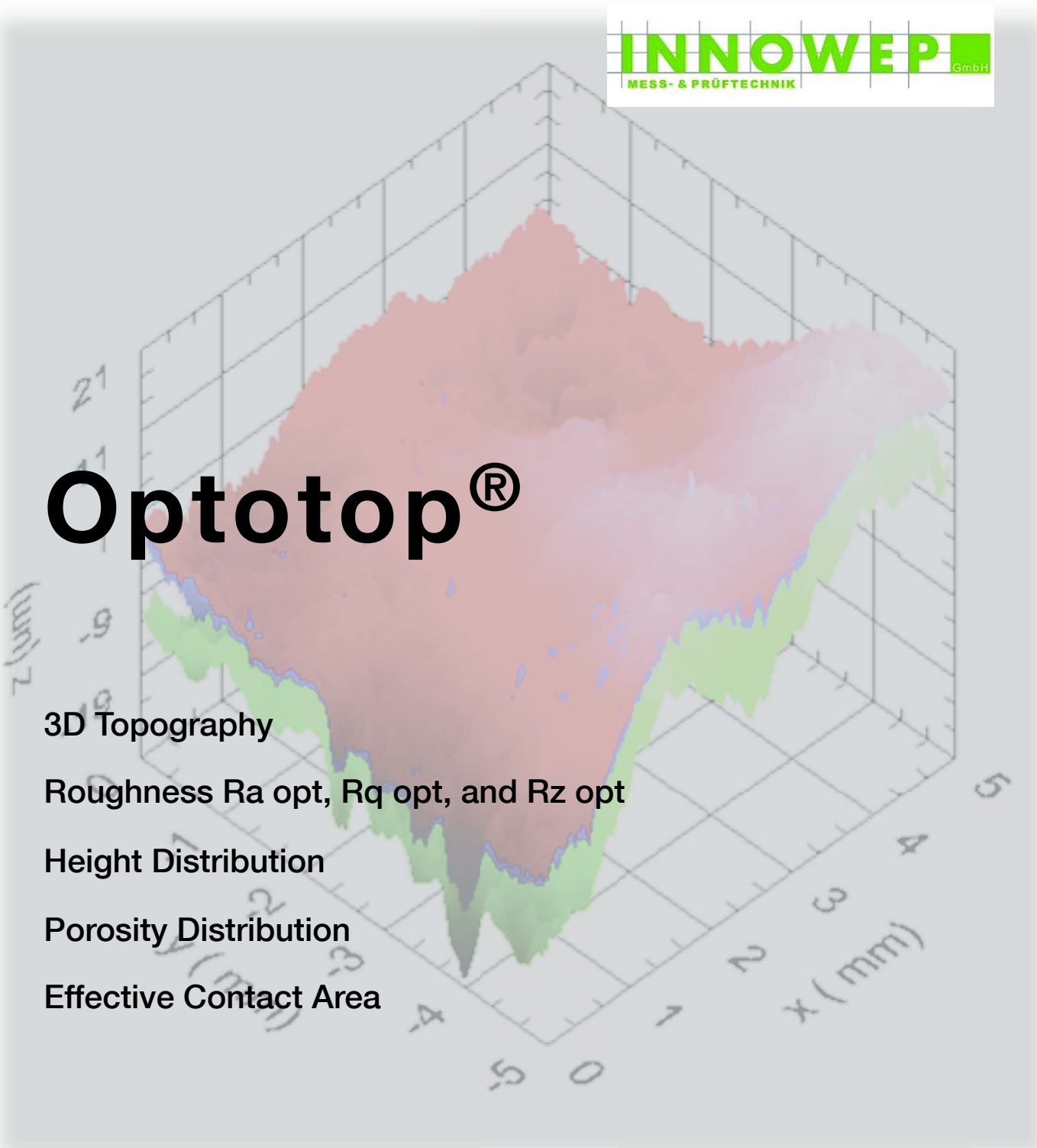

Optotop®

3D Topography

Roughness Ra opt, Rq opt, and Rz opt

Height Distribution

Porosity Distribution

Effective Contact Area

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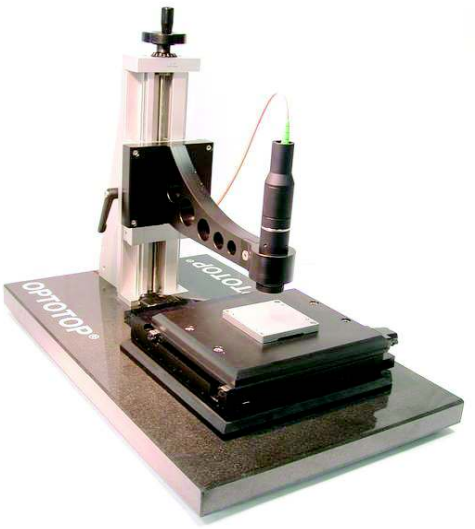
Highlights

- big measurement area up to 60mm x 60mm
- Easy operation
- Non-contact measurement
- Selection of optical sensor with different resolution
- Reproducible and calibratable
- Fast data acquisition



Basic Functions

Surface profile is a key parameter for a product's quality, it also affects the coating's overall performance. The height value (oftenly refers to valley and peaks) of the surface determines many functional features, eg. abrasion, adhesion, etc.
The analysis of a wear or abrasion after many mechanical tests are also needed to determine the quality of the surface coating. Therefore, an accurate measurement and documentation of the surface profile helps to make the right decision for the quality control.

Optotop® is a testing machine which measures the surface profile in a non-contact fashion. The high accuracy measurement of 3D topography makes it widely used for new material development as well as the quality control of manufacturing process.

Parameters can be measured with Optotop® include:

- Roughness
- 3D Topography/Mapping
- Macro & micro geometries
- Light intensity
- Porosity
- Effective contact area ratio

Additionaly, Optotop® can be adapted as a hardware module to UST® , a universal surface tester which applies tactile measuremet of 3D topography on a surface.

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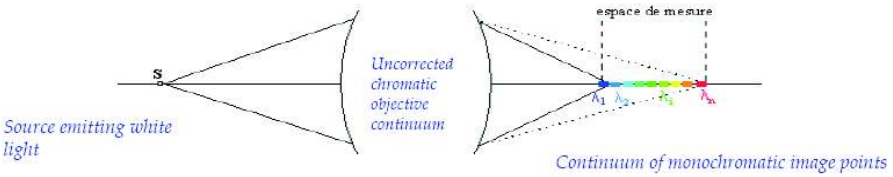
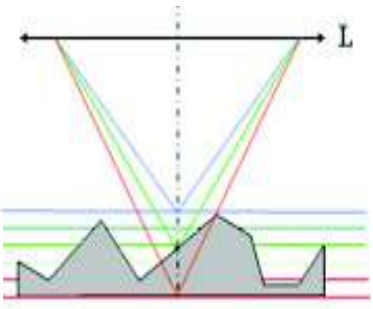
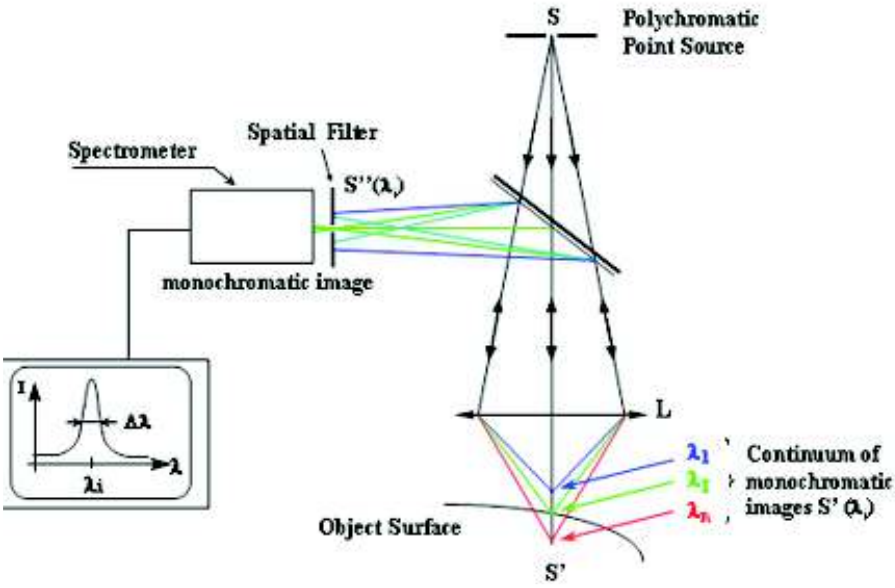
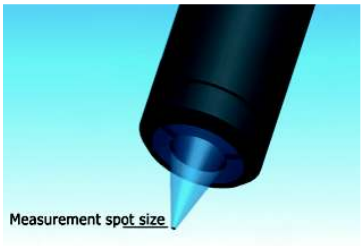
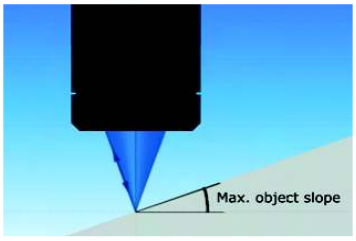
Test Principle











- Measured by Chromatic Confocal Sensor.
- High-resolution, non-contact measurement
- A quasi-confocal setting with extended field along the z-axis achieved by spectral encoding of the z-axis
- Comparing with ordinary microscope which is limited by the wavelength of the visible light (min. spot size 0.8μm), the resolution of the white light interferometry can reach up to 10nm

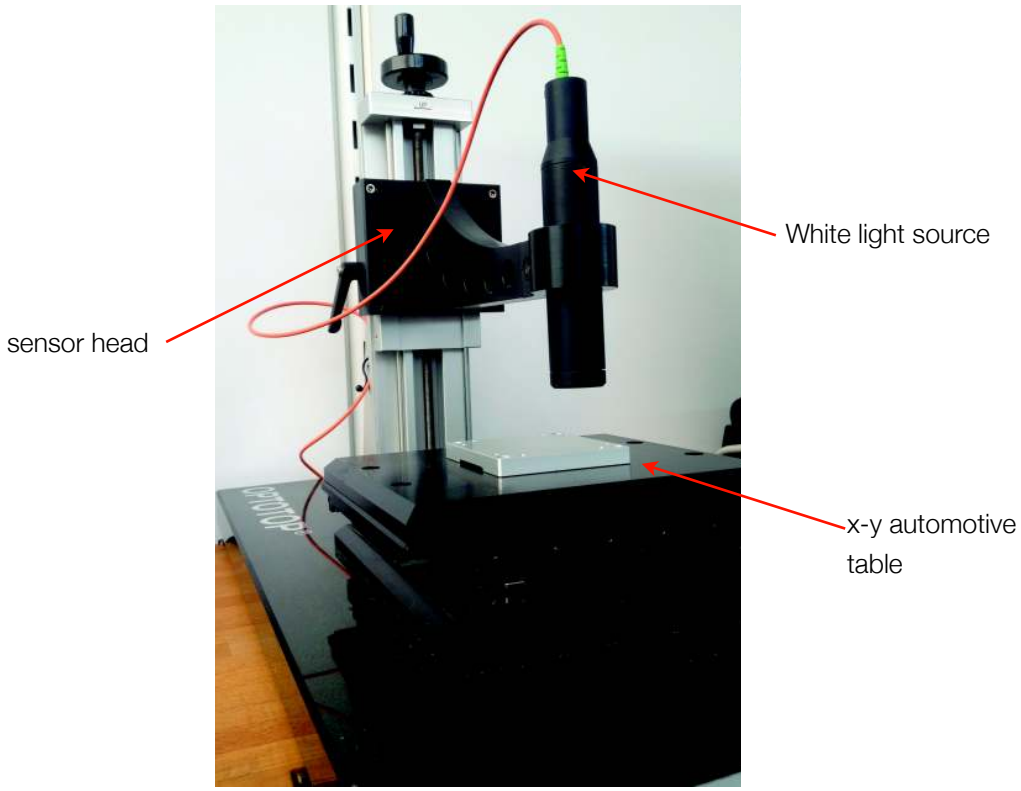
Applications

OptoTop® has many possibilities in quantitative measurement of 3D topography in the range of a few microns to hundreds of microns, especially in Z-direction of the sample. By scanning the sample area in X-Y directions, OptoTop® offers the micro structure of all types of surfaces. These include flat, textured and curved upper surfaces, glossy and opaque materials.

Configuration

The main components of the measurement system are:

- white light sources (LED)
- a sensor head
- a x-y direction moving table
- a computer with control and analysis software



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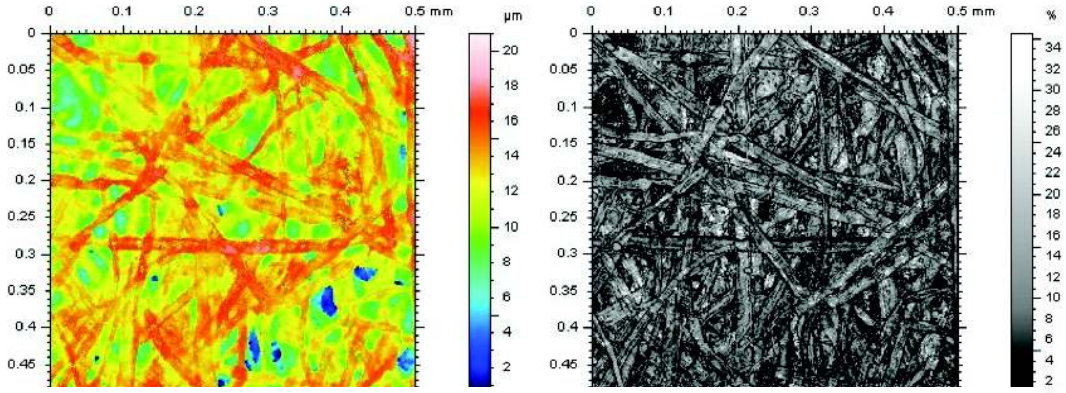
Examples

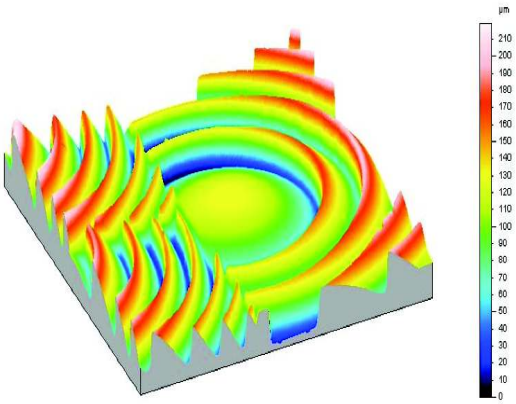
1. Printing Paper



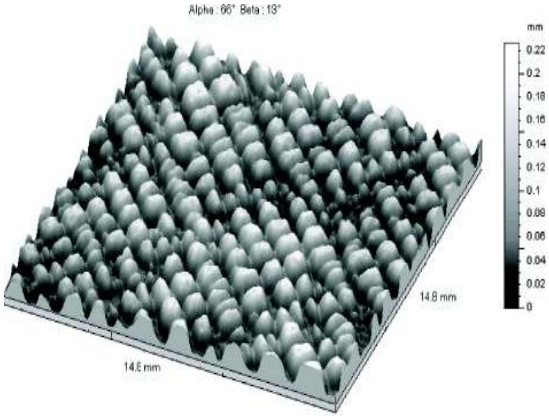
Height measurement Intensity measurement

Paper fibers, the distribution of the fibers and microstructure are the key parameters for the determination of the quality, homogeneity and functionality of a printing paper.

2. Fresnel Lens



3. Structured Leather



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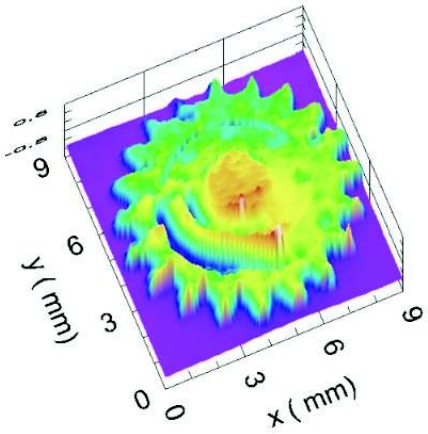
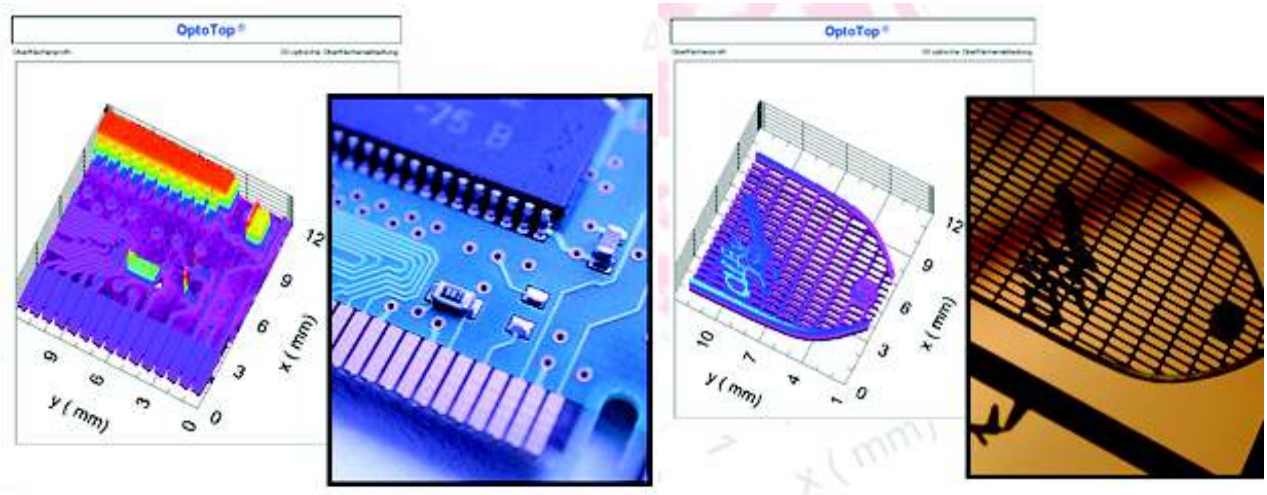
4. Micro part



The geometry, the mciro-topography of a micro part is measured by Optotop® for determination of quality and consistency of the manufacturing process. It should be noted that Optotop® has the capability of measuring a relatively big sample of mm size within the AFM nanometer resolution.

5. Semiconductor



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Technical Specifications

Sensor	Chromatic Confocal		
Measurement Range (Z direction)	300µm	1 mm	2 mm
Resolution in Z direction	12 nm	25 nm	75 nm
Lateral resolution	1.55µm	2µm	4µm
Measuement distance	11 mm	12.7 mm	16.4 mm
Measurement frequency	30Hz，100Hz，300Hz，1kHz		
Standard X-Y range	60 mm x 60 mm		
Velocity	0.1 ~ 10 mm/s		
Standard table size	165 x 165 mm or upon request		