



Automating the Painting of Infrastructure Maintenance Machinery to Achieve a Greater Efficiency of The Process: The Choice of RASCO

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In order to automate the painting process and reach an even higher quality level, Croatian infrastructure maintenance machinery manufacturer RASCO installed a new automated painting line provided by Eurotherm.

The one we are about to tell, is a story that portrays the resilience and ingenuity. It all starts in 1990, when two engineers, Frane Franičević and Darko Paviša, founded a craft workshop that dealt with fixing parts of agricultural machinery and refurbishing tool machines.

Soon, a company that needed spare parts for road maintenance machines approached the two engineers. Yet, the timing could not have been more off: the war had started and importing machine parts was very difficult.



Founded in 1990 and headquartered in Kalinovac (Croatia), RASCO manufactures infrastructure maintenance machinery, such as snowploughs, salt spreaders, crane mowers, compact sweepers and multi-purpose vehicles.

This is when RASCO's founders decided to try their hand at producing spare parts for road maintenance machines, soon realizing that they could actually manufacture the entire machine by themselves. By 1994, they built their first snowplough and the first salt spreader, paving the way to the production of infrastructure maintenance machinery, which is to this day the core business of RASCO. In fact, after the war, reconstruction in Croatia begun, starting with roads, which were in need of maintenance equipment. In 2000, from a local business RASCO became an established, structured company, exporting its machinery abroad, establishing its presence in several different markets and employing about 100 people by 2010. Today, the company counts 400 employees, two factories – one in Croatia and the other in Serbia – and a distribution network that covers over 40 countries, offering about 70 products for infrastructure maintenance, such as snowploughs, salt spreaders, crane mowers, compact sweepers and multi-purpose vehicles. “We have a fully integrated process. This means that the production process takes place in-house, starting with the raw metal and ending

with the finished product, including electronics, hydraulics and mechanical parts”, states Ivan Franičević, the son of one of the two founders, Frane Franičević, and CEO of RASCO. “Our production includes several different products, each with its own peculiarities and specifications, especially when it comes to the painting process. When we started an investment project to expand our production facility, we also wanted to find a solution in order to install a new automated painting plant that could help us reduce human manipulation as much as possible, without compromising on quality”. For the installation of the painting installation, RASCO relied on Eurotherm, a manufacturer of coating lines based in Turin (Italy).

RASCO's production process

“The production process at RASCO starts with raw materials, which undergo machining operations such as cutting, grinding, drilling, bending and welding. After the mechanical processes, the pieces are ready for the surface protection process, which consists of mainly two steps: chemical and mechanical pre-treatment and liquid painting. Once the pieces are painted, they are assembled and



The liquid painting line with the automatic Power&Free overhead conveyor designed by Eurotherm.



the final product is ready to be delivered”, explains Ivan Franičević.

“RASCO’s product portfolio comprises of more than 70 products. This entails different painting processes according to the product’s quality specifications and end use. We usually employ different painting systems, from the monolayer (direct-to-metal) one to the three layers (primer + basecoat + topcoat) one. However, we also have painting systems that have been specifically developed in collaboration with our suppliers to achieve extremely high levels of corrosion protection. For example, for the salt spreaders, which work in the worst possible environment for any metallic part, due to the constant presence of salt, moisture and abrasion from the materials they’re spreading, we have an anticorrosion system specifically designed for this application, which can reach thicknesses of over 400 microns”.

“We’ve always taken great care of our surface treatment process, investing a lot in it: guaranteeing product quality is a must for our business and it’s not only a matter of achieving a good aesthetic quality but first and foremost of ensuring the durability



The automatic power&free overhead conveyor (on top) and the loading and unloading area.

of the product itself, since they are usually employed in tough environments”.

“However, ensuring optimal quality has to go hand-in-hand with cost and production efficiency. This is why, even though we know the difficulties posed by the very nature of our products, we embarked on a journey to automate the surface treatment process as much as possible. We reached our goal with the installation of a new painting line that allowed us to maintain a high level of quality while eliminating the most time-consuming steps of the process, which required human intervention, i.e., moving the pieces from one stage to the next”.

“Therefore, once we started to expand our production space, it became clear that it was time to start thinking about a new automated painting installation. We needed to find a partner that could not only deliver a project for our scope but that could

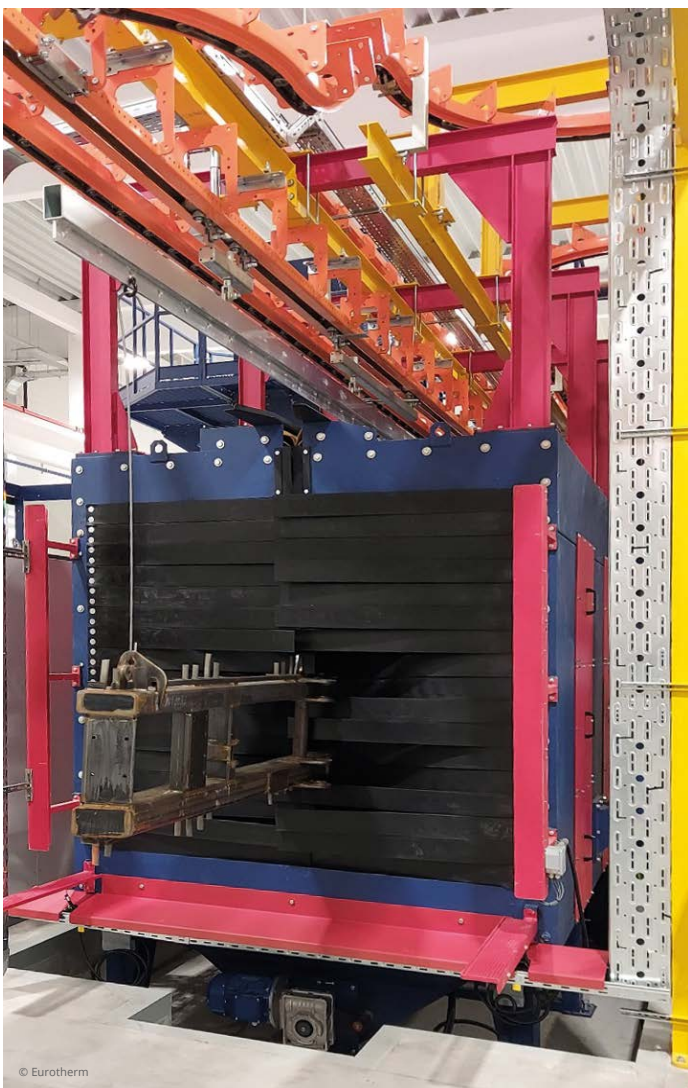
also integrate the new system into the new structure while it was being built. We found this partner in Eurotherm, which acted as a system integrator, designing the entire system and coordinating all subcontractors”.

The new painting line

After undergoing a chemical pre-treatment process to remove any residue from machining operations that could jeopardize the efficiency of the mechanical pre-treatment, the pieces are brought to the new 60-metres long painting line installed by Eurotherm.

The pieces are loaded onto the Power&Free overhead conveyor, equipped with two elevators and with a step-by-step advancement. Then the parts are moved to a buffer where they are stationed, waiting to be painted.

When the time is right, the parts pass through a continuous through-



The entrance of the automatic shot blasting machine with turbines supplied by Cogeim.



The blowing zone after the shot blasting.



One of the two pressurized painting booth.

feed, suspended load GTU shotblaster provided by Italian company Cogeim, capable of treating them up to the SA 2.5 degree with a depth of approximately 60-80 microns.

The plant has been equipped with two abrasive elevators in order to make it more compact in height, given the limited space available in the Rasco factory.

The system, integrated into the coating line by Eurotherm, also features 8 high-efficiency single-disc turbines, each with an installed power of 11 kW, and an automatic grit recovery, cleaning, and selection system, which ensures that the abrasive used is always free of slag and impurities.

Moreover, the machine includes a touch-up and blow-off chamber with an operating dimension of 3 x 6 x 3 h m and a suction system for cleaning any residual abrasives from the workpieces. The maximum size of workable parts is 1500 x 4000 x 1500 h mm. In order to minimize sound pressure, the system has been equipped with a soundproof box. For greater filtration efficiency, in addition to a self-cleaning cartridge filtration unit, it features an absolute filter for the second abatement stage.

After undergoing the mechanical pre-treatment, the pieces enter the

first pressurised painting booth, in which Rasco applies the primer and /or the basecoat. Afterwards, there is a flash-off area and the baking oven, which operates at 80° C. Once the parts leave the baking oven, there is a cooling area and then a second pressurised painting booth, dedicated to the application of the topcoat, followed by a second flash-off and baking oven. Both painting booths are equipped with a desolvation chamber. Then, the power&free conveyor brings the pieces to a buffer. Once they are cooled off, the components are unloaded from the conveyor and sent to the assembly lines or to other production processes.

“Before installing the new painting system, we had three finishing lines: two with manual shot blasting and manual painting and one with automated shot blasting and manual painting. The new painting line by Eurotherm did not only expanded our production capacity but it also allowed us to shut down the old lines and recover that space for other production processes. Moreover, the new coating installation is completely automated and allows us a greater degree of flexibility: we can choose to apply one, two or three layers, according to the product requirements” explains Franičević. The liquid paints used are solvent-based, marine quality ones.

“We use marine quality coatings, usually from the Sigma Coatings brand by PPG, in order to provide a higher corrosion protection. In fact, we have anticorrosion systems that can reach up to 4000 hours of resistance in the salt spray test”, adds Franičević.

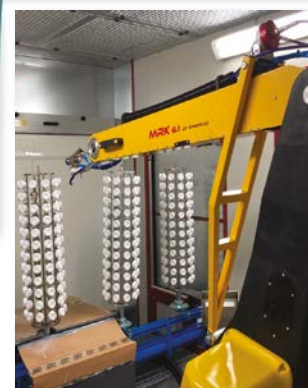
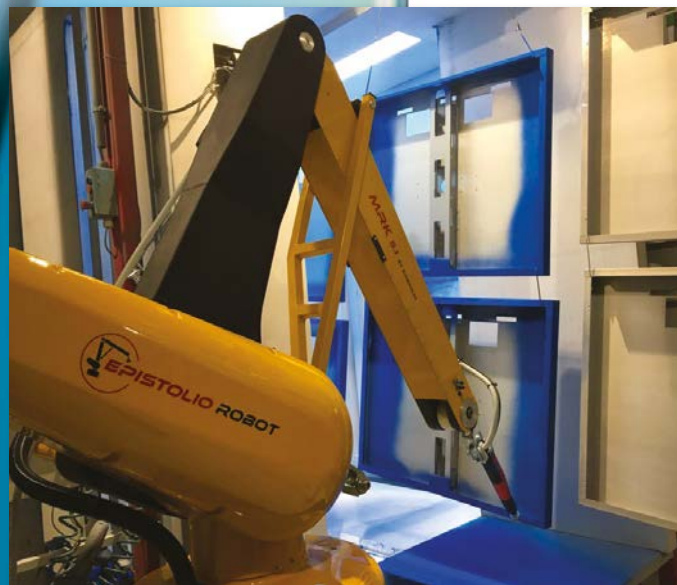
One global supply for an easy-to-manage system

“The purchase of the painting new line happened in parallel with the construction of the new building so we needed a supplier able to deliver good quality technology, understand our needs, deliver everything on time within the specifications we provided but also support us during the construction phase of the building itself. Another pivotal aspect for us was that we did not want to have



The flash-off tunnel.

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The paint kitchen.



Close up on Graco's Merkur pumps used for the paint supply.

to deal with several different suppliers. In Eurotherm not only did we find a reliable partner who perfectly understood our needs, delivering everything on time, but one that also acted as a system integrator, coordinating the entire project", explains Ivan Franičević. "All the technologies that make up the painting plant – from the conveyor to the shot blasting chamber up to the application booths and the ovens – can be managed from a single touchscreen control panel. This allows us to be very flexible, setting the process parameters and adopting the most effective painting system according to the specific requirements of the pieces to be coated. Another major advantage we

obtained with this new painting line is that we can now handle the parts quicker, without the need of human intervention. This contributed to increasing the quality of the end product, as well". "The line has been working for about three months now and we are very satisfied with it. The new line does not include the chemical pre-treatment phase because we already had a system for it. However, we are currently installing a new chemical pre-treatment system, provided by Eurotherm, as well. It will be ready in about three months and installed right next to the new painting line, to allow us even more flexibility", concludes Franičević. ●