications, it allows to reach a utilisation rate close to 98%, saturating the plant with small to medium batches typical of orders in the aeronautical sector - a decisive factor in the choice of investment.

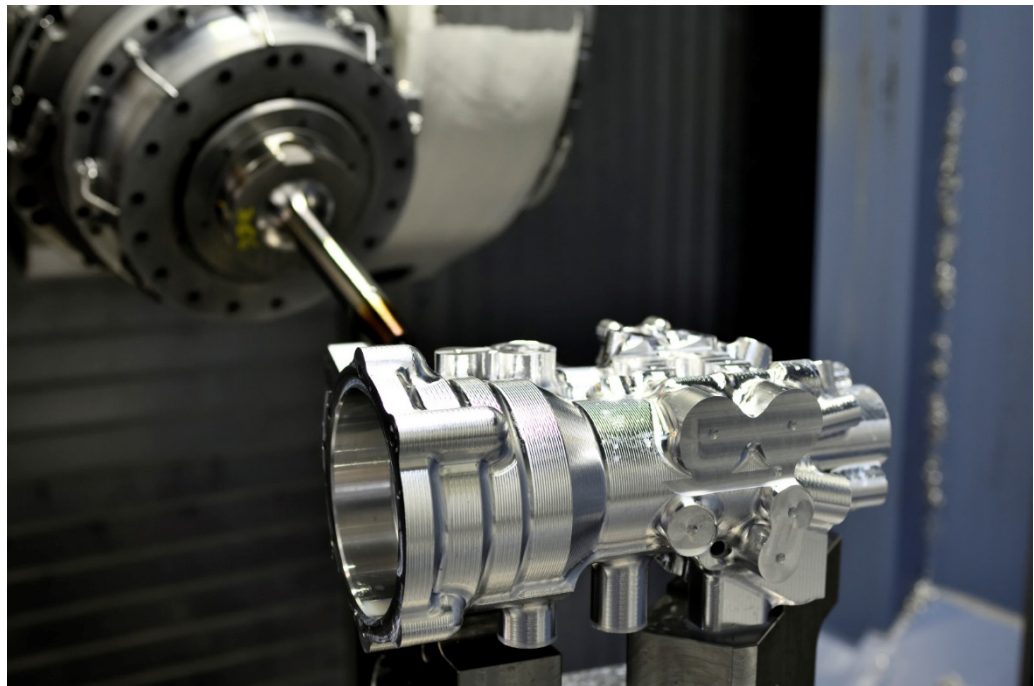
## Standardized customization

MCM has been able to meet Secondo Mona's requirements, satisfying all their requests for machine customization. A result achieved thanks to the know-how developed and gathered over the years by MCM in the construction of solutions able to ensure high-precision machining on three shifts. The main concept of an FMS is to enable even difficult and extremely complex workpieces to be machine in unattended manner. This is now possible thanks to the adoption of sensors, integrated on MCM machines, and the mechanical options available, such as spindles equipped with elongation compensation or vibration detectors. The experience gained in many years of collaboration with Aerospace customers has, in fact, led MCM to have today a complete range of options and customization possibilities that can be used to set up the machine version best suited to the specific requests.

MCM machines were born as horizontal and universal machining centres and can be offered to all customers, in a variety of industrial sectors. These solutions have been designed and tested over time for specific aeronautical sectors – particularly high demanding users in terms of efficiency, controls and precision. And this not only applies to the mechanical development aspect, but also to the software development aspect.

## Software at the core

The core of MCM's FMS production efficiency is the jNODE 2.0 computer unit with jFMX software platform, the system supervisor developed by MCE IT department. jFMX is another key element in the customers' choice. This instrument makes the use of complex systems efficient and easy, and allows Secondo Mona to work on three shifts, even unmanned, ensuring maximum saturation of available hours, together with extreme flexibility and precision. Furthermore, coupled with the jFRX suite available on the machines, it offers real-time monitoring of system and order status, enabling the implementation of predictive maintenance services.



The project Piattaforma India has been promoted by UCIMU – Association of Italian Machine Tools Manufacturers and AMAPLAST – Italian Plastics and Rubber Processing Machinery and Moulds Manufacturers Association. The two associations agreed on the idea that promoting a network of associations and entrepreneurs who have developed knowledge and experience on the Indian market, can be useful in favoring of new paths of development for business. The Indian companies who are interested to form JV, cooperation, technical tie up, purchase machinery etc from/with Italian companies can contact below mentioned address for any assistance:

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