

Efficient solutions for flawless painting results

Identifying and eliminating painting defects and preventing them in the long term

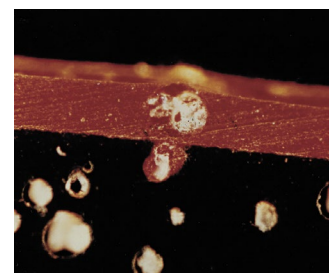
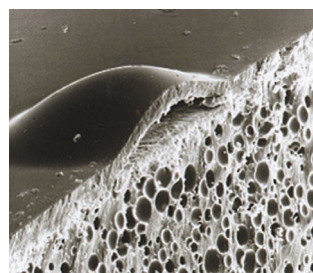
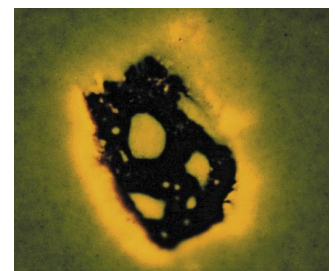
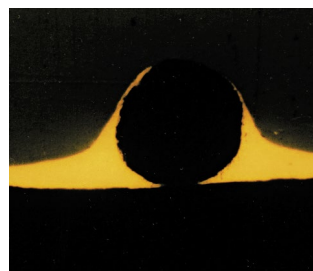
Painting defects can occur all of a sudden, and their causes are often varied and difficult to identify. In such cases, prompt assistance is needed to reduce high rework costs and reject rates. At the same time, it is important to stabilize the painting process in the long term and extend the process window to compensate for any fluctuations that might arise.

Triggers which could cause painting defects include inadequate pre-treatment, incorrect paint application, non-compliance with process parameters, disruptive external influences or an accumulation of process fluctuations - to name but a few. Finding the exact cause and eliminating it completely is often no easy task.

Fraunhofer IPA offers you comprehensive support and expertise to quickly identify and eliminate the root causes of painting defects and develop long-term solutions. Our experienced team of experts uses proven methods as well as the latest measuring and testing technologies to analyze and optimize the quality and cost-effectiveness of all production steps. Painting defects whose causes are not clear are carefully analyzed in the laboratory using methods such as microscopy, spectroscopy and chemical analyses.

However, defects and weak points that lead to rework in the paint shops are not limited to the painting area alone. These can arise even before the start of the painting process, e.g. during production of the parts concerned or their assembly before being processed. There is a reciprocal relationship between the relevant influencing variables.

In conjunction with quality fluctuations, these can result in to a substantial accumulation of defects - even if the discrepancies are only minor. The reliability of the painting process is then no longer guaranteed. In this phase, the focus is on quickly restoring reliable production and the required quantities and quality.



*Top left: Welding bead
Bottom left: Paint bubble on
polyurethane foam part*

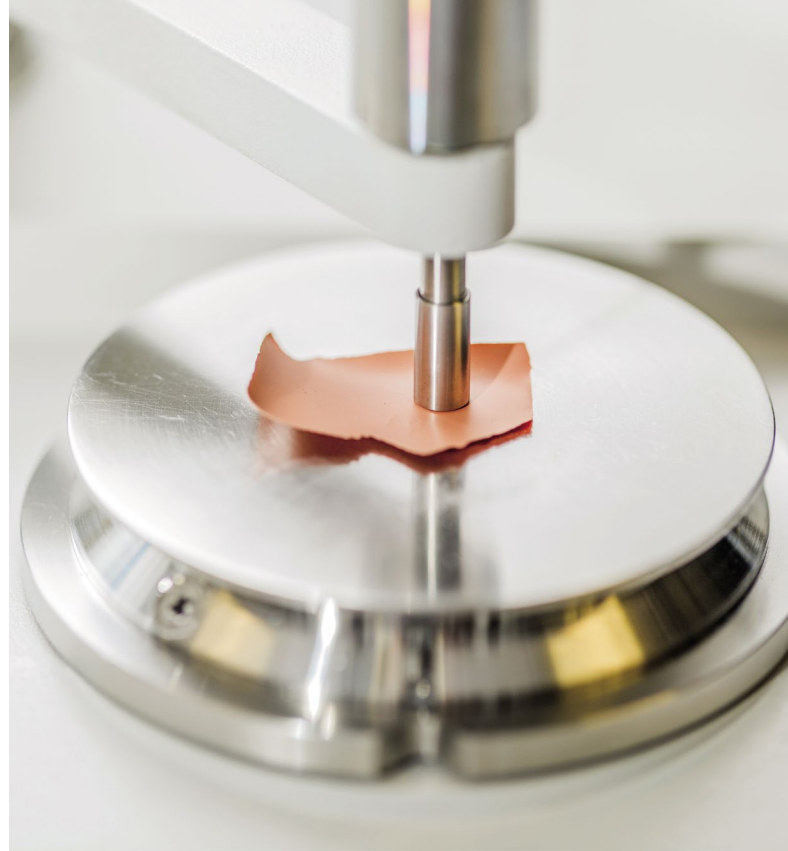
*Top right: Crater
Bottom right: Pores in
polyurethane foam part*

Our approach: Immediate measures

Our experts carry out an on-site inspection as quickly as possible and record the current situation in a systematic manner. Depending on the type of painting defect, we concentrate on the critical processes. Using our own measuring devices, we measure the relevant parameters and determine whether they are within the permissible limits. Affected components can either be analyzed immediately on site or in our laboratories. By being able to carry out all tests ourselves, you can be sure that we will deal with your problem fast, as no external analyses need to be commissioned. Fraunhofer IPA has all the necessary standard measuring technology at its disposal for analyzing defects, such as infrared spectrometers and microscopy, SEM/EDX with FIB, confocal Raman spectroscopy, microscopy (including LSM), gas chromatography with mass spectrometry, to name but a few.

Long-term process stability

During the main inspection, we take a close look at every single defect. Extensive defects counts are particularly useful. These counts can be broken down according to the respective production step to ensure that a representative cross-section of the various types, causes and accumulations of defects are recorded. Only with a sufficient evaluation period can the time dependence of defects be assessed.



Analyzing defects by infrared spectroscopy (caption)

With the informative results obtained from the defect analysis, we then draw up a catalog of measures in cooperation with the departments concerned. Priorities, responsibilities and deadlines are defined in order to plan the necessary measures. Initial cost calculations are also carried out.

Further ways of analyzing defects:

- Analytical comparison of dirt generators specific to a paint shop, such as abrasion from the conveyor system or paint overspray particles, which can be taken from the production process.
- Simulation tests in the laboratory to characterize the defects.

We would welcome the opportunity to help you prevent painting defects in the long term and ensure stable and flaw-free painting processes.

Get in touch with us!

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