



## High-resolution, non-contact measurement of single or multi-layer thin films

### Typical Applications

- measurement of thickness of oxides, nitrides, photoresist and other semiconductor process films
- measurement of antireflection coatings and antiscratch coatings
- measurement on opaque substrates e.g. aluminum, brass, ceramics, copper, steel and plastics
- measurement of thin films in the optics industry
- measurement of lacquers and thin foils

### Measuring Principle

The FRT FTR bases on the superimposition of light beams reflected at the boundaries of a thin film. The evaluation of the spectral interference pattern of the superimposed light beams results in the film thickness.

This measured reflectance spectrum is compared with a calculated one, where the unknown thickness is systematically varied until both spectra match.

### Measuring Features

- measurement of thin films by spectral reflectance
- non-destructive, non-contact, high-resolution measurement (10nm – 100µm) in less than a few seconds
- measurement of single or multi-layer films

### Technical Specifications

| Model                | VIS  | NIR              | VIS/NIR          | UV/VIS            | UV/VIS/NIR       |
|----------------------|--|------------------|------------------|-------------------|------------------|
| wavelength           | 400 nm – 850 nm  | 650 nm – 1100 nm | 400 nm – 1100 nm | 250 nm – 850 nm   | 250 nm – 1100 nm |
| measuring range      | 50 nm – 20 µm  | 70 nm – 70 µm    | 50 nm – 100 µm   | 20 nm – 20 µm     | 20 nm – 70 µm    |
| light source         | halogen  |                  |                  | deuterium halogen |                  |
| resolution thickness | 1 nm   |                  |                  |                   |                  |
| resolution x,y       | 200 µm - 800 µm without extra optic (better than 10 µm with extra optic) |                  |                  |                   |                  |

### Scope of Delivery

- passive measuring head with optical fiber
- configurable sensor electronics
- software package including n/k library
- USB connection cable
- power cable, operating manual



FTR 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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