

# Intellium™ Z40

FIZEAU INTERFEROMETER



## Full Featured 40 mm Fizeau Interferometer for Flat or Spherical Surfaces

### Non-Contact and Transmitted Wavefront Measurement of Optical Components and Assemblies

#### Applications

- Transmission and surface testing of small optics
- Measure optics, machined parts, ceramics, semiconductors, and wafers
- Integrated ROC measurements

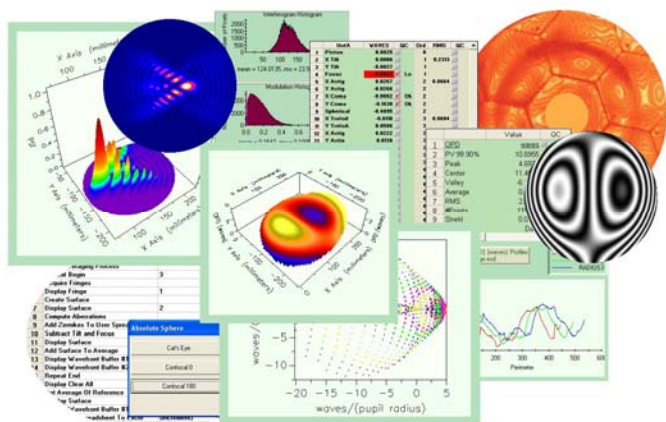
#### Main Features & Benefits

- 6x zoom for measuring parts as small as 0.5 mm diameter
- 3 modes of interferogram analysis - Phase shifting, **IntelliPhase™** - static spatial carrier analysis, or Fringe Tracing (automated or manual)
- Small size and form factor design allows easy integration into OEM systems
- Compact, Rugged design
- Transmission Spheres from F/0.7 to F/6.0



**Intellium™ Z40** is shown with an optional vertical workstation and computer.

The **Intellium™ Z40** is a full-featured interferometer that can provide non-contact measurement of flat or spherical surfaces and transmitted wavefront of optical components and assemblies. The **Intellium™ Z40** is ideal for measuring optical components such as flats, prisms, lenses, or precision metal parts such as bearings, sealing surfaces, contact lens molds, or polished ceramics. Measurements can be made using simple basic visual fringe inspection, **IntelliPhase™** static spatial carrier analysis, or phase-modulated interferogram analysis. The **Intellium™ Z40** provides flexibility to handle today's industrial applications at an unprecedented value.



#### **IntelliWave™** Software Features

- Phase-shifted or static acquisition and analysis
- Peak-to-Valley, RMS measurements, Strehl Ratio
- Zernike and Seidel analysis
- Diffraction analysis (PSF, MTF, Encircled Energy)
- Geometric analysis (Geometric Spot Diagrams, Encircled Energy)
- Automation for factory floor applications
- Power filtering and averaging features for noisy data
- Interface with MATLAB™, IDL™, MS Excel™, and LabVIEW™
- **IntelliPhase™** – static spatial carrier analysis

### Surface & Wavefront Metrology Beyond Compare

Engineering Synthesis Design, Inc.

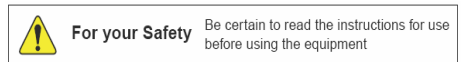
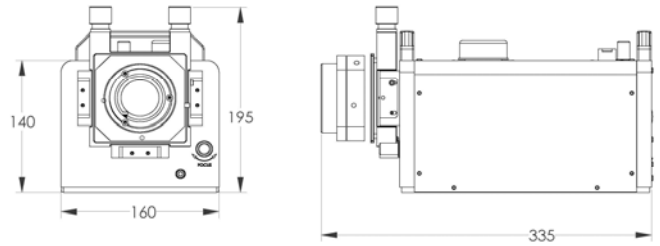
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<b>Intellium™ Z40 Specifications</b>	
<b>Technology</b>	Phase Shifting and/or <b>IntelliPhase™</b>
<b>System</b>	
Test Beam	38 mm (1.5")
6X Zoom	Manual
Focus	Manual; +/- 1.5 m
Intensity	Rotary Dial
Alignment	Simple two spot alignment
Alignment View	± 1.5 degrees
Part Viewing	Live video on computer screen
<b>Performance<sup>1</sup></b>	
Repeatability 3-Flat <sup>2</sup>	$\lambda/300$ PV
RMS Repeatability <sup>3</sup>	$\leq 1 \text{ \AA}$
Calibrated Accuracy	$\lambda/100$
Height Resolution	$\lambda/8000$
Spatial Resolution	640 x 480
Fringe Resolution	180 fringes
Digitization	8 bits
Acquisition Time	<300 ms
Averaging Modes	Intensity and Phase
<b>Laser Beam</b>	
Source	Helium-Neon, 632.8 nm, < 1 mw (other wavelength options available)
Polarization	Linear
Coherence	>100 m
<b>Electrical Power</b>	110/240 Volts, 50/60 Hz, 50 Watts
<b>Mechanical</b>	
Dimensions	140 mm x 165 mm x 254 mm 5.5" x 6.5" x 10.00"
Weight	7.25 kg (16 lb)
<b>Environment Requirements<sup>4</sup></b>	
Temperature	15 to 30°C (59 to 86°F)
Rate of Temp. Change	<1.0°C per 15 min
Humidity	Relative 5% to 95%, no condensing
Vibration Isolation	Required for frequencies from 1 Hz to 120 Hz
<b>Computer</b>	High Performance – Current Technology
1) Vibration free environment with temp. change < 1°C/15 min. between 20-23°C, no thermals 2) 3 sigma repeatability of 3-Flat Test with 32 averages per set 3) 3 sigma of the rms for 128 data sets, each an average of 32 measurements 4) These parameters state conditions which the system can operate; they do not represent the environmental stability required to meet performance.	

## Intellium™ Z40 Interferometer



### Configurations

- Vertical and horizontal configurations
- Static or Phase-Shifting
- Radius of curvature

### Accessories

- Reference optics (see lower left)
- Video printer
- Desktop isolation tables

### Computer Workstations

- State-of-the-art computer workstation with **IntelliWave™** software pre-installed
- All hardware interfaces pre-installed for complete **Intellium™ Z40** interferometer data acquisition

### IntelliWave™ Software

- Five polynomial sets to choose from
- Diffraction and geometric analysis
- Derivatives and integrals
- Complex masking including unlimited mask groups
- Fiducials and image transformations
- Measurements: Wavefront, Wedge, Angle, Prisms, 3-Flat Test, Two Sphere Test, Homogeneity
- Interfaces: MATLAB™, IDL™, LabVIEW™, Excel™
- **IntelliPhase™** – static spatial carrier analysis

Reference Optics								
	TS						RS	TF
F/#	0.7	1.0	2.0	3.0	4.0	6.0	6.5	40
Diameter (mm)	40						40	
Accuracy	$\lambda/10$						$\lambda/15$	$\lambda/20$



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