



HITACHI
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 **Hitachi Energy**

Aluminum tubes for high-voltage equipment with high-quality coating

Improved surface quality and doubling production capacity

 **Nordson**

High-quality powder coating for energy sector

Hitachi Energy Brno, a manufacturer of high-voltage equipment, is now coating with Nordson's HDLV technology, improving surface quality and doubling its production capacity.



The Challenge

Hitachi Energy is one of the world's leading manufacturers of high-voltage equipment and produces some of the components required for this in Brno. In the Czech Republic's second largest city, the company coats aluminum tubes up to 12 m long, which have different geometries inside and a diameter of up to 0.80 m, using the environmentally friendly powder coating process. A capacity doubling was needed while still ensuring that the coating of the workpieces met high safety and quality standards due to the high-risk area of application: An increase in output with the automatic guns of the existing old plant was not possible to the requested scope. In addition, the company also wanted to make the coating process more economical and achieve powder savings in order to meet its high environmental requirements. Based on this, the decision was made to invest in a new, robot-guided powder plant.

The Solution

As part of their research, Hitachi Energy executives researched HDLV® dense phase technology and conducted some preliminary testing at an HVAC manufacturer's facility. "Although we did not have 3D models of the workpieces for this robotic coating and therefore could not program the robots accurately, our customer was impressed with the results," says Ing. Jaroslav Blažek Managing Director at Czech system integrator Surfin Technology. To put the technology to the test on the workpieces in its own production, Hitachi Energy received two Encore® HD manual powder coating

systems from Nordson. The powder guns that go with them are lightweight and well-balanced, and enable high-quality, fast coatings that can be repeatable at any time, regardless of the powder. They also feature excellent coating of edges and corners, as well as optimal penetration depth, even into challenging shapes. "We were extremely positively surprised by the performance of Nordson HDLV technology. We did not expect the result like this," Vaclav Holecek Production Development Specialist / Corrosion Engineer at Hitachi Energy, reports in retrospect. Due to the very good results, the company decided to use this technology and contracted Surfin Technology to install two Nordson ColorMax® E (engineered) powder coating systems with robotic coating guns.

In Booth 1, the inner surfaces of the pipes are coated with two Encore HD Select robotic guns mounted on two ABB coating robots. The dense-phase guns always enable repeatable, reproducible coating quality, achieve low powder consumption, and combine flexibility and profitability in powder coating. The Spectrum® HD powder feed center ensures a reliable powder supply. The integrated dense phase pump technology ensures precise powder feed and combines consistent coating results with significant powder savings with minimal maintenance and downtime. Precise control of the powder feed center is provided by the PowderPilot HD control system. It allows the user, through the simple and color touch-screen control, to adjust all aspects for high quality powder application - from feed and atomizing air to electrostatics, gun stroke and triggering.



Hitachi Energy manufactures the high-voltage equipment for customers around the world, so the components are coated in a variety of colors. For powder coating, this means up to 15 color changes per day. To be able to implement these quickly and reliably, Hitachi Energy has selected Nordson's automatic Color-on-Demand® (CoD) system. Color changes are done in 20 - 50 seconds. The system automatically cleans the entire powder path - from the powder hopper to the powder gun. Manual color changing is not necessary. CoD offers maximum flexibility and enables coatings to be applied to order at short notice. Another benefit is that users can implement customer requirements quickly and reliably, even for batch sizes of 1, and small batches.

Hitachi Energy uses the CoD system in Booth 1 with "spraying to waste" to enable the company to perform fast color changes in just a few seconds. "This is very efficient precisely because of Nordson dense phase technology, as the extremely soft dense phase powder

cloud allows the robotic guns to get very close to the parts with no bounce back effect, and there is minimal overspray," explains Nordson sales manager Martin Vodak. Booth 2 is where the outer surfaces of the aluminum pipes are powdered, and like Booth 1, it features Encore HD robotic guns and two painting robots. It is also equipped with a twin cyclone, as this is where the overspray is processed and returned to the production cycle.

Special features include weigh cells on the Spectrum HD powder feed centers, on the Color-on-Demand systems, and on the two after filters. Regarding the high standards for environmental compatibility and sustainability, these provide the operator with real-time information about the current powder consumption and the quantity of overspray.

The Customer Benefit: Maximizing production output, coating quality, and degrees of automation while reducing powder consumption to achieve high environmental goals.

Installation and commissioning of the new powder coating system was implemented by Surfin Technology together with Nordson service technicians in December 2021 during the holiday season, allowing the system to start operating immediately after the production break. "By combining robots and Nordson dense phase technology, we have doubled our production output, even though we are powder coating with fewer guns than before," says Vaclav Holecek at Hitachi Energy, summarizing the experience with the new powder coating system. "We have been able to install high process repeatability for our process, and the system now allows us to plan production and monitor the production process more efficiently. At the same time, the manual work and rework previously required has been reduced to almost zero. From time to time, for example with special workpieces, we still work with manual coating. For this purpose, we also have our own station with a manual booth and an Encore HD dolly in production. Thanks to the soft cloud provided by HDLV technology, the same high-quality result is always achieved.



Combining robots and Nordson HDLV technology, Hitachi Energy doubled production output, even though they coat with fewer powder spray guns than before.

Nordson HDLV Dense Phase Technology

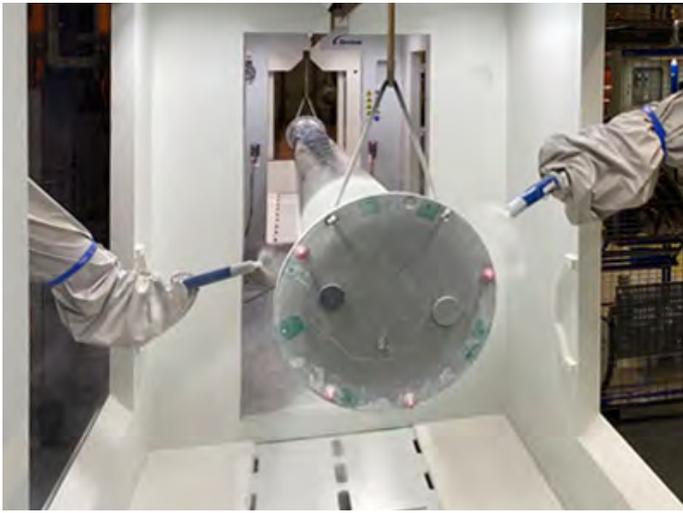
Nordson's patented HDLV® pumps, called Encore® HD Pump, use dense-phase technology with high-density powder, low-velocity air to pump more powder to the spray gun with a minimum of air, and maximum process control.

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



With employees in mind, high operator safety is ensured at the same time, as well as maximum material utilization and a significant reduction in powder consumption.” Holecek proudly adds, “We have simply found a very modern and high-quality coating solution for our very important products to contribute to a sustainable energy future for future generations.” With the coated products, the manufacturer of high-voltage equipment is now able to meet the strict requirements of safety standards and repeat the coating processes of the different products at any time. They can also efficiently plan production and monitor the processes with the future-oriented Industry 4.0 standard. By reducing powder consumption and maximizing material utilization, the company’s own high environmental targets can be met.



Nordson Industrial Coating Systems

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