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Opening photo: Some components machined by Copra – Minuterie Metalliche di Precisione.

## **All Machining and Cleaning Products for Mechanical Components from One Source: the Success Story of Copra Minuterie Metalliche di Precisione**

Monica Fumagalli **ipcm**®

The more and more stringent qualitative requirements

imposed and the progressive tightening of regulations on health and safety at work are among the main reasons that push manufacturers to upgrade or replace their plants and products. This is particularly evident in the metal cleaning sector, where demands for ever-higher levels of cleanliness and increasing attention to the operational and environmental safety of the chemicals used make this issue a top priority for companies.

We recently visited Copra – Minuterie Metalliche di Precisione (Pila, Vercelli, Italy), a firm that has machined components of various materials intended for the sectors of taps and fittings, industrial valves, domestic appliances, furnishing components, electronics, and aerospace for almost forty years. With such a varied range of products, including round parts of different sizes, with a diameter from 3 to 65 mm, the cleaning phase is certainly crucial. That is why Copra has followed all stages of the evolution of washing plants and products (**ref. Opening photo**). In particular, they have strategically decided to rely on one supplier for both lubricating oils for mechanical machining operations and cleaning agents. This has required the perfect



**Figure 1: Copra's production process starts with these 3 m long bars.**

calibration of production processes in terms of chemical compatibility; however, it has also ensured highly efficient washing operations. The support of the quality analysis and control lab of Dollmar Spa, the company chosen by Copra as its sole supplier, was crucial to achieve this goal.

### From brass to stainless steel: the qualitative leap made by Copra

“We have always paid attention to the innovations offered by the market to improve our products and adapt them to the ever-changing needs of clients,” says Maurizio Prandina, the co-owner of Copra. “Since we are located in the Piedmont district of taps and fittings, we immediately focused on the processing of brass components intended for this sector. However, in order to differentiate ourselves from competition, at the end of the 1990s we decided to specialise in the production of stainless steel parts, while maintaining our brass machining department. We knew that this choice would have involved the performance of

more complex surface treatments and the use of machines and products with different characteristics than those we were used to. In particular, as a specific lubricant for steel, we started using a neat oil provided by Dollmar Spa, a Milan-based company and the Italian exclusive distributor of MotulTech oils.”





Figure 2: The mechanical machining department.

### Small metal components with high-level finishes

The production of metal components starts with the machining of 3 m long bars with numerical control systems (Figs. 1 and 2). Different materials require different machining operations. “Brass requires special attention to be paid to finishes and to the handling of the parts that will be subjected to nickel and chrome plating,” states Prandina. “Stainless steel, on the other hand, is cleaned and then subjected to the manual removal of burrs. In order to maintain a high quality level, besides the continuous upgrade of the equipment of our machining and cleaning departments, we have added an operation before the shipment of the finished workpieces: we package the most delicate ones before putting them into the boxes, in order to avoid any indentation due to a possible collision during transport (Fig. 3).” As well as stainless steel and brass, Copra produces components in various



Figure 3: The quality of Copra's components has been the key to its success for forty years.

steels, aluminium, copper, bronze, titanium, POM, PVC, and Teflon. “In this way, we offer our customers a wide range of products to choose from,” says Prandina.

### The evolution of cleaning chemicals

The company originally had a water and detergent-based cleaning system for brass parts. “The quality level was sufficient, considering the characteristics of the natural oil used for machining this material,” says Prandina.

“In 1996, we acquired a cleaning plant using Soltene®, a product by Dollmar Spa, perchlorethylene-based specially stabilised for use in closed loop washing systems. It consisted of specially stabilised perchlorethylene for use in closed loop washing systems. From that moment, the quality of our cleaning process and the cleanliness degree of our workpieces have always been satisfactory.”

“Then, the greater variety of our products, calling for a different cleaning process and cleanliness degree for each component, led us to further upgrade our technologies,” says Marco Defabiani, the manager of the cleaning department of Copra. “After analysing the compatibility with our oils together with the Dollmar’s staff, in January of this year, we replaced our system with a one-chamber machine, which washes two baskets at a time with Dollmarsol G120, modified alcohols provided by Dollmar Spa (Fig. 4).”

“In the industrial cleaning field, it is commonly believed that there are chemicals exclusively intended for certain plants,” states Roberto Pacchiarini, the Sales Manager of Dollmar Meccanica. “Actually, if the CAS identification number of a chemical is identical to that of another product, it means that the formulation, and therefore the product, are the same.”



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**The choice of Copra: a modified alcohol cleaning solution**

After checking the compatibility of the cleaning solutions proposed by Dollmar with the oil used by Copra for its machining operations, there were two options available: a hydrocarbon and a modified alcohol system. “The choice fell on the second one,” explains Marco Defabiani, “because the result of the tests with modified alcohols were more convincing and, above all, for the sake of greater safety and environmental health. The tests carried out confirmed that only 0.01% of modified alcohol remains in the oil after distillation, lowering its flammability level by a degree. In this way, there is no risk of fire and the oil can be safely recirculated in the machining systems.”

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Figure 4: The cleaning machine, in operation for about a year.







In order to safely deliver the product, Dollmar Meccanica has designed the SAFETY FX device with a 25 kg barrel, homologated and compliant with the Italian and European regulations (Fig. 5). “Thank to it,” says Pacchiarini, “our chemicals can be currently used on any cleaning plant designed for use with modified alcohols. We can guarantee that our product will remain stable even after the four distillation operations per hour performed by Copra to eliminate the oil removed from the workpieces by the cleaning fluid. Here, the contribution of Copra’s operators is crucial. Indeed, two fundamental but often underestimated factors are the maintenance and control of the product and of the whole system.”



Figure 5: The SAFETY FX device with barrel supplied by Dollmar Spa.

### Cleaning brass and stainless steel

The cleaning phase, which Copra performs both between different operations and as the final process stage, plays a decisive role.

Says Marco Defabiani: “The components are placed in bulk or, more often, in fixed positions inside the two baskets, with a maximum load of 70 kg each. The cleaning system has five different programs to meet the different needs arising from the various material characteristics, the high number of parts, and their conformity requirements.

A washing cycle lasts on average 16 minutes. Including the loading and unloading of the two baskets, we can run 3 cleaning cycles every hour. The machine operates for 7 hours a day and it performs 4 short distillation operations every hour.

At night, we run an oil stripping process; the oil is then filtered with fossilised flour and it is finally recirculated into the machining centres (Fig. 6).”

### Conclusions

“The courage that Copra’s management has shown by defying some common misconceptions in the industrial cleaning sector is admirable,” says Pacchiarini.



Figure 6: Tanks for collecting the distilled product.

“They have always been ready to take some risks to improve their production standards and, until now, they have always proved right. Dollmar, on the other hand, is committed to maintain its role as a reliable chemical partner. That is why we are now developing a vegetable oil with very different toxicity levels than the mineral one. As regards modified alcohols, we have started a project to formulate some new products that could change the whole sector of cleaning chemicals already next year.”