TCG Incorporated *Technology Connections™*

Introducing... the **FS-1**
Banded Wavelength Ellipsometer by

Production Usability
Research Performance
Paradigm Shift

Ph.D., optical scientist & black magic not required

Banded Wavelength Ellipsometry™ (BWE™)

Sampling discrete bands across the visible spectrum, the **FS-1** ***Banded Wavelength Ellipsometer*** realizes many of the benefits of spectroscopic ellipsometry without all the complication.

Key Features & Benefits

- The **FS-1** Banded Wavelength Ellipsometer (BWE) provides the **operational simplicity** of a classic single wavelength ellipsometer, but without the single wavelength limitations (**no thickness periodicity issues**).
- Multiple LED sources (465 nm, 525 nm, 580 nm, 635 nm), with long lifetimes (>50,000 hours). **No costly lamp changes, time consuming alignments or PM procedures.**
- No moving parts in the ellipsometric detector, enabling **fast measurement times** (banded wavelength data in 10 ms) and **long term reliability**.
- Excellent thickness precision for many samples (better than 0.01nm, for a 1 second acquisition), even for sub-monolayer film thicknesses. **Measurement precision that is only possible with an ellipsometer.**
- Integrated computer for instrument control and data analysis, with a web browser interface accessible from any modern computer, laptop, or tablet**. No complicated software setup and maintenance.**
- ***Affordability****:* the **FS-1** offers the power of banded wavelength ellipsometry (BWE), but at the price point of the single wavelength ellipsometer and spectroscopic reflectometer systems.

Enabling Technologies

- Banded Wavelength Ellipsometry Technology* (BWE)
- Optical Model compensation for LED bandwidth*
- Division-of-Amplitudes-Polarimeter (DOAP), with beam mis-alignment compensation*
- Model Validator™

**Patent Pending*

Applications

The FS-1 BWE excels at measuring the thickness and index of transparent single films, in the thickness range from 0 to 1000 nm. Measurements on semitransparent and absorbing films, and 2-3 layer films are also possible.

- Semiconductor: oxides and nitrides, high/low k dielectrics, amorphous and poly Si, photoresists
- Optical Coatings: high and low index films
- Display industry: TCO's, a-Si films, organic films (for OLED technology)
- Data Storage industry: DLC films
- Process R&D: in situ characterization of film deposition, for MBE, CVD, ALD, sputtering, etc.
- Chemistry and Biology: detection of sub-monolayer material adsorption
- Industrial: in-line monitoring and control

About Film Sense

Our mission is to create robust and affordable thin film sensors that provide best-in-class solutions for a wide range of thin film applications. We provide our customers with honest and objective advice on how our thin film sensors can best meet their measurement requirements. Film Sense was founded in 2013 by Mr. Blaine Johs, who has more than 20 years of experience in the spectroscopic ellipsometry industry. Visit our website at: www.film-sense.com.

Ex-situ Table Top Configuration

In-situ Configuration

Focused Configuration

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