

ELEANOR ROOSEVELT – Ro-pax ferry



Shipbuilder:	Astilleros Armon
Vessel's name:	<i>Eleanor Roosevelt</i>
Owner/Operator:	Baleària
Country:	Spain
Designer:	Incat Crowther Australia
Country:	Cyprus
Flag:	Cyprus
IMO number:	9863637
Total number of sister ships already completed (excluding ship presented):	0
Total number of sister ships still on order:	0

Designed by Incat Crowther and built by Spanish shipyard Astilleros Armon for local ferry operator Baleària, *Eleanor Roosevelt* achieved two significant 'firsts' when delivered in early 2021. As well as being the longest fast ro-pax ferry in operation at the time of delivery, the vessel was also the first fast ferry with reciprocating gas-fuelled engines. In addition, *Eleanor Roosevelt* incorporates smart ship technology for onboard services and uses Big Data to monitor its efficiency and emissions in real time.

Baleària has a policy of developing all its fleet to run on LNG whether by way of conversion or newbuildings, although in October 2021 the company switched to using LNG only in port due to rocketing LNG prices. This is seen as a temporary setback as the company is determined to extend its green credentials.

As is to be expected for a fast ferry, *Eleanor Roosevelt* has been constructed from marine grade aluminium. The 12,262gt vessel which is a one-off has capacity for 1,200 passengers and space for 500 linear metres of trucks and 250 cars, or alternatively 450 cars, on the car deck. Access to the two vehicle decks is by a stern ramp.

For passengers, priority has been given to spaciousness and the separation between seats, and comfort on board by means of a state-of-the-art stabilisation system, which will considerably reduce movement. Motions have been reduced with the latest iteration of Incat Crowther's proven catamaran hull form, coupled with an operation-specific centre bow design. A retractable centre T-foil will also be used to smooth the ride, whilst an isolated superstructure provides ultra-quiet passenger spaces. Vibrations and noise will also be minimised thanks to an elastically floating superstructure and the installation of high-tech insulation.

As well as the usual restaurant, shopping and entertainment facilities that are found on most modern ro-pax vessels, *Eleanor Roosevelt* also has some novel features. There are kennels to allow travellers to bring their pets, with kennel monitoring via a smart phone app. In keeping with the shipowner's environmental vision and increasing electric vehicle ownership, the ship has been equipped with electric vehicle charging stations. The ship has also been designed as a 'smart ship' permitting boarding by way of QR codes on passengers' mobile devices through WhatsApp, whilst high-speed Wi-Fi is available throughout the vessel.

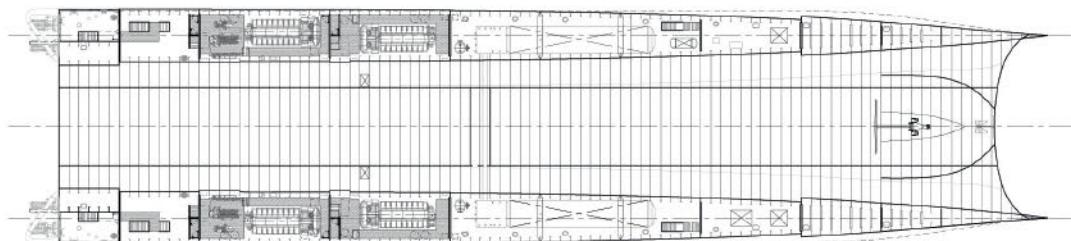
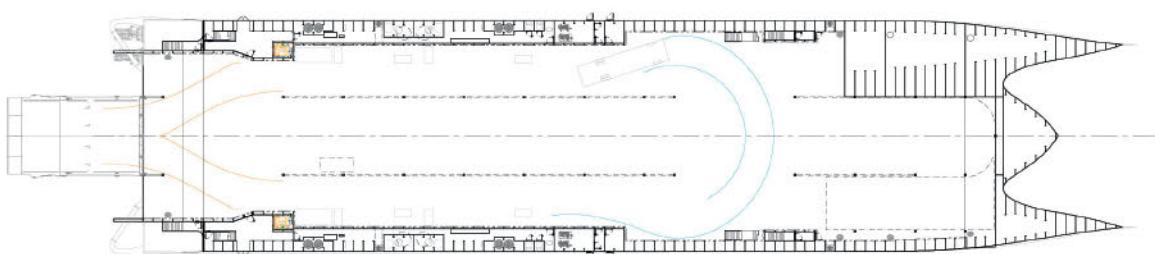
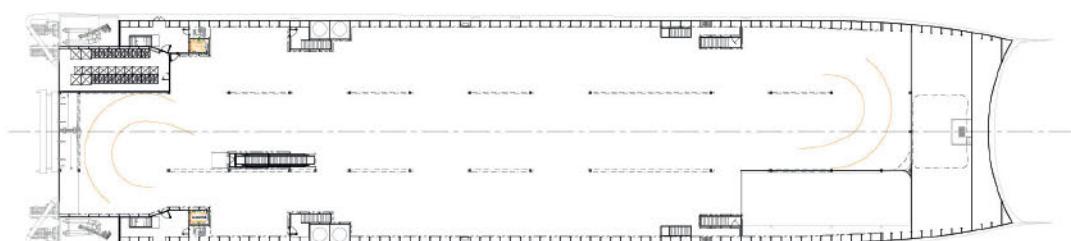
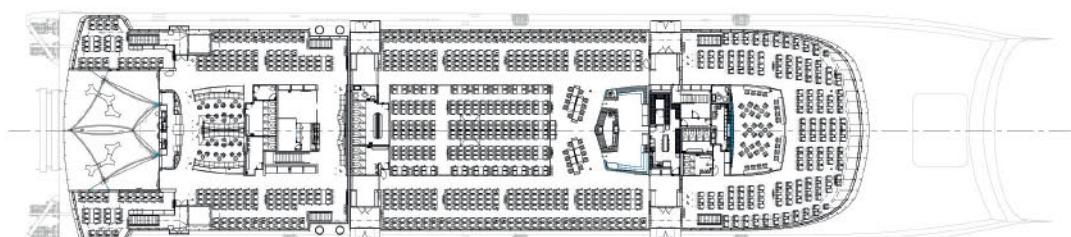
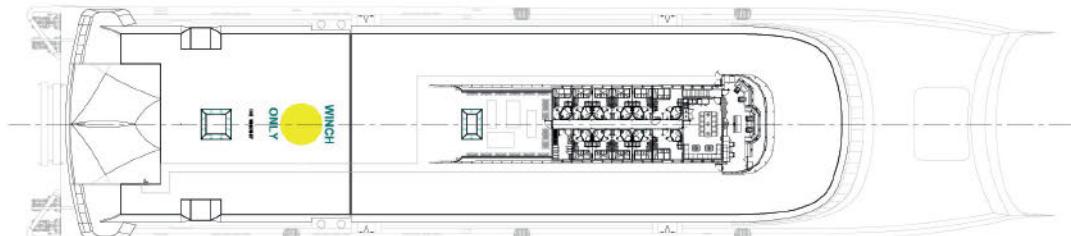
On the propulsion side the ship adds a new reference for Wärtsilä's 31DF engine of which four 16-cylinder Vee versions are installed. These produce 8,800kW power each at 750rpm. Two engines are placed in an in-line position in each of the catamaran hulls. The engines in each hull are slightly offset allowing the power to be taken through two Reintjes' SLVJ850 gearboxes to a pair of Wärtsilä LJX 1500SR waterjets. Giving a total

of four gearboxes and waterjets powering the vessel. Service speed is around 37knots, but maximum speed is 40knots.

TECHNICAL PARTICULARS

Length oa:	123.0m
Breadth moulded:	28.0m
Depth moulded:	7.8m
Draught	
design:	3.25m
Lightweight:	2,000t
Deadweight:	1,200t
Speed, service (%MCR output):	35knots
Classification society and notations:	Bureau Veritas
Propulsion	
Main engine(s)	
Model:	16V31 DF
Manufacturer:	Wärtsilä
Number:	4
Type of fuel:	Diesel/LNG
Output of each engine:	8,800kW@750rpm
Gearbox(es)	
Make:	Reintjes
Model:	SLVJ 850
Number:	4
Propeller(s) - Waterjets	
Designer/Manufacturer:	Wärtsilä LJX 1500 SR Waterjets
Number:	4
Vehicles	
Number of vehicle decks (fixed/movable):	2
Total cars:	450
Passengers	
Total:	1,200
Efficiency	
Energy Saving Technologies:	Duel fuel, reciprocating engines and LNG tanks
Contract date:	May 2018

ELEANOR ROOSEVELT



FAUSTINE – Vehicles carrier



Shipbuilder:	Hyundai Mipo Dockyard Co., Ltd
Vessel's name:	Faustine
Owner/Operator:	CLDN
Country:	Belgium
Designer:	Hyundai Mipo Dockyard Co., Ltd
Country:	Republic of Korea
Flag:	Malta
IMO number:	9889708
Total number of sister ships already completed (excluding ship presented):	0
Total number of sister ships still on order:	1

Faustine, delivered in October 2021, and sister ship Seraphine scheduled for February 2022 delivery are LNG-fuelled freight ro-ros built for Belgian operator CLDN by Hyundai Mipo in South Korea.

The vessels are 216.47m in length with a beam of 32.26m. They have a gross tonnage of 50,450 and a deadweight of 20,200t. With their bulbous bows, transom sterns and stern ramps have a typical freight ro-ro profile. They are however, the most technologically advanced vessels in the CLDN fleet and have been designed to run on LNG or biogas. Both vessels will operate on the owner's Zeebrugge to Gothenburg service.

Faustine has seven cargo decks and a total lane length of 4,948m. Two of the decks (3A and 4A) are hoistable car decks. The uppermost deck is an open deck. Capacity is for 318 freight units and 822 cars. All internal ramps and the main stern ramp were supplied by MacGregor. The type-C LNG fuel tank and gas treatment room is installed on the No.3 deck. Faustine is equipped with a FLUME tank system for roll reduction.

The propulsion system comprises a HYUNDAI-built MAN B&W 7550ME-C9.5-GI dual-fuel engine with a power output of 12,460kW at 117rpm driving a Kongsberg controllable pitch propeller. Service speed is 17.6knots. The main engine also has a shaft generator and a power take home mode. Auxiliaries are three HIMSEN 8H25/33 gensets and one HIMSEN 6H21/32.

In February 2022, CLDN ordered two larger 8,000-lane-meter ships from the same builder which will also feature dual-fuel engines in a hybrid configuration.

TECHNICAL PARTICULARS

Length oa:	216.47m
Length bp:	204.00m
Breadth moulded:	32.26m
Depth moulded to No.3 deck:	12.20m
to No.5 deck:	27.30m
Width of double skin side:	1.10m
bottom:	1.70m

Draught
scantling:.....8.20m
design:.....7.40m
Gross:.....50,450t
Deadweight
scantling:.....20,200t
design:.....15,800t
Speed, service:.....17.60kn
Bunkers (m³)
Light Fuel oil:.....1,960
Gas oil:.....330
Water ballast (m³):.....12,800
Daily fuel consumption (tonnes/day)
Main engine only:.....22.4(gas mode)
.....27.5(diesel mode)

Classification society and notations:.....+1A,
RO/RO ship, CONTAINER, EO, DG(P),
NAUT(AW),
CLEAN, BIS, TMON(oil lubricated), Gas fuelled,
LCS, Recyclable

Propulsion
Main engine(s)
Design:.....MAN ES
Model:.....Hyundai-B&W 7S50ME-C9.5-GI
(TIER II)
Manufacturer:.....HHI-EMD
Number:.....1 set / ship
Type of fuel:.....Natural gas / LFO /
MGO / MDO
Output of each engine:.....12,460kW x
117rpm (Nominal rating)
Is this a diesel-electric or hybrid?:.....N
Propeller(s)
Material:.....Ni-Al Bronze
Designer/Manufacturer:.....Kongsberg
Number:.....1 set / ship
Fixed/Controllable pitch:.....Controllable pitch
Special adaptations:.....Propeller shaft clutch
for PTH application

Fuel Gas Supply System
Manufacturer:....HHI-EMD (FGSS), Dong-sung
(LNG fuel storage tank)
Type of LNG fuel storage tank:....Type C tank,
Double hull, Vacuum perlite insulation
Max. flow of LNG supply pump:.....abt.
.....1,672kg/h

Diesel-driven alternators
Number:.....4 sets / ship
Engine make/type:HHI-EMD / 3 sets/ship
of 8H25/33, 1 set of 6H21/32
Type of fuel:LFO/MGO/MDO
Thermal Oil Heater
Number:.....1 set/ship
Type:.....H4-TFO-015
Make:.....Alfa Laval
Output, each boiler:.....1,400kW
Bow thruster(s)
Make:.....Kawasaki
Number:.....2
Output (each):2,000kW x 1,200min
Stern thruster(s)
Make:.....Kawasaki
Number:.....2

Output (each):.....1,500kW x 1,200min
Other cranes
Number:.....1
Make:.....Shin Myung Tech Co. Ltd
Type:.....Elec. driven
Tasks:.....Provision Handling
Performance:.....Hoisting Speed abt.
.....10m/min, 4t, 4.5m working radius

Mooring equipment
Number:.....6
Make:.....Kongsberg
Type:.....Hydraulic
Special lifesaving equipment
Number of each and capacity:.....1
Make:.....Viking Norsafe
Type:.....Free-Fall Lifeboat

Vehicles
Number of vehicle decks:.....7 decks
Total lane length:.....4,948 lane length
Total cars:.....822 personal cars
Total freight units (specify size):.....318 unit
(13.6m x 2.6m trailer)
Doors/ramps/lifts/movable car decks
Number of each:.....2/3/0/2(38 panels)
Type:.....Top Hinged Hyd. Cylinder / Fwd
Hinged Hyd. Cylinder/ x / Electric motor driven
Designer:.....MacGregor

Ballast water treatment system
Make:.....Techcross
Capacity:.....1,000m³/h
Complement
Officers:.....12
Crew:.....30
Suez/Repair Crew:.....6

Navigation and other equipment
Bridge control system
Make:.....HGS
Is bridge fitted for one-man operation?Y
Integrated bridge system:.....Y
If yes, make:.....JRC
Model:.....JAN-9202
Radars
Number:.....2
Make:.....JRC
Model(s):.....JMR-9282-S & JMR-9225-9X

Fire detection system / Gas detection system
Make:.....Consilium
Type:.....Salwico Cargo
Fire extinguishing systems
Cargo holds:....Low pressure CO₂ Sys./Sea water
Make/Type:.....Danfoss-semco/Low
pressure CO₂
Engine room:....Low pressure CO₂ Sys./Sea water
Make/Type:.....Danfoss-semco/Low
pressure CO₂
Cabins:.....Portable fire extinguisher/Sea water
Make/Type:.....Fain (Portable fire extinguisher)
Public spaces:.....Portable fire extinguisher/
Sea water

Make/Type:....Fain (Portable fire extinguisher)
LNG bunker station:....Dry chemical powder Sys.
Make/Type:.....Fain
LNG fuel storage space: ...Low pressure CO₂ Sys.
Make/Type:....Danfoss-semco/Low pressure CO₂
Fuel Gas Supply Room:Low pressure CO₂ Sys.
Make/Type:.....Danfoss-semco/Low
pressure CO₂

Waste disposal plant
Incinerator
Make:.....HMMCO

Sewage plant
Make:.....RWO

Efficiency
Attained EEDI value:.....7.14
Required EEDI value:.....9.58
Other installed monitoring tools:....Shaft horse
power meter
Energy Saving Technologies:.....PROMAS
Hull coatings:....Hempel Antifouling Globic 9500
Type:.....Premium high solids chemically
hydrolyzing antifouling based on
nano technology.

Contract date:.....10 July 2019
Launch/float-out date:.....27 May 2021
Delivery date:.....08 October 2021

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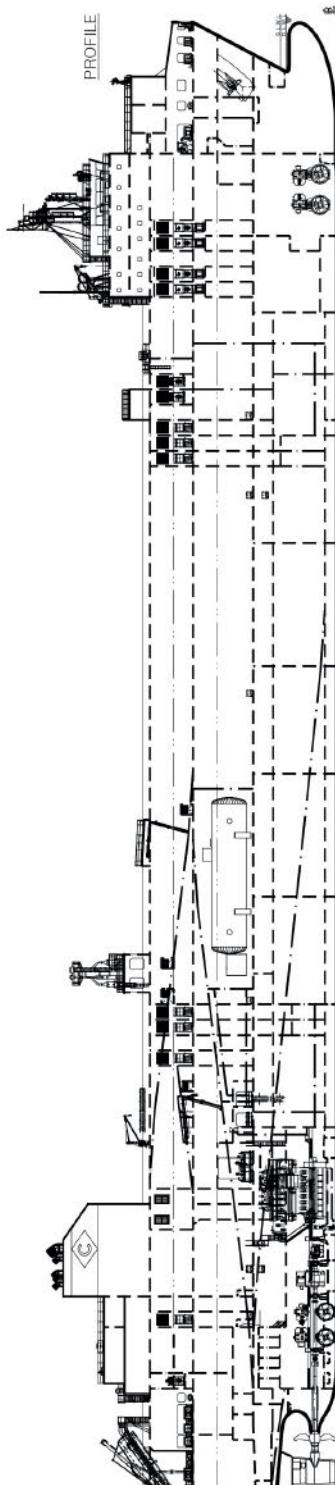


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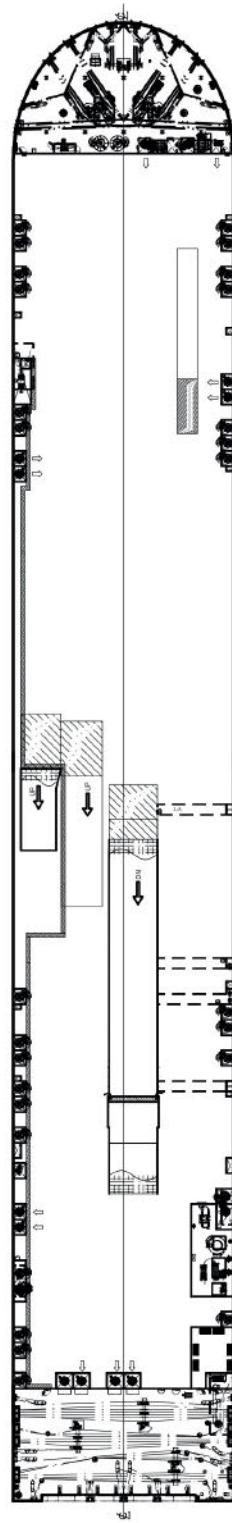
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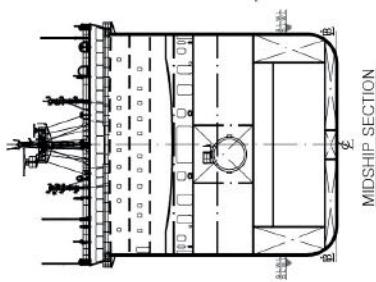
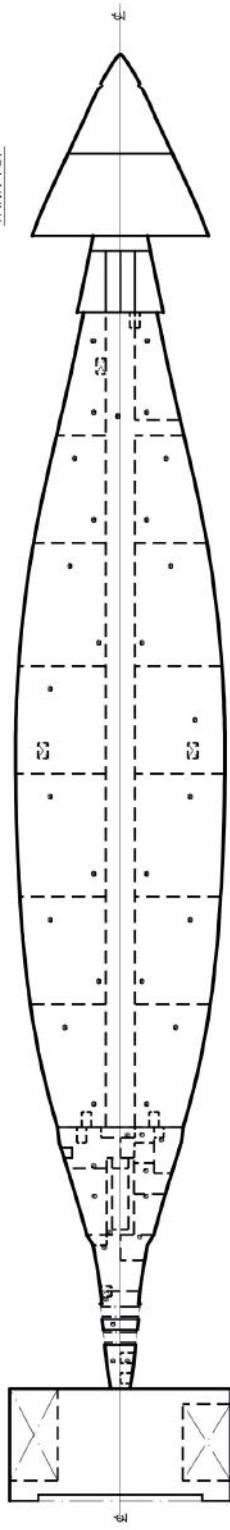
FAUSTINE



NO. 4 DECK (WEATHERTIGHT)



TANK TOP



electric & hybrid marine

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FERRY KYOTO – Ro-pax ferry



Shipbuilder:	Mitsubishi Shipbuilding Co., Ltd; Shimonoseki, Japan
Vessel's name:	Ferry Kyoto
Owner/Operator:	Japan Railway Construction, Transport and Technology Agency (JR TT) & Meimon Taiyo Ferry Co., Ltd
Country:	Japan
Designer:	Mitsubishi Shipbuilding Co., Ltd
Country:	Japan
Flag:	Japan
IMO number:	9890991
Total number of sister ships already completed (excluding ship presented):	Nil
Total number of sister ships still on order:	1

Built to replace an older vessel and to meet growing demand in Japan for short-sea ferry operations, Ferry Kyoto was built by Mitsubishi Shipbuilding in Shimonoseki for operator Meimon Taiyo Ferry. The 33,390gt ro-pax was delivered in December and commenced operations on the Osaka-Shinmoji Kitakyushu route. A sister vessel, Ferry Fukuoka, is due to be delivered in March 2022.

Ferry Kyoto is 195m long, 27.8m wide, and 20.3m deep. It is the largest ship ever operated by Meimon Taiyo Ferry. The vessel has 245 passenger cabins and capacity for 675 persons. There are five car decks with entry via stern or bow ramps and vehicle capacity for approximately 162 12m trucks and 140 passenger cars. The upper car deck has been fitted with ten charging points for EVs.

The vessel has a hybrid propulsion system powered by two JFE Engineering 12PC2-6B engines outputting 8,000kW at MCR. This is a popular engine choice for Japanese ferries and is a development of the SEMT Pielstick engine. The auxiliaries are three Daihatsu 6DE-23 gensets each providing 1,400kWe. The main engines are connected through a gearbox to a 5.8m diameter CPP and in addition there are two electric motor powered azimuthing thrusters. The main engines are intended to be run using high sulphur fuel and to ensure compliance with 2020 SOx regulations, a Valmet scrubber has been installed.

Environmental performance is enhanced by the use of the Mitsubishi Air Lubrication System (MALS) developed by the shipbuilder. This improves energy efficiency and when combined with the overall improved efficiency of the vessel and size increase over existing ships, is claimed to reduce fuel consumption by 35% for each truck carried.

TECHNICAL PARTICULARS	
Length oa:	195.00m
Length bp:	184.00m
Breadth moulded:	27.80m
Depth moulded	
to main deck:	20.30m (6DK)
to upper deck:	15.15m (5DK)
to other decks:	9.55m (4DK)
Draught	
scantling:	6.70m
design:	6.70m
Gross:	33,390t
Deadweight	
scantling:	6,273t
design:	6,273t
Speed, service:	23.2knots(85%MCR)
Bunkers (m³)	
Heavy oil:	128.7(Low Sulphur) / 586.9 (High Sulphur)
Diesel oil:	20.1
Water ballast (m³):	3,649.8
Classification society and notations:	JG, MO
Heel control equipment:	Cross flooding pipe
Propulsion	
Main engine(s)	
Design:	JFE Engineering Corporation
Model:	12PC2-6B
Manufacturer:	JFE Engineering Corporation
Number:	2
Type of fuel:	HFO (High Sulphur)
Output of each engine:	8,000kW(MCR), 6,800kW(NOR)
Is this a diesel-electric or hybrid?	hybrid
Gearbox(es)	
Make:	Renk
Model:	NDSHL II-4500
Number:	1
Propeller(s) / Azimuthing Propeller(s)	
Material:	CAC703 / CAC703
Designer, Manufacturer:	Nakashima Propeller Co., Ltd
Number:	1 / 2
Fixed, Controllable pitch:	CPP / CPP
Diameter:	5.80m / 2.40m
Main-engine driven alternators	
Number:	1
Make/type:	Nishishiba Electric Co., Ltd
Output/speed of each set:	1,400kW
Diesel-driven alternators	
Number:	3
Engine make/type:	Daihatsu Diesel MFG. Co., Ltd / 6DE-23

Type of fuel:.....HFO (Low Sulfur) or MDO
Alternator make/type:.....Nishishiba Electric Co., Ltd
Output/speed of each set:1,400kWe/
900rpm

Exhaust-gas scrubbing equipment

Manufacturer:Valmet
Type:Marine SOx Scrubber
On main engines?:Yes
On auxiliary engines?:No

Boilers

Number:1
Type:HTB-150L
Make:Miura Co., Ltd
Output, each boiler:1,744kW

Stern appendages/special rudders:Becker rudder

Bow thruster(s)

Make:Nakashima Propeller Co., Ltd
Number:1
Output (each):261.6kN

Mooring equipment

Number:4
Make:Manabe Zoki Co., Ltd
Type:Electric hydraulic

Special lifesaving equipment

Number of each and capacity:Lifeboat
Make:Mansei Inc
Type:GJ 6.10

Vehicles

Number of vehicle decks:5 (fixed)
Total cars: 162 (12m trucks), 140 (4.5m cars)

Doors/ramps/lifts/movable car decks

Number of each:5 doors / 4 ramps
Type:Linear-motion cylinder, Jigger cylinder / Linear-motion cylinder, Jigger cylinder
Designer:MacGregor

Ballast control system

Make:NYK Trading Corporation
Type:Trim/Heel adjuster

Complement

Officers:11
Crew:26

Passengers

Total:675
Number of cabins:245
Percentage/number outboard:0

Navigation and other equipment

Bridge control system
Make:Tokyo Keiki Inc
Type:PR-9000
Is bridge fitted for one-man operation?:No
Integrated bridge system:No
Radars
Number:1
Make:Japan Radio Co., Ltd
Model(s):JMR-9225-9X

Fire detection system

Make:Consilium Nittan Marine Ltd
Type:Salwico CCP

Fire extinguishing systems

Engine room:CO₂ Fire extinguishing device

Make/Type:Nippon Dry-Chemical Co., Ltd

Vehicle spaces:Manual sprinkler

Make/Type:Nohmi Bosai Ltd / MHS32

Cabins:Seawater fire hydrant

Public spaces:Seawater fire hydrant

Waste disposal plant

Sewage plant

Make:Taiko Kikai Industries Co., Ltd
Model:CRP-9000, CR-125H

Efficiency

Energy Saving Technologies:MALS
(Mitsubishi Air Lubrication System)

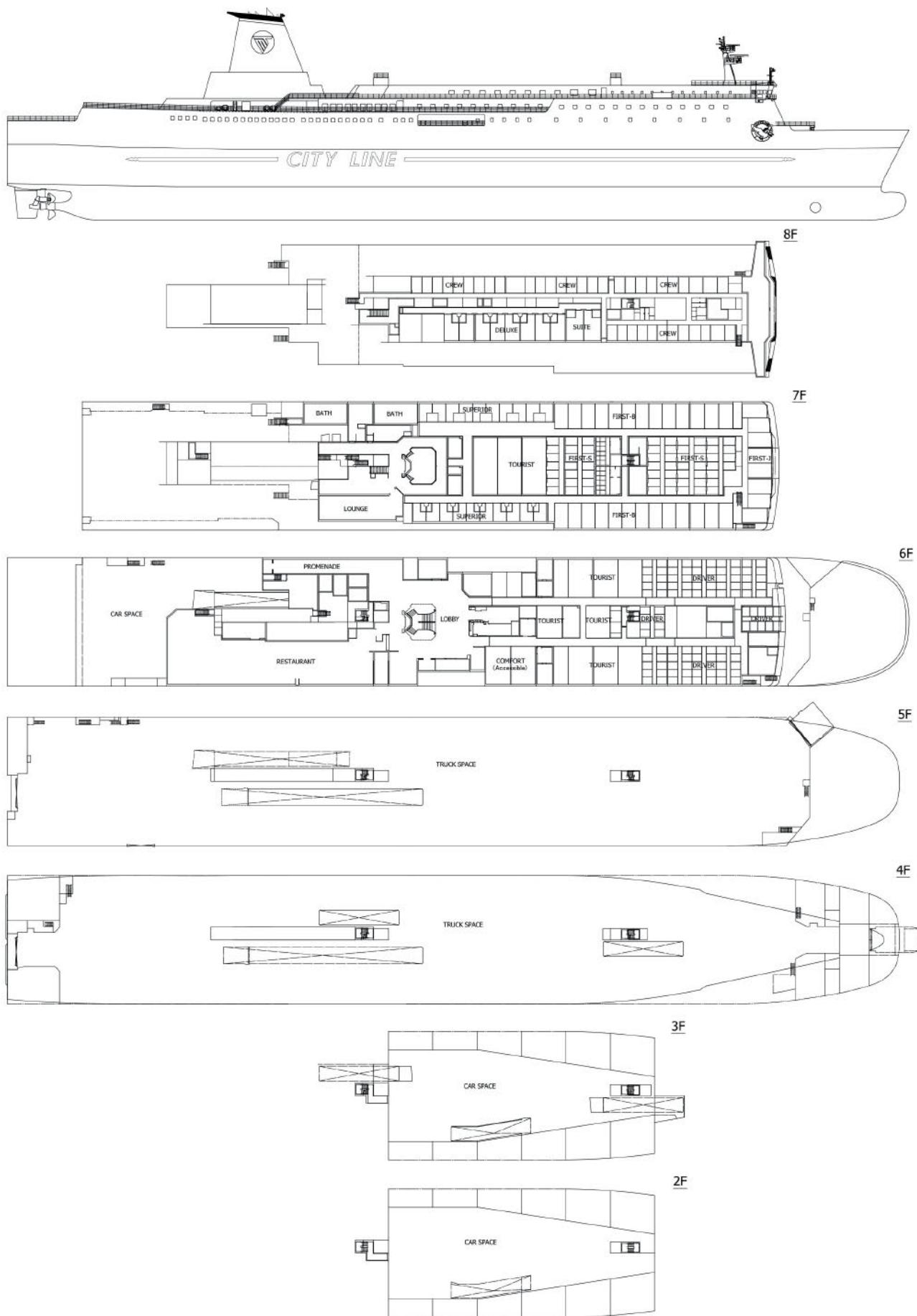
Hull coatings:Self-polishing antifouling paint

Contract date:26 July 2019

Launch/float-out date:13 May 2021

Delivery date:10 December 2021

FERRY KYOTO



GAS GABRIELA – LPG carrier



Shipbuilder: **Hyundai Heavy Industry Co., Ltd**
 Vessel's name: **Gas Gabriella**
 Owner/Operator: **KSS Line Ltd**
 Country: **Republic of Korea**
 Designer: **Hyundai Heavy Industry Co., Ltd**
 Country: **Republic of Korea**
 Flag: **Panama**
 IMO number: **9887451**
 Total number of sister ships already completed (excluding ship presented): **4**
 Total number of sister ships still on order: **0**

Built by Hyundai Industries for Korean operator KSS Line, Gas Gabriella is an 84,000m³ capacity VLGC that was delivered in January 2021 directly into a long-term charter with Spanish energy trader Vilma Oil.

The vessel is the first in a series of six ships, four sisters were delivered later in 2021 – Gas Ares (February), Gas Gala (March), Gas Barbarossa (April and Gas Ghazi (October). The final vessel in the series hasn't yet been named but is scheduled for delivery in July 2022.

The VLGC segment is one which has seen rapid vessel size growth over the last few years with records for the largest expected to tumble regularly. Gas Gabriella is not the largest in the segment by some distance but because of its 32.25m beam, can claim the title of being the largest capacity vessel able to use both the old and new Panama Canal lock systems.

Most of the vessels of similar capacity have been designed only to use the new locks and can, according to KSS, suffer delays as a consequence. Most vessels which can use the old locks have a capacity of 75,000m³ to 80,000m³ and therefore the 84,000m³ capacity of Gas Gabriella allows for 5% more cargo to be carried.

In most other respects, Gas Gabriella is typical of the type and has a length of 229.98m and a scantling draught of 12.1m. The main engine is a MAN B&W 6G60ME-C9.5-HPSCR outputting 12,253kW and driving a directly coupled 7.2m diameter propeller. The HPSCR suffix indicating the vessel has a high pressure selective catalytic reduction system for controlling NOx. A Hyundai open loop scrubber ensures compliance with SOx rules.

The higher cargo capacity also permits the vessel to comfortably meet EEDI requirements with an attained rating of 5.72 against a required rating of 7.02.

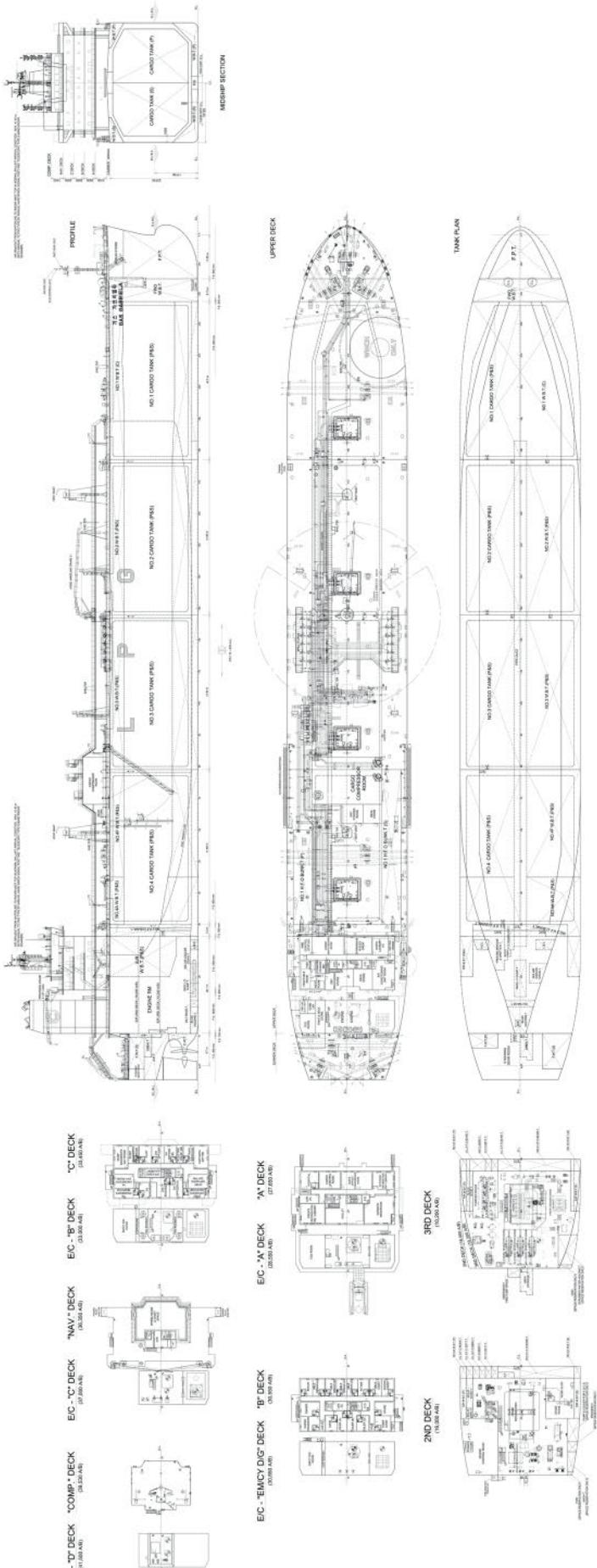
TECHNICAL PARTICULARS

Length oa: 229.98m
 Length bp: 223.45m
 Breadth moulded: 32.25m
 Depth moulded to main deck: 23.75m

to upper deck: 23.75m
 to other decks: 18.50m (mooring deck)
 Width of double skin
 side: 1.695m
 bottom: 1.85m
 Draught
 scantling: 12.1m
 design: 11.7m
 Gross: 48,858t
 Deadweight
 scantling: 53,779.9t
 design: 51,106.9t
 Speed, service (--%MCR output): 16.9knots
 Cargo capacity(m³)
 Liquid volume: 84,021.3
 Bunkers (m³)
 Heavy oil: 2,167.8
 Diesel oil: 233.6
 Water ballast (m³): 21,661.5
 Daily fuel consumption (tonnes/day)
 Main engine only: 39.7
 Classification society and notations: KR + KRS 1, Liquefied Gas Carrier, 2G 1A(R)/ 0.28 bar, -52°C, 0.61SG(IGC), IWS, SeaTrust(HCM, DSA1, FSA1), PSPC, LI, +KRM1-UMA, Reliquefaction, BWT, STCM, LG, CLEAN1, IHM, IGS, EEAS-SCR, EEAS-EGC-O
 Propulsion
 Main engine(s)
 Design: Hyundai-MAN B&W
 Model: 6G60ME-C9.5-HPSCR
 Manufacturer: Hyundai-MAN B&W
 Number: 1
 Type of fuel: HFO, ULSFO, MGO
 Output of each engine: 12,253kW
 Is this a diesel-electric or hybrid?: N
 Propeller(s)
 Material: Ni-Al-Bronze
 Designer/Manufacturer: HHI-EMD
 Number: 1
 Fixed/Controllable pitch: Fixed pitch
 Diameter: 7.2m
 Speed: 93.2rpm
 Diesel-driven alternators
 Number: 3
 Engine make/type: HiMSEN, 6H21/32
 Type of fuel: HFO, ULSFO, MGO
 Alternator make/type: Hyundai Electric / HFC7 564-08P
 Output/speed of each set: Diesel Engine: 1,320kW / Alternator: 1,200kW
 Exhaust-gas scrubbing equipment
 Manufacturer: Hyundai Power System
 Type: Open Loop Wet Scrubber
 On main engines?: Yes (Up to 85% of MCR)
 On auxiliary engines?: Yes (Up to 90% of MCR for 2 Sets with M/E simultaneous operation)
 Boilers
 Number: 1
 Type: Composite boiler
 Make: Kangrim
 Output, each boiler: 3,000 / 1,000kg/hr
 Steam generation (Oil-fired / Exh-gas)
 Stern appendages/special rudders: Hi-PSD and Hi-Rudder with bulb

Deck machinery
 Cargo cranes/cargo gear
 Number: 1
 Make: Oriental
 Type: Electro-hydraulic
 Performance: SWL 5t, Working radius Max. 25m ~ min. 5.2m
 Other cranes
 Number: 2
 Make: Oriental
 Type: Electro-hydraulic
 Tasks: Provision crane
 Mooring equipment
 Number: 8
 Make: Flutek Ltd
 Type: Hydraulic
 Special lifesaving equipment
 Number of each and capacity: 1 x Life boat (26 persons)
 Make: Norsafe
 Type: Free-fall type
 Cargo tanks
 Number: 4 (No.1~4)
 Grades of cargo carried: 2
 Product range: Commercial Butane, Pure Propane, Commercial Propane, Mixture of Propane and Butane in any proportion, Propylene
 Coated tanks – make and type of coating: Low Temperature Steel
 Structure: Low Temperature Steel, Piping, ASTM A312 Gr 304L
 Cargo pumps
 Number: 8
 Type: Vertical Deepwell Pump
 Make: Wärtsilä Svanehoj
 Stainless steel: Acid resistant steel, AISI 316
 Capacity (each): 600m³/h
 Cargo control system
 Make: Kongsberg Maritime AS
 Type: K-Chief 600
 Ballast control system
 Make: Hanla IMS
 Type: Hydraulic actuators for valves
 Ballast water treatment system
 Make: HiBallast
 Capacity: Electrolysis Unit - 2,000m³/h x 1 / Filter Unit - 1,000m³/h x 2
 Complement
 Officers: 13
 Crew: 12
 Supernumeraries/Spare: 1
 Suez/Repair Crew: 6
 Navigation and other equipment
 Bridge control system
 Make: Tokyo Keiki
 Type: PR-9340A-DW-SS2
 Is bridge fitted for one-man operation?: N
 Integrated bridge system: N
 Radars
 Number: 2
 Make: JRC
 Model(s): JMR-9282-S(S-Band 1 set) & JMR-9225-6X(X-Band 1 set)
 Fire detection system
 Make: Autronica
 Type: UEN024/63-1
 Fire extinguishing systems
 Cargo holds: Dry powder
 Make/Type: NK Co., Ltd
 Engine room: CO₂ fire extinguishing
 Make/Type: NK Co., Ltd
 Waste disposal plant
 Incinerator
 Make: Hyundai Marine Machinery Co., Ltd
 Model: MAXI T50 SL WS
 Waste compactor
 Sewage plant
 Make: IL-Seung Co., Ltd / Model: ISB-02
 Efficiency
 Attained EEDI value: 5.72
 Required EEDI value: 7.02
 Energy Saving Technologies: Hi-PSD and Hi-Rudder with bulb
 Hull coatings: Nippon Paint Marine antifouling paint
 Performance Monitoring Regime: Hyundai-ISS
 Contract date: 22 May 2019
 Launch/float-out date: 23 October 2020
 Delivery date: 18 January 2021

GAS GABRIELA



HACHINOHE MARU – Wood chip carrier



Shipbuilder: ..Oshima Shipbuilding Co., Ltd
 Vessel's name:Hachinohe Maru
 Owner/Operator:Nippon Yusen Kabushiki Kaisha
 Country:Japan
 Designer:Oshima Shipbuilding Co., Ltd
 Country:Japan
 Flag:Japan
 IMO number:9913781
 Total number of sister ships already completed (excluding ship presented):1
 Total number of sister ships still on order: 0

Built by Japanese bulk carrier specialist Oshima Shipbuilding for NYK Line, *Hachinohe Maru* is one of a series of six woodchip carriers and was delivered in December 2021. Other vessels of the same type have also been delivered to different owners through the year.

This new variant of what has become a standard Oshima design is claimed to be some 15% more efficient than previous types. It retains the 210m length and 37m which is a standard for ships of this type and capacity.

Wood chip carriers are a strong segment for Japanese ship operators traditionally carrying cargo to meet the demands of the Japanese paper industry. More recently the opening of biomass power plants in Japan has seen a new opportunity for the ship type.

With a deadweight of 60,288, the vessel appears superficially similar to an Ultramax bulker but woodchip carriers are designed for carriage of a lower density cargo and tend to have deeper holds and in this case six rather than five cargo holds. The cargo capacity is 122,517m³ and the vessel is equipped with three deck cranes with a SWL of 14.7tonnes at 27m outreach and a self-unloading system of conveyor belts.

The vessel is an eco-ship that uses approximately 15% less fuel compared to conventional wood-chip carriers. These advancements have been made through improvements to the hull form while maintaining transportation capacity and the use of a larger propeller that improves propulsion. The carrier is also equipped with ladder fins that improve water flow generated at the aft-end of the vessel. SOx emissions from the JEC 6UEC50LSH-Eco-C2 main engine and three Daihatsu auxiliaries are handled by a PureteQ scrubber.

TECHNICAL PARTICULARS

Length oa:209.96m
Breadth moulded:37m
Depth moulded	
to main deck:22.8m
to upper deck:22.8m
Width of double skin	
side:single hull type for all cargo hold
Draught	
scantling:11.523m
Gross:49,887t
Deadweight	
scantling:60,288t
Speed, service (--%MCR output):14.20knuts

Cargo capacity (m ³)	
Grain:122,517m ³
Bunkers (m ³)	
Heavy oil:2,753m ³
Diesel oil:319m ³
Water ballast (m ³):30,910m ³

Classification society and notations:ClassNK NS*(BC-XII, PSPC-WBT, NC), SOx(EGCS), (EEDI-p3), IHM, MNS* (SOx-EGCS-M/E), G/E(Nos. 1, 2, 3)

Propulsion
Main engine(s)
 Design:Japan Engine Corporation
 Model:6UEC50LSH-Eco-C2
 Manufacturer:Japan Engine Corporation
 Number:1
 Type of fuel:HFO
 Is this a diesel-electric or hybrid?:No

Propeller(s)
 Material:Ni-Al-Bronze
 Designer/Manufacturer:Nakashima Propeller Co., Ltd
 Number:1
 Fixed/Controllable pitch:Fixed pitch

Diesel-driven alternators
 Number:3
 Engine make/type:Daihatsu Diesel Mfg. Co., Ltd
 Type of fuel:HFO
 Alternator make/type:Nishishiba Electric Co., Ltd

Exhaust-gas scrubbing equipment
 Manufacturer:PureteQ K.K.
 Type:Inline type
 On main engines?:1 set of main engine exhaust gas line

On auxiliary engines?:3 sets of main generator engine exhaust gas line

Boilers
 Number:1
 Type:Horizontal smoke tube vertical composite boiler
 Make:Tortoise Engineering Co., Ltd

Deck machinery
Cargo cranes/cargo gear
 Number:3
 Make:I Know Machinery Co., Ltd
 Type:Jib type
 Performance:14.7T x 27m

Other cranes
 Number:1
 Make:Kyoritsu Kikai Co., Ltd
 Type:Electric motor driven
Tasks:Machinery parts/Provision handling crane
Performance:3.0t

Mooring equipment
 Number:4-mooring winch, 2-windlass/
 mooring winch
 Make:Nippon Pusnes Co., Ltd
 Type:Electro-hydraulic

Special lifesaving equipment
 Number of each and capacity:2 lifeboats
 25 persons
 Make:Shigi Shipbuilding Co., Ltd
 Type:F.R.P. totally enclosed

Cargo/capacity
Hatch covers
 Design:I Know Machinery Co., Ltd
 Manufacturer:I Know Machinery Co., Ltd
 Type:Weather tight folding type

Ballast control system
 Make:Nakakita Seisakusyo Co., Ltd
 Type:multi control panel

Ballast water treatment system
 Make:Sunrui Marine Environment Engineering Co., Ltd

Complement
 Officers:11
 Crew:13
 Supernumeraries/Spare:1

Navigation and other equipment
Bridge control system
 Make:Furuno
 Is bridge fitted for one-man operation? ... No
 Integrated bridge system:No

Radar
 Number:2
 Make:Furuno

Fire detection system
 Make:Nohmi Bosai Ltd
 Type:Smoke, Thermal, Flame

Fire extinguishing systems
Cargo holds:
 Make/Type:Air Water Safety Service Inc. / CO₂ fire extinguishing system

Engine room:
 Make/Type:Air Water Safety Service Inc. / CO₂ fire extinguishing system

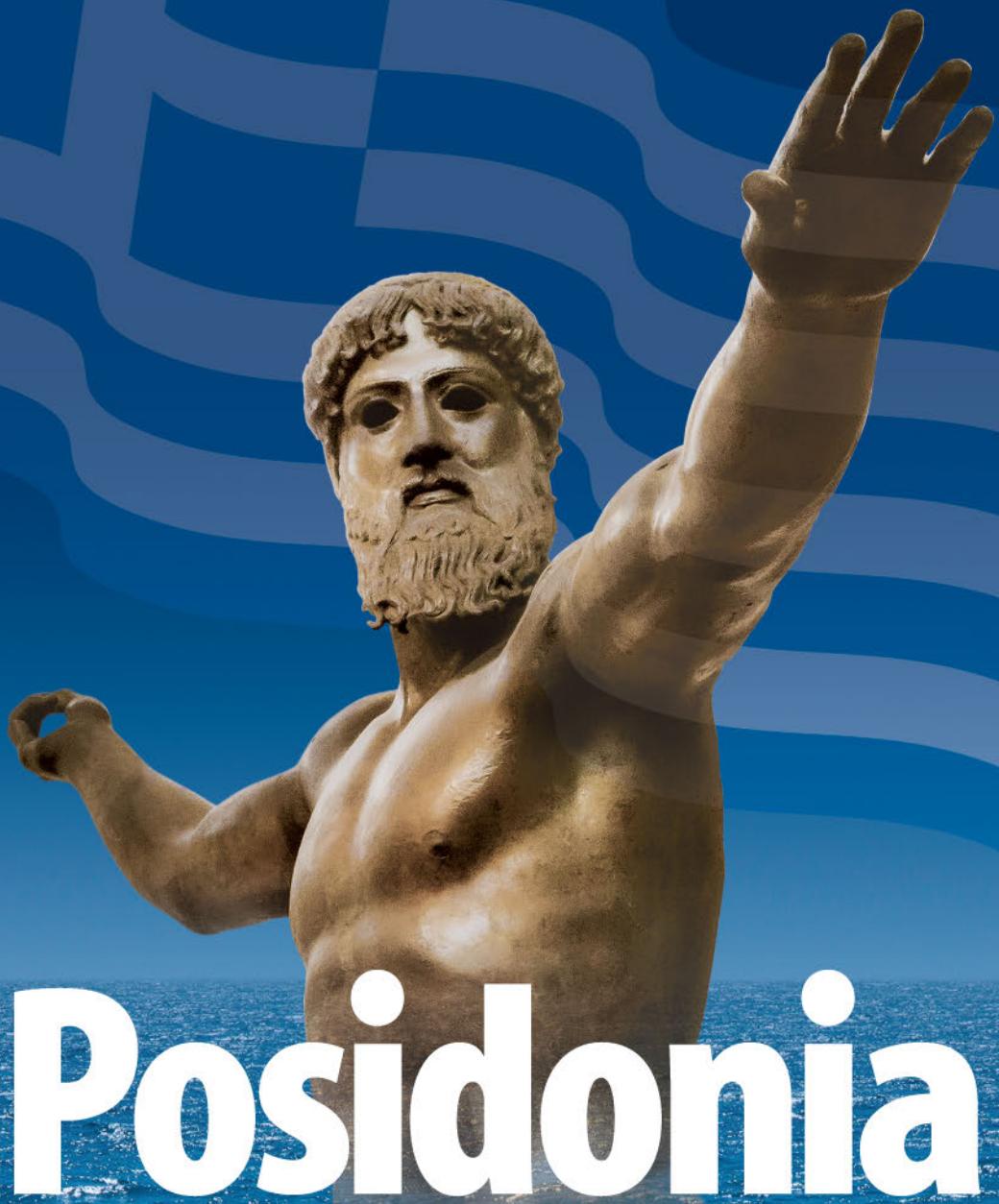
Cabins:as per rule requirement
Public spaces:as per rule requirement

Waste disposal plant
Waste handled:Garbage and waste oil
Incinerator
 Make:Sunflame Co., Ltd

Waste shredder/crusher
 Make:Mitsuboshi Chuki Mfg.Co., Ltd
Sewage plant
 Make:Taiko Kikai Industries Co., Ltd

Efficiency
 Attained EEDI value:-34.9%

Delivery date:28 December 2021

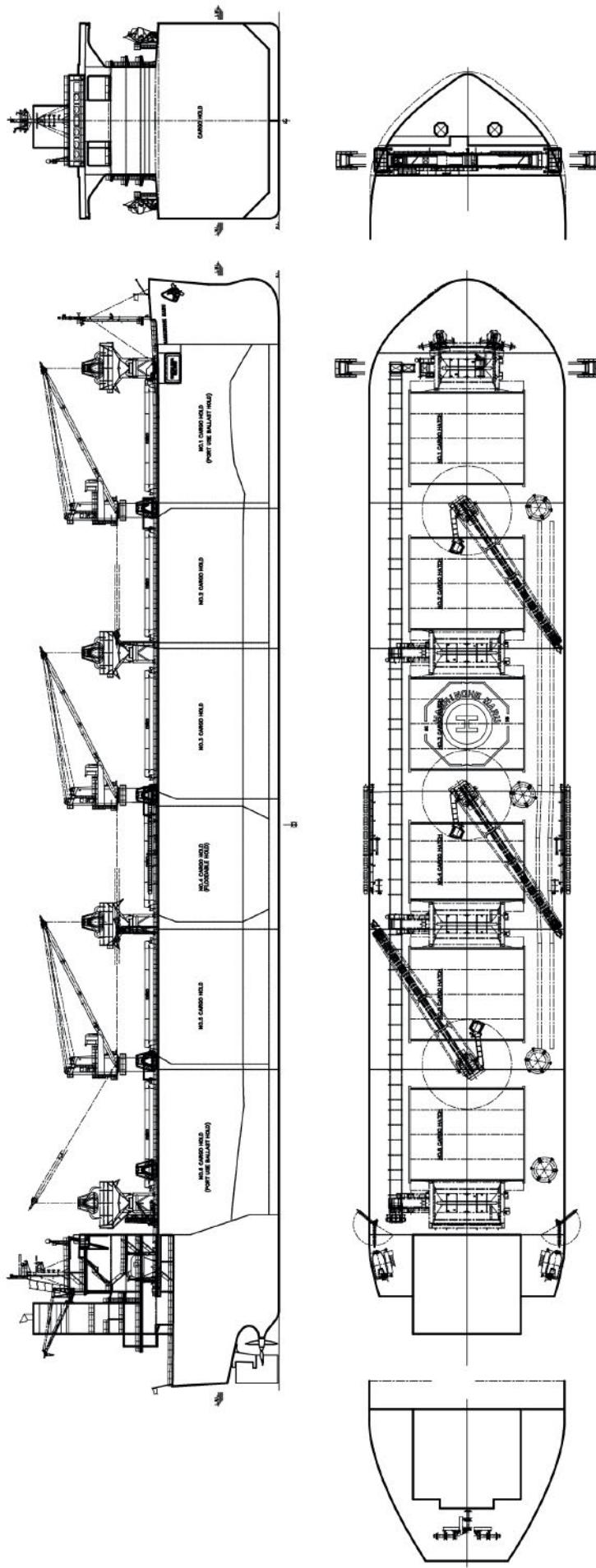


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HAMAYU – Ro-pax ferry



Shipbuilder:	Mitsubishi Shipbuilding Co., Ltd., Nagasaki, Japan
Vessel's name:	Hamayu
Owner/Operator:	Shin Nihonkai Ferry Co., Ltd
Country:	Japan
Designer:	Mitsubishi Shipbuilding Co., Ltd
Country:	Japan
Model test establishment used:	MHI Nagasaki R&D Centre, Japan
Flag:	Japan
IMO number:	9894569
Total number of sister ships already completed (excluding ship presented):	1
Total number of sister ships still on order:	0

The first of two sister 31,408gt ro-pax vessels ordered in 2019, *Hamayu* was delivered by Mitsubishi Shipbuilding to Shin Nihonkai Ferry Co. in February 2021. Sister ship *Soleil* was delivered in June 2021. The vessels are part of a restructuring that is taking place in Japan's ferry routes aimed at shifting freight off roads and on to short sea services. *Hamayu* and *Soleil* operate on a service that links Tokyo with the island of Kyūshū and takes on average 20 hours.

Dimensions of the vessels are an overall length of 225m, beam of 25m and a scantling draught of 7.44m. Vehicular access is via a stern centre ramp or a stern quarter ramp depending upon berthing arrangements and there are also two side shell doors. The ships have two fixed vehicle decks and can accommodate 154 trucks and 30 cars. There are 51 passenger cabins and room for 268 passengers in total.

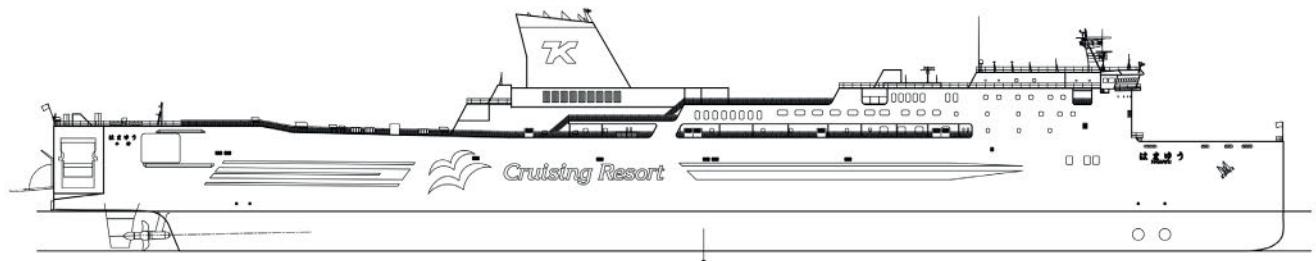
The ship has a vertical bow form that is designed to increase the efficiency of the vessel compared to older ferries in use. Considering the route time and length, a relatively high service speed of 28.3knots was decided as essential and to achieve this the ship is fitted with four Wärtsilä 14V31 engines intended for use with HFO or MDO. Each engine produces 8,540kW power and are used in pairs in separate engine rooms driving two controllable pitch propellers through Wärtsilä gearboxes. SOx scrubbers are adopted for the main engines and generators.

While *Hamayu* is the lead ship of the pair, *Soleil* has added its own distinction being used to test autonomous ship operation in Japanese waters. In January 2022 the vessel made a seven-hour voyage fully autonomously including berthing and unberthing using turning and reversing movements and high-speed navigation of up to 26knots.

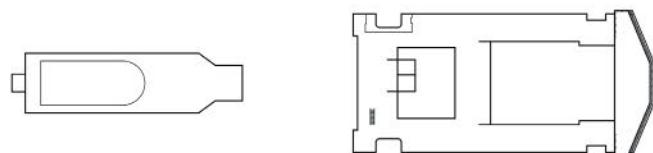
TECHNICAL PARTICULARS

Length oa:	222.5m
Length bp:	209.30m
Breadth moulded:	25.00m
Depth moulded	
to main deck:	10.00m
to upper deck:	20.40m
Draught	
scantling:	7.44m
design:	7.20m
Gross:	31,408t
Deadweight	
scantling:	6,631t
design:	5,662t
Speed, service (%MCR output):	28.3knots
Bunkers (m³)	
Heavy oil:	1,129
Diesel oil:	104
Water ballast (m³):	3,504
Classification society and notations:	Not applied
Heel control equipment:	Auto Heeling system
Roll-stabilisation equipment:	Fin Stabilizer
Propulsion	
Main engine(s)	
Design:	Wärtsilä
Model:	14V31
Manufacturer:	Wärtsilä
Number:	4
Type of fuel:	HFO & MDO
Output of each engine:	8,540kW
Is this a diesel-electric or hybrid?:	Diesel-electric
Gearbox(es)	
Make:	Wärtsilä
Number:	2
Propeller(s)	
Material:	CAC703
Designer/Manufacturer:	Kawasaki Heavy Industries, Ltd
Number:	2
Fixed/Controllable pitch:	CPP
Diameter:	5.4m
Main-engine driven alternators	
Number:	2
Make/type:	Nishisiba Electric Co., Ltd.
Diesel-driven alternators	
Number:	3
Engine make/type:	Yanmar Co., Ltd / 6EY26LW
Type of fuel:	HFO & MDO
Exhaust-gas scrubbing equipment	
Manufacturer:	Wärtsilä
Type:	I-SOx Open Loop EGC System
On main engines?:	Yes
On auxiliary engines?:	Yes
Boilers	
Number:	1
Make:	Miura Co., Ltd
Output, each boiler:	4,000kg/h

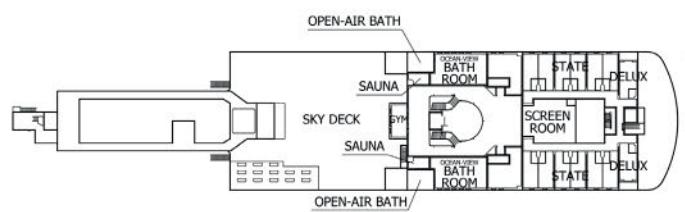
Stern appendages/special rudders:	reaction rudder with bulb
Bow thruster(s)	
Make:	Kawasaki Heavy Industries, Ltd
Number:	2
Output (each):	17.5t
Stern thruster(s)	
Make:	Kawasaki Heavy Industries, Ltd
Number:	2
Output (each):	12.5t
Mooring equipment	
Number:	5 x Mooring winch, 2 x windlass
Make:	Manabe Zoki Co., Ltd
Type (electric/hydraulic/steam):	EL-HY
Special lifesaving equipment	
Number of each and capacity:	MES-2
Make:	Fujikura Composites Inc
Type:	FSMES-180 • N
If MES, vertical or sloping chutes?:	vertical
Vehicles	
Number of vehicle decks:	2 (fixed)
Total cars:	Truck 154, Car 30
Doors/ramps/lifts/movable car decks	
Number of each:	4
Type:	1 x stern side ramp, 1 x stern center ramp, 2 x side shell door
Designer:	Kyoritsu Kikai Co., Ltd
Ballast control system	
Make:	NYK Trading Corporation
Complement	
Officers:	10
Crew:	20
Supernumeraries/Spare:	7
Passengers	
Total:	268
Number of cabins:	51
Navigation and other equipment	
Bridge control system	
Make:	Nabtesco
Type:	electric
Radar	
Number:	2
Make:	JRC
Model(s):	JMR-9230-S, JMR-9225-9X
Fire detection system	
Make:	NHE Nippon Hakuyo Electronics, Ltd
Type:	Smoke detector type & Temperature type
Fire extinguishing systems	
Engine room:	
Make/type:	Kashiwa Co., Ltd / inside air
Vehicle spaces:	
Make/type:	Nohmi Bosai Ltd / fixed
Public spaces:	
Make/Type:	Nohmi Bosai Ltd / sprinkler
Contract date:	27 June 2019
Launch/float-out date:	07 August 2020
Delivery date:	26 February 2021



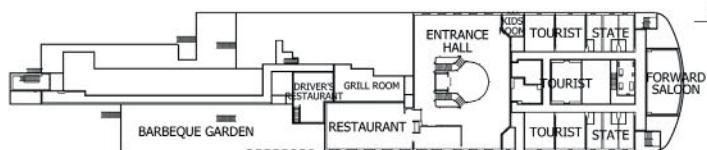
7 DECK



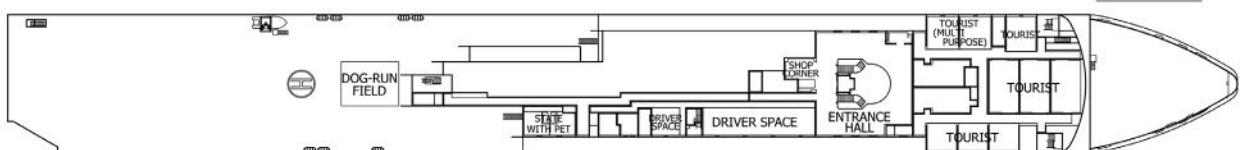
6 DECK



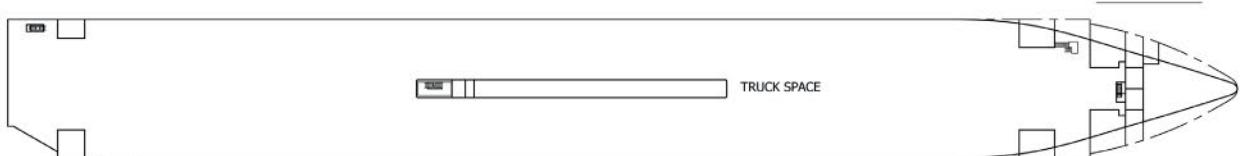
5 DECK



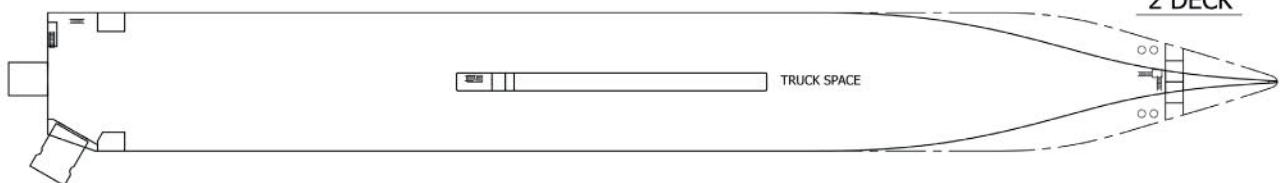
4 DECK



3 DECK



2 DECK



HAVILA CAPELLA – Ro-pax ferry



Shipbuilder:	Tersan Shipyard Inc
Vessel's name:	<i>Havila Capella</i>
Owner/Operator:	Havila Kystruten Operations AS
Country:	Norway
Designer:	HAV Ship Design
Country:	Norway
Flag:	Norway
IMO number:	9865570
Total number of sister ships already completed (excluding ship presented):	Nil
Total number of sister ships still on order:	1

When Turkey's Tersan shipyards delivered *Havila Capella* in October 2021 it was not just as the first of four innovative new design coastal ferries, but also the very first vessel for operator Havila Kystruten. The ships were designed by HAV Ship design, a sister company of the operator.

Havila Kystruten was formed in 2017 for the purpose of bidding for one of three licences for coastal ferry services from the Norwegian government which had decided to end the monopoly of the famous Hurtigruten brand. The ship operates on the Bergen-Kirkenes service taking an average seven days and calling at multiple ports along the way.

In line with Norway's penchant for green vessels, the 15,519gt ship is powered by Bergen LNG engines driving two Azipull thrusters in a diesel electric configuration. There are four C26:33L engines, two of which are nine-cylinder units and two six-cylinder giving a total 8,100kW between them. When delivered its 6,500kWh battery pack was the world's largest. It allows the vessel to sail for four hours on battery power alone.

The vessel can be charged with clean hydropower at the quay and it has a waste energy recovery system that will make use of the 65% of fuel energy that is normally lost through the exhaust and cooling water systems. A further 5% fuel saving is made possible by the use of a Wavefoil retractable bow foil device. A future transition to hydrogen power is anticipated when technology permits.

There is capacity for 640 passengers of which 468 can be accommodated in cabins while 172 will be day passengers. The vessel also has capacity for nine cars and some palletised cargoes.

TECHNICAL PARTICULARS

Length oa:	12.10m
Length bp:	115.20m
Breadth moulded:	22.10m
Depth moulded	
to main deck:	8.20m
to upper deck:	11.30m
Width of double skin	
bottom:	1.5m
Draught	
scantling:	5.35m
design:	5.2m
Gross:	4,419t
Displacement:	8,639.7t
Lightweight:	6,768.4t
Deadweight: Abt.	
scantling:	18,71.3t
design:	1,800t
Block co-efficient (please state relevant draught):	0.6251 / 5.4mt
Speed, service (--%MCR output):	16 knots
Bunkers (m ³)	
LNG: abt.....	370m ³ (2 x LNG storage tanks)
Water ballast (m ³):	2,100m ³
Daily fuel consumption (tonnes/day)	
Main engine only:.....	7,550kj/kWh+5% (LNG) per engine

Classification society and notations: DNV, + 1A1, Passenger Ship, Comfort C(2)-V(2) Naut (AW), BIS, Gas Fuelled, Battery (Power), Clean (Design), EO, Recyclable

% high-tensile steel used in construction: 97%
% aluminium used in hull/superstructure: 3%

Roll-stabilisation equipment: Active Fin Stabilizers on each side, STB and PS

Propulsion

Main engine(s)

Design:	Bergen Engines AS
Model:	2 x C26:33L6AG and 2 x C26:33L9AG
Manufacturer:	Bergen Engines AS
Number:	as above
Type of fuel:	LNG
Output of each engine:	2 x 1,620kW (+) 2 x 2,430kW

Is this a diesel-electric or hybrid?: Hybrid;
LNG - Battery

Propeller(s)

Material:	Ni-Al-Bronze
Designer/Manufacturer:	Kongsberg Maritime
Number:	2 pcs Azipul type thrusters
Fixed/Controllable pitch:	CPP
Diameter:	3,300mm
Speed:	variable, 205rpm at MCR

Main-engine driven alternators

Number:	2 + 2
Make/type:	2 x NEGR 560 LA6 + 2 x NEGR 630 LA6
Output/speed of each set:	2 x 1,555kW (+) 2 x 2,330kW

Boilers

Number:	4 pcs
Type:	A300-2500
Make:	Ulmatec Pyro AS

Stern appendages/special rudders: 2 x Azipull aft thrusters

Bow thruster(s)

Make:	Bergen Maritime, type: TT2400 DPN CP "Super Silent"
Number:	2 pcs
Output (each):	1,600kW

Vehicles

Total cars: 9 cars

Doors/ramps/lifts/moveable car decks

Number of each: 1 pcs car/cargo ramp
combined lift

Designer: Ulmatec Handling Systems

Passengers

Total: 715 (468 passengers in cabins + 172 daily passengers + 75 crew)

Navigation and other equipment

Bridge control system

Make: Norwegian Control Systems
Is bridge fitted for one-man operation?: No

Integrated bridge system: Yes

Efficiency

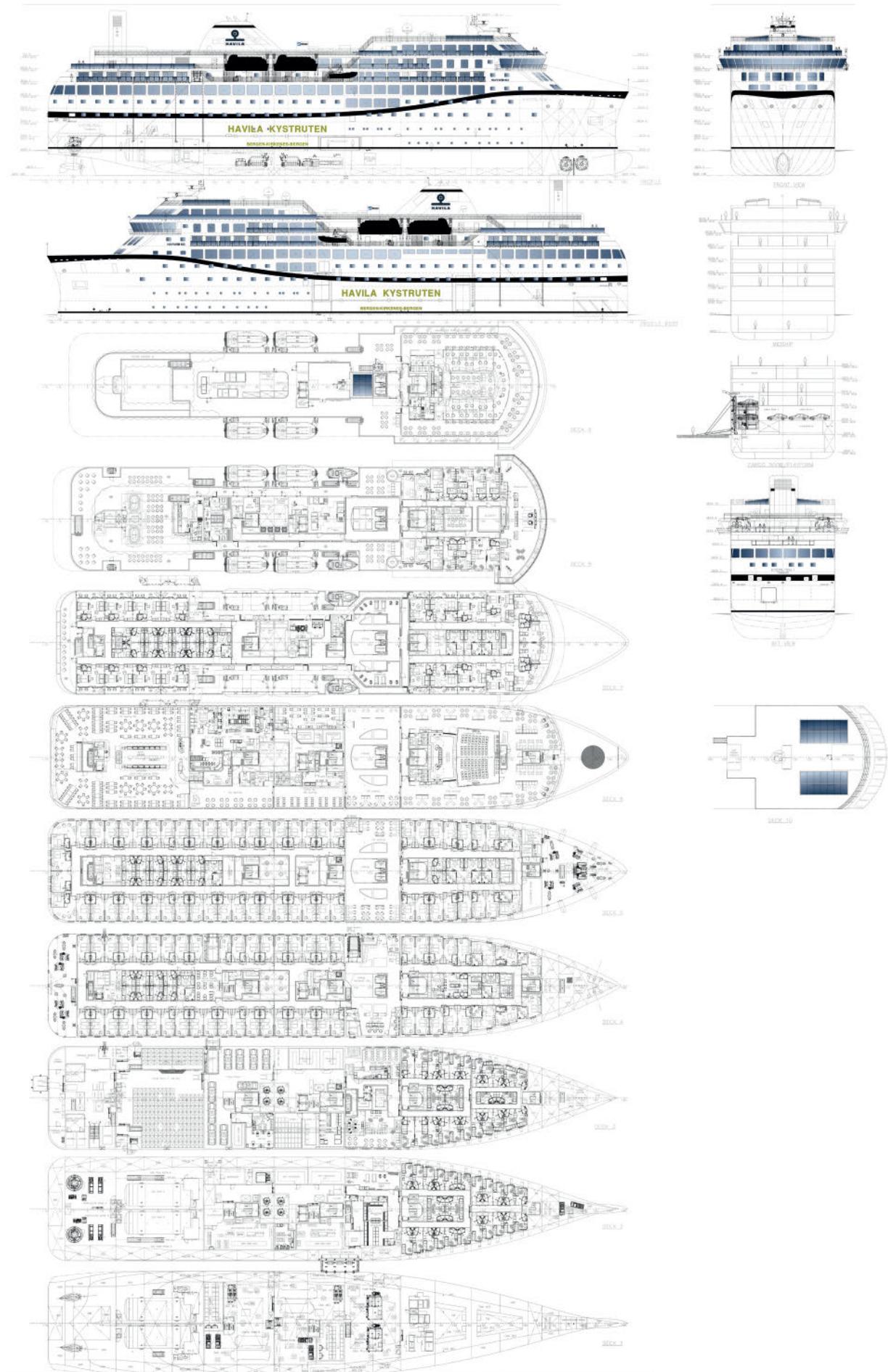
Energy Saving Technologies: Waste Energy Recovering System, Battery Storage Systems, total capacity: 6,500kWh

Contract date: October 2018

Launch/float-out date: September 2020

Delivery date: October 2021

HAVILA CAPELLA



HL ECO – Bulk carrier



Shipbuilder:	Hyundai Samho Heavy Industries Co., Ltd
Vessel's name:	HL Eco
Owner/Operator:	H-Line
Country:	Republic of Korea
Designer:	Hyundai Samho Heavy Industries Co., Ltd
Country:	Republic of Korea
Flag:	Panama
IMO number:	9869332
Total number of sister ships already completed (excluding ship presented):	2
Total number of sister ships still on order:	1

HL Eco is a pioneer of the trend for more vessel types to adopt LNG as a marine fuel. Although dual-fuel and gas powered small vessel types have more than two decades of history, it is only recently that larger vessels have adopted the idea – mostly as a means of meeting increasingly stringent emission regulations.

Delivered by Hyundai Samho to South Korean operator H-Line in December 2020, *HL Eco* was too late to make the last edition of *Significant Ships*, but as the world's first LNG-fuelled Newcastlemax bulk carrier its significance should not be overlooked. The 179,070dwt ship along with its sister *HL Green* were built, launched and delivered almost simultaneously. Two further sisters, *HL Oceanic* and *HL Sunny* are due for delivery in April and July 2022 respectively.

As well as being the first large bulk carriers to be LNG-fuelled, the ships can also claim to be the first where 9% Nickel steel has been used for the cryogenic fuel tank construction. The ships are fitted with two 1,600m³ tanks for LNG fuel installed at the aft of the vessel behind the superstructure.

With a length of 292m, a breadth of 45m, and a depth of 24.8m, the ships follow typical Newcastlemax construction and have a nine hold configuration with side rolling hatches. Holds 2, 4 and 8 are partially floodable and hold 6 fully floodable for trimming purposes during cargo operations.

The main engine is a WinGD 6X72DF type producing 16,180kW at 76.5rpm. Running on LNG, the ships are designed to achieve a 99% reduction in emissions of SOx and particulate matter, up to an 85% reduction in NOx and a 30% reduction in GHG emissions compared to the levels of existing ships.

TECHNICAL PARTICULARS

Length oa:	291.90m
Length bp:	286.90m

Breadth moulded:	45m
Depth moulded	
to main deck:	24.80m
to upper deck:	24.80m
Width of double skin	
bottom:	2.6m
Draught	
scantling:	18m(mould)
design:	16.50m(mould)
Gross:	97,545t
Displacement:	207,202t
Lightweight:	28,132t
Deadweight	
scantling:	179,070t
design:	159,996t
Block co-efficient:	0.8674(at Scantling draft)
Speed, service (~%MCR output):	14.5knots at design draught and at NCR of M/E with 15% Sea margin

Cargo capacity (m ³)	
Bale:	199,872.4m ³

Bunkers (m ³)	
Heavy oil:	1,328.9m ³
Diesel oil:	676.8m ³
LNG Fuel:	3,203.6m ³

Water ballast (m ³):	79,162.6m ³ (inc. No. 6 floodable hold)
% high-tensile steel used in construction:	80%

Propulsion	
Main engine(s)	
Design:	WinGD
Model:	W6X72DF
Manufacturer:	Hyundai (HHI-EMD)
Number:	1 set
Type of fuel:	L.F.O. / M.G.O. / Gas(LNG)
Output of each engine:	16,180kW x 76.5rpm
Is this a diesel-electric or hybrid?	N

Propeller(s)	
Material:	Ni-Al-Bronze
Designer/Manufacturer:	Hyundai Heavy Industries

Number:	1
Fixed/Controllable pitch:	Fixed
Diameter:	8,800mm
Speed:	76.5rpm at MCR

Diesel-driven alternators	
Number:	3 sets
Engine make/type:	HiMSEN 5H22C DF
Type of fuel:	LFO / MGO / GAS
Alternator make/type:	HHI-EES
Output/speed of each set:	1,010kW x 900rpm

Boilers

Number: One(1) set
Type: DF type
Make: Alfa Laval
Output, each boiler: 4,000kg/h X 6K

Stern appendages/special rudders: Hi-PSD and Hi-Rudder with bulb as Energy Saving Device

Other cranes

Number: 2 (Port - 1, Stbd - 1)
Make: Oriental
Type: Electro-hydraulic driven, cylinder luffing type jib crane
Tasks: Handling provision, engine room part
Performance: Port - 7.5t, Stbd - 2t

Mooring equipment

Number: 8
Make: Flutek
Type: Electric

Special lifesaving equipment

Number of each and capacity: Free-fall lifeboat - 1 (25P)
Make: Viking Norsafe
Type: Free-fall type

Cargo/capacity

Hatch covers
Design: SMS-SME
Manufacturer: Hyundai Samho Heavy Industries Co., Ltd
Type (upper deck/other decks): Side rolling type(Upper deck)

Ballast control system

Make: Hanla IMS
Type: Hydraulic valve remote control system

Ballast water treatment system

Make: Techcross
Capacity: 2,600m³/h x 2 sets

Complement

Officers: 11 persons
Crew: 14 persons
Suez/Repair Crew: 6 persons

Navigation and other equipment

Bridge control system
Make: Kongsberg
Type: Autoclient-600
Is bridge fitted for one-man operation?: N

Integrated bridge system?

Radar

Number: 2 sets (S-band, X-band)
Make: JRC
Model(s): S-band(JMR-9230-S), X-band(JMR-9225-6X)

Fire detection system

Make: Consilium
Type: SG-42229/30, 42923/24

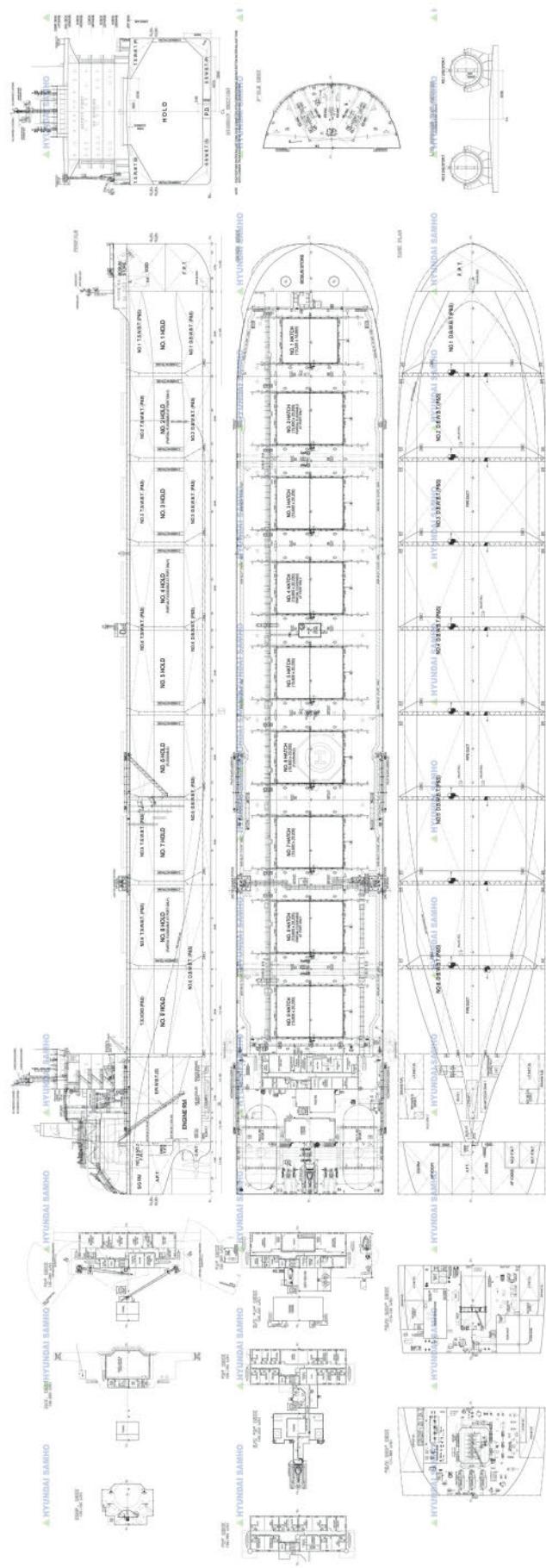
Fire extinguishing systems

Cargo holds: Sea Water Hydrants
Engine room: High pressure CO₂ / Portable Fire Extinguisher / Local Fire Fighting / Sea Water Hydrants
Make/Type: NK / Fain / Fain / Fain
Cabins: Portable Fire Extinguisher / Sea Water Hydrants
Make/Type: Fain
Public spaces: Portable Fire Extinguisher / Sea Water Hydrants
Make/Type: Fain

Efficiency

Attained EEDI value: 2.51
Required EEDI value: 2.70(Phase 1)
Energy Saving Technologies: Hi-PSD and Hi-Rudder with bulb as Energy Saving Device

Contract date: 12 October 2018
Launch/float-out date: 27 June 2020
Delivery date: 16 November 2020



HMM NURI – Container ship



Shipbuilder:	Hyundai Heavy Industry Co., Ltd
Vessel's name:	HMM Nuri
Owner/Operator:	HMM Co., Ltd
Country:	Republic of Korea
Designer:	Hyundai Heavy Industry Co., Ltd
Country:	Republic of Korea
Model test establishment used:	Hyundai Maritime Test Institute
Flag:	Liberia
IMO number:	9869162
Total number of sister ships already completed (excluding ship presented):	7
Total number of sister ships still on order:	0

In 2018, South Korean operator HMM placed orders for 20 new vessels, 12 of these were to be ships of the HMM Algeciras class of 24,000TEU ships and at one point the lead ship was the largest box ship in service. The other order for eight ships was thus a little overshadowed, but the class of 16,000TEU vessels headed by *HMM Nuri* which was delivered by Hyundai Heavy Industries in March 2021 has its own merits.

Designed to be as flexible as possible, *HMM Nuri* is said to have the highest cargo capacity for any box ship that can pass through the Panama Canal thus allowing worldwide trading with only port dimensions dictating access.

The series of vessels were constructed quite rapidly, with *HMM Gaon* following into service a week after *HMM Nuri* and then remaining six all entering service between 30 April and 25 June in the same year.

The ships are 365.16m in length, 51m wide and with a draught of 16m. Total cargo capacity of the fully cellular ships is 16,010TEU of which 6,450 are under deck and 9,560 on deck. At 14tonnes homogenous the capacity is 10,462TEU at scantling draught. The cell guides have been designed and strengthened for mixed of 8'6" and 9'6" boxes. There are 1,200 reefer points.

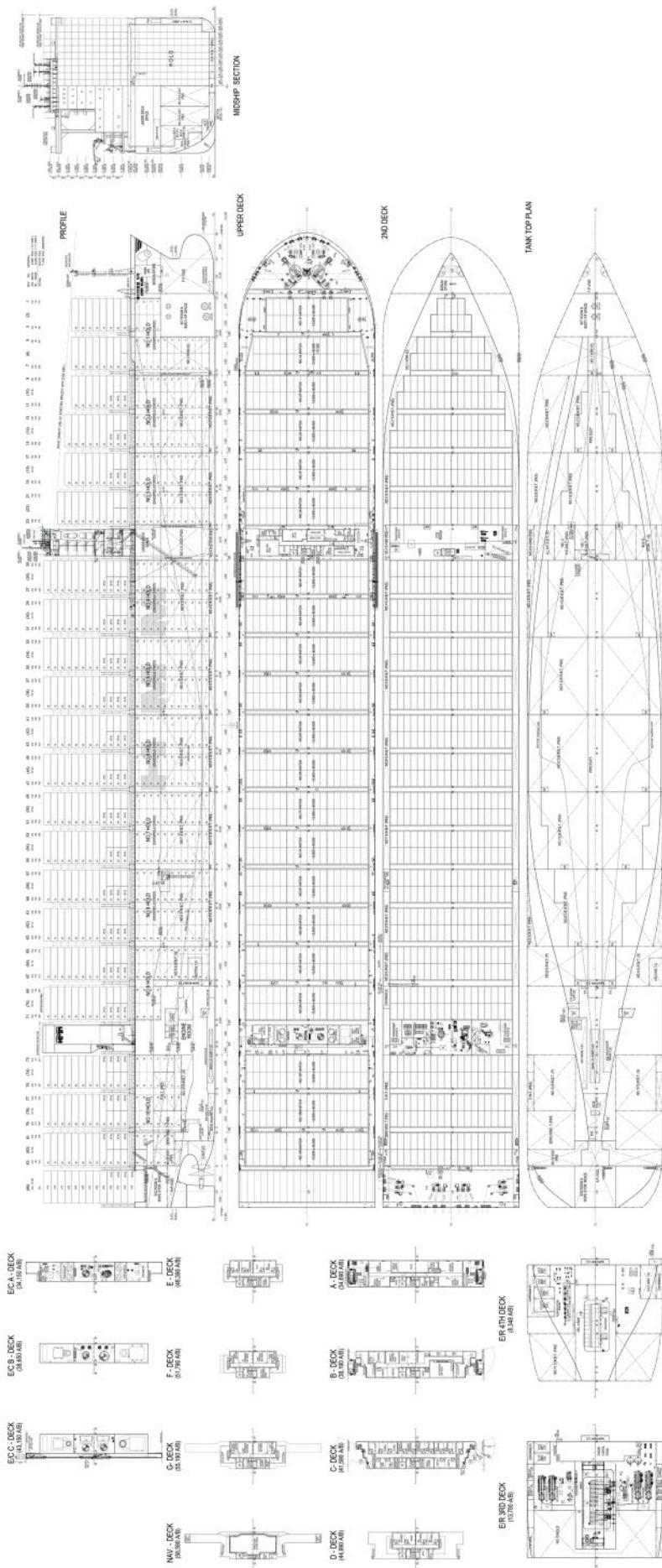
The ships main engine is a 9G95ME-C10.5 with a 46,444kW output allowing for a 22.35knots service speed, and there are four HIMSEN auxiliaries – two 9-cylinder and two 7-cylinder H32/40 types. A HPS open loop scrubber is installed to treat exhaust from all engines allowing running on high sulphur HFO.

TECHNICAL PARTICULARS

Length oa:	365.16m
Length bp:	350.00m
Breadth moulded:	51.00m
Depth moulded to main deck:	29.85m
to upper deck:	29.85m
to other decks:	25.628m (mooring deck)
Width of double skin side:	2.5m
bottom:	2.3m
Draught scantling:	16.00m
design:	14.50m

Gross:	152,003t
Deadweight	
scantling:	203,981t
design:	180,434t
Speed, service (86.8% MCR output):	22.35knuts
Bunkers (m³)	
Heavy oil:	8,3773
Diesel oil:	1,2411
Water ballast (m³):	42,102.4
Container ships – water ballast in loaded condition (tonnes):	11,200t based on 10T cont. loading
Daily fuel consumption (tonnes/day)	
Main engine only:	148.9
Classification society and notations:	ABS +A1, Container Carrier, (E), RW, SH, SHCM, SH-DLA, SFA(20), CPS, UWILD, +AMS, +ACCU, TCM, BWT, BWE, IHM, CSC, CLP-V, HVSC, HIMP, EGC-SOx, NOx Tier III, LNG Ready(ME convertible to gas)
KR +KRS1 Container, Ship LS(CL, RS), SeaTrust(DSA2,FSA3,HCM), CLEAN1, IWS, ERS, CDG, IHM, PSPC, LNG Ready (ME-C), EEAS-SCR, EEAS-EGC, LG, LI, +KRM1 UMA3, BWT, STCM, HVSC	
Heel control equipment:	Anti-heeling system
Propulsion	
Main engine(s)	
Design:	Hyundai-MAN B&W
Model:	9G95ME-C10.5
Manufacturer:	Hyundai Heavy Industry Co., Ltd
Number:	1
Type of fuel:	HFO, ULSFO, MGO
Output of each engine:	46,444kW
Is this a diesel-electric or hybrid?:	N
Propeller(s)	
Material:	Ni-Al-Bronze
Designer/Manufacturer:	HHI-EMD
Number:	1
Fixed/Controllable pitch:	Fixed pitch
Diameter:	10.0m
Speed:	75.7rpm
Diesel-driven alternators	
Number:	4
Engine make/type:	Hyundai-HIMSEN 9H32/40 x 2 sets, 7H32/40 x 2 sets
Type of fuel:	HFO, ULSFO, MGO
Alternator make/type:	HSJ9 915-10P / HSJ9 805-10P
Output/speed of each set:	4,500kW x 720rpm, 3,500kW x 720rpm
Exhaust-gas scrubbing equipment	
Manufacturer:	HPS
Type:	Open loop
On main engines?:	1
On auxiliary engines?:	4
Boilers	
Number:	Aux. boiler x 1 set
Type:	Water tube, Oil-fired
Make:	Kangrim
Output, each boiler:	5,000kg/h
Stern appendages/special rudders:	Pre-swirl duct / Full spade rudder with bulb
Bow thruster(s)	
Make:	Kawasaki heavy industries
Number:	2
Output (each):	1,800kW x 2

Other cranes	
Number:	2
Make:	Oriental
Type:	Electro-hydraulic
Tasks:	Provision
Performance:	SWL 3t x 2
Mooring equipment	
Number:	Foreship - 2 Windlass, 2 Mooring Winch Stern Deck - 4 Mooring Winch
Make:	Mirae industries
Type:	Electric
Special lifesaving equipment	
Make:	Jiangyinshi Beihai Isa
Type:	Totally enclosed, Davit launched type
Cargo/capacity	
Hatch covers	
Design:	SMS-SME
Manufacturer:	Kangrim / Marinetech
Type:	Pontoon, non-sequential operation type
Containers	
Lengths:	6,058 (20ft) / 12,192 (40ft) / 13,716 (45ft)
Heights:	2,591 (20ft) / 2,591, 2,896 (40ft) / 2,896 (45ft)
Cell guides:	Cell guide is strengthened for mixed storage of 8'6" and 9'6"
Total TEU capacity:	16,010
On deck:	9,560
In holds:	6,450
Homogeneously loaded to 14tonnes:	10,462 TEU at scant. draught
Reefer plugs:	In accordance with C.E.E 17 standards and I.E.C. as well as I.S.O. 1496-2 Featuring AC380V to AC440V configuration with circuit breakers and C.E.E 17 3H contact position
Tiers/rows (maximum)	
On deck:	12 / 20
In holds:	11 / 18
Ballast control system	
Make:	Pleiger
Type:	Hydraulic type valve remote control
Ballast water treatment system	
Make:	Panasia
Capacity:	1,200m³ / hr
Complement	
Officers:	12
Crew:	16
Navigation and other equipment	
Bridge control system	
Make:	Nabtesco
Type:	M-800V
Is bridge fitted for one-man operation?:	N
Integrated bridge system:	Y
If yes, make:	MECys
Model:	HTB22
Radar	
Number:	2
Make:	Furuno
Model(s):	FAR-3330S-SSD, FAR-3320
Fire detection system	
Make:	B-I Industries
Type:	BSD-4000
Fire extinguishing systems	
Cargo holds:	CO ₂ Fire extinguishing
Make/Type:	NK / CO ₂
Engine room:	CO ₂ Fire extinguishing
Make/Type:	NK / CO ₂
Waste disposal plant	
Incinerator	
Make:	HMMC0
Model:	MAXI 1500SL WS
Efficiency	
Attained EEDI value:	7.45
Required EEDI value:	14.1
Installed Fuel Meters:	Mass flow type for fuel oil
Other installed monitoring tools:	Shaft torque & power & thrust meter, draught gauge
Energy Saving Technologies:	Pre-swirl duct, Rudder bulb
Hull coatings:	Tin free SPC antifouling paint manufactured by Jotun
Performance Monitoring Regime:	Ship management system (SMS) with IP-based network equipment
Contract date:	28 September 2018
Launch/float-out date:	09 September 2020
Delivery date:	19 March 2021



HUI ZHI HAI – Newcastlemax bulk carrier



Shipbuilder: **COSCO Shipping Heavy Industry (Yangzhou) Co., Ltd**
 Vessel's name: **Hui Zhi Hai**
 Owner/Operator: **China COSCO Bulk**
 Country: **China**
 Designer: **Shanghai Merchant Ship Design & Research Institute, CSSC (SDARI)**
 Country: **China**
 Model test establishment used: **China Ship Scientific Research Centre**
 Flag: **Hong Kong**
 IMO number: **9887683**
 Total number of sister ships already completed (excluding ship presented): **0**

Delivered at the end of 2020 and entering service in January 2021, *Hui Zhi Hai* is the first of an eight-ship series of 210,000 ordered from COSCO Shipping Heavy Industry (Yangzhou) by China COSCO Bulk. The other seven vessels in the series were all delivered in the first six months of 2021.

With a deadweight of 210,918, a length of 299.95, beam of 50m and draught of 18.5m, the series of Newcastlemax ships are the largest ever built at the yard which was established in 2007. They are the newest Newcastlemax ships in the owner's fleet but with over 400 vessels operated by COSCO Bulk including VLOC's up to 400,000dwt they are not the largest.

The ships were designed by SDARI and according to the owner, the yard, the designer and the twin classification societies of LR and CCS to ensure as far as possible that the vessels were 'cutting edge' with the highest possible cargo capacity for hull dimensions and lowest possible fuel consumption.

The vessel is constructed as a conventional Newcastlemax ship with nine holds and side rolling hatch covers. It has a grain capacity of 226,455m³ and is strengthened for heavy cargoes. In operation the vessel is permitted to sail with the even number holds empty. It has a vertical erect stem and transom stern.

Power comes from a MAN B&W 6G70ME-C9.5 long stroke engine directly coupled to a 9.6m diameter fixed pitch propeller. The engine outputs 15,650kW allowing for a 14.5knots service speed at 90%MCR. To achieve this the engine consumes 45.3tonnes of fuel daily. With no scrubber installed the ship is obliged to use 2020 compliant fuels.

TECHNICAL PARTICULARS

Length oa: **299.95m**
 Length bp: **295.20m**

Breadth moulded: 50.00m
 Depth moulded
 to main deck: 25.00m
 to upper deck: 25.00m
 Width of double skin
 bottom: 2.50m
 Draught
 scantling: 18.50m
 design: 16.10m
 Gross: 108,588t
 Deadweight
 scantling: 210,918t
 design: 177,052t
 Speed, service 90%MCR output: 14.5knots
 Cargo capacity (m³)
 Grain: 226,455

Daily fuel consumption (tonnes/day)
 Main engine only: 45.3
 Classification society and notations: CCS
 ★ CSA Bulk Carrier, CSR, BC-A, (Holds Nos 2,4,6&8 may be empty), Grab[35], Strengthened for Heavy Cargoes, COMPASS(R,D,F), PSPC(B), CM, i-Ship(N,M,E,I), Loading Computer(S,I,G), ESP, In-Water Survey, ERS ★ CSM AUT-0, SCM, PMS, Clean, FTP, GWC, BWMP, Green Ship II, EEDI(II+), GPR, BWMS, Crew Accommodation(MLC), IBTS

Propulsion
 Main engine(s)
 Design: MAN B&W
 Model: 6G70ME-C9.5
 Manufacturer: China Shipbuilding Industry Corporation Diesel Engine Co., Ltd
 Number: 1
 Type of fuel: HFO & MDO & MGO
 Output of each engine: 15,650kW
 Is this a diesel-electric or hybrid?: N

Propeller(s)
 Material: Ni-Al-Bronze
 Designer/Manufacturer: Shanghai Marine Propeller Design Co., Ltd
 Number: 1
 Fixed/Controllable pitch: FPP
 Diameter: 9,600mm

Diesel-driven alternators
 Number: 3
 Engine make/type: Yanmar Co., Ltd / MAN 6EY22ALW
 Type of fuel: HFO & MDO & MGO
 Alternator make/type: Hanshin Electric Mfg Co., Ltd / 6EY22

Output/speed of each set: 950kW/900rpm
 Boilers
 Number: 2
 Type: 1 x composite boiler
 Make: ZhangJiaGang Greens Shazhou Boiler Co., Ltd

Output: 3,000Kg/h(oil section);
 1,200Kg/h(exhaust gas section)

Other cranes
 Number: 2
 Make: Ningbo Kairong Ship Machinery Co., Ltd
 Type: Electric-hydraulic Cylinder luffing
 Tasks: Provision handling
 Performance: SWL 8t @ 4~18m working radius

Mooring equipment
 Number: 9
 Make: Masada
 Type: Electric-hydraulic

Special lifesaving equipment
 Number of each and capacity: 1 and 28 person
 Make: Jiangyin Neptune Marine Appliance Co., Ltd
 Type: 7.5m Totally enclosed Life Complement
 Crew: 28
 Single/double/other rooms: 1 cabin for pilot

Navigation and other equipment
 Bridge control system
 Make: Furuno
 Is bridge fitted for one-man operation?: N
 Integrated bridge system?: N

Radars
 Number: 2
 Make: Furuno
 Model(s): FAR-2338SW,FAR-2328W

Fire detection system
 Make: Apollo
 Type: Syncro

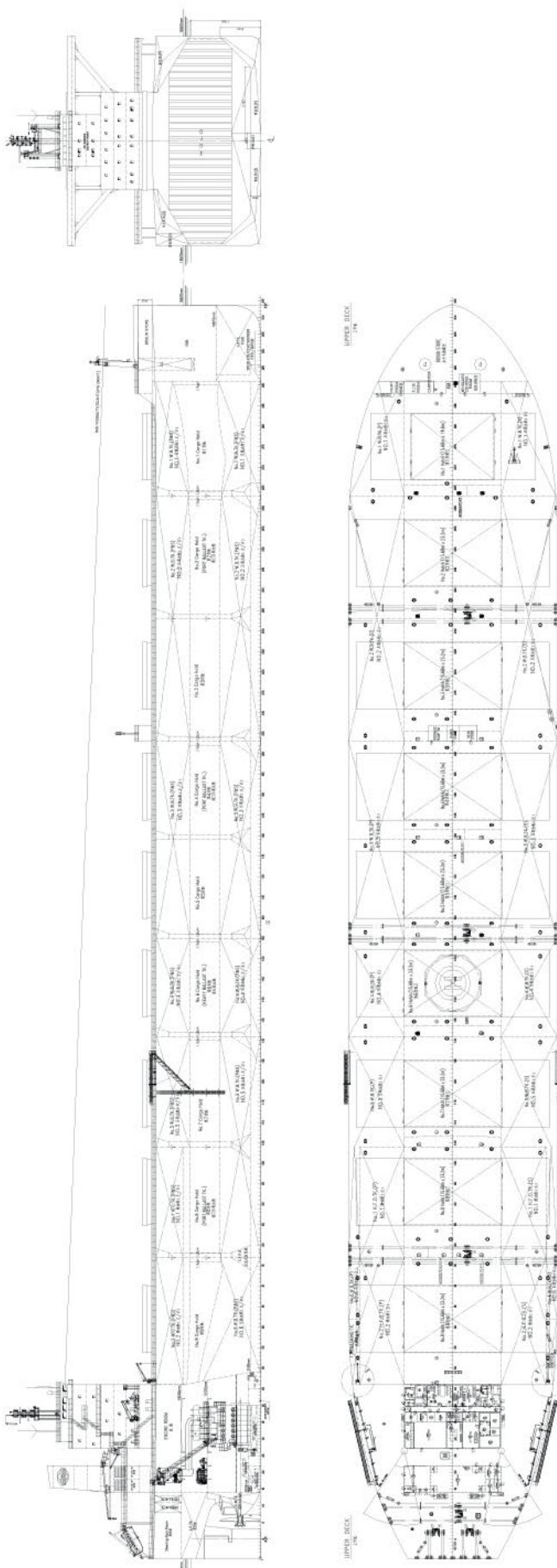
Fire extinguishing systems
 Engine room: CO₂ and fixed water-based local application fire-fighting
 Make/Type: CSSC Jiujiang Fire Equipment Co. Ltd / Shanghai Sure-Safe Fire Equipment Co. Ltd

Vehicle spaces: CO₂ / water spray
 Make/Type: Jiangsu Nanji Machinery Co., Ltd / Shanghai Sure-Safe Fire Equipment Co. Ltd

Waste disposal plant
 Sewage plant
 Make: Jiangsu Nanji Machinery Co., Ltd
 Model: WCMBR-50(UII)

Efficiency
 Attained EEDI value: 2.12
 Required EEDI value: 2.78
 Energy Saving Technologies: Duct + Cap

Contract date: 2019
 Delivery date: December 2020



JAARLI – Crude oil tanker



Shipbuilder:	Hyundai Heavy Industry Co., Ltd
Vessel's name:	Jaarli
Owner/Operator:	Neste
Country:	Finland
Designer:	Hyundai Heavy Industry Co., Ltd
Country:	Republic of Korea
Model test establishment used:	Hyundai Maritime Research Institute
Flag:	Finland
IMO number:	9892432
Total number of sister ships already completed (excluding ship presented):	1
Total number of sister ships still on order:	0

In 2015, Finnish oil and energy company Neste completed its departure from shipowning with the sale of its final two vessels. Four years later, it decided to re-enter the arena and ordered a pair of ice-classed LR2 Aframax vessels from Hyundai Heavy Industries. *Jaarli* was delivered in September 2021 as the first of the pair with *Jantuli* following three months later.

When determining what sort of vessel was best suited to its operations, Neste employed the help of Aker Arctic. After deciding against a double acting ship or one with an ice breaker bow, the final choice was a conventional tanker based upon the design principals of the 2005-built *Stena Arctica* but with much improved features. The dimensions of the vessel with its 249.84loa, beam of 44m and draught of 151m correspond almost exactly to those of *Stena Arctica*.

Cargo facilities are typical of the type with six pairs of cargo tanks for 125,300m³ capacity and one pair of slop tanks of 1,400m³ each. The ship has three cargo pumps of 3,000m³/h capacity supplied by Hamworthy Pumps marking that company's return to the mainstream after being sold off by Wärtsilä in 2018. The ship is powered by a MAN B&W 6G60ME-C9.5 main engine which has an NCR of 11,220kW at 84.5rpm and an MCR of 15,646kW at 94.4rpm.

Intended service area for the vessel is the Baltic Sea from Russia's Primorsk and Ust-Luga terminals to Porvoo and Naantali in Finland. Thus the ship has been designed for the 1A Finnish-Swedish Ice Class with Ice Class 1A FS notation and has ice navigating capability. A high lift rudder for good manoeuvring characteristics and ice-knife are fitted. There is a rudder bulb to improve propulsion efficiency and a controllable pitch propeller.

Other modern features include a cyber security system arranged in accordance with the requirements for the LR's Cyber Security notation and HYUNDAI-ISS (Integrated Smart ship Solution) to help

voyage monitoring, route optimisation, fuel/energy flow monitoring, performance analysis and reporting.

TECHNICAL PARTICULARS

Length oa:	249.84m
Length bp:	238.90m
Breadth moulded:	44.00m
Depth moulded	
to main deck:	21.40m
to upper deck:	21.40m
Width of double skin	
side:	2.35m
bottom:	2.60m
Draught	
scantling:	15.1m
design:	13.60m
Gross:	63,532t
Deadweight	
scantling:	112,459t
design:	97,727t
Speed, service (%MCR output):	13.9knots
Cargo capacity (m ³)	
Liquid volume:	125,334.6
Bunkers (m ³)	
Heavy oil:	2,327.3
Marine gas oil:	427.1
Water ballast (m ³):	44,318.0
Daily fuel consumption (tonnes/day)	
Main engine only:	43.4
Classification society and notations:	Lloyd's Register +100A1, Double Hull Oil Tanker, CSR, ESP, ShipRight (ACS(B, C) CM), *IWS, LI, SPM4, ECO (BWT, P, VEC5-L), +LMC, UMS, BWTS, NAV1, IBS, Ice Class1A FS with descriptive Notes, ShipRight (BWMP(T), SCM, IHM, MPMS), Cyber Security (ICMS, HISS), SERS

Propulsion

Main engine(s)

Design:	Hyundai-MAN B&W
Model:	6G60ME-C9.5
Manufacturer:	HII Engine & Machinery Division

Number:	1
Type of fuel:	LFO / ULSD / MGO
Output of each engine: MCR:	15,646kW x 94.4rpm / NCR: 11,220kW x 84.5rpm

Is this a diesel-electric or hybrid?: N
Propeller(s)

Material: Ni-Al-Bronze

Designer/Manufacturer: Kongsberg

Number: 1

Fixed/Controllable pitch: Controllable

Diameter: 7.8m

Diesel-driven alternators

Number: 4

Engine make/type: Hyundai HIMSEN 9H25/33 x 2sets, 6H25/33 x 2sets

Type of fuel: LFO, ULSD, MGO

Alternator make/type: HFC7 716-08P x 2 sets, HHC7 636-08P x 2 sets

Output/speed of each set: 2,650kW x 2 sets, 1,790kW x 2 sets, 900rpm

Boilers

Number:	2
Type:	large oil-fired boiler
Make:	Alfa Laval

Output, each boiler: 15t/h x 2 sets

Stern appendages/special rudders: Full spade rudder

Bow thruster

Make:	Kawasaki
Number:	2

Output (each): Max. 1,700kW

Deck machinery

Cargo cranes/cargo gear

Number:	2
Make:	Oriental
Type:	Electro-Hydraulic

Performance: SWL 15t

Other cranes

Number:	2
Make:	Oriental

Type: Electro-Hydraulic

Tasks: Provision

Performance: SWL 4t / 2t

Mooring equipment

- Foreship: 2 Windlass, 1 Mooring Winch
- Upper Deck: 2 Mooring Winch
- Stern Deck: 3 Mooring Winch
- Make: Kongsberg
- Type: Electric

Special lifesaving equipment

Number of each and capacity: 1 x 34 persons

Make: Viking Norsafe

Type: Totally enclosed free-fall type

Cargo tanks

Number: 12 (excl. slop tanks)

Grades of cargo carried: 3 Groups

Product range: Crude Oil

Cargo pumps

Number:	3
Type:	Vertical Centrifugal Single Stage, Variable Speed Electric Motor Driven.

Make: Hamworthy Pump(Wärtsilä)

Capacity (each): 3,000m³/h x 130mTH

Cargo control system

Make: Scana Korea

Type: Hydraulic type valve remote control

Ballast control system

Make: Scana Korea

Type: Hydraulic type valve remote control

Ballast water treatment system

Make: Alfa Laval

Capacity: 3,000m³/h x 2 set, 250m³/h x 1 set

Complement

Officers: 9

Crew: 14

Suez/Repair Crew: 6

Riding Crew: 8

Navigation and other equipment

Bridge control system

Make: Hyundai Global Service

Type: One man

Is bridge fitted for one-man operation? Y

Integrated bridge system

If yes, make: JRC

Model: GRD-921

Radar

Number: 2

Make: JRC

Model(s): JMR-9282-S, JMR-9225-6X

Fire detection system

Make: Consilium

Type: Salwico Cargo

Fire extinguishing systems

Engine room: CO₂ Fire Extinguishing Sys

Make/Type: Fain/CO₂ Fire Extinguishing Sys.

Waste disposal plant

Make: Evac Oy

Model: Ecotreat 2

Efficiency

Attained EEDI value: 3.58

Required EEDI value: 3.76

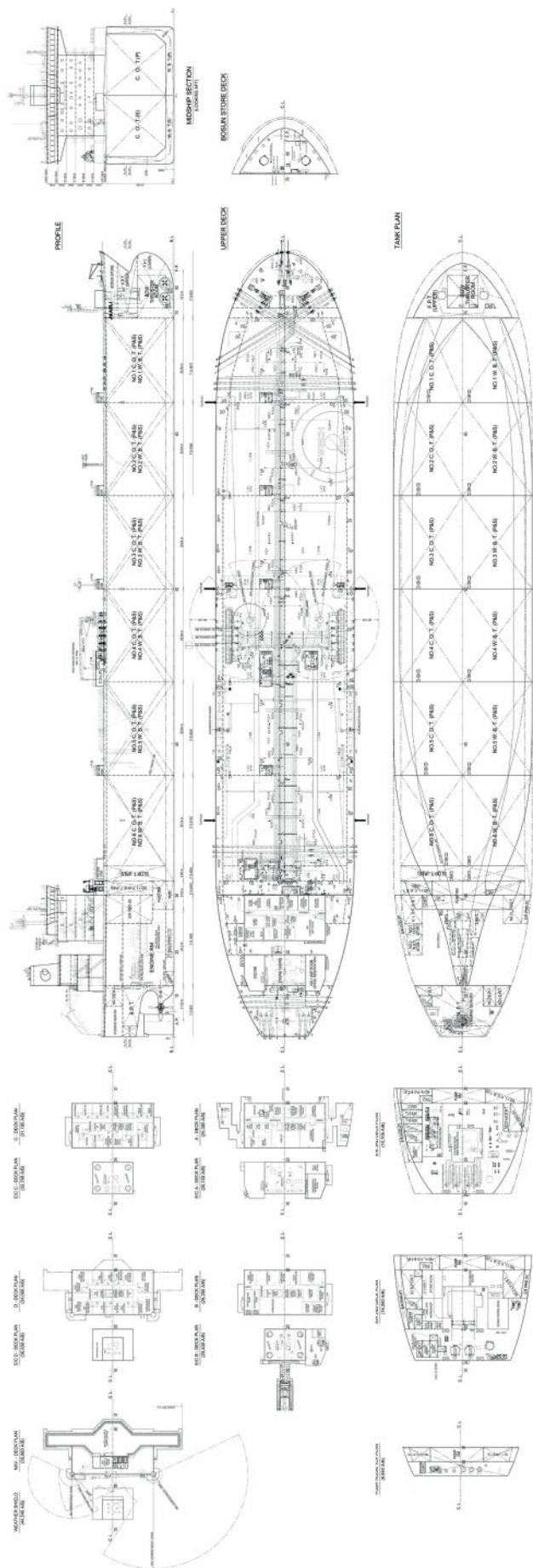
Energy Saving Technologies: Rudder bulb

Hull coatings: Marathon IQ 2 & Jotun Sequamunt POR U

Contract date: 28 June 2019

Launch/float-out date: 15 June 2021

Delivery date: 30 September 2021



JI LONG DAO – Ro-pax ferry



Shipbuilder:CSSC Guangzhou Shipyard International Company Ltd
 Vessel's name:Ji Long Dao
 Owner/Operator:COSCO Shipping Ferry Co., Ltd
 Country:China
 Designer:Shanghai Merchant Ship Design & Research Institute, CSSC (SDARI)
 Country:China
 Model test establishment used:Shanghai Ship & Shipping Research Institute
 Flag:China
 IMO number:9904003
 Total number of sister ships already completed (excluding ship presented):0
 Total number of sister ships still on order: 1

Ordered by COSCO Shipping Ferry in 2019 and delivered by CSSC Guangzhou Shipyard in August 2021, Ji Long Dao is a 43,195gt ro-pax that is the first of two and on delivery was the largest ro-pax vessel operated by its owner and the second largest in operation on Bohai Bay. A sister vessel Xiang Long Dao was delivered in December 2021. Its service speed of 22.5kt also gives it another claim to fame as the fastest ro-pax vessel currently operating in China.

With an overall length of 208m and a width of 28.6m, the vessel can accommodate 1,375 passengers in 360 cabins. Three vehicle decks with a total of 2,800 lane meters are available for 500 vehicles of 5m length. There is a straight stern ramp, a quarter stern ramp on the starboard side and a bow ramp for loading and unloading.

The ship has a twin propulsion system which gives redundancy. The two main engines are MAN 12V48/60CR units each with a power output of 14,400kW. The power train for each engine includes a Renk RSH-1180 gearbox reducing output speed to 133.3rpm. The propellers, also supplied by Man, are controllable pitch types of 5.1m diameter, installed in front of twin flap rudders.

Passenger accommodation and service areas are located over four upper decks. Facilities include restaurants, VIP lounges, a cinema and children's play areas. The owners have installed an intelligent passenger system to facilitate rapid embarkation and access to different services.

Evacuation systems comprises of 120-person lifeboats and 350 person vertical chute rapid evacuation systems.

TECHNICAL PARTICULARS

Length oa:208.00m
 Length bp:193.60m
 Breadth moulded:28.60m

Depth moulded:9.80m
 Width of double skin bottom:1.50m
 Draught scantling:6.60m
 design:6.40m
 Gross:43,195t
 Deadweight scantling:8,500t
 design:7,500t
 Block co-efficient (please state relevant draught):0.637 at design draught
 Speed, service 85% MCR output:22.3knots at 85% MCR with 15% SM
 Daily fuel consumption (tonnes/day)
 Main engine only:103.3

Classification society and notations:China Classification Society

★ CSA RO-RO Passenger Ship; Ice Class B

★ CSM MCC; SCM; PMS

Heel control equipment:1 pair of Anti-heeling tank

Roll-stabilization equipment:1 pair of fin stabilizer

Propulsion

Main engine(s)

Design:MAN B&W
 Model:MAN 12V48/60CR
 Manufacturer:MAN
 Number:2
 Type of fuel:HFO & MDO & MGO
 Output of each engine:14,400kW
 Is this a diesel-electric or hybrid?:N

Gearbox(es)

Make:Renk
 Model:RSH-1180
 Number:2
 Output speed:133.3rpm

Propeller(s)

Material:Ni-Al-Bronze
 Designer/Manufacturer:MAN
 Number:2
 Fixed/Controllable pitch:CPP
 Diameter:5,100mm
 Speed:133.3rpm (MCR)

Diesel-driven alternators

Number:3
 Engine make/type:Yanmar Co., Ltd
 Type of fuel:HFO, MDO & MGO
 Alternator make/type:Taiyo Electric Co., Ltd
 Output/speed of each set:1,000kW/750rpm

Boilers

Number:3
 Type:2 x Exhaust gas heaters; 1x oil-fired thermal oil heater
 Make:Heatmaster
 Output:Exhaust gas heaters: 1,500kW;
 oil-fired thermal oil heater: 3,000kW
 Stern appendages/special rudders:2 flap rudders

Bow thruster(s)

Make:Wuhan Kawasaki Marine Machinery Co., Ltd
 Number:2
 Output (each):1,000kW

Other cranes

Number:2
 Make:Jiangyin Safety Sea Marine Equipment Co., Ltd

Type:Electric Provision Crane

Tasks:Provision handling

Performance:SWL 2t @ 6m outreach

Mooring equipment

Number:8
 Make:Jiangsu Masada Heavy Industries Co., Ltd

Type:hydraulic

Special lifesaving equipment

Number of each and capacity:120p for each lifeboat and 350p for each MES

Make:CSSC Luzhou Zhenjiang Marine Auxiliary Machinery Co., Ltd and Shanghai Star Rubber Products Co., Ltd

Type:Totally enclosed FRP lifeboat
 If MES, vertical or sloping chutes?:vertical

Vehicles

Number of vehicle decks (fixed/movable)....3

Total lane length:.....2,800m

Doors/ramps/lifts/movable car decks

Number of each:

- 1 set bow door;
- 1 set bow ramp;
- 1 set inner bow door;
- 1 set stern ramp;
- 1 set inner stern door;
- 1 set stern side ramp/door;
- 1 set movable ramp dk5;
- 1 set ramp cover dk3;
- 1 set combined ramp dk1 (aft);
- 1 set cargo lift;
- 1 set lift cover;
- 6 sets shell doors

Type:Hydraulic

Designer:TTS-Huahai

Complement

Officers:8

Crew:75

Passengers

Total:1,375

Number of cabins:360

Navigation and other equipment

Bridge control system

Make:Hangyue Electric

Is bridge fitted for one-man operation?:N

Integrated bridge system:N

Radar

Number:3

Make:Furuno

Model(s):FAR-2338S,FAR-2228

Fire detection system

Make:Consilium

Type:Salwico Ro/Pax

Fire extinguishing systems

Engine room:CO₂ / ER water mist system

Make/Type:Shanghai Sure-safe Fire Equipment Co. Ltd. / Juijiang Fire Fighting Equipment Co. Ltd

Vehicle spaces:CO₂ / fixed spraying fire fighting system

Make/Type:Shanghai Sure-safe Fire Equipment Co. Ltd / Ningbo Yonghang Fire Equipment Co. Ltd

Cabins

Fixed sprinkler system

Make/Type:Shanghai Sure-safe Fire Equipment Co. Ltd

Waste disposal plant

Sewage plant

Make:VAC Drain

Model:CSWC-200 x 3 sets /CSWC-120 x 1 set

Efficiency

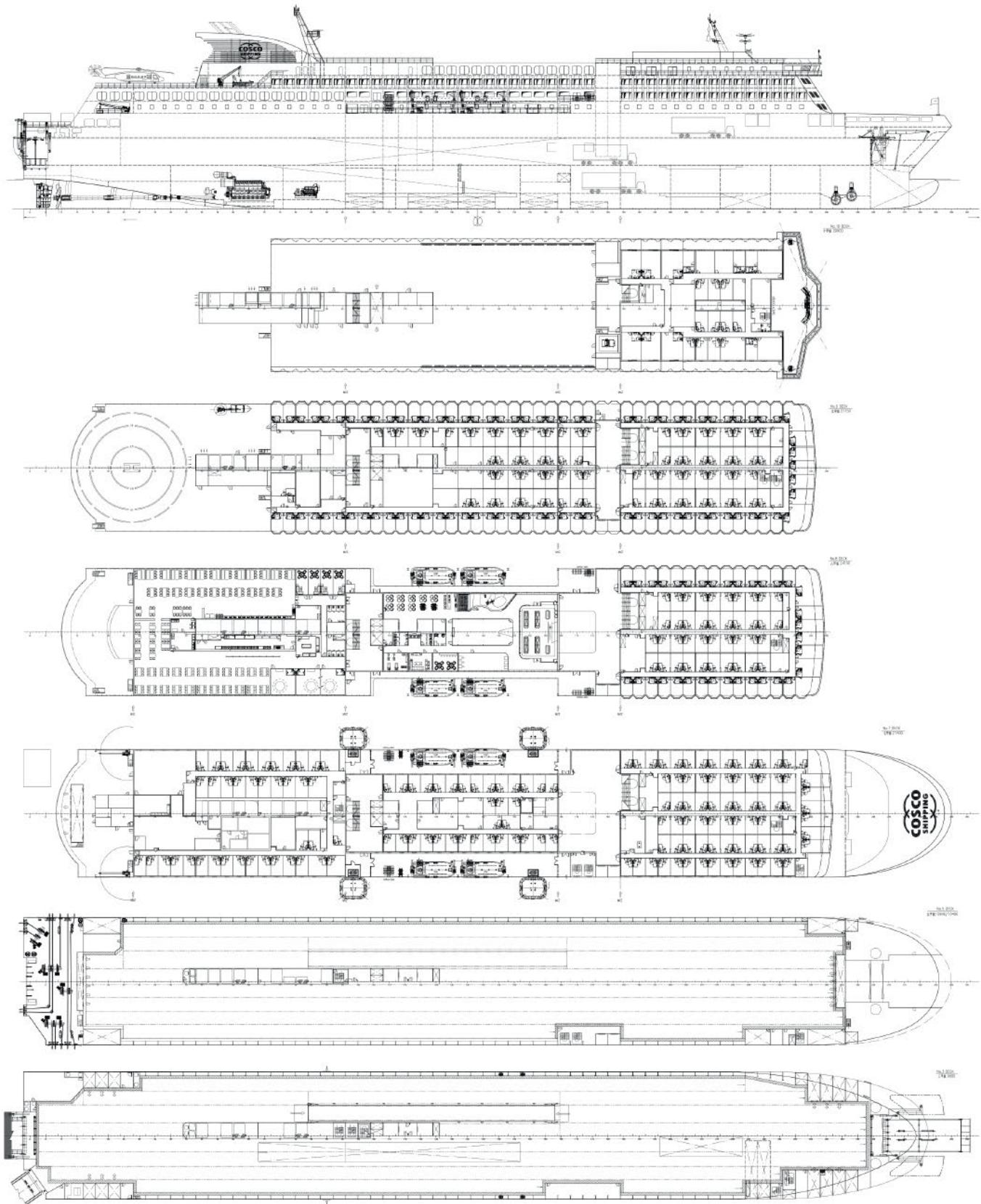
Attained EEDI value:g-CO₂/tonne-NM

Required EEDI value:g-CO₂/tonne-NM

Contract date:March 2019

Launch/float-out date:January 2021

Delivery date:August 2021



KATORI – Multi-purpose vessel



Shipbuilder: **Nanjing Jinling Shipyard Co., Ltd (China)**
 Vessel's name: **Katori**
 Owner/Operator: **Nippon Yusen Kaisha**
 Country: **Japan**
 Designer: **CSSC Shanghai Merchant Ship Design & Research Institute (SDARI)**
 Country: **China**
 Model test establishment used: **CSSC Shanghai Merchant Ship Design & Research Institute (SDARI)**
 Flag: **Panama**
 IMO number: **9892937**
 Total number of sister ships still on order: **0**

Multi-purpose and heavy lift vessels have not been much in demand in recent years so any order can be considered interesting. The 13,230dwt *Katori* with a lifting capacity of 800tonnes is not the largest vessel of the type by any means but it is significant in that it is the first vessel of its type built by Nanjing Jinling Shipyard for Japanese owners – in this case NYK Bulker & Projects, a subsidiary of NYK Group. The vessel was delivered in September 2021 and a sister vessel, *Kifune* was handed over in January 2022.

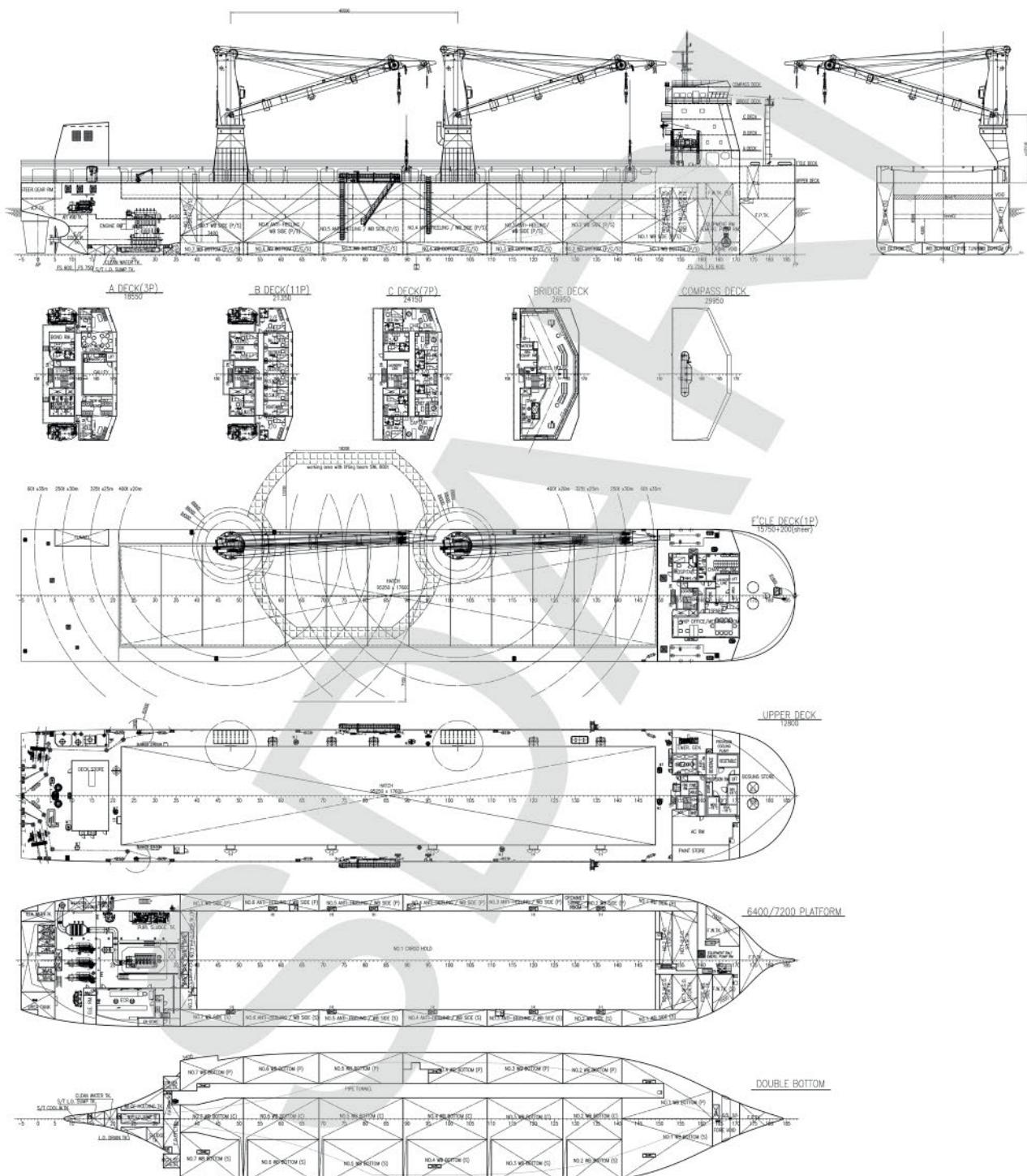
Katori is 138m in length, 23.6m in width, 12.8m in depth and has a draught of 8.3m. the ship is a SDARI design intended for service in Southeast Asia and Africa for transporting large equipment and bulky parts.

It is claimed that the ship has the longest hold of any ship currently in operation. The 95.25m by 17.6m hold has no bulkheads or other obstructions. The ship can operate hatch coverless enabling the loading of tall and large cargo and with a forward superstructure there is no disruption to forward visibility during navigation. Two 400tonne capacity cranes are located on the port side of the vessel and can operate at full capacity within a radius of 20m reducing to 65tonnes at the full outreach of 35m. The cranes can tandem lift 800tonne loads in an area between them.

The ship's engine room is located aft of the single hold and houses a Japan Engine Corporation 6UEC35LSE-Eco-B2-SCR engine with a 3,200kW power output linked to a fixed pitch propeller. Service speed is 13knots.

TECHNICAL PARTICULARS

Length oa:	138.0m	Boilers
Length bp:	135.0m	Number: 1
Breadth moulded:	23.6m	Type: Thermal oil heater
Depth moulded:	12.8m	Make: Miura Co., Ltd
Draught			Output, each boiler: 930kW
scantling:	8.3m	Bow thruster(s)
design:	7.5m	Number: 1
Gross:	12,792t	Output (each): 736kW
Deadweight			Deck machinery
scantling:	13,230t	Cargo cranes/cargo gear
Speed, service (--%MCR output):	13knots	Number: 2
Cargo capacity (m ³)			Performance: 400t-20m
Grain:	18,800	Cargo equipment
Bunkers (m ³)			Mooring equipment
Heavy oil:	900	Number: 4
Diesel oil:	330	Type: hydraulic
Water ballast (m ³):	8,460	Special lifesaving equipment
Daily fuel consumption (tonnes/day)			Number of each and capacity: 22p
Main engine only:	10.8	Type: Gravity fall arm type lifeboat
Auxiliaries:	3.0	Hatch covers
Classification society and notations:	DNV	Design: TTS Hua Hai
Propulsion			Type: Lifting type
Main engine(s)			Complement
Design:	UE Engine	Officers: 10
Model:	6UEC35LSE-Eco-B2-SCR	Crew: 11
Manufacturer:	J-ENG	Suez/Repair Crew: 6
Number:	1	Single/double/other rooms: 21/0/1
Type of fuel:	HFO & MGO	Navigation and other equipment
Output of each engine:	3,200kW x 123rpm	Bridge control system
Is this a diesel-electric or hybrid?:	N	Make: Nabtesco
Propeller(s)			Type: M-800-V
Material:	Ni-Al-Bronze(Cu3)	Is bridge fitted for one-man operation?: N
Designer/Manufacturer:	Nakashima	Integrated bridge system: N
Number:	1	Radar
Fixed/Controllable pitch:	FPP	Number: 2
Diameter:	4.85	Make: Furuno
Speed:	123	Model(s): XN-24CF, SN-36CF
Diesel-driven alternators			Fire detection system
Number:	3	Make: Consilium
Engine make/type:	Daihatsu Diesel Mfg. Co., Ltd/ 6DE-18	Type: Salwico Cargo
Type of fuel:	HFO & MGO	Contract date: August 2019
Alternator make/type:	Nishishiba/NTAKL-VE	Launch/float-out date: March 2021
Output/speed of each set:	650kW x 900rpm	Delivery date: September 2021



LE COMMANDANT CHARCOT – Polar expedition ship



Shipbuilder:	Vard
Vessel's name:	Le Commandant Charcot
Owner/Operator:	Ponant
Country:	France
Designer:	Stirling Design
Country:	France
Model test establishment used:	SSPA (Sweden) & Aker Arctic
Flag:	France
IMO number:	9846249
Total number of sister ships already completed (excluding ship presented):	0
Total number of sister ships still on order:	0

Delivered by Vard to French expedition cruise operator Ponant, *Le Commandant Charcot* has been one of the most discussed and written about vessels since it was first announced in 2017. The hybrid, LNG-fuelled polar expedition ship's hull was built at Tulcea in Romania and completed by Vard's Soviknes yard in Norway. After fitting out there the vessel was moved in July 2020 to St Nazaire in France for installation of its Azipod propulsion system before returning to Norway for completion and delivery in August 2021.

Le Commandant Charcot is 31,283gt, 149.9m long, 28.3m wide and can accommodate 245 passengers in 123 staterooms, in addition to a crew of 215 persons. The ship is Polar Class 2 with icebreaking capabilities forward and aft. As a double acting vessel, it is able to keep a constant speed of 2knots in 2.4m thick intact ice and cross ice ridges of more than 15m.

In addition to four 14-cylinder and two 10-cylinder Wärtsilä 31DF main engines, Wartsila also supplied the fuel gas supply system of two membrane LNG tanks with a total capacity of 4,500m³. The engines have a total power output of 37,400kW to provide electric power for the two 17MW ABB azipod propulsion thrusters. A pair of 1,600kW bow thrusters provide manoeuvring power and also allow the ship to have a station keeping ability in cross winds up to 35knots. A Corvus Energy Orca battery system with a capacity of 4,520kWh provides zero emission peak shaving and spinning reserve functionality.

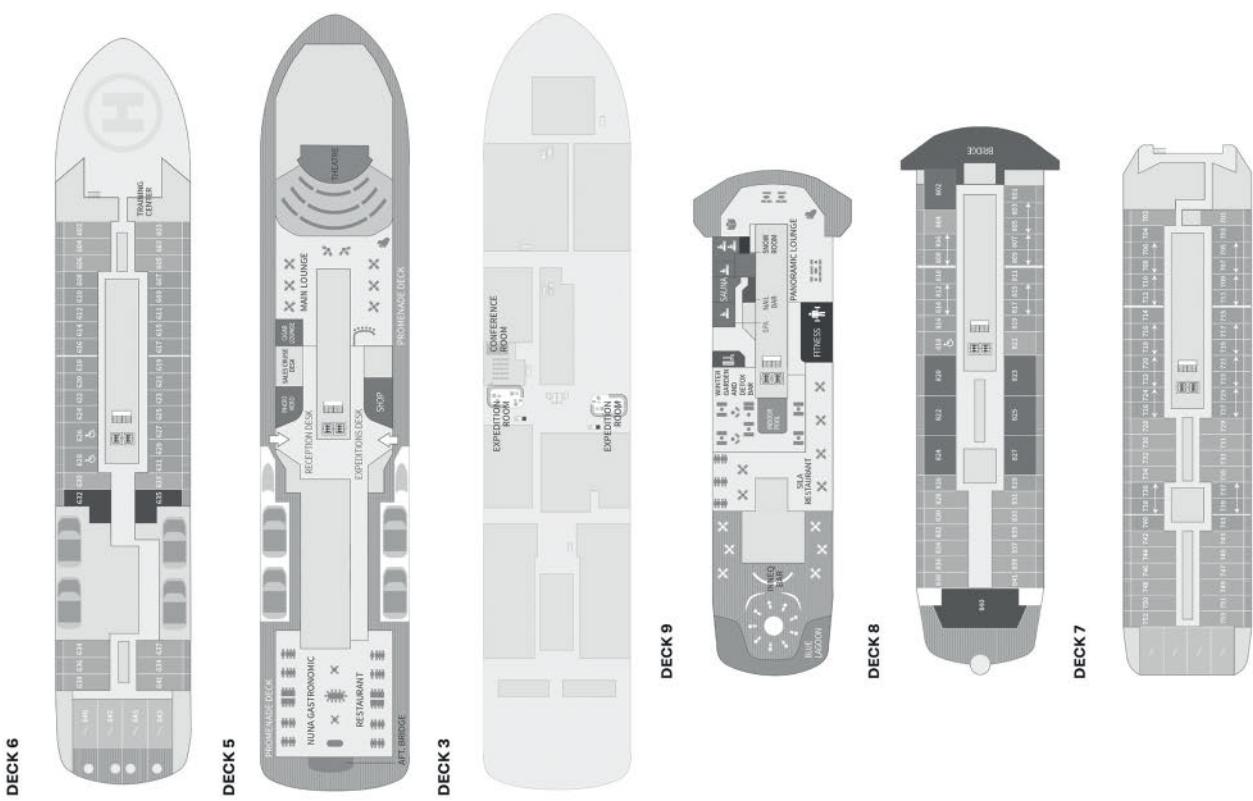
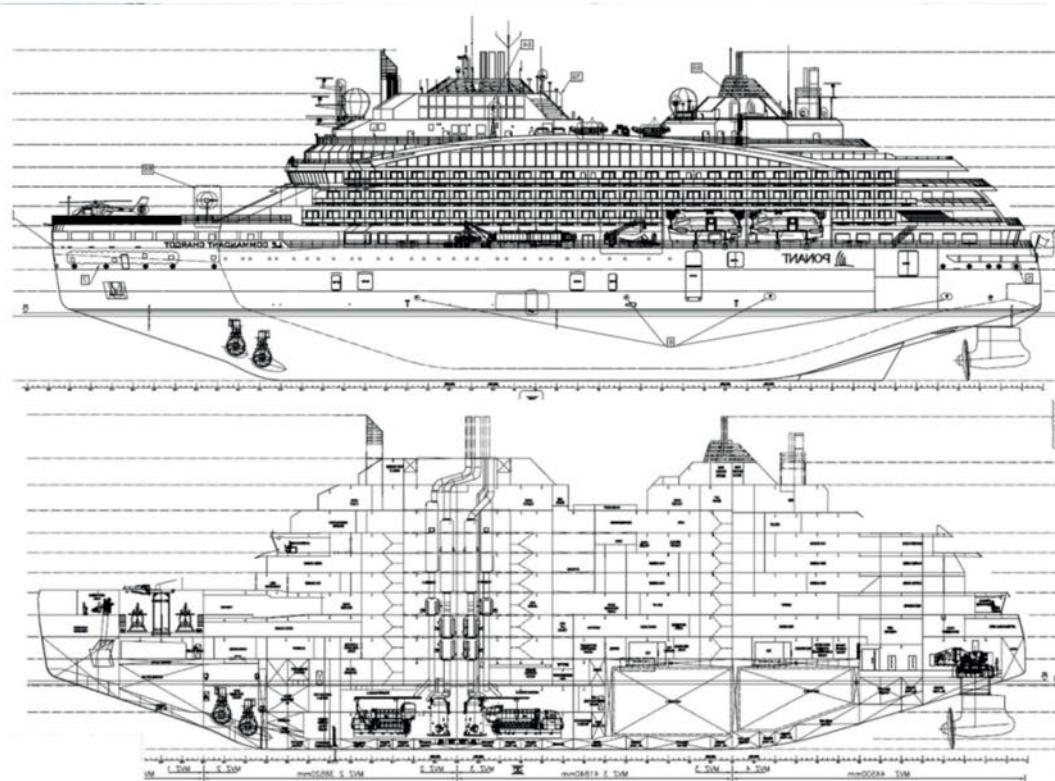
TECHNICAL PARTICULARS

Length oa:	149.9m
Length bp:	142.345m
Breadth moulded:	28.3m
Depth moulded to upper deck:	15.3m
Width of double skin side:	2.95m
bottom:	1.915m
Draught scantling:	10.2m

design:	9.5m open water 10.0m in ice
Gross:	31,283t
Displacement:	28,973.5t
Lightweight:	21,521.3t
Deadweight: design:	7,452.2t
Block co-efficient (please state relevant draught):	0,6769 at 9.50m & 0,6892 at 10.00m
Speed, service (--%MCR output):	...18.04kn at 9.50m at 54,25% MCR
Bunkers (m³)	
Diesel oil:	3,800m³
LNG:	4,509m³
Water ballast (m³):	4,289m³
Daily fuel consumption (tonnes/day)	
Main engine only:	Electrical propulsion system, varies according to speed and navigation condition (open water / ice)
Classification society and notations:Bureau Veritas *HULL *MACH, Unrestricted Navigation, Passenger Ship - SRTP - DUALFUEL - POLAR CAT A *AUT-PORT *AUT-UMS *Veristar - HULL POLAR CLASS 2 ICEBREAKER 3 (Bow) ICEBREAKER 4 (Stern) COLD (H -15°C, E -25°C) INWATERSURVEY CLEANSHIP BWT AWT A/B COMF-NOISE-1 COMF-VIB-1 ERS-S HYBRID ELECTRIC (PM,ZE)
Heel control equipment:	Framo
Roll-stabilisation equipment:	SKF Marine Retractable Fin Stabilizer Type UHL S600 -12m²
Propulsion	
Main engine(s)	
Design:	Dual Fuel
Model:	31DF
Manufacturer:	Wärtsilä
Number:	6
Type of fuel:	Dual fuel, MDO and NG
Output of each engine:2x 5,500kW and 4x 7,700kW
Is this a diesel-electric or hybrid?:	Y
Propeller(s)	
Material:	Stainless steel
Designer/Manufacturer:	ABB
Number:	2x5
Fixed/Controllable pitch:	fixed
Diameter:	6m
Speed:	135rpm
Boilers	
Number:	2
Type:	CHB 6000 dual fuel
Make:	Alfa Laval - Aalborg
Output, each boiler:6,000Kg/h 8 bar
Stern appendages/special rudders:Azimuth thrusters ABB Pod
Bow thruster(s)	
Make:	Brunvoll
Number:	2
Output (each):17,000kW
Deck machinery	
Cargo cranes/cargo gear	
Number:	2

Make:Seaonics
Type:	foldable boom
Performance:2t 16m
Moorings equipment	
Number:	7
Make:Palfinger
Type:electric
Special lifesaving equipment	
Number of each and capacity:4 polar lifeboat 115 /tender 60 + 8 polar GSK ICECUBE 64p each
Make:Fassmer
Type:PLL 1099 polar design
Cargo/capacity	
Hatch covers	
Design:Helicopter Hangar deck hatch and elevator 4t
Manufacturer:Ultimatech
Type (upper deck/other decks):Helideck
Cargo pumps:Fuel Gaz Handling System
Number:8 GVU + 2 BOG compressor + 2 Nitrogen generator + 2 TCS fuel gaz prep unit
Make:Wärtsilä
Complement	
Crew:260
Single/double/other rooms:37 single, 79 double crew standard, 15 double occ. pax standard
Passengers	
Total:240
Number of cabins:120
Navigation and other equipment	
Bridge control system	
Make:Wärtsilä
Type:Platinum
Is bridge fitted for one-man operation?:Y
Integrated bridge system:Y
If yes, make:Wärtsilä
Model:Nacos Platinum
Radar	
Number:4
Make:Wärtsilä
Model(s):Nacos Platinum
Fire detection system	
Make:Autronica
Type:Autrosafe
Fire extinguishing systems	
Engine room:water mist and gaz
Make/Type:Ultrafog + Novec
Cabin:water mist
Make/Type:Ultrafog
Public spaces:water mist
Make/Type:Ultrafog
Waste disposal plant	
Incinerator	
Make:Evac / Model: DI 500
Waste compactor	
Make:Evac
Waste shredder/crusher	
Make:Evac
Sewage plant	
Make:Evac / Model: MBR 145 K
Efficiency	
Attained EEDI value:17.53
Required EEDI value:18.55
Installed Fuel Meters:Massic flowmeter Emerson for MDO and NG
Other installed monitoring tools:	
- Greenpilot energy efficiency monitoring system developed by Maroka.	
- Innovating Adrena Ice routing software	
- Continuous Ice measurement system SIMS	
- Continuous Thermosalinometer	
- Meteorological recording station	
Energy Saving Technologies:Corvus ESS system 4.5MWh ORCA type.
Hull coatings:INERTA abrasion resistant paint
Performance Monitoring Regime:	
- 2 SCR for NOx reduction Wärtsilä	
- 6 exhaust gaz boiler for heat recovery of central heating loop (HVAC, potable hot water, swimming pools, laundry, galley, tank heating)	
- Sea water exchanger for chilled water in polar area	
- Fan coil for pax cabin HVAC	
- HVAC AHU with VFD and enthalpic wheels	
Contract date:December 2017
Launch/float-out date:February 2020
Delivery date:19 July 2021

LE COMMANDANT CHARCOT



LEGACY – LPG carrier



Shipbuilder:	Hyundai Mipo Dockyard Co., Ltd
Vessel's name:	Legacy
Owner/Operator:	Nieto Trading B.V
Country:	Netherlands
Designer:	Hyundai Mipo Dockyard Co., Ltd
Country:	Republic of Korea
Flag:	Malta
IMO number:	9893656
Total number of sister ships already completed (excluding ship presented):	0
Total number of sister ships still on order:	0

When *Legacy*, a 38,321m³ LPG carrier was delivered by Hyundai Mipo to Mexican gas supply specialist Empresas Nieto on 2 July 2021, it marked the beginning of the company's status as a shipowner.

Until taking delivery of *Legacy*, Empresas Nieto had been involved in most parts of the gas supply chain, from terminals, pipelines, storage, land transport as well as energy trading but had always relied upon chartered vessels for sea transport.

At 179.86m in length and with a 28.4m beam, *Legacy* is considered a midsize LPG carrier. In many respects the vessel is typical of its type and the basic design is a staple of Hyundai Mipo which has built many of the type and has several more on order for different owners.

The ship has six cargo tanks in three pairs and one deck tank. Two grades of cargo can be carried and the ship is certified for carriage of 1,3-Butadiene, Butane, Butylene, Propane, Commercial propane, Propylene, Vinyl Chloride monomer and Mixed C4.

The cargo pumps are six Svanehøj deepwell cargo pumps, DW200/200-3-K+I, two booster pumps of type NMB150c and two Fuel and Sampling pumps, EFP11-6.

The main engine is a further reference for MAN B&W LGIP range able to run on LPG. This engine is becoming increasingly popular since its introduction in late 2018 and at the time of its ordering for *Legacy* almost 80% of all LPG carriers over 2,500m³ were stipulating its installation. The unit on *Legacy* is a 6G50ME-C9.6-LGIP-HPSCR producing 10,320kW at 100rpm and allowing a 16kn speed. The lower CO₂ emissions from LPG allow the ship to have an attained EEDI of 6.65 which is well below the required maximum of 9.32.

TECHNICAL PARTICULARS

Length oa:	179.86m
Length bp:	173.50m
Breadth moulded:	28.40m
Depth moulded to main deck:	18.20m
to upper deck:	18.20m

Width of double skin side:	1.40m
bottom:	1.70m
Draught scantling:	10.40m
design:	9.50m
Gross:	25,110t
Deadweight scantling:	28,886t
design:	24,871t
Speed, service:	16.00kn
Cargo capacity (m ³)	38,321.9m ³
Liquid volume:	
Bunkers (m ³)	
Light oil:	1,366.1m ³
Gas oil:	274.9m ³
Water ballast (m ³):	11,756.4m ³
Daily fuel consumption (tonnes/day)	
Main engine only:	23.9t/day

Classification society and notations: DNV, +1A, Tanker for Liquefied Gas, EO, BIS, TMON, COAT-PSPC(B), LCS, BWM(T), Recyclable, Clean, SPM, CMON, ER(SCR, TIER III)

Propulsion
Main engine(s)
Design:
Model:
Manufacturer:
Division
Number:
Type of fuel:
Output of each engine:
Is this a diesel-electric or hybrid?:
N Propeller(s)

Material: NiAl-Bronze

Designer/Manufacturer: Hyundai Heavy Industries Co., Ltd

Number: 1

Fixed/Controllable pitch: Fixed

Main-engine driven alternators

Diesel-driven alternators

Number: 3

Engine make/type: HHI – Engine & Machinery Division

Type of fuel: HFO & MDO

Alternator make/type: Hyundai Electric Co., Ltd

Output/speed of each set: 960kW x 720rpm

Boilers

Number: 1

Type: LFO Burning

Make: Kangrim

Output, each boiler: 3,500/600kg/hr (Oil-fired/Exh gas side) / 79kg/cm²g (working/design pressure)

Deck machinery

Cargo cranes/cargo gear

Number: 1

Make: Oriental

Type: Electro-hydraulic

Performance: SWL 5ton / Outreach 6.2 ~ 29.0m

Other cranes

Number: 1

Make: Jiangsu Masada Heavy Industries Co. Ltd

Type: Electro-hydraulic

Tasks: Provision and machinery parts handling in engine room

Performance: SWL 3.2tons / Outreach 2.4 ~ 9.5m

Mooring equipment

Number: 8

Make: Flutek Ltd.

Type: Electro-hydraulic

Special lifesaving equipment

Number of each and capacity: 2 / 30

Make: Jiangjinshi Beihai LSA Co., Ltd

Type: Davit-launched type

Cargo tanks

Number: 6 Cargo tanks / 1 deck tank

Grades of cargo carried: 2 grades

Product range: 1,3-Butadiene, Butane, Butylene, Propane, Commercial propane, Propylene, Vinyl Chloride monomer, Mixed C4

Stainless steel – structure/piping: ASTM A312 Gr 304L

Cargo pumps

Number: 6

Type: Deepwell, Electric Motor driven

Make: Babcock Liquid Gas Equipment Ltd

Stainless steel: ANSI A312 Gr 304L

Capacity (each): 400m³/hr

Cargo control system

Make: Wärtsilä

Type: MOS Platinum

Ballast control system

Make: Hanla IMS

Ballast water treatment system

Make: Techcross

Capacity: 1,000m³/hr

Complement

Officers: 8

Crew: 15

Suez/Repair Crew: 6

Single/double/other rooms: 2 (Cadat, Owner)

Navigation and other equipment

Bridge control system

Make: Hyundai Heavy Industries

Is bridge fitted for one-man operation?: No

Integrated bridge system: Y

If yes, make: JRC

Model: GRD-921

Radar

Number: S-Band Radar (1EA), X-Band Radar (1EA)

Make: JRC

Model(s): JMR-9282-S / 9225-6X

Fire detection system

Make: Autronica fire and security

Type: Autoprime BS-250

Fire extinguishing systems

Cargo holds: Dry powder

Make/Type: Fain

Engine room: CO₂

Make/Type: Fain

Cabins: Dry powder

Make/Type: Fain / 6kg portable

Public spaces: Foam

Make/Type: Fain / 9kg portable

Waste disposal plant

Incinerator

Make: HMMCO / Model: MAXI NG50SL WS

Sewage plant

Make: IL Sung Co. Ltd / Model: ISB-03

Efficiency

Attained EEDI value: 6.65gCO₂/tnm

Required EEDI value: 9.32gCO₂/tnm

Installed Fuel Meters: Electro pneumatic type tank level gauge

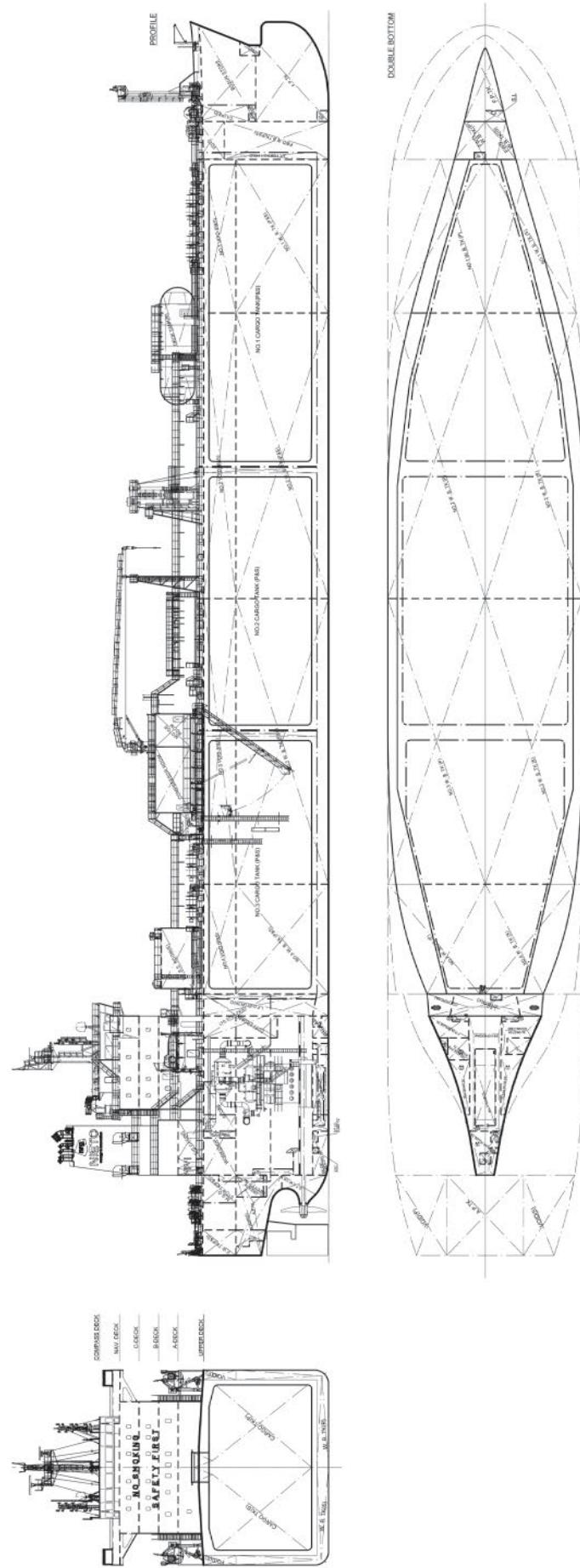
Other installed monitoring tools: Electro pneumatic type draft gauge

Hull coatings: KCC / EGISPACIFIC(L)

Contract date: 23 July 2019

Launch/float-out date: 19 March 2021

Delivery date: 02 July 2021



MSC SEASHORE – Cruise ship



Shipbuilder:	Fincantieri
Vessel's name:	MSC Seashore
Owner/Operator:	MSC Cruises
Country:	Switzerland
Designer:	Fincantieri
Country:	Italy
Flag:	Malta
IMO number:	9843792
Total number of sister ships still on order:	1

MSC Seashore delivered in July 2021 and its sister MSC Seaside due for delivery in June 2023 are a development of the owner's Seaside class appropriately dubbed as the Seaside EVO class. Both vessels are the products of Fincantieri's Monfalcone yard.

The 170,412gt MSC Seashore has had 65% of the public areas completely reimagined and is significantly larger than the earlier class which had a 153,516gt and a length of 323m. The vessel is also deeper by more than 2m. An additional 10,000m² of open deck space gives it the highest ratio of outdoor space per guest of any MSC ship. Passenger capacity is 5,877 maximum or 4,540 at double occupancy. The additional space on the new vessel has allowed an extra 200 cabins to be installed bringing the total to 2,270.

During the Covid pandemic a lot of thought was given to making cruise ships safer for guests and MSC Seashore reflects this by being given the Biosafe Ship Notation by classification society RINA. It is claimed the vessel is the first ship in the world to integrate the Safe Air system which uses UV-C lamps technology guaranteeing clean and safe air for all guests and crew. RINA has also rewarded the environmental aspects of the ship by giving it a Sustainable Ship notation.

Four Wärtsilä 14V46F engines provide a total power output of 67.2MW for the diesel electric propulsion which drives two 6.1m controllable pitch propellers. Wärtsilä has also supplied a hybrid exhaust gas cleaning system which keeps emissions from all four engines compliant with 2020 SOx rules and SCR is used for NOx Tier III compliance. The ship has an attained EEDI of 8.8 against the required 10.38.

TECHNICAL PARTICULARS

Length oa:	339m
Length bp:	311.71m
Breadth moulded:	41m

Depth moulded to main deck: 14.99m
Draught
scantling: 8.8m
design: 8.55m
Gross: 170,412t
Displacement: 83,102t
Block co-efficient: 0.744 @ 8.55m of draught
Speed, service (87% MCR output): 21.1knots

Bunkers (m³)
Heavy oil: 3,694.1m³
Diesel oil: 1,213.1m³
Water ballast (m³): 4,908.3m³

Classification society and notations: RINA

% high-tensile steel used in construction: 80% approx

Propulsion
Main engine(s)
Model: 14V46F with Selective Catalytic Reduction
Manufacturer: Wärtsilä
Number: 4
Type of fuel: HFO and MGO
Output of each engine: 16.8MW
Is this a diesel-electric or hybrid?: Y

Propeller(s)
Material: Ni Al Bronze
Designer/Manufacturer: Mecklenburger Metallguss GmbH
Number: 2
Fixed/Controllable pitch: Fixed
Diameter: 6.1m
Speed: abt. 129rpm

Diesel-driven alternators
Number: 4
Alternator make/type: NIDEC ASI / GSCR 11 Y 12
Output/speed of each set: 600rpm

Exhaust-gas scrubbing equipment
Manufacturer: Wärtsilä
Type: Hybrid
On main engines?: Y

Boilers
Number: 2 + 4
Type: OFB, EGB
Make: Saake GmbH, Alfa Laval
Output, each boiler: 2 x 25t/h, 4.5t/h
@85% MCR

Bow thruster(s)
Make: Wärtsilä

Number: 4
Output (each): 3,100kW

Stern thruster(s)
Make: Wärtsilä
Number: 3
Output (each): 3,100kW

Deck machinery
Cargo cranes/cargo gear
Number: 3
Make: Concrane
Type: Slewing crane
Performance: 2 x 2.5t / 1 x 1t

Other cranes
Number: 4
Make: Fuchs
Type: Telescopic crane
Tasks: Diesel generators
Performance: 2t

Mooring equipment
Number: 8
Make: Kongsberg
Type: Electric

Special lifesaving equipment
Number of each and capacity: 14 Lifeboat (314pax each); 4 Lifeboat/Tender (267pax each); 2 Liferaft (60pax each)
Make: Boat maker: Hatecke; Raft maker: Hatecke;
Type: PEL12.5/PL14/ GSL7.6C; Boat type: Semi-enclosed; Raft type: Totally enclosed
If MES, vertical or sloping chutes?: Vertical

Ballast water treatment system
Make: Alfa Laval
Capacity: 500m³/h

Complement
Crew: 1,648
Single/double/other rooms: 943

Passengers
Total: 5,632
Number of cabins: 2,270
Percentage/number outboard: 77%

Navigation and other equipment
Bridge control system
Make: APSS Wärtsilä

Radars
Number: 5
Model(s): 2 S-Bands downmast, 1 X-Bands downmast, 2 X-Bands upmast

Fire detection system
Type: Martec

Fire extinguishing systems
Engine room: CO₂
Make/Type: Tyco
Cabins: Water Mist
Make/Type: Marioff
Public spaces: Water Mist
Make/Type: Marioff

Waste disposal plant
Waste handled: black, grey water, food rejected water, can & tin, paper/cardboard, plastic, glass

Incinerator
Make: Wärtsilä
Waste compactor
Make: Wärtsilä

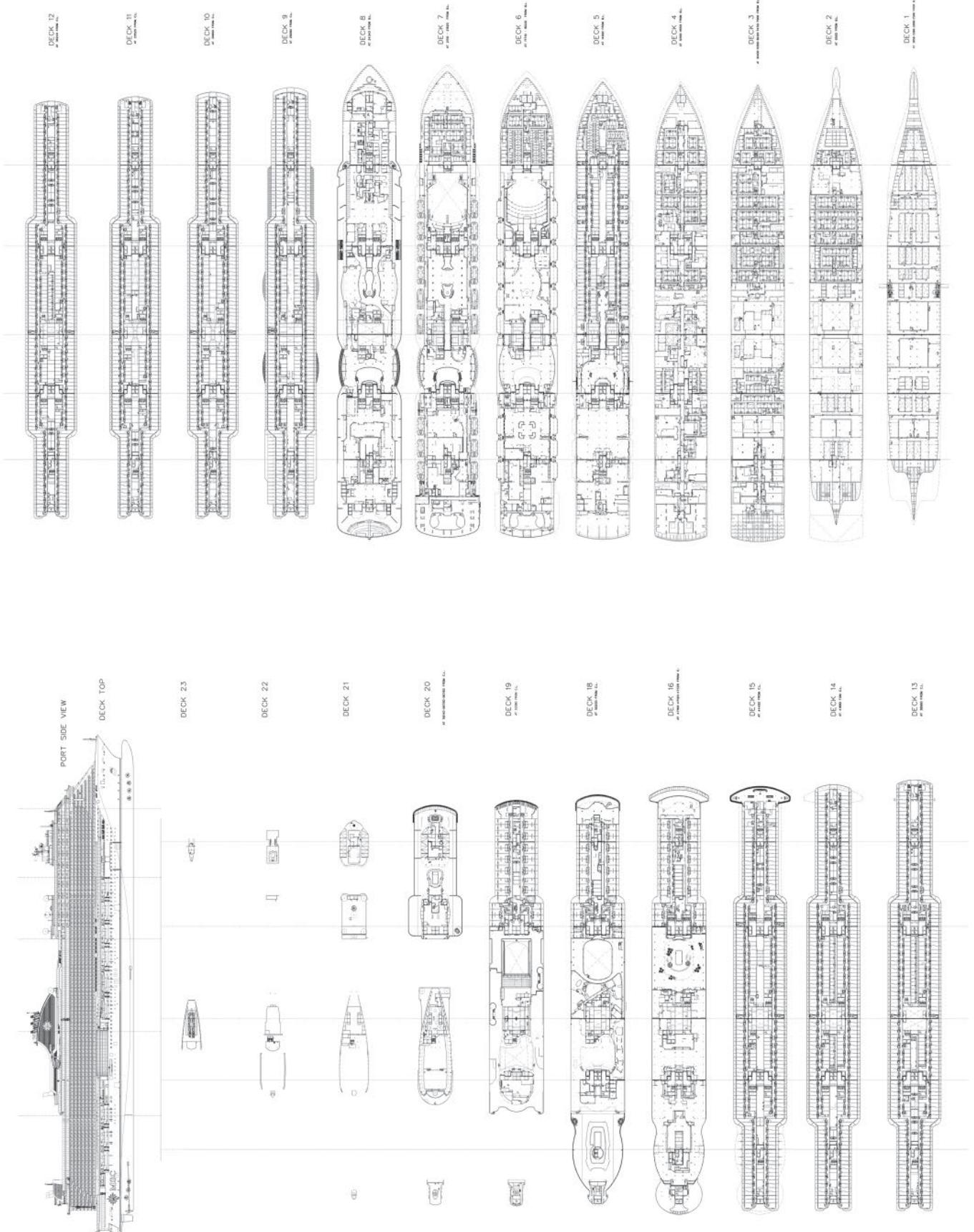
Waste shredder/crusher
Make: Wärtsilä

Sewage plant
Make: Wärtsilä

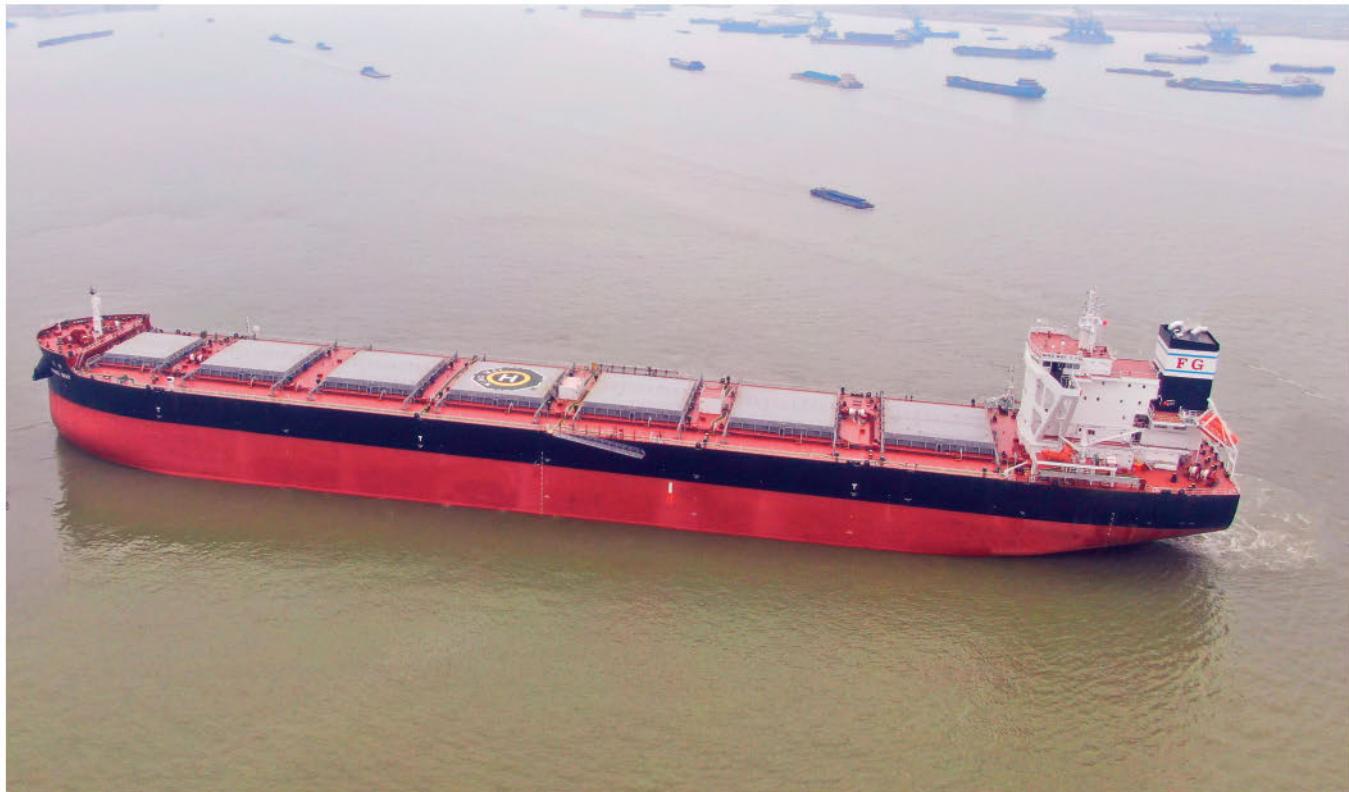
Efficiency
Attained EEDI value: 8.8
Required EEDI value: 10.38
Installed Fuel Meters: mass flow

Contract date: 29 November 2017
Launch/float-out date: 20 August 2020
Delivery date: 26 July 2021

MSC SEASHORE



NING MAY – Bulk carrier



Shipbuilder:Chengxi Shipyard Co., Ltd
Vessel's name:Ning May
Owner/Operator:Foremost (Shanghai) Maritime Co., Ltd
Country:China
Designer: Shanghai Merchant Ship Design & Research Institute, CSSC (SDARI)
Country:China
Model test establishment used: .China Ship Scientific Research Centre
Flag:Liberia
IMO number:9891866
Total number of sister ships already completed (excluding ship presented):4
Total number of sister ships still on order: 10

A SDARI designed Post-Panamax bulk carrier of 85,200dwt built by Chengxi Shipyard for Foremost Shipping, *Ning May* is one of a new breed of vessel aimed at being among the most flexible and suited to many trades.

The ship was the first of its design to be delivered at the very end of 2020 but has been joined since by four sister ships including *Xiao May* delivered in March 2021 for the same owner. The other delivered vessels and a further 10 still on order or under construction are for different owner/operators.

With a 229.9m loa the vessel falls into the KamsarMax category although at 36m beam and having a scantling draught of 13.68m, it is wider and has a shallower draught than most of the other ships in this size bracket. These dimensions allow it to make use of the New Panama locks and would have permitted the ship to operate fully laden at all times over the past two years when lack of rains and low water levels at Lake Gatun have caused the Canal Authority to restrict sailing draughts through the Canal.

The ship has the typical seven-hold configuration of this class and its wider beam allows for a 106,000m³ grain capacity which is higher than the vessels which maintained the old Panama Canal beam of 32.2m. In keeping with modern trends, the bow form is erect without a bulb.

The main engine is a MAN B&W 6S60ME-C super long stroke type producing 9,600kW

at 84rpm and driving a single propeller to give a service speed of 14.3knots. A fan cap and propeller duct aid efficiency allowing for an attained EEDI of 3.23 comfortably below the required figure of 3.85.

A SunRui ballast treatment system is installed and approved by both IMO and US Coast Guard.

TECHNICAL PARTICULARS

Length oa:.....229.90m
Length bp:.....226.40m
Breadth moulded:.....36m
Depth moulded:.....20.15m
Draught
scantling:.....13.68m
design:.....11.50m
Displacement:.....~99,800t
Lightweight:.....~14,600t
Deadweight
scantling:.....~85,200t

Block co-efficient (please state relevant draught):.....Ts 0.87
Speed, service CSR output):.....~14.3knots

Cargo capacity (m³)
Grain:~106,000
Bunkers (m³)
Heavy oil:2,350
Diesel oil:600
Water ballast (m³):.....26,800

Daily fuel consumption (tonnes/day)
Main engine only:~26.0

Classification society and notations:ABS
* A1 (E), Bulk Carrier, BC-A (Holds 2, 4 & 6 may be empty), CSR, AB-CM, ESP, GRAB[30], UWILD, CPS, BWE , PMA, POT, CRC(SP), RW, MLC-ACCOM, ENVIRO, IHM, RRDA * AMS, * ACCU, TCM, BWT+, EGC-SOx

% high-tensile steel used in construction:~88%

Propulsion

Main engine(s)
Design:MAN B&W
Model:MAN B&W 6S60ME-C
Manufacturer:HuDong Heavy Machinery Co., Ltd

Number:1
Type of fuel:HFO & MDO
Output of each engine:9,600kW
84rpm MCR

Is this a diesel-electric or hybrid?:.....N

Diesel-driven alternators

Number:3
Engine make/type:Daihatsu/ 6DE-18
Type of fuel:HFO & MDO
Output/speed of each set:....780kW / 900rpm

Boilers

Number:1
Type:1 x Composite boiler
Make:Aalborg OC-TCI
Output, each boiler:.....1,500kg/h / 500kg/h

Mooring equipment

Type:Hydraulic

Ballast water treatment system

Make:SunRui Marine Environment Engineering Co., Ltd
Capacity:1,500m³/H x 2

Complement

Officers:11
Crew:15
Single/double/other rooms: ..1 cabin for pilot

Navigation and other equipment

Bridge control system
Is bridge fitted for one-man operation?:N
Integrated bridge system:.....N

Fire extinguishing systems

Cargo holds:CO₂
Engine room:CO₂ and fixed water-based local application fire fighting

Efficiency

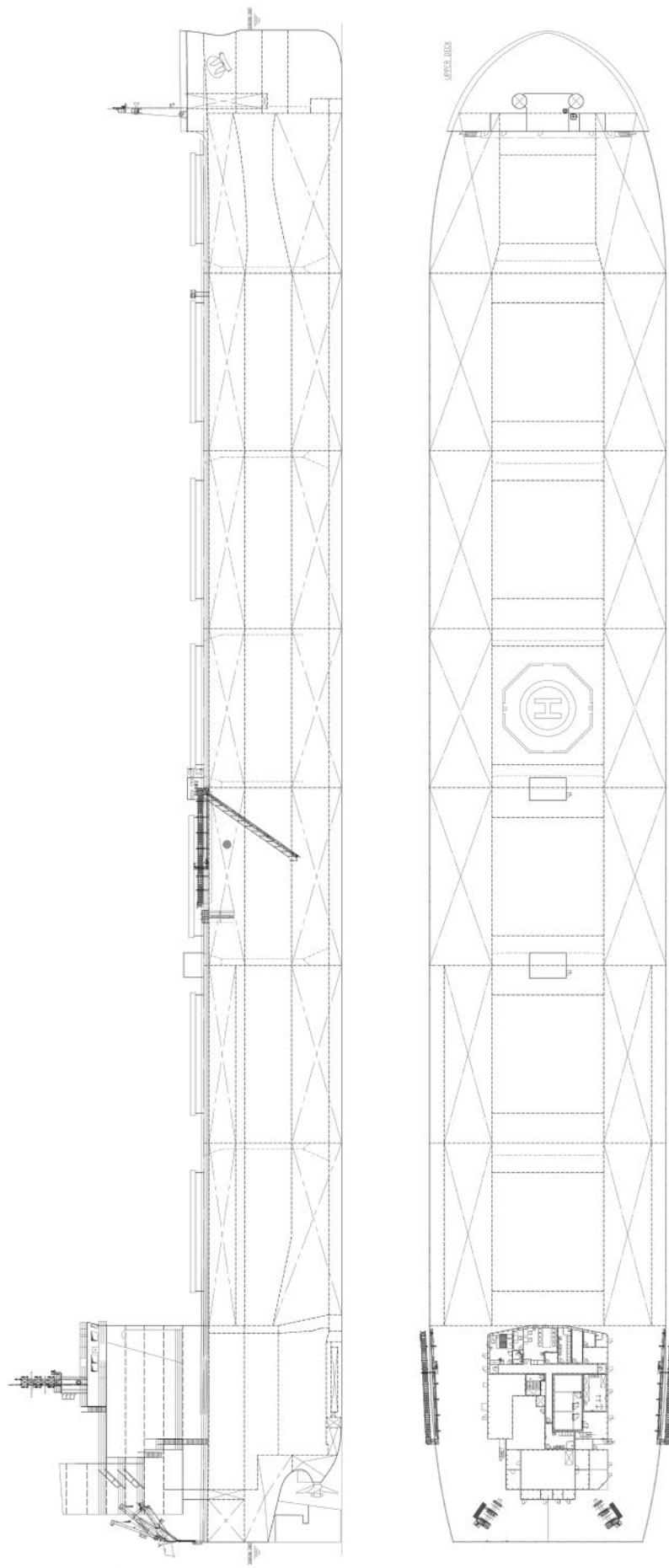
Attained EEDI value:3.23
Required EEDI value:3.85
Installed Fuel Meters:mass flow
Energy Saving Technologies:SDARI Fan Cap & Fan Duct

Hull coatings:antifouling paint

Contract date:October 2018
Delivery date:December 2020



NING MAY



NORDIC NULUJAAK – Bulk carrier



Shipbuilder:	Guangzhou Shipyard International Co Ltd
Vessel's name:	Nordic Nulujaak
Owner/Operator:	Nordic
Country:	China
Designer:	Shanghai Merchant Ship Design & Research Institute, CSSC (SDARI)
Country:	China
Model test establishment used:	China Ship Scientific Research Centre, HSVA
Flag:	Marshall Islands
IMO number:	9884966
Total number of sister ships already completed (excluding ship presented):	3
Total number of sister ships still on order:	0

Nordic Nulujaak, claimed by its owner Nordic Bulk Carriers as the most efficient ship trading in the Arctic, was delivered by Guangzhou International Shipyard in China in May 2021. The vessel is the first of four 95,758dwt ice classed Post Panamax vessels with the remaining three having been delivered at various times throughout 2021.

The SDARI-designed ships will be used for transport of iron ore under a contract between the owner's parent Panagea Logistics Solutions and Baffinland Iron Mines which owns facilities in the Canadian Arctic. The *Nordic Nulujaak* has ice-class 1A which allows for sailing only through one-year Arctic ice up to about 30cm thick so it will be obliged to follow icebreakers on some voyages as it moves cargoes via the Northern Sea Route to China.

The ice strengthened vessel is 229.5m in length and with a 38m beam while the scantling draught is 15m. Cargo spaces are the familiar seven holds with side rolling hatch covers. Grain capacity is 114,593m³ and bale 113,400.

Nordic Nulujaak's propulsion and steering system comprises a MAN B&W 6G60ME-C9.5 Main engine producing 14,000kW at 60% MCR. A design requirement was for an efficient system and the engine consumes 31.7tonnes daily when operating at service speed. A 7.8m fixed pitch propeller with a fan cap operates in front of a twisted flap type rudder. The required EEDI for the vessel is 3.64 and the attained value is 3.26.

The engine meets NOx Tier II requirements under normal conditions and makes use of high pressure SCR when operating in ECAs. There is no scrubber so the ship must make use of compliant fuels to meet SOx requirements.

A Techcross 3,000m³/h ballast treatment

system type-approved by both IMO and US Coast Guard is installed.

TECHNICAL PARTICULARS

Length oa:	229.50m
Length bp:	225.50m
Breadth moulded:	38.00m
Depth moulded	
to main deck:	21.30m
to upper deck:	21.30m
Width of double skin	
bottom:	1.90m
Draught	
scantling:	15.00m
design:	12.20m

Gross:	54,066t
Displacement:	112,008.2t
Lightweight:	16,249.82t
Deadweight	
scantling:	95,758.4t
design:	72,762.3t

Block co-efficient (please state relevant draught): Td 0.8288 Ts 0.8485 Speed, service 60%MCR output): 14.43knots

Cargo capacity (m ³)	
Bale:	113,400
Grain:	114,593
Bunkers (m ³)	
Heavy oil:	2,382
Diesel oil:	397
Water ballast (m ³):	28,531
Daily fuel consumption (tonnes/day)	
Main engine only:	31.7

Classification society and notations: DNV, 1A, Bulk Carrier, BC (A), CSR, ESP, Grab (30), Hold (2, 4&6) may be empty, CMON, ICE (1A), COAT-PSPC (B), BIS, LCS, Recyclable, Clean, EO, BWM (T), TMON (Oil Lubricated)

% high-tensile steel used in construction: 73% Heel control equipment: 1 pair Anti-heeling tank

Propulsion
Main engine(s)
Design: MAN B&W
Model: 6G60ME-C9.5 Tier II/III (HP SCR)
Manufacturer: CSSC-MES Diesel Co., Ltd
Number: 1
Type of fuel: HFO & MGO
Output of each engine: 14,000kW
Is this a diesel-electric or hybrid?: N

Propeller(s)
Material: Ni-Al-Bronze
Designer/Manufacturer: Lyen Marine Technology Co., Ltd

Number: 1
Fixed/Controllable pitch: FPP
Diameter: 7,800mm
Speed: 90rpm

Diesel-driven alternators
Number: 3
Engine make/type: CSSC Marine Power Co., Ltd / MAN 7L23/30H
Type of fuel: HFO & MGO
Output/speed of each set: 1,050kW / 900rpm

Boilers
Number: 1
Type: 1 x Oil fired boiler / 1 x exhaust gas boiler
Make: Alborg
Output, each boiler: 1 x 4,000kg/h / 1 x 800kg/h
Stern appendages/special Rudders: Twisted flap type rudders

Other cranes
Number: 1
Make: South China marine machinery Co., Ltd
Type: Hydraulic telescope cylinder luffing
Tasks: Provision handling
Performance: SWL 4t @3m outreach

Mooring equipment
Number: 8
Make: Jiangsu Masada Heavy Industries Co., Ltd
Type: Hydraulic

Special lifesaving equipment
Number of each and capacity: 1 Liferaft for 6 persons, throw over board type/ 2 Liferaft for 16 persons, throw over board type/ 2 Liferaft for 16 persons, davit launchable type
Make: Viking
Type: 6DK/ 16DK/ 16DKF

Cargo/capacity
Hatch covers
Design: 7
Manufacturer: TTS

Ballast control system
Make: Techcross
Type: ECS 3200B
Ballast water treatent system
Make: Techcross
Capacity: 3,000m³/h

Complement
Crew: 28
Single/double/other rooms: 1 cabin for pilot

Navigation and other equipment
Bridge control system
Make: Hangyue
Is bridge fitted for one-man operation: N
Integrated bridge system: N
Radar
Number: 2
Make: Furuno
Model(s): FAR-2328,FAR-2338S

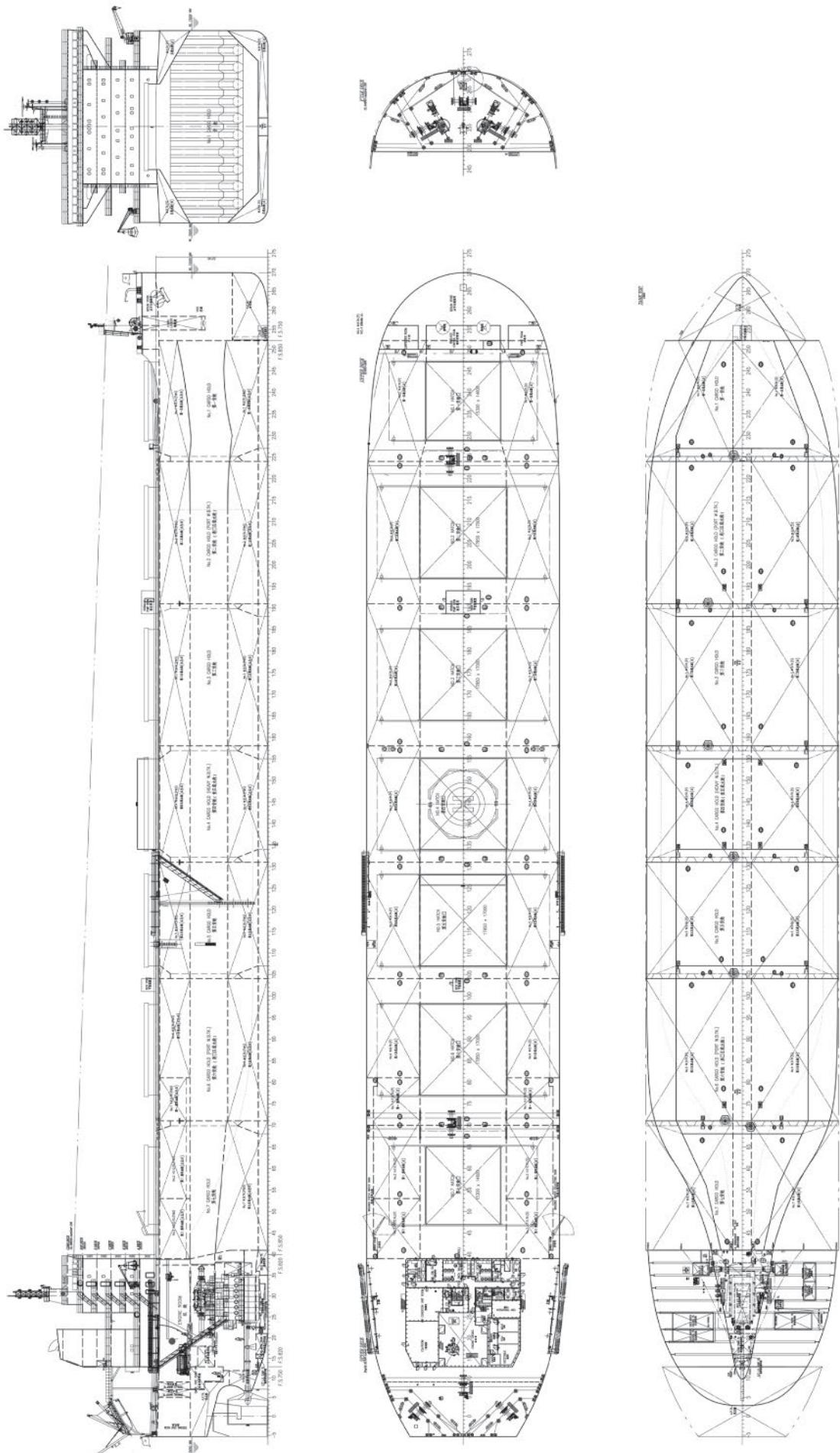
Fire detection system
Make: Consilium
Type: Salwico Cargo
Fire extinguishing systems
Engine room: CO₂ and fixed water-based local application fire fighting
Make/Type: Seaplus / Seaplus

Waste disposal plant
Sewage plant
Make: CSSC Nanjing Luzhou Machine Co., Ltd
Model: STD-2

Efficiency
Attained EEDI value: 3.26
Required EEDI value: 3.64
Energy Saving Technologies: Propeller Fan Cap

Contract date: April 2019
Launch/float-out date: February 2021
Delivery date: May 2021

NORDIC NULUJAAK



ONEX PEACE – Product/chemical tanker



Shipbuilder:	Hyundai Samho Heavy Industries Co., Ltd
Vessel's name:	ONEX Peace
Owner/Operator:	ONEX DMCC
Country:	United Arab Emirates
Designer:	Hyundai Samho Heavy Industries Co., Ltd
Country:	Republic of Korea
Flag:	Panama
IMO number:	9893204
Total number of sister ships already completed (excluding ship presented):	2
Total number of sister ships still on order:	0

ONEX Peace, an Aframax LRS product tanker built by Hyundai Samho Heavy Industries and delivered to its owner UAE-based ONEX DMCC achieved significance by becoming the world's first merchant ship to receive DNV's SILENT-E notation.

ONEX Peace was delivered on 31 March and was followed in May by ONEX Precious and in September by the third in class ONEX Phoenix. Although not the first vessels in the operator's fleet, the trio were the first ships ordered as newbuildings. After deliver ONEX Peace was placed in the Scorpio LR2 Pool.

At 249.99m in length with a beam of 44m and a deadweight of 114,600tonnes the ships are fairly typical of the type in dimension. There are 12 cargo tanks in six pairs and two slop tanks located between the No. 6 cargo tanks and pump room and bunker tanks.

A Hyundai-MAN B&W 6G60ME-C9.5_HPSR engine of 12,000kW at 78.8rpm gives the ship a 14.5knots service speed.

DNV is the first classification society to offer an underwater noise notation and in developing it DNV, HHI and Korea Research Institute of Ships & Ocean conducted a joint research project on measuring and evaluating underwater radiation noise. As part of the study, the parties carried out the underwater noise measurement and analysis of the ONEX Peace.

SILENT-E notation ensures ships do not exceed typical average-to-moderate Underwater Radiation Noise (URN) levels. Vessels with this notation can avoid harmful impact on marine life and document noise performance for authorities or those demanding proof of noise emissions for transit through vulnerable areas. The noise reduction is assisted by the use of a pre-swirl duct and a rudder bulb.

TECHNICAL PARTICULARS

Length oa:	249.99m
Length bp:	245.00m

Breadth moulded:	44.00m
Depth moulded	21.60m
to upper deck:	21.60m
Width of double skin	
side:	2.30m
bottom:	2.40m
Draught	
scantling:	15.2m
design:	13.6m
Gross:	63,134t
Displacement:	134,650t
Lightweight:	20,030t
Deadweight	
scantling:	114,600t
design:	98,800t
Block co-efficient (please state relevant draught):	0.7998 (scantling draught)
Speed, service (%MCR output):	14.50knots (78% NCR with 15% SM)
Cargo capacity (m³)	
Liquid volume:	130,900
Bunkers (m³)	
Heavy oil:	2,480
Diesel oil:	580
Water ballast (m³):	37,410
Daily fuel consumption (tonnes/day)	
Main engine only:	36.2
Classification society and notations:	DNV +1A Tanker for Oil, ESP, CSR, EO, BIS, TMON, COAT-PSPS(B,O), CMON, LCS, BWMT, CLEAN, VCS(2B), SPM, Recyclable, ER(SCR, Tier III)
Propulsion	
Main engine(s)	
Model:	Hyundai-Man B&W 6G60ME-C9.5_HPSR
Manufacturer:	HHI-EMD
Number:	1
Type of fuel:	HFO
Output of each engine:	12,000kW x 78.8rpm
Propeller(s)	
Material:	Ni-Al-Bronze
Designer/Manufacturer:	HHI-EMD
Number:	1
Fixed/Controllable pitch:	FPP
Diameter:	8,300mm
Diesel-driven alternators	
Number:	3
Engine make/type:	HHI-EMD / HIMSEN 6H21/32
Type of fuel:	HFO
Alternator make/type:	HHI-EES / HFC7 564-08P
Output/speed of each set:	1,150kW x 900rpm
Boilers	
Number:	1
Type:	Composite boiler Automatic, forced draft, F.O. burning marine boiler

Make: Kangrim
Output, each boiler: Evaporation (Kg/H) - 1,800

Deck machinery
Cargo cranes/cargo gear
Number: 2
Make: Sangsangin
Type: Elect-hyd
Performance: SWL 15t

Other cranes
Number: 2
Make: Sangsangin Industry Co., Ltd
Type: Elect-hyd
Tasks: Hose Handling Crane
Performance: SWL 15t

Mooring equipment
Number: 8
Make: Flutek Ltd
Type: Hydraulic

Special lifesaving equipment
Number of each and capacity: 36 Person
Make: Viking Norsafe Co., Ltd
Type: JYN-65 MKI

Cargo tanks
Number: 14 ea tanks
Grades of cargo carried: Product Carrier
Cargo tanks - IPK / THA 700/703, THA 702/703

Cargo pumps
Number: 3
Type: KV450-3A
Make: Shinko
Capacity (each): 4,000m³/h x 135mth
Cargo control system
Make: Hanla IMS
Type: Hydraulic Valve Operated Control System

Ballast control system
Make: Hanla IMS
Type: Hydraulic Valve Operated Control System

Ballast water treatment system
Make: Hyundai Heavy Industries Co., Ltd
Capacity: 1,700m³/h x 2

Complement
Officers: 13 persons
Crew: 16 persons

Navigation and other equipment
Bridge control system
Make: MESCO

Radar
Number: 1x S-BAND, 2x X-BAND
Make: Furuno
Model(s): S-BAND: FAR-332Q, X-BAND: FAR-3320

Fire detection system
Make: Consilium
Type: SG-43000/01/02

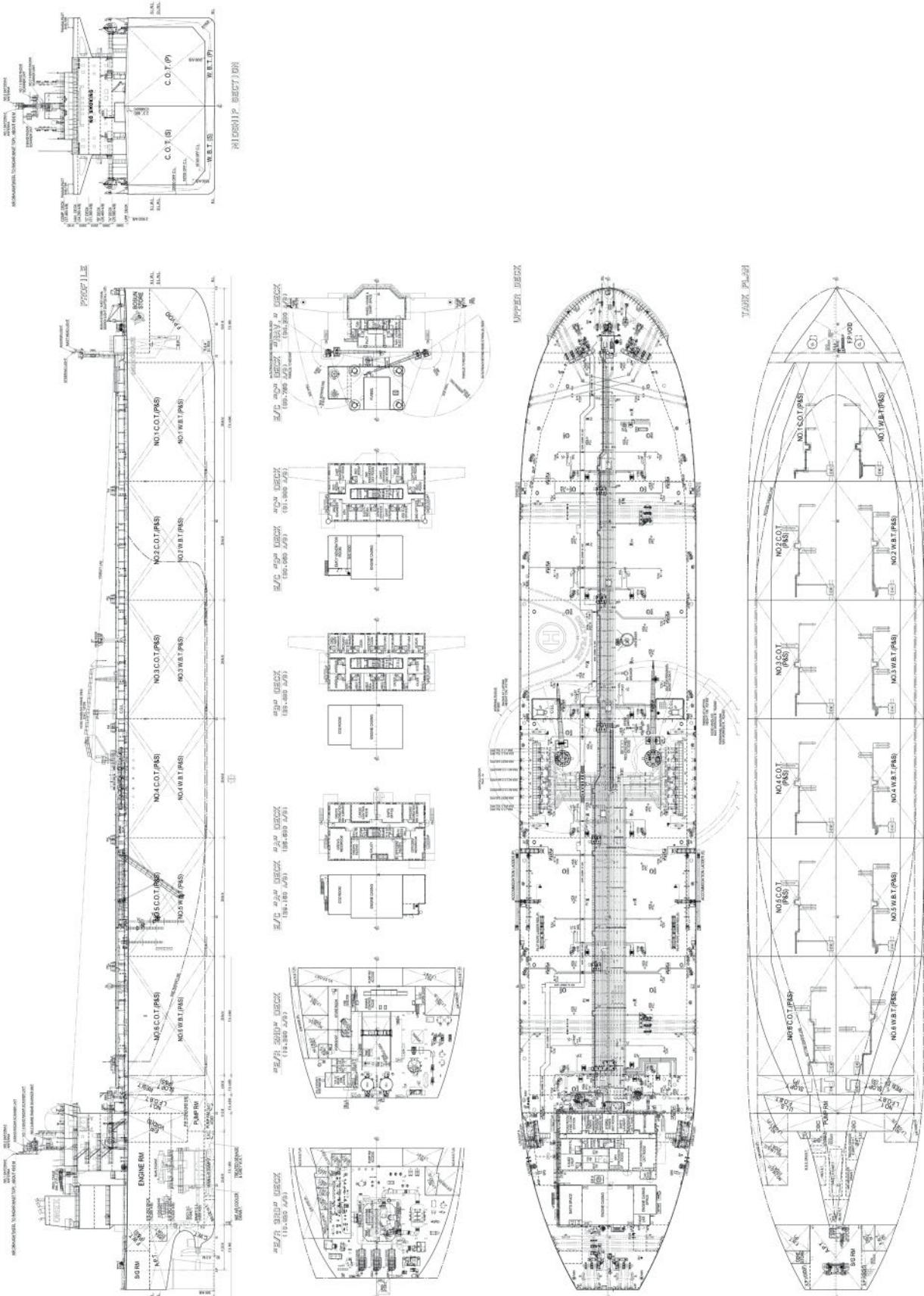
Fire extinguishing systems
Engine room:
Make/Type: Fain Co., Ltd / CO₂
Cabins:
Make/Type: Portable fire extinguisher
Public spaces:
Make/Type: Portable fire extinguisher

Waste disposal plant
Incinerator
Make: Hyundai Marine Machinery Co., Ltd
Model: MAXI NG150SL WS

Sewage plant
Make: Il Seung Co., Ltd
Model: ISB-02

Efficiency
Attained EEDI value: 3.0526
Required EEDI value: 3.3121
Energy Saving Technologies: Hyundai Pre-Swirl Duct, Hyundai Rudder Bulb

Contract date: 23 August 2019
Launch/float-out date: 08 January 2021
Delivery date: 31 March 2021



PACIFIC INEOS BELSTAFF – Ethane/ethylene carrier



Shipbuilder:	Jiangnan Shipyard (Group) Co., Ltd
Vessel's name:	Pacific Ineos Belstaff
Owner/Operator:	Pacific Gas
Country:	China
Designer:	Jiangnan Shipyard (Group) Co., Ltd
Country:	China
Model test establishment used:	SSRI
Flag:	Hong Kong
IMO number:	9901398
Total number of sister ships already completed (excluding ship presented):	0
Total number of sister ships still on order:	6

Pacific Ineos Belstaff is the world's first and largest very large ethane/ethylene carrier (VLEC) with an IMO Type B tank design. Delivered to Pacific Gas on 28 December 2021, 99,000m³ capacity vessel has been chartered by the INEOS Group for the transportation of American liquified ethane to an ethylene cracker in Belgium.

The VLEC is 230m long, 36.6m wide and 22.5m deep and was fully designed and constructed by Jiangnan Shipyard (Group) Co., Ltd. It is the first in a series of seven Panda gas ships being built by the shipyard.

One of the vessel's most outstanding features is the adoption of the Type B cargo containment system (CCS), named BrillianceE® CCS, which was also developed by Jiangnan. Compared with existing ethane/ethylene carriers, most of which use GTT's membrane CCS, BrillianceE® CCS is said to be high in safety, high in reliability, low in maintenance costs, and free from sloshing concerns.

Pacific Ineos Belstaff's two deck cargo/fuel buffer tanks provide flexibility for carrying LPG or ethylene as alternative fuels. The vessel is powered by MAN's latest ethane dual-fuel GIE engine with an in-line shaft generator, cutting the SOx emission by 99% and CO₂ emissions by 18%, and has reached EEDI Phase 4 in advance thanks in part to a Jiangnan-developed hull form (VS-BOW®) technique and optimised propeller reaction fin-CAPRO®.

Its maiden voyage was from Houston to Taizhou, a shallow-draught port in Yangtze River. The partially loaded vessel arrived in March 2022, with no sloshing problems reported in the Type B tanks, demonstrating strong seaworthiness in the harsh winter Pacific and the benefits of its refined hull form with VS-BOW.

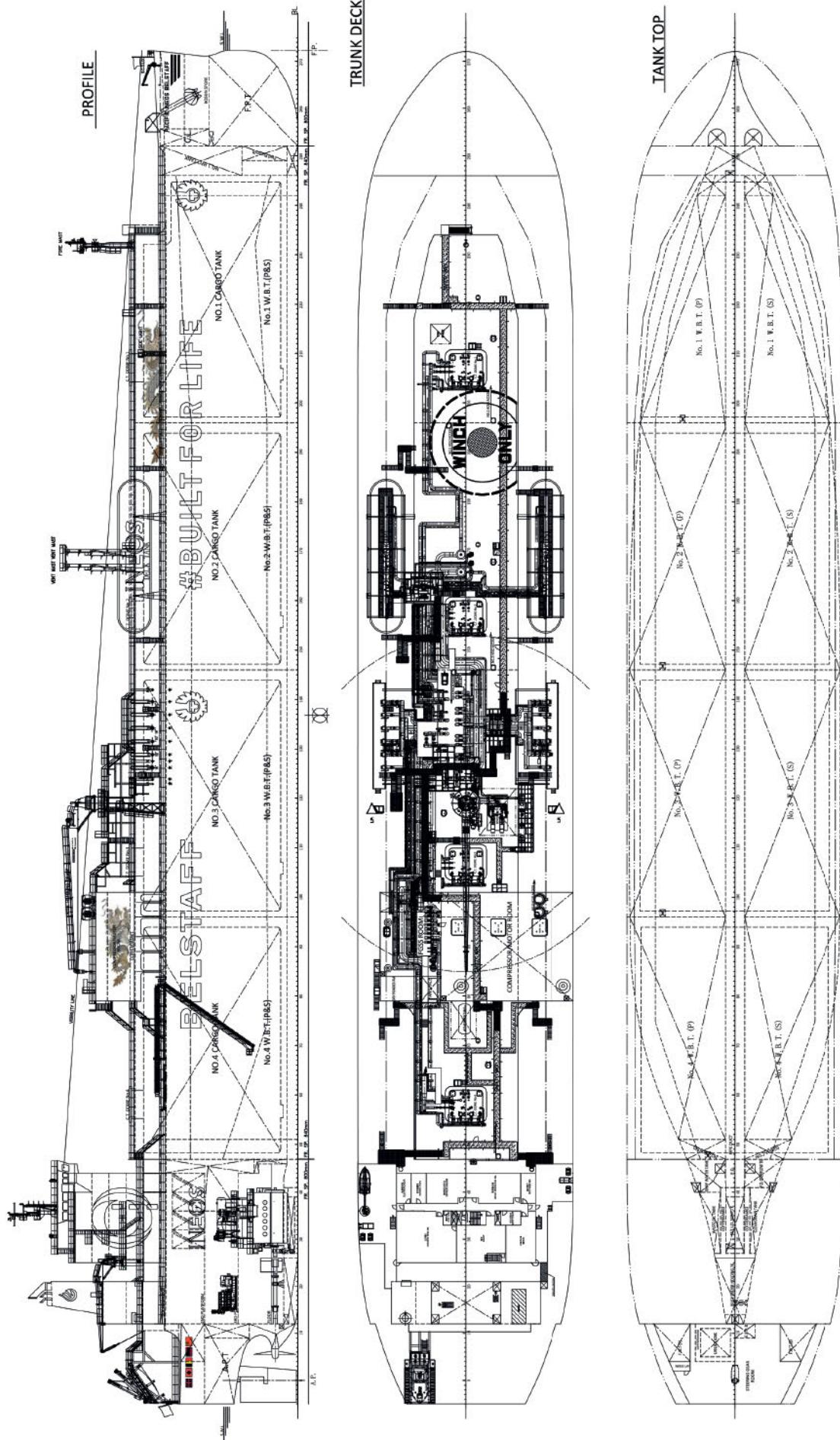
TECHNICAL PARTICULARS

Length oa:	230m
Length bp:	226m
Breadth moulded:	36.6m
Depth moulded	
to main deck:	22.5m
Draught	
scantling:	12.8m
design:	11.9m
Gross:	56,081t
Deadweight	
scantling:	60,226t
Speed, service (--%MCR output):	16.75knots
Cargo capacity (m ³)	
Liquid volume:	99,152
Bunkers (m ³)	
Heavy oil:	2,300
Diesel oil:	400
Water ballast (m ³):	24,000
Daily fuel consumption (tonnes/day)	
Main engine only:	35.8
Classification society and notations:	ABS
* A1 (E), Liquefied Gas Carrier, SH, SHCM, CPS, UWILD, NBLES, ENVIRO, IHM, TCM, BWE, BWT, DFD-Ethane * AMS, * ACCU. With description in the record: "Ship type 2G with Independent Tanks type B (Min. cargo temperature -1040C, Max. vapour pressure 0.25 barG), IDM-A"	
Propulsion	
Main engine(s)	
Design:	MAN Energy Solutions
Model:	6G60ME-C9.5 GIE
Manufacturer:	Hyundai Engine
Number:	1
Type of fuel:	Ethane/HFO/MDO
Output of each engine:	12,480kW
Propeller(s)	
Material:	Ni-Al-Bronze
Designer/Manufacturer:	Dalian
Number:	1
Fixed/Controllable pitch:	FPP
Speed:	90rpm
Diesel-driven alternators	
Number:	3
Engine make/type:	Yanmar
Type of fuel:	HFO/MDO
Alternator make/type:	Taiyo
Output/speed of each set:	1,720kW x 720rpm
Boilers	
Number:	1
Type:	Smoke Tube
Make:	Alfa Laval
Output, each boiler:	3,000kg/h

Deck machinery

Cargo cranes/cargo gear	
Number:	1 x hose handling crane
Make:	Hengyuan
Type:	Electro-hydraulic
Performance:	SWL 15t
Mooring equipment	
Number:	2 windlass, 7 mooring winches
Make:	Wuhan Marine Machinery Plant Co., Ltd
Type:	Electro-hydraulic
Special lifesaving equipment	
Number of each and capacity:	1 x 30 persons
Make:	Jiangsu Jiaoyan Marine Equipment Co., Ltd
Type:	Free fall
Cargo tanks	
Number:	4
Grades of cargo carried:	2
Product range:	Ethane, Ethylene, Propane, Butane, Propylene
Cargo pumps	
Number:	8
Type:	Deepwell
Make:	Svanehøj
Capacity (each):	650m ³ /h x 140mlc
Ballast water treatment system	
Make:	Optimarin
Complement	
Officers:	14
Crew:	14
Navigation and other equipment	
Bridge control system	
Make:	Furuno, Yokogawa
Type:	Auto-pilot (Yokogawa), ECDIS (Furuno)
Radar	
Number:	2
Make:	Furuno
Fire detection system	
Make:	Tyco
Type:	Addressable
Fire extinguishing systems	
Upper deck:	Johnson/Dry powder
Engine room:	Johnson Control/CO ₂
Waste disposal plant	
Incinerator	
Make:	TeamTec
Model:	OG400CS
Sewage plant	
Make:	Evac
Model:	Ecotreat5
Contract date:	30 December 2019
Launch/float-out date:	31 August 2021
Delivery date:	28 December 2021

PACIFIC INEOS BELSTAFF



PRISM COURAGE – LNG carrier



Shipbuilder:	Hyundai Heavy Industry Co., Ltd
Vessel's name:	Prism Courage
Owner/Operator:	SK Shipping
Country:	Republic of Korea
Designer:	Hyundai Heavy Industry Co., Ltd
Country:	Republic of Korea
Model test establishment used:	Hyundai Maritime Research Institute
Flag:	Panama
IMO number:	9888481
Total number of sister ships already completed (excluding ship presented):	2
Total number of sister ships still on order:	1

Delivered in October 2021, *Prism Courage* is the third in a series of 180,000m³LNG carriers built by Hyundai Heavy Industries for South Korean operator SK Shipping. Ships to the same design have also been delivered to other owners. The 299m long and 48m wide vessel was ordered in 2016 and along with its two sisters accounted for almost half of the LNG carrier orders that year globally.

The two earlier sisters were both delivered in May 2019 before the 2020 SOx regulations came into effect. *Prism Courage*, although in most respects identical to *Prism Agility* and *Prism Brilliance*, reflects some of the necessary changes made to comply with the 2020 rules. For example, despite having dual-fuel engines and running most of the time on boil off, the two earlier vessels had bunker tanks for 4,390m³ of HFO and 1,160m³ of MDO. *Prism Courage* by contrast only carries MGO as alternative to the boil off and has a tank capacity of 5,563m³. The cargo containment system is a GTT Mark III Flex type comprising four tanks. Cargo handling is by two Shinko pumps per tanks.

As with many large LNG carriers, the ship has a twin skeg design. Like its earlier sisters, *Prism Courage* is powered by a pair of WinGD 5X72DF engines producing 12,949kW at 71/5 rpm. The twin 8.7m fixed pitch propellers allow for a service speed of 19.65knots very slightly faster than the 2019 pair. Auxiliary engines are Himsen 35DF types – two each of eight and six cylinder variants.

Prism Courage features propriety Hyundai Hi-Rudder TS and Hi-Fin for improving propulsion efficiency. Hyundai-ISS (Integrated Smart ship Solution) is installed to help voyage monitoring, route optimisation, fuel/energy flow monitoring, performance analysis and reporting.

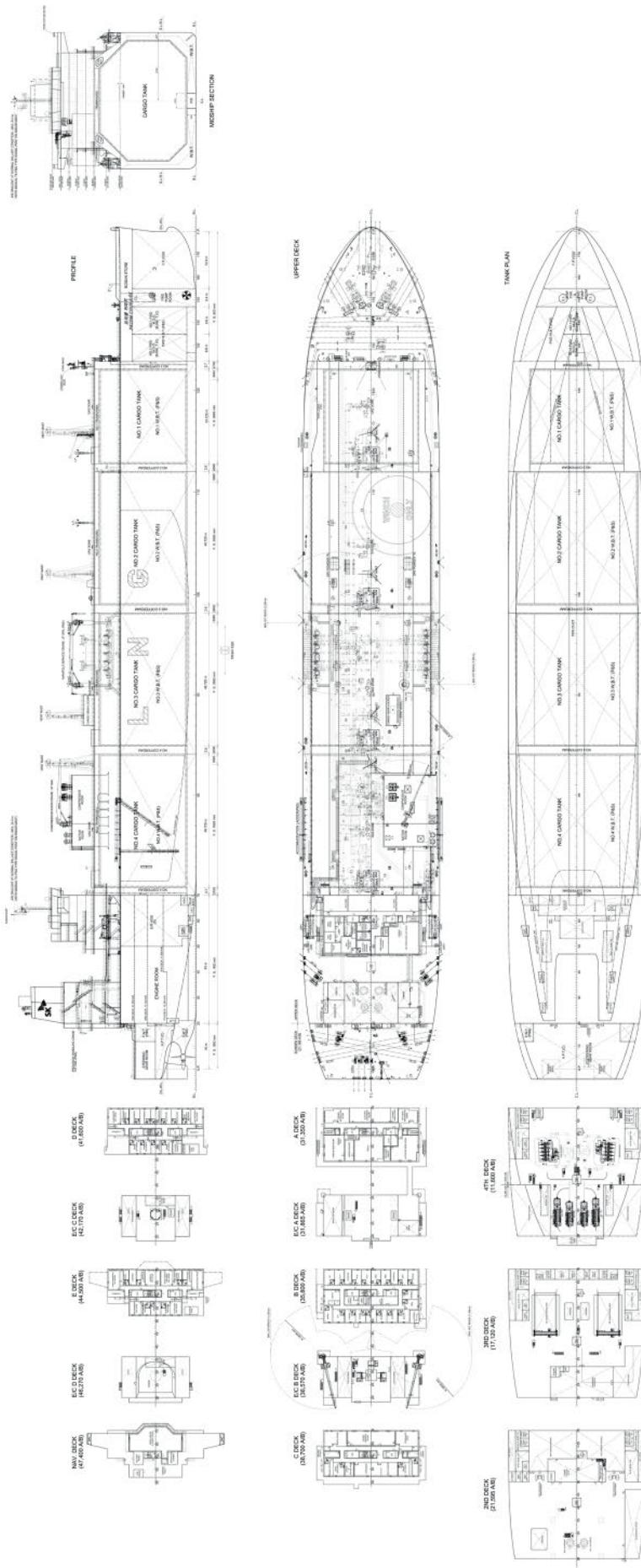
TECHNICAL PARTICULARS

Length oa:	298.97m
Length bp:	293.6m
Breadth moulded:	48.00m
Depth moulded to main deck:	35.50m

to upper deck:	26.40m
Width of double skin side:	2.677m
bottom:	3.20m
Draught	
scantling:	12.5m
design:	11.5m
Gross:	122,166t
Deadweight	
scantling:	97,493.6t
design:	85,659.6t
Speed, service (–%MCR output):	19.65knots
Cargo capacity (m ³)	
Liquid volume:	180,063
Bunkers (m ³)	
Marine gas oil:	5,563.0
Water ballast (m ³):	67,994.7
Daily fuel consumption (tonnes/day)	
Main engine only:	89.7
Auxiliaries:	6.7
Classification society and notations:	<KR> +KRS1 - Liquefied Gas Carrier, 2G 3M(R)/0.35 bar, -163°C, 0.5SG(IGC), SeaTrust(DSA1,FSA2, HCM), IWS, ERS, PSPC, IHM, CLEAN1, PA, LG, LI, EEAS-SCR +KRM1 - UMA, STCM, NBS2, DFDE, GCU, IGS, BWT <ABS> +A1(E), Liquefied Gas Carrier, Ship Type 2G, Methane(LNG) in membrane tanks, maximum vapour pressure 0.35 barg, minimum cargo temperature minus 163°C, Specific Gravity 0.5 kg/m ³ , RW, SHCM, SH, FL(40), +AMS, +ACCU, ENVIRO, IHM, BWT, CPS, UWILD, POT, RRDA, TCM, CRC, NIHS, DFD, GCU, PMP, PORT, EGC-SCR
Propulsion	
Main engine(s)	
Design:	Hyundai-WinGD
Model:	5X72DF
Manufacturer:	HII Engine & Machinery Division
Number:	2
Type of fuel:	MGO, LNG
Output of each engine:	MCR : 2x 12,949kW x 71.5rpm / NCR : 2x 11,007kW x 67.7rpm
Is this a diesel-electric or hybrid?:	N
Propeller(s)	
Material:	NiAl-Bronze
Designer/Manufacturer:	HII / HII Engine & Machinery Division
Number:	2
Fixed/Controllable pitch:	Fixed pitch
Diameter:	8.7m
Speed:	MCR 2 x 12,949kW x 71.5rpm
Special adaptations:	Hi-Fin
Diesel-driven alternators	
Number:	4
Engine make/type:	HII Engine / 2 x 8H35DF & 2 x 6H35DF
Type of fuel:	MGO, LNG
Alternator make/type:	HII-EES / HSJ7 809-10P & HSJ9 805-10P
Output/speed of each set:	3,840kW at 720rpm & 2,880kW at 720rpm
Boilers	
Number:	6

Type:	2 x Aalborg OS-TCI / 2 x Aalborg XS-7V / 2 x Aalborg XS-TC7A
Make:	Alfa Laval
Output, each boiler:	2 x 7,500kg/h / 2 x 1,300kg/h / 2 x 1,100kg/h
Stern appendages/special rudders:	Skeg bulb / Hi-Rudder TS
Bow thruster(s)	
Make:	Kawasaki
Number:	1
Output (each):	2,500kW x 900min-1
Deck machinery	
Cargo cranes/cargo gear	
Number:	2 (P&S)
Make:	Oriental
Type:	Electro-Hydraulic
Performance:	SWL 5.0t, Hoisting Height (60m), Working radius (Max.25m ~ min.5.2m)
Other cranes	
Number:	1
Make:	Oriental
Type:	Electro-Hydraulic
Tasks:	Cargo Compressor Room Crane
Performance:	SWL 6t, Hoisting Height (65m)
Number:	2 (P&S)
Make:	Oriental Precision & Engineering Co., Ltd
Type:	Electro-hydraulic driven
Tasks:	Provision Handling Crane
Performance:	SWL 10t, Hoisting Height (65m)
Mooring equipment	
Number:	Windlass 2ea, Winch 8ea
Make:	Flutek
Type:	Electric
Cargo tanks	
Number:	4
Cargo pumps	
Number:	8
Type:	Vertical Submerged
Make:	Shinko
Stainless steel:	Aluminim Alloy Casting
Capacity (each):	1,850m ³ /h
Cargo control system	
Make:	KSB
Type:	Hydraulic Actuators for Valves
Ballast control system	
Make:	KSB
Type:	Hydraulic Actuators for Valves
Ballast water treatment system	
Make:	HiBallast
Capacity:	Electrolysis Unit – 6,000m ³ /h x 1 / Filter Unit – 3,500m ³ /h x 2
Complement	
Officers:	23
Crew:	17
Suez/Repair Crew:	6
Navigation and other equipment	
Bridge control system	
Make:	Tokyo Keiki
Type:	TG-8000
Is bridge fitted for one-man operation?:	Y
Integrated bridge system:	Y
If yes, make:	JRC
Model:	GRD-921
Radars	
Number:	3
Make:	JRC
Model(s):	JMR-9282-S(1 set), JMR-9225-6X(2 sets)
Fire detection system	
Make:	Consilium
Type:	SG-42647
Fire extinguishing systems	
Cargo holds:	Dry powder
Make/Type:	NK Co., Ltd
Engine room:	High Expansion Foam
Make/Type:	NK Co., Ltd
Efficiency	
Attained EEDI value:	6.77
Required EEDI value:	8.76
Energy Saving Technologies*:	Hi-Rudder TS, Hi-Fin
Hull coatings:	Jotun antifouling paint
- Flat bottom:	Se aquantum Pro U, 205 MIC.
- Side bottom:	Se aquantum Pro U, 340 MIC.
Contract date:	01 July 2019
Launch/float-out date:	09 April 2021
Delivery date:	17 October 2021

PRISM COURAGE



RAVENNA KNUTSEN – LNG carrier



Shipbuilder:Hyundai Mipo Dockyard Co., Ltd
 Vessel's name:Ravenna Knutsen
 Owner/Operator:Knutsen OAS Shipping
 Country:Norway
 Designer:Hyundai Mipo Dockyard Co., Ltd
 Country:Republic of Korea
 Flag:NIS
 IMO number:9874040
 Total number of sister ships already completed (excluding ship presented):0
 Total number of sister ships still on order: 1

Built as a one-off vessel for Knutsen OAS by Hyundai Mipo, Ravenna Knutsen was ordered to serve a small-scale LNG field developed by Edison off Ravenna, Italy. The vessel is a 30,000m³ LNG carrier and has been taken on a 12 year charter with option to extend for further eight years. The ship has been constructed with a fatigue life of 40 years.

Ravenna Knutsen is 183.03m in length, has a beam of 28.4m and a scantling draught of 8.4m. It has a bulbous bow and a transom stern.

The cargo arrangements comprise three independent, self-supporting type C tanks with a bi-lobe shape. The cargo handling system has been designed for the ship to load a fully refrigerated cargo in 12 hours and to discharge the same using all six Svanhoj deepwell tanks with a capacity of 335m³/h. The ship also features a reliquefaction unit which guarantees a higher level of operational flexibility and a reduced environmental impact with regard to boil off.

Propulsion comes from a WinGD5X52DF main engine producing 7,450kW at 105rpm driving a controllable pitch propeller through a Renk gearbox. Service speed is 15.4knots. The ship also has a main engine driven generator and three Wärtsilä 8L20DF auxiliaries. The rudder is a flap type.

With all engines being dual fuel, the ship can run on LNG or 2020 compliant MGO. The LNG will be boil off from the cargo and there is 400m³ MGO tank. The ship's required EEDI is 19.4 but the attained EEDI based on the ship running only on LNG is a significantly lower 7.5.

TECHNICAL PARTICULARS

Length oa:183.03m
 Length bp:171.20m
 Breadth moulded:28.40m
 Depth moulded to upper deck:19.40m
 Width of double skin bottom:1.8m

Draught
 scantling:8.4m
 design:8.1m
Gross:27,000t
Deadweight
 scantling:29,000t
 design:27,800t
Speed, service:15.4knots
Cargo capacity (m³)
 Liquid volume:30,000
 Bunkers (m³)
 Diesel oil:400
 Water ballast (m³):13,000
Daily fuel consumption (tonnes/day)
 Main engine only:21 (Gas mode)
Classification society and notations:DNV +1A, Tanker for liquefied gas Ship 2G(-163 C, 500kg/m, 3.8bar) GF, EO, BIS, TMON(Oil lubricated), COAT-PSPC(B), LCS, BWM(T), Recyclable with descriptive note on fatigue life for 40 years in world wide operation

Propulsion
Main engine(s)
 Model:Hyundai-WinGD 5X52DF
 Manufacturer:Hyundai Heavy Industries
 Number:1
 Type of fuel:MGO and LNG
 Output of each engine:7,450kW x 105rpm (Nominal rating)
 Is this a diesel-electric or hybrid?:N

Gearbox(es)
 Make:Renk
 Model:SHH II 1600/765
 Number:1

Propeller(s)
 Material:Ni-Al Bronze
 Designer/Manufacturer:Wärtsilä
 Number:1
 Fixed/Controllable pitch:Controllable pitch

Main-engine driven alternators
 Number:1
 Make/type:ELIN / MKH845E06
 Output/speed of each set:1,000kWe / 1,800.7rpm (at M/E 93.7rpm)

Diesel-driven alternators
 Number:3
 Engine make/type:Wärtsilä 8L20DF
 Type of fuel:MGO and LNG
 Alternator make/type:Hyundai Electric and Energy Systems / HFC7 568-06P
 Output/speed of each set:1,775kVA x 1,200rpm

Bow thruster(s)
 Make:Kongsberg
 Number:1
 Output (each):1,500kW

Deck machinery
Cargo cranes/cargo gear
 Number:1
 Make:Oriental
 Type:Electro-hydraulic driven, cylinder luffing type jib crane
 Performance:SWL 5t / Working radius 5.8~27m

Other cranes
 Number:1
 Make:Oriental
 Type:Electro-hydraulic driven, cylinder luffing type jib crane
Tasks:Provision and machinery part handling in engine room.
Performance:SWL 3.5t / Working radius 2.7~10m

Mooring equipment
 Number:6
 Make:Fluteck
 Type:Hydraulic

Special lifesaving equipment
 Number of each and capacity:1 x 25P
 Make:Viking Norsafe
 Type:Free fall type

Cargo tanks
 Number:3
 Grades of cargo carried:1
 Product range:LNG
 Stainless steel – structure/piping:NI 9% Low temperature steel

Cargo pumps
 Number:6
 Type:Deepwell
 Make:Svanhoj
 Stainless steel:Yes
 Capacity (each):335m³/h

Cargo control system
 Make:Wärtsilä
 Type:Piano type console

Ballast control system
 Make:Kongsberg
 Type:K-chief 700

Ballast water treatment system
 Make:Alfa Laval
 Capacity:1,000m³/h

Complement
 Officers:12
 Crew:13
 Suez/Repair Crew:6

Navigation and other equipment
Bridge control system
 Make:Kongsberg
 Type:AutoChief 600
 Is bridge fitted for one-man operation?:N
Integrated bridge system:N

Radar
 Number:2
 Make:Furuno
 Model(s):FAR-2338S-NXT / FAR-2328

Fire detection system
 Make:Autronica
 Type:Autrosafe 4

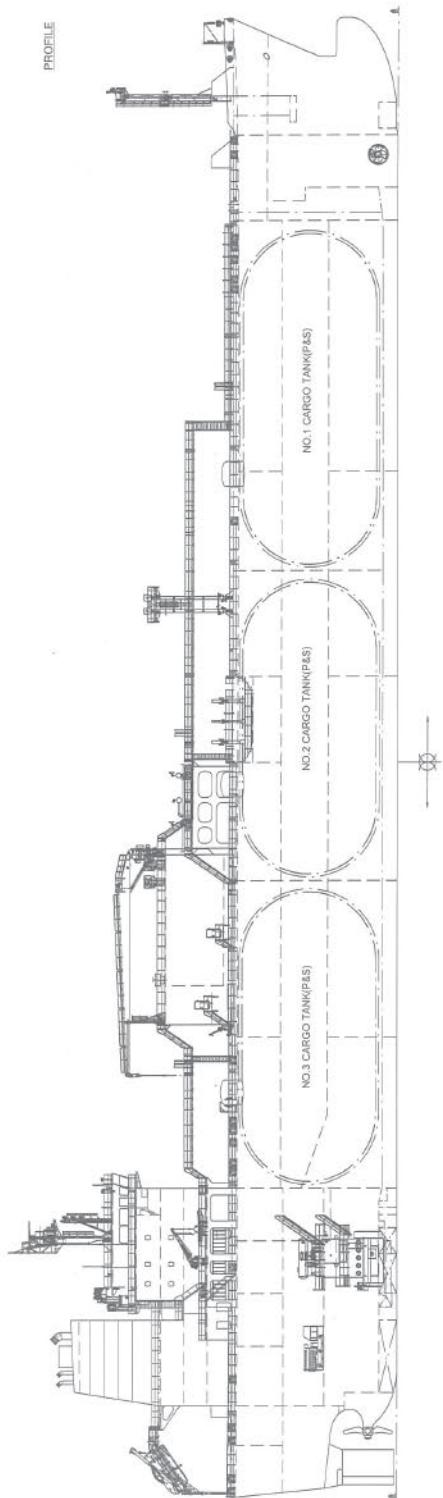
Fire extinguishing systems
 Engine room:CO₂
 Make/Type:NK/Total Flooding

Efficiency
 Attained EEDI value:7.5
 Required EEDI value:19.4
 Other installed monitoring tools:Torsion meter, Electro pneumatic type tank & draught gauge
Energy Saving Technologies:Flap rudder
Hull coatings:SeaQuantum X200
Type:Hydrolysing silyl methacrylate antifouling coating

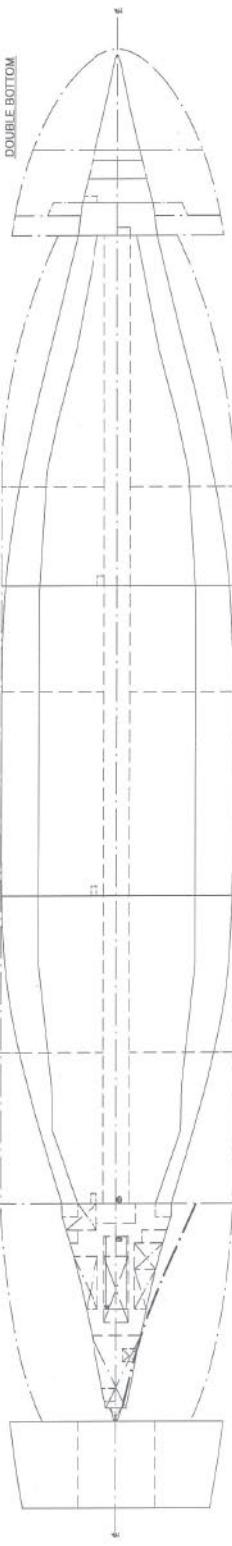
Contract date:05 December 2018
Launch/float-out date:27 July 2020
Delivery date:09 February 2021

RAVENNA KNUTSEN

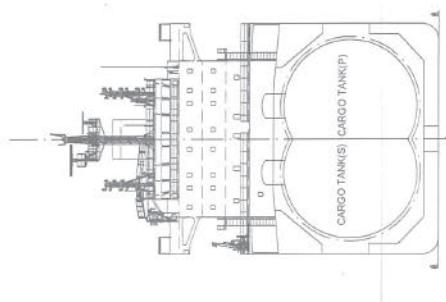
PROFILE



DOUBLE BOTTOM



MIDSHIP SECTION



SILVER DAWN – Cruise ship



Shipbuilder:	Fincantieri
Vessel's name:	Silver Dawn
Owner/Operator:	Silversea Cruises
Country:	Bermuda
Designer:	Fincantieri
Country:	Italy
Flag:	Bahamas
IMO number:	9857937
Total number of sister ships already completed (excluding ship presented):	2
Total number of sister ships still on order:	0

In most aspects *Silver Dawn*, delivered by Fincantieri's Ancona yard to Silversea Cruises, is very much an identical sister to its two sisters, *Silver Muse* delivered in 2017 and *Silver Moon* delivered in 2020. The ship was ordered by Silversea in May 2018 as Royal Caribbean Group took a US\$1 billion stake in the company and by the time the vessel was delivered the Silversea brand was entirely owned by Royal Caribbean.

Silversea has cultivated a niche as a luxury brand, small ship operator and at 212.9m in length and with a gross tonnage of 40,855, *Silver Dawn* falls well into this category. The major difference between *Silver Dawn* and her sisters is in the degree of luxury that passengers can expect. Accommodating a maximum 596 passengers in 298 cabins spread over eight decks and all but 12 with individual verandas, the owner describes the ship as the natural evolution of its fleet saying '*Silver Dawn* inherits the best features of her sister ships *Silver Muse* and *Silver Moon* but is in a class all of her own. Sumptuous suites plus cutting-edge design and technology, *Silver Dawn* sets new standards of luxury'.

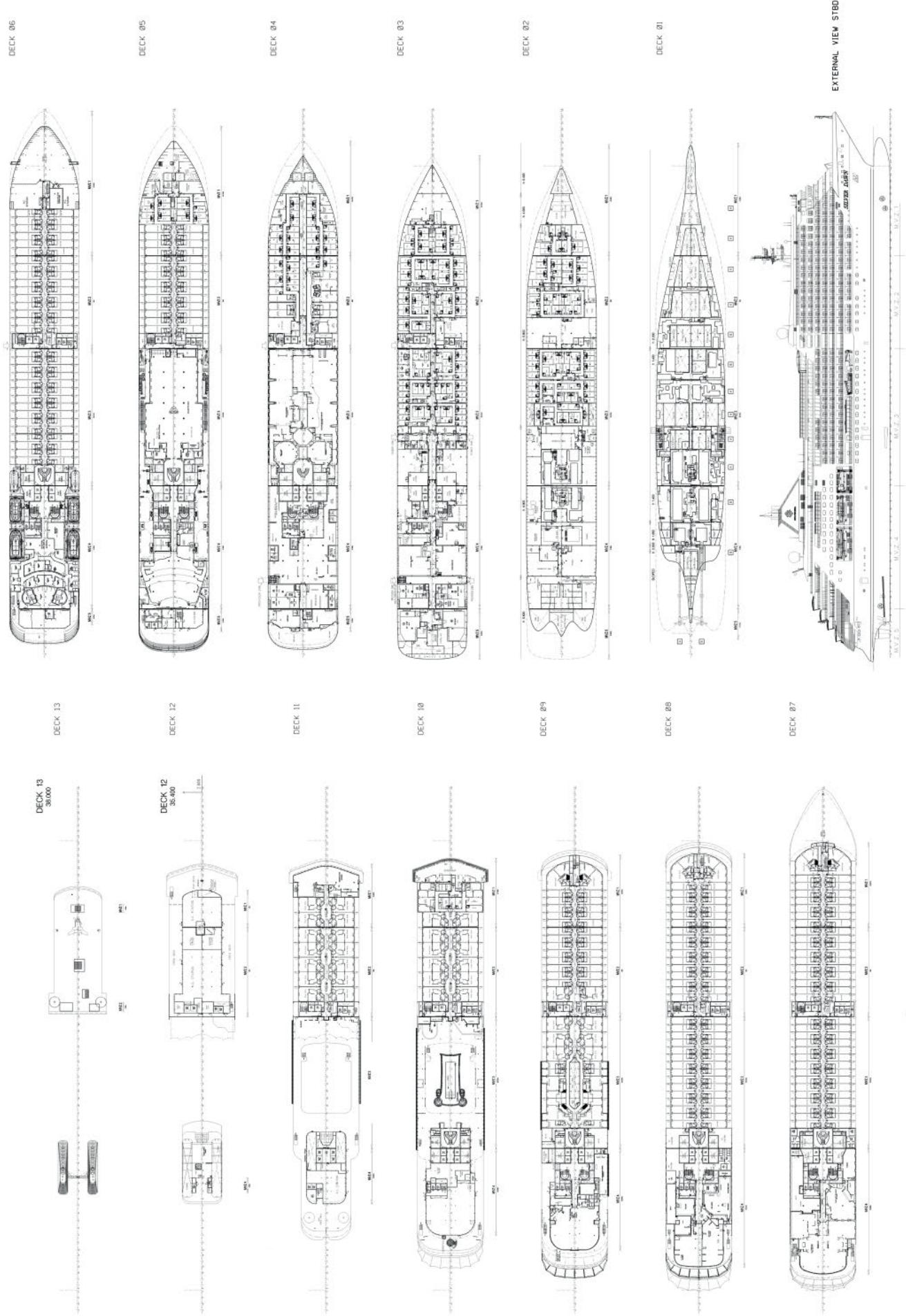
The ship is a twin screw diesel electric vessel powered by four Wärtsilä 9L38 engines each rated at 6,525kW. The ship's environmental features which enable it to claim a Green Star 3 design notation from classification society RINA, include a high voltage shore connection that manages the load transfer operation between ship and shore to be done with just a single diesel generator on the network. It also features an open loop scrubber system to meet the 2020 SOx requirements.

TECHNICAL PARTICULARS

Length oa:	212.9m
Length bp:	180.85m

Breadth moulded:	27m
Depth moulded to main deck:	8.6m
Draught scantling:	6.7m
design:	6.55m
Gross:	40,855t
Displacement:	abt. 22,085t
Block co-efficient:	0.707 @ 6.56m of draught
Speed, service (--%MCR output):	17 knots
Bunkers (m ³)	
Heavy oil:	1,459m ³
Diesel oil:	314m ³
Water ballast (m ³):	1,939m ³
Classification society and notations:	RINA, C+ Passenger ship, Unrestricted navigation, + AUT-UMS, Green star 3 design, inwatersurvey
% high-tensile steel used in construction:	abt. 80%
Propulsion	
Main engine(s)	
Model:	9L38
Manufacturer:	Wärtsilä
Number:	4
Type of fuel:	HFO and MGO
Output of engine:	6,525kW
Is this a diesel-electric or hybrid?:	Y
Propeller(s)	
Material:	Ni-Al Bronze
Designer/Manufacturer:	Wärtsilä
Number:	2
Fixed/Controllable pitch:	Fixed
Diameter:	4.6m
Speed:	abt. 152rpm
Main-engine driven alternators	
Number:	4
Make/type:	VEM
Output/speed of each set:	600rpm
Exhaust-gas scrubbing equipment	
Manufacturer:	Wärtsilä Moss AS
Type:	Open Loops
On main engines?:	Y
Boilers	
Number:	2 + 4
Type:	OFB, EGB
Make:	Alfa Laval Aalborg Oy
Output, each boiler:	2 x 6 t/h, 4 x 1,7 t/h @80% MCR
Bow thruster(s)	
Make:	Fincantieri
Number:	2
Output (each):	1,000kW
Stern thruster(s)	
Make:	Fincantieri
Number:	1
Output (each):	1,500kW
Deck machinery	
Cargo cranes/cargo gear	
Number:	1
Make:	Nova Co.Vis srl
Type:	Slewing crane
Performance:	0.75t
Other cranes	
Number:	2
Make:	Concrane
Type:	Telescopic crane
Tasks:	Zodiac handling
Performance:	0.9t
Mooring equipment	
Number:	6
Make:	Kongsberg
Type:	Electric
Special lifesaving equipment	
Number of each and capacity:	4 Lifeboat/ Tender (150pax each); 2 Lifeboat (90pax each); 20 Liferaft (35pax each)
Make: Boat maker:	Hatecke,
Type: Boat type:	partially enclosed;
	Raft type: davit-launched
Ballast water treatment system	
Make:	Alfa Laval
Capacity:	140m ³ /h
Complement	
Crew:	380
Single/double/other rooms:	431
Passengers	
Total:	660
Number of cabins:	596
Percentage/number outboard:	100%
Waste disposal plant	
Waste handled:	
Incinerator	
Make:	Scanship
Model:	SE600
Waste compactor	
Make:	Scanship
Model:	X10
Waste shredder/crusher	
Make:	Scanship
Model:	BDR110/600
Sewage plant	
Make:	Scanship
Efficiency	
Attained EEDI value:	15.3 [G-CO ₂ /GRT Mile]
Required EEDI value:	15.4 [G-CO ₂ /GRT Mile]
Launch/float-out date:	14 January 2021
Delivery date:	12 November 2021

SILVER DAWN



SUISO FRONTIER – Liquid hydrogen carrier



Shipbuilder:	Kawasaki Heavy Industries, Ltd., Kobe Shipyard
Vessel's name:	Suiso Frontier
Owner/Operator:	HySTRA
Country:	Japan
Designer:	Kawasaki Heavy Industries, Ltd
Country:	Japan
Flag:	Japan
IMO number:	9860154
Total number of sister ships still on order:	0

Delivered on 3 December 2021, by Kawasaki Heavy Industries Kobe yard, the 7,849gt *Suiso Frontier* has claimed the distinction of being the world's first liquid hydrogen carrier. It is very much a prototype as few of the cargo control and storage systems have previously been used at sea. The ship is involved in shipping experimental cargos of liquid hydrogen from Australia to Japan.

For sea carriage, hydrogen is cooled to -253°C to be liquefied and its volume is reduced to 1/800 of its original gas-state volume. The cargo containment system comprises a double shell vacuum insulated IMO Type C tank of 1,250m³ capacity tank which was developed by Kawasaki Heavy Industries with support of NEDO (New Energy and Industrial Technology Development Organization). The support structure for the tank is made of highly durable GFRP to further ensure a reduction in heat transfer.

Because liquid hydrogen boils off up to 10 times faster than LNG, a compressor-less, hydrogen-compatible gas combustion unit supplied by German industrial burner manufacturer Saacke will ensure that any boil-off gas is completely and safely combusted to reduce the risk of increased pressure. The cargo pumps are a pair of 100m³/h Shinko submerged electric centrifugal type.

Suiso Frontier has a loa of 116m and a beam of 19m. The propulsion system comprises three Daihatsu DE-23 1,320kW diesel engines and two 1,360kW electric motors connected through a Daihatsu gearbox to a single 3.2m diameter controllable pitch propeller and giving a maximum speed of 13knots. With an 880m³ fuel tank and a consumption of 16tonnes of MDO per day the ship has around 50 days endurance.

TECHNICAL PARTICULARS

Length oa:	116.00m
Length bp:	109.00m
Breadth moulded:	19.00m
Depth moulded:	
to main deck:	10.60m
to upper deck:	10.60m

Width of double skin
side: 3.20m
bottom: 1.30m

Draught
scantling: 4.5m
design: 4.5m

Gross: 7,849t

Deadweight
scantling: 2,272t

Speed, service (%MCR output): abt 13knots
at normal output with 50% sea margin

Cargo capacity (m³)
Liquid volume: 1,253m³ (100% full at -253°C, excluding inner vessel dome)

Bunkers (m³)
Diesel oil: abt 880m³ (Diesel and gas oil tank including service tank)
Water ballast (m³): abt 3,000m³
Daily fuel consumption (tonnes/day): abt 16.0
at 100% MCO

Classification society and notations: NS* (Liquefied Gas Carrier Type 2G, PSPC-WBT, NC)
MNS* (MO)

Descriptive note: Design Maximum Pressure 0.5 MPaA / Minimum Temperature -253°C, Vacuum Insulation Performance Deterioration Monitoring System

Propulsion

Main propulsion motors

Design: 3-phase induction motor for marine totally enclosed air-cooled type
Model: NTIKE-RC5
Manufacturer: Nishishiba Electric Co., Ltd
Number: 2
Speed of each motor: abt 885rpm
Output of each motor: 1,360kW at M.C.O.
Is this a diesel-electric or hybrid?: Y

Gearbox(es)

Make: Daihatsu Diesel Mfg. Co., Ltd
Model: RCD-25J
Number: 1
Output speed/power: abt 216rpm / 2,650kW at MCO

Propeller(s)

Material: KALBC3 (Ni-Al-Bronze)
Designer/Manufacturer: Kamome propeller Co., Ltd.
Number: 1
Fixed/Controllable pitch: Controllable pitch
Diameter: 3,200mm
Speed: abt 216rpm

Diesel-driven alternators

Number: 3
Engine make/type: Daihatsu Diesel Mfg. Co., Ltd / 6DE-23
Type of fuel: MDO or MGO
Alternator make/type: Nishishiba Electric

Co., Ltd. / Single bearing and self lubrication type

Output/speed of each set: 1,400kW / 900rpm

Boilers

Number: 1
Type: Vertical oil-fired boiler
Make: Osaka Boiler Mfg. Co., Ltd
Output, each boiler: 700kg/h, 0.4MPaG

Stern appendages/special rudders: Monovec hanging rudder

Bow thruster(s)

Make: Kawasaki Heavy Industries, Ltd
Number: 1
Output (each): Approx. 78kN (Approx. 8.0t)

Other cranes

Number: 1
Make: Kyoritsu Kikai Co., Ltd
Type: Electric motor driven
Tasks: Engine parts/Provisions handling
Performance: 0.9t ×10m

Mooring equipment

Number: 4
Make: Kawasaki Heavy Industries, Ltd
Type: Electro-Hydraulic

Special lifesaving equipment

Number of each and capacity: 1, 25 persons
Make: Viking life-Saving Equipment K.K.
Type: Freefall lifeboat

Cargo tanks

Number: 1
Grades of cargo carried: Liquid Hydrogen
Product range: 1,250m³

Cargo pumps

Number: 2
Type: Electric motor driven centrifugal submerged type
Make: Shinko Ind. Ltd
Capacity (each): 100m³/h

Ballast water treatment system

Make: Techcross Co., Ltd.
Capacity: 150m³/h

Complement

Officers: 10
Crew: 13
Supernumeraries/Spare: 2

Navigation and other equipment

Bridge control system

Make: Furuno Electric Co., Ltd
Is bridge fitted for one-man operation?: N
Integrated bridge system: N

Radar

Number: 2 sets
Make: Furuno
Model(s): FAR-2328 (X-band) / FAR-2338S(S-band)

Fire detection system

Make: Nippon Hakuyo Electronics, Ltd

Type: FF-3063

Fire extinguishing systems

Engine room:
Make/Type: Kashiwa Co., Ltd / Fixed Local Application Fire Extinguishing System
Air Water Safety Service Inc. / CO₂ Fire Extinguishing System

Cabins

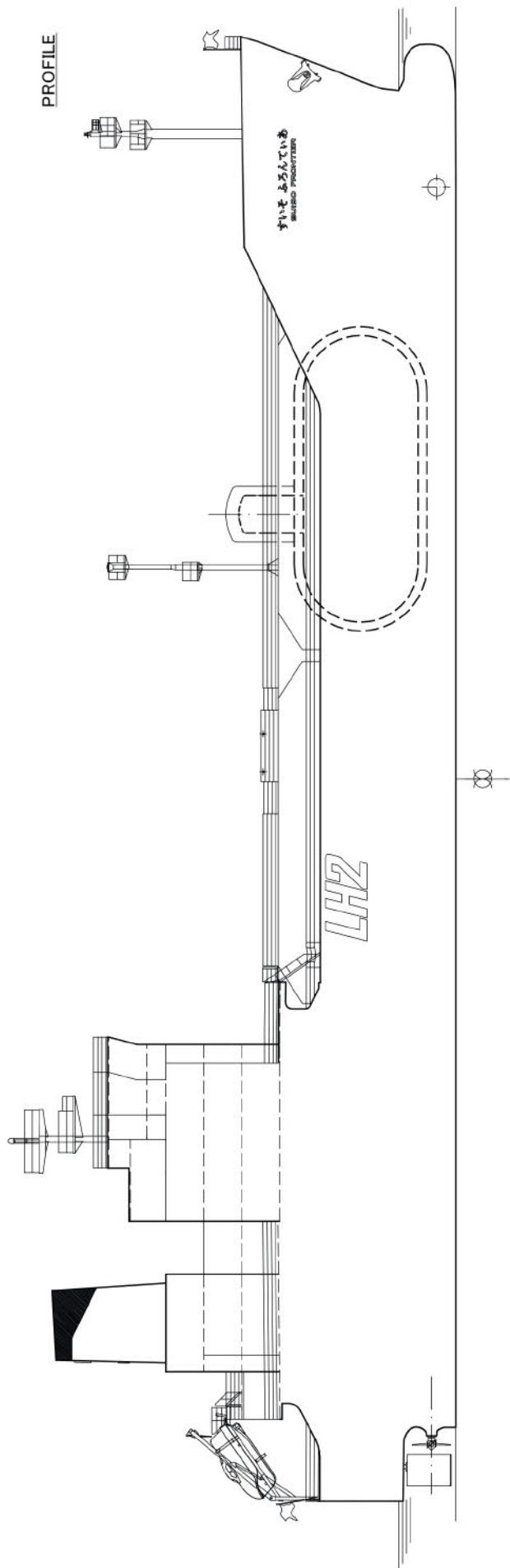
Make/Type: Shinko Ind Ltd / Fire & Wash Deck System
Yamato Protec / Portable fire extinguishers

Waste disposal plant

Sewage plant

Make: Sasakura engineering Co., Ltd
Model: SD-3R

Contract date: 25 September 2017
Launch/float-out date: 11 December 2019
Delivery date: 03 December 2021



TAIXING – Heavy lift multipurpose vessel



Shipbuilder: CSSC Chengxi Shipyard Co., Ltd
 Vessel's name: Taixing
 Owner/Operator: Chinese-Polish Joint Stock Shipping Company
 Country: China
 Designer: CSSC Shanghai Merchant Ship Design & Research Institute (SDARI)
 Model test establishment used: Shanghai Ship & Shipping Research Institute
 Flag: Hong Kong
 IMO number: 9930909
 Total number of sister ships already completed (excluding ship presented): 0
 Total number of sister ships still on order: 7

Built by Chengxi Shipyard and delivered in December, the 62,000dwt *Taixing* is the first of four new vessels to join the fleet of heavy lift specialist Chipolbrok (Chinese-Polish Joint Stock Shipping Company). The three later vessels have scheduled delivery dates in 2022. Power and propulsion system comprises a 6G50ME-C9.6

The vessel is claimed to be the world's largest multipurpose heavy lift vessel, it measures 199.9m in length and has a 32.26m beam and has a vertical bow form. The vessel was designed by SDARI and is a double hull vessel with five holds the longest of which is 40m in length for special project cargoes.

Four of the holds are box shaped and all have strengthened tank tops for heavy cargoes. The ship has pontoon type tween decks that can be employed in all five holds. Total bale capacity is 73,000m³. The flush hatch covers allow for a length of 160m and some 5,000m² of space for deck cargoes.

Cargo handling is facilitated by four deck cranes with a 38m outreach, and the two 150tonne capacity cranes located either end of hatch 3 can work in tandem to lift 300tonnes. The other two cranes have safe working loads of 45 and 60tonnes.

The ship's power and propulsion system comprises a six-cylinder MAN B&W G50ME-C9.6 engine producing 8,000kW @83rpm. This drives a 6.9m diameter fixed pitch propeller to give a service speed of 14.5knots. To achieve Tier III NOx compliance, the engine makes use of high pressure selective catalytic reduction. A Blue Ocean Shield ballast treatment system allows for worldwide operation having type approval from IMO and USCG.

TECHNICAL PARTICULARS

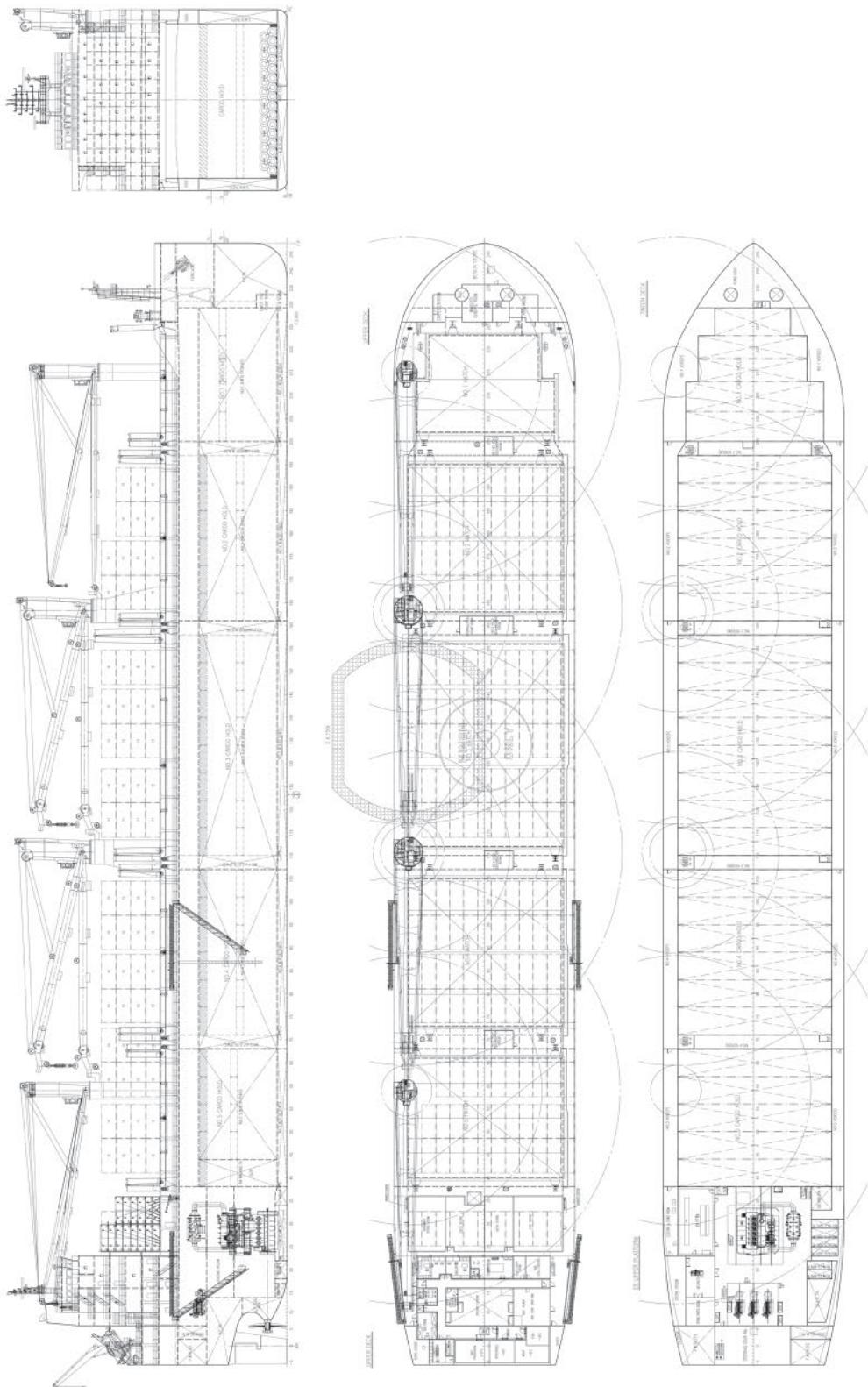
Length oa: 199.90m
 Length bp: 196.50m
 Breadth moulded: 32.26m

Depth moulded: 19.3m
 Draught
 scantling: 13.50m
 design: 11.30m
 Gross: 39,433t
 Deadweight
 scantling: 62,000t
 Speed, service (--%MCR output): 14.5knots
 Cargo capacity (m³)
 Grain: 75,000
 Bunkers (m³)
 Heavy oil: 1,750
 Diesel oil: 450
 Water ballast (m³): 23,500
 Daily fuel consumption (tonnes/day)
 Main engine only:
 - 24.6 (1 Set, Tier II mode)
 - (2 Sets, Tier III mode)
 Auxiliaries:
 - (1 Set, Tier II mode)
 - (1 Set, Tier III mode)
 Classification society and notations: DNV & CCS
 Propulsion
 Main engine(s)
 Design: MAN
 Model: 6G50ME-C9.6 HPSCR
 Manufacturer: Hudong Heavy Machinery Co. Ltd
 Number: 1
 Type of fuel: HFO & MGO
 Output of each engine: 8,000kW x 83rpm
 Propeller(s)
 Material: Ni-Al-bronze(Cu3)
 Designer/Manufacturer: CSSC Shanghai Merchant Ship Design & Research Institute (SDARI)
 Number: 1
 Fixed/Controllable pitch: FPP
 Diameter: 6.9
 Speed: 77
 Diesel-driven alternators
 Number: 3
 Engine make/type: CSSC Marine Power Co.,Ltd. CMP-MAN 6L23/30H MK2
 Type of fuel: HFO & MGO
 Alternator make/type: ZhengJiang China Marine-XianDai Generating Co., Ltd
 Output/speed of each set: 850kW x 720rpm
 Boilers
 Number: 1
 Type: Composite boiler
 Make: Alfa Laval
 Output, each boiler: fuel /ME exh. exh.side (1,500/800kg/h)
 Deck machinery
 Cargo cranes/cargo gear
 Number: 4
 Make: MacGregor
 Type: 2XGL8024/MLC/4538-2/3338GR,
 2XGLH15018/MLC/6038-2/4538GR
 Performance: 45t-38m, 60t-38m/150t-18m

Other cranes
 Number: 1+1
 Make: Wuxi HaideLong Marine Equipment Co., Ltd
 Type: Hydraulic slewing crane
 Tasks: For provision
 Performance: 1.5t-7.2m, 1.5t-11.4m
 Mooring equipment
 Number: 4
 Make: WMMP
 Type: hydraulic
 Special lifesaving equipment
 Number of each and capacity: 26p
 Make: Jiangsu Jiaoyan Marine Equipment Co., Ltd
 Type: Free-fall lifeboat
 If MES, vertical or sloping chutes?: sloping
 Cargo/capacity
 Hatch covers
 Design: TTS Hua Hai
 Type: folding type
 Ballast control system
 Make: Hoppe
 Type: electro-hydraulic
 Ballast water treatment system
 Make: Blue Ocean Shield
 Capacity: 900m³/h
 Complement
 Officers: 12
 Crew: 14
 Suez/Repair Crew: 6
 Single/double/other rooms: 26/0/1
 Navigation and other equipment
 Bridge control system
 Make: Kongsberg
 Type: Autochief 600
 Is bridge fitted for one-man operation? N
 Integrated bridge system: N
 Radars
 Number: 3
 Make: Furuno
 Model(s): FAR-2328/FAR-2338S/FAR-2218
 Fire detection system
 Make: Consilium
 Type: Salvico cargo
 Fire extinguishing systems
 Cargo holds: CO₂
 Make/Type: VTI
 Engine room: CO₂/ Local Mist Spray
 Make/Type: VTI/DESMI
 Waste disposal plant
 Incinerator
 Make: Nanjing Luzhou
 Model: OG200CS
 Sewage plant
 Make: Nanjing Luzhou
 Model: STC-2
 Contract date: April 2020
 Launch/float-out date: July 2021
 Delivery date: November 2021



TAIXING



TANG HONG – Vehicles carrier



Shipbuilder: China Merchants Heavy Industry (Jiangsu) Co., Ltd
 Vessel's name: Tang Hong
 Owner/Operator: China Merchants Shen Zhen RoRo Shipping Co., Ltd
 Country: China
 Designer: Shanghai Merchant Ship Design and Research Institute (SDARI)
 Country: China
 Model test establishment used: Shanghai Ship and Shipping Research Institute (SSRI)
 Flag: China
 IMO number: 9903205
 Total number of sister ships already completed (excluding ship presented): 2
 Total number of sister ships still on order: 0

Designed by SDARI and built by China Merchants Heavy Industry Jiangsu, the 35,245gt PCTC *Tang Hong* was delivered to China Merchants Shen Zhen RoRo Shipping in March 2021 as the first of a pair. The sister ship *Mao Hong* was handed over in July.

With their dimensions of 169.1m length, beam of 28m and draught of 8.5m together with a capacity of 4,066ceus, the ships are not among the largest of their kind although they are claimed as being the largest domestic service car carriers in China. *Tang Hong* has 11 car decks including one hoistable deck and on deck six can accommodate vehicles up to 5m in height.

Cargo operations faster than other ships of its type are facilitated by way of two 50tonne SWL quarter stern ramps one on each side of the vessel. The ventilation system allows for 20 air changes/hour during cargo operations and 10 changes per hour at other times.

In appearance, *Tang Hong* is typical of the PCTC type and to improve its efficiency SDARI has featured some lower wind resistance for the superstructure, an S-Bow design and a 5.6m diameter fixed pitch propeller with boss cap fin. Power is provided by a MAN B&W 6S50ME-C8.5 main engine producing 7,550kW at 120rpm. In operation, the ship makes use of shore power during port stays further limiting emissions. The attained EEDI value is 15.626 significantly below the required minimum of 21.915.

The ship has a ballast water capacity of 4,000m³ but because it is intended for purely domestic use in Chinese waters, no ballast water treatment system is required.

TECHNICAL PARTICULARS

Length oa: 169.10m
 Length bp: 164.50m
 Breadth moulded: 28.00m
 Depth moulded to main deck: 13.82m (Freeboard deck No.6 deck)
 to upper deck: 28.79m
 Width of double skin side: 2.75m
 bottom: 1.95m
 Draught scantling: 8.50m
 design: 7.70m
 Gross: 35,425t
 Deadweight scantling: 11,780t
 design: 8,730t
 Speed, service (70%MCR output): 16.00knots

Bunkers (m³)
 Heavy oil: 800
 Diesel oil: 110
 Water ballast (m³): 4,000
 Daily fuel consumption (tonnes/day)
 Main engine only: 20

Classification society and notations: CCS
 ★ CSA Car Carrier; R1; Ice Class B; FTP; Green
 Ship 1; In-Water Survey ★ CSM AUT-0;
 SCM; AMPS

% high-tensile steel used in construction: 30%

Propulsion
 Main engine(s)
 Design: MAN B&W
 Model: 6S50ME-C8.5, Tier II
 Manufacturer: Hudong Heavy Machinery Co., Ltd

Number: 1
 Type of fuel: HFO,MGO
 Output of each engine: 7,550kW x 120rpm
 Is this a diesel-electric or hybrid?: N

Propeller(s)
 Material: Ni-Al-Bronze
 Designer/Manufacturer: SDARI
 Number: 1
 Fixed/Controllable pitch: Fixed
 Diameter: 5.60m

Diesel-driven alternators
 Number: 3
 Engine make/type: Yanmar Co., Ltd./ 6EY22ALW

Type of fuel: HFO,MGO
 Alternator make/type: Taiyo FE 547-6
 Output/speed of each set: 830kW x 1,000rpm

Boilers

Number: 2
 Type: Steam, 1 x Aux boiler, 1 x Exhaust gas boiler
 Make: Alfa Laval
 Output, each boiler: 1,500kg/h of Aux boiler, 550kg/h of Exhaust gas boiler
 Bow thruster(s)
 Make: Wuhan Kawasaki Marine Machinery Co., Ltd
 Number: 1
 Output (each): 1,000kW

Other cranes

Number: 2
 Make: Jiangyin Chengjiang Ship Equipment Co., Ltd
 Type: 4t provision crane
 Tasks: provision crane
 Performance: 4t x 5m for provision crane on starboard/4t x 4m for provision crane on portside

Mooring equipment

Number: 4
 Make: Jiangsu Masada Heavy Industries Co., Ltd
 Type: hydraulic

Special lifesaving equipment

Number of each and capacity: 2
 Make: Jiangyin Neptune Marine Appliance Co., Ltd
 Type: totally enclosed life boat

Vehicles

Number of vehicle decks: 11 (10 fixed / 1 moveable)
 Total cars: 4,066(RT43)
 Doors/ramps/lifts/moveable car decks
 Number of each: stern ramp x2; moveable ramp x3; moveable car deck x1
 Type: ramps, hydraulic; car deck, electric
 Designer: TTS HuaiHai

Complement

Officers: 9
 Crew: 13
 Supernumeraries/Spare: 1 spare +1 pilot +1 owner
 Single/double/other rooms: 25 Single rooms

Navigation and other equipment

Bridge control system
 Make: Kongsberg
 Type: Autochief 600
 Is bridge fitted for one-man operation?: N
 Integrated bridge system: N
 Radars
 Number: 2
 Make: Furuno
 Model(s): FAR-2328 / 2338S

Fire detection system

Make: Autronica
 Type: Autosafe4

Fire extinguishing systems

Engine room: CO₂
 Make/Type: Sea hydrant, Danfoss LP-CO₂, portable extinguishers

Vehicle spaces: CO₂
 Make/Type: Sea hydrant, Danfoss LP-CO₂, portable extinguishers

Cabins: Sea water
 Make/Type: Sea hydrant, portable extinguishers

Public spaces: Sea water
 Make/Type: Sea hydrant, portable extinguishers

Waste disposal plant

Sewage plant
 Make: China Merchants Heavy Industry (Jiangsu) Co., Ltd
 Model: STD-2

Efficiency

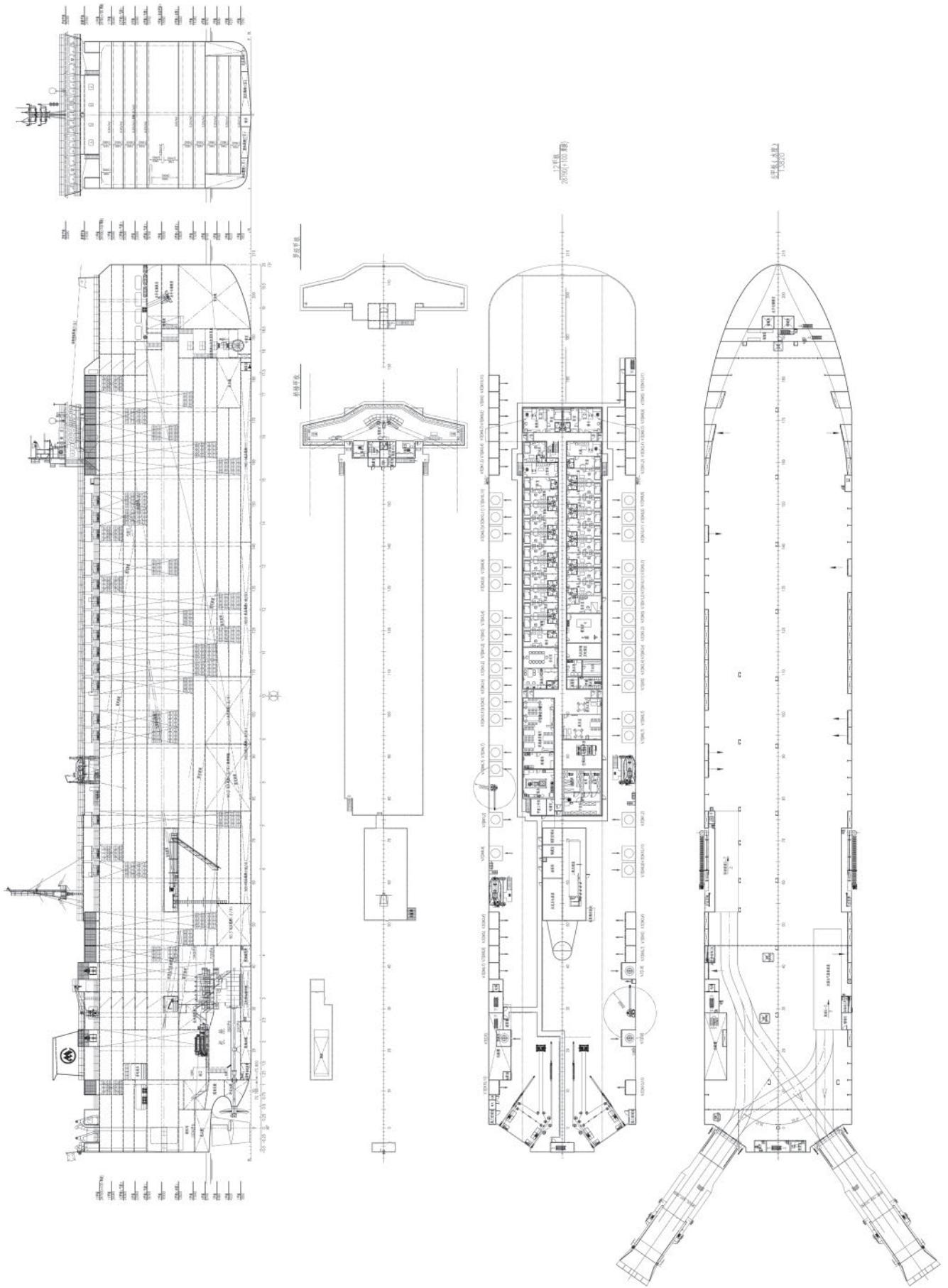
Attained EEDI value: 15.6260 g-CO₂/(tnmile)
 Required EEDI value: 21.9150 g-CO₂/(tnmile)

Energy Saving Technologies: SDARI fan cap for propeller

Contract date: June 2019

Launch/float-out date: December 2020

Delivery date: March 2021



TRANSGAS POWER – LNG carrier/FRSU



Shipbuilder:	Hudong-Zhonghua Shipbuilding (Group) Co., Ltd
Vessel's name:	Transgas Power
Owner/Operator:	Dynagas
Country:	Greece
Designer:	Hudong-Zhonghua Shipbuilding (Group) Co., Ltd
Country:	China
Flag:	Malta
IMO number:	9861809
Total number of sister ships already completed (excluding ship presented):	1
Total number of sister ships still on order:	0

In July, Hudong-Zhonghua Shipbuilding delivered *Transgas Power* to Dynagas, marking the first ever large FSRU to be built in China. The ship is also significant as being only the second FSRU built for a Greek owner. A sister vessel, *Transgas Force*, was delivered in November.

Transgas Power has a loa of 294.0m and a beam of 46.95m. It has a GTT NO96 cargo containment system with a capacity of 174,000m³. The ship has been built for a dual purpose role as either a conventional LNG carrier or as a FSRU serving as a link between a shore connection and other gas carriers.

The vessel's regasification system consisting of three trains installed at both sides of the first LNG cargo tank was supplied by Wärtsilä. In addition, Wärtsilä also supplied related regasification equipment comprising pumps, heat exchangers, valves, and instrumentation for installation in the engine room. The regasification system uses seawater and steam as energy sources, and water/glycol as the energy carrier in a combined loop. The three trains each have a capacity of approximately 500m³/h.

The ship's power plant is an unusual choice at a time when many gas carriers are utilising two-stroke dual-fuel engines. *Transgas Power* has been equipped with four MAN medium-speed 51/60DF engines. Two are nine-cylinder units each producing 9,000kW and the other pair are eight-cylinder versions rated at 8,000kW each – all engines run at 514rpm. The ship has twin 8.2m diameter fixed pitch propellers connected to the engines through Renk gearboxes. The arrangement allows a service speed of 19.5knots.

TECHNICAL PARTICULARS

Length oa:	294.00m
Length bp:	288.00m
Breadth moulded:	46.95m
Depth moulded to main deck:	26.25m
to upper deck:	33.40m

Width of double skin side:	2,585mm
bottom:	2.99m
Draught scantling:	12.50m
design:	11.60m
Gross:	117,573t
Deadweight scantling:	94,415t
design:	83,587t
Speed, service (%MCR output):	19.5kn@DPP
Cargo capacity (m ³) Liquid volume:	174,000m ³
Bunkers (m ³) Heavy oil:	~3,800m ³
Diesel oil:	~850m ³
Water ballast (m ³):	60,500m ³
Classification society and notations:	ABS +1A1, Liquefied Gas Carrier, (E) (Ship type 2G), LNG(R), SH, SHCM, +ACCU, ENVIRO, UWILD, SH-DLA, CPS, DFD, TCM, +AMS, BWE, NIBS, SFA(40), POT, IHM, RRDA, GCU, SElev, CRC, BWT, RW
Cargo tank working pressure shall be based on below two mode: 1. When acting as LNGC, the cargo tank pressure shall be 25kpa; 2. When acting as FSRU, the cargo tank pressure shall be 70kpa.	
Propulsion Main engine(s) Design: MAN 2x9L51/60DF&2x8L51/60DF Model: 2x9L51/60DF&2x8L51/60DF Manufacturer: MAN Number: 4 Type of fuel: HFO & MDO & MGO & GAS Output of each engine: - 9L51/60DF:MCR=9,000kW @ 514rpm - 8L51/60DF:MCR=8000kW @ 514rpm Is this a diesel-electric or hybrid?: Y Gearbox(es) Make: Renk Model: RSH-2050 Number: 2 Output speed: n 1=517rpm-605rpm; n 2=65-76rpm Propeller(s) Material: solid HSP Type Designer/Manufacturer: Nakashima Propeller Number: 2 Fixed/Controllable pitch: Fixed Diameter: 8.2m Speed: 69rpm Boilers Number: 2 Type: FMB-VM Make: Saacke Output, each boiler: 6,000kg/h Stern appendages/special rudders: 2 full-spaide type rudders Bow thruster(s) Make: Kawasaki Number: 1 Output (each): 2,500kW	

Deck machinery Cargo cranes/cargo gear Number:	2
Make:	TTS
Type:	Electro-hydraulic
Performance:	5tx25m
Other cranes Number:	4
Make:	TTS, Ningbo Kairong Ship Machinery Co., Ltd
Type:	Electro-hydraulic
Performance:	5tx17m, 10tx17m, 8tx13m, 20tx32m

Mooring equipment Number:	2 combined Windlass & Mooring winch +8 Mooring winches
Make:	MacGregor
Type:	electrically driven with frequency inverter control

Special lifesaving equipment Number of each and capacity:	1set ,50P
Make:	CCSSC Luzhou Zhenjiang Marine Auxiliary Machinery Co., Ltd
Type:	fire-protected free fall lifeboat

Cargo pumps Number:	8pcs 2pcs/tank
Type:	Vertical submerged 3-phases indication
Make:	Shinko
Stainless steel:	Al Alloy casting
Capacity (each):	1,800m ³ /h
Cargo control system Make:	Intergrated into IAS
Ballast control system Make:	Intergrated into IAS
Ballast water treatment system Make:	Sunrui Marine Environment Engineering Co., Ltd
Capacity:	2x 2,500m ³ /h

Complement Officers:	19
Crew:	19
Supernumeraries/Spare:	4
Suez/Repair Crew:	6
Single/double/other rooms:	38/2/1
Passengers Total:	4
Number of cabins:	2

Navigation and other equipment Bridge control system Make:	ABB
Type:	PCS 800xA
Is bridge fitted for one-man operation?	NIBS
Integrated bridge system:	Y
If yes, make:	JRC
Radar Number:	2
Make:	JRC
Model(s):	JMR-9282-SN,JMR-9225-9XN

Fire detection system Make:	Consilium
Type:	Salwico CCP

Fire extinguishing systems Engine room: Make/Type:	Main fire extinguishing systems, Local water based mist (SEMCO), high expansion foam system (Survitec), portable fire extinguisher (Lingjack)
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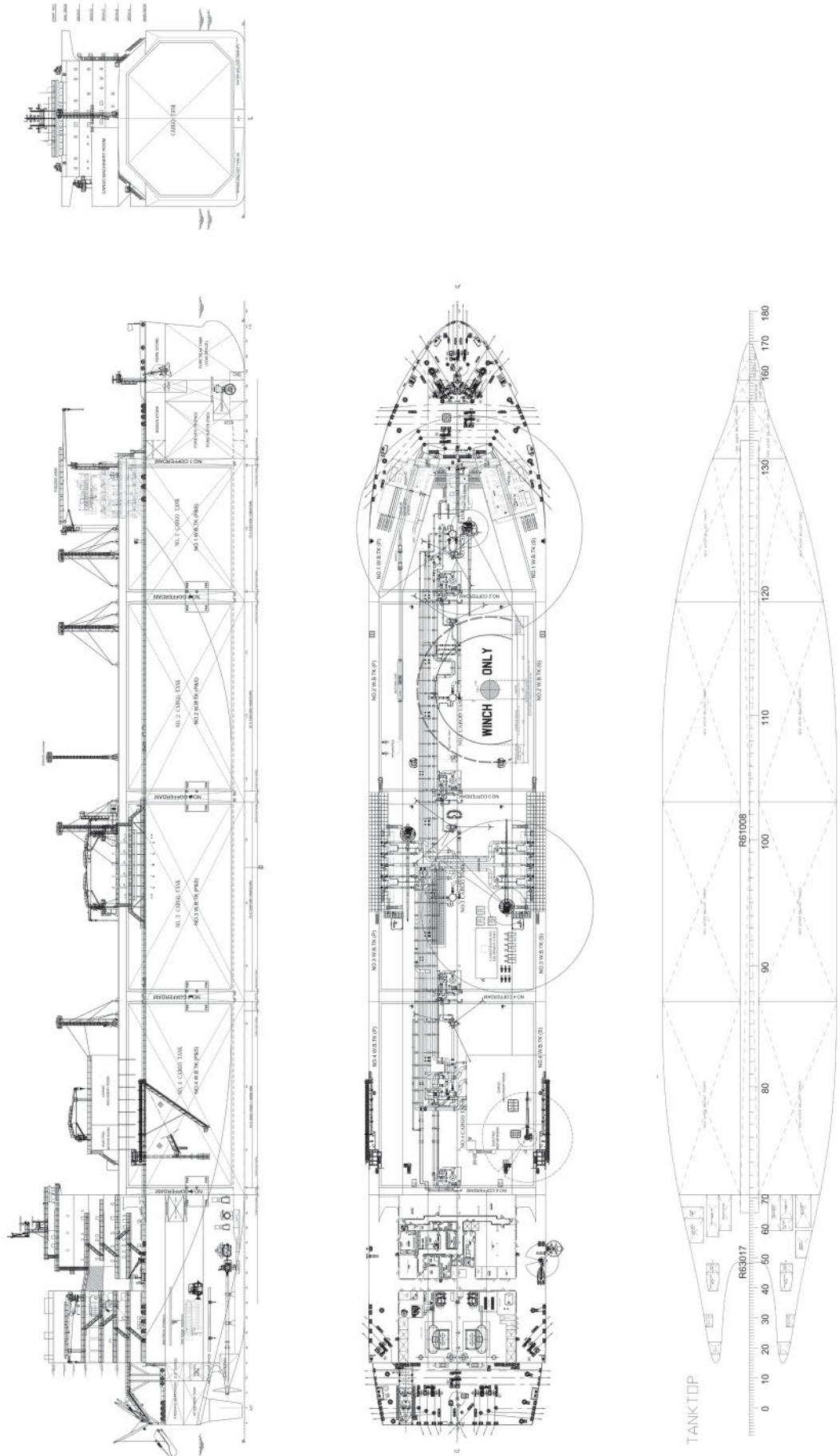
Cargo machinery spaces: Make/Type:	Main fire extinguishing systems, water spray system, CO ₂ system (Survitec), portable fire extinguisher (Lingjack)
Switchboard room: Make/Type:	CO ₂ system (Survitec), portable fire extinguisher (Lingjack)
Paint store, chemical store: Make/Type:	CO ₂ system (Survitec)

Efficiency Attained EEDI value:	6.03g-CO ₂ /ton mile, fulfil with EEDI Phase III
Required EEDI value:	8.8914 g-CO ₂ /ton mile (Phase I)

Launch/float-out date:	30 March 2020
Delivery date:	15 July 2021



TRANSGAS POWER



WU TONG – Chemical/product tanker



Shipbuilder:CSSC Wuchang Shipbuilding Industry Group Co., Ltd
Vessel's name:	Wu Tong
Owner/Operator:	Shanghai Gentco Logistics Co., Ltd
Country:	China
Designer:CSSC Shanghai Merchant Ship Design & Research Institute (SDARI)
Country:	China
Model test establishment used:Shanghai Ship & Shipping Research Institute
Flag:	China
IMO number:	9889722
Total number of sister ships already completed (excluding ship presented):	0
Total number of sister ships still on order:	1

Delivered in October 2021, Wu Tong is the latest generation of small size stainless steel chemical tanker developed by SDARI and built by Wuchang Shipbuilding Industry Group for Shanghai Gentco Logistics. The vessel is the first of a pair with its sister Mu Mian due for delivery in April 2022.

The 111.4m loa and 17.6m beam ship has a deadweight of 7,200tonnes. It has been designed to carry eight grades of product simultaneously in six pairs of tanks with No. 6 tank on port side doubling as a slop tank. For chemical cargoes the ship is restricted to types 2 and 3.

Each tank is fitted with a Framo submerged hydraulically driven centrifugal pump. Ten of the pumps have a capacity of 200m³/h while two are smaller and rated at 120m³/h. The tank heating systems use thermal oil as heat transfer medium allowing carriage of cargoes not permitted to be heated by water or steam. Additional PV valves are provided for much higher pressure setting during recirculating tank washing in harbour when using high volatile detergent to minimise emission as well as reducing the consumption of detergent and tank washing time.

The hull form is optimised for efficiency and manoeuvring with a vertical bow form without bulb. Power is provided by a six-cylinder Guangzhou Diesel Factory G32 medium-speed engine. Output of the engine is 2,665kW at 600rpm. The drive is through a CNG power gearbox to a 4.2m fixed pitch propeller with boss cap fin running at 176rpm. The daily fuel oil consumption is 9.95t/day at a service speed 13knots and 7.1m draught.

TECHNICAL PARTICULARS

Length oa:111.40m
Length bp:107.40m
Breadth moulded:17.60m

Depth moulded:9.50m
Draught

scantling:7.10m
design:7.10m

Gross:5,416t

Deadweight

scantling:7,200t
Speed, service (--%MCR output):13.0knots

Cargo capacity (m³)

Liquid volume:8,350

Bunkers (m³)

Heavy oil:280

Diesel oil:100

Water ballast (m³):2,900

Tankers – percentage segregated ballast:..100%

Daily fuel consumption (tonnes/day)

Main engine only:9.95

Classification society and notations:CCS

Propulsion

Main engine(s)

Design:GDF

Model:6G32

Manufacturer:Guangzhou Diesel Engine Factory Co., Ltd

Number:1

Type of fuel:HFO & MGO

Output of each engine:2,665kW x

600rpm

Is this a diesel-electric or hybrid?:.....N

Gearbox(es)

Make:CN Gpower Gearbox Co., Ltd

Model:GWS6066

Number:1

Output speed:146.5rpm

Propeller(s)

Material:Ni-Al-Bronze(Cu3)

Designer/Manufacturer:CSSC Shanghai Merchant Ship Design & Research Institute (SDARI)

Number:1

Fixed/Controllable pitch:FPP

Diameter:4.2

Diesel-driven alternators

Number:3

Engine make/type:Chongqing Cummins Engine Co., Ltd CCEC K19-DM

Type of fuel:MGO

Alternator make/type:CSIC Electrical Machinery Science & Technology Co., Ltd

Output/speed of each set:.....400kW x

1,800rpm

Boilers

Number:2

Type:Auxiliary, Composite Boiler

Make:Sanjie Industry

Output, each boiler:Auxiliary 8,000kg/h,

Composite (Oil-fired /ME exh-side

1,000/800kg/h)

Deck machinery

Cargo cranes/cargo gear

Number:1

Make:Jiangyin Safety Sea Marine Equipment Co., Ltd

Type:Electric-hydraulic

Performance:5t-14m

Other cranes

Number:1

Make:Jiangyin Safety Sea Marine Equipment Co., Ltd

Type:Electric

Tasks:for Engine spare

Performance:1.5t-4.5m

Mooring equipment

Number:4

Make:Jiangsu Masada Heavy Industries Co., Ltd

Type:Hydraulic

Special lifesaving equipment

Number of each and capacity:20p

Make:Wuxi Wenjiao F. R. R. P Factory

Type:Free-fall lifeboat

Cargo tanks

Number:12

Grades of cargo carried:

Product range:.....Product oil (excluding asphalt, bitumen) and /or chemicals (ship type 2 and 3)

Stainless steel – structure/piping:....205/316L

Cargo pumps

Number:12

Type:Submerged centrifugal pumps, hydraulic motor driven

Make:Framo

Stainless steel:316L (Mo≥2.5%)

Capacity (each):10-200m³/h x 110mLc, 2-120m³/h x 110mLc

Cargo control system

Make:Framo

Type:Framo cargo pumping system

Ballast control system

Make:API Marine

Type:hydraulic

Ballast water treatment system

Make:Ahead Ocean Technology (Dalian) Co., Ltd

Capacity:200m³/h

Complement

Officers:10

Crew:8

Suez/Repair Crew:6

Single/double/other rooms:18/0/1

Navigation and other equipment

Is bridge fitted for one-man operation?:N

Integrated bridge system:.....N

Radar

Number:2

Make:Furuno

Model(s):FAR-2328/FAR-2338S

Fire detection system

Make:Brightsky

Fire extinguishing systems

Cargo holds:Deck area, deck foam fire fighting system, and sea water

Make/Type:.....Shanghai Anhang Maritime Firefighting Equipment, Co., Ltd / Deck foam

Engine room:CO₂ / Local Mist Spray

Make/Type:Shanghai Anhang Maritime Firefighting equipment, Co., Ltd

Cabins:Sea water

Public spaces:Sea water

Waste disposal plant

Incinerator

Make:Hansun (Shanghai) Marine Technology Co., Ltd

Model:HSINC-18

Sewage plant

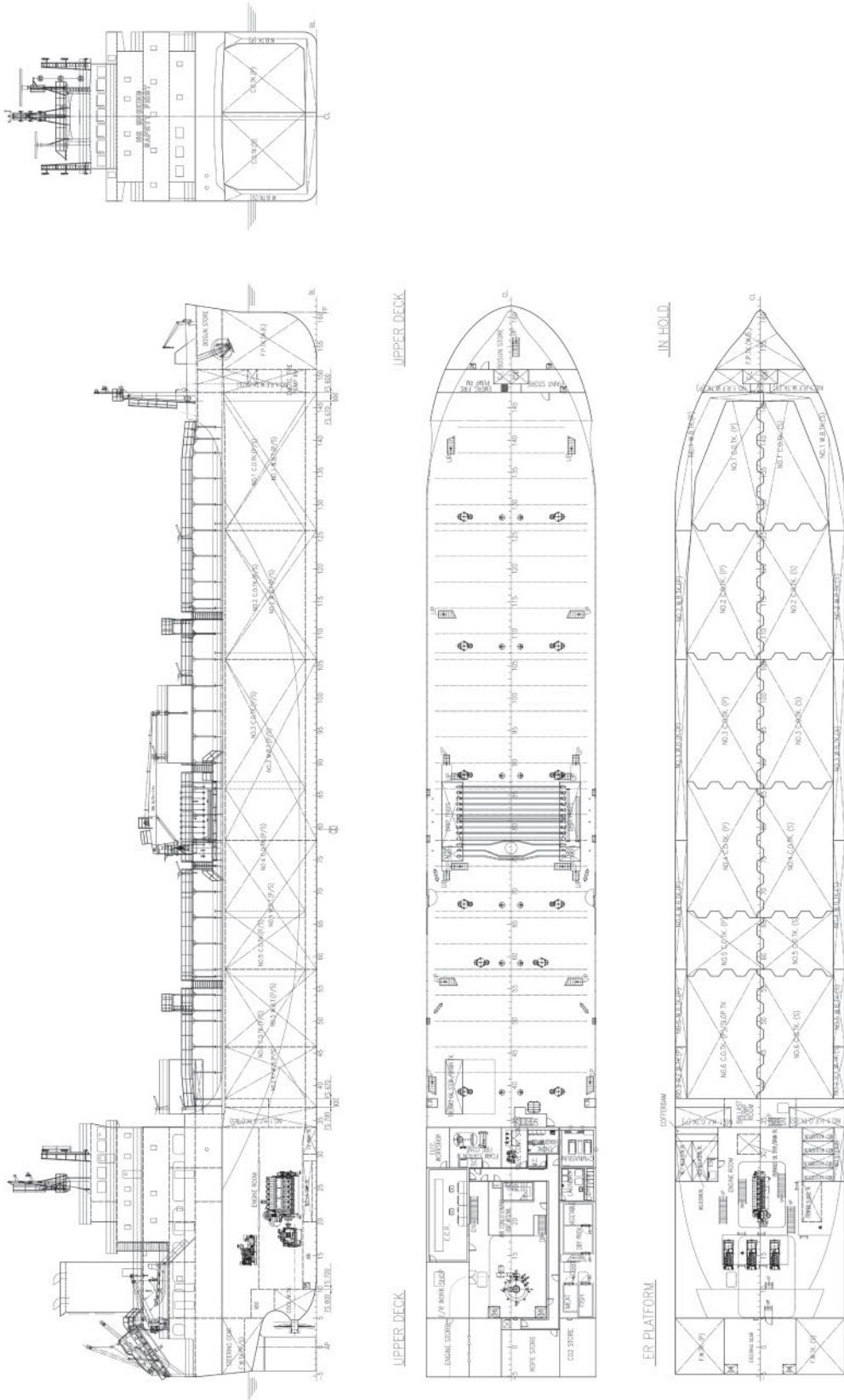
Make:Wuhan Zhongzhou Env. Protection Equipment Co., Ltd

Model:WC BX-20C

Contract date:November 2018

Launch/float-out date:May 2021

Delivery date:October 2021



XIANG AN KOU – Heavy lift vessel



Shipbuilder:	CSSC Guangzhou Shipyard International Co. Ltd
Vessel's name:	Xiang An Kou
Owner/Operator:	COSCO (HK) Investment & Development Co., Ltd
Country:	China
Designer:	Shanghai Merchant Ship Design & Research Institute, CSSC (SDARI)
Country:	China
Model test establishment used:	Shanghai Ship & Shipping Research Institute
Flag:	Liberia
IMO number:	9888089
Total number of sister ships already completed (excluding ship presented):	0
Total number of sister ships still on order:	0

Xiang An Kou is a 48,500dwt semi-submersible heavy lift vessel tailor-made for Chinese Owner COSCO (HK) Investment & Development and delivered in May 2021. The vessel was built by CSSC Guangzhou Shipyard and although a one off is a development of three earlier vessels in the owner's X-Class.

While the hull dimensions of 216.7m length and 43m beam are the same as the older vessels, and all four share the same configuration of forward superstructure and aft casings, *Xiang An Kou* can be distinguished by its vertical bow and lack of a bulb. The vessel also has a different propulsion system and is more powerful than its elder siblings.

It is designed as a twin screw, diesel-electric with four MAN 8L32/40 powered gensets each producing 3,860kW at 720rpm. The SCR NOx emission treatment system on the four main engines and auxiliary generators ensure compliance with the Tier III emission limit. The ship's twin fixed pitch propellers are each driven at a maximum 94.8rpm by Siemens 6,000kW electric motor through reduction gearboxes. *Xiang An Kou* has two bow thrusters and two stern thrusters with DP2 dynamic positioning capability.

The open deck has a length of 164.8m from the superstructure to the front of the aft casings and 177.6m from superstructure to the stern between the casings. The ballasting system comprises four 6,600m³/hr air compressors, two 1,200m³/hr pumps, and two 160m³/hr pumps. No less than 61 ballast tanks, including top tanks, double bottom tanks, centre tanks and side tanks enable the vessel to better control motions and accelerations. The ship can ballast down to have 13m of water above the main deck.

Xiang An Kou can carry a non-buoyant cargo of 20,000tonnes with a VCG OF 23m above the ship's main deck or a buoyant

cargo of 30,000tonnes and a VCG of 25m above the ship's main deck.

TECHNICAL PARTICULARS

Length oa:	216.70m
Length bp:	212.46m
Breadth moulded:	43.00m
Depth moulded	
to main deck:	13.00m
to upper deck:	13.00m
Draught	
scantling:	9.60m
design:	9.60m
Gross:	38,935t
Deadweight	
scantling:	48,500t
design:	48,500t
Speed, service:	14.5knots
Bunkers (m ³)	
Heavy oil:	4,750
Diesel oil:	360
Water ballast (m ³):	93,500
Classification society and notations:	CCS
★ CSA Semi-Submersible Vessel; ERS; PSPC(B); Ice Class B; BWMP; Loading Computer(S,I); In-Water Survey ★ CSM AUT-0; SCM; GPR(EU); Green Ship I; NEC(III); BWMS; FTP; PR-2	
Propulsion	
Propulsion Motor(s)	
Design:	Siemens
Manufacturer:	Siemens
Number:	2
Output of each engine:	6,000kW
Is this a diesel-electric or hybrid?:	Y
Gearbox(es)	
Make:	Nanjing High Accurate Marine Equipment Co., Ltd
Number:	2
Output speed:	94.8rpm
Propeller(s)	
Material:	Ni-Al-Bronze
Designer/Manufacturer:	Shanghai Merchant Ship Design & Research Institute, CSSC (SDARI)
Number:	2
Fixed/Controllable pitch:	FPP
Diameter:	6,000mm
Speed:	74.8rpm
Diesel-driven alternators	
Number:	4
Engine make/type:	Shaanxi Diesel Engine Heavy Industry Co., Ltd / MAN 8L32/40
Type of fuel:	HFO & MDO
Alternator make/type:	TFJ4 906-3
Output/speed of each set:	3,860kW / 720rpm
Boilers	
Number:	5
Type:	1x Oil Fired Thermal Oil heater/ 4 x Exhaust Gas heater
Make:	Göteborgs Energy Systems AB
Output, each boiler:	1 x 1,600kW / 4 x 400kW

Stern appendages/special rudders: semi-balanced rudders with rudder bulbs

Bow thruster(s)

Make:	SMMC
Number:	2
Output (each):	1,800kW
Stern thruster(s)	
Make:	SMMC
Number:	2
Output (each):	1,500kW
Other cranes	
Number:	2
Make:	Ningbo Kairong Ship Machinery Co., Ltd
Type:	YB2-315M-4-H
Tasks:	Provision handling
Performance:	SWL 35t @ 21m

Mooring equipment

Number:	10
Make:	Jiangsu Masada Heavy Industries Co., Ltd
Type:	Hydraulic

Special lifesaving equipment

Number of each and capacity:	50 person
Make:	Jiangsu Jiaoyan Marine Equipment Co., Ltd

Type:	Totally enclosed lifeboat and rescue boat
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Ballast water treatment system

Make:	Headway Technology Co., Ltd
Capacity:	1,200m ³ /h

Complement

Crew:	37
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Passengers

Total:	12
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Number of cabins:	3
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Navigation and other equipment

Bridge control system

Make:	COSCO Shipping Electronics (Guangzhou) Co., Ltd
Is bridge fitted for one-man operation?N

Integrated bridge system

Radar:	
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Number:	2
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Make:	Furuno
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Model(s):	FAR-2328,FAR-2338S
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Fire detection system

Make:	Consilium
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Type:	Salwico Cargo
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Fire extinguishing systems

Engine room:CO ₂
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Waste disposal plant

Incinerator:	
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Make:	Hansun
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Model:	HSINC-50A
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Efficiency

Installed Fuel Meters:	mass flow
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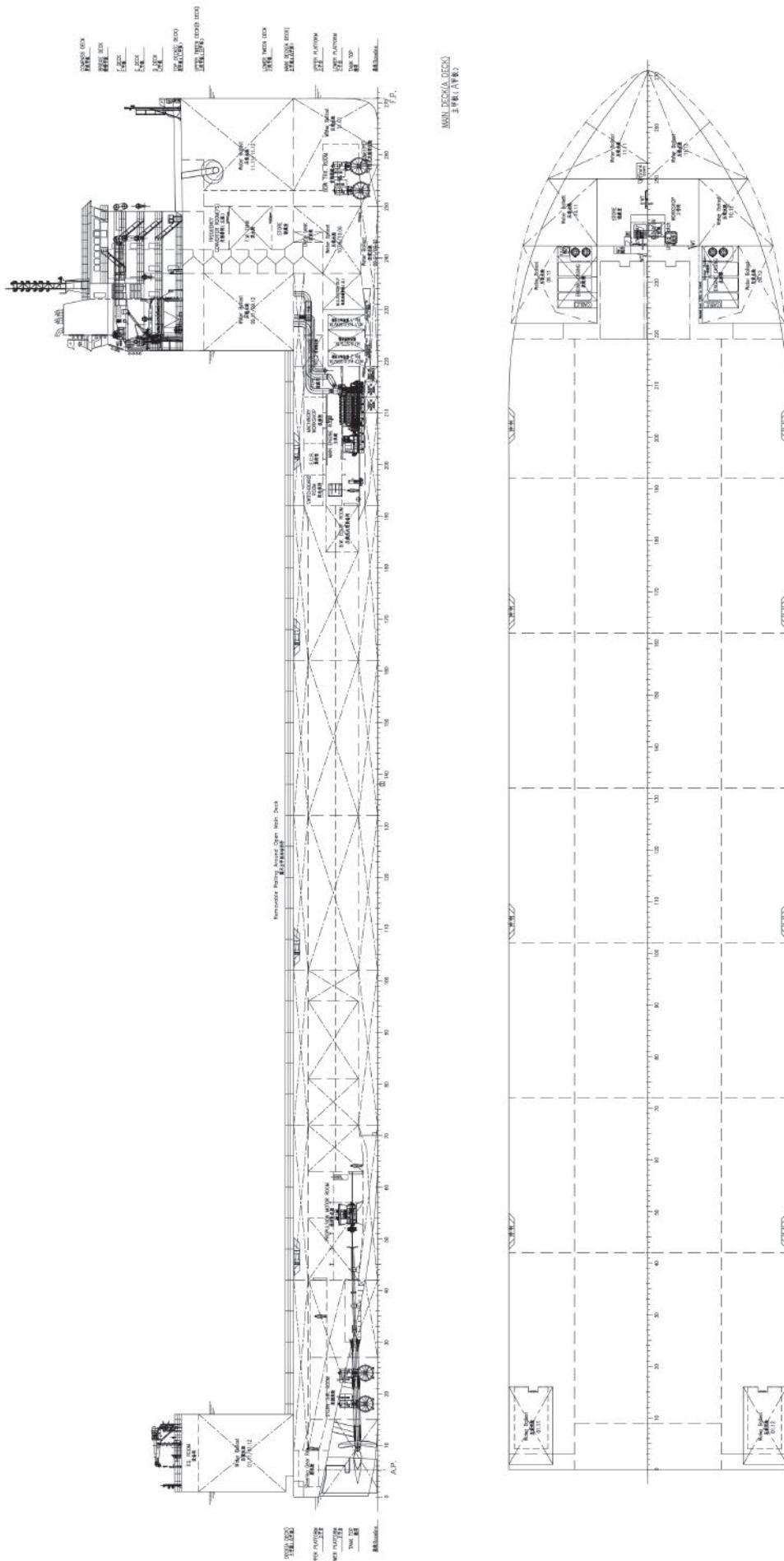
Energy Saving Technologies:	rudder bulb
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Contract date:	May 2019
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Launch/float-out date:	December 2020
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Delivery date:	May 2021
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XIANG AN KOU



RINA PUBLICATIONS

The RINA has established an excellent reputation for producing Technical Magazines, Conference Proceedings and Transactions of the highest quality covering all aspects of naval architecture and the maritime industry in general.



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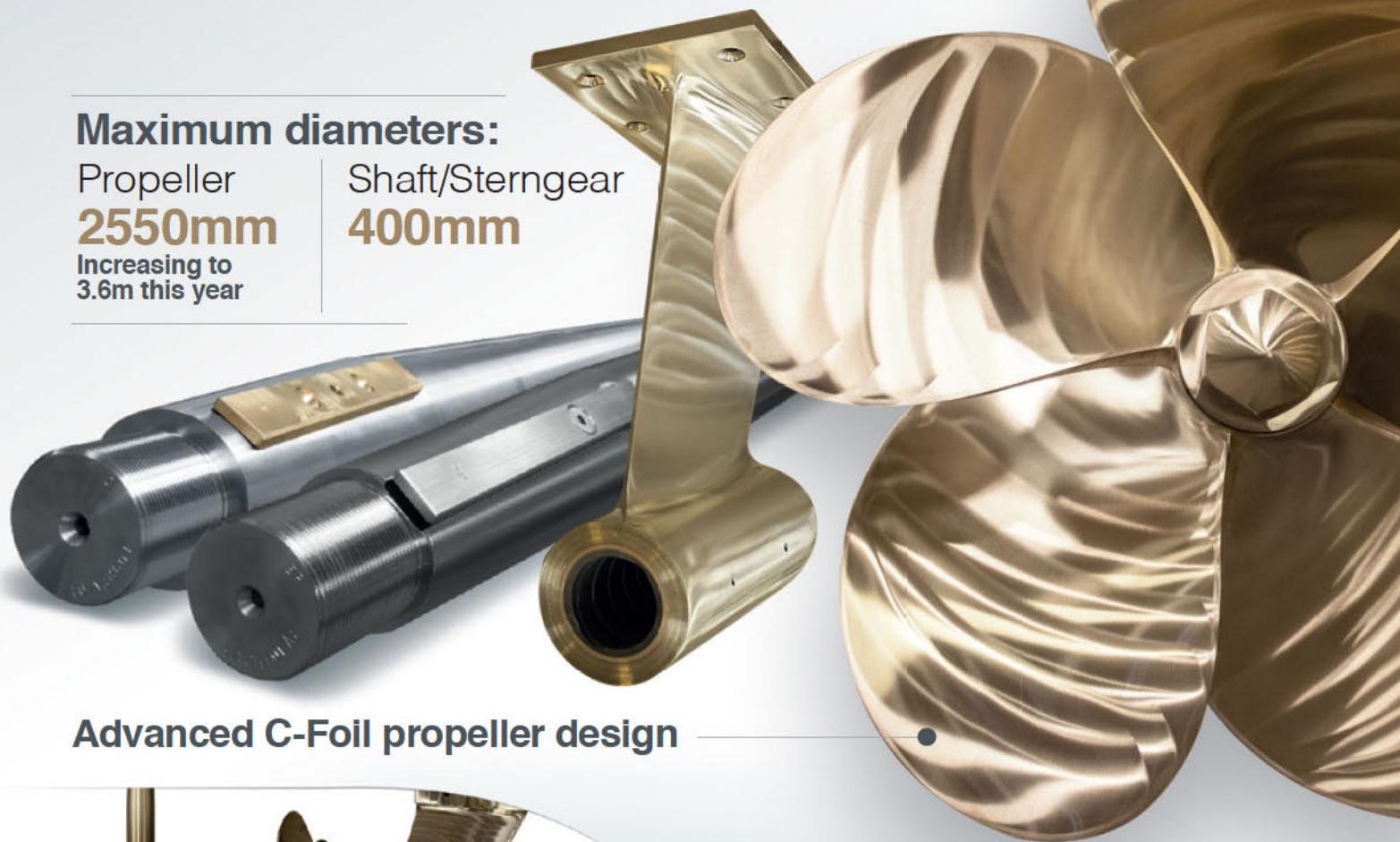


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