Fraunhofer
FEP

Fraunhofer Institute for Electron
Beam and Plasma Technology FEP

CLUSTER 300

Experimental plant
for stationary magnetron sputtering

Overall view of the CLUSTER 300 with cleanroom

Coating of 12" substrates

We use sputter technologies and high-rate PECVD to develop processes for depositing optical, electrical, acoustic, and magnetic layers and layer systems precisely and homogeneously on large substrates at high coating rates.

In particular, applications in the areas of optics, electronics, sensor technology, solar energy, and medical technology require uniform coatings of high quality with few defect sites on large areas or on large numbers of substrates.

Our long-term stable sputter processes are ideal for manufacturing these precision layer systems. We have extensive experience with reactive gas feed control, process control, and in-situ quality monitoring and are thus able to carry out reactive processes highly reproduceable.

The equipment CLUSTER 300 can coat stationary substrates having a diameter up to 12" (300 mm). There are double ring magnetrons in the coating chambers. The superposition of their inner and outer discharge rings allows homogeneous layer thicknesses and layer property distributions to be achieved. Furthermore, gradient layer systems can also be deposited, which for certain applications have better properties than multilayer systems.

The cluster equipment can also be used to apply metals, alloys, multilayer systems, compounds, and hybrid systems of metals and organic compounds to glass, silicon wafers, metal surfaces, and films with high process reliability.

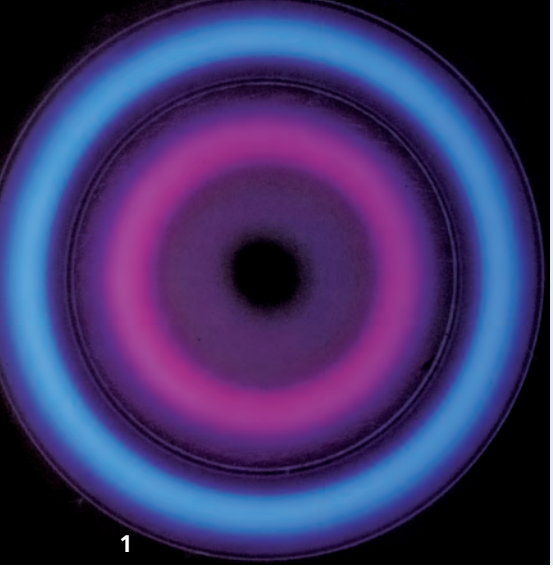
Contact

Dr. Hagen Bartzsch
Phone +49 351 2586-390
hagen.bartzsch@fep.fraunhofer.de

Fraunhofer Institute for Electron
Beam and Plasma Technology FEP

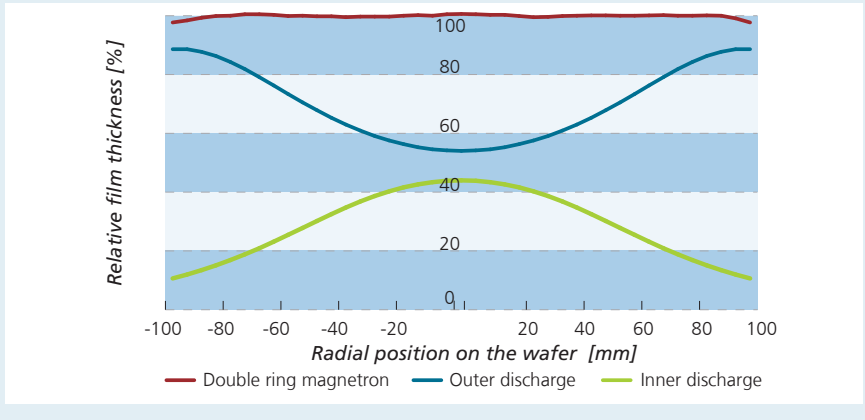
Winterbergstr. 28
01277 Dresden, Germany

www.fep.fraunhofer.de

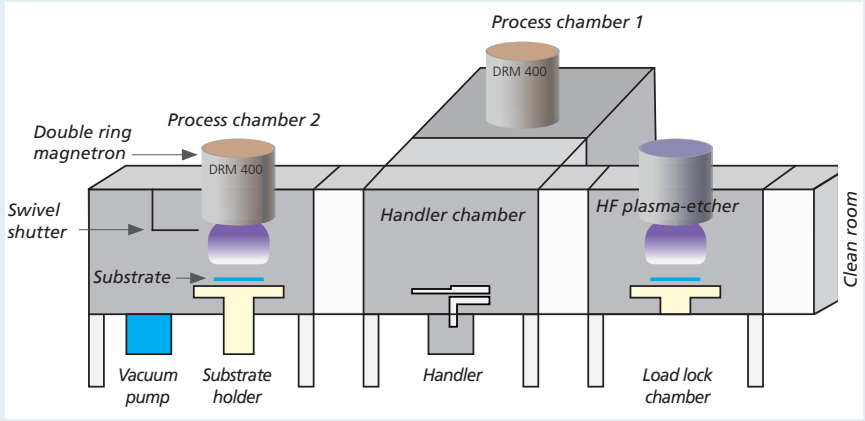


Technical specifications

Four chamber plant (load lock chamber, handler chamber, and 2 process chambers)
Working pressure 2 × 10^{-7} mbar
Hydrocarbon-free vacuum
Cleanroom conditions for substrate handling
Substrate diameter up to 12" (300 mm)/substrate thickness up tp 20 mm
Sputter sources: double ring magnetron DRM 400
Substrate pre-treatment: HF plasma-etching
Deposition conditions: HF substrate bias, substrate cooling and heating (10 to 500°C)
Suitable for corrosive and explosive gases including fluorine and silanes
Fully automatic process control



Superposition of film thickness distribution of the DRM 400



Schematic representation of the CLUSTER 300 plant

Applications

- Optical multilayer systems
- Multicomponent layers and gradient layers
- Electrically insulating layers
- Barrier layers and protective layers
- Piezoelectric layers
- Alternating systems of PVD and magnetron-PECVD layers

Our offer

- Development and optimization of coating technologies and layer systems for your applications
- Development of key components (magnetron sputter sources, plasma-etching units) customized for specific coating tasks
- Coating of samples and pilot production
- Transfer of integrated packages (comprising key components, fully automatic control systems, and technology) to production plants
- Support with cost determination and technical realization

1 *Plasma generated by a double ring magnetron*
2 *Switch cabinet for controlling sputter systems*
3 *Double ring magnetron DRM 400*

TÜVRheinland ZERTIFIZIERT
Management System
ISO 9001:2015
ISO 50001:2018
www.tuv.com
ID 9105050079

We focus on quality and the ISO 9001.