

MarSurf FI 3100 VB

VIBRATION INSENSITIVE
FIZEAU INTERFEROMETER



Simultaneous Phase-Shifting for Vibration Intensive & Turbulent Environments

Now with Auto-SPARC

SPARC Technology Insures Measurement Errors of Less than $\lambda/100$ with NO Vibration Isolation

The **MarSurf FI 3100 AS** Simultaneous Phase-Shifting Fizeau Interferometer is a real-time, high-speed, truly vibration-insensitive metrology instrument with shutter speeds as fast as $35\mu\text{s}$. Ideally suited for shop/production floors and other vibration or turbulent environments, the **MarSurf FI 3100 AS** offers unsurpassed measurement accuracy, versatility, stability and repeatability for analyzing optical, machined, and semiconductor wafer surfaces.

APPLICATIONS

- Measure flat, concave & convex surfaces, small to astronomical size
- Long optical path length and remote Fizeau cavity measurements
- Vacuum/cryogenic chamber measurements
- In-situ measurements of optical, machined & wafer surfaces
- Dynamic measurements for thermodynamic events, rotating discs, etc.
- Characterization & removal of birefringence effects

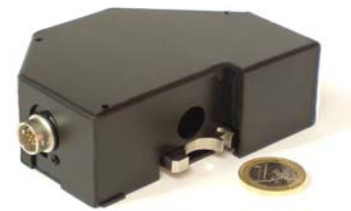
MAIN FEATURES & BENEFITS

- Absolute vibration insensitivity
- Common path Fizeau geometry
- Measure surfaces with 0.1% to 100% reflectivity
- Automated stress measurement
- Remote Fizeau cavity & long optical path applications
- $10\mu\text{s}$ exposure times
- True 1k x 1k resolution, fringe densities equivalent to ≥ 250 fringes of tilt
- Uses Industry Standard 100 mm (4") bayonet reference optics

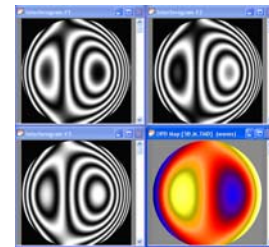


How it Works

Simultaneous phase-shifting inside the **MarSurf FI 3100 AS** is accomplished by replacing the standard camera with the patented **HyperPhase™** module.



The **HyperPhase™** module produces three ultra precise phase-shifted interferograms, which are simultaneously acquired and processed into a 3D surface map.

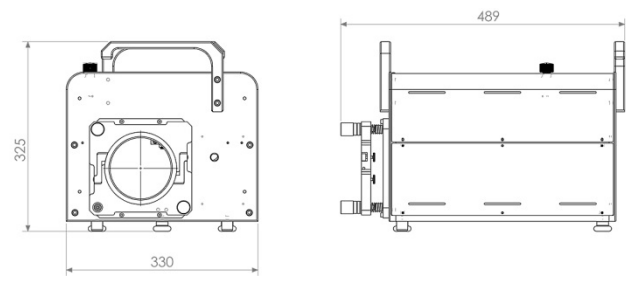


The **HyperPhase™** module is so robust it is backed by a **lifetime** alignment and phase-shift warranty.

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Specifications	
SYSTEM	
Test Beam	102 mm (4.0")
Zoom	1x to 4x - Remote controlled
Focus	+/- 4.0 m - Remote controlled
Attenuation	Software controlled
Alignment	Simple two spot alignment
Alignment View	± 1.5 degrees
Part Viewing	Live video with two monitor option
PERFORMANCE¹	
RMS Repeatability ²	< 1 Å
Accuracy	< λ/100 Instrument Error
Height Resolution	λ/8000
Spatial Resolution	1k x 1k True Resolution
Fringe Resolution	Fringe densities equivalent to ≥250 fringes of tilt
Digitization	10 bits
Recording Speeds	25 Frames/sec. (faster frame rate options)
Exposure Time	35µs minimum
Averaging Modes	Intensity and Phase
Sample Reflectivity	0.1 to 100% with no attenuation or special coatings required
LASER	
Wavelength	633nm
Polarization	Linear
Coherence Length	>100 m
ELECTRICAL & MECHANICAL	
Power	110/240 Volts, 50/60 Hz, <25 Watts
Dimensions	489 x 330 x 325 mm (19.3" x 13" x 12.8")
Weight	27kg (60 lbs.)
ENVIRONMENTAL REQUIREMENTS³	
Temperature	15 to 30°C (59 to 82°F)
Rate of Temp. Change	<1.0°C per 15 min
Humidity	Relative 5% to 95%, no condensing
Vibration	NO vibration isolation required
<p>1) Performance in a lab with temp change < 1°C/15 min between 20-23°C. 2) 3 sigma of the rms for 128 data sets, each an average of 32 measurements. 3) These parameters state conditions which the system can operate; they do not represent the environmental stability required to meet performance.</p>	



Configurations

- Operates in ANY orientation
- Long Optical Path and Remote Fizeau Cavity
- OEM Integration

Accessories

- Full set of reference optics
- 100 mm (4") to 150 mm (6"), 200mm (8") and 300mm (12") beam expanders
- Compatible with all industry standard 4" reference optics

Computer Workstations

- High performance computer with IntelliWave™ software pre-installed
- All hardware interfaces pre-installed for complete MarSurf FI 3100 AS interferometer data acquisition

IntelliWave™ Software

- Multiple fringe unwrapping algorithms
- Multiple aberration polynomial sets for analysis
- 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
- Interface to MATLAB™, IDL™, LabVIEW™, Excel™

Reference Optics (partial list)					
F/#	TS				TF
	0.75	1.5	3.3	7.0	
Diameter (mm)	130				126
Height (mm)	93	88	70	92.5	30
Weight (kg)	3	2.9	2.1	2	0.7
Radius of TS	47	120	299	665	-
Accuracy	≤ λ/10				≤ λ/20

