scia systems

scia Coat 200

HIGH QUALITY MULTILAYER DEPOSITION

Features & Benefits

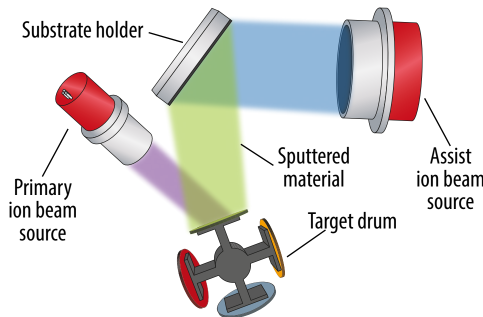
- Excellent uniformity by substrate rotation and tilt
- Up to 5 water cooled target materials on a rotational holder for in-situ change
- Recipe controlled multilayer deposition with quartz crystal oscillator and/or optical thickness monitor (OTM) and test glass changer
- Direct wafer handling or adaptation to variable substrate sizes with carrier handling
- If equipped with a 350 mm ion beam source as assist source also usable for ion beam etching processes

Applications

- Optical coatings for high- and anti-reflective layers, bandpass and notch filters
- Multilayer films for magnetic sensors (GMR, TMR, spintronics)
- High laser damage threshold coatings
- Deposition of dielectric and metal layers
- In-situ preprocessing of substrates (etching, cleaning, smoothing)

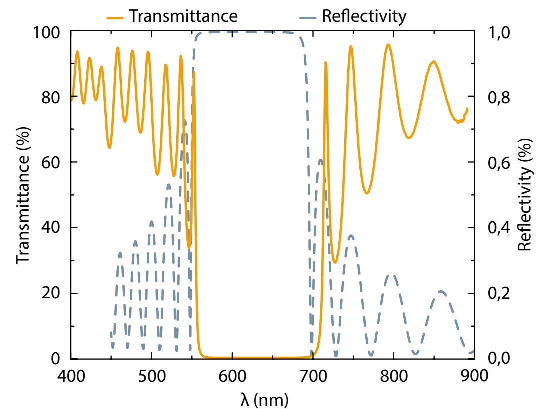
Principle

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



Application Example

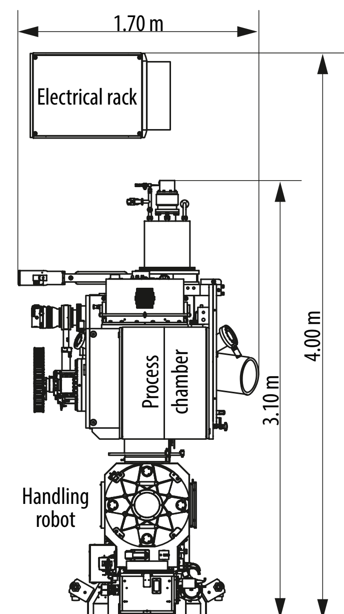
- Deposition of quarter wave stack consisting of Ta_2O_5 and SiO_2 for high-reflective mirror @ 630 nm
  - Reflectivity > 99.9 % and transmittance 15-20 ppm



Transmittance and reflectivity diagram of a high reflective mirror.

Technical Data

Substrate size (up to)	200 mm dia.
Substrate holder	Water cooled, helium backside cooling contact, substrate rotation 5 to 20 rpm, tiltable in-situ from 0° to 160° in 0.1° steps
Ion beam sources	Sputter source: 120 mm circular RF source (RF120-e) Assist source: 120 mm circular RF source (RF120-e) or 350 mm circular RF source (RF350-e) or 218 mm circular microwave ECR source (MW218-e)
Neutralizer	Filament driven (N-DC) or RF driven (N-RF) plasma bridge neutralizer
Target holder	Target drum with tiltable and water cooled targets, up to 5 (each max. 220 mm dia.) or up to 4 (each max. 300 mm dia.)
Typical deposition rates	Ag: 35 nm/min, Al: 10 nm/min, Si: 15 nm/min, Ti: 8 nm/min, Al_2O_3: 15 nm/min, SiO_2: 20 nm/min, Ta_2O_5: 15 nm/min, TiO_2: 6 nm/min
Uniformity variation	≤ 0.5 % (σ/mean)
Base pressure	< 5 x 10^{-7} mbar
System dimension (W x D x H)	3.10 m x 1.70 m x 2.40 m, for single chamber with cassette handling (without electrical rack and pumps)
Configurations	Single chamber with single substrate load-lock or cassette handling, Cluster system with cassette handling
Software interfaces	SECS II / GEM, OPC



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