

OPTICAL THICKNESS GAUGE 157/137 Series

Non-contact thickness measurement with the reliable accuracy required for the most meaningful test results.

Precise thickness information is critical in the development and production of a variety of materials. To address this need, Bristol Instruments offers a family of Optical Thickness Gauge products that employ proven interferometer-based technology to accurately measure material thickness. This technique also measures multiple layers simultaneously with exceptional long-term repeatability. This performance makes these products ideal for applications such as:

- **Optical Components and Lens Assemblies:**
measures individual components and lens stack thickness
- **OLED, AMOLED, and LCD Displays:**
measures total and individual layer thickness including laminating adhesives
- **Contact and Intraocular Lenses:**
measures center thickness and sagittal height
- **Medical Balloon Catheters:**
measures wall thickness of body, neck, and cone
- **Medical Tubing:**
measures wall thickness, outer diameter, and inner diameter



KEY FEATURES

- Absolute accuracy as high as $\pm 0.1 \mu\text{m}$.
- Exceptional long-term measurement repeatability as good as $\pm 0.02 \mu\text{m}$.
- Continuous calibration with a built-in intrinsic standard of length.
- Measurement confidence level of $\geq 99.7\%$.
- Traceable to NIST standards.
- Unmatched stability virtually eliminates thermal drift.
- Broad measurement range of $35 \mu\text{m}$ to 40mm .
- Measures thickness from one side without damage or deformation.
- Up to 31 layers can be measured simultaneously.
- Windows-based software is provided to control measurement parameters and to report thickness data.
- APIs are available to help with integration into a manufacturing process via USB or Ethernet.
- Optional fully integrated optical switch allows for up to eight test stations with a single instrument.

It's Our Business to be Exact!

(585) 924-2620
bristol-inst.com
info@bristol-inst.com

SPECIFICATIONS

157/137 Series

MODEL	157	157LS	137	137LS
THICKNESS MEASUREMENT				
Method	Non-contact optical interferometry			
Maximum Physical Thickness (Layer of air with index of refraction of 1.0)	12 mm	40 mm	12 mm	40 mm
Maximum Physical Thickness (Material with index of refraction of 1.5)	8 mm	26 mm	8 mm	26 mm
Minimum Physical Thickness (Layer of air with index of refraction of 1.0)	35 μ m			
Accuracy ^{1, 2}	$\pm 0.1 \mu$ m		$\pm 1.0 \mu$ m	
Repeatability ^{3, 4}	$\pm 0.02 \mu$ m		$\pm 0.05 \mu$ m	
Traceability	Verified with NIST certified gauge blocks			
Units	mm, μ m, mils			
MEASUREMENT RATE	20 Hz	7 Hz	20 Hz	7 Hz
INSTRUMENT INTERFACE	USB and Ethernet with Windows-based OTG display software Ethernet can be used for network connection allowing instrument access to up to 8 clients Library of commands for LabVIEW, .NET, and custom programming			
COMPUTER REQUIREMENTS ⁵	PC running Windows 7, 8, or 10, 1 GB available RAM, USB 2.0 (or later) port, monitor, pointing device			
OPTICAL SWITCH ⁶				
Capacity	Integrated 1 x 8 fiber switch			
Switch Time ⁷	1 ms			
ENVIRONMENTAL ⁸				
Warm-Up Time	None			
Temperature	15°C to +30°C (-10°C to +70°C storage)			
Pressure	500 – 900 mm Hg			
Humidity	\leq 90% R.H. at + 40°C (no condensation)			
DIMENSIONS AND WEIGHT				
Dimensions (H x W x D)	3.5" x 17.0" x 15.0" (89 mm x 432 mm x 381 mm)			
Weight	17 lbs (7.65 kg)			
POWER REQUIREMENTS	90 - 264 VAC, 47 - 63 Hz, 80 VA max			
WARRANTY	3 years, includes parts and labor			

- (1) Defined as measurement uncertainty, or maximum thickness error, with a confidence level of \geq 99.7%.
- (2) Uncertainty over the entire operational environmental conditions.
- (3) Standard deviation for a 60 minute measurement period.
- (4) Dependent on the reflectivity of the material under test at the probe wavelength of 1.3 μ m. Specification is given at 4% reflectivity. When reflectivity is lower, repeatability is reduced to a worst case of about $\pm 0.15 \mu$ m.
- (5) Required for initial optical probe alignment and use with the Windows-based OTG display software. Not required for measurement.
- (6) Integrated fiber optic switch included with models 157-8 and 137-8.
- (7) Switch time has no effect on the measurement rate of the 157-8 and 137-8 systems.
- (8) Characteristic performance, but non-warranted.



Bristol Instruments reserves the right to change the detail specifications as may be required to permit improvements in the design of its products. Specifications are subject to change without notice.