verifire™ HD MST

Specifications

High resolution Fizeau interferometer with patented FTPSI™ technology and ring of fire artifact suppression for high performance true on-axis common path surface form metrology and material characterization.

System Overview

Measurement Capability	Surface form of reflective materials and optics simultaneous, front and back surface form of plane parallel transparent optics, transmitted wavefront, material homogeneity and optical thickness
Data Acquisition Modes	FT-PSI – Fourier transform phase-shifting interferometry FT-QPSI - Vibration robust Fourier transform phase-shifting interferometry WS-PSI – Temporal phase-shifting interferometry WS-QPSI – vibration robust temporal phase-shifting interferometry DynaPhase™ – vibration insensitive instantaneous interferometry (option)
Alignment System	Quick Fringe Acquisition System (QFAS) with twin spot reticle
Test Beam Diameter	4 inch (102 mm) or 6 inch (152 mm)
Alignment FOV	4 inch: ±3 degrees, 6 inch: ±2 degrees
Optical Centerline	4.25 in. (108 mm)
Camera Details	Resolution: 2304 x 2304 pixels Frame Rate: 60 Hz
Acquisition Time [1]	0.5 sec – 65 sec
Magnification	1X Fixed optical (1-50X digital);
Polarization	Nominally circular (1.2:1 or better)
Pupil Focus Range	4 inch: ±2 m, 6 inch: ±4.5 m
Computer and Software	High-performance PC, Windows 10 64-bit, Mx™ software
Mounting Configuration	Horizontal or vertical
Artifact Reduction	Ring of Fire™ extended ring source
Accessories	See the ZYGO *Laser Interferometer Accessory Guide, OMP-0463*
Physical Envelope (LWH)	60 x 31 x 34 cm (23.6 x 12.1 x 13.4 in.)
Weight	≤85 lb (38 kg)

Laser Details

Laser Source	Tunable solid-state laser, Class 3B
System Class	IIIa (meets 3R ANSI requirements)
Wavelength	633 nm
Coherence Length	>6 m

Test Part Characteristics

Min thickness [2]	0.6 mm minimum optical thickness
Thickness Range [3]	0.6 mm to 5 m (optical thickness)

Utility Requirements

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

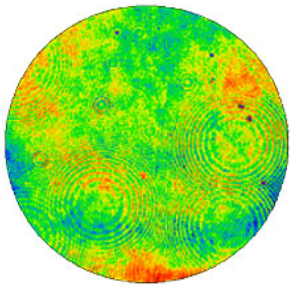
Operational Environment [4]

Temperature	17 to 25°C (62 to 77°F)
Rate of Temp. Change	<1.0°C per 15 min
Humidity	5 to 95% relative, non-condensing
Vibration Isolation	Passive vibration isolation recommended with FTPSI acquisition.

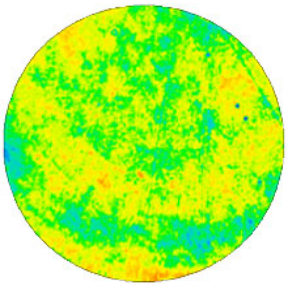
Performance [5]

RMS Wavefront Repeatability [6]	<0.35 nm, λ/1,800 (mean + 2σ)
Peak Pixel Deviation [7]	<0.5 nm, λ/1,200 (99.5th %)
ITF [8]	4 inch: > 0.7 @ 5.4 cyc/mm 6 inch: > 0.7 @ 3.6 cyc/mm

Comparison with and without artifact suppression [9]



Point Source Illumination



Ring Source Illumination

Notations

1. Data acquisition and processing time is dependent on the measurement configuration and frequency range.
2. Denotes *optical* thickness. Physical thickness = optical thickness / index. For example, the minimum physical thickness for a material with an index of 1.5 and optical thickness of 6 mm is 4 mm.
3. This range defines the minimum and maximum distances allowed between any pair of parallel surfaces in the test setup.
4. These parameters outline the conditions under which the system can operate; they do not represent the environmental stability required to meet specified performance.
5. Performance qualified with stable temperature set point between 20-23°C.
6. RMS Wavefront Repeatability is defined by the mean RMS difference plus 2X the standard deviation for the differential between all even numbered measurements and a synthetic reference defined as the average of all odd numbered measurements); 36 sequential measurements (16 averages) form the basis for calculation.
7. Pixel Peak Deviation is defined by the 99.5th percentile of the pixel-wise standard deviation map for 36 sequential measurements (16 averages); this result measures time varying behavior (or Type A uncertainties).
8. Instrument Transfer Function (ITF) defines the spatial resolution capability of the instrument at ½ Nyquist with a short plano cavity.
9. Measurement of identical cavity switching between point and ring source illumination. Artifacts intentionally added into interferometer to highlight artifact suppression capability.

Specifications subject to change without prior notice.

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