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Hua Xia Hydrogen Technology (Xiamen) Co.,Ltd.

Committed to become a global leader in providing high-quality
and high-efficiency off-grid hydrogen generator and integrated
system solutions

HUA XIA
HYDROGEN

HUA XIA HYDROGEN

TERÅWARD 第三屆智慧能源創新大賽頒獎典禮 THE 3RD SMART INNOVATION COMPETITION AWARD PRESENTATION CEREMONY



華商廈庚氫能技術(廈門)有限公司
Hua Xia Hydrogen Technology (Xiamen) Co., Ltd.



In April 2024, our project "R&D & Industrialization of Off-Grid High-Performance Alkaline Hydrogen Generation System" secured the Gold Prize (USD 1 M) at the 3rd Smart Energy Innovation Competition—a globally influential green tech event co-hosted by Hong Kong China Gas and SPIC, attracting 450 entries from 59 countries.

Hua Xia Hydrogen

Founded in 2021 as a joint venture between CM Energy Tech Co., Ltd., a HongKong-listed company under China Merchants Industry Group, and Tan Kah Kee Innovation Laboratory.

Leveraging cutting-edge technical expertise, our organization has established industry leadership in advanced electrolytic hydrogen generation systems through dedicated research on core engineering challenges. We spearheads pioneering development of critical components including high-efficiency electrodes and composite membranes, complemented by structural innovations in electrolyzer stack.

As an integrated technology provider encompassing full-cycle capabilities from conceptual design to precision manufacturing and quality verification, we maintain an innovation-driven philosophy that propels technological advancements in alkaline water electrolysis.

Products & Services

- Core components (electrodes, membranes)
- High-efficiency electrolyzers
- Turnkey hydrogen generation systems
- Hydrogen generator&generation system testing

Certifications & Honors



R&D Capabilities

• R&D Facilities

Hua Xia Hydrogen collaborates with IKKEM to establish a joint R&D lab equipped with state-of-the-art facilities, covering materials and equipment in a systematic and independent development framework.



Electrochemical Laboratory



Spectroscopic Analysis and Nanoscopic Imaging Platform



Electron Microscopy Platform



Micro-Nano Fabrication Platform



Core Component Test Platform



Membrane R&D Platform

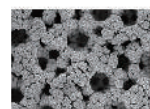
• R&D System

- High Efficiency Electrodes
- Composite Diaphragm R&D

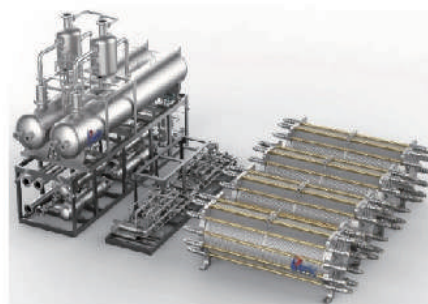
- ☐ High Current Density
- ☐ Low DC energy consumption

- Development of high efficiency separation technology
- Precision control technology development

- ☐ Rapid Cold start
- ☐ Wide Power Range



High-performance ALK electrolytic water hydrogen generation system



• Participate in Major R&D Projects

1. 2023 National key R&D Program-Hydrogen Energy Project 1.1
Ministry of Science and Technology(MOST)
2. 2023 Xiamen Municipal Major S&T Project in Future Industries
Xiamen Municipal Bureau of Science and Technology
3. 2024 Xinjiang Uygur Autonomous Region Key R&D Task Special Project
Xinjiang Department of Science and Technology

Production Capacity

10,000m² manufacture facilities with 12 MW testing center (With the capability of R&D→Manufacturing→Integration→Testing)

Quality, Environment, and Safety



Product Certification



Testing Center



Testing Capability: 2,500 Nm³/h hydrogen generation system

Electroplating Workshop



200,000 m² electrodes/yr

Assembly and Integration Workshop



50×1,000 Nm³/h stacks/yr

Thermal Spray Coating Workshop



100,000 m² electrodes/yr

Composite Membrane Workshop



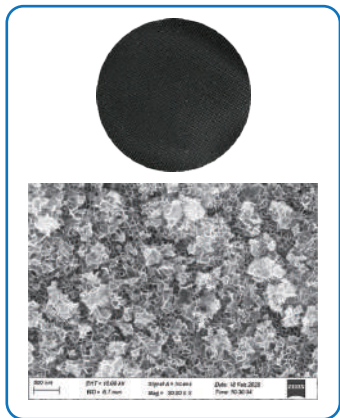
200,000 m² membrane/yr

High-Efficiency Electrodes

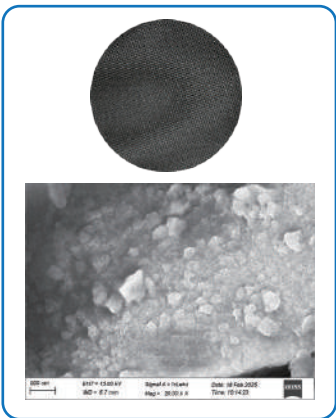
Features

High current density	Low power consumption	High-temperature resistance	Strong adhesion	Exceptional stability
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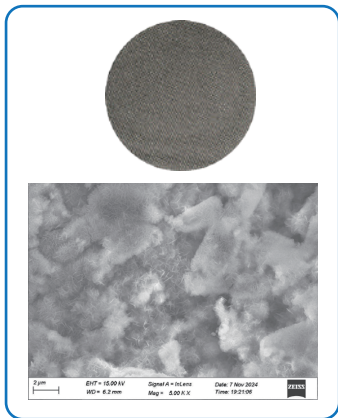
FD1 (Electroplating)



FD2 (Sprayed Alloy)



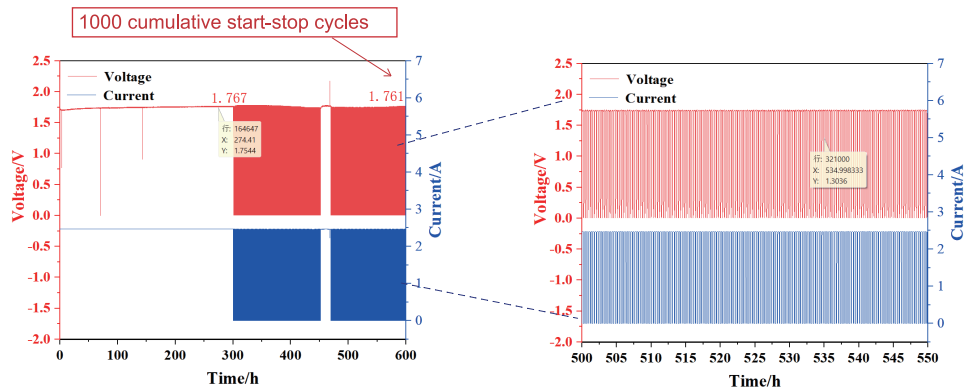
FD3 (Sprayed Nickel-Based)



Model		FD1 (Electroplating)	FD2 (Sprayed Alloy)	FD3 (Sprayed Nickel-Based)
Mesh & Weave Pattern		46 Mesh, 0.19, Plain Weave	46 Mesh, 0.19, Plain Weave	46 Mesh, 0.19, Plain Weave
Technical Parameters	Activity (Overpotential)	HER:195mV@2500A/m ² 232mV@5000A/m ² OER:230mV@2500A/m ² 241mV@5000A/m ²	HER: 97mV@2500A/m ² 118mV@5000A/m ²	HER: 200mV@2500A/m ² 235mV@5000A/m ²
	Cell Voltage	1.60V@2500A/m ² 1.75V@5000A/m ²	1.56V@2500A/m ² 1.65V@5000A/m ²	1.63V@2500A/m ² 1.77V@5000A/m ²
	Mechanical Stability (Weight Loss Rate)	2.56%	1.26%	0.33%
	Product Dimensions	Diameter 1850mm	2150mm*2150mm	2150mm*2150mm
Application		Anode & Cathode	Cathode	Cathode

Reverse Current Test: With 1000 cumulative start-stop cycles showing zero performance degradation, it fully complies with off-grid hydrogen production technical standards.

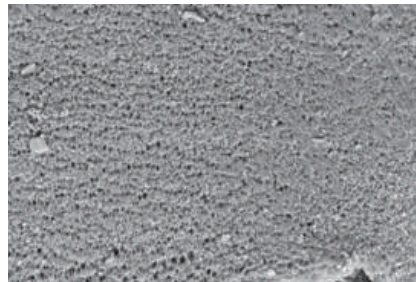
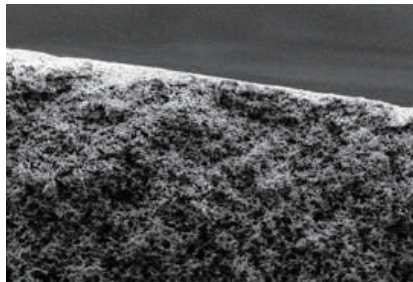
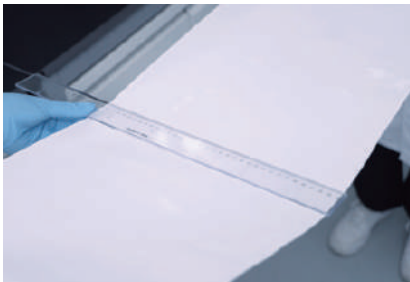
Anode: FD1 | Cathode: FD3 Current density: 4,000 A/cm² | Temperature: 90°C
Zero attenuation after 1,000 cycles (20 min operation + 10 min standby per cycle)



Composite Membranes

Features

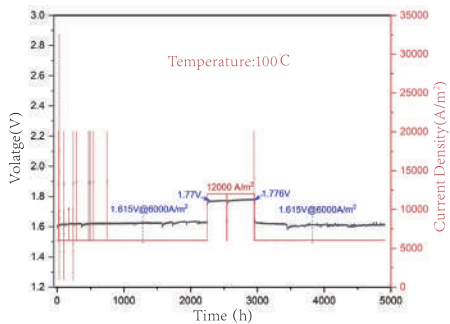
High gas tightness	Low surface resistance	High hydrophilicity	Low gas permeability	High puncture and tensile strength
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Specification	Unit	HXACM-500	HXACM-200
Thickness	um	500	200
Width	m	0.5-2.0	0.5-2.0
Max. Continuous Temperature	°C	110	110
Surface Resistance	mΩ·cm, 90°C	80-110	60-80
Bubble Point	bar	2.5	2.0
Volume Density	g/cm ³	0.9	0.55
Porosity	%	55	60
Gas Permeability	L/min·cm ² , 2bar	0	0
Puncture Strength	g	> 2000	> 1500
Tensile Strength	N/mm ²	> 35	> 25
Thermal Shrinkage	%, 100°C/1h	< 1	< 1.5
Surface Appearance	Light Box Inspection	Free of pinholes, coating defects, wrinkles, streaks, scratches, and burrs	Free of pinholes, coating defects, wrinkles, streaks, scratches, and burrs
Non-Metallic Impurities	Light Box + Microscopic Inspection	Size: ≤10 μm Quantity: ≤10 particles per unit area	Size: ≤10 μm Quantity: ≤10 particles per unit area

5,500-Hour Endurance Test

Conditions: Current density: 10,000 A/m² |
Cell voltage: 1.65 V | Temperature: 100°C

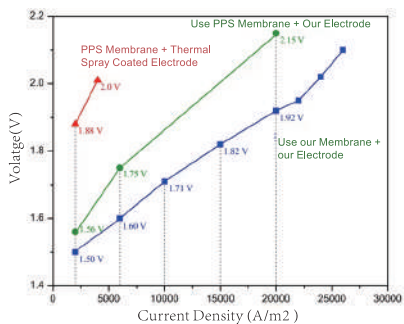


Performance Comparison:

Technical Edge: 15–20% lower DC consumption

vs PPS Membranes:

Higher current density | Lower voltage | For compact design



Electrolyzer

High-Efficiency Water Electrolyzer for Hydrogen Generation

Provide a series of 0.5 to 2000 Nm³/h alkaline electrolyzers, and two types (E and C series) are provided to support different applications of hydrogen generation

			
Product Series		Series E	Series C
Application		Grid Power	Wind/Solar Off-Grid Power
Features	Economy	Low DC consumption	Fast Cold Start
	Safety	Stable Operation for Long Term	High Current Density
	High-efficiency	Fast Cold Start	Wide Power Range

HX1-E Series

Hydrogen Generation (Nm³/h)	Model	Weight (T)	DC power consumption (kWh/Nm³)	Cold start time (min)	Load range (%)	Work pressure (MPa)	Operating temperature (°C)
2	HX1-2E	0.55	≤4.0	≤5	40-150	1.6/3.2	90±5
5	HX1-5E	1.2					
10	HX1-10E	1.5					
20	HX1-20E	3.2					
30	HX1-30E	3.6					
50	HX1-50E	4.3					
80	HX1-80E	7.2					
100	HX1-100E	8		≤20		1.6	
200	HX1-200E	12					
300	HX1-300E	22					
400	HX1-400E	26					
500	HX1-500E	30					
800	HX1-800E	35					
1000	HX1-1000E	38					
1200	HX1-1200E	42					

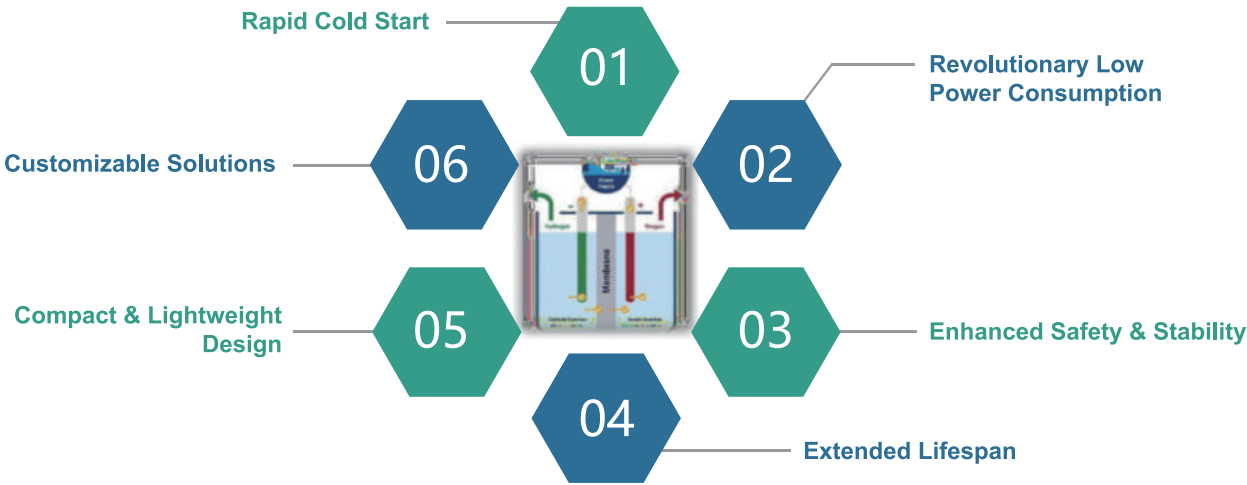
Note: DC power consumption value which is working under 100% of the load.

HX1-C Series

Hydrogen Generation (Nm³/h)	Model	Weight (T)	DC power consumption (kWh/Nm³)	Cold start time (min)	Load range (%)	Work pressure (MPa)	Operating temperature (°C)
2	HX1-2C	0.45	≤4.3	≤1	15-150	1.6/3.2	90±5
5	HX1-5C	0.6					
10	HX1-10C	1.2					
20	HX1-20C	1.5					
30	HX1-30C	1.8					
50	HX1-50C	3.4					
80	HX1-80C	3.9		≤15		1.6	
100	HX1-100C	4.3					
200	HX1-200C	8					
300	HX1-300C	10					
400	HX1-400C	18					
500	HX1-500C	20					
800	HX1-800C	26					
1000	HX1-1000C	28					
1200	HX1-1200C	31					
1500	HX1-1500C	37					
2000	HX1-2000C	45					

Note: DC power consumption value which is working under 100% of the load.

Product Features



Certifications & Performance

CNAS-certified (China National Accreditation Service for Conformity Assessment).
Industry-leading performance metrics in power efficiency, durability, and adaptability.



1000Nm³/h Electrolyzer

Tested in March 2023

Weight: 35T

CNAS test data (DC power consumption)

3.75kWh/Nm³H₂@2000A/m²

4.03kWh/Nm³H₂@4000A/m²

Cold start time: 134 s



20Nm³/h hydrogen generator



200Nm³/h hydrogen generator



1000Nm³/h hydrogen generator

Integrated Solution for Water Electrolysis Hydrogen Generation System

In addition to standard products, customized hydrogen generation system solutions are provided for different hydrogen generation scenarios and customer requests.

- Optimize project economy;
- Optimized space utilization;
- Reduce total costs of hydrogen generation;
- Improve the utilization rate of renewable energy;
- Collaborate with upstream and downstream industry partners to provide integrated solutions.

Applications



Off-grid hydrogen generation by renewable energy



Coupling green hydrogen in chemical industry



Hydrogen generation and refueling station



Hydrogen generation by offshore wind power



Using green hydrogen in metallurgy industry



Marine hydrogen-based fuel production

Post-treatment System Based on 1000Nm³/h Eletrolyzer(Customizable)

Component	Performance Indicator	1 to 1	4 to 1
Gas Separation equipment	Hydrogen processing capacity (Nm³/h)	1000 (1500)	4000 (6000)
	Working pressure (MPa)	1.6	
Purification Equipment	Hydrogen processing capacity (Nm³/h)	1000 (1500)	4000 (6000)
	Hydrogen purity (%)	≥99.999	
	Dew point (°C)	≤-70	
	Output pressure (MPa)	1.6	
	Regeneration method : three-tower process,hydrogen regeneration,no venting		

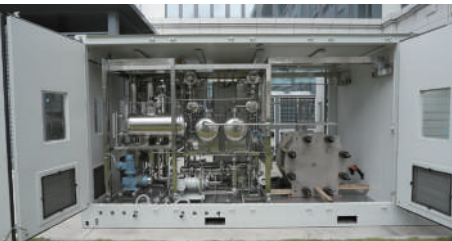
Delivered Project



National Key R&D Program – Hydrogen Energy Project 1.1
1000Nm³/h Hydrogen Generator



5Nm³/h Hydrogen Generator
Jan.2023



20Nm³/h Hydrogen Generator
Nov.2023



200Nm³/h Hydrogen Generator
May.2024



600Nm³/h Hydrogen Generator
Jun.2025



1000Nm³/h Hydrogen Generator
Apr.2025



1000Nm³/h Hydrogen Generator
Feb.2025

Application Projects

