

# TROPEL FLATMASTER® FAMILY

Surface Form Measurement of Ground, Lapped, Honed, Polished and Superfinished Components

Tropel Metrology Instruments are the performance and market leaders in optical metrology solutions.

Our patented FlatMaster Instrument family leads the industry in optical flatness metrology. By recording an entire surface in under 5 seconds they rapidly and accurately measure flatness, line profile, radius and other parameters.

Our FlatMasters quickly pay for themselves by allowing our customers to monitor and improve their processes, yield and productivity.

## Form Measurement Solutions for Manufacturers of:

- Precision Industrial Components
- Fuel Injectors
- Semiconductor Wafers
- Computer Hard Disks
- Photomask Blanks
- Automotive Parts

FI atMaster® 40



FI atMaster® 100



FI atMaster® 200



## Why Consider the Tropel FlatMaster?

**Advanced Performance** Non-contact measurement in under 5 seconds; Accuracy to 0.05 microns

**Measurement Integrity** NIST traceable; Full-surface 3-D measurements of up to 250,000 data points

**Simple to Use** Minimal fixtures needed—place and measure parts; Intuitive, menu-driven software

**Rugged Construction** C.E. Certified; Manufacturing floor or clean room ready

**Performance FlatMaster® 40, 100 & 200**

Measurement Method	Grazing-incidence interferometer
Accuracy <sup>1</sup>	0.05 µm (2.0 µ")
Repeatability <sup>1</sup>	0.015 µm (0.6 µ")
Resolution	0.01 µm (0.4 µ")
Dynamic Range <sup>2</sup>	30 µm (typical)
Part Range <sup>3</sup>	FM 40 5–40 mm; FM 100 25–100 mm; FM 200 25–200 mm
Measured Data Points	Up to 250,000 (in hi-resolution mode)
Measurement Time	Less than 5 seconds (in hi-throughput mode)
Standard Measurements	Flatness, line profile, spherical radius
Optional Measurements*	Angularity, parallelism, perpendicularity (*special fixturing required—subject to Tropel sample evaluation and quote)
Data Analysis	3-D, topographic, yield, distribution, and x, y, circular and radial slice; flat, spherical, conical fit data

**Data Management**

Data Storage	8.4 GByte hard drive (~80,000 measurements)
Communications	10/100-BaseT ETHERNET, RS-232c port
Hard Copy	High-speed color inkjet printer

**Materials and Surfaces**

Materials	Metals, ceramics, polymers, glass
Surfaces	Ground, lapped, honed, polished, superfinished
Reflectivity	Minimum of 10% at 85° incidence angle
Maximum Roughness	1.0 µm (40 µ") Ra (typical at 4 µm/fringe)

**Dimensions**

Instrument	FM 40 103 x 57 x 26 cm (41 x 22 x 10 in.) FM 100 & 200 76 x 65 x 34 cm (30 x 26 x 13 in.)
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**Weights**

Instrument	FM 40 60 kg (132 lb.); FM 100 & 200 75 kg (165 lb.)
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**Each System Includes**

Grazing-incidence laser interferometer  
High-speed engineering workstation  
NIST-traceable calibration and verification artifacts  
High-resolution color monitor  
High-speed color inkjet printer  
Graphical user interface  
ETHERNET local area network interface  
2 operator manuals  
12-month warranty

**Options**

System console and computer cart (shown on front)  
XR: FM 100 & 200 Allows measurements at different dynamic ranges and accuracies  
XRA: FM 100 XR capabilities with even greater accuracies; FM 200 Call to discuss

Typical specifications at 2 micrometers/fringe sensitivity and subject to change based on specific customer requirements.

- 1 Refers to instrument limited accuracy and repeatability as measured on NIST traceable artifact. See Tropel Acceptance Procedure for further details
  - 2 Typical, limited by surface slope
  - 3 Smaller parts may be measured at different performance specs. Call to discuss
- All specifications subject to change.

**TROPEL**  
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