VERSA
PILOT PLANT FOR PLASMA-ACTIVATED ELECTRON BEAM VAPOR DEPOSITION

Technologies

Coating:
High-rate electron beam vapor deposition:
- Plasma-activated high-rate deposition
  - Spotless arc-activated deposition process (SAD process)
  - Hollow cathode arc-activated deposition process (HAD process)
- Reactive depositions
- Deposition of metals, alloys, and compounds
- Pulsed magnetron sputtering
- PECVD

Pre-treatment:
- Preheating of the substrates
- Plasma-based pre-treatment
- Magnetron sputtering of intermediate layers

Our services

- Technology and process development, in particular new plasma-based processes featuring high-rate vapor deposition and substrate pre-treatment
- Development of new PVD systems of layers
- Basic research on plasma-enhanced vapor deposition
- Feasibility studies
- Sample coatings
**Technical specifications**

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<tr>
<th>Component</th>
<th>Specification</th>
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<tr>
<td>Electron beam gun</td>
<td>up to 300 kW / 50kV</td>
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<tr>
<td>Substrate dimensions</td>
<td>up to 120 mm × 200 mm (metal, glass, wafers, etc.)</td>
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<td>Substrate speed</td>
<td>1 cm/s to 1 m/s</td>
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<td>Substrate pre-treatment</td>
<td>• Handling under inert gas environment possible by using a glovebox</td>
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<td></td>
<td>• Radiative heater max. 6 kW</td>
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<td>• Sputter etcher max. 6 kW</td>
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<td></td>
<td>• DC magnetron max. 8 kW</td>
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<tr>
<td>Plasma activation</td>
<td>• Spotless arc-activated deposition process (SAD process)</td>
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<td></td>
<td>• Hollow cathode arc-activated deposition process (HAD process)</td>
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<tr>
<td></td>
<td>• 2000 A – arc power supply</td>
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<td>Evaporation crucibles</td>
<td>• Water-cooled copper crucibles</td>
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<td></td>
<td>• Hot ceramic crucibles</td>
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<td>Measurement systems</td>
<td>• Coating rates</td>
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<td>• Optical emission measurements</td>
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<td>• Substrate temperature</td>
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<tr>
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<td>• Deposition rates</td>
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<td>• Power balance</td>
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**Available deposited layer materials**

- Aluminum and aluminum alloys
- Aluminum oxide
- Amorphous carbon
- Barium oxide
- Bronze
- Chromium/nickel-chromium/chromium nitride
- Copper and copper alloys
- Copper oxide
- Indium tin oxide
- Iron
- Iron chromium nickel alloys
- Lead
- Lithium phosphate/lithium iron phosphate
- Lithium titanate
- Magnesium/magnesium oxide
- Molybdenum
- Nickel
- Silicon/silicon oxide
- Silver
- Tantalum
- Tin
- Titanium/titanium carbide/titanium nitride/titanium oxide
- Tungsten/tungsten carbide
- Yttrium
- Yttrium barium copper oxide
- Yttrium-stabilized zirconium oxide
- Zirconium/zirconium oxide

We focus on quality and the ISO 9001.