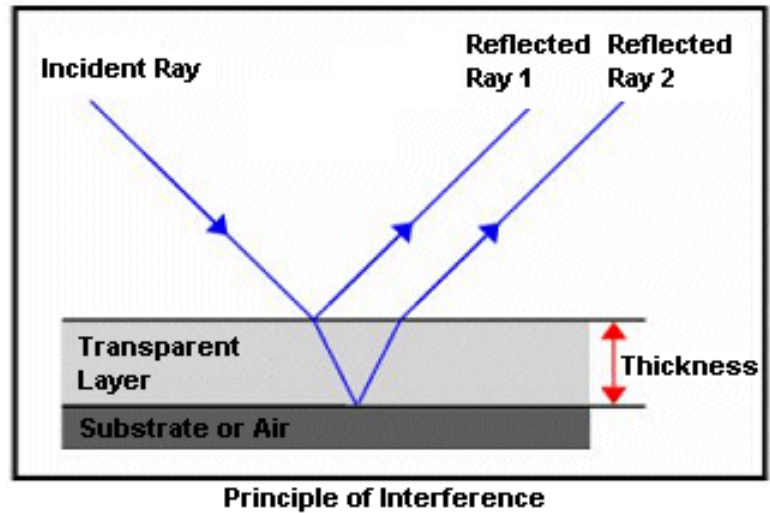


# UV/VIS/NIR SPECTROMETER FOR THICKNESS DETERMINATION OF THIN TRANSPARENT FILMS

Within nearly all industrial branches we find products, which are coated with thin transparent layers to improve the surface features: Window sheet glasses obtain changes in reflection and absorption behavior, ceramics are treated with coatings to lower water adhesion, coatings on metals create corrosion resistance or better sliding factors. Transparent coating plays a major role in semiconductor and plastics industries. One of the important features to be determined and controlled is the thickness of the layers to balance performance and material input, during development and production.

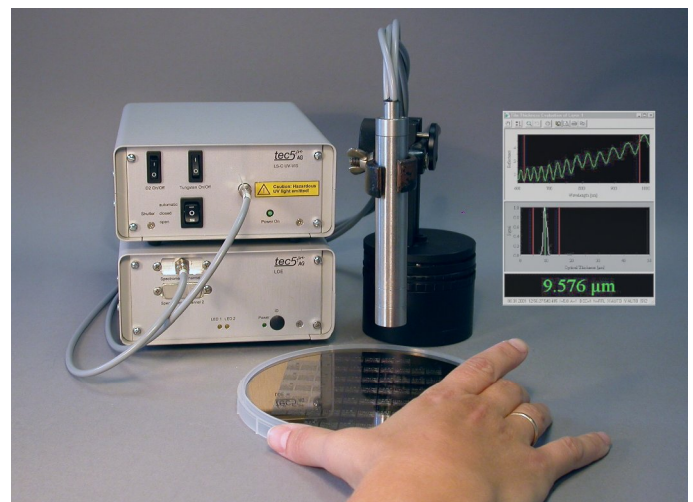


## Measurement Principle

White-light interference is the interaction of light partially reflected on optical boundaries caused by index changes of the materials. The difference in pathlength is a function of the wavelength, the refractive index and the geometrical thickness, causing interference if the layers are transparent, smooth, and parallel. The reflected intensity varies with wavelength, creating an interference spectrum. This can be detected and analyzed by a so-called Fast-Fourier-Transform algorithm. This allows to determine the optical thickness very fast while a production process is running – without destroying, changing or even touching the surface. If the optical thickness of two layers are not too close both thickness can be measured simultaneously.

## System Solutions

**tec5** supplies high-quality OEM components and compact, high-end UV-VIS-NIR spectrometer systems for thin film measurements based on diode-array and fiber-optic technology. Single and dual layers in the range of 0.1 to 100µm geometrical thickness can be determined at high rates. The instruments of the **MultiSpec** series in 19" housings can be easily fitted to a process installation. For laboratory use the **Evaluation Line** series is a reasonable priced solution, as well for mobile applications. The used **MMS** spectral sensors from **Carl Zeiss** guarantee an outstanding wavelength reproducibility and therefore high precision thickness data.



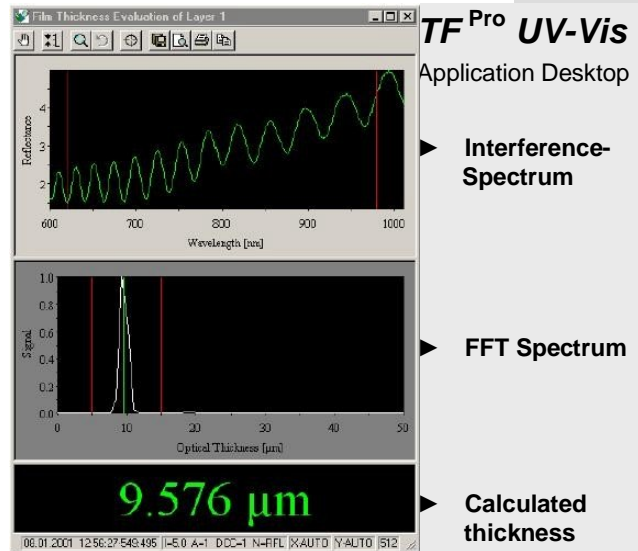
**Film Thickness Measurement with Evaluation Line in the Lab**



- Spectrometer Systems
- Instrument Design and Development
- OEM Electronic Components
- Fiber-Optic Accessories

## Application Software

The software **TF<sup>Pro-lite</sup> UV/Vis** specially developed for film thickness measurements provides user friendliness and fast data processing of single and dual layers. Besides the measured interference spectrum the calculated FFT spectrum and the resulting thickness value are displayed. The measurement runs continuously with automatic saving of all data and results.



Film Thickness Measurement with MultiSpec-Systems in Process

## The Partner

Since 1993 **tec5** develops fiber-optic spectrometer systems based on detector-array technology. Therefore, a long lasting experience with many applications is at hand. We provide components and systems, which can be matched to customer's demand due to large in-house development capacities.

