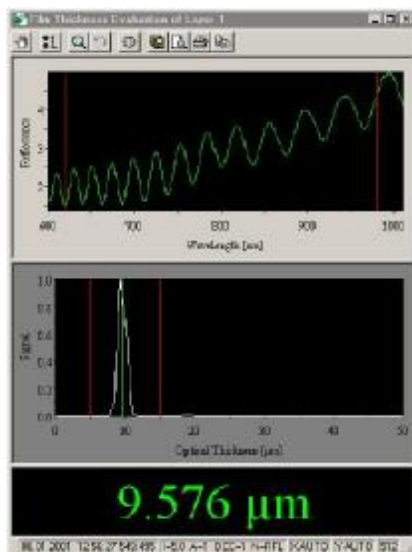


# Film Thickness Measurement Software

## TF<sup>Pro</sup> UV-Vis / TF<sup>Pro Lite</sup>

TF<sup>Pro</sup> UV-Vis is a software package designed to determine the film thickness of transparent layers. It provides spectrometer system control, data acquisition and processing, as well as many different display options including TTL output control. TF<sup>Pro</sup> UV-Vis supports tec5 MultiSpec<sup>®</sup> Desktop spectrometer systems as well as the PCI Operating Electronics.



TF<sup>Pro</sup> UV-Vis  
Application Desktop

► Interference-spectrum

► FFT-spectrum

► Calculated film thickness

- Film thickness ranges from 0.1 ... 150 nm (depending on the spectrometer module)
- Film thickness accuracy: +/- 0.005 nm
- Various status / error / warning messages
- Two independent evaluation parameter sets permit simultaneous double-layer evaluation
- Continuously running measurement with automatic data/result storage
- Provides TTL trigger input and output
- Supports scanning bridges for Web Coaters
- Runs on Windows 2000/XP

## Spectrometer System Control

TF<sup>Pro</sup> UV-Vis permits to set parameters for all major tec5 spectrometer system functions like integration time, averaging or automatic shutter control of a connected halogen and/or deuterium light source. Integrated TTL trigger input and two TTL trigger output ports allow direct feedback of the measured film thickness results for process control.

## Data Acquisition Modes

TF<sup>Pro</sup> UV-Vis provides various measurement set-ups, by which the data acquisition can be triggered either manually or automatically via a TTL trigger event. All spectra measured can be automatically saved to a so-called Spectra-Recorder File. Independently from the connected spectrometer system hardware, the Spectra-Recorder File can be accessed off-line thus allowing data processing for film thickness evaluation.

## Film Thickness Determination

The interference pattern of the typical spectrum created by a thin transparent layer is analyzed by a special developed Fast Fourier Transform algorithm.

Certain software evaluation filters permit to improve the data processing, for instance, defining a spectral evaluation range to reduce statistical noise of the measured interference spectrum.

TF<sup>Pro</sup> UV-Vis provides to setup user defined film thickness limits, which can be used to trigger the spectrometer TTL out ports for a current feedback loop of your in-line process control.

## TF<sup>Pro-lite</sup>

TF<sup>Pro-lite</sup> is a low-priced version of the above mentioned software. It is focused on manual measurements in laboratory and simple process applications. It can be connected to all tec5 electronics with an USB 2.0 port (USB 1.0 compatible). Together with an instrument of the **Evaluation Line** series it is a high-precision device for film-thickness measurement with an outstanding price/performance ratio.

## Specifications

Features marked with \* are not available with TF<sup>Pro-lite</sup>

### General

- Multi-document-interface for easy data access
- Multi-threaded document view (charts)
- Spectrometer control toolbox

### Data Acquisition

- Single, multiple and continuous measurements
- Automatic dark current correction
- Automatic shutter control
- External TTL trigger for scan cycles \*
- Support of scanning bridge for fully automatic two-dimensional film thickness determination \*
- Spectra-recorder for data storage \*

### Data Evaluation

- Dispersion correction via Cauchy function
- Simultaneous double-layer examination
- On-line film thickness trend analysis

### On-Line Charts

- Raw data, dark current, reference and interference spectrum
- FFT spectrum and film thickness result
- 2D film thickness trend chart
- 3D film thickness contour chart \*

### Data Export/Storage

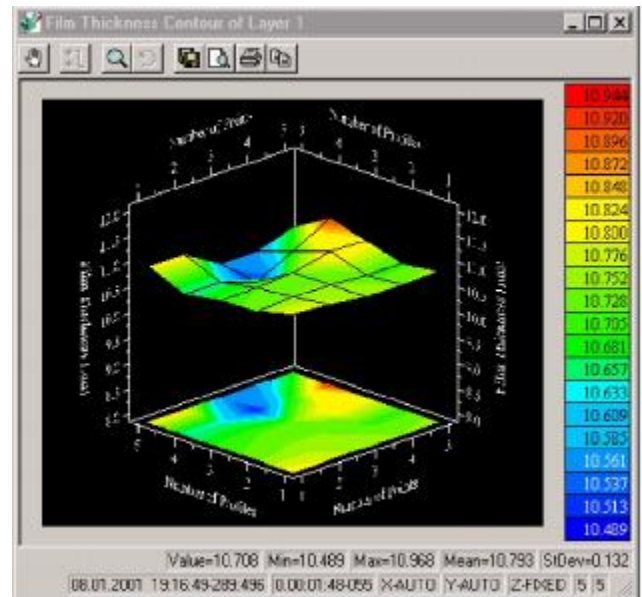
- Manual and automatic data export of all documents in ASCII format (Excel compatible)
- Spectra-recorder file including dark current, reference and all interference spectra

### Trigger Input/Output

- One TTL trigger input \*
- Two independent usable TTL trigger outputs \*
- Internal trigger option for scanning bridges \*

## Optical Thickness Ranges and Accuracy

- 0.8 ... 180  $\mu\text{m}$  (MCS UV-NIR)
- 2.1 ... 198  $\mu\text{m}$  (MCS NIR)
- 0.7 ... 49  $\mu\text{m}$  (MMS-1)
  
- Overall accuracy:  $\pm 0.005 \mu\text{m}$
- Overall repeatability:  $\pm 0.002 \mu\text{m}$  (standard WEG test)



TF<sup>Pro</sup> UV-VIS 3D film thickness contour plot \*

## Hardware Requirements

- tec5 spectrometer system or operating electronics with PCI interface for TF<sup>Pro</sup> and accordingly USB 2.0 (USB 1.1 compatible) for TF<sup>Pro-lite</sup>
- tec5 light source
- PC with Windows 2000/XP
- Intel Pentium 4, 256 Mbytes RAM 20 MB HDD space, SVGA, High Color



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