



## STOZ GMBH

*Almost a hundred years ago, Stoz GmbH was founded by Paul Stoz as a painting company in Sindelfingen. The company soon developed into a modern full-service painting specialist, demonstrating its core competence in industrial production from the development of suitable coating systems, pre-treatment and high-quality wet painting to finishing and final assembly.*

*The painting facilities were continuously enlarged. A total of 13 painting lines - including seven fully automated robot systems - meet even the most demanding customer requirements and industrial specifications. And everything under a "green label": since 2017, the entire company has been BImSch G. approved and ISO 14001 and ISO 50001 certified. For Stoz, professional surface technology means active environmental protection.*

## ***Brilliant performance: Stoz checks wet paint on chrome prior to baking***

*From piano lacquer finish and metallic effect to anti-slip coating: Stoz GmbH at Rottenburg am Neckar processes parts that are primarily used in sanitary technology, the bike and automotive industries and electronics. These industries have one thing in common: they all have extremely demanding requirements in terms of visual and tactile quality, durability and strength.*

*A particular challenge is painting on chrome – especially checking the exact thickness of the coating while still in the wet state. The executive team, Managing Director Maximilian Stoz, Production Manager Holger Salzmann, Quality Assurance Manager Jürgen Andrusch and Technical Manager Steffen Fessele, explain how this can be achieved.*

## Anwenderbericht STOZ

*Quality assurance at the highest level: Holger Salzmann uses the OptiSense PaintChecker Mobile to regularly check the challenging wet paint finish of high-quality chrome taps.*

### High-performance coatings

Today, Stoz GmbH offers many products and processes with unique features under its own label. All of them are high-performance coatings that focus on particular technical properties. This includes corrosion protection, anti-friction coating, graffiti protection and anti-slip coating. Each system is perfectly matched to the substrate – particularly when it comes to the coating of chrome-plated parts. Of course, the visual appearance of the surfaces is equally important, as the brilliant world of kitchens and bathrooms shows:

### Striking accents in the kitchen and bathroom: colored faucets

Fittings play a special role in the modern home. They are among the most heavily used objects. "Innovative technologies, futuristic design, long-lasting value and environmental sustainability are standard today.

The requirements on the surface finish and thus on the coating are just as high," says Managing Director Maximilian Stoz, describing the demanding standards of his sanitary technology customers.

Occasionally at first, but now also in the mainstream of the world of fittings, a new variety of surfaces has developed, which is particularly impressive due to its rich colors. Manufacturers and consumers were probably fed up with boring chrome – everything should be more individual and at the same time create a touch of luxury in the bathroom and kitchen. Colors such as copper, rose gold, various shades of



black, anthracite or even silky matt white are very much in vogue.

### Contacting measurement devices reach their limits

However, there was a major drawback: determining the thickness of the coating required extreme effort. "The part first had to be baked and could only be tested once it had hardened – often this was only possible with destructive grinding," says Salzmann.

*“Thanks to the PaintChecker, we can now for the first time measure on chrome in series production.”*

**Steffen Fessele**

Technical Director, STOZ GmbH

User Andrusch confirms: "There were also clear limits to the measuring capability of the eddy current device we had been using until then. Although the coa-

ting thickness test works well on steel, we were unable to obtain reliable measurement results on a chrome-plated substrate." To make things even worse, these parts often had complex geometries with small measuring spots, tight bends, grooves and cavities.

### Coating thickness test on chrome while the paint is still in the wet state

While searching for a testing device that can determine the coating thickness on chrome-plated substrates, Holger Salzmann came across a technical article in an industry magazine about the OptiSense PaintChecker, a miniature handheld device designed specifically for measuring small areas in holes, recesses and hard-to-reach places.

After the Stoz management team gathered first hand experience of the PaintChecker quality at the leading industry show PaintExpo in Nuremberg, they decided to test the coating thickness measurement system extensively in their own company.

"The manufacturer from Halten provided us with a loan unit for a month. We wanted to find out whether the PaintChecker

Quality Assurance Manager Jürgen Andrusch is amazed by the measurement results of the PaintChecker Mobile: without touching it, he checks the door sill of a legendary British luxury sports car.

Right:

Managing Director Maximilian Stoz spot-checks the soft-touch coating of a brown car center console for an automotive customer as well as the royal blue special paint finish of a high-quality insulated coffee can.



could really reliably check the coating thickness of the wet paint on the chrome material," says Managing Director Stoz. "At the same time, we tried out a Swiss brand to measure wet paint on chrome. However, we aborted the test of the competitor's device because it never really worked. And so even those employees who were rather critical at first were quickly convinced by the PaintChecker. The OptiSense measuring system is indeed the only one on the market that can precisely test this material combination. This was confirmed in all our reference measurements," says Salzmann, summarizing the result of the test phase.

#### Photothermal perfection in testing

PaintChecker coating thickness measurement devices use the non-destructive photothermal method to determine the thickness of a coating from a distance without touching the surface. This method relies on the different thermal properties of coating and substrate to determine the coating thickness. The coating surface is warmed up by a few degrees with a short, intense light pulse and then cools down again by dissipating the heat into deeper areas. The thinner the coating, the faster the temperature drops. The temperature curve over time is recorded with a highly sensitive infrared sensor and converted into the coating thickness.

The photothermal measuring method thus provided a fast, quantitative method of determining the coating thickness that delivers precise, reproducible results.

#### Measurement made easy

Maintaining the correct measuring distance in particular is very intuitive, adds the production manager: "The Paint Checker has three LEDs that visually indicate the perfect measuring distance. The proper distance is achieved as soon as the three positioning light dots converge at one point. That's a very clever solution." Coating thickness measurement on wet paint offers many advantages for the company, as most of the Stoz painting systems are robot-operated.

For this purpose, specific painting sequences are programmed for each job. In the first phase of programming, it is particularly important to achieve a uniform coating of the entire part. The actual coating thickness can be set later via the quantity of paint applied.

#### Uniform paint application guaranteed already prior to series production

"With the PaintChecker's photothermal test method, our programmer knows immediately whether the coating thickness is the same everywhere or whether the application needs to be readjusted in order

to achieve a completely uniform coating," says technical manager Fessele.

When asked how many points are tested per part, Fessele explains: "It depends on the chrome-plated test sample. There are visible surfaces on a painted part where the coating thickness must be strictly maintained. There are also surfaces, for example, that may be coated but do not have to be. Ultimately, the programmer decides how many measuring points he needs to optimally adjust the line."

*“Being able to check the coating thickness distribution in the wet state while programming the line significantly increases the quality.”*

**Maximilian Stoz**

Managing Director, STOZ GmbH

Every faucet manufacturer has its own designs, and there are countless different



versions of lever mixers, kitchen spouts, etc. The variety of parts is enormous and the individual batches are relatively small, however, the total quantity is quite high. Stoz coats around 20,000 sanitary parts every week.

### Resource-saving all round

The company ensures environmental protection - including the processing of solvents and other hazardous substances - through approval in accordance with the Federal Immission Control Act and certification in accordance with the international environmental management standard. Through modern plant technology and the exclusive use of electricity from renewable energy sources, Stoz also reduces CO2 emissions.

And, by the way, the company also reduces material costs, as the coating thickness test immediately shows how thick the coating will be after curing. So excessive "safety margins" are a thing of the past.

### Functionally relevant measurement for bikes

The PaintChecker is of course also used

for jobs in various other areas, such as the bike industry. Here, Stoz paints e.g. brake levers for motorcycles.

The coating thickness is functionally relevant here. The thickness range of 30 and 110  $\mu\text{m}$  is relatively large, but with multi-layer coatings, the coating thickness can easily be undercut or exceeded despite this large tolerance range.

*“The OptiSense measurement device contributes significantly to our waste reduction. This applies both to quality - i.e. less rework - and to quantity, i.e. less paint consumption”*

**Holger Salzmann**

Head of Production, STOZ GmbH

If the paint is too thick, the brake lever jams or can no longer be mounted. And,

due to their shape, these kind of aluminum parts are difficult to measure with a contacting measuring system. That's where the paint checker has to come in again," smiles Salzmann.

### High-tech paints in the automotive industry

Another Stoz specialty are decorative coatings with special visual and tactile properties on a wide range of substrates. High-gloss coatings in all colors are just as popular as metallic effects or soft paints with a particularly comfortable surface.

These paintjobs are meanwhile also tested with the PaintChecker. For example, trims for the car interior have to be functional and appear modern and elegant.

### Anti-fingerprint paint can be measured as well

However, fingerprints often spoil the appearance. To ensure that these remain invisible in the car interior, the parts need to be painted with a special clear coat, whose thickness is also precisely monitored with the PaintChecker. "Due to the



## *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.*

*The PaintChecker  
is easy to use  
and provides accurate  
measurement data.*

**Jürgen Andrusch**

Head of Quality Assurance, STOZ GmbH

particularly fine paint structure, the surface achieves optimum anti-fingerprint characteristics and very good gloss behavior," explains Andrusch. In addition to the anti-stick effect and optical suppression of fingerprints, the paint applied by Stoz is particularly abrasion-resistant and virtually transparent.

### **Soft-touch effect coating on the test bench**

Soft-touch coatings give components a certain feel. Depending on the finish, the surface feels velvety soft and silky or almost rubbery. Normally hard and plain product surfaces are given an effect that resembles the feel of leather. Soft-touch finished products are therefore often referred to as hand flatterers. In the automotive industry, soft-touch coatings are mainly used in the car interior.

The STOZ GmH headquarters



The soft-touch effect paint is transparent, so the final color depends on the substrate or primer and the optical character of wood or metal can be preserved. Even colored soft-touch paints are possible by adding suitable pigments.

The various haptic perceptions of soft-touch paints are caused by the paint composition or special drying processes. The light is completely scattered on the microstructured surface, which creates the distinctly matte effect. And here too, Stoz achieves excellent test results with the PaintChecker.

#### Summary

„The use cases could go on and on,” summarizes Managing Director Stoz, “For our applications, we are optimally prepared with the PaintChecker.”



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