HIMOINSA
A YANMAR COMPANY

Two-Layer Powder Coating Protects Generators

Surface finish for maximum resistance

Performance by design

Nordson

Cutting-Edge Generators Secure Power Supply

People rely on light and power from HIMOINSA gas and diesel generators when a public grid is not available. A superior powder coating finish ensures years of reliability – even under the most difficult climatic conditions.

The Company

Modern diesel and gas generators secure the energy supply on the open sea, in Antarctic research stations or at major events and often make the power supply of residences and industrial areas in distant regions possible. For this purpose, the Spanish manufacturer HIMOINSA manufacturers its gas generators, diesel generators, and light towers to withstand many years of use under the most difficult climatic conditions and up to the highest corrosivity category C5I-H. Around 60,000 generators are produced worldwide every year. Ten subsidiaries and 130 distribution partners are available for interested and existing HIMOINSA customers around the world for sales support and customer service. Powder coating equipment from Nordson plays a key role in its manufacturing process.

The Challenge

The silencer canopies are critical to ensure a durable protection for the sensitive interior of the generators themselves. Their resistance is determined and classified by means of salt spray tests. “Spraying the canopies with salty water simulates the aggressive conditions that many of our devices have to withstand over a long period of time when used in a climate with high humidity and a high salt content,” explains Manuel Ingles, Global Head of Procurement. “To pass the requirements set in the highest corrosivity category C5I-H, for example, a silencer canopy has to withstand 1,440 hours of extreme exposure to salt spray. This is equivalent to 15 years of use in such an environment. And to maximize the resistance of our silencer canopies, we focus on two aspects: the quality of our steel and the quality of our coatings.”

The Solution

With this goal in mind, HIMOINSA installed a new powder coating system from Nordson in 2018, initially in San Javier, Murcia, Spain. The highlight: After the metal canopies have been pretreated, they pass through two independent coating processes in succession.

In the first coating process, a primer is applied using the conventional Venturi process before the finish is applied using Nordson dense phase technology.

“What may sound simple now was actually the biggest challenge of this project,” says Manuel Ingles. “Both coating processes had to be coordinated in such a way that at the end of an economically and ecologically sensible process, a durable and highly satisfying surface finish was available in the correct coating thickness – and repeatable an unlimited number of times,” he says, summarizing the goal of numerous calculations and tests from the initial phase of the system.

HIMOINSA’s range of power supply products is diverse and represents high-performance solutions for industry.

State-of-the-art ColorMax[3] powder coating booths from Nordson are used for both coating applications in San Javier.

As soon as the conveyor moves a workpiece into the primer booth, eight Encore® LT automatic powder guns start the coating process. Six of them are mounted vertically on a reciprocator, one each fixed at the top and bottom of the powder application zone. For the rare cases of rework, a ninth, manual powder gun is available.

In the second ColorMax® booth, powder application is performed by eleven Encore HD automatic powder guns using dense phase technology. Unique to Nordson, dense phase technology offers patented HDLV® pumps, which deliver a high concentration of powder to the spray gun with only a fraction of the air required by conventional, ejector-pump systems. This spray pattern air is added separately, straight to the spray gun. The separation of powder and air allows powder coaters to fine-tune the powder output for the required production rate and customize spray velocity and pattern size for the best application results.

“Because the powder particles hit the surface of the workpiece relatively slowly, they practically do not bounce off. This results in a high first pass application efficiency, even with complex surfaces,” explains Manuel Ingles, who also immediately names other advantages of the technology. “Of course, there is also less overspray. And because a smaller amount of air only has to be moved relatively slowly, this type of coating is also very energy-efficient and environmentally friendly.”

With the new powder coating system, a coating thickness of 60 µm as well as 120 µm is achieved, depending on the product and use.

In general, HIMOINSA has also taken the update of its powder coating plant as an opportunity to bring the environmental compatibility and sustainability of production up to the state of the art and to meet the strict requirements that apply today.

> When we are changing between our six main colors, it only takes about ten minutes for the line to be back in production. This makes coating very flexible and even small batch sizes economical.

The powder is transported by the durable and long-lasting HDLV Encore HD pumps. Their advantage is the uniform and controllable flow rate. This ensures optimum process control throughout the coating process and duplicability of the results. The pumps supply powder to the guns, transport the overspray collected in the booth to reprocessing, and from there back to recovery.

All operations throughout the system can be monitored by the system operator on the touch screen of the PowderPilot™ HD control system. If their assistance is required, they receive the necessary instructions step by step in the form of icons to resolve the situation.

The result: 2,000 hours in the salt spray – “Best in Class”

“Basically, we coat in a single 8-hour shift operation,” explains Manuel Ingles “but the powder coating line operates 12 hours a day. Two hours after the end of the shift in the evening and two hours before the start of the shift in the morning, we coat parts so that they are ready for further processing right when we start working.” The coating department team at HIMOINSA is made up of five employees, one of whom works as a system operator. “The low need for manpower in operating the system is a big plus, because in Spain we also suffer a lot from the shortage of skilled workers.”

The line is designed for workpieces with a maximum height of 2,150 mm and a width of 900 mm. “If we run at a conveyor belt speed of 1.5 meters per minute, we coat around 220 square meters in an hour.” There are only short breaks when a color change is due. “The booth, guns and powder center together provide a very efficient color change system. When we change between our six main colors, it only takes about ten minutes for the system to go back in production. This functionality makes coating very flexible and even small batch sizes economical,” says Manuel Ingles with satisfaction.

In a first coating step, a primer is applied using the conventional Venturi process before the finish is applied using Nordson dense phase technology.

The quality of the double coating is also beyond doubt. With the new powder coating system, it is now possible to achieve a coating thickness of exactly 60 µm as well as 120 µm, depending on the product and application. This significantly improves the resistance of the coating, and sensitive areas such as edges, meshes, or perforations now defy even the most adverse conditions for even longer. “Our double-coated silencer canopies withstand the salt spray test for 2,000 hours, i.e., considerably longer than the 1,440 hours required to achieve the highest corrosivity category C5I-H. Needless to say, we have converted all of our productions worldwide and are now “Best in Class” everywhere in this international market!”

Nordson HDLV Dense Phase Technology

Nordson’s patented HDLV® pumps, called Encore HD Pump, use dense-phase technology with high-density powder, low-velocity air to pump more powder to the spray gun with a minimum of air, and maximum process control.

This results in superior efficiency, unmatched coverage, and reliable self-clean color change, boosting productivity and reducing operating costs.

With more than 15 years of field-proven experience, Nordson remains at the cutting edge of dense phase pump technology in the powder coating industry.

- Powder output stability and process control, for precise applied coating thickness and significant powder savings
- Highest application efficiency with soft spray pattern
- Superior coverage of recessed areas through optimised spray velocities
- Unmatched wear life of the internal pump components significantly reduces maintenance downtime for maximum productivity
- Contamination free color change of the entire spray system due to an automated purge clean system

For more information please visit: **www.nordson.com/hdlv**

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