

HUMAN Heavy Industries Co., Ltd.  
Put the customers' trust and  
satisfaction on the top priority.

이 휴먼중공업

일자 : 2018년 3월 24일(토)



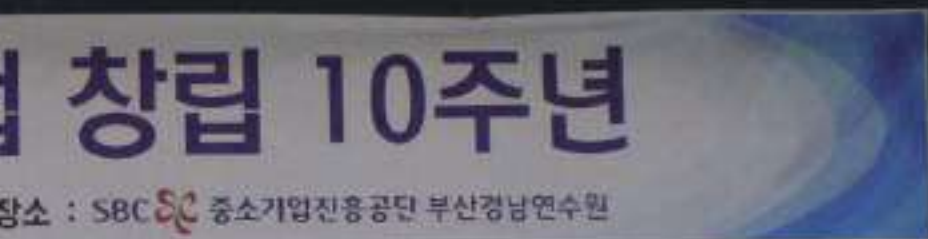
## HISTORY

### 2008 ~ 2010

- 2008.03 Established Human Heavy Industry Co., Ltd.
- 2008.12 Navy (Defense Industry)  
Volume Contract (Domestic No. 1)
- 2009.01 Contract with Korea Coast Guard (Domestic No. 1)
- 2009.09 Certificate of Venture Business  
(Small Business Corporation)
- 2009.11 ISO 9001,14001 Certificate  
(International Industry Certification Institute)
- 2010.06 Issuance of parts specialized company  
(ship component parts) (Ministry of Knowledge Economy)

### 2010 ~ 2013

- 2011.06 Certificate of Establishment of R & D Department  
(Korea Industrial Technology Association)
- 2011.10 Certified as INNO-BIZ  
(Technology Innovative Small and Medium Business)  
(Ministry of Small and Medium Venture Business)
- 2011.11 Certified as venture company
- 2012.05 (technology evaluation company)  
(Technology Guarantee Fund)
- 2012.08 Gyeonggi Ocean Ho (Super Yacht) Construction Merit Award
- 2012.12 Moved head office and factory to Gyenaeri, Chilseo-myeon, Haman-gun
- 2013.10 OHSAS-18001 Certification (International Industry Certification Institute)  
Appointed as an advisory board member of 2014  
International shipbuilding and marine industry exhibition  
(Governor of Gyeongsangnam-do)



### 2014 ~ 2017

- 2014.05 Certificate of company affiliated research institute (Korea Industrial Technology Association)
- 2014.07 Offshore Plant (STATOIL) PQ APPROVED
- 2016.09 Inaugurated as Chairman of Gyeongnam Shipbuilding & Marine Equipment Cooperative
- 2016.09 Letter of Appreciation from the Minister of National Safety (No. 16-1121)
- 2016.11 Patent (No. 10-0030054) Soundproof DOOR for High Speed Ship
- 2017.09 Factory expansion (2nd factory) completed Currently in production (including fleet and quay)
- 2017.10 Appointed Chairman of the Presidential Commitment Committee for the Promotion of the Shipbuilding and Marine Industry Structure

### 2018 ~ 2019

- 2018.04 Appointed as a policy advisor to Namhae Maritime Police Agency
- 2018.05 Certificate of Appreciation from the Commissioner of the Korea Coast Guard (No. 18-342)
- 2018.08 Appointed Gyeongsangnam-do Economic Innovation Promotion Committee
- 2018.12 Nomination of Job Committee members in South Gyeongsang Province
- 2019.01 Selected as a youth-friendly small company (Ministry of Employment and Labor)
- 2019.04 Selected as a small company (Ministry of Employment and Labor)
- 2019.06 Selected as an excellent company (Gyeongsangnam-do)
- 2019.07 Appointed a public-private council member for development of Gyeongnam Shipbuilding Industry (Governor of Gyeongnam Province)
- 2019.09 Awarded the order of industrial service merit at the 16th Korea Maritime Day



# Introduction

기업소개



CEO

## Young Woo Na

FUNNEL, and other various fittings and pipes as well as the upper structures, unlike other companies' technicians who only manufacture the upper structures of vessels with fragmentary skills.

And we have expanded our business into the field of Off-shore Plant, and AL yacht and the Korean-model submarines for our business diversification. In particular, we are entering a business of localization development on special fields such as all sorts of materials, fittings, and ABS DOOR that we heavily depended on imports for whole quantities in the business of the Korea-model submarines. We also have aggressively invested in future economic growth engine, participating in the research and development of the LNG bunkering business, which has been emerging as a new breakthrough in the financial downturn of shipbuilding industry in Korea. We will do our best to build the hard-working corporate image with goals to provide high quality products and through follow-up service by relentless pursuit of technology development and quality enhancement.

## Human Heavy Industries is prioritizing customer confidence and customer satisfaction.

Human Heavy Industries was established with goals to manufacture and produce aluminum patrol killers and yacht, and nonferrous structures, and our employees are competent workers who have participated in the field of AL special ships and defense industries among many years of shipbuilding industries

Our company started as Seokwon Industries, a professional of manufacturing AL, on September, 2000, and was renamed as Human Heavy Industries on March, 2008. We are proud that our employees and technicians are veterans who got into the shipbuilding industries at the early stage of shipbuilding industries. (Experienced workers from Naval Arsenal, Public Corporation of Shipbuilding, Korea TAKOMA, Hanjin Heavy Industries, DSME, STX offshore & shipbuilding Co.,Ltd.) Especially, considerable numbers of the technicians are experienced workers who designed patrol killers among special ships, and manufactured naval vessels and vessels of maritime police that are known as the first AL vessels in Korea. (PSMM, PSK, PKM, PCC, FFK, LSF, KDX, PKG, YATCH, PC etc)

Moreover, we are proud that we have a lot of technical skills regarding sheet welding technology and special AL shipbuilding, which are the essential elements when it comes to manufacturing patrol killers. We also have a broad range of experience of manufacturing one completed AL vessel which is thoroughly preoutfitted with main structure of the ship, MAST structure,

# Human Heavy Industries Co., Ltd. History

Human Heavy Industries Co., Ltd.			
CEO	Young Woo Na	Established date	2008.03.19
Address (Head Office)	((52003) 110 Gyeryong-ro, Chilseo-myeon, Haman-gun, Gyeongnam)		
2018 Sales	13 Millions	Number of workers	108 Persons
Industry Code	C31114	Industry classification	Ship component parts manufacturing industry
Main Customer	Korea Maritime Police Agency, Daewoo Shipbuilding & Marine Engineering Co., Ltd., Hyundai Heavy Industries Co., Ltd., Local Government		
History	2008.03	Established Human Heavy Industry Co., Ltd.	
	2009.09	Certificate of Venture Business (Small Business Corporation)	
	2009.11	ISO 9001, 14001 Certificate (International Industry Certification Institute)	
	2011.10	INNO-BIZ Certification (Ministry of Small and Medium Venture Business)	
	2012.12	OHSAS-18001 Certification (International Industry Certification Institute)	
	2014.05	Company affiliated research institute certificate (Korea Industrial Technology Association)	
	2015.02	Patent (10-1493388) Welding Deformation Fixture	
	2016.11	Patent (10-1675806) Marine Soundproof Door	
	2017.09	Factory Expansion (2nd factory)	
Core Technology	Aluminum welding technology	DNV, LR, ABS, KR WPS certificate regarding aluminum, stainless steel and dissimilar metals	
Main Products / New Products	Special ship	Medium speed craft, rescue boats, fire fighting boats, customs supervision boats, administrative ships, environmental ships, Fishery guidance boat, fishing boat (coastal compound, coastal net, squid fishing)	
	AL BLOCK	DECKHOUSE, FUNNEL, RADAR MAST, CATAMARAN YACHT	
	Outfitting	Submarine Equipment (ABS DOOR, PRESSURE HATCH, COAMING, SLEEVE, GRID, FLAG MAST, LANTERN MAST, TORPEDO GUIDE RAIL)	
	LNG Fuel Tank	9% Nickel / Aluminum / High Manganese Steel Material (50M3 ~ 500M3)	

# Main product Aluminium



Coast Guard Bulletproof High Speed Patrol Boat



Coast Guard Rescue Boat



Gyeonggi Province Administrative Line



Haenam Fishery Control ship



Fishing vessel



Squid Vessel



Catamaran Yacht



yacht



# Main product Aluminium



Coast Guard PC-500



Navy FFX



Coast Guard PC-500 D/H



Coast Guard Air-Cushion Vehicle



Mast



Navy Mast &amp; Funnel



Submarine Large pen. pc's



Aluminium LNG Tank

# Defense Field

## Navy Business

Term	Contents	Quantity	Owner
2008	12 Naval Landing Boat LCM Hull Production	3	Hanjin Heavy Industries
2009	12 Navy guided missile high speed ship PKG (manufactured and mounted by HOUSE / MAST)	4	Hanjin Heavy Industries
2010	08 Navy destroyer FFX-I (MAST / FUNNEL production, deployment)	1	Hyundai Heavy Machinery
	08 Navy destroyer FFX- I (MAST / FUNNEL, official iron, battlefield, iron shelter, air conditioning)	1	Hyundai Heavy Machinery
2012	01 Navy Watercraft Rescue Ship AST-II (Funnel Production)	1	Daewoo Shipbuilding & Marine Engineering
	06 Navy guided missile high speed ship PKG (manufactured and mounted by HOUSE / MAST)	3	Hanjin Heavy Industries
2013	05 Navy guided missile high speed ship PKG (manufactured and mounted by HOUSE / MAST)	1	Hanjin Heavy Industries
	06 Navy Naval Service HUB-F (TRAFFIC)	2	Hanjin Heavy Industries
	06 214 submarine (STOWAGE BOX / GALLEY)	1	Hyundai Heavy Machinery
2014	04 214 submarine (STOWAGE BOX / GALLEY)	1	Daewoo Shipbuilding & Marine Engineering
	05 Indian Submarine (STOWAGE BOX / ABS DOOR / Equipment, Chairman)	3	Daewoo Shipbuilding & Marine Engineering
	06 214 class submarine (STOWAGE BOX / GALLEY / Equipment, design)	1	Daewoo Shipbuilding & Marine Engineering
	08 British Navy Battleships (Equipment, Various FDN)	1	Daewoo Shipbuilding & Marine Engineering
	09 Mine laying (MLS) (made by AL MAST)	1	Hyundai Heavy Machinery
2015	04 Navy destroyer (MAST / FUNNEL production, mounted)	1	Daewoo Shipbuilding & Marine Engineering
	05 Thai Navy destroyer (MAST / FUNNEL production, mounted)	1	Daewoo Shipbuilding & Marine Engineering
	06 214 class submarine (ENGINE ROOM ABS DOOR)	1	Daewoo Shipbuilding & Marine Engineering
	07 Navy Large Landing Ship LST-II (Funnel / LCM House)	1	Hyundai Heavy Machinery
	07 209-class submarine (ENGINE ROOM SOUND DOOR)	3	Daewoo Shipbuilding & Marine Engineering
	08 209-class submarine (HYDRO OIL STATION)	3	Daewoo Shipbuilding & Marine Engineering
	09 Produced ABS DOOR for naval intelligence chief: Patent acquisition	2	Hyundai Heavy Machinery
	09 214 class submarine (EXHAUST GAS PIPE)	1	Daewoo Shipbuilding & Marine Engineering
	09 214 class submarine (STOWAGE BOX)	1	Daewoo Shipbuilding & Marine Engineering
	10 209 & 214 class submarine	2	Daewoo Shipbuilding & Marine Engineering
	11 FLXTURE PLEXIGLASS SHILLD	2	Daewoo Shipbuilding & Marine Engineering
	11 209 & 214 submarine (penetrating PIECE) 280	280	Daewoo Shipbuilding & Marine Engineering
2016	02 209 class submarine (BATTERY ROOM CELL GUIDE)	1	Daewoo Shipbuilding & Marine Engineering
	03 Class 209 submarine (LANTERN MAST)	1	Daewoo Shipbuilding & Marine Engineering
	04 209 HYDRO PLAN Rudder	2	Daewoo Shipbuilding & Marine Engineering
	05 Navy Large Landing Ship LST-II (FUNNEL & LCM HOUSE production and deployment)	1	Hyundai Heavy Machinery
	05 Navy MTB BLOCK Production	1	Hanjin Heavy Industries
	05 209-class submarine (TORPEDO GUIDE RALL)	1	Daewoo Shipbuilding & Marine Engineering
	06 Class 209 Submarine (FLOOR PLATE)	1	Daewoo Shipbuilding & Marine Engineering
	06 209 & 214 class submarines (HVAC SEAT and various battlefield seat, rail FDN)	multiple	Daewoo Shipbuilding & Marine Engineering
2017	03 Produced and mounted Navy LST- II AL MAST, FUNNEL, BULKWARK	2	Hyundai Heavy Machinery
	03 3000 ton submarine (Jangbo Bogo-III) penetrations and equipment, design 200	200	Daewoo Shipbuilding & Marine Engineering
	04 3,000 ton submarine (Jangbo Bogo-III)	2	Daewoo Shipbuilding & Marine Engineering
	04 Production of Navy destroyer FFX- II electric propeller housing	1	Hyosung Heavy Industries
2018	05 Navy destroyer FFX-II (MAST / FUNNEL production, deployment)	1	Daewoo Shipbuilding & Marine Engineering
	05 Navy destroyer FFX- II (tubing, battlefield, iron dresser, air conditioning)	1	Daewoo Shipbuilding & Marine Engineering
	12 Navy Destroyers FFX- II (Central, Battlefield, Iron Chair, Air Conditioning)	1	Hyundai Heavy Machinery
	12 Navy Destroyers FFX- II (Central, Battlefield, Iron Chair, Air Conditioning)	1	Hyundai Heavy Machinery
	12 Philippine navy destroyer (MAST / FUNNEL)	1	Hyundai Heavy Machinery
2019	06 Philippine navy destroyer (MAST / FUNNEL)	1	Hyundai Heavy Machinery

Maritime Police Business

Term	Contents	Quantity	Owner
2010	06 Naval Guard PC-300 (HOUSE / MAST production, mounting, design work)	3	Daewoo Shipbuilding & Marine Engineering
	06 Navy Police Patrol Ship PC-300 (Kanto, Battlefield, Iron Chair, Air Conditioning)	3	Daewoo Shipbuilding & Marine Engineering
	08 Naval Guard PC-500 (HOUSE / MAST production, installation, design work)	5	Daewoo Shipbuilding & Marine Engineering
	08 Naval Police Cruiser PC-500	5	Daewoo Shipbuilding & Marine Engineering
2011	02 Naval Police Cruiser PC-500	3	Hanjin Heavy Industries
	05 Naval Guard PC-300 (HOUSE / MAST production, mounting, design work)	4	Hanjin Heavy Industries
	05 Naval Guard PC-1000 (HOUSE / MAST production, installation, design work)	2	Hanjin Heavy Industries
	05 Naval Police Patrol PC-300	2	Maritime Police Agency
	05 Naval Police Patrol PC-1000 / (Temporary, Battlefield, Iron Chair, Air Conditioning) 300	1	Maritime Police Agency
2012	05 Naval Guard PC-500 / 300 (HOUSE / MAST production, installation, design work)	5	Hanjin Heavy Industries
2014	03 Coast Guard PC-300 (HOUSE / MAST production, installation, design work)	1	Hanjin Heavy Industries
2016	03 750ton Fishery Guidance Line (Kanto, Battlefield, Iron Chair, Air Conditioning)	1	Maritime Police Agency
	11 Manufacture and installation of Nakyung High Speed M60 Cradle	2	Maritime Police Agency
2017	04 14M Coastal Rescue Boat	6	Maritime Police Agency
2018	04 Medium Bullet Proof (24.7m AL, Finished Line)	2	Maritime Police Agency





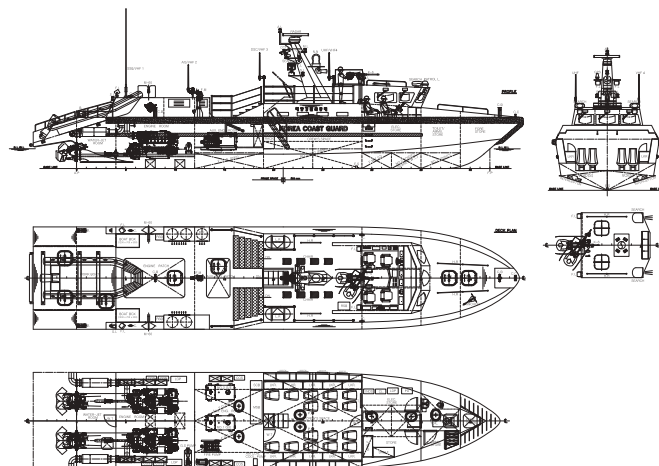
# Coast Guard Bulletproof type High Speed Patrol Boat



**24.7M** Seascope  
Special Startup

## Specification

LENGTH	O.A	ABT.	24.7m
LENGTH	B.P		21.0m
BREADTH			5.2m
DEPTH	MLD		2.6m
DRAFT	D.L.W.L	ABT.	1.0m
COMPLEMENT			20 PERSONS
CREW			6 PERSONS
OTHERS			14 PERSONS



## The launching ceremony for two medium-sized bulletproof type High Speed Patrol boats of the Korea Coast Guard



국방중공업에서 11일 제주 제1공무소에서 해경교보합선 수주한 특수기동형 고속전투함인 '천수익'을 개칭하고 '천수익'으로 명명했습니다.



# Construction process





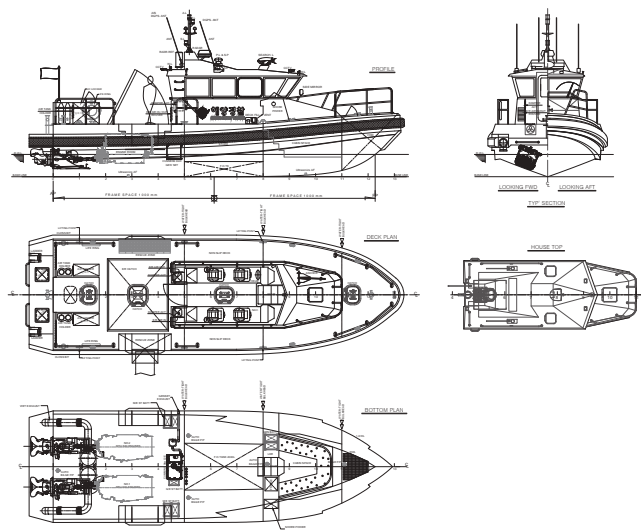
# Coast Guard High-Speed Rescue Boat



## 14M Rescue Boat

### Specification

LENGTH	O.A	14.30m
LENGTH	W.L	12.27m
BREADTH	MLD	4.26m
BREADTH	EXT	4.26m
DEPTH	MLD	2.09m
DRAFT	D.L.W.L	0.85m
DISPLACEMENT	D.L.W.L	17436kg
DEADRISE	TRANSOMa	20.6 deg
POWER	TWIN MTU S60 750 PS @ 2300rpm	
PROPULSION	TWIN HAMILTON WATERJET HJ364 WITH GEARBOX	
SPEED ESTOMATED	MCR 3 PAX + 70% FUEL 35 KNOTS	
COMPLEMENT	8	





# Submarine equipment

Indo Batch-I Navy Submarine  
(KRI 403 / 404 / 405)



# Private demands Field

## Public ship, civil line construction business

Term	Contents	Quantity	Owner
2003	04 BP Thunder Hose L / Q-E / R ROOM (Line, Trailing Chair and Air Conditioning)	1	Daewoo Shipbuilding & Marine Engineering
2004	03 Yeosu Fire Department G / T 150Ton (All AL Ships)	1	Yeosu
2005	06 Port Display Line 90Ton (All AL Ships)	4	Incheon Port Authority
2007	01 Transocean L / Q- HOUSE (Through and HYDRO)	1	Shinhan Machinery
	05 Fishery Guidance Line (Yongju) G / T 180Ton (All AL Ships)	1	Jeju Island
2008	01 Turtle Ship 305Ton (manufactured, mounted)	1	Jeonnam Development Corporation
	03 YACHT 12-Seater (All AL Ship)	1	Export Ship (New Zealand)
	08 Dokdo Cruise (Peace Lake) G / T 177Ton (All AL Ships)	1	Ulleung-gun Office
	08 Customs supervision 30Ton (All AL ships)	1	Customs Service
2009	05 Fishery Guidance Line (Mugunghwa No. 9/11) G / T 168Ton (All AL Ships)	2	Ministry of Food, Agriculture, Forestry and Fisheries
2010	02 Han River TOUR Line 688Ton (House production, Equipped)	1	Seoul
	09 NOBEL 4001 L / Q (Plumbing and HYDRO)	1	STX Shipbuilding
2011	02 Marine Vessel G / T 90Ton (All AL Vessel)	1	Marine Researcher
	05 Fisheries Research Vessel G / T 30Ton (All AL Vessel)	1	Fisheries Academy
	05 SLS HOUSE (Sun, trailing chairman)	1	Sejin
	06 SHI-M1879 E / R CASING (Line, Trailing Chair)	1	Oriental Precision
	06 Stroke SUPER YACHT G / T 120Ton (All AL Vessel)	1	Gyeonggi-do Provincial Office
	09 BULK Line 1015 E / R (Kwan Chul, Chairman)	1	Oriental Major
	12 Stroke SUPER YACHT G / T 120Ton (Kan, Battlefield, Iron Chair, Air Conditioning)	1	Gyeonggi-do Provincial Office
2012	01 CATAMARAN YACHT (All AL Ships)	1	Export Ship (ISONAVAL, S.I)
	01 Marine Research Vessel (2nd Sea) G / T 273Ton (All AL Vessel)	1	Marine Researcher
2013	02 G / T 50Ton Class Squid Fishing Boat (Andongho) _Completed Ship	1	Dong Ho An (Shipowner)
	09 SONGA PROJECT (Equipment, Chairman, Battlefield)	3	Daewoo Shipbuilding & Marine Engineering
2014	02 BULK Line / CONICAL PIECE	6	For shipbuilding
	02 BULK Line / CHAIN SE AT	6	For shipbuilding
	07 72FEET CATMARANE AL YACHT	1	Busan
	09 72FEET AL CATAMARAN YACHT (HAND R AIL manufacture and installation)	1	Busan
2015	07 Ministry of Oceans and Fisheries 1470Ton Fishery Guidance Line (House / MAST Production, Mounting)	1	West Sea Fisheries Management Team
	10 AL. Manufacture of LNG F, O TANK MOCK-UP	1	Hyundai Heavy Machinery
2016	03 Ministry of Maritime Affairs & Fisheries 750Ton Fishery Guidance Line (House / MAST Production, Mounting)	1	West Sea Fisheries Management Team
	03 Ministry of Maritime Affairs & Fisheries 750 Ton Fishery Guidance Line (Kwan Chul, Battlefield, Iron Chair, HVAC)	1	West Sea Fisheries Management Team
	05 6.5MR Water Leisure Yacht (42KNots)	1	Ocean industry
	06 Pohang Hyungsan Steel Bridge Construction-All AL	1	Yanase Shipbuilding
2017	08 690 TON Diving Support Boat	1	Maritime Police Agency
	09 Ministry of Oceans and Fisheries 750 Ton Fishery Guidance Line	3	West Sea Fisheries Management Team
	09 Ministry of Oceans and Fisheries 750 Ton	3	West Sea Fisheries Management Team
	12 Ministry of Oceans and Fisheries 1,450 Ton / 1,500 Ton Fishery Guidance Line	4	For shipbuilding
	12 Ministry of Oceans and Fisheries 1,470 Ton / 1,500 TON Fishery Guidance Line	4	For shipbuilding
2018	09 Standardized fishing boat modernization project model	2	Korea Maritime Institute of Science and Technology Promotion
2019	02 Green algae	2	Ministry of Environment
	02 Environment	1	Ministry of Environment
	02 500H High Manganese Steel LNG CARGO TANK	1	POSCO
	03 35 Ton fishing map	1	Haenam-gun Office
	09 1600 Ton Fisheries Science Research Vessel	1	National Fisheries Research and Development InstituteV

## Aluminum repair ship business

Term	Contents	Quantity	Owner
2012	07 Rapid Cruise Ship Swallow (AL Hull Extension)	1	COSMO.(Export)
2014	03 SUNFLOWER No. 2 SIDE SHELL DAMAGE (PORT) -RENEW	1	Daea Express Shipping Co., Ltd.
	05 SUNFLOWER No. 2 SIDE SHELL DAMAGE (STBD) -RENEW	1	Daea Express Shipping Co., Ltd.
	06 Ocean Lahore Hull Bow Repair	1	Sea shipping
	06 WEST FRONTIER BOW & SIDE SHELL DAMAGE (P / S) -KEEL Crystal & SHELL RENEW	2	Shinhan Shipping Co., Ltd.
	09 SEA FLOWER SIDE SHELL DAMAGE (P / S) -RENEW & LONGI reinforcement	1	Hyundai E & C
2015	02 SUNFLOWER SIDE SHELL DAMAGE-LONGI Reinforcement & RENEW	2	DaeJe Shipping Co., Ltd.
	06 Ocean La Laho Hull Forward Renovation	1	Dimul Shipping
	10 WEST FRONTIER BOW & SIDE SHELL DAMAGE (P / S) -BOW REPAIR & SHELL RENEW	1	Shinhan Shipping Co., Ltd.
	10 QUEEN STAR 2 PORT BOW DAMAGE-REPAIR	2	Sea World Express Ferry
	10 QUEEN STAR 2 PORT BOW DAMAGE-REPAIR	1	Sea World Express Ferry
2016	01 OCEAN FLOWER BOW DAMAGE-RENEW & REPAIR	1	Daea Express Shipping Co., Ltd.
	02 Dolphin SHELL DAMAGE (P / S) -RENEW & REPAIR	1	Dolphin Shipping
	03 WEST FRONTIER SIDE SHELL DAMAGE & ENGINE ROOM BHD REPAIR (P / S)-SHELL RENEW & REPAIR	1	Shinhan Shipping Co., Ltd.
2018	07 Ocean Laraho Hull Repair	1	Sealine Express Shipping Co., Ltd.
	08 Air lift	1	Maritime Police Agency





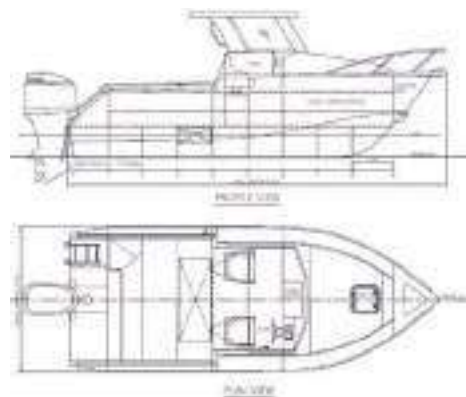
# Marine leisure



## 6.5M 42 knots Aluminum leisure boat

### Specification

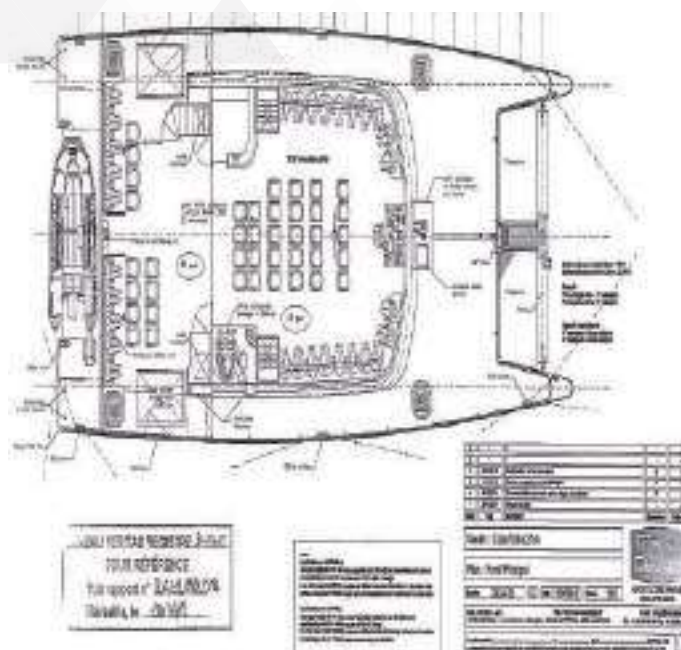
LOA	6.5m
BEAM	2.4m
DRAFT	0.3m
Displacement	1.9t
Fuel tank	180 L
Max Speed	42 Knots



# 21.5M <sup>20 knots</sup> Aluminum yacht

## Specification

LOA	21.5 m
BEAM	9.15 m
DRAFT	1.57 m
Fuel tank	2 x 1300 t
Max Speed	20 Knots
Cruising Speed	4 Knots
Engines	2 x 500 Hp
Total capacity	99 passengers



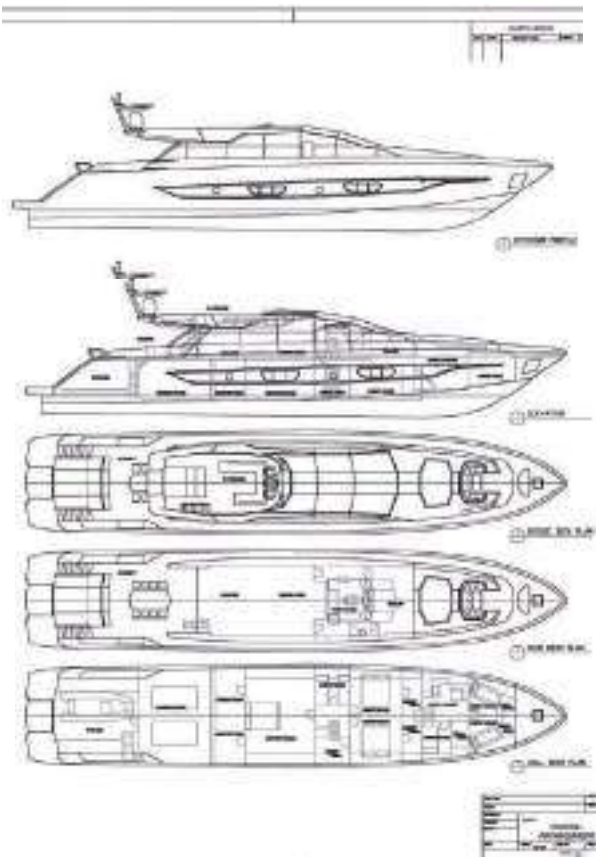


# 35M

35 knots  
Aluminum superyacht

## Specification

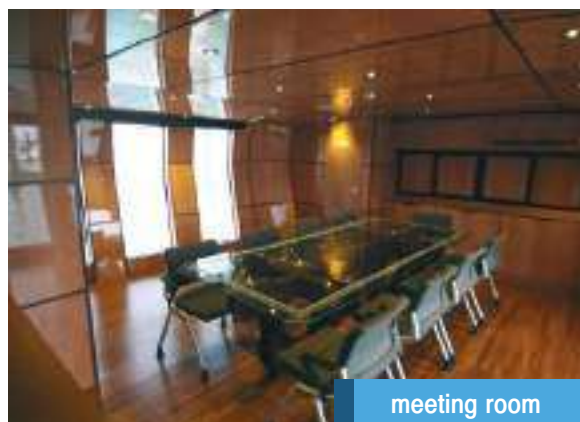
LOA	35.0 m
BEAM	7.6 m
DRAFT	1.3 m
Disaplacement	160 t
Fuel tank	18500 L
Max Speed	35 Knots
Cruising Speed	27 Knots





# High-speed administrative line

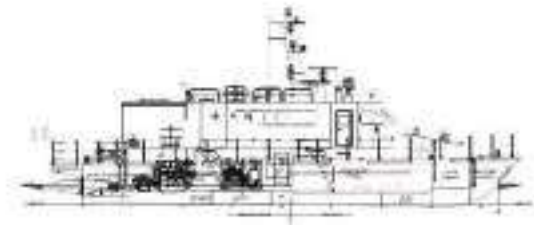
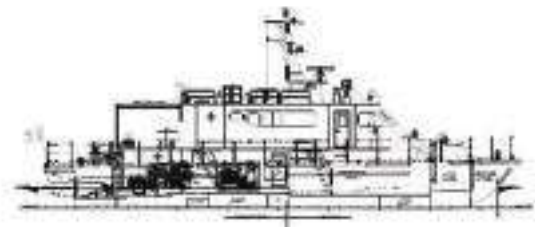
(The 120-ton Gyonggi Vessel)



# Fishery Control Ship (G/T 35 Tons)

## specification

LENGTH	L.O.A	abt. 22.450m
LENGTH	L.B.P	20.000m
LENGTH	LT, 측정길이	21.000m
BREADTH		4.900m
DEPTH		2.100m
DRAFT	D.L.W.L	1.000m
DRAFT	S.L.W.L	1.1000m
MAIN ENGINE		CAT C32
MCR	1,450 BHP (1,081 KW) X 2,300 RPM X 2 Sets	
SPEED	at TRIAL MAX. (100% MCR, D/W 20% LOAD) abt. 30.00 kts	
Boarding number		10명
sailor		3명
Other		7명
Nautical Area		Inshore area
Sailing time		4 hours



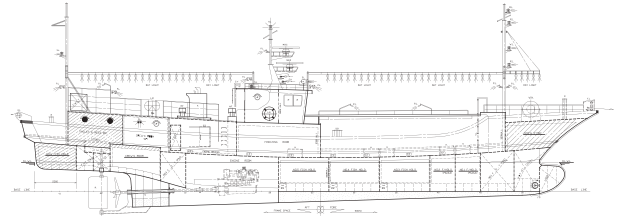
# Eco-friendly Fishing Boat



## G/T 50 Ton Aluminum Light Alloy Fishing vessel development and construction

### specification

LOA	35.0 m
BEAM	7.6 m
DRAFT	1.3 m
Displacement	160 t



### ► Classification

- ◎PROJECT : Aluminum Eco-Friendly Fishing Boat Construction
- ◎Convergence Technology : Aluminum light alloy fishing boat linear development
- ◎Development performance : ALLOY HULL 3D production drawing and work MANUAL, LED pick up light power storage SYS, Energy Saving System, Automation of ancestors and localization

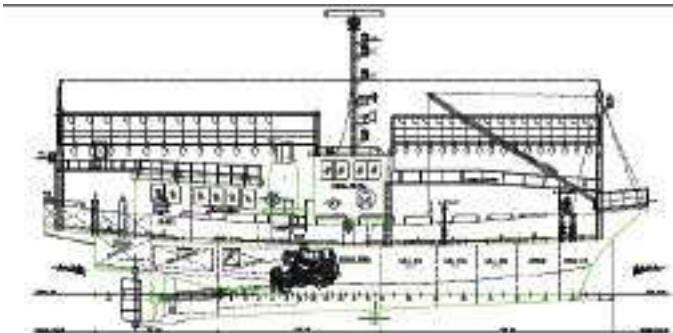
◎sharpness : Andong Ho





# G/T 19 Ton eco-friendly Next Generation Fishing Boat

Specification	
LOA	20.35 m
BEAM	4.9 m
DRAFT	0.9 m
SPEED	15 Knots
PERSON	10 People



# Research and Development field

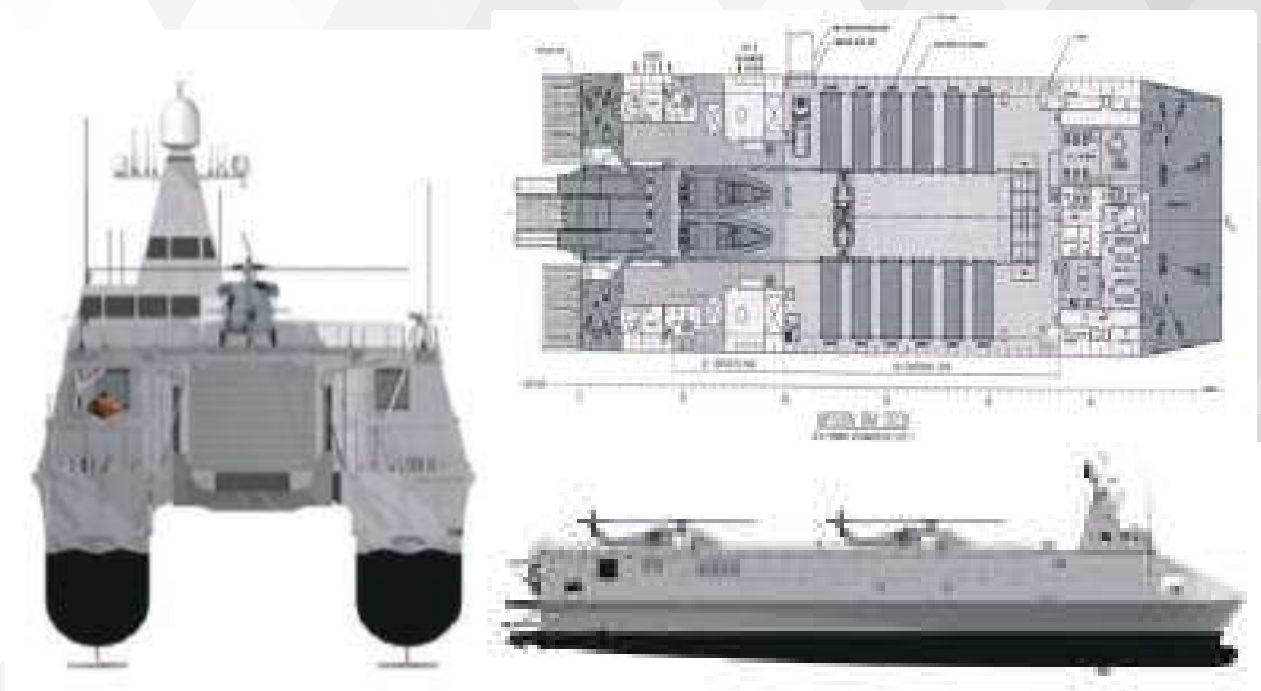
## Air cushioned landing ship LSF-II

### Specification

LOA	27.9 m
BEAM	14.6 m
DISAPLACEMENT	155 t
MAX SPEED	74 Knots

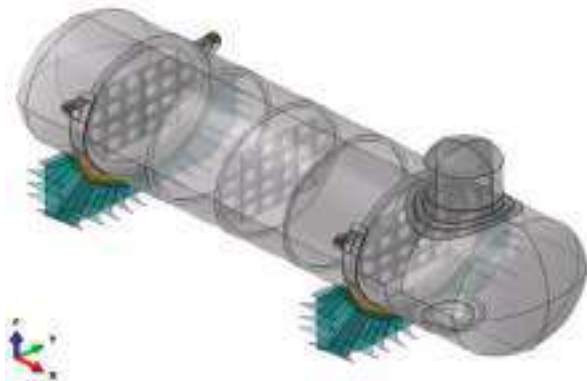
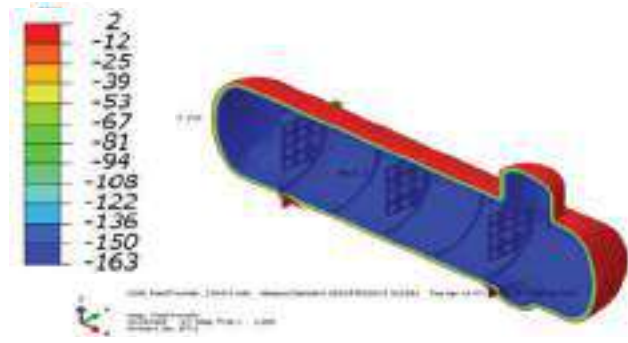
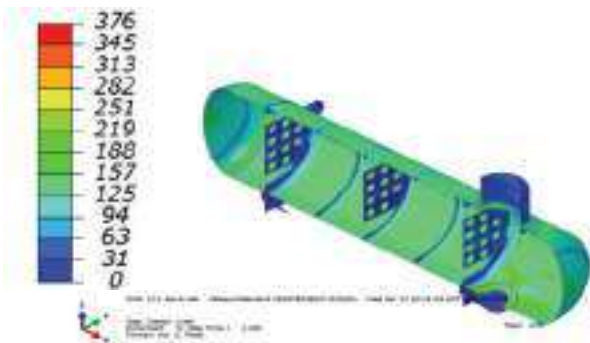
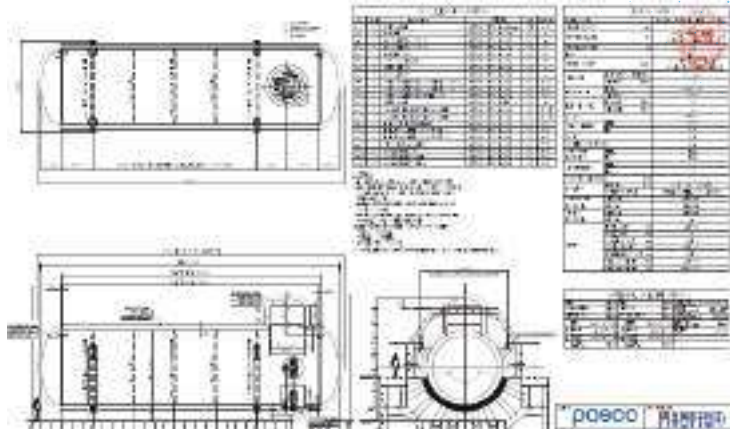


## Development of 60M Aluminum Super High Speed Special Ship



# LNG CARGO TANK

용량 : 500M<sup>3</sup> (21.7M x Dia.5.55M)



Characteristic				
Plate material	9% NI	SUS 304	AL 5083	High Mn
yield strength(Mpa)	≥ 585	≥ 205	124~200	≥ 400
tensile strength(Mpa)	690~825	≥ 515	276~352	800~970
price(USD \$/Ton)	3040~3650	3040~3650	3910~4780	2170~2600
welding rod material	Inconel	Type 308	ER5356	FCA,SA,GTA
yield strength(Mpa)	-	-	-	≥ 400
tensile strength(Mpa)	≥ 690	≥ 550		≥ 660
price(USD \$/kg)	87	87	11	11
weight ratio	1	1.73	0.93	1
average unit price (USD \$/Ton)	4806	5908	4200	2560



# Aluminum weld deformation correction and control system



정 하중상태에서의 최대발생 처짐 : 0.132mm



다기능 성형 시스템의 판재성형 변형형상



상부 실린더 부여 하중 조건



정 하중상태에서의 최대발생 응력 : 5.13MPa



다기능 성형 시스템의 판재성 최대응력



최대응력 82.18MPa(SS400 항복강도의 35%)

## <3D Analysis of Aluminum Multi-Function Forming System>



<Prototype development of marine Al alloy multi-functional molding system>

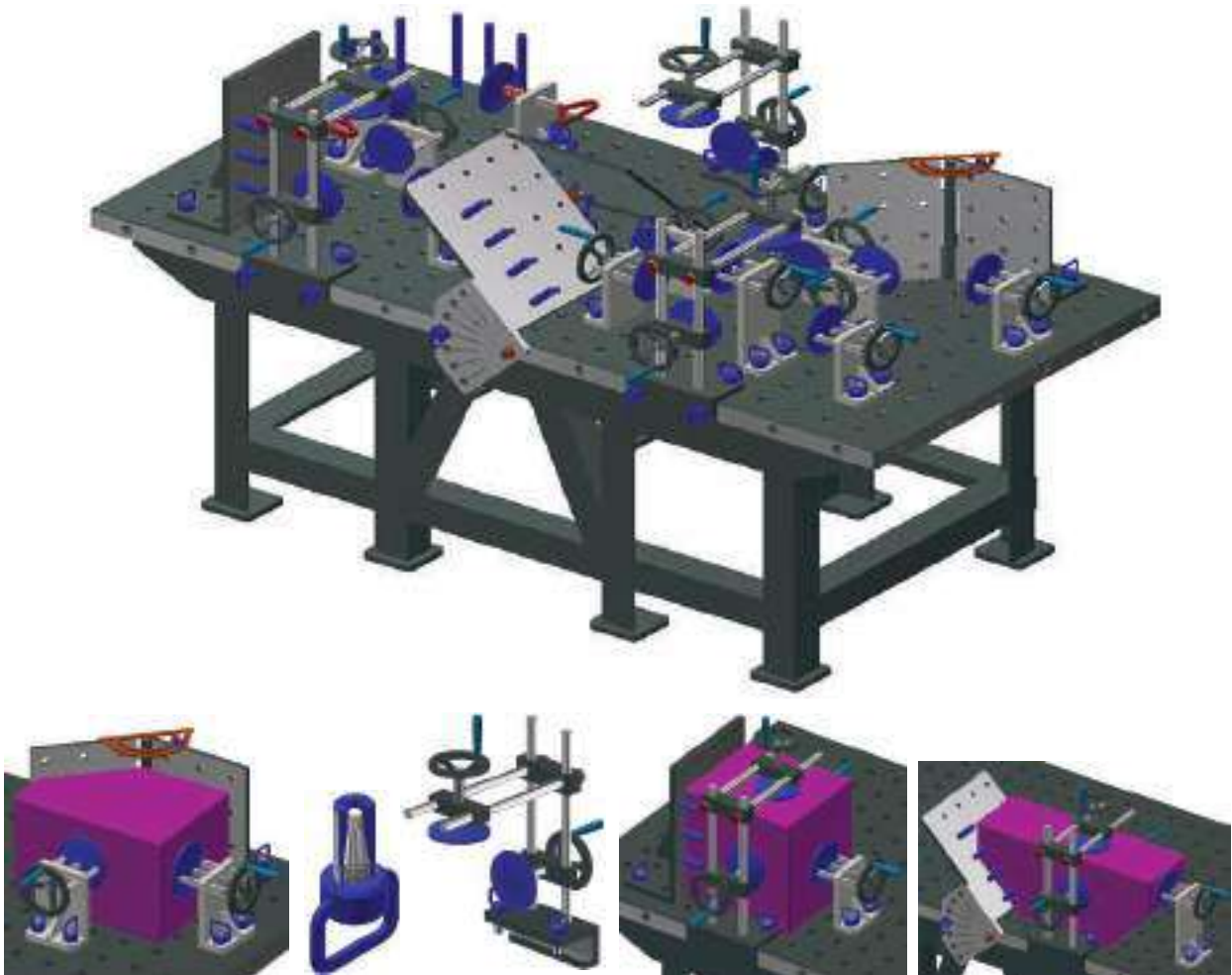


<Marine leisure Al ship with multifunctional molding system>

# Development of Steel/Aluminum Outfitting Welding Table and Setting Device

## ○ Accessories and features of equipment

- Vise of right angle table and handle type with positioning holes (horizontal and vertical)
- Adjustable vertical and horizontal pushers (using collet locking pins)
- Right angle (90°) setting device and vise set (with vertical / horizontal pushers and handle type vise)
- Adjustable quick horizontal angle setting device (0°, 15°, 30°, 45°, 60°, 75°, 90°)
- Horizontal angle adjuster and positioning pusher (X, Z plane)
- Vertical angle adjuster and positioning pusher (X, Y plane)



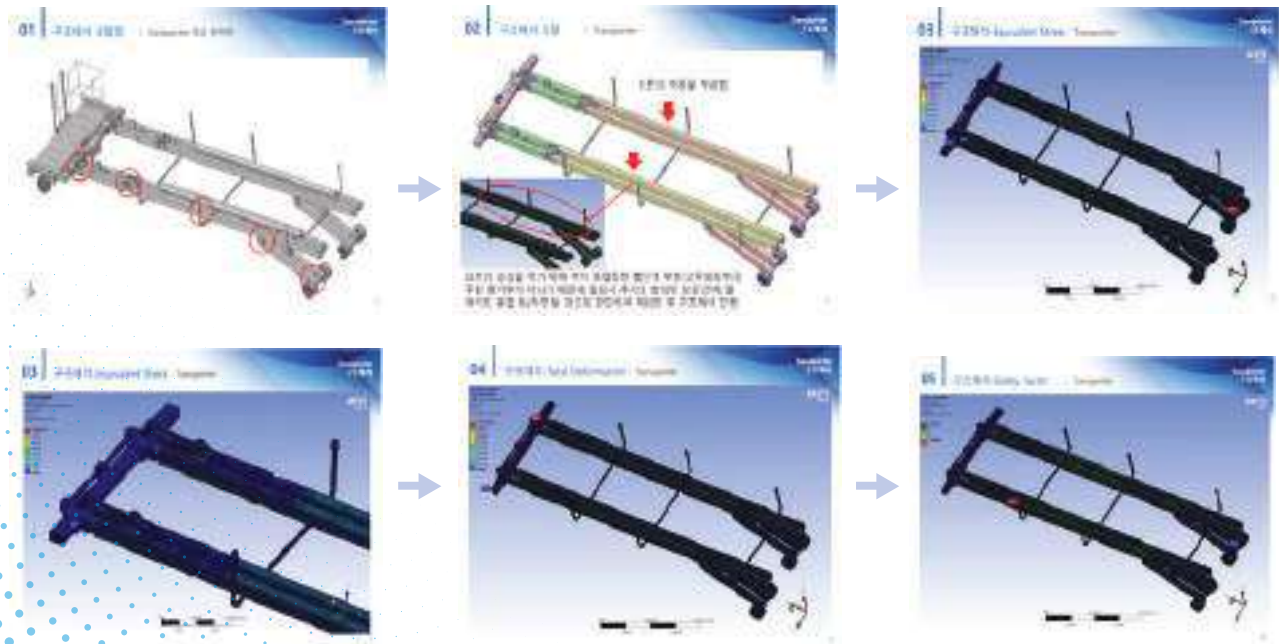
# Automatic Position Control 20 Ton Marine leisure Equipment

## Dry specification

Length	11.6 m
Vwidth	2.8 m
Height	1.98 m
adjustment	width : 1.18 m / VRight and left height 1.2 m



## Transmitter Structure Analysis





# Main Qualification Holdings



Quality Management System Certificate



Environmental Management System Certificate



Safety and Health Management System Certificate



NICE Evaluation Information Excellent Company Certificate



Company-affiliated research institute certificate



Youth-Friendly Jiangsu AEnterprise Selection Letter



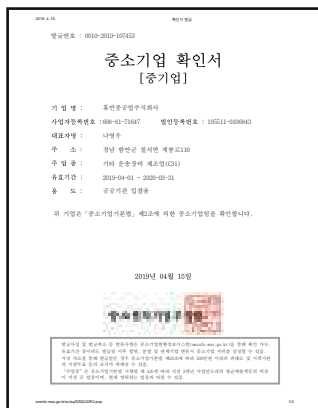
Patent-Marine Soundproof Door



Patent-Welding deformation correction device



Utility Model Registration-Bending Control Device



Small Business Confirmation



Venture company certificate



Venture company confirmation



Risk Assessment Certificate



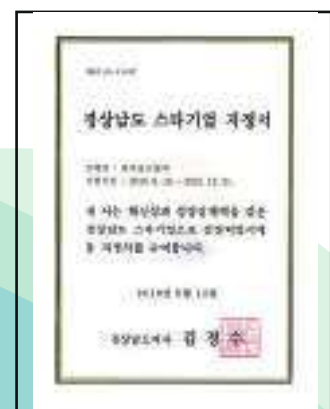
Security Status Confirmation Report

New Export Enterprise Support Project  
Selected company confirmation

Jiangsu Enterprise Certificate



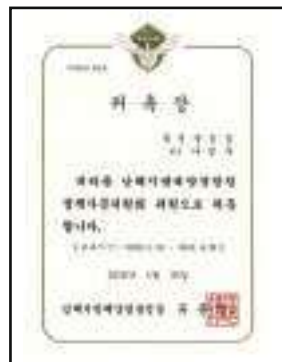
Direct Production Certificate

South Gyeongsang Province  
star corporate certificate

# Main Qualification Holdings



INNOBIZ



Namhae Regional Coast Guard  
Appointed members of the  
Policy Advisory Committee



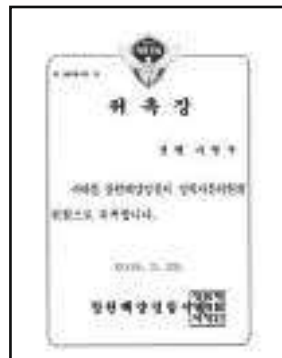
For Gyeongnam Shipbuilding Industry  
Development Commission of Public-Private  
Council Members



Commitment to Advance Shipbuilding  
& Marine Industry Structure Appointment  
of committee for promotion committee



Small and Medium  
ABusiness Administration Citation



Changwon Maritime Police Station  
Appointed members of  
the Policy Advisory Committee



Commissioned  
Maritime Advisor



Maritime Security Day  
Certificate of Appreciation from  
the Minister of National Security



16th Korea Maritime Day  
Industrial Medal Certificate



Excellent job creation company



Commendation of  
Merit by Gyeonggi-do  
Governor

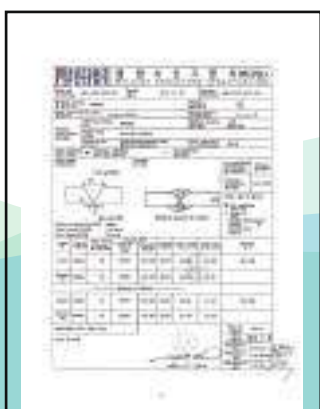


Certificate of Appreciation





ABS-HMHI WPS-2017-A03

ABS AL5083 H321  
ASTMB928 3GLR 2017 AL 5083-H321\_  
20.0\_1,2,3,4GLR 2017 AL 6061-T6\_  
8.0\_1,2,3,4GLR WPS 2018\_A05  
SUS316L\_1.0mm\_1GABS AL 5083 H321  
ASTM B928 2GDNV GL AL 5083P  
2G 2012A01DNV GL AL 5083P  
3G 2012A02KR AL 5083P 3G-UP 3~20mm  
2012A05

# Main Qualification Holdings



DNV GL 5083



KR 2017 AL 5083-H321



LR 2017\_AL 5083



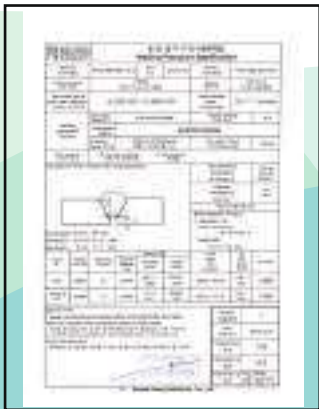
LR 2017\_AL\_5083-H321  
\_40.0\_AUTO\_1G(75%He)



LR 2017\_AL\_5083-H321  
\_40.0\_1,2,3,4G(75%He)



LR 2017\_AL\_5083-H321  
\_40.0\_AUTO\_1G(25%He)



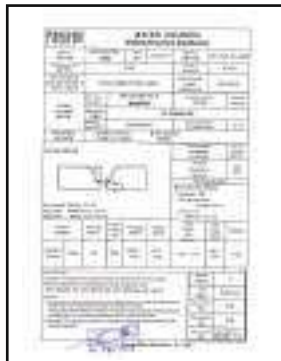
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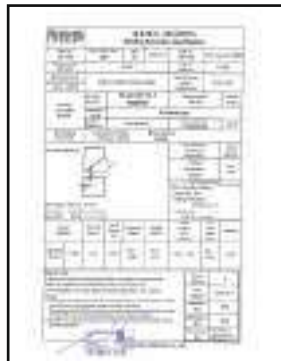
LR AL 5083P 2G 3~24mm  
2014A07



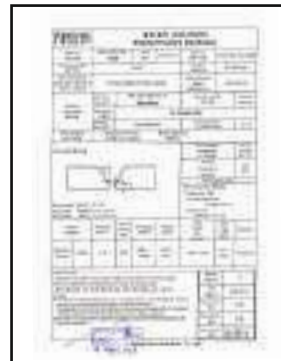
LR AL 5083P 3G 3~24mm  
2014A08



LR WPS 2018 A06\_High  
manganese\_25MM\_1G



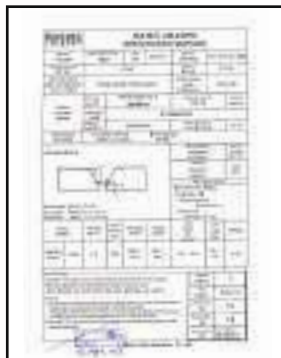
LR WPS 2018 A07\_  
manganese\_25MM\_2G



LR WPS 2018 A08\_  
manganese\_25MM\_3G-UP



LR WPS 2018 A09\_  
manganese\_25MM\_4G



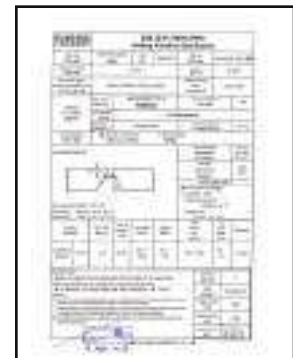
LR WPS 2018\_A10\_  
manganese\_12MM\_1G



LR WPS 2018\_A11\_  
manganese\_12MM\_2G



LR WPS 2018\_A12\_  
manganese\_12MM\_3G-UP



LR WPS 2018\_A13\_  
manganese\_12MM\_4G



KR 2012 A05 Approval List



KR-SUS316L+CuNi Alloy



KR-DUPELEX-2G/3G UP



# Human Heavy Industries News

## Human Heavy Industries Co., Ltd. Brings Korea's First Special Startup



Human Heavy Industries Co., Ltd. possesses the best technology for aluminum ships. Held a launching ceremony for the medium-sized high-speed bulletproof boat, including Moon Hee-mu, Changwon Mayor Moon Seung-wook, Governor of Gyeongnam Province, and Kim Do-joon Major personnel such as the head of the equipment technology department and Kim Tae-kyun, chief of Changwon Maritime Police, were greatly impressed with the company's unique technology. He would The aluminum hull structure has a superior speed of 40 knots, a range of over 300 miles, and an excellent specification that can be operated at a limit of 3m. Because I boast.

### Fishing boat modernization, aluminum is the answer

Human Heavy Industries Co., Ltd. was established in 2008. Related to the actual aluminum welding, WPS certification of SUS, DNV for dissimilar metals, LR, ABS, KR He holds the first place and seized the leading position. Unlike the sieves built ships with steel wire and FRP, AluRepresentative Na Young-woo, who anticipated the opening of the medium ship eraThe director's judgment hit, and sales that soured the first year surged. It has laid a foundation for growth by drawing a curve. It is used for special ships, aluminum blocks, equipment and LNG fuel tanks. As demand starts to grow, This is because we found Human Heavy Industries Co., Ltd. Do not settle for the current company certification in 2014 In the midst of the R & D, Nayoung Woo put more energy into research and development. "Aluminum has a slightly higher hull cost, It has more strengths. "It is especially eco-friendly.Essential skills for modernizing fishing vessels, as well as public ships. " Explained. Aluminum is more eco-friendly than FRP vessels In terms of low fuel consumption and future ship management, There are few problems such as cracks. Above all, environmental pollution and excellent Because of its resilience, even if a marine accident Can be reduced.

### Passed bulletproof test for the first time in Korea

Digging into aluminum has many advantages. Light ship Excellent in straightness, rotational and resilience There seems to be a chance in the defense industry as well. "Human In the words of CEO Na Young-woo, Heavy Industry Co.,Ltd. Small and medium-sized aluminum high speed craft As I jumped into the dry market, the triumph sounded.



At first, the design of submarine equipment or the construction of high speed boat hulls in the seascape, On August 13, Korea's first special maneuvering boat (medium sized high speed bulletproof) The ship had two launches. Knocked on Human Heavy Industries Co., Ltd. to carry out its mission most effectively and economically In the meantime, the maritime maneuvering boats lacked bulletproof functions to weaken the armed forces and protect the crew. Activities have been limited at high speeds and low water depths, while special maneuvering launched by Human Heavy Industries Co., Ltd. First ship to pass ballistic test at National Defense Academy In addition, bulletproof plate with excellent light weight performance is installed in all areas of the upper part of waterline to greatly protect the crew's protection function. In addition to the K-6 and M-60 armed, it was also capable of naval counter-terrorism operations, maritime security and ship defense. It is the first small ship in Korea that can fire 350

ons of seawater up to 100M per hour The installation is expected to be effective in cracking down on illegal fishing vessels and fighting off fires at sea. In addition, a high-performance infrared camera, night vision, and searchlight specialized in the performance of special missions were installed. CEO Young-woo Na said, "The weight of the hull and the water jet are installed to fit the high speed operation. It is possible to operate a range of 300 miles at 40 knots or more. " We will focus on exporting various kinds of special ships made of aluminum. "

## Promotion of new business related to LNG

Amid the long-term recession of the domestic shipbuilding industry, the heavy lifting of Human Heavy Industries Co., Ltd. has great implications for the shipbuilding industry. I applaud the energy that I won with extraordinary items in the aftermath of the recession. This is also because of this. In fact, my CEO recognized the strengths of aluminum materials Domestic production of main facilities I got mad. In addition, the Ministry of Maritime Affairs and Fisheries participates in the development and demonstration of the next-generation Korean fishing boat. It is actively promoting the expansion of aluminum fishing boats. Gyeongnam Shipbuilding & Marine Equipment Cooperative Chairman of the Board of Directors, in order to prepare for a breakthrough in overseas shipbuilding equipment manufacturers and overseas export breakthroughs. Busy steps are also moving. Aside from company affairs, I'm looking for government departments or financial institutions, He is enthusiastic about throwing water. Recently, LNG to overcome the difficult crisis of shipbuilding and marine industry In addition to developing new products such as fuel tanks and collaborating with KOTRA, the company also launched new overseas markets in Southeast Asia. CEO Na said, "Eco-friendly world trend, we are investing a lot in LNG." "Now LNG The fuel tank was developed using aluminum and high manganese steel materials, which will be the main business in the future. "said. LNG fuel tanks mounted on small vessels are Type C tanks with a storage capacity of less than 100 m3. Human Heavy Industries Co., Ltd. has begun to develop products with increased safety due to government tasks. The government plans to order 140 LNG fuel ships for six years from 2020 to 2025. It can be another food for the company. CEO Young-woo Na said, "Individually, I am most excited and rewarding when I go to the event. " "Hope that the Hanshibapi shipbuilding industry will regain stability and revive. "To this end, localization of equipment is urgently needed, but strong support is needed at the national level." Mentioned.



# Human Heavy Industries News



From the left, Daewoo Shipbuilding & Marine Engineering Kwon Oh-ik, CEO, Human Heavy Industries Na Young-woo, Hyundai Heavy Industries Kim, Tae-Moon, General Manager of Hyundai Mutual Heavy Industries, Nam-Hoon Kim, Researcher, Small and Medium Shipbuilding Research Institute



The star companies selected this year are Taejin Heavy Industries, Kenkoa Air Space, KMT, Korea L-Tech, Visor, DM Technology, ITECO Co., Ltd., Korea Systems Co., Ltd., Dong-A Special Metal Co., Silver Star Chemical Co., Ltd. ISPEC Co., Ltd., JPS, Eugene Metal Industry Co., Ltd., Moojin Co., Ltd., and Human Heavy Industry Co., Ltd.



Kyoung-Hak Kwon, Director, Gyeongnam Regional Small and Medium Venture Business Administration  
Representatives of SME cooperatives are shouting. Gyeongnam Regional Headquarters





< MBC News >

<https://tv.naver.com/v/9500524>

<https://youtu.be/QiyfvRFZgNI>



< KNN News >

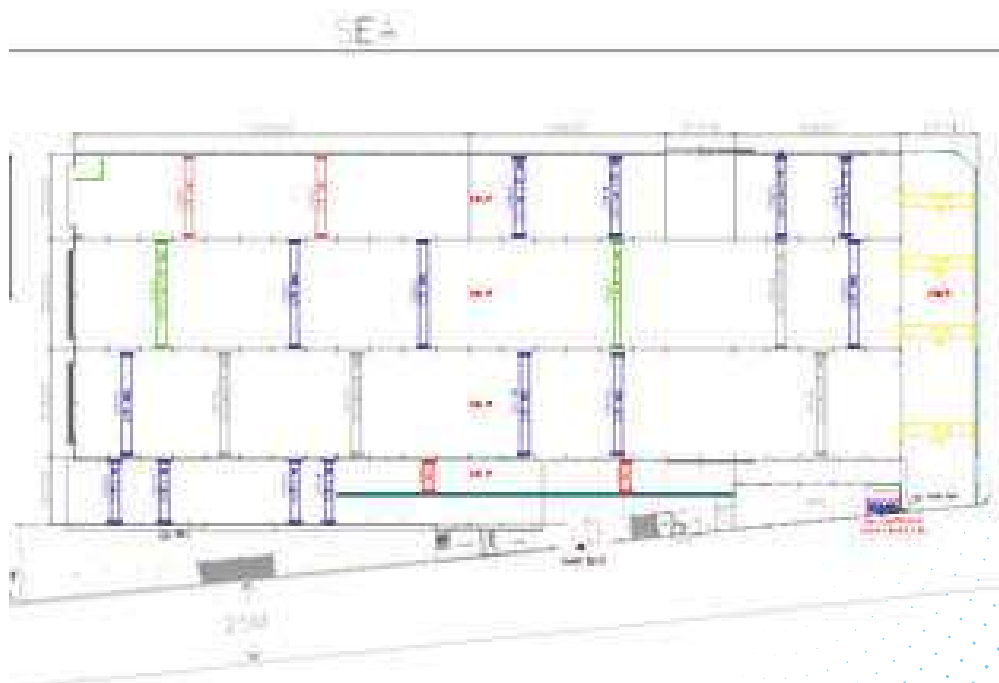
<https://tv.naver.com/v/9503956>

<https://youtu.be/GwcVCUI19sg>

# Human Heavy Industries Co., Ltd.'s 2nd Factory



2nd Factory: Jeokhyeon-ro, Seongsan-gu, Changwon, Gyeongsang Province



# Human Heavy Industries Co., Ltd.'s Headquarter



Head Office / Factory 1: 110, Gaeyong-ro, Chilseo-myeon, Haman-gun, Gyeongnam



building 3,966<sup>m</sup><sup>2</sup> (Land 16,528<sup>m</sup><sup>2</sup>), Power 500kw x 380V/220V

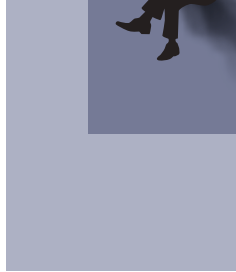


# Epilogue



Customer trust and satisfaction  
are the top priority of  
Human Heavy Industries Co., Ltd.





## Customer Trust and Satisfaction

