





# Metalcolor: a New Coating Plant with a Low Environmental Impact for Greater Production Versatility

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In each issue of ipcm®, we bring examples of companies that, regardless of their size, employee number, turnover, and production capacity, have recognised the importance of making targeted investments to establish themselves in their target sectors and stand out in an increasingly fast and competitive market through very high quality standards. An ever-changing market, however, entails an evolution of the demand itself. This, in turn, means that companies must cope with the most diverse needs, thus always taking new challenges and looking for the right investment and the most suitable technological partner.

This is the case of Metalcolor (Caprazzino di Sassocorvaro, PU, Italy), belonging to the Epta Group and specialising in the treatment and coating of metal. In 2015, it implemented an important site expansion project (also reported by ipcm®<sup>1</sup>) by moving to a 3500 m<sup>2</sup> facility equipped with cutting-edge systems, with the aim of specialising in particular in the treatment of large-sized parts. For

this purpose, Metalcolor collaborated with SAVIM Europe, a company that designs and produces both manual and automatic complete coating systems. In 2016, faced with an increasing demand and aiming at opening up to new sectors, Metalcolor turned again to SAVIM Europe to install a second coating system. "In order to expand our service range without slowing down our heavy

whereas for the pre-treatment phase we adopted Chemtec's one-stage process Toran 3®: an innovative technology with a low environmental impact that uses organic polymers."

## The new painting line for light carpentry components

"The layout of the first plant installed by SAVIM includes two thermosetting powder

application booths, one automatic and one manual, an oven booth to apply liquid coatings on parts up to 14 m, and a static oven for polymerising powder coatings. The pre-treatment is performed with an automatic shotblasting system or, in the presence of complex shapes, with a manual sandblasting operation," says Davide Dini.

"Treating light carpentry workpieces in such a large system, however,

was uneconomical and not very productive. A new automatic line was therefore started in November 2016 (**Fig. 1**), equipped with a one-stage pre-treatment tunnel, a drying oven, a Wagner SuperCenter booth featuring a quick colour change system and 10 guns (**Fig. 2**), and a bell curing oven (**Fig. 3**)."



**Figure 1: The new coating system designed by SAVIM Europe.**

carpentry production rate, we installed a new automatic powder coating line devoted exclusively to the processing of small components such as sheets and carters (**ref. Opening photo**)," explains Metalcolor production manager Davide Dini. "We relied again on SAVIM Europe,

<sup>1</sup> "A coating line designed specifically for the heavy carpentry sector and to ensure maximum energy savings" ipcm®, International Paint&Coating Magazine Vol. VI, No. 35 September-October, pages 104-108

**Opening photo:** in order to expand its service range, Metalcolor (Caprazzino di Sassocorvaro, PU, Italy) installed a new automatic powder coating line devoted to light carpentry parts.





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**Figure 2: The Wagner SuperCenter automatic coating booth with a quick colour change system.**

“On average, we perform two colour change operations a day, working in two shifts. In order to make our production flow more flexible, besides the automatic booth we added a small manual unit built by us. This is devoted to the coating of batches requiring different colours than the one applied on the automatic line,” says Dini. “The polymerisation oven is about 3 m long and, like the drying oven, it is equipped with a modulating air vein burner that, compared with a conventional burner, ensures lower pollutant emissions and higher energy saving thanks to its high combustion efficiency.”

The new plant features a 124 m long one-rail overhead conveyor and it was designed to fit the available space. “One of the main issues of this project was the relatively small space available in our factory. SAVIM Europe

managed to design a functional but compact system: a simple solution, but able to meet our needs and required standards,” states Dini. “Moreover, Metalcolor pays great attention to environmental sustainability and it has

**“The pre-treatment tunnel of the new plant is about 10 m long and equipped with a containment tank with a capacity of about 2,000 litres. It uses Chemtec’s Toran 3® technology, a VOC free process based on organic fluids and developed to clean, degrease, and protect metal surfaces.”**

always been committed to reduce pollutants. This is also reflected in the choice of both the coatings used, which are free of solvents, chromium and lead, and the plant installed, with a low environmental impact and ensuring considerable energy saving.”

### **Toran 3®: a one-stage pre-treatment process based on organic fluids**

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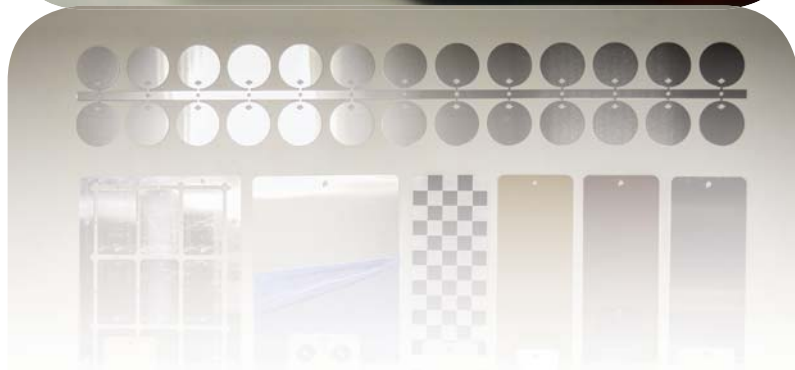
containment tank with a capacity of about 2,000 litres. It uses Chemtec’s Toran 3® technology, a VOC free process based on organic fluids and developed to clean, degrease, and protect metal surfaces (Fig. 4). “Metalcolor treats several different materials for different industrial sectors. Our customers are mainly manufacturers of machines for marble, glass, and wood processing,

whose components are usually treated by our plant devoted to heavy carpentry parts. Carters, doors, and sheets in general, on the other hand, are processed in the new dedicated system. The materials used are also different: carbon steel, cold galvanised steel, iron, and aluminium.



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**Realizzazione di campionari colori e finiture ad effetto per i produttori di vernici anche in formati speciali (farfalla, mezza sfera).** Ciclo di produzione integrato dal taglio delle pastiglie alla verniciatura dei pannelli fino alla personalizzazione grafica della mazzetta.

**Lamierini per test di laboratorio secondo standard Qualicoat e Unichim.**

**Creation of colour and effects samples for the coatings manufacturers even in special formats (fan-shaped, folding).** Integrated production process from the cutting of the sheets to the painting of the panels and the graphic personalisation of the sample colour swatches.

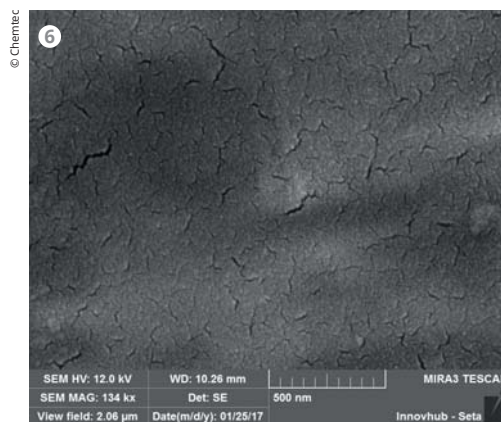
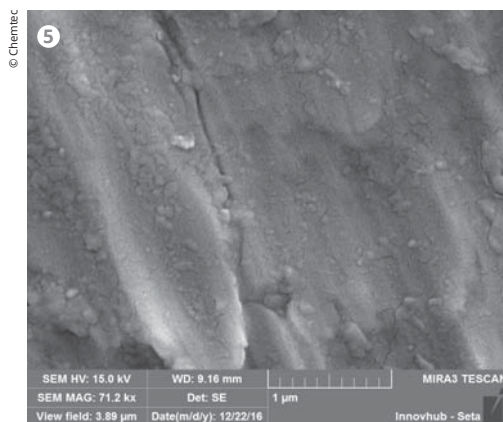
**Test panels according to Qualicoat and Unichim standards.**



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Figure 4: The containment tank for Chemtec's Toran 3® process.





**Figures 5 and 6: A SEM image of a steel Q-Panel degreased without Toran 3® (left) and treated with Toran 3® (right).**

That is why we needed a versatile multi-metal pre-treatment process able to handle different types of workpieces while maintaining a high quality standard," says Davide Dini. "We had the opportunity to verify the effectiveness of Toran 3® first-hand in a few plants in France and we decided to adopt it, too."

The process operates at room temperature in one stage including treatment, dripping, and drying at a maximum temperature of 140 °C. Toran 3® consists of polymers and special additives dissolved in a particular mixture of organic fluids. When the product dries, cross-linking of polymers occurs; they coat the surfaces with a very thin continuous three-dimensional conversion film, which is about 1 micron thick and able to increase adhesion of the coating (epoxy, polyester, or mixed), provide oxidation protection, and improve corrosion resistance (Figs. 5 and 6).

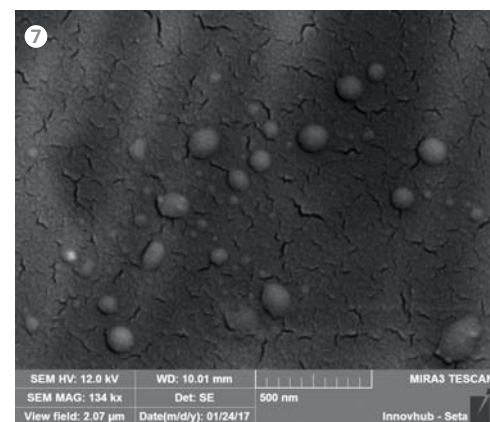
"We performed some tests with Chemtec's cleaning process and, with one powder coat, we managed to achieve a salt spray resistance value of 500 hours," says Davide Dini. "Before installing the new system, we only implemented a mechanical pre-treatment that, however, could not ensure perfect paint adhesion on some types of parts. With this new pre-treatment process, we have managed to get excellent results in terms of both adhesion and corrosion resistance."

The organic polymer that covers the components absorbs oils and organic contaminants up to about 1.5 g of oil per square metre treated (Fig. 7). The process, therefore, traps oils and grease in the three-dimensional structure of the polymer created on the metal. It does not generate any waste, but it rather converts contaminants into an active part of the



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treatment. "We were particularly impressed by the presence of a microprimer that, as well as degreasing the material, incorporates dirt and contaminants. This translates into a lower environmental impact because there is no emission or creation of solid waste to be disposed of. This is perfectly in line with our corporate philosophy of respect for the environment, including the working one, which in this way is cleaner and safer," states Dini.



**Figure 7: A metal sheet with Toran 3® + 2% of laminating oil: the oil is incorporated into the polymer in "nanobubbles".**

## Conclusions

"Metalcolor was established in 2005 and initially it was equipped with a small coating plant. Our immediate strong growth led us to install a larger system designed by SAVIM Europe, which enabled us to cope with the growing demand from our area," says Davide Dini. "Then, in order to be even more competitive and grow in terms of

production, we realised that we had to invest again in coating.

That is why we relied on the expertise of SAVIM, which once again met our needs with a compact, functional, advanced, and eco-friendly system, the latter characteristic being very important for us."

"The integration of our previously implemented mechanical pre-treatment with the Toran 3® organic fluid-based one provided by Chemtec allowed us to solve

the problems we encountered in the cleaning of some parts. We immediately obtained excellent results that enabled us to successfully meet even the most particular customer requests and specifications," says Davide Dini. "The whole plant can be managed by one control panel. This facilitates the timely resolution of any problems and the maintenance operations. Two years after the installation, we cannot but be very pleased," he states. ○