

Fraunhofer Institute for Electron Beam and Plasma Technology FEP

nanoFlex

Laboratory pilot plant

nanoFlex with gas flow control



Magnetron PECVD with heated substrate

The surface modification and coating provides polymer films, other flexible and rigid substrates particularly valuable properties. Such refinement enables the materials to be used for a wide range of innovative products.

The Fraunhofer FEP possesses a large number of pilot-scale facilities that allow processes to be scaled up. However, feasibility studies and technology development on a small scale are carried out in advance on our pilot plants first.

The special feature of the nanoFlex experimental plant is the possibility to combine important vacuum process technologies on a small scale. Thus the system is equipped with a dual magnetron system, shielding facilities for target materials and a graphite heater. With this system, metals and dielectrics can be sputtered onto substrates or (plasma-activated) chemical vapor depositions of e.g. graphene can be performed at temperatures up to 950°C. Suitable substrate materials are glass as well as silicon wafers, plastic or metal foils, metal sheets and ceramic plates.

This allows the compatibility of new coatings on different substrates to be tested in the plant, as well as the quality of new sputtering targets or other process components, for example by means of plasma diagnostics.

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Technical data

Base vacuum	10 ⁻⁴ Pa
Substrate heating	20 950°C
Substrate size	up to 60 × 60 mm ²
	 Dual magnetron system with round target Ø 90 mm
Coating modules	 Ion source
	 Microwave source
In-situ characterization	Plasma emission spectroscopy



Scheme of the system

Technologies

Pulse Magnetron Sputtering

- Dual magnetron system
- Power supply for pulsed DC
- Metallic and reactive process control

Magnetron PEVCD

- Monomer inlet for gases
- Dual magnetron system as plasma source
- Heater as CVD source

Plasma treatment of surfaces

Our offer

- Feasibility studies
- Process development
- Test of coating sources and materials

1 Substrate carrier with substrate heating and anode



We focus on quality and the ISO 9001.

