



KORAD^{3D}

3D-Shape

Info:

The measurement procedure is based on the principle of white-light interferometry and allows a full-area surface measurement with a measurement uncertainty down to the nanometer range.

Light from a white source (with a coherence length of typically a few micrometres) is passed through a half-silvered mirror (beam splitter). The two resulting beams illuminate simultaneously the object for measurement and a reference mirror. Light waves reflected by the object and the reference mirror pass through the beam splitter again and on to a detector (camera chip). If the path length to the object matches the path length to the reference mirror, the instrument produces interference patterns that are sensed by the camera and can be analysed.

Long-term experience in research and development is the basis for the success of the KORAD^{3D} optical measurement system.

Based on this system, 3D-Shape GmbH offers a sensor family whose capabilities have been demonstrated under both laboratory and industrial conditions worldwide. Various surfaces in different processing states, diverse materials and complex geometries can be measured contact free and three-dimensionally with KORAD^{3D}.

In addition to the KORAD^{3D} sensor, 3D-Shape also offers customized hardware and software solutions. Evaluation software is available upon request. Alternatively, pre-existing and/or customer's proprietary software can be integrated to further allow for the economical management of your new measurement requirements.

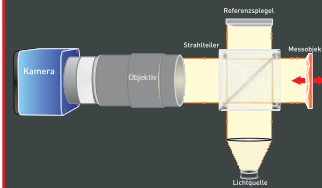
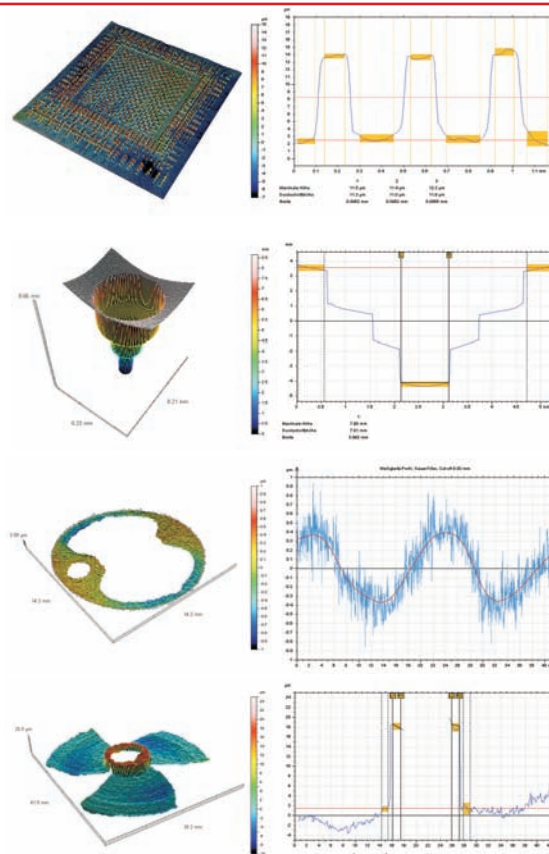


The KORAD^{3D} S-MXS 13 system was developed for quick and precise control on production lines, with a goal of 100% inspection. It reaches measurement times of approximately one second, with a measurement uncertainty of less than 1 micrometer. The example displays a color-coded height image of a flip-chip array and a cross section through the surface of three bumps. Remarkably, this full-area result is available within one second.

In the new generation of injector nozzles, the position and size of different cones must be checked with high accuracy during the process. The image shows a test sample of 10mm maximum depth at a minimum diameter of 1mm. The cone of the drill hole can be measured with a repeatability of 0.04°.

KORAD^{3D} is used for the inspection of seal surfaces in injector systems. The example shows a measured area with a diameter of 14mm. Roughness and flatness are calculated from this. The profile represents the height variation over the circular rim. Quality control in mass production is possible due to measurement times below five seconds with a measurement uncertainty of 20 nm.

Incorporating measurement fields of up to 50 x 50 mm², flatness and sample geometry can be acquired with interferometric accuracy on large surface areas. Systems can be configured to meet customer needs, providing optimal accuracy and measurement speed. The example shows a rotary valve with a diameter of approximately 40mm. The total surface measurement was completed in under ten seconds. (See also our measuring device KorMASTER^{3D})



Software interprets fluctuations in brightness in order to compute the object distance for each object point. As the object moves along the optical axis, a height map of the object with sub-micrometre precision can be created in this way. The scanning speed is typically between a few micrometres per second and 100 μm/s, depending on the precision required.



Test measurements of sample parts to demonstrate the application capabilities of KORAD^{3D} for your application can be performed. Further fields of view and longitudinal measurement ranges can be implemented as needed.