

- 1 *Barrier films for food packaging*
2 *High-barrier coatings for flexible electronics*

COATING OF FLEXIBLE PRODUCTS

Advanced coatings on polymer films, thin metal foils, and textiles

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Vacuum roll-to-roll coating of flexible products

Vacuum roll-to-roll coating continues to be the most efficient way to coat flexible materials.

The Fraunhofer FEP is a worldwide leader in research and development in vacuum coating of polymer films and other flexible materials such as textiles, paper and thin metal foils.

The coated flexible materials are used in a wide range of modern products such as:

- displays
- packaging
- flexible circuit boards
- anti-counterfeiting labels
- batteries
- super-caps
- solar cells

combination of multiple functionalities in one single layer.

Vacuum web coaters, equipment manufacturers and end users of coated webs need advanced research and development resources to keep pace with the fast developing and innovative web coating business. The Fraunhofer FEP is uniquely qualified to address this growing need. We have full in-house capability to take a project from concept through to a final industrial solution. Our service for contract coating enables our clients to quickly enter the market with their new products before their own coating capabilities have been installed.

Vacuum coating technologies are capable of providing a variety of advanced surface properties. One of our research goals is the

We are dedicated to developing new products and vacuum coating technologies that represent the state of the art in vacuum roll-to-roll coating.



Our coatings portfolio

- functional layers for flexible a-Si/ μ s-Si solar cell
- optical multilayer stacks
- labels for the inscription with laser engraving systems
- high refractive index coatings
- transparent barrier films for packaging
- high barrier coatings
- transparent conductive electrodes
- plasma-assisted evaporation of Copper and Indium for CIS solar cells
- electrodes for high-power batteries

Technologies

The Fraunhofer FEP offers and continuously develops innovative coating technologies.

Our technologies include:

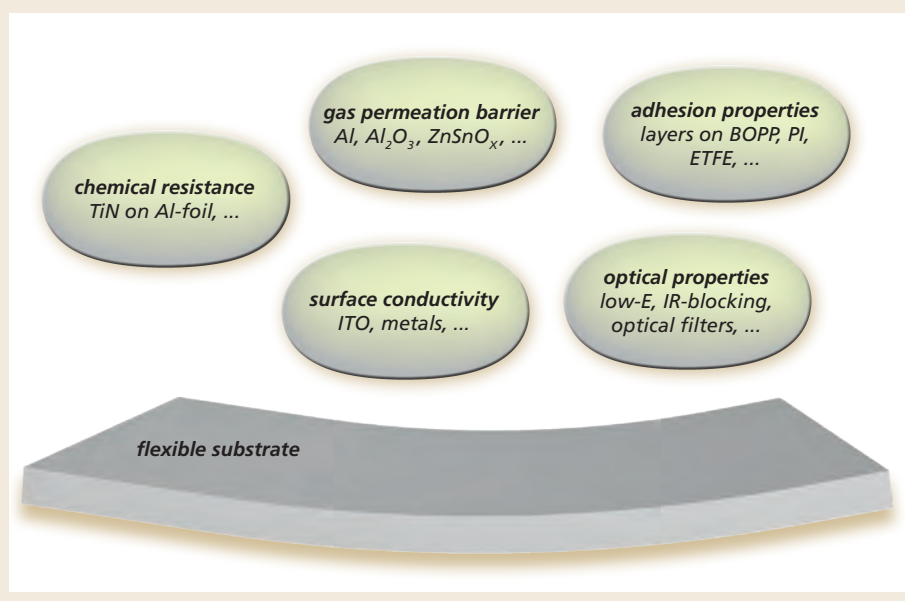
- pulse magnetron sputtering
- plasma-activated evaporation (boat evaporation, thermal evaporation and electron beam evaporation with plasma-assistance)
- plasma-enhanced CVD (PECVD)
- plasma and ion surface treatment
- in-line optical monitoring

Our offer

We have full in-house capability to take a project from concept through to a final industrial solution, including:

- feasibility studies
- development of layer systems, products, and coating technologies for vacuum web coating
- scale-up of coating technologies to large web widths (up to 600 mm at Fraunhofer FEP) and high web speeds
- technology transfer and fitting web coating plants with key components (magnetrons, plasma sources, reactive gas systems, product and process monitoring systems)
- contract coating in the pilot phase of a product, which enables our clients to quickly enter the market with their new products before their own coating capabilities have been installed

Applicable advanced surface properties



Principle of a roll-coater

