

The world's highest resolution automated optical 3D profiler

Sub-angstrom resolution

Invaluable for super-polished optical components, semiconductor, MEMS and other applications requiring the ultimate in high precision 3D profile analysis. Talysurf CCI 6000 brings an unparalleled level of performance to non-contact 3D measurement with 0.1Å (10pm) resolution.

Scanning Broadband Interferometry

Talysurf CCI is an advanced type of measurement interferometer. It uses a patented correlation algorithm to find the coherence peak and phase position of an interference pattern produced by a selectable bandwidth light source. This method provides both high resolution and excellent sensitivity to returning light.

Outstanding system performance

Excellent data resolution in X, Y and Z axes combined with a very low missing data rate contribute to outstanding system performance.

- 0.1Å vertical resolution
- 0.5Å noise floor
- 0.4-0.6µm optical resolution
- 1,048,576 data points
- 0.03Å RMS repeatability

Results in seconds

The instrument combines the surface imaging quality of a microscope with the high accuracy measuring capability of a surface profiler. The result is a 3D surface texture, step height and micro dimensional measurement system that gives results in seconds.

All Surface Types Can Be Measured

Talysurf CCI 6000 features ultimate versatility. Polished, rough, specular or scattering components having reflectivity between 0.3% and 100% can be analyzed. All material types including glass, metal, photo resist, polymer, liquid inks and pastes can be measured without difficulty.

System stability is assured

Composite granite and welded steel construction provide stiffness and stability throughout the measuring loop while a pneumatic anti-vibration system isolates the instrument from external vibrations.

Simple set-up and operation

Measurement set-up is easy: place the component on the positioning stage, set the focus height and push the start button; components need only be free of contamination. Unusual samples can be measured by using a combination of stitching, auto focus, fixtures, jigs and vacuum chucks.

Verifiable results

Artifacts traceable to international standards are used to calibrate the instrument in both the vertical and lateral measurement axes. Therefore the geometrical, dimensional and surface characteristics of any artifact can be easily reproduced with confidence.

Data stitching

Specimen areas larger than the maximum 7mm x 7mm field of view can be measured using the data stitching feature. The stitching feature can also be used to take very high resolution measurements over areas up to the maximum size of the automated X-Y-Z stage used.



Optical specifications

Magnification	X 2.5	X 5	X 10	X 20	X 50
Numerical aperture	0.075	0.13	0.3	0.4	0.55
Working distance (mm)	10.3	9.3	7.4	4.7	3.4
Optical resolution (µm) [*surface dependent]	7.2	3.6	1.8	0.9	0.4 - 0.6*
Maximum slope (degrees)	2.0	4.0	7.7	14.6	27.7
Measurement area (mm)	7.0 x 7.0	3.6 x 3.6	1.8 x 1.8	0.9 x 0.9	0.36 x 0.36
Lateral sampling resolution (µm)	7.0	3.5	1.75	0.88	0.35

Taylor Hobson has a policy of continual improvement due to technical developments and reserves the right to deviate from catalog specifications.

Talymap 3D analysis

Industry leading software makes the third dimension of surface metrology readily accessible

Automatic analysis routines

Detailed measurement analysis can be carried out with a single button press. Surface features defined by diameter, area or volume can be automatically identified, measured and sorted.

Data manipulation tools

Preparation and staging of the component is greatly simplified because measured data can be software leveled and aligned.

- High resolution zooming
- leveling and rotation
- inverted and mirror images
- form and defect removal
- profile extraction

Data analysis tools

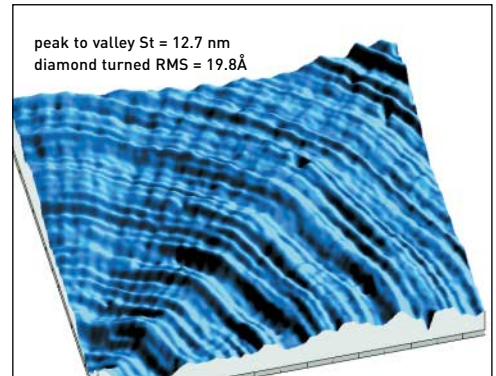
Internationally recognized waviness and roughness parameters in both 3D and 2D are included. Dimensional measurement in X, Y and Z axes is also provided.

- area and volume parameters
- 120 parameters in 2D mode
- 40 parameters in 3D mode
- counting and sorting
- automatic step height

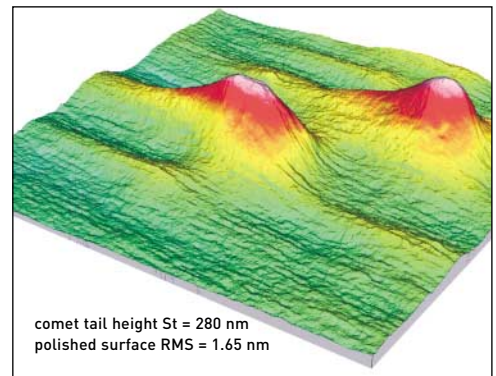
Data presentation tools

User defined scale, viewing angle and rotation plus photo-realistic images in full color or monochrome provide a natural view of 3D planar surfaces. A full package of tools for desktop publishing, including templates for repetitive work, assures consistent, comprehensive documentation of measurement analysis and results.

- photo simulation
- contour diagram
- frequency spectrum
- text and symbol insertion tools
- images exportable as bitmaps



micro roughness, waviness, feed rate and depth of cut on diamond turned surfaces can be evaluated



surface texture (RMS) to sub-angstrom levels can be measured on super-polished optical components

System specifications

Performance

Measurement technique	Advanced coherence correlation interferometry
Vertical range [Z]	100µm (standard) 400µm (optional) 10mm (optional)
Vertical resolution (over 100µm range)	0.1Å (10µm)
Noise floor [Z]	0.5Å (50µm)
Step height repeatability	0.1nm (25nm step) 0.03% (50µm step)
Repeatability of surface RMS [Z]	0.03Å (3µm)
Measurement area [X, Y]	360µm ² - 7.0mm ²
Number of measurement points	1,048,576 (1024 x 1024 pixel array)
Optical resolution [X, Y]	0.4µm-0.6µm (surface dependent)
Linearity [Z]	0.03% of measured value
Surface reflectivity	0.3% - 100%
Measurement Time	Typically 5-20 seconds

System

Component size (max)	X and Y = 300mm; Z = 100mm
Component weight (max)	10 kg
Manual X-Y stage	25 x 25mm
Motorized X-Y stage (small)	75 x 100mm
Automated X-Y stage (medium)	150 x 150mm
Automated X-Y stage (large)	250x200mm
Manual Z stage	100mm
Automated Z stage	100mm (with auto focus)

Installation conditions

Temperature / humidity	15 - 30C° / 80% non-condensing
Vibration	Pneumatic anti-vibration system included
Dimensions (floor space)	750mm wide x 500mm deep

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