

Plasma Inline Coating System

Modular system engineered for high-performance coatings

Plasma Inline Coating System

Bosch Manufacturing Solutions is a leading provider and developer of advanced coating technologies, leveraging over 30 years in plasma surface engineering. Our Plasma Inline Coating System applies versatile PVD/PECVD coatings such as DLC, GLC, Nitrides, Oxides, Carbides, and Metals.

Plasma Inline Coating System engineered for your production needs

Our system features a compact, modular vacuum chamber design engineered for maximum efficiency and scalability. The Architecture allows you to start with a lean, cost-efficient setup and seamlessly expand your production capacity as demand grows. The multi-chamber configuration is designed to produce dense, uniform, multi-layer coatings with exceptional consistency. By supporting a range of technologies—including DCMS, HiPIMS, and microwave-assisted PECVD—the system is optimized for high-throughput manufacturing, enabling you to increase output without compromising on coating quality or performance.



Abb. Vertical Plasma Inline Coating System for high throughput

Product specifications

- Inline technology: cost-efficiency for sheet substrates
- Proven microwave technology is used for substrate pretreatment and PECVD coatings
- Microwave technology: low energy consumption and dense layers
- Low deposition temperature below 250°C leads to minimized risk of deformation and annealing
- Ready to grow: Modular chamber and component design facilitates easy upscaling
- Modular configuration with DCMS / PECVD (MW) / DC-Arc / HiPIMS / microwave assisted DCMS / Pulsed cathodic Arc (ta-C)
- Versatile layers: DLC (a-C:H, a-C:H:Me, ta-C) / GLC (a-C) / Nitrides (e.g. TiN, CrN, AlTiN) / Oxides (e.g. Al₂O₃, SiO₂) / Carbides (e.g. CrC, WC) / Metals (e.g. Ti, Cr, W, Au, Pt)

Plasma Inline Coating System: for your demands

Whether you're launching pilot lines or expanding high-volume production, BMG's inline coating solution is your key to efficient, future-ready manufacturing of PEM fuel cell and PEM electrolyzer components. As well as other components that require a PVD / PECVD coating and are better suited for inline compared to batch technology.

Electrolyzer:

Bipolar plates coated with precious metals (Gold / Platinum). Outstanding corrosion protection for long product life and minimal contact resistance, which results in less energy losses.

Fuel Cell:

Bipolar plates coated for enhanced corrosion resistance and excellent electrical conductivity.
High-performance coatings ensure durability and cost-efficient operation in demanding environments.
International performance standards fulfilled (DOE).

Hydrogen Barrier Coatings:

Prevents hydrogen diffusion to reduce risk of hydrogen embrittlement or leakage. PVD / PECVD coatings of heavy metals or ceramics on sheet substrates possible.

Sheet substrates:

High-throughput coating of metal sheets and flat components. Functional or decorative layers, optimized for large-scale production and low cost per part.



Abb. R&D horizontal Plasma Inline Coating System

Example configuration for C-based coatings on Bipolar Plates

Possible Configuration	Low volume Line	Mid volume Line	High volume Line
Machine Space	8 m x 4 m	14 m x 4 m	24 m x 4 m
Quantity per Carrier*	5 BPPs/carrier	20 BPPs/carrier	20 BPPs/carrier
Coating Cycle Time	< 20 s/BPP	< 4 s/BPP	< 2 s/BPP
Annual Output (BPP)	1 mio BPPs	5 mio BPPs	10 mio BPPs

*Bipolar Plates with an area of 600 cm²

Robert Bosch Manufacturing Solutions GmbH
Wernerstr. 51
70469 Stuttgart
Germany
contact@boschmanufacturingsolutions.com

www.BoschManufacturingSolutions.com

