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 x 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

We focus on quality and the ISO 9001.