

VERSA

Pilot plant for plasma-activated
electron beam vapor deposition

Technologies

Coating

High-rate electron beam physical vapor deposition (EB-PVD):

- 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
- Plasma-enhanced physical vapor deposition (PECVD)

Pre-treatment

- Pre-heating 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-activated vapor deposition
- Feasibility studies
- Sampling of coatings

Contact

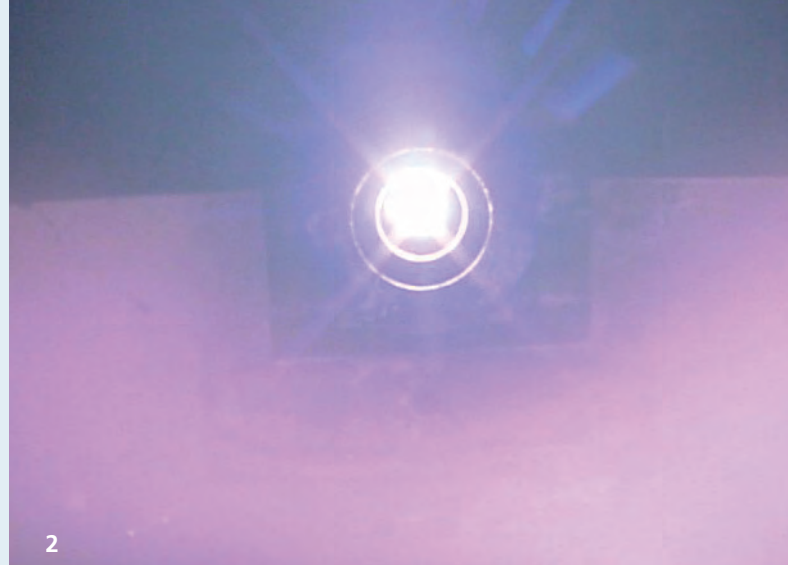
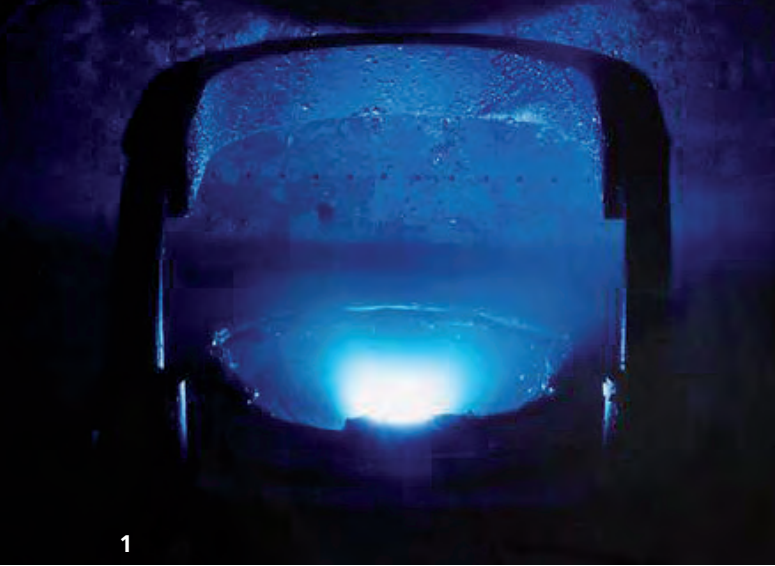
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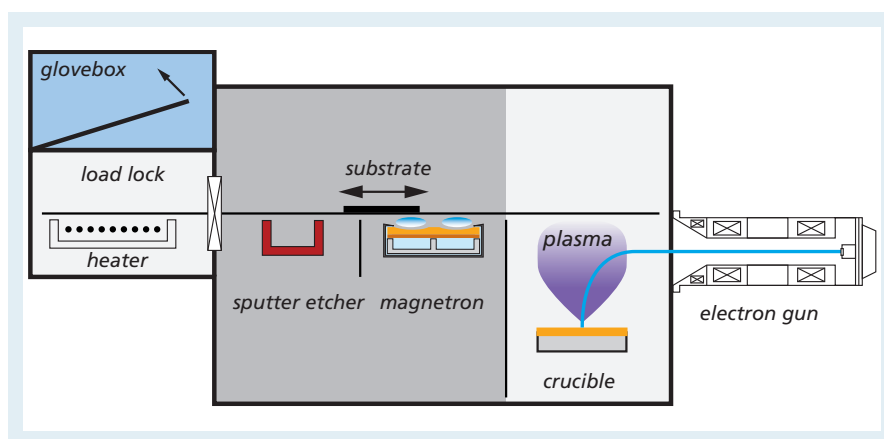


Technical specifications

Electron beam gun	up to 300 kW / 45 kV
Substrate dimensions	up to 120 mm × 200 mm (metal, glass, wafers, etc.)
Substrate speed	1 cm/s to 1 m/s
Substrate pre-treatment	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	Spotless arc-activated deposition process (SAD process) Hollow cathode arc-activated deposition process (HAD process) 2000 A – arc power supply
Evaporation crucibles	Water-cooled copper crucibles Hot ceramic crucibles
In-situ measurement systems	Coating rates Optical emission measurements Substrate temperature Evaporation rates Power balance

Already realized 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



Schematic representation of the VERSA

- 1 Spotless arc discharge during electron beam vapor deposition (SAD process)
- 2 Hollow cathode arc discharge (HAD process)