



江苏华滋能源工程有限公司

Jiangsu Watts Energy & Engineering Co., Ltd.



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I.
Overview
公司概况

I. Overview 公司概况



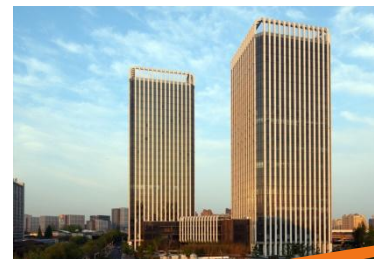
Jiangsu Watts Energy & Engineering Co., Ltd
江苏华滋能源工程有限公司

- **Registered capital: RMB 400 million**
注册资本：4 亿元人民币
- **Total Investment: RMB 2 billion**
投资总额：20 亿元人民币
- **Area: 1000mu**
占地面积：1000 亩



No.88, Offshore Road, Qidong, Jiangsu. P.R.C
江苏启东海工大道88号

制造基地，启东



Building A, Watts Gallop Tower,
2816# Yixian Road, Shanghai
逸仙路2816号华滋奔腾大厦A栋208室

研发中心，上海



Jiangsu Watts Energy & Engineering Co., Ltd (“WE” for short) is established by Watts Gallop Group in September 2008, as formerly with the name of Nantong Watts Gallop Shipyard.

In year 2015, WE introduced a second shareholder named JHW Engineering & Contracting Limited, who is registered in Hong Kong and mainly invested by JACCAR Holdings. Both shareholders target at leading WOE to be a professional mega special oil & gas energy equipment manufacturing facility.

江苏华滋能源工程有限公司（简称华滋能源）前身为南通华滋奔腾船业有限公司，于2008年由上海华滋奔腾控股集团（简称华滋奔腾集团）投资创立。

2015年，公司引进法国雅凯控股集团，与华滋奔腾集团一起致力于将公司打造成油气能源工程大型特种装备制造基地。

I. Overview
公司概况

Development History
发展历程



Introduced a second shareholder Jaccar Holdings, renamed as WE. Oil & Gas project oriented facilities started to extend
公司引进法国雅凯控股集团，更名为“江苏华滋能源工程有限公司”，并投资改扩建工程项目，打造油气能源特种装备制造基地

2008.8

Nantong Watts Gallop Shipyard is initiated by Shanghai Watts Gallop Group
华滋奔腾集团投资设立南通奔腾船业，主营特种船舶修理及船舶拆解业务

2015.2



World first 85,000m³ VLEC Tank Delivery
全球首制85,000m³ 超大型液化乙烷船液罐交付

2017.12



First 15,000m³ RPV Ethylene Tanks Delivery
首制15,000m³ RPV陆上乙烯乙烷储罐交付

2018.4



First Chemical Pressure Vessels Delivery
首制大型石化压力容器交付

2018.6

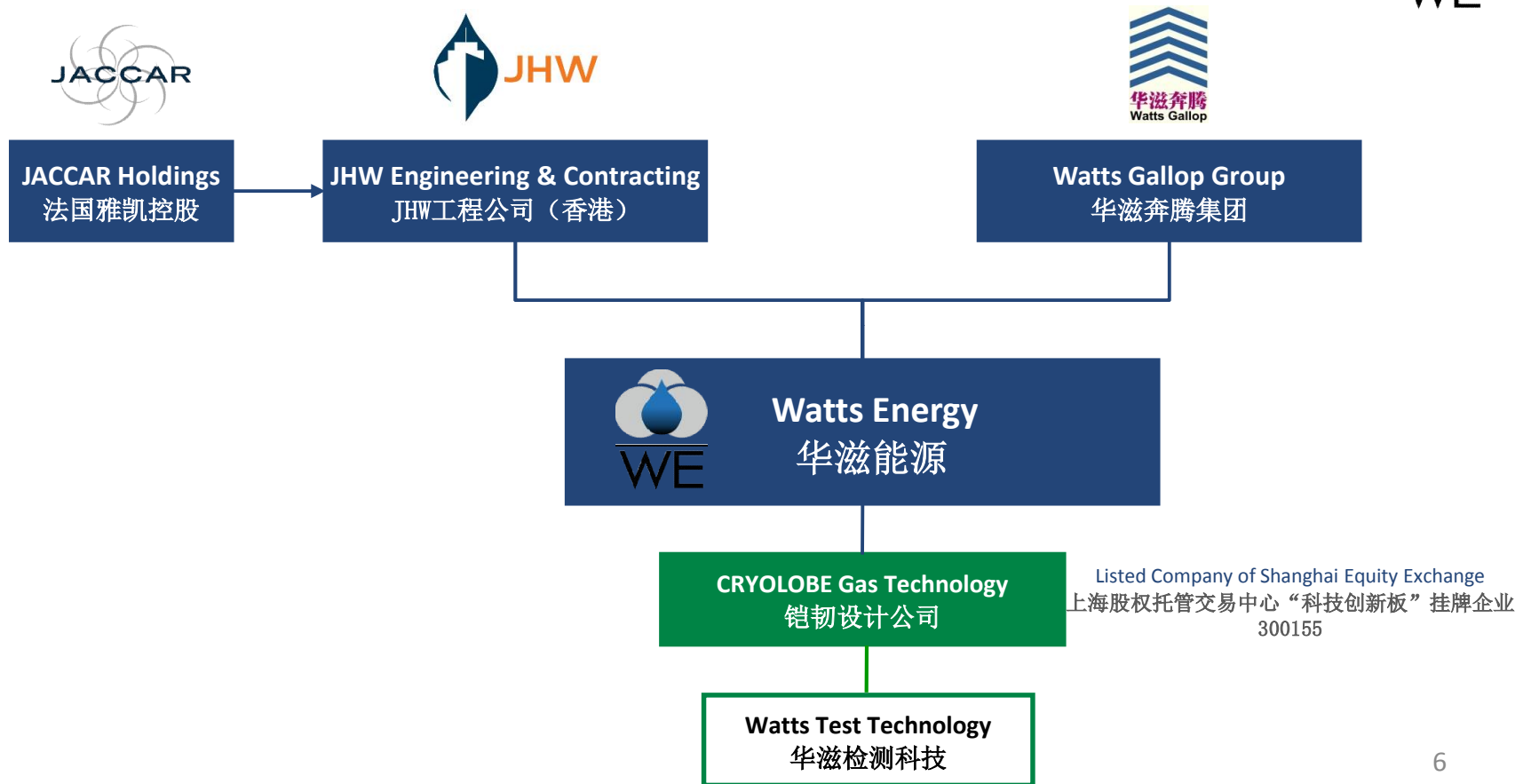


First Offshore Wind Energy Pile Delivery
首制大型海洋风电装备交付

2018.6

I. Overview
公司概况

Shareholding Structure
股权结构





上海华滋奔腾控股集团有限公司

创立于1999年，前身为浙江省富阳市政工程公司，经过三十多年的开拓进取与积累沉淀，公司形成以**海洋工程施工(华滋国际海洋, 2258HK)**与**市政园林工程、能源装备制造、房地产开发及商业投资**为三大主营业务的综合型企业集团，业务遍及长三角、珠三角及沿海沿江地区，并已稳步拓展到德国、法国、印尼、文莱、越南、菲律宾等海外市场。

Shanghai Watts Gallop Holding Group

Former as Zhejiang Fuyang Municipal Engineering Company, Shanghai Watts Gallop Holding Group was initiated in 1999. After more than thirty years' development, Watts Gallop Group is now growing as an integrated enterprise group with main business sectors: **Maritime Engineering Construction (Watts International Maritime, 2258HK) and Municipal Engineering, Energy Equipment, Real Estate Development and Industry Investment.** The business areas include Yangtze River Delta, Pearl River Delta and other coastal areas, and has steadily extended to Europe, Indonesia, Brunei, Vietnam, and Philippines etc.,





JHW工程公司

由法国雅凯控股投资设立于香港的海上油气工程总承包公司。

雅凯控股为法籍Jacques de Châteauevieux先生持有的私人集团公司，主营业务为气体运输、海上项目EPC、深海渔业等，拥有一支年轻的LEG\LNG船队，下属公司丹麦EVERGAS是全球领先的中小型液化气船运输公司之一。在母公司雅凯控股的支持下，JHW工程公司能够提供从5000m³到95000m³的LPG/LEG/LNG运输船EPC服务。

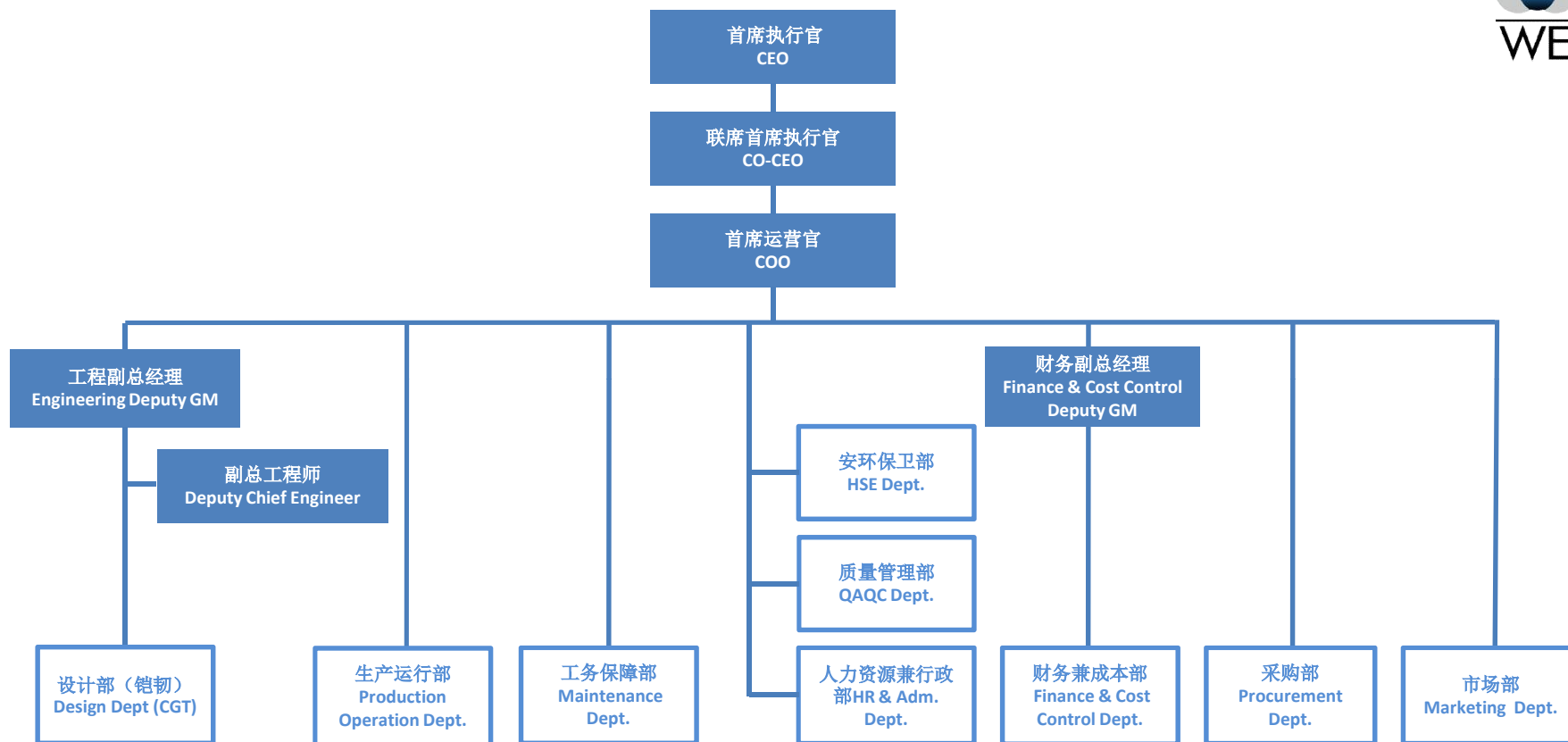
JHW Engineering & Contracting (JHW E&C)

A new EPC (engineering, procurement & contracting) company registered in Hong Kong offering detailed EPC management solutions tailored to suit the customers' needs for the international shipping and offshore oil and gas industries invested by JACCAR Holdings. JACCAR is owned and managed by Mr. Jacques de Châteauevieux. JACCAR is also renowned for its tuna, toothfish and lobster fishing fleet (SAPMER). With a young fleet JACCAR's subsidiary EVERGAS is the world leading company in small and medium scale gas shipping. Since 2010 JACCAR has built and optimized a fleet dedicated to the transportation of ethylene, ethane and propane. With the support from its parent company JACCAR Holdings, JHW E&C can provide the EPC service for the high-tech LPG/LEG/LNG carriers from 5000m³ to 95000m³ with innovative C-type tank solutions.



I. Overview
公司概况

Organization Chart
组织架构



I. Overview 公司概况

Company Qualification 公司资质

➤ **Welding Workshop Approval Certificate**
LR、DNV-GL、BV、日本三菱造船工厂认证

This certificate replaces certificate n which is hereby terminated.

DNV-GL
WELDING WORKSHOP APPROVAL CERTIFICATE

This is to certify:
That **Jiangsu Watts Offshore & Engineering Co., Ltd.**
24#, Jiangsu Village, Hehe Town, Jiangsu Province
Qinghai, China

is approved for
Welding
in accordance with
DNV GL rules for classification – Ship

This Statement is issued to
Jiangsu Watts Energy & Production (Shanghai) Co., Ltd.
18 June 2019

QMS System Audit & Factory Audit Report

Ship Hull Structure and Offsetting Steel Structure Carbon, carbon Manganese (Steel) (Ship Hull)

Pressure Vessel Fabrication Steel Material: Austenitic Stainless Steel

RECOGNITION FOR BV MODE II SCHEME

Jiangsu Watts Offshore & Engineering Co., Ltd.
JIANGSU - CHINA

This certificate will expire on: 14 Mar 2022

➤ **Management System (ISO9001,14001,18001,50001)**
BV 四大管理体系认证

BUREAU VERITAS Certification

BUREAU VERITAS Certification

BUREAU VERITAS Certification

BUREAU VERITAS Certification

江苏华滋能源工程有限公司

江苏华滋能源工程有限公司
中国江苏省启东市东唐镇工灶港 888 号
统一社会信用代码: 913206816796201570
统一社会信用代码: 913206816796201570
统一社会信用代码: 913206816796201570
统一社会信用代码: 913206816796201570

必德认证集团认证有限公司美国分公司
能以上述单位的管理体系已经评审
并确认符合下列管理体系标准全部适用条款的要求

体系覆盖范围

ISO 9001:2015

质量、研发系统、燃气处理工程类模块、海上能源类模块、船结构的建造、储运系统、燃气处理工程类模块、海上能源类模块的设计及建造

首次获证日期: 2017 年 9 月 13 日
上次获证日期: NA
获证日期: NA
获证日期: 2017 年 9 月 13 日

证书号: CNB212323UK 版本号: No. 2. 控制日期: 2019 年 6 月 20 日

➤ **Special Equipment 特种设备制造**
✓ **A1 A2 Pressure Vessel A1A2压力容器**
✓ **GC2 Pressure Piping GC2压力管道**
➤ **ASME (U, U2) Certificate**
美国机械工程师学会认证

中华人民共和国
特种设备制造许可证
Manufacture License of Special Equipment
People's Republic of China
(压力容器)

编号: TS2210N1-2022

单位名称: 江苏华滋能源工程有限公司
制造地址: 江苏省南通市启东市东唐镇工灶港 888 号

经审查, 获准从事下列压力容器的制造:

级别	类别	品种	备注
A1 级	固定式压力容器	第三类压力容器	高压容器单套
A2 级			

江苏省特种设备安全监督检验研究院

发证日期: 2018 年 10 月 15 日
变更日期: 2019 年 05 月 27 日

CERTIFICATE OF AUTHORIZATION

U2

The named company is authorized by the American Society of Mechanical Engineers (ASME) for the scope of activity in accordance with the applicable rules of the ASME Boiler and Pressure Vessel Code. The use of the certification mark and the authority granted by the Certificate of Authorization are subject to the provisions of the agreement set forth in the application. Any contribution made with the certification mark shall have been fully audited in accordance with the provisions of the ASME Boiler and Pressure Vessel Code.

COMPANY: Jiangsu W

SCOPE: Manufacture of p

AUTHORIZED: Ap
EXPIRES: Ap
CERTIFICATE NUMBER: 96

CERTIFICATE OF AUTHORIZATION

U

The named company is authorized by the American Society of Mechanical Engineers (ASME) for the scope of activity stated below in accordance with the applicable rules of the ASME Boiler and Pressure Vessel Code. The use of the certification mark and the authority granted by the Certificate of Authorization are subject to the provisions of the agreement set forth in the application. Any contribution made with the certification mark shall have been fully audited in accordance with the provisions of the ASME Boiler and Pressure Vessel Code.

COMPANY: Jiangsu Watts Offshore & Engineering Co., Ltd
No. 88, Yezheng Avenue
Qidong, CHINA 226200
People's Republic of China

SCOPE: Manufacture of pressure vessels at the above location only

AUTHORIZED: April 9, 2018
EXPIRES: April 9, 2021
CERTIFICATE NUMBER: 95,891

➤ **70 Technical Patents**
70项技术专利(45项已授权)

➤ **Scientific & Technological Enterprise**
江苏省民营科技企业

➤ **Nantong Engineering Research Center**
南通市工程技术研究中心

发明专利证书

实用新型专利证书

发明名称: 一种汽液分离器

发明人: 陆广辉, 李文斌, 沈海华, 陶海峰, 王刚

专利号: ZL 2017 1 0857529.8

专利申请人: 上海铂智气体工程股份有限公司

授权公告日: 2019 年 05 月 08 日

发明名称: 一种汽液分离器

发明人: 陆广辉, 李文斌, 沈海华, 陶海峰, 王刚

专利号: ZL 2017 1 0857529.8

专利申请人: 上海铂智气体工程股份有限公司

授权公告日: 2019 年 05 月 08 日

江苏省民营科技企业

苏民科企证字 第 F-20160578 号

江苏华滋海洋工程有限公司

经确认符合《江苏省发展民营科技企业条例》的有关规定, 特此发证。

南通市科学技术局

通科委〔2016〕163 号

关于认定美亚药业海安有限公司等 49 家企业研发机构为南通市工程技术研究中心的通知

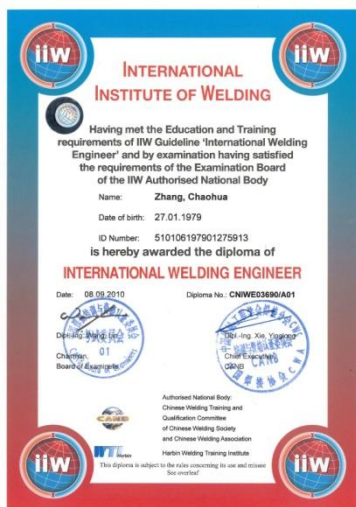


I. Overview
公司概况

Company Qualification
公司资质



➤ International Welding Engineer
IWE国际焊接工程师



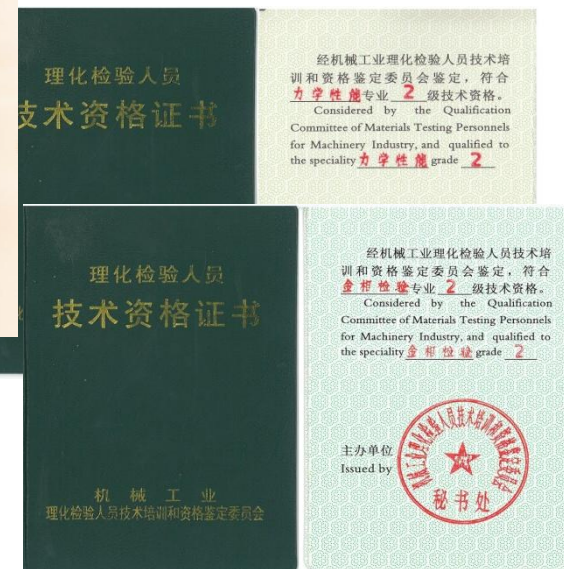
➤ Certified Welding Inspector
CWI注册焊接检验师
(美国焊接工程师协会)



➤ CCS-MT/PT/RT/UT II级
无损检测技术资格证书



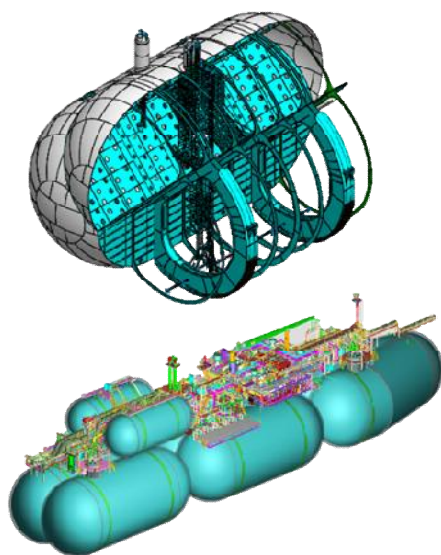
➤ Qualification Certificate for Physical
and Chemical Inspection
理化检验人员技术资格证书



I. Overview
公司概况

Partners
合作伙伴



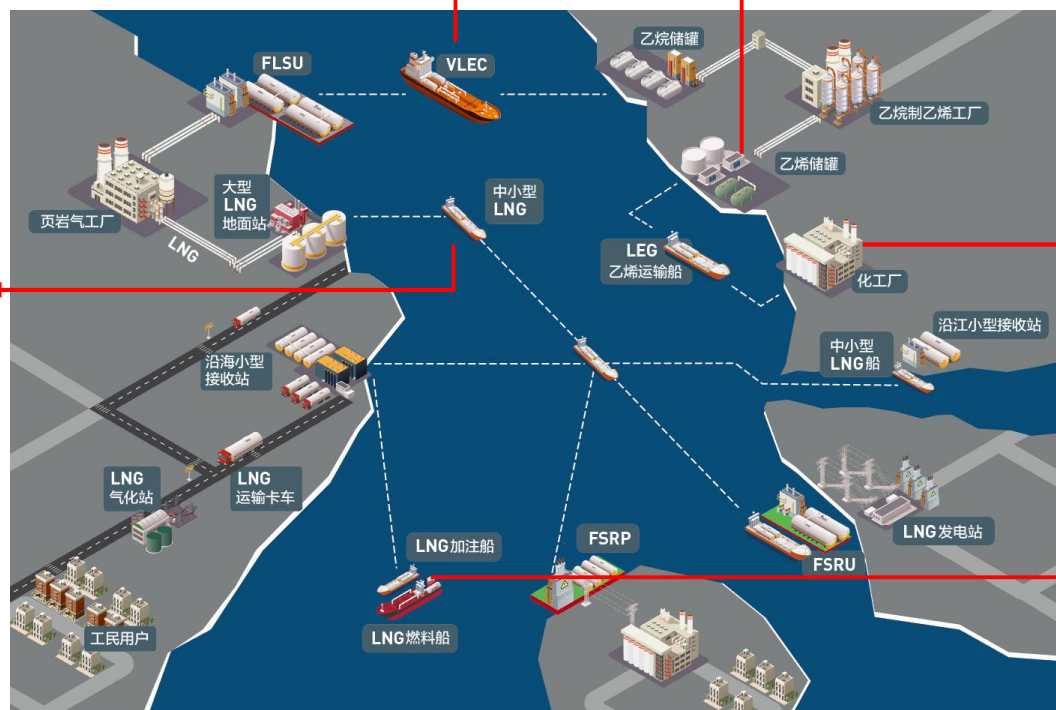
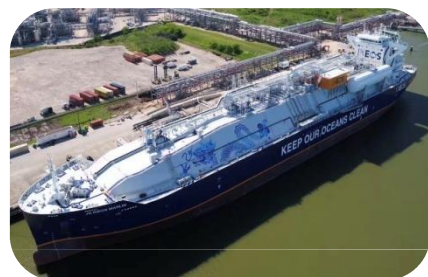


II. Engineering & Technology Capacity

工程技术能力

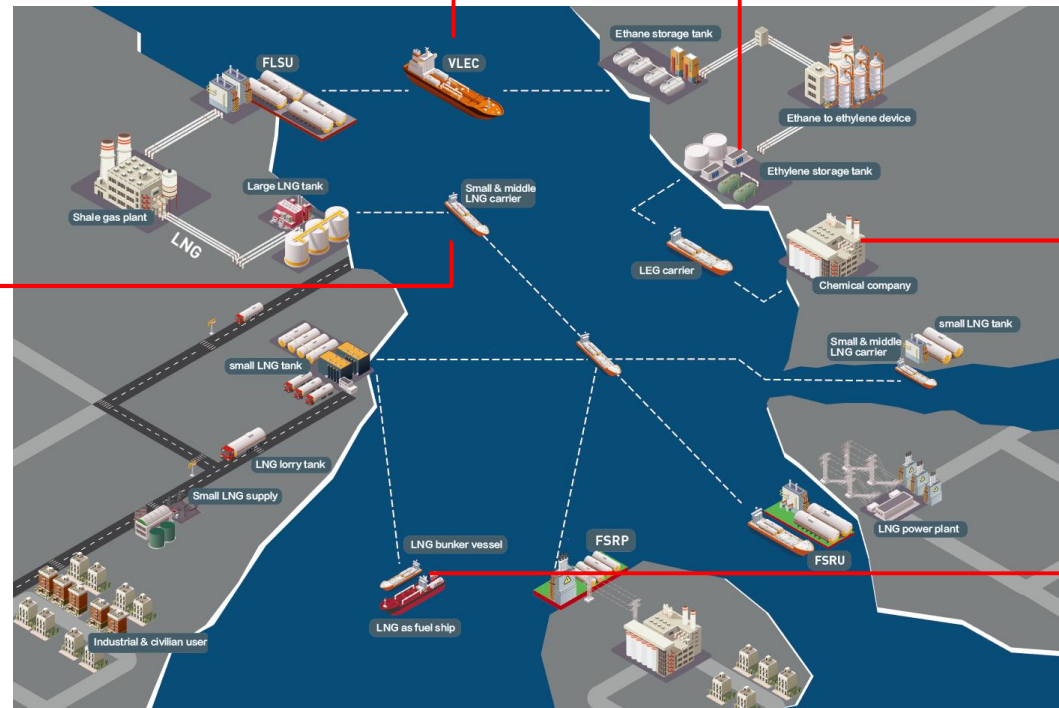
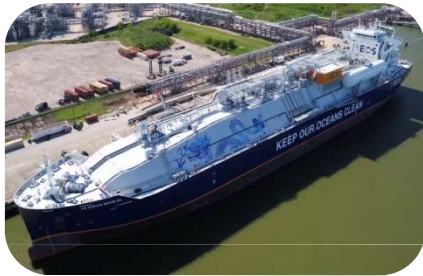


LNG/LEG Energy Storage & Transportation Solution 油气能源储运装备定制解决方案



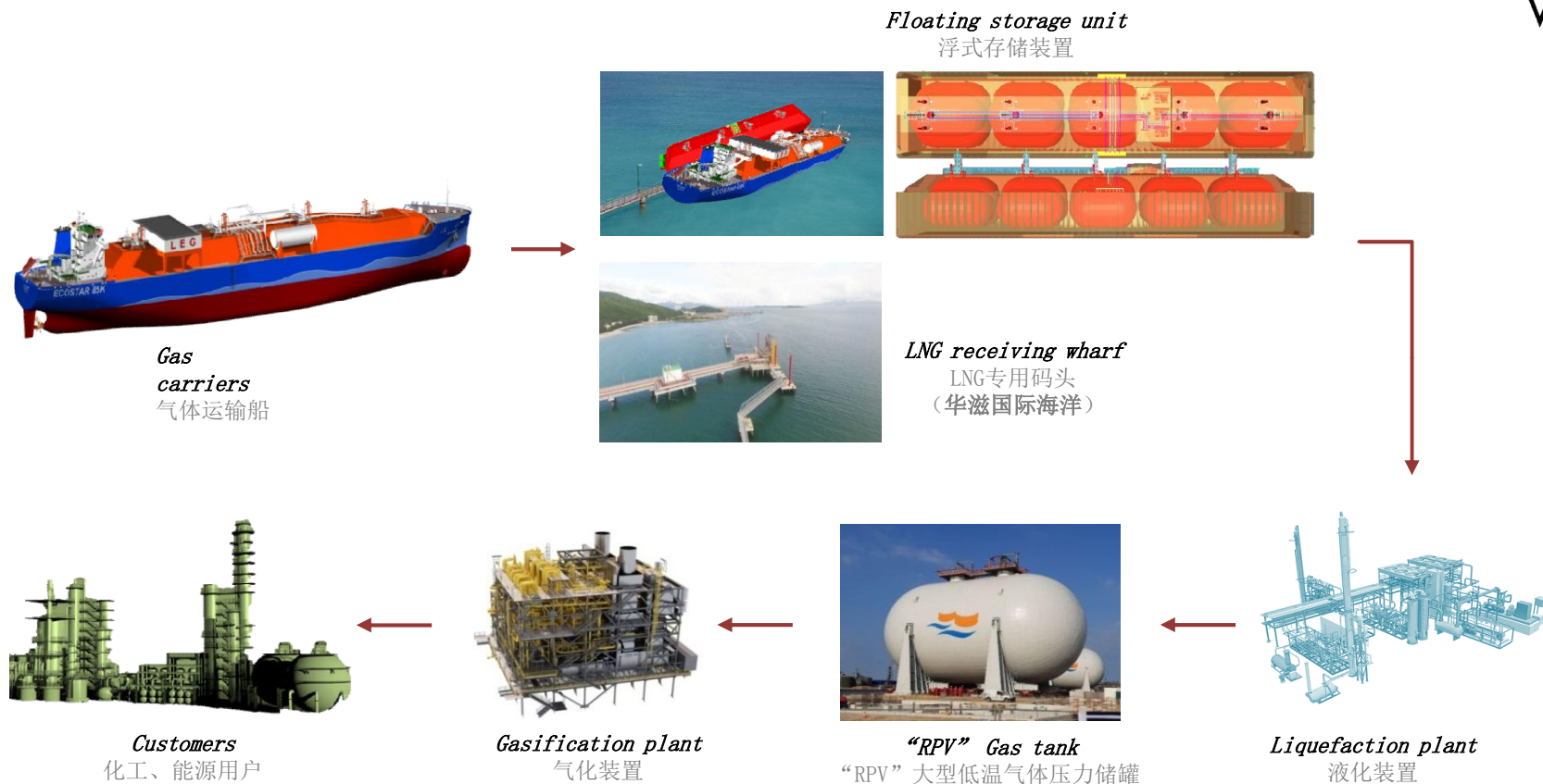


LNG/LEG Energy Storage & Transportation Solution 油气能源储运装备定制解决方案



II. Engineering & Technology Capacity
工程技术能力

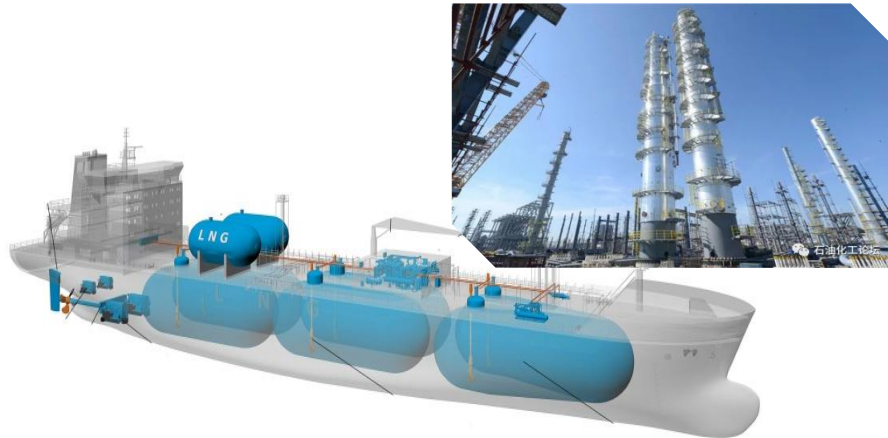
Scope
业务范围



液罐液货系统、石化压力容器
Cargo Tanks/Cargo Handling System/
Petrochemical Pressure Vessel

系列化的液罐及液货系统、石化压力容器
设计建造及交付

Series of cargo tanks, cargo handling system,
Petrochemical pressure vessel design, construction,
delivery



港机装备及海工模块
Port Machine/Offshore Modules

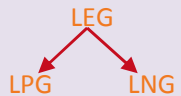
设计、采购、制造、现场监管及交付服务
Engineering, Procurement, Manufacturing,

Site Supervision, delivery service

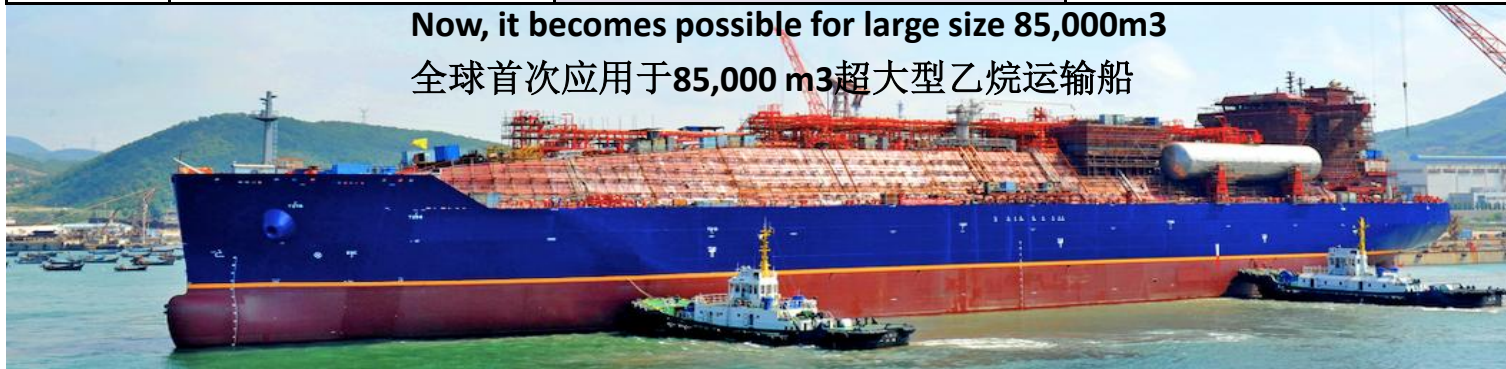


LNG Carrier
LNG 运输船

Semi-refrigerated Type-C tank solution for VLEC&VLGC
为VLEC&VLGC提供创新型半冷半压式C型罐解决方案

	Fully Pressurized 全压式	Semi Refrigerated 半冷半压式	Fully Refrigerated 全冷式
Working principle 工作原理	Gas in liquid because under pressure 由于压力使气体维持液态	Gas in liquid by a combination of low temperature and pressure 通过压力和低温的组合使气体维持液态	Gas in liquid because at low temperature (no pressure at all) 由于低温使气体维持液态 (无任何压力)
Vessel size 船型	Small vessels 小型船舶	Small to medium size 小型-中型船舶	Medium to big size 中型-大型船舶
Cargo 液货	LPG		LNG, LPG, LEG

Now, it becomes possible for large size 85,000m3
全球首次应用于85,000 m3超大型乙烷运输船



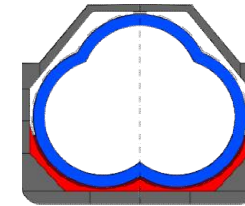
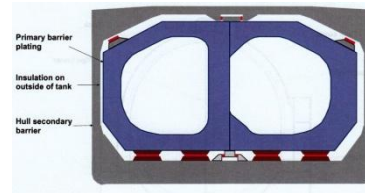
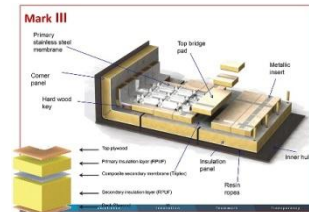
II. Engineering & Technology Capacity
工程技术能力

Scope
业务范围



LNG Carrier
LNG运输船

Containment Systems
容器系统



Topic 项目	Mark III-Membrane 薄膜式	Type A A型舱	Type C Star Trilobe C型三罐
MARVS 压力释放阀允许最大调定值	0.025 barg	0,25 barg	Abt. 4.5 barg 约4.5 barg
Boil off rate 汽化率	High due to low allowable MARVS 高 (由于MARVS低)	High due to low allowable MARVS 高 (由于MARVS低)	low due to high allowable MARVS 低 (由于MARVS高)
Pressure range 压力范围	0 ~ 0.025 barg	0 ~ 0.025 barg	0 ~ Abt. 4.5 barg
Secondary barrier 次屏壁	Yes, needed 需要	Yes, needed 需要	No need 不需要
Cargo warming up during passage 旅途中液货是否可升温	No 不	No 不	Yes, possible 可以
Required gas handling system 所需的液货系统	Fully-refrigerated 全冷式	Fully-refrigerated 全冷式	Semi-refrigerated 半冷半压式
Application 应用	The Large LNG Solutions 大型LNG船	The Large LPG Solutions 大型LPG船	The Preferred Multigas Solutions 多用途船的最佳选择

II. Engineering & Technology Capacity
工程技术能力

Scope
业务范围

LNG Carrier
LNG运输船

The preferred multi-gas solutions
多种气体的最佳解决方案



Safety
安全

The sealing system with C-type pressure tank is the safest in the system of liquid cargo, no need for secondary barrier
用C型压力罐的密封系统是在装液货的系统中最安全的，不需要次屏壁

Compared with non-independent membrane, C-type tanks avoid the risk of sloshing during navigation
与非独立薄膜仓相比，C型罐可以避免在航行过程中的晃荡所带来的风险

Low risk during construction
建造过程中

Flexibility
灵活性

Load or unload cargo at fully pressure or fully refrigerated terminals, so can load multiple cargoes
可以在全压或者全冷的终端装卸货物，因此可以装载多种货物

Possibility of storage and transportation of some liquid cargoes
部分液货存储及运输的可能性

Efficiency & Cost
效率与成本

Reduce energy consumption by eliminating the need for a continuous cooling system during transportation
由于在运输过程中不需要一个持续降温系统，因此可以降低能耗

Reduce energy consumption due to low boiling point
由于低沸点所带来的能耗的降低

Increase construction efficiency due to independence from the cabin
由于独立

Environmental
环保

Low emiss
低排放

II. Engineering & Technology Capacity 工程技术能力

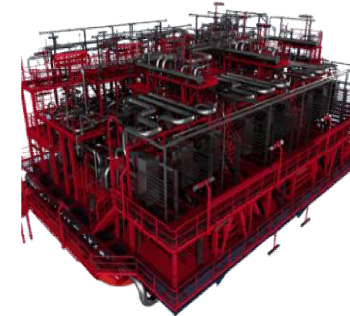
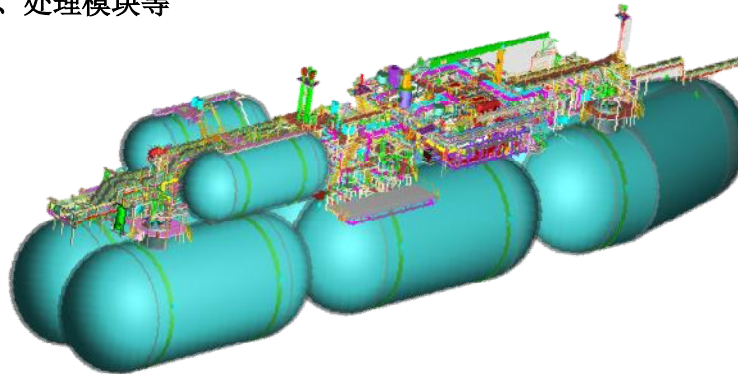
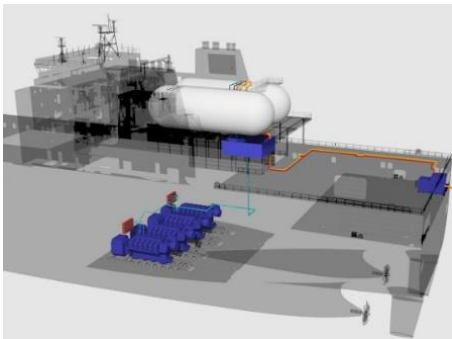
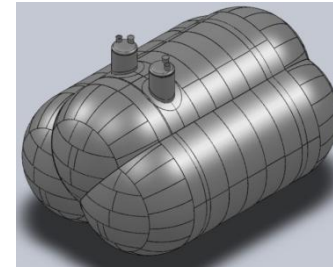
Scope 业务范围



▶ Mega gas cargo tanks and gas plant for LNG/LPG/LEG 超大型LNG/LPG/LEG液罐及系统

Engineering design (Cooperation with first class engineering company), equipment and materials procurement and site construction technology consulting services for gas units
为气体装备提供工程设计(与国际一流工程公司合作)、工艺、设备及材料采购、以及现场施工、技术管理、咨询等服务

- LNG/LEG/LPG Cargo tank, cargo handling system
LNG/LEG/LPG船的液罐、液货系统
- LNG/LEG Onshore storage tank
陆上超大型低温LNG/LEG压力储罐“RPV”
- Marine LNG dual fuel gas storage and supply system
船用LNG双燃料存储供气系统
- Oil and gas storage and transportation, processing module for FSRU and FPSO, etc.,
FSRU及FPSO上的油气储运、处理模块等



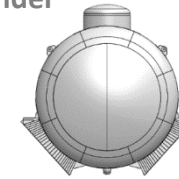
II. Engineering & Technology Capacity
工程技术能力

Team experience and capacity
团队经验及能力

Cargo tanks and gas plant for LPG/LEG/LNG Carriers
LPG/LEG/LNG 船用液罐及系统

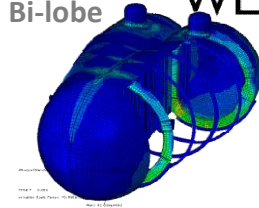
气体船 Gas Carrier	沸点 Gas boiling point	尺寸 Size	气体处理系统 Handling system*	货舱 Storage tank
LPG船 LPG Carrier	-45° C	小型 Small sized	全压式 Fully Pressurized	C型舱 Type C
			半冷半压式 Semi Refrigerated	
		中型/大型/超大型 MGC/LGC/VLGC(84K)	全冷式 Fully Refrigerated	A型舱 Type A
乙烷/乙烯船 Ethane /Ethylene Carrier	-88/ -104° C	中小型 Small-Mid sized	半冷半压式 Semi Refrigerated	C型舱 Type C
		超大型 VLEC (85K-95K)	半冷半压式 Semi Refrigerated	C型舱 Type C
			全冷式 Fully Refrigerated	薄膜舱 Membrane
LNG船 LNG Carrier	-163° C	中小型 Small-Mid sized	半冷半压式 Semi Refrigerated	C型舱 Type C
		超大型 Large sized (100K-220K)	全冷式 Fully Refrigerated	薄膜舱 Membrane
			全冷式 Fully Refrigerated	B型舱 Type B

单罐
Cylinder



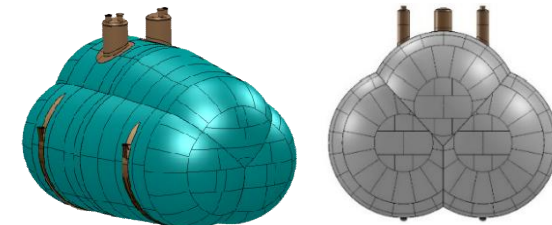
500-13000m³ per tank

双罐
Bi-lobe



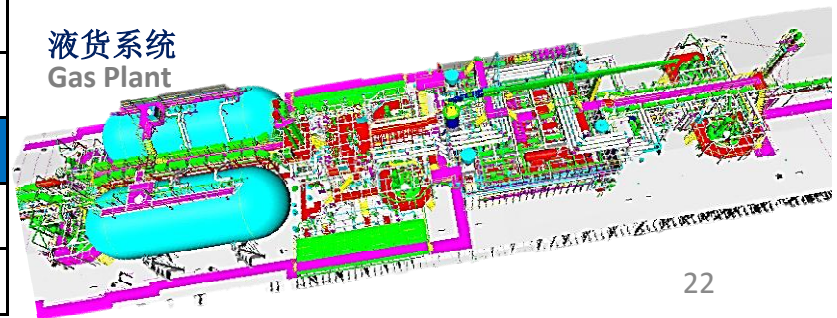
4000-12000m³ per tank

三耳罐
Tri-lobe



12000-26000m³ per tank

液货系统
Gas Plant



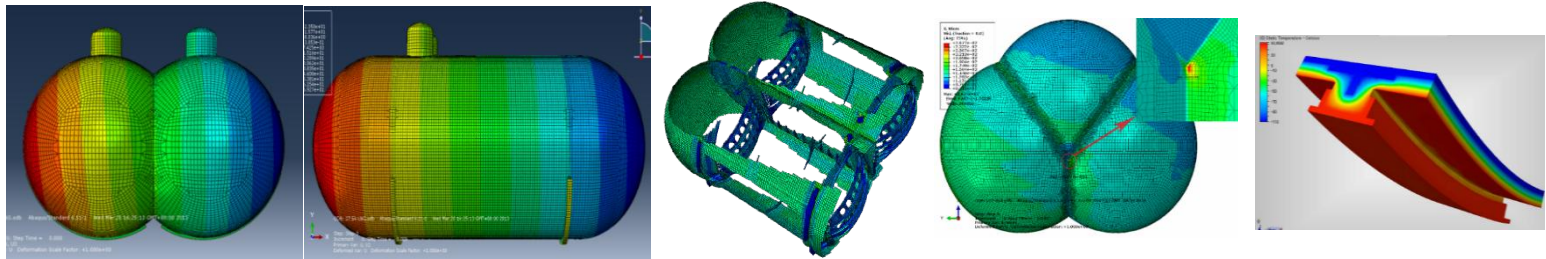
II. Engineering & Technology Capacity
工程技术能力

Team experience and capacity
团队经验及能力



Cargo tanks and gas plant for LPG/LEG/LNG Carriers
LPG/LEG/LNG 船用液罐及系统

In-house Engineering
自主设计



Draft the industrial standard
行业标准编制

<p>ICS 47.020.50 U 42</p> <p>CB</p> <p>中华人民共和国船舶行业标准</p> <p>CB/T 4241—2013</p> <p>本标准按照GB/T 1.1—2009给出的规则起草。 本标准由中国船舶工业集团公司提出。</p> <p>船用半冷半压式液化气储罐 [公司].</p>	<p>ICS 47.020.50 U 42 备案号:</p> <p>CB</p> <p>中华人民共和国船舶行业标准</p> <p>散装运输液化气体船舶 液货监控及报警系统</p> <p>Monitoring and alarm system of ships carrying liquefied gases in bulk [公司], 武汉富高流体 控制系统工程有限公司。 本标准主要起草人：黄华兴、吴永平、谢春、刘金鹏。</p>
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Tank steel localization
液罐材料国产化

- ✓ **Localized 5% Ni Steel was applied to 12000cbm LEG carrier under the cooperation with AN steel**
联合鞍钢集团 成功开发国产5% 镍钢，并应用到 12,000cbm LEG 船上
- ✓ **Localized 9% Ni Steel was applied to 27500cbm LNG carrier under the cooperation with Nanjing steel**
联合南京钢铁集团 成功开发国产9% 镍钢，并应用到 27,500cbm LNG 船上



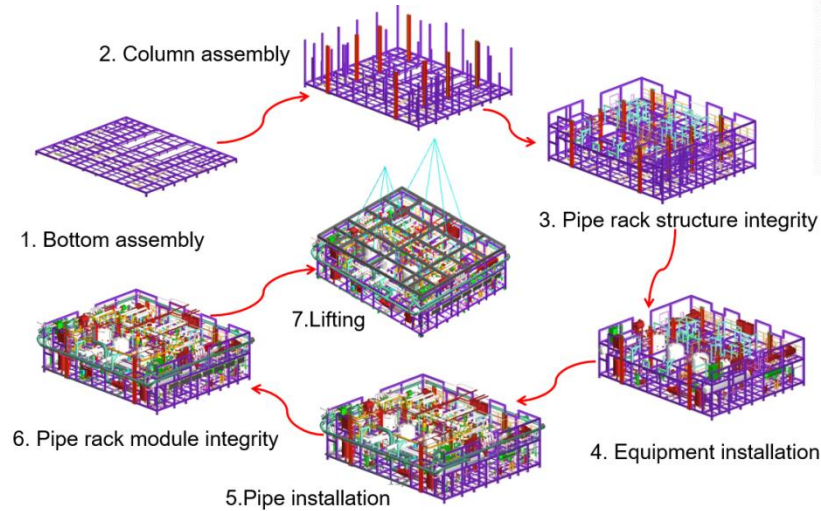
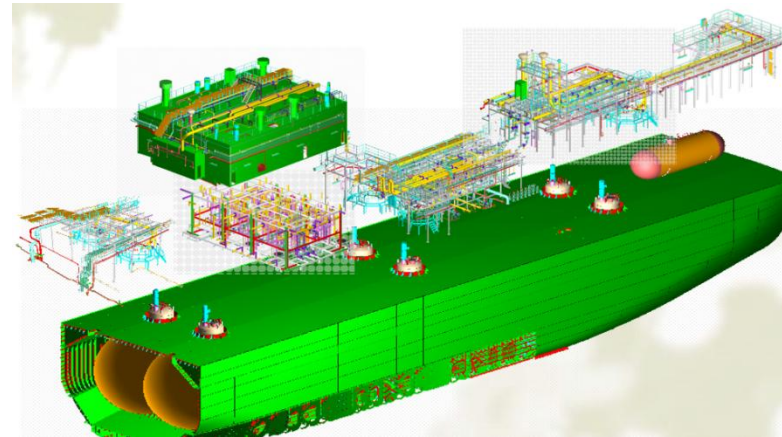
II. Engineering & Technology Capacity 工程技术能力

Team experience and capacity 团队经验及能力

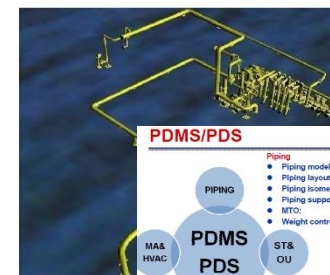


Cargo tanks and gas plant for LPG/LEG/LNG Carriers LPG/LEG/LNG 船用液罐及系统

CHS module design and fabrication 液货系统模块设计及制作



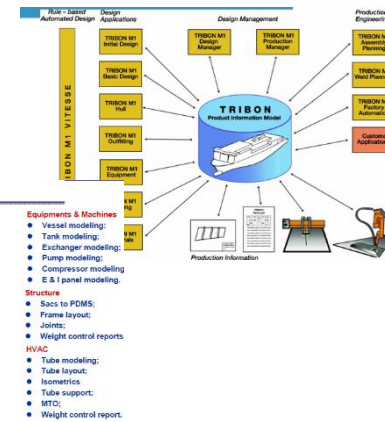
PDMS 3D Model



PDMS/PDS



- PIPING**
- Piping modeling;
 - Piping layout;
 - Piping isometrics;
 - Piping support;
 - MTC;
 - Weight control report.
- M&S HVAC**
- Cable tray, lights, gauges modeling;
 - Light model;
 - Cable tray layout;
 - Lighting support;
 - MTC;
 - Weight control report.
- E & I**
- Cable tray, lights, gauges modeling;
 - Light model;
 - Cable tray layout;
 - Lighting support;
 - MTC;
 - Weight control report.

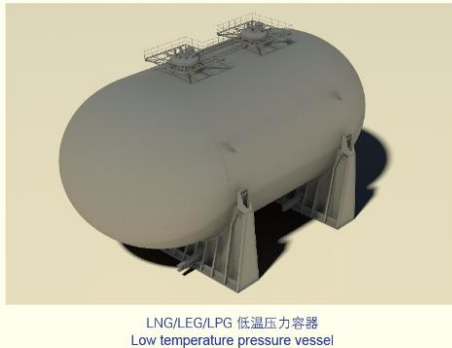


II. Engineering & Technology Capacity 工程技术能力

Team experience and capacity 团队经验及能力



▶ Onshore refrigerated pressure tanks, chemical pressure vessel 陆上LPG/LEG/LNG 低温压力储罐、化工压力容器



LNG/LEG/LPG 低温压力容器
Low temperature pressure vessel

LEG Onshore refrigerated pressure vessel 陆上液化乙烯、乙烷等多用途气体压力储罐

The 15,000m³ Refrigerated Pressure Vessel is used for LEG onshore storage, which will be fabricated with 5% Ni steel. It can load various kinds of liquefied gas, such as ethylene, ethane, propylene, butane. With single cylinder horizontal vessel design, the loading capacity of one tank is up to 15,000 m³ and steel weight is 1200t per tank. 陆上超大型全冷半压式压力容器（简称“RPV液罐”），采用5%的镍钢制造，可装载乙烯、乙烷、丙烯、丙烷、丁烷多种液货，单罐设计容积可达15000立方米，每罐重量达1200吨。

Chemical Process Pressure Vessel\Tower 化工压力容器、塔器

Chemical vessels\ towers are widely used in physical processes such as separation or absorption, changing complex mixtures of gases or liquids, and have complex internal structure.

The dimension of the biggest pressure vessel\ tower WOE produced with the diameter 8m, height 80m, plate thickness 96mm, 900t.

化工压力容器、塔器广泛应用于分离或吸收、改变气体或液体复杂混合物等化工流程，具有复杂的内件结构，公司已成功制作的塔器、容器尺寸达到：直径8m、高度80米、钢板厚度96mm，单台重量约900t。



化工容器 Chemical process vessel

II. Engineering & Technology Capacity
工程技术能力

Team experience and capacity
团队经验及能力



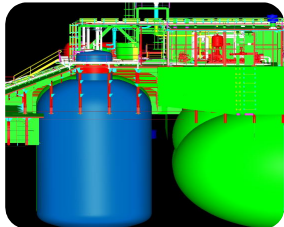
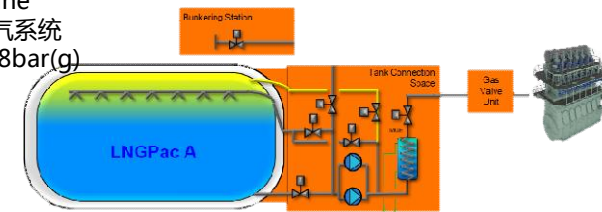
Fuel Gas Tank & Supply System
燃气储罐及供气系统



FGSS on 27,000cbm LEG/LNG Carrier

- Tank size : 2X1000 m3
- Gas fuel : LNG or Ethane
- Tank design press.: 8 bar(g)
- Min. temp. : -165 °C

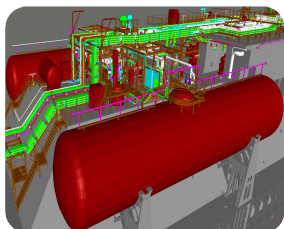
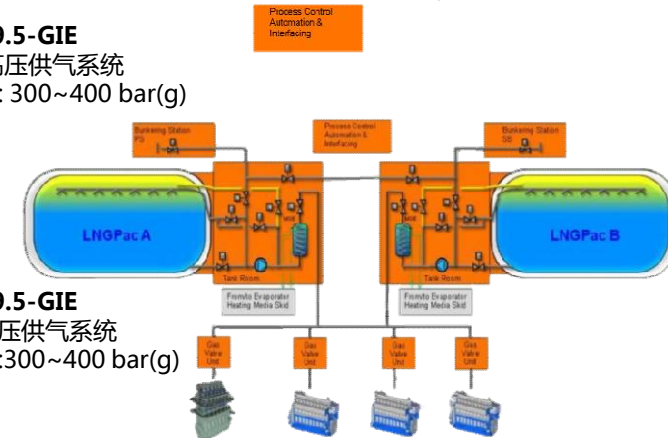
For **Wartsila 6L50DF Engine**
Low press. system 低压供气系统
Design press.设计压力: 6~8bar(g)



FGSS on 36,000cbm LEG Carrier

- Tank size: 2X1000 m3
- Gas fuel: LNG or Ethane
- Tank design press.: 9 bar(g)
- Min. temp. : -165 °C

For **MAN 7G50ME-C9.5-GIE**
High press. System 高压供气系统
Design press.设计压力: 300~400 bar(g)



FGSS on 85,000cbm VLE Carrier

- Tank size: 2X1000 m3
- Gas fuel: LNG or Ethane
- Tank design press.: 9 bar(g)
- Min. temp. : -165 °C

For **MAN 6G60ME-C9.5-GIE**
High press. System 高压供气系统
Design press.设计压力: 300~400 bar(g)

II. Engineering & Technology Capacity
工程技术能力

Team experience and capacity
团队经验及能力



Offshore Oil & Gas Module
海上油气处理模块

LNG FSRU Regas Module LNG再气化模块

Project	Dimension	Weight	Capacity	Class
项目	尺寸 (米)	重量 (吨)	处理量	船级社
No.1	21*31*16	700	500 mmscfd	DNV
No.2	21*18*13	500	375 mmscfd	DNV
No.3	27*18*13	630	384 mmscfd	DNV
No.4	21*18*13	520	375 mmscfd	DNV
No.5	27*18*13	650	500 mmscfd	DNV



MOHO NORD FPU 浮式生产模块

Project 项目	FPU S6 Module	FPU P7 Module
Dim. 尺寸 (m)	19.3*22.3*21.4	22*23.7*16
Weight 重量 (T)	1300	664
Class 船级社	BV	BV

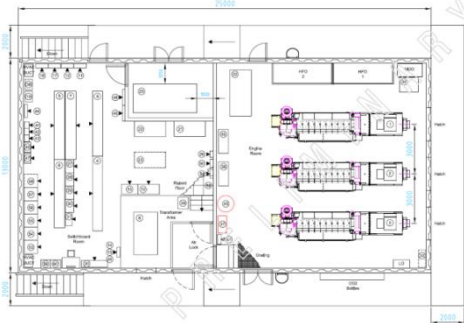
II. Engineering & Technology Capacity
工程技术能力

Team experience and capacity
团队经验及能力



Offshore Oil & Gas Module
海上油气处理模块

Power Generation Module 海工电气模块



2D drawing 2D图纸



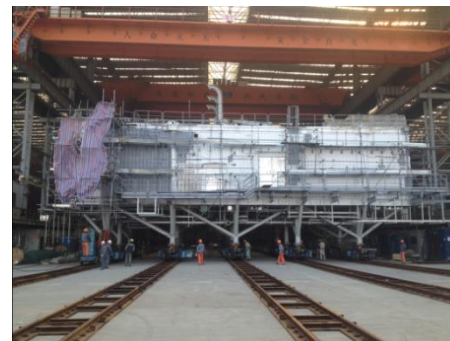
3D model 3D建模



Module construction 模块建造



Load out 模块出运



Module transfer 模块移位

II. Engineering & Technology Capacity
工程技术能力

Team experience and capacity
团队经验及能力



Offshore & Onshore Crane
吊车/海工吊车

1000吨造船式龙门吊
1000t Shipbuilding
Gantry Crane



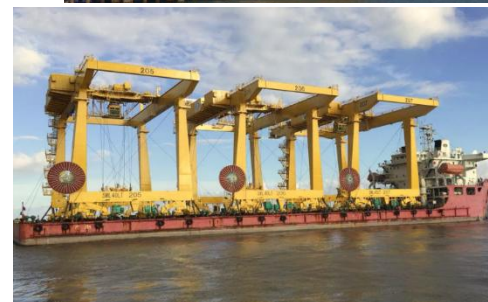
岸边集装箱起重机
Onshore Container Crane

Typical Projects Experience 典型产品经验

<i>Project</i>	<i>Product</i>	<i>Quantity</i>	<i>Capacity</i>
项目	产品	数量 (台)	处理量
No.1	65t Quay Crane	2	65t
No.2	60t Quay Crane	5	60t
No.3	40t Quay Crane	5	40t
No.4	Ship Unloaders	1	3300t/hour
No.5	Ship Unloaders	1	1800t/hour
No.6	Ship Unloaders	2	1500t/hour
No.7	Port Crane	1	850t/hour
No.8	Ship Unloaders	1	4000t/hour
No.9	Port Crane	3	3535 Four-Link



桥式抓斗卸船机
Bridge Ship Grab Unloader



轨道式集装箱起重机
Rail Mounted Gantry Crane

II. Engineering & Technology Capacity
工程技术能力

Welding & Procedure Research
焊接及工艺研究



WTT is specializing in providing third-party testing services, including research and development of new materials, physical and chemical testing of materials, non-destructive testing of products, and testing of measuring instruments.

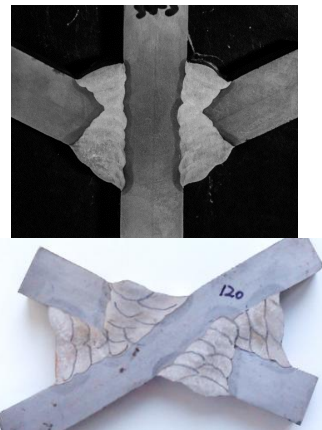
华滋检测科技（WTT）是一家专业提供第三方检测服务的公司，主要业务包括新材料研发、材料理化检测、化学分析检测、产品无损检测服务、计量器具检测等。

Automatic welding application improves the construction efficiency and quality, reduces the cost; Already realized 50% automatic application.

公司自动焊应用提高了建造效率和质量，降低了成本；已经实现50%自动化。

Approved chemical, mechanical, metallographic, corrosion analysis

获认可的化学成分分析、力学性能测试、金相分析、腐蚀试验分析



全自动埋弧焊
Automatic SAW



全自动气保护焊接
Automatic FCAW

全自动气保护焊接 Automatic FCAW



III. *Our Facility*

我们的设施

III. Our Facility
我们的设施

Layout
厂区概览

占地面积: 1000亩 TOTAL AREA: 660,000m²



III. Our Facility
我们的设施

Layout
厂区概览

占地面积: 1000亩 TOTAL AREA: 660,000m²



III. Our Facility
我们的设施

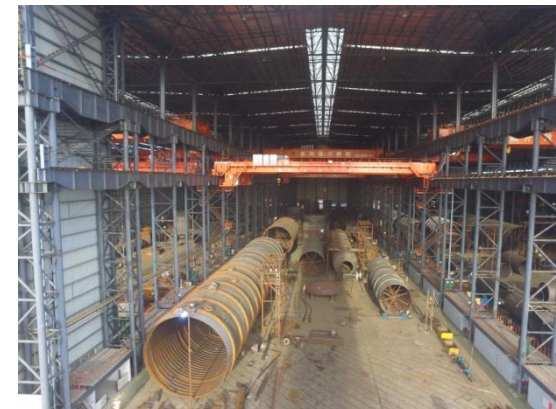
Customized Large Workshop
定制化大型装焊车间



W=33.063M < 42M (Width车间宽度)
H=18.01M < 26M (the height of crane track 最低行车轨道高度)

The huge workshop is customized for the block fabrication for mega tanks up to 24,000m³-26,500 m³ per tank specially designed for 85K-95K VLEC/VLMC

该大型车间可用于制造单罐装载量达24,000m³-26,500 m³ 的超大型液罐分段
(用于配套85K-95K的VLEC/VLMC)



III. Our Facility
我们的设施

Ultra Heavy Platform for Tank Erection, Pressure Test and Insulation
重型平台-液罐总组、压力试验、绝缘



Block turnover by 1000T crane
利用1000T龙门吊进行液罐总段翻身



Final erection by 1000T crane
利用1000T龙门吊液罐总组

Ultra Heavy Platform 重型平台: 8568m² (L*D: 126m*68m)

- ❑ **Equipped with two Weather Shelters**
配备移动风雨棚 2 座
- ❑ **With 1000T gantry crane**
配备1000T龙门吊
- ❑ **Platform bearing capacity is 110t/ which can be available for the hydraulic and tightness test for two super large type C cargo tanks at the same times.**

平台每平方米承重110t, 可同时容纳2只超大型液罐水压及气密试验。



Pressure test
水压试验

**Up to 25000 ton
总重达25000吨**



Insulation under shelter
风雨棚内绝缘

III. Our Facility 我们的设施

Loading out platform and jetty 出运通道及码头



- The load out platform and jetty are designed for mega structures (tanks & modules) delivery
为超大型结构产品（液罐、模块）出运量身定制出运通道及重装码头。
- The width and length of the loading out platform is 40m and 500m.
出运通道宽40m, 长500m。
- The loading out jetty width is 158m with the capacity to load out product up to 4000 ton by SPMT
出运码头宽158m, 可满足4000吨重构件模块小车滚装上船。

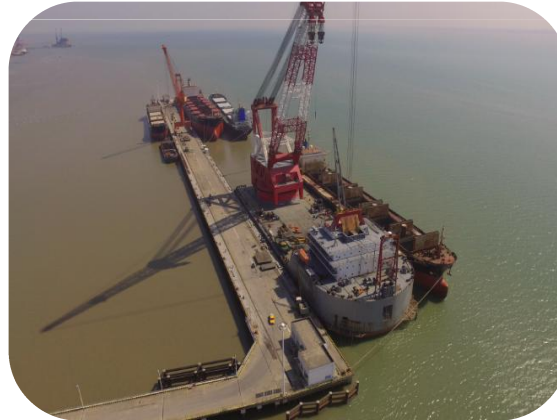


III. Our Facility 我们的设施

Dry dock & Outfitting jetty 海工坞及舾装码头



- Dry dock with 1000t gantry crane, L*D*H: 270m * 50m * 12.8m
海工坞 (270m * 50m * 12.8m)
- Outfitting jetty, with national first class open approval (export directly)
舾装码头, 具有国家一类开放口岸证书
- Painting workshop
涂装车间





IV.
Our Products
我们的产品

IV. Our Products
我们的产品

Type-C Mega Cargo Tanks & Fuel Tanks
C型超大型货罐及燃料罐

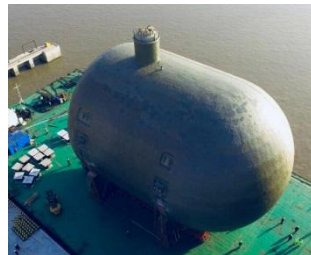


85000m³ VLEC Cargo Tank

85000立方米超大型乙烷运输船用液罐

With this innovative star tri-lobe design, each cargo tank of the VLEC can load 24,000m³ liquefied gas, which is double than mainstream Type C tanks in volume, and makes the tank becoming the largest independent Type C tank in the world.

创新的应用了超大型Type C星型三耳罐，单罐装载量达24,000m³同一尺寸的船舶搭载这种新型储罐，可以比传统双联罐多装载20%



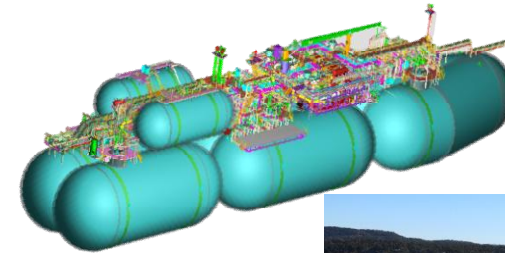
World First Tank delivered by
2017.12.29



World First 85K VLEC
Delivered by 2019.1.15

27500m³ LNGC Cargo Tank & Gas Plant Solution

27500立方米超大型乙烷运输船用液罐及液货系统解决方案



IV. Our Products 我们的产品

Onshore RPV 陆上超大型全冷半压式压力容器



World Largest Onshore Ethylene/Ethane RPV 15000立方米全球最大陆上乙烯储罐

- The 15,000m³ mega Refrigerated Pressure Vessel is used for LEG onshore storage built for AC-INOX, which are fabricated with 5% Ni steel. It can load various kinds of liquefied gas, such as ethylene, ethane, propylene, butane.
为德国AC-INOX制造的陆上超大型全冷半压式压力容器（简称“RPV液罐”），采用5%的镍钢制造，可装载乙烯、乙烷、丙烯、丙烷、丁烷多种液货。
- With single cylinder horizontal vessel design, the loading capacity of one tank is up to 15,000 m³ and steel weight is 1200t per tank. It is currently the world largest onshore cylindrical LEG tank ever built.
RPV液罐采用单圆柱型卧式容器设计，单罐设计容积达15000立方米，每罐重量达1200吨，是目前全球最大陆上全冷半压式乙烯储罐。
- The solution for production engineering, fabrication and transportation is provided by WOE. The tank engineering and fabrication is qualified by Europe PED and in accordance with the regulations of DNV-GL.
公司提供生产设计、建造以及运输的解决方案。设计和建造获得欧盟压力容器认证PED，并入级DNV GL船级社。

Delivered by 2018.4.15



Installation at Antwerp, Belgium, 2018.7



IV. Our Products 我们的产品

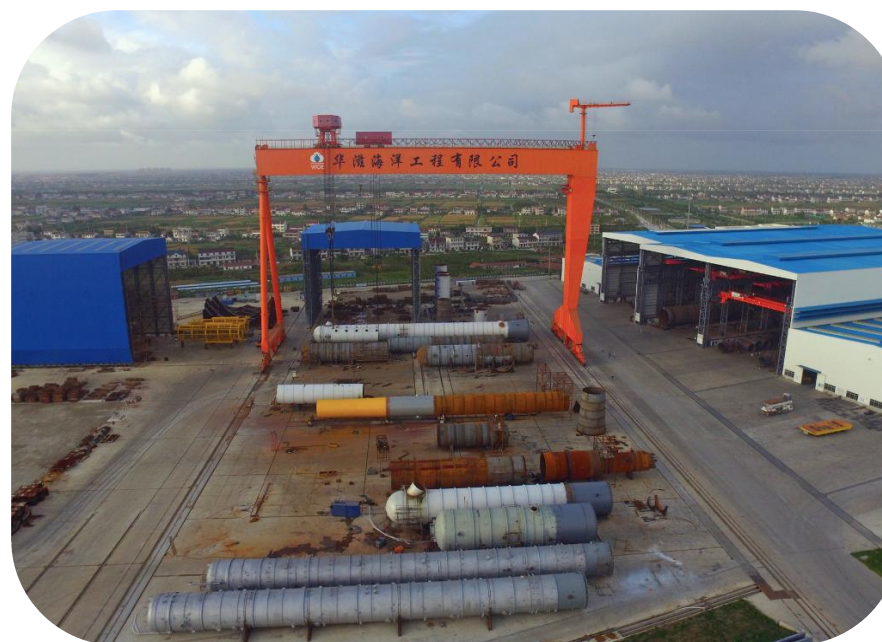
Petrochemical Pressure Vessel 石化压力容器



Petrochemical Pressure Vessel 化工压力容器

These large scale pressure vessels are used for chemical plant for ZPC, the main material is Q345R which is specially used on pressure vessel. The dimension of the biggest Tower is that diameter 8m, height 80m, plate thickness 96mm.

为浙江石化、恒逸石化制造的大型化工塔器装备，主要材质为Q345R压力容器板、单台最大重量约900t，成功交付压力容器、塔器累计约60台，货物介质：丁二烯，丙烷脱氢、苯乙烯、气氛、芳烃、乙烯等装置。其中，2台气氛塔器长度达90M，重量900吨；3台碳二加氢反应器壁厚105mm，重量150吨，试验压力7.6Mpa.



IV. Our Products
我们的产品

Offshore Wind Power Equipment
海洋风电装备



Offshore wind power pile
海洋风电管桩

Wind power piles to CCCC, Tianjin Port Aviation, up to 77 meters, 1000 tons per pile.

中交三航局大丰、滨海、灌云、平潭，及天津港航华能风电项目塔筒，最大高度77米，最大重量1000吨



Offshore wind power piling platform
海洋风电稳桩平台



Wind power piling platform to CCCC, Yangjiang Guangdong project, L*W*H=60*30*38 meters, total 1600 tons (4 piles included).

中交三航局广东阳江风电项目稳桩平台，重量1600吨

IV. Our Products
我们的产品

Port Machinery
港口机械



▶ Bucket Stacker & Reclaimer
斗轮堆取料机

The first bucket stacker & reclaimer made for Indonesia Tsingshan Stainless Steel, and its production capacity is 4500 t/h of stacker, 1500 t/h of reclaimer and turning radius is 35m.

公司首台出口印尼 堆4500t/h,取1500t/h,回转半径35m的斗轮堆取料机



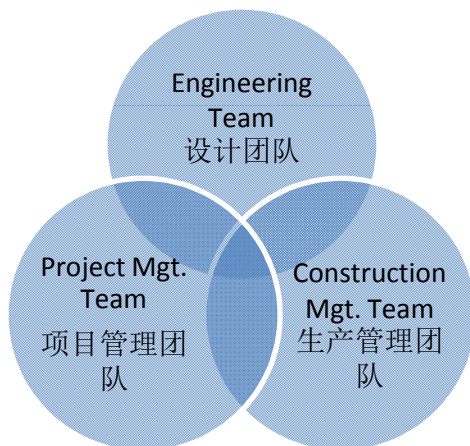
V. Why Us
我们的优势



Supportive Shareholder
股东支持



Experienced & Professional Team
富有经验的专业团队



Customized Facility
定制化的设施



Efficiency
高效



WE make it happen!
我们创造可能！