BRISTOL INSTRUMENTS

Accuracy. Reliability. Confidence.

OPTICAL THICKNESS GAUGE

157/137 Series

Non-contact thickness measurement for R&D and production applications.

Thickness information is critical in the development and production of a variety of materials. To address this need, Bristol Instruments offers a family of thickness gauge products that employ proven optical technology to provide the most precise and reliable thickness measurement available. What's more, this level of performance is achieved with an unprecedented level of versatility and convenience. These instruments are ideal for applications such as:

- **Optical Components and Lens Assemblies:** measures individual components and multi-element stacks
- **OLED, AMOLED, and LCD Displays:** measures total and individual layer thickness including laminating adhesive
- **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:

- Measures hard and soft materials without damage or deformation.
- Up to 31 layers can be measured simultaneously.
- Accuracy as high as ± 0.1 µm.
- Long-term measurement repeatability up to ± 0.02 µm.
- Continuous calibration with a built-in standard of length.
- Traceable to NIST standards.
- Broad measurement range of 12 µm to 80 mm.
- Display software provided to control measurement parameters and report thickness data.
- APIs 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.

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SPECIFICATIONS — 157/137 Series

MODEL	157	157LS	157XLS	137	137LS	137XLS
THICKNESS MEASUREMENT						
Method	Non-contact optical interferometry					
Maximum Physical Thickness (Layer of air with index of refraction of 1.0)	12 mm	40 mm	80 mm	12 mm	40 mm	80 mm
Maximum Physical Thickness (Material with index of refraction of 1.5)	8 mm	26 mm	53 mm	8 mm	26 mm	53 mm
Minimum Physical Thickness [1] (Material with index of refraction of 1.5)	16 µm	20 µm	24 µm	35 µm		
	12 µm (± 1.0 µm accuracy)	12 µm (± 1.0 µm accuracy)	16 µm (± 1.0 µm accuracy)			
Accuracy [2]	± 0.1 µm			± 1.0 µm		
Repeatability [3, 4]	± 0.02 µm			± 0.05 µm		
Traceability	Verified with NIST certified gauge blocks					
Units	mm, µm, mils					
MEASUREMENT RATE	20 Hz	7 Hz	4 Hz	20 Hz	7 Hz	4 Hz
INSTRUMENT INTERFACE	USB and Ethernet with Windows-based display program 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 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	≤ 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 (parts and labor)					

(1) Measurements can be made down to 12 µm (157, 157LS) and 16 µm (157XLS), but with lower accuracy.
(2) Defined as measurement uncertainty, or maximum thickness error, with a confidence level of ≥ 99.7%. Accuracy is verified with NIST Traceable gauge blocks up to 50mm.
(3) Standard deviation for a 60 minute measurement period.
(4) Specification is given for 1 mm sample with an index of refraction of 1.5. Dependent on the reflectivity of the material under test at the probe wavelength of 1.3 µm. Specification is given at 4% reflectivity. When reflectivity is lower, repeatability is reduced to a worst case of about ± 0.15 µm.
(5) Required for initial optical probe alignment and use with the Windows-based display program. Not required for measurement.
(6) Integrated fiber optic switch included with models 157-8, 157LS-8, 157XLS-8, 137-8, 137LS-8 and 137XLS-8.
(7) Switch time has no effect on system's measurement rate.
(8) Characteristic performance, but non-warranted.

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