scia Coat 500

LARGE AREA MULTILAYER DEPOSITION

Features & Benefits

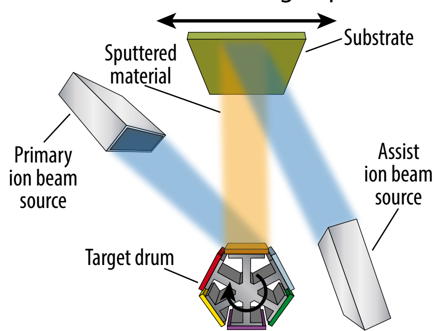
- Excellent uniformity by superposition of substrate rotation and linear movement
- Up to 6 water cooled target materials on a rotational holder for in-situ change
- Recipe controlled multilayer deposition with quartz crystal oscillator and/or optical thickness monitor (OTM)
- Controlled movement of linear axis system for gradient coating or surface error correction
- Optional substrate heating up to 250 °C to optimize film stress

Applications

- Multilayer films for optical filters, X-ray mirrors and synchrotron mirrors
- Optical coatings for high- and anti-reflective layers
- Deposition of films with property gradients (Göbel mirrors)
- Ion beam smoothing
- One-dimensional ion beam figuring

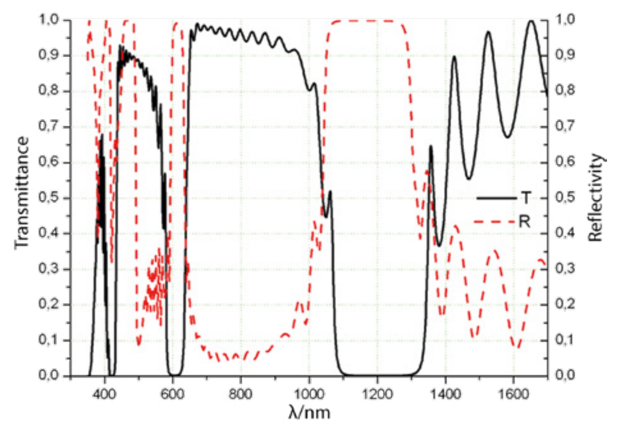
Principle

- Ion Beam Sputtering (IBS), Dual Ion Beam Sputtering (DIBS), Ion Beam Etching (IBE)
  - Primary source sputters material from a target to the face-down oriented substrate
  - Secondary source used for precleaning the substrate and/or assist during deposition



Application Example

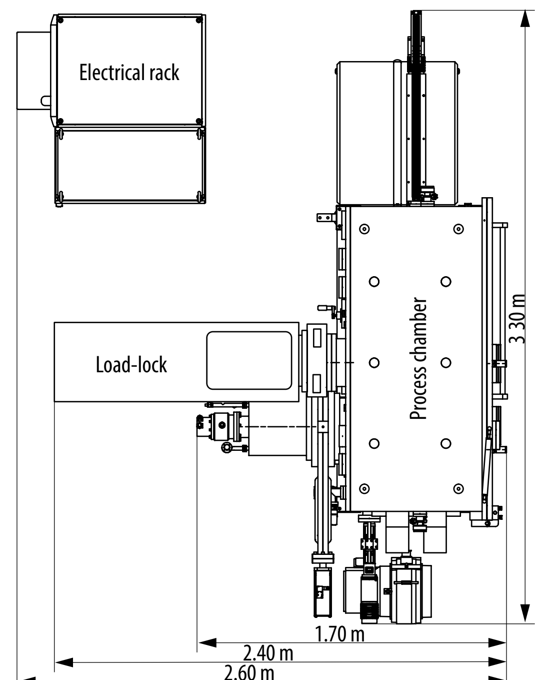
- Deposition of Al_2O_3/TiO_2 multilayers for VIS/IR filters (15 x [$Al_2O_3/TiO_2/Al_2O_3$] on quartz (IS599))



Transmittance and reflectivity diagram with courtesy of Fraunhofer IWS Dresden

Technical Data

Substrate size (up to)	500 mm x 300 mm
Substrate holder	Linear movement from 0.1 mm/min up to 15 mm/s, rotation up to 300 rpm (max. 300 mm dia.)
Ion beam sources	Two 380 mm linear microwave ECR-sources (LIN380-e)
Neutralizer	Filament driven plasma bridge neutralizer (N-DC)
Target holder	Target drum with up to 6 tiltable and water cooled targets (each max. 400 mm x 200 mm)
Typical deposition rate	Si: 10 nm/min
Uniformity variation	≤ 0.5 % over 200 mm dia. (σ/mean) ≤ 2.0 % over 500 mm x 300 mm (σ/mean)
Base pressure	$< 5 \times 10^{-8}$ mbar
System dimension (W x D x H)	3.30 m x 1.70 m x 2.00 m (without electrical rack and pumps)
Configurations	Single chamber, optional single substrate load-lock for substrates up to 200 mm dia.
Software interfaces	SECS II / GEM, OPC



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