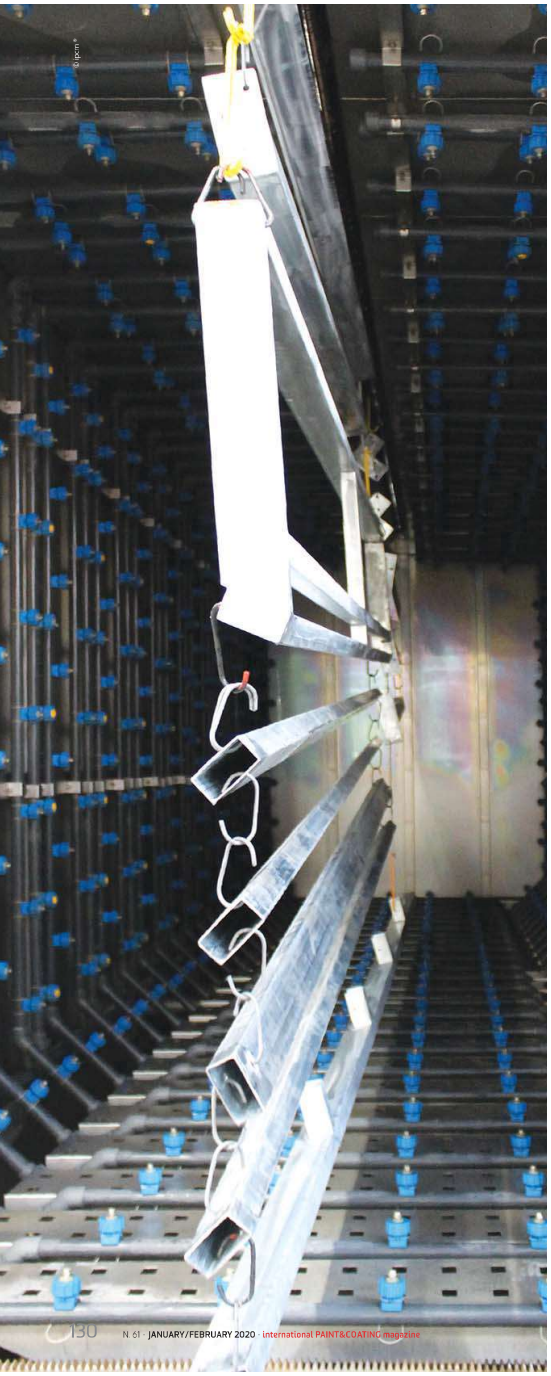

Finimetal: The Evolution of a Static Powder and Liquid Coating Plant for Workpieces of all Sizes

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When space is limited but demands are high, innovative projects are born. Savim has designed, built, and installed a static coating system with automatic part handling in order to enable Finimetal to provide an all-round coating service and meet any customer need by making the most of a limited space and with reduced labour costs.

"In a region dotted with contracting coating firms, such as Veneto, in Italy, providing a complete service in order to meet the most diverse customer requests is certainly the strength of our company," says Nicolò Brognara, owner and plant manager at Finimetal. Based in Cerea, in the province of Verona, Finimetal was founded by Brognara to combine his passion for the restoration of vintage cars and motorcycles with his long-standing experience in the field of surface treatments and liquid painting.

Established in 2017 and became operational about two years later, Finimetal is a part of an industrial group of excellence that includes five other Veronese companies, each with a different core business, headed by the Faben family.

The chemical pre-treatment cycle occurs in two different cleaning tunnels. In the first one, it includes a phosphodegreasing stage and a rinse with mains water, whereas the second one calls for a further rinse with mains water and one with demineralised water.

The loading area is equipped with an elevator that facilitates the operations.

"Finimetal specialises in the coating of metal carpentry parts and sheets, but the flexibility of our new plant enables us to serve several different industrial sectors, such as agricultural machines, stoves, and panels: indeed, our recently installed coating system allows painting both large and small products with both powder and liquid products. The goal that led me to found a new company was precisely to offer customers a diversified, all-round coating service. Thanks to my hobby of restoring vintage cars, I am a great connoisseur of liquid painting. On the other hand, I believe that powder coatings are the future, by virtue of their low environmental impact. Therefore, I wanted a coating plant that combined these two worlds. In order to achieve this objective we turned to Savim, an Italian leader in the production of industrial coating booths and systems. It took us two years to analyse all the technologies available on the market and develop this configuration. Savim started the plant in February 2019 and now we are very pleased with it," explains Brognara.

The layout of the coating system

The main feature of this coating line it that, although it does not have a dynamic overhead conveyor, its load bars are managed and handled through automated shuttles. It can therefore be considered an evolution of conventional static systems with manual handling devices. "It is an evolution of high-labour content static systems, which entail great physical effort for operators and significant labour costs for companies," says Francesco Scavini, the owner of Savim together with his sisters Marina and Nicoletta. "With this system, the first of its kind, the

operator works exclusively in the coating booth and in the loading and unloading area, exactly as happens on systems with a dynamic conveyor."
The plant has a very compact layout and it is equipped with as follows:
- a loading and unloading area with an elevator;
- two pre-treatment tunnels;
- two drying ovens;
- two coating booths.

Between one station and another, there are storage and cooling buffers where the components remain while waiting to undergo subsequent treatments. "The line has two parallel working areas, centrally served by two automated shuttles that can handle 6 metre long bars with a maximum load of 1000 kg. The two shuttles have the task of transporting, introducing, and extracting the load bars in and from the various stations. The loading operator has a digital controller with which they match each load bar with a coating program. After the manual load of the workpiece with the help of the elevator, a shuttle picks up the bar and takes it to the appropriate workstation according to the program selected. If this area is already "occupied", explains Francesco Scavini, the system "parks" it in a storage buffer, from which it is picked up when its processing station is free. The system knows the position of each load bar. The shuttles continue to place workpieces to be coated in all free positions: as soon as a workstation is freed, the system picks up a bar in the queue to proceed with the set cycle. The plant has a compact layout but at the same time it is very complete, in terms both of coating processes that it can perform and of productivity and storage capacity, because it does not have a chain conveyor that requires the workpieces to move along curves and edges to the detriment of the system's footprint."

Thanks to the flexibility of its new coating system, Finimetal can serve different industrial sectors, including panel manufacturing.

The coating cycle

"The chemical pre-treatment cycle occurs in two different cleaning tunnels. In the first one, it includes a phosphodegreasing stage and a rinse with mains water, whereas the second one calls for a further rinse with mains water and one with demineralised water," says Finimetal owner. "After pre-treatment, the parts are dried in an oven and they then reach the application area equipped with two booths, one for liquid and the other for powder coatings. Then, they are taken to a second oven for the powder curing or liquid drying phase. The plant's control system sets the temperature required," notes Scavini. "The paint application is manual in order to offer a high final quality degree even on large-sized parts."
"The two identical ovens are both equipped with a larger drying chamber designed for large workpieces and a smaller one for small components. In addition to allowing simultaneously painting several components of different sizes and weights, this double configuration enables us to keep

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One of the shuttles that handle the load bars through the various processing stages.

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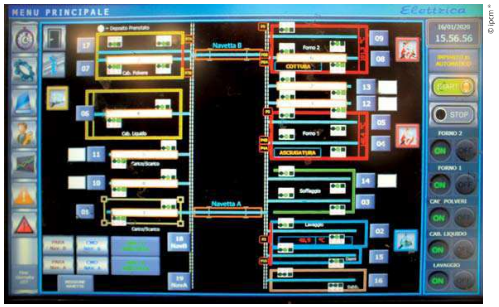
The plant is equipped with storage and cooling buffers where the components remain while waiting to undergo subsequent treatments.

the powder coated parts separate from the liquid painted ones thus avoiding contamination," says Brognara.
"Another peculiarity of the ovens is that they are equipped with air vein burners. This guarantees numerous advantages compared with conventional ovens, in terms of both time and costs. In a standard indirect heating system, a large steel mass, that is, the combustion chamber, is heated in order to subsequently transfer this heat to the oven, with wasted time and energy; air vein burners, on the other hand, have numerous micro flames that light up instantly and exchange heat with air, thus immediately producing heat and quickly reaching the set temperature.



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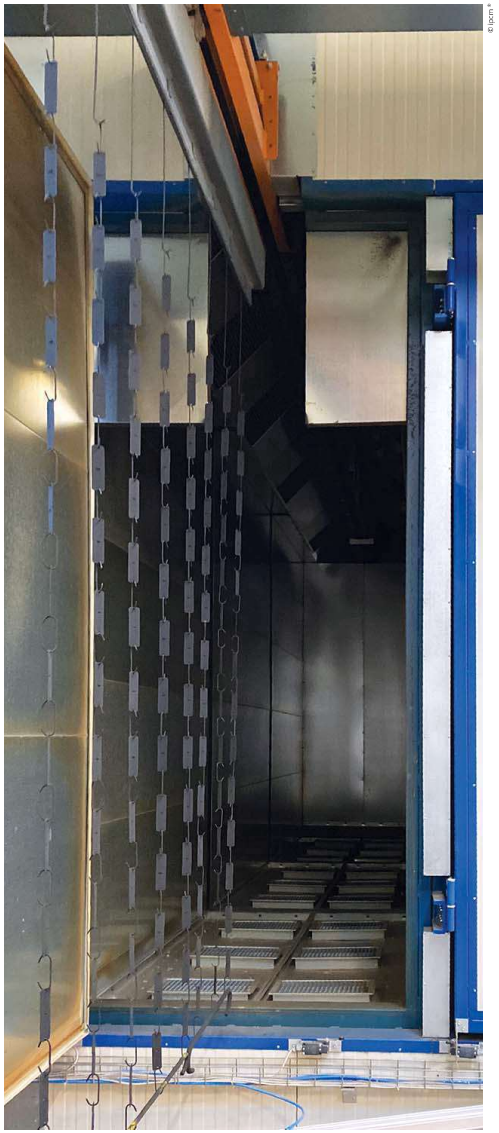
The digital controller with which the operator matches each load bar with a coating program during loading.

Moreover, with this type of system, combustion is ecological since it is free of carbon dioxide emissions. In terms of costs, natural gas consumption is reduced by 30% and a further saving is guaranteed by the possibility of disposing of the fumes directly from the extractor of the drying oven, without installing a special chimney. Finally, both ovens have double thermal insulation systems, which ensures even greater savings in terms of heat dispersion," states Scavini.

Reasons for a choice

"After a careful analysis of the systems and technologies available on the market, we decided to turn to Savim on the basis of their excellent references. We are very pleased with our choice, because after a long discussion and close collaboration, this plant manufacturer has managed to conceive the best solution for our needs. In fact, we required a very compact system due to the small size of our factory, but that could combine powder and liquid coating technologies and was not too labour-intensive. By designing this truly innovative system, Savim has meet all our requirements while proving a reliable partner with a good assistance service," says Nicolò Brognara.
"A plant is conceived through dialogue, the analysis of the data provided by the customer, and the understanding of the options available in terms of space and finishing process," notes Francesco Scavini. "When space is limited but demands are high, you need to design something innovative and compact. We therefore had the revolutionary idea of implementing automatic shuttles for the handling of load bars; these shuttles were fully conceived and designed by Savim."



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Workpieces entering the drying oven.

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The oven is equipped with a larger drying chamber designed for large workpieces and a smaller one for small components.

Future projects

"Our collaboration with Savim will not end here. We will soon expand our pre-treatment phase by adding a pickling stage, which will allow us painting also aluminium products, and a shot blasting chamber, in order to give our customers the opportunity to choose between the chemical and mechanical pre-treatment processes. Finally, with the aim of providing an increasingly global painting service, we will equip our factory with a coating line with a dynamic conveyor," states Brognara.

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A detail of some coated parts.