

3D analysis in tribological processes

- Form and geometry measurement
- True color information to registered 3D data
- Roughness and contour measurement conforming to latest ISO standards
- Measurement of surfaces showing steep flanks and strong reflections
- Surface characterisation of sub miniaturized components
- Highest resolution across measurement areas of several mm
- Fast and easy failure analysis
- Optimisation of manufacturing processes
- Research and Development
- Automatic detection of e.g. corroded surfaces via scripting

Applications

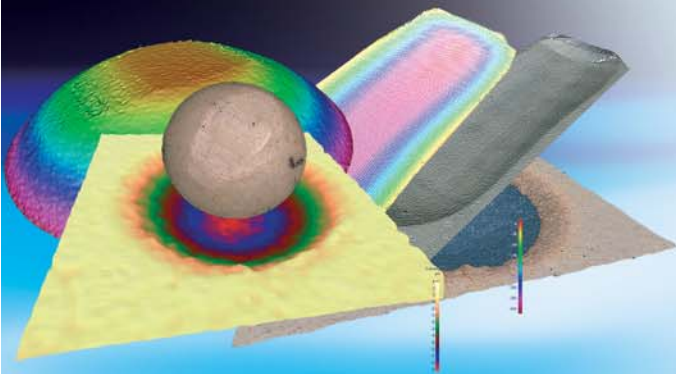
- WEAR MEASUREMENT
- USING MICRO SCALE ABRASION
- CORROSION ANALYSIS
- OF RADIATORS

INFINITE FOCUS

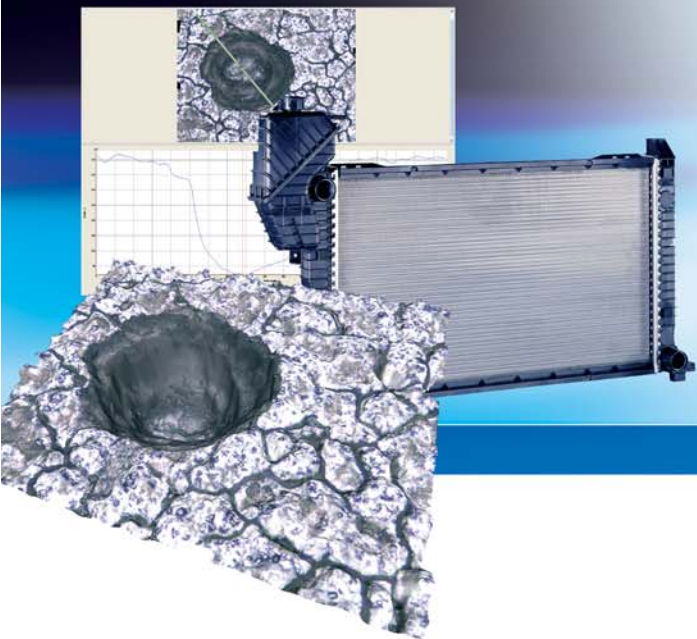
The understanding of tribological processes such as friction and wear analysis is essential for the optimisation of many mechanical processes. In contrast to conventional methods, which are based on the analysis of 2D data, InfiniteFocus® provides numerical quantification and detailed 3D surface characterization. In e.g. wear analysis, the optical system allows easy and reliable abrasion measurement of thin coat. Depth, thickness of the coat as well as the true wear-volume of artificially produced crates are measured. Corroded surfaces can be studied through volumetric material oxidation rate determination.

InfiniteFocus® is based on Focus-Variation. The optical 3D measurement device provides the entire surface topographic information in combination with its true color information. Measurements reach a vertical resolution of up to 10nm even at complex geometries such as steep flanks and strong reflections. InfiniteFocus® can be used in the lab as well as an Inline sensor in production.

OPTICAL SURFACE MEASUREMENT WITH TRUE COLOR

INFORMATION – INFINITE**FOCUS**[®] IN QUALITY ASSURANCE**Wear measurement
using micro scale
abrasion**

Micro scale abrasion tests are used to analyse the wear resistance of coated materials. A rotating ball, typically of bearing steel, is pressed against the test sample in the presence of an abrasive slurry. By measuring the worn material of the coating and the underlying substrate important information about the wear resistance is obtained. Traditionally, these tests are carried out via two dimensional analysis of magnified images. However, this testing method is error bound and hardly provides accurate numerical information. These problems can be overcome with the optical 3D measurement device InfiniteFocus[®]. InfiniteFocus[®] does not only deliver measurement results with a vertical resolution of up to 10nm, it also provides full color information of the measured surface. The system allows fast and easy measurements of complex parameters such as the coating thickness, the ball crater radius or the real volume of the crater. InfiniteFocus[®] is an ideal tool for tribological analysis as measurement results are repeatable and traceable.

**3D analysis of corroded
radiators**

Engine cooling highly depends on the quality of radiators and materials resistance in terms of defects such as corrosion. Detailed knowledge about the effects of corrosion optimises the manufacturing processes of high quality engine cooling systems.

The German manufacturer Behr, a leading OEM supplier for vehicle air conditioning and engine cooling in passenger and commercial vehicles, uses InfiniteFocus[®] to improve quality and lifespan of cooling radiators. This is achieved by particular tests that target the evaluation of the materials' composition and the affects on the production process. The coolant in the radiator is replaced by corrosive substances to analyse the effects of corrosion on aluminium components. Then, corroded patches of the aluminium, so called pittings, are measured with InfiniteFocus[®]. Material loss caused by corrosion can be numerically verified.

ISO conform measurements such as profile, volume, area and roughness help to measure the corrosion distribution leading to a better understanding of how the material is affected during its life.

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