



## Preparation is everything

### Surface cleanliness as a guarantee of intact coatings

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**Whether for a superyacht or a shipyard crane: the durable coating of steel surfaces plays an important role in the maritime sector and other industries. The problem is that if the substrate is not properly prepared before coating, there is a risk of costly subsurface corrosion. Wrede Technologies (WRETEC) conducts laboratory analyses of coating defects and its reports provide a reliable basis for warranty claims.**

Pavel Jeljakin, Project Manager and Material Scientist at Wrede Technologies GmbH, explains how defects can occur when steel substrates are coated: "It is crucial that steel surfaces are thoroughly cleaned before the primer is applied. If the substrate is not properly prepared, rust or other coating defects can occur." As an example of this, the company recently had an order for a crane that exhibited extensive subsurface corrosion while still within the warranty period. In order to be able to assert any warranty claims against the manufacturer, the customer submitted material samples of the paint (paint chips) to WRETEC for laboratory testing. Jeljakin and his team used a 3D microscope to get to the root of the problem. To do so, they cast ten randomly selected paint chips in resin, polished them up and examined the cross-sectional area under a microscope. "When examining the coating cross-section, particles of metal were found under the primer layer in almost every sample. These may have been the cause of corrosion. In this case, the particles were an indicator of poor cleaning." The findings from the analysis indicate that the steel component was not sufficiently cleaned after blasting and thus the 2.5 Sa level of surface preparation specified by the manufacturer, which describes the required cleanliness, was not met.

"Using the microscopy method, we can identify defects and their potential root cause very quickly, usually without the need for any additional procedures. This constitutes a neutral and reliable basis for any potential claims for damages or costs", says the coating expert. In this case, metallic particles were trapped between the surface and the primer. But inadequate substrate preparation can also be the cause of other impurities. This is why Jeljakin recommends having the result of cleaning checked before the primer and varnish



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are applied. "Using a portable microscope, we have the ability to carry out visual checks for dust or foreign particles on surfaces directly on site. In addition, a salinity measurement of the surface reveals soluble salts and ion-specific contamination that are often not visible to the naked eye." WRETEC also offers a measurement of surface tension to enable the detection of oily layers on the steel. Measuring the roughness of the substrate can also be important, as the surface profile of the steel has a great influence on the subsequent adhesion of the coating to the substrate. "If you make sure beforehand that the substrate preparation level is maintained before coating, meaning that surface cleanliness is guaranteed, you can avoid any subsequent costs for recoating", summarises the laboratory expert.

### Surface preparation levels

Preparation level	Method	Description
Sa 1	Blast cleaning	Loose mill scale, rust, paint coatings and foreign particles are removed.
Sa 2		Mill scale, rust, paint coatings and foreign particles are substantially removed.
Sa 2.5		Mill scale, rust, paint coatings and foreign particles are removed. Only traces remain in the form of spots or stripes.
Sa 3		Mill scale, rust, paint coatings and foreign particles are entirely removed. The cleaned surface should have a uniform metallic colour.

(Source: [https://www.fh-muenster.de/bau/downloads/personen/muero/intern/bau/4.5\\_Vorbehandlung.pdf](https://www.fh-muenster.de/bau/downloads/personen/muero/intern/bau/4.5_Vorbehandlung.pdf))

### About WREDE Technologies GmbH

Founded in 2015, WREDE Technologies GmbH (WRETEC) is the first port of call when it comes to the unequivocal clarification of coating damage on superyachts. The Hamburg-based company benefits from Wrede Consulting GmbH's many years of experience in consulting on coating processes and combines this with state-of-the-art technical analysis methods. More information is available at: [www.wretec.com](http://www.wretec.com)



# *Press Release*

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