The wet coating of polymer films and other flexible substrates and their modification allows these materials to be used in a wide range of products. Roll-to-roll plants allow coatings to be efficiently applied at favorable cost.

With the new coating line *atmoFlex 1250* (manufactured by 3D-Micromac GmbH, Germany) optical and decorative functional layers, abrasion resistant layers and structured layers manufactured by embossing processes can be applied. The maximum web speed of 150 m/min ensures highly productive coating processes. Wet and dry lamination processes are also possible with the *atmoFlex 1250*.

The wet coating takes place through a 1.2 m wide slot-die, ensure highly uniform layers in web and cross-web direction. The crosslinking of lacquers will be done by means of an electron beam system. This system may be used also for post-curing of polymers or sterilization of polymer webs or textiles.

All rollers within the *atmoFlex 1250* are optimized regarding diameter and surface to handle pre-coated materials properly. Therefore vacuum coated materials maybe processed without altering the thin and delicate vacuum layers.

The *atmoFlex 1250* enables Fraunhofer FEP to provide a complete in-house process chain for research and development of multilayer systems, made by wet and vacuum coating processes at industrial scale.
Examples of textured surfaces, made by wet coating and cured by means of electron beam.

SEM cross-section picture of a permeation barrier layer system, consisting of two vacuum deposited barrier layers and a planarization layer, deposited by wet coating - a surface defect of the substrate is effectively covered.

Technical specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coating width</td>
<td>1200 mm</td>
</tr>
<tr>
<td>Substrate width</td>
<td>1250 mm</td>
</tr>
<tr>
<td>Substrate thickness</td>
<td>10 ... 300 µm</td>
</tr>
<tr>
<td>Outer diameter substrate roll</td>
<td>500 mm</td>
</tr>
<tr>
<td>Winding speed</td>
<td>1 ... 150 m/min</td>
</tr>
<tr>
<td>Electron beam energy</td>
<td>90 ... 150 keV</td>
</tr>
</tbody>
</table>

Process modules

- Unwinder (supports masking films)
- Corona pre-treatment
- Contact cleaning
- Slot-die coating
- Wet and dry lamination
- Electron beam curing and treatment
- Rewinder (supports masking films)

Technology

- Slot die
- Lamination
- Electron beam curing
- Electron beam treatment
- In-line pre-treatment/contact cleaning
- Optimized handling of pre vacuum-coated substrates

Our offer

- Development of technologies for coating polymer films and other flexible materials
- Coating tests of lacquers, cured by radiation for different applications (optical and decorative functional layers, abrasion resistant layers, permeation barrier layers)
- Development and testing of key components
- Sample provision for testing and marketing purposes, and pilot production
- Studies on the efficiency of coating processes

We focus on quality and the ISO 9001.