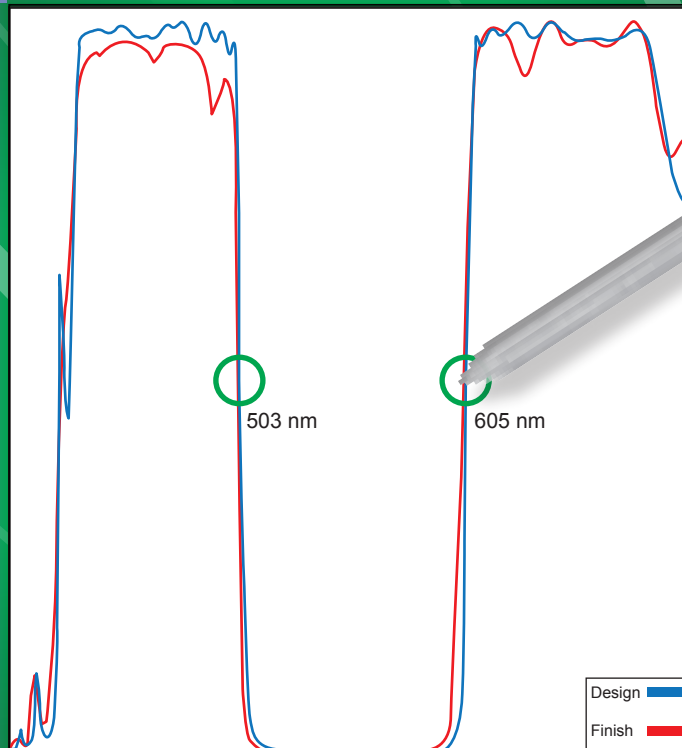


# NAIL IT

## FIRST TIME EVERY TIME



44 layers using  $\text{TiO}_2$  &  $\text{SiO}_2$

**Easily train your Design Program to properly predict the final product using Index Dispersion Enhanced Monitoring (IDEM).**

## The SL-2012A provides in-situ Optical Monitoring and Rate Control.

- Index Dispersion Enhanced Monitoring (IDEM) matched for each deposition material and your individual system characteristics.
- All layers from 1 nm deposited to within 1 nm.

Increase capability, productivity, and profit by having the SL-2012A in your coating systems!



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# SpectraLock 2012A

## IDEM Optical Monitor and Deposition Rate Controller

- Rate control without crystals
- Coatings that match their Design



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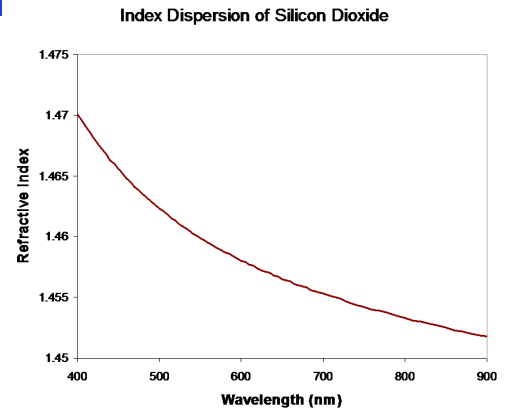
# Index Dispersion Enhanced Optical Monitoring (IDEM)

Instead of continuously struggling to get your coating system to produce films that match your design program, why not use the SpectraLock IDEM to allow your design program to accurately predict the product your machine will produce?

## What is IDEM?

Two fundamental properties define the full spectrum optical properties of a transparent coating: its Thickness and its Refractive Index dispersion

Current Thin Film Design Programs and Optical Coating Systems use standard materials reference table values for refractive index dispersion in the design and monitoring of coatings. Unfortunately, the refractive index dispersion for each material in a given coating system process deviates from the standards by a small amount. These errors multiply with each additional layer applied requiring expert compensation by specialists for successful results.



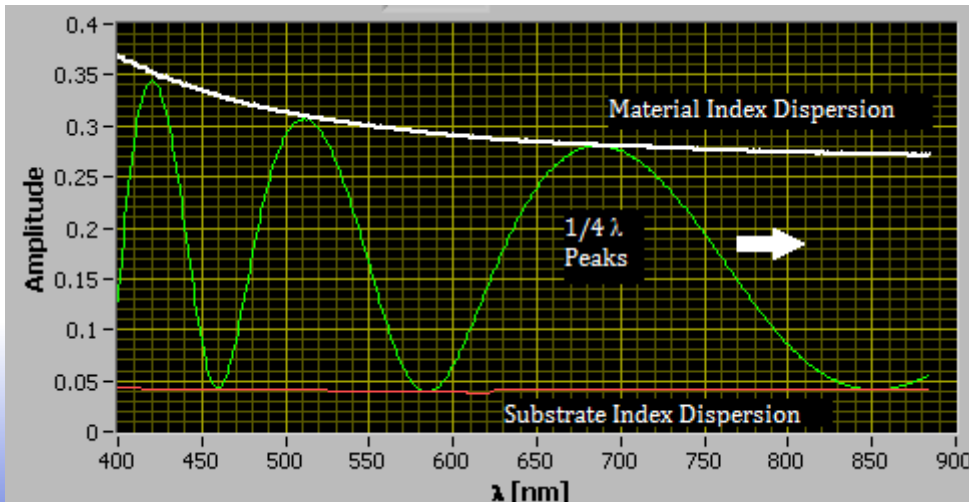
The SpectraLock IDEM provides calibration of the exact Refractive Index Dispersion for each material and process you use. Thereafter, your Thin Film Design Program and the Optical Monitoring Controller produce optical coatings that precisely match their design every time without iteration or error.

## How does IDEM work?

Prior to fabrication of designed coatings, a 2000nm-3000nm calibration layer is deposited on witness and sample substrates for each coating process to be used in your system. The SpectraLock measures the Refractive Index Dispersion of the coating on each witness chip and stores the curves for future use. The substrate samples are then measured to determine the monitor to work ratio for each material.

These process Index Dispersions and Monitor to Work ratios are then translated and loaded into both your Thin Film Design Program and the SpectraLock Controller for precise coating thickness control at each layer.

The SpectraLock is the only commercial instrument capable of measuring In-Situ the broadband Optical Index Dispersions produced by your coating machine.



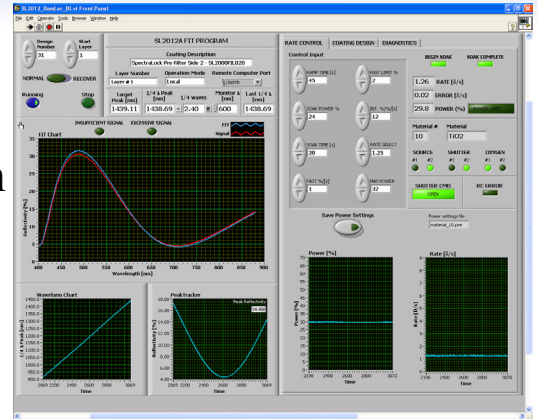
SpectraLock display during calibration.



# SpectraLock 2012A Features

By easily measuring the exact Index Dispersions and Monitor to Work Ratios of your system the SpectraLock can provide:

- **Coatings that match their design models**
- Rate Control without Crystals
- Optical Thickness Monitoring and Control from 1nm to over 5,000nm
- Customer Tested for over 6 years
- Multiple layers per Witness Chip
- Real Time notice of process deviations
- Interrupted run recovery
- Compatible with most automated coating systems
- Reliability established through over 6 years of commercial use



## SpectraLock Operation

### Calibration

Deposit 2,000 - 3,000nm on Witness and Substrate chips

↓

SpectraLock calibrates Index Dispersion

↓

Load Index Dispersion into your Thin Film Program

↓

Measure Substrate Chip optical thickness

↓

Calibrate Monitor/Work Ratio using Thin Film Program

Repeat for each material/process

### Operation

Design

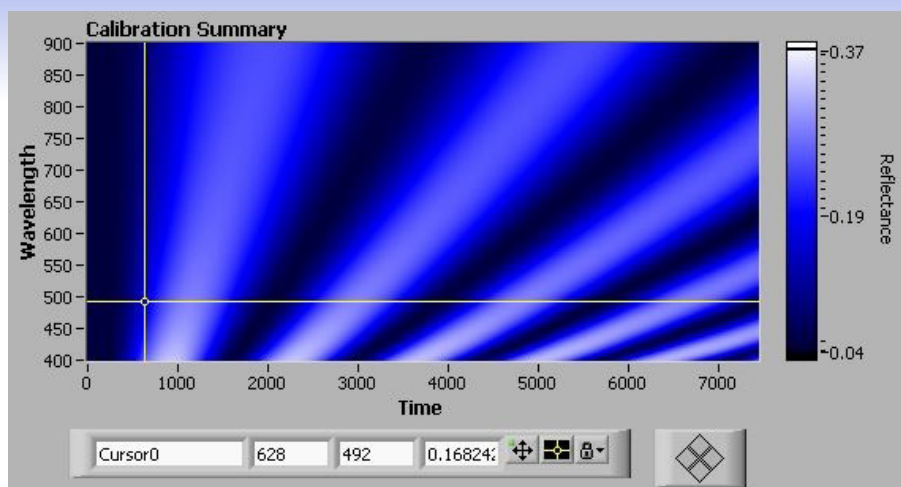
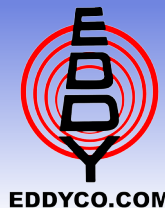
↓

Coat

↓

Confirm

# Calibration Summary



This 3D graph of Reflectance vs. Wavelength vs. Time illustrates the comprehensive data collected by the SpectraLock during a calibration run. The SpectraLock verifies the quality of each Calibration before generating Refractive Index coefficients.

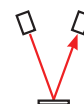
## MONITOR OPTIONS

The SpectraLock may be configured for Bottom, Top, or Intermittent monitoring to match your Coating System's requirements.

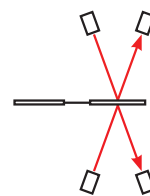
Bottom Monitoring



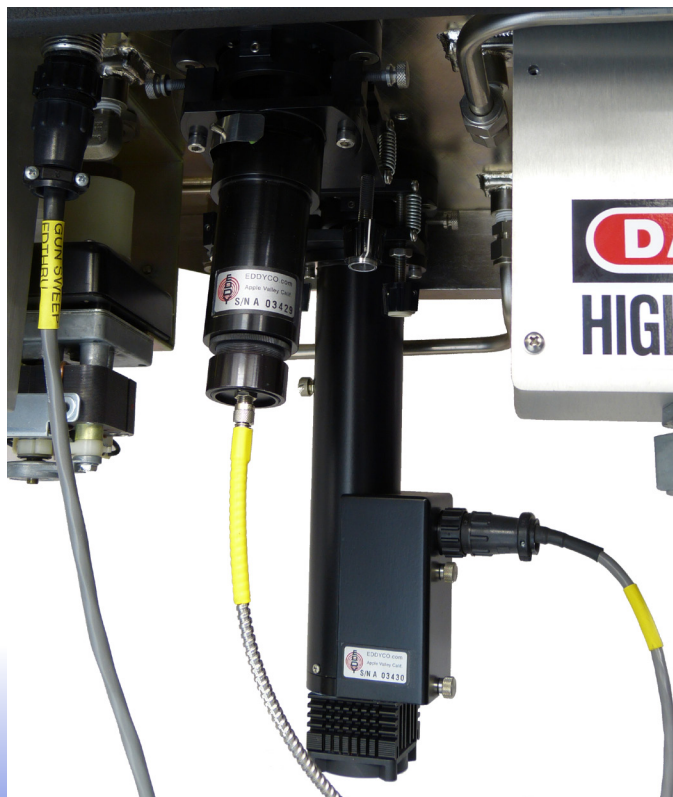
Top Monitoring



Interrupted Monitoring



SpectraLock Source and Detector (Mounted)

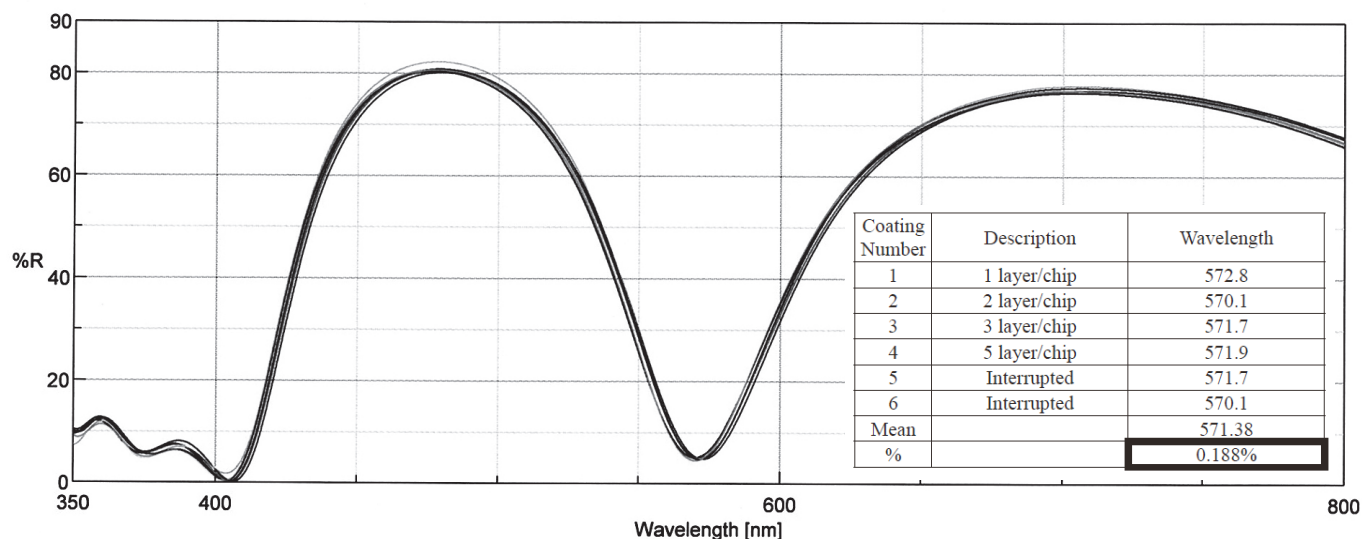


CC-60 Chip Changer for optimum performance

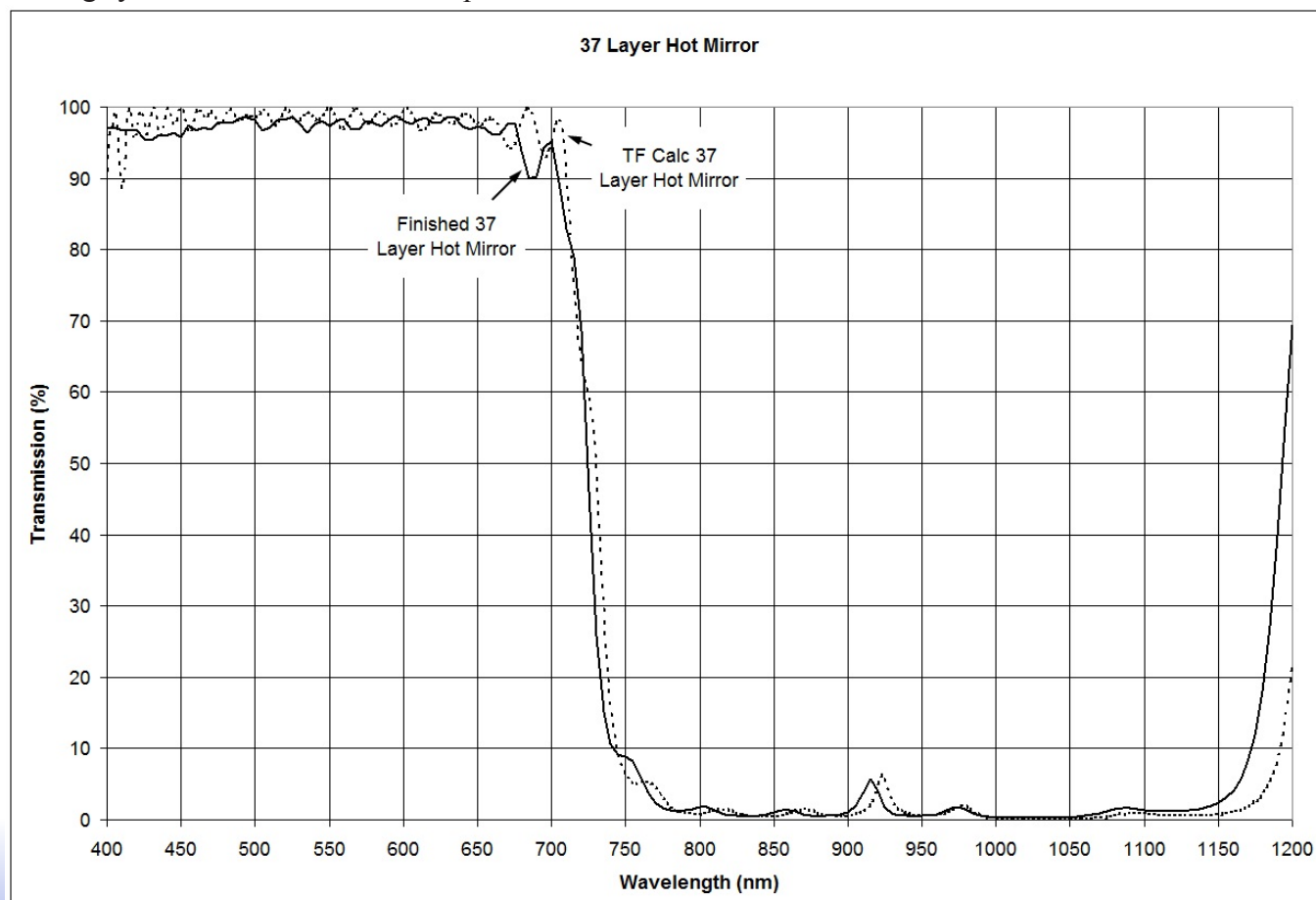


# IDEM Performance

These results obtained without process iteration illustrate the capabilities of the IDEM system. The following 6 curves were generated for identical 5 layer coatings applied to 6 different substrates and includes 2 interrupted runs. Repeatability across the 6 runs was 0.2%



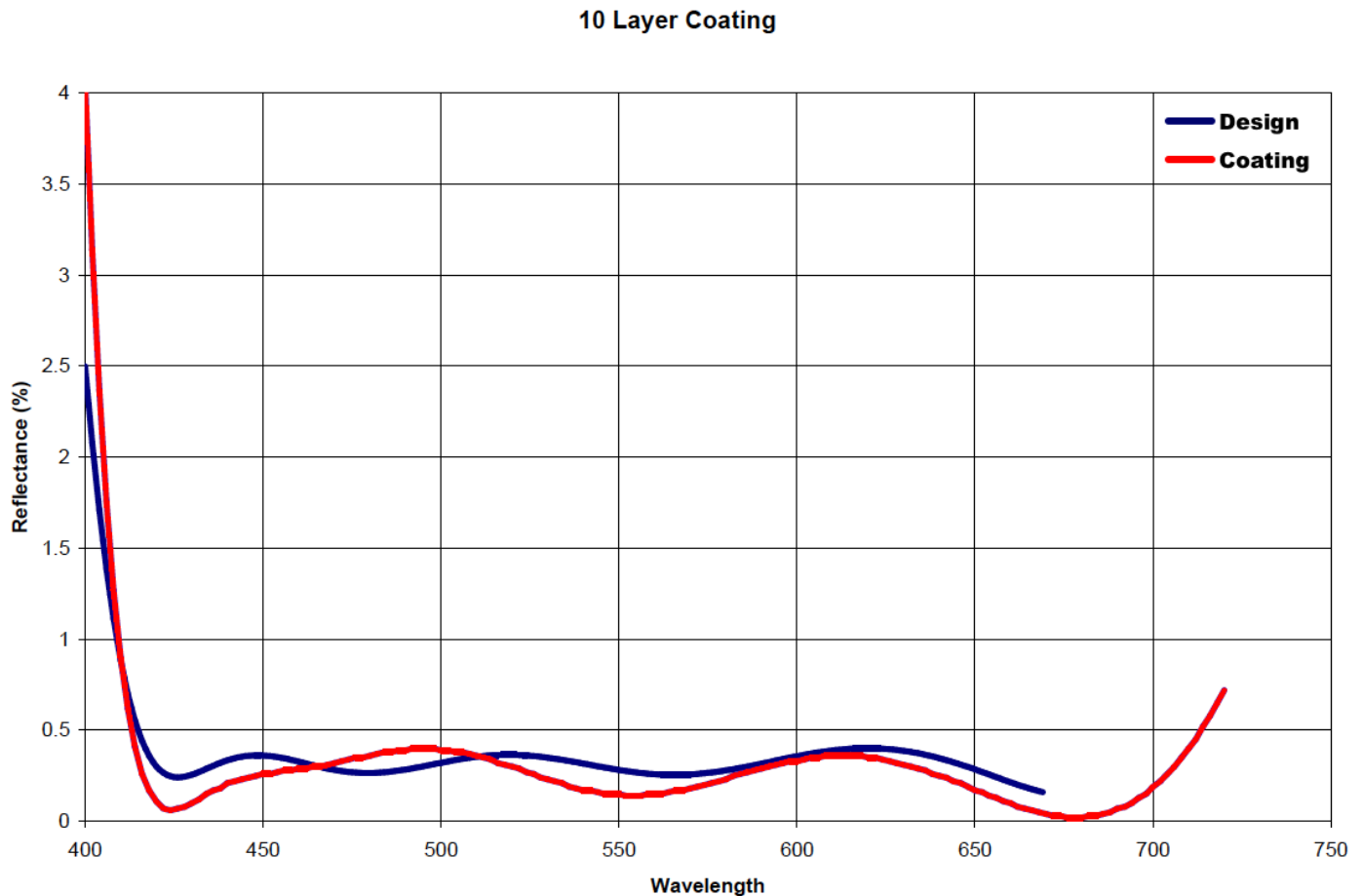
The curves below illustrate the simplicity of coating with an IDEM Calibrated system. This 37 layer coating was applied without trial runs or process iterations. Just design and coat. It is that easy once your coating system is calibrated with a SpectraLock 2012A.



# Typical IDEM Results

The SpectraLock 2012A easily and accurately controls both thick and thin layers.

This typical example is a 10 layer all oxide design produced with Ion assist and no “test” runs before coating the parts.



- Ion Assisted
- All Oxides
- On Target from the First Run

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# Specifications for SpectraLock 2012A

Light Source	Halogen Lamp
Wavelength Range	400nm-900nm
Operation Modes	Bottom or Top Mount, Intermittent
Detector	Hamamatsu NMOS
Thin Film Program	Internal
Rate control range	1 nm/min to 100 nm/min
Number of calibration materials	99
Number of processes storage	999
Run recovery	Easily initiated
Calibration parameters	Sellmeier Coefficients, Monitor to Work Ratio
Options:	
Chip Changer (Recommended)	Eddy Company CC-60
Planetary Drive	Eddy Company PL-36-14-U
Synchronized detection	On request
Warranty	2 years



## About the Eddy Company

For over 40 years the Eddy Company has been developing and manufacturing cutting edge thin film optical monitoring systems. The company has grown steadily over the years supplying precision monitors and accessories to the high vacuum coating industry. In the mid '80s the Eddy Company integrated these components into its own custom designed automated high vacuum chambers producing complete state of the art coating systems.

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