



GSO Oberflächentechnik

Since 1988, GSO Oberflächentechnik GmbH has stood for quality, reliability and innovative spirit in powder coating.

Founded on just 100 m² in Munich, the company grew steadily, was located in Mammendorf for many years and moved into its new facility in Olching-Geiselbullach in 2014. On more than 3,000 sqm of production space, more than 20 highly motivated, well-trained employees work on state-of-the-art production equipment. GSO sees its unique selling proposition as a partner of the metal processing industry primarily in its many years of experience and continuous striving for optimum quality.

GSO Oberflächentechnik continues to build on its strengths:

An ode to the quality of powder coating – also thanks to the OptiSense coating thickness testing system

Highest quality with no ifs and buts, that's what GSO Oberflächentechnik is measured by its customers. With more than 1,000 different coatings applied by the Bavarian company every year, this is quite a demanding task. With an increasing tendency, because the end customers want more and more individual products, which leads to smaller batches and to even more frequent color changes.

It is therefore essential to further increase line availability and productivity – while maintaining a consistently high level of quality. In addition to a stable process workflow through automation, the early layer thickness measurement of OptiSense plays a decisive role. The editorial team spoke with GSO managing director Horst Schuller about the use of the non-contact inspection system PaintChecker mobile.



The PaintChecker mobile LED-B operates without any contact with the object.

Even before the baking process, the coating quality is checked, thus guaranteeing process conform production.

Quality assurance as the be-all and end-all

The typical orders of the Bavarian company are wide-ranging. They come from the automotive supply industry, the electrical industry and mechanical engineering. Elaborate surface treatments for medical products can also be mentioned. The range here extends from analytical equipment to huge aluminum steel press housings that are refined. Interesting coating applications can also be found in other sectors, for example in consumer goods, in the furniture industry or in trade show and store fitting.

"Our strength is the high quality of the coating," says GSO Managing Director Horst Schuller, ranking his company in the market, "which is why end-to-end process optimization and quality control are playing an increasingly important role."

Wanted: The early evaluation of coating processes

Coating processes are influenced by countless parameters. One important influencing parameter is the coating thickness. Until recently, coating thickness measurement at GSO was carried out with contacting coating thickness gauges, which could only be used after baking and cooling. However, there was a time delay between the coating process and

the detection of a defective coating, ranging from 30 minutes to several hours. Thus, it repeatedly happened that a deviation from specified tolerances was detected much too late; extremely expensive rework and scrap were the result.

“Mr. Mülleneisen recognized our requirements immediately. He is close to the customer without being pushy. And he really has a clue.”

Horst Schuller

GSO Oberflächentechnik GmbH

Non-destructively inspecting surfaces before baking

"That's why we were looking for a measuring solution that would allow us to check the coating thickness as early as possible in the process," explains the GSO managing director.

In order to be able to measure flexibly on the three different coating lines, the technical business economist was interested in a mobile, non-contact and thus non-destructive system that could

be used in the large, automatic continuous and also in one of the two smaller booths, depending on the order volume. For more than a year, Horst Schuller's team put various coating thickness gauges through their paces. GSO became aware of the PaintChecker mobile non-contact system by the OptiSense website.

"Sales specialist Jörg Mülleneisen demonstrated the device to us on the shop floor. Everything just fit," Schuller recalls, "the PaintChecker mobile convinced immediately, because all measured values were correct. And Mr. Mühleneisen knew our industry and the requirements exactly. He was very close to the customer from the very first conversation, without being pushy. And he really has a clue."

Outperforming all competitors

That this is not a matter of course was evident from the competitors who were also invited to the presentation. "We had a comparable device from a Swiss manufacturer in house. The device was more than twice as expensive and the constant flashing of the xenon lamp bothered us extremely.

In addition, the device required a permanent connection to the Internet, since all calculations had to be made via a the manufacturer's server," says Schuller,

“With the mobile PantChecker, our coating staff can very quickly determine the coating thickness of the workpiece. This often saves us sampling – we can start production immediately.”

Horst Schuller

GSO Oberflächentechnik GmbH



The PaintChecker mobile family

Compact controller and ultra-light sensor

The complete measuring system consists of two units: The controller with the evaluation electronics and the lightweight, compact sensor as the actual measuring device. The tiny dimensions of the smallest sensor of 130 × 25 mm with a weight of just 50 g enable measurements in places that were previously difficult to access.

The right sensor for every task

The mobile OptiSense laser models are mainly used for smooth coatings on metallic substrates. Due to their tiny measuring spot, the slim laser sensors are particularly suitable for coating thickness tests on delicate small parts, corners and edges.

Due to the larger measuring spot, LED sensors are ideal for freehand measurements on rough surfaces. The PaintChecker mobile Gun-R model is particularly suitable for components made of plastic or rubber.

The PaintChecker mobile Gun-B is optimized for non-parts contacting tests of freshly applied powder coatings before baking. It measures the still soft powder layer on substrates such as metal, wood, glass or plastic, independent of color and type. The shrinkage during the baking process is taken into account.

naming the disadvantages of the competitor's technology.

The measurement results of two other competitors were not convincing: "Not a single measurement value was correct. We were thoroughly disappointed by the other providers' demonstrations."

Fast, accurate and flexible

After comparing the different systems, the decision in favor of OptiSense was made very quickly. With a loaner unit, GSO Oberflächentechnik was able to gain further, in-house experience.

"We measured the coating thickness on a wide variety of objects - from fittings to lampshades to motorcycle parts. The PaintChecker mobile really did an excellent job."

Because of its speed, accuracy and flexibility, the mobile, non-contact coating thickness measurement system can be used almost universally. No wonder: the PaintChecker mobile Gun-B is optimized for non-contact testing of freshly applied powder coatings before baking.

It measures the still soft powder layer on substrates such as metal, wood, glass or plastic, independent of color and type. Shrinkage during melting is also taken into account.

The coating process at GSO Oberflächentechnik



1 Incoming goods >>>>>>> 2 Preparation >>>>>>> 3 Pretreatment >>>>>>> 4 Drying & Masking

Continuous quality assurance throughout the coating process

But first things first, because the actual coating process consists of seven steps:

Already during incoming goods inspection (1), the delivered parts are randomly checked for possible damage, for example due to corrosion or transport. The next check is carried out during preparation (2), i.e. when the product carriers are loaded.

The third process step, the fully automated pretreatment (3) of steel and aluminum with an innovative cross-cycle 8-zone system, is also permanently checked. Whether degreasing, pickling, phosphating via chrome-free passivation or rinsing - nothing escapes the watchful eye of the operator.

After pretreatment, the parts are dried from adhesive water (4) - also fully automatically. Each part is inspected again here. Employees then select the goods in order to mask any surfaces or threads that are not to be coated.

Now it's off to one of three coating lines (5). Series products are coated in the automatic 8 gun conveyor system with powder recovery. Each workstation in the production hall is equipped with a PC. For recurring parts, parameters such as current intensity, powder quantity

and also speed of the conveyor belt are already stored. The coating staff calls up these key data and can configure the system in a matter of seconds. Then it's just a matter of fine-tuning, because the coating system independently controls the reciprocators with their guns thanks to intelligent part recognition.

“Rework? That is a thing of the past. With PaintChecker mobile, we get to target much faster to meet our quality standards.”

Horst Schuller

GSO Oberflächentechnik GmbH

Large parts up to 7 m long pass through a large-capacity booth. For rapid color changes of individual and sample parts, coating takes place in the small parts booth. Manual work is still required here.

The employee precoats the parts; this is a demanding task, especially for parts with corners, edges or angles.

After coating, the parts leave the booth suspended from a goods carrier via a conveyor chain. The next inspection

station is waiting at the booth exit: the coating thickness measurement. This should be carried out immediately after application, although at this point the coating is still soft and sensitive.

Continuous process monitoring requires prompt measurement

Now the PaintChecker mobile from OptiSense takes over the process monitoring, because a non-contact measurement is a basic requirement in order not to destroy the coating. The coating result is checked with the lightweight, flexible hand-held device before baking, and the process can be readjusted immediately if necessary and the coating optimized.

To do this, the coating staff calls up the job on the PC screen to view the testing requirements. "To do this, we define the parameters that are important for the product in question together with our customer before production starts and check them at the various stages of the coating process."

The measuring points for coating thickness testing are defined in advance. These may well be 8 or even 10 control points, all of which are marked on a drawing and stored in the program. The maximum tolerances are also determined in advance. For documentation purposes, the measurement results can be



ng >>>>> **5 Coating** >>>>>>>>>>> **6 Baking oven** >>>>>>>>>> **7 Shipping**

permanently recorded in the test log. Early testing saves time-consuming rework, for example if the coating thickness is too low. Says Schuller, "Our employee at the line can quickly and easily recoat by hand – without the parts having to go through a second round of recoating and rebaking."

Quality assurance all the way to the baking end

After coating, the parts enter the large-scale cross-cycle burn-in oven (6). And even after baking, further quality controls come into play. Here, an employee checks the coating thickness again by-the-line after curing. Finally, the parts are ready for shipping (7).

GSO customers have very different requirements for the surface of the products. Sometimes the focus is on decorative coatings; the pharmaceutical industry requires other surfaces than mechanical engineering. But the following always applies: The coating thickness must be right, and it must be exact. We have a very diverse clientele, starting with locksmiths, for whom we coat balconies and garden railings in large quantities. There, it's not so much about the coating thickness tolerance, but about a minimum coating thickness. On the other hand, there are many orders from the medical sector where the tolerance of the coating thickness

values is functionally relevant," Schuller knows.

Even calibration is no longer an issue

Thanks to the calibrations specially developed for measuring powder coatings, the PaintChecker mobile LED-B is ready to go out of the box – without any time-consuming training. This means that the measuring time, excitation pattern and intensity are already factory adjusted to the application and immediately provide exact results. These calibrations are for all colors with a coating thickness of 20 to 250 µm.

"With the factory calibrations, we completely cover our 1,000 different coatings. It also doesn't matter whether they are dark or light colors – with the PaintChecker mobile, we measure the coating thickness precisely and reproducibly, even on complex-shaped parts with edges, corners or curved inner surfaces," explains the coating expert.

Quality assurance all around

Its simple operation, the ergonomically shaped, lightweight sensor and the fast measurement make the mobile measuring system indispensable: The PaintChecker mobile is used daily at GSO Oberflächentechnik.

But that's not the end of the story when it comes to quality assurance: "It parts

The quality of the individual work steps must be carefully and continuously monitored. Testing is carried out according to the number of pieces and type of application; in the case of function-critical quality parameters, customers additionally define dimensional specifications and target values required in advance.

that we only use high-quality powder from renowned manufacturers. In addition, we are periodically certified by TÜV SÜD according to the guidelines of DIN ISO 9001.

And last but not least, our team takes part in numerous training courses. All employees at the plant have been trained on the PaintChecker mobile. In this way, we ensure that everyone tests to the same quality standard," says Schuller, describing just one of the many measures he takes to meet his high quality standards.

Conclusion: Ready for Industry 4.0

The PaintChecher mobile's advantages of measuring early and non-destructively in the coating process guarantee optimum quality control, reduce powder consumption and increase efficiency.

"We have had really consistently good experiences. We would now like to transfer these to industrial 100% inspection. I read the user report about the new OptiSense measuring technology at ILB Industrielackierung Biedermann. There, the innovative measurement technology not only ensures seamless quality control in an

Appreciates the advantages of the contact-free PaintChecher mobile: GSO Managing Director Horst Schuller



industrial environment, but also provides valuable information for further process optimization. This is highly interesting and could well be a topic we tackle together next year," says GSO Managing Director Schuller, looking positively into the future.



OptiSense GmbH & Co. KG
Annabergstraße 120
45721 Haltern am See
GERMANY
Tel. +49 23 64 50 882-0
Fax +49 23 64 50 882-11
info@optisense.com
www.optisense.com