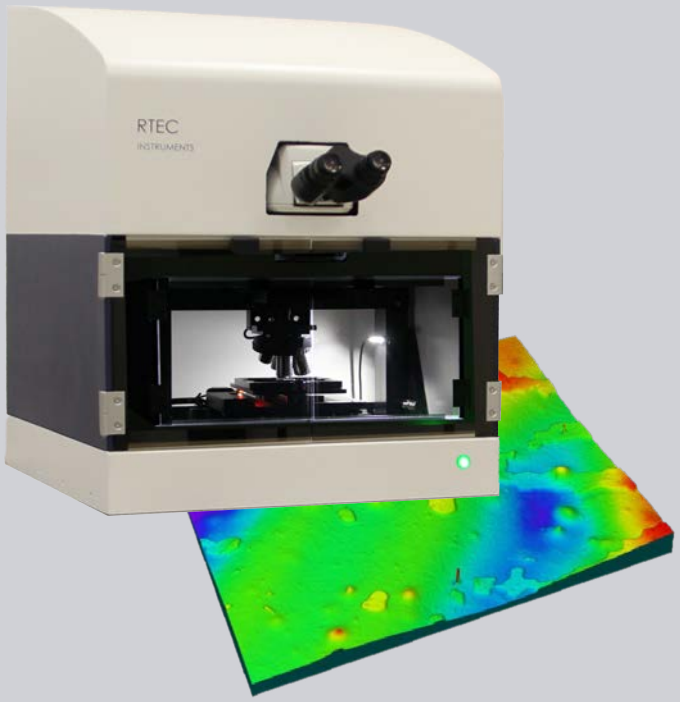
Universal Profilometer

Multiple Imaging Modes With Same Profiler

Accurate

Reliable

Traceable



Analyze Any Surface - Transparent, Dark, Smooth, Rough, Flat, Non Flat

Confocal + White Light Interferometer + Dark Field + Bright Field + Variable Focus Imaging

White Light Interferometer

+

Spinning Disk Confocal

+

Dark Field Imaging

+

Bright Field Imaging

+

Variable Focus Imaging

Combination Allows To Measure Any Sample

Non Contact

Fast 3D Measurement

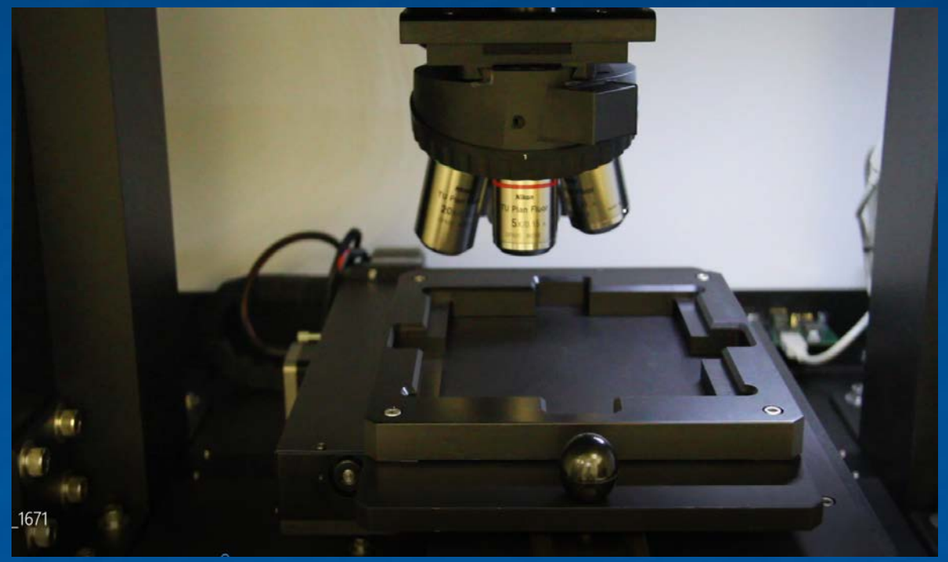
Area Measurement Technique

- Surface roughness
- Film thickness
- Step height
- Topography
- Track volume wear
- Thin film stress (curvature)
- Cracks, defects
- Slope measurement
- Sub Surface Features
- Pass Fail Criteria

- Smooth coating
- Rough Coatings
- 2D Materials
- Transparent
- Dark Coatings
- Shiny Surfaces
- Flat Surface
- Non Flat surface
- Bio Materials
- Ceramic, Metal, Polymers

3D Universal Profilometer

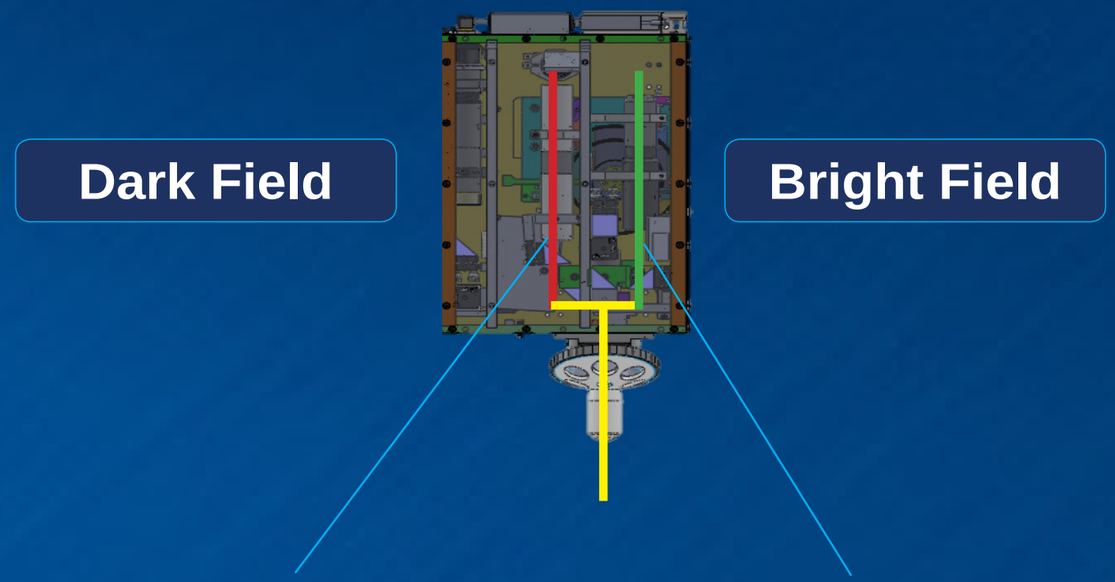
For Research and Quality control tests



Click of button Changes the Operating Mode

Separate Optical Paths for Best Performance

Dedicated Camera For Each Mode



White Light Interferometer

- Measures Flat Samples
- Highest Z resolution
- Z Resolution Independent of Magnification
- Fringe Analysis

Confocal Microscopy

- Measures Flat and Non Flat Samples
- Steep Slope Analysis
- High Lateral Resolution
- Dark Field and Bright Field Modes

Highest Camera Resolution and Speed in Industry

5 Million Pixel

160 FPS at Highest Pixel

Industry leading Camera and highest Frame/Seconds

Pixel is a sample of an original image; more samples provides more accurate representations of the original. Rtec uses a ultra high resolution and industry leading high speed scanning camera to gather data on curved on steep surface and also minimizes amount of noise, a common issue with several conventional, non contact measurements.

Fully Automatic

One Click Operation

The profilometer is very easy to use. With click of a button the sample surface can be scanned and automatic test report in standard format can be created with ease. The software also allows for automatic pass/fail criteria to enable its use in quality control environment.

Optimized for any sample

Ideal for any applications

Multi mode head (Interferometer + Confocal) allows to measure any kind of sample (flat, non flat, transparent, rough, smooth etc) with ease. Single click on button changes the imaging mode.

High Resolution Objectives

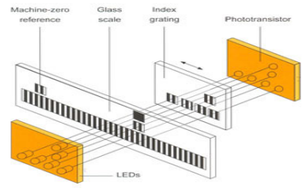
Wide Lens Lineup

The tester comes with 6 objective manual or automatic turret that can accommodate several objectives. Each lens comes with calibration and inspection settings on the tester. The three mode allows to mount objective with very high numerical aperture ratios.

High Resolution Encoders

Advanced Encoder Scales

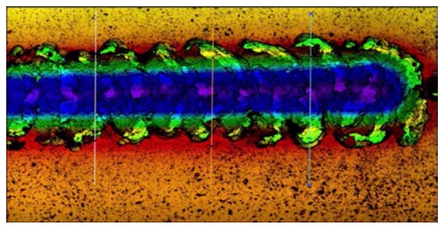
The tester comes ultra high resolution encoder designed specifically for precision at nano scale level. The Z resolution using this encoder is several times better than conventional systems.



Large Area Scan

Automatic Stitching

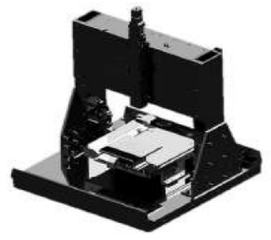
The profiler comes with 160FPS camera that allows it to scan the surface with high speed. This allows to cover big areas and stitch them together at rapid pace.



Rigid Platform

Less Noise

The tester is an open platform architecture that with a acoustic cover. The rigid heavy platform allows to minimise the noise created due to both mechanical and acoustic vibrations.



Quad Light Source

Light is electromagnetic radiation visible to the human eye. It consists of different wavelengths, which are perceived as different colours. Very long wavelengths are perceived as red, and very short ones as violet. Light that has a specific colour is emitted on a narrow band of wavelengths. For example, the yellow sodium streetlights only cover one wavelength - that emitted by excited sodium atoms. The same is true for most coloured light, White light is a combination of many wavelengths.

Rtec Universal Profilometer comes with quad band light. It has dedicated LED for white, red, blue, green and red light source. The different color LED are turned on and off automatically dependent on the test mode. Quad band led allows the profiler to have a control on the wavelength and allows uses to chose proper band for colored samples.

Easy Sample Movement

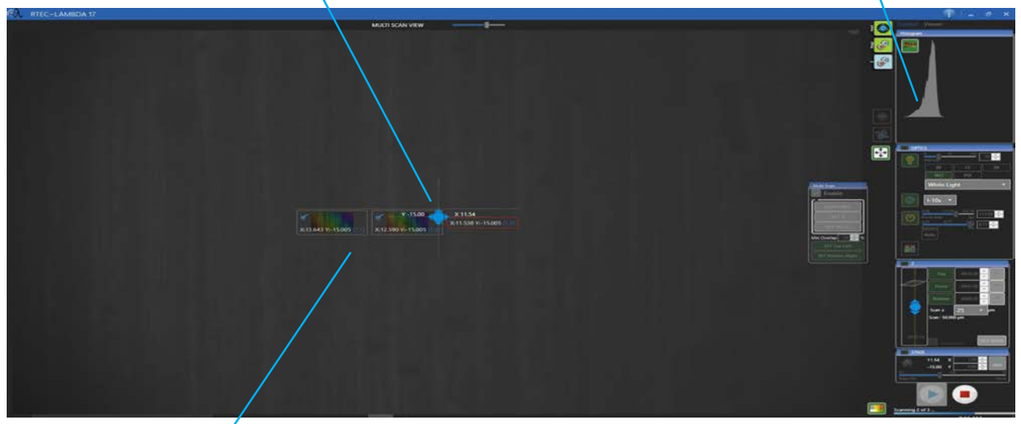
Sample Positioning

The tester comes with 6 objective manual or automatic turret that can accommodate several objectives. Each lens comes with calibration and inspection settings on the tester. The three mode allows to mount objective with very high numerical aperture ratios.

Intensity Change

Advanced Logarithms Gain

The profiler comes non linear intensity control that allows to change intensity for very dark to very shiny surface with slide of a bar.



Real Time Data

Real time Surface Images

Profiler real time images during stitching process can be seen.

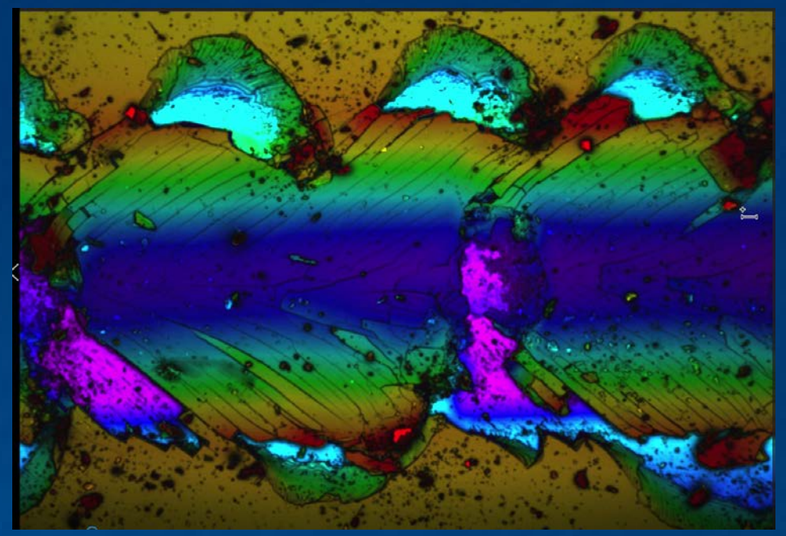
Automatic Re-Scan

Multiple Scan Function

The profiler comes with unique multi scan feature that scans the same area multiple time in case the confidence in the data is not high.

Confocal

Nipkow Confocal
Most Advanced Way of Confocal Microscopy



- Spinning disc (Nipkow) confocal technology for fast vertical scanning
- Best technology for surface and sub-surface feature measurement
- Full field 3D characterization of steep slope analysis (Maximal slope: 72^0 vs. 44^0 from Interferometry)
- Highest lateral resolution in optical profiling. With 5Mp digitalized resolution camera, the spatial sampling down to 0.04um, best for surface feature and profiling measurement
- No limitation on surface roughness/surface reflectivity (from 0.05% to 100%)
- Both bright field and dark field; optical DIC

Rtec Nipkow Confocal is better in speed and resolutions than conventional point confocal techniques (laser or chromatic confocal).

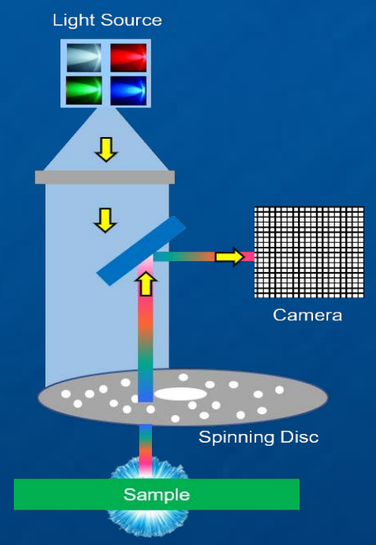
Tilted Object do not affect data

High Lateral Resolution

Measures Steep Slopes

Measures Transparent Surfaces

Very Easy to Detect Surfaces



Wide Objective Lens Selection

Steep Slope Analysis

Confocal microscopy allows to get data from steep slopes 72o vs 44o for interferometry. This is due to the fact that confocal microscopy allows to use wide range of objective which have numerical apertures more than 0.9.

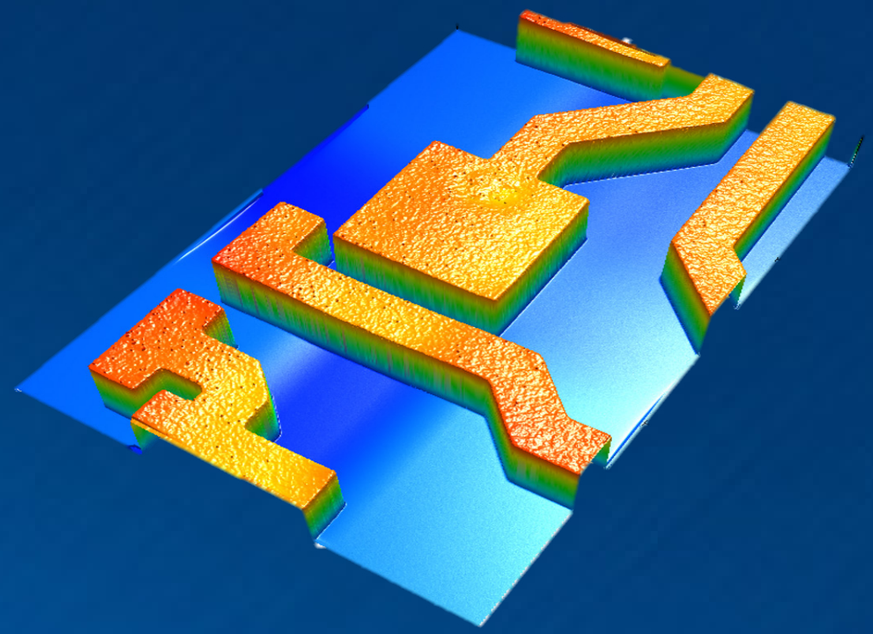
Transparent Surfaces, Sub Surface

Signal only from Focus

Confocal Microscopy allows only the light from focus to enter via infinite small pin-hole. This allows it to scan any kind of sample and surface. The profiler can easily scan transparent sample, sub surfaces features etc.

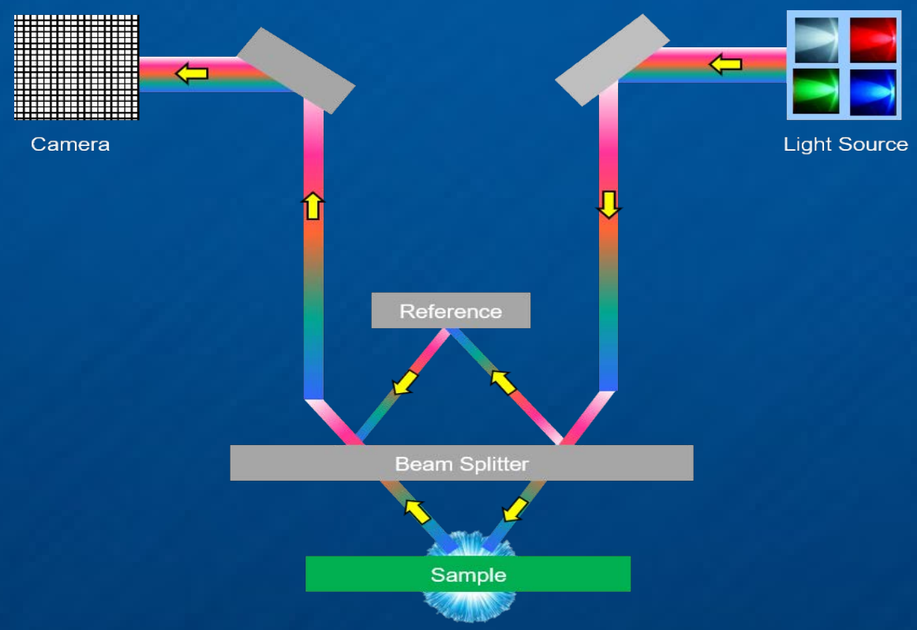
Interferometry

Highest Z Resolution In Non Contact Profilometery



Rtec Interferometer uses Quad Band Lights to do both white light interferometry and Phase Shift Interferometry

- Highest Z resolution, sub-nanometer
- Both phases shifting (PSI) and vertical scanning (VSI) modes
- Z resolution independent of magnification
- User selectable four color LED light source (white, red-630nm, green-530nm, and blue-460nm) improves lateral resolution and optical coherence length (blue light provides higher lateral resolution)
- Up to 5Mp digitalized resolution camera



Roughness Analysis

Sub nm Resolution

The tester comes with 6 objective manual or automatic turret that can accommodate several objectives. Each lens comes with calibration and inspection settings on the tester. The three mode allows to mount objective with very high numerical aperture ratios.

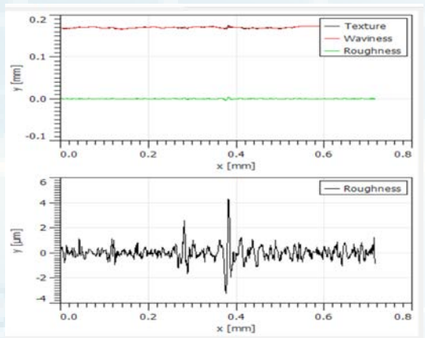
Dual Modes

PSI and WLI modes

The tester can run both phase shift interferometry (for smooth samples) and white light interferometry (for smooth or rough samples).

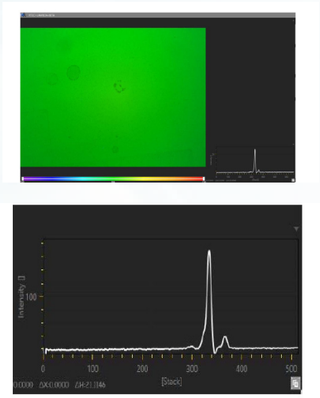
Line, Area Roughness

The software allows to compute both line and area roughness. Calculation of nearly all ASME, ISO, and DIN surface roughness parameters.



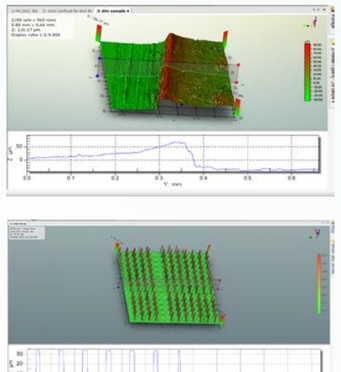
Film Thickness

The software allows to calculate film thickness of transparent and non transparent coatings.



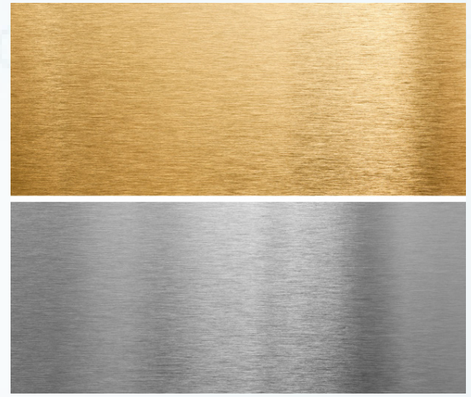
Cross Section Profile

The software allows to create cross sectional view to analyze any area of choice.



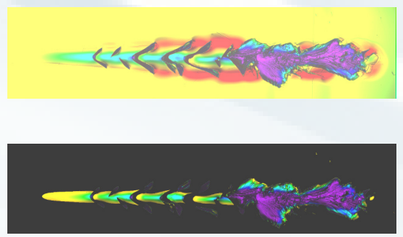
Real Color Images

Profiler allows to image and quantify real color of the sample. This can be used for quality control. The camera comes with calibration certified standard samples.



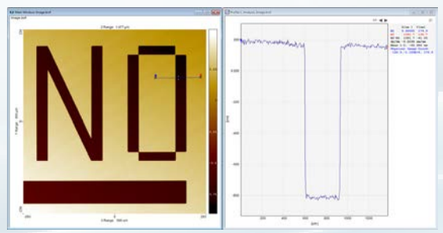
Volume Wear

The software allows to calculate volume of the track or material lost. The calculation accounts for



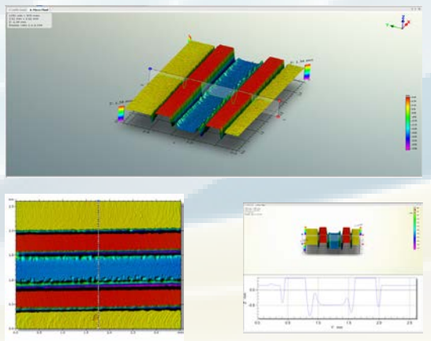
Step Height

Software allows to measure step height per ISO, ASME and DIN standards. The height can be measure based on a line profiler or selected area of choice.



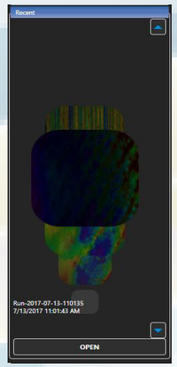
Transparent Films

The tester comes ultra high resolution encoder designed specifically for precision at nano scale level. The Z resolution using this encoder is several times better than conventional systems.



Easy File Sorting

The software records and displays thumbnails of all the recent historical tests for easy comparison and sorting. The files name can also store the textual information about the sample that can be indexed for future retrieval.



Truly Universal

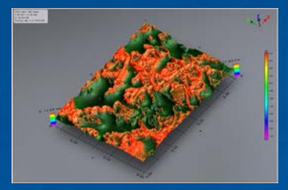
Applications

The versatility of tester allows the profiler to play an important role for several applications. It can be used for thin or thick films, bio materials, ceramic, polymers, metals, smooth or rough surfaces, flat or non flat surfaces, transparent or opaque surfaces, nano or macro scale, coating or bulk materials etc.

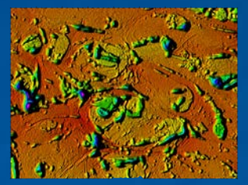
Wide Applications

Markets

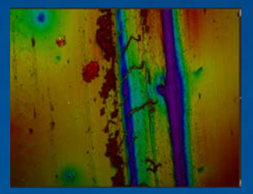
The ease of use allows this tester to play an important role in several industries from hi tech to traditional industries. The tester can be used for both research and routine analysis for production and quality control.



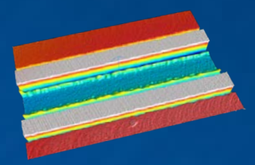
2D Material



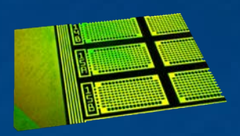
Paper Surface



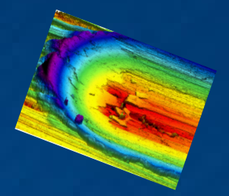
Polymer Surface



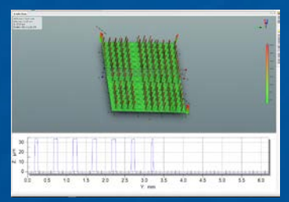
Micro Fluid Device Channel



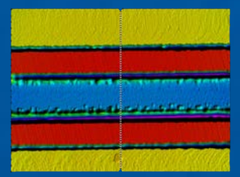
Semiconductor Wafer



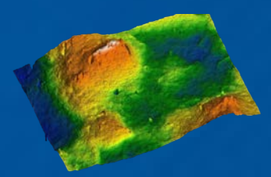
Scratch Mark



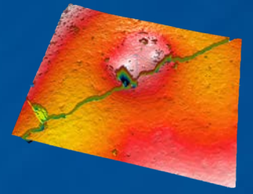
Pillars on Wafer



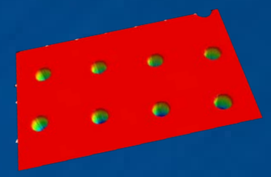
Capillary



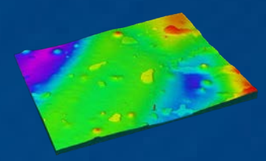
Damage Surface



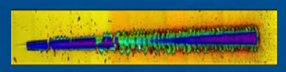
Failure, Crack



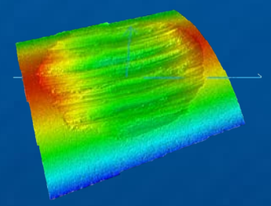
Wafer Bumps



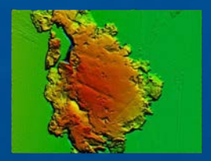
Transparent Coating



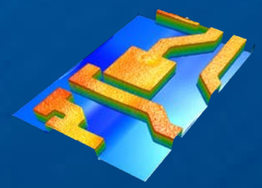
Scratch on Surface



3D In-line High Resolution Imaging

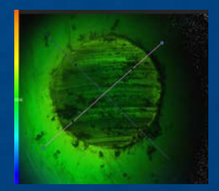


Ink on Surface

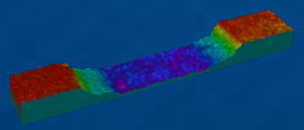


Via and Features on Wafer

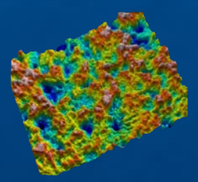
Pellicle and Mask Inspection



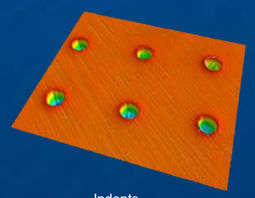
Ball Surface



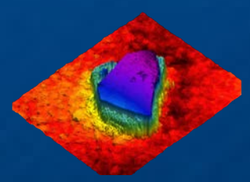
Thermal Spray Coating



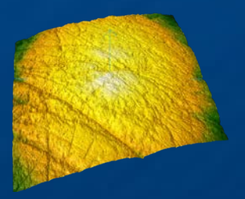
Corrosion Pits



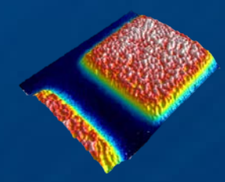
Indents



Diamond Abrasive



DLC coating



Polymer Pad

Analysis Package

- Real time imaging of 3D surface topography.
- Overlay color and intensity images on 3D topography.
- Data acquisition artifact processing - outliers, local defects.
- Roughness and surface texture - with the latest ISO and national standards.
- Surface geometry - including volume of surface structures (bumps, holes), step heights.
- Extract and analyze regions of interest
- Easy publication - export analysis documents, pages and individual images
- Modules for advanced surface texture analysis, contour analysis, grains and particles analysis, 3D Fourier analysis, image co-localization, statistics and more.

Several Standard Compatible

- Fast, automated, traceable surface analysis report creation
- Smart desktop publishing user environment in ten languages (EN, FR, DE, ES, IT, PL, PT-BR, CN, JP, KR)
- Page viewer for fast navigation.
- Pass/fail criteria with green/red traffic lights can be specified for any parameter.
- Series of measurements can be analyzed automatically using templates and Minidocs (common sequences of analysis steps).
- Comprehensive data export: PDF, RTF, screen and print quality bitmaps, Excel-compatible numerical results for compatibility with quality management and other systems.

- Analysis of surface texture and geometry
- Full set of surface roughness/waviness filters including Gaussian (ISO 16610-61), cubic spline filter (ISO 16610-62), robust Gaussian filter (ISO 16610-71).
- Functional studies including bearing ratio curve, depth distribution histo-gram, surface substraction and more.
- Calculation of distances, angles, areas, volumes and step heights.

- The most popular 2D and 3D surface texture parameters
- ISO 25178 3D height and functional bearing ratio parameters.
- ISO 4287 2D primary and roughness parameters.
- ASME B46.1 3D and 2D parameters.
- EUR 15178 amplitude and area & volume parameters
- DIN (Germany), JIS (Japan), GB/T (China), NF (France), BSI (UK), UNI (Italy), UNE (Spain) equivalents of ISO parameters.

Interferometry Objectives						
	2.5X	5X	10X	20X	50X	100X
Numerical Aperture (NA)	0.075	0.13	0.3	0.4	0.55	0.7
Working Distance (mm)	10.3	9.3	7.4	4.7	3.4	2
FOV (um)	6910x5180	3460x2590	1730x1300	860x650	350x260	170x130
Spatial Sampling (um) 5MP CCD	2.7	1.35	0.67	0.34	0.13	0.07
Optical Resolution (L&S 460 nm) (um)	1.87	1.08	0.47	0.35	0.26	0.20
Maximum Slope (arcsin(NA))	4	7	17	24	33	44
Vertical Resolution	Better than 0.01nm					
Vertical RMS repeatability RMS	0.01nm					
Vertical measurement range	Up to 10mm					

Confocal Platform									
	Standard Working Distance						Long Working Distance		
	5X	10X	20X	50X	100X	150X	20X	50X	100X
Numerical Aperture (NA)	0.15	0.3	0.45	0.8	0.9	0.95	0.4	0.6	0.8
Working Distance (mm)	23.5	17.5	4.5	1	1	0.3	19	11	4.5
Field of view (um)	3460x2590	1730x1300	860x650	350x260	170x130	120x90	860x650	350x260	170x130
Spatial Sampling 5MP	1.35	0.67	0.34	0.13	0.07	0.04	0.34	0.13	0.07
Optical Resolution (L&S 460nm)(um)**	0.94	0.47	0.31	0.18	0.16	0.15	0.35	0.23	0.18
Maximum Slope (arcsin(NA))	9	17	27	53	64	72	24	37	53
Vertical Resolution (nm)	72.0	18.0	8.0	2.5	2	1.8	10.1	4.5	2.5
Confocal Frame Rate 5MP/1MP	15/30 fps typical (>100 with binning)								
Typical Measurement Time (s)	<1s for 30 Confocal Slices								
Vertical Measurement Range (mm)	Up to 15 mm								

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