



- 1 *Abrex test.*
- 2 *Combustion test.*
- 3 *Impact test – Stone hammer blow test device.*

SAMPLING PAINTED PARTS TO ENSURE PROCESS QUALITY

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Situation

When choosing a new car, it is not just the design of the bodywork and the technical features that count.

Whether matt or glossy, the finish of a car's paintwork has to be flawless. This applies regardless of current trends and fashions. A highly complex process is behind this requirement, which must be optimally designed in all its steps in order to meet the high demands regarding appearance and haptics, as well as chemical and mechanical properties.

Especially in the today's world, it is essential to avoid complaints from customers.

For economic reasons, these days fewer and fewer OEMs are inspecting the quality of painted parts themselves. Accredited test laboratories sample and test painted parts

to assess whether they meet their specific requirements. In our laboratories at Fraunhofer IPA, we implement accredited test procedures according to DIN EN ISO/IEC 17025:2018. This ensures that suppliers meet OEM specifications.

Initial sample

The sampling process is carried out in several stages. Before an initial sample is produced, depending on the situation the selected substrate and the coating must be tested in the laboratory/coating manufacturer's testing facility. Subsequently, the paint/paintshop/component is then adapted as required. Finally, suitability for series production is confirmed by the initial sample. The entire sampling process is carried out according to the quality specifications of the OEM concerned and, where possible, also according to DIN EN ISO/IEC 17025:2018.



We can help

For many suppliers, sampling is a major challenge. Thanks to its longstanding experience and wealth of expertise, Fraunhofer IPA can give suppliers targeted assistance. The automotive industry has high quality standards. In order to guarantee consistently good painting results, delivery instructions specify certain paint-related features, such as

- coating adhesion,
- corrosion protection,
- resistance to chemicals and operating media and
- appearance (color, gloss, waviness).

The necessary sampling tests are stated in the OEM's specifications and are based on the respective DIN standards. We have been performing such tests successfully for car manufacturers for many years. The required quality features, and therefore also the test methods for characterizing the quality of the coating, vary greatly from one OEM to the next. Fraunhofer IPA works closely with a large number of OEMs. As a result, we are familiar with current delivery specifications and thus also with the corresponding test programs, which vary according to the component concerned. The sampling processes are conducted by specially-trained staff using state-of-the-art testing equipment.

Test centers

Our test centers have been in existence for 40 years. During this time, we have invested in an extensive range of test equipment, enabling us to test samples according to standardized and normed procedures. With the test techniques, we record the dynamic behavior of the coatings immediately after their application in a reproducible and authentic way right up to the critical point in time when their long-term stability can no longer be guaranteed.

Within the scope of the sampling tests, we can help our customers

- develop specifications
- perform tests
- interpret results
- prepare work instructions
- train staff
- develop test equipment.

Examples of sampling tests:

Steam jet testing device

By simulating an extremely high-pressure cleaning process, we use this device to substantiate information on the bond strength of the paint layer under mechanical stress.

Stone hammer blow test device

This VDA-standardized device (multi impact device) uses low-mass bodies impacting at high speed to generate damage images. In this way, damage to the surface of a car due to stone chippings can be simulated and evaluated.

Abrex test device

With the Abrex test method, visco-elastic processes of manual abrasion and pressure, especially the stress induced on buttons, knobs, etc. by sweaty, greasy fingers, can be simulated on taking chemical circumstances into account. The damage inflicted on surfaces by the human hand is one of the main reasons behind of a product's loss in value.

Fogging test

The fogging test is a method for simulating outgassing from a vehicle's interior over time in a way that is both measurable and reproducible. High temperatures and large surfaces inside vehicles cause volatile and semi-volatile organic compounds to be released in the form of gases at an accelerated rate from polymers, fabrics and materials used in interiors. If these compounds condense on the cooler surface of the windshield, this could severely impair a driver's vision.

Combustion test

The combustion test or fire test serves to prevent hazards associated with products burning out of control and gives an indication of the combustion behavior of parts and their coatings in a vehicle's interior. The combustion rate is determined under standardized conditions.

- 4 *Steam jet system.*
- 5 *Fogging test.*