

scia Coat 500 for Dual Ion Beam Deposition (DIBD)

The scia Coat 500 is designed for homogeneous coating of high precision optics. Typical applications of the system are multilayer films for X-ray mirrors and filter coatings.

The scia Coat 500 applies a beam from a linear ion beam source onto a rectangular sputter target. This linear geometry provides a good homogeneity of the deposited film in one dimension. Meanwhile, the sample is moved on a linear axis in a direction perpendicular to the beam's profile, thereby contributing to homogeneity or defined gradients of the coating in the second dimension.

In addition the sample stage is equipped with a spin rotation and a changeable shaper system (up to 4 shapers) in front of the sample stage.

Features

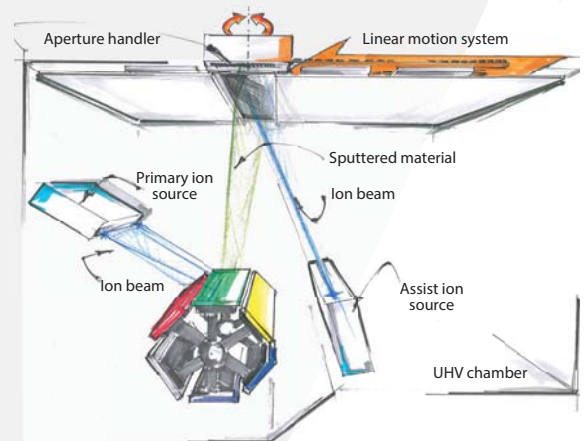
- Superposition of substrate rotation and linear movement
- Aperture technique e.g. for lateral layer thickness distribution and material-dependent homogenization
- Rectangular sputter and assist ion beam sources
- Primary ion source with concave grid for focused linear ion profile on the target
- Secondary ion source for pre-cleaning and assist during deposition
- Up to 6 water cooled target materials on a rotational holder
- Additional tilt of target surface
- Very short coating times are precisely controllable e.g. for thin barrier layers

Applications

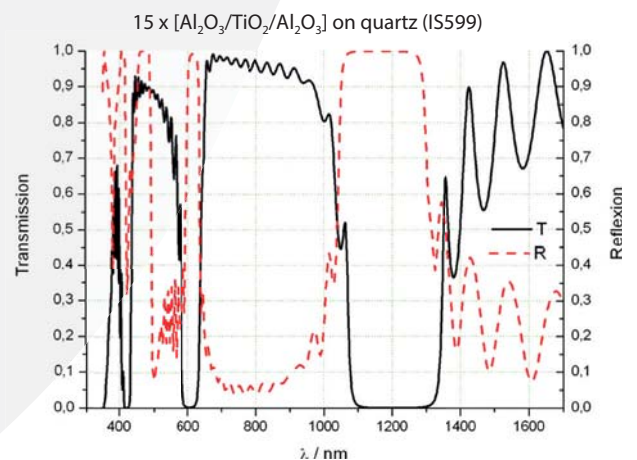
- Multilayer films for
 - X-ray mirrors
 - Anti-reflective coatings
 - Optical filters
 - Gradient coatings (e.g. Göbel-mirrors)
 - Synchrotron mirrors
- Ion Beam Smoothing
- One-dimensional Ion Beam Figuring



scia Coat 500



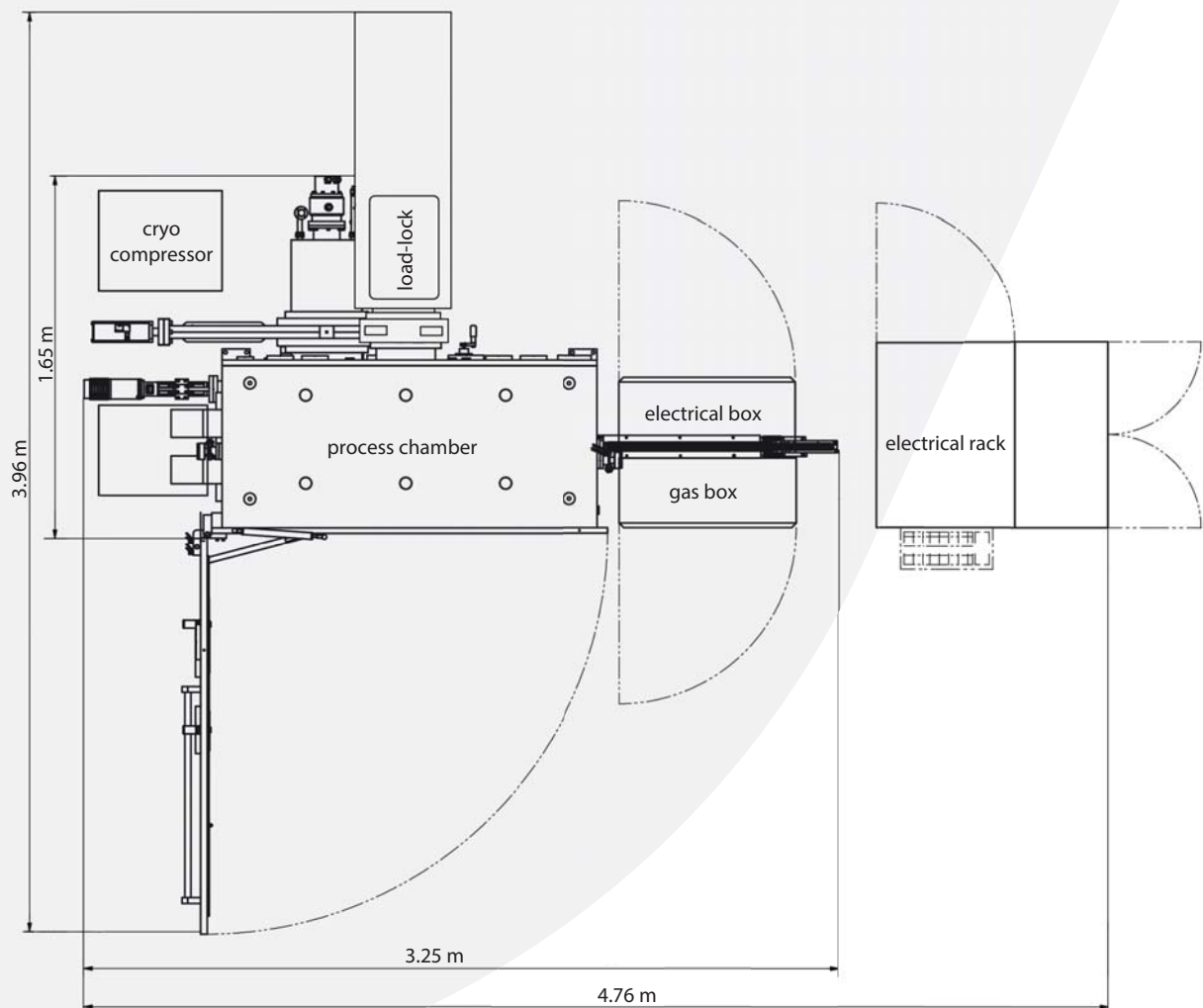
Schematic principle of scia Coat 500



DIBD of Al₂O₃/TiO₂ multilayers for VIS/IR filters with courtesy of Fraunhofer IWS Dresden

Technical Data

Substrate diameter	Up to 200 mm dia. with load-lock Up to 500 mm x 300 mm with manual loading
Ion beam source	Rectangular microwave ECR-source LIN380-e
Neutralizer	Plasma bridge neutralizer N-DC
Target holder	Target drum with 6 targets (tiltable), each with max. 400 mm x 200 mm
Typical deposition rate for Si (static)	10 nm/min
Axes performance	Linear from 0.1 mm/min up to 15 mm/s Rotation up to 300 rpm
Uniformity deviation	≤ 0.5 % over 200 mm dia. ≤ 2 % over 500 mm x 300 mm
Base pressure	≤ 5 x 10 ⁻⁸ mbar
System dimensions (W x D x H)	3.25 m x 1.65 m x 2.10 m (without electrical rack, pumps and load-lock)
Tool configuration	1 process chamber, 1 load-lock optional
Software interfaces	SECS II / GEM, OPC on request



Footprint of scia Coat 500