

ELCoat

Durable and Low-Cost Corrosion Protection

In a nutshell

Corrosion in Fuel Cell (FC) and Electrolyzer (EL) systems remains a major bottleneck for widespread development of hydrogen technologies. The degradation of bipolar plates and metal components shorten stack lifetime and increases costs.

Our technology brings in depth scientific knowledge of corrosion in FC/EL systems, advance coating design, and additive manufacturing into practical industrial application. We develop coatings tailored to the specific chemical, thermal, gas-exposure, and electrochemical stresses found in both high and low temperature FC/EL environments. Our coatings improve system lifetime, offer high durability, and reduce costs at the stack level.

Why is our technology important?

Metal components in FC/EL are among the most expensive parts of the stack. Under harsh operational condition, these metallic components undergo corrosion and degradation, which limits system lifetime. Corrosion in FC/EL systems is a multifactorial challenge influenced driven by harsh chemical, thermal, and electrochemical stresses. The industry currently relies on costly coatings that are often outsourced, and there is still a strong need for scientifically optimized, cost-efficient coating solutions.

ELCoat addresses these gaps by combining material design with a deep understanding of corrosion mechanism. Our first coatings, developed during the PhD research, already shows strong durability and competitive cost, showing market readiness. Additional novel coatings for more complex atmospheres are under development at lab scale. Using new materials and optimized coating process, we offer scalable, more durable, and more cost-effective corrosion-protection solutions than current commercial options.

The benefits of our solution

- Increase in component durability (based on preliminary long-term studies)
- Cost-reduction due to alternative materials and simplified, scalable coating methods
- Improved corrosion resistance under harsh environments
- Science-driven designs, that ensures reliability
- Innovative coating materials with enhanced stability and performance
- additive manufacturing-based coating methods for rapid, efficient, and low-waste fabrication

Keywords

Corrosion protection; Harsh environment; Fuel Cell; Electrolyzer; Advance coatings; Additive manufacturing; Durability; Surface engineering;

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