



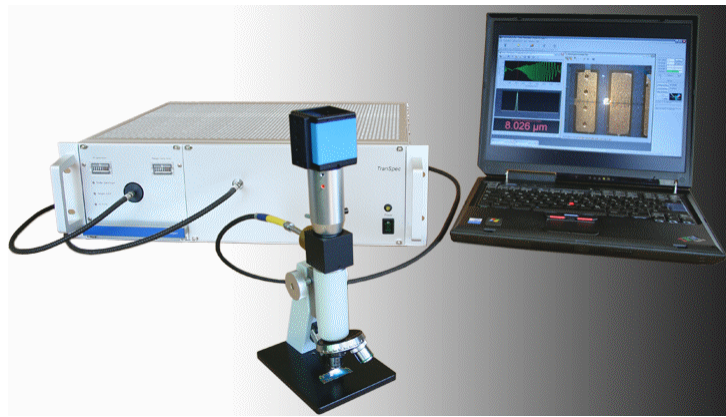
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## FTM-Micro

### Film Thickness Microscope with Live Camera View

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The **FTM-Micro** film thickness gauge uses the same white-light interference phenomenon for non-contact film thickness measurement of transparent layers as our TranSpec and FTM-Lite instruments. In order to determine the thickness on very small spots, however, the FTM-Micro instrument uses a fiber optics coupled microscope with live camera view.



#### **TranSpec Photodiode Array Spectrometer**

Our TranSpec spectrometer exclusively uses the high-innovative spectrometer modules of Carl Zeiss, Germany. With these modules, the entrance slit is imaged on a photodiode array (PDA) by means of a holographic created, concave diffraction grating. All optical components of the spectrometer module are firmly mounted together in one unit and permanently adjusted to each other, which means that there are no mechanically moveable parts at all. The TranSpec spectrometers are assembled with a high-power 50 watts halogen spectral lamp in order to detect white-light interference spectra using a bifurcated fiber optics cable connected to the microscope.

#### **Fiber Optics Coupled Microscope with Live Camera**

The fiber optics coupled microscope reduces the film thickness measurement spot size down to approximately 50-100 micrometers, depending on the selected magnification. The measurement spot image is viewed in real-time by a special color camera assembled to the microscope.

#### **FTM-ProVis Professional Film Thickness Software**

The convenient and easy-to-use software package FTM-ProVis Professional uses an improved Fast-Fourier Transformation (FFT) algorithm to determine the film thickness from measured white-light interference spectra of thin transparent layers. The film thickness result is computed in real-time and displayed as on-line chart together with the microscope camera image.

Technical specifications on next page ►



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## FTM-Micro Film Thickness Microscope • Technical Specifications

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### Minimum Hardware and Software Requirements

- PC/Laptop with at least Pentium-4
- Windows XP or Windows Vista
- CD-ROM drive for installation
- Graphics adapter with at least 1024 x 768 pixel, 1280 x 1024 pixel is recommended
- Two available USB 2.0 ports

### Microscope

- Special microscope with appropriate lenses for spectroscopy
- Two objectives with magnification 5x and 10x
- Ocular lens with magnification 10x and integrated optical crosshair
- Special fiber optics coupler for bifurcated fiber optics cable with 4mm ferrule
- Color camera with 640 x 480 or 1280 x 1024 pixel, USB 2.0 connection

### TranSpec - Spectrometer with integrated Spectral Lamp

- Industry standard FSMA connector for bifurcated fiber optics cable
- Spectrometer modules of Carl Zeiss, Germany, with holographic created concave diffraction grating
- Photodiode array (PDA) with 512 pixel, no cooling required
- Permanently adjusted module, no mechanically moveable parts, maintenance free!
- Module specific wavelength range: ~ 600 - 1020 nm
- Module specific spectral resolution: ~ 3.2 nm
- Module specific spectral pixel interval: ~ 0.8 nm
- Absolute wavelength accuracy:  $\leq 0.3$  nm
- Temperature drift: typically  $< 0.005$  nm / Kelvin
- 50 watt high-power halogen lamp with running time meter
- Automatic shutter switch and bulb burn control

### FTM-ProVis Professional - Film Thickness Software

- Multi-threaded MDI-Application for Windows XP/Vista, online-help, color printed user's manual
- Evaluation of interference spectra with the help of a special Fast-Fourier-Transformation (FFT)
- New algorithm for high-precise sub-pixel determination of the FFT peak position (film thickness result)
- Consideration of refraction index and dispersion (Cauchy dispersion correction)
- Real-time chart representation of Interference and FFT spectrum during measurement
- Real-time representation of microscope camera image

### Film Thickness Measurement Range

The film thickness range generally measurable with FTM-Micro is approximately 2 to 100 micrometer ( ~ 0.08 to 4 mil ), but depends essentially on the currently selected spectral evaluation range, which can be setup in the software individually for each type of layer. Other factors which determine the measurable film thickness range are the refraction index (and its dispersion) of the layers to be measured.

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**Note** TranSpec is a registered German trademark of Dipl.-Ing. (FH) Th. Fuchs, Engineer's Office for Applied Spectroscopy. All other mentioned product names are or possibly might be trademarks or registered trademarks of their owners.