

Evolution of Optical Monitoring for Thin Film Coating

by

Wayne Rodgers, President, Eddy Co.

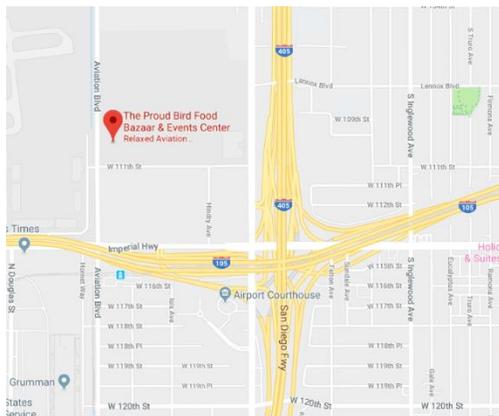
Abstract: Multi-layer optical coatings play a key part in modern photonics, tailoring optical properties to create high-performance mirrors, low reflectivity surfaces, and wavelength or polarization dependent optics. Without such coatings, many optical systems would not be practical, or even possible. While multi-layer optical coating technology has developed tremendously since its inception in the 1940's, there are still challenges that can lead to failed designs and require optimization by trial and error.



Much of the trial and error in coating design is driven by the difficulty in accurately specifying index dispersion for each material. While index dispersion can be approximated by bulk index values or thin film measured values, for many this is insufficient to accurately design a coating without multiple iterations. What is required is an accurate estimate of index dispersion produced by a particular coating technique on a particular machine.

The IDEM system provides a unique index calibration for each material and process used in particular machine. IDEM then monitors the reflected vis/NIR spectrum (400nm-900nm), fitting the reflectivity curve derived for the layer's calibrated index dispersion and the combined dispersion of the substrate and previous layers (IDEM can track more than four layers on one witness chip), rather than monitoring a key wavelength. Additional benefits are continuous insight into system performance, and ability to restart a coating run after a system interruption. IDEM significantly increases the reliability and efficiency of creating multi-layer optical coatings, reducing lead-time and increasing cost margin.

About our speaker: Wayne's involvement in the coating industry began in 1962, working at Infra-red Industries in Carpinteria. This was followed by 4 years in the US Air Force, after which he joined the UCLA molecular beam lab, where he spent 15 years designing and building vacuum systems, spectrometers and particle detectors. During this time, Wayne's entrepreneurial spirit was awakened, and he founded the Eddy Co, and Select Coating Lab. Since its creation, the Eddy Co has been a leader in multi-layer coating technology and scientific equipment design and development.



Wednesday, May 8th, 2019

Reception: 6:00; Dinner: 7:00; Talk: 8:00

**Dinner: \$35 for members registered by May 2 (\$40 non-members), \$40 after for members (\$45 non-members)
(OSSC Student Members \$10 by May 2, \$20 after)**

**The Proud Bird Food Bazaar & Event Center
11022 Aviation Blvd, Los Angeles, CA 90045
(310) 670-3093**

On-line Registration: www.osscc.org or

Contact: Alex Small

Events@osscc.org, 240-672-7639