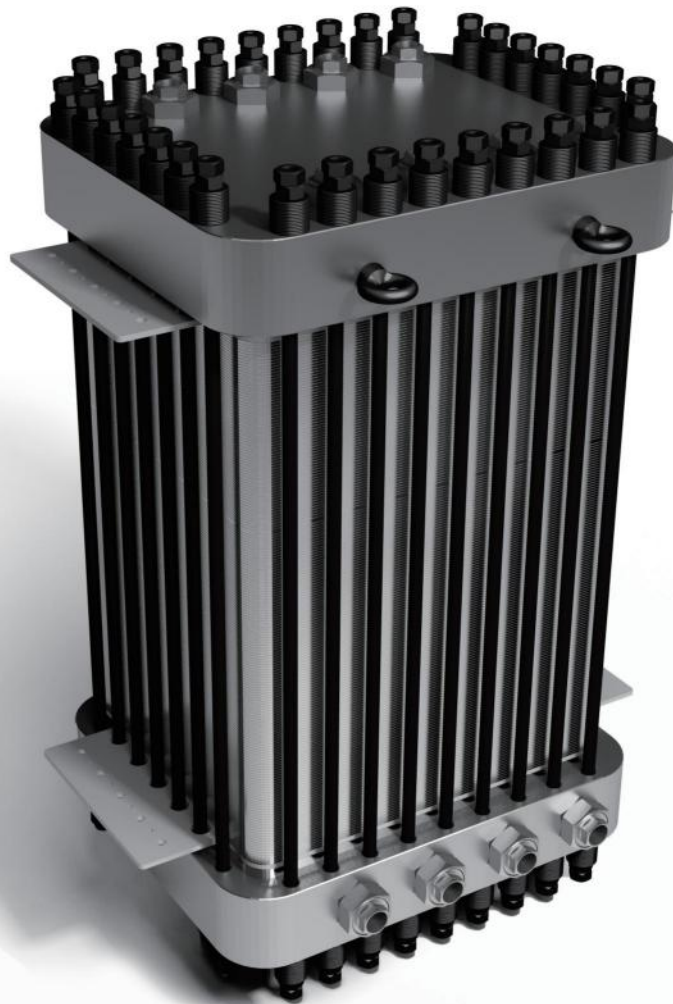
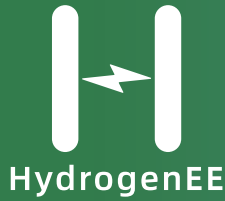


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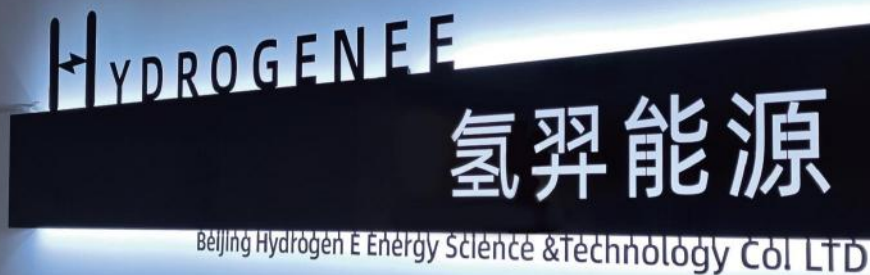
Beijing Hydrogen E Energy Science & Technology Co., Ltd. (referred to as "Hydrogen E Energy") is an integrated technology company founded by a team of PhDs. It focuses on research and development, manufacturing, system integration, engineering construction support, as well as EPC projects. Headquartered in Beijing, and has established subsidiaries in Suzhou, Shaanxi, and Inner Mongolia, comprehensively expanding business in the hydrogen energy sector.

The company offers a range of water electrolysis hydrogen production products, including catalysts, Membrane Electrode Assembly, PEM/AEM/ALK electrolyzer, and BOP systems. A single PEM electrolyzer produces up to 600 Nm³/h. Additionally, the company provides various services such as technical cooperation, co-research and development, and relevant technical support.

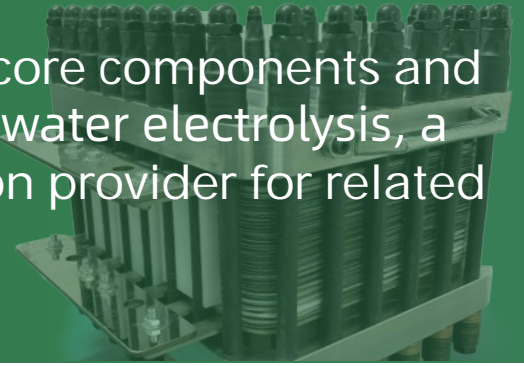
The engineering team members of the company have excellent project development experience in water electrolysis for hydrogen production and integrated development projects involving wind-solar-hydrogen storage. These professionals have backgrounds in large enterprises or public companies.

The company excels in providing integrated solutions for the entire industry chain, covering both upstream and downstream sectors. This includes wind and solar power generation, water electrolysis for hydrogen production, ammonia production, methanol production, and fuel cell power generation.

Moreover, the company is proficient in undertaking related engineering design and construction, EPC projects, and can develop and operate large-scale alkaline and PEM water electrolysis for hydrogen production-ammonia production projects to maximize economic benefits for clients.



We are a professional manufacturer of core components and equipment for hydrogen production by water electrolysis, a system integrator and an overall solution provider for related industries



The product models achieve full coverage from laboratory grade to industrial grade hydrogen production, mainly including several series of industrial large-scale PEM/AEM electrolyzer (single stack capacity 20-600Nm³/h), medium-scale (0.5-20Nm³/h) for enterprise usage, and corresponding High purity hydrogen purification system.

The company has advanced membrane electrode assembly preparation technology with the maximum membrane electrode assembly area of 8000cm² above, and provides membrane electrode assembly preparation services; at the same time, the company has developed an advanced testing system of hydrogen production by water electrolysis.

At the same time, the company can provide comprehensive technology solutions for upstream and downstream of related industries, such as wind and solar power generation, PEM water electrolysis for hydrogen production, fuel cell power generation.

20-600Nm³/h

The capacity of a single stack of large-scale PEM water electrolysis for hydrogen production is 20-600Nm³/h.

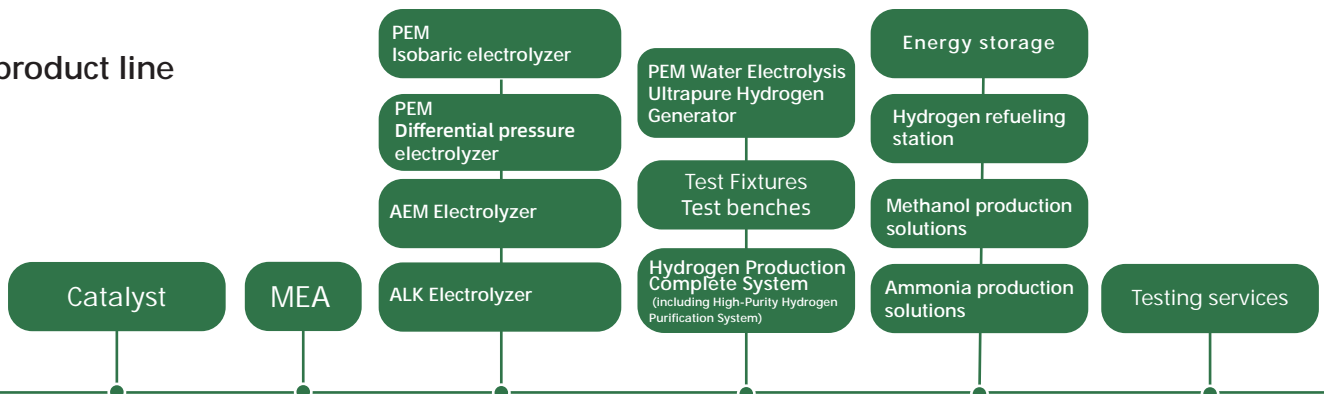
0.5Nm³/h-20Nm³/h

The capacity of a single stack of medium-scale PEM water electrolysis for hydrogen production is 0.5-20Nm³/h.

≥8100cm²

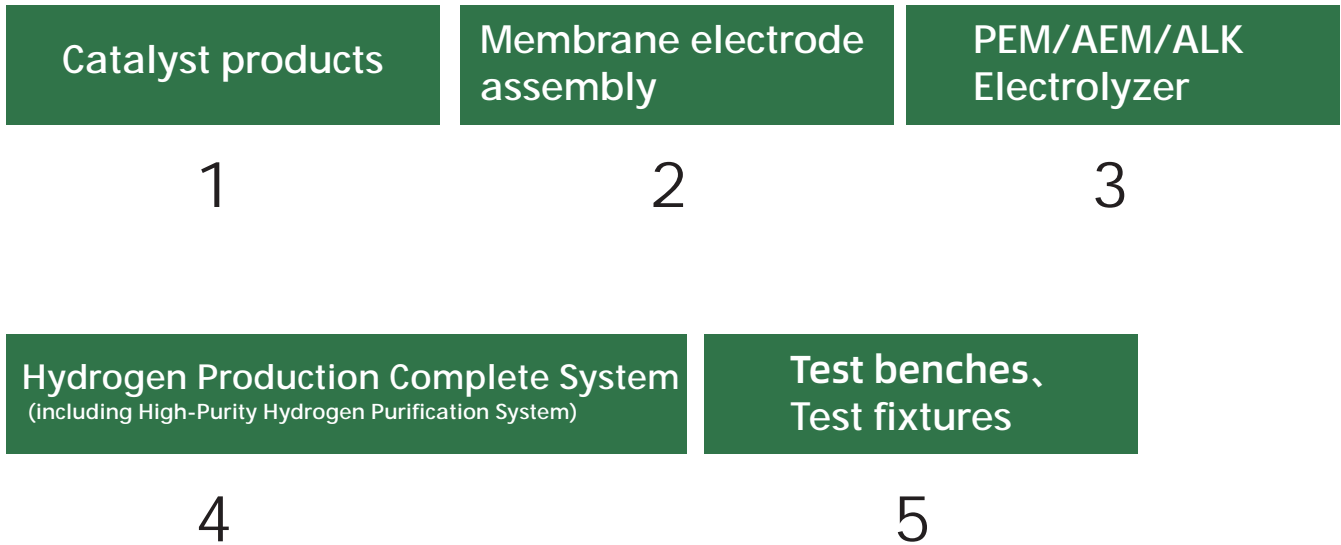
The maximum membrane electrode assembly area can reach 8100 cm² above

Main product line

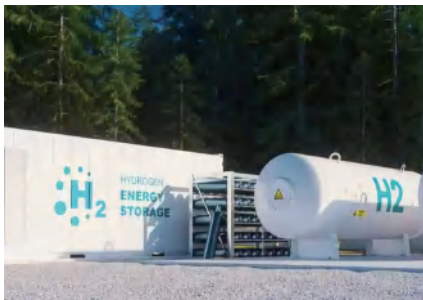


Service dimension and product dimension

| Core products



| Service plans



Green hydrogen solutions for wind and solar power generation
Electronic-grade high-purity hydrogen solutions



Electrolyzer testing



Catalysts evaluation test
MEA evaluation test

Technological advantages



01

Extremely low leakage rate and excellent security

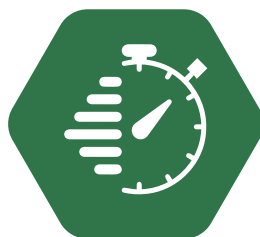
The entire series of electrolyzer, based on actual tests, have a 24-hour leakage rate far better than the national standard limit of 0.5%. This effectively eliminates the explosion hazard to the surrounding environment caused by hydrogen leaks.



02

High differential voltage electrolyzer

Electrolyzer of various models have achieved industry-leading full lifecycle differential pressure control levels, allowing for normal pressure on the oxygen side and high pressure on the hydrogen side. This effectively prevents hydrogen-oxygen crossover caused by current fluctuations, thereby reducing operational risks. This metric can be explicitly included in the technical agreement and subject to user evaluation.



03

Record of long-term operation of high-power electrolyzer

Megawatt-level hydrogen production products have undergone tens of thousands of hours of operational testing at central state-owned enterprise facilities, accumulating a certain amount of practical operating experience.



04

The self-developed catalyst has high activity and stability

The self-developed anode and cathode catalysts have reduced precious metal loading by more than 40%, the anode catalyst's activity has reached twice that of commercial catalysts, and it has passed tens of thousands of cyclic voltammetry tests and over a thousand hours of stability tests. Overall performance is excellent, while also offering significant cost advantages.



05

The self-developed gradient membrane electrode assembly has excellent performance

The unique gradient MEA fabrication process reduces the use of precious metals by more than 20% compared to conventional MEA, significantly enhancing their performance. Additionally, the slurry formulation and processing techniques have been optimized, greatly extending the lifespan of the MEA.



06

Complete technology package

The company has mastered the full set of independent intellectual property and technology from anode and cathode catalytic materials, membrane electrode assembly to electrolyzer and system integration, achieving independent research, design, and production across the entire chain. Electrolyzer and systems have a full set of technologies with independent intellectual property rights, Entirely independently developed, designed, manufactured, and integrated.





The company's laboratory is equipped with various precision testing equipment and material testing equipment, ensuring the quality and performance of products. Continuously striving to develop more advanced, environmentally friendly, efficient products is aimed at meeting or exceeding customer requirements.



Beijing headquarters and R&D center

Catalyst R&D and
Testing Center



Membrane electrode assembly
R&D and Testing Center



Electrolyzer R&D and Testing
Center



Company Laboratory



Production Factory and Testing Center in Suzhou City

Suzhou production line is located in Changshu Yineng Science and Technology Industrial Park, covering an area of 2300m², the production line is designed in accordance with the corresponding national standards or industry standards, the structure of the equipment has enough static, dynamic, thermal rigidity and precision, safety and environmental protection in line with national standards. The control system is advanced, and the system components have high precision and good reliability.



The Suzhou production line includes electrolyzer assembly production line, BOP system assembly production line, Membrane Electrode Assembly production line, and the main production equipment includes electrolyzer assembly equipment, air tightness testing equipment, membrane electrode hot pressing equipment, frame cutting equipment, etc.

The PEM electrolyzer production line in Suzhou has a capacity of 100MW/year, and adopts the most advanced stacking assembly technology and automatic air leak detection technology to ensure the tightness and durability of the electrolyzer. The production capacity of the membrane electrode production line is 20,000 square meters/year, and the advanced automatic spraying and transfer process is adopted, and the maximum spraying area can reach more than 8,100 square centimeters. At present, the factory has been fully put into use and can achieve large-scale production capacity.

PEM electrolyzer capacity

100MW/year

MEA capacity

20000m²/year

The maximum spraying area of the membrane electrode

8100cm²



Shaanxi production plant

In 2025, Hydrogen Energy will complete the construction of a 1GW production line in Yulin, Shaanxi Province, with a plant area of 5,000m², an annual production capacity of 1GW of PEM/AEM electrolyzers and systems, and an annual MEA production capacity of 100,000 square meters. With advanced production equipment and technology, the company is committed to maintaining a leading position in the PEM/AEM electrolyzer industry.

Plant area

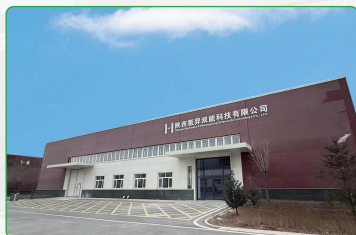
5000m²

Annual output of PEM/AEM electrolyzer and systems

1GW/year

The maximum spraying area of the membrane electrode

100000m²/year



Core products

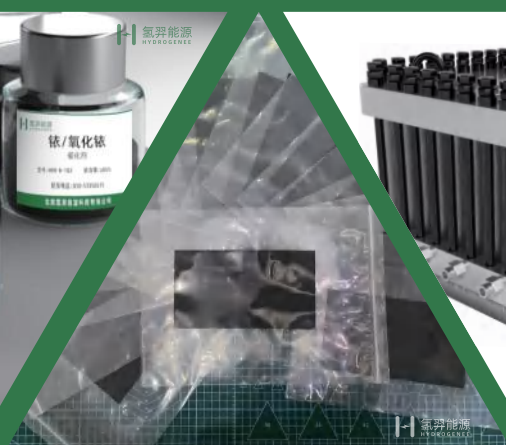
Catalysts



Electrolyzer



Membrane electrode assembly



High purity hydrogen-purification system



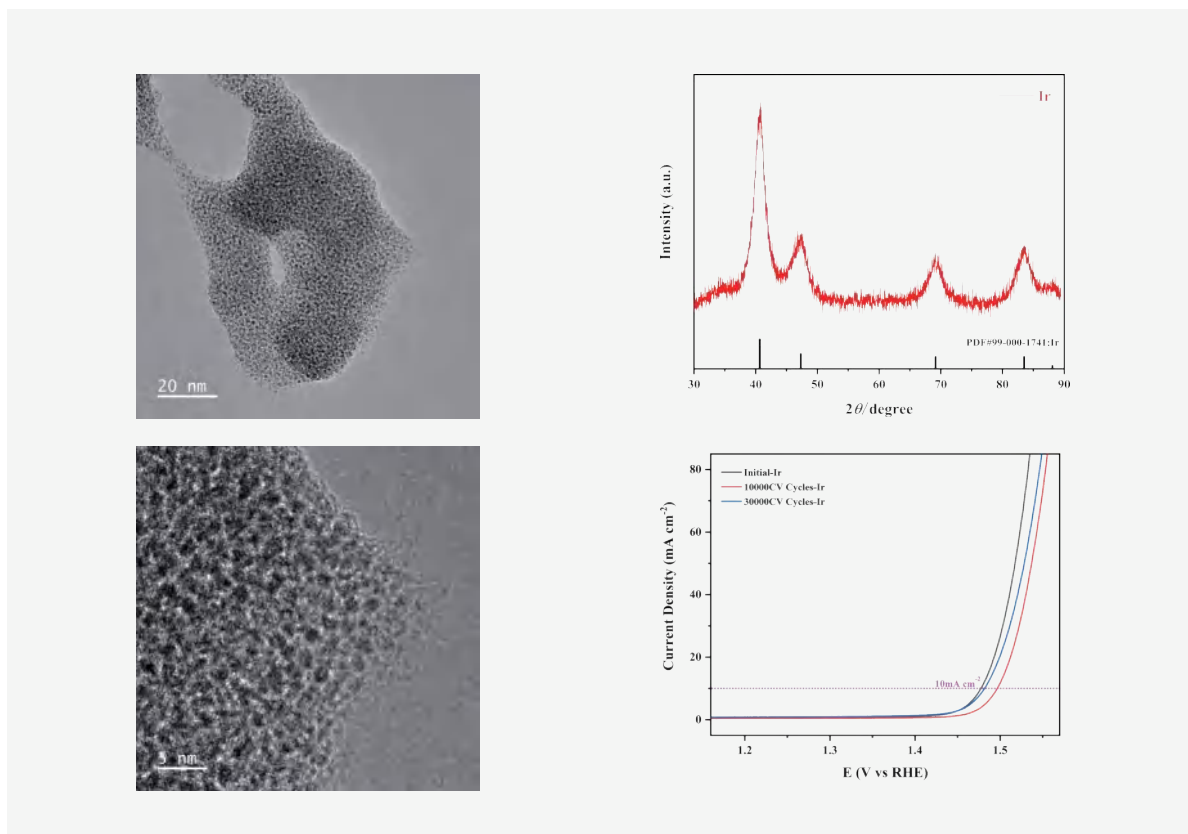
01 Catalyst

Product introduction

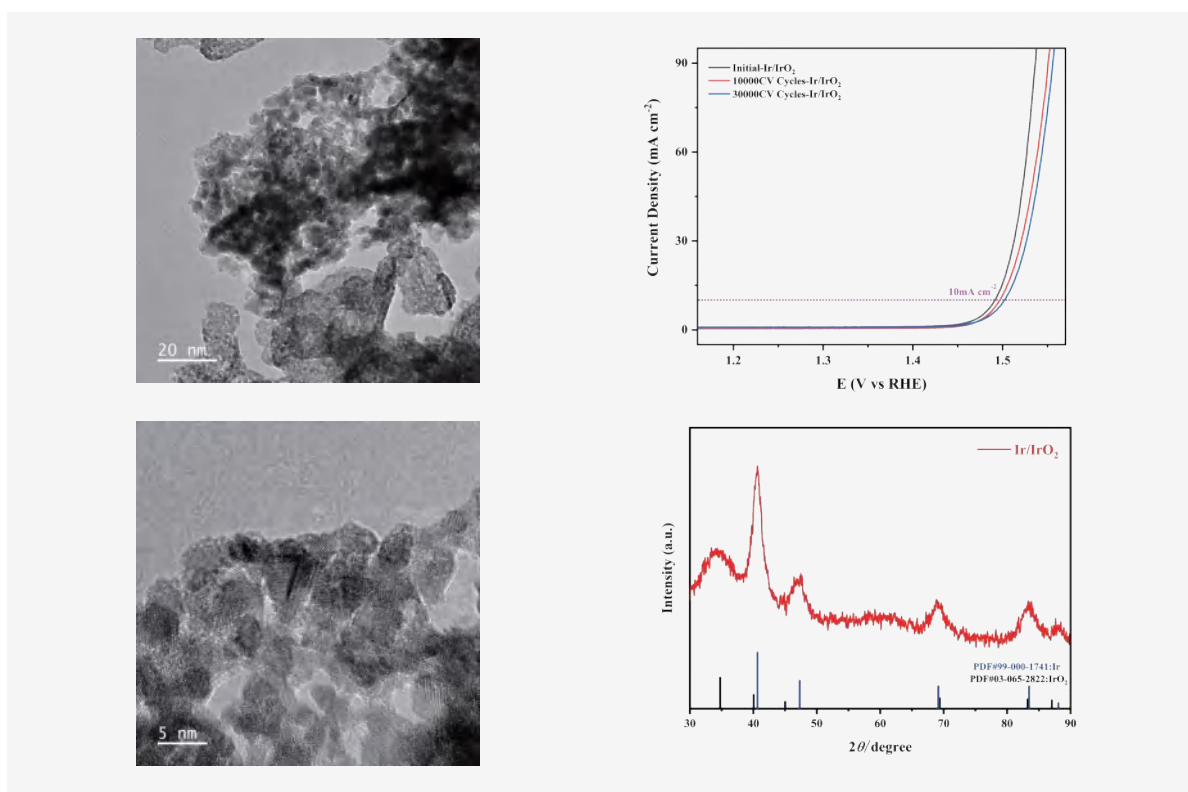
- Various independently developed Iridium-based catalysts have high catalytic activity and stability, as well as oxidation resistance and acid/alkali corrosion resistance.
- The catalyst preparation process is mature, which can achieve kilogram-level mass production with high batch consistency
- The slurry prepared by the catalyst has good dispersibility and excellent performance when applied to membrane electrode assembly.



Iridium (HEE-Ir-101)



Iridium/Iridium oxide (HEE-Ir-102)



Technical Parameter

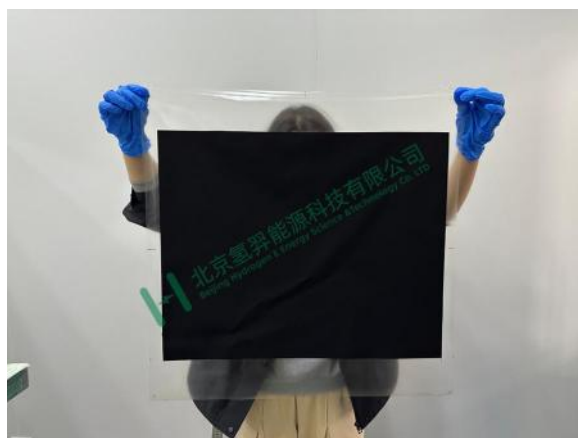
Specification parameters	Catalyst name	Iridium	Iridium/Iridium oxide
	Catalyst model	HEE-Ir-101	HEE-Ir-102
	Average particle size/nm	1-3	2-4
	Iridium content/wt. %	≥ 99	≥ 85
	Chlorine content/ppm	< 10	< 10
	Water content/wt. %	< 0.1	< 0.1

02 Membrane electrode assembly

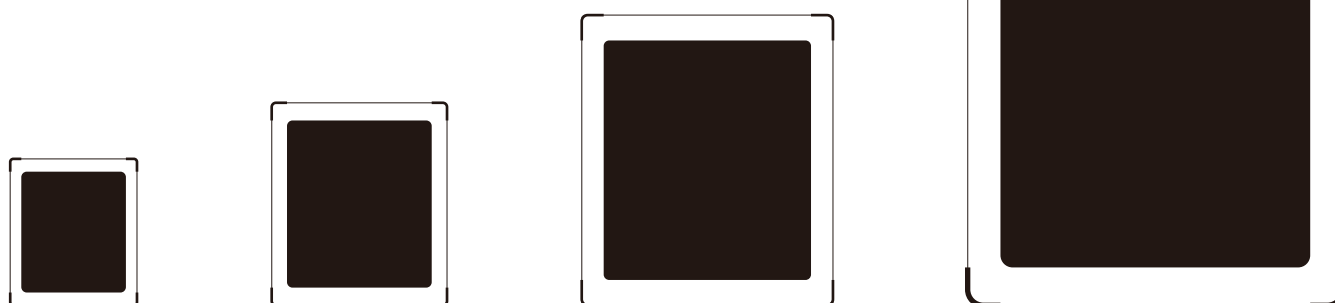
Focusing on each technical difficulty of the electrolytic stack, hundreds of experiments were conducted to maximize the performance of the catalyst.

Realizing the production of membrane electrode assembly of various sizes, with a maximum effective area reaching 8100 cm² above.

Mastering various membrane electrode assembly preparation techniques, which can be used from laboratory level to industrial production level. Various customized services are provided, such as exploration of catalyst formulation and catalyst evaluation.



Multi scale membrane electrode assembly preparation

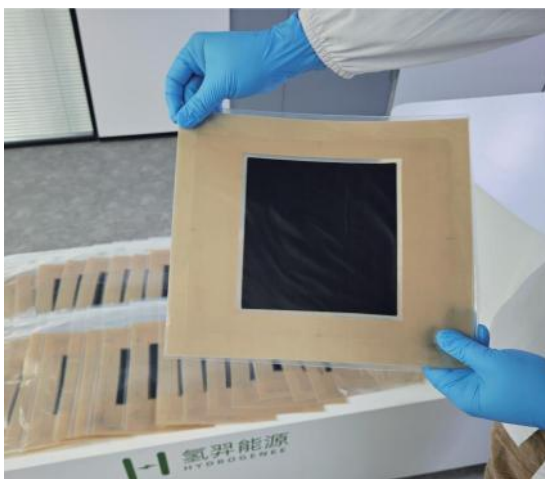
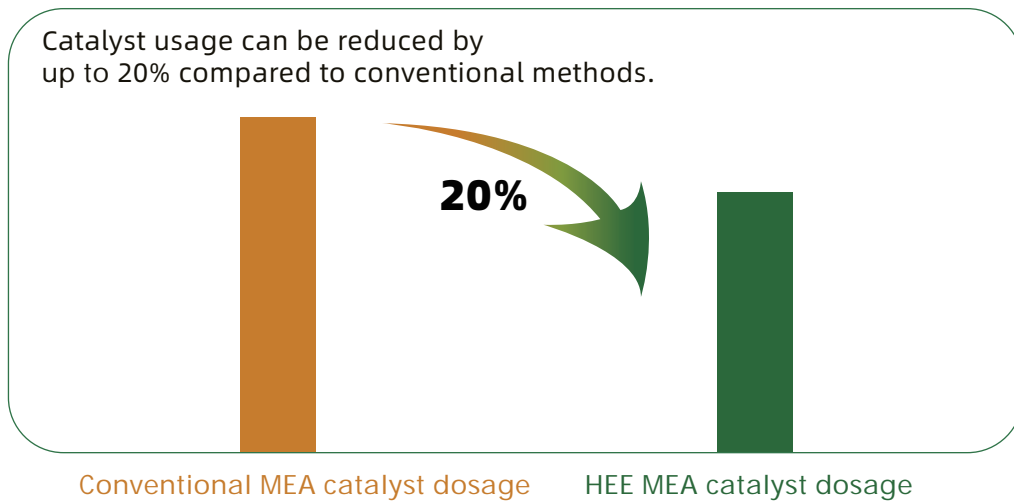


The maximum effective area can reach 8100cm² above with large area homogenization

Mastering various membrane electrode assembly preparation techniques



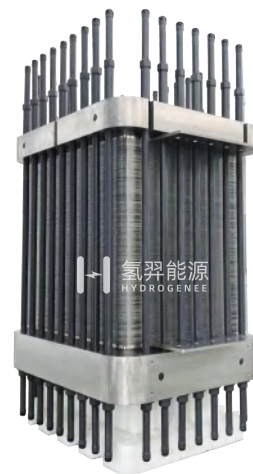
Unique gradient membrane electrode assembly



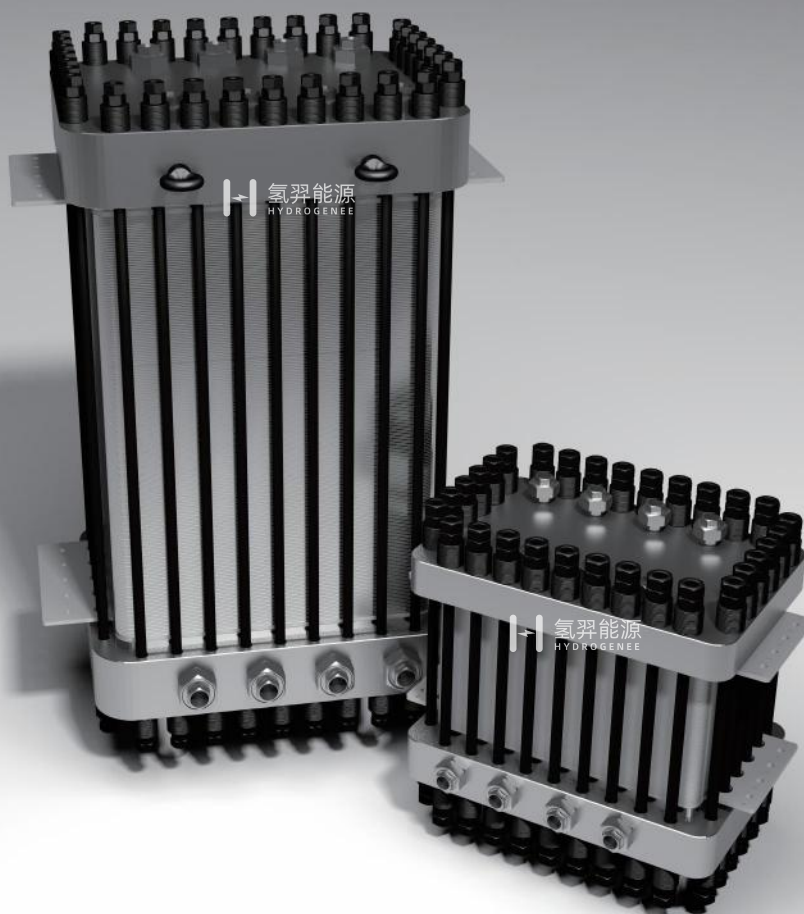
Index	Numerical value	Unit	Remarks
Active area	≥8100	cm ²	Customizable
Rated load capacity	≤1	mg/cm ²	
Electrochemical performance	≤1.661V@2A/cm ² ≤1.723V@3A/cm ² ≤1.792V@4A/cm ²		
Decay rate	≤1	μV/h	
Operation temperature	5-80	°C	


03


PEM Electrolyzer





- Industrial hydrogen production series electrolyzers are suitable for large-scale hydrogen use scenarios
- High safety 0.01% ultra-low leakage rate electrolyzer, far lower than the national standard of 0.5%
- High differential pressure 3.5MPa operation
- The cost of high-density film and long-life membrane electrode is greatly reduced
- With the High purity hydrogen purification system of hydrogen energy, the purity of hydrogen production can reach 99.99% and above
- The hydrogen output of a single tank can reach 600Nm³/h





- 


High current density
- 


Saving energy and protecting environment
- 

Fast response speed
- 

High purity hydrogen production
- 

High efficiency
- 

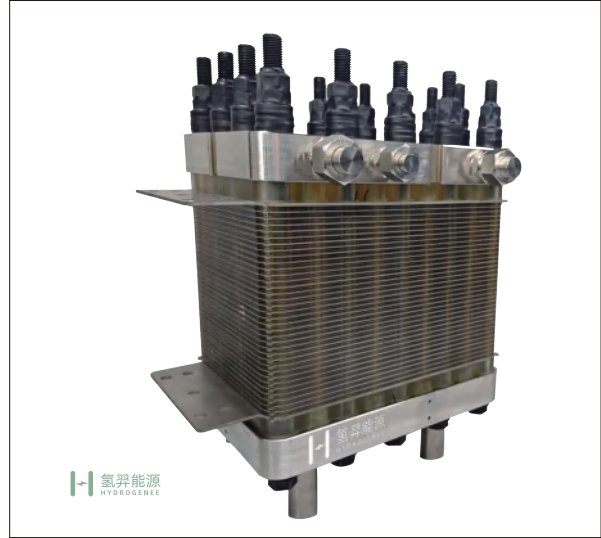
Long service life
- 

Low maintenance cost
- 

Easy to install



HEE-P5



HEE-P10



HEE-P50



HEE-P600

Electrolytic stack Technical parameters

Project	Numerical value	Unit	Remarks
Hydrogen production	0-600	Nm ³ /h	Customizable
Oxygen production	0-300	Nm ³ /h	Customizable
Hydrogen/oxygen pressure	0-3.5	Mpa	Adjustable Pressure
Hydrogen purity	99.99	%	Combined with BOP system to achieve 5N, 7N.
Dc power consumption	3.8-4.2	kWh/Nm ³	Rated working condition
Oxygen purity	98.5	%	

04

AEM Electrolyzer

Product Introduction

Using non-precious metal or low-precious metal electrode materials, operating temperature range 50-80°C, leakage rate below 0.01%. Optimized for AEM technology, low energy consumption, high compatibility, with online monitoring and fault diagnosis functions.



- Low cost
- High efficiency
- Excellent dynamic response
- Modular design, easy to install

Technical Parameters

Parameter Category	AEM Electrolyzer Parameters(100KW)	Technical Significance
Rated Power	100 kw	
Hydrogen Production Rate	20 Nm ³ /h (1.6MPa)	
Operating Pressure	1.6 MPa	Meets direct storage and transportation requirements
Leakage Rate	0.01%/24h	Domestic average level > 0.5%
Dynamic Response Range	10%-120% load	Outstanding performance in broadband adjustment
Response Time	<1s	
DC Power Consumption	4.5-5.2 kWh/Nm ³	
System Efficiency	0.82	
Current Density	10,000 A/m ²	Performance comparable to PEM
Design Lifespan	>4,000hours	
Catalyst System	Non-precious metal catalyst	Completely get rid of iridium dependence
System Integration Feature	Multi-stack coupled modular design	
Volume/Weight	1/4 the volume of traditional alkaline electrolyzers	Lightweight Integrated Design
Cold Start Time	< 5 minutes	
Applicable Temperature Range	0-70°C	
Water Quality Requirement	Pure water (resistivity > 1 MΩ·cm)	

05

PEM Water Electrolysis Ultrapure Hydrogen Generator



- Ultra-Pure Hydrogen Production
- Easy Operation
- Reliable & Durable
- Intelligent Management
- Compact Design

Product Introduction

Hydrogen E Energy's ultra-pure hydrogen generator uses PEM technology to produce hydrogen by electrolyzing pure water. Its independently developed purification module ensures the production of high-grade hydrogen with ultra-high purity.

High-purity hydrogen (purity $\geq 99.99999\%$, 7N and above), as a key electronic-grade specialty gas, is widely used in semiconductor manufacturing, integrated circuits, new displays, photovoltaic cells, optical fiber communications, high-end new materials, precision scientific research and other fields.

It is mainly used as reducing atmosphere, protective atmosphere, carrier gas and process reaction gas, and can meet the requirements of high-end manufacturing processes such as wafer epitaxy, oxidation annealing, thin-film deposition, precision cleaning and crystal growth.

It plays an irreplaceable role in improving product yield and ensuring device performance and reliability, and is a core basic material for the high-end electronic information industry and advanced materials sector.

Technical Parameters

Model	HEE-P0.2	HEE-P0.5	HEE-P1	HEE-P2	HEE-P5
Flow rate (Nm ³ /h)	0.2	0.5	1	2	5
Electrolyzer	PEM pure water electrolysis				
Purity	$\geq 99.99999\%$				
Output pressure	0-1.2 Mpa adjustable				
Hydrogen purification system	Membrane separation & purification, PSA pressure swing adsorption for impurity removal, Final purification, Etc.				
Control system	PLC system				
Humidity range	5-50°C				
Screen	Touch LED screen (operation parameters, system status, liquid level display, alarm prompt, one-key startup)				
Safety configuration	Water shortage alarm, Hydrogen leakage detection, Over-temperature detection, Over-pressure relief, Passive flame retardant, Automatic water replenishment, Water quality detection, Leak detection, Power failure protection, Remote control				
Water quality requirement	Deionized water (conductivity $< 0.5\mu\text{S}/\text{cm}$)				
Protective gas/Nitrogen	G1/4 clamp interface				
Dimension	1300mm*800mm*1600mm		1800*1200*2000		2800*1600*2000
Weight (kg)	300Kg	300Kg	500kg	800kg	1100kg
Energy consumption	$\leq 2\text{KW}$	$\leq 3\text{KW}$	$\leq 6\text{KW}$	$\leq 12\text{KW}$	$\leq 30\text{KW}$
Hydrogen outlet	DN6 clamp interface	DN8 clamp interface	DN10 clamp interface	DN15 clamp interface	DN20 clamp interface
Power supply	AC220V			AC380V	
Hydrogen vent/Oxygen vent	G1/4 clamp interface			G1/2 clamp interface	
Water inlet/Water outlet	G1/4 clamp interface			G1/2 clamp interface	

06

Hydrogen Production Complete System

Various hydrogen production systems can be provided according to customer demands, including standard/-customized High purity hydrogen purification system combined with PEM electrolyzer with flexible configurations.

Combined with High purity hydrogen purification system, the hydrogen purity can reach 5N or above.

High purity hydrogen purification system achieves one click start stop. While manually intervening, the system will automatically determine the current state in crisis situations, providing a dual guarantee for the safety of hydrogen usage by customers.

Each set of equipment is pre-assembled online and not-limited by the venue. The design truly meets customer demands.



| System Model Diagram



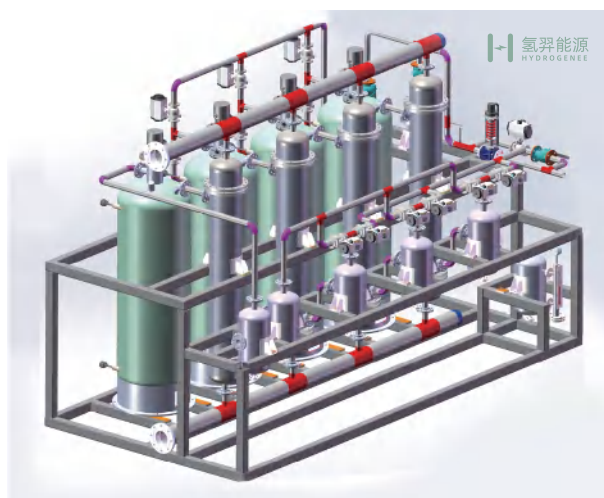
HEE-PEM-5(Hydrogen production machine)



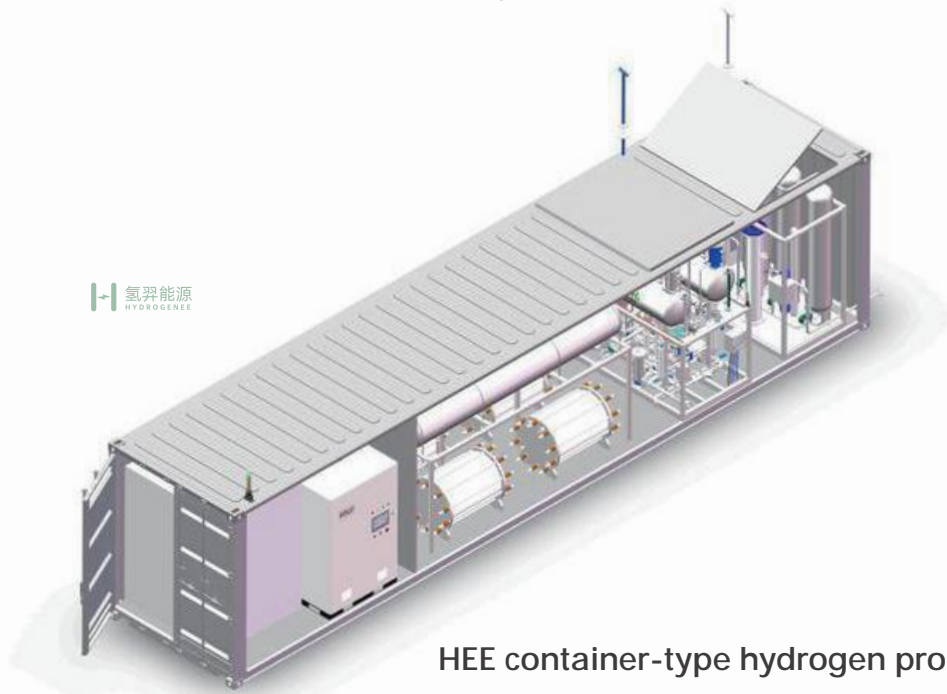
HEE-PEM-200



HEE-AW-1000(separation equipment assembly)

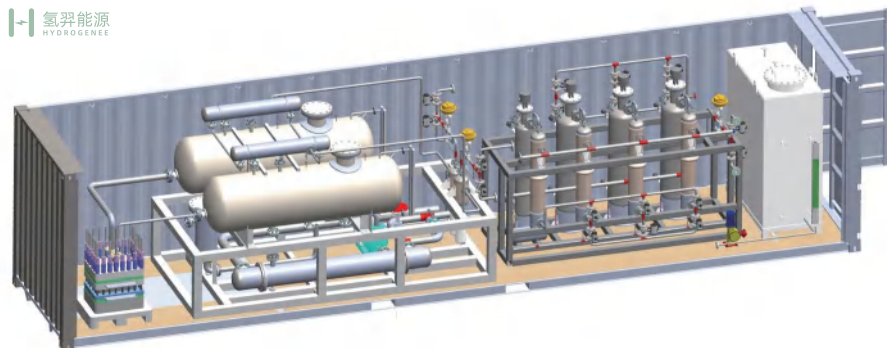


HEE-AW-1000 (purifying equipment)

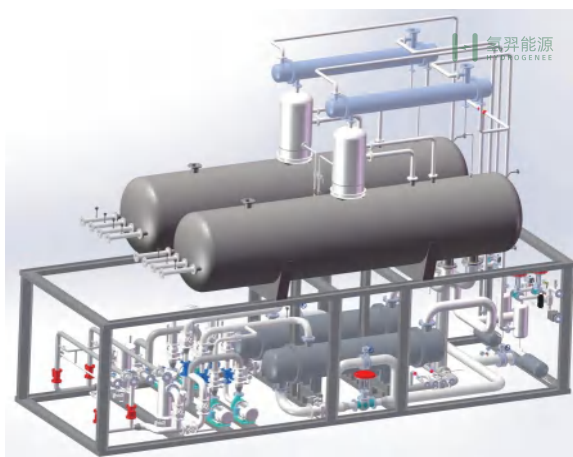


HEE container-type hydrogen production system

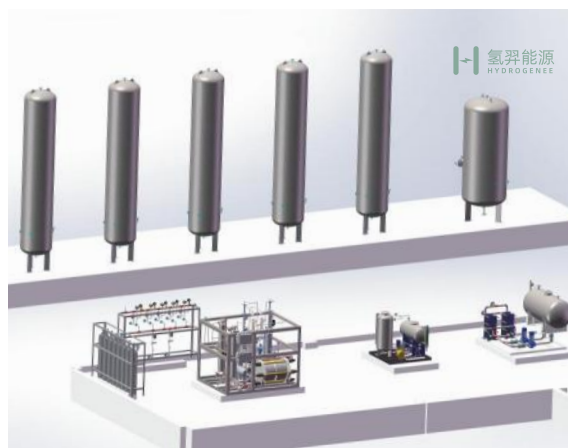
| System Model Diagram



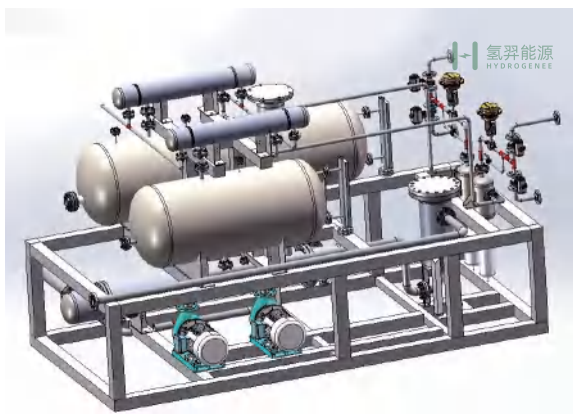
HEE-PEM-200



HEE-AW-4000



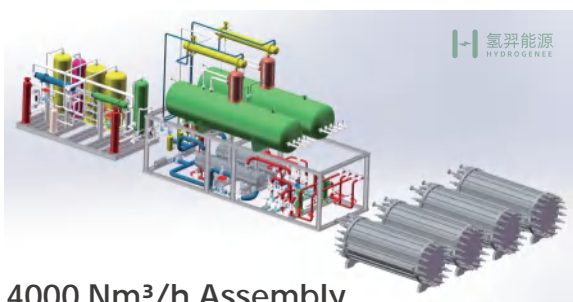
HEE-AW-10



HEE hydrogen separation equipment



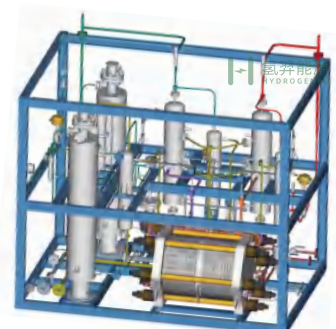
HEE hydrogen purifying equipment



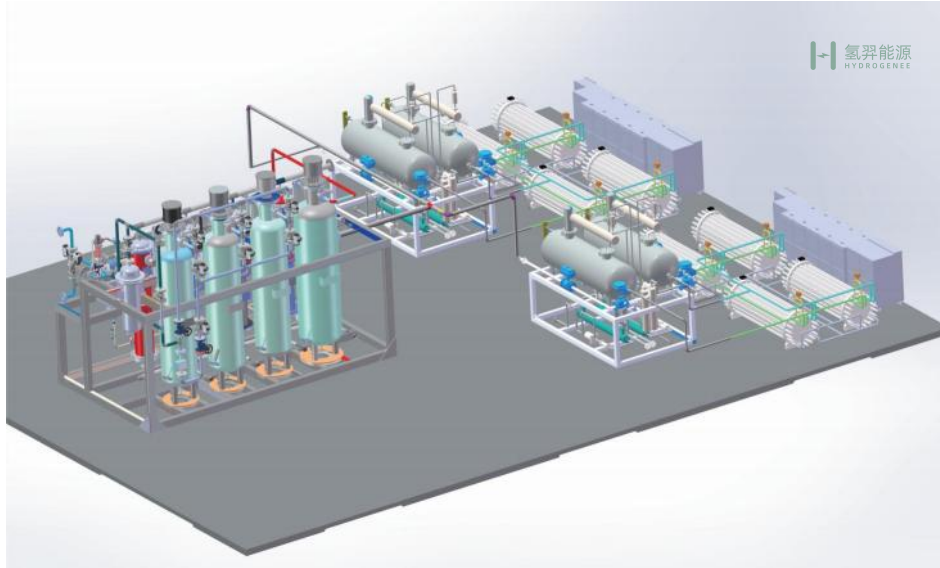
4000 Nm³/h Assembly

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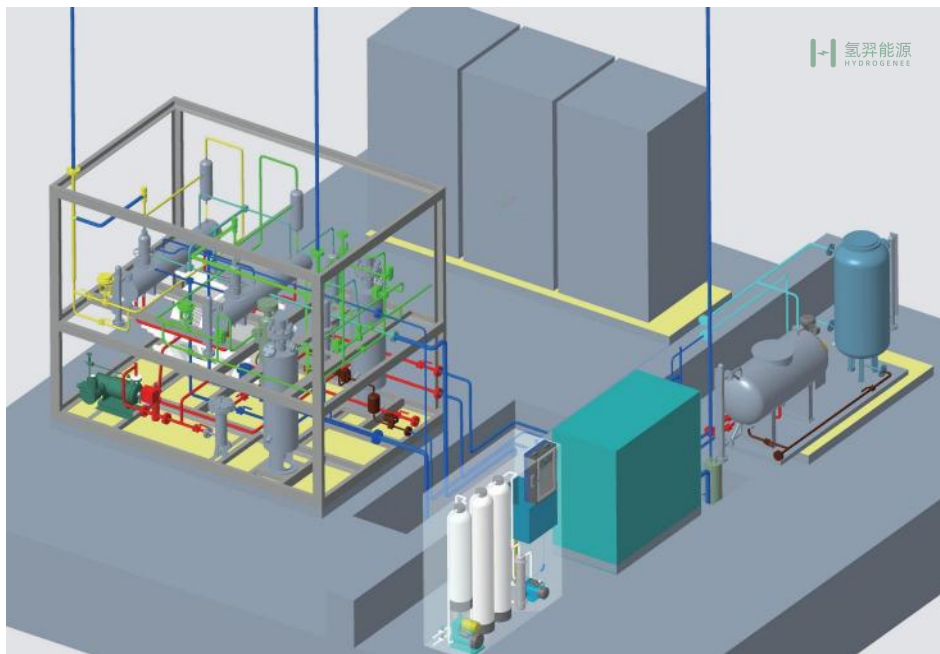
HEE-AW-5



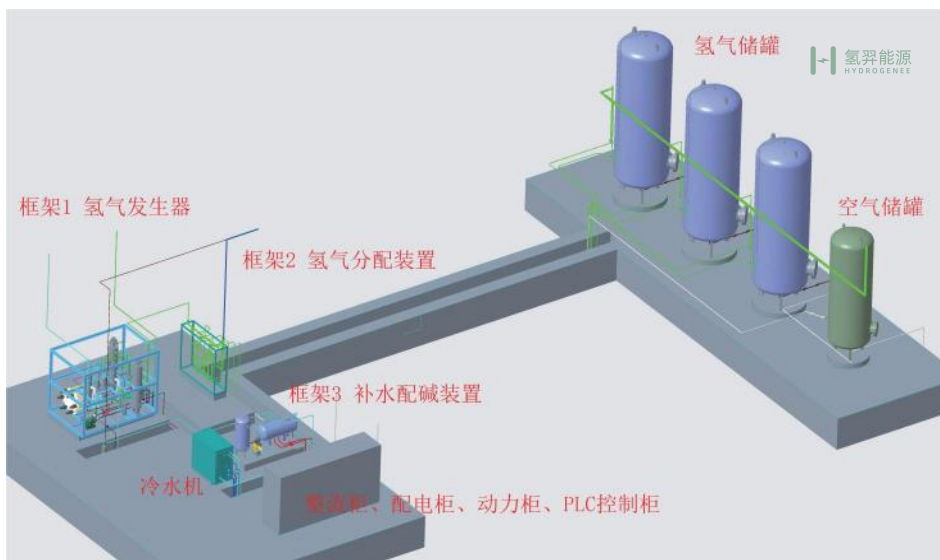
System Model Diagram



HEE-8000 Nm³/h Assembly



HEE-hstation-10



HEE-hstation-5

07

PEM water electrolysis hydrogen production test equipment

PEM electrolyzer test system

It provides an accurate and reliable test platform for hydrogen production from PEM electrolyzers.

Through the on-line data monitoring and processing of the test system platform, the polarization curve, durability, sensitivity, activation, conductivity of pure water on the anode side, hydrogen in oxygen/oxygen concentration in hydrogen, and consistency of each monomer of the PEM electrolyzer can be met.



PEM electrolyzer test fixture

The PEM water electrolysis hydrogen production test fixture is connected with relevant test instruments to carry out related tests on the polarization performance, electrochemical activity, activation polarization overpotential and ohmic polarization overpotential of the membrane electrode.

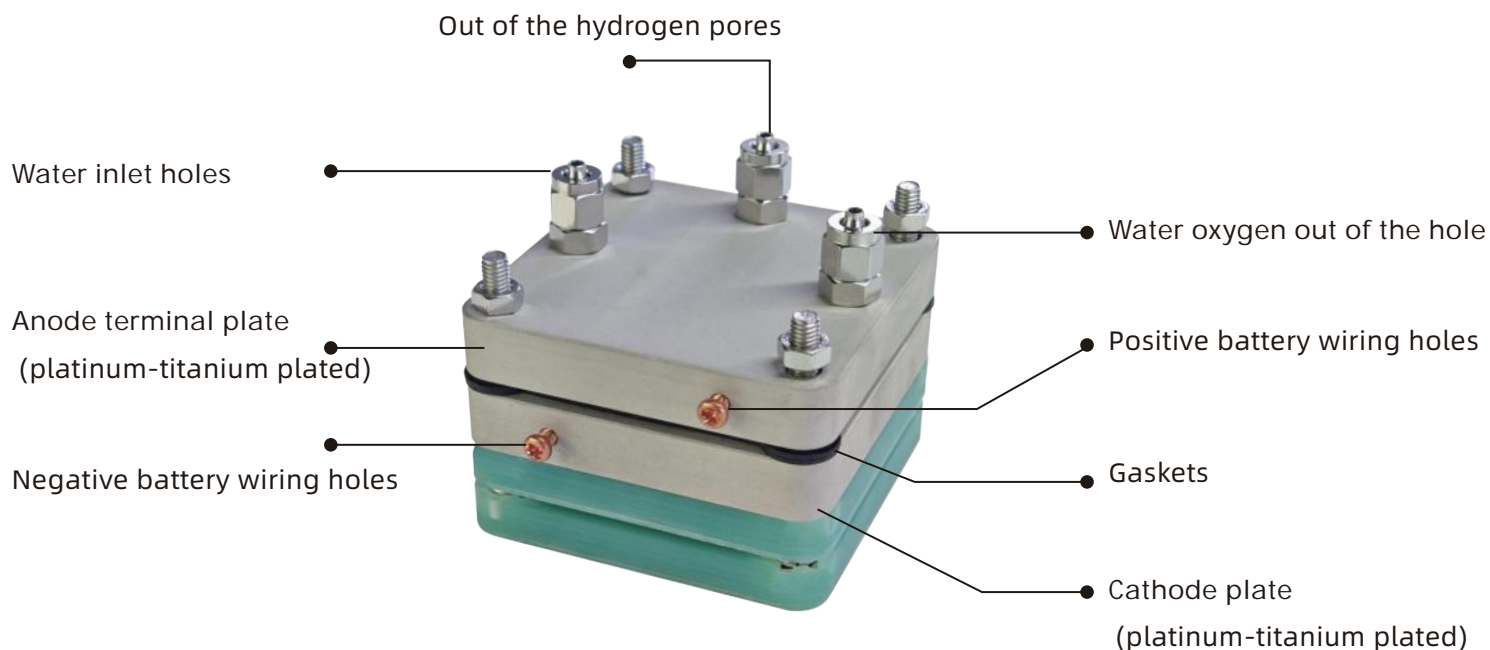
The effective area can be customized

An example of this diagram is a 5×5 test fixture



Product illustration

test fixture constituent



- Runner design: straight runner
- Platinum plating thickness: 0.5 μ m



High-quality materials

The fixture is made of pure titanium material in order to enhance its oxidation resistance and prolong its lifespan. Additionally, the surface treatment of platinum plating significantly improves the fixture's resistance to acid and alkali corrosion, reducing its internal resistance.



All-in-one design

The fixture adopts the method of designing the runner on the cathode and anode plates to realize the integration of the end plate and the flow field plate, which greatly simplifies the fixture structure, simplifies the disassembly process, and shortens the disassembly and assembly time.



Runner design

The clamp runner adopts a straight runner design scheme, and the water flow is efficient and stable, ensuring that the temperature of the single cell is uniform and stable.



High tightness

The fixture is made of rubber material with high sealing and high temperature resistance to ensure that the water and gas channels are circulated smoothly during the test.

Part of the power generation from new energy sources such as photovoltaics and wind turbines is connected to the grid, and the other is used for hydrogen production by water electrolysis. The hydrogen is purified and stored, and when the output of new energy generation is insufficient, the stored hydrogen is used to generate electricity through fuel cells, hydrogen gas turbines, and other means to return to the grid system for power supply. This can effectively solve the problem of new energy consumption, and also play a role in peak shaving and valley filling, alleviating the stability problem of the grid, improving the utilization rate of the transmission network and energy utilization. It is an effective way for long-term and large-scale energy storage in new power systems.



The electricity generated by distributed photovoltaics and grid electricity, are used for hydrogen production by water electrolysis. The hydrogen is purified, compressed and stored in storage tanks. When there is a lack of hydrogen in station, it can be replenished. This not only utilizes electricity with lower prices generated from distributed photovoltaics and/or grid valley electricity to reduce the cost of hydrogen preparation, but also saves the high cost of hydrogen storage and transportation. As a result, the overall cost of hydrogen at the muzzle end of the hydrogen refueling station is reduced, accelerating the application of hydrogen energy in the transportation field.

Energy storage and peak shaving power station

Hydrogen production and refueling integrated station

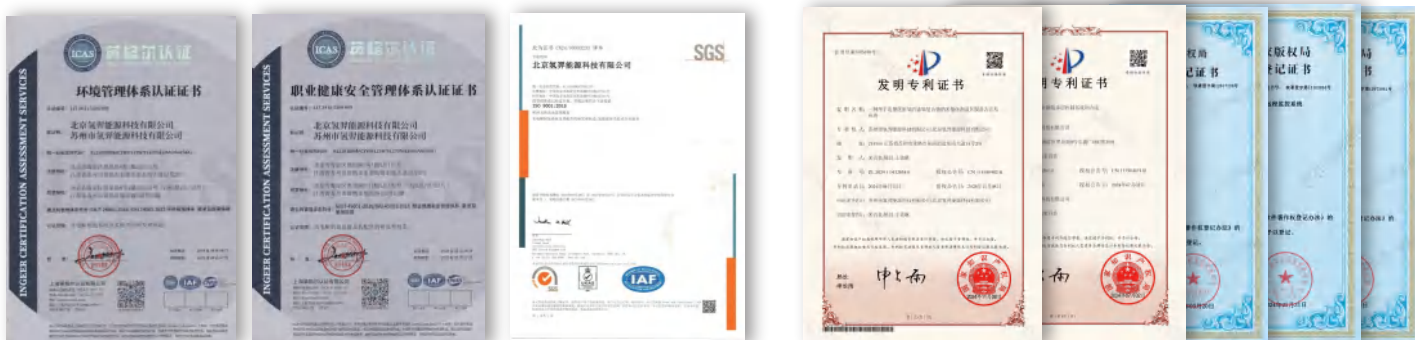
Synthetic ammonia

Synthetic methanol

Green electricity generated from new energy sources such as photovoltaics and wind power is produced by electrolyzing water to produce green hydrogen. Green electricity drives air separation equipment to produce nitrogen, which is then combined with green hydrogen to produce green synthetic ammonia. It can be directly burned as a green fuel for power generation, industry, and other fields, or used as a raw material to produce green products such as urea. Green ammonia can also be used as an energy carrier to transport green energy over long distances and develop international trade of green ammonia.

Green electricity generated from new energy sources such as photovoltaics and wind power is produced by electrolyzing water to produce green hydrogen. Green hydrogen is combined with carbon dioxide captured by CCS to synthesize methanol, which can provide power for ships and cars through direct combustion, fuel cell power generation, and can also be used as raw materials to produce green products such as olefins and synthetic oil. Methanol can also be used as an energy carrier to transport green energy over long distances and develop international trade of green methanol. In addition, this industry chain does not generate carbon emissions and consumes carbon dioxide, so it can be considered as "negative carbon", indirectly turning other traditional industries into green industries.







Professional manufacturer of core components and equipment
for hydrogen production by water electrolysis, a system integrator
and an overall solution provider for related industries



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Media Platform



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抖音
Douyin

北京氢羿能源科技有限公司

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