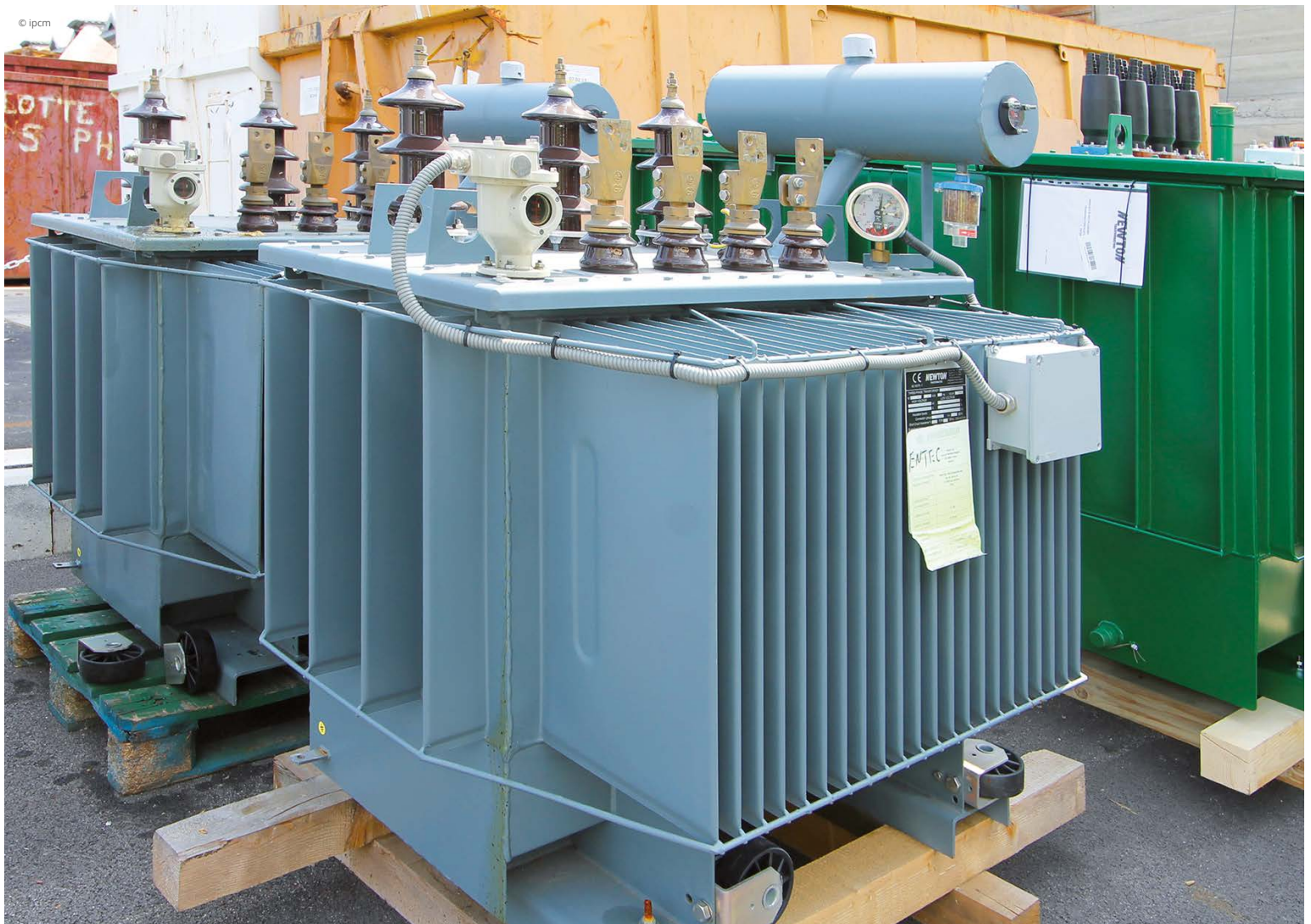


# Verniciatura Vannucci's winning choice: a semi-automatic powder coating plant and a single-phase pre-treatment product

Federico Melideo, **ipcm**<sup>®</sup>

**Verniciatura Vannucci S.r.l., a long-established Tuscan company specialising in powder coating metal surfaces, has recently installed a semi-automatic system from Eurotherm combined with Chemtec's TORAN 3<sup>®</sup> single-phase pre-treatment product. This advanced process configuration guarantees sustainability, energy savings, increased productivity, and high finishing quality.**

In an era in which efficiency, sustainability, and quality have become the production standard for companies in all industries to remain competitive, the coating sector has also been and continues to be at the epicentre of a significant evolution. The most mature businesses have seized this opportunity for change, focusing on the adoption of smart technologies, updating their plants in line with Industry 4.0 and 5.0 principles, and investing in process sustainability as a growth factor. In particular, some contract coating companies with strong roots in their local communities stand out for their vision, focusing on innovation to meet the needs of increasingly diversified and sophisticated markets. Verniciatura Vannucci S.r.l. (Altopascio, Lucca, Italy) distinguishes itself



in this context. Alongside the investment in a new semi-automatic coating plant for large parts, it chose to implement a single-stage cold pre-treatment process with Chemtec's TORAN 3® as an alternative to traditional phosphating, an innovative and environmentally friendly solution does not require rinsing or degreasing, operates at room temperature, and does not create sludge or waste to be disposed of.

**A family affair**

This company's history began in 1982, although at that time it did not yet bear its current name. "Our father, Sandro Vannucci, founded it together with other partners," says Veronica Vannucci, current co-owner. "In 2006, the others gradually left, and my father was left alone. That year, Verniciatura Vannucci was officially established as a partnership company."

In the following years, Sandro's two daughters, Veronica and Valentina, joined the business, taking over its management and transforming it into a limited company, which now specialises exclusively in powder coating all types of metal. "We process materials ranging from cast iron to aluminium and galvanised steel. Italy is our only target market: we do not export directly, but we work with a very diverse and cross-sectoral client base

that also sells abroad. We mainly serve industries such as metalworking, shop furniture, and metal components for motorhomes and cars, as well as small businesses and local blacksmiths," explains Veronica Vannucci.

**Two automatic lines for large batches**

Verniciatura Vannucci already had two automatic powder coating plants designed to handle high volumes of small to medium-sized components. These lines apply both one- and two-coat systems, with the option of including an anti-corrosion primer depending on the product's intended use. "The choice of cycle performed depends on the conditions of use of each part. For example, electrical panels intended for installation in humid environments, a sector in which we are particularly active, require a coating that complies with corrosion class C5 and can withstand salt spray tests for up to 1,440 hours," explains Veronica Vannucci. The chemical pre-treatment process used on these two lines is traditional: degreasing, phosphodegreasing, and rinsing with osmotic water.

**A third plant to boost production capacity**

"Since the beginning, we had also been using a standard manual booth for coating large components and small batches," adds Veronica Vannucci.



**Verniciatura Vannucci Srl is an Italian company specialising in powder coating metal surfaces.**

**On the left: the pre-treatment tunnel.**

**Above: The powder coating booth.**



**The loading/unloading station.**

"However, we had been feeling the need to upgrade it for some time, as it did not include an automated cleaning phase: the components were cleaned manually, with results that were inevitably inferior to those guaranteed by an automatic solution." To improve process quality, increase efficiency, and optimise its entire production flow, the company thus recently decided to install a new, semi-automatic powder coating plant supplied by Eurotherm (Volpiano, Turin, Italy) and integrated with the TORAN 3® pre-treatment system from Chemtec (Corbetta, Milan, Italy). "Over time, we had been assessing the new technologies available on the market, focusing on semi-automatic lines equipped with a manual monorail conveyor, which had proved to be more practical and faster for treating large-sized components. We completed the installation of the new plant between the end of 2022 and the beginning of 2023, and at the same time, we started using Chemtec's chemical product," indicates Veronica Vannucci.

**Technical features of the new plant**

The new system, designed to ensure maximum flexibility and high performance, handles workpieces up to 6,500 mm in length, 1,500 mm in depth, and 2,400 mm in height. The weight capacity of the loading bars is 1,000 kg, allowing the handling and treatment of particularly sturdy and heavy structures.

The line includes the following elements:

- ◆ an automatic Ecojet cleaning cell;
- ◆ a powder application booth;
- ◆ a static curing oven with a maximum operating temperature of 200 °C;
- ◆ a semi-automatic overhead conveyor with integrated transfer solutions for smooth and safe part handling throughout the various stages of the coating cycle;
- ◆ a motorised lifting station for loading/unloading products with a capacity of up to 1,000 kg.

The plant is also already optimised for future expansion and reconfiguration, ensuring maximum flexibility and adaptability to new production requirements.



**On the left the drying and/or curing oven and on the right the pre-treatment tunnel.**

### Technical features of TORAN 3®

The investment in the new plant also included the implementation of Chemtec's TORAN 3® pre-treatment product. The new cleaning cell uses this innovative chemical, which enables cleaning, rinsing, and passivation to be carried out in one stage without using water and, as a result, without generating waste water for disposal. "TORAN 3® is a latest-generation, single-phase product that has revolutionised the pre-treatment process, making it more efficient, sustainable, and environmentally friendly," explains Tommaso Giovenzana, Scientific Research & Business Development expert at Chemtec S.r.l. "It gives rise to an anhydrous process based on functionalised polymers in organic fluids, capable of ensuring deep and consistent cleaning. The polymers are designed to break down, encapsulate, and neutralise the oils on the parts' surfaces, thus preventing these contaminants from interfering with the subsequent surface treatment stages. The inactive oils are encapsulated and retained in the bath itself, keeping the liquid clean and effective over time. By incorporating the contaminant, the polymers also create an ultra-thin protective film (about 0.5 microns) on the cleaned components, which promotes paint adhesion and temporarily protects the parts from corrosion if they are not coated immediately, preventing premature oxidation."

### An innovative pre-treatment process

The new pre-treatment process takes place inside a cleaning cell equipped with spray bars designed to apply TORAN 3®. "It begins in the loading area, where the load bars are positioned manually onto the overhead conveyor. The workpieces are then transferred into the cleaning cell, which closes hermetically to start the cycle," illustrates Tommaso Giovenzana. "The spray nozzles are mounted on a mobile gantry that moves longitudinally, ensuring that the cleaning product reaches the parts' surfaces completely and evenly. The system is also integrated with a static oven used both for drying after pre-treatment and for paint curing."

### Operational and environmental advantages of TORAN 3®

"TORAN 3® is extremely versatile and compatible with all types of paint, including multi-metal and multi-coating ones, such as industrial polyesters and architectural products. The resulting system marks a significant technological advance thanks to its operational flexibility and increased load capacity. It guarantees consistent quality, application precision, and high productivity even with small to medium batches. At the same time, the modular configuration and the presence of operators in the most critical phases allow adapting the coating cycles to the specific protection and finishing requirements of each end customer," says Tommaso Giovenzana. "Another important advantage of TORAN 3® is its durability over time, as the pre-treatment

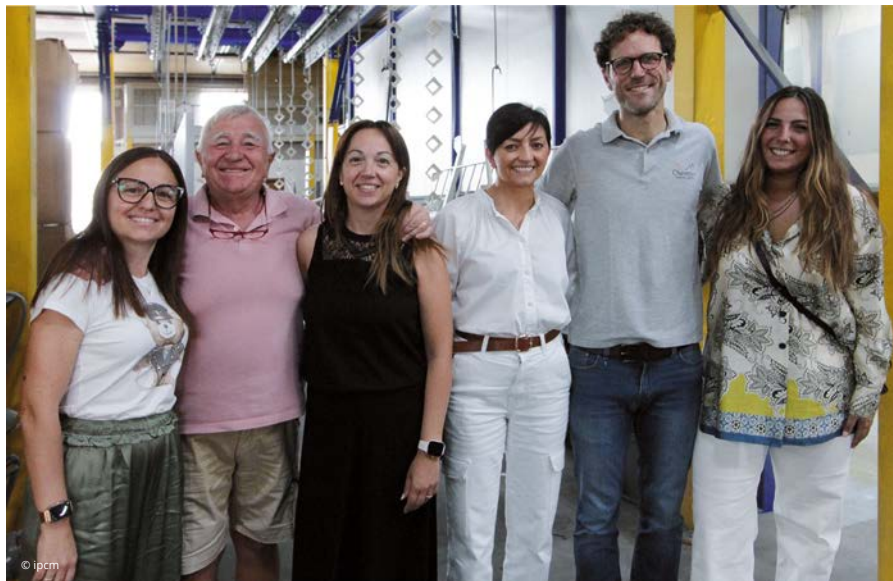


# MOVING WITHOUT LIMITS

**MONORAIL, POWER&FREE, MORRIS,  
AND MANUAL CONVEYORS FOR:**

industrial processes | surface treatments | material handling





**From left to right: Veronica, Sandro, and Valentina Vannucci from Verniciatura Vannucci, Alessia Venturi from ipcm®, and Tommaso Giovenzana and Beatrice Turri from Chemtec.**

**The buffer of the monorail overhead conveyor.**

bath does not require complete replacement but is simply replenished with the amount of product consumed. Quality control is carried out quarterly by analysing samples collected directly from the plant and sent to the laboratory, where key parameters such as polymer concentration, oil content, solvent quality, and impurity levels are checked. In 99% of cases, the results confirm the effectiveness of our product; in the event of anomalies, targeted corrections or calibrated dilutions are made to ensure optimal performance at all times."

"TORAN 3® is a simple-to-use, low-environmental-impact technology that integrates perfectly with this new coating plant. It provides a uniform and sustainable pre-treatment process, while its ability to work without having to add water or dispose of waste water reduces waste and streamlines daily process management without compromising quality. Finally, TORAN 3® is versatile and compatible with different types of paints, ensuring high and consistent performance over time," adds Beatrice Turri from Chemtec's sales & marketing office.

**Conclusions**

"We are completely satisfied with our new semi-automatic plant and the TORAN 3® pre-treatment product. This investment was essential to replace an obsolete machine that lacked automatic part cleaning and only relied on manual labour. In addition to filling a significant technological gap, our main objective was to improve our finishing quality, especially for larger components than those treated with our automatic lines. The resulting line has far exceeded expectations in terms of both quality and energy efficiency. As a cold product, TORAN 3® eliminates the need to dispose of chemical waste, does not waste water, and does not require waste water treatments. Finally, the system does not require daily checks or titrations, thus greatly streamlining management without compromising quality," concludes Veronica Vannucci. "This translates into faster and more reliable operations, with a positive impact on our entire production process. Our customers have also confirmed the improvement in our coatings' quality." ▶