scia systems

scia Coat 200

HIGH QUALITY MULTILAYER DEPOSITION

Features & Benefits

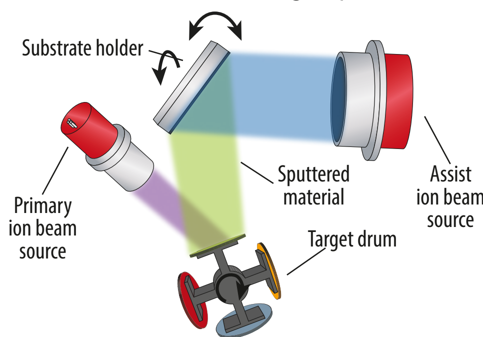
- Excellent uniformity by substrate rotation and tilt
- Up to 5 water-cooled target materials on a rotational holder for in-situ change
- Recipe-controlled multilayer deposition with quartz crystal oscillator and/or optical thickness monitor (OTM) and test glass changer
- Direct wafer handling or adaptation to variable substrate sizes with carrier handling
- 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)

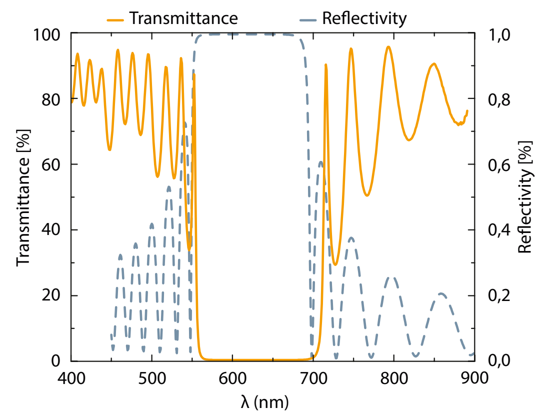
Principle

- 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 pre-cleaning the substrate and/or assist during deposition



Application Example

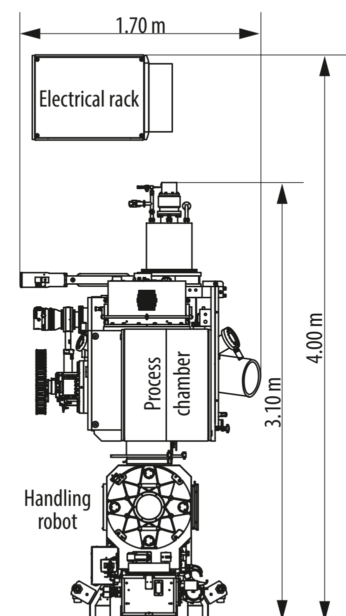
- Deposition of quarter wave stack consisting of Ta_2O_5 and SiO_2 for high-reflective mirror at 630 nm
  - Reflectivity > 99.9 % and transmittance 15-20 ppm



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



scia Systems GmbH | Clemens-Winkler-Straße 6c, 09116 Chemnitz, Germany
www.scia-systems.com | info@scia-systems.com