

1 Spotless arc discharge during electron beam vapor deposition (SAD process)

VERSA

PILOT PLANT FOR PLASMA-ACTIVATED ELECTRON BEAM VAPOR DEPOSITION

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Technologies

Coating:

High-rate electron beam vapor deposition:

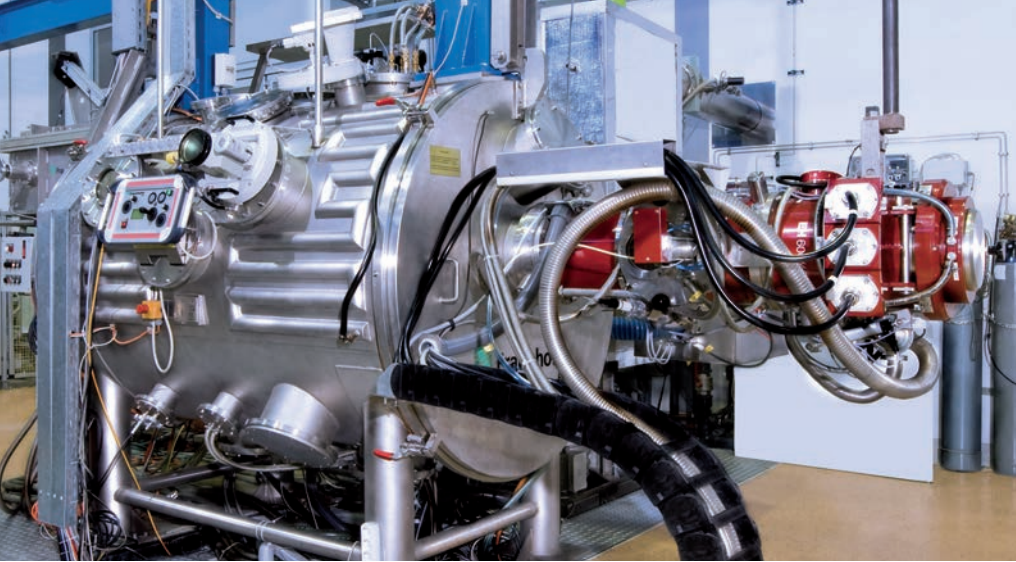
- Plasma-activated high-rate deposition
 - Spotless arc-activated deposition process (SAD process)
 - Hollow cathode arc-activated deposition process (HAD process)
- Reactive depositions
- Deposition of metals, alloys, and compounds
- Pulsed magnetron sputtering
- PECVD

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



Hollow cathode arc discharge (HAD process)

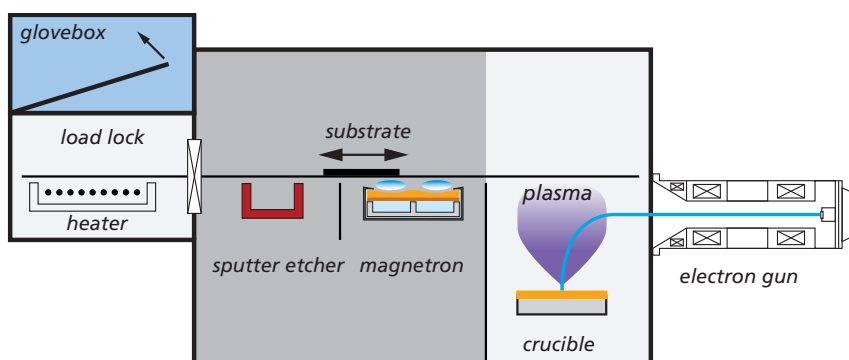
Technical specifications

Electron beam gun	up to 300 kW / 50kV
Substrate dimensions	up to 120 mm × 200 mm (metal, glass, wafers, etc.)
Substrate speed	1 cm/s to 1 m/s
Substrate pre-treatment	<ul style="list-style-type: none"> ▪ Handling under inert gas environment possible by using a glovebox ▪ Radiative heater max. 6 kW ▪ Sputter etcher max. 6 kW ▪ DC magnetron max. 8 kW
Plasma activation	<ul style="list-style-type: none"> ▪ Spotless arc-activated deposition process (SAD process) ▪ Hollow cathode arc-activated deposition process (HAD process) ▪ 2000 A – arc power supply
Evaporation crucibles	<ul style="list-style-type: none"> ▪ Water-cooled copper crucibles ▪ Hot ceramic crucibles
Measurement systems	<ul style="list-style-type: none"> ▪ Coating rates ▪ Optical emission measurements ▪ Substrate temperature ▪ Deposition rates ▪ Power balance

Available deposited layer materials

- Aluminum and aluminum alloys
- Aluminum oxide
- Amorphous carbon
- Barium oxide
- Bronze
- Chromium/nickel-chromium/ chromium nitrite
- 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 nitrite/titanium oxide
- Tungsten/tungsten carbide
- Yttrium
- Yttrium barium copper oxide
- Yttrium-stabilized zirconium oxide
- Zirconium/zirconium oxide

2 Schematic representation of the VERSA



We focus on quality
and the ISO 9001.