



© OZ Spa

Opening photo: OZ has manufactured alloy wheels for racing cars and motorcycles since 1971.



FOCUS ON TECHNOLOGY

SPECIAL AUTOMOTIVE



Coating Waste Water Treatment: a Value Added to the Well-Known Quality of OZ Racing Alloy Wheels

Monica Fumagalli **ipcm**[®]

OZ Racing is a well-established Italian brand, known and appreciated by all car and motorcycle lovers. The company, which is headquartered in San Martino di Lupari, near Padua, is in fact one of the world top suppliers of alloy wheels for racing cars and motorcycles as well as the related aftermarket (**ref. Opening photo**).

It is also the proof that craftsmanship and attention to details, two factors behind a successful product, can be integrated in advanced and innovative industrial systems. “The more functional the systems and devices installed in our plant,” says Armando Gabbiadini, the coating department head at OZ Spa, “the higher the

possibility to ensure high quality for our wheels and the clients’ satisfaction, once the vehicle has been equipped with our products. The more the equipment installed meets the company requirements for a safe working environment, respecting the health of operators and the environment, the more we are stimulated to carry out our tasks in

SUPERIOR
POWDER
COATING
TECHNOLOGY

ms[®]
topcoater

the best possible way to keep up the OZ brand name (Fig. 1)."

Craftsmanship and quality, which have always characterised the production activity of OZ, as well as reduced environmental impact, are the requisites that drive this company's continuous search for improvement and are among the main reasons behind the implementation of always new systems. "In particular, the finishing treatments carried out in our industry are undoubtedly among those with the highest impact on the environment," adds Gabbiadini. "Last year, our company decided to invest in a plant for treating the waste water from our powder and liquid coating application booths, the goal being to reduce energy consumption and improve the management of the whole department in terms of maintenance." Chemtec, a company based in Corbetta, near Milan, was chosen by OZ to design and install a waste water purification plant to meet these precise requirements.



Figure 1: An OZ wheel is synonymous with quality.

The OZ legend

"Our company was set up in 1971 by Silvano Oselladore and Pietro Zen: the initial letters of their surnames were taken to create the acronym that identifies the OZ company," explains Martina Bordignon, Communication Manager at the Veneto company. "Both fond of cars and competitions, at the time they took part in a local rally with a Mini Cooper model fitted with alloy wheels made by them. The market then did not offer what they required: a lighter wheel than those used at the time. Their success was

such that in a short time the small firm became well known for its high quality products; in 1978, it became a joint stock company and opened its current plant (Fig. 2). In 1984, the OZ Racing division was created for the production of racing wheels, especially for the Formula 1 cars: the first vehicle to be fitted with these wheels was the Alfa Romeo Euroracing F1, which was equipped with magnesium and aluminium alloy wheels designed by Eng. Claudio Bernoni, the current CEO and President of OZ S.p.A. Since then, the company's history has been invariably linked to the great names of the car and motorcycle racing world."

Today the OZ plant covers a total surface area of 100,000 m² (of which 75,000 roofed) and has more than 180 employees; it offers

a range of 35 alloy wheel models, which mainly differ as for the type and vehicle range for which they are intended, with a total production volume of about 100,000 wheels a year.

"The racing sector, our core business, accounts for a small percentage of our turnover, the remaining part being accounted for by the aftermarket," says Bordignon. "Most of our products are destined to the foreign market, mainly Germany and Japan,

home to our two largest commercial branches, then the USA and Scandinavian countries. In line with our corporate policy, due to the strong desire of

our President, the OZ Racing wheels are entirely produced in Italy, helping make the "Made in Italy" brand universally known in the automotive and motorcycle world."

“The more functional the systems and devices installed in the OZ plant, the higher the possibility to ensure high quality for wheels and the clients' satisfaction, once the vehicle has been equipped with these products.”



■ Lightweight, efficient and easy to use





Figure 2: The headquarters of San Martino di Lupari (Padua), where the OZ Racing wheels are produced.

Racing alloy wheels: a matter of style

OZ operates on the spare parts market for cars and motorcycles with 4 brands: OZ Racing, a light and performing wheel inspired by the racing world technology; X Line, a range fit for any vehicle type; MSW, the first brand marketed by OZ in the 1980s; and Sparco Wheels, a range of wheels born from the collaboration between OZ and Sparco, an Italian company that produces and markets components and technical wear for automotive competitions.

“Attention to innovation in terms of both design and production technology is very important for us,” states Bordignon, “because it enables us offer always new and original solutions to our clients. From the lightest wheels to those with the

“OZ decided to invest in a plant for treating the waste water from the powder and liquid coating application booths, the goal being to reduce energy consumption and improve the management of the whole department in terms of maintenance.”

brightest colours, creativity in this sector is essential to get the best results in terms of technical performance and aesthetics. Our product underwent a major evolution as for the materials used as well: the alloy types used for the OZ wheels are the result of our long experience in the racing world.

The same technologies and know-how are also implemented in the production of wheels for the aftermarket, for which one of the lightest aluminium alloys is used, with a specific weight of 2.7 g/cm³. Magnesium alloys are instead used for the some racing wheels, depending on the championship of belonging, this being the lightest material among structural metals: it has a specific weight of 1.74 g/cm³, 35% less than aluminium. Magnesium alloys are therefore characterised by top lightness, resistance to impact and vibrations and they are not subject to stretching.”

OZ carries out strict control tests on its products: all its wheels are certified and approved by TÜV and by several Italian and international certification bodies. “Our company carries out a further test,”

© OZ Spa



Figure 3: The application of the liquid coating with a robot.

“OZ’s product underwent a major evolution as for the materials used as well: the alloy types used for the OZ wheels are the result of our long experience in the racing world .”

explains Bordignon, “that is not required from the suppliers of wheels for the aftermarket, but that guarantees the high quality and performance of our products. This is the LBF test, where wheels of any type and size undergo extreme stress tests by simulating a 35,000 km long race on the famous Nürburgring track and their reactions are carefully monitored.”

© OZ Spa



Figure 4: The application of the powder clearcoat.

Automatic washing cell

Cella di lavaggio automatica



for ALL type of surfaces
per TUTTI i tipi di superfici



info@eurotherm.eu

T + 39 011 98 23 500 F + 39 011 98 23 560

Via Pisa, 78 - 10088 Volpiano (TO) Italy

🇮🇹 EUROTHERM SpA 🇫🇷 EUROTHERM SAS 🇩🇪 EUROTHERM GmbH

eurotherm.eu

A production system inspired by the Toyota model

Since 2002, OZ has implemented Toyota's "Lean" approach, i.e. the so-called "just in time" production system. "The Lean system," says Bordignon, "turns the production cycle into a continuous flow. It also finds and eliminates any waste and introduces the "one piece at a time" concept, which streamlines production and complies with the craftsmanship attitude of our brand. Our focus on each production detail is the technological and stylistic aspect that makes us stand out in the racing world and the one on which the OZ Racing brand's success is based. For the production flow management, on the other hand, we have implemented the Kanban system, which enables us to gradually replace spares as they run out, thus avoiding high stocks and the related costs."

The production cycle, which is entirely carried out at the Padua plant, starts with reception of materials, which are subjected to two different treatment types: casting and forging. After casting, the ingots are processed in melting furnaces and then undergo a low pressure treatment using in-house produced moulds, from which wheels are obtained. As for the machining of forged wheels, which have higher performing features, the department receives the alloy billets on which further operations are carried out to remove the material in excess from the wheels' spokes to make them as light as possible. Every wheel is then subjected to heat treatment and coating, after which the wheels are ready for packaging and shipment.

Tailor-made finishing: the Personal Colour programme by OZ

The paintshop is equipped with a monorail floor conveyor that continuously transports the wheels to the two water veil spray booths – one equipped with a robot installed by CMA Robotics of Pradamano, Udine, Italy

“For several years OZ has been offering a programme called “Personal Colours” that provides its clients with a wide range of colours to choose the ideal one for matching the wheel with the car.”



Figure 5: The visual inspection after coating.

(Fig. 3), the other fitted with two automatic electrostatic guns supplied by Wagner Spa – and then to the automatic powder application plant (Fig. 4).

"Our coating system," explains coating department head Armando Gabbiadini, "includes a powder primer, a basecoat in several colours, and a liquid or powder acrylic clearcoat. All our coating products are supplied by Inver-Valspar and the German company Lankwitzer. A few months ago, we completed the replacement of solvent-based coatings with water-

based products, in compliance with the company's environmental policy. The coating application is followed by a flash-off process at room temperature for the clear liquid basecoats, and then the wheels are fed to the oven at 180 °C for 20 minutes. The average production capacity is 120 wheels/hour."

"For several years," states Bordignon, "OZ has been offering a programme called "Personal Colours" that provides our clients with a wide range of colours to choose the ideal one for matching the wheel with the car. We offer 10 different shades for the aftermarket sector, on three models of the i-Tech series, our top-of-the-range cast wheels. Also due to the large variety of models and colours offered, producing an alloy wheel for the aftermarket is not, as one may assume, a highly industrialised process: visual inspections and manual operations are still indispensable to obtain perfect finishes and ensure high quality (Fig. 5)." Quality is also guaranteed through rigorous coating tests. Along with adhesion and 1,000-hour salt spray tests, the wheels undergo other checks such as the CASS test, which measures their corrosion resistance inside a room saturated with a copper-saline-acetic solution for 240 hours, and the QUV test, which simulates the weather effects during the passage from night to day and in which the wheels are exposed for a long period (up to 700 hours) to UV rays in a dark environment with high temperatures, with humidity conditions that lead to dew formation.

A bottleneck in the coating phase: the removal of sludge

Until last year, the most critical aspect of the coating phase was the sludge removal operation, carried out manually in the static tank gathering all booths' waste water. Besides the waste of water resources, the two main issues were

Painting robots and turnkey solutions



Figure 6: The waste water treatment plant installed by Chemtec.

the need to frequently interrupt the coating cycle for the daily cleaning of the tank and the risk that the overspray particles accumulated, thus jeopardising the application results. The problem was solved with the installation of a purification system consisting of an automatic dirt separator that removes any trace of sludge and recirculates the clean water to the coating plant. “Chemtec has developed a custom-made system for OZ based on the production volumes of its paintshop,” says Carlo Guidetti, the owner of the Milan-based company, which specialises in the production of chemicals for the industrial surface treatment sector and which has been designing water treatment systems operating in both continuous and batch



Figure 7: The purified water tank.

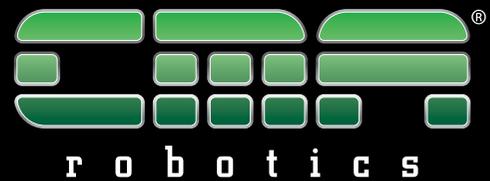


ATEX Certified 

Self-teaching Point to Point Off Line Scanner



astment



CMA Robotics Spa - Italy - T +39 0432 640172
www.cmarobotics.it - info@cmarobot.it

CMA Roboter GmbH - Germany - T +49 89 99216131
www.cmaroboter.de - info@cmaroboter.de

mode since 2014. “The system installed works in continuous mode to purify the waste water coming from the paintshop with a chemical-physical process. It removes sludge through a scraper that pushes such residues in a container specifically designed for the collection and drying of sludge, thus ensuring the water recirculated to the plant is perfectly clean (Fig. 6).”

The synergy between the purification plant and the eco-friendly chemicals: a peculiarity of Chemtec

The combination of the purification plant installed with the chemicals used is crucial to the efficiency of the waste water treatment system designed by Chemtec. “We have been formulating and producing eco-friendly chemicals for several years,” adds Guidetti. “The creation of a new division devoted to the waste water treatment processes has enabled us to design a plant that operates in harmony with the chemicals supplied, thus offering an eco-friendly process and a more efficient and flexible management of the plant.” “We supplied OZ with the coagulants needed to make the paint inert,” says Adolfo Palmanti, the Product Manager of Chemtec. “Although water-based coatings are now being used, these products still contain a few non-hydrosoluble components. When the paint comes into contact with the water veil of the booth, it is deactivated and turned into nanometre-sized colloidal particles. These micro particles are pumped from the collection tank under the coating plant to

the waste water treatment system. Here, flocculant is added to start the flocculation process, resulting in the formation of a large-size molecule whose electrostatic charge attracts the deactivated coating particles to obtain a light and non-hydrosoluble molecule that goes back to the surface (Fig. 7). These inert molecules are gathered by the scraper and pushed into the sludge container (Figs. 8 and 9). The products’ feeding and dosing occur in an automatic and timed manner through adjustable

dosing pumps. We also offer other chemicals for the control of the foam generated in the tank, of the particles’ microlife, and of the aqueous solution’s pH value.”

Eco-friendliness: a common goal

“Chemtec’s plant has three main advantages,” states Gabbiadini. “First of all, the coating system is more efficient: it performs better thanks to the reduction of overspray and it is more flexible because

we no longer need to stop it for our cleaning operations, so that it is always ready to operate. Secondly, we have reduced water consumption: water is constantly recycled and it does not need to be replaced, also resulting in cost savings. Finally, the management of the plant has been improved thanks to Chemtec’s assistance for both the plant and the chemical products, but also to the significant reduction in the amount of sludge to be disposed of by a specialised company.

“One of the most important aspects for us was the reduction of our polluting emissions,” adds Gabbiadini. “Chemtec shares our same environmental vocation: precisely thanks to this common goal, we have both strived to achieve such satisfying results. The collaboration of their staff has contributed to the improvement of the efficiency of our production flow, helping to maintain the high quality level that has characterised the OZ wheels for over forty years.” 



Figure 8: The scraper collects the inert molecules and pushes them into the sludge container.



Figure 9: The sludge container is replaced every two weeks and disposed of every six months.