

# Thin noble metal coatings for PEM Electrolyzers

## Low-cost coating for metallic bipolar plates and PTL's

The global hydrogen economy is expanding. To support this expansion, the demand for fuel cells and electrolyzers is expanding as well. To be validated performance and lifetime wise, fuel cell and electrolyzer stack components need to meet tough requirements. They need to show stable, reliable performance at high demand levels over time. In addition to these performance and durability requirements, they need to achieve acceptable price levels once scaled to high volume.

## The fundamentals

Physical Vapour Deposition (PVD) plays a key role in enhancing the performance and durability of electrochemical systems, like water electrolysis, fuel cells and redox flow systems. The need for applying conductive layers is there, because the components in these applications are often exposed to highly corrosive and electrochemically demanding environments. In these environments the substrate is prone to oxidation and the formation of insulating (oxide) layers, which significantly reduce the overall efficiency of the electrolyzer system.

## Ionbond solutions

Depending on the conditions that the coating-substrate system will be placed in there are different coatings which can be offered. In the case of PEM fuel cells for example a conductive carbon layer with a Ti interlayer can be applied (please check our factsheet on our fuel cell carbon technology). In PEM Electrolyzers, the components are exposed to high potentials, above a certain potential threshold, a carbon coating is not suited anymore as it will become unstable. It is in these applications that noble metal coatings can be a good solution. Despite their minimal thickness of often just multiples of tens of nanometers these precious metal coatings can already provide excellent electrical conductivity, stability and durability. PVD can compete with conventional technologies such as electroplating while having a much more efficient material use and hence a cost advantage. Moreover, adhesion, uniformity and scalability are considered superior.



Precious metal and interlayer thickness can be fully tailored to meet specific requirements on the anode and cathode side of the bipolar plate as well on the PTL in your PEM Electrolyzer. Ionbond PVD precious metals like gold and platinum are offered on batch equipment and as of the middle of 2026 on a dedicated high volume inline coating system. This inline system focuses on large volume production, reproducible and uniform coatings while optimizing efficiency and the recycling of precious metals.

## Get in touch

Kindly reach out to learn more about our protective and conductive coating portfolio for electrolyzer and high-end fuel cell components