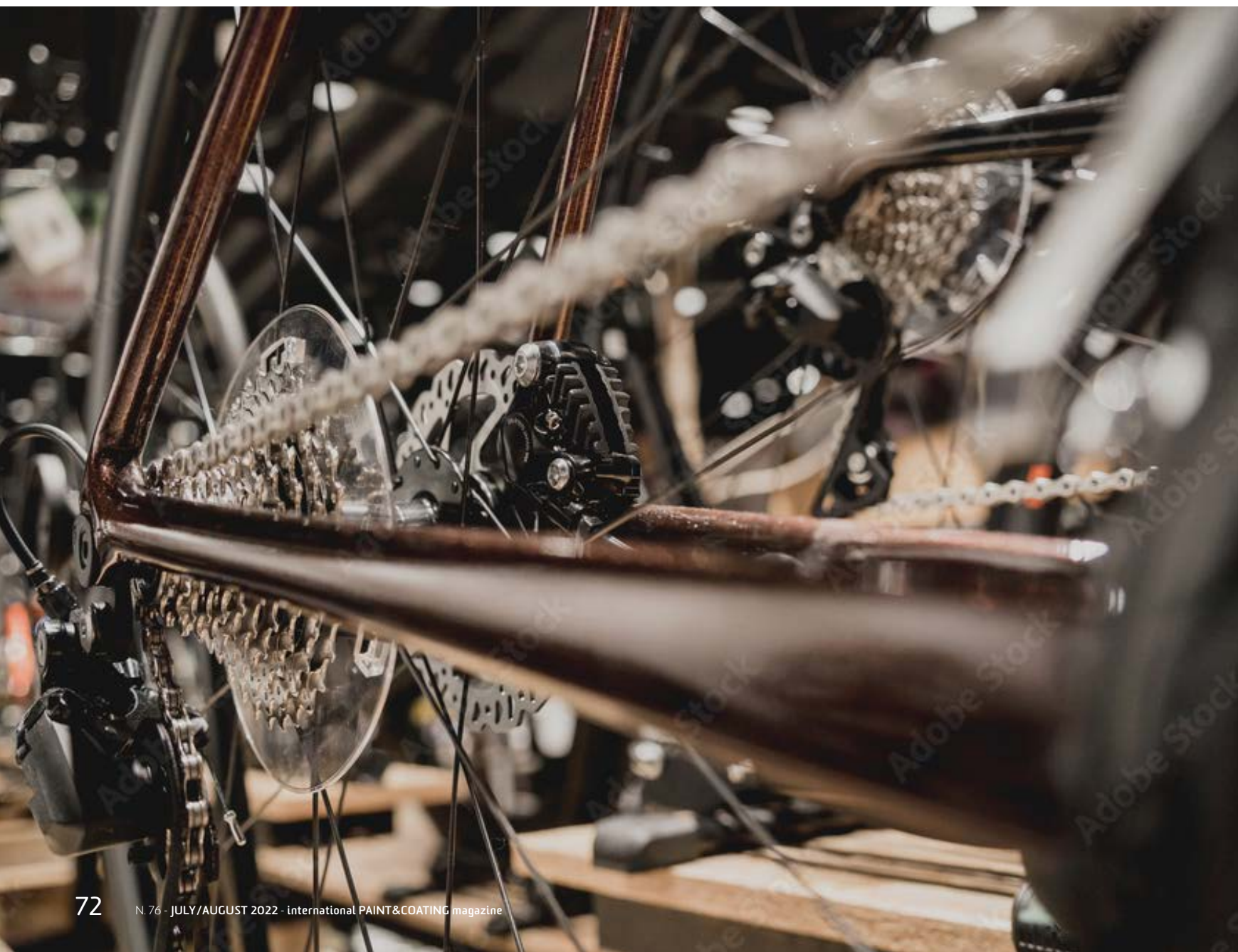




Quick Colour Change as a Growth Strategy for a Coating Contractor

Gabriele Lazzari **ipcm**[®]

In order to expand and grow, coating contractor Sa.Ve.M. decided to broaden its target markets and treat small components for the ACE and furniture sectors, as well as bicycle frames with different geometries. In order to quickly meet all customer demands, it chose Gema's MagicCompact EquiFlow booth and OptiSpray AP 01 pumps with Smart Inline Technology to perform colour change operations in just two minutes and improve finishing quality.



Gema's MagicCompact automatic booth and OC07 powder management unit.



Bicycle handlebars moved from the overhead conveyor to the chemical pre-treatment tunnel.

Differentiating its target markets can help a coating contractor to expand and grow. The key to success with this strategy is to achieve the highest quality possible for all types of products handled, regardless of their shape, size, coating specifications, and required finishes. This means that it is necessary to invest in flexible technologies that can be easily adapted to the needs of different customers and the characteristics of different parts without requiring the installation of more than one coating line. Sa.Ve.M. (Borgo San Dalmazzo, Cuneo, Italy) is a coating contractor specialising in bike frames. In 2021, 1,975,000 products were sold on the Italian bicycle market, with a 5% increase over the previous year for e-bikes¹. This required the industry to produce numerous types of bicycles (racing, road, mountain bike, electric, etc.), with different shapes, sizes, and aesthetic characteristics. Having decided to expand its product range even beyond, up to including components for the agricultural machinery and school furniture sectors, Sa.Ve.M. initially encountered some difficulties in optimising its production flow, as its spray paint booth required up to two hours for the colour change operation.

¹ <https://www.repubblica.it/motori/sezioni/attualita/2022/04/14/news/la-febbre-delle-bici-in-italia-mercato-vicino-a-due-milioni-di-pezzi-345438184/>

It therefore approached Gema Europe to cooperate on developing an ideal solution, capable of integrating with its existing coating plant. In March 2022, Sa.Ve.M.'s premises were integrated with a Gema MagicCompact EquiFlow powder coating booth with Smart Inline Technology feed pumps and a Gema OC07 powder management unit, aimed at enabling the coating contractor to improve paint penetration and spreading, reduce powder consumption, and above all speed up its whole production process, with colour change operations carried out in just two minutes. "The market is changing rapidly and requires very tight delivery times. Over the years, Sa.Ve.M has always invested in new technologies to expand and respond to the new demands of its customers. When the our colour change and production speeds started to slow down our growth, we decided to take action to further improve our offer and provide all customers with a quick and high-quality service," states Fulvio Giordano, the CEO of Sa.Ve.M.

From an exclusive contractor to a flexible business

Fulvio Giordano founded Sa.Ve.M as a contract coating company in 1996, when he took over a business specialising in sandblasting and liquid painting of bicycle frames from its previous owner. The company exclusively coated components for the Aurelia Dino brand (now Dino Bikes), an international manufacturer of adult and children's bicycles.



Sa.Ve.M. parts at the entrance to the coating booth.



Automatic powder coating.

This is why it had installed five manual powder coating booths, one for each frame colour in the Dino Bikes range (i.e. red, blue, white, black, and fluorescent green).

However, Giordano decided to expand the firm's production capacity and target markets by starting to treat components of agricultural and food machinery, fans, and school furniture for small, local craft and industrial manufacturers. In order to meet the different requirements of its new customers, in 2007 Sa.Ve.M installed a four-stage cleaning tunnel (phospho-degreasing, two rinses, and final drying in an oven). Moreover, with the aim of appropriately handling even components that required mechanical pre-treatment, in 2010 it replaced the sandblasting plant inherited from the previous company with a semi-automatic rotary hook shot blasting system supplied by OMSG - Officine Meccaniche San Giorgio S.p.A. "The addition of new machines allowed us to differentiate our target markets. However, customer requirements continued to change, and we were no longer able to meet all demands with our five manual booths alone. Therefore, we installed an automatic movable booth with two reciprocators, equipped with three guns each," explains Giordano. "We thus grew and became more flexible, adapting our processes to the new parts to be coated."

Sa.Ve.M.'s growth

The automatic booth was mainly used to paint batches of the same colour. In fact, when a colour change was necessary, the machine had to be moved and cleaned by an operator – which could take up to two hours – while the five manual booths were used for coating. "The amount of batches to be painted had undoubtedly increased, so much so that we were working on two shifts. Bicycles still accounted for most of our workflow, but they were of different types. We treated frames and components for men's and women's bicycles, children's bicycles, racing bicycles, mountain bikes, and electric bikes, which had to be touched up by hand. At the same time, some customers also supplied us with small quantities of parts for other markets, while others only relied on us for one month a year. Therefore, our production was (and still is) very varied. Yet, our colour change operation, which was crucial to quickly meet customer demands, was difficult and time-consuming. This is why we decided to invest in a new automatic powder application booth," states Giordano.

Gema's supply

"The positive experience we were having with our automatic booth convinced us to continue investing in automation. We carried out

market research and asked for the opinion of many fellow coaters. We then decided to rely on Gema, after listening to numerous testimonials and acknowledging the professionalism demonstrated by their technicians in the initial phase of our collaboration. They listened to our needs, visited our plant to study its layout, and finally identified the most suitable technologies," indicates Giordano.

The solution provided by Gema was the MagicCompact EquiFlow rectangular booth, complete with a cyclone, eight OptiSpray feed pumps with Smart Inline Technology, two reciprocators, and a powder management unit for quick colour change operations. The booth's structure, built in plastic, prevents powder from accumulating on the bottom and adhering to the walls, while its H-shaped design ensures excellent air distribution and balanced suction. The reciprocators are equipped with three nozzles per side and two hand guns at each end of the booth for pre- and post-finishing operations. The booth is also equipped with a gantry structure housing sensors for workpiece recognition, which allows the powder coating process to be automatically managed according to the type of part to be treated. In anticipation of a possible need to further expand production, Gema's booth can also be configured differently in terms of size, air intake volume, and number of guns and manual touch-up stations. The OptiSpray feed pumps with Smart Inline Technology, using a single-channel circuit, generate a homogeneous powder flow and guarantee improved spray pattern management. Indeed, they allow a precise quantity of powder to be dispensed, varying according to the different application needs, while maintaining a constant flow. The booth is designed for quick colour change operations and automatic cleaning of internal circuits, the float, spray pipes, and spray guns. "Bicycle frames, which account for most of our workflow as explained, usually have a similar shape and never exceed 1,200 x 600 millimetres. However, as our business' expansion had also brought new customers, we needed to be able to adapt the flow of powder delivered to the size of smaller components with different geometries. Incidentally, the sensors placed at the entrance of the booth allow the paint to be dispensed only when the workpiece is in the exact position, thus also guaranteeing a considerable saving of paint product," notes Giordano.

Colour change in two minutes

"Thanks to the MagicCompact EquiFlow booth, Sa.Ve.M. is now able to coat parts with a conveyor speed of 3.6 metres per minute, almost twice as fast as the previous manual process, with which operators were not able to exceed 2 metres per minute. In addition, being in-line and installed after the pre-treatment tunnel, Gema's solution has enabled our whole production flow to be sped up as well. However, although the speed with which parts are pre-treated and coated has certainly increased, the most important aspect for us has been the



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Workpieces leaving the coating booth and the OptiSpray AP 01 feed pumps with Smart Inline Technology.

extreme speed of the colour change operations, which previously slowed down our entire workflow," says Giordano. In fact, the company had experienced several difficulties in optimising its production rhythms due to the time required for colour changes. "Our customers expect maximum production speed from us. We now perform four colour change operations per shift, in order to fulfil all orders as quickly as possible. With the previous booth, as mentioned, we had to spend a lot of time cleaning between colour changes, which slowed down production. On the other hand, Gema's new booth is self-cleaning and it allows selecting between two different cleaning modes for the powder management unit, the tank, the pipes, the booth, and the cyclone: Fast and Quality. For example, if we have to apply a tint that is similar to the previous one, as in the case of changing from white to beige, the Fast automatic cleaning mode enables us to apply the new powder in just two minutes. Other times, when we need to change to a very different colour, such as from red to fluorescent green, we select the Quality cleaning cycle. In any case, we never exceed six minutes for a quick colour change operation," points out Giordano.

Smart Inline Technology: higher quality and lower consumption

Although it has only been installed for four months now, Gema's booth has already given satisfactory results. "In addition to speed, the quality of our finishes and the healthiness of our working environment have also increased," notes Luigi Benvegna, the production manager of Sa.Ve.M. "Gema's SIT technology has brought us three advantages right from the outset: powder penetration and spreading have improved,

and powder consumption has decreased." "Previously, it was sometimes necessary to work on two shifts in order to carry out all the necessary touch-up operations so that our coated parts met our internal requirements in terms of product quality. With Gema's technologies, on the other hand, although our booth is equipped with two manual spray guns, we have never had to carry out any touch-up. The productivity rate attained enabled us to discontinue the previous automatic booth and two of the five manual booths. We kept the other three for testing and sampling, but we no longer use them for daily production," indicates Giordano.

A tailor-made solution for the needs of Sa.Ve.M.


"Although the quantity of batches to be treated has increased, our cycle time has decreased and we now only work on one shift. Thanks to our collaboration with Gema, we are now equipped with a compact booth, which is installed in-line with the already existing pre-treatment tunnel and curing oven and which has allowed us to overcome the critical issues in our production process related to colour change. The MagicCompact EquiFlow automatic powder coating booth and Gema's other technologies were the ideal solution to solve our problems. In addition to a considerable saving in powder, which was an incidental requirement, Gema's equipment also has made it possible to improve our paint penetration and spreading rates, even on difficult-to-reach surface areas such as the edges of complex geometries, which cause the Faraday cage effect," explains Giordano. "Many years ago, Sa.Ve.M. was the first company in the Cuneo area to use a powder coating plant, which accelerated our production rate and enabled us to expand the range of parts we could treat and

thus attract new local customers. We therefore upgraded our equipment and installed new machines to meet market demands. However, colour changes continued to be a problem. That is why our collaboration with Gema has been so fruitful. The decision to rely on them has proved to be a winning one, because they listened to our requests and designed together with us the most suitable solution for our production process: a state-of-the-art dense phase system," states Benvegna. "In addition, their SIT technology has enabled us to improve our final quality degree and reduce the time needed for quick colour change operations. In turn, this has increased our turnover, improved the healthiness of our working environment, and decreased powder consumption. Our investment paid off handsomely and we solved all the issues we were previously encountering. In fact, we could say that Gema's booth has actually caused us some positive problems, because our shot blasting machine is no longer suited to our new production rates and we will soon have to install another belt machine," Giordano jokingly concludes.



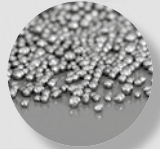
Coated furnishing components ready to be shipped to the customer.

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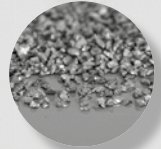


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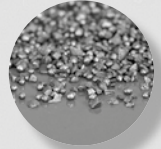
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