Confocal sensors
confocalDT

Confocal measurement of dental samples

In order to test the suitability of new materials for dental fillings, the surface deterioration and robustness need to be determined. In order to measure this deterioration, the two companies Syndicad and Certiga-Engineering Solution have developed, in collaboration with the LMU Munich Polyclinic for Conservation and Periodontology, the KF-30 measurement system using confocalDT 2451 sensors from Micro-Epsilon. These high precision, non-contact confocal measurement sensors detect the surfaces of different materials and generate a three-dimensional representation.

The research lab of the Munich dental clinic uses these sensors to measure the chewing surfaces for dental materials and to analyse the resulting wear. A CCD camera enables the visual representation of the surface to be measured. The required area is marked directly in the live image. In addition, it is possible to measure up to eight surfaces automatically.

The software included represents the data as three-dimensional surfaces. Confocal sensor technology achieves a maximum technical resolution of 0.12 μm. In practice, results are not quite this high due to the non-horizontal dental surfaces. However, they are still 10 to 50 times better than the previous system.

Reasons for choosing the sensor
- Very high resolution
- Long service life
- Maintenance-free
- No mechanical contact with the sample surface
- Enhanced measurement resolution of the existing measurement systems by a factor of at least 10

Requirements for the measurement system
- Resolution in XY-axis of 5μm
- Resolution in Z-axis of $\leq$ 0.01% FSO