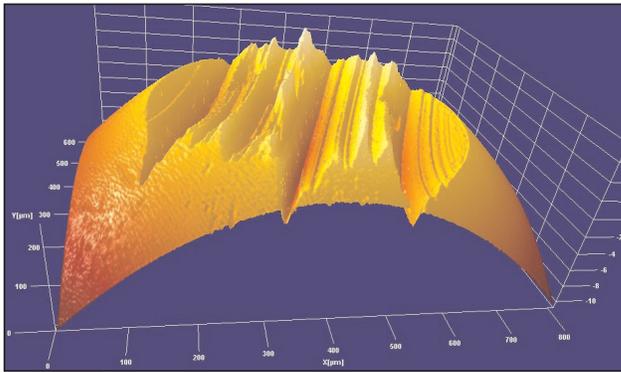
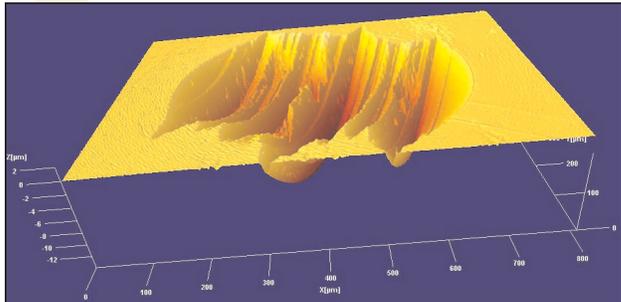


MicroXAM

surface mapping microscope



Ball wear on disk.



Ball wear, surface figure removed.



Histogram of ball wear volume.



Non-Contact Surface Mapping

Measures roughness, finish and texture of surfaces ranging from highly polished optics to rough surfaces such as rolled steel and aluminum, paper, plastics, ceramics, magnetic media and silicon wafers. Specialized applications are configurable, for example those for read/write heads and analysis of laser texture on disk media.

Research Flexibility, Yet Speed for Process Control

Using the powerful MapVue™ mapping and analysis software provided, product developers can obtain surface information which can optimize the texture, shape and finish of surfaces. Complete mapping options allow three-dimensional pictures to be drawn, profiles examined and color output to be printed. Eyepieces also provide the researcher with direct observation of the surface.

Once R&D has refined the surface, the instrument readily adapts to production process control. A DSP-based video digitizer, optimized software, and the fastest Pentium processor permit the throughput rates that are critical on the production floor.

Essential Information Immediately Displayed

Regardless of the application, MicroXAM's software is designed for industrial use. Industry standard statistics are stored in reports or as graphical data. ASCII data files are based on University of Birmingham specified (UDF) format. Extreme amplitude and average amplitude parameters are calculated, stored, and displayed. Configuration options allow the process engineer to select the essential information for display, while the report retains the whole picture for review and manipulation by spreadsheet.

Measurement Features

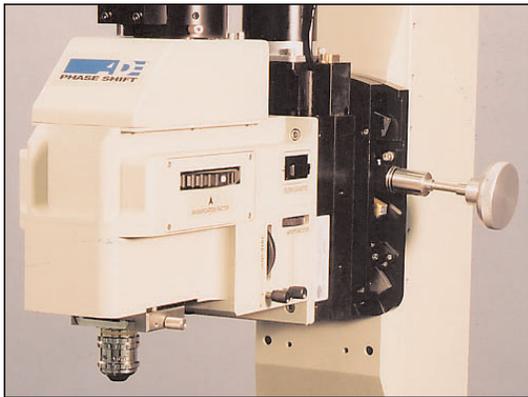
3-D interferometric profiling. Quantitative, visual and confocal modes using optical interferometry. Standard 2D and 3D surface statistics including summit and valley analyses and University of Birmingham specified S-parameters.

Software Features

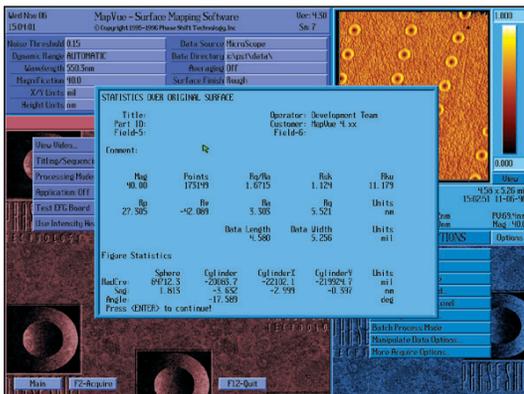
Comprehensive graphical software for the acquisition, analysis, manipulation and visualization of data. Calculation of surface statistics including summit and valley analysis. Fourier transform based spatial filtering tools facilitate high/low/band pass and band-reject filtering. Polynomial fitting, data filtering, scaling, masking and interpolation. Interactive zoom. X-Y and line segment profiles. 3D wire, hybrid and solid plots. Area difference plot for step height measurement.

Physical Features

Optical Microscope with eyepieces and video display of images. Computer sensing of turret-based objectives allow easy change of magnification. High resolution camera measures up to 752x480 data points in seconds. Autofocus simplifies measurements. Upgradeable Pentium® computer. Options include motorized stage controller, various objectives, and multiple magnification wheel.



MicroXAM RTS configuration: a sub-angstrom optical profiler.



Specifications

Equipment:

Digitized resolution: 752x480 pixels
 1000x1000 pixels
 XY translation stage range: 100mm by 100 mm
 options: 150mmx150mm
 200mmx200mm
 300mmx300mm
 R-theta stage range: 100 mm in y direction

Tip-tilt range: ± 7 degrees
 Camera rotation: ± 90 degrees, worm-gear drive
 Electronics/software platform: Pentium 4 PC
 Video display: 17 inch flat panel SVGA monitor,
 Data acquisition (standard rate): $2.1 \mu\text{m}/\text{sec}$.
 Data acquisition (high speed rate): $7.2 \mu\text{m}/\text{sec}$
 Vibration isolation table: optional

Magnification

Objective Magnification:	50x	20x	10x	5x	2.5x
Numerical aperture:	0.55	0.40	0.30	0.13	0.075
Measurement Area (μm)	165x125	413x313	827x626	1654x1253	3308x2506
Spatial sampling (μm):	0.22x0.26	0.55x0.65	1.1x1.3	2.2x2.6	4.4x5.2
Optical resolution					
@ 550nm (μm):	0.50	0.69	0.92	2.12	3.67
Working distance (mm):	3.4	4.7	7.4	9.3	10.3
Depth of focus @550nm (μm):	1.16	2.19	3.89	20.72	62.25
Degrees of maximum surface slope (EX mode):	22.6	9.5	4.8	2.4	1.2

Performance

RMS repeatability (standard mode): 1 nm
 RMS repeatability (precision mode): 0.1 nm
 RMS repeatability (single wavelength): 0.05 nm
 Vertical scan range: up to 10mm
 Data acquisition time: up to $7.2 \mu\text{m} / \text{sec}$
 Lateral surface sampling: 0.11 to $8.8 \mu\text{m}$

Field-of-view: 8x10mm (@ .78x)
 .084x .063mm (@ 100x)
 Maximum slope: 40 to 3.2 degrees
 Calibrated accuracy: better than 0.1%
 Reflectivity: 1% to 100%

Magnification Changer

Factor	50x	20x	10x	5x	2.5x	
Measurement area (μm)	2X	82x62	206x156	413x313	827x626	1654x1253
	1.25X	132x100	330x250	661x501	1323x1002	2647x2005
	.625X	264x200	661x501	1323x1002	2647x2005	5294x4010
Spatial sampling (μm)	2X	0.11x0.13	0.28x0.33	0.54x0.64	1.10x1.31	2.2x2.6
	1.25X	0.18x0.21	0.44x0.52	0.87x1.03	1.76x2.09	3.52x4.16
	.625X	0.35x0.41	0.88x1.04	1.74x2.06	3.53x4.18	7.04x8.32

Facilities/Environment

Humidity: 10-80%, relative humidity, non-condensing
 Temperature: 65-85 degrees Fahrenheit ($\Delta T < 1$ degree/hour)
 Vibration: < 90 micro-in/sec (velocity)
 Acoustic: < 60 dB-A
 Power Requirements: 110VAC 60 Hz, 110/240 VAC, 50/60 Hz
 Power Consumption: $< 400\text{W}$
 Compressed Air: 40 to 80 psi

Contact Information

ADE Phase Shift
<http://www.phase-shift.com/>
sales@phase-shift.com

Eastern regional USA:
 (860)267-8999
 Fax (860)267-8997

US & International:
 3470 E. Universal Way
 Tucson Arizona 85706
 (520) 573-9250
 Fax (520) 573-9355

