

PERMEATION BARRIERS

*Enabling light and power
from the roll*





APPLICATIONS

Permeation barriers are vital for a range of applications. Fraunhofer FEP has an extensive experience in R&D and pilot manufacturing of high-quality barrier films for:

- flexible packaging
- smart packaging
- flexible organic electronics
- flexible photovoltaic devices
- electrochromic systems
- thin film energy harvesting and energy storage devices
- holographic systems on polymers
- sensors and flexible/organic transistors
- quantum dot and OLED displays
- wearables and other flexible electronic devices

OUR TECHNOLOGIES

For each application, we provide the best suitable technological approach taking into account technical requirements and economic targets. Our technologies include:

Technology	Productivity (line speed) m/min	WVTR at 38°C/90% r.h. [g/(m ² d)]
hollow-cathode plasma-assisted evaporation (HAD)	600	1
reactive sputtering of oxides	1	0.005
multi-layer stack: sputtering + wet coating of ORMOCER®	1	0.0002
multi-layer stack single pass: sputtering + arcPECVD	≥ 4	0.005
atomic layer deposition	static process	< 0.001

COATING EQUIPMENT

Fraunhofer FEP uses a set of roll-to-roll vacuum coating machines for laboratory and pilot production scale up to 650 mm web width.

Lab coater: *labFlex® 200*

- 220 mm web width
- sputtering and PECVD
- roll-to-roll OLED encapsulation without roller contact of coated side

Pilot coaters: *coFlex® 600* and *novoFlex® 600*

- 650 mm web width (pilot scale)
- sputtering, PECVD and evaporation
- multilayer deposition in one run
- web speed up to 10 m/s
- double-side coating

OUR OFFER

Our services include contract R&D, joint development, technology transfer and licensing focusing on:

- evaluation of polymer substrates for barriers
- sampling, material provision and feasibility studies
- roll-to-roll pilot production of barrier film rolls
- adaption of barrier films to specific application
- functional film design and deposition
- product integration
- key components for barrier layer deposition
- direct thin film encapsulation of devices
- barrier film and device characterization
- roll-to-roll particle and defect inspection
- coulometric permeation measurement



OUR MISSION

With our key technologies your products are one step closer to the market. Don't hesitate to contact us with your specific needs.

CONTACT

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