



L-H₂ Vessel and Company Introduction

国富万家 氢尽所能

Catalogue

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Sales Performance

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L-H₂ Product introduction



First phase: Workshop 44,000m², office building, 7,200m²;

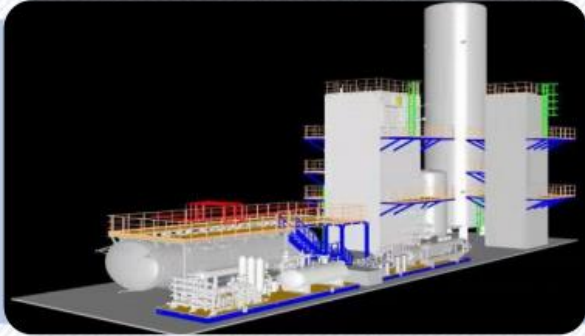
Second phase: Workshop 15,000m²;

Third phase: Workshop & office building: 100,000m²;

Jiangsu GUOFU Hydrogen Energy Equipment Co., Ltd. was established in 2016, specializes in the design, manufacture and technical service of electrolyzer, liquid hydrogen vessels, HRS and on board hydrogen supply system. We also undertake the design and manufacture of hydrogen liquefaction plants and other projects. Based on advanced technology and professional experience, GUOFUHEE is becoming the leading equipment supplier in China for the integrated hydrogen solution.

More than 400 patents have been applied for and 166 patents have been authorized, including 20 invention patents. Participated in the compilation of 6 national standards and 8 group standards, and obtained 14 software copyrights; The company has undertaken 5 national key R & D projects and more than 10 provincial major scientific research projects.

Main products



Liquid hydrogen products

Large-scale hydrogen liquefaction equipment
Liquid hydrogen storage tanks, Containers



HRS Products

High-pressure Hydrogen Refueling Stations
Liquid Hydrogen Refueling Stations
Compressor skid, Dispenser



Compressed Hydrogen Storage System

High-pressure Hydrogen Cylinder, Type III
& Type IV
Onboard hydrogen supply system, Storage
tube bundle

ASME Certification for Class 1/2/3 transport tanks and pressure vessels

The American Society of Mechanical Engineers	 CERTIFICATE OF AUTHORIZATION	 CERTIFICATE OF AUTHORIZATION	The American Society of Mechanical Engineers
	<p>The named company is authorized by The American Society of Mechanical Engineers (ASME) for the scope of activity shown below in accordance with the applicable rules of the ASME Boiler and Pressure Vessel Code. The use of the ASME Single Certification Mark and the authority granted by this Certificate of Authorization are subject to the provisions of the agreement set forth in the application. Any construction stamped with the ASME Single Certification Mark shall have been built strictly in accordance with the provisions of the ASME Boiler and Pressure Vessel Code.</p> <p>COMPANY: Jiangsu Guofu Hydrogen Energy Equipment Co., Ltd. No.236, Guotai North Road, Yangshe Town, Zhangjiagang, Jiangsu 215600 People's Republic of China</p> <p>SCOPE: Manufacture of Class 1, 2 & 3 transport tanks at the above location only</p> <p>AUTHORIZED: August 13, 2021 EXPIRES: August 13, 2024 CERTIFICATE NUMBER: 59586</p> <p style="text-align: right;">  Board Chair, Conformity Assessment  Managing Director, Conformity Assessment </p>	<p>The named company is authorized by The American Society of Mechanical Engineers (ASME) for the scope of activity shown below in accordance with the applicable rules of the ASME Boiler and Pressure Vessel Code. The use of the ASME Single Certification Mark and the authority granted by this Certificate of Authorization are subject to the provisions of the agreement set forth in the application. Any construction stamped with the ASME Single Certification Mark shall have been built strictly in accordance with the provisions of the ASME Boiler and Pressure Vessel Code.</p> <p>COMPANY: Jiangsu Guofu Hydrogen Energy Equipment Co., Ltd. No.236, Guotai North Road, Yangshe Town, Zhangjiagang, Jiangsu 215600 People's Republic of China</p> <p>SCOPE: Manufacture of pressure vessels at the above location only</p> <p>AUTHORIZED: August 13, 2021 EXPIRES: August 13, 2024 CERTIFICATE NUMBER: 59587</p> <p style="text-align: right;">  Board Chair, Conformity Assessment  Managing Director, Conformity Assessment </p>	
<p>Certification: “T”</p> <p>Products Scope: Manufacture of Class 1, 2 & 3 transport tanks at the above location only</p>		<p>Certification: “U”</p> <p>Products Scope: Manufacture of pressure vessels</p> <p>Cert. Organization: The American Society of Mechanical Engineers</p>	

European Union CE Certification for compressed hydrogen bottles and tube bundles

Certificate

type approval
for manufacturing of
transportable pressure equipment

Certificate-No.: 01 202 642/B-190023-T

Applicant: Zhangjiagang Furui Hydrogen Power Equipment Co., Ltd.
No. 919 Guotaibei Road, Yangshe Town, Zhangjiagang Suzhou City, Jiangsu Province, China

Manufacturer: See Applicant

Applicable provisions and standards: Dir. 2010/35/EU, in compliance with ADR/RID 2019 and ISO 11119-2:2012 + Amd. 1:2014

Description of the type: Refillable fully wrapped fibre reinforced composite gas cylinders with load-sharing metal (aluminium) liner for compressed gases with the entry 'AA' in column 6 (cylinders/A) in table 1 of EN ISO 11114-1.
Volume 150 l, Working Pressure p_w 300 bar(g), Test Pressure p_t 450 bar(g), Diameter 403±4 mm, Working Temperature -50 / +65 °C, design life 30 years, no underwater use permitted, max. torque 130 Nm, use only without pressure relief device, liner heat treatment acc. to dwg. no. CPRIII-377-60-150-30-S-02.

Drawing No.: CPRIII-377-60-150-30-S-01 and CPRIII-377-60-150-30-S-02; both rev. 0, dated 2018.12

Report-No.: This approval is based on the results of the type examination report no. 244121095, CHN 6, 190018 T, revision 0, dated 2019-07-19

Validity: This approval is valid for a period not exceeding ten years. End of period: 2029/09

D-54295 Trier, 2019-09-30
TÜV Rheinland Industrie Service GmbH
Am Grauen Stein, D-51105 Köln

on behalf Dipl.-Ing. (FH) Christof Lenters
Notified body according to dir. 2010/35/EU and ADR/RID,
accredited according to EN ISO/IEC 17020 by DAkkS and ZLS.



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e-mail: idiada@idiada.com

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INFORME / REPORT N° CN18120673

REGLAMENTO (CE) No.79/2009 Y REGLAMENTO (EU) No.406/2010 RELATIVOS A LOS DEPÓSITOS DE HIDRÓGENO DISEÑADOS PARA EL USO DE HIDRÓGENO COMPRIMIDO (EN ESTADO GASEOSO)
REGULATION (EC) No.79/2009 AND REGULATION (EU) No.406/2010 RELATING TO HYDROGEN CONTAINERS DESIGNED TO USE COMPRESSED (GASEOUS) HYDROGEN

Solicitante / Applicant: Zhangjiagang Furui Hydrogen Equipment Co., Ltd.
Marca / Make: FURUIHP
Tipo / Type: CGH3-C-376-140-35-S
Clasificación de los taques / Container Classification: --
Fecha y lugar de emisión del informe / Place and Date of issue: L'Albormar, Santa Oliva (Tarragona) 22/03/2019

CONCLUSIONES / CONCLUSIONS: Este contenedor ha sido probado de acuerdo a las especificaciones del Reglamento (CE) no 406/2010 con los siguientes resultados obtenidos. / This container has been tested according to specifications from Regulation (EU) No.406/2010 with the following achieved results.

Realizado / Performed by: V. B* / Revised by:

Allen Shen

Fei (allen) Shen
INGENIERO DE HOMOLOGACIONES
HOMOLOGATION ENGINEER

Linis Sant Gomis

Linis Sant Gomis
JEFE DE DEPARTAMENTO
DEPARTMENT MANAGER

LOS RESULTADOS PRESENTADOS SE REFIEREN ÚNICAMENTE A LA MUESTRA ENSAYADA.
THE PRESENTED RESULTS REFER ONLY TO THE TESTED SAMPLE.
QUEDA TERMINantemente PROHIBIDA LA REPRODUCCION PARCIAL DE ESTE INFORME SIN PERMISO EXPRESO DE IDIADA.
THE PARTIAL REPRODUCTION OF THIS REPORT WITHOUT THE PERMISSION OF IDIADA IS COMPLETELY FORBIDDEN.

IDIADA Ingeniería y Tecnología, S.A. ILLP, A-03061810



Módulo de informe de conformidad con el Reglamento (CE) No. 79/2009 y el Reglamento (UE) No. 406/2010. El informe de informe de conformidad con el Reglamento (CE) No. 79/2009 y el Reglamento (UE) No. 406/2010.

IDIADA CN18120673

CE Certification : ETPED 2010/35/EU with
ADR/RID:2017,
Products Name:

Hydrogen storage bottles manufactured according to
EN ISO 11119-2:2012 and tube bundles manufactured
based on EN ISO 10961: 2012.

Cert. Organization:TÜV Rheinland
EU PED Directive: No.79/2009 and No.406/2010

Products Name:
Compressed hydrogen container manufactured
according to No.79/2009 and No.406/2010,type:
CGH3-C-376-140-35-S.
Cert. Organization:IDIADA

European Union CE Certification for HRS equipments





协议编号: TUV-2340856HRS-001

HRS certification Agreement
加氢站认证协议

Between

TÜV Rheinland Greater China
TÜV 德国莱茵大中华区

And

JangsuGuofu Hydrogen Energy Technology Equipment Co.,Ltd
江苏国富氢能技术装备股份有限公司

Annex 1: Object list and certificate 产品清单和认证要求

设备名称	认证要求	备注
管件	EN10204-3.1/3.2	采购的产品自带证书即可
安全阀	PED	采购的产品自带证书即可
电磁阀	ATEX	采购的产品自带证书即可
卸气柱	ATEX	所有电气部件需 ATEX 证书
压缩机撬	ATEX, MD	所有电气部件需带有 ATEX 证书 压缩机、风机也需要提供 ATEX 证书
顺序控制盘	ATEX	所有电气部件需带有 ATEX 证书
加氢机控制面板	ATEX	防爆保护类型 Ex ic
加氢机面板隔爆箱	ATEX	需要防爆体系
加氢机整机	ATEX	不含压缩机, 所有电气部件需带有 ATEX 证书
加氢机整机	EMC	可选项
冷冻机组	MD	若不在安全区, 需要 ATEX
安全控制器、安全仪表	SIL 认证	采购的部件自带证书即可
安全仪表系统 SIS	出具安全完整性等级 SIL 验证报告	加氢站 PED 认证的必要工作
安全控制回路 (传感器, 探测仪等)	出具安全回路 PL 等级评估报告	控制柜 LVD 认证的必要工作
启动柜/变频器/控制柜	LVD	安全控制回路需要做功能安全评估
加氢站	MD, PED	所有的证书发证之后, 包括 ATEX、PED、EMC、LVD、MID 等, 对加氢站整体发一张 MD, PED 证书
加氢站	EMC	现场测试

备注:

- 上述设备单元的 EMC 工作可由制造商自我申明, 若需要 TUV 莱茵认证, 费用另计
- 若客户分阶段认证, 根据需要认证的产品名称和认证类别, 需再与 TUV 莱茵签署相应的认证合同, 作为本协议的补充部分。



HRS products are currently undergoing CE certification, and a framework agreement has been signed with Shanghai TÜV Rheinland, and all HRS products will be certified.

There are 129 patents for our HRS products

- The company is a high-tech enterprise in Jiangsu Province.
- Qualification:
 - ✓ C2 pressure vessel design and manufacturing license
 - ✓ B3 special cylinder manufacturing license
 - ✓ ISO9001 quality management system
 - ✓ IATF 16949-2016 system

- **Participate in the preparation of national standards**

- ✓ GB/T 18442.3-2019 《Static vacuum insulated cryogenic pressure vessels Part3: Design》
- ✓ GB/T 40045-2021 《Fuel specification for hydrogen fuel cell vehicles : Liquid hydrogen》
- ✓ GB/T 40061-2021 《Technical specification for liquid hydrogen production system》
- ✓ GB/T 40060-2021 《 Technical requirements for storage and transportation of liquid hydrogen》



齐鲁氢能（山东）发展有限公司一期氢能一体化项目中标公示
(招标编号: SDJCJS2021001)

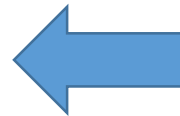
一、中标人信息:

标段(包)[001]副产氢制氢(同时满足天然气制氢及齐鲁石化副产氢)EPC(土建部分提供土建条件图;地脚螺栓;模板;配合总体院(三维)进行土建基础设计);:

中标人: 山东津攀环保科技有限公司 中标价格: 988.320000 万元

标段(包)[002]氢液化、储存、装车站EPC(土建部分提供土建部分条件图;地脚螺栓;模板;配合总体院(三维)进行土建基础设计);:

中标人: 江苏国富氢能技术装备股份有限公司 中标价格: 12820.000000 万元



Shandong Qilu LH2 project

The first commercial solution of LH2 industry chain(liquefaction/storage/filling),rated at 13,200 tons LH2 production per year,3 sets 200m3 horizontal storage vessels.

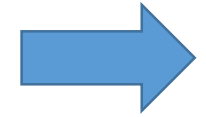
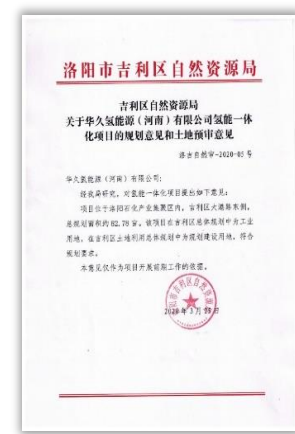
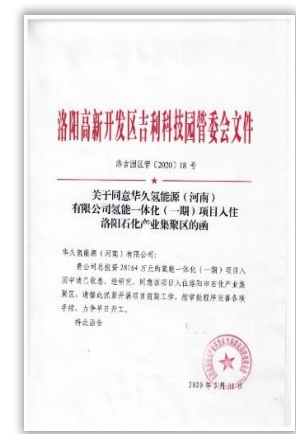
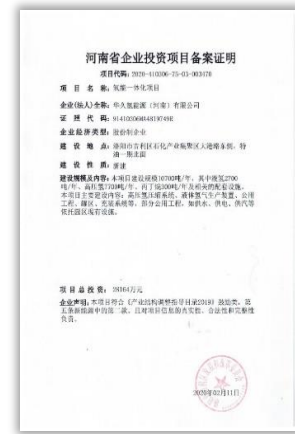
The project is under construction now,will start LH2 production at the end of 2023.

He'nan Huajiu energy project

LH2 production at 2,700 tons/year,GH2 7,700 tons/year, 3 sets 200m3 horizontal storage vessels.

The project is under construction now,will start LH2 production at 2024.

Huajiu energy project



Until now, GUOFUHEE has provided complete sets of equipment for more than 83 hydrogen refueling stations in with a domestic market share of about 40%, market share NO.1.

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No.	Project	HRS capacity	Supply scope
1	Shiyan Dongfeng HRS	500kg/d	Compressor Skid with dispensor
2	Zhongshan Dayang HRS	500kg/d	Compressor Skid with dispensor
3	Shanghai Dian qudong HRS	500kg/d	Compressor Skid with dispensor
4	Guangdong Guohong HRS	500kg/d	Compressor Skid with dispensor
5	Sanshui Bus HRS	60kg/d	Temporary HRS
6	Nantong Baiying HRS	60kg/d	Compressor Skid with dispensor
7	Shenzhen Kaihaoda HRS with site H2 production	60kg/d	Compressor H2 production with dispensor
8	Shanghai Zhognsu Jiangqiao HRS	750kg/d	Skid type HRS, GUOFUHEE provide HRS design, equipment production and installation.
9	Sichuan Energy Invertment Chengdou Bidou District HRS	500kg/d	Compressor Skid with dispensor
10	Zhengzhou Yutong HRS	1000kg/d	Fixed type HRS, GUOFUHEE provide HRS design, equipments and installation.
11
12



FoShan Sinopec HRS



DaTong HRS(Hydrogen Generate on site)



FoShan Sinopec HRS



Zhengzhou Yutong HRS



FoShan Sanshui HRS



GuangZhou HRS



GuoFu HRS



ChengDu HRS



GaoMing HRS for Light Rail



TongLing HRS



JiaHua HRS



FoShan HRS



大同开沃燃料电池公交车



淄博吉利燃料电池公交车



武汉开沃燃料电池公交车



郑州燃料电池公交车



佛山氢燃料电池物流车



华菱星马氢燃料电池31T自卸车 (210L×6)



一汽氢燃料电池49T重卡 (165L×8)



开沃氢燃料电池31T自卸车 (165L×6)

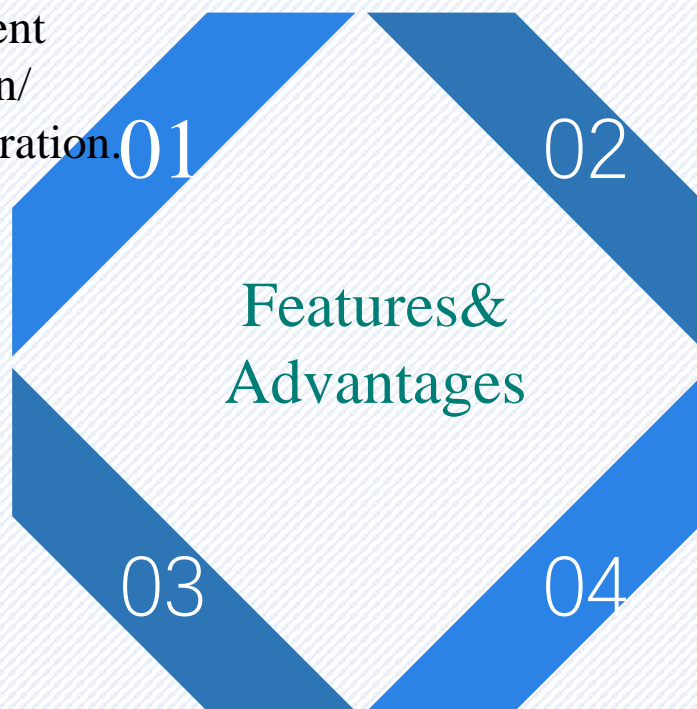
Item	Product				
	60/1.0 V LH2 stor. vessel	60/1.0 H LH2 stor. vessel	40/1.0 V LH2 stor. vessel	40/1.0 H LH2 stor. vessel	200/0.4 V LH2 stor. vessel
Working pressure(MPa)	≤1.0	≤1.0	≤1.0	≤1.0	≤0.4
Design pressure(MPa)	1.20	1.20	1.20	1.20	0.55
Working temp.(°C)	-253~-240	-253~-240	-253~-240	-253 ~ -240	-253 ~ -246
Material min. design temp.(°C)	-253	-253	-253	-253	-253
Main internal material withstand pressure	S31608-LH	S31608-LH	S31608-LH	S31608-LH	S31608-LH
Geo. volume(normal temp.)(m ³)	60	60	44.45	45.45	200
Rated filling ratio	90%	90%	90%	88%	90%
Static boil-off rate(%/d)	≤0.1(LN ₂)/≤0.74(LH ₂)	≤0.1(LN ₂)/≤0.74(LH ₂)	≤0.115(LN ₂)/≤0.805(LH ₂)	≤0.115(LN ₂)/≤0.805(LH ₂)	≤0.46 (LH ₂)
Vacuum interlayer leakage ratio (Pa*m ³ /s)	≤1×10 ⁻⁶	≤1×10 ⁻⁶	≤1×10 ⁻⁶	≤1×10 ⁻⁶	≤1×10 ⁻⁶
Sealing-off vacuum degree(Pa)	≤0.03	≤0.03	≤0.02	≤0.02	≤0.03
Insulation	Multi-layers high vacuum insulation				
Dimension(mm)	13215×5600×3670 L×W×H(Horizontal)	13635×3800×8965	11700×5600×3670 L×W×H(Horizontal)	10860×3800×8965	~26283×4872×9800
Mass when empty (kg)	~25330	24630	20800	20400	64930
Application	LH ₂ HRS	LH ₂ HRS	LH ₂ HRS	LH ₂ HRS	LH ₂ factory

Special Materials

Special materials are used to compliant with liquid hydrogen. In the material's development stage, the failure mode/chemical composition/mechanical properties are taken into consideration.

Unique vacuum process

Adopting the company's vacuum treatment process, which can effectively improve the interlayer vacuum degree of thermal insulation materials, reduce the leakage rate in the whole life cycle and increase the vacuum life.



Excellent thermal insulation

By adopting the special designed structure support, with finite element stress and heat transfer analysis, minimize the solid heat conduction and radiant heat conduction. Ensure safety and reliability.

Sufficient low temperature verification

Cold shock test and helium leak detection are adopted in the manufacturing process of liquid hydrogen container to reduce the risk of leakage and failure in the usage of the product.

Type	DXH3612			
ISO Container	42K7			
Item	Unit	Parameter		Remark
Medium	—	Inter vessel LH2(Parahydrogen Content≥95%)	Outside shell	
Medium features	—	Flammable、Explosive	—	
Medium density	kg/m ³	70.83	—	
Working pressure	MPa	≤1.0	Vacuum	
Design pressure		1.20	-0.1	
Working temp.	°C	-253 ~ -240	-40 ~ 50	
Material min. design temp.		-253	-40	
Geometric volume	m ³	39.5	10.92 (Interlayer)	
Net volume		35.5	—	Rated filling ratio: 0.9
Vessel material	—	S31608-LH/ S31603III-LH	16MnDR/S30408	
Static boil off rate	%/d	≤0.128 (LN ₂) /≤0.73 (LH ₂)		
Sealing-off vacuum degree	Pa	≤0.08		
Vacuum interlayer leakage ratio	Pa*m ³ /s	≤1×10 ⁻⁶		
Mass when empty	kg	15900		/
Load mass		2515		/
Rated mass		24000		
Insulation	—	Muti-layers high vacuum insulation		/
Dimension	mm	12192×2438×2591		L×W×H

Water-land transshipment

Zero storage changes from the initial filling of liquid hydrogen to the end user, reduce the loss in the process of liquid hydrogen transportation

Efficient support structure

Special designed supporting structure for liquid hydrogen container, can effectively reduce the overall heat leakage and the static evaporation rate can be less than 0.73% / day (LH₂), and the non-destructive storage time shall not be less than 15 days



New insulation design

The new combined high vacuum multilayer insulation structure and the vacuum treatment process scheme, the vacuum degree will not exceed 120% of the design value within 3 years

Multi-function pipes

Equipped with filling/overflow/self pressure building and full level measuring pipe

Key Product for Liquid Hydrogen Storage and Transportation

► Liquid Hydrogen Tank of vertical and horizontal Type



➤ Liquid Hydrogen Container for transportation





持续创新才有国富
生生不息方为氢能

Thanks for attention!