

Reliably Measure Coating Thickness

A mechanical engineering company not only processes its own sheet metal and steel parts in its surface coating center, but also carries out contract orders. In the case of a large-volume order, the required coating thickness could not always be optimally maintained due to a new type of powder coating prescribed by the customer. To ensure consistent quality, it was necessary to check the coating thickness before baking.

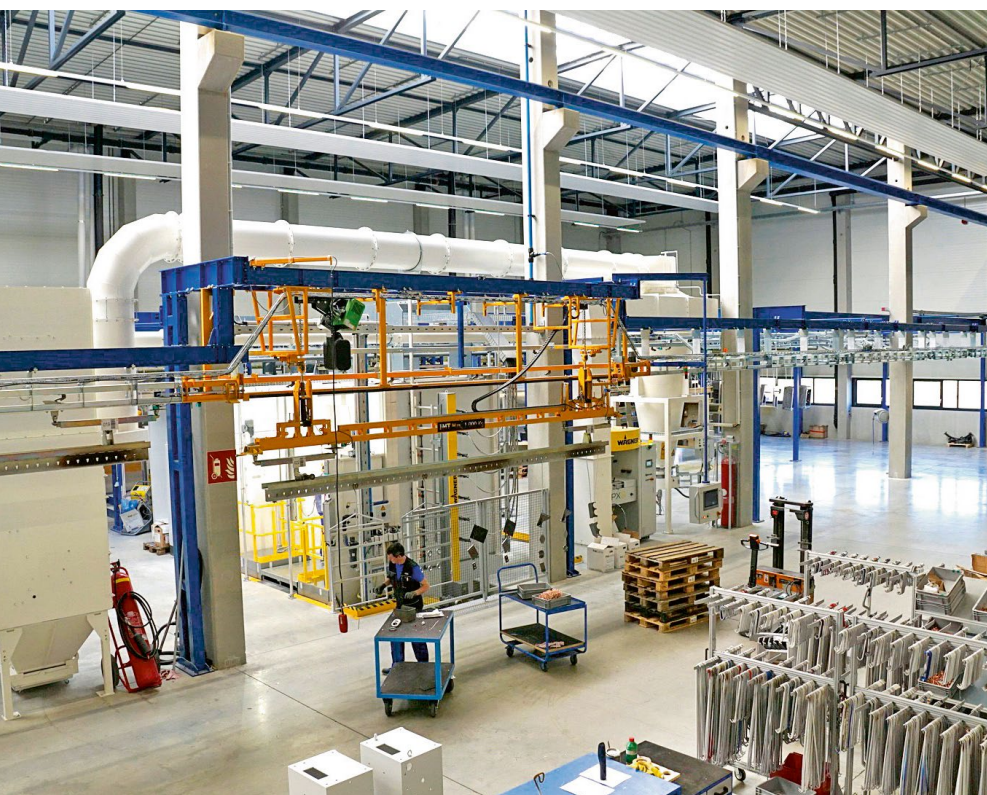
The globally active mechanical engineering company Brückner Group has been developing, producing and selling machines and complete systems for finishing textiles since 1949. The textile industry's call for ever larger and more efficient plants has also changed demand

at the family-run group of companies. It invested 40 million euros to expand its capacities and replace existing equipment with state-of-the-art systems. In the new production plant, the specialists now manufacture and assemble very large parts on an area of around 25,000m², all

of which are also pretreated and coated in Tittmoning (Germany).

Wet paint expert invests in powder coating plant

The new powder coating system also takes account of the increasing dimensions of the components. It comprises a powder booth with 14 automatic guns, a further two guns below and a manual application for recoating. A bypass section for dual coating is also integrated. "The system is designed for large workpieces up to 6m in length and weighing up to 1000kg," explains Benedikt Seidel, master coater and main person responsible for coating technology at Brückner. When asked why Brückner, as a wet paint expert, invested in powder coating, Seidel explains, "The components consist of galvanized steel, hot-dip aluminized sheet, black steel, cast steel and stainless steel. The finished products are exposed to a very acidic and aggressive atmosphere on a daily basis at our customers' facilities – these are harsh conditions that lead to accelerated rust formation. That's why, since 2018, we've been coating machine components with powder coating, which allows us to meet the very high requirements for corrosion and chemical resistance." Another advantage, he says, is that powder coating is solvent-free, because the comparable amount of wet paint would contain around 5t of solvents (VOC).



The modern coating plant of the textile machinery manufacturer.

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The stenter frame is the heart of textile finishing.



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Benedikt Seidel, foreman and head of the painting technology department (left) in conversation with shift foreman Turo Zoltan (both from the Brückner Group), who checks the workpieces with the mobile measuring device – here a blue fuel tank for a feed mixer.

The right amount of powder is what counts

In 2020, the Brückner Group received a large-volume contract coating order for insulating panels with a dissipative lacquer. The insulated 60 × 60cm panels are used in trade show construction and in clean rooms of hospitals and laboratories. These square insulating panels were to be coated in the white tones RAL 9010 and 9016; the customer had defined the tolerance limits of the coating thickness in advance as 80 and 100µm. The specified powder coating was new on the market.

“Each powder can be processed differently. Even identical color shades require different amounts of powder output, depending on the manufacturer. It is a constant learning process how much powder has to be ejected to obtain the 80µm coating thickness,” the department manager describes the background. “At that time, we could only measure the components after baking. At that point, it’s no longer possible to recoat manually. We had to dispose of the parts that were undercoated or overcoated,” Seidel looks back. “And due to the high scrap rate, the order did not pay off. After this experience, we immediately researched whether there was a measuring device with which we could measure the coating thickness earlier, i.e. before baking.”

The department manager quickly found what he was looking for: The Paint Checker Mobile from Opti Sense seemed to be a promising candidate. Sales Manager Sascha Schmidt soon presented the device in Brückner Textile Technologies’ new surface coating center. In addition, the 16-person coating team led by Benedikt Seidel was able to put the testing device through its paces in its own production facility for two weeks. “Yes, there was a competitor. But their device flashed with every measurement. And when an employee makes 200 measurements, he has asterisks in front of his eyes at the end of the day. In addition, we couldn’t even measure with the device immediately after the booth because the flash immediately triggered our extinguishing system.” The decision in favor of Opti Sense was therefore made quickly.

Powder application stenter frame

An example of a powder application for the parts produced in-house is the stenter

frame from Brückner, the heart in textile finishing. Such a stenter frame has working widths of up to 7 m and is 20 to 30 m long. "It is increasingly developing into a multifunctional plant for the production of technical textiles and other web-shaped materials. Every day, countless meters of different types of fabric are stretched, dried, heat-set, functionalized and coated on it all over the world," the master coater knows.

The stenter frames must therefore meet high quality and performance requirements. The individual components for the stenter frames are powder-coated in the company's own plant. For this purpose, an investment was made in a new plant: The Wagner powder plant with its automatic guns takes over a good 80 % of the application, the remaining 20 % – the hard-to-reach areas – are prepared manually by one of the recoaters.

Coating thickness testing in automation

The coating thickness of the stenter frame systems should be between 80 and 100 µm. The recoater is responsible for quality assurance here. "He checks the frame components for the correct coating

The measuring device

The Paint Checker Mobile is a complete measuring system consisting of two units: the compact controller with the evaluation electronics and the lightweight sensor as the actual measuring device. The small dimensions of the smallest sensor of 130x25 mm with a weight of just 50 g enable measurements in places that were previously difficult to access. The mobile Optisense laser models are mainly used for smooth coatings on metallic substrates. Due to their small measuring spot, the slim laser sensors are particularly suitable for coating thickness tests on filigree small parts, corners and edges. Due to the larger measuring spot, LED sensors are ideal for freehand measurements on rough surfaces.

thickness and immediately determines whether a nozzle is clogged or the area to be coated was not reached by the automatic system," explains Seidel.

The components of the Brückner machines are coated in the standard colors light gray and signal gray. "With these automated powder applications, the process runs smoothly. The coating thickness is well leveled," the department manager states with satisfaction, "only in the case of components with many undercuts, random checks are important. "It can happen that the powder is not evenly distributed everywhere," says Seidel. In such cases, the Paint Checker is also regularly used on the automated powder system.

The pulverizer checks whether the minimum coating thickness of 80 µm has been reached. If not, manual re-powdering takes place. "Atline testing is significantly more cost-effective and less time-consuming. If a faulty coating thickness is only detected on a component after the drying oven, this part has to do a complete lap of honor in the plant," Seidel emphasizes.

The measuring device as a virtual teacher While only random samples of tricky parts are checked with the Paint Checker Mobile in the automated process, quality control in manual coating is much more intensive. "This is in the nature of things, because special components are coated here with different, sometimes completely new powders. For the special machines and special colors, the ideal values for the coating thickness are 60 µm for the primer and 80 µm for the top coat. So there are no standardized process sequences," says Seidel, explaining the differences.

The coating thickness gauge has yet another function in the manual application: The Paint Checker is a virtual teacher, so to speak. New employees, some of whom still have little experience, can thus check

the quality of their powder application themselves. Immediately after manual application – while the powder is still soft – the employee re-measures his coating job and can correct it quickly and easily. And the experienced employees in Seidel's team also rely on the Paint Checker. They also check Atline and know: If the coating thickness is OK on the softly measured powder, they no longer need to worry about whether the coating will still fit after baking. "Why? We carried out control measurements with a contact measuring device – the measured values from the Paint Checker Mobile and the contact reference measurement matched 100 %," reports Seidel.

Employees favorite device

The measurement series from the mobile handheld device are stored on the PC. This documentation serves as proof for Brückner in case of possible complaints, and also for the customer for his archiving. In addition, the data is evaluated with regard to the respective powder consumption. Seidel: "We need around 35t of powder annually. We were able to reduce this significantly thanks to the early measurements with the Paint Checker. Less scrap means less powder and therefore minimized costs." Asked for his conclusion, Benedikt Seidel smiles: "The Paint Checker Mobile makes work much easier – it's my employees' favorite device." //



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The mobile measuring device measures in every corner, no matter how small.

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