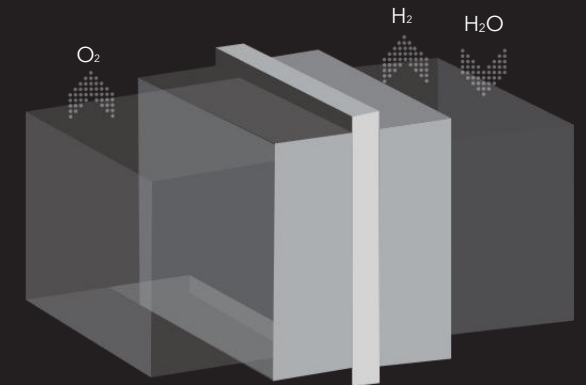


Anion Exchange Membrane Water Electrolysis

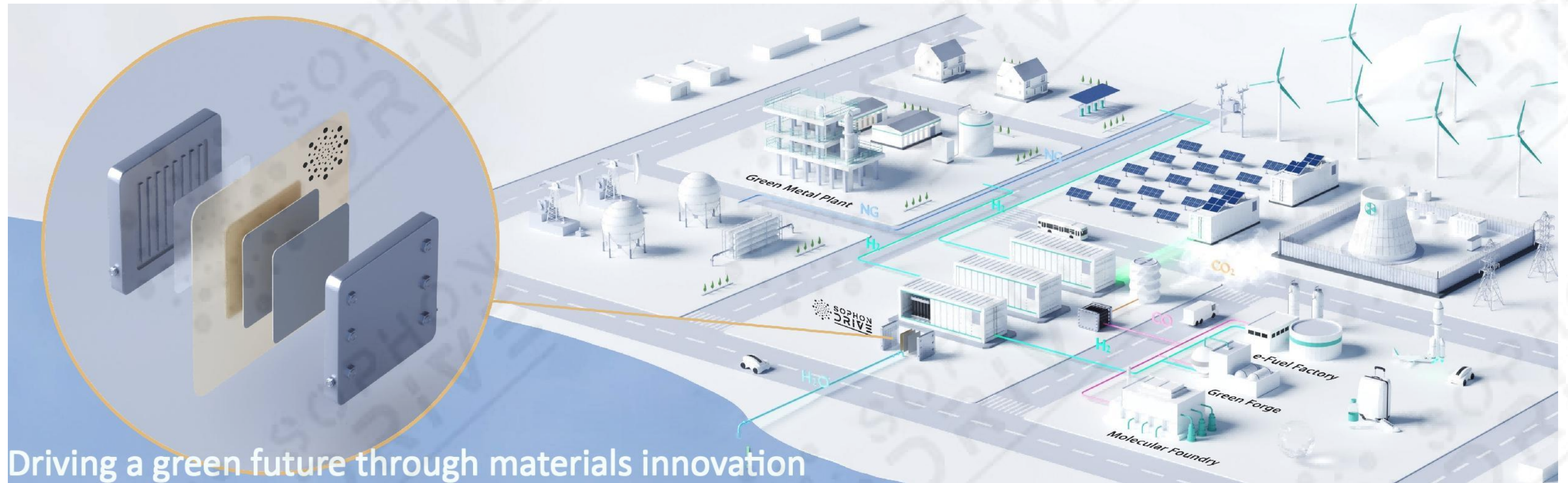


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HANGZHOU SOPHON DRIVE TECH CO.,LTD



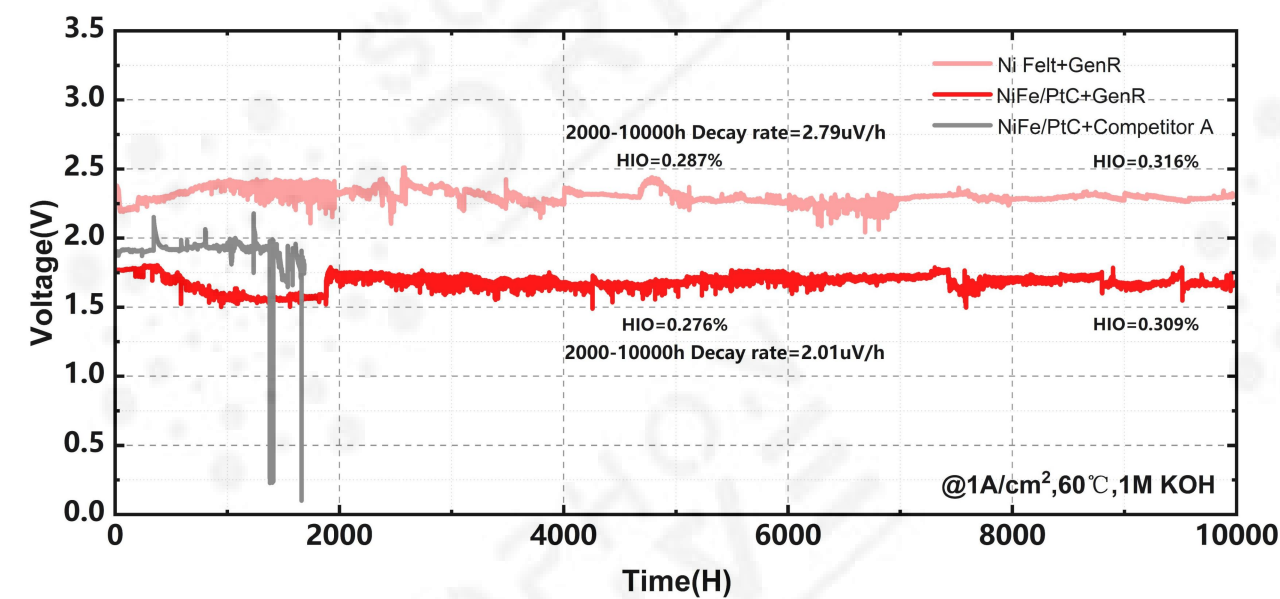
Sophon Drive focuses on the R&D and industrialization of core materials for electrochemical equipment. Our core team consists of professor-level senior engineers and senior experts from both domestic and international backgrounds, with over 50 achievements including patents, papers, and publications. It possesses cross-scale R&D capabilities spanning from molecular structure design, ion transport, and nanocatalysis to membranes, electrodes, and system integration. Targeting the water electrolysis for hydrogen production scenario, the company offers HydroION™ anion exchange membranes and HydroECO™ high-performance catalytic electrodes, providing low-energy, highly reliable, and scalable core material support for hundred-megawatt-scale AEM water electrolysis projects.



AEM Membrane Materials-Hydroion™



Comparative analysis of stability performance beyond 10,000 hours



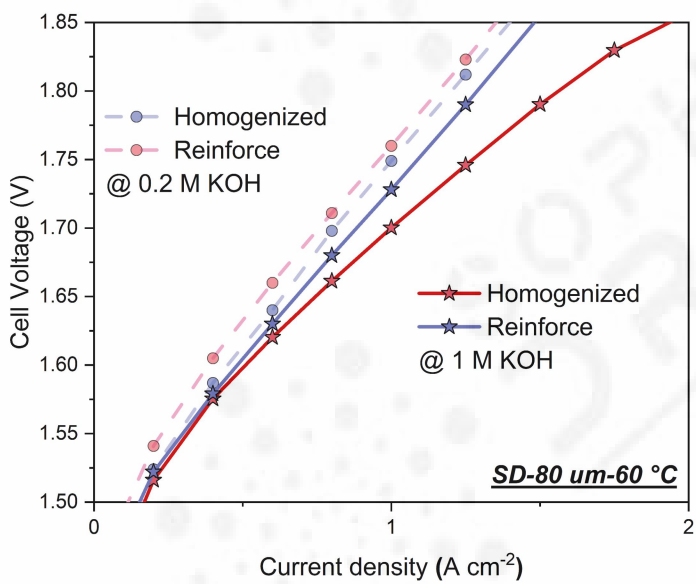
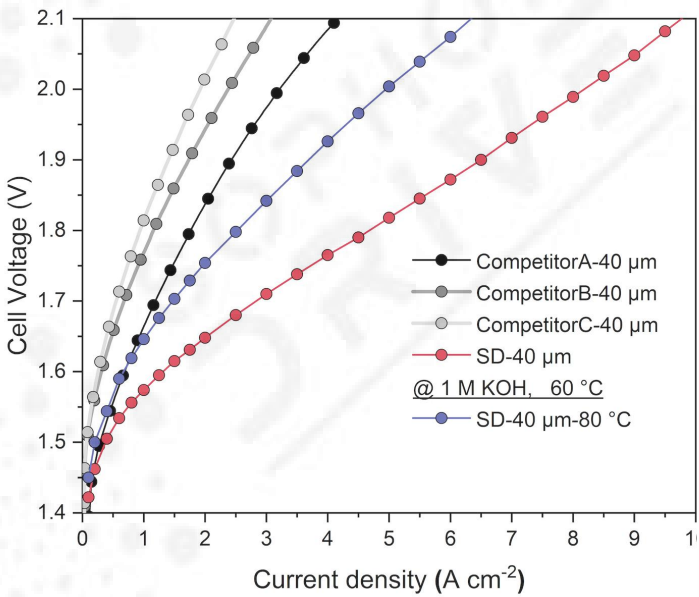
10 kW stack (physical unit)

- Notes:
- 1. Decay rate: $< 3 \mu\text{V/hr}$; the actual tested service life supports 3 years of continuous operation (based on an annual wind and solar utilization duration of 3,000 hours).
 - 2. Linear extrapolation of the service life reaches 7–10 years (with $<10\%$ performance degradation).

Technical Specifications

Basic Properties	Gen A Series	Gen R Series
Typical Thickness(μm)	40, 60, 80, 100	80, 100
Thickness Tolerance	$< \pm 5\%$	$< \pm 5\%$
Tensile Strength (MPa)	30-100	60-100
Water Swelling Ratio (Pure Water, RT)	$< 10\%$	$< 2\%$
Ionic Conductivity in Pure Water, 60 °C (mS/cm)	80-150	80-150
H ₂ in O ₂ , 1M KOH, 60 °C @0.2 A/cm ² (%)	0.531%	0.417%

Polarization Curve



AEM Membrane Materials-Hydroion™



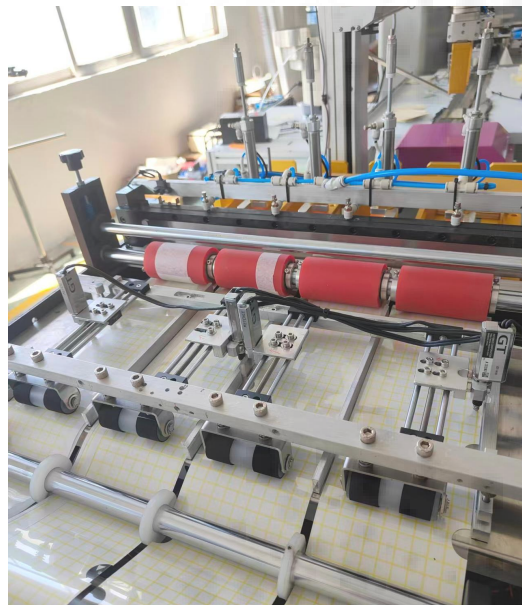
Roll-to-roll production



Automated production line: web width 60 cm+; annual capacity 10,000 m²+

High-quality roll-to-roll production

Quality assurance capability



Thickness measurement



100% factory leak test

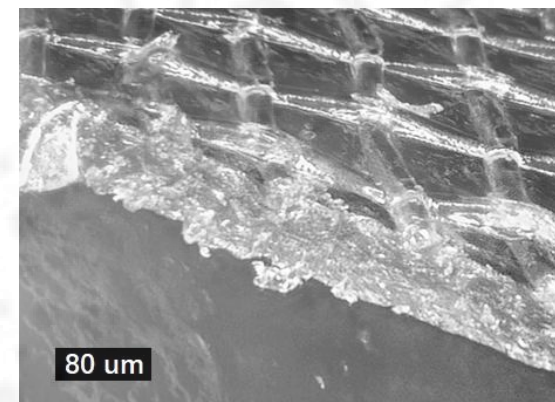
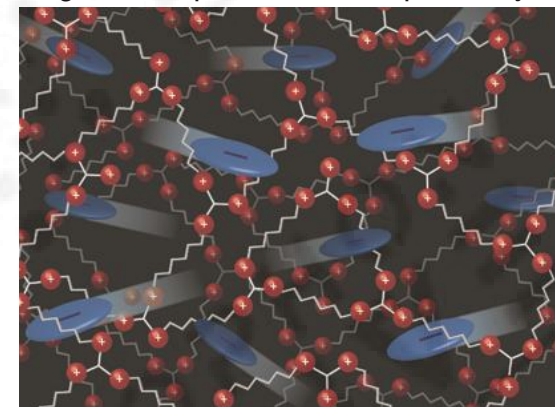
Self-developed powder materials



Technological innovation

The GenA series materials feature a cross-linked 3D polymer structure that breaks the conventional trade-off between mechanical stability and ionic conductivity observed in linear-chain electrolytes.

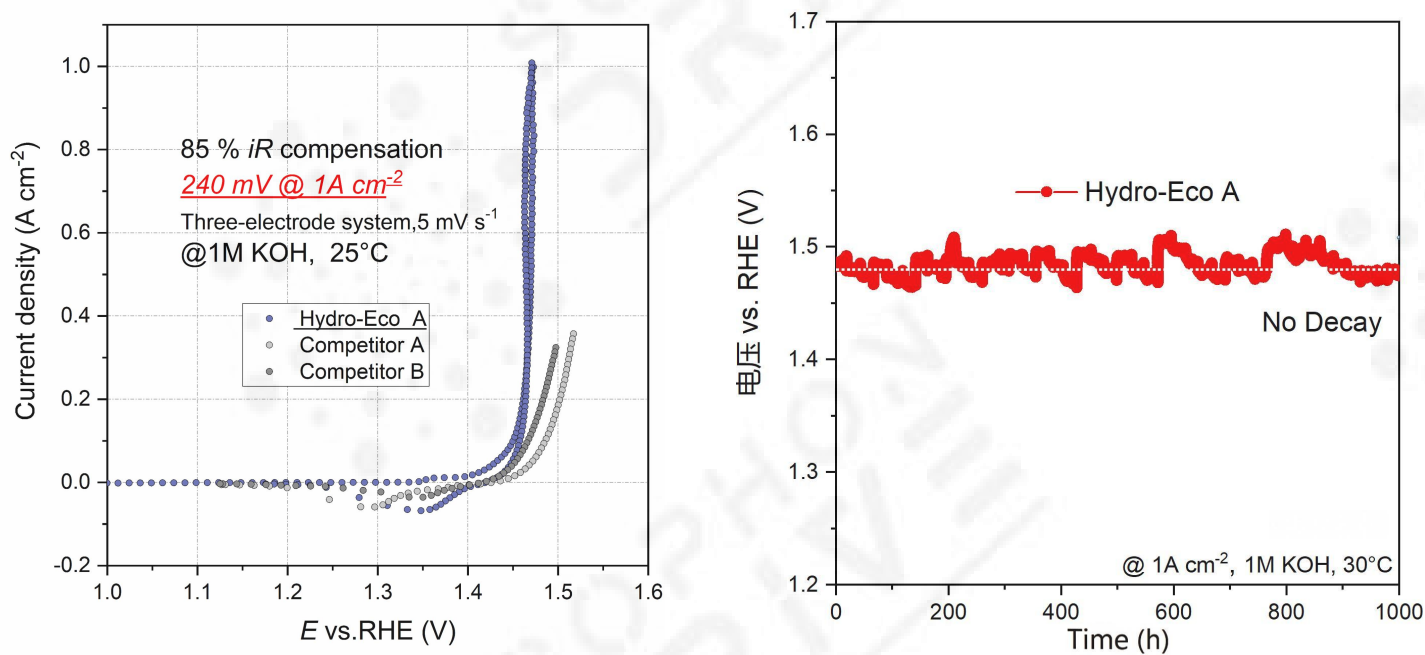
The GenR series materials further significantly enhance mechanical and dimensional stability through the optimized compatibility between the support layer and the polymer backbone.



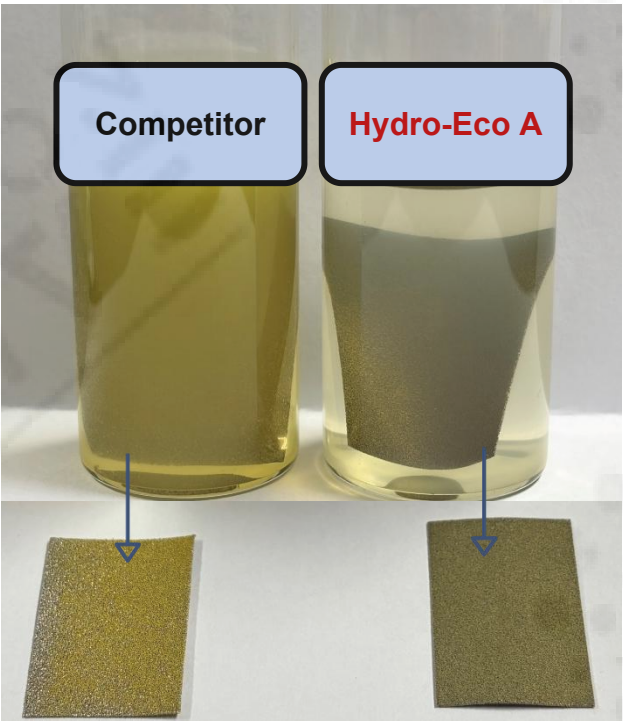
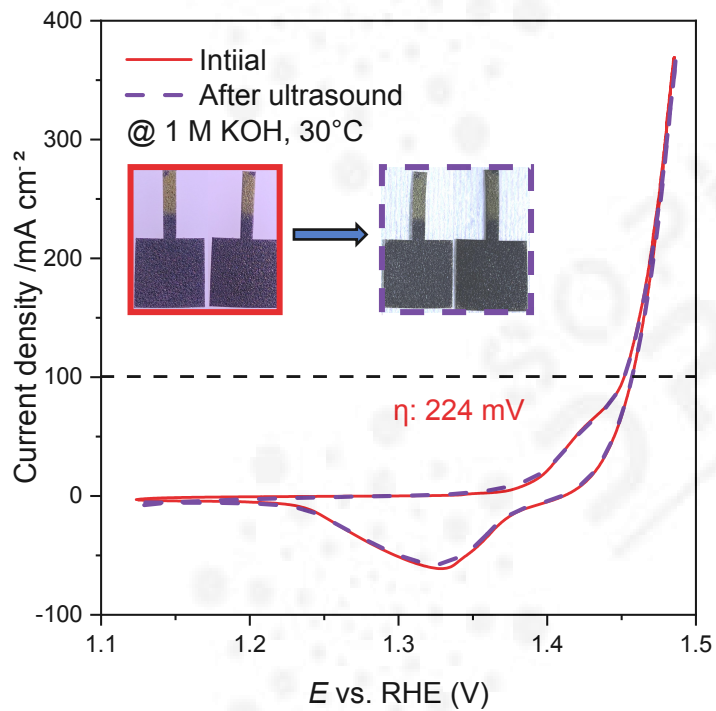
AEM ELECTRODE-Hydroeco™



Three-electrode system



Mechanical strength

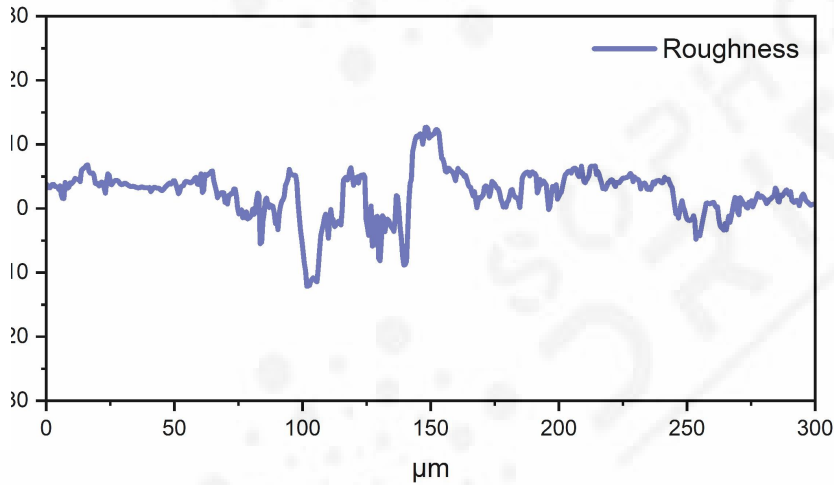
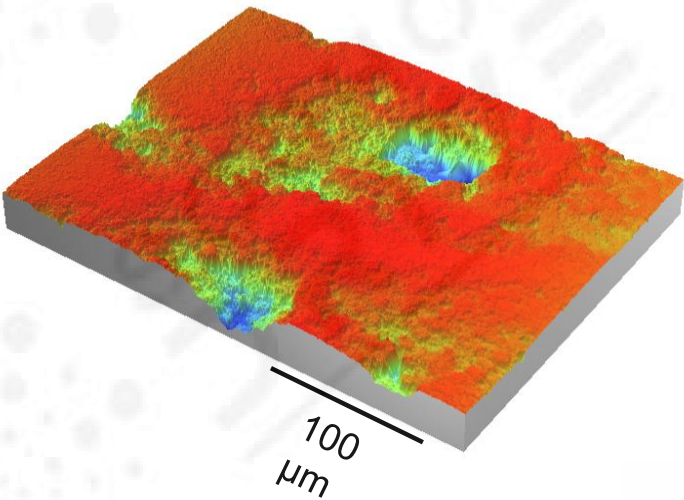


60 °C, 200 w, 40 khz,
Ultrasonicated in deionized water for 3h

Technical Specifications

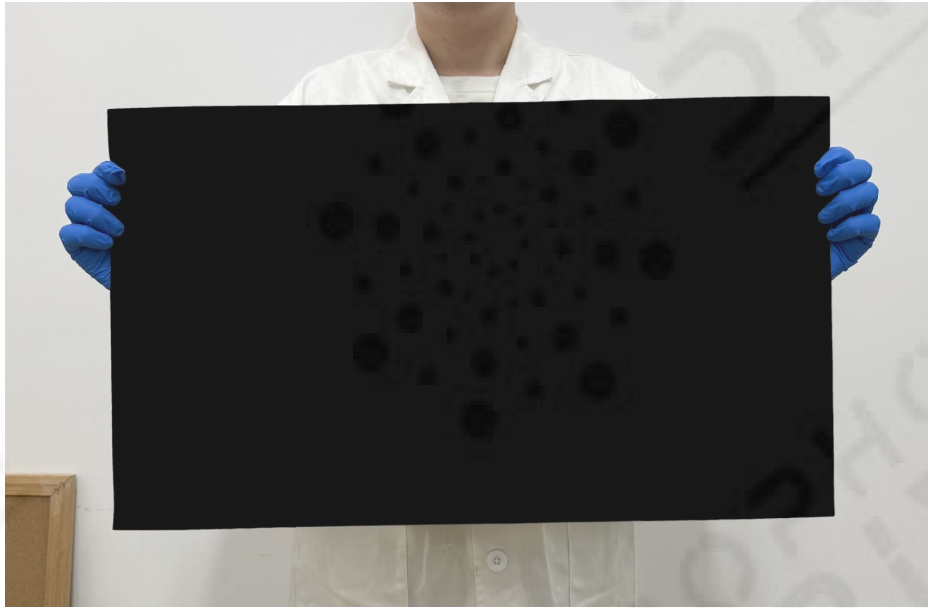
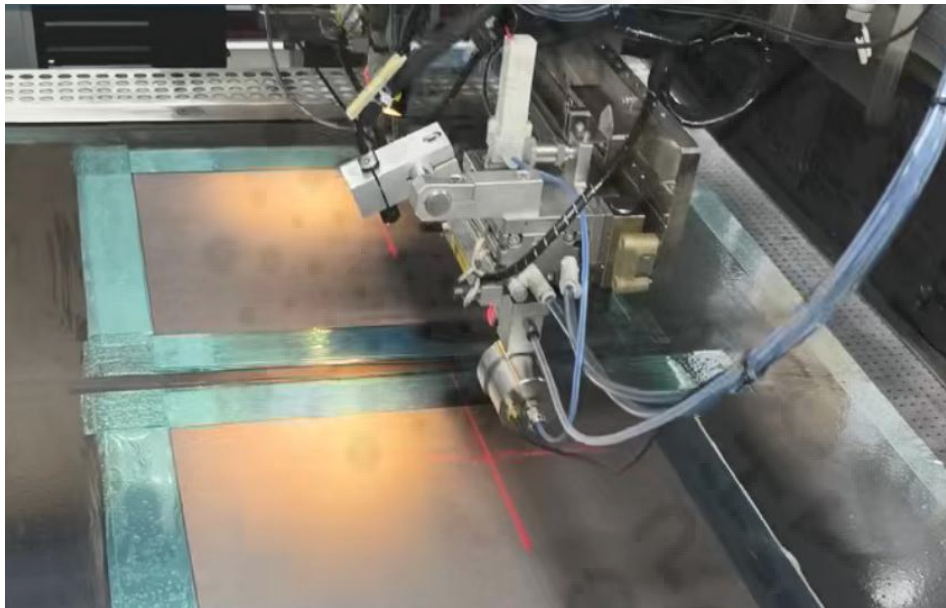
Basic Specs	Hydro-Eco C	Hydro-Eco A	Hydro-Eco A-P
Series	Cross-linked, High-strength Pt/C Catalyst Layer	Galvanic Method, NiFe-based	Fe-controlled Powder Catalyst
Overpotential @1 A cm ⁻² (mV)	145 (0.4mg _{Pt} cm ⁻²)	240 (2 mg cm ⁻²)	314 (1 mg cm ⁻²)
Energy Efficiency@60°C (kWh/Nm _(H2) ⁻³)	4.02	4.02	4.07
Electrolytic Activity @60°C (V@1A cm ⁻²)	1.68	1.68	1.70
Degradation Rate (≥1000h)	9 μV hr ⁻¹	9 μV hr ⁻¹	25 μV hr ⁻¹
Specific Metal Dissolution (≥1000hr)	/	30±5 ug cm ⁻² (Fe) < 5 ug cm ⁻² (Ni)	/
Available Sizes	Customizable	Width 600 mm	Customizable

Roughness & maximum peak-to-valley height

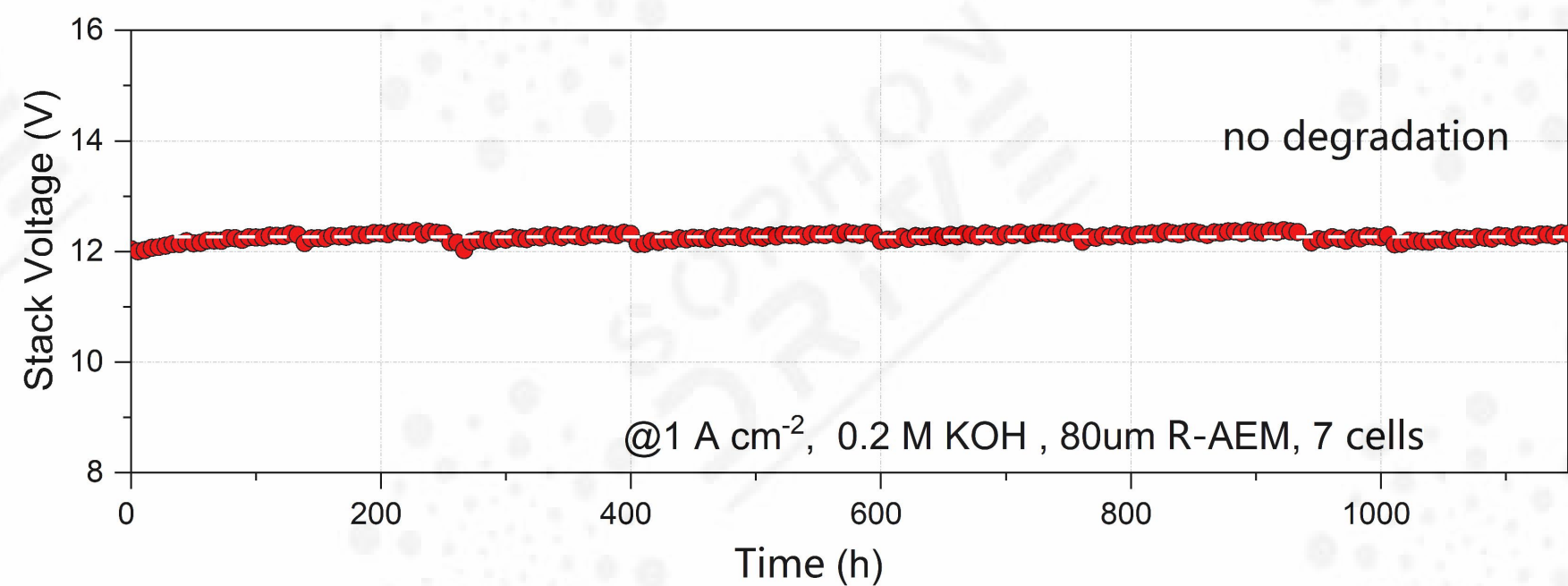
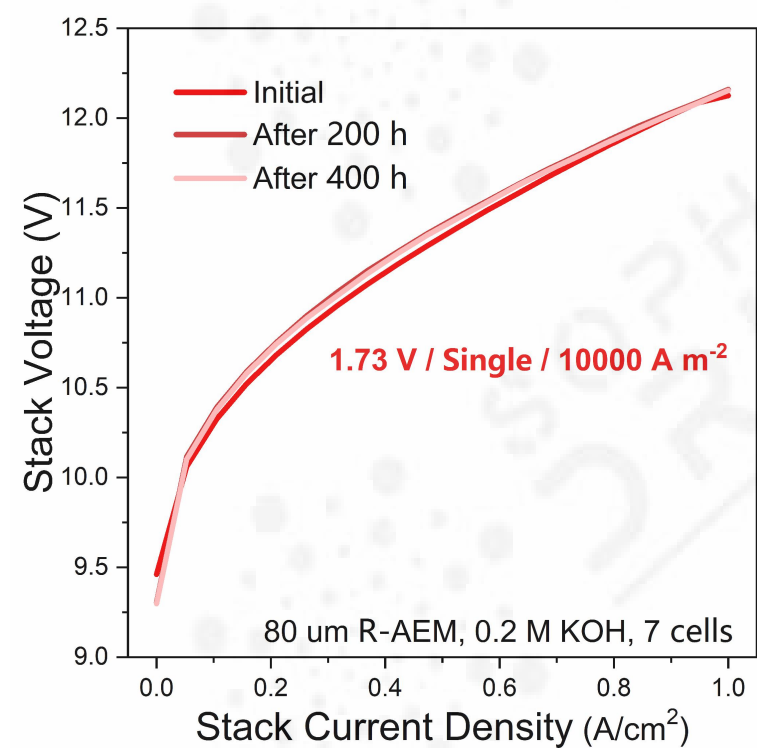


Average roughness: 8.1 μm;
Maximum peak - to - valley height: 12.5 μm

Mass Production & Product Showcase



Stack testing



The product has been verified through long-term testing on a kilowatt-class stack.

Five-in-one product sample (Hydro-MEA)



We offer customized 5-in-1 samples. Please contact us if you are interested!

