The surface treatment and coating give polymer films and other flexible substrates very valuable properties. Such modifications allow these materials to be used for a wide variety of innovative products.

The Fraunhofer FEP possesses a large number of pilot-scale plants. Equally important, however, is our small-scale experimental equipment for carrying out initial feasibility studies and technology development work.

The special feature of the LB 9 experimental equipment is the ability to combine key vacuum process technologies on a small scale. For example, the LB 9 has an evaporation unit, a hollow cathode for plasma activated evaporation, and a dual magnetron system which allows metals and dielectric materials to be sputtered onto substrates. This flexibility of processing means that a wide variety of layers can be applied to the substrates. The substrates can also be heated. Both glasses and polymer films are suitable substrate materials.

The LB 9 allows the compatibility of new layers to be tested on different substrates, and also the quality of new sputter-targets or other process components can be evaluated, for example using plasma diagnostics.
Technical specifications

- base vacuum lower than $10^{-4}$ Pa
- substrate holder with heating capabilities up to 450°C
- substrate size 110 × 48 mm²
- different coating modules installable
- dual magnetron system
  - with circular targets Ø 100 mm
  - target cooling, direct and indirect
- boat evaporator, resistance-heated
- crucible evaporator, radiation-heated
- combination of evaporation and plasma-activated evaporation with ion densities up to $10^{20}$ m⁻³
- plasma diagnostics using an ion energy analyzer

Technologies

- Plasma-activated high-rate deposition
  - boat evaporator
  - radiation-heated evaporation
  - plasma-activated evaporation using hollow cathode arc discharge

- Pulse magnetron sputtering
  - dual magnetron system
  - power supply for pulsed DC and RF
  - metallic and reactive process management

- Magnetron PECVD
  - monomer inlet for liquids and gases
  - dual magnetron system as plasma source

Our offer

- feasibility studies
- process development

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