



Giga-Coating GmbH

The company, based in Twist (Emsland), specializes in cathodic dip and powder coating of large heavy duty parts. In recent years, Giga-Coating invested about € 16 million in an 8,600 m² facility featuring a highly efficient pretreatment system, four cathodic dip-ovens, two powder ovens and two powder systems to coat workpieces weighing up to 9 tons.

Customers are from all over Europe. An order volume of roughly 1.5 million m² of these large-size, corrosion-prone components ensures high utilization of the production capacities in a three-shift operation. Currently, around 40 people are working in the ultra-modern facilities.

Think big, act small when coating large heavy-duty parts:

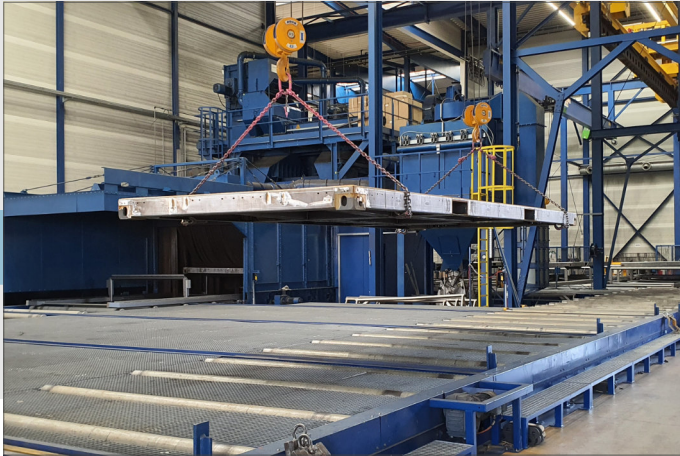
Giga-Coating uses a mini-measuring system to check coating thickness

The name says it all: Giga-Coating GmbH operates the most advanced contract coating facility for cathodic dip and powder coating in whole Europe. The company based in Lower Saxony employs an innovative combination of cathodic dip and powder coating with great success. The highly efficient systems can automatically process parts weighing up to 9 tons and measuring almost 16 meters in length.

We talked to Managing Director Ingo Wildermann and Powder Plant Manager Thomas Maubach, about the benefits of OptiSense's miniaturized coating thickness measurement devices in the giant Giga-Coating plant.

Giga-Coating Success Story

A crane moves the incoming raw parts into the integrated blasting station



Goods carriers move the huge truck loading bridges through the cathodic dip coating line



The target: maximum level of automation

The high-performance coating lines are designed for extremely large components. For its clients, Giga-Coating processes large-scale medical equipment, parking garage components, huge vehicle parts, demanding XXL-sized special projects and many others.

In order to carry out these orders in a cost-effective way, the hypermodern contract coating facility is tuned towards maximum automation: After blasting, a sophisticated conveyor system moves the heavy parts through the 11-stage pretreatment process of degreasing, zinc phosphatization and cathodic dip coating to finally arrive at one of the two powder coating lines. The powder booths are each equipped with 16 or 20 automatic coating guns. A current job order serves as a good example of how the coating process works:

Long-lasting corrosion protection for truck bodies

Truck bodies and trailers roam the world and are subject to hard wear and tear over many years. Maximum corrosion protection plays a key role in the service life of these vehicles.

Thanks to its high level of automation and optimized coating processes, Giga-Coating is able to perform these jobs efficiently even in the face of stringent requirements, while at the same time

meeting the strict specifications of the automotive industry.

This job involves coating oversized loading bridges for trucks, including the platform floor and the checker plate, with a very special corrosion-resistant paint. Loading bridges are interchangeable carriers that can be detached from the vehicle, thus greatly simplifying everyday transport operations by allowing cargo to be handled quick, efficient and in a time-saving manner.

Coating thickness measurement with the PaintChecker saves more than 1000 Euros in costs per scrap part.

Ingo Wildermann

Giga-Coating Managing Director

The challenge with this job is not only the size of the components, but also the accuracy of the coating thickness. If this is too low, corrosion damage can quickly occur. If too much powder is applied, the coating easily flakes off, which can also lead to corrosion.

It all starts with the digital recipe

A crane moves the incoming raw parts into the integrated wheel blasting station,

where the truck loading bridges are stripped and cleaned. Immediately after blasting and cleaning, the parts are attached to a goods carrier and placed on the loading and unloading manipulator. At the same time, each part gets a digital label. Thomas Maubach explains: „It is similar to a cake baking recipe that describes the ingredients and the individual workflow. Our electronic coating recipe contains detailed information about the required coating color. It also describes which kind of surface treatment the part shall receive, e.g. a chemical pretreatment or a preconditioning with CDC and subsequent powder coating.“

Suspended from the goods carrier and guided by distribution and loading/unloading manipulators, the part now fully automatically runs through the entire production process. The conveyor system directs the individually numbered goods carriers up and down as well as left and right. Each goods carrier can be loaded with up to nine tons of weight.

From parking position to powder booth

The conveyor system now moves the loading bridges to the preparation area. Here, threads and drill holes are masked. Furthermore, the component is checked for residues of the blasting agent. If the powder booth is still occupied, the part is temporarily parked in the so-called storage area so that the next one can be prepared for powder coating in the



The in-house software is the intelligence of the coating line

Even smallest corners are easy to reach with the PaintChecker Mobile's sensor head and spot measurements can be taken on the narrowest welding seam. This can greatly reduce the risk of miscoating.

meantime. As soon as the line is free, the waiting loading bridges are automatically conveyed to the powder booth in the predefined order.

Now color comes into play: The first line uses eight automatic guns per hoist frame to synchronously apply powder to both sides of the part in XXL format – horizontally as well as vertically. „In the past, this was a real challenge when parts were hanging at an angle“, Maubach recalls, “The space between gun and part varied with position. At the upper edge of the part, the spray nozzles had a distance of e.g. 250 mm while at the lower edge, the guns were already more than 400 mm away.”

With these variations in distance, the automatic coating application was obviously uneven. A clever improvement of the control system eliminated these fluctuations in the second powder coating line: the new generation features a scanner in the entry area of the booth that detects the geometry of the incoming part. With this data, the powder guns are placed at the optimum distance. Each gun can be moved back and forth individually so that an equidistant spacing is achieved even with parts hanging at an angle. The

result is a more uniform coating of complex geometries, lower powder consumption, fewer re-coatings and higher productivity.

The smart in-house software directs the parts

The in-house software is the brain of the coating line. Each unit manager can retrieve and display the current status of all parts at any time. Of course, the individual process flow can also be controlled in this way: The entire line is operated via an icon-based touchscreen interface on a tablet or PC. The color coding of the icons indicate where the parts are currently located. Parts are e.g. marked in purple while they are coated in the powder line and are highlighted in red as soon as they move into the curing oven.

Coating thickness measurement saves 1000 Euros per scrap part

With such a sophisticated, precise process, the question arises whether coating thickness testing is necessary at all. „If we were coating only flat sheet metal, it might be possible to omit the tests. But we have to deal with complex geometries most of the time. The charging does not proceed automatically from the bot-

tom to the top. We are also manually recoating very special shapes or areas that cannot be reached by the automatic guns. Especially in these cases, a detailed check makes a lot of sense“, Maubach explains why coating thickness measurement is nevertheless indispensable.

„In case of light colors such as yellow or orange, insufficient powder application is easy to detect, as the black CDC substrate visibly shines through. More tricky, for example, is RAL color 7024. Graphite gray always appears as if the paint has a perfect coverage.

But this is often deceptive. If the part then enters the curing oven with too little powder applied, and we only find out after baking that it is undercoated, the huge part has to go through the entire line for a second time. This second round trip costs us a good thousand Euros per part“, explains the Managing Director.

For Giga-Coating, powder savings by optimizing the coating thickness were not the most important argument in the search for a suitable coating thickness measurement system. „Undercoating is a real disaster for us!“ says Wildermann. „We are using an epoxy CDC as a sub-

Giga-Coating Success Story

The powder booths are equipped with 16 and 20 automatic guns respectively



Areas inaccessible to the automatic guns are manually coated



strate and need a certain film thickness to ensure the permanent UV protection of the base layer"

The OptiSense PaintChecker Mobile and its non-contact measuring method

For Giga-Coating, powder savings by Managing director Ingo Wildermann learned about OptiSense and the photo-thermal coating thickness measurement from a technical article in the Besser Lackieren magazine. In this approach, the surface is briefly heated, then the cooling process is evaluated and converted into coating thickness. The measuring method is contactless, fast and efficient. Very high process stability can be achieved with this technology and the resulting perfect repeatability of coating quality is at the highest level.

Already the first presentation of the PaintChecker Mobile was convincing all along the line. However, in order to back up his decision, the powder line manager also had a look at the product of a competitor from Switzerland. „The competing device had some disadvantages in terms of handling and follow-up costs – such as having to change the filter every week."

„The PaintChecker, in contrast, works maintenance-free, is handy and measures just 14 cm. We could rest assured that we had chosen exactly the right measuring device", Wildermann sums up. Meanwhile, the PaintChecker Mobile is used every day.

Seven employees have been trained and now perform coating thickness checks with the OptiSense system.

„Especially with complex components, miscoatings happened from time to time in the past", Maubach adds. „Particularly if employees with little experience start coating manually. Thanks to the Paint Checker Mobile, the newbies can now quick and easy check their powder application themselves before the part goes into the oven. Even smallest corners are easy to reach with the PaintChecker Mobile's sensor head and spot measurements can be taken on the narrowest welding seam. This can greatly reduce the risk of miscoating."

The PaintChecker is maintenance-free, handy and measures just 14 cm. It is exactly the right instrument for us.

Thomas Maubach

Head of Powder Coating, Giga-Coating GmbH

Truck loading bridges in bronze green

For a current order, the automatic guns are powder coating the truck loading bridges in bronze green. Giga-Coating

calculates a powder consumption of 15 to 16 kilograms per part, with a good three quarters of these being applied automatically. For large series productions, both powder coating lines are operated with the same color, in order to work in parallel and thus more efficient.

The employees stand on a hydraulic lift and coat the areas inaccessible to the automatic guns by hand. One coater is working on the upper section, a second on the lower section of the part. The team can switch back and forth between the two powder lines. Orders are thus processed even faster and waiting periods can be avoided at the same time.

From curing oven to final inspection and shipment

Prior to the next process step, the thickest part of the coating is manually determined and entered on the PC. After that, everything is fully automated again: Before the goods carrier enters the line of treatment tanks, it is weighed on a calibrated scale. Based on coating thickness, size and weight, the system calculates how long the part must remain in the CDC curing or powder baking oven.

An oven manipulator then takes the component out of the oven. The suspended part first cools down for a while to avoid subsequent damage to people or goods carriers. Then a distribution manipulator automatically moves the truck loading bridges further on. In the ship-

“Mit dem PaintChecker ist unsere Beschichtungsqualität deutlich gestiegen, weil Unterbeschichtungen weitestgehend vermieden werden können. Und unsere Prozesse laufen stabiler!”

Ingo Wildermann

Geschäftsführer Giga-Coating



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 coating on substrates such as metal, glass or plastic, independent of color and type. The shrinkage during the baking process is taken into account.*

ping department, each part is tested for the last time. This includes random checks such as cross-cut, gloss level and coating thickness. Once commissioning is complete, the customer is notified by email, if requested, that his order is ready.

About the value of coating thickness measurement

After the first few weeks of using the PaintChecker Mobile, managing director Ingo Wildermann can already draw a thoroughly positive conclusion. „The decision to test the coating in detail with the PaintChecker has resulted in a much more stable production. Our coating quality has significantly improved, as undercoating has been virtually eliminated. And our processes run even more stable now. The OptiSense coating thickness measurement thus contributes to a maximum of process reliability.

And we have long since recovered the investment cost” says Wildermann with confidence. Powder plant manager Maubach adds: „Our production process is already Industry 5.0-capable, and OptiSense has played its part with the innovative PaintChecker.”

*At Giga-Coating, Managing Director
Ingo Wildermann (left) and
Powder Plant Manager Thomas Maubach
rely on the non-contact coating thickness
measurement system from OptiSense*



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