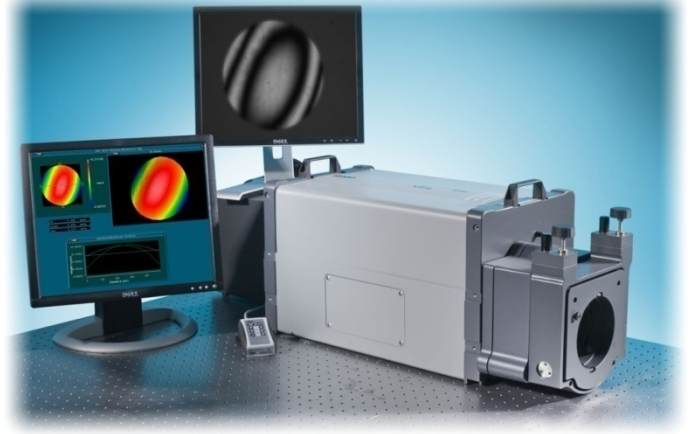
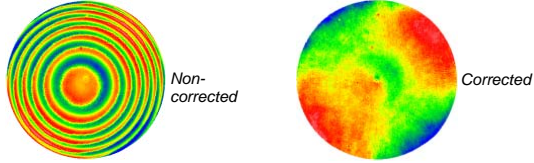


VERIFIRE^{PE}

High performance laser Fizeau mechanical phase-shifting interferometer with rapid data acquisition for use in production environments that are prone to vibrations. Includes proprietary algorithms that eliminate vibration induced fringe ripple, FlashPhase software, and precision rail interface.

Vibration Correction



SYSTEM

Measurement Capability	Measures surface form of reflective materials and optics, and transmitted wavefront of transparent optics. Provides accurate surface metrology in stable and vibration-prone environments.
Measurement Technique	Laser-based, three-dimensional, mechanical phase-shifting interferometry and carrier-fringe interferometry (FlashPhase ⁽¹⁾)
Test Beam Diameter	4 inch (102 mm) or 6 inch (152 mm)
Mounting Options	Horizontal or Vertical
Optical Centerline	4.25 in. (108 mm)
Alignment System	Quick Fringe Acquisition System (QFAS) with twin spot reticle
Zoom Range	1:6X
Alignment	4 inch: ± 3 degrees
Field of View	6 inch: ± 2 degrees
Pupil Focus Range	4 inch: ± 2.5 m 6 inch: ± 5.5 m
Computer and Software	High-performance Dell PC with ZYGO MetroPro™ software

PERFORMANCE⁽²⁾

Repeatability of Three-Flat Test ⁽³⁾	< 2 nm $\lambda/300$ (2σ)
Repeatability of rms ⁽⁴⁾	< 0.1 nm $\lambda/10,000$ (2σ)
Camera Resolution	640 x 480 pixels
Camera Frame Rate ⁽⁵⁾	210 Hz
Fringe Resolution ⁽⁶⁾	180 fringes
Acquisition Time ⁽⁷⁾	62 ms
Digitization	8 bits

LASER

Type	Helium-Neon, Class II
Wavelength	632.8 nm
Output Power	≤ 1 milliwatt
Polarization	Nominally circular (1.2:1 or better)
Coherence Length	Greater than 328 ft (100 m)

PHYSICAL CHARACTERISTICS

Dimensions (HWD) (without handles)	4 inch: 12.1 x 27.3 x 12.1 in. (308 x 694 x 308 mm) 6 inch: 12.1 x 36.3 x 12.1 in. (308 x 992 x 308 mm)
Weight	4 inch: 85 lb (38 kg) 6 inch: 100 lb (45 kg)

UTILITY REQUIREMENTS

Power	100 to 240 VAC, 50/60 Hz
Compressed Air	80 psi (5.5 bar); dry and filtered source (for optional vibration isolation)

OPERATIONAL ENVIRONMENT⁽⁸⁾

Temperature	15 to 30°C (59 to 86°F)
Rate of Temp. Change	<1.0°C per 15 min
Humidity	5 to 95% relative, noncondensing
Vibration Isolation	Vibration error suppression effectiveness depends on the vibration frequency and amplitude. A passive isolation system is recommended when using mechanical phase-shifting acquisition.

TEST PART CHARACTERISTICS

Material	Various; glass, super-finished metals, ceramics, and plastics
Preparation	None; measurements are noncontact, nondestructive, and performed under ambient conditions
Reflectivity	0.1% to 100% (based on transmission element)

OPTIONS

- 4 inch or 6 inch output aperture
- Encoded zoom (1:5X)
- Encoded focus
- Wireless remote control
- Linear or switchable polarization
- Guide rail and accessories
- Radius of curvature hardware

See the *GPI and VeriFire Accessory Guide, OMP-0463* for a complete listing of available options.

Notations

- 1 For FlashPhase acquisition the minimum camera exposure time that can be set is 20 microseconds. Exposure time is cavity reflectivity dependent; high reflective parts allow shorter exposure time than low reflective parts.
- 2 Performance qualified in lab environment with the temperature set point between 20-23°C.
- 3 Repeatability of the three-flat test is an in-use example of performance in a controlled environment with a rate of temperature change less 0.1 °C per hour. Flat 'A' is tested six times, using the six available pairs of flats B, C, D, and E to complete six three-flat combinations, with 16 phase averages per data set. The specification represents the 2σ value from these six three-flat tests. System accuracy for relative testing is dependent on the reference optic quality.
- 4 Repeatability of the quoted statistic is for 100 measurements of the same cavity, with 16 phase averages per data set. The specification represents the 2σ value of each statistic.
- 5 Beam expanders >6" diameter are not compatible at 210 Hz. A lower camera frame rate must be set when integrated with a beam expander.
- 6 The approximate number of tilt fringes in the part image that can be resolved by the interferometer at 1X.
- 7 Acquisition time is the total time for acquisition of a full data set using a 13 bucket algorithm.
- 8 These parameters outline the conditions under which the system can operate; they do not represent the environmental stability required to meet specified performance.