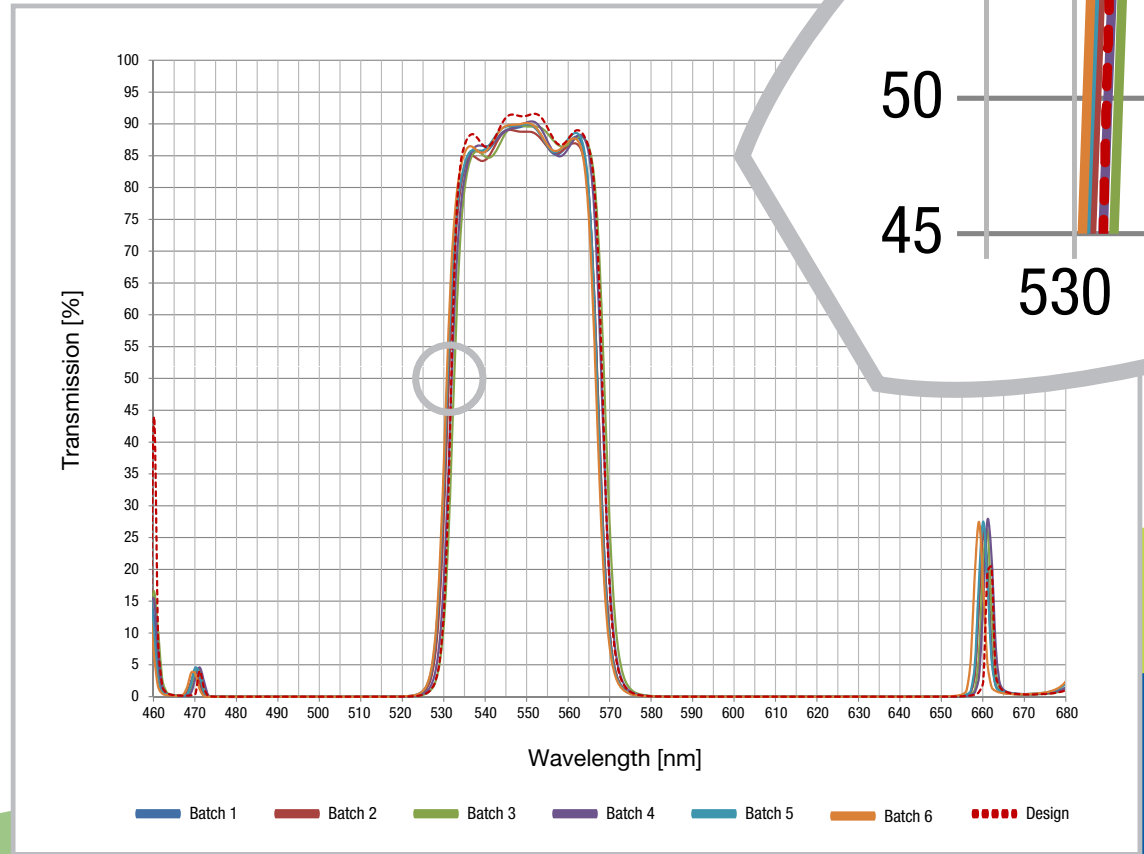


Take a look at the results



	Batch 1	Batch 2	Batch 3	Batch 4	Batch 5	Batch 6	Design	max-min (nm)	max-min (%)
T=50% (rising edge)	531.04	531.19	532.45	531.84	530.86	530.66	531.71	1.79	0.34
T=50% (falling edge)	566.89	566.91	568.53	567.88	566.81	566.50	568.07	2.03	0.36

Technique: Sputtering in MSP batch tool.

Test schedule: 6 batches spread over 30 days, including non-consecutive runs. No prior test runs.

GSM Mode: Broadband

Process repeatability: $T_{50} \pm 0.18\%$ overall, even with non-consecutive runs.

Dichroics Bandpass & Edge Filters AR Coatings Laser Mirrors IR Blocking



System Data

Light Sources	2 Quartz-Tungsten Halogen lamps, Plug & Play, 6000hrs life
Wavelength Range	Standard: 380nm to 1100nm Custom: According to customer specification
Operation Modes	Reflection, transmission on test glass or directly onto substrates
Detectors	Monochromatic: Photodiode according to wavelength range Broadband: Temperature stabilized, CCD array, 1024 pixels
GTC 621	6 measurement positions, transmission or reflection
GTC 1100	140 heated test glasses, mixed measurement



About Evatec

Evatec offers complete solutions for thin film deposition and etch in the optical and semiconductor markets. Evatec engineers are able to offer practical production advice from R&D to prototyping and mass production. We recognize that no single technique offers the answer to all problems. With a technology portfolio including standard and enhanced evaporation as well as sputter, we are ready to offer sampling services and custom engineering to meet our customers individual needs.

We provide sales and service through our global network of local offices. For more information visit us at www.evatecnet.com or contact our head office.

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Product descriptions, photos and data are supplied within the brochure for general information only and may be superseded by any data contained within Evatec quotations, manuals or specifications.



GSM

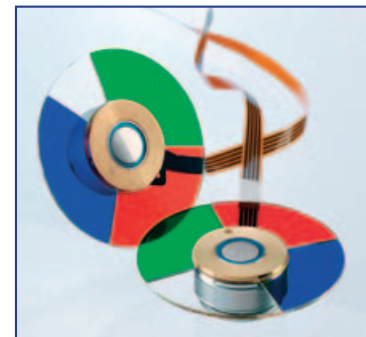
Optical Monitor



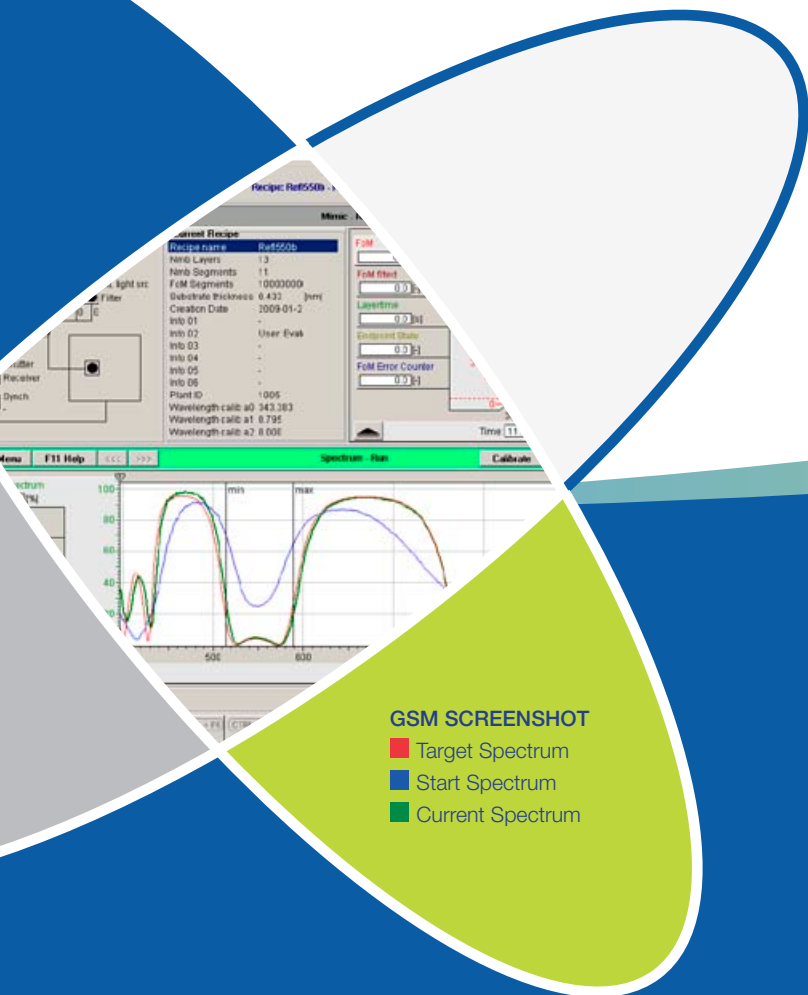
GSM

Why Optical Monitoring?

Today's enhanced electron beam and sputter deposition processes enable the production of thin films with high density, excellent temperature and environmental stabilities and a minimum of absorption making them ideal for high end optical applications including laser mirrors, sensors and colour separation. As demands on filter performance increase, optical stacks become more complex and process times extend. Accurate, repeatable process control technology becomes essential for cost effective high yield production.



Conventional, indirect quartz monitoring techniques measure changes of oscillation frequency of a quartz crystal as it gets coated. In-situ optical monitoring techniques make direct measurements of changes of intensity from a beam of light transmitted through or reflected from a substrate (or test glass) during the coating process. Such precise techniques enable edge repeatabilities of $\pm 0.3\%$ or better making them ideal for the most demanding thin film stack designs.



GSM

The Evatec Solution

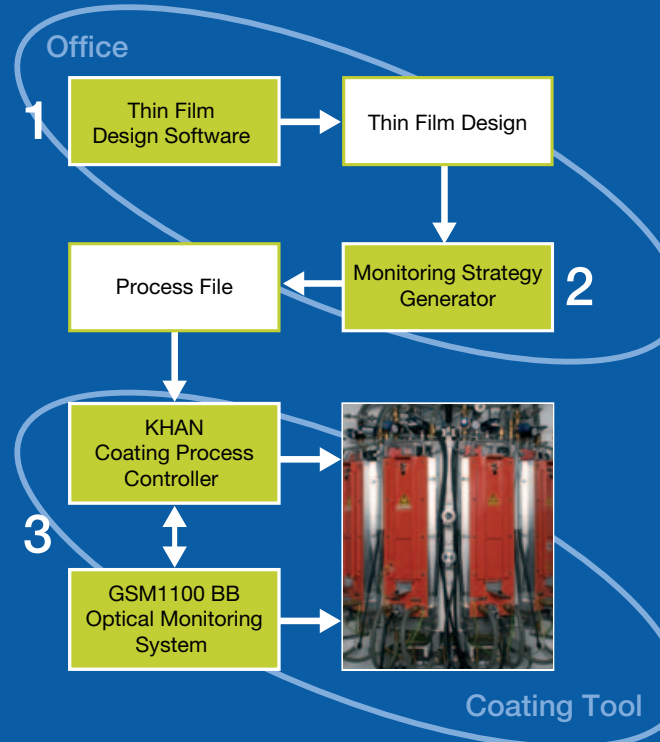


GSM Design Features

- Long lamp lifetimes
- Temperature drift elimination
- Real Time "Unix" operating system
- Optical fibre system connections
- Powerful endpoint detection algorithms

The GSM1100 is available for both stand alone and fully integrated operation. When operated in conjunction with our Khan process controller it offers a seamless production route from thin film stack design through user choice of end point strategy, process recipe generation, coating itself and customised process data logging.

Our third generation modular concept integrates practical design elements allowing easy configuration of the system. Mechanical set up, operation and maintenance are simpler than ever. Plug and play sources and receivers are exchanged from the front of the standard 19 inch rack control unit, and compact heads have easy mounting and alignment outside the vacuum system. We support industry standard thin film design software and offer a choice of algorithms for end point detection



GSM

Configure Your System

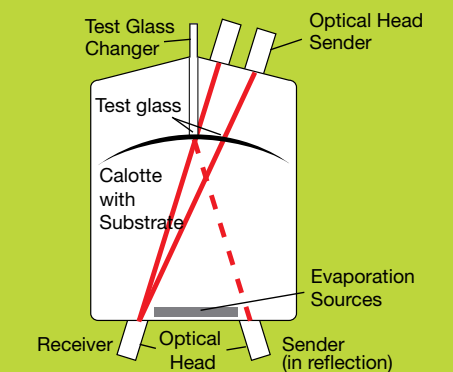
Monochromatic

In standard operation, the light intensity subsequent to transmission through or reflection from a test glass coated alongside the actual production substrates is measured at a specified wavelength through a monochromator. Each coating layer is terminated upon reaching predefined intensities, with options including maxima or minima, absolute, or intensity values relative to the last measured maximum and minimum. A choice of GTC 621, or GTC1100 test glass changers is available according to application needs. The technique has tight spectral resolution, excellent signal to noise ratios and test glasses can be kept conveniently as permanent production records.

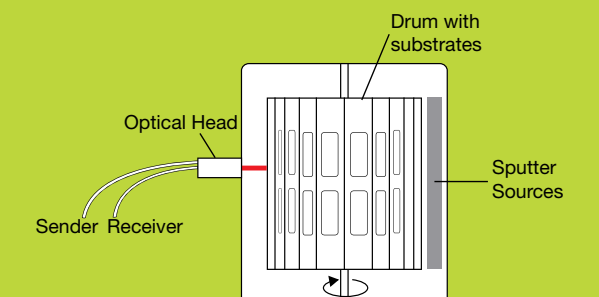
Broadband

The GSM monitors the optical performance of the actual substrate or test glass and the standard receiver is replaced by a high performance spectrometer with temperature stabilized CCD array. This ensures optimum results over a whole spectral range and compensates for variation in coating rate and refractive indices. Measured spectra of each layer are stored for analysis.

BAK Evaporator



MSP Sputter Tool



RADIANCE Cluster Tool

