



CPM designs and manufactures ball bearings, roller bearings, needle roller bearings, and precision rings.

CPM chooses a cutting-edge and sustainable cleaning process for its special bearings

CPM, an Italian company specialising in the production of special bearings, has entrusted ILSA-MC (San Pietro in Casale, Bologna, Italy) with upgrading its final cleaning process through an IK40-e system. This closed-loop vacuum plant with continuous-flow distillation allows the reuse of the cleaning solvent and the recovery of the processing oil, and it is integrated with a protective oil application system. Thanks to this solution, the company has made a decisive leap forward in quality - uniform cleaning, consistent quality, less waste, and greater environmental sustainability.



In today's manufacturing industry, the component cleaning process is no longer an accessory phase but a strategic step to ensure repeatability, reliable performance, and compliance with increasingly stringent environmental regulations. This is particularly true in highly specialised sectors where component cleanliness directly affects end product quality.

In recent years, there has been growing interest from companies in closed-loop cleaning systems that can reduce resource and energy consumption, recover solvents, and cut harmful emissions. The European regulatory framework also drives this trend: the REACH Regulation (EC No. 1907/2006) imposes strict controls on the use and registration of chemicals, whereas Directives 2010/75/EU (Industrial Emissions Directive) and 1999/13/EC (VOC Directive) regulate the use and emissions of organic solvents, pushing companies to adopt more sustainable cleaning technologies.¹

¹ Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32010L0075>

The transition to Industry 4.0 and 5.0, with the latter focusing on the synergy among people, machines, and sustainability, is promoting the introduction of intelligent, low-environmental impact solutions in production processes. This is the context for the project to upgrade the final cleaning phase carried out by CPM in collaboration with ILSA-MC, with the aim of combining production efficiency and environmental responsibility.

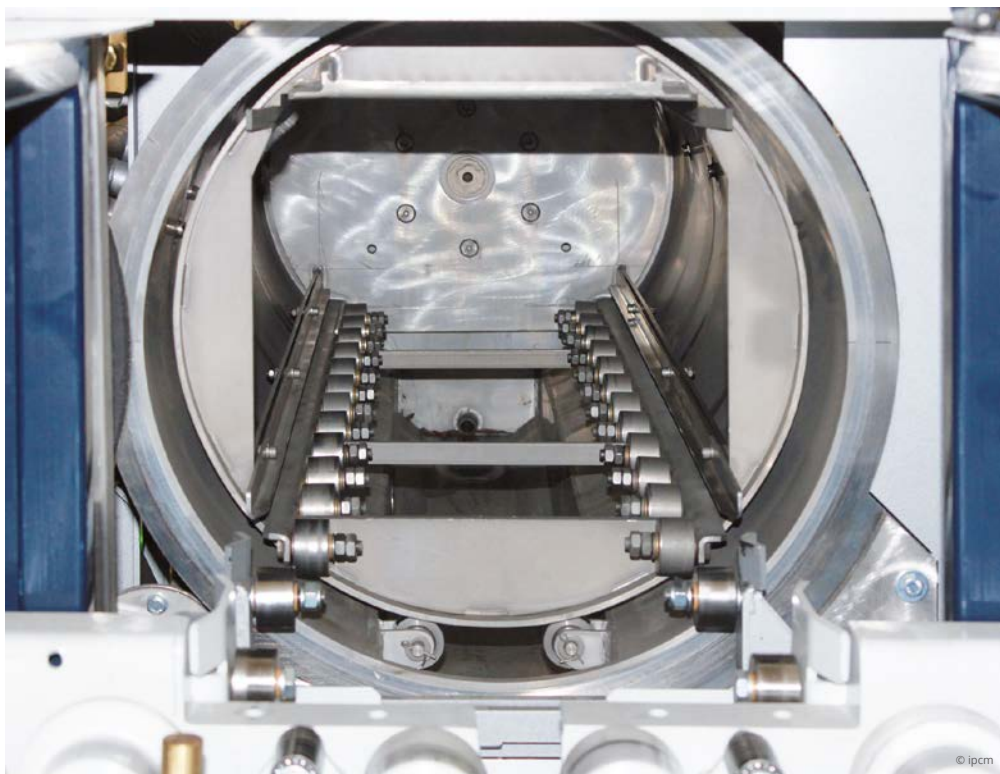
About CPM

Founded in 1967, CPM Spa is a company based in Nova Milanese (Monza e Brianza, Italy) specialising in the manufacture of mechanical parts and special bearings. With over 200 employees and 100% Italian production, it has evolved over time thanks to continuous investment in personnel and machinery.

"Our core business is power transmission, but we are also present in the medical, textile, robotics, automotive, machine tool, and earthmoving industries. We operate in 6 factories and have a solid international presence, especially in Germany, but also in Asia and North America," illustrates Lorenzo Santambrogio, the technical manager of CPM.



The ILSA-MC IK40-e cleaning system.



100% Made in Italy production

"The domestic market accounts for just under 50% of our turnover, with 95% of production taking place in-house: turning, grinding, assembly, and final inspection are all carried out at our various plants in Nova Milanese; the heat treatment phase is handled by a company in Arcore (Italy) wholly owned by CPM," says Santambrogio. "We manufacture around 3.5 million bearings per year, with diameters ranging from 10 mm to 800 mm. Production starts with the receipt of raw materials such as steel tubes and rolled rings," explains Gianni Morselli, assembly manager at CPM. The production cycle then continues as follows:

- Turning
- Heat treatment
- Preliminary and high-precision grinding
- Assembly
- Final cleaning

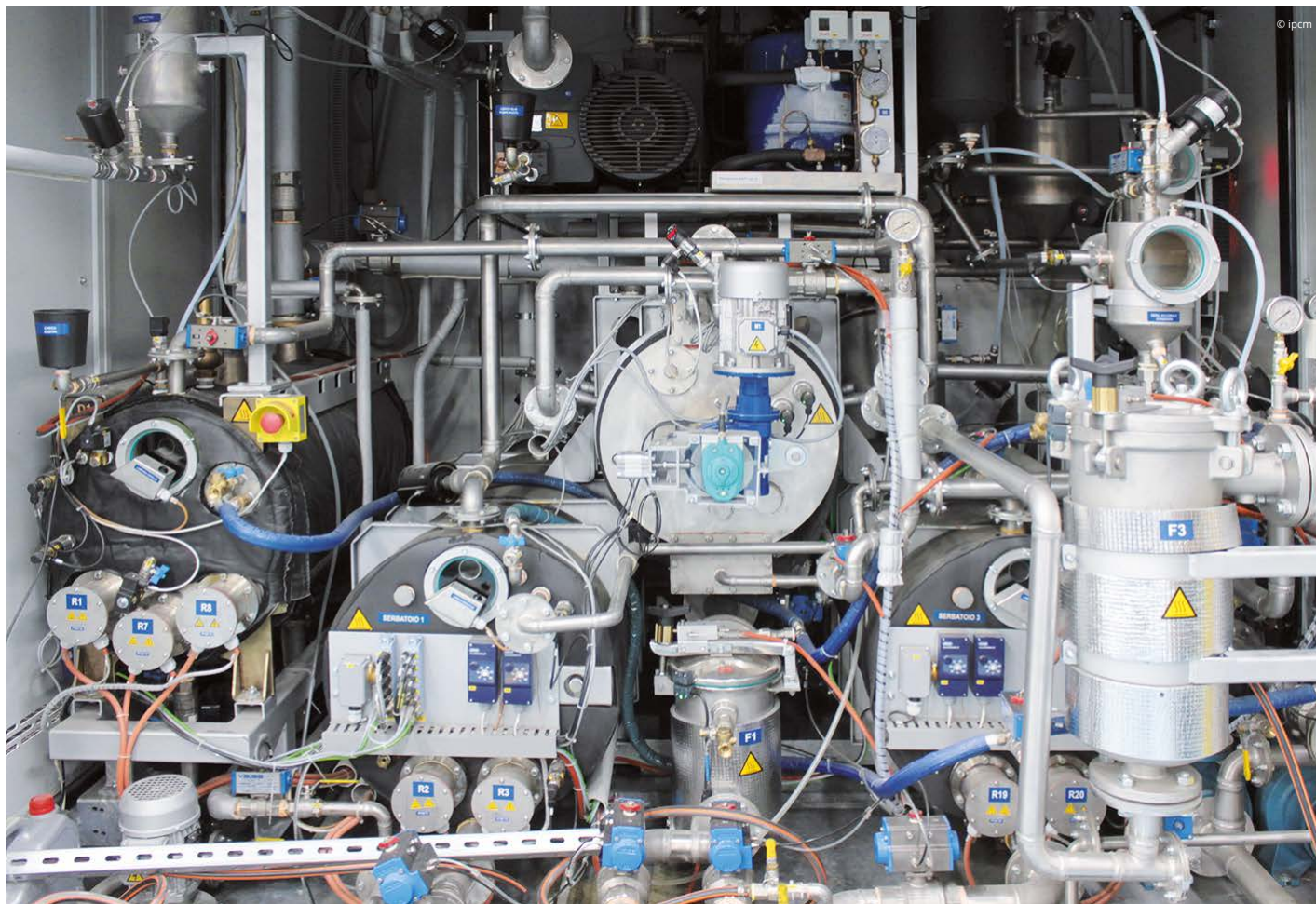
"An intermediate cleaning operation is also carried out between different machining stages, but it is the final one that ensures we supply ready-to-use components that do not require further treatment. Each bearing must be delivered clean, dry, and protected: the customer only has to install it on its product," continues Morselli.

The ILSA-MC IK40-e cleaning system

ILSA-MC supplied CPM with an IK40-e cleaning plant, a compact closed-loop machine that can use modified alcohols or aliphatic hydrocarbons, ideal for treating metal components. It also features a system for the final application of a protective oil in total immersion, fully integrated into the treatment cycle but isolated from the cleaning solvent piping. It is also equipped with a continuous-flow distillation system, several continuous-flow filtration steps, and an immersion cleaning chamber with a turbulence generation unit via lateral flushing and ultrasound. The cycle is completed by vapour



The inside of the IK40-e cleaning system and bearings placed in the basket before the cleaning operation.



The IK40-e cleaning system's tanks.

degreasing and drying in a vacuum chamber, which ensures a high degree of technical cleanliness and the absence of residues. The plant is managed through a touch screen interface with PLC software allowing for continuous monitoring and customisation of the cleaning cycles. It complies with EC regulations and is designed to ensure maximum energy efficiency and reduced environmental impact.

"The new plant performs a closed-loop, vacuum cycle with continuous-flow distillation that keeps the solvent constantly pure, ensuring effective and repeatable cleaning results. The process consists of immersion – with ultrasonic action during full immersion – agitation by turbulence, hydrocarbon vapour degreasing, and complete drying. When required, a protective oil application phase is also integrated: the hydrocarbon and the chosen protective oil are mixed in a third, dedicated tank, and the full immersion step is repeated, followed by the drying phase," illustrates Morselli. "The process we implemented in the past also included a

protective oil application phase by immersion, but that entailed a high amount of raw material waste because the parts had to be emptied of the lubricant collected in the holes, in addition to uneven application results and the impossibility of recovering the excess product. With our new ILSA-MC machine, the components come out dry and with a protective film on the surface, thanks to the final drying stage. The cycle lasts approximately 18 min., and the parts are bulk processed, a method that ensures uniformity in both cleaning and lubrication."

A winning choice

"Thanks to the plant's integrated filtering system, we can now guarantee consistent quality over time, something that was not always possible in the past. This investment has enabled us to optimise our process and manage a significant part of the production destined for final assembly in-house. Moreover, the recovery of solvent within the machine and



The touch screen with PLC software.



From left to right: CPM's assembly manager Gianni Morselli and technical manager Lorenzo Santambrogio.

the optimisation of the protective oil application phase have drastically reduced our waste volumes and environmental impact," states Morselli.

"Installing this ILSA-MC cleaning system marked a leap forward in quality. We saw immediate improvements: cleaner components, less raw material waste, less maintenance, and fewer liquid replacement operations, as well as economic and environmental benefits. On top of that, the plant is extremely flexible and enables us to handle different batches without changing the process or product. Today, about 15% of our production is cleaned with this system and sent directly to final assembly. The investment has paid for itself," says Santambrogio. "We chose ILSA-MC because of the excellent value for money offered by its machine, but we also received excellent assistance and technical support, both during the purchase phase and while designing specific cleaning cycles, e.g. with or without the application of protective agents, with special parameter settings, or with a higher-intensity action to achieve greater cleanliness on certain parts."

CPM's vision for the future: innovation, quality, and sustainability

With a production process entirely performed in Italy and, at the same time, a strong international presence, CPM looks confidently to the future, ready to face the challenges of a constantly evolving global market. "We are ready to adapt and respond to new market demands, aiming to consolidate our leadership in the production of special bearings. We will continue to invest in innovation, quality, and sustainability: these values will enable us to successfully tackle even the most complex challenges," concludes Lorenzo Santambrogio, confirming the company's commitment to offering increasingly cutting-edge and environmentally friendly solutions. The new cleaning plant, in line with the principles of Industry 4.0 and 5.0, also underlines CPM's focus on adopting innovative and smart solutions, contributing to the continuous improvement of its production processes. ▶