



Schematic presentation of the measuring principle

Messprinzip

The FRT CWL IR bases on the spectral analysis of the interference of beams reflected at the boundaries of a transparent film on a substrate. The intensity of the reflected radiation shows a periodical waviness pattern that is dependent on the thickness of the film. From the intensity pattern and with the known refractive index of the film material the film thickness is calculated.

This method is also used in the FRT CWL FT sensor, which, however can only be used for films up to 250 μm thickness, because of its white light source. The CWL IR has been developed especially for samples which are opaque in the VIS but are transparent in the near IR, like many semiconductor materials.

The CWL IR comes with a narrow band source with 1300 nm center wavelength.

Technical Specifications

Sensor	CWL-IR 250	CWL-IR 500	CWL-IR 1000
Measuring range (min-max) ¹	28 - 1100 μm	34 - 1900 μm	60 - 3500 μm
Film-thickness resolution	50 nm	100 nm	200 nm
Lateral resolution	6.5 μm		
Working distance	23.5 mm		
Measuring angle	$90^\circ \pm 5^\circ$		
Light source	SLD 1300 nm		
Interfaces	USB 2.0, RS232, analog		

¹ At refractive index of n=1

high-resolution, fast and non-contact film-thickness measurement

Typical Applications

- measurement of materials, that are opaque in visible light but are transparent in the near infrared
- measurement of film-thickness of objects on opaque carrier materials
- local measurement of film-thickness in the semiconductor industry
- film-thickness mapping with MicroProf® and MicroGlider® systems

Measurement Features

- non-destructive, non-contact measurement
- measurement of semiconductors with infrared light
- high measuring range
- high local resolution

Scope of Delivery

- measuring head CWL IR
- sensor electronics
- 2m optical fiber with plastic jacket, (optionally 10m, also with protective metal jacket)
- power cable, manual



FRT CWL IR sensor with electronics

Reference Customers

ASE Inc.
Audi AG
Ball Packaging Europe GmbH
Bayer AG
Beiersdorf AG
BMW AG
Boehringer Ingelheim microParts GmbH
Carl Zeiss SMT AG
DAIMLERCHRYSLER
Dow Benelux N.V.
EKO Stahl GmbH
Fraunhofer-Institute
Freescale
Fuji Magnetics GmbH
General Electric Plastics B.V.
Gillette
HILTI AG
Hoechst Trespaphan GmbH
Human Optics AG
IBM
Infineon Technologies AG
Lexmark International, Inc.
MAN Roland Druckmaschinen AG
Matsushita Electric Works
Nortel Networks Optical Components (Switzerland) AG
Océ-Technologies B.V.
Optische Werke G. Rodenstock GmbH
Philips Electronics Nederland B.V.
Robert Bosch GmbH
Schott Glas
SGL Carbon AG
SIEMENS AG
Sulzer Innotec AG
Texas Instruments
Universities
Voestalpine Stahl GmbH
Volkswagen AG
Western Digital Fremont, Inc.

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