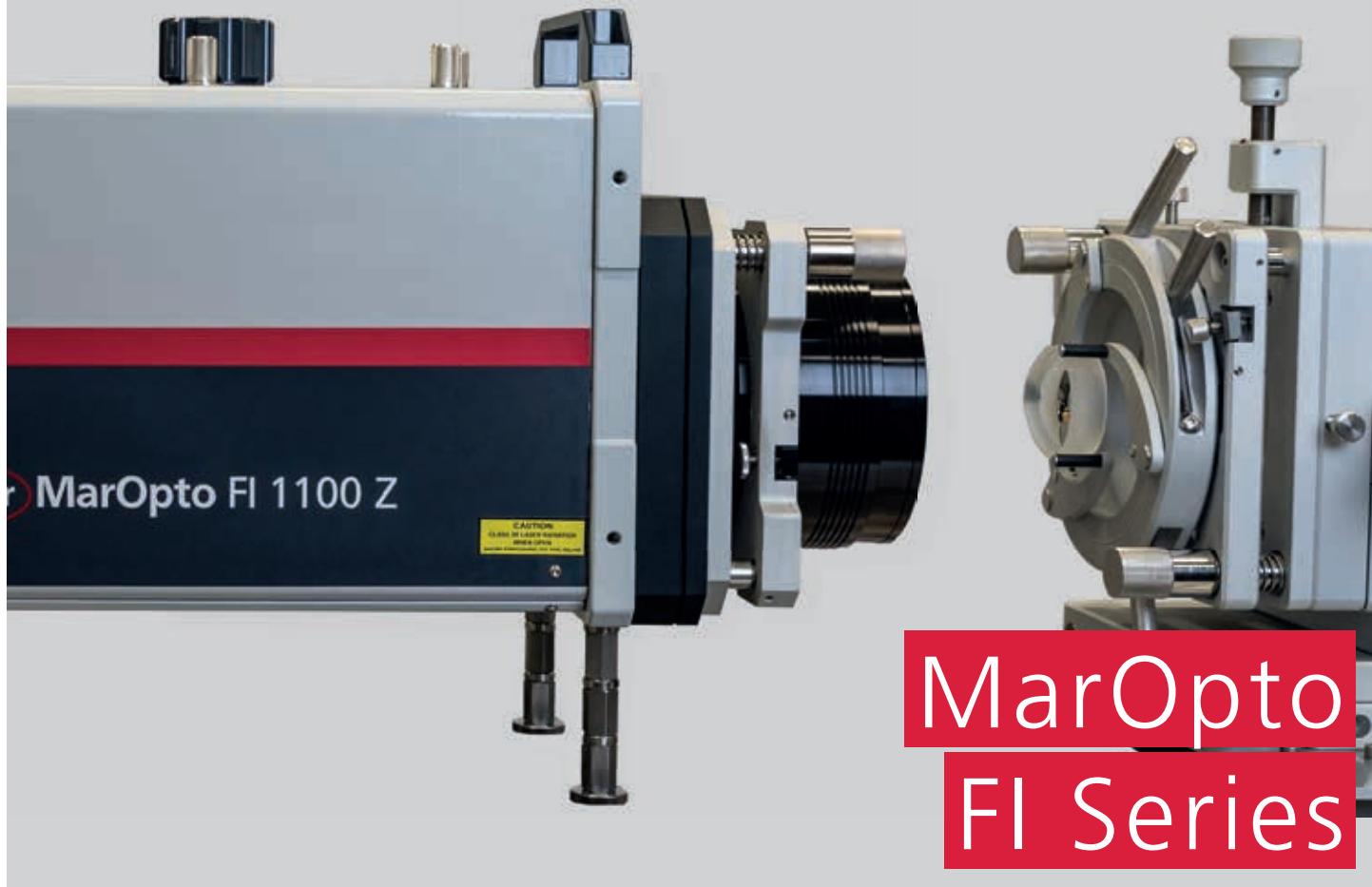


MarOpto



MarOpto
FI Series

POWERFUL FIZEAU INTERFEROMETERS

- High-accuracy measurement capability with unsurpassed flexibility and versatility
- Non-contact form and wavefront measurement

- 0 +

Mahr
EXACTLY

This is what we mean by EXACTLY.

NON-CONTACT FORM AND WAVEFRONT MEASUREMENT



MarOpto FI 1040 Z with optional vertical measuring stand

► MEASURING TASKS

- Measurement of flat, concave or convex surfaces
- Wedge angle and homogeneity measurements
- Transmission and surface testing of optics
- Measurement of the radius of curvature
- Wavefront analysis of optical systems and components



More information

www.mahr.com, WebCode: 21874 + 21875

+49(0) 551 7073 800

info@mahr.com

OPTICAL MEASURING INSTRUMENT MAROPTO FI 1040 Z, 1100 Z, 1150 Z

The **MarOpto FI 1040 Z**, **FI 1100 Z** and **FI 1150 Z** are powerful interferometers that enable the non-contact measurement of flat or spherical surfaces and transmitted wavefront of optical components and assemblies.

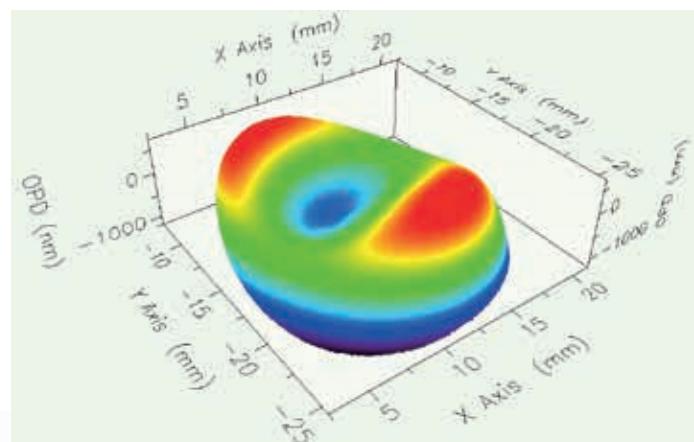
Measurements can be performed using simple basic visual fringe inspection, IntelliPhase static spatial carrier analysis, or phase-modulated interferogram analysis.

MarOpto FI 1040 Z, **FI 1100 Z** and **FI 1150 Z** offer flexibility and excellent performance for handling today's industrial applications.



FEATURES

- 3x zoom / 6x zoom
- Total USB connectivity option with 1k x 1k true spatial resolution
- 3 modes of interferogram analysis: Phase shifting, IntelliPhase – static spatial carrier analysis, or fringe tracing
- Vibration-insensitivity can be achieved using Mahr's IntelliPhase static spatial carrier recording and evaluation software
- Compatible with all industry standard 4" (100 mm) and 150 mm (6") reference optics and accessories (MarOpto FI 1100 Z and MarOpto FI 1150 Z)
- Small size allows easy integration into OEM systems
- Compact, rugged design
- High-accuracy measurements at an affordable price
- Configurations include horizontal, vertical look up and vertical look down. Optional workstations for flats and for radius of curvature measurements.



MAROPTO FI 1040 Z

FIZEAU INTERFEROMETER FOR FLAT OR SPHERICAL SURFACES



REFERENCE OPTICS

F/# the TS	Radius TS [mm]
	$\lambda/10$
0.7	17
1	25
2	64
3	123
4	131
6	206
TF: $\varnothing 40$ mm	



MEASURING TASKS

- Transmission and surface testing of small optics
- Measurements of the radii of curvature



More information

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info@mahr.com

MAROPTO FI 1100 Z - HIGH ACCURACY MEASUREMENT CAPABILITY WITH UNSURPASSED FLEXIBILITY AND VERSATILITY



REFERENCE OPTICS

F/# the TS	Radius TS [mm]	
	$\lambda/10$	$\lambda/20$
0.55	19	---
0.65	39	
0.74	47.6	
1	90	
1.5	120.4	
2.2	175.9	
2.4	264.5	
3.3	300	
4	370	---
4.9	540	
5	450	---
7.0	665	---
7.1	800	
10.7	1200	
11	1050	---
23	2329.8	---
TF: $\varnothing 100$ mm		



MEASURING TASKS

- Measurement of flat, concave or convex surfaces
- Wedge angle and homogeneity measurements
- Transmission and surface testing of optics components
- Measurement of optics components, ceramic, and wafer surfaces
- Wavefront analysis of optical systems and components
- Measurements of the radii of curvature



More information

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+49 (0) 551 7073 800

info@mahr.com



MAROPTO FI 1150 Z

EASY AND FAST INTERFEROMETRIC CHARACTERIZATION



REFERENCE OPTICS

F/# theTS	Radius TS [mm]	
	$\lambda/10$	$\lambda/20$
0.75	72.09	
1.1	130.68	
1.6	220.35	
2.4	346.7	
3.5	518.3	
5	739.8	
7.4	1128	
TF: $\varnothing 150$ mm		



MEASURING TASKS

- Measurement of flat, concave or convex surfaces
- Wedge angle and homogeneity measurements
- Transmission and surface testing of optics components
- Measurement of optics components, ceramic, and wafer surfaces
- Wavefront analysis of optical systems and components
- Measurements of the radii of curvature



More information

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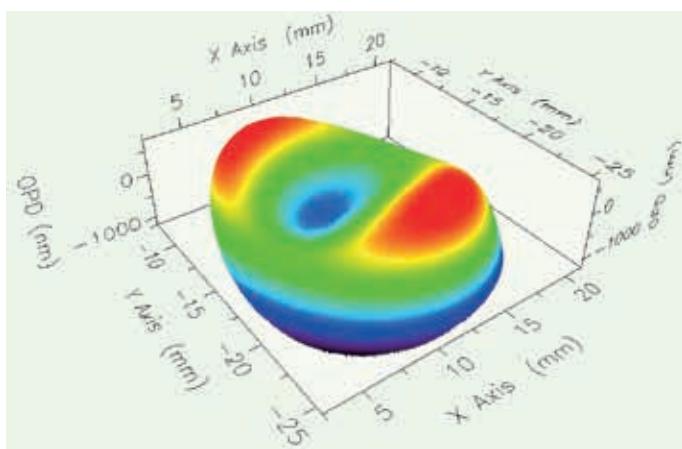
MAROPTO INTELLIWAVE SOFTWARE

HIGH PERFORMANCE INTERFEROMETRIC ANALYSIS SOFTWARE

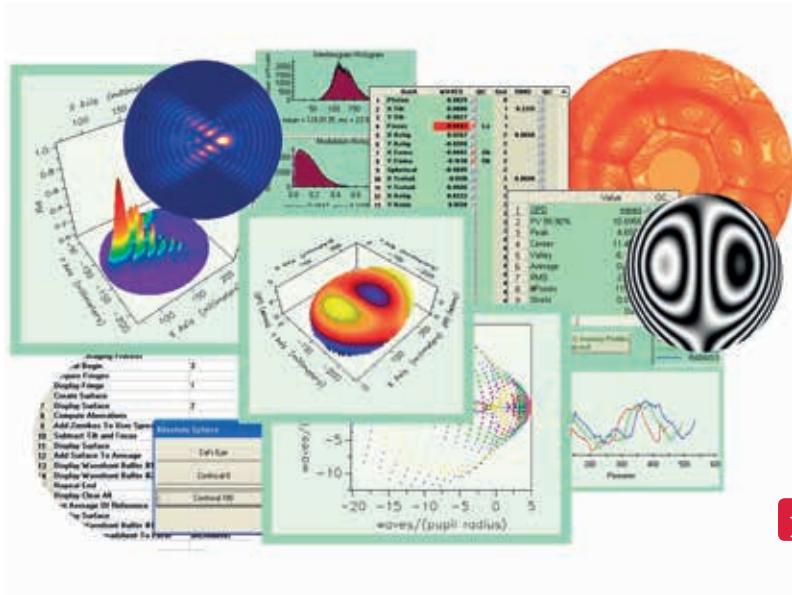


DESCRIPTION

IntelliWave allows for the characterization of spherical optics, aspheric optics, machined parts, ceramics, semiconductor wafers, and analysis of optical wavefronts. Applications include measuring, flatness, irregularity, curvature, stress, and strain.



- Multiple polynomial sets (aberrations) for analysis
- Differentials and integrals
- Complex masking including unrestricted masking groups
- Fiducials and image transformations
- Measurement of wavefront, wedg, angle, prisms, 3-flat-test, homogenity
- Optional interfaces: IDL™, LabVIEW™, Excel™
- IntelliPhase – static spatial carrier analysis



[More information](#)

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info@mahr.com

MAROPTO FI SYSTEMS

TECHNICAL DATA

MarOpto FI - System	FI 1040 Z	FI 1100 Z	FI 1150 Z
Beam diameter	38 mm	102 mm	150 mm
Zoom	6x / 3x	6x	6x
Focus	±1.5 m	± 2.0 m	± 2.0 m
Intensity	adjustable		
Alignment	easy two-point alignment		
View to the alignment	±1.5°		
Display	live video on the computer screen		
Performance Parameters ¹			
RMS repeatability ²	1 nm		
Calibrated accuracy	λ / 100		
Height resolution	λ / 8000		
Lateral resolution	640 x 480 / 1k x 1k		
Digitalization	8 bit / 10 bit		
Recording time	300 ms		
Averaging methods	intensity and phase		
Laser			
Wavelength	632.8 nm HeNe-Laser / stabilized HeNe laser		
Polarization	linear / circular		
Coherence	≥ 100 m		
Laser class	2		
Power supply, dimensions, weight			
Power supply	110 / 240 V; 50 / 60 Hz / < 155 Watt	110 / 240 V; 50 / 60 Hz / < 130 Watt	110 / 240 V; 50 / 60 Hz / < 130 Watt
Dimension [mm]	335 x 195 x 160	421 x 190 x 256	604 x 304 x 316
Weight	7.25 kg	14 kg	42 kg
Environmental conditions ³			
Temperature	+15°C up to + 30°C		
Allowed temperature change	< 1.0°C pro 15 min		
Relative humidity	5% to 95%, non-condensing		
Vibration damping	required at frequencies 1Hz to 120 Hz		

1. Vibration-free environment with temperature change < 1°C / 15 min between 20°C and 23°C, no thermals
2. 1 σ repeatability accuracy of the RMS for 32 data sets, each as an average of 16 measurements
3. The system can be operated under these conditions; the conditions, however, are not the environmental conditions that are required for the best performance.

MAROPTO FI SYSTEMS

CONFIGURATION POSSIBILITY

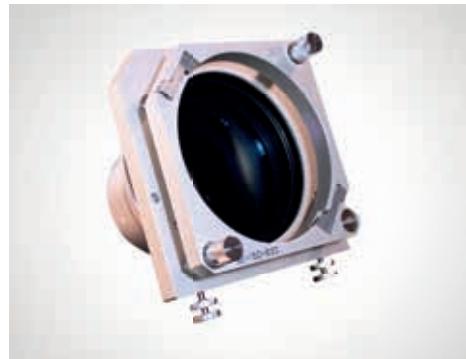
- Position-independent use, e.g. vertical and horizontal
- Static or dynamic phase shift
- Option to measure the radii of curvature

WORKING PLACE STATION

- Powerful computer with software IntelliWave installed
- All hardware interfaces are set up to operate the MarOpto FI interferometer.

ACCESSORIES (DEPENDING ON THE SYSTEM)

- Complete set of reference optics
- Beam: 102 mm to 150 mm, 200 mm and 300 mm
- Isolations table
- Compatible with all standardized 4" reference optics



PRODUCTION METROLOGY



MarOpto MT 100 / 100i
High-precision Fizeau interferometer measuring tower for the testing of spherical glass surface.

WebCode: 22065
www.mahr.com

MarOpto MT 150
Highly precise Fizeau interferometer measuring tower for the testing of flat, spherical and optionally aspherical lenses.



MarOpto MT 150p
High-precision Fizeau interferometer measuring tower for the testing of single plane surfaces or multiple carriers in optics production.

WebCode: 22068
www.mahr.com

MarOpto MT 150i
Highly precise Fizeau interferometer measuring tower for the testing of spherical and aspherical lenses with CGH.



MarOpto MT 50
A compact Fizeau workshop interferometer for the testing of spherical components in the production environment.

WebCode: 22064
www.mahr.com

Precimar SM 60
Length measuring bench
A user-friendly measuring instrument for fast, precise outside measurements on workpieces.



MarSurf UD 130 Aspheric 2D
Precision 2D measuring station for measuring and evaluating optical components.

WebCode: 22044
www.mahr.com

MarForm MFU 200 Aspheric
High-precision contour measurement of spheres and aspheres. 3D determination of form error early in production process.

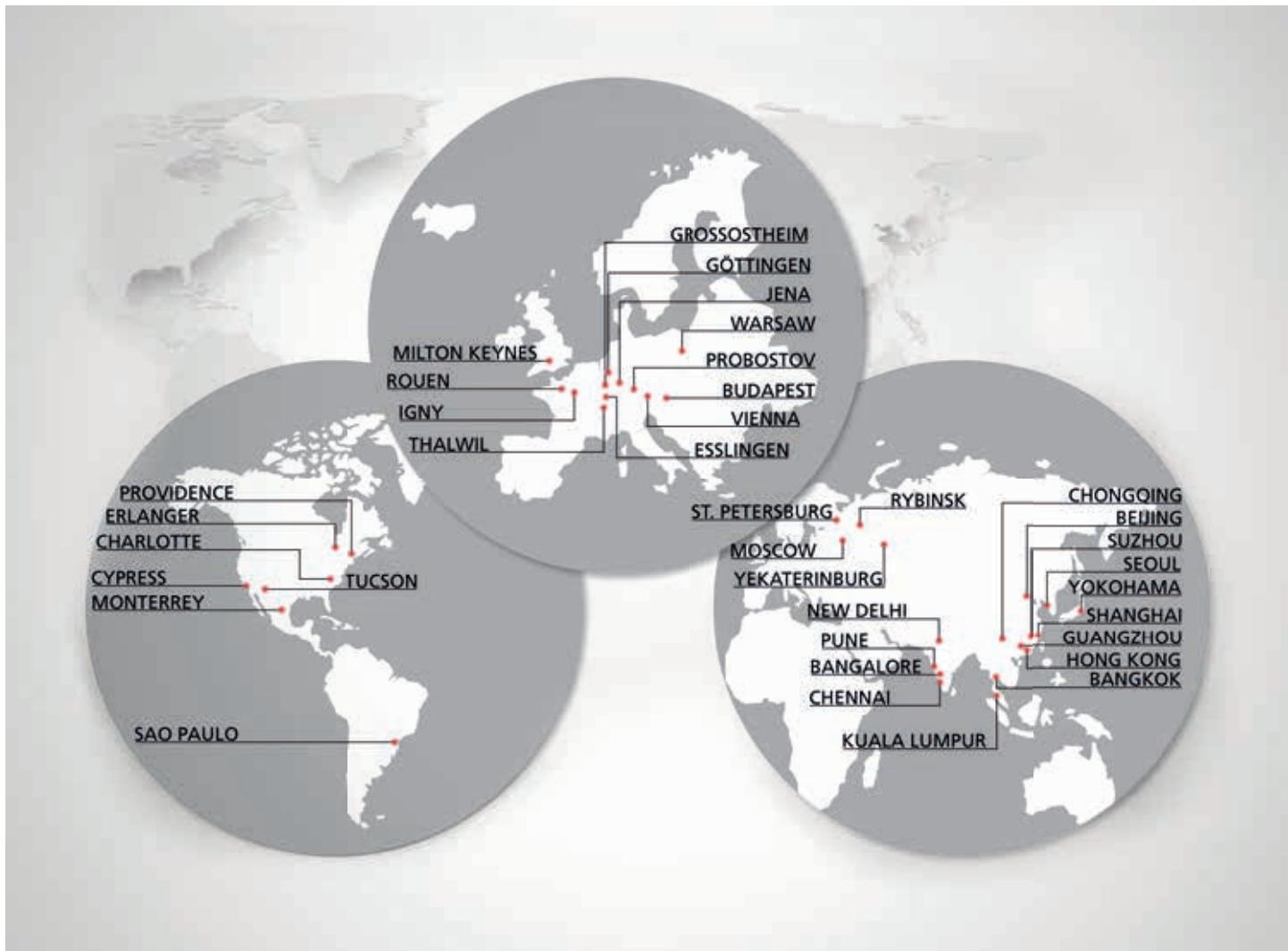


MarSurf LD 130 / 260
Aspheric 2D / 3D
High-precision contour measurement of spheres and aspheres. 3D determination of form error early in production process.

WebCode: 21880
www.mahr.com

MarOpto TWI 60
Tilted wave interferometer for fast and highly accurate measurement of aspheres.





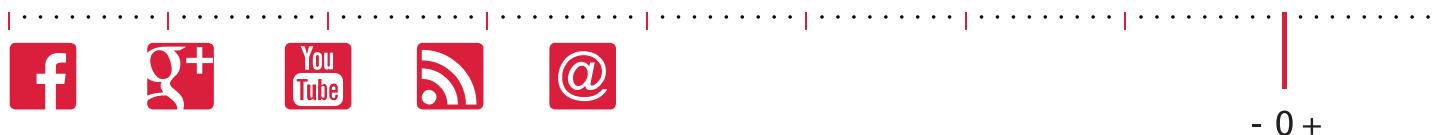
Partner of manufacturing companies worldwide.

Close to our customer.



Got QUESTIONS? Want more INFORMATION?

Call us on +49 (0) 551 7073 800, or email us at info@mahr.com



Mahr GmbH

Carl-Mahr-Straße 1, 37073 Göttingen, Germany
Phone +49 551 7073-800, Fax +49 551 7073-888

Reutlinger Str. 48, 73728 Esslingen, Germany
Phone +49 711 9312-600, Fax +49 711 9312-725
info@mahr.com, www.mahr.com



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