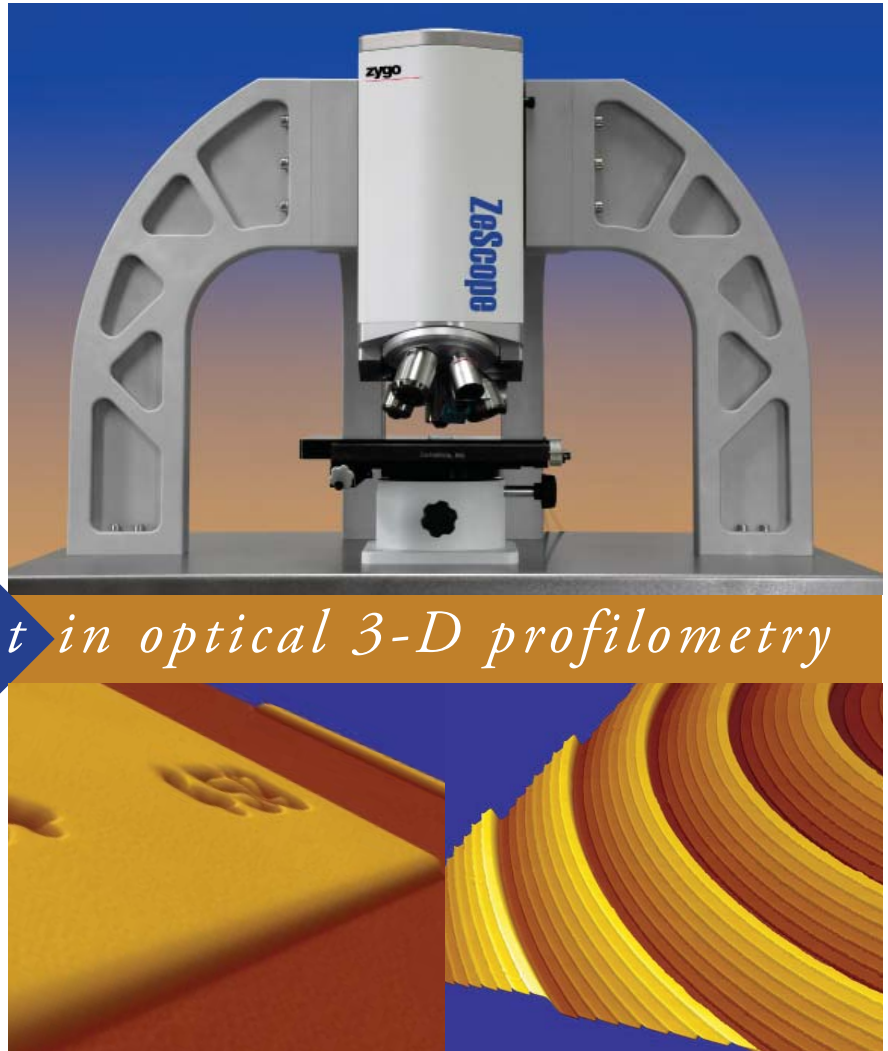


# ZeScope™

Optical Profiling System

*High value concept in optical 3-D profilometry*



## 3D PROFILING

The ZeScope optical profiling system provides a high quality, high stability alternative to typical optical profilometers — while delivering superior Angstrom-level height accuracy. Designed with application versatility and high-demand environments in mind, the ZeScope system's distinctive architecture achieves superior resolution in measurements, and faster data processing than anything else in its class.

### ◆ **Large capacity, rigid mechanical platform**

Designed using finite-element analysis (FEA), the ZeScope system increases accuracy by reducing vibration-induced errors and blurring, critical when high magnification, high resolution measurements are needed. The scanning optical head is on a high-stiffness four-legged stand which limits resonant vibration common to cantilevered stands.

### ◆ **High resolution 1.3 million pixel digital sensor standard**

Compared with industry standard cameras, the ZeScope system offers more data, in larger fields of view — with better resolution than most top-end profilers. A high speed camera option with a smaller field of view increases scanning speed significantly.

### **Interferometric optical focus scanning**

◆ A large scanning range of greater than 50 mm is achieved using focal scanning—moving the optical assembly vertically. The motorized optical head moves in a 180 mm range.

### **Value engineered automation**

◆ The ZeScope profiler offers motorization of common functions for ease of use. The computer-controlled 5-position objective turret and motorized auxiliary magnification multiplier automate field of view and magnification, and improve ROI for each objective fitted.

### **LED light source**

◆ Long life, high brightness, computer controlled LED illumination.

**zygo®**

## ◆ Convenient work space and simplicity

The unique and versatile ZeScope stand and base allows large, heavy test samples to be measured in a space of 500 mm by 500 mm. ZeScope's test area accommodates objects of up to 180 mm in height with the scanning optics head traveling through a full 180 mm of motorized vertical motion. The standard manual measurement stage offers 150 mm by 150 mm of travel. A fully motorized 200 mm by 200 mm stage is optional, allowing large area mapping by stitching multiple measurements. Stitch maps with over 130 million data points without issues!

Once a test object is placed on the stage, a live video preview helps the user locate the region of interest on the object using the StageView™ integrated camera feature.

## ◆ Athermal objectives and magnification multiplier

Interferometric objective lenses with long working distances are specially selected and modified to achieve stable measurements over long periods of time, without influence from temperature variations. The six objectives available, plus the multiple magnifications built into the system, provide a large range of fields of view, allowing the user to optimize the surface data set and slope sensitivity without compromising optical resolution or field size. Zygo offers a high resolution 100X athermalized interference objective with a substantial 2 mm of working distance, allowing measurement of objects with a fair amount of surface relief.

## ZeScope Objective Specification Table

Objective	Magnifier setting	Total magnification	Working Distance	Optical Resolution	High-Res Camera		High-Speed Camera	
					Pixel Sampling	Field of View (µm)	Pixel Sampling	Field of View (µm)
2.5X	.625X	1.563	10.3 mm	3.67 µm	4.13 µm	5370 × 4130	4.74 µm	3036 × 2270
2.5X	1X	2.5	10.3 mm	3.67 µm	2.58 µm	3350 × 2580	2.96 µm	1890 × 1420
2.5X	2X	5	10.3 mm	3.67 µm	1.29 µm	1680 × 1290	1.48 µm	950 × 710
5X	.625X	3.125	9.3 mm	2.12 µm	2.06 µm	2680 × 2060	2.37 µm	1520 × 1140
5X	1X	5	9.3 mm	2.12 µm	1.29 µm	1680 × 1290	1.48 µm	950 × 710
5X	2X	10	9.3 mm	2.12 µm	0.65 µm	840 × 650	0.74 µm	470 × 360
10X	.625X	6.25	7.4 mm	0.92 µm	1.03 µm	1340 × 1030	1.18 µm	760 × 570
10X	1X	10	7.4 mm	0.92 µm	0.65 µm	840 × 650	0.74 µm	470 × 360
10X	2X	20	7.4 mm	0.92 µm	0.32 µm	420 × 320	0.37 µm	240 × 180
20X	.625X	12.5	4.7 mm	0.69 µm	0.52 µm	670 × 520	0.59 µm	380 × 280
20X	1X	20	4.7 mm	0.69 µm	0.32 µm	420 × 320	0.37 µm	240 × 180
20X	2X	40	4.7 mm	0.69 µm	0.16 µm	210 × 160	0.19 µm	120 × 90
50X	.625X	31.25	3.3 mm	0.50 µm	0.21 µm	270 × 210	0.24 µm	150 × 110
50X	1X	50	3.3 mm	0.50 µm	0.13 µm	170 × 130	0.15 µm	95 × 70
50X	2X	100	3.3 mm	0.50 µm	0.06 µm	84 × 65	0.07 µm	50 × 36
100X	.625X	62.5	2 mm	0.39 µm	0.10 µm	130 × 100	0.12 µm	80 × 60
100X	1X	100	2 mm	0.39 µm	0.06 µm	84 × 65	0.07 µm	47 × 36
100X	2X	200	2 mm	0.39 µm	0.03 µm	42 × 32	0.04 µm	24 × 18

## ◆ Performance Specifications

The ZeScope system achieves high precision, accuracy and repeatability by optimal design of low noise detection, signal processing and algorithms and system mechanical stability.

RMS repeatability	0.01 nanometers
RMS precision	0.1 nanometers
Step height accuracy	larger of 0.75% or 0.75nm

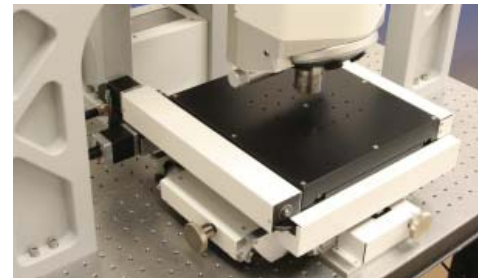
## ◆ Calibration Standards

### NIST Traceable Step Height Standards

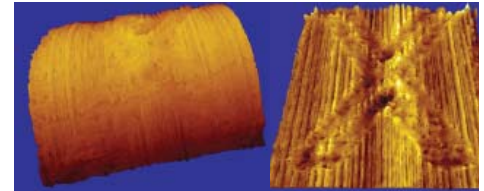
Available for the ZeScope system are calibration step height standards to confirm system measurement accuracy. These optional standards include a 44 nm, 4.5 micron, and 14.5 micron calibrated step standards.

### Reference Standard

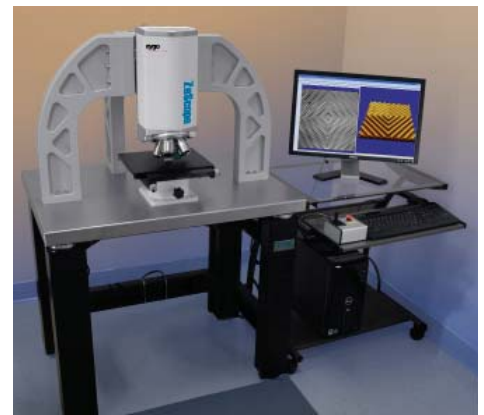
An optional super-polished Sapphire reference flat is available for calibration of objective reference surface in the interferometric objectives. With calibration, surface reference flatness is brought to less than 0.1 nanometers.



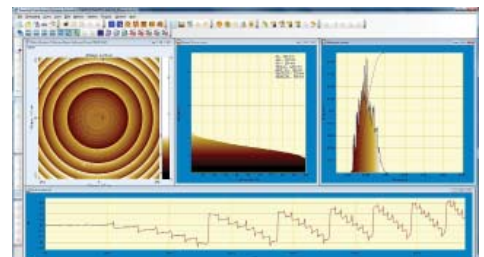
Motorized stage option has auto-move and programmable sequencing functions.



Laser etching on metal sleeve—before and after removing cylinder shape.



Designed for an accessible and versatile workstation.



2D profiling and histograms plots.