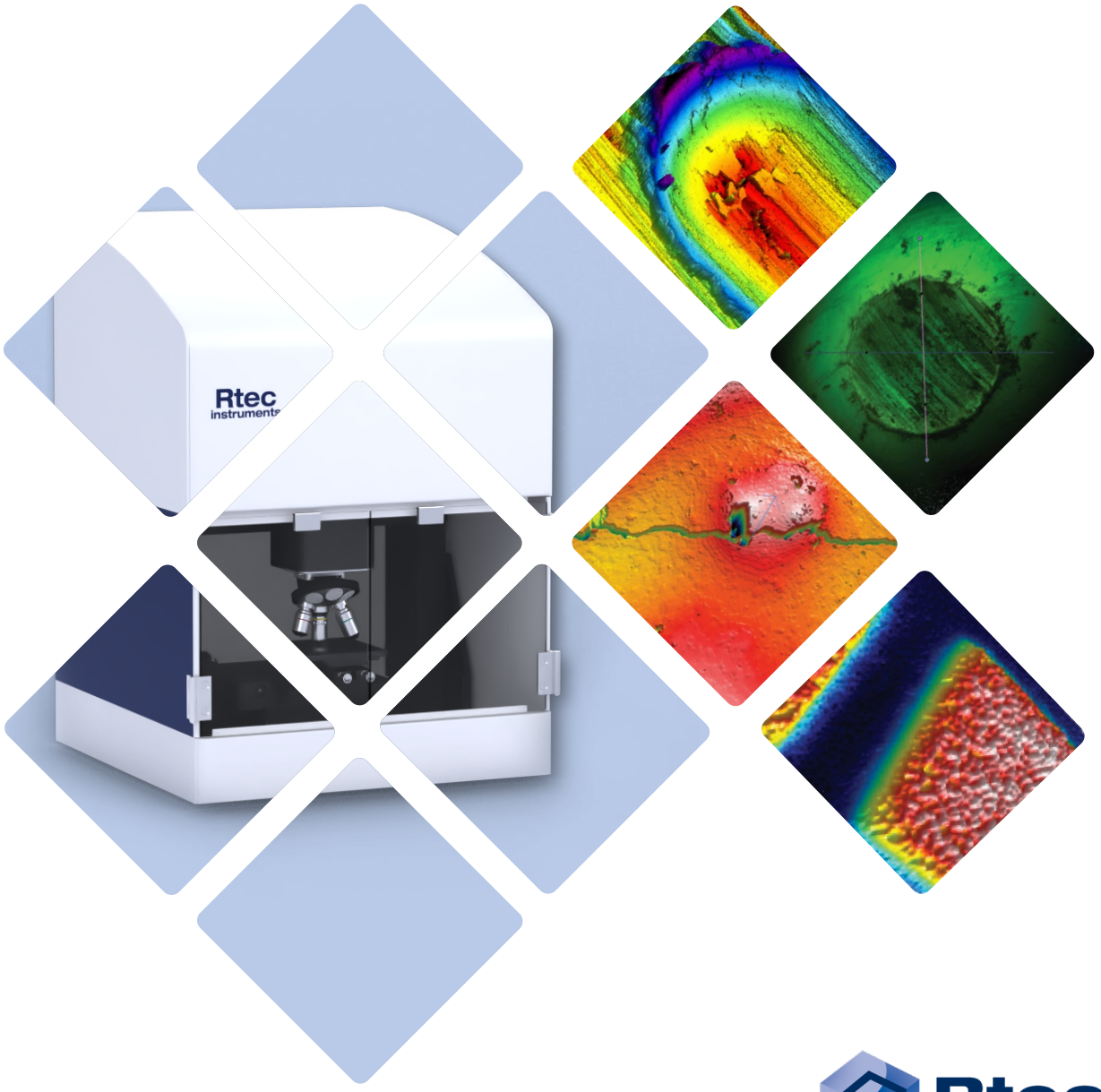
Universal Profilometer

UP-24

3D Microscope With Multiple Imaging Modes



Rtec instruments

Ultimate Combination

- Non Contact
- Fast 3D Measurement
- Area Measurement Technique

White Light Interferometer

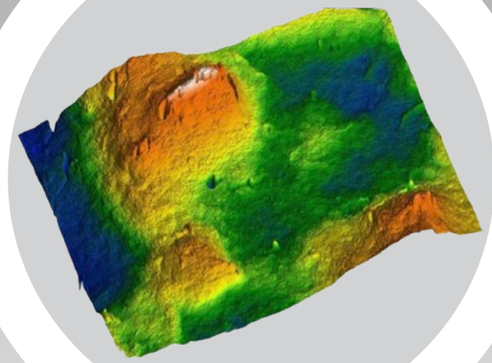
Dark Field Imaging

Bright Field Imaging

Spinning Disk Confocal

Variable Focus Imaging

Combination Measures Any Sample



Wide Applications

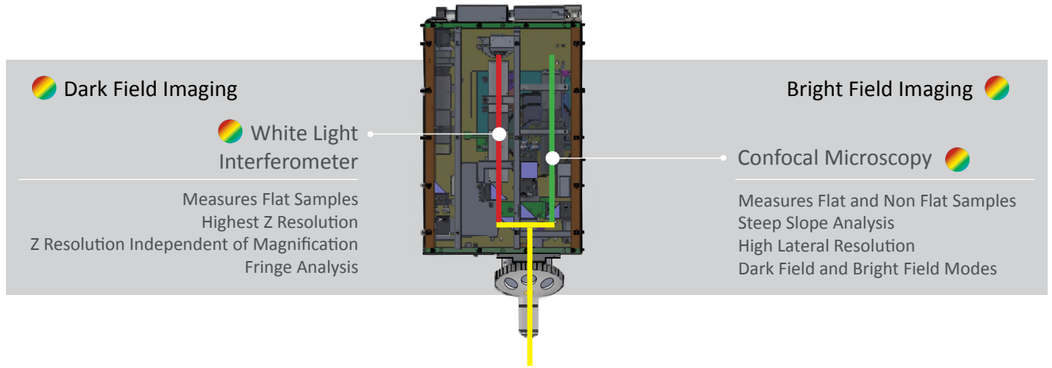
The ease of use allows this tester to play an important role in several industries from high tech to traditional industries. The tester can be used for both research and routine analysis for production and quality control.

- 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
- Biomaterials
- Ceramic, Metal, Polymers

Separate Optical Paths For Best Performance

Dedicated Camera For Each Mode



Quad Light Source

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

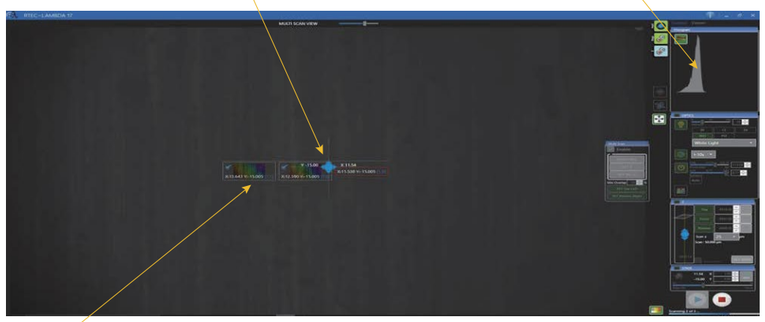
Intensity Change

Advanced Logarithms Gain

The profiler comes with non linear intensity control that changes intensity for very dark to very shiny surfaces, with slide of a bar.

Easy Sample Movement

Sample Positioning



Real Time Data

Real Time Surface

The profiler's 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 times in case the confidence in the data is not high.

Confocal

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

Wide Objective Lens Selection

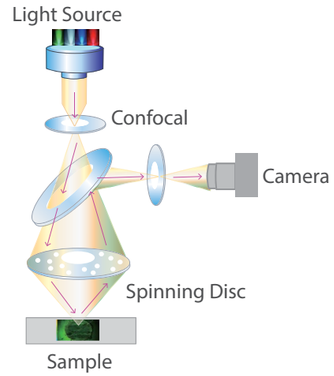
Steep Slope Analysis

Confocal microscopy can retrieve data from steep slopes, 72° vs. 44°, from interferometry. This is due to the fact that confocal microscopy uses a wide range of objectives that have numerical apertures more than 0.9.

Transparent Surfaces, Sub Surface

Signal Only From Focus

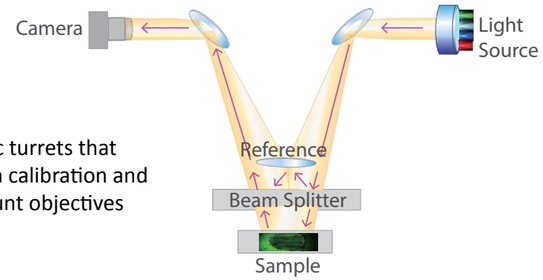
Confocal Microscopy allows only the light from focus to enter via infinite small pin-hole. Therefore, it can scan any kind of sample and surface. The profiler can easily scan transparent samples, sub surfaces features, etc.



- 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° vs. 44° from Interferometry)
- Highest lateral resolution in optical profiling. A 5Mp digitalized resolution camera and spatial resolution down to 0.04um. It is 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

Interferometry

Highest Z Resolution In Non Contact Profilometery



Roughness Analysis

Sub nm Resolution

The tester comes with 6 objective manual or automatic turrets that accommodate several objectives. Each lens comes with calibration and inspection settings on the tester. The three modes mount objectives 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).

- 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

Rtec Profilometer Feature

160 FPS at Highest Pixel

Highest Camera Resolution and Speed in Industry

Fully Automatic

With click of a button the sample surface can be scanned and an automatic test report in standard format can be created with ease. (for automatic pass/fail criteria to enable its use in quality control environment.)

Optimized For Any Sample

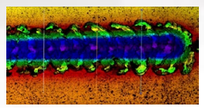
The multi-mode head (Interferometer + Confocal) can measure any kind of sample (flat, non flat, transparent, rough, smooth etc) with ease. A single click on button changes the imaging mode.

Wide Lens Lineup (High Resolution)

The tester comes with 6 objective manual or automatic turrets. Each lens comes with calibration and inspection settings on the tester. The three modes mount objective with very high numerical aperture ratios.

Automatic Stitching

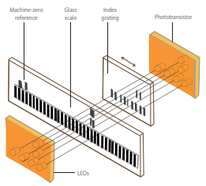
The profiler comes with 160FPS camera that allows it to scan the surface with high speed. This enables it to cover big areas and stitch them together at rapid pace.



High Resolution Encoders

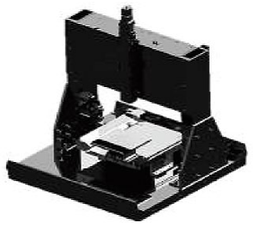
Advanced Encoder Scales

The tester comes with an 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.



Rigid Platform and 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.



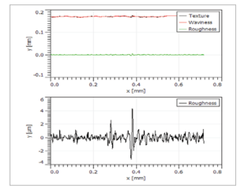
Analysis Package

- 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.
- Extract and analyze regions of interest (Page viewer for fast navigation.)
- Modules for advanced surface texture analysis, contour analysis, grains and particles analysis, 3D Fourier analysis, image co-localization, statistics, and more.

- Fast, automated, traceable surface analysis report creation
- 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.

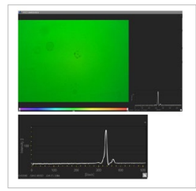
Line, Area Roughness

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



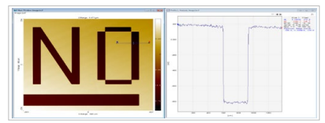
Film Thickness

The software calculates film thickness of transparent and non transparent coatings.



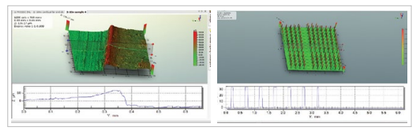
Step Height

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



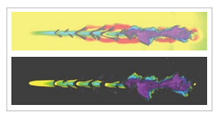
Cross Section Profile

The software has cross sectional views to analyze any area of choice.



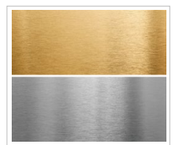
Volume Wear

The software calculates volumes of the track or material lost.



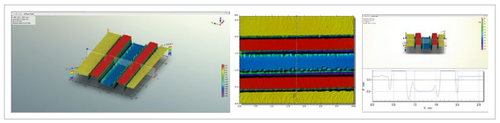
Real Color Images

Profiler images and quantifies the real color of the sample. This can be used for quality control. The camera comes with calibration certified standard samples.



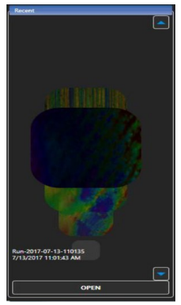
Transparent Films

The tester comes with an 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 file names can also store the textual information about the sample that can be indexed for future retrieval.



Several Standard Compatible

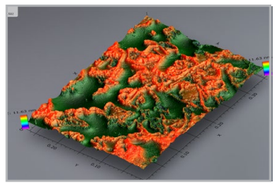
- Full set of surface roughness/waviness filters including Gaussian (ISO16610-61) cubic spline filter (ISO 16610-62), robust Gaussian filter (ISO16610-71)
- Functional studies including bearing ratio curve, depth distribution histogram, surface substraction and more.
- Calculation of distances, angles, areas, volumes and step heights.

- 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.

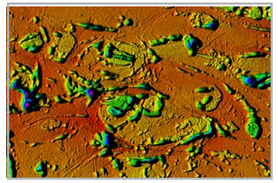
Truly Universal

Applications

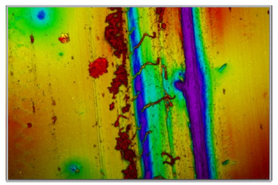
The versatility of the tester enables the profiler to play an important role for several applications. It can be used for thin or thick films, biomaterials, ceramic, polymers, metals, smooth or rough surfaces, flat or non flat surfaces, transparent or opaque surfaces, nano or macro scale, coating or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



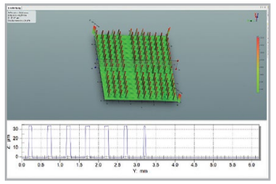
2D Material



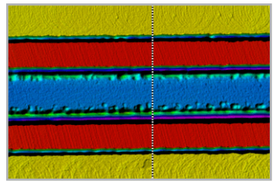
Paper Surface



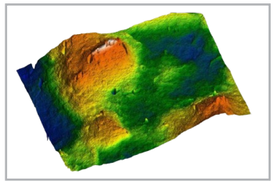
Polymer Surface



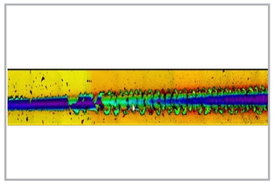
Pillars on Wafer



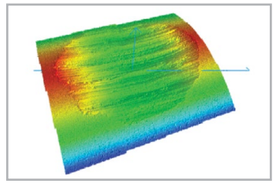
Capillary



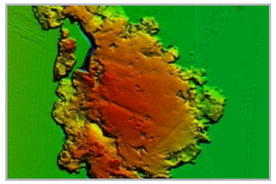
Damage Surface



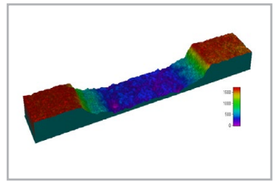
Scratch on Surface



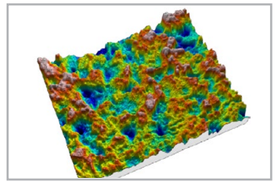
3D In-line High Resolution Imaging



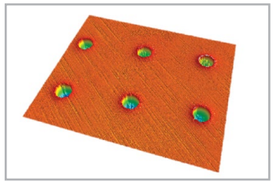
Ink on Surface



Thermal Spray Coating



Corrosion Pits

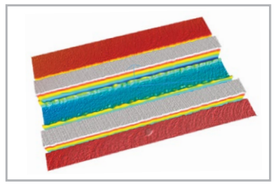


Indents

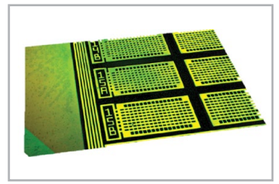
Wide Applications

Markets

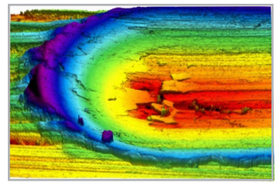
The UP-24's ease of use makes it conventional for several industries, from high tech to traditional indus tries. The tester can be used for both research and routine analysis for production and quality control.



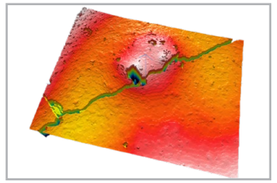
Micro Fluid Device Channel



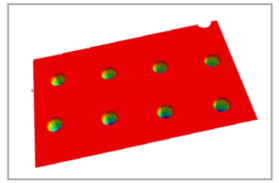
Semiconductor Wafer



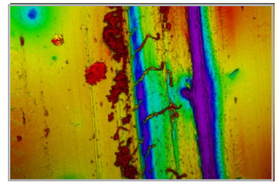
Scratch Mark



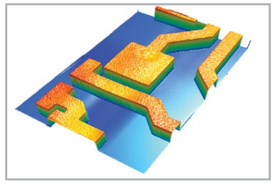
Failure, Crack



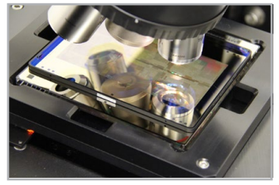
Wafer Bumps



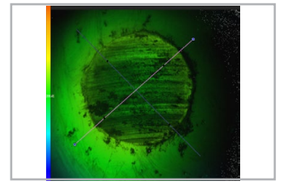
Transparent Coating



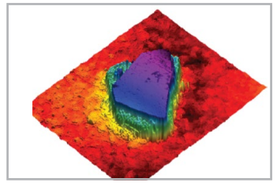
Via and Features on Wafer



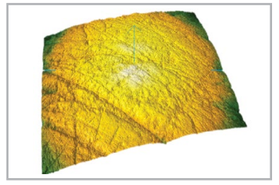
Pellicle and Mask Inspection



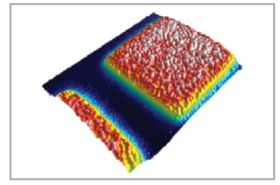
Ball Surface



Diamond Abrasive



DLC Coating



Polymer Pad

Specifications

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

Notes

About us

Rtec-Instruments develops and manufactures advanced imaging and surface mechanical property measurement solutions for research and industrial applications. Based in Silicon Valley, we are the leading provider of testing instrumentation such as tribometer, optical profilometer, 3D scratch tester and micro/nano hardness tester.

We share a philosophy that embraces collaboration and partnership with customers, leaders in academia and industry, to ensure that our products answer real needs with innovative solutions.

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