

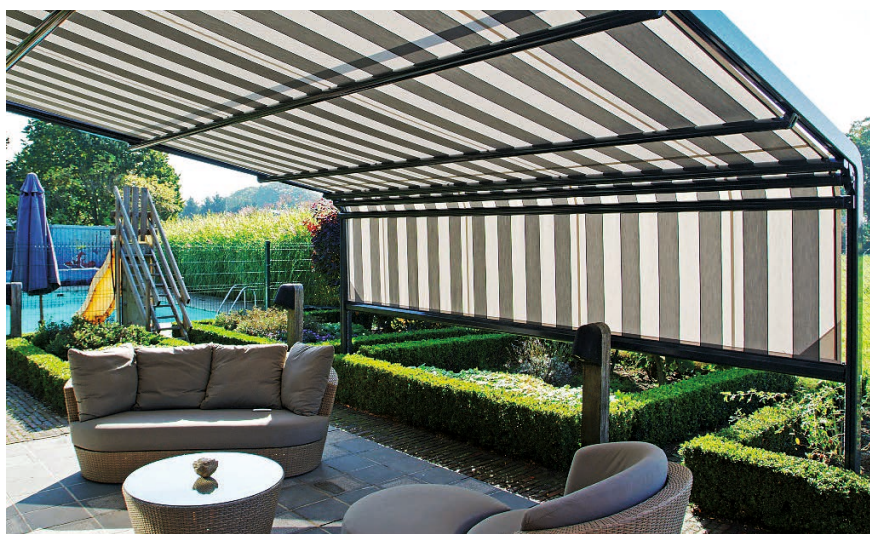
Flexible Coating Solution with High Quality Results

A manufacturer of sun protection systems invested in a modern powder coating line to make its production process much more flexible and cost-effective. This article describes the new powder coating shop and reports on the operator's experiences.

The name Varisol stands for high-quality awnings and sun protection systems for conservatories, balconies, terraces and windows which are made in Germany. The company behind the brand is Rödelbronn, a medium-sized family business with around 110 employees and a production facility that covers an area of 10,000 square metres. Rödelbronn sells its products via specialist dealers in 18 countries all over the world.

Over recent years, customers' requests for made-to-order products in personalised colours to match their glass roofs and the company's desire to stand out from its competitors have led to very large numbers of awnings being made in special colours. In 2013, Rödelbronn decided that it needed to change its manufacturing process. "Originally we had five standard colours," explains Karl Rödelbronn, the company's managing director. "That was fine for our folding arm awnings, but it was not enough for our glass roof products." If a conservatory roof is designed in a special colour, the sun blinds must match the roof. As a result, the number of special colours has increased dramatically over the last 10 years.

In the past, small parts such as fittings were coated manually in-house and the profiles were sent to a specialist coating company. The wide range of parts and the special designs presented the factory management team with a growing number of challenges. Long delivery times, complex logistics, the use of a huge amount of



© Rödelbronn

Rödelbronn manufactures high-quality sun protection systems. To improve the flexibility of its production process, it has installed an in-house automatic powder coating line that uses dense phase technology.

packaging and a lack of flexibility meant that the company could no longer meet its customers' requirements for more and more personalised products. A new manufacturing process was needed. At the same time, the company was planning to expand and enlarge its production plant. The obvious solution was to bring all the powder coating processes in-house, but the company had no experience of fully automatic powder coating. Following conversations with other people in the industry and with suppliers, plus additional re-

search on the Internet, Rödelbronn found out about the machinery manufacturer Nordson. The team travelled to Nordson's site in Erkrath to investigate its solutions in the test lab there.

Faster colour changes and improved powder recovery

Rödelbronn opted for Nordson's dense phase system, including a powder feed centre with rapid colour changes (Spectrum HD), a powder coating booth (Color-



max3) and automatic guns (Encore HD), plus a twin cyclone for powder recovery. The decisive factors were the much faster colour change, the reproducibility of the process and the reliable powder recovery system. It is very important for Rödelbronn that its production processes make efficient use of resources. Other considerations included the wide variety of materials used, which range from aluminium to plastic, and the complexity of the components. The coating process was demonstrated in a powder coating booth in Nordson's lab which met all the technical requirements.

The decision to choose the system presented in the lab was an obvious one. "A powder coating shop with this level of technology would normally have been at the limits of our price range," says plant manager Joachim Göbels. "We would have opted for a lower-level solution, but because of the very good quotation we received, we now have a high-end product for the price of a traditional booth." The dense phase system met all of Rödelbronn's requirements. Following a slight delay in the construction of the new production building, the powder coating system was finally installed and came into operation in May 2015.

Rödelbronn can now manufacture products to order. Each awning is custom-made in terms of its dimensions, width, materials and frame colour. When products are being produced to order in a variety of different colours, making efficient use of the coating racks is essential. In order to allow for this and to avoid colour carry-over, the individual components are pre-sorted by colour and coated in batches.

Manual pre- and post-coating for the best possible coverage

The parts pass through the pre-treatment process before reaching the automatic powder coating booth. The powder booth has four openings for the automatic spray guns, which are mounted on two electromechanical reciprocators. An integral underfloor extraction unit, which is easily accessible, keeps the build-up of powder to a minimum. Rödelbronn uses a total of ten automatic powder guns (Encore HD) with dense phase technology. They have a built-in 100 kV power supply and give high levels of application efficiency and reliability. The +/-1% accuracy in the amount of powder provided to the individ-

System coatings & application-solutions from one source.



We develop and produce all conventional coating systems under one roof. We are thus able to offer our customers not only all the important coating technologies but can also match these to the respective coating structure and finish to optimum effect.

The advantages: best material properties, consistent colour results (even with varying products and coating types) and the needs-based configuration of individual coatings – and all from one source.

Visit us
www.freilacke.com



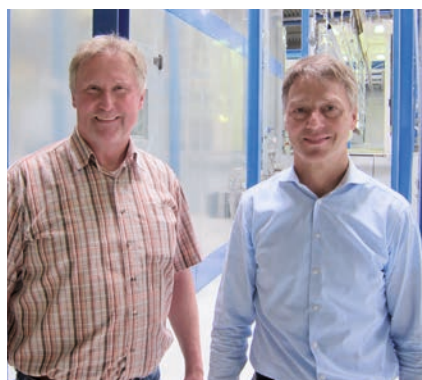
© Rödelbronn

An overview of the new powder coating shop. In the centre of the picture is the pre-treatment line and next to it the fast colour change spray booth with the powder feed centre. On the right is curing oven.



© Rödelbronn

The complex profiles are sprayed before or after the coating process with two hand-held guns in order to ensure the best possible coverage.



© JOT

Joachim Göbels (left), plant manager at Rödelbronn, and managing director Karl Rödelbronn are satisfied with the changeover: "The decisive factor was the very fast colour changes, which involve very little powder wastage."

ual pumps ensures a consistent and constant powder supply, improves the application efficiency and produces coatings of an excellent quality, in particular on complex aluminium profiles with large numbers of corners and edges.

The shape and size of the profiles varies considerably. For example, some are round and others have hollow chambers. Employees with two Encore HD hand-held guns apply powder to certain areas of the components before or after the coating process itself in order to ensure the best possible coverage of what are sometimes very complex shapes. Because of its soft powder cloud, the HDLV (high density, low velocity) system allows parts with complicated designs to be coated. It also has excellent penetration and low levels of back corona discharge, while significantly reducing overspray.

The powder feed centre supplies the spray guns directly from the powder hopper using HDLV gun pumps. The recycled powder is removed from the self-cleaning twin cyclone using an HDLV transfer pump. It

passes through an ultrasonic sieve in the powder feed centre and is returned to the powder hopper. The suction pipes, powder hoses and spray guns are regularly cleaned with compressed air from the HDLV pumps, which allows the powder feed centre to make colour changes automatically and efficiently.

As Goebels explains: "The colour changes with the new system are very fast. We are working on a 7-minute cycle."

The ATEX-approved afterfilter cartridge is designed for a volume flow of 20,000 cubic metres of air per hour and ensures that air is extracted consistently from the booth, the pipes and the cyclone. An advanced control system (iControl), which has a touch screen with graphical symbols, makes the powder guns, reciprocators and gun triggers easy to use. It also includes hopper fluidisation and level control functions and manages the recovery of used powder, the supply of fresh powder and the colour change sequences. It is a digital system with 255 coating programs to ensure consistent coating results.

Changeover presents challenges

The coating staff at Rödelbronn were trained to use the new system from the starting point of the existing manual coating booth. The intensive courses held on Nordson's premises removed any uncertainty they may have had about the new automated system, because they were able to work with their own products in an identical set-up.

The awnings are now made partly from components held in stock and partly from customised parts that are specially coated, which represented a big change for the employees. "In the past, we produced the parts we would need for a whole year during the winter and put them in stock. Now the parts are coated and then assembled, which means we that have a completely new way of working," says Goebels. The preliminary assembly process takes place after the parts are coated and before the awnings are manufactured. In the past, the metalworking shop was responsible for assembling the parts. The

employees at Rödelbronn have also had to learn how hang up and take down the parts. In addition, the new processes have to be monitored on the computer. Instead of assembling the coated parts as they had done in the past, the employees now go through the complex process of dividing up the parts for each product, depending on whether they are available from the warehouse or still have to be coated. Managing director Karl Rödelbronn believes that the decision was an obvious one. "It would be possible to buy profiles like these ready-coated from a press plant. But it soon became clear to us that if we wanted to reduce our stock levels and provide our customers with a flexible service, then production to order was the best solution. The other advantage is the quality. We no longer have to transport our parts to and fro and the cut edges of the components are also coated." The coating on the edges brings additional advantages by helping to prevent corrosion creepage. The company can also guarantee that all the

parts of one awning come from the same coating batch.

Flexible and efficient manufacturing

Rödelbronn invested around 5 million euros in constructing its new building and installing the machinery. The company is very satisfied with the end result. "The major benefit is the quality. We can provide higher quality profiles, simply because they are handled less often." Another important change relates to flexibility. "Sometimes we find that a profile has been damaged before it is assembled. We are now in a position to coat it again within four to twelve hours." In the past this might have delayed the delivery date by up to a week, because the parts were not coated in-house. Goebels also has a positive view of the powder coating line in particular. "The decisive factors were the very fast colour changes, involving very little powder wastage, and the fact that we can recover the powder that we use."

Karl Rödelbronn believes that his family business is now in a strong position for the future. "It may be possible for us to take on coating jobs from outside. We have already seen that the demand is there. But we need to take another step forward before we can do that. We have now reached the point where we can meet our own needs and are satisfied with the quality of our products." The company is also considering the possibility of introducing two- or three-shift operation in future. (uz)

Contacts

Rödelbronn GmbH

Mönchengladbach, Germany, Tel. +49 2166 964980, info@varisol.de, www.varisol.de

Nordson Deutschland GmbH

Erkrath, Germany, Tel. +49 211 9205141, ics.eu@nordson.com
www.nordson.com/powder



EISENMANN

BODY SHOP CONVEYORS AND
FINAL ASSEMBLY LINES

FACTORY PLANNING

COMPLETE PAINT SHOPS

PRODUCTION CONTROL SYSTEMS

SOLAR THERMAL SOLUTIONS

ENVIRONMENTAL TECHNOLOGY



End-to-end solutions – from body shop to coating and final assembly.

www.eisenmann.com