

# AL ADAILIAH – Oil tanker

Shipbuilder: **Hyundai Mipo Dockyard Co., Ltd.**  
Vessel's name: ..... **Al Adailiah**  
Owner/Operator: ..... **Kuwait Oil Tanker Company S.A.K.**  
Country: ..... **Kuwait**  
Designer: ... **Hyundai Mipo Dockyard Co., Ltd.**  
Country: ..... **Republic of Korea**  
Model test establishment used: ..... **SSPA**  
Flag: ..... **Kuwait**  
IMO number: ..... **9856684**  
Total number of sister ships already completed (excluding ship presented): ..... **3**  
Total number of sister ships still on order: ..... **Nil**

Ordered in 2018 as part of Kuwait Oil Tanker Company's (KOTC) fleet renewal project, which plans to double the company's fleet size to around 60 vessels of various types over 20 years, *Al Adailiah* is the first in a series of four MR product tankers designed and built by Hyundai Mipo Dockyard.

The vessel was delivered in February and was followed over the next four months by *Al Yamamah* (March), *Shegardiah* (April) and *Sifsafah* (May) to complete the series.

*Al Adailiah* has a deadweight of 48,578 tonnes, hull dimensions of 183.06m loa, 32.20m beam and a moulded depth of 18.80m. The hull has a bulbous bow and a transom stern.

With 12 tanks placed six each side separated by a central bulkhead, the ship is designed for carrying six grades of cargo and simultaneously handling all cargo related operations with double valve and spool piece segregation between the grades. There are also two slop tanks.

The ship is fitted with an inert gas generator and cargo handling is performed with Framo submerged centrifugal pumps in each tank. The cargo pumps have a 600m<sup>3</sup>/h capacity and those in the slop tanks 300m<sup>3</sup>/h. There is also a 50m<sup>3</sup>/h pump in the residue tank.

Power comes from a Hyundai-built MAN B&W 6G50ME-C9.5-HPSCR main engine rated at 8,400kW. The G prefix signifies an ultra-long stroke (2,500mm) variant and the HPSCR suffix denoting that IMO Tier III NOx requirements are met by way of a high-pressure selective catalytic reduction system. The owner has opted not to use a scrubber for meeting SOx emission rules so the vessel will run either on VLSFO or MGO as appropriate. The engine is mechanically linked to a single fixed pitch propeller to give a service speed of 15knots. *Al Adailiah* is also fitted with a trio of HIMSSEN gensets using six-cylinder H21/32 engines, each of which produces 1,400kW at 900rpm.

## TECHNICAL PARTICULARS

Length oa: ..... Approx. 183m  
Length bp: ..... 175.3m  
Breadth moulded: ..... 32.20m  
Depth moulded  
to main deck: ..... 18.80m  
to upper deck: ..... 18.80m  
Width of double skin  
side: ..... 2.0m  
bottom: ..... 2.15m

Draught  
scantling: ..... 12.60m  
design: ..... 10.50m  
Gross: ..... 29,888gt  
Deadweight  
scantling: ..... 48,500t  
design: ..... 37,300t  
Speed, service (83%MCR output with 15% S.M.): ..... Approx. 15.0knots  
Cargo capacity (m<sup>3</sup>)  
Liquid volume: ..... 54,600  
Bunkers (m<sup>3</sup>)  
Heavy oil: ..... 1,600  
Gas oil: ..... 500

Water ballast (m<sup>3</sup>): ..... 20,700

Daily fuel consumption (tonnes/day)  
Main engine only: ..... 28.3

Classification society and notations:.....LR  
+100A1, Double Hull Oil Tanker, CSR, ESP, ShipRight (ACS(B), CM), LI, \*IWS, SPM4, ECO (BWT, IHM, SEEMP), +LMC, BWTS, IGS, UMS, NAV1 with descriptive note: COW(LR), ETA, ShipRight(BWMP(T), SCM, SERS)

Propulsion  
Main engine(s)  
Design: ..... Hyundai – MAN B&W  
Model: ..... 6G50ME-C9.5-HPSCR  
Manufacturer: ..... HHI Engine & Machinery Division  
Number: ..... 1  
Type of fuel: ..... HFO, MGO  
Output of each engine: ..... 8,400kW  
Is this a diesel-electric or hybrid?: ..... No

Propeller(s)  
Material: ..... Ni-Al-Bronze  
Designer/Manufacturer: ..... Hyundai Heavy Industries  
Number: ..... 1  
Fixed/Controllable pitch: ..... Fixed  
Diameter: ..... 6.8m  
Speed: ..... 92.8rpm at MCR

Diesel-driven alternators  
Number: ..... 3  
Engine make/type: ..... HHI Engine & Machinery Division / 6H21/32 HIMSSEN  
Type of fuel: ..... HFO, MGO  
Alternator make/type: ..... Hyundai Electric and Energy System / HFJ7 568-08P  
Output/speed of each set: 1,140kW / 900rpm

Boilers  
Number: ..... 1  
Type: ..... Heavy fuel oil burning  
Make: ..... Alfa Laval  
Output, each boiler: ..... 18,000kg/h (evaporation) / 7kg/cm<sup>2</sup>g (steam condition)  
Stern appendages/special rudders: ..... N/A  
Deck machinery  
Cargo cranes/cargo gear  
Number: ..... 1  
Make: ..... Oriental  
Type: ..... Electro hydraulic  
Performance: ..... SWL 10.0t / Outreach 6.8 ~ 25.5m

Other cranes  
Number: ..... 1  
Make: ..... Oriental  
Type: ..... Electro-hydraulic  
Tasks: ..... Provision and machinery parts handling in engine room  
Performance:.....SWL 3.2t / Outreach 2.7 ~ 10.6m

Mooring equipment  
Number: ..... 6  
Make: ..... Rolls-Royce  
Type: ..... Hydraulic

Special lifesaving equipment  
Number of each and capacity: ...2 x 40 persons  
Make: ..... Hyundai Lifboat  
Type: ..... Davit-launched type by falls  
If MES, vertical or sloping chutes?: ..... N/A

Cargo tanks  
Number: .....12 cargo tanks / 2 slop tanks  
Grades of cargo carried: Products (MARPOL Annex I)  
Product range: ..... Crude oil / Clean and Dirty Petroleum Products  
Coated tanks: ..... Chokwang Jotun Paint / Pure epoxy tank coating  
Stainless steel – structure/piping: SUS 316L / JIS ERW S 370, STPG 370 E

Cargo pumps  
Number: .....12 cargo tanks / 2 slop tanks / 1 residual tank  
Type: ..... Submerged centrifugal  
Make: ..... Framo  
Stainless steel: ..... AISI 316L  
Capacity (each): ..... 600m<sup>3</sup>/h(cargo) / 300m<sup>3</sup>/h(slop) / 50m<sup>3</sup>/h(residual)

Cargo control system  
Make: ..... Framo  
Type: ..... Piano type control console

Ballast control system  
Make: ..... Emerson  
Type: ..... Hydraulic control system

Ballast water treatment system  
Make: ..... Erma First  
Capacity: ..... 800m<sup>3</sup>/h x 2 (upper deck) / 300m<sup>3</sup>/h x 1 (E/R)

Complement  
Officers:..... 17  
Crew:..... 12  
Suez/Repair Crew: ..... 6  
Single/double/other rooms: ..... 25 / 4 / 1  
Navigation and other equipment  
Bridge control system  
Make: ..... Kongsberg  
Type: ..... AutoChief 600  
Is bridge fitted for one-man operation? ...Yes  
Integrated bridge system? .....No

Radars  
Number: ..... 2  
Make: ..... Japan Radio Co.,Ltd.  
Model(s): ..... JMR-9272-S / JMR-9225-6X

Fire detection system  
Make: ..... Consilium  
Type: ..... Salwico Cargo

Fire extinguishing systems  
Engine room: .. CO<sub>2</sub> fire extinguishing system, local fire extinguisher  
Make/Type: ..... NK / High pressure, fixed  
Cabins: ..... Fire extinguisher  
Make/Type: ..... NK / Portable  
Public spaces: ..... Fire extinguisher  
Make/Type: ..... NK / Portable

Efficiency  
Attained EEDI value: ..... 5.06 g/t-nm  
Required EEDI value: ..... 5.66 g/t-nm  
Installed Fuel Meters: ...Electro pneumatic type tank level gauge

Other installed monitoring tools: ..... Torsion meter, Electro pneumatic type draught gauge  
Energy Saving Technologies\*:  
Hull coatings: Jhokwang Jotun / Seaquantum Pro U

Performance Monitoring Regime: ..... KYMA / SPMS (Ship Performance Monitoring System)

Contract date: ..... 30 April 2018  
Launch/float-out date: ..... 6 September 2019  
Delivery date: ..... 28 February 2020

# BAJAMAR EXPRESS – Passenger/ro-ro ship

Shipbuilder: ..... **Austal**  
Vessel's name: ..... **Bajamar Express**  
Owner/Operator: ..... **Fred Olsen Express**  
Country: ..... **Spain**  
Designer: ..... **Austal**  
Country: ..... **Australia**  
Flag: ..... **Spanish Maritime Authority**  
IMO number: ..... **9874296**  
Total number of sister ships already completed  
(excluding ship presented): ..... **Nil**  
Total number of sister ships still on order: ..... **1**

The 118m high-speed trimaran ferry *Bajamar Express* was delivered to Fred Olsen Express of the Canary Islands on 7 July 2020. The ship is the first of a pair, with the second vessel *Bañaderos Express* expected in 2021. *Bajamar Express* was built at Austal's yard in Australia, but its sister has been entrusted to the company's yard in the Philippines and will be the largest vessel built there when completed. Fred Olsen operates the ferries in the Atlantic, serving the Canary Islands and connecting ports across seven of the islands.

Both vessels are a little shorter than Fred Olsen's 2005-built *Benchijigua Express*, which remains the largest ferry ever built by Austal. However, the two ships are a generation ahead in terms of seakeeping and comfort and they will become the second largest vessels in the builder's high-speed ferry portfolio.

The original contract for the ships was announced in October 2017. Back then, they were said to be 117m in length but, as delivered, *Bajamar Express* is 118m in length and has a beam of 28.48m. It can carry 1,100 passengers and has 350 lane metres, accessed by a stern ramp for trucks, capable of holding a total of 276 cars over two decks.

*Bajamar Express'* power and propulsion system comprises four MTU 20V800 M71L engines each outputting 9,100kW. Every engine serves a dedicated Kongsberg Kamewa 125 S3 waterjet through a Reintjes gearbox. The two models in the forward engine room serve the centre two waterjets and the two in the aft engine room the port and starboard waterjets. Normal cruising speed is 37.5knots, but during sea trials the vessel reached over 44knots. Austal's Motion Control System of T-foils (one forward and two aft) and rim flaps give a smoother ride.

The ship also features Austal's next-generation Marinelink integrated monitoring, alarm and control systems. This can assist decision-making as to motion control, trim, speed and route planning in

accordance with loading and sea state conditions and can share information with the shore.

## TECHNICAL PARTICULARS

Length oa: ..... 118m  
Length bp: ..... 109.6m  
Breadth moulded: ..... 28.48m  
Depth moulded  
to main deck: ..... 8m  
Draught  
scantling: ..... 3.79m  
Gross tonnage: ..... 7,900gt

Deadweight  
scantling : ..... 750t  
Speed, service (85%MCR output): .....37.5knots  
Bunkers (m³)  
Diesel oil: ..... 187

Classification society and notations: ....DNV GL,  
\*1A HSLC R1 Car Ferry B EO BIS  
Heel control equipment: ... 1 forward T-foil and 2  
trim tabs  
Roll-stabilisation equipment: 2x swinging T-foils  
and 2 trim tabs

Propulsion  
Main engine(s)  
Model: .....20V8000 M71L  
Manufacturer: .....MTU  
Number: ..... 4  
Type of fuel: .....MDO  
Output of each engine: ..... 9,100kW  
Is this a diesel-electric or hybrid?: .....No  
Fuel Efficiency of each set: .....2,072/h

Gearbox(es)  
Make: ..... Reintjes  
Model: ..... VLJ 7531  
Number: ..... 4

Waterjet(s)  
Designer/Manufacturer: ..... Kongsberg  
Model: ..... Kamewa S3-125  
Number: ..... 4

Diesel-driven alternators  
Number: ..... 4  
Engine make/type: ..... Cat C18  
Type of fuel: .....MDO  
Maximum power output of each set: ..465kW  
Stern appendages/special rudders: ..... T-max  
Bow thruster(s)  
Make: ..... Thrustmaster

Type: ..... TH500MLR  
Number: ..... 2

Deck machinery  
Davit(s)  
Number: ..... 2  
Make: ..... Davit international-hische  
Type: ..... Rescue boat davit  
Tasks: ..... Rescue boat deployment and  
retrieval

Anchor Winch  
Number: ..... 1  
Make: ..... Hypac  
Type: ..... Hydraulic  
Capstan(s)  
Number: ..... 4  
Make: ..... Hypac  
Type: ..... Hydraulic

Special lifesaving equipment  
Number of each and capacity: .....13 x 100  
persons, 1x 50 persons  
Make: .....Liferaft Systems Australia  
Type: ..... 4 x MES, 10 x liferafts  
If MES, vertical or sloping chutes?: ... Sloping

Cargo/capacity  
Vehicles  
Number of vehicle decks: ... 2 vehicle decks  
Total lane length: 350 lane meters for trucks  
(and 100 cars)  
Total cars: .....276 cars  
Total motorcycles: .....21 motorcycles

Doors/ramps/lifts/moveable car decks  
Number of each: .....3 hoistable ramps,  
4 hoistable decks  
Type: ..... Hoistable ramps and decks  
Designer: ..... Austal

Complement  
Max Crew: ..... 28  
Single/double/other rooms: ... 4 single rooms,  
10 double rooms

Passengers  
Total: ..... 1,100

Navigation and other equipment  
Bridge control system  
Make: ..... MARINELINK  
Type: ..... Intergrated monitoring and  
control system  
Is bridge fitted for one-man operation?: No

Radars  
Number: ..... 2  
Make: ..... Sperry  
Model(s): ... Vision Master Net Radar (S- and  
X-band)

Fire detection system  
Make: .....Consilium  
Type: ..... Custom

Fire extinguishing systems  
Engine room: .....CO<sub>2</sub> & fire main  
Make/Type: .....Consilium and Austal  
Vehicle spaces: ..... Drencher & fire main  
Make/Type: ..... Austal  
Cabins: ..... Sprinkler & fire main  
Make/Type: ..... Austal  
Public spaces: ..... Sprinkler & fire main  
Make/Type: ..... Austal

Efficiency  
Installed Fuel Meters: .....8 fuel flow meters  
installed on main engine supply and return lines  
Other installed monitoring tools: ..Torque meter,  
ultrasonic sensor system  
Energy Saving Technologies: .Trim optimisation  
using Austal's MARINELINK-Smart and  
Austal's Motion Control System  
Hull coatings: .....International Intersleek

Performance Monitoring Regime: ..MARINELINK-  
Smart

Contract date: .....October 2017  
Launch/float-out date: ..... February 2020  
Delivery date: ..... July 2020

Shipbuilder: ..... **Oshima Shipbuilding Co., Ltd**  
Vessel's name: ..... **Beate Oldendorff**  
Owner/Operator: **Oldendorff Carriers GmbH & Co. KG**  
Designer: ..... **Oshima Shipbuilding Co., Ltd.**  
Country: ..... **Japan**  
Flag: ..... **Madeira**  
IMO number: ..... **9853022**  
Total number of sister ships already completed  
(excluding ship presented): ..... **2**  
Total number of sister ships still on order: .... **Nil**

The three ships in the series, *Beate Oldendorff*, *Benjamin Oldendorff* and *Britta Oldendorff* (all of which are 62,500dwt), and larger vessel *Dietrich Oldendorff* were christened in a joint naming ceremony in January 2020. All four vessels were delivered on time two to three months later.

The holds are CO<sub>2</sub> fitted and have strengthened tanktops allowing 25tonnes/m<sup>2</sup> in holds 1 to 4 and 26tonnes/m<sup>2</sup> in hold 5. When carrying heavy cargoes, holds 2 and 4 can be empty. There are cement ports in the hatches allowing for loading of grain or cement by pumps. Cargo handling gear consists of four electro-hydraulic cranes with a capacity of 30tonnes and a radius of 26m. Total grain capacity is 79,506m<sup>3</sup>.

Power to move the ship at a service speed of 14knots is provided by a Kawasaki-built MAN B&W 6S50ME-B9.5 engine series with a 7,220kW output at 94rpm. There are three Daihatsu gensets each producing 530kW at 900rpm. All gensets and the main engine can run on HFO and are connected to a Yara scrubber system allowing the vessel to meet the latest SOx regulations.

**TECHNICAL PARTICULARS**

Length oa: ..... 199.995m  
Length bp: ..... 196m  
Breadth moulded: ..... 32.26m  
Depth moulded .....  
    to main deck: ..... 18.97m  
    to upper deck: ..... 18.97m  
Width of double skin  
    side: ..... Single hull type for all cargo hold

Cargo capacity (m <sup>3</sup> )	
Grain: .....	79,506
Bunkers (m <sup>3</sup> )	
Heavy oil: .....	1,652m
Diesel oil: .....	367
Water ballast (m <sup>3</sup> ): .....	33,235

Classification society and notations: .....Nippon  
Kaiji Kyokai  
NS\*(CSR, BC-A, BC-XII, GRAB 20, PSCP-  
WBT, EQ C DG, NC) (ESP) (IWS) (PSCM)  
(IHM), (SOx(EGCS)), MNS\*(M0), Strengthened  
for heavy cargo loading where hold No.2 and  
4 may be empty, (SOx-EGCS-M/E, G/E(Nos.  
1,2,3)).

Propulsion  
Main engine(s)  
Design: ..... Kawasaki Heavy Industries  
Model: .. Kawasaki MAN B&W 6S50ME-B9.5  
Manufacturer: .... Kawasaki Heavy Industries, Ltd.  
Number: ..... 1  
Type of fuel: ..... HFO  
Is this a diesel-electric or hybrid?: ..... No  
Propeller(s)  
Material: ..... Ni-Al-Bronze  
Designer/Manufacturer: ...Nakashima Propeller

Number: ..... 1  
Fixed/Controllable pitch: .....Fixed  
Diesel-driven alternators  
Number: ..... 3  
Engine make/type: ..... Daihatsu Diesel Mfg.

**Exhaust-gas scrubbing equipment**

Manufacturer:	...Yara Marine Technologies AS
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: ..... Vertical cylindrical composite type  
Make: ..... Osaka Boiler Mfg.

Deck machinery  
Cargo cranes/cargo gear  
Number: ..... 4  
Make: ..... Iknow Machinery  
Type: ..... Jib type  
Performance: ..... 30t x 26m

**Mooring equipment**

Number: ..... 2 mooring winch, 2 windlass/  
mooring winch  
Make: ..... Nippon Pusnes  
Type: ..... Electro-hydraulic

Special lifesaving equipment  
Number of each and capacity: ..... 1 free-fall  
lifeboat / 25 persons  
Make: ..... Shigi Shipbuilding  
Type: ..... F.R.P. totally enclosed

Hatch covers  
Design: ..... Iknow Machinery  
Manufacturer: ..... Iknow Machinery  
Type: ..... Weather-tight folding type

Ballast control system  
Make: .....Nakakita Seisakusyo  
Type: .....Multi control panel

Ballast water treatment system  
Make: .....Techross Inc.

Complement

Officers:.....	8
Crew: .....	13
Supernumeraries/Spare: .....	4

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

Radars  
Number: ..... 2  
Make: ..... Furuno Electric

Fire detection system  
Make: ..... Consilium Nittan Marine  
Type: ..... Smoke, thermal, flame

Fire extinguishing systems  
Cargo holds:  
Make/Type: ..... Air Water Safety Service  
Inc. / CO<sub>2</sub> fire extinguishing system

Engine room:  
Make/Type: ..... Air Water Safety Service  
Inc. / CO<sub>2</sub> 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  
Waste shredder/crusher  
Make: ..... Mitsuboshi Chuki Mfg.  
Sewage plant  
Make: ..... Taiko Kikai Industries

Efficiency  
Attained EEDI value: .....-29.5%

Contract date: ..... March 2016  
Delivery date: ..... 18 March 2020

# BO HAI HENG TONG – Ro-ro

Shipbuilder: ..... **Yantai CIMC Raffles Offshore Ltd.**  
Vessel's name: ..... **Bo Hai Heng Tong**  
Owner/Operator: .. **Bohai Ferry Group Co., Ltd**  
Country: ..... **China**  
Designer: .. **Shanghai Merchant Ship Design & Research Institute, CSSC (SDARI)**  
Country: ..... **China**  
Model test establishment used: **Shanghai Ship & Shipping Research Institute (SSRI)**  
Flag: ..... **China**  
IMO number: ..... **9870680**  
Total number of sister ships already completed (excluding ship presented): ..... **1**  
Total number of sister ships still on order: ..... **Nil**

Delivered in September 2020 by the Yantai CIMC Raffles shipyard to owner Bohai Ferry Group of China, *Bo Hai Heng Tong* is the first of two multipurpose ro-ro ships built for service with the owner's joint venture company operating in Bohai Bay. Its sister *Bo Hai Heng Da* was launched a month later.

The vessel is significant for several reasons as it is the largest of its type in Asia, the first for the joint venture established by Bohai Ferry and Hengtong Logistics and the first ro-ro built by the yard. The shipyard has since secured a new contract with Wallenius SOL for an ice class ro-ro due to operate in the Gulf of Bothnia and Baltic Sea.

*Bo Hai Heng Tong* is 189.9m in length and has a beam of 26.4m. The 24,777gt ship has three fixed vehicle decks with a total of 2,700 lane meters served by a stern ramp, a stern starboard quarter ramp and a bow ramp with interior ramps and lifting platforms. The weather deck is covered for around half of the vessel's length providing space for 96TEU containers. There are also 60 reefer points to accommodate chilled cargo.

Power and propulsion is by way of twin MAN 9L32/40 medium-speed engines each rated at 4,500kW connected through gearboxes to twin 4.6m diameter controllable pitch propellers. The ship is fitted with twin twisted flap rudders equipped with a rudder bulb. Service speed is a creditable 17knots. The ship has a single bow thruster and is equipped with fin stabilisers and anti-roll tanks.

There is no scrubber installed so the vessel is obliged to run on compliant low sulphur fuels. The ship is also not intended for service in any existing ECA and only needs to comply with NOx Tier II requirements.

## TECHNICAL PARTICULARS

Length oa: ..... 189.9m  
Length bp: ..... 176m  
Breadth moulded: ..... 26.4m  
Depth moulded  
to main deck: ..... 9.2m  
to upper deck: ..... 15.45m  
Width of double skin  
side: ..... 3.50m  
bottom: ..... 2.90m

Draught  
scantling: ..... 6.50m  
design: ..... 6.00m  
Gross: ..... 24,777gt  
Displacement: ..... 21,000t  
Lightweight: ..... 9,712t  
Deadweight  
scantling: ..... 11,288dwt  
design: ..... 9,236dwt

Block co-efficient (please state relevant draught): ..... 0.661(Td), 0.676(Ts)  
Speed, service: ..... 90% MCR output 17.0knots

Bunkers (m<sup>3</sup>)  
Heavy oil: ..... 614  
Diesel oil: ..... 93  
Water ballast (m<sup>3</sup>): ..... 5,346  
Daily fuel consumption (tonnes/day)  
Main engine only: ..... 35.4

Classification society and notations: ..... CCS  
★ CSA RO-RO Ship; ICE CLASS B; SOLAS II-2 Reg.19; Equipped with Container Securing Arrangements; Loading Computer (S,I); In-Water Survey ★ CSM AUT-0; SCM; Clean; AFS; GPR  
% high-tensile steel used in construction: .. 73%  
Heel control equipment: ..... 1 pair anti-heeling tanks  
Roll-stabilisation equipment: ..... 1 pair fin stabilisers, 2 anti-roll tanks

Propulsion  
Main engine(s)  
Design: ..... MAN B&W  
Model: ..... 9L32/40 Tier II  
Manufacturer: .. Shanxi Diesel Engine Heavy Industry  
Number: ..... 2  
Type of fuel: ..... HFO, MDO  
Output of each engine: ..... 4,500kW  
Is this a diesel-electric or hybrid?: ..... No

Gearbox(es)  
Make: ..... Chongqing Gearbox  
Model: ..... GCSF1200-WX-V1.5  
Number: ..... 2  
Output speed: ..... 118.9rpm

Propeller(s)  
Material: ..... Ni-Al-Bronze  
Designer/Manufacturer: ..... Lyen Marine Technology  
Number: ..... 2  
Fixed/Controllable pitch: ..... Controllable  
Diameter: ..... 4,600mm  
Speed: ..... 118.9rpm

Main-engine driven alternators  
Number: ..... 1  
Make/type: ..... Kangfu Sci-tech  
Output/speed of each set: .. 1,500kW/1,500rpm  
Diesel-driven alternators  
Number: ..... 2  
Engine make/type: ..... CSSC Marine Power Co.,Ltd / MAN 6L23/30H

Type of fuel: ..... HFO, MDO  
Alternator make/type: ..... ZhenJiang China  
Marine-XianDai Generating / HFC6 564-84K  
Output/speed of each set: ..... 780kW/750rpm

Boilers  
Number: ..... 3  
Type: ..... 1 x oil fired boiler / 2 x exhaust gas boiler

Make: ..... ZhangJiaGang Greens Shazhou Boiler  
Output, each boiler: ..... 1 x 1,800kW / 2 x 800kW

Stern appendages/special rudders: ... Twisted flap type rudders

Bow thruster(s)  
Make: ..... Kawasaki-KWJ  
Number: ..... 1  
Output (each): ..... 1,000kW

Other cranes  
Number: ..... 2  
Make: ..... Jiangyin Oya Marine Machinery  
Type: ..... Hydraulic telescope, cylinder luffing  
Tasks: ..... Provision handling  
Performance: ..... SWL 2t x 7m outreach

Mooring equipment  
Number: ..... 7  
Make: ..... Rolls-Royce  
Type: ..... Hydraulic

Special lifesaving equipment  
Number of each and capacity: ..... 51 persons  
Make: ..... Jiangyinshi Beihai LSA  
Type: .. 7.5m totally enclosed life/rescue boat

Containers  
Total TEU capacity: ..... 96  
On deck: ..... 96  
Reefer plugs: ..... 60  
On deck: ..... 2/6

Vehicles  
Number of vehicle decks (fixed/moveable): .. 3 (3/0)  
Total lane length: ..... 2,700  
Total freight units (specify size): ..... 251 units (10.0m x 2.5m)

Doors/ramps/lifts/moveable car decks  
Number of each: ... Stern ramp/inner door (1), stern side ramp (1, starboard), bow ramp/inner door (1), tilttable ramp (1), lifting platform(1)  
Type: ..... Hydraulic  
Designer: ..... SMS-SME

Complement  
Crew: ..... 38  
Single/double/other rooms: ... 1 cabin for pilot  
Passengers  
Total: ..... 12  
Number of cabins: ..... 3

Navigation and other equipment  
Bridge control system  
Make: ..... Dong ze  
Is bridge fitted for one-man operation? ..... No  
Integrated bridge system?: ..... No  
Radars  
Number: ..... 2  
Make: ..... Furuno  
Model(s) : ..... FAR-2338SW, FAR-2328W

Fire detection system  
Make: ..... Apollo  
Type: ..... Syncro

Fire extinguishing systems  
Engine room: ..... CO<sub>2</sub>, fixed water-based local application fire fighting  
Make/Type: ..... CSSC Jiujiang Fire Equipment / Shanghai Sure-safe Fire Equipment  
Vehicle spaces: ..... CO<sub>2</sub>, water spray  
Make/Type: ..... Jiangsu Nanji Machinery / Shanghai Sure-safe Fire Equipment

Sewage plant  
Make: ..... Jiangsu Nanji Machinery  
Model: ..... WCMBR-50(UII)  
Energy Saving Technologies\*: ... Twisted flap type rudders, rudder bulb

Contract date: ..... 23 October 2018  
Launch/float-out date: ..... 31 June 2020  
Delivery date: ..... 29 September 2020



# BOW EXPLORER – Chemical/product tanker

Shipbuilder: **Hudong-Zhonghua Shipbuilding (Group) Co., Ltd.**  
 Vessel's name: ..... **Bow Explorer**  
 Owner/Operator: ..... **Odfjell**  
 Country: ..... **Norway**  
 Designer: ..... **Shanghai Merchant Ship Design & Research Institute, CSSC (SDARI)**  
 Country: ..... **China**  
 Flag: ..... **Norway (NIS)**  
 IMO number: ..... **9828211**  
 Total number of sister ships already completed (excluding ship presented): ..... **2**  
 Total number of sister ships still on order: ..... **Nil**

Ordered as part of owner Odfjell's fleet renewal programme, which began in 2016 and involves more than 30 newbuildings, *Bow Explorer* is the first of two 38,235dwt chemical/product tankers built by China's Hudong-Zhonghua Shipbuilding.

The ship was designed by SDARI with input from the owner and has dimensions of loa 182.88m, beam 32.2m and a moulded depth of 17.1m. It was built at the same yard and with the same advanced features as the award-winning 49,000dwt *Bow Orion*, but although smaller in size has more cargo tanks.

Described by Odfjell as a super-segregator, the ship has no less than 40 stainless steel cargo tanks suitable for IMO II and III cargoes served by Framo pumps with capacities ranging from 220m<sup>3</sup>/h to 600m<sup>3</sup>/h. Total cargo capacity is around 45,000m<sup>3</sup>.

The vessels have been designed for efficiency throughout from the hull shape with its vertical stem through to the propulsion system and extensive use of energy saving measures across many areas. Taken together they have allowed the ship to achieve an EEDI rating of 4.76, which is significantly below the required 6.37.

*Bow Explorer's* main engine is a derated ultra-long stroke MAN B&W 6-cylinder G50ME-C 9.5 type producing 7,289kW at 92.1rpm and is connected to a single large diameter fixed pitch propeller. An asymmetric rudder with rudder bulb is fitted and service speed is 14knots. The engine is gas ready, allowing for later conversion to LNG or LPG if required. As the vessel is not scrubber fitted it must

make use of compliant low sulphur fuels to meet IMO SOx regulations.

Additional efficiency measures include LED lighting throughout, such as floodlights and navigation lights. Where possible frequency controlled motors have been used, including the engine room, boiler and air conditioning fans, and in the main seawater cooling pumps.

## TECHNICAL PARTICULARS

Length oa: ..... 182.88m  
 Length bp: ..... 179.43m  
 Breadth moulded: ..... 32.2m  
 Depth moulded to main deck: ..... 17.1m  
 Draught scantling: ..... 11.0m  
 design: ..... 9.5m  
 Deadweight scantling: ..... 38,000t  
 design: ..... 30,400t

Speed, service (~%MCR output): ..... 14.0knots (65%)

Classification society and notations:..... DNV  
 \*1A1 tanker for chemicals and oil products esp, E0, CSR, ETC, BIS, NAUT(OC), TMON, CCO, F(A), COAT-PSPC(B,V), VCS(2), BWM(T), BMON, Recyclable, Gas Ready(D,MEc), Ship Type 2, a2, b3, c3, f2, str 0.075, k, ss

Propulsion  
 Main engine(s)  
 Design: ..... MAN  
 Model: ..... 6G50 ME-C 9.5  
 Number: ..... 1  
 Type of fuel: ..... HFO, MGO  
 Output of each engine: ... 7,289kW x 92.1rpm  
 Is this a diesel-electric or hybrid?: ..... No  
 Propeller(s)  
 Material: ..... Ni-Al-Bronze, Cu3  
 Number: ..... 1  
 Fixed/Controllable pitch: ..... Fixed

Boilers  
 Number: ..... 3  
 Type: ..... Oil-fired and composite boiler

Output, each boiler: .. 2 x 12.5t/h, 1 composite boiler (5t/h + 1.5t/h)

Bow thruster(s)  
 Number: ..... 1  
 Output (each): ..... 1,000kW

Cargo tanks  
 Number: ..... 40  
 Grades of cargo carried: ..... IMO II/III

Cargo pumps  
 Number: ..... 40  
 Type: ..... Hydraulic pump  
 Make: ..... Framo  
 Capacity (each): ..... 3 types. 600m<sup>3</sup>/h, 330m<sup>3</sup>/h and 220m<sup>3</sup>/h

Complement  
 Officers:..... 16  
 Crew: ..... 15

Navigation and other equipment  
 Bridge control system  
 Make: ..... NanJing Friends  
 Type: ..... DNV NAUT-OC arrangement  
 Is bridge fitted for one-man operation? ..Yes

Integrated bridge system : ..... Yes  
 If yes, make: ..... Sperry Marine  
 Model: ..... DNV NAUT-OC VisionMaster FT

Radars  
 Number: ..... 2  
 Make: ..... Sperry Marine  
 Model(s): ..... X-band Chart Radar Antenna 65608/A-7 8ft / S-band Chart Radar Antenna 65612/A-16 12ft

Fire detection system  
 Make: ..... Autronica  
 Type: ..... 116-BZ-500 4 address loops

Efficiency  
 Attained EEDI value: ..... 4.76  
 Required EEDI value:..... 6.37  
 Installed Fuel Meters: ..... Volume

Contract date: ..... March 2017  
 Delivery date: ..... August 2020

# CELSIUS COPENHAGEN – LNG carrier

Shipbuilder: ..... **Samsung Heavy Industries**  
Vessel's name: ..... **Celsius Copenhagen**  
Owner/Operator: ... **Celsius Shipping / Gunvor**  
Country: ..... **Denmark / Switzerland**  
Designer: ..... **Samsung Heavy Industries**  
Country: ..... **Republic of Korea**  
Flag: ..... **Marshall Islands**  
IMO number: ..... **9864784**  
Total number of sister ships already completed (excluding ship presented): ..... **1**  
Total number of sister ships still on order: ..... **3**

Delivered in October 2020, the Samsung Heavy Industries-built LNG carrier *Celsius Copenhagen* is significant for two reasons.

The vessel is the first LNG carrier in the Celsius Shipping fleet, and it is the first LNG carrier to feature the builder's in-house developed air lubrication system – SAVER Air.

Celsius is a relative newcomer to shipping having been formed only in 2012. Until the order for its first LNG carrier in 2018 it was operating tankers and dry cargo ships but as it was founded by ex-Maersk LNG and Gaslog chief Jeppe Jensen an entry into LNG was not unexpected.

*Celsius Copenhagen* is the first of four sister ships ordered as a two plus two option in 2018 with the options declared in 2019. The second vessel, *Celsius Canberra*, was delivered in December with the remaining two due early in 2021. *Celsius Copenhagen* has been initially fixed on a charter to Swiss-based energy trader Gunvor and the remaining three vessels on long-term charters to Cheniere in December 2020.

With a cargo capacity of 180,300m<sup>3</sup> – *Celsius Copenhagen* is slightly larger than the average when ordered, but Samsung and other builders have since added several more of similar sizes to their orderbooks. All of the newbuilds feature GTT's Mark III Flex containment system with reliquefaction capability.

The propulsion system of the twin skeg vessel is built around a pair of WinGD W5X72DF engines rated at 12,023kW, each connected to their own 8.2m diameter fixed pitch propellers. Ordinarily the engines will run on boil-off gas from the cargo but can also burn HFO or MGO. The auxiliary engines are HiMSen H35DF types, with two 8-cylinder and two 6-cylinder units installed.

The required EEDI for the vessel is 9.0 but the eco-friendly design achieves a rating of 5.6.

## TECHNICAL PARTICULARS

Length oa: ..... 299.155m  
Length bp: ..... 292m  
Breadth moulded: ..... 45.8 m  
Depth moulded  
to upper deck: ..... 26.2m  
Width of double skin  
side: ..... 2.6m  
bottom: ..... 3.0m

Draught  
summer: ..... 12.0m  
design: ..... 11.5m  
Gross: ..... 119,338gt  
Deadweight  
summer: ..... 92,400  
design: ..... 86,500  
Speed, service: ..... 19.5knots  
Cargo capacity (m<sup>3</sup>)  
volume: ..... 180,300  
Bunkers (m<sup>3</sup>)  
Diesel oil: ..... 6,300  
Water ballast (m<sup>3</sup>): ..... 63,700  
Classification society and notations: ..... LR

Propulsion  
Main engine(s)  
Design: ..... Winterthur Gas & Diesel Ltd. (WinGD)  
Model: ..... W5X72DF  
Manufacturer: ..... HSD Engine  
Number: ..... 2 sets  
Type of fuel: ..... Boiled-off Gas, HFO, MGO  
Output of each engine: ... 12,023kW (DMCR), 10,820kW (NCR)  
Is this a diesel-electric or hybrid?: ..... No

Propeller(s)  
Material: ..... Ni-Al-Bronze  
Designer/Manufacturer: ..... Samsung Heavy Industries / Silla Metal Co.  
Number: ..... 2 sets  
Fixed/Controllable pitch: ..... Fixed  
Diameter: ..... 8.2m  
Speed: ..... 74.0rpm

Diesel-driven alternators  
Number: ..... 4  
Engine make/type: ..... Hyundai Heavy Industries / 8H35DF, 6H35DF  
Type of fuel: ..... Boiled-off Gas, HFO, MGO  
Alternator make/type: ..... Hyundai Electric and Energy Systems / HSJ9 807-10P and HSJ9 803-10P  
Output/speed of each set: ..... 4,562.5kVA / 720rpm (2 sets), 3,437.5kVA / 720rpm (2 sets)

Boilers  
Number: ..... 2 sets  
Type: ... Oil fired, vertical, forced draft, smoke tube type  
Make: ..... Alfa Laval  
Output, each boiler: ..... 5,000kg/h x 0.7MPa saturated steam

Bow thruster(s)  
Make: ..... Kawasaki  
Number: ..... 1  
Output (each): ..... 2,300kW

Deck machinery  
Cargo cranes/cargo gear  
Number: ..... 2 (manifold service crane)

Make: ..... Tech flower  
Type: ..... Elec-hyd, single jib  
Performance: ..... 10.0t SWL  
Other cranes  
Number: ..... 3 (2 provision cranes / 1 CMR crane)  
Make: ..... Tech flower  
Type: ..... Elec-hyd, single jib  
Tasks: ..... 2 sets for provision and E/R equipment / 1 set for CMR  
Performance: ... 2 X 8.0t SWL for provision, 1 X 6.0t SWL for CMR

Mooring equipment  
Number: ... 10 sets (2 winches combined with windlass and 8 winches)

Make: Flutek  
Type: ..... Elec-hyd driven (high pressure type)

Special lifesaving equipment: ..... N/A (applied conventional type)

Cargo tanks  
Number: ..... 4  
Grades of cargo carried: ..... LNG  
Product range: ..... LNG  
Coated tanks: ..... GTT Mark-III FLEX  
Stainless steel – structure/piping: ... SUS304L

Cargo pumps  
Number: ..... 8  
Type: ..... Centrifugal, submerged  
Make: ..... Shinko  
Capacity (each): ..... 1,950m<sup>3</sup>/h x 160MLC

Cargo control system  
Make: ..... Kongsberg  
Type: ..... K-Gauge LNG/CTS

Ballast water treatment system  
Make: ..... Samsung Heavy Industries  
Capacity: ..... 6,000m<sup>3</sup>/h

Complement  
Officers: ..... 25 (Incl. 2 captain class)  
Crew: ..... 13  
Supernumeraries/Spare: 2 worker/riding squad  
Suez/Repair Crew: ..... 6 Suez. crew  
Single/double/other rooms: ... 38 single rooms (officers and crews), 1 double room (workers), 1 other room (Suez crews) – total 40 cabins

Navigation and other equipment  
Bridge control system  
Make: ..... Kongsberg  
Type: ..... AutoChief 600  
Is bridge fitted for one-man operation? ... Yes  
Integrated bridge system?: ..... Yes  
If yes, make: ..... Furuno  
Model: ..... 2 x ECDIS (FMD-3300), 1 x conning display (FMD-3300)

Radars  
Number: ..... 2 sets (1 x S-band, 1 x X-band)  
Make: ..... Furuno  
Model(s): ..... 1 x FAR-3330S, 1 x FAR-3320

Fire detection system  
Make: ..... Consilium  
Type: ..... Salvico Fire Alarm System CCP  
Fire extinguishing systems  
Cargo holds: ..... Dry chemical powder  
Make/Type: ..... NK  
Engine room: ..... High expansion foam  
Make/Type: ..... NK

Waste disposal plant  
Incinerator  
Make: ..... Hyundai Marine Machinery  
Model: ..... MAXI T150 SL WS  
Sewage plant  
Make: ..... Il Seung  
Model: ..... ISB-07

Efficiency  
Attained EEDI value: ..... 5.6  
Required EEDI value: ..... 9.0  
Installed Fuel Meters: ..... Coriolis type (mass type) for main engine, generator engine, GCU and auxiliary boiler

Energy Saving Technologies\*: ... Rudder bulb, air lubrication (SAVER Air)  
Hull coatings: ..... Tin-free SPC type A/F

Contract date: ..... August 2018  
Delivery date: ..... October 2020

# CMA CGM JACQUES SAADÉ – Container ship

Shipbuilder: **Hudong-Zhonghua Shipbuilding (Group) Co., Ltd**  
 Vessel's name: ..... **CMA CGM Jacques Saadé**  
 Owner/Operator: ..... **CMA CGM**  
 Country: ..... **France**  
 Designer: ..... **Marine Design and Research Institute of China (MARIC)**  
 Country: ..... **China**  
 Model test establishment used: ..... **Marine Research Institute Netherlands (MARIN)**  
 Flag: ..... **France**  
 IMO number: ..... **9839179**  
 Total number of sister ships already completed (excluding ship presented): ..... **1**  
 Total number of sister ships still on order: ..... **7**

Arguably the most talked about container ship since Maersk's Triple E design was unveiled in 2011, *CMA CGM Jacques Saadé* may be eclipsed in size eventually but will always be able to claim the title of the world's first LNG-powered ultra large container ship (ULCS). It is also presently the largest LNG-powered container ship in the world along with its sisters.

The ship is the first of nine sister vessels being built across two yards. Five at Hudong-Zhonghua Shipbuilding (Group) and four at Shanghai Jiangnan Changxing Shipbuilding. Including the lead ship, four (two from each shipyard) have been delivered at monthly intervals since September.

With its length a shade under 400m, beam of 61.3m and moulded depth of 33.5m, *CMA CGM Jacques Saadé* has a total capacity of 23,112TEU of which 13,328TEU are on deck and 9,784TEU under deck.

It is the choice of LNG as fuel that has been the main talking point of the vessel following its announcement. Other operators have also since opted for LNG, but the majority of similar newbuildings appear to have favoured HFO and scrubbers.

*CMA CGM Jacques Saadé* is powered by a single WinGD 12X92DF engine rated at 63,840kW and linked to a 10.1m diameter propeller rotating at 80rpm, granting a service speed of 21.97knots at 90% MCR. With its dual-fuel engine the vessel could also run on VLSFO or MDO, but the owner has specified a large 18,762m<sup>3</sup> GTT Mark III tank for LNG, allowing the ship to complete a Far East – Europe round trip on one bunkering. By contrast, the HFO tank would only provide for 10 or 11 days of sailing.

## TECHNICAL PARTICULARS

Length oa: ..... 399.9m  
 Length bp: ..... 393.9m  
 Breadth moulded: ..... 61.3m  
 Depth moulded  
 to main deck: ..... 33.5m  
 to upper deck: ..... 33.5m  
 to other decks: ..... 22.915m to second deck  
 Width of double skin  
 side: ..... 2.55m  
 bottom: ..... 2.65m

Draught  
 scantling: ..... 16m  
 design: ..... 14.5m  
 Gross: ..... 236,583gt  
 Displacement: ... 288,355.3t at scantling draught  
 Lightweight: ..... 67,104.7t  
 Deadweight  
 scantling: ..... 221,250.6t  
 design: ..... 189,260.5t

Block co-efficient: ... 0.7262 at scantling draught  
 Speed, service: .... 21.97knots at 90% MCR and scantling draught

Cargo capacity (m<sup>3</sup>)  
 Refrigerated storage: ..... 2,200 pcs electrical plugs for reefer containers

Bunkers (m<sup>3</sup>)  
 Heavy oil: ..... 2,541  
 LNG: ..... 18,762  
 Diesel oil: ..... 1,586  
 Water ballast (m<sup>3</sup>): ..... 56,602  
 Container ships – water ballast in loaded condition (tonnes): ..... 16,382t at heterogeneous loading and scantling draught at maximum geometric capacity

Daily fuel consumption (tonnes/day)  
 Main engine only: ..... 239.1t in fuel mode / 192t in gas mode  
 Auxiliaries: ..... 16.6t in fuel mode / 16.7t in gas mode

Classification society and notations: ..... BV, I, Hull, Mach, Container Ship, DUAL FUEL Unrestricted Navigation, VERISTAR HULL FAT 25, Aut-UMS, Mon-shaft, In Water Survey, CPS (BWT), CLEANSHIP, GREENPASSPORT EU, Aut-Port, Lashing-WW, LI-HG-S2, ESA, +ALP, SDS

Heel control equipment: ..... Anti heeling pump and tanks

Propulsion  
 Main engine(s)  
 Design: ..... WinGD  
 Model: ..... 12X92DF  
 Manufacturer: ..... CMD  
 Number: ..... 1  
 Type of fuel: ..... LNG, HFO, MDO  
 Output of each engine: ... 63,840kW at 80rpm  
 Is this a diesel-electric or hybrid?: ..... No

Propeller(s)  
 Material: ..... Ni-Al-Bronze  
 Designer/Manufacturer: ..... MMG  
 Number: ..... 1  
 Fixed/Controllable pitch: ..... Fixed  
 Diameter: ..... 10.1m  
 Speed: ..... 80rpm

Diesel-driven alternators  
 Number: ..... 6  
 Engine make/type: . 2 x Wärtsilä 9L34DF, 4 x Wärtsilä 8L34DF  
 Type of fuel: ..... LNG, HFO, MDO  
 Alternator make/type: ... Hyundai Electric / 2 x

HSJ9 911-10P, 4 x HSJ9 809-10P  
 Output/speed of each set: ... 2 x 4,320kW, 4 x 3,840kW

Boilers  
 Number: ..... 1 auxiliary boiler, 1 exhaust gas boiler  
 Type: ..... Aalborg OL, Aalborg XS-2V  
 Make: ..... Alfa Laval  
 Output, each boiler: ..... AB: 14,650kg/h, EGB: 5,730 kg/h

Bow thruster(s)  
 Make: ..... Kawasaki-KWJ KT-300B3  
 Number: ..... 2  
 Output (each): ..... 430kN thrust

Other cranes  
 Number: ..... 2 provision cranes, 1 monorail crane, 2 engine room cranes  
 Make: ..... Oriental  
 Type: ..... 2 x HPC 70-0410, 1 x SMC-150, 2 x CHD

Mooring equipment  
 Number: ..... 14 winches, 2 combined windlass/winches  
 Make: ..... NOV-BLM  
 Type: ..... Electric

Hatch covers  
 Design: ..... MacGregor  
 Manufacturer: ..... Built by shipyard  
 Type: ..... Steel pontoon type on upper deck

Containers  
 Lengths: ..... 24 x 40' bays on deck  
 Heights: ..... 12 tiers on deck and 11 tiers in holds  
 Cell guides: ..... Cell guides in cargo holds  
 Total TEU capacity: ..... 23,112TEU  
 On deck: ..... 13,328TEU  
 In holds: ..... 9,784TEU  
 Homogeneously loaded to 14tonnes: . 14,810TEU at scantling draught

Reefer plugs: ..... 2,200  
 Tiers/rows (maximum)  
 On deck: ..... 1,400  
 In holds: ..... 800

Ballast control system  
 Make: ..... SAM electronics  
 Type: ..... Platinum

Ballast water treatment system  
 Make: ..... Bio UV  
 Capacity: ..... Max flow rate IMO: 1,500m<sup>3</sup>/h  
 Max flow rate USCG: 1,000m<sup>3</sup>/h

Complement  
 Officers: ..... 9  
 Crew: ..... Max. 20  
 Supernumeraries/Spare: ..... 4  
 Suez/Repair Crew: ..... 6 Suez crew + 1 Suez electrician  
 Single/double/other rooms: ..... All crews with single cabins

Passengers  
 Total: ..... 6 passengers  
 Number of cabins: ..... 4 cabins

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

Radars  
 Number: ..... 3  
 Make: ..... Sperry Marine  
 Model(s): ..... VisionMaster Net S-band, 2 x VisionMaster Net X-band

Fire detection system  
 Make: ..... Consilium  
 Type: ..... Salwico Cargo

Fire extinguishing systems  
 Cargo holds: ..... CO<sub>2</sub>  
 Make/Type: ..... Seaplus  
 Engine room: ..... CO<sub>2</sub>, local water-based  
 Make/Type: ..... Seaplus / Survitec

Efficiency  
 Attained EEDI value: 6.035 g-CO<sub>2</sub>/tonne-mile  
 Required EEDI value: 13.2 g-CO<sub>2</sub>/tonne-mile  
 Installed Fuel Meters: ..... Monitoring on fuel, lube oil and gas system

Contract date: ..... 19 September 2017  
 Launch/float-out date: ..... 06 October 2019  
 Delivery date: ..... 22 September 2020

# CMA CGM TENERE – Container ship

Shipbuilder: .....Hyundai Samho Heavy Industries Co.,Ltd.  
 Vessel's name: .....**CMA CGM Tenere**  
 Owner/Operator: .....**Eastern Pacific Shipping Pte, Ltd.**  
 Country: .....**Singapore**  
 Designer: ..**Hyundai Samho Heavy Industries Co., Ltd.**  
 Country: .....**Republic of Korea**  
 Flag: .....**Malta**  
 IMO number: .....**9859117**  
 Total number of sister ships already completed (excluding ship presented): .....**Nil**  
 Total number of sister ships still on order: .....**5**

Delivered in September 2020, the Hyundai Samho-built 14,806TEU container ship *CMA CGM Tenere* can claim to be the world's first gas powered VLCS. It has since been eclipsed in size by the *CMA CGM Jacques Saadé* class and, in 2021, Hapag-Lloyd's retrofitted *Sajir* can claim to be the oldest ship running on LNG, but *CMA CGM Tenere* will always be recognised as the first.

The ship is the first of six LNG-fuelled vessels but is a development of an earlier series of ships built at the same yard and fitted with HFO engines and scrubbers. These previous oil burning ships have a slightly higher box capacity of 15,128TEU, with the difference due to the space lost to the type B fuel tank and gas supply system installed in the gas burners. The fuel system of *CMA CGM Tenere* allows for a volume of 12,448m<sup>3</sup> LNG, sufficient for a round trip from the Far East to Europe.

The vessel's significance clearly lies in its power and propulsion system, which features a Hyundai-built MAN B&W ME-GI dual-fuel two-stroke engine. The 11G90ME-GI engine is the dual-fuel variant of the 11G90ME-C engines installed on *CMA CGM Tenere's* oil burning predecessors. It is the first model to feature MAN Energy Solutions' PBIV fuel injection system, which reduces the amount of pilot fuel needed when running in gas mode.

The engine type is capable of an output of 68,640kW but for *CMA CGM Tenere* it has been derated and produces 46,360kW at 75.7rpm. Connected directly to a 10m diameter propeller, the engine allows a service speed of just under 22knots.

## TECHNICAL PARTICULARS

Length oa: .....365.99m  
 Length bp: .....350m  
 Breadth moulded: .....51.0m  
 Depth moulded: .....29.85m  
 to main deck: .....29.85m  
 to upper deck: .....29.85m  
 Width of double skin  
 side: .....2.5 m  
 bottom: .....2.3m  
 Draught  
 scantling: .....16m  
 design: .....14.5m  
 Gross: .....150,844gt  
 Displacement: .....204,285t  
 Lightweight: .....44,671t

Deadweight .....159,614t  
 scantling: .....159,614t  
 design: .....135,660t  
 Block co-efficient: .....0.6777 at design draught  
 Speed, service: .....21.86knots at 80%MCR (NCR) with 15% sea margin  
 Cargo capacity (m<sup>3</sup>)  
 Bale: .....14,806TEU  
 Refrigerated storage: .....1,000FEU  
 Bunkers (m<sup>3</sup>)  
 Light Fuel oil: .....5,375  
 Diesel oil: .....1,442  
 LNG fuel : .....12,448  
 Water ballast (m<sup>3</sup>): .....41,833  
 Container ships – water ballast in loaded condition (tonnes): .....22,638 at 10t homogeneously loaded at scant  
 Daily fuel consumption (tonnes/day)  
 Main engine only: .....120t (LNG) at NCR  
 Auxiliaries: .....8.4t (LNG) at 50% MCR  
 Classification society and notations: .....LR (3 vessels), DNVGL(3 vessels), LR, +100A1 Container Ship, ShipRight (SDA, FDA, FDA SPR, WDA2, CM, ACS(B)), \*IWS, LI, +LMC, LFPF (GF, NG), UMS, with descriptive notes: ShipRight (BWMP(T), IHM, SCM), DNVGL, +1A Container Ship, RSD, E0, BIS, TMON, COAT-PSPC(B), LCS, CMON, WIV, RSCS, BWM(T), Gas fuelled, Recyclable  
 % high-tensile steel used in construction: .....Approx. 70%  
 Heel control equipment: ....No.5 S.W.B.T. (P&S, heeling tanks) and other side ballast tanks  
 Roll-stabilisation equipment: .....Bilge keel Propulsion  
 Main engine(s)  
 Design: .....MAN-ES ME-GI ENGINE  
 Model: .....11G90ME-C10.-GI-EGRTC  
 Manufacturer: .....Hyundai-B&W  
 Number: .....1 set  
 Type of fuel: .....Gas, LFO, ULSFO, 1 set  
 Output of each engine: .....46,360kW x 75.7rpm  
 Is this a diesel-electric or hybrid?: .....Yes (Diesel/gas)  
 Propeller(s)  
 Material: .....Ni-Al-Bronze  
 Designer/Manufacturer: .....Hyundai Heavy Industries  
 Number: .....1  
 Fixed/Controllable pitch: .....Fixed  
 Diameter: .....10,000mm  
 Speed: .....75.7rpm (MCR)  
 Diesel-driven alternators  
 Number: .....4 sets  
 Engine make/type: .....HHI-HIMSEN / 8H35DF  
 Type of fuel: .....LNG GAS, MGO, LFO, ULSFO  
 Alternator make/type: .....Hyundai Electric Co., Ltd  
 Output/speed of each set: .....3,840kW x 720rpm  
 Boilers  
 Number: .....1 set  
 Type: .....Dual-fuel burning type  
 Make: .....KangRim Heavy Industries  
 Output, each boiler: .....8,000kg/h

Bow thruster(s)  
 Make: .....KTE  
 Number: .....1 set  
 Output (each): .....3,000kW  
 Other cranes  
 Number: ...Provision crane (2 sets), monorail crane (1 set)  
 Make: .....Sangsangin Industry / Oriental  
 Type: .....Electric-hydraulic  
 Tasks: .....Provision handling, e/r spare parts handling, etc.  
 Performance: .....SWL 3t / SWL 12.5t  
 Mooring equipment  
 Number: ....Windlass (2 sets), mooring winch (6 sets)  
 Make: .....MacGregor  
 Type: .....Electric-hydraulic  
 Special lifesaving equipment  
 Number of each and capacity: .....Lifeboat (2 sets x 32 persons)  
 Make: .....Hyundai Lifeboats  
 Type: .....Conventional (Gravity)  
 Hatch covers  
 Design: .....SMS-SME  
 Manufacturer: .....HSHI  
 Type (upper deck/other decks): .....Pontoon, non-sequential operation type (non-tight)  
 Containers  
 Lengths: .....20ft, 40ft, 45ft  
 Heights: .....8ft 6in, 9ft 6in  
 Cell guides: 40ft container of 40'(L) x 8'(W) x 9'6"(H) ISO container  
 Total TEU capacity: .....14,806TEU  
 On deck: .....8,778TEU  
 In holds: .....6,028TEU  
 Homogeneously loaded to 14tonnes: 10,236TEU  
 Reefer plugs: .....1,000FEU (on deck/ hatch covers)  
 Tiers/rows (maximum)  
 On deck: .....11 tiers / 20 rows  
 In holds: .....11 tiers / 18 rows  
 Cargo tanks  
 Number: .....9 holds  
 Grades of cargo carried: .....Containers  
 Ballast control system  
 Make: .....Kongsberg  
 Type: .....Remote hydraulic control  
 Ballast water treatment system  
 Make: .....HiBallast  
 Capacity: .....2,000m<sup>3</sup>/h  
 Complement  
 Officers: .....8  
 Crew: .....20  
 Suez/Repair Crew: .....6  
 Navigation and other equipment  
 Bridge control system  
 Make: .....Nabtesco  
 Type: .....M-800-V  
 Is bridge fitted for one-man operation? .....No  
 Radars  
 Number: .....2 sets (S-band, X-band)  
 Make: .....JRC  
 Model(s): .....S-band radar: JMR-9282-S, X-band radar: JMR-9225-7X3  
 Fire detection system  
 Make: .....Autronica  
 Type: .....AutroSafe 4  
 Fire extinguishing systems  
 Cargo holds: .....Fain / Fixed CO<sub>2</sub>  
 Engine room: .....Fain / Fixed CO<sub>2</sub>  
 Cabins: .....Portable fire extinguisher  
 Public spaces: .....Portable fire extinguisher  
 Incinerator  
 Make: .....Hyundai Marine Machinery  
 Model: .....MAXI 1500SL WS  
 Sewage plant  
 Make: .....Jonghap Machinery  
 Model: .....Biological type  
 Efficiency  
 Attained EEDI value: ...6.46 g-CO<sub>2</sub>/tonne-NM  
 Required EEDI value: 14.11 g-CO<sub>2</sub>/tonne-NM  
 Installed Fuel Meters: .....Flow meter  
 Other installed monitoring tools: .....Kongsberg CAMS (Control Alarm and Monitoring System), reefer container monitoring system  
 Energy Saving Technologies\*: .....Rudder bulb, Becker Mewis Duct Twisted  
 Hull coatings: .....Antifouling paint  
 Performance Monitoring Regime: ..Hyundai-ISS  
 Contract date: .....April 2018  
 Delivery date: .....September 2020



# CNTIC VPOWER GLOBAL – LNG carrier

Shipbuilder: ..... **Cosco Shipping Heavy Industries, Dalian - China**  
 Vessel's name: ..... **CNTIC VPower Global**  
 Owner/Operator: ..... **CNTIC VPower LNG Logistics Holding Limited.**  
 Country: ..... **Hong Kong**  
 Designer: ..... **Cosco Shipping Heavy Industries, Dalian – China**  
 Country: ..... **China**  
 Flag: ..... **Hong Kong**  
 IMO number: ..... **9696735**  
 Total number of sister ships already completed (excluding ship presented): ..... **1**  
 Total number of sister ships still on order: ..... **Nil**

Although delivered in April 2020, five years later than originally planned, *CNTIC VPower Global* has still managed to become significant for two reasons. The 28,000m<sup>3</sup> LNG carrier was initially ordered by Dalian Inteh Group back in 2013 and was named *Qi Yuan* but for various reasons it was never delivered. Early last year it was bought from the yard by Singapore-based CNTIC VPower LNG Logistics, a joint venture between China National Technical Import and Export Corporation and Hong Kong's VPower Group which will use the ship to service LNG power plants in Myanmar.

It is the first ever LNG carrier built by Cosco Dalian and the first vessel in its new owner's fleet. When initially ordered, the builder predicted that the design would become a new standard in the Chinese domestic energy market.

*CNTIC VPower Global* is 176.8m long, 27.6m wide and was designed by Shanghai Bestway Marine Engineering. Because its type C LNG tanks are mostly contained under the main deck, the biggest visual clue to the ship's purpose is the letters LNG painted along each side of the vessel.

The three tanks are bilobe types with a central bulkhead to prevent excessive cargo movement. The two aft most tanks each have a capacity of 10,000m<sup>3</sup> and each of the lobes in the tank are the same width throughout their entire length. The No 1 tank is more heart shaped when viewed from above, narrowing toward the bow of the ship. Cargo is carried at -162°C.

The vessel has a diesel electric propulsion system powered by a Wärtsilä 9L50DF engine rated at 8,775kW. The propeller is a controllable pitch type with a diameter of 5.6m driven through a Wärtsilä gearbox. Service speed is 18.1knots

## TECHNICAL PARTICULARS

Length oa: ..... 176.80m  
 Length bp: ..... 166.0m  
 Breadth moulded: ..... 27.60m  
 Depth moulded : ..... 18.50m  
 Width of double skin: ..... 27.60m

Draught  
 scantling: ..... 8.0m  
 design: ..... 7.8m  
 Gross: ..... 23,516gt  
 Displacement: ..... 26,558t  
 Lightweight: ..... 10,562t  
 Deadweight: ..... 15,996t  
 scantling: ..... 15,996t  
 design: ..... 15,335t  
 Block co-efficient: ..... 0.7050 (8m draught)  
 Speed, service (100%MCR output): ..... 18.14/7,732

Cargo capacity (m<sup>3</sup>)  
 Liquid volume: ..... 28,610 (100%)  
 Bunkers (m<sup>3</sup>)  
 Diesel oil: ..... 656.8 (100%)  
 Water ballast (m<sup>3</sup>): ..... 8,173  
 Daily fuel consumption (tonnes/day)  
 Main engine only: ..... Avg. 24t  
 Auxiliaries: .. Avg. 5t (No.1 and No.2), Avg. 2t for HG

Classification society and notations: ..... CCS & CSA LNG CARRIER, TYPE 2G, TYPE C INDEPENDENT TANK.

Propulsion  
 Main engine(s)  
 Model: ..... 9L50DF  
 Manufacturer: ..... Wärtsilä  
 Number: ..... PAAE254447  
 Type of fuel: ..... MDO  
 Output of each engine: ..... 8,775kW  
 Is this a diesel-electric or hybrid?: ..... Yes

Gearbox(es)  
 Make: ..... Wärtsilä  
 Model: ..... SCV112-P70  
 Output speed: ..... 114

Propeller(s)  
 Material: ..... Cu-Ni-Al  
 Designer/Manufacturer: ..... Wärtsilä  
 Number: ..... 1  
 Fixed/Controllable pitch: ..... Controllable  
 Diameter: ..... 5,600mm  
 Speed: ..... 114rpm

Main-engine driven alternators  
 Number: ..... MB15292  
 Make/type: .. Marelli Motori SpA , Italy / MJBMB 450MB4 B34

Output/speed of each set: ..... 1,370kVA

Diesel-driven alternators  
 Number: ..... 114010018  
 Engine make/type: ..... Wärtsilä  
 Type of fuel: ..... MDO  
 Alternator make/type: ..... CSIC Electrical Machinery Science & Technology Co., Ltd. / 1FC6 564-8SA83

Output/speed of each set: ..... 975/903

Boilers  
 Number: ..... 0-8100-129926-14-3  
 Type: ..... CMB-VS1.2+1.2/7  
 Make: ..... SAACKE Qingdao Marine Boiler  
 Output, each boiler: ..... 1,806

Bow thruster(s)  
 Make: ..... Brunvoll  
 Number: ..... AR63LTC1750 11/36 850kW  
 Output (each): ..... 850kW

Deck machinery  
 Cargo cranes/cargo gear  
 Number: ..... 1  
 Make: ..... Shanghai Hengyuan Marine  
 Type: ..... EY-10-20-SL  
 Performance: ..... Good

Other cranes  
 Number: ..... 1  
 Make: ..... Shanghai Hengyuan Marine  
 Type: ..... EY-3-6-SL  
 Tasks: ... Provision, garbage and other stores  
 Performance: ..... Good

Mooring equipment  
 Number: ..... 6  
 Make: ..... Wuhan Marine Machinery Plant  
 Type: ..... Hydraulic

Special lifesaving equipment  
 Number of each and capacity: ..... 1, 26  
 Make: ..... Beihai Shipbuilding  
 Type: ..... Free-fall, Model – BH-F750

Cargo tanks  
 Number: ..... 3  
 Grades of cargo carried: ..... LNG  
 Product range: ..... 28,000m<sup>3</sup>  
 Coated tanks: ... TGE and PPG coating system  
 Stainless steel – structure/piping: ..... Yes

Cargo pumps  
 Number: ..... 6  
 Type: ..... Deepwell  
 Make: ..... Wärtsilä  
 Stainless steel: ..... Yes  
 Capacity (each): ..... 450m<sup>3</sup>/h

Cargo control system  
 Make: ..... Fleming  
 Type: ..... 100.01907

Ballast water treatment system  
 Make: ..... Wuxi Brightsky Electronic  
 Capacity: ..... 400m<sup>3</sup>/h

Complement  
 Officers: ..... 11  
 Crew: ..... 13  
 Single/double/other rooms: ..... 25/2

Navigation and other equipment  
 Bridge control system ..... Bridge Equipment  
 Alarm System

Make: ..... Furuno  
 Type: ..... MU-190

Integrated bridge system?: ..... Yes  
 If yes, make: ..... Furuno

Radars  
 Number: ..... 2  
 Make: ..... Furuno  
 Model(s): ..... FAR-8287, FAR-8237s

Fire detection system  
 Make: ..... Apollo World Class Fire Solutions  
 Type: ..... Smoke, heat, flame

Fire extinguishing systems

Cargo holds: ..... Fix DCP  
 Make/Type: ..... Shang Hai An Hang/Fix  
 Engine room: ..... Fix CO<sub>2</sub>, hyper mist, portable foam

Make/Type: ..... Wilhelmsentech. Solution  
 Sp. & N.K. Co. Ltd. / Portable foam, Qingdao Loushan / Portable

Cabins: ..... DCP

Make/Type: ...Qingdao Loushan / Portable

Public spaces: ..... DCP

Make/Type: ...Qingdao Loushan / Portable

Waste disposal plant

Incinerator

Make: TeamTec ..... Model: OG200 CS

Sewage plant

Make: CSSC ..... Model: STC-2

Efficiency

Attained EEDI value: ... 7.77 g-CO<sub>2</sub>/tonne-mile

Required EEDI value: .. 12.2 g-CO<sub>2</sub>/tonne-mile

Installed Fuel Meters: ..... Volume

Other installed monitoring tools: ..... Draughts

Energy Saving Technologies\*: ..... SmartShip

Hull coatings: ..... Anti fouling

Performance Monitoring Regime: ..... Noon

reporting

Delivery date: ..... 9 April 2020

# CSSC CAPE TOWN – Mini Capesize bulker

Shipbuilder: ..... **CSSC Huangpu Wenchong Shipbuilding Company Limited**  
 Vessel's name: ..... **CSSC Cape Town**  
 Owner/Operator: ..... **Fortune Central Shipping Limited**  
 Country: ..... **China**  
 Designer: ..... **Shanghai Merchant Ship Design & Research Institute (SDARI), CSSC**  
 Country: ..... **China**  
 Model test establishment used: ..... **China Ship Scientific Research Center (CSSRC)**  
 Flag: ..... **Hong Kong**  
 IMO number: ..... **9853888**  
 Total number of sister ships already completed (excluding ship presented): ..... **2**  
 Total number of sister ships still on order: ..... **4**

Built by CSSC's Huangpu Wenchong Shipbuilding subsidiary, *CSSC Cape Town* is a 120,000dwt mini Capesize vessel and the first of a four plus two option series for the builder's shipowning arm, CSSC Leasing, to serve a charter agreement signed in 2018 by commodity giant Cargill.

Designed by Shanghai Merchant Ship Design and Research Institute (SDARI) to be able to transit the enlarged Panama Canal locks, the ship type has been promoted as a successor to smaller bulk carriers of between 80,000 and 100,000dwt. At the time the charter contract with Cargill was signed, the company said the vessels would add flexibility to their fleet and would likely be used primarily for coal and grain cargoes.

Although the initial design was by SDARI, certain changes were requested by Cargill during construction, including the installation of scrubbers to meet 2020 SOx regulations.

The builder claims the vessel is the first of its type to meet both the latest IACS harmonised common structural rules and Phase 2 of the EEDI. The required EEDI rating of 3.62 was easily improved by the ship's assigned 2.81 indexing. Construction began in March 2019 and was completed remarkably quickly in May 2020.

*CSSC Cape Town* is 254.92m in length with a beam of 43m, moulded depth of 20.5m and scantling draught of 14.6m. In appearance it resembles a scaled up Panamax with its seven holds and hatches and gearless configuration. A vertical bow without bulb is adopted and the vessel's cargo capacity is 135,000m<sup>3</sup>.

The main engine is a Chinese-built MAN B&W 6G60ME-C9.5 type with an output of 11,600kW at 77rpm. To meet SOx emission rules the vessel is fitted with an Ecospray Technologies open loop scrubber serving the main engine and the three Daihatsu auxiliary engines. The ballast treatment system comprises two Headway Technology units with flow rates of 2,600m<sup>3</sup>/h.

## TECHNICAL PARTICULARS

Length oa: ..... 254.92m  
 Length bp: ..... 251.00m  
 Breadth moulded: ..... 43.00m  
 Depth moulded: ..... 20.50m  
 to main deck: ..... 20.50m  
 Width of double skin side: ..... 2.46m  
 bottom: ..... 2.35m

Draught  
 scantling: ..... 14.60  
 Gross: ..... 66,786gt  
 Displacement: ..... 140,000t  
 Lightweight: ..... 19,500t  
 Deadweight  
 scantling: ..... 120,000t  
 Block co-efficient (please state relevant draught): ..... 0.87

Cargo capacity (m<sup>3</sup>)  
 Grain: ..... 135,000  
 Bunkers (m<sup>3</sup>)  
 Heavy oil: ..... 2,700  
 Diesel oil: ..... 580  
 Water ballast (m<sup>3</sup>): ..... 42,000

Classification society and notations: ..... DNVGL 1A, Bulk Carrier, BC(A), CSR, ESP, Grab(30), Hold(2,4&6) may be empty, CMON, COAT-PSPC(B), BIS, LCS, Recyclable, Clean, E0, BWM(T), TMON (Oil Lubricated)  
 % high-tensile steel used in construction: .. 80%

Propulsion  
 Main engine(s)  
 Design: ..... Two-stroke, single-acting, direct reversible crosshead type marine diesel engine with constant pressure turbocharging  
 Model: ... CD-MAN-B&W 6G60ME-C9.5 Tier II  
 Manufacturer: ..... CSSC-MES Diesel  
 Number: ..... 1  
 Type of fuel: ..... HFO, MGO  
 Output of each engine: ..... SMCR 11,600kW x 77rpm  
 Is this a diesel-electric or hybrid?: ..... No

Propeller(s)  
 Material: ..... Ni-Al-Bronze  
 Designer/Manufacturer: ..... Wärtsilä-CME Zhenjiang Propeller  
 Number: ..... 1  
 Fixed/Controllable pitch: ..... Fixed  
 Diameter: ..... 8,200mm  
 Speed: ..... 77.0rpm

Diesel-driven alternators  
 Number: ..... 3  
 Engine make/type: ..Anqing-Daihatsu 6DK-20e

Type of fuel: ..... HFO,MGO  
 Alternator make/type: ..... CMXD HFC  
 Output/speed of each set: ... 990kW / 900rpm

Exhaust-gas scrubbing equipment  
 Manufacturer: ..... EcoSpray Technologies  
 Type: ..... Open loop system  
 On main engines?: ..... Yes  
 On auxiliary engines?: ..... Yes

Boilers  
 Number: ..... 1  
 Type: .... Jiujiang Mitsubishi composite boiler, vertical cylindrical smoke tube  
 Make: ..... Jiujiang Haitan Equipment Manufacture  
 Output, each boiler: ..... 1,800kg/h at oil fired section, 1,200kg/h at ME exh.gas section

Mooring equipment  
 Number: ..... 6  
 Make: ..... MacGregor  
 Type: ..... Hydraulic

Special lifesaving equipment  
 Number of each and capacity: ..... 1 free-fall  
 Make: ..... CSSC Luzhou Zhenjiang Marine Auxiliary Machinery  
 Type: ..... YH5.9FP

Cargo/capacity  
 Hatch covers  
 Design: ..... TTS  
 Manufacturer: ..... TTS  
 Type: ..... Upper deck

Ballast water treatment system  
 Make: ..... Headway Technology  
 Capacity: ..... 2 x 2,600m<sup>3</sup>/h

Complement  
 Crew: ..... 25

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

Integrated bridge system?: ..... No

Radars  
 Number: ..... 2  
 Make: ..... JRC  
 Model(s): .... JMR-9230-SN / JMR-9225-9XN

Fire detection system  
 Make: ..... Consilium  
 Type: ..... Salwico Cargo

Fire extinguishing systems  
 Cargo holds:  
 Make/Type: ..... Sea water hydrant  
 Engine room:  
 Make/Type: ..... NK Co.,Ltd/ high pressure CO<sub>2</sub> firefighting system, Minimax / local water mist application system, sea water hydrant

Cabins:  
 Make/Type: ..... Sea water hydrant  
 Public spaces:  
 Make/Type: ..... Sea water hydrant

Waste disposal plant  
 Incinerator  
 Make: ..... CSSC Nanjing Luzhou Machine Company Limited  
 Model: ..... OG 200C

Sewage plant  
 Make: ..... II Seung  
 Model: ..... ISB-02

Efficiency  
 Attained EEDI value: ..... 2.81  
 Required EEDI value: ..... 3.62

Energy Saving Technologies: ..... PSV

Contract date: ..... 14 May 2018  
 Launch/float-out date: ..... 16 March 2020  
 Delivery date: ..... 26 May 2020

# DEL MONTE GOLD – Reefer container ship

Shipbuilder: .....CSSC, HuangPu WenChong Shipbuilding Co.,Ltd  
Vessel's name: ..... **Del Monte Gold**  
Owner/Operator: ..... **Del Monte Fresh Produce Inc / Valencia Shipping Corporation**  
Country: ..... **USA**  
Designer: .... **Shanghai Merchant Ship Design and Research Institute (SDARI)**  
Country: ..... **China**  
Model test establishment used: ... **Shanghai Ship & Shipping Research Institute (SSRI)**  
Flag: ..... **Panama**  
IMO number: ..... **9849643**  
Total number of sister ships already completed (excluding ship presented): ..... **3**  
Total number of sister ships still on order: ..... **3**

*Del Monte Gold* is the first vessel in a series of six 600FEU reefer container vessels ordered by Del Monte Fresh Produce Inc. The ship was designed by Shanghai Merchant Ship Design and Research Institute (SDARI) and built by Huangpu WenChong Shipbuilding.

The names of the five sisters are *Del Monte Rose*, *Del Monte Harvester*, *Del Monte Spirit*, *Del Monte Valiant* and *Del Monte Pride*. Delivery of the whole series should be completed by mid-2021.

With a capacity of 634FEU and equipped with 634 reefer points, *Del Monte Gold* is a pure reefer container vessel. CFD was used to ensure optimum ventilation in the holds and reduce cargo fan power requirements. Three deck cranes allow the vessel to load and discharge at less developed ports.

The hull dimensions are a length of 192m and 30m beam. Its notable feature is the SDARI-designed Erect Invisibility Bulb-Bow named 'S-BOW', which has a more efficient performance at various trims and draughts than a traditional bulb bow. Other attributes include SDARI's Adapted Twisted Rudder with rudder bulb to recover energy loss at the rear of the propeller.

Its main engine is an 8-cylinder MAN B&W super long stroke S60ME-C unit with a power output of 18,200kW driving a fixed pitch propeller to give a service speed of 21.5knots. The high electric demand for the reefer and ventilation system is addressed by four Anqing-Daihatsu diesel gensets, comprising two 6DK-28e units producing 1,850kW each and two 8DK-28e units rated at 2,650kW each. The attained EEDI rating of 18.24 is comfortably under the maximum of 20.05 for the vessel.

A Bilfinger hybrid scrubber is fitted onboard, which takes the exhaust from all engines on the ship. Another environmentally friendly feature is a shore power connection allowing cold ironing so that, where required, the ship does not need to run its gensets in port to maintain its reefer capability.

## TECHNICAL PARTICULARS

Length oa: ..... 192.00m  
Length bp: ..... 187.70m  
Breadth moulded: ..... 30.00m

Depth moulded: ..... 15.30m  
to main deck: ..... 15.30m  
to upper deck: ..... 15.30m  
Width of double skin side: ..... 2.30m  
bottom: ..... 1.5m

Draught scantling: ..... 10.90m  
design: ..... 9.30m  
Gross: ..... 22,305gt  
Displacement:  
Deadweight scantling: ..... 27,800t  
Speed, service (~%MCR output): ..... 21.5knots

Bunkers (m<sup>3</sup>)  
Heavy oil: ..... 2,200  
Diesel oil: ..... 300  
Water ballast (m<sup>3</sup>): ..... 10,200  
Daily fuel consumption (tonnes/day)  
Main engine only: ..... 64.2

Classification society and notations: .... DNV GL  
+1A, Container ship, SAFELASH, BIS, E0,  
LCS, NAUT (NAV), BWM(T), Clean, Recyclable,  
TMON, DG(P)

Propulsion  
Main engine(s)  
Design: ..... MAN  
Model: ..... 8S60ME-C10.5, Tier II  
Manufacturer: ..... HHM  
Number: ..... 1  
Type of fuel: ..... HFO, MDO  
Output of each engine: ..... 18,200kW  
Is this a diesel-electric or hybrid?: Diesel-electric

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

Diesel-driven alternators  
Number: ..... 4  
Engine make/type: ..... Anqing CSSC Diesel  
Engine / 6DK-28e, 8DK-28e  
Type of fuel: ..... HFO, MDO  
Alternator make/type: ... Anqing CSSC Diesel  
Engine / 6DK-28e, 8DK-28e  
Output/speed of each set: .. 1,850kW, 2,650kW

Exhaust-gas scrubbing equipment  
Manufacturer: ..... Bilfinger  
On main engines?: ..... On M/E  
On auxiliary engines?: ..... On A/E

Boilers  
Number: ..... 1  
Type: ..... Steam  
Make: ..... Jiujiang-Mitsubishi marine boiler

Output, each boiler: Oil fired section: 2,500kg/h,  
Exh.gas section: 2,100kg/h  
Stern appendages/special rudders: ..... SDARI  
Adapted Twisted Rudder

Bow thruster(s)  
Make: .... Wuhan Kawasaki Marine Machinery  
Number: ..... 1  
Output (each): ..... 1,000kW

Deck machinery  
Cargo cranes/cargo gear  
Number: ..... 4  
Make: ..... TTS-LMG Marine Cranes  
Type: ..... Electro-Hydraulic  
Performance: ..... TLB 45/40t-26/29m

Other cranes  
Number: ..... 1  
Make: ..... Zhenjiang Marine Auxiliary  
Machinery Works  
Type: ..... Single arm davit  
Tasks: ..... For provision  
Performance: ..... 4t-6.5m

Mooring equipment  
Number: ..... 7  
Make: ..... MacGregor Germany  
Type: ..... Electric

Special lifesaving equipment  
Make: ..... CSSC Luzhou Zhenjiang  
Marine auxiliary  
Machinery Co., Ltd  
Type: ..... Totally enclosed lifeboat

Hatch covers  
Design: ..... TTS Hua Hai  
Manufacturer: ..... TTS  
Type: ..... Pontoon, non-sequential

Containers  
Total TEU capacity: ..... 634FEU  
Reefer plugs: ..... 634  
Hold refrigeration system: ..... Air-cooled

Ballast control system  
Make: ..... DMH  
Type: ..... Pneumatic  
Ballast water treatment system  
Make: ..... ERMA FIRST  
Capacity: ..... 400m<sup>3</sup>/h

Complement  
Officers: ..... 10  
Crew: ..... 12

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

Radars  
Number: ..... 2  
Make: ..... JRC  
Model(s): ..... JMR-9230-S, NKE-2103-6

Fire detection system  
Make: ..... Consilium  
Type: ..... Salvico Cargo

Fire extinguishing systems  
Cargo holds: ..... CO<sub>2</sub>, sea water  
Make/Type: ..... Seaplug  
Engine room: ..... CO<sub>2</sub>, fixed fresh water  
mist system  
Make/Type: ..... Seaplug  
Cabins: ..... Sea water  
Public spaces: ..... Sea water

Sewage plant  
Make: ..... Clarimar MF3  
Model: ..... ACO

Efficiency  
Attained EEDI value: ..... 18.24  
Required EEDI value: ..... 20.05  
Installed Fuel Meters: ..... Volume  
Energy Saving Technologies: .... SDARI Adapted  
Twisted Rudder

Contract date: ..... June 2015  
Delivery date: ..... June 2020



# DIETRICH OLDENDORFF – Bulk carrier

Shipbuilder: ..... **Oshima Shipbuilding Co., Ltd.**  
 Vessel's name: ..... **Dietrich Oldendorff**  
 Owner/Operator: ... **Oldendorff Carriers GmbH & Co. KG**  
 Designer: ..... **Oshima Shipbuilding Co., Ltd.**  
 Country: ..... **Japan**  
 Flag: ..... **Madeira**  
 IMO number: ..... **9860350**  
 Total number of sister ships already completed (excluding ship presented): ..... **1**  
 Total number of sister ships still on order: ..... **Nil**

*Dietrich Oldendorff* is the first in a pair of 100,000dwt Post-Panamax ships ordered by German bulk carrier operator Oldendorff Carriers from Japan's Oshima Shipyard and is also the first of the type designed by the yard.

The vessel was delivered in March 2020 following a joint naming ceremony with three super-eco Ultramaxs at the shipyard in January 2020, and its sister ship *Diana Oldendorff* was delivered the same year in May. Both vessels are part of Oldendorff's fleet renewal programme, which will see the company taking delivery of around 30 ships over the three-year period 2019-2021.

Included in the ship's design is the yard's signature Seaworthy Bow, which has no bulb but is used to allow vessels to maintain optimal speed during adverse weather conditions. The highly efficient hull form also features other Oshima proprietary energy saving devices such as the advanced flipper fins and a rudder fin. This combination allows *Dietrich Oldendorff* to achieve an EEDI rating well below the reference line for the ship type.

The seven hold/hatch vessel is gearless, has a typical octagonal bulk cross section and is optimised for carrying coal, grain and ore. Its length is 234.96m and beam 38m, providing some 115,356m<sup>3</sup> of cargo capacity, and its summer draught is 15m.

*Dietrich Oldendorff* is powered by an ultra-long stroke MAN B&W 6G60ME-C9.5 main engine built by Mitsui. It's designed to run at the L4 rating for the engine type, producing 9,000kW at 72rpm. Auxiliary power is provided by three Daihatsu gensets. Compliance with SOx regulations is enabled by the installation of a Yara Marine Technologies exhaust gas cleaning system connected to the main and auxiliary engines. A Techcross ballast water treatment system is also included among the ship's environmental equipment.

## TECHNICAL PARTICULARS

Length oa: ..... 234.96m  
 Breadth moulded: ..... 38.00m  
 Depth moulded  
   to main deck: ..... 20.62m  
   to upper deck: ..... 20.62m  
 Width of double skin  
   side: ..... Single hull type for all cargo hold

Draught  
 scantling: ..... 15.040m

Gross: ..... 53,219gt  
 Deadweight  
 scantling: ..... 100,449t  
 Speed, service: ..... 14knots

Cargo capacity (m<sup>3</sup>)  
 Grain: ..... 115,356  
 Bunkers (m<sup>3</sup>)  
 Heavy oil: ..... 2,364  
 Diesel oil: ..... 617  
 Water ballast (m<sup>3</sup>): ..... 46,233

Classification society and notations: ..... Nippon Kaiji Kyokai  
 NS\* (CSR, BC-A, BC-XII, GRAB 20, PSPC-WBT, NC) (ESP) (IWS) (PSCM) (IHM) (SOx(EGCS)) MNS\*(M0), Strengthened for heavy cargoes loading where holds Nos. 2, 4 and 6 may be empty, (SOx-EGCS-M/E, G/E(Nos.1,2,3))

Propulsion  
 Main engine(s)  
 Design: ..... Mitsui E&S Machinery  
 Model: ..... Mitsui MAN 6G60ME-C9.5  
 Manufacturer: ..... Mitsui E&S Machinery  
 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

Diesel-driven alternators  
 Number: ..... 3

Engine make/type: ..... Daihatsu Diesel  
 Type of fuel: ..... HFO  
 Alternator make/type: ..... Nishishiba Electric

Exhaust-gas scrubbing equipment  
 Manufacturer: .Yara Marine Technologies AS  
 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: ..... Vertical cylindrical smoke tube, composite type  
 Make: ..... Osaka Boiler Mfg.

Other cranes  
 Number: ..... 1  
 Make: ..... Kyoritsu Kikai  
 Type: ..... Electric motor driven  
 Tasks: Machinery parts, provision, Suez boat handling crane  
 Performance: ..... 4.0t

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

Special lifesaving equipment  
 Number of each and capacity: ..... 1 free-fall lifeboat (25 persons)  
 Make: ..... Shigi Shipbuilding  
 Type: ..... F.R.P. totally enclosed

Hatch covers  
 Design: ..... Iknow Machinery  
 Manufacturer: ..... Iknow Machinery  
 Type: ..... Weather-tight side rolling type

Ballast control system  
 Make: ..... Nakakita Seisakusyo  
 Type: ..... Multi control panel  
 Ballast water treatment system  
 Make: ..... Techcross Inc.

Complement  
 Officers: ..... 8  
 Crew: ..... 13  
 Supernumeraries/Spares: ..... 4

Navigation and other equipment  
 Bridge control system  
 Make: ..... Furuno Electric

Is bridge fitted for one-man operation? ..... No  
 Integrated bridge system?: ..... No

Radars  
 Number: ..... 2  
 Make: ..... Furuno Electric

Fire detection system  
 Make: ..... Consilium Nittan Marine Ltd.  
 Type: ..... Smoke, thermal, flame  
 Fire extinguishing systems  
 Cargo holds:  
   Make/Type: ..... / Sea water fog, jet  
 Engine room:  
   Make/Type: ..... Kashiwa / Foam 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  
 Waste shredder/crusher  
 Make: ..... Mitsuboshi Chuki Mfg.  
 Sewage plant  
 Make: ..... Taiko Kikai Industries

Efficiency  
 Attained EEDI value: ..... -30.4%

Contract date: ..... June 2018  
 Delivery date: ..... March 2020



# EAGLE BLANE – Shuttle tanker

Shipbuilder: ..... **Samsung Heavy Industries Co., Ltd**  
Vessel's name: ..... **Eagle Blane**  
Owner/Operator: ..... **AET Inc. Ltd.**  
Country: ..... **Singapore**  
Designer: ..... **Samsung Heavy Industries Co., Ltd.**  
Country: ..... **Republic of Korea**  
Model test establishment used: **Samsung Ship Model Basin (SSMB)**  
Flag: ..... **Norway (NIS)**  
IMO number: ..... **9833101**  
Total number of sister ships already completed (excluding ship presented): ..... **2**  
Total number of sister ships still on order: ..... **Nil**

Singapore-based tanker owner AET took delivery of *Eagle Blane* in February 2020, the first in a pair of LNG Dual-Fuel Dynamic Positioning Shuttle Tankers (DPSTs) claimed to be among the most efficient ships of its type globally. Along with its sister, *Eagle Balder*, the vessel was named in a joint ceremony at the Samsung Heavy Industries (SHI) Geoje Shipyard in October. The ships entered into service for Equinor in 2020 and are chartered by the Norwegian energy company for seven years.

*Eagle Blane* is a 128,427dwt vessel of 277m in length and with a beam of 46m. There are 12 cargo tanks and four cargo pumps, a typical configuration for a shuttle tanker of this size.

Shuttle tankers need to load cargoes under sometimes difficult conditions and *Eagle Blane* is one of the first vessels to feature MacGregor's 5th generation Pusnes bow loading system. This latest version is capable of connecting the loading hose in wave heights up to Hs 4.5m and at an entering angle of 110 degrees, 50 degrees more than the previous system.

The efficiency of the vessel is due to its ability to capture 100% of the VOCs emitted by the cargo during voyages and use this as fuel to supplement LNG, which is the primary fuel for the twin dual-fuel main engines.

The twin skeg vessel is powered by a pair of WinGD 7X52DF Otto cycle engines, each rated at 10,430kW driving 6.9m diameter controllably pitch propellers. The vessel also has a pair of ABB shaft generators and twin Wärtsilä 9L34DF auxiliary engines. Wärtsilä supplied the VOC recovery plant, a liquefied VOC fuel tank, the fuel mixing unit, the LNG fuel tank and fuel supply system. VOC recovery should save around 3,000tonnes of fuel per year thus contributing to the ship's 40-48% CO<sub>2</sub> reduction compared to a 2008 shuttle tanker.

## TECHNICAL PARTICULARS

Length oa: ..... 277m  
Length bp: ..... 265m  
Breadth moulded: ..... 46m  
Depth moulded to main deck: ..... 23.4m  
Width of double skin side: ..... 3.0m  
bottom: ..... 3.0m

Draught  
scantling: ..... 15.32m  
design: ..... 15.0m  
Gross: ..... 85,700gt  
Deadweight  
scantling: ..... 128,700t  
design: ..... 125,000t  
Speed, service: ..... 14.5knots  
Cargo capacity (m<sup>3</sup>)  
Liquid volume: ..... 141,200  
Bunkers (m<sup>3</sup>)  
Diesel oil: ..... 3,650  
Water ballast (m<sup>3</sup>): ..... 6,200  
Tankers – percentage segregated ballast: ..... 100%  
Daily fuel consumption (tonnes/day): ..... 46.2– gas mode, 56.8– oil mode  
Classification society and notations: ..... DNV GL +1A Tanker for oil ESP Plus E0  
DYNPOS(AUTR) F(A,M,C) Bow loading  
HELDK(S,H) NAUT(AW) TMON Clean(Design)  
COMF(V3,C3) CSR CSA(FLS2) CCO BWM(T)  
DAT(-10°C) VCS(3) COAT-PSPC(B,C) Gas fuelled  
% high-tensile steel used in construction: Approx. 70%

Propulsion  
Main engine(s)  
Design: ..... WinGD  
Model: ..... 7X52DF  
Manufacturer: ..... HHI-WINGD  
Number: ..... 2  
Type of fuel: ..... MGO, LNG  
Output of each engine: ..... 10,430kW  
Is this a diesel-electric or hybrid?: ..... No  
Propeller(s)  
Material: ..... Ni-Al-Bronze  
Designer/Manufacturer: .. Kawasaki Heavy Ind.  
Number: ..... 2  
Fixed/Controllable pitch: ..... Controllable  
Diameter: ..... 6.9m  
Speed: ..... 86.7rpm  
Shaft generator:  
Number: ..... 2  
Make/type: ..... ABB / PMG-1250-Z/36  
Output/speed of each set: ..... 4,000kW / 68–94rpm

Diesel-driven alternators  
Number: ..... 2  
Engine make/type: ..... Wärtsilä / 9L34DF  
Type of fuel : ..... MGO, LNG  
Alternator make/type: ABB / AMG 0900SM10 LSE  
Output/speed of each set: ..... 4,452kVA / 720rpm, 3,486kVA / 600rpm

Boilers  
Number: ..... 3  
Type: ..... 1 for oil fired , 1 for triple fuel, 1 for oil fired(donkey)  
Make: ..... Alfa Laval  
Output, each boiler: ..... 1 x 25 t/h, 1 x 35 t/h, 1 x 7 t/h

Bow thruster(s)  
Make: ..... Kawasaki

Number: ..... 2 x azimuth thrusters, 1 x tunnel thruster  
Output (each): ..... 2,200kW each  
Stern thruster(s)  
Make: ..... Kawasaki  
Number: ..... 1 azimuth thruster  
Output (each): ..... 2,200kW  
Deck machinery  
Cargo cranes/cargo gear  
Number: ..... 2  
Make: ..... SSII  
Type: ..... High pressure, electro-hydraulic self-contained, single jib type  
Performance: ..... 15.0t SWL, each  
Other cranes  
Number: ..... 2  
Make: ..... SSII  
Type: ..... High pressure, electro-hydraulic self-contained, single jib type  
Tasks: ..... For provision / engine room equipment handling  
Performance: ..... 5.0t SWL, each  
Mooring equipment  
Number: ..... Two (2) - 1 C/L + 2 M/D + 1 W/H, each, Six (6) - 2 M/D + 1 W/H, each  
Make: ..... MacGregor  
Type : ..... High pressure, electro-hydraulic driven

Special lifesaving equipment  
Number of each and capacity: ... 1 x 36 persons  
Make: ..... Norsafe  
Type: ..... Totally enclosed freefall type  
Cargo pumps  
Number: ..... 4  
Type: ..... Centrifugal, electric motor driven  
Make: ..... HHI  
Capacity (each): ..... 3,000m<sup>3</sup>/h x 135m at S.G 1.025

Cargo control system  
Make: ..... KSB  
Type: ..... Hydraulic type valve remote control system

Ballast control system  
Make: ..... KSB  
Type: ..... Hydraulic type valve remote control system

Ballast water treatment system  
Make: ..... NK  
Capacity: ..... 2 x 3,000m<sup>3</sup>/h & 1 x 410m<sup>3</sup>/h

Complement  
Officers: ..... 18  
Crew: ..... 12  
Suez/Repair Crew: ..... 6  
Single/double/other rooms: ..... 30 cabins (single), 3 cabins (for Suez crew, with 1 two-tier bed)

Navigation and other equipment  
Bridge control system  
Make: ..... Kongsberg  
Is bridge fitted for one-man operation? Yes  
Integrated bridge system?: ..... Yes  
If yes, make: ..... Furuno  
Model: ..... FMD-3300, etc.

Radars  
Number: ..... 2  
Model(s) : ..... 1 x FAR-3330S-SSD, 1 x FAR-3320

Fire detection system  
Make: ..... Consilium  
Type: ..... Salwico fire alarm system CCP

Fire extinguishing systems  
Cargo holds: ..... Survitec / deck foam  
Engine room: ..... JCIK / high pressure CO<sub>2</sub> system

Cabins: ..... - / Fire hydrants  
Public spaces: ..... - / Fire hydrants

Waste disposal plant  
Incinerator  
Make: ..... TeamTec  
Model: ..... GS500CICS

Sewage plant  
Make: ..... Il-Seung  
Model: ..... ISB-07

Efficiency  
Energy Saving Technologies\*: ..... DC Grid (1kV)  
Hull coatings: ..... Silyl acrylate anti fouling technology

Contract date: ..... June 2017  
Launch/float-out date: ..... April 2019  
Delivery date: ..... February 2020

# EAGLE PETROLINA – Shuttle tanker

Shipbuilder: ..... **Samsung Heavy Industries Co., Ltd.**  
 Vessel's name: ..... **Eagle Petrolina**  
 Owner/Operator: ..... **AET Inc. Ltd.**  
 Country: ..... **Singapore**  
 Designer: ..**Samsung Heavy Industries Co., Ltd.**  
 Country: .....**Republic of Korea**  
 Model test establishment used: **Samsung Ship Model Basin (SSMB)**  
 Flag: .....**Singapore**  
 IMO number: ..... **9858553**  
 Total number of sister ships already completed (excluding ship presented): ..... **4**  
 Total number of sister ships still on order: ..... **1**

*Eagle Petrolina* is the first of four 153,200dwt Suezmax DP2 shuttle tankers built by Samsung Heavy Industries (SHI) for AET Tankers to service long-term contracts with Petrobras of Brazil.

The vessels have been built to Petrobras' technical requirements for DP2 shuttle tankers in a collaboration with the builder, DNV GL, and ship manager, Eaglestar. It will operate to the highest operational and environmental standards, including full compliance with IMO NOx Tier III and SOx emission requirements.

Unlike the owner's smaller dual-fuel shuttle tanker *Eagle Blane*, also built at Samsung, *Eagle Petrolina* is intended to run on VLSFO to meet 2020 SOx requirements and does not use VOC emissions as fuel. It has only a single main engine and propeller rather than the twin skeg design of the smaller vessel.

The engine is a WinGD 5X72 rated at 16,300kW driving a directly linked 8.6m diameter propeller. There are also four HiMSEN H32/40 gensets. Manoeuvrability is aided by three Brunvoll bow thrusters – two azimuthing and one a tunnel thruster. At the stern there is one azimuth and one tunnel thruster – also supplied by Brunvoll.

A significant feature of the vessel is the Smart technology that has been included. The project focused on the development of Smart ship, aiming at a 'Half Crew Ready Smart Ship' with SHI and DNV GL as joint developers. It is the first DP2 class Shuttle Tanker with DNV GL's Smart Ship notation. To qualify for this, *Eagle Petrolina* is equipped with technological features in accordance with the DNV GL class guidelines for Smart Ship CG-0508.

This covers a navigation decision support system with route optimisation features, an energy efficiency management system with trim optimisation, as well as a ship performance monitoring system. *Eagle Petrolina* is also equipped with SVESSEL, which is SHI's own solution to meet the Smart Ship standard and to enable monitoring, planning and reporting data from onshore.

## TECHNICAL PARTICULARS

Length oa: ..... 277m  
 Length bp: ..... 264.0m  
 Breadth moulded: ..... 48.8m

Depth moulded to upper deck: ..... 23.6m  
 Width of double skin side: ..... 2.45m  
 bottom: ..... 2.55m  
 Draught scantling: ..... 17.2m  
 design: ..... 16.0m  
 Gross: ..... 83,700gt  
 Deadweight scantling: ..... 153,200t  
 design: ..... 139,000t  
 Speed, service: ..... 14.5knots (75.2% DMCR)  
 Cargo capacity (m³) Liquid volume: ..... 162,700  
 Bunkers (m³) Heavy oil: ..... 2,900  
 Diesel oil: ..... 500  
 Water ballast (m³): ..... 51,900  
 Tankers – percentage segregated ballast: .32%  
 Daily fuel consumption (tonnes/day) Main engine only: ..... 47.5

Classification society and notations: ..... DNV GL +A1, Tanker for oil, ESP, CSR, E0, DPS(2), Bow loading, F(M), TMON(oil lubricated), NAUT(OC), BIS, BWM(T), VCS(2), SPM, COAT-PSPC(B,C), Recyclable, Clean % high-tensile steel used in construction: ... Approx. 80%

Propulsion Main engine(s) Design: .....WinGD  
 Model: .....5X72  
 Manufacturer: ..... HHI-WinGD  
 Number: ..... 1  
 Type of fuel: ..... HFO, MGO  
 Output of each engine: ..... 16,300kW  
 Is this a diesel-electric or hybrid?: .....No

Propeller(s) Material: ..... Ni-Al Bronze  
 Designer/Manufacturer: ..... Kongsberg  
 Number: ..... 1  
 Fixed/Controllable pitch: .....Fixed  
 Diameter: ..... 8.6m

Diesel-driven alternators Number: ..... 4  
 Engine make/type: .....HHI H32/40  
 Type of fuel: ..... HFO, MGO

Boilers Number: ..... 2  
 Type: ..... Oil fired  
 Make: ..... Alfa Laval  
 Output, each boiler: ..... 20t/h

Bow thruster(s) Make: ..... Brunvoll  
 Number: ..2 azimuth thrusters, 1 tunnel thruster  
 Output (each): ..... 3,100kW, each  
 Stern thruster(s) Make: ..... Brunvoll

Number: .....1 azimuth thruster, 1 tunnel thruster  
 Output (each): ..... 2,200kW, each  
 Deck machinery Cargo cranes/cargo gear Number: ..... 2  
 Make: ..... Oriental Precision  
 Type: .....High pressure, electro-hydraulic self-contained, single jib type  
 Performance: .....20.0t SWL, each  
 Other cranes Number: ..... 2  
 Make: ..... Oriental Precision  
 Type: .....High pressure, electro-hydraulic self-contained, single jib type  
 Tasks: .....For provision / engine room equipment handling  
 Performance: ..... 1 x 8.0t SWL, 1 x 2.0t SWL  
 Mooring equipment Number: .....Two (2) - 1 C/L + 2 M/D + 1 W/H, each, Six (6) - 2 M/D + 1 W/H, each  
 Make: ..... Flutek  
 Type: High pressure, electro-hydraulic driven  
 Special lifesaving equipment Number of each and capacity: ...2 x 36 persons  
 Make: ..... Norsafe  
 Type: ..... Totally enclosed conventional type  
 Cargo pumps Number: ..... 3  
 Type: .....Centrifugal, electric motor driven  
 Make: ..... HHI  
 Capacity (each): ..... 3,800m³/h x 135m at S.G 1.025

Cargo control system Make: ..... KSB  
 Type: .....Hydraulic type valve remote control system

Ballast control system Make: ..... KSB  
 Type: .....Hydraulic type valve remote control system

Ballast water treatment system Make: ..... Samsung S&SYS  
 Capacity: ..... 4,000m³/h

Complement Officers: ..... 16  
 Crew: ..... 14  
 Suez/Repair Crew: ..... 6  
 Single/double/other rooms: .....30 cabins (single), 1 cabin (for Suez crew, with 3 two-tier beds)

Navigation and other equipment Bridge control system Make: ..... Kongsberg  
 Is bridge fitted for one-man operation? Yes  
 Integrated bridge system?: ..... Yes  
 If yes, make: ..... JRC  
 Model: .....JAN-9201, etc.

Radars Number: ..... 2  
 Make: ..... JRC  
 Model(s): .. 1 x JMR-9282-S, 1 x JMR-9225-6X

Fire detection system Make: .....Consilium  
 Type: .....Salwico Fire Alarm System CCP

Fire extinguishing systems Cargo holds: .....Survitec / Deck foam  
 Engine room: ..... NK / High pressure foam  
 Cabins: ..... - / Fire hydrants  
 Public spaces: ..... - / Fire hydrants

Waste disposal plant Incinerator Make: ..... HMMCO  
 Model: .....MAXI T150SL

Sewage plant Make: ..... Il-Seung  
 Model: ..... ISB-03

Efficiency Attained EEDI value: ..... 3.054  
 Required EEDI value: ..... 3.234

Energy Saving Technologies\*: ..Saver Fin, SARB (Rudder bulb)

Hull coatings: ..... Sailadvance GX / low friction antifouling based on hydrolysable binder composition

Performance Monitoring Regime: ..... Samsung Smartship Solution (SVESSEL)

Contract date: ..... May 2018

Launch/float-out date: .....October 2019

Delivery date: .....May 2020

# ECO VALENCIA – Ro-ro

Shipbuilder: ..... **China Merchants Jinling Shipyard (Nanjing) Co. Ltd.**  
 Vessel's name: ..... **Eco Valencia**  
 Owner/Operator: ..... **Grimaldi Lines**  
 Country: ..... **Italy**  
 Designer: ..... **Knud E. Hansen A/S**  
 Country: ..... **Denmark**  
 Model test establishment used: .. **Hamburgische Schiffbau - Versuchsanstalt (HSVA)**  
 Flag: ..... **Italy**  
 IMO number: ..... **9859533**  
 Total number of sister ships already completed (excluding ship presented): ..... **Nil**  
 Total number of sister ships still on order: ..... **8**

*Eco Valencia*, delivered in October 2020 by Jingling Shipyard, is the first of 12 hybrid ro-ro ships designed by Danish naval architect Knud E. Hansen for the Naples-based Grimaldi Group. The vessels are known as the GG5G class or, to give them their full title, the 'Grimaldi Green 5th Generation'. Of the 12 ships, three will operate for the owner's Finnlines subsidiary and the remainder in the Mediterranean.

At 238m in length, beam of 34m and with a gross tonnage of 67,311, *Eco Valencia* is claimed to be the largest short-sea ro-ro vessel in the world and can transport 7,800 linear metres of rolling freight, equivalent to around 500 trailers. Its capacity is twice that of the biggest ships currently operated by Grimaldi but it consumes the same amount of fuel, effectively halving the CO<sub>2</sub> footprint of each truck or trailer.

Cargo is spread over five decks including the weather deck and two hoistable car decks. Vehicles are loaded through two stern ramps and a system of interior ramps.

As the name and class suggest, these vessels are designed to be environmentally friendly and have earned the highest Green Plus notation from Italian classification society RINA for ships that go beyond the required environmental compliance. For the GG5G vessels, this includes an air lubrication system for the hull, a waste heat recovery system, premium anti-fouling and more.

The propulsion system comprises a pair of MAN B&W 9S50ME-C9.6 main engines and twin Rolls-Royce Promas Lite integrated rudder and propeller propulsion systems. Shaft generators and 600m<sup>2</sup> of solar panels are used for charging the ship's lithium-ion battery system, which is used in port to ensure emission-free operations. The main engines are intended to run on HFO with an Ecospray Technologies exhaust gas cleaning system, allowing compliance with 2020 sulphur regulations.

## TECHNICAL PARTICULARS

Length oa: ..... 238.00m  
 Length bp: ..... 229.75m  
 Breadth moulded: ..... 34.00m  
 Depth moulded  
 to tank top: ..... 3.30m  
 to main deck: ..... 9.30m

to lower deck: ..... 17.20m  
 to upper deck: ..... 23.10m  
 to weather decks: ..... 28.85m  
 Width of double skin  
 side: ..... 1.40m  
 bottom: ..... 3.30m  
 Draught  
 scantling: ..... 7.40m  
 design: ..... 7.20m  
 Gross: ..... 67,311gt  
 Deadweight  
 design: ..... Approx. 18,120t  
 Bunkers (m<sup>3</sup>)  
 Heavy oil: ..... 1,640  
 Diesel oil: ..... 248  
 Water ballast (m<sup>3</sup>): ..... 12,584

Classification society and notations: ..... RINA  
 C\* Ro-Ro Cargo Ship, INWATERSURVEY,  
 BWM-T, AUT-UMS, SYS-NEQ-1, SYS-IBS,  
 GREEN PLUS, UNRESTRICTED NAVIGATION  
 % high-tensile steel used in construction: ... Approx. 95%

Heel control equipment: ..... One pair of  
 heeling tanks  
 Roll-stabilisation equipment: ..... Prepared Flume  
 tank stabilization system

Propulsion  
 Design: ..... Man-ES  
 Model: ..... 9S50ME-C9.6  
 Manufacturer: ..... HHI-EMD  
 Number: ..... 2  
 Type of fuel: ..... HFO  
 Output of each engine: ..... 12,780kW  
 Is this a diesel-electric or hybrid?: ..... No

Propeller(s)  
 Main engine(s)  
 Material: ..... Ni-Al Bronze  
 Designer/Manufacturer: ..... Rolls-Royce  
 Number: ..... 2  
 Fixed/Controllable pitch: ..... Controllable  
 Special adaptations: ..... Rudder bulb

Main-engine driven alternators  
 Number: ..... 2  
 Output/speed of each set: ..... 2,000kW / 117rpm  
 Diesel-driven alternators  
 Number: ..... 3  
 Engine make/type: ..... Hyundai 7H21/32  
 Type of fuel: ..... MDO  
 Alternator make/type: ..... Hyundai Electric &  
 Energy System  
 Output/speed of each set: ..... 1,540kW /  
 1,000rpm

Exhaust-gas scrubbing equipment  
 Manufacturer: ..... Ecospray Technologies  
 On main engines?: ..... Yes  
 On auxiliary engines?: ..... No

Boilers  
 Number: ..... 1 x oil fired, 2 x exhaust  
 Type: ..... 1 x PA0601P01, 2 x EA45013  
 Make: ..... KangRim  
 Output, each boiler: ..... 1 x 1,250kg/h,  
 2 x 1,300kg/h

Bow thruster(s)  
 Make: ..... Wärtsilä  
 Number: ..... 2  
 Output (each): ..... 2,000kW (input)  
 Mooring equipment  
 Type: ..... Electric

Special lifesaving equipment  
 Number of each and capacity: ..... 2 lifeboats  
 (45 persons each)  
 Make: ..... Fassmer Marland  
 ZhongShan China  
 Type: ..... CLR-C5.9

Containers  
 Reefer plugs: ..... 200 plugs for reefer  
 trailers (100 reefer trailers simultaneously)

Vehicles  
 Total lane length: ..... 7,800m  
 Doors/ramps/lifts/moveable car decks  
 Stern ramp/door: ..... 2  
 Side hinged ramp cover: ..... 1  
 Moveable ramp flap: ..... 1  
 Ramp way door: ..... 4  
 End hinged ramp: ..... 1  
 Hoistable car deck: ..... 2  
 Car deck ramp: ..... 2  
 Pilot/Bunker door: ..... 2  
 Type: ..... Hydraulic operated  
 Designer: ..... TTS Marine AB

Ballast water treatment system  
 Make: ..... OceanGuard (Qingdao  
 Headway Technology)  
 Capacity: ..... 650m<sup>3</sup>/h

Complement  
 Officers: ..... 11  
 Crew: ..... 17  
 Suez/Repair Crew: ..... 1

Single/double/other rooms:  
 Single: .... 11 officers cabins, 17 crew cabins,  
 1 Suez cabin, 1 owner cabin, 1 stowaway cabin  
 Double: ..... 6 driver cabins  
 Other rooms: ... 2 offices, 1 conference room,  
 3 laundries, 2 linen, 1 luggage room hospital,  
 gymnasium, changes room, dayroom, duty  
 mess, crew mess, officer mess, driver  
 mess/dayroom, galley, pantry, provision store

Passengers  
 Total: ..... 12  
 Number of cabins: ..... 6  
 Percentage/number outboard: ..... 42%

Fire detection system  
 Make: ..... Consilium

Fire extinguishing systems  
 Engine room: ..... CO<sub>2</sub>  
 Make/Type: ..... Danfoss/low pressure

Vehicle spaces:  
 Make/Type: ..... Danfoss/low pressure  
 Deck 1 (Tank top): ..... CO<sub>2</sub>  
 Deck 3 (Main deck): ..... CO<sub>2</sub>  
 Hoistable car decks: ..... CO<sub>2</sub>  
 Make/Type: ..... Minimax  
 Deck 4 (Lower deck): ..... Drencher  
 Deck 6 (Upper deck): ..... Drencher  
 Deck 7 (Weather deck): ..... Drencher and  
 water monitors

Cabins: ..... None (method -IC of SOLAS)  
 Public spaces: ..... None (method -IC of SOLAS)

Waste disposal plant  
 Sewage plant  
 Make: ..... Jets

Efficiency  
 Attained EEDI value: ..... Confidential  
 Required EEDI value: ..... 10.42 g/DWT\*Nm  
 (calculated for model test)

Installed Fuel Meters: ..... Installed for all  
 consumers  
 Energy Saving Technologies\*: ... Rudder bulb, air  
 lubrication (Silverstream Technologies), batteries  
 (zero emission in port), 600m<sup>2</sup> of solar panels  
 Hull coatings: ..... Bottom and sides  
 up to load line, 2 x coats of anticorrosive and 2  
 x coats of silicon paint

Contract date: ..... 26 April 2018  
 Launch/float-out date: ..... 4 September 2020  
 Delivery date: ..... 16 October 2020



# ESPERANZA – Ro-pax

Shipbuilder: ..... **Guangdong Bonnyfair Heavy Industry Ltd.**  
 Vessel's name: ..... **Esperanza**  
 Owner/Operator: ..... **Navimag Ferries SA.**  
 Country: ..... **Chile**  
 Designer: ..... **NaviForm Consulting & Research Ltd.**  
 Country: ..... **Canada**  
 Model test establishment used: .. **SVA Potsdam GmbH**  
 Flag: ..... **Chile**  
 IMO number: ..... **9850783**  
 Total number of sister ships already completed (excluding ship presented): ..... **Nil**  
 Total number of sister ships still on order: ..... **1**

Significant as being the first newbuilding owned by Chilean ferry company Navimag, *Esperanza* is a 150m-long ro-pax built by Guangdong Bonnyfair Heavy Industry of China.

The vessel has been designed by Canadian naval architect Naviform for service in the Patagonian Fjords from Puerto Montt in the North to Puerto Natales in the South along Chile's extensive Pacific coastline. In many respects the ship is unremarkable. Its 1,788 lane metres and 274 passenger capacity in 54 cabins would not separate it from many similar sized vessels.

The ship is, however, more than a little unusual and once seen will probably remain in memory for a long time. The stern, with its stern ramp serving the ro-ro space on Decks 3 and 4, is fairly typical but moving to the side view there are noticeably angular characteristics, including a skeletal funnel casing and pyramid-shaped features on the forward weather deck.

In the 21st century, a number of uncommon bow forms have appeared – for example Ulstein's X-Bow – but that which Naviform devised for the *Esperanza* takes unusual to a new dimension. Below the waterline is a typical bulbous bow but above the water line its shape resembles the open mouth of a robotic predator.

Naviform describes this unique, patented design as a Winged Bow, claiming that it eliminates slamming and greatly reduces wave-induced motions and accelerations. Another Naviform patented device is a pair of bulbs that alter the flow to the propellers and also contribute to a reduction in the ship's power requirement.

The vessel's twin Wärtsilä propulsion systems comprising 9L20 medium-speed engines, each with an output of 1,800kW at MCR and linked through gearboxes to twin CLT propellers, give the ship a speed of 13.5knots. The owner says that of the total 3,600kW output, only 2,500 is needed to allow maximum service speed.

## TECHNICAL PARTICULARS

Length oa: ..... 150.0m  
 Length bp: ..... 136.8m  
 Breadth moulded: ..... 23.0m

Depth moulded  
 to main deck: ..... 7.2m  
 to upper deck: ..... 13.1m  
 Width of double skin  
 side: ..... 1.0m  
 bottom: ..... 1.2m  
 Draught  
 scantling: ..... 5.0m  
 design: ..... 4.8m  
 Gross: ..... 18,604gt  
 Displacement: ..... 10,618.5t  
 Lightweight: ..... 5,695.2t  
 Deadweight  
 scantling: ..... 4,924.2t  
 design: ..... 4,924.2t  
 Block co-efficient: ..... 0.619 (@ 5.0m draught)  
 Speed, service (85%MCR output): ..... 13.5knots  
 Cargo capacity (lane meters): ..... 1,788

Bunkers (m<sup>3</sup>)  
 Heavy oil: ..... 544  
 Diesel oil: ..... 102  
 Water ballast (m<sup>3</sup>): ..... 995  
 Daily fuel consumption (tonnes/day)  
 Main engine only: ..... 13.2

Classification society and notations: ... American Bureau of Shipping  
**ABS +A1 VEHICLE PASSENGER FERRY**  
**+AMS +ACCU +UWILD**

% high-tensile steel used in construction: ....20%  
 % aluminium used in hull/superstructure: ....0%  
 Heel control equipment: .....Ballast  
 Roll-stabilisation equipment: .....Bilge keels

Propulsion  
 Main engine(s)  
 Design: ..... Wärtsilä  
 Model: ..... 9L20  
 Manufacturer: ..... Wärtsilä  
 Number: ..... 2  
 Type of fuel: ..... Dual-fuel. MGO, HFO  
 Output of each engine: ..... 1,800kW  
 Is this a diesel-electric or hybrid?: ..... No  
 Gearbox(es)  
 Make: ..... Wärtsilä  
 Model: ..... SV68  
 Number: ..... 2  
 Output speed: ..... 176rpm

Propeller(s)  
 Material: ..... Ni-Al-Bronze  
 Designer/Manufacturer: ... Sistemar / Wärtsilä  
 Number: ..... 2  
 Fixed/Controllable pitch: ..... Controllable  
 Diameter: ..... 3.4m  
 Speed: ..... 13.5knots  
 Special adaptations: ... Contracted and loaded tip (CLT) propeller

Main-engine driven alternators  
 Number: ..... 2  
 Make/type: ..... AvK

Output/speed of each set: ..... 800kW  
 Diesel-driven alternators  
 Number: ..... 2  
 Engine make/type: ..... Mitsubishi / CCFJ800J-MY marine diesel generator set  
 Type of fuel: ..... MDO  
 Alternator make/type: . Cummins / synchronous  
 Output/speed of each set: ...800kW / 1,500rpm

Boilers  
 Number: ..... 4  
 Type: ..... Plate heat exchanger  
 Make: ..... Alfa Laval  
 Output, each boiler: .....50kg/s

Stern appendages/special rudders: .....Flow spinning stern bulbs, optimized bilge keels

Bow thruster(s)  
 Make: ..... Wärtsilä  
 Number: ..... 1 x FT150  
 Output (each): ..... 600kW

Other cranes  
 Number: ..... 1  
 Make: ..... GHE  
 Type: ..... Telescopic boom crane  
 Tasks: ..... Provision handling  
 Performance: ..... 1t at 5m

Mooring equipment  
 Number: ..... 4 mooring winches  
 Make: ..... SEC  
 Type: ..... Hydraulic

Special lifesaving equipment  
 Number of each and capacity: .....2 x 300 persons, inflatable evacuation slides  
 Make: ..... Haining  
 Type: ..... MES-VP-300  
 If MES, vertical or sloping chutes?: ... Vertical

Vehicles  
 Number of vehicle decks: ..... 2 fixed decks  
 Total lane length: ..... 1,788  
 Doors/ramps/lifts/moveable car decks  
 Number of each: ..... 1  
 Type: ..... Cable actuated ro-ro stern ramp  
 Designer: ..... NaviForm Consulting & Research Ltd.

Complement  
 Officers: ..... 10  
 Crew: ..... 12  
 Suez/Repair Crew: .....12 drivers  
 Single/double/other rooms: ..... 12/4/11 x 4 persons

Passengers  
 Total: .....274 persons  
 Number of cabins: ..... 54  
 Percentage/number outboard: ..... 32 / 60%

Navigation and other equipment  
 Bridge control system  
 Make: ..... Terasaki  
 Type: ..... Bridge Control System  
 Is bridge fitted for one-man operation? ..Yes  
 Integrated bridge system?: .....No

Radars  
 Number: ..... 2  
 Make: ..... JRC

Fire detection system  
 Make: ..... Fireco  
 Type: ..... Sprinkler head fuse

Fire extinguishing systems  
 Vehicle spaces: ..... SSF / Sprinklers  
 Cabins: ..... Fireco / Sprinklers  
 Public spaces: ..... Fireco / Sprinklers

Waste disposal plant  
 Sewage plant  
 Make: ..... Il Seung  
 Model: ..... ISB-23

Efficiency  
 Attained EEDI value: ..... 25.8  
 Required EEDI value: ..... 28.0

Other installed monitoring tools: ....Torque Trak 10k shaft power meter  
 Energy Saving Technologies\*: ... Flow spinning stern bulbs, CLT propellers

Contract date: ..... 31 March 2017  
 Launch/float-out date: .....18 January 2020  
 Delivery date: .....10 September 2020



# FLEX AURORA – LNG carrier

Shipbuilder: ..... **Hyundai Samho Heavy Industries Co., Ltd.**  
 Vessel's name: ..... **Flex Aurora**  
 Owner/Operator: ..... **Flex LNG**  
 Country: ..... **Norway**  
 Designer: .. **Hyundai Samho Heavy Industries (HSHI)**  
 Country: ..... **Republic of Korea**  
 Flag: ..... **Marshall Islands**  
 IMO number: ..... **9857365**  
 Total number of sister ships already completed (excluding ship presented): ..... **1**  
 Total number of sister ships still on order: ..... **2**

Delivered in July 2020 as the first of four 5th generation LNG Carriers, *Flex Aurora* was built by Hyundai Samho Heavy Industries. It's owned by John Fredriksen's Flex LNG which, with 13 vessels in service or on order, is said to have the largest fleet of 5th generation carriers.

These vessels have a capacity around 174,000m<sup>3</sup>, employ a GTT Mark III membrane containment system and are characterised by the choice of low-speed, high-efficiency two-stroke engines and a low cargo boil-off rate.

*Flex Aurora's* sister – *Flex Amber* – was delivered in October 2020 and the remaining two vessels, already named as *Flex Volunteer* and *Flex Vigilant*, are to follow in early 2021. This class of ship is 297.09m in length and 46.4m in beam, with a scantling draught of 12.5m.

The ship's efficiency is demonstrated by its EEDI value, which at 4.52 is almost half of the 8.92 required rating for a vessel of this type and size. This comes courtesy of the combination of its twin skeg hull and power and propulsion system.

Unlike all the other ships in the owner's fleet, which employ MAN B&W ME-GI engines, *Flex Aurora* and its sisters have WinGD 5-cylinder X72DF engines installed. Each vessel has a pair of these units rated at 12,259kW, each running at 69.5rpm and linked to its own 8.7m diameter fixed pitch propeller. The propellers are equipped with Hyundai's Hi-FIN boss cap, which improves efficiency by generating countering swirls that offset those generated by the propeller.

The vessels were reportedly intended to be fitted with scrubbers, but this was not pursued and they can instead meet 2020 SOx rules by running on LNG or compliant fuels. They are also fitted with SCR systems for NOx Tier III compliance.

## TECHNICAL PARTICULARS

Length oa: ..... 297.09m  
 Length bp: ..... 291.0m  
 Breadth moulded: ..... 46.40m

Depth moulded  
 to main deck: ..... 26.50m  
 to upper deck: ..... 26.50m  
 to other decks: ..... 35.50m (Trunk deck)  
 Width of double skin  
 side: ..... 2.56m  
 bottom: ..... 3.20m  
 Draught  
 scantling: ..... 12.50m (moulded)  
 design: ..... 11.50m (moulded)

Gross: ..... 116,430gt  
 Displacement: ..... 128,206t (scant. draught)  
 Lightweight: ..... 34,431t  
 Deadweight  
 scantling: ..... 93,775t  
 design: ..... 82,286t

Block co-efficient: ..... 0.7392 (scant. draught)  
 Speed, service (–%MCR output): ..... 19.5 knots  
 (design draught, NCR with 20% S.M.)  
 Cargo capacity (m<sup>3</sup>)  
 Liquid volume: ..... 174,001  
 Bunkers (m<sup>3</sup>)  
 Heavy oil: ..... 5,220  
 Diesel oil: ..... 550  
 Water ballast (m<sup>3</sup>): ..... 64,560

Classification society and notations: ..... ✱1A  
 Tanker for liquefied gas BIS BWM(T) Clean  
 CMON COAT-PSPC(B) EO F(A, C) LCS  
 NAUT(NAV) Recyclable TMON(oil lubricated)

% high-tensile steel used in construction: .....24.8%

Propulsion  
 Main engine(s)  
 Design: .....WinGD  
 Model: .....W5X72DF  
 Manufacturer: ..... Hyundai (HHI-EMD)  
 Number: .....2 sets  
 Type of fuel: ..... HFO, ULSFO, MGO,  
 GAS(LNG)  
 Output of each engine: ..... 12,259kW  
 x 69.5rpm

Is this a diesel-electric or hybrid? : .....No

Propeller(s)  
 Material: ..... Ni-Al-Bronze  
 Designer/Manufacturer: ..... Hyundai Heavy Industry  
 Number: ..... 2  
 Fixed/Controllable pitch: .....Fixed  
 Diameter: ..... 8,700mm  
 Speed: .....69.5rpm (at MCR)  
 Special adaptations: .....Hi-Fin  
 Diesel-driven alternators  
 Number: .....4 sets

Engine make/type: .....Wärtsilä / 8L34DF,  
 6L34DF  
 Type of fuel: ...HFO, ULSFO, MGO, GAS(LNG)  
 Alternator make/type: ..... HHI-EES / HSJ9  
 807-10P, HSJ9 803-10P  
 Output/speed of each set: ..... 3,840kW x  
 720rpm, 2,880kW x 720rpm

Boilers  
 Number: .....2 sets  
 Type: .....Automatic, forced draught, HFO  
 burning, marine boiler (Aalborg OS-TCi)  
 Make: .....Alfa Laval  
 Output, each boiler: ..... 7,500kg/h x 7kg/cm<sup>2</sup>  
 Stern appendages/special rudders: Skeg bulb /  
 Hi-Rudder

Deck machinery  
 Cargo cranes/cargo gear  
 Number: .....2 sets  
 Make: ..... Oriental  
 Type: .....Electro-hydraulic  
 Performance: .....SWL 10t  
 Other cranes  
 Number: .....3 sets  
 Make: ..... Oriental  
 Type: .....Electro-hydraulic  
 Tasks: ..... Provision handling, cargo  
 machinery room service  
 Performance: .....SWL 8t, SWL 6t

Mooring equipment  
 Number: .....10 sets  
 Make: ..... Flutex  
 Type : .....Electric

Special lifesaving equipment  
 Number of each and capacity: .....2 sets /  
 34 persons  
 Make: .....Norsafe  
 Type: .....Davit launched

Cargo tanks  
 Number: .....4  
 Grades of cargo carried: .....LNG  
 Product range: .....Nitrogen 0.35,  
 Methane 95.74, Ethane 3.2, Propane 0.6,  
 Butane 0.1, Pentane and Heavier 0.01  
 Coated tanks: ..... Membrane type  
 Stainless steel – structure/piping: ..... ASTM  
 A312 GR.TP304L

Cargo pumps  
 Number: .....8 sets  
 Type: .....Verticla centrifugal, submerged  
 Make: ..... Shinco  
 Stainless steel: ..... Ball bearing  
 Capacity (each): ..... 1,850m<sup>3</sup>/h x 165m

Cargo control system  
 Make: ..... Emerson  
 Type: ..... Electro-hydraulic remote  
 control system

Ballast control system  
 Make: ..... Emerson  
 Type: ..... Electro-hydraulic remote  
 control system

Ballast water treatment system  
 Make: .....SunRui  
 Capacity: .....2,500m<sup>3</sup>/h x 2 sets

Complement  
 Officers: ..... 19  
 Crew: ..... 15  
 Suez/Repair Crew: ..... 6

Navigation and other equipment  
 Bridge control system  
 Make: ..... Kongsberg  
 Type: ..... AutoChief-600  
 Is bridge fitted for one-man operation? ..Yes  
 Integrated bridge system?: .....No

Radars  
 Number: ..... 2 sets (S-band, X-band)  
 Make: ..... JRC  
 Model(s): ..... S-band(JMR-9282-S),  
 X-band(JMR-9225-6X)

Fire detection system  
 Make: .....Consilium  
 Type: ..... SG41006/07/08/09

Efficiency  
 Attained EEDI value: ..... 4.52  
 Required EEDI value: ..... 8.92  
 Energy Saving Technologies: .....Hi-FIN,  
 Hi-Rudder Bulb

Contract date: ..... 6 March 2018  
 Launch/float-out date: ..... 6 September 2019  
 Delivery date: ..... 29 July 2020

# FUELNG BELLINA – Bunkering tanker

Shipbuilder: **Keppel Nantong Shipyard Co. Ltd**  
 Vessel's name: **FueLNG Bellina**  
 Owner/Operator: **FueLNG Pte Ltd**  
 Country: **Singapore**  
 Designer: **Keppel Offshore & Marine**  
 Country: **Singapore**  
 Model test establishment used: **Vienna Model Basin**  
 Flag: **Singapore**  
 IMO number: **9859636**  
 Total number of sister ships already completed (excluding ship presented): **Nil**  
 Total number of sister ships still on order: **Nil**

**FueLNG Bellina** is Singapore's first LNG bunkering vessel, built to Keppel O&M's proprietary MTD 7500U LNG design for bunker supplier FueLNG – a joint venture between Keppel and Shell. Constructed at Keppel O&M's Nantong shipyard in China, it is the second LNG bunkering vessel and fifth dual-fuel vessel delivered by Keppel O&M.

Named at the building yard in October 2020, **FueLNG Bellina** finally arrived in Singapore in the first few days of the New Year. It will be used to bunker LNG-fuelled ships calling at Singapore and already has contracts in place for Shell and with Hapag Lloyd for bunkering its retrofitted container vessel, *Sajir*.

The ship has a barge-like extended flat surface to provide bunker for a wide range of vessels. It is highly manoeuvrable with two stern azimuth thrusters and one bow thruster. This enables the ship to even carry out a crabbing manoeuvre during bunkering operations, minimising tug utilisation and in turn reducing fuel consumption and emissions.

As its design suggests, **FueLNG Bellina** has an LNG capacity of 7,500m<sup>3</sup> and is able to supply the liquefied gas to various types of ships at heights ranging from 3–23m above water level, with a filling rate range of 100–1,000m<sup>3</sup> per hour. It is more efficient than conventional bunker vessels, harnessing boil-off gas as fuel for power generation and propulsion.

Its power comes from three Wärtsilä L20DF engines; one 8-cylinder unit and two 6-cylinder models. Combined they have a power output of 3,700kW.

It is also the world's first bunkering vessel with Smart Notation. Equipped with Keppel O&M's proprietary VesselCare solutions, **FueLNG Bellina** has ABS class notations for Smart Infrastructure (Smart INF) and Crew Assistance and Augmentation (Smart CAA) to support FueLNG in enabling remote monitoring and real-time support of vessel operations, as well as predictive maintenance.

## TECHNICAL PARTICULARS

Length oa: 119.50m  
 Length bp: 114.708m  
 Breadth moulded: 19.50m  
 Depth moulded: 9.50m  
 to main deck: 9.50m  
 to upper(Canopy) deck: 14.75m  
 to other decks (Wheelhouse Top): 26m

Width of double skin side: 2.75m  
 Draught scantling: 5.85m  
 design: 5.7m

Gross: 8,319 gt  
 Displacement: 10,544t  
 Lightweight: 4,572t  
 Deadweight: design: 5,972t

Speed, service (90%MCR output): 11knots

Cargo capacity (m<sup>3</sup>)  
 Liquid volume: 7,500  
 Bunkers (m<sup>3</sup>)  
 Diesel oil: 290  
 Water ballast (m<sup>3</sup>): 4,250

Daily fuel consumption (tonnes/day)  
 Main engine only: 18tonnes

Classification society and notations: ABS  
 +A1, Liquefied Gas Carrier with  
 Independent Tanks, +AMS, +ACCU, DFD,  
 +APS,GCU,SH,SHCM.

Propulsion  
 Main engine(s)  
 Model: W8L20DF, W6L20DF  
 Manufacturer: Wärtsilä  
 Number: 1 x W8L20DF, 2 x W6L20DF  
 Type of fuel: Dual-fuel  
 Output of each engine: 1,480kW, 1,110kW  
 Is this a diesel-electric or hybrid?: Yes

Main-engine driven alternators  
 Number: 3  
 Make/type: Hyundai CMXD  
 Output/speed of each set: 1 x 1,680kVA, 2 x 1,300kVA

Bow thruster(s)  
 Make: NGC, NCT110  
 Number: 1  
 Output (each): 400kW

Stern thruster(s)  
 Make: NGC, NRP140-012  
 Number: 2  
 Output (each): 1,000kW  
 Deck machinery  
 Cargo cranes/cargo gear  
 Number: 1  
 Make: TTS Bohai  
 Type: GPK380-5-24  
 Performance: 5t at 24m  
 Other cranes  
 Number: 1  
 Make: TTS Bohai  
 Type: GP 80-2-8  
 Tasks: Provision crane  
 Performance: 2t at 8m

Mooring equipment  
 Number: 6  
 Make: Nantong Liwei  
 Type: Hydraulic

Special lifesaving equipment  
 Number of each and capacity: 1 free-fall lifeboat, 12 persons  
 Make: Jiangyinshi Beihai  
 Type: 6.6m totally enclosed fire-protected free-fall lifeboat

Cargo tanks  
 Number: 2  
 Product range: LNG  
 Coated tanks: Spray insulated  
 Stainless steel – structure/piping: Plate EN 10028-4 X7Ni9

Cargo pumps  
 Number: 4  
 Type: Cryogenic submerged pump  
 Make: Artika 300-2S  
 Stainless steel: Yes  
 Capacity (each): 250m<sup>3</sup>

Ballast water treatment system  
 Make: PureBallast 3.2 300 Compact Flex  
 Capacity: 75 – 300m<sup>3</sup>

Complement  
 Officers: 7  
 Crew: 5  
 Single/double/other rooms: 12 single rooms

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

Radars  
 Number: 1 x X-band radar, 1 x S-band radar  
 Make: Furuno

Fire detection system  
 Make: Tyco  
 Type: Flame, smoke, gas, heat detectors

Fire extinguishing systems  
 Cargo area: Water spray system, dry powder system, water curtain system  
 Make/Type: Wilsafe  
 Engine room: High pressure CO<sub>2</sub>, low pressure water mist  
 Make/Type: Wilsafe  
 Cabins: Fire extinguishers  
 Public spaces: Fire extinguishers

Waste disposal plant  
 Sewage plant  
 Make: Wärtsilä  
 Model: STC 02-13

Efficiency  
 Attained EEDI value: 17.7  
 Installed Fuel Meters: 1 x flowmeter for fuel oil, 1 x Coriolis mass flowmeters for LNG liquid line, 1 x Coriolis mass flowmeters for vapour line  
 Hull coatings: Antifouling paint  
 Performance Monitoring Regime: Keppel's Asset Care, remote digital monitoring system  
 VFD for electric motors, LNG Dual Fuel

Contract date: 4 June 2018  
 Launch/float-out date: 25 May 2020  
 Delivery date: January 2021

# FUJISAN MARU – Crude oil tanker

Shipbuilder: ..... **Namura Shipbuilding Co., Ltd.**  
 Vessel's name: ..... **Fujisan Maru**  
 Owner/Operator: ..... **Iino Kaiun Kaisha, Ltd.**  
 Country: ..... **Japan**  
 Designer: ..... **Namura Shipbuilding Co., Ltd.**  
 Country: ..... **Japan**  
 Flag: ..... **Japan**  
 IMO number: ..... **9827360**  
 Total number of sister ships already completed (excluding ship presented): ..... **1**  
 Total number of sister ships still on order: ..... **Nil**

Namura Shipbuilding delivered the 312,499dwt VLCC *Fujisan Maru*, built at its Imari shipyard, to shipowner Iino Kaiun Kaisha in March 2020.

The vessel is fourth in the newly developed 310,000dwt type VLCC from Namura that complies with IACS' Harmonized Common Structural Rule (CSR-BC&OT) but is the first of two for its owner. The second – *Shoho Maru* – was delivered in September 2020. *Fujisan Maru* also bears a significant title. In 1931, a vessel of the same name and owned by the same company became Japan's first ocean-going oil tanker.

*Fujisan Maru* is a 4th generation Malaccamax and therefore one of the largest ships able to pass through the Strait of Malacca. Its length is a fraction under 339m, 6m more than the previous Malaccamax generation and 24m more than the first.

There are 15 cargo tanks arranged in five sets of port, starboard and centre tanks and two slop tanks. This arrangement allows for simultaneous carriage of three grades. Three Shinko steam turbine driven cargo pumps and two stripping eductors comprise the cargo handling equipment.

The additional length allows for a more efficient vessel due to the slightly increased cargo capacity of approximately 351,500m<sup>3</sup>. The ship's propulsion performance is improved by adoption of energy saving devices developed by Namura. This includes the Namura flow Control Fin and the Rudder Fin attached to the stern, together with the aerodynamic narrow superstructure, hub vortex reduction type propeller boss cap, and low-friction type antifouling coatings.

The ship is fitted with an ultra-long stroke MAN B&W 7G80ME-C9.5 two-stroke diesel main engine built by Mitsui, rated with a 24,700kW output at 67rpm. SOx compliance to IMO 2020 rules is permitted by the installation of an Alfa Laval open loop scrubber. This is the first vessel in the owner's fleet to be scrubber equipped.

## TECHNICAL PARTICULARS

Length oa: ..... 338.92m  
 Breadth moulded: ..... 60.00m

Draught  
 scantling: ..... 21.05m  
 Gross: ..... 160,106gt  
 Deadweight: ..... 312,499t  
 scantling: ..... 21.05m  
 Cargo capacity (m<sup>3</sup>)  
 Liquid volume: ..... Approx. 351,500

Bunkers (m<sup>3</sup>)  
 Heavy oil: ..... Approx. 6,400  
 Diesel oil: ..... Approx. 600

Water ballast (m<sup>3</sup>): ..... Approx. 101,300

Classification society and notations: ..... NK  
 NS\*/MNS\* (CSR, TOB, PSPC-WBT, PSPC-COT, NC) (ESP) (PSCM) (IHM) (SOx(EGCS)) (M0)

Propulsion  
 Main engine(s)  
 Design: ..... MAN  
 Model: ..... B&W 7G80ME-C9.5 high load tuning  
 Manufacturer: ..... Mitsui E&S Machinery Co., Ltd.  
 Number: ..... 1 set  
 Type of fuel: ..... HFO (up to RMG380), MDO (DMB), MGO (DMA,DMZ)  
 Output of each engine: ..... 24,700kW  
 Is this a diesel-electric or hybrid? : ..... No

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

Number: ..... 1 set  
 Fixed/Controllable pitch: ..... Fixed

Diesel-driven alternators  
 Number: ..... 3  
 Engine make/type: ..... Daihatsu diesel Mfg. Co., Ltd.

Type of fuel: ..... HFO (up to RMG380), MDO (DMB), MGO (DMA,DMZ)  
 Alternator make/type: ..... Taiyo Electric / EF 558A-8  
 Output/speed of each set: ..... 1,400kW / 900min-1

Exhaust-gas scrubbing equipment  
 Manufacturer: ..... Alfa Laval Nijmegen B.V.  
 Type: ..... U-type open loop system  
 On main engines?: ..... Applied  
 On auxiliary engines?: ..... Applied

Boilers  
 Number: ..... 1 set  
 Type: ..... Oil fired, forced-draught, two drums, water tube type boiler with automatic combustion control (MAC-80B) / forced circulating water tube with fin type economiser

Make: ...MHI Marine Machinery & Equipment / Osaka boiler Mfg.  
 Output, each boiler: ..... 80,000kg/h of 1.96MPa, 1,600 kg/h of 0.59MPa saturated steam (Oil-fired side)

Deck machinery  
 Other cranes  
 Number: ..... 2  
 Make: ..... Manabe Zoki  
 Type: ..... Electro-hydraulic driven  
 Tasks: ..... Hose handling  
 Performance: ..... 20t

Mooring equipment  
 Number: ..... 10  
 Make: ..... Kawasaki Heavy Industries,  
 Type: ..... Hydraulic oil motor driven

Special lifesaving equipment  
 Number of each and capacity: ..... 30  
 Make: ..... Shigi Shipbuilding  
 Type: ..... Totally enclosed type

Cargo tanks  
 Number: ..... 17  
 Grades of cargo carried: ..... 3 grades  
 Cargo pumps  
 Number: ..... 3  
 Type: ..... Steam turbine driven vertical centrifugal type  
 Make: ..... Shinko Ind.

Cargo control system  
 Make: ..... Nakakita Seisakusho  
 Type: ..... Hydraulic remote control system

Ballast control system  
 Make: ..... Nakakita Seisakusho.  
 Type: ..... Hydraulic remote control system

Ballast water treatment system  
 Make: ..... JFE Engineering Corporation

Complement  
 Officers: ..... 13  
 Crew: ..... 17  
 Single/double/other rooms: ..... 6 (Workers)

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

Radars  
 Number: ..... 2  
 Make: ..... JRC  
 Model(s): ..... JMR-9272-S, JMR-9225-9X

Fire detection system  
 Make: ..... Consilium Nittan Marine Ltd.  
 Type: ..... Addressable type

Fire extinguishing systems  
 Engine room: ..High expansion type foam fire extinguishing system  
 Cabins: ..... Sea water hydrants and portable fire extinguisher  
 Public spaces: ..... Sea water hydrants and portable fire extinguisher

Waste disposal plant  
 Incinerator  
 Make: ..... Sunflame Co., Ltd.  
 Model: ..... OSV – 900SAI  
 Sewage plant  
 Make: ..... Taiko Kikai Industries  
 Model: ..... SBH - 40

Efficiency  
 Installed Fuel Meters: ..... 1 set of main engine & generator engine F.O. flow meter (volume type), 2 sets of generator engine F.O. flow meter (volume type), 1 set of auxiliary boiler F.O. flow meter (volume type), 1 set of MDO/MGO flow meter (volume type)

Other installed monitoring tools: .... 1 set of shaft horse power meter  
 Energy Saving Technologies: ..... Aerodynamic narrow superstructure, Namura flow Control Fin, Rudder Fin, hub vortex reduction type propeller boss cap fin

Delivery date: ..... 23 March 2020

# FUTURE DIAMOND – LPG carrier

Shipbuilder: ..... **Hyundai Heavy Industries Co., Ltd.**  
 Vessel's name: ..... **Future Diamond**  
 Owner/Operator: ..... **JX Ocean**  
 Country: ..... **Japan**  
 Designer: **Hyundai Heavy Industries Co., Ltd.**  
 Country: ..... **Republic of Korea**  
 Model test establishment used: ..... **Hyundai Maritime Research Institute (HMRI)**  
 Flag: ..... **Panama**  
 IMO number: ..... **9853864**  
 Total number of sister ships already completed (excluding ship presented): ..... **Nil**  
 Total number of sister ships still on order: ..... **Nil**

*Future Diamond* was delivered by builder Hyundai Heavy Industries to JX Ocean in January 2020. The vessel is an 80,000m<sup>3</sup> LPG carrier and will operate in the Helios LPG pool under a three-year time charter to Dorian LPG. It is the first VLGC that its owner has contracted outside of Japan and was confirmed as a single ship order in 2018.

The dimensions of the 50,900dwt vessel include a length of 229.94m, beam of 32.25m and moulded depth of 23.2m. Scantling draught is 12.1m.

Cargo capacity in the four IMO Type A independent self-supporting prismatic cargo tanks is 80,000m<sup>3</sup>. There are also two IMO Type C pressure vessel type deck storage tanks with a capacity of 800m<sup>3</sup> for coolant. The former tanks can carry two grades of cargo, including propylene. Pumping arrangements comprise two 600m<sup>3</sup>/h Svanehoj deepwell pumps in each tank.

Power and propulsion arrangements include a Hyundai-built MAN B&W 6G60ME-C9.5HPSCR main engine with an output of 11,765kW at 91.9rpm, directly linked to a 7.2m diameter fixed pitch propeller. Service speed is 16.5knots and the EEDI rating is 5.79 against a required 7.2.

The HPSCR suffix for the main engine denotes a high-pressure selective catalytic reduction (SCR) system and the three diesel generators also employ SCR, allowing the ship to meet IMO Tier III NOx rules. Compliance with the 2020 SOx cap is achieved with the installation of a Clean Marine hybrid scrubber operating on all four engines. The ship's ballast treatment system is a Techcross model accepted by the USCG.

In line with shipping's move towards digitalisation, *Future Diamond* is equipped with the builders' Hyundai-ISS (Integrated Smart ship Solution). This allows for voyage monitoring, route optimisation, fuel/energy flow monitoring, performance analysis and reporting to shore.

## TECHNICAL PARTICULARS

Length oa: ..... 229.94m  
 Length bp: ..... 223.00m  
 Breadth moulded: ..... 32.25m

Depth moulded to main deck: ..... 23.2m  
 Width of double skin side: ..... 1.68m  
 bottom: ..... 1.85m  
 Draught scantling: ..... 12.1m  
 design: ..... 11.65m  
 Gross: ..... 46,863gt  
 Deadweight scantling: ..... 50,900.4t  
 design: ..... 47,963.4t  
 Speed, service: ..... 16.5knots  
 Cargo capacity (m<sup>3</sup>) Liquid volume: ..... 80,876.6  
 Bunkers (m<sup>3</sup>) Heavy oil: ..... 1,855.7  
 Diesel oil: ..... 370.7  
 Water ballast (m<sup>3</sup>): ..... 17,709.2  
 Daily fuel consumption (tonnes/day) Main engine only: ..... 38

Classification society and notations: ..... DNV GL +1A Tanker for liquefied gas, Ship type 2G(-50°C, 610kg/m<sup>3</sup>, 0.028Mpa), BIS, BWM(T), CLEAN, CMON, COAT-PPSP(B), E0, LCS, TMON(oil lubricated), ER(EGCS Hybrid, SCR, Tier III)

Propulsion Main engine(s) Design: ..... Hyundai-MAN B&W  
 Model: ..... Hyundai-MAN B&W 6G60ME-C9.5-HPSCR  
 Manufacturer: ..... Hyundai-MAN B&W  
 Number: ..... 1  
 Type of fuel: ..... HFO, MDO  
 Output of each engine: ..... 11,765kW x 91.9rpm  
 Is this a diesel-electric or hybrid?: ..... No

Propeller(s) Material: ..... Ni-Al-Bronze  
 Designer/Manufacturer: ..... Hyundai Heavy Industries  
 Number: ..... 1  
 Fixed/Controllable pitch: ..... Fixed  
 Diameter: ..... 7.2m  
 Speed: ..... 91.9rpm  
 Diesel-driven alternators Number: ..... 3  
 Engine make/type: Hyundai Heavy Industries  
 Type of fuel: ..... HFO  
 Alternator make/type: ..... Hyundai Electric / HFC 568-08P  
 Output/speed of each set: ..... 1,425kVA / 900rpm, 3 sets

Exhaust-gas scrubbing equipment Manufacturer: ..... Clean Marine  
 Type: ..... Hybrid system  
 On main engines?: ..... 1  
 On auxiliary engines?: ..... 3

Boilers Number: ..... 1  
 Type: ..... Composite boiler  
 Make: ..... KangRim Heavy Industries  
 Output, each boiler: ..... 3,000kg/h

Deck machinery Cargo cranes/cargo gear Number: ..... 1  
 Make: ..... Oriental  
 Type: ..... Electro-hydraulic  
 Performance: ..... SWL 10t, working radius max. 25m ~ min. 6.7m

Other cranes Number: ..... 1  
 Make: ..... Oriental  
 Type: ..... Electro-hydraulic  
 Tasks: ..... Provision crane  
 Performance: ..... SWL 2t, working radius max. 14m ~ min. 3.7m

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

Special lifesaving equipment Number of each and capacity: ..... 1 x lifeboat  
 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, propylene  
 Stainless steel – structure/piping: ..... Piping, ASTM A312 Gr 304L

Cargo pumps Number: ..... 8, 2 per tank  
 Type: ..... Vertical deepwell  
 Make: ..... Wärtsilä Svanehoj  
 Stainless steel: ..... AISI 304L or 316L  
 Capacity (each): ..... 600m<sup>3</sup>/h

Cargo control system Make: ..... Kongsberg Maritime AS  
 Type: ..... K-Chief 600

Ballast control system Make: ..... Kongsberg Maritime AS  
 Type: ..... K-Chief 600

Ballast water treatment system Make: ..... Techcross  
 Capacity: ..... 1,600m<sup>3</sup>/h x 1 set

Complement Officers: ..... 14  
 Crew: ..... 14  
 Suez/Repair Crew: ..... 6  
 Single/double/other rooms: ..... 30 / 4 / 1; Hospital

Navigation and other equipment Bridge control system Make: ..... Hyundai Electric  
 Type: ..... Floor mounting and standing  
 Is bridge fitted for one-man operation? .. No  
 Integrated bridge system?: ..... Yes  
 If yes, make: ..... Hyundai Heavy Industries  
 Model: ..... ISS

Radars Number: ..... S-band radar (1ea), X-band radar (1ea)  
 Make: ..... JRC  
 Model(s): ..... S-band(NKE-1130), X-band(NKE-1125-6)

Fire detection system Make: ..... Consilium  
 Type: ..... Analogue addressable optical smoke detector

Fire extinguishing systems Cargo holds: ..... Dry chemical powder fire extinguishing system on deck  
 Make/Type: ..... FAIN, dry powder  
 Engine room: .. CO<sub>2</sub> fire extinguishing system  
 Make/Type: ..... NK, Central Total Flooding  
 Cabins: ..... Portable fire extinguisher on deck  
 Make/Type: ..... NK, dry powder or CO<sub>2</sub>  
 Public spaces: ..... Portable fire extinguisher on deck  
 Make/Type: ..... NK, dry powder or CO<sub>2</sub>

Efficiency Attained EEDI value: ..... 5.79  
 Required EEDI value: ..... 7.2  
 Contract date: ..... 23 February 2018  
 Launch/float-out date: ..... 18 October 2019  
 Delivery date: ..... 31 January 2020



# GALICIA – Ro-ro

Shipbuilder: ..... **China Merchants Jinling Shipyard (Weihai)**  
 Vessel's name: ..... **Galicia**  
 Owner/Operator: ..... **Stena / Brittany Ferries**  
 Country: ..... **Sweden / France**  
 Designer: ..... **Deltamarin**  
 Country: ..... **Finland**  
 Model test establishment used: ..... **Marine Research Institute Netherlands (MARIN)**  
 Flag: ..... **United Kingdom**  
 IMO number: ..... **9856189**  
 Total number of sister ships already completed (excluding ship presented): ..... **3**  
 Total number of sister ships still on order: ..... **5**

*Galicia*, the first of three ships in Stena RoRo's E-Flexer class constructed to the specific design of French charterer Brittany Ferries, was delivered in September 2020 from Chinese shipyard CMI Jinling (Weihai). Two more of the type have been chartered by the French operator and will be delivered in 2022 and 2023. Brittany ferries has a five-year charter with option to purchase.

The changes that mark out *Galicia* from the first E-Flexer, *Stena Estrid*, is that the car deck on Deck 7 has been converted into cabin accommodation and deckhouse extensions on Decks 7 and 8 have allowed a near doubling of cabin numbers from 175 to 341. Extra lifeboats have been added to cover the increased passenger numbers. Overall length of 214.5m and beam of 27.8m remain the same as other ships in the class.

Less obvious differences are that *Galicia* has been fitted with Alfa Laval closed loop scrubbers on its two MaK 12VM43C medium-speed main engines and is the first in its class to use this means of complying with 2020 SOx rules. The two later sisters are planned to be fuelled by LNG. All of the vessels in the E-Flexer class that are not gas-fuelled are capable of having their engines upgraded to dual-fuel configuration for operation on LNG or methanol.

Planned for use on Brittany ferries' popular routes from Portsmouth UK to Santander in Spain or Cherbourg in France, *Galicia's* interior and facilities have been themed around Spain, suggesting that the Santander route will be its intended service.

The ship has a passenger capacity of 1,100 and is 3,036 lane metres over the three vehicle decks, one of which is hoistable. A stern ramp gives access to the vehicle area and is designed to be able to serve two levels simultaneously. Although freight traffic is important, the dedicated driver restaurant that is often a feature on Stena vessels is not repeated on *Galicia*.

## TECHNICAL PARTICULARS

Length oa: ..... 214.5m  
 Length bp: ..... 202.5m  
 Breadth moulded: ..... 27.8m  
 Depth moulded  
 to main deck: ..... 9.5m  
 to upper deck: ..... 15.3m

Width of double skin  
 side: ..... 0.83m  
 bottom: ..... 1.45m  
 Draught  
 scantling: ..... 6.7m  
 design: ..... 6.4m  
 Gross: ..... 41,671gt  
 Displacement: ..... 24,850t  
 Lightweight: ..... 15,873t  
 Deadweight: ..... 8,977t  
 Block co-efficient (please state relevant draught): ..... 0.634 design draught  
 Speed, service: ..... 22knots  
 Bunkers (m³)  
 Heavy oil: ..... 1,234  
 Diesel oil: ..... 162  
 Water ballast (m³): ..... 2,064

Classification society and notations: ..... 1A Ferry  
 (A) BIS BWM(T) Clean COMF(V-2) E0 Ice(1C)  
 NAUT(AW) Recyclable TMON VIBR

% high-tensile steel used in construction: ... 100  
 Heel control equipment: ..... Nordic flow control  
 water / pump  
 Roll-stabilisation equipment: ..... Fin stabilisers  
 (Mitsubishi)

Propulsion  
 Main engine(s)  
 Design: ..... Four-stroke medium-speed  
 turbocharged and intercooled V-type  
 Model: ..... 12VM43C  
 Manufacturer: ..... MaK  
 Number: ..... 2  
 Type of fuel: ..... HFO, MDO  
 Output of each engine: ..... 12,600kW  
 Is this a diesel-electric or hybrid?: ..... No

Gearbox(es)  
 Make: ..... RENK  
 Model: ..... RSHL 1120  
 Number: ..... 2  
 Output speed: ..... 150.8

Propeller(s)  
 Material: ..... Bronze  
 Designer/Manufacturer: ..... Caterpillar / Berg  
 Number: ..... 2  
 Fixed/Controllable pitch: ..... Controllable  
 Diameter: ..... 4,800mm  
 Speed: ..... 150.8  
 Special adaptations: ..... Feathering mode

Main-engine driven alternators  
 Number: ..... 2  
 Make/type: ..... WE Tech / WE drive (variable frequency)  
 Output/speed of each set: ..... 1,800rpm

Diesel-driven alternators  
 Number: ..... 3  
 Engine make/type: ..... Wärtsilä 8L20  
 Type of fuel: ..... HFO, MDO  
 Alternator make/type: ..... ABB  
 Output/speed of each set: ..... 1,760kW

Exhaust-gas scrubbing equipment  
 Manufacturer: ..... Yara  
 Type: ..... Closed loop

On main engines?: ..... Yes  
 On auxiliary engines?: ..... No  
 Boilers  
 Number: ..... 2  
 Type: ..... FMB-VS-2.5/7  
 Make: ..... Saacke  
 Output, each boiler: ..... 2.5t /h  
 Stern appendages/special rudders: ..... High lift  
 streamlined flap rudders of twisted leading  
 edge type  
 Bow thruster(s)  
 Make: ..... Wärtsilä  
 Number: ..... 2  
 Output (each): ..... 2,400kW  
 Mooring equipment  
 Number: ..... 8  
 Make: ..... Masada  
 Type: ..... Electric  
 Special lifesaving equipment  
 Number of each and capacity: ..... 2 / 708  
 persons  
 Make: ..... Survitec  
 Type: ..... Brude MES chute  
 If MES, vertical or sloping chutes?: ... Vertical

Vehicles  
 Number of vehicle decks (fixed/moveable): 3 / 1  
 Total lane length: ..... 3,036  
 Total cars: ..... Hoistable car deck 2,000m²  
 Doors/ramps/lifts/moveable car decks  
 Number of each: ..... Drive through twin  
 tier loading  
 Designer: ..... TTS  
 Ballast water treatment system  
 Make: ..... Alfa Laval  
 Capacity: ..... 500m³/h  
 Complement  
 Officers: ..... 15  
 Crew: ..... 46  
 Single/double/other rooms: ..... 22/24/-  
 Passengers  
 Total: ..... 1,100  
 Number of cabins: ..... 341  
 Percentage/number outboard: ... 38% / 128 pcs

Navigation and other equipment  
 Bridge control system  
 Make: ..... Sperry  
 Type: ..... Naut AW  
 Is bridge fitted for one-man operation? .. Yes  
 Integrated bridge system?: ..... Yes  
 If yes, make: ..... Sperry  
 Radars  
 Number: ..... 2  
 Make: ..... Sperry  
 Model(s): ..... Vision master (S-band / X-band)

Fire detection system  
 Make: ..... Consilium  
 Type: ..... Salwico Cruise  
 Fire extinguishing systems  
 Cargo holds: ..... Drencher  
 Make/Type: ..... Minimax  
 Engine room: ..... Water mist  
 Make/Type: ..... Marioff / Hi-FOG  
 Vehicle spaces: ..... Drencher  
 Make/Type: ..... Minimax  
 Cabins: ..... Water mist  
 Make/Type: ..... Marioff / Hi-FOG  
 Public spaces: ..... Water mist  
 Make/Type: ..... Marioff / Hi-FOG  
 Waste disposal plant  
 Sewage plant  
 Make: ..... EVAC  
 Model: ..... Eco screen

Efficiency  
 Attained EEDI value: ..... 20,743 gCO₂/t-nm  
 Required EEDI value: ..... 22,279 gCO₂/t-nm  
 Energy Saving Technologies: ..... Optimised hull  
 and propeller design with propeller fairing cone,  
 high lift streamlined flap rudders of twisted lead-  
 ing edge type with rudder bulbs, variable fre-  
 quency shaft generators, frequency controlled  
 pumps and fans, LED lights.  
 Hull coatings: ..... Chugoku

Contract date: ..... 11 July 2017  
 Launch/float-out date: ..... 10 September 2019  
 Delivery date: ..... 3 September 2020

# GAS AGILITY – LNG bunkering vessel

Shipbuilder: **Hudong-Zhonghua Ship Building (Group) Co., Ltd.**  
 Vessel's name: ..... **Gas Agility**  
 Owner/Operator: **Emerald Green Maritime Ltd.**  
 Country: ..... **Malta**  
 Designer: ... **Hudong-Zhonghua Ship Building (Group) Co., Ltd.**  
 Country: ..... **China**  
 Model test establishment used: ..... **SSPA**  
 Flag: ..... **Malta**  
 IMO number: ..... **9850680**  
 Total number of sister ships already completed (excluding ship presented): ..... **Nil**  
 Total number of sister ships still on order: ..... **1**

*Gas Agility*, the world's largest LNG bunker tanker, was conceived in 2017 when Total Marine Fuels entered into an agreement with French container line operator CMA CGM to supply the new LNG-fuelled box ships then under construction.

With a 10-year bunkering agreement inked, Total agreed to a charter for a bunker barge with Japanese owner Mitsui OSK Lines (MOL), which MOL then ordered at Hudong-Zhonghua Shipbuilding in Shanghai. Construction started in November 2018 with delivery taking place in April 2020.

Hull dimensions of the vessel are a length of 135.9m, beam of 24.5m and depth of 16m. Draught is 6.8m fully loaded. *Gas Agility* has a capacity of 18,600m<sup>3</sup> and employs a GTT Mark III Flex membrane containment system. It is equipped with a reliquefaction unit ensuring that any excess boil off beyond what is required to power the vessel's dual-fuel engines is returned to the cargo tanks.

The reliquefaction unit, bunkering manifolds and hose handling cranes give the ship's deck a more crowded appearance than would normally be seen on LNG carriers or bunker barges. The manifolds allow for loading and bunkering operations on either side of the vessel. The upper manifolds are for LNG loading and the lower for bunkering. Bunkering capacity is 1,600m<sup>3</sup>/h.

Power for the vessel comes from four Wärtsilä 8L20DF gensets producing a combined total of 5,680kW. The propulsion system comprises a pair of Wärtsilä steerable thrusters of type WST 18FP and there is also a Wärtsilä CT150H bow thruster. This combination allows for a high degree of manoeuvrability, which is essential for a vessel that will be making ship-to-ship fuel transfers and also permits operation without tug assistance.

## TECHNICAL PARTICULARS

Length oa: ..... 135.90m  
 Length bp: ..... 131.00m  
 Breadth moulded: ..... 24.50m  
 Depth moulded  
   to main deck: ..... 16.00m  
   to upper deck: ..... 19.74m  
 Width of double skin  
   side: ..... 0.012m  
   bottom: ..... 0.014m  
 Draught  
   scantling: ..... 6.80m  
   design: ..... 6.60m  
 Gross: ..... 17,645gt  
 Displacement: ..... 17,186.7t  
 Lightweight: ..... 7,728.8t  
 Deadweight  
   scantling: ..... 9,457.9t  
   design: ..... 8,858.9t  
 Block co-efficient (please state relevant draught): ..... 0.8508 (depth=13.6m)  
 Speed, service: ..... 12knots  
 Cargo capacity (m<sup>3</sup>)  
   Liquid volume: ..... 18,669.2  
 Bunkers (m<sup>3</sup>)  
   Diesel oil: ..... 1,155.7  
 Water ballast (m<sup>3</sup>): ..... 8,287.6

Classification society and notations:.....Bureau Veritas  
 I, +HULL, +MACH, Liquefied gas carrier LNG bunkering ship / Ship type 2G, Methane(LNG) in Membrane tanks, Max.vapour pressure 0.7 barg, Min. temperature -163 deg C RE Initial-CD IG-Supply BOG -dualfuel, Unrestricted Navigation, +VeriSTAR-HULL CM FAT, GREEN PASSPORT EU, +AVM-DPS, +AUT-UMS, +AUT-PORT, +SYS-NEQ, MONSHAFT, BWE, BWT, CLEANSHIP, ERS-S, INWATERSURVEY

Propulsion  
 Diesel-driven alternators  
 Number: ..... 4 sets  
 Engine make/type: ..... Dual-Fuel generator engines, Wärtsilä 8L20DF  
 Type of fuel: ..... MGO, MDO and Gas  
 Alternator make/type: .. ABB AMG 0500LN06 WAA  
 Output/speed of each set: ..... 1,420kW x 1,200rpm

Boilers  
 Number: ..... 1 set  
 Type: ..... Composite boiler

Make: ..... Saacke  
 Output, each boiler: ..... 3,500kg/h  
 Bow thruster(s)  
 Make: ..... Wärtsilä  
 Number: ..... 1 set  
 Output (each): ..... 850kW  
 Stern thruster(s)  
 Make: ..... Wärtsilä  
 Number: ..... 2 sets  
 Output (each): ..... 1,750kW x 2 sets  
 Deck machinery  
 Cargo cranes/cargo gear  
 Number: ..... 2 sets  
 Make: ..... TTS Bohai  
 Type: ..... GP 380-10-23, GP 380-10-20  
 Performance: ..... 10t x 23m, 10t x 20m  
 Other cranes  
 Number: ..... 2 sets  
 Make: ..... TTS Bohai  
 Type: ..... GP 40-2-5  
 Tasks: ..... Spare parts and provision crane  
 Performance: ..... 2t x 5m, 2t x 5m  
 Mooring equipment  
 Number: ..... 2 sets  
 Make: ..... TTS Hua Hai  
 Type: ..... Electric-hydraulic  
 Special lifesaving equipment  
 Number of each and capacity: ..... 1 set x 20 persons  
 Make: ..... Jiangyin Norsafe  
 Type: ..... free-fall lifeboat, GES-21 T

Cargo tanks  
 Number: ..... 2 tanks  
 Grades of cargo carried: ..... LNG  
 Stainless steel – structure/piping: .... SUS316

Cargo pumps  
 Number: ..... 4 sets  
 Type: ..... Vertical Submerged  
 Make: ..... Shinko  
 Stainless steel: ..... Al alloy casting  
 Capacity (each): ..... 420m<sup>3</sup>/h

Cargo control system  
 Make: ..... GTT  
 Type: ..... Mark III Flex

Ballast control system  
 Make: ..... KSB Seil  
 Type: ..... Hydraulic system

Ballast water treatment system  
 Make: ..... Wärtsilä  
 Capacity: ..... 1,000m<sup>3</sup>/h

Complement  
 Officers: ..... 10  
 Crew: ..... 10  
 Suez/Repair Crew: ..... 6  
 Single/double/other rooms: ..... 20 rooms

Navigation and other equipment  
 Bridge control system  
 Make: ..... Furuno  
 Is bridge fitted for one-man operation? ..No  
 Integrated bridge system?: .....No  
 Radars  
 Number: ..... 2 sets  
 Make: ..... Furuno  
 Model(s): ..... FAR-2328, FAR-2338S

Fire detection system  
 Make: ..... Consilium  
 Type: ..... Salwico Fire Alarm System  
 Fire extinguishing systems  
 Cargo holds: ... Dry chemical / Sprayed water  
 Make/Type: ..... Survitec  
 Engine room: ..... CO<sub>2</sub> / Local water based  
 Make/Type: ..... Survitec / Tanktech  
 Cabins: ..... Portable fire extinguisher  
 Public spaces: ..... Sprayed water

Waste disposal plant  
 Sewage plant  
 Make: ..... CSSC Nanjing Luzhou Machine  
 Model: ..... STC -3

Efficiency  
 Installed Fuel Meters: ..... Gas flow meter  
 Hull coatings: ..... Anti-fouling paint  
 Performance Monitoring Regime: .... Continuous access to data both onboard and onshore.

Contract date: ..... 2 February 2018  
 Launch/float-out date: ..... 10 October 2019  
 Delivery date: ..... 30 April 2020

# GLOBAL ENERGY – LNG carrier

Shipbuilder: ....**Daewoo Shipbuilding & Marine Engineering Co., Ltd.**  
 Vessel's name: .....**Global Energy**  
 Owner/Operator: .....**Maran Gas Maritime Inc.**  
 Country: .....**Greece**  
 Designer: .....**Daewoo Shipbuilding & Marine Engineering Co., Ltd.**  
 Country: .....**Republic of Korea**  
 Model test establishment used: ...**KRISO, SSPA**  
 Flag: .....**Marshall Islands**  
 IMO number: .....**9845013**  
 Total number of sister ships already completed (excluding ship presented): .....**3**  
 Total number of sister ships still on order: .....**2**

Built by DSME as the first of four LNG carriers ordered in 2017 by Global Shipping, the Nakilat-Marane Ventures joint venture, *Global Energy* is a 5th generation LNG carrier with a capacity of 173,400m<sup>3</sup>. The vessel was delivered in May 2020 and its first sister – *Global Star* – in January 2021.

*Global Energy* is 294.9m in length with a beam of 46.4m and scantling draught of 12.5m. It is a twin skeg ship with a GTT-NO96 membrane containment system comprising four tanks. The cargo arrangements ensure a low boil-off rate and a full re-liquefaction system which enables no gas combustion unit (GCU) operation.

Nakilat was the first LNG carrier owner to employ a MAN B&W ME-GI engine. In 2015, it converted the twin MAN B&W S70ME-C HFO-burning engines on five-year-old Q-Max vessel *Rasheeda* to ME-GI specifications. *Global Energy*, which has twin ultra-long stroke MAN B&W 5G70ME-C9.5-GI engines, is the first newbuild for the owner to feature this model.

Its main engines, manufactured under license by Hyundai Heavy Industries, have a maximum continuous rating of 12,590kW at 69rpm. The fixed pitch propellers are 8.3m diameter in size and move the vessel through the water at a service speed of 19.5knots.

Two of the later sisters will depart from *Global Energy's* propulsion arrangement and will be fitted with WinGD X-DF low-pressure Otto cycle engines and have a slightly higher cargo capacity of 174,000m<sup>3</sup>.

## TECHNICAL PARTICULARS

Length oa: ..... 294.9m  
 Length bp: ..... 288.5m  
 Breadth moulded: ..... 46.4m  
 Depth moulded to upper deck: ..... 26.5m  
 Draught  
   scantling: ..... 12.5m  
   design: ..... 11.5m  
 Gross: ..... 113,800gt  
 Displacement: ..... 131,000t  
 Deadweight  
   scantling: ..... 93,500t  
   design: ..... 82,000t  
 Speed, service (85 %MCR output): ..... 19.5knots

Cargo capacity (m<sup>3</sup>)  
 Refrigerated storage: ..... 173,400  
 Bunkers (m<sup>3</sup>)  
   Heavy oil: ..... 5,200  
   Diesel oil: ..... 540  
 Water ballast (m<sup>3</sup>): ..... 60,000  
 Daily fuel consumption (tonnes/day)  
   Main engine only: ..... 82.0 (oil) / 67.1 (gas)  
 Classification society and notations: ...American Bureau of Shipping  
   +A1(E) Liquefied gas carrier, Ship type 2G (Membrane tank, Maximum pressure of 0.25/0.35 barg, Minimum temperature -163°C, Specific gravity 0.5), SH, FL(40), SH-DLA, SHCM, SFA(40), SLAM-S, RRDA, GP, +AMS, +ACCU##, +APS, DFD, TCM, PMP, R2, NIBS, CPS, UWILD, ENVIRO###, BWT, BWE, IHM, CRC(SC), RW, SElev  
 % high-tensile steel used in construction: .....7.7%  
 Propulsion  
 Main engine(s)  
   Design: .....Two-stroke, dual-fuel  
   Model: .....MAN B&W 5G70ME-C9.5-GI  
   Manufacturer: .....Hyundai Heavy Industries Co.,Ltd  
   Number: .....2  
   Type of fuel: .....HFO, MDO, LSMGO and fuel gas  
   Output of each engine: .....12,590kW x 69.1rpm (MCR)  
   Is this a diesel-electric or hybrid?: .....No  
 Propeller(s)  
   Material: .....Ni-Al-Bronze  
   Designer/Manufacturer: ..Daewoo Shipbuilding & Marine Engineering / Nakashima Propeller  
   Number: .....2  
   Fixed/Controllable pitch: .....Fixed  
   Diameter: .....8.3m  
   Speed: .....19.5knots  
 Diesel-driven alternators  
   Number: .....4  
   Engine make/type: .....Wärtsilä / 34DF, four-stroke, trunk piston, dual-fuel  
   Type of fuel: ..HFO, MDO, LSMGO & Fuel Gas  
   Alternator make/type: .....Hyundai Electric / Synchronous type  
   Output/speed of each set: .3,670kW/720rpm, 2,750kW/720rpm  
 Boilers  
   Number: .....2  
   Type: .....Vertical, water tube  
   Make: .....Alfa Laval  
   Output, each boiler: .....6,500kg/h x 6.0bar g. saturated  
 Bow thruster(s)  
   Make: .....Kawasaki  
   Number: .....1  
   Output (each): .....2,500kW  
 Deck machinery  
   Cargo cranes/cargo gear  
   Number: .....2

Make: .....Oriental  
 Type: .....Hydraulic  
 Performance: .....SWL 10t  
 Other cranes  
   Number: .....2  
   Make: .....Oriental  
   Type: .....Hydraulic/electric  
   Tasks: ...Provision & engine spare part handling  
   Performance: .....SWL 8t  
 Mooring equipment  
   Number: .....9  
   Make: .....Fukushima  
   Type: .....Hydraulic  
 Special lifesaving equipment  
   Number of each and capacity: .....2  
   Make: .....Hyundai  
   Type: ....Conventional gravity launching type  
 Cargo tanks  
   Number: .....4  
   Grades of cargo carried: .....LNG  
 Product range: .....GTT-NO96 cargo containment system  
   Stainless steel – structure/piping: ...Membrane type (INVAR)  
 Cargo pumps  
   Number: .....8 in total  
   Type: .....Centrifugal, vertical, submerged, single stage, integrated electric motor  
   Make: .....Shinko  
   Capacity (each): .....1,800m<sup>3</sup>/h  
 Cargo control system  
   Make: .....Kongsberg  
   Type: ....Integrated Automation System (IAS)  
 Ballast control system  
   Make: .....Kongsberg  
   Type: ....Integrated Automation System (IAS)  
 Ballast water treatment system  
   Make: .....NK (Ozonation)  
   Capacity: .....6,400m<sup>3</sup>/h  
 Complement  
   Officers: .....20  
   Crew: .....19  
   Suez/Repair Crew: .....6 Suez / 6 shore worker  
   Single/double/other rooms: ....Single rooms / 2 beds in one room for shore worker / 6 beds in one room for Suez crew  
 Navigation and other equipment  
   Bridge control system  
   Make: .....Kongsberg  
   Type: .....Bridge manoeuvring system  
   Is bridge fitted for one-man operation? ..Yes  
   Integrated bridge system?: .....No  
 Radars  
   Number: .....3  
   Make: .....JRC  
   Model(s): .....JMR-9225-7X3, JMR-9225-6X, JMR-9282-S  
 Fire detection system  
   Make: .....Consilium  
   Type: .....Addressable  
 Fire extinguishing systems  
   Engine room:.....Kashiwa / High expansion foam system  
 Waste disposal plant  
 Incinerator  
   Make: .....TeamTec  
   Model: .....GS1000CRSX  
 Waste compactor  
   Make: .....Metos  
   Model: .....IP 500  
 Sewage plant  
   Make: .....Jonghap  
   Model: .....AEROB-25N  
 Efficiency  
   Attained EEDI value: .....5.37 g/ton-mile  
   Required EEDI value: .....8.88 g/ton-mile  
 Installed Fuel Meters: .....Positive displacement (volume) for fuel oil, coriolis (mass) for fuel gas  
 Other installed monitoring tools: .....Ship performance monitoring system  
 Energy Saving Technologies\*: .....DSME full spade rudder with bulb, exhaust gas economiser for ME & GE  
 Hull coatings: .....Silyl methacrylate anti-fouling coating  
 Performance Monitoring Regime: .....Noon and voyage reporting  
 Contract date: .....6 December 2017  
 Delivery date: .....5 May 2020



# HMM ALGECIRAS – Container ship

Shipbuilder: ....**Daewoo Shipbuilding & Marine Engineering Co., Ltd. (DSME)**  
 Vessel's name: .....**HMM Algeciras**  
 Owner/Operator: .....**HMM Co., Ltd.**  
 Country: .....**Republic of Korea**  
 Designer: .....**Daewoo Shipbuilding & Marine Engineering Co., Ltd.**  
 Country: .....**Republic of Korea**  
 Model test establishment used: .....**HSVA**  
 Flag: .....**Panama**  
 IMO number: .....**9863297**  
 Total number of sister ships already completed (excluding ship presented): .....**6**  
 Total number of sister ships still on order: .....**Nil**

In the world of mega container ships, the title of largest in the world is one that is not held for very long. When the 23,964TEU *HMM Algeciras* was delivered by DSME in April 2020, it claimed the crown from *MSC Gulsun* delivered less than a year before in July 2019.

The vessel is the first in seven ships of its type to be built for Korean operator HMM at DSME. A further five vessels of very similar design were ordered at rival builder Samsung, including *HMM Oslo* (which also features in this publication).

Although its container capacity exceeds that of the former title holder, *HMM Algeciras* is physically smaller. The two vessels have the same length of 399.9m but the newer vessel's beam is just 61m compared to 61.5m. In gross tonnage terms, *MSC Gulsun* measures up at 232,618gt while *HMM Algeciras* can boast only 228,283gt.

In terms of power and propulsion, *HMM Algeciras*'s main engine is the most powerful model ever produced to MAN Energy Solutions specifications. The MAN B&W 11G95ME-C10.5 has a maximum per cylinder output of 6,870kW but for this ship it has been derated to a maximum 60,380kW at 77.5rpm. This new engine, with its improved fuel injection, is claimed to allow a 51% reduction in CO<sub>2</sub> emissions compared to earlier container ships of similar size.

## TECHNICAL PARTICULARS

Length oa: .....Approx. 399.9m  
 Length bp: .....383.3m  
 Breadth moulded: .....61.0m  
 Depth moulded  
 to upper deck: .....33.2m  
 to other decks: .....25.878m (mooring deck)  
 Width of double skin  
 side: .....2.45m  
 bottom: .....2.55m  
 Draught  
 scantling: .....14.5m  
 design: .....16.5m  
 Gross: .....228,300gt

Deadweight  
 scantling: .....232,700t  
 design: .....189,200t  
 Speed, service (90% MCR output): .....22.4knots  
 Bunkers (m<sup>3</sup>)  
 Heavy oil: .....12,000  
 Diesel oil: .....1,100  
 Water ballast (m<sup>3</sup>): .....62,800  
 Daily fuel consumption (tonnes/day)  
 Main engine only: .....203.6  
 Classification society and notations: .....Lloyd's Register & Korean Register (Dual Class)  
 LR +100A1, Container ship, BoxMax (V,W,L), CCSA, ShipRight (ACS(B), CM, SDA,FDA plus(25, WW), WDA2, FDA SPR), \*IWS, LI, +LMC, EGCS(Hybrid), ECO(IHM, BWT), BWTS, UMS, NAV1, with descriptive note GR(A) Main Engine capable for conversion to operate with fuels of Low Flash Point, ShipRight (BWMP(S,T), SCM, IHM, SERS, Digital AL3 SAFE SECURITY(Ship Security System), Digital AL3 SAFE SECURITY(Emergency Calling System)), OPS  
 KR +KRS 1 - Container Ship, LS(CL, RS), SeaTrust(DSA1, FSA1, HCM), SeaTrust(SPR1), WHIP, IWS, CDG, IHM, CLEAN2, PSPC, LNG Ready I(ME-C), EEAS-EGC, LG, LI, ERS +KRM 1 – UMA3, STCM, NBS2, HVSC-Partial, BWT  
 % high-tensile steel used in construction: ..Approx. 80%  
 Heel control equipment: .....Anti-heeling system with a pump  
 Propulsion  
 Main engine(s)  
 Design: .....MAN Energy Solutions  
 Model: .....MAN B&W 11G95ME-C10.5  
 Manufacturer: .....HSD engine  
 Number: .....1  
 Type of fuel: .....HFO, ULSFO and LSMGO  
 Output of each engine: .....60,380kW x 77.5rpm (MCR)  
 Is this a diesel-electric or hybrid?: .....No  
 Propeller(s)  
 Material: .....Ni-Al-Bronze  
 Designer/Manufacturer: ..DSME / Nakashima  
 Propeller  
 Number: .....1  
 Fixed/Controllable pitch: .....Fixed  
 Diameter: .....10.3m  
 Speed: .....77.5rpm  
 Diesel-driven alternators  
 Number: .....5  
 Engine make/type: HHI / HiMSEN 9H32/40 x 3 sets, 6H32/40 x 2 sets  
 Type of fuel: .....HFO, ULSFO and LSMGO  
 Alternator make/type: .....Hyundai Electric / HSJ9 915-10P, HSJ9 805-10P, synchronous  
 Output/speed of each set: 4,300kW / 720rpm, 2,800kW / 720rpm

Exhaust-gas scrubbing equipment  
 Manufacturer: .....Valmet  
 Type: .....Hybrid, in-line  
 On main engines?: .....1 scrubber for ME  
 On auxiliary engines?: .....1 scrubber for GES and aux. boiler

Boilers  
 Number: .....1 x auxiliary, 1 x exh. gas  
 Type: ... Vertical, oil fired (aux. boiler), smoke tube with built-in steam drum (exh. gas boiler)  
 Make: .....KangRim  
 Output, each boiler: .....5,000kg/h x 7.0bar g. saturated (aux. boiler), 4,000kg/h x 7.0bar g. saturated (exh. gas boiler)

Stern appendages/special rudders: .....Pre-swirl stator / streamlined full spade rudder with bulb  
 Bow thruster(s)

Make: .....Kawasaki Heavy Industries  
 Number: .....2  
 Output (each): ..3,000kW (thrust: approx. 424kN)

Other cranes  
 Number: .....2  
 Make: .....Oriental  
 Type: .....Single jib, cylinder luffing  
 Tasks: ...Provisions, FO hose, Suez mooring boat handling  
 Performance: .....4t (SWL) on both sides  
 Number: .....1  
 Make: .....Oriental  
 Type: Electric monorail hoisting and travelling  
 Tasks: .....Engine spare parts and Suez mooring boat handling  
 Performance: .....12.5t (SWL)

Mooring equipment  
 Number: .....2 sets x windlass, 16 sets x mooring winch

Make: .....MIRAE Industries  
 Type: .....Electric motor driven

Special lifesaving equipment  
 Number of each and capacity: .....2 sets x 30 persons

Make: .....Hyundai Lifeboats  
 Type: .....Conventional, totally enclosed, water-cooled diesel engine driven

Cargo/capacity  
 Hatch covers  
 Design: .....SMS-SME  
 Manufacturer: .... Samwoo Heavy Industry  
 Type: .....Pontoon type steel open web construction

Containers  
 Lengths: .....20ft  
 Heights: .....8' 6"  
 Cell guides: .....40ft  
 Total TEU capacity: .....23,964TEU  
 On deck: .....14,032  
 In holds: .....9,932  
 Homoneously loaded to 14tonnes: .....15,450  
 Reefer plugs: .....1,500FEU  
 Tiers/rows (maximum)  
 On deck: .....13 tiers / 24 rows  
 In holds: .....12 tiers / 22 rows

Ballast water treatment system  
 Make: .....Panasia  
 Capacity: .....1,000m<sup>3</sup>/h x 1 set

Complement  
 Officers:.....18  
 Crew: .....12  
 Suez/Repair Crew: .....6 Suez crew  
 Single/double/other rooms: . Single rooms / 6 beds in one room for Suez crew

Navigation and other equipment  
 Bridge control system  
 Make: .....Nabtesco  
 Type: .....Bridge Manoeuvring System (M-800-V)

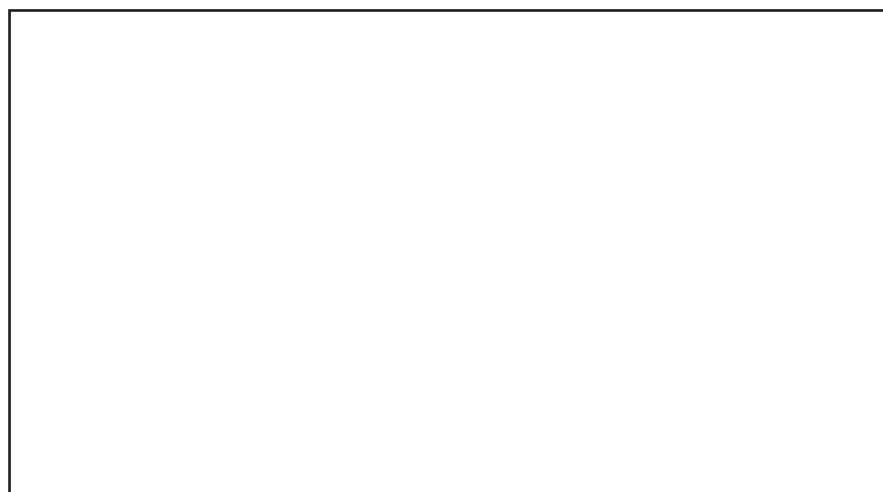
Is bridge fitted for one-man operation?: ..Yes  
 Integrated bridge system?: .....No

Radars  
 Number: .....S, X-band radar (2 sets)  
 Make: .....Furuno  
 Model(s): .....FAR-3320, FAR-3330S-SSD

Efficiency  
 Attained EEDI value: .....6.66 g/tonne-mile  
 Required EEDI value: .....13.08 g/tonne-mile  
 Energy Saving Technologies: ... Pre-swirl stator, full spade rudder with bulb

Contract date: .....28 September 2018  
 Launch/float-out date: .....21 December 2019  
 Delivery date: .....24 April 2020





# HMM OSLO – Container ship

Shipbuilder: ..... **Samsung Heavy Industries Co., Ltd.**  
Vessel's name: ..... **HMM Oslo**  
Owner/Operator: ..... **HMM**  
Country: ..... **Republic of Korea**  
Designer: ..... **Samsung Heavy Industries Co., Ltd.**  
Country: ..... **Republic of Korea**  
Model test establishment used: **Samsung Ship Model Basin (SSMB)**  
Flag: ..... **Panama**  
IMO number: ..... **9868326**  
Total number of sister ships already completed (excluding ship presented): ..... **4**  
Total number of sister ships still on order: ..... **Nil**

Delivered in May 2020, *HMM Oslo* may be considered by some to be the second vessel of the *HMM Algeciras* class but whereas the ship which is currently lauded as the largest container ship in the world was built by DSME, *HMM Oslo* is the product of rival shipbuilder Samsung Heavy Industries. On delivery, it was the largest container ship ever built by Samsung.

As a consequence, there are subtle differences between the two vessels that will not be immediately obvious at first sight. The ships have identical lengths of 399.99m, but *HMM Oslo* has a 61.5m beam – 0.5m more than its 'sister' and its gross tonnage of 232,311gt is over 4,000 more than the 228,283gt of *HMM Algeciras*. Despite those supposed advantages, *HMM Oslo's* nominal cargo capacity is at 23,820TEU, some 144TEU below that of *HMM Algeciras*. The container capacity is split 9,788TEU under deck and 14,032TEU above deck. There are 1,500 reefer plugs on deck.

*HMM Oslo* has four sisters built by Samsung – *HMM Rotterdam*, *HMM Southampton*, *HMM Stockholm* and *HMM St. Petersburg*. The latter was delivered in September, completing the series of 12 ships from the two shipyards.

The power and propulsion is similar to that on *HMM Algeciras* and uses an ultra-long stroke MAN B&W 11G95ME-C10.5 derated to a maximum 59,600kW, a little less than on the earlier vessel's 60,380kW at 77.5rpm. *HMM Oslo* also features a 10.4m diameter Samsung Tip Advanced Rake (STAR) propeller and a full spade rudder with twisted leading edge and bulb, as well as a Samsung Saver Fin energy saving device (ESD). Service speed is 22.5knots.

## TECHNICAL PARTICULARS

Length oa: ..... Approx. 399.9m  
Length bp: ..... 383.0m  
Breadth moulded: ..... 61.5m  
Depth moulded  
to upper deck: ..... 33.2m  
Width of double skin  
side: ..... 2.61m  
bottom: ..... 2.7m

Draught  
scantling: ..... 16.5m  
design: ..... 14.5m  
Gross: ..... Approx. 232,300gt  
Deadweight  
scantling: ..... Approx. 228,600t  
design: ..... Approx. 186,800t  
Speed, service: ..... 22.25knots (90% DMCR)  
Bunkers (m³)  
Heavy oil: ..... Approx. 13,500  
Diesel oil: ..... Approx. 900  
Water ballast (m³): ..... Approx. 59,000  
Daily fuel consumption (tonnes/day)  
Main engine only: ..... 200.7 (at 90% DMCR)

Classification society and notations: .... DNV GL, KR  
DNV GL: \*1A Container Ship, RSD, E0, BIS, DG, NAUT(OC), TMON, BWM(E(s), T), Clean, ERS, LCS, WIV, Gas ready(D, MEc), RSCS, ECA(SOx-A), HLP, Recyclable, ER(EGCS Hybrid)  
KR: \*KRS 1 – Container Ship  
LS(CL, RS), SeaTrust(DSA2, SPR1), WHIP, IWS, ERS, CDG, IHM, CLEAN1, PSPC, LNG Ready I(ME-C), EEAS-EGC, LG, LI \*KRM 1 – UMA, STCM, NBS, HVSC-Partial, BWT  
% high-tensile steel used in construction: ..Approx. 85%

Propulsion  
Main engine(s)  
Design: ..... MAN ES  
Model: ..... 11G95ME-C10.5  
Manufacturer: ..... HHI-MAN  
Number: ..... 1  
Type of fuel: ..... HFO, MGO  
Output of each engine: ..... 59,600kW  
Is this a diesel-electric or hybrid?: ..... No  
Propeller(s)  
Material: ..... Ni-Al Bronze  
Designer/Manufacturer: ..... SHI / MMG  
Number: ..... 1  
Fixed/Controllable pitch: ..... Fixed  
Diameter: ..... 10.4m  
Special adaptations: ..... STAR propeller (Samsung Tip Advanced Rake)  
Diesel-driven alternators  
Number: ..... 5  
Engine make/type: ..... HHI H32/40  
Type of fuel: ..... HFO, MGO  
Alternator make/type: ..... Hyundai Electric / 3 x HSJ9 913-10P, 2 x HSJ9 803-10P  
Output/speed of each set: ..... 3 x 5375 kVA, 2 x 3500 kVA / 720rpm

Boilers  
Number: ..... 1  
Type: ..... Oil fired  
Make: ..... KangRim Heavy Ind.  
Output, each boiler: ..... 5t/h  
Bow thruster(s)  
Make: ..... Kawasaki  
Number: ..... 2 - tunnel thrusters  
Output (each): ..... 3,000kW, each

Other cranes  
Number: ..... 3  
Make: ..... Oriental Precision  
Type: ..... 2 - electro-hydraulic single jib type, 1 - electric motor driven monorail type  
Tasks: .. For provision and Suez mooring boat / engine room equipment handling  
Performance: ..... 2 - 4.0t SWL, each / 1 - 13.5t SWL

Mooring equipment  
Number: ..... One (1) - 1 C/L + 1 M/D + 1 W/H, one (1) - 1 C/L + 1 M/D, Ten (10) - 1 M/D + 1 W/H, Six (6) - 1 M/D  
Make: ..... Mirae  
Type: ..... Electric motor driven (frequency converter type)

Special lifesaving equipment  
Number of each and capacity: ...2 x 32 persons  
Make: ..... HLB  
Type: ..... Totally enclosed conventional type

Cargo/capacity  
Hatch covers  
Design: ..... 100t (20 ft), 220t (40/45 ft), 280t (mixed)  
Manufacturer: ..... Samsung  
Type: ..... Steel pontoon, non-sequential opening/closing

Containers  
Lengths: ..... 20ft  
Heights: ..... 8ft 6inches  
Total TEU capacity: ..... 23,820  
On deck: ..... 14,032TEU  
In holds: ..... 9,788TEU  
Homogeneously loaded to 14tonnes: 15,056TEU  
Reefer plugs:  
Tiers/rows (maximum)  
On deck: ..... 1,500  
In holds: ..... 0  
Ballast control system  
Make : ..... Pleiger Far East  
Type: .... Self-contained electro-hydro system  
Ballast water treatment system  
Make: ..... Panasia  
Capacity: ..... 1,200m³  
Complement  
Officers: ..... 15  
Crew: ..... 14  
Suez/Repair Crew: ..... 6 Suez crew  
Single/double/other rooms: ..... 29 cabins (single), 1 cabin (for Suez crew, with 3 two-tier beds)

Navigation and other equipment  
Bridge control system  
Make: ..... Kongsberg  
Is bridge fitted for one-man operation? Yes  
Integrated bridge system?: ..... Yes  
If yes, make: ..... Furuno  
Model: ..... FMD-3300, etc.

Radars  
Number: ..... 2  
Make: ..... Furuno  
Model(s): ..... 1 x FAR-3330S, 1 x FAR-3320

Fire detection system  
Make: ..... Consilium  
Type: .... Fire Detection & Alarm System CCP

Fire extinguishing systems  
Cargo holds: ..... High pressure CO<sub>2</sub> system  
Make/Type: ..... FAIN  
Engine room: ..... High pressure CO<sub>2</sub> system  
Make/Type: ..... FAIN

Waste disposal plant  
Incinerator  
Make: ..... HMMCO  
Model: ..... MAXI NG25SL  
Sewage plant  
Make: ..... Il-Seung

Efficiency  
Attained EEDI value: . 6.69 g-CO<sub>2</sub> /tonne-mile  
Required EEDI value: ..... 13.12 g-CO<sub>2</sub> /tonne-mile (Based on Phase I) (10% reduction compared to the EEDI reference line)  
Energy Saving Technologies\*: ..... Full spade rudder with twisted leading edge and rudder bulb, SAVER Fin

Hull coatings: ..... SeaQuantum X-200 / hydrolysing silyl methacrylate antifouling coating  
Performance Monitoring Regime: .... SAMSUNG SMARTSHIP Solution (INTELLIMAN SHIP)  
Contract date: ..... November 2018  
Launch/float-out date: ..... December 2019  
Delivery date: ..... May 2020

# JAWA SATU – FSRU

Shipbuilder: ..... **Samsung Heavy Industries**  
Vessel's name: ..... **Jawa Satu**  
Owner/Operator: ..... **PT Jawa Satu Regas**  
Country: ..... **Indonesia**  
Designer: ..... **Samsung Heavy Industries**  
Country: ..... **South Korea**  
Flag: ..... **Indonesia**  
IMO number: ..... **9854935**  
Total number of sister ships already completed (excluding ship presented): ..... **Nil**  
Total number of sister ships still on order: ..... **Nil**

South Korea's Samsung Heavy Industries completed the *Jawa Satu* LNG FSRU in late December 2020 and the 170,000m<sup>3</sup> vessel left the yard on 4 January 2021. The ship is intended for receiving cargoes from LNG carriers, storing and regasifying it to supply a gas-fired power plant in West Java. This is said to be Asia's first LNG FSRU to power project and the vessel has a regasification capacity of 300 million cubic feet per day of gas.

*Jawa Satu* is owned by Jawa Satu Regas, a joint venture between Indonesia's national oil company Pertamina and Japan's Marubeni and Sojitz.

The vessel is 292.5m in length with a beam of 43.4m and draught of 12.9m. The cargo containment system comprises a four-tank GTT Mark III membrane system with four Shinko centrifugal pumps. Its regasification system is Samsung's S-Regas(GI) and marks the debut for the shipbuilder's proprietary in-house developed system. The S-Regas(GI) uses a glycol-based solution that reduces the chances of corrosion in comparison to the more normal method of heating LNG directly with seawater, and it gives energy savings of 5%.

Built around four Wärtsilä 34DF medium speed engines, *Jawa Satu's* power system is diesel-electric. Three of these engines are 8-cylinder models that produce 4,562kVA, and the fourth a smaller 6-cylinder variant producing 3,437kVA. They power two Indar propulsion motors that link to a single propeller through a Renk gearbox.

As a FSRU that is intended mainly for stationary employment, speed is not a major consideration, but the vessel is capable of 12.4knots for evacuation in emergencies, transferring between sites and drydocking.

## TECHNICAL PARTICULARS

Length oa: ..... 292.5m  
Length bp: ..... 281.0m  
Breadth moulded: ..... 43.4m  
Depth moulded  
to main deck: ..... 26.6m  
to upper deck: ..... 26.6m  
Width of double skin  
side: ..... 2.4m  
bottom: ..... 3.1m

Draught  
scantling: ..... 12.9m  
design: ..... 12.1m  
Gross: ..... 107,000gt  
Displacement: ..... 118,374 (@ design draught)  
Deadweight  
scantling: ..... 86,400t  
design: ..... 82,000t  
Speed, service: ..... 12.4knots  
Cargo capacity (m<sup>3</sup>)  
Liquid volume: ..... 170,000  
Bunkers (m<sup>3</sup>)  
Diesel oil: ..... 1,600  
Water ballast (m<sup>3</sup>): ..... 55,500  
Daily fuel consumption (tonnes/day)  
Main engine only: ..... 50.7  
Classification society and notations:.....BV  
I, +HUL, +MACH, Liquefied gas carrier-FSRU  
(Ship type 2G, Membrane(LNG) in Membrane tank, Maximum vapour pressure 0.25 bar in navigation mode, Maximum vapour pressure 0.7 bar in FSRU, Minimum temperature -163 deg.), +AUT-UMS, +AUT-PORT, INWATERSURVEY, MON-SHAFT, CPS(WBT), dualfuel, Spectral Fatigue(Cilamya) FAT 40 years, CLEANSHIP, GREENPASSPORT, REGAS, SLOSHING, ALP, Veristar-Hull FAT 40, IATP  
% high-tensile steel used in construction: Approx. 30%  
Propulsion  
Propulsion motor(s)  
Make/type:..... INDAR (a part of ABB propulsion package) ACP-710-X/6  
Number: ..... 2 sets  
Output/speed of each set: .... 4,150kW / 670rpm  
Gearbox(es)  
Make: ..... RENK  
Model: ..... NDSH-3200  
Number: ..... 1 set  
Output speed: ..... 78.4rpm  
Propeller(s)  
Material: ..... Ni-Al-Bronze  
Designer/Manufacturer: ..... Samsung/Silla  
Number: ..... 1 set  
Fixed/Controllable pitch: ..... Fixed  
Diameter: ..... 8,000mm  
Speed: ..... 700rpm at MCR  
Special adaptations: ..... Net cutter  
Diesel-driven alternators  
Number: ..... 3 / 1 sets  
Engine make/type: Wärtsilä / 3 x 8L34DF, 1 x 6L34DF  
Type of fuel: ..... MDO, MGO  
Alternator make/type: ..... Hyundai (a part of ABB propulsion package) / HSJ9 809-10P x 3 sets, HSJ9 803-10P x 1 set  
Output/speed of each set: ..... 4,562.5kVA / 720rpm x 3 sets, 3,437.5kVA / 720rpm x 1 set  
Boilers  
Number: ..... 2 sets  
Type: ..... Aalborg OS-TCI

Make: ..... Alfa Laval  
Output, each boiler: ..... 5,000kg/h @ 10 barg saturated steam  
Exhaust gas economizers  
Number: ..... 3 / 1 sets  
Type: ..... Aalborg XS-7V  
Make: ..... Alfa Laval  
Output, each boiler: ..... 3 x 1,200 / 1 950kg/h @ 10 bar g saturated steam  
Deck machinery  
Cargo cranes/cargo gear  
Number: ..... 1 (manifold service crane)  
Make: ..... Oriental  
Type: ..... Elec.-hyd. single jib  
Performance: ..... 15.0t SWL  
Other cranes  
Number: ..... 2 x provision crane / 1 x CMR crane  
Make: ..... Oriental  
Type: ..... Elec.-hyd. single jib  
Tasks: ..... 2 sets for provision and E/R equipment / 1 set for CMR  
Performance: ..... 1 x 12.0t & 1 x 5.0t SWL for Provision, 1 x 5.0t SWL for CMR  
Mooring equipment  
Number: ..... 10 sets (2 winches combined with windlass & 8 winches)  
Make: ..... Flutek  
Type: ..... Electric-hyd. driven (high pressure type)  
Special lifesaving equipment..... Applied conventional type  
Cargo tanks  
Number: ..... 4  
Grades of cargo carried: ..... LNG  
Product range: ..... LNG  
Coated tanks: ..... GTT Mark-III  
Stainless steel – structure/piping: ..SUS304L  
Cargo pumps  
Number: ..... 4  
Type: ..... Centrifugal, submerged  
Make: ..... Shinko  
Capacity (each): ..... 1,750m<sup>3</sup>/h x 160MLC  
Regasification  
Type: ..... Glycol water indirect  
Capacity: ..... Nominal – 300mmscf/d, peak – 400mmscf/d  
Cargo control system  
Make: ..... Samsung (S&Sys)  
Ballast control system  
Make: ..... Samsung (S&Sys)  
Navigation and other equipment  
Bridge control system  
Make: ..... ABB (El. propulsion motor control system)  
Is bridge fitted for one-man operation? ... Yes  
Integrated bridge system?: ..... No  
Model: ..... Each 1 x ECDIS (FMD-3300), 1 x Conning (FMD-3300)  
Radars  
Number: ..... 2 sets (1 x S-band, 1 x X-band)  
Make: ..... Furuno  
Model(s): ..... FAR-2338SW, FAR-2328W  
Fire detection system  
Make: ..... Consilium  
Type: ..... CDF5000 SIL2  
Fire extinguishing systems  
Cargo holds: ..... Dry chemical powder  
Make/Type: ..... NK  
Engine room: ..... High expansion foam  
Make/Type: ..... NK  
Waste disposal plant  
Waste handled: ..... Food waste digester (SIMPLE 100NS)  
Waste compactor  
Make: ..... Metos  
Model: ..... DT-200MCP  
Waste shredder/crusher  
Make: ..... Metos  
Model: ..... SD-190LCS  
Efficiency  
Attained EEDI value: ..... 4.214  
Required EEDI value: ..... 9.273  
Energy Saving Technologies\*: ..VFD for cooling SW pump  
Performance Monitoring Regime: ..... Samsung SMART SHIP SOLUTION  
Contract date: ..... 12 October 2018  
Launch/float-out date: ..... 11 January 2020  
Delivery date: ..... January 2021

# KMTC SEOUL –Container ship

Shipbuilder: **Hyundai Mipo Dockyard Co., Ltd.**  
Vessel's name: ..... **KMTC Seoul**  
Owner/Operator: ..... **Korea Marine Transport Co., Ltd.**  
Country: ..... **Republic of Korea**  
Designer: ... **Hyundai Mipo Dockyard Co., Ltd.**  
Country: ..... **Republic of Korea**  
Model test establishment used: ..... **KRISO**  
Flag: ..... **Liberia**  
IMO number: ..... **9882205**  
Total number of sister ships already completed (excluding ship presented): ..... **1**  
Total number of sister ships still on order: ..... **3**

In March 2019, feeder container ship operator Korea Marine Transport Company (KMTC) booked a three-ship order with Hyundai Mipo, ending a seven-year break from newbuilding. In June the same year, KMTC returned and added two more for a five-ship series of 2,500TEU vessels. *KMTC Seoul* was delivered in August 2020 is the first of the series to enter service.

Ships of this size have been a neglected area for newbuilds in recent years and the age profile is quite high. This meant that fleet renewal was becoming necessary, not least with ballast treatment regulations and 2020 SOx rules certain to make some older vessels obsolete.

*KMTC Seoul* is 196m in length, has a Panamax beam of 32.5m and scantling draught of 11.7m. The hull form is typical of its type with a bulbous bow, transom stern forecastle and raised quarter deck. It has five cellular holds and a capacity of 2,540TEU, of which 940 are under deck and 1,600 on deck. Reefer containers can be accommodated in its No.5 hold and on deck, whereas overheight and standard containers can be loaded in the holds. At 14tonnes homogeneous, the cargo capacity reduces to 2,030TEU.

With a power output of 16,700kW at 100.8rpm, *KMTC Seoul's* main engine is a Hyundai-built MAN B&W 7S60ME-C10.5. It is directly linked to a fixed pitch 7.2m diameter propeller. The arrangement allows for a service speed of 18.6knots.

The ship's three gensets are based on HiMSEN H21/32 engines. Both its main engine and gensets make use of an in-house Hyundai open loop scrubber for compliance with IMO 2020 SOx regulations. For this vessel the required EEDI is 18.91, which is comfortably met by the attained value of 13.46.

Compliance with ballast water regulations is achieved through the installation of an Alfa Laval PureBallast system with a capacity of 500m<sup>3</sup>/h.

## TECHNICAL PARTICULARS

Length oa: ..... Approx. 196m  
Length bp: ..... 185.0m  
Breadth moulded: ..... 32.50m

Depth moulded  
to main deck: ..... 16.80m  
to upper deck: ..... 16.80m  
to other decks: ..... 18.40m (raised quarter deck)  
Width of double skin  
side: ..... 2.15m  
bottom: ..... 1.65m  
Draught  
scantling: ..... 11.70m  
design: ..... 10.00m  
Gross: ..... 27,99gt  
Deadweight  
scantling: ..... 37,200t  
design: ..... 28,500t  
Speed, service (63.8%MCR output with 15% S.M.): ..... Approx. 18.6knots  
Bunkers (m<sup>3</sup>)  
Heavy oil: ..... 1,330  
Diesel oil: ..... 150  
Water ballast (m<sup>3</sup>): ..... 12,300  
Daily fuel consumption (tonnes/day)  
Main engine only: ..... 42.3  
Classification society and notations: ..... KR  
+KRS-Container Ship LS Sea Trust(DSA1,  
FSA2, HCM) IWS CDG IHM CLEAN1 PSPC  
EEAS-EGC LG LI +KRM1-UMA STCM BWT  
Heel control equipment: ..... Anti-heeling  
pump system  
Propulsion  
Main engine(s)  
Design: ..... Hyundai-MAN B&W  
Model: ..... 7S60ME-C10.5 (Tier II)  
Manufacturer: ..... HHI Engine & Machinery  
Division  
Number: ..... 1  
Type of fuel: ..... HFO, MDO  
Output of each engine: ..... 16,700kW  
Is this a diesel-electric or hybrid? : ..... No  
Propeller(s)  
Material: ..... Ni-Al-Bronze  
Designer/Manufacturer : ..... Hyundai Heavy  
Industries  
Number: ..... 1  
Fixed/Controllable pitch: ..... Fixed  
Diameter: ..... 7.2m  
Speed: ..... 100.8rpm at MCR  
Diesel-driven alternators  
Number: 3  
Engine make/type: ..... HHI Engine & Machinery  
Division / 8H21/32  
Type of fuel: ..... HFO  
Alternator make/type: ... Hyundai Electric and  
Energy System / HFC7 636-08P  
Output/speed of each set: 1,700kW x 900rpm  
Exhaust-gas scrubbing equipment  
Manufacturer: ..... Hyundai Power Systems  
Type: ..... Open loop  
On main engines?: ..... Yes  
On auxiliary engines?: ..... Yes

Boilers  
Number: ..... 1  
Type: ..... Vertical, cylindrical type  
Make: ..... KangRim Heavy Industries  
Output, each boiler: ..... 2,000kg / 1,050h  
Bow thruster(s)  
Make: ..... KTE  
Number: ..... 1  
Output (each): ... 1,150kW / AC 3,300V / 3Ø / 60Hz  
Other cranes  
Number: ..... 1  
Make: ..... Tech Flower  
Type: ..... Elec-Hyd  
Tasks: ..... Provision crane  
Performance: ..... 4t x 2.6-11.8m  
Mooring equipment  
Number: ..... 4  
Make: ..... Flutek  
Type: ..... Elec-Hyd  
Special lifesaving equipment  
Number of each and capacity: ..... 21P  
Make: ..... DSB Engineering  
Type: ..... Gravity type  
Cargo/capacity  
Hatch covers  
Design: ..... MacGregor  
Manufacturer: ..... MacGregor  
Type (upper deck/other decks): ... Pontoon  
Containers  
Lengths: ..... 6.058m  
Heights: ..... 2.591m  
Cell guides: ..... Y  
Total TEU capacity: ..... 2,540TEU  
On deck: ..... 1,600TEU  
In holds: ..... 940TEU  
Homogeneously loaded to 14tonnes: 2,030TEU  
Reefer plugs:  
Tiers/rows (maximum)  
On deck: ..... 6 / 13  
In holds: ..... 6 / 11  
Ballast control system  
Make: ..... Wärtsilä  
Type: ..... MOS Platinum  
Ballast water treatment system  
Make: ..... Alfa Laval  
Capacity: ..... 500m<sup>3</sup>  
Complement  
Officers: ..... 10  
Crew: ..... 11  
Single/double/other rooms: ..... 21/0/0  
Navigation and other equipment  
Bridge control system  
Make: HHI  
Is bridge fitted for one-man operation?: ... No  
Integrated bridge system (Y/N?): ..... Yes  
If yes, make: ..... JRC  
Model: ..... GRD-921  
Radars  
Number: ..... 2  
Make: ..... JRC  
Model(s) : ..... JMR-9282-S / JMR-9225-6X  
Fire detection system  
Make: ..... B-I Industrial Co. Ltd.  
Type: ..... BDS-4000MIF  
Fire extinguishing systems  
Cargo holds: ..... Fixed CO<sub>2</sub>  
Make/Type: ..... FAIN  
Engine room: ..... Fixed CO<sub>2</sub>  
Make/Type: ..... FAIN  
Cabinets: ..... Portable fire extinguisher  
Make/Type: ..... FAIN  
Public spaces: ..... Portable fire extinguisher  
Make/Type: ..... FAIN  
Waste disposal plant  
Incinerator  
Make: ..... HMMCO  
Model: ..... MAXI NG50SL WS  
Sewage plant  
Make: ..... Jonghap Machinery  
Model: ..... AEROB – 12N(A)  
Efficiency  
Attained EEDI value: ..... 13.46 g/tonne-nm  
Required EEDI value: ..... 18.91 g/tonne-nm  
Installed Fuel Meters: ..... Electro pneumatic type  
tank level gauge  
Other installed monitoring tools: ..... Electro  
pneumatic type draught gauge  
Contract date: ..... 20 March 2019  
Launch/float-out date: ..... 5 June 2020  
Delivery date: ..... 27 August 2020



# LA SEINE – LNG carrier

Shipbuilder: ..... **Hyundai Heavy Industries Co., Ltd.**  
 Vessel's name: ..... **La Seine**  
 Owner/Operator: ..... **TMS Cardiff Gas Ltd.**  
 Country: ..... **Greece**  
 Designer: **Hyundai Heavy Industries Co., Ltd.**  
 Country: ..... **Republic of Korea**  
 Model test establishment used: **Hyundai Maritime Research Institute (HMRI)**  
 Flag: ..... **Malta**  
 IMO number: ..... **9845764**  
 Total number of sister ships already completed (excluding ship presented): ..... **3**  
 Total number of sister ships still on order: ..... **3**

*La Seine* is a 174,000m<sup>3</sup> LNG carrier with a reliquefaction plant and was delivered by Hyundai Heavy Industries to TMS Cardiff Gas in February 2020. The ship was ordered in 2018 as a one plus one option, but the owner has returned twice more to increase the total number of vessels to seven. TMS Cardiff Gas has also ordered four similar sized ships from Samsung. Together the 11 vessels form the owner's X-class of LNG carriers.

The 299.06m-long vessel has a 46.4m beam and maximum draught of 12.5m. It is of twin skeg design and has four cargo tanks with a GTT Mark III membrane containment system. The reliquefaction plant is housed on the starboard side of the vessel directly in front of the superstructure. It can operate at 1.5t/h and reduces the daily boil-off rate to 0.085% of the cargo volume.

Operated by Total under a long-term charter, *La Seine* achieved further significance when, in September 2020, it delivered the first carbon-neutral cargo ever carried by the charterer.

The X-class label derives from the fact that all vessels are fitted with WinGD X-DF low-pressure Otto cycle main engines. For *La Seine*, these are a pair of 5X72DF units each rated at 12,111kW and directly coupled to 8.4m fixed pitch propellers. Efficiency is improved by Hi-Fin propeller hubs, which generate countering swirls, and Hi-Rudders – Hyundai's in-house flow adapted twisted rudder design for twin skeg vessels. The arrangement allows a service speed of 19.5knots and an EEDI of 6.33, which is significantly below the 8.93 required.

## TECHNICAL PARTICULARS

Length oa: ..... 299.06m  
 Length bp: ..... 291.00m  
 Breadth moulded: ..... 46.40m  
 Depth moulded  
 to main deck: ..... 35.50m  
 to upper deck: ..... 26.50m  
 Width of double skin  
 side: ..... 2.655m  
 bottom: ..... 3.20m

Draught (moulded)  
 scantling: ..... 12.5m  
 design: ..... 11.5m  
 Gross: ..... 115,139gt  
 Deadweight  
 scantling: ..... 93,534.9t  
 design: ..... 82,063.9t  
 Speed, service: ..... 19.5knots  
 Cargo capacity (m<sup>3</sup>)  
 Liquid volume: ..... 174,062  
 Bunkers (m<sup>3</sup>)  
 Heavy oil: ..... 5,199.5  
 Gas oil: ..... 636.4  
 Water ballast (m<sup>3</sup>): ..... 64,692.8  
 Daily fuel consumption (tonnes/day)  
 Main engine only: ..... 84.8  
 Auxiliaries: ..... 6.7  
 Classification society and notations: ...I, +HULL, +MACH, Unrestricted navigation, Liquefied gas carrier(Ship type 2G, Methane(LNG) in Membrane tanks, Maximum vapour pressure 0.35 bar, Minimum temperature -163°C), ESA, dual fuel, +VeriSTAR-HULL CM, Spectral fatigue(worldwide FAT 40 years), CPS(WBT), GREEN PASSPORT EU, INWATERSURVEY, LI-HG-S3, +AUT-UMS, BWT, MON-SHAFT, +AVM-DPS, +SYS-NEQ-1, +ALP-MR, CLEAN-SHIP, ERS-S

Propulsion  
 Main engine(s)  
 Design: ..... Hyundai-WinGD  
 Model: ..... 5X72DF  
 Manufacturer: ..... HHI Engine & Machinery Division  
 Number: ..... 2  
 Type of fuel: ..... HFO, MGO, LNG  
 Output of each engine: . 12,111kW x 77.1rpm  
 Is this a diesel-electric or hybrid?: .....No

Propeller(s)  
 Material: ..... Ni-Al-Bronze  
 Designer/Manufacturer: ..... HHI  
 Number: ..... 2  
 Fixed/Controllable pitch: .....Fixed  
 Diameter: ..... 8.4m  
 Speed: ..... 77.1rpm

Diesel-driven alternators  
 Number: ..... 4 sets total  
 Engine make/type: . HHI Engine & Machinery Division / 8H35DF x 2 sets, 6H35DF x 2 sets  
 Type of fuel: ..... HFO, MDO, LNG  
 Alternator: .....  
 Output/speed of each set: ..... 3,840kW x 720rpm, 2,880kW x 720rpm

Boilers  
 Number: ..... 2 sets  
 Type: ..... Oil fired  
 Make: ..... Alfa Laval  
 Output, each boiler: ..... 7,500kg/h  
 Stern appendages/special rudders: ...Hi-Rudder & Hi-Fin

Deck machinery  
 Cargo cranes/cargo gear  
 Number: ..... 3  
 Make: ..... Sangsagin Industries  
 Type: ..... Electro-hydraulic driven crane  
 Performance: SWL 5t x 25m x 2sets, SWL 6t x 23m x1set

Other cranes  
 Number: ..... 2  
 Make: ..... Sangsagin Industries  
 Type: ..... Electro-hydraulic driven crane  
 Tasks: ..... Provision Handling  
 Performance: .. SWL 8t x 22m x 1set, SWL 2t x 22m x 1set

Mooring equipment  
 Number: ..... 9  
 Make: ..... Flutek  
 Type : ..... Electric

Special lifesaving equipment  
 Number of each and capacity: ..... 42p  
 Make: ..... Viking - Norsafe Life-Saving Equipment Jiangyin  
 Type: ..... Motor propelled, totally enclosed FRP, davit launched type

Cargo tanks  
 Number: ..... 4

Cargo pumps  
 Number: ..... 8 (2 per each tank)  
 Type: ... Centrifugal, vertical, submerged, fixed  
 Make: ..... Shinko  
 Stainless steel: ..... Applied for ball bearing  
 Capacity (each): ..... 1,850m<sup>3</sup>/h x 165mlc

Cargo control system  
 Make: ..... Scana / Kongsberg  
 Type: .. Hydraulic remote control / Integrated Automation System

Ballast control system  
 Make: ..... Scana / Kongsberg  
 Type: ... Hydraulic remote control / Integrated Automation System

Ballast water treatment system  
 Make: ..... Sunrul  
 Capacity: ..... 2,600m<sup>3</sup>/h x 2

Complement  
 Officers: ..... 18  
 Crew: ..... 18  
 Suez/Repair Crew: ..... 6

Navigation and other equipment  
 Bridge control system  
 Make: ..... Kongsberg  
 Type: ..... AutoChief 600  
 Is bridge fitted for one-man operation?: Yes  
 Integrated bridge system?: ..... Yes  
 Model: ..... Furuno FMD-3300

Radars  
 Number: ..... 2  
 Make: ..... Furuno  
 Model(s): ..... FAR-2338SNXT(S-band), FAR-2328(X-band)

Fire detection system  
 Make: ..... Consilium  
 Type: ..... Salwico

Fire extinguishing systems  
 Cargo deck: ..... Fain / Dry chemical powder system  
 Engine room: ..... Johnson Controls / High expansion foam  
 Cabins: ..... Fain / Portable fire extinguisher  
 Public spaces: ..... Fain / Portable fire extinguisher

Waste disposal plant  
 Incinerator  
 Make: ..... HMMCO  
 Model: ..... MAXI 1200 SL WS  
 Sewage plant  
 Make: ..... Il Seung  
 Model: ..... ISB-04

Efficiency  
 Attained EEDI value: ..... 6.33  
 Required EEDI value: ..... 8.93  
 Installed Fuel Meters: .. Mass flow type for fuel oil and fuel gas

Other installed monitoring tools: ..... Trim & list, draughts

Energy Saving Technologies\*: ..... Hi-RUDDER, Hi-FIN

Hull coatings: ..... Tin free SPC antifouling paint manufactured by International Paint

Contract date: ..... 6 December 2017

Launch/float-out date: ..... 31 May 2019 (L/C)

Delivery date: ..... 28 February 2020



# LA SEINE – LNG carrier

Shipbuilder: ..... **Hyundai Heavy Industries Co., Ltd.**  
 Vessel's name: ..... **La Seine**  
 Owner/Operator: ..... **TMS Cardiff Gas Ltd.**  
 Country: ..... **Greece**  
 Designer: **Hyundai Heavy Industries Co., Ltd.**  
 Country: ..... **Republic of Korea**  
 Model test establishment used: **Hyundai Maritime Research Institute (HMRI)**  
 Flag: ..... **Malta**  
 IMO number: ..... **9845764**  
 Total number of sister ships already completed (excluding ship presented): ..... **3**  
 Total number of sister ships still on order: ..... **3**

*La Seine* is a 174,000m<sup>3</sup> LNG carrier with a reliquefaction plant and was delivered by Hyundai Heavy Industries to TMS Cardiff Gas in February 2020. The ship was ordered in 2018 as a one plus one option, but the owner has returned twice more to increase the total number of vessels to seven. TMS Cardiff Gas has also ordered four similar sized ships from Samsung. Together the 11 vessels form the owner's X-class of LNG carriers.

The 299.06m-long vessel has a 46.4m beam and maximum draught of 12.5m. It is of twin skeg design and has four cargo tanks with a GTT Mark III membrane containment system. The reliquefaction plant is housed on the starboard side of the vessel directly in front of the superstructure. It can operate at 1.5t/h and reduces the daily boil-off rate to 0.085% of the cargo volume.

Operated by Total under a long-term charter, *La Seine* achieved further significance when, in September 2020, it delivered the first carbon-neutral cargo ever carried by the charterer.

The X-class label derives from the fact that all vessels are fitted with WinGD X-DF low-pressure Otto cycle main engines. For *La Seine*, these are a pair of 5X72DF units each rated at 12,111kW and directly coupled to 8.4m fixed pitch propellers. Efficiency is improved by Hi-Fin propeller hubs, which generate countering swirls, and Hi-Rudders – Hyundai's in-house flow adapted twisted rudder design for twin skeg vessels. The arrangement allows a service speed of 19.5knots and an EEDI of 6.33, which is significantly below the 8.93 required.

## TECHNICAL PARTICULARS

Length oa: ..... 299.06m  
 Length bp: ..... 291.00m  
 Breadth moulded: ..... 46.40m  
 Depth moulded  
 to main deck: ..... 35.50m  
 to upper deck: ..... 26.50m  
 Width of double skin  
 side: ..... 2.655m  
 bottom: ..... 3.20m

Draught (moulded)  
 scantling: ..... 12.5m  
 design: ..... 11.5m  
 Gross: ..... 115,139gt  
 Deadweight  
 scantling: ..... 93,534.9t  
 design: ..... 82,063.9t  
 Speed, service: ..... 19.5knots  
 Cargo capacity (m<sup>3</sup>)  
 Liquid volume: ..... 174,062  
 Bunkers (m<sup>3</sup>)  
 Heavy oil: ..... 5,199.5  
 Gas oil: ..... 636.4  
 Water ballast (m<sup>3</sup>): ..... 64,692.8  
 Daily fuel consumption (tonnes/day)  
 Main engine only: ..... 84.8  
 Auxiliaries: ..... 6.7  
 Classification society and notations: ...I, +HULL, +MACH, Unrestricted navigation, Liquefied gas carrier(Ship type 2G, Methane(LNG) in Membrane tanks, Maximum vapour pressure 0.35 bar, Minimum temperature -163°C), ESA, dual fuel, +VeriSTAR-HULL CM, Spectral fatigue(worldwide FAT 40 years), CPS(WBT), GREEN PASSPORT EU, INWATERSURVEY, LI-HG-S3, +AUT-UMS, BWT, MON-SHAFT, +AVM-DPS, +SYS-NEQ-1, +ALP-MR, CLEAN-SHIP, ERS-S

Propulsion  
 Main engine(s)  
 Design: ..... Hyundai-WinGD  
 Model: ..... 5X72DF  
 Manufacturer: ..... HHI Engine & Machinery Division  
 Number: ..... 2  
 Type of fuel: ..... HFO, MGO, LNG  
 Output of each engine: . 12,111kW x 77.1rpm  
 Is this a diesel-electric or hybrid?: .....No

Propeller(s)  
 Material: ..... Ni-Al-Bronze  
 Designer/Manufacturer: ..... HHI  
 Number: ..... 2  
 Fixed/Controllable pitch: .....Fixed  
 Diameter: ..... 8.4m  
 Speed: ..... 77.1rpm

Diesel-driven alternators  
 Number: ..... 4 sets total  
 Engine make/type: . HHI Engine & Machinery Division / 8H35DF x 2 sets, 6H35DF x 2 sets  
 Type of fuel: ..... HFO, MDO, LNG  
 Alternator: .....  
 Output/speed of each set: ..... 3,840kW x 720rpm, 2,880kW x 720rpm

Boilers  
 Number: ..... 2 sets  
 Type: ..... Oil fired  
 Make: ..... Alfa Laval  
 Output, each boiler: ..... 7,500kg/h  
 Stern appendages/special rudders: ...Hi-Rudder & Hi-Fin

Deck machinery  
 Cargo cranes/cargo gear  
 Number: ..... 3  
 Make: ..... Sangsagin Industries  
 Type: ..... Electro-hydraulic driven crane  
 Performance: SWL 5t x 25m x 2sets, SWL 6t x 23m x1set

Other cranes  
 Number: ..... 2  
 Make: ..... Sangsagin Industries  
 Type: ..... Electro-hydraulic driven crane  
 Tasks: ..... Provision Handling  
 Performance: .. SWL 8t x 22m x 1set, SWL 2t x 22m x 1set

Mooring equipment  
 Number: ..... 9  
 Make: ..... Flutek  
 Type : ..... Electric

Special lifesaving equipment  
 Number of each and capacity: ..... 42p  
 Make: ..... Viking - Norsafe Life-Saving Equipment Jiangyin  
 Type: ..... Motor propelled, totally enclosed FRP, davit launched type

Cargo tanks  
 Number: ..... 4

Cargo pumps  
 Number: ..... 8 (2 per each tank)  
 Type: ... Centrifugal, vertical, submerged, fixed  
 Make: ..... Shinko  
 Stainless steel: ..... Applied for ball bearing  
 Capacity (each): ..... 1,850m<sup>3</sup>/h x 165mlc

Cargo control system  
 Make: ..... Scana / Kongsberg  
 Type: .. Hydraulic remote control / Integrated Automation System

Ballast control system  
 Make: ..... Scana / Kongsberg  
 Type: ... Hydraulic remote control / Integrated Automation System

Ballast water treatment system  
 Make: ..... Sunrul  
 Capacity: ..... 2,600m<sup>3</sup>/h x 2

Complement  
 Officers: ..... 18  
 Crew: ..... 18  
 Suez/Repair Crew: ..... 6

Navigation and other equipment  
 Bridge control system  
 Make: ..... Kongsberg  
 Type: ..... AutoChief 600  
 Is bridge fitted for one-man operation?: Yes  
 Integrated bridge system?: ..... Yes  
 Model: ..... Furuno FMD-3300

Radars  
 Number: ..... 2  
 Make: ..... Furuno  
 Model(s): ..... FAR-2338SNXT(S-band), FAR-2328(X-band)

Fire detection system  
 Make: ..... Consilium  
 Type: ..... Salwico

Fire extinguishing systems  
 Cargo deck: ..... Fain / Dry chemical powder system  
 Engine room: ..... Johnson Controls / High expansion foam  
 Cabins: ..... Fain / Portable fire extinguisher  
 Public spaces: ..... Fain / Portable fire extinguisher

Waste disposal plant  
 Incinerator  
 Make: ..... HMMCO  
 Model: ..... MAXI 1200 SL WS  
 Sewage plant  
 Make: ..... Il Seung  
 Model: ..... ISB-04

Efficiency  
 Attained EEDI value: ..... 6.33  
 Required EEDI value: ..... 8.93  
 Installed Fuel Meters: .. Mass flow type for fuel oil and fuel gas

Other installed monitoring tools: ..... Trim & list, draughts

Energy Saving Technologies\*: ..... Hi-RUDDER, Hi-FIN

Hull coatings: ..... Tin free SPC antifouling paint manufactured by International Paint

Contract date: ..... 6 December 2017  
 Launch/float-out date: ..... 31 May 2019 (L/C)  
 Delivery date: ..... 28 February 2020

# MARINE VICKY – Bunkering tanker

Shipbuilder: **Keppel Nantong Shipyard Co. Ltd.**  
Vessel's name: **Marine Vicky**  
Owner/Operator: **V-Bunkers Tankers Pte. Ltd.**  
Country: **Singapore**  
Designer: **SeaTech Solutions International (S) Pte. Ltd.**  
Country: **Singapore**  
Flag: **Singapore**  
IMO number: **9880520**  
Total number of sister ships already completed (excluding ship presented): **Nil**  
Total number of sister ships still on order: **Nil**

Somewhat overshadowed by *FueLNG Bellina*, which is acknowledged as Singapore's first LNG bunker vessel, *Marine Vicky* (delivered in January 2020) is significant as being the city state's first conventional bunker vessel with an LNG-fuelled main engine.

Ordered in 2018, *Marine Vicky* was designed by SeaTech Solutions and built at Keppel Nantong Shipyard for bunker vessel operator Sinanju. In 2019, Sinanju entered into a two-year time charter with ExxonMobil for the ship. A decisive factor for ExxonMobil was that, under the Maritime Singapore Green Port Programme, registered ships served by alternative or cleaner marine fuelled harbour crafts during their port stay are granted a 10% port dues reduction. In April 2020, Vitol Marine Fuels, a subsidiary of the Vitol Group, acquired Sinanju Tankers and renamed it Vitol Bunkers.

*Marine Vicky* is 102.84m in length with a beam of 19m, depth of 10m and its deadweight is 8,137.92 tonnes. The ship has 10 cargo tanks, five port and five starboard separated by a central bulkhead with a combined capacity of 8,494.7m<sup>3</sup>. Three grades of cargo can be carried: MGO, HFO and ULSFO. There are three cargo pumps, two of 500m<sup>3</sup>/h and one of 700m<sup>3</sup>/h. The vessel's own bunker tanks are one of 247m<sup>3</sup> for MGO and a 55m<sup>3</sup> LNG tank on deck.

The tanker is powered by a pair of Yanmar 6EY26DF dual-fuel engines, each rated 1,200kW at 750rpm. The engines drive twin fixed pitch propellers through Yanmar gearboxes to give a speed of 11.5knots.

## TECHNICAL PARTICULARS

Length oa: 102.84m  
Length bp: 97.72m  
Breadth moulded: 19.00m  
Depth moulded  
to main deck: 10.00m  
to upper deck: 10.00m  
Draught  
scantling: 7.50  
design: 7.00

Gross: 5,310gt  
Displacement: 10,900t  
Lightweight: 5,950t  
Deadweight  
scantling: 8,137.92t  
design: 7,990t  
Speed, service (100%MCR output): 11.50knots  
Cargo capacity (m<sup>3</sup>)  
Liquid volume: 8,494.7  
Bunkers (m<sup>3</sup>)  
Gas Oil: 247.6  
LNG: 55  
Water ballast (m<sup>3</sup>): 3,637.8  
Tankers – percentage segregated ballast: 100%  
Classification society and notations: BV  
I\*HULL\*MACH, Oil tanker -flash point > 60°C ESP -dualfuel, Unrestricted navigation, CPS(WBT), MON-SHAFT, GREEN PASS-PORT, INWATERSURVEY

Propulsion  
Main engine(s)  
Design: Dual-fuel  
Model: 6EY26DF  
Manufacturer: Yanmar Co. Ltd, Japan  
Number: 2  
Type of fuel: Dual-fuel (MGO, LNG)  
Output of each engine: 1,200kW  
Is this a diesel-electric or hybrid?: No

Gearbox(es)  
Make: Yanmar Kanzaki Kokyukoki Mfg Co Ltd Japan  
Model: YXH – 2000C  
Number: 2

Propeller(s)  
Material: Cu3  
Designer/Manufacturer: Wuhan Heavy Industry Casting and Forging Co, Ltd (Wuhan -CHN)  
Number: 2  
Fixed/Controllable pitch: Fixed  
Diameter: 2,549.2mm  
Speed: 247.5rpm

Diesel-driven alternators  
Number: 3  
Engine make/type: Cummins Engine CCEC K19-DM  
Type of fuel: MGO  
Alternator make/type: Leroy Somer LSAM47.2M7  
Output/speed of each set: 350kWe /1,500rpm

Bow thruster(s)  
Make: Wuhan Kawasaki Marine Machinery Co. Ltd. (Wuhan -CHN)  
Number: 1  
Output (each): 330kW

Deck machinery  
Cargo cranes/cargo gear  
Number: 1  
Make: Jiangyin Safety Sea Marine Equipment  
Type: 2t / 25m Hydraulic Slewing Crane; AYQ2t / 25m  
Performance: 2,000kg

Other cranes  
Number: 1  
Make: 0.5t/5m electric hose crane  
Type: YZ112M-6-H  
Performance: 0.5t

Mooring equipment  
Number: 1 winch set  
Make: INI Hydraulic  
Type: Hydraulic

Special lifesaving equipment  
Number of each and capacity: Free-fall lifeboat - 1  
Make: Zhejiang Hengxin Ship Equipments

Cargo/capacity  
Hatch covers  
Design: Steel Small Hatch Cover  
Manufacturer: Nanjing Lishui Zhenxing Ship Accessories  
Type: Upper deck

Doors/ramps/lifts/moveable car decks  
Number of each: 17 doors  
Type: Marine Weathertight Single-Leaf Steel door

Cargo tanks  
Number: 10  
Grades of cargo carried: 3  
Product range: ULSFO, MGO, HFO  
Coated tanks: Fully coated epoxy tanks

Cargo pumps  
Number: 3  
Type: Horizontal Screw pumps  
Make: Taiko Kikai Industries Co., Ltd  
Capacity (each): 2 x 700m<sup>3</sup>/h 1 x 500m<sup>3</sup>/h

Cargo control system  
Make: Taiko Kikai Industries

Ballast water treatment system  
Make: Panasia Co., Ltd GloEn-Patrol Ballast Water Treatment System  
Capacity: 500m<sup>3</sup>/h

Complement  
Officers: 1 Master, 5 officers  
Crew: 9  
Single/double/other rooms: 12 single man cabins, 2 double man cabins

Radars  
Number: 2  
Make: Furuno  
Model(s): Furuno FAR-2228, FAR-2238

Fire detection system  
Make: Consilium Marine & Safety AB  
Type: Smoke, heat and flame detectors

Fire extinguishing systems  
Cargo holds: Fixed foam  
Make/Type: Macron Safety Systems (UK) Ltd, FJM-80

Engine room: Fixed high-pressure CO<sub>2</sub>  
Waste disposal plant  
Waste shredder/crusher  
Make: Jiangyin Jiang Jia Kitchen Equipment  
Model: CB/T3872-1999 Waste Pulverizer for Ship's Kitchens

Sewage plant  
Make: Hansun (Jiangsu) Marine Technology  
Model: ST-20U

Efficiency  
Attained EEDI value: 11.9 grams-CO<sub>2</sub> / tonne-mile  
Required EEDI value: 14.7 grams-CO<sub>2</sub> / tonne-mile

Installed Fuel Meters: 2 Endress and Hauser Coriolis MFM's installed  
- 10" (FO) recommended flowrate ≥ 150t/h  
- 6" (MGO) recommended flowrate ≥ 50t/h

Energy Saving Technologies\*: Alternative fuels (MGO/LNG dual-fuel main engine)  
Hull coatings: TBT free self-polishing antifouling coating manufactured by PPG Coatings (Kunshan)

Contract date: 16 April 2018  
Delivery date: 13 January 2020

Shipbuilder: ..... **OJSC Shipyard Krasnoye Sormovo**  
Vessel's name: ..... ***Mustai Karim***  
Owner/Operator: ..... **Vodohod Russian River Cruises**  
Country: ..... **Russia (Russian Federation)**  
Designer: ..... **Marine Engineering Bureau**  
Country: ..... **Ukraine**  
Flag: ..... **Russian Federation**  
IMO number: ..... **9879351**  
Total number of sister ships already completed (excluding ship presented): ..... **1**  
Total number of sister ships still on order: ..... **Nil**

As with most of Russia's river-sea vessels, manoeuvrability is of prime importance and for this reason the propulsion system is comprised of a pair of

Propulsion

Main engine(s)

Design: ..... Diesel

Model: ..... 6L20

Manufacturer: ..... Wärtsilä

Number: ..... 2

Type of fuel: ..... HFO

Output of each engine: ..... 1,200kW 1,000rpm

Is this a diesel-electric or hybrid?: ..... No

Contract date: ..... 28 March 2017  
Launch/float-out date: ..... 11 September 2019  
Delivery date: ..... 3 August 2020

# NATIONAL GEOGRAPHIC ENDURANCE – Cruise ship

Shipbuilder: ..... **Ulstein**  
 Vessel's name: ..... **National Geographic Endurance**  
 Owner/Operator: ..... **LEX Endurance LLC/ Lindblad Expeditions**  
 Country: ..... **United States**  
 Designer: ..... **Partnership Design**  
 Country: ..... **Hamburg, Germany**  
 Flag: ..... **Bahamas**  
 IMO number: ..... **9842554**  
 Total number of sister ships already completed (excluding ship presented): ..... **Nil**  
 Total number of sister ships still on order: ..... **1**

Expedition cruising has become a new sector for shipbuilders in recent years, particularly for those yards which have been able to draw on offshore shipbuilding and design expertise.

*National Geographic Endurance* is the first of two vessels in Ulstein's CX104 type built for US-based expedition cruise operator Linblad Expeditions. The ship, with the builder's signature X-Bow, was delivered by Ulstein from its Norway-based yard in March 2020. The sister vessel, *National Geographic Resolution*, is currently being built for delivery in 2021.

Construction of both vessels followed Ulstein's usual practice with the hull being built elsewhere. Work began at the Crist Shipyard in Poland in March 2018 and the partially completed vessel left in April 19 for completion and fitting out in Ulsteinvik. The hull of the sister vessel departed from the Polish yard in October 2020 and is now in Norway.

*National Geographic Endurance* can claim at least two significant firsts; it is the first newbuild that the operator has ever commissioned and is the first cruise vessel built to Polar Code PC5 (Category A) ice class.

Just 124.4m in length and with a beam of 21m, the 12,768gt ship, which is named after polar explorer Ernest Shackleton's vessel *Endurance*, is a small vessel by cruising standards and its 69 cabins accommodate only 126 passengers. Of these cabins, 12 are intended for single occupancy. Further, the ship has the highest comfort class notations and is fully stabilised.

As an expedition cruise ship, viewing is of prime importance and this has been factored into the design; the X-Bow enables optimal forward and straight down-the-sides viewing. The unobstructed downward sight lines, plus multiple

walk-out areas from the bridge and observation lounge as well as glass rails on the top deck, create superb conditions for viewing and photography. Almost 80% of the cabins also feature a balcony. On top of the above surface viewing, *National Geographic Endurance* can also allow glimpses of underwater activity thanks to its own camera equipped ROV.

The commitment to viewing is taken to a new extreme as even the bridge of the vessel has been designed to be large enough to allow all passengers to experience the control centre of the ship simultaneously.

The X-Bow hull has gained a reputation for comfort and stability in the offshore sector so should transfer well to expedition cruising where extreme weather will be expected. Another feature from offshore vessels that has been adopted is the ROV garage. On this ship, it allows for launching of zodiacs and kayaks as well as a workshop for their maintenance. Passengers will board the zodiacs from a stern platform or through doors on either side of the vessel at Deck No 3.

A further first for the ship is that its two 8L250MDC and two 12V250MDC main engines were the first marine order for Wabtec, which acquired GE Transportation in 2019. The models can meet IMO Tier III NOx rules without any after treatment due to an exhaust gas recirculation (EGR) system. Total power output from the four engines is 10,260kW. The ship also has a diesel-electric propulsion system featuring twin ABB 3.5MW Azipod DO propulsors. Manoeuvrability is enhanced by two Brunvoll bow thrusters.

The environmental credentials of the vessel are boosted by use of variable frequency drives on compressors and seawater pumps and a waste heat recovery system.

## TECHNICAL PARTICULARS

Length oa: ..... 124.4m  
 Length bp: ..... 118.27m  
 Breadth moulded: ..... 21.0m  
 Depth moulded: ..... 10.4m  
 Gross: ..... 12,768gt  
 Deadweight: ..... 21,000t @ 5.7 draught  
 Bunkers (m³): .....  
 Diesel oil: ..... 930  
 Water ballast (m³): ..... 1,333.2

Daily fuel consumption (tonnes/day)  
 Main engine only: ..... 12-14m³/day – port consumption 4.6m³

Classification society and notations: ..... \*1A  
 Passenger ship BIS BWM(T) Clean(Design)  
 COMF(C-1, V-1) ECO LCS(DC) NAUT(AW)  
 PC(5) Recyclable Silent(E) VIBR

Propulsion  
 Main engine(s)  
 Design/manufacturer/model/ output : ..... 2 x  
 General Electric VMS GROUP 8L250MDC,  
 2,138kW 2 x General Electric VMS GROUP  
 12V250MDC, 2,992kW MGO only

Propeller(s)  
 Material: ..... Stainless steel  
 Designer/Manufacturer: ..... ABB Azipod DO  
 3.5MW  
 Number: ..... 2  
 Fixed/Controllable pitch: ..... Fixed

Main-engine driven alternators  
 Number: ..... 4  
 Make/type: ..... ABB  
 Output/speed of each set: ..... 910rpm

Boilers  
 Number: ..... 2  
 Type: ..... Oil fired  
 Heat recovery system: ..... 648-600  
 Bow thruster(s)  
 Make: ..... Brunvoll  
 Number: ..... 2  
 Output (each): ..... 1,000kW

Ballast water treatment system  
 Make: ..... Alfa Laval PureBallast 150  
 Capacity: ..... 150m³

Passengers  
 Total: ..... 126  
 Number of cabins: ..... 69

Energy Saving Technologies\*: ...AC Compressors  
 x 2 with VFD control, VFD control on sea water  
 pumps, air handling units, passenger cabin fan  
 coils installed on all cabins. Waste heat recovery  
 system installed for potable water heating  
 and AC heating

Contract date: ..... November 2017  
 Launch/float-out date: ..... 7 December 2019  
 Delivery date: ..... 16 March 2020



# QUEEN JENUVIA – Ro-pax

Shipbuilder: **Hyundai Mipo Dockyard Co., Ltd.**  
 Vessel's name: ..... **Queen Jenuvia**  
 Owner/Operator: ..... **Seaworld Express Ferry**  
 Country: ..... **Republic of Korea**  
 Designer: ..... **Hyundai Mipo Dockyard Co., Ltd.**  
 Country: ..... **Republic of Korea**  
 Model test establishment used: ..... **KRISO**  
 Flag: ..... **Panama**  
 IMO number: ..... **9867475**  
 Total number of sister ships already completed (excluding ship presented): ..... **Nil**  
 Total number of sister ships still on order: ..... **Nil**

Presently a one-off ship built by Hyundai Mipo, *Queen Jenuvia* is a result of rebuilding the South Korean domestic ferry fleet after the *Sewol* tragedy of 2014. The ro-pax sector represents a new growth area for Hyundai Mipo which, apart from this vessel and an earlier ship for Chinese interests, has also gained orders from the Isle of Man and New Zealand.

*Queen Jenuvia* is a coastal service twin skeg ro-pax ship with bulbous bow, transom stern, open water type stern frame. Its owner is Seaworld Express Lines based in Mokpo, South Korea, and the new vessel is the company's flagship.

From its outside appearance, the 170m-long 27,391gt ship is quite European, and this is reinforced by a Scandinavian style interior that would not be out of place in modern Northern European ferries. There is ample seating, lounge areas, cafes and restaurants on the passenger decks as well as a cinema and games zone.

With four vehicle decks and a combined lane length of 2,102m, *Queen Jenuvia* can sufficiently accommodate 478 cars and 88 trucks. There is a single stern ramp for transport access with movable ramps inside. For foot passengers there are two sets of doors.

Its two main engines are HiMSEN 8H46/60P medium-speed units, each with a power output of 10,000kW. They drive their own dedicated 4.5m diameter Kongsberg propellers through a Renk gearbox at a speed of 160rpm. Service speed of the ship is 21.8knots at 85%MCR. Power take-off comes from the main engines using Hyundai alternators and there are also three Yanmar gensets. Since the intended service area is not in an ECA, the engines only need to reach Tier II NOx compliance.

Lifesaving requirements are met by a pair of Chinese-made marine evacuation systems with vertical chutes. Fire detection systems have been provided by Autronica and the bridge and navigation systems by Kongsberg.

## TECHNICAL PARTICULARS

Length oa: ..... Approx. 170.0m  
 Length bp: ..... 158.0m  
 Breadth moulded: ..... 26.0m  
 Depth moulded  
 to No.4 Deck: ..... 14.45m  
 to No.3 Deck: ..... 9.20m

Width of double skin  
 side: ..... 1.1m  
 bottom: ..... 1.3m  
 Draught  
 scantling: ..... 6.50m  
 design: ..... 6.20m  
 Gross: ..... 27,391gt  
 Deadweight  
 scantling: ..... 6,300t  
 design: ..... 5,300t  
 Speed, service (85%MCR output with 10% S.M.): ..... Approx. 21.8knots

Bunkers (m<sup>3</sup>)  
 Heavy oil: ..... 560  
 Diesel oil: ..... 230  
 Water ballast (m<sup>3</sup>): ..... 2,100  
 Daily fuel consumption (tonnes/day)  
 Main engine only: ..... 72.6

Classification society and notations: ..... KR  
 +KRS 0C – Passenger Ship Car Ferry, PSPC,  
 LI +KRM 0C – UMA

Propulsion  
 Main engine(s)  
 Design: ..... HHI Engine & Machinery Division  
 (medium speed four-stroke)  
 Model: ..... HiMSEN 8H46/60P (Tier II)  
 Manufacturer: ..... HHI Engine & Machinery  
 Division  
 Number: ..... 2  
 Type of fuel: ..... HFO, MGO  
 Output of each engine: ..... 10,000kW  
 Is this a diesel-electric or hybrid?: ..... No

Gearbox(es)  
 Make: ..... Renk  
 Model: ..... RSH-1000  
 Number: ..... 2  
 Output speed: ..... 160rpm

Propeller(s)  
 Material: ..... Ni-Al-Bronze  
 Designer/Manufacturer: ..... Kongsberg  
 Number: ..... 2  
 Fixed/Controllable pitch: ..... Controllable  
 Diameter: ..... 4.5m  
 Speed: ..... 160rpm at MCR

Main-engine driven alternators  
 Number: ..... 2  
 Make/type: ..... Hyundai Electric / HFC7 566-04P  
 Output/speed of each set: ..... 1,500kVA /  
 1,800rpm (No.1), 1,750kVA / 1,800rpm (No.2)

Diesel-driven alternators  
 Number: ..... 3  
 Engine make/type: ..... Yanmar /  
 6EY22ALW  
 Type of fuel: ..... HFO, MGO  
 Alternator make/type: ..... Taiyo / FE 653B-8  
 Output/speed of each set: 1,300kW / 900rpm

Boilers  
 Number: ..... 1  
 Type: Automatic, vertical, forced draft, heavy  
 fuel oil burning, marine boiler

Make: ..... KangRim Heavy Industries  
 Output, each boiler: ..... 4,000kg/h  
 Bow thruster(s)  
 Make: ..... KTE  
 Number: ..... 1  
 Output (each): ..... 1,200kW, AC440V, 3Pi,  
 60Hz, 6P

Stern thruster(s)  
 Make: ..... KTE  
 Number: ..... 1  
 Output (each): ..... 1,000kW, AC440V, 3Pi,  
 60Hz, 6P

Other cranes  
 Number: ..... 1  
 Make: ..... Shinmyung Tech.  
 Type: ..... Air motor driven davit  
 Tasks: ..... Provision dandling  
 Performance: Manual slewing gear, air winch  
 hoisting (approx. 10m/min.)

Mooring equipment  
 Number: ..... 2 x windlass, 3 x winch  
 Make: ..... Flutek  
 Type: ..... Hydraulic

Special lifesaving equipment  
 Number of each and capacity: ..... 2 x MES  
 (660 persons/set)  
 Make: ..... Shanghai Youlong Rubber Products  
 Type: ..... Double passage type  
 If MES, vertical or sloping chutes?: ..... Vertical

Vehicles  
 Number of vehicle decks (fixed/moveable): ..... 4  
 Total lane length: ..... Approx. 2,102m (incl. No.1 &  
 2 deck)  
 Total cars: ..... 478 units of small car / 88 units of  
 25t truck

Doors/ramps/lifts/moveable car decks  
 Number of each: ..... Stern ramp, 1 set / movable  
 ramp, 2 sets / passenger door, 2 sets  
 Type: ..... Hydraulic. Direct cylinder / end-hinged  
 (hydraulically operated jigger winch) / side hinged  
 swing out (hydraulic. direct cylinder)  
 Designer: ..... SMS-SME

Ballast control system  
 Make: ..... Scana (VRC)  
 Type: ..... Hard mimic board on piano  
 type panel

Complement  
 Officers: ..... 12 (2 captain class + 10  
 officer class)  
 Crew: ..... 23  
 Single/double/other rooms: ..... 33 single / 2 day  
 and bedroom

Passengers  
 Total: ..... 1,284  
 Number of cabins: ..... 116

Navigation and other equipment  
 Bridge control system ..... (Propulsion Remote  
 Control System)  
 Make: ..... Kongsberg  
 Type: ..... AutoChief 600  
 Is bridge fitted for one-man operation? ..... No  
 Integrated bridge system?: ..... No

Radars  
 Number: ..... 2  
 Make: ..... Furuno  
 Model(s): ..... FAR-2328

Fire detection system  
 Make: ..... Autronica  
 Type: ..... AutoSafe 4

Fire extinguishing systems  
 Engine room: ..... High pressure CO<sub>2</sub> system  
 Make/Type: ..... Fain  
 Vehicle spaces: ..... Manua sprinkler system  
 Make/Type: ..... TankTech / Sea water  
 Cabins: ..... Auto Sprinkler system  
 Make/Type: ..... Fain / Fresh water  
 Public spaces: ..... Auto Sprinkler system  
 Make/Type: ..... Fain / Fresh water

Efficiency  
 Energy Saving Technologies:  
 Hull coatings: ..... Interflex 8700  
 Type: ..... Copper-free, low friction,  
 self-polishing copolymer antifouling,  
 ultra-level antifouling performance

Contract date: ..... 17 September 2018  
 Launch/float-out date: ..... 20 March 2020  
 Delivery date: ..... 7 September 2020

# SAKIZAYA STAR – Bulk carrier

Shipbuilder: **Japan Marine United Corporation**  
 Vessel's name: ..... **Sakizaya Star**  
 Owner/Operator: ..... **Mount Wisdom S.A.**  
 Country: ..... **Taiwan**  
 Designer: ..... **Japan Marine United Corporation**  
 Country: ..... **Japan**  
 Flag: ..... **Liberia**  
 IMO number: ..... **9861316**  
 Total number of sister ships already completed (excluding ship presented): ..... **2**  
 Total number of sister ships still on order: ..... **5**

## TECHNICAL PARTICULARS

Length oa: .....Max. 229.0m  
 Breadth moulded: ..... 32.26m  
 Depth moulded to upper deck: ..... 20.20m  
 Gross: ..... 44,314gt  
 Deadweight scantling: ..... 82,516t  
 Speed, service (~%MCR output): ..... 14.5knots  
 Cargo capacity (m<sup>3</sup>)  
 Grain: ..... 98,054.10  
 Bunkers (m<sup>3</sup>)  
 Heavy oil: ..... 2,157.8

Classification society and notations:..... NS\*  
 (CSR, BC-A, BC-XII, GRAB30, PSPC-WBT, NC) (ESP), (HCM-GBS) (IWS), (IHM), MNS\* (M0)

Propulsion  
 Main engine(s)  
 Design: ..... MAN Energy Solutions SE  
 Model: ..... 6S60ME-C8.5-EGRBP  
 Manufacturer: ..... Mitsui E&S Machinery  
 Number: ..... 1  
 Type of fuel: ..... HFO, MDO  
 Output of each engine: ..... 9,120kW, 84rpm  
 Is this a diesel-electric or hybrid?: .....No

Propeller(s)  
 Material: .....Ni-Al-Bronze  
 Designer/Manufacturer: .....Japan Marine United Corporation / Nakashima Propeller  
 Number: ..... 1  
 Fixed/Controllable pitch: .....Fixed

Diesel-driven alternators  
 Number: ..... 3  
 Engine make/type: ..... Yanmar  
 Type of fuel: ..... HFO, MDO  
 Alternator make/type: ..... Taiyo Electric

Boilers  
 Number: ..... 1  
 Type: ..... Vertical composite boiler  
 Make: .....Osaka Boiler MFG.

Stern appendages/special rudders: .....SSD  
 (Super Stream Duct), SURF-BULB, ALV-Fin  
 (Advanced Low Viscous Resistance Fin)

Mooring equipment  
 Number: ..... 2 x windlass & mooring winch, 4 x mooring winch  
 Make: .....Manabe Zoki  
 Type: ..... Electro-hydraulic driven

Special lifesaving equipment  
 Number of each and capacity: 1 x 25 persons  
 Make: ..... Nishi-F  
 Type: ..... Free-fall type

Cargo/capacity  
 Hatch covers  
 Design: .....MacGregor Japan  
 Manufacturer: .....MacGregor Japan  
 Type (upper deck/other decks): ..... Side rolling

Ballast control system  
 Make: .....Nakakita Seisakusho  
 Ballast water treatment system  
 Make: ..... Techcross Inc.

Complement  
 Officers:..... 9  
 Crew: ..... 13  
 Supernumeraries/Spare: ..... 3

Integrated bridge system?: .....No  
 Radars  
 Number: ..... 2  
 Make: ..... JRC

Fire extinguishing systems  
 Engine room: ..... High-expansion foam  
 Make/Type: .....Kashiwa

Waste disposal plant  
 Sewage plant  
 Make: ..... Taiko Kikai Industries

Efficiency  
 Energy Saving Technologies\*: ... SSD (Super Stream Duct), SURF-BULB, ALV-Fin (Advanced Low Viscous Resistance Fin), well-refined shape of superstructure

Hull coatings: ..... Low-friction type of antifouling paint  
 Performance Monitoring Regime: ...Sea-Navi 2.0

Contract date: ..... February 2018  
 Delivery date: ..... 27 March 2020

*Sakizaya Star*, constructed for Taiwanese Operator Mount Wisdom, is described by Japan Marine United (JMU) as the first Panamax vessel built to its new J-Series and designated J82BC. This series was announced in 2018 and is a response to the IACS new harmonised common structural rules. Since *Sakizaya Star*, JMU has delivered two further examples of the type and has five under construction.

At the time, JMU said the new rules would mean an increase in steel weight and a decrease in cargo capacity, but the J-Series' optimised hull overcomes these challenges and results in a ship with higher cargo capacity and lower fuel consumption than the builder's preceding G81BC series.

While JMU refers to the vessel as a Panamax due its beam of 32.26m, its length of 229m would mean most bulkier specialists of 229m consider it a Kamsarmax. Typical of this class of vessel, *Sakizaya Star* has seven holds with side rolling MacGregor hatch covers and is gearless. Its deadweight is 82,516tonnes and has a grain capacity of 98,054.1m<sup>3</sup>. As with most ships of this type, the intended cargoes are grain, ore and coal.

Its main engine is a Mitsui-built super long stroke MAN B&W 6S60ME-C8.5EGRBP. The EGR suffix indicates that the vessel has a single high efficiency turbocharger and employs exhaust gas recirculation (EGR) with bypass matching to achieve compliance with IMO NOx regulations. There is no scrubber installed so the vessel must run on complaint fuel for 2020 SOx compliance. Power output is 9,120kW at 84rpm.

The optimisations and efficiency measures of the ship include a superstructure designed to minimise wind resistance and JMU's proprietary energy saving devices. Notably, an advanced low viscous resistance fin (ALV-Fin) which controls flow to the propeller, complemented by a Super Stream Duct, and a SURF-BULB incorporated into the rudder. *Sakizaya Star* has a service speed of 14.5knots.

# SARA – Bulk carrier

Shipbuilder: .... **Hyundai-Vietnam Shipbuilding Co., Ltd.**  
 Vessel's name: ..... **Sara**  
 Owner/Operator: ..... **Bahri Dry Bulk Company LLC.**  
 Country: ..... **Saudi Arabia**  
 Designer: ... **Hyundai Mipo Dockyard Co., Ltd.**  
 Country: ..... **Republic of Korea**  
 Model test establishment used: ..... **HSVA**  
 Flag: ..... **Liberia**  
 IMO number: ..... **9837119**  
 Total number of sister ships already completed (excluding ship presented): ..... **2**  
 Total number of sister ships still on order: ..... **1**

**S**ara is the first of four Kamsarmax bulkers ordered from Hyundai Mipo in 2017 by Bahri Dry bulk – a joint venture between Bahri and Arabian Agricultural Services (ARASCO). The vessel was actually built by Hyundai-Vietnam Shipbuilding and was delivered in April 2020.

With a deadweight of 80,729tonnes and hull dimensions of 229m length, 32.26m beam and draught of 14.45m, the ship is a typical Kamsarmax and therefore is gearless and has seven holds and hatches. Holds 2 and 6 can be partially flooded when in port for adjusting the air draught and Hold 4 can be flooded as necessary for ballasting and trim purposes.

Typical cargoes for this size ship would normally include coal and ores and these may well be carried onboard *Sara*. However, its part ownership by ARASCO suggests that it will be mostly employed to transport grain cargoes for which there is a growing demand in Saudi Arabia.

The ship's power and propulsion system comprises a Hyundai-built MAN B&W 6S60ME-C10.5HPSCR engine. As the designation suggests, this employs high-pressure selective catalytic reduction to meet NOx Tier III levels but the system is not employed when outside of ECAs. A Hyundai open loop scrubber enables the ship to burn ordinary HFO and still comply with the 2020 sulphur cap.

At its highest rating, the engine selected can produce 14,940kW but for this class it has been derated and is capable of 9,665kW at 89rpm. The propeller is a fixed pitch 7.2m diameter Ni-Al-Bronze type and a Mewis Duct is installed to increase efficiency. Speed is 14.2knots.

EEDI rules call for a rating of 3.95, which *Sara* comfortably achieves with its 3.47 attained value. An Erma First ballast water management system with a flow rate of 3,000m<sup>3</sup>/h allows for global trading as it is IMO and USCG type-approved.

## TECHNICAL PARTICULARS

Length oa: ..... Approx. 229m  
 Length bp: ..... 222.0m  
 Breadth moulded: ..... 32.26m  
 Depth moulded  
 to main deck: ..... 20.05m  
 to upper deck: ..... 20.05m  
 Width of double skin  
 bottom: ..... 1.7m

Draught (mld.)  
 scantling: ..... 14.45m  
 design: ..... 12.20m  
 Gross: ..... 43,735gt  
 Deadweight  
 scantling: ..... 80,700t  
 design: ..... 64,700t  
 Speed, service (77.1%MCR output with 15% S.M.): ..... Approx. 14.2knots  
 Cargo capacity (m<sup>3</sup>)  
 Bale: ..... 92,200  
 Grain: ..... 95,570  
 Bunkers (m<sup>3</sup>)  
 Heavy oil: ..... 2,500  
 Diesel oil: ..... 380  
 Water ballast (m<sup>3</sup>): ..... 21,500  
 Daily fuel consumption (tonnes/day)  
 Main engine only: ..... 28.0

Classification society and notations: .... DNV GL +1A, Bulk Carrier ESP, CSR, E0, BIS, TMON, COAT-PSPC(B), LCS, BWM(E[F],T), BC(A), Holds 2, 4 and 6 may empty, Grab[30], Recyclable, Clean, BMON, CMON, ER(SCR,EGCS Open)

Propulsion  
 Main engine(s)  
 Design: ..... Hyundai - MAN B&W  
 Model: ..... 6S60ME-C.10.5-HPSCR  
 Manufacturer: ..... HHI Engine & Machinery  
 Division  
 Number: ..... 1  
 Type of fuel: ..... HFO, MGO  
 Output of each engine: ..... 9,665kW  
 Is this a diesel-electric or hybrid?: ..... No

Propeller(s)  
 Material: ..... Ni-Al-Bronze  
 Designer/Manufacturer: ..... Hyundai Heavy Industries.  
 Number: ..... 1  
 Fixed/Controllable pitch: ..... Fixed  
 Diameter: ..... 7.2m  
 Speed: ..... 89.0rpm at MCR

Diesel-driven alternators  
 Number: ..... 3  
 Engine make/type: .. HHI - Engine & Machinery Division / 6H21/32  
 Type of fuel: ..... HFO  
 Alternator make/type: ... Hyundai Electric and Energy System / HFC7 508-08P  
 Output/speed of each set: .. 1,070kW x 900rpm

Exhaust-gas scrubbing equipment  
 Manufacturer: ..... Hyundai Power System  
 Type: ..... Open loop  
 On main engines?: ..... Yes  
 On auxiliary engines?: ..... Yes

Boilers  
 Number: ..... 1  
 Type: ..... Composite boiler  
 Make: ..... KangRim Heavy Industries  
 Output, each boiler: 1,600kg/h + 400kg/h (Oil fired, exh.gas)

Other cranes  
 Number: ..... 2

Make: ..... Sangsangin Industry (DMC)  
 Type: ..... Electro-hydraulic driven type  
 Tasks: ..... Provision crane  
 Performance: ..... SWL 4.0t / Outreach max. 12.1m, min. 3.3m

Mooring equipment  
 Number: ..... 8  
 Make: ..... Flutek  
 Type: ..... Electro-hydraulic

Special lifesaving equipment  
 Number of each and capacity: .... 25 persons  
 Make: ..... Jianyinshi Beihai LSA  
 Type: ..... Free-fall Lifeboat

Cargo/capacity  
 Hatch covers  
 Design: ..... MacGregor  
 Manufacturer: ..... MacGregor  
 Type: ..... Hyd. side rolling type

Cargo tanks  
 Number: ..... 7  
 Product range: ..... Grain, iron ore, coal

Ballast control system  
 Make: ..... Hyundai Electric  
 Type: ..... ACONIS-DS

Ballast water treatment system  
 Make: ..... Erma First  
 Capacity: ..... 3,000m<sup>3</sup>/h

Complement  
 Officers: ..... 12  
 Crew: ..... 13  
 Suez/Repair Crew: ..... 6/0  
 Single/double/other rooms: .... 25/0/6 Beds in on room for Suez crew

Navigation and other equipment  
 Bridge control system  
 Make: ..... Dongyang  
 Type: ..... Flour mounting and self-standing  
 Is bridge fitted for one-man operation? .No  
 Integrated bridge system?: ..... Yes  
 If yes, make: ..... JCR  
 Model: ..... GRD-921

Radars  
 Number: ..... S-band radar (1 set) / X-band radar (1 set)  
 Make: ..... JRC  
 Model(s): ..... JMR-9230-S(S-band) / JMR-9225-6X(X-band)

Fire detection system  
 Make: ..... Consilium Marine AB  
 Type: ..... Cargo/4L

Fire extinguishing systems  
 Cargo holds: ..... Sea water  
 Engine room:  
 High pressure CO<sub>2</sub> total flooding  
 Make/Type: ..... FAIN/CO<sub>2</sub>  
 Sea water  
 Portable fire extinguishers  
 Make/Type: .... NK/CO<sub>2</sub>, foam, wet chemical, dry powder

Fixed local fire extinguishers  
 Cabins:  
 Sea water  
 Portable fire extinguishers  
 Make/Type: ..... NK/CO<sub>2</sub>, foam, wet chemical, dry powder

Public spaces:  
 Portable extinguishers  
 Make/Type: .... NK/CO<sub>2</sub>, foam, wet chemical, dry powder

Waste disposal plant  
 Incinerator  
 Make: ..... HMMCO  
 Model: ..... MAXI NG100SL WS

Sewage plant  
 Make: ..... Il Seung  
 Model: ..... ISB-02

Efficiency  
 Attained EEDI value: ..... 3.47g/tonne-nm  
 Required EEDI value: ..... 3.95g/tonne-nm  
 Installed Fuel Meters: ..... Electro pneumatic type tank level gauge

Other installed monitoring tools: . Torsion meter, electro pneumatic type draught gauge  
 Energy Saving Technologies\*: ..... Mewis Duct

Contract date: ..... 25 August 2017  
 Launch/float-out date: ..... 15 January 2020  
 Delivery date: ..... 29 April 2020

# SCARLET LADY – Cruise ship

Shipbuilder: ..... Fincantieri  
 Vessel's name: ..... **Scarlet Lady**  
 Owner/Operator: ..... **VC Ship One Limited**  
 Country: ..... **Bermuda**  
 Model test establishment used: ..... **Maritime Research Institute Netherlands (MARIN)**  
 Flag: ..... **Bahamas**  
 IMO number: ..... **9804801**  
 Total number of sister ships already completed (excluding ship presented): ..... **Nil**  
 Total number of sister ships still on order: ..... **3**

*Scarlet Lady*, the first of four vessels ordered by Richard Branson's fledgling cruise line, was delivered in February 2020 and marks the entry of the entrepreneur's venture into the sector. The first sister – *Valiant Lady* – is due for delivery this year. All of the vessels are being built at Fincantieri's Sestri Ponente yard.

At 277.2m in length, 38m in beam and with a gross tonnage of approximately 110,000, the ship is by no means large by today's standards, but it is intended for a niche market catering for adult passengers only. The vessel has 17 decks with hotel and public spaces on decks 5 to 17.

Accommodation occupies almost the full length of *Scarlet Lady* with public open spaces being mostly confined to the two uppermost decks. The ship has a vertical bow similar to that of the Hurtigruten expedition vessels, a form designed to improve seakeeping and reduce fuel consumption.

The power and propulsion system of the vessel is a fairly typical diesel-electric set up with two 8-cylinder and two 12-cylinder Wärtsilä 46F engines driving twin ABB Azipods. Between them, the four Wärtsilä engines produce 48,000kW and the two Azipod XO units rated at 16,000kW each will take two thirds of the power when running at full speed. The normal service speed of the vessel is 20knots.

Virgin has chosen not to opt for dual-fuel engines but to operate with HFO as the main fuel. A Wärtsilä hybrid scrubber allows for SOx compliance and a SCR system achieves NOx Tier III emission standards. This is important as the ship will be based in Florida and thus operate for long periods in the US ECA zones.

A Climeon waste heat recovery system using the Organic Rankine Cycle can add a further 1,000kW to power output under ideal conditions, helping the ship achieve an EEDI rating of 10.7 against a required 13.58.

## TECHNICAL PARTICULARS

Length oa: ..... 277.20m  
 Length bp: ..... 266.90m  
 Breadth moulded: ..... 38.00m  
 Depth moulded to main deck: ..... 11.24m  
 Draught  
 scantling: ..... 8.30m  
 design: ..... 8.05m  
 Gross: ..... Approx. 110,000gt  
 Displacement: ..... Approx. 61,000t  
 Lightweight: ..... Approx. 48,300t  
 Deadweight  
 scantling: ..... 12,950t  
 design: ..... 8,300t  
 Block co-efficient: ..... 0.70 @ 8.3m of draught  
 Speed, service (~%MCR output): ..... 20.0knots at 73% of POD power  
 Bunkers (m<sup>3</sup>)  
 Heavy oil: ..... 2,315  
 Diesel oil: ..... 660  
 Water ballast (m<sup>3</sup>): ..... 2,400  
 Classification society and notations: ..... Lloyd's Register  
 +100A1 Passenger Ship, +LMC with CCS notation, IWS  
 % high-tensile steel used in construction: ..... Approx. 80%  
 Propulsion  
 Main engine(s)  
 Model: ..... 8L46F, 12V46F  
 Manufacturer: ..... Wärtsilä  
 Number: ..... 4  
 Type of fuel: ..... HFO, MGO  
 Output of each engine: ..... 2 x 14,400kW, 2 x 9,600kW  
 Is this a diesel-electric or hybrid?: ..... Yes  
 Propeller(s)  
 Material: ..... Ni-Al-Bronze  
 Designer/Manufacturer: ..... ABB  
 Number: ..... 2  
 Fixed/Controllable pitch: ..... Fixed  
 Diameter: ..... 5.7m  
 Speed: ..... Approx. 130rpm at 100%  
 Main-engine driven alternators  
 Number: ..... 4  
 Make/type: ..... ABB  
 Output/speed of each set: ..... 2 x 16,560kVA, 2 x 11,000kVA

Exhaust-gas scrubbing equipment  
 Manufacturer: ..... Wärtsilä Moss AS  
 Type: ..... V-Sox hybrid  
 On main engines?: ..... Yes  
 Boilers  
 Number: ..... 2 + 4  
 Type: ..... OFB, EGB  
 Make: ..... Saacke  
 Output, each boiler: ..... 2 x 12t/h, 2 x 3.7t/h, 2 x 2.5t/h  
 Bow thruster(s)  
 Make: ..... Fincantieri  
 Number: ..... 3  
 Output (each): ..... 2,500kW  
 Mooring equipment  
 Number: ..... 4 winch aft, 5 fore  
 Type: ..... Electric  
 Special lifesaving equipment  
 Number of each and capacity: ..... 1,071  
 Make: ..... Viking  
 Type: ..... VEDC  
 If MES, vertical or sloping chutes?: ... Vertical  
 Complement  
 Officers: ..... 93  
 Crew: ..... 1,095  
 Single/double/other rooms: ..... 813  
 Passengers  
 Total: ..... 3,212 (2,770 lower beds)  
 Number of cabins: ..... 1,408  
 Percentage/number outboard: ..... 93%  
 Radars  
 Number: ..... 5  
 Make: ..... Wärtsilä  
 Model(s): ..... 1 S-band, 4 X-band  
 Fire extinguishing systems  
 Engine room: ..... Automatic water mist – CO<sub>2</sub>  
 Make/Type: ..... Eusebi  
 Cabins: ..... Automatic water mist  
 Make/Type: ..... Eusebi  
 Public spaces: ..... Automatic water mist  
 Make/Type: ..... Eusebi

Efficiency  
 Attained EEDI value: ..... 10.7  
 Required EEDI value: ..... 13.58  
 Other installed monitoring tools: ..... Hull Flex Monitoring System.

The system is to be able to supply the following information:

- dynamic measuring/monitoring system for measuring of ship's floating position in port and at sea
- real time measuring of ship's trim, heel, hull deflection (hog/sag) and torsion
- draft values presented at draft scale locations and at the centre-line, corrected for deflection, torsion and sea water density
- presentation of hydrostatics corrected for trim and deflection

Real Time Performance Tool that provides decision support aid for ship's deck and engine officers with real-time and historic data of fuel and energy consumption in order to achieve energy conservation and energy saving.

Energy Saving Technologies: ..... Climeon waste heat recovery system, optimised air conditioning system with fancoils in cabins and public areas, occupancy based ventilation in public areas, demand based ventilation for galleys (Hoods Marvel system from Halton), extensive use of VFD for electric motors, extensive adoption of LED lighting

Hull coatings: ..... Self-polishing copolymer sylil acrylate antifouling

For funnel a transom polysiloxane paint with following characteristics:

- High volume solids compared to traditional polyurethanes results in lower VOC per litre and reduced impact on the applicator and the environment
- High loss retention ensuring a very long-lasting beautiful appearance. The durability of this finish is also supported by the very good abrasion and chemical resistance ensuring the structure looks new for a long time

Contract date: ..... 5 December 2015  
 Launch/float-out date: ..... 19 February 2019  
 Delivery date: ..... 14 February 2020



# SCF LA PEROUSE – LNG tanker

Shipbuilder: ..... **Hyundai Samho Heavy Industries Co., Ltd.**  
 Vessel's name: ..... **SCF La Perouse**  
 Owner/Operator: ..... **SCF**  
 Country: ..... **Russia**  
 Designer: .. **Hyundai Samho Heavy Industries Co., Ltd.**  
 Country: ..... **Republic of Korea**  
 Flag: ..... **Liberia**  
 IMO number: ..... **9849887**  
 Total number of sister ships already completed (excluding ship presented): ..... **2**  
 Total number of sister ships still on order: ..... **Nil**

Russian owner Sovcomflot took delivery of *SCF La Perouse* in February as the first of three 174,000m<sup>3</sup> Atlanticmax LNG tankers ordered from South Korean shipbuilder Hyundai Samho. The two sister ships, *SCF Barents* and *SCF Timmerman*, were delivered in July 2020 and January 2021 respectively. *SCF La Perouse* has been time chartered by Total and its sisters by Shell.

The hull dimensions of the vessel are a length of 297.09m, beam of 46.4m and moulded depth of 26.5m. The cargo containment system is a GTT Mark III Flex type and the ship is easily identifiable as a membrane type carrier. However, the silhouette is unusual due to *SCF La Perouse's* Babcock LGE ecoSMRT boil-off partial reliquefaction system. The compressor room for this system is a cuboid structure placed forward of the accommodation and over its No.4 Tank. It extends across most of the starboard side of the deck. All vessels of the series are among the first globally to feature the ecoSMRT system, which significantly reduces cargo losses while on long voyages or awaiting cargo operations.

*SCF La Perouse* is a twin skeg ship and its propulsion system comprises a pair of low-pressure Otto cycle WinGD 5-cylinder X72DF engines built under license by Hyundai. Each of the engines has a power output of 12,035kW at 69rpm. The twin propellers are 8.7m diameter fixed pitch types fitted with Hyundai's proprietary Hi-Fin cap, which offset the swirls generated by the propeller and thus improve efficiency. Hyundai's Hi-Fin rudders with bulbs complete the propulsion arrangement.

Four dual-fuel gensets are installed; two of each 7- and 8-cylinder versions of the HiMSEN H35DF engines with Hyundai Electric alternators. The combination of dual-fuel models and energy saving measures allows the vessel to achieve an EEDI rating of 5.19 compared with a required rating of 8.95.

## TECHNICAL PARTICULARS

Length oa: ..... 297.09m  
 Length bp: ..... 291.0m  
 Breadth moulded: ..... 46.40m  
 Depth moulded  
   to main deck: ..... 26.50m  
   to upper deck: ..... 26.50m  
   to other decks: ..... 35.50m (trunk deck)

Width of double skin  
   side: ..... 2.56m  
   bottom: ..... 3.20m  
 Draught  
   scantling: ..... 12.50m (moulded)  
   design: ..... 11.52m (moulded)  
 Gross: ..... 116,779gt  
 Displacement: ..... 127,760t (scantling draught)  
 Lightweight: ..... 34,734t  
 Deadweight  
   scantling: ..... 93,026t  
   design: ..... 81,776t  
 Block co-efficient: ..... 0.7364 (scant. draught)  
 Speed, service (–%MCR output): ..... 19.48knots  
   (design draught, NCR with 20% S.M.)  
 Cargo capacity (m<sup>3</sup>)  
   Liquid volume: ..... 173,958.4  
 Bunkers (m<sup>3</sup>)  
   Heavy oil: ..... 4,879.0  
   Diesel oil: ..... 869.0  
 Water ballast (m<sup>3</sup>): ..... 64,316.0  
 Classification society and notations: ..... BV  
 % high-tensile steel used in construction: ..... 29.8%

Propulsion  
 Main engine(s)  
   Design: ..... Two stroke, crosshead, turbocharged, reversible, diesel  
   Model: ..... 5X72DF  
   Manufacturer: ..... Hyundai-WinGD  
   Number: ..... 2  
   Type of fuel: ..... HFO, ULSFO, MGO, MDO, GAS(LNG)  
   Output of each engine: ..... 12,035  
   Is this a diesel-electric or hybrid?: ..... No, diesel

Propeller(s)  
 Material: ..... Ni-Al-Bronze  
 Designer/Manufacturer: ..... Hyundai Heavy Industry  
 Number: ..... 2  
 Fixed/Controllable pitch: ..... Fixed  
 Diameter: ..... 8,700mm  
 Speed: ..... 69.0rpm (at MCR)  
 Special adaptations: ..... Hi-Fin

Diesel-driven alternators  
 Number: ..... 4  
 Engine make/type: ..... Hyundai HiMSEN / 7H35DF, 6H35DF  
 Type of fuel: ..... HFO, ULSFO, MGO, MDO, GAS(LNG)  
 Alternator make/type: ..... Hyundai Electric / HSJ9 803-10P  
 Output/speed of each set: .. 4,000kVA (2 sets) / 720rpm, 3,450kVA (2 sets) / 720rpm

Boilers  
 Number: ..... 1  
 Type: ..... Cylindrical, forced draught  
 Make: ..... Alfa Laval  
 Output, each boiler: ..... 7,500kg/h  
 Stern appendages/special rudders: . Skeg bulb / Hi-Rudder

Deck machinery  
 Cargo cranes/cargo gear  
   Number: ..... 2 sets  
   Make: ..... Oriental  
   Type: ..... Electro-hydraulic  
   Performance: ..... SWL 5t  
 Other cranes  
   Number: ..... 3 sets  
   Make: ..... Oriental  
   Type: ..... Electro-hydraulic  
   Tasks: ..... Provision handling, cargo machinery room service  
   Performance: ..... SWL 8t / 2t, SWL 6t  
 Mooring equipment  
   Number: ..... 9 sets  
   Make: ..... Flutek  
   Type: ..... Electric  
 Special lifesaving equipment  
   Number of each and capacity: ..... 2 sets / 34 persons  
   Make: ..... Norsafe  
   Type: ..... Davit launched  
 Cargo tanks  
   Number: ..... LNG 4 tanks  
   Grades of cargo carried: ..... LNG  
   Product range: ..... Nitrogen 0.35, methane 95.74, ethane 3.2 propane 0.6, butane 0.1, pentane and heavier 0.01  
   Coated tanks: ..... Membrane type GTT Mark III Flex  
   Stainless steel – structure/piping: ..... ASTM A312 GR.TP304L  
 Cargo pumps  
   Number: ..... 8 sets  
   Type: ..... Vertical centrifugal, submerged  
   Make: ..... Shinco  
   Stainless steel: ..... Ball bearing  
   Capacity (each): ..... 1,850m<sup>3</sup>/h x 165m  
 Cargo control system  
   Make: ..... Emerson  
   Type: ..... Electro-hydraulic remote control system  
 Ballast control system  
   Make: ..... Emerson  
   Type: ..... Electro-hydraulic remote control system  
 Ballast water treatment system  
   Make: ..... Techcross  
   Capacity: ..... 2,600m<sup>3</sup>/h x 2 sets  
 Complement  
   Officers: ..... 19  
   Crew: ..... 15  
   Suez/Repair Crew: ..... 6  
 Navigation and other equipment  
 Bridge control system  
   Make: ..... Hyundai Electric  
   Type: ..... Floor mounting and self-standing type  
   Is bridge fitted for one-man operation? .. Yes  
   Integrated bridge system?: ..... No  
 Radars  
   Number: ..... S-band radar / X-band radar (total: 2 set)  
   Make: ..... JRC  
   Model(s): ..... JMR-9230-S (S-band) / JMR-9225-6X  
 Fire detection system  
   Make: ..... Consilium  
   Type: ..... Fire detection system CCP  
 Fire extinguishing systems  
   Engine room: ..... CO<sub>2</sub> system  
   Make/Type: ..... NK  
   Cabins: ..... Portable fire extinguisher  
   Make/Type: ..... Fine  
   Public spaces: ..... Portable fire extinguisher  
   Make/Type: ..... Fine  
 Waste disposal plant  
 Sewage plant  
   Make: ..... ACO marine  
   Model: ..... Biological  
 Efficiency  
   Attained EEDI value: ..... 5.19  
   Required EEDI value: ..... 8.95  
 Energy Saving Technologies\*: ..... Hi-FIN, Hi-Rudder Bulb  
 Contract date: ..... 28 December 2017  
 Delivery date: ..... 10 February 2020

# SETTSU – Passenger/ro-ro ship

Shipbuilder: ..... **Mitsubishi Shipbuilding Co., Ltd.**  
 Vessel's name: ..... **Settsu**  
 Owner/Operator: ..... **Hankyu Ferry Co., Ltd.**  
 Country: ..... **Japan**  
 Flag: ..... **Japan**  
 IMO number: ..... **9860831**  
 Total number of sister ships already completed (excluding ship presented): ..... **1**  
 Total number of sister ships still on order: ..... **Nil**

The first of a pair of new cruise ro-pax ferries built by Mitsubishi shipbuilding for Hankyu Ferry, the 36,206gt *Settsu* was delivered in February 2020. The second vessel, *Yamato*, was delivered in June. *Settsu* operates on a regular route between Shinmoji and Kobe.

The vessel is 195m in length with a 29.6m beam and a 6.95m draught. The ship also has eight decks with the uppermost being for the bridge and crew quarters. There is a stern and a bow ramp on deck three and another ramp each side on deck four. In all, there are 2,700 lane meters for 188 cars and 277 trucks.

Passenger capacity is 663 and there are a mix of 129 cabins in both Western and Japanese styles including four suites and 15 dormitory rooms. Collectively there are six classes of cabins ranging from single occupancy to four persons and 20 persons in each dormitory style room. A variety of restaurants, bars, entertainment areas, spas and shops complete the public areas.

*Settsu* is notable for several reasons; being the first reference for the Wärtsilä 31 engine in a Japanese vessel, the first Japanese ro-pax featuring a scrubber to meet 2020 SOx rules and installed with engines more efficient than the ship's predecessor with lower consumption and equivalent speed.

The ship has a twin engine, twin propeller propulsion system featuring two 14V31 medium-speed main engines each producing 8,540kW at 750rpm. The engines are connected through their own dedicated Wärtsilä gearboxes to controllable pitch propellers. Wärtsilä also supplied the two hybrid scrubbers for the vessel. For hotel and other power requirements, there are 1,600kW shaft generators on each main engine and three Yanmar gensets each with an output of 1,370kW.

Manoeuvrability for docking and undocking in harbours is aided by the installation of two bow

thrusters and two stern thrusters.

Aiding the vessel's efficiency is a Mitsubishi Air Lubrication System (MALS), which reduces friction under the hull when the vessel is underway.

## TECHNICAL PARTICULARS

Length oa: ..... 195.00m  
 Length bp: ..... 179.60m

Breadth moulded: ..... 29.60m  
 Depth moulded: ..... 20.60m

Draught: ..... 6.95m  
 Gross: ..... 36,206gt

Speed, service: ..... 23.5knots

Classification society and notations: ...Japanese Government

## Propulsion

Main engine(s)  
 Design: ..... Wärtsilä  
 Model: ..... 14V31  
 Number: ..... 2  
 Type of fuel: ..... HFO  
 Output of each engine: ..... 8,540kW, 750rpm  
 Is this a diesel-electric or hybrid?: ..... No

## Gearbox(es)

Make: ..... Wärtsilä  
 Model: ..... SH116-PD67  
 Number: ..... 2

## Propeller(s)

Number: ..... 2  
 Fixed/Controllable pitch: ..... Controllable

## Main-engine driven alternators

Number: ..... 2  
 Make/type: ..... Shaft Generators  
 Output/speed of each set: ..... 1,600kW

## Diesel-driven alternators

Number: ..... 3  
 Engine make/type: ..... Yanmar 6EY22ALW  
 Output/speed of each set: ..... 1,370kW

Exhaust-gas scrubbing equipment ..... 2  
 Manufacturer: ..... Wärtsilä

Type: ..... Hybrid  
 On main engines?: ..... Yes

## Bow thruster(s)

Number: ..... 2  
 Output (each): ..... 1,150kW

## Stern thruster(s)

Number: ..... 2  
 Output (each): ..... 825kW

## Special lifesaving equipment

Number of each and capacity: ..... 2 x MES

## Vehicles

Total lane length: ..... 2,700  
 Total cars: ..... 188  
 Total freight units (specify size): ..... 277 max length 8.5m

## Doors/ramps/lifts/moveable car decks

Number of each: ..... 2 side ramps (1 each side at Deck 4), 1 stern axial ramp, 1 bow ramp at Deck 3

## Complement

Crew: ..... 36

## Passengers

Total: ..... 663  
 Number of cabins: ..... 129 including 4 suites and 15 dormitory style. Mix of Western and Japanese styles

## Radars

Model(s): ..... X-band and S-band

## Efficiency

One other unique feature of the ferry is its navigation software. By taking factors such as tidal current and wind velocity into account, the system can calculate arrival times as well as recommended speed settings to keep fuel consumption as low as possible.

Performance Monitoring Regime: ..... MALS (Mitsubishi Air Lubrication System)\*1 x1 set

Launch/float-out date: ..... 2 August 2019  
 Delivery date: ..... 27 February 2020

# SIDER BUFFALO – Cargo ship

Shipbuilder: ..... **Zhejiang Xinle Shipbuilding CO., Ltd.**  
 Vessel's name: ..... **Sider Buffalo**  
 Owner/Operator: .. **Westport Shipping Limited/ Technical Core Management SRL**  
 Country: ..... **Malta/Italy**  
 Flag: ..... **Portugal**  
 IMO number: ..... **9861512**  
 Total number of sister ships already completed (excluding ship presented): ..... **1**  
 Total number of sister ships still on order: ..... **5**

In April 2020, NovaAlgoma Short Sea Carriers (NASC) – a joint venture of Canada's Algoma Central Corporation and Nova Marine headquartered in Switzerland – took delivery of *Sider Buffalo*, a 7,600dwt mini-bulk carrier built by Ningbo Xinle Shipyard in China. At the time, the owners said the ship is the first of six newbuild mini-bulkers to be delivered by the yard. The second in the series, *Sider Ibiza*, was delivered in November 2020.

The collaboration was formed in 2017 and its two stakeholders have also begun other ventures, including a cement shipping operation. It has been rumoured that some of the other newbuilding orders (there are 18 in total for different vessel sizes) may be converted into other ship types.

Nova Marine will operate *Sider Buffalo* in the European trading area of the mini-bulk market, joining a fleet of some 15 vessels from 5,000 to 15,000dwt.

The ship is 109.9m long, 16m in beam, 8m deep, with a 5.4m full-load draught and has a vertical stem with no bulb. Although described by its owners as a mini-bulk carrier, the vessel is classified as a general cargo ship. It is gearless and of double hull construction with a void of 1.5m and two box holds. The hatch covers are MacGregor stacking type. Grain capacity is 7,922.3m<sup>3</sup> and bale 7,843.3m<sup>3</sup>. The holds are intended for heavy cargoes and have a 20t/m<sup>2</sup> tank top strength.

*Sider Buffalo*'s main engine is a Daihatsu 8DK-28e medium-speed model with a power output of 2,800kW at 750rpm. It connects to a 3.6m diameter controllable pitch propeller through a Reintjes reduction gearbox with a 4.956:1 ratio. Service speed is 12knots when loaded and 12.75 in ballast. The engine complies with IMO Tier II NOx levels, which is sufficient as it was built before the European NOx ECAs came into effect.

## TECHNICAL PARTICULARS

Length oa: ..... 109.9m  
 Length bp: ..... 107.9m  
 Breadth moulded: ..... 16m  
 Depth moulded to main deck: ..... 8.0m

to upper deck: ..... 10.8m  
 to other decks: ..... Bridge deck 13.4m  
 Width of double skin  
 side: ..... 1.5m  
 bottom: ..... 1.2m  
 Draught  
 scantling: ..... 6.366m  
 design: ..... 5.4m  
 Gross: ..... 4,764gt  
 Displacement: ..... 9,801.5t  
 Lightweight: ..... 2,200.8t  
 Deadweight  
 scantling: ..... 7,600.7t  
 design: ..... 6,000t

Block co-efficient (please state relevant draught): ..... 0.826/4.5m  
 Speed, service (~%MCR output): ..... Ballast 12.7knots, 85% loaded 12knots

Cargo capacity (m<sup>3</sup>)  
 Bale: ..... 7,843.3  
 Grain: ..... 7,922.3  
 Liquid volume: ..... 7,960.0  
 Bunkers (m<sup>3</sup>)  
 Heavy oil: ..... 338  
 Diesel oil: ..... 95.9  
 Water ballast (m<sup>3</sup>): ..... 2,942.3  
 Daily fuel consumption (tonnes/day)  
 Main engine only: ..... 9.7 85%  
 Auxiliaries: ..... At sea 0/at port 0.7  
 Classification society and notations: ..... RINA

Propulsion  
 Main engine(s)  
 Design: ..... Daihatsu  
 Model: ..... 8DK-28e  
 Manufacturer: ..... Daihatsu Diesel MFG  
 Number: ..... 1  
 Type of fuel: ..... HFO  
 Output of each engine: ..... 2,800kW x 750rpm  
 Is this a diesel-electric or hybrid?: ..... No

Gearbox(es)  
 Make: ..... Reintjes GmbH Eugen-Reintjes-Str. 7, D-31785 Hamein  
 Model: ..... LAF 3455  
 Number: ..... 1  
 Output speed Gear ratio: ..... 4.956

Propeller(s)  
 Designer/Manufacturer: ..... Schottel  
 Number: ..... 1  
 Fixed/Controllable pitch: ..... Controllable  
 Diameter: ..... 3.6m  
 Speed: ..... 150rpm

Main-engine driven alternators  
 Number: ..... 1  
 Make/type: ..... Marelli Motori  
 Output/speed of each set: ..... 600

Diesel-driven alternators  
 Number: ..... 2  
 Engine make/type: ..... Lindenberg-Anlagen / SCANIA DI 13 074M  
 Type of fuel : ..... MDO  
 Alternator make/type: ..... 2  
 Output/speed of each set: ..... 323kW x 1,500rpm

Boilers  
 Number: ..... 1  
 Type: ..... Oil fired  
 Make: ..... GESAB  
 Output, each boiler: ..... 2,370 cap.500kW, flow 24.3m<sup>3</sup>/h

Bow thruster(s)  
 Make: ..... Schottel STT 170TCK  
 Number: ..... 1  
 Output (each): ..... 300kW, 1,490rpm

Other cranes  
 Number: ..... 1  
 Make: ..... Jiangyinshi Beihai LSA  
 Type: ..... SC45KR  
 Tasks: ..... Rescue boat

Mooring equipment  
 Number: ..... 4  
 Make: ..... Jiangsu Haitai Ship's World Set  
 Type : ..... Hydraulic

Special lifesaving equipment  
 Number of each and capacity: ..... 1 x 15 persons  
 Make: ..... Jiangyinshi Beihai LSA  
 Type: ..... Free-fall

Cargo/capacity  
 Hatch covers  
 Design: ..... MacGregor  
 Manufacturer: ..... Mac pillar  
 Type (upper deck/other decks): ..... Lift away hatch cover

Ballast control system  
 Make: ..... Alfa Laval Tumba AB  
 Type: ..... PureBallast 3.0/3.0 Ex, PureBallast 3.1 Compact, PureBallast

Ballast water treatment system  
 Make: ..... Alfa Laval Tumba AB  
 Capacity: ..... 300m<sup>3</sup>/h

Complement  
 Officers: ..... 5  
 Crew: ..... 5  
 Supernumeraries/Spare: ..... 4  
 Single/double/other rooms: ..... Single

Navigation and otherequipment  
 Bridge control system  
 Make: ..... SaierNico Electric & Automation Ltd.  
 Type: ..... AU  
 Is bridge fitted for one-man operation? ..Yes  
 Integrated bridge system?: .....No

Radars  
 Number: ..... 2  
 Make: ..... JRC  
 Model(s): ..... JMR-7230-S, JMR-7210-6X

Fire detection system  
 Make: ..... Salwico  
 Type: ..... Consilium

Fire extinguishing systems  
 Cargo holds: ..... Wuhan Modern Changji  
 Make/Type: ..... E01 CO<sub>2</sub>  
 Engine room: ..... Wuhan Modern Changji  
 Make/Type: ..... E01 CO<sub>2</sub>

Waste disposal plant  
 Incinerator  
 Make: ..... CSSC, Nanjing Luzhou Machine Co., Ltd.  
 Model: ..... OG120C

Waste shredder/crusher  
 Make: ..... Anqing Mar Sc. and Tech.  
 Model: ..... Pulvizer  
 Sewage plant  
 Make: ..... CSSC, Nanjing Luzhou Machine Co., Ltd.  
 Model: ..... STC-2

Efficiency  
 Attained EEDI value: ..... 14.53  
 Required EEDI value: ..... 15.43  
 Installed Fuel Meters: ..... Volume  
 Hull coatings: ..... Antifouling

Contract date: ..... 8 September 2015  
 Launch/float-out date: ..... 20 November 2019  
 Delivery date: ..... 30 March 2020

# SIEM CONFUCIUS – Vehicle carrier

Shipbuilder: ..... **XSI Xiamen Shipbuilding Industry Co., Ltd.**  
Vessel's name: ..... **Siem Confucius**  
Owner/Operator: ..... **LS-LBR Co, Ltd.**  
Country: ..... **Liberia**  
Designer: ..... **SDARI Shanghai Merchant Ship Design & Research Institute**  
Country: ..... **China**  
Flag: ..... **Liberia**  
IMO number: ..... **9841017**  
Total number of sister ships already completed (excluding ship presented): ..... **1**  
Total number of sister ships still on order: ..... **Nil**

*Siem Confucius* and its sister ship *Siem Aristotle*, delivered in March and October 2020 respectively, were built by Xiamen Shipbuilding Industry in China for Norwegian owner Siem Car Carriers to satisfy an exclusive charter to Volkswagen Group. The vessels are the world's largest LNG-fuelled PCTCs and will work between Emden in Germany and Jacksonville in the United States.

Opting for LNG was a decision driven by the charterer's requirements for the lowest possible CO<sub>2</sub> emissions in line with its environmental mission statement "goTOzero".

The ship has a gross tonnage of 72,900, is 200m in length and can carry 7,500CEU over 13 decks, four of which are hoistable. At 38m in beam, the vessel is some 6m wider than comparable ships which would normally have a 32.3m Panamax dimension. The extra width is largely due to the additional space needed for two 1,800m<sup>3</sup> LNG fuel tanks.

Loading of vehicles is via a starboard stern quarter ramp and a side for transport up to 20tonnes and a maximum height of 5.4m.

The dual-fuel main engines is a Hyundai-built MAN B&W 7S60ME-C10.5GI with exhaust gas recirculation (EGR) for meeting IMO NOx Tier III levels when running on oil fuels. In gas mode NOx is sufficiently reduced, enough to not require this EGR to operate. The engine is rated at 12,624kW at 99rpm and is connected directly to a 6.95m diameter fixed pitch propeller. Service speed is 16.5knots.

## TECHNICAL PARTICULARS

Length oa: ..... 199.90m  
Length bp: ..... 195.618m  
Breadth moulded: ..... 38.00m  
Depth moulded  
to main deck: ..... 14.816m  
to upper deck: ..... 36.61m  
Width of double skin  
side: ..... 15.0mm  
bottom: ..... 20.0mm  
Draught  
scantling: ..... 10.00m  
design: ..... 8.65m

Gross: ..... 72,900gt  
Displacement: ..... 39,640.4t  
Lightweight: ..... 20,489.4t  
Deadweight  
scantling: ..... 19,151.0t  
design: ..... 11,664.4t  
Block co-efficient: ..... 0.5189  
Speed, service: ..... 19.0knots  
Cargo capacity (m<sup>3</sup>)  
CC deck area: .. 64,506m<sup>2</sup> / Approx. 7,500CEU  
Bunkers (m<sup>3</sup>)  
LNG: ..... 2 x 1,800  
Diesel oil: ..... 639.6  
Water ballast (m<sup>3</sup>): ..... 6,680.44  
Daily fuel consumption: ..... Eco Speed  
Main engine only: ..... 19.0t/day  
Auxiliaries: ..... 4.5t/day  
Classification society and notations: ..... ABS  
+ A1, Vehicle Carrier, E, + AMS, +ACCU,  
SH,SHCM,GFS(DFD),TCM,UWILD,HAB,  
ENVIRO,BWT,CPS,IHM,NBLES  
% aluminium used in hull/superstructure: .. 0.015%  
~ 0.08%  
Heel control equipment: ..... AH System Hoppe  
Marine  
Roll-stabilisation equipment: ..... Bilge keel  
Propulsion  
Main engine(s)  
Model: ..... 7S60ME-C10.5GI Tier III  
Manufacturer: ..... Hyundai-MAN B&W  
Number: ..... 1  
Type of fuel: ..... LNG, MGO  
Output of each engine: ..... 12,614kW  
Is this a diesel-electric or hybrid?: ..... No  
Propeller(s)  
Material: ..... MA5X  
Designer/Manufacturer: ..... Vendor's Logo /  
Dalian Marine Propeller  
Number: ..... 1  
Fixed/Controllable pitch: ..... Fixed  
Diameter: ..... 6,950  
Speed: ..... 99rpm  
Diesel-driven alternators  
Number: ..... 3  
Engine make/type: ..... 1 x MAN /7L28/32DF,  
2 x MAN/ 9L28/32DF  
Type of fuel: ..... LNG, MGO  
Alternator make/type: ..... CM-Hyundai  
Output/speed of each set: ..... 1,400/720,  
1,800/720, 1,800/720  
Exhaust-gas scrubbing equipment: ..... EGR  
Manufacturer: ..... MAN  
Type: ..... EGR10G1V051  
On main engines?: ..... Yes  
On auxiliary engines?: ..... No  
Boilers  
Number: ..... 2  
Type: FMB-VS (Burner SKVG) + exhaust gas  
marine boiler EMB-HST  
Make: ..... Saacke

Output, each boiler: ..... 42,700kJ/kg-MDO  
49,500kJ/kg-NG

Bow thruster(s)  
Make: ..... Kawasaki-KWJ KT-219B3  
Number: ..... 1  
Output (each): ..... 2,000kW.  
Deck machinery  
Cargo cranes/cargo gear: ..... Ro-ro division  
quarter and side ramp/doors  
Number: ..... 2  
Make: ..... MacGregor  
Type: ..... Quarter ramp – SWL: 200 up to 300t,  
45.10m (L) x 14.94m (B) x 3.00/3.40/5.40m (H)  
Side ramp - SWL: 20t, 25.00m (L) x 7.70m  
(B) x 3.00/3.40/5.40m (H), (adjustable  
between Dk # 5 and #6)  
Mooring equipment  
Number: ..Fwd: windlass 2, mooring winch 3,  
drums 5, gypsy 2.  
Aft: mooring winch 3, drums 5, 3 gypsy.  
Make: ..... SEC Deck Machinery  
Type: ..... Electric EMW – 225kN; EAMW  
87U3 – 225kN.

Special lifesaving equipment  
Number of each and capacity: ..... Free-fall  
lifeboat CFL-C66E, rigid rescue boat  
RR4.2, Viking life rafts  
Make: ..... Fassmer-Marland Ltd. / Viking  
Type: ..... CFL-C66E, 26 persons max  
/ RR 4.2 6 persons / 2 x Viking 16DK+, 2 x  
Viking 16DKF+, 1 x Viking 6DK+

Vehicles  
Number of vehicle decks (fixed/moveable): 9 / 4  
Total lane length: ..... 64,506m<sup>2</sup>  
Total cars: ..... RT43 7,708; Audi A6 lim 4,790  
Total freight units (specify size): ..... Bus  
(12.0x2.5x3.2m) 380; dump truck(A)  
(7.8x3.7x3.6m) 243

Doors/ramps/lifts/moveable car decks  
Number of each: ..... 2 x ramps, 8 x movable  
ramps  
Quarter ramp – SWL: ..... 200 up to 300t,  
45.10m (L) x 14.94m (B) x 3.00/3.40/5.40m (H)  
Axle load = 55t / 4 wheels; axle load =  
25t / 2 wheels  
Side ramp - SWL: .... 20t, 25.00m (L) x 7.70m  
(B) x 3.00/3.40/5.40m (H), Axle  
load = 15t / 2 wheels (adjustable  
between Dk # 5 and #6)

Designer: ..... MacGregor  
Ballast control system  
Make: ..... Kocumation  
Type: ..... Shipmaster  
Ballast water treatment system  
Make: ..... Erma First BWTS FIT 400  
Capacity: ..... 400m<sup>3</sup>/h  
Navigation and other equipment  
Bridge control system  
Make: ..... Furuno / Simbo Marine  
Systems

Is bridge fitted for one-man operation? ... Yes  
Integrated bridge system (Y/N?): ..... Yes  
If yes, make: ..... Furuno  
Model: ..... Furuno

Radars  
Number: ..... 2  
Make: ..... Furuno Marine Radar / ARPA  
Model(s): ..... FAR 2827 (X-band), FAR 2837S  
(S-band)

Fire detection system  
Make: ..... Consilium  
Type: ..... Salwico fire detection system  
SG - 39918

Fire extinguishing systems  
Cargo holds: ..... CO<sub>2</sub>  
Make/Type: ..... Semco Fire Protection /  
Low pressure CO<sub>2</sub> system  
Engine room: ..... CO<sub>2</sub> and water-mist  
Make/Type: ..... Semco Fire Protection /  
Low pressure CO<sub>2</sub> system / Minimax GmbH &  
Co. / Consilium water mist fixed  
Model: ... "Minifog" fine spray water system  
Vehicle spaces: ..... Same as cargo holds  
Cabins: ..... Fire extinguishers and fire hoses  
Public spaces: ..... Same as cabins

Energy Saving Technologies\*: ..Alternative fuel  
(LNG), trim optimisation, ventilation  
optimisation, VFD for electric motors  
Contract date: ..... 13 April 2017  
Delivery date: ..... 12 March 2020



# SILVER ORIGIN – Cruise ship

Shipbuilder: ..... **De Hoop**  
 Vessel's name: ..... **Silver Origin**  
 Owner/Operator: ..... **Silversea Cruises**  
 Country: ..... **Ecuador**  
 Designer: ..... **De Hoop**  
 Country: ..... **The Netherlands**  
 Flag: ..... **Ecuador**  
 IMO number: ..... **9837937**  
 Total number of sister ships already completed (excluding ship presented): ..... **Nil**  
 Total number of sister ships still on order: ..... **Nil**

*Silver Origin* is the second expedition cruise vessel to be built at the Dutch yard De Hoop in two years, following *Celebrity Flora* delivered in 2019. The two are the only cruise ships to be built in the Netherlands since the 1970s.

In 2017, Celebrity Cruises booked the *Celebrity Flora* at De Hoop and held an option for a second vessel. The following year, Celebrity acquired a majority stake in Silversea Cruises and transferred the second slot to them.

The two vessels are similar in size and in some technical areas are almost identical, but they are quite different in appearance. At 110m in length, *Silver Origin* is more than 8.5m longer than *Celebrity Flora*, whereas both ships have a 17m beam and a moulded depth of 6.5m. *Silver Origin* has a gross tonnage of 6,365 and a displacement of 5,090 tonnes.

The most obvious physical difference between the two is that *Silver Origin* has a conventional raked bow and bulb, while the earlier vessel has a vertical stem. There are the same number of decks, but the superstructure has many subtle differences.

Passenger capacity is 102 in 51 cabins and suites and for the 88 crew members there are 55 cabins. *Silver Origin* has been purposely designed for Galapagos cruising and carries zodiacs for sightseeing excursions.

The ship has dynamic position ability because Galapagos cruising calls for long periods of stationary operation to allow sightseeing and extra-ship activity. The power supply for the twin Steerprop propellers, two Veth bow thrusters and hotel load is supplied by four Caterpillar C32 diesel generator sets rated at 994kW each. NOx emissions to IMO Tier III levels are handled by SCR systems.

A MMC ballast water treatment system supplied by Norwegian Green Technology with a flow rate of 100m³/h enables the ship to meet the 2004 Ballast Convention requirements.

## TECHNICAL PARTICULARS

Length oa: ..... 110.01m  
 Length bp: ..... 97.72m  
 Breadth moulded: ..... 17.0m

Depth moulded: ..... 6.50m  
 Draught  
 scantling: ..... 4.50m  
 Gross: ..... 6,365gt  
 Displacement: ..... 5,090t  
 Lightweight: ..... 3,815t  
 Deadweight: ..... 1,200t

Block co-efficient (please state relevant draught): ..... 0.67  
 Bunkers (m³)  
 Diesel oil: ..... 255.8  
 Water ballast (m³): ..... 344

Classification society and notations: ..... Lloyd's Register

Heel control equipment: ..... Anti heeling system, pump RBP250-3 vertical 2 tanks 73m³ capacity stb and port side

Roll-stabilization equipment: ..... 2 fins, SKF Marine - Serial No. Z300-654-19

Propulsion  
 Main engine(s)  
 Model: ..... C32  
 Manufacturer: ..... Caterpillar  
 Number: ..... 4  
 Type of fuel: ..... MDO  
 Output of each engine: ..... 994kW at 1,800rpm  
 Is this a diesel-electric or hybrid?: ..... Diesel electric

Propeller(s)  
 Material: ..... Ni-Al-Bronze  
 Number: ..... 4  
 Fixed/Controllable pitch: ..... Fixed  
 Diameter: ..... Forward 2,400mm - Aft 1,950mm  
 Speed: ..... 0 – 240rpm

Diesel-driven alternators  
 Number: ..... 4  
 Engine make/type: ..... Caterpillar C32  
 Type of fuel: ..... MDO  
 Alternator make/type: ..... Leroy – SOMER – LSAM 50.2 L8 65/4  
 Output/speed of each set: ..... 994kW / 1,800rpm

Exhaust-gas scrubbing equipment  
 Manufacturer: ..... Caterpillar  
 Type: ..... DEF - UREA  
 On main engines?: ..... Yes  
 On auxiliary engines?: ..... No

Boilers  
 Number: ..... 1  
 Type: ..... HW 700  
 Make: ..... Heat-Master B.V.

Bow thruster(s)  
 Make: ..... Veth Propulsion Type VT-550  
 Number: ..... 2  
 Output (each): ..... 400kW  
 Other cranes  
 Number: ..... 1  
 Make: ..... Sormec  
 Type: ..... M40SA  
 Tasks: ..... Sea state – harbour  
 Performance: ..... SWL 2,000kg – reach 10m.  
 Mooring equipment  
 Number: ..... 2 fwd – 1 aft Dromec  
 Make: ..... C. Kraawevel B.V  
 Type: ..... Hydraulic KA-10-E-TR/46D

Special lifesaving equipment  
 Number of each and capacity: ..... 2 lifeboats – 80 persons each  
 Make: ..... Palfinger  
 Type: ..... PFH130  
 Special lifesaving equipment: ..... Free-fall life rafts  
 Number of each and capacity: ..... 8 Life rafts – 25 persons each  
 Make: ..... Viking  
 Type: ..... Davits x 2 Palfinger – 04-04M  
 Serial No. B16190067-40 port side - B16190067-30 starboard side

Ballast control system  
 Make: ..... MMC Ballast Water Management System  
 Type: ..... NGT BWMS

Ballast water treatment system  
 Make: ..... MMC Ballast Water Management System  
 Capacity: ..... 100m³/h

Complement  
 Officers: ..... 20  
 Crew: ..... 68  
 Passengers  
 Total: ..... 102  
 Number of cabins: ..... 51

Navigation and other equipment  
 Bridge control system  
 Make: ..... JRC Alphantron  
 Type: ..... Alphantron Marine  
 Integrated bridge system: ..... Yes  
 If yes, make: ..... Alphantron Marine  
 Model: ..... Alpha-MINDS JRC-MFD Interswitch

Radars  
 Number: ..... 3 (X-band 2 units / 1 S-band) - JMR-9200 Series Radar Systems  
 Make: ..... Alphantron JRC  
 Model(s): ..... JRM – 9200

Fire detection system  
 Make: ..... Consilium fire detection system  
 Type: ..... Consilium M4 fire panel

Fire extinguishing systems  
 Engine room: ..... Yes  
 Make/Type: ..... Ultra-Hi-Fog  
 Cabins: ..... Yes  
 Make/Type: ..... Ultra Hi-Fog  
 Public spaces: ..... Yes  
 Make/Type: ..... Ultra Hi-Fog

Waste disposal plant  
 Incinerator  
 Make: ..... Atlas A/S  
 Model: ..... Atlas 1200 S XL WS  
 Waste compactor  
 Make: ..... Bermatigen  
 Model: ..... DIXI 5 S-K  
 Waste shredder/crusher  
 Make: ..... LIN-TEC  
 Model: ..... DENSIFIER P10  
 Sewage plant  
 Make: ..... Martin System  
 Model: ..... BMA 300S

Efficiency  
 Installed Fuel Meters: ..... Yes, each MG has fuel meter (litres)  
 Energy Saving Technologies\*: ..... LED & VFD

Contract date: ..... October 2018  
 Launch/float-out date: ..... December 2019  
 Delivery date: ..... June 2020



## SINGAN – Bulk carrier

Shipbuilder: .....The Hakodate Dock Co., Ltd.  
Vessel's name: ..... **Singan**  
Owner/Operator: ..... **Swire Bulk**  
Country: ..... **Singapore**  
Designer: .....The Hakodate Dock Co., Ltd.  
Country: ..... **Japan**  
Flag: ..... **Hong Kong**  
IMO number: ..... **9873735**  
Total number of sister ships already completed (excluding ship presented): ..... **1**  
Total number of sister ships still on order: ..... **Nil**

Delivered by Hakodate Dock to China Navigation on 28 April 2020, *Singan* is the first of a pair that is operated by a new entity, Swire Bulk, established by China Navigation's parent company last year. Its sister vessel *Sungkiang* was delivered in the summer of 2020, and the two ships are known as Swire Bulk's S-class.

*Singan* is a development of the High Bulk 34E design jointly devised by Hakodate and Namura Shipbuilding. The first of the original type was delivered in 2014 and has since become popular, with more than 30 ships built for various owners. Construction of *Singan*, Swire Bulk's first ever newbuild, follows the basics of the original High Bulk 34E type but features an optimised hull form and has been built with energy saving devices.

The vessel's length of 179.97m, beam of 30m and a deadweight of 34,490tonnes puts it at the crossover between Handy and Handymax size ships. It is of double hull construction and features five semi-box shaped holds and MacGregor folding hatch type covers. The grain capacity is 44,147m<sup>3</sup> and bale capacity is 42,911m<sup>3</sup>.

There are four cranes located along the centre line of 30tonnes SWL at 24m radius, but its No. 4 crane actually has an increased radius of 26m. Since the vessel is intended primarily for duty as a log carrier, the collapsible steel stanchions along the ship are a prominent feature.

The vessel is fitted with a Makita-Mitsui MAN B&W 6S46ME main engine with an output of 5,720kW at 110rpm, directly connected to a five-bladed 5.6m diameter fixed pitch propeller. The ship is designed for optimal speed and consumption at 12.5knots in loaded condition. The eco-efficiency additions of the rudder bulb, wake fin and pre-swirl improve the its hull efficiency.

### TECHNICAL PARTICULARS

Length oa: ..... 179.97m  
Length bp: ..... 174m

Breadth moulded: ..... 30.00m  
Depth moulded to main deck: ..... 14.05m

Gross: ..... 21,526gt  
Deadweight: ..... 34,490t

Cargo capacity (m<sup>3</sup>)  
Bale: ..... 42,911.57  
Grain: ..... 44,146.86

Bunkers (m<sup>3</sup>)  
Heavy oil: ..... 1,292.26  
Diesel oil: ..... 147.43

Water ballast (m<sup>3</sup>): ..... 14,663.88

Classification society and notations: ..... LR

Propulsion  
Main engine(s)  
Design: ..... Makita-Mitsui  
MAN B&W  
Model: ..... 6S46ME  
Manufacturer: ..... Makita Corporation  
Number: ..... 1257  
Type of fuel: ..... HFO  
Output of each engine: ..... 5,720kW x 110.0rpm  
Is this a diesel-electric or hybrid?: ..... Diesel

Propeller(s)  
Material: ..... Ni-Al-Bronze  
Designer/Manufacturer: ..... Nakashima Propeller Co., Ltd.  
Number: ..... 5 blades  
Fixed/Controllable pitch: ..... Fixed  
Diameter: ..... 5,600mm  
Speed: ..... 110rpm

Main-engine driven alternators  
Output/speed of each set: ..... 500kW

Diesel-driven alternators  
Number: ..... 3 sets  
Engine make/type: ..... Yanmar / 6EY18ALW  
Type of fuel: ..... HFO  
Alternator make/type: ..... Taiyo Electric Ltd. / FE541C-8  
Output/speed of each set: ..... 575kVA

Boilers  
Number: ..... 1 set  
Type: ..... OVS2-80/60-22

Make: ..... Osaka Boiler MFH. Co., Ltd.  
Output, each boiler: ..... Oil burning /800kg/h, Exh. gas heating 725kg/h

Deck machinery  
Cargo cranes/cargo gear  
Number: ..... 4 sets  
Make: ..... Mitsubishi Heavy Industries Machinery System  
Type: ..... Electric-hydraulic type  
Performance: ..... 30t X 24m (R) No.1~No.3 , 30t X 26m (R) No.4

Other cranes  
Number: ..... 1 set  
Make: ..... Mansei Inc  
Type: ..... Electric motor driven  
Tasks: ..... Miscellaneous crane  
Performance: ..... 2.0t X 6.5m/r

Mooring equipment  
Number: ..... 2 sets  
Make: ..... Mitsubishi Heavy Industries Machinery System  
Type: ..... Electro-hydraulic

Special lifesaving equipment  
Number of each and capacity: ..... 24 persons x 2 sets  
Make: ..... Jiangsu Jiaoyan Marine Equipment Co., Ltd.  
Type: ..... Totally enclosed type with engine

Cargo/capacity  
Hatch covers  
Design: ..... MacGregor/ folding type  
Manufacturer: ..... MacGregor  
Type: ..... Folding

Ballast water treatment system  
Make: ..... Alfa Laval Tumba AS  
Capacity: ..... 600m<sup>3</sup>/h x 2 sets

Complement  
Officers: ..... 13  
Crew: ..... 9  
Supernumeraries/Spares: ..... 2

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

Radars  
Number: ..... 2  
Make: ..... Japan Radio Co. Ltd. (JRC)  
Model(s): ..... JMR 9225-6X, JMR9272-S

Fire detection system  
Make: ..... Consilium Nittan Marine Ltd.  
Type: ..... Salvico CCP fire detection system

Fire extinguishing systems  
Cargo holds: ..... CO<sub>2</sub>  
Make/Type: ..... Nippon Dry Chemical Co., Ltd./ 55.0kg X 96 cylinders  
Engine room: ..... CO<sub>2</sub> / Fix local application  
Make/Type: ..... Kashiwa/ Hyper mist system

Waste disposal plant  
Incinerator  
Make: ..... Sunflame  
Model: ..... OSV-240SAI  
Sewage plant ..... Vacuum toilet system  
Make: ..... Harada Corporation  
Model: ..... Evac Oy, Finland combined type

Efficiency  
Installed Fuel Meters: ..... Volume flow meter for M/E D/G inlet & outlet. Boiler.

Launch/float-out date: ..... 18 February 2020  
Delivery date: ..... 28 April 2020

# SOLAR SHARNA – Chemical/product tanker

Shipbuilder: **Hyundai Mipo Dockyard Co., Ltd.**  
 Vessel's name: **Solar Sharna**  
 Owner/Operator: **Tristar Transport LLC**  
 Country: **UAE**  
 Designer: **Hyundai Mipo Dockyard Co., Ltd.**  
 Country: **Republic of Korea**  
 Model test establishment used: **HMRI**  
 Flag: **Marshall Islands**  
 IMO number: **9877614**  
 Total number of sister ships already completed (excluding ship presented): **3**  
 Total number of sister ships still on order: **2**

*Solar Sharna* is the first in a series of six 25,000dwt MR chemical/product tankers for UAE-based Tristar Group and was delivered in June 2020. Sister ships *Solar Nesrin*, *Solar Suzanne* and *Solar Skyler* were also delivered last year and *Solar Ailene* and *Solar Sheridan* in January 2021. The vessels were designed and built by Hyundai Mipo. All six are fixed on long-term charters with oil major Shell, signed concurrent with the order in 2018.

The order for the series builds upon a previous contract under which Hyundai delivered six 50,000dwt MR tankers to Tristar in 2016.

The vessel has hull dimensions of 169m loa, 25.6m beam and a scantling draught of 10m. *Solar Sharna* is typical of its type with regards to the hull configuration and features a bulbous bow, transom stern, flush deck with forecabin and poop. It is an IMO Type 2 chemical tanker and has a central bulkhead, six pairs of cargo tanks, one pair of slop tanks and five pairs of water ballast tanks.

Cargo pumps comprise 12 Marflex electric driven centrifugal pumps with a capacity of 375m³/h and the slop pumps are of the same make operating at 150m³/h. A Techcross ballast water treatment system with a flow rate of 1,000m³/h ensures compliance with ballast treatment requirements, including in US waters.

The power and propulsion system features a Hyundai-built MAN B&W super long stroke 6S46ME-B8.5 main engine rated at 7,000kW and a single fixed pitch propeller. To comply with NOx Tier III standards in ECAs, a high-pressure selective catalytic reduction (SCR) system is fitted. There is no scrubber, so the vessel is obliged to use a VLSFO to meet 2020 SOx requirements.

Its auxiliary engines, which are NOx Tier III compliant, are a trio of HiMSEN 6H21/32 gensets each with an output of 1,050kW at 900rpm.

## TECHNICAL PARTICULARS

Length oa: **Approx. 169m**  
 Length bp: **161.0m**  
 Breadth moulded: **25.6m**  
 Depth moulded  
 to main deck: **15.6m**  
 to upper deck: **15.6m**  
 Width of double skin  
 side: **1.80m**

bottom: **1.71m**  
 Draught  
 scantling: **10.0m**  
 design: **9.20m**  
 Gross: **17,915gt**  
 Deadweight  
 scantling: **25,039t**  
 design: **22,000t**  
 Speed, service (61.3% MCR output with 15% S.M.): **Approx. 14.5knots**  
 Cargo capacity (m³)  
 Liquid volume: **30,200**  
 Bunkers (m³)  
 Heavy oil: **1,090**  
 Diesel oil: **280**  
 Water ballast (m³): **12,800**  
 Daily fuel consumption (tonnes/day)  
 Main engine only: **16.7**  
 Classification society and notations: **LR +100A1, Double Hull Oil and Chemical Tanker, Ship Type 2, CSR, ESP, ShipRight(ACS(B), CM), LI, \*IWS, SPM4, ECO(SEEMP,BWT,TC,CRM,BIO,IBTS,VECS-L),+LMC, BWTS, IGS, UMS, with descriptive note: ETA, ShipRight (BWMPT(S,T), SCM, SERS, IHM, VECS)**  
 Propulsion  
 Main engine(s)  
 Design: **Hyundai-MAN B&W**  
 Model: **6S46ME-B8.5-HPSCR**  
 Manufacturer: **HHI Engine & Machinery Division**  
 Number: **1**  
 Type of fuel: **HFO, MGO**  
 Output of each engine: **7,000kW**  
 Is this a diesel-electric or hybrid?: **No**  
 Propeller(s)  
 Material: **Ni-Al-Bronze**  
 Designer/Manufacturer: **Hyundai Heavy Industries**  
 Number: **1**  
 Fixed/Controllable pitch: **Fixed**  
 Diameter: **5.8m**  
 Speed: **114.0rpm at MCR**

Diesel-driven alternators  
 Number: **3**  
 Engine make/type: **HHI Engine & Machinery Division / 6H21/32**  
 Type of fuel: **HFO, MGO**  
 Alternator make/type: **Hyundai Electric and Energy Systems / HFC7 508-08P**  
 Output/speed of each set: **1,050kW / 900rpm**  
 Boilers  
 Number: **1**  
 Type: **Heavy fuel burning & marine gas oil**  
 Make: **Alfa Laval**  
 Output, each boiler: **18,000kg/h (evaporation) / 7.0kg/cm²(steam condition)**  
 Deck machinery  
 Cargo cranes/cargo gear  
 Number: **1**

Make: **Oriental**  
 Type: **Electro-hydraulic driven**  
 Performance: **SWL 10.0t / Outreach 4.5m~20m**  
 Other cranes  
 Number: **1**  
 Make: **Oriental**  
 Type: **Electro-hydraulic driven**  
 Tasks: **Provision and machinery parts handling in engine room**  
 Performance: **SWL 2.0t / Outreach 2.7m~9m**  
 Mooring equipment  
 Number: **6**  
 Make: **Flutek**  
 Type: **Electro-Hydraulic**  
 Special lifesaving equipment  
 Number of each and capacity: **1 / 28 person**  
 Make: **Hyundai Lifeboat**  
 Type: **Free-fall type**  
 Cargo tanks  
 Number: **12 cargo tanks / 2 slop tanks**  
 Grades of cargo carried: **IMO ship type 2 and 3**  
 Product range: **Petroleum products / chemical cargoes (ship type 2) / caustic soda / vegetable oil / molasses / DPP / ethanol / methanol**  
 Coated tanks: **TCA900/902, TCA901/902 / Bimodel epoxy**  
 Stainless steel – structure/piping: **Mild steel / SUS316L**  
 Cargo pumps  
 Number: **12 cargo / 2 slop**  
 Type: **Electric driven centrifugal**  
 Make: **Marflex**  
 Stainless steel: **AISI316L**  
 Capacity (each): **375m³/h (cargo) / 150m³/h (slop)**  
 Cargo control system  
 Make: **Marflex**  
 Type: **Piano type**  
 Ballast control system  
 Make: **Marflex**  
 Type: **Piano type**  
 Ballast water treatment system  
 Make: **Techcross**  
 Capacity: **1,000m³/h 1 set**  
 Complement  
 Officers: **8**  
 Crew: **15**  
 Supernumeraries/Spare: **1**  
 Suez/Repair Crew: **6**  
 Single/double/other rooms: **24/ - / 4**  
 Passengers  
 Total: **4**  
 Number of cabins: **1**  
 Percentage/number outboard: **14.2%**  
 Navigation and other equipment  
 Bridge control system  
 Make: **Nabtesco**  
 Type: **M-800-V**  
 Is bridge fitted for one-man operation? **No**  
 Integrated bridge system ? **No**  
 Radars  
 Number: **2**  
 Make: **JRC**  
 Model(s): **JMR-9282-S, JMR-9225-6X**  
 Fire detection system  
 Make: **Consilium**  
 Type: **Salvico Cargo**  
 Fire extinguishing systems  
 Engine room: **CO<sub>2</sub> fire extinguishing system, local fire extinguisher**  
 Make/Type: **NK / High pressure, fixed**  
 Cabins: **Fire extinguisher**  
 Make/Type: **NK / Portable**  
 Public spaces: **Fire extinguisher**  
 Make/Type: **NK / Portable**  
 Efficiency  
 Attained EEDI value: **6.99 g/tonne-nm**  
 Required EEDI value: **7.83 g/tonne-nm**  
 Installed Fuel Meters: **Electro pneumatic type tank level gauge**  
 Other installed monitoring tools: **Electro pneumatic type draft gauge**  
 Hull coatings: **A/F Seaquantum Spectrum S, A/F Seaquantum Pro U**  
 Contract date: **21 December 2018**  
 Launch/float-out date: **6 March 2020**  
 Delivery date: **15 June 2020**

# TOVE KNUTSEN – Shuttle tanker

Shipbuilder: ..... **Hyundai Heavy Industries**  
 Vessel's name: ..... **Tove Knutsen**  
 Owner/Operator: ..... **Knutsen NYK Offshore Tankers AS**  
 Country: ..... **Norway**  
 Designer: ..... **Hyundai Heavy Industries**  
 Country: ..... **Republic of Korea**  
 Model test establishment used: ..... **Hyundai Maritime Research Institute (HMRI)**  
 Flag: ..... **Norway (NIS)**  
 IMO number: ..... **9868376**  
 Total number of sister ships already completed (excluding ship presented): ..... **1**  
 Total number of sister ships still on order: ..... **Nil**

*Tove Knutsen*, delivered by Hyundai Heavy to Knutsen NYK Offshore Tankers (KNOT) in September 2020, is the first of a pair of shuttle tankers ordered in 2018. Along with its sister *Synnøve Knutsen*, the vessels will operate in Brazil under a long-term charter with energy major Equinor.

The ship is a 152,686dwt DP2 class shuttle tanker with a Pusnes 5th generation bow loading system that allows for buoy loading or tandem operations with an FPSO. Hull dimensions are a length of 278.95m, beam of 48m, depth of 23.6m and a draught of 17.15m.

Cargo arrangements include six pairs of cargo tanks separated by a centreline bulkhead and one pair of slop tanks. Cargo oil tank capacity is 169,500m<sup>3</sup> and 3,500m<sup>3</sup> for the slop tanks. Three grades of cargo can be carried and the three cargo pumps are electric Hamworthy centrifugal types, each with a capacity of 4,000m<sup>3</sup>/h.

The main engine is an ultra-long stroke MAN B&W6G70ME-C10.5 with a power output of 16,190kW driving a single 8.7m controllable pitch propeller. For dynamic positioning (DP) operations, manoeuvrability and station keeping is permitted by three Wärtsilä retractable azimuthing thrusters – two forward rated at 3,100kW each and one unit at 2,200kW aft. A 3,300kW tunnel thruster forward and a stern tunnel thruster of 2,200kW aft complete the arrangement.

There are five gensets all based on HiMSEN 32/40 engines – two 9-cylinder and three 7-cylinder sets. Total combined output is 18,720kW. The vessel has a DC grid electrical arrangement suited to DP and allowing a DNV GL class notation of DYNPOS (AUTR).

## TECHNICAL PARTICULARS

Length oa: ..... 278.95m  
 Length bp: ..... 268.70m  
 Breadth moulded: ..... 48.00m  
 Depth moulded  
 to main deck: ..... 23.60m  
 to upper deck: ..... 23.60m  
 Width of double skin  
 side: ..... 2.5m  
 bottom: ..... 2.7m

Draught  
 scantling: ..... 17.15m  
 design: ..... 17.15m  
 Gross: ..... 84,666gt  
 Deadweight  
 scantling: ..... 152,868.1t  
 design: ..... 152,868.1t  
 Speed, service (84%MCR output): NCR 14.5knots  
 Cargo capacity (m<sup>3</sup>)  
 Liquid volume: ..... 170,028  
 Bunkers (m<sup>3</sup>)  
 Diesel oil: ..... 3,512.9 (light fuel)  
 Water ballast (m<sup>3</sup>): ..... 54,209.7  
 Daily fuel consumption (tonnes/day)  
 Main engine only: ..... 51  
 Classification society and notations: .... DNV GL, +1A, Tanker for Oil, ESP, CSR, E0, DYNPOS(AUTR), BOW LOADING, F(A,M,C), TMON, NAUT(OC), BIS, CCO, BWM(T), SPM, VCS(2), COAT-PSPC(B,C), RECYCLABLE, LCS, CMON, CLEAN.

Propulsion  
 Main engine(s)  
 Model: ..... B&W 6G70ME-C10.5  
 Manufacturer: ..... Hyundai Heavy Industries  
 Number: ..... 1  
 Type of fuel: ..... MDO  
 Output of each engine: ..... 16,190kW  
 Is this a diesel-electric or hybrid?: ..... No

Propeller(s)  
 Material: ..... Ni-Al-Bronze  
 Designer/Manufacturer: ..... Wärtsilä  
 Number: ..... 1  
 Fixed/Controllable pitch: ..... Controllable  
 Diameter: ..... 8.7m

Diesel-driven alternators  
 Number: ..... 5  
 Engine make/type: ..... HHI-HiMSEN 9H32/40 x 2s ets, / 7H32/40 x 3 sets  
 Type of fuel: ..... LFO or MGO  
 Alternator make/type: ..... HFJ7 914-10P x 2 sets, HFJ7 910-10P x 3 sets  
 Output/speed of each set: .4,320kW x 2 sets, 3,360kW x 3 sets, 720rpm

Boilers  
 Number: ..... Aux boiler x 1 set / Composite boiler x 1 set  
 Type: ..... PB TYPE / PC TYPE  
 Make: ..... Kanglim  
 Output, each boiler: ..50t/h x 1 set / 2.5t/h x 1 set (burner section), 1.4t/h (exh. gas section)

Stern appendages/special rudders: ...Full spade rudder

Bow thruster(s)  
 Make: ..... Wärtsilä  
 Number: ..... Azimuth 3,100kW x 2, tunnel 3,300kW x 1

Stern thruster(s)  
 Make: ..... Wärtsilä

Number: .....Azimuth 2,200kW x 1, tunnel 2,200kW x 1  
 Bow loading system: ..... Pusnes 5th generation  
 Deck machinery  
 Cargo cranes/cargo gear  
 Number: ..... 2  
 Make: ..... Oriental  
 Type: ..... Electro-hydraulic  
 Performance: .....20t SWL  
 Other cranes  
 Number: ..... 2 / 1  
 Make: ..... Oriental  
 Type: ..... Electro-hydraulic  
 Tasks: ..... Provision / BLS service  
 Performance: .....8t, 2t SWL / 5t SWL  
 Mooring equipment  
 Number: .....Two(2) – 1 C/L + 2 M/D + 1 W/H, each, Two(2) – 1 M/D, each, Six(6) – 2 M/D + 1 W/H, each  
 Make: .....Flutek  
 Type : ..... Electro-hydraulic  
 Special lifesaving equipment  
 Number of each and capacity: ...1 x 36 persons  
 Make: ..... Viking Norsafe  
 Type: .....Totally enclosed free-fall type  
 Cargo tanks  
 Number: ..... 12  
 Grades of cargo carried: ..... 3 group  
 Product range: ..... Crude oil  
 Cargo pumps  
 Number: ..... 3  
 Type: .....Vertical centrifugal single stage, variable speed electric motor driven  
 Make: .....Hamworthy pump (Wärtsilä)  
 Capacity (each): .....4,000m<sup>3</sup>/h x 135mTH  
 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: ..... Hyundai welding  
 Capacity: ..... 5,000m<sup>3</sup>/h  
 Complement  
 Officers: ..... 13  
 Crew: ..... 16  
 Supernumeraries/Spare: ..... 1  
 Suez/Repair Crew: ..... 6  
 Single/double/other rooms: ..... 30 / 3  
 Navigation and other equipment  
 Bridge control system  
 Make: ..... MRC  
 Type: .....One man  
 Is bridge fitted for one-man operation? Yes  
 Integrated bridge system: ..... Yes  
 If yes, make: ..... Furuno  
 Model: ..... FMD-3300  
 Radars  
 Number: ..... 2  
 Make: ..... Furuno  
 Model(s): ..... FAR-3330  
 Fire detection system  
 Make: ..... Autronica  
 Type: .....Autrosafe (BS-420)  
 Fire extinguishing systems  
 Engine room: .....CO<sub>2</sub>  
 Make/Type: .....NK/CO<sub>2</sub>  
 Waste disposal plant  
 Incinerator  
 Make: ..... HMMCO  
 Model: ..... MAXI T150SL WS  
 Sewage plant  
 Make: ..... Il Seung  
 Model: ..... ISB-02  
 Efficiency  
 Attained EEDI value: ..... 3.00  
 Required EEDI value: ..... 3.24  
 Installed Fuel Meters: ..... Mass type flow meter  
 Other installed monitoring tools: .....Shaft torque and power, trim and list, draughts  
 Energy Saving Technologies\*: ...Pre swirl duct, D.C. switchboard, VFD thrusters, VFD for electric motors, trim optimisation, LED lighting, Hull coatings: .....Jotun Seaquantum X200  
 Performance Monitoring Regime: .....Hyundai-ISS: voyage monitoring, route optimisation (weather routing), trim optimisation  
 Contract date: .....26 September 2018  
 Launch/float-out date: ..... 6 March 2020  
 Delivery date: .....28 September 2020



# YM CELEBRITY – Container ship

Shipbuilder: ..... **CSBC Corporation, Taiwan**  
 Vessel's name: ..... **YM Celebrity**  
 Owner/Operator: ..... **Yang Ming Marine Transport Corp.**  
 Country: ..... **Taiwan**  
 Designer: ..... **CSBC Corporation**  
 Country: ..... **Taiwan**  
 Model test establishment used: **Hamburg Ship Model Basin (HSVA)**  
 Flag: ..... **Liberia**  
 IMO number: ..... **9864502**  
 Total number of sister ships already completed (excluding ship presented): ..... **5**  
 Total number of sister ships still on order: ..... **4**

Built by CSBC at Kaohsiung shipyard in Taiwan for local liner operator Yang Ming Marine Transport, *YM Celebrity* and *YM Continent* were named in a joint ceremony in May 2020. While *YM Celebrity* was delivered on 27 May, its sister was a few days later in June.

The vessel is the first of ten 2,940TEU container ships built to a CSBC design, which will form the owner's C-Class of vessels. They have been designed for feeder and local services in Asia and to call at a maximum number of ports to provide flexibility. Delivery of all ten vessels is expected to be complete by mid-2021.

With a length of 209.75m, a width of 32.8m and a draught of 11.2m, the ships are five hold type. The hull is somewhat wider than other vessels of similar size, giving more stability and reducing the need for water ballast. They feature a vertical bulbous Sea Sword Bow, which is less sensitive to trim, draught and speed loss and its deck wetness probabilities are much lower than a conventional bulbous bow.

Container capacity is 1,040TEU under deck, 1,900 above deck and there are 353 reefer plugs. The securing system above deck allows for mixed or Russian stowage of different sized boxes.

The main engine is a MAN B&W7S70ME-C10.5 with an output of 20,500kW at 91rpm and a single high-efficiency fixed pitch propeller. The rudder is a twisted type with bulb and vessel speed is 21knots.

*YM celebrity* is the first vessel to receive an ABS SMART (INF, SHM) notation. This means the ship supplies its owner with structural health awareness, assesses and predicts structural damage and provides decision-making support on safer and more optimal vessel operation, inspection and repairs, and asset integrity management.

All ten vessels in the series will be designated Smart ships but with different classification societies, five by ABS, three by DNV GL and two by BV

## TECHNICAL PARTICULARS

Length oa: ..... 209.75m  
 Breadth moulded: ..... 32.80m  
 Depth moulded: ..... 16.80m

to upper deck: ..... 16.8m  
 to other decks: ..... Nil  
 Draught  
 scantling: ..... 11.20m  
 design: ..... 9.50m  
 Gross: ..... 32,720gt  
 Deadweight  
 scantling: ..... abt. 37,400t  
 design: ..... abt. 27,500t  
 Speed, service (90%MCR output): ..... 21knots

Cargo capacity (m<sup>3</sup>)  
 Refrigerated storage: ..... 353FEU  
 Bunkers (m<sup>3</sup>)  
 Heavy oil: ..... abt. 2,700  
 Diesel oil: ..... Approx. 200  
 Water ballast (m<sup>3</sup>): ..... Approx. 11,200  
 Daily fuel consumption (tonnes/day)  
 Main engine only: ..... 71.2

Classification society and notations: ..... ABS  
 +A1 (E), "Container Carrier", +AMS, +ACCU, SH, SHCM, FL(25), ENVIRO, IHM, UWILD, BWT, TCM, CSC, CLP-V, CPS, NBL, SMART (INF,SHM)

Propulsion  
 Main engine(s)  
 Design: ..... MAN B&W  
 Model: ..... 7S70ME-C10.5  
 Manufacturer: ..... HSD  
 Number: ..... 1  
 Type of fuel: ..... HFO  
 Output of each engine: ..... 20,500kW x 91.0rpm

Is this a diesel-electric or hybrid?: ..... No  
 Propeller(s)  
 Material: ..... Ni-Al-Bronze  
 Designer/Manufacturer: ... CSBC/ Nakashima Propeller Co., Ltd.  
 Number: ..... 1  
 Fixed/Controllable pitch: ..... Fixed  
 Diameter: ..... 7.8m

Diesel-driven alternators  
 Number: ..... 3  
 Engine make/type: ..... STX Engine/ L27/38  
 Type of fuel: ..... HFO, MGO  
 Alternator make/type: ... Hyundai Electric and Energy Systems Co., Ltd. / HFC7 710-10P  
 Output/speed of each set: ..... 1,900kW

Boilers  
 Number: ..... 1  
 Type: ..vertical oil fired boiler (water tube type)  
 Make: ... KangRim Heavy Industries Co., Ltd.  
 Output, each boiler: ..... 2,300kg/h  
 Bow thruster(s)  
 Make: ..... Kawasaki Heavy Industries  
 Number: ..... 1  
 Output (each): ..... 1,200kW

Mooring equipment  
 Number: ..... 2 x mooring winch/windlass, 4 x mooring winch  
 Make: ..... Rolls-Royce Oy Ab  
 Type: ..... Electric  
 Special lifesaving equipment  
 Number of each and capacity: ... 2 x 30 persons  
 Make: ..... Norsafe  
 Type: ..... Diesel engine

Cargo/capacity  
 Hatch covers  
 Design: ..... MacGregor  
 Manufacturer: ..... CSBC  
 Type: ..... upper deck

Containers  
 Lengths: ..... 20ft / 40ft  
 Heights: ..... 8.6ft & 9.6ft  
 Total TEU capacity: ..... 2,940TEU  
 On deck: ..... 1,900TEU  
 In holds: ..... 1,040TEU  
 Homogeneously loaded to 14tonnes: .. Approx. 2,100

Reefer plugs: ..... 353  
 Tiers/rows (maximum)  
 On deck: ..... 9/13  
 In holds: ..... 6/11

Ballast water treatment system  
 Make: ..... Alfa Laval  
 Capacity: ..... 500m<sup>3</sup>/h

Complement  
 Officers: ..... 16  
 Crew: ..... 10  
 Suez Crew: ..... 6

Radars  
 Number: ..... 3  
 Make: ..... Sperry Marine

Fire extinguishing systems  
 Cargo holds:  
 Make/Type: ..... NK Co., Ltd. /CO<sub>2</sub> fire extinguishing system

Waste disposal plant  
 Incinerator  
 Make: ..... Sunflame Co., Ltd  
 Model: ..... OSV-600SAI  
 Sewage plant  
 Make: ..... Il Seung Co., Ltd  
 Model: ..... ISB-03

Efficiency  
 Attained EEDI value: ..... 15.70  
 Required EEDI value: ..... 18.88  
 Installed Fuel Meters: ..... Mass flow meter  
 Energy Saving Technologies\*: ... Energy Saving Sea Sword Bow, twisted rudder with un-symmetry rudder bulb

Contract date: ..... 15 August 2018  
 Launch/float-out date: ..... 22 December 2019  
 Delivery date: ..... 27 May 2020

# YUAN DA FAN RONG – General cargo ship

Shipbuilder: ..... **CSSC, Wuchang Shipbuilding Industry Group Co., Ltd.**  
Vessel's name: ..... **Yuan Da Fan Rong**  
Owner/Operator: ..... **Qingdao Grand Ocean Maritime Co., Ltd.**  
Country: ..... **China**  
Designer: ..... **Shanghai merchant ship design and research institute (SDARI)**  
Country: ..... **China**  
Model test establishment used: ..... **Shanghai Ship & Shipping Research Institute (SSRI)**  
Flag: ..... **China**  
Total number of sister ships already completed (excluding ship presented): ..... **2**  
Total number of sister ships still on order: ..... **Nil**

**Y**uan Da Fan Rong is the lead vessel of new series of 700TEU feeder container/general cargo ships designed by Shanghai Merchant Ship Design and Research Institute (SDARI). Built by Wuchang Shipbuilding Industry Group for Qingdao Grand Ocean Maritime, the vessel was delivered in July 2020.

The ship has three boxed shaped holds, with its No. 1 hold narrowing in steps from seven to five to three containers wide. Yuan Da Fan Rong's No. 1 Hold is three bays in length and four bays for the No 2 and 3 holds. Cell guides are only fitted on the forward and aft bulkheads of No 2 and No 3, leaving the holds also suitable for loading general cargo of various types to increase the flexibility of the vessel. Deck cargo can be loaded on the hatch covers of the three holds and in two bays on the deck between Hold 3 and the superstructure.

Total container capacity is 266TEU in the holds and 448TEU on deck. There are 109 reefer plugs and those within the hold benefit from a ventilation system, which also allows for some dangerous goods to be loaded. To balance the cargo hold fan energy consumption and ventilation effect, the ventilation system was designed using CFD to optimise temperature control.

The hull has the accommodation located fully aft and features a vertical bow according to SDARI's S-Bow design.

Its main engine is a NOx Tier II compliant medium-speed 6G32 type by Guangzhou Diesel Engine Factory, which produces 2,265kW and is connected to a single fixed pitch propeller through a Chongqing GWC6371 reduction gearbox. The rudder is a SDARI Adapted Twisted Rudder. This arrangement allows for a service speed of 12.9knots on 10.3tonnes of fuel per day.

The auxiliary gensets are a pair of Cummins KTA19-DM1 units and a single Cummins 6LTA8.9-GM200. They produce 300kW and 150kW each respectively.

## TECHNICAL PARTICULARS

Length oa: ..... 118.00m  
Length bp: ..... 115.00m  
Breadth moulded: ..... 20.80m

Depth moulded  
to main deck: ..... 11.20m  
to upper deck: ..... 11.20m  
Width of double skin  
side: ..... 1.56m  
bottom: ..... 1.35m  
Draught  
scantling: ..... 7.20m  
design: ..... 7.20m  
Gross: ..... 8,057gt  
Deadweight  
scantling: ..... 9,330  
Speed, service: ..... 12.90knots

Bunkers (m³)  
Heavy oil: ..... 260  
Diesel oil: ..... 100  
Water ballast (m³): ..... 4,000  
Container ships – water ballast in loaded condition (tonnes): ..... 2,100t (14t/TEU)  
Daily fuel consumption (tonnes/day)  
Main engine only: ..... 10.3

Classification society and notations: .....  
CCS ★ CSAD Container Ship / General Dry Cargo Ship; Great Coastal Service; Ice class B; Loading Computer(S,I,D) FTP ★ CSMD MCC

Propulsion  
Main engine(s)  
Design: ..... Guangzhou Diesel Engine Factory  
Model: ..... 6G32, Tier II  
Manufacturer: ..... Guangzhou Diesel Engine Factory  
Number: ..... 1  
Type of fuel: ..... HFO, MDO  
Output of each engine: ..... 2,265kW  
Is this a diesel-electric or hybrid?: ..... No

Gearbox(es)  
Make: ..... Chongqing Gearbox  
Model: ..... GWC6371  
Number: ..... 1  
Output speed ..... 131.82rpm

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

Diesel-driven alternators  
Number: ..... 3  
Engine make/type: ..... Cummins Engine /KTA19-DM1/ 6LTA8.9-GM200  
Type of fuel: ..... MDO  
Alternator make/type: ..... Marathon / MP-300-4/ MP-150-4  
Output/speed of each set: ..... 300kW , 150kW  
Boilers  
Number: ..... 1

Type: ..... Steam  
Make: ..... Sanjie Industry  
Output, each boiler: Oil fired section 800kg/h, exh.gas section: 900kg/h  
Stern appendages/special rudders: ..... SDARI Adapted Twisted Rudder

Other cranes  
Number: ..... 1  
Make: .. Zhejiang Norsier Lifesaving Equipment Technology  
Type: .....23kN rescue boat/ raft launching appliance & crane  
Tasks: ..... Rescue boat/ raft launching & provision crane  
Performance: .....23kN for rescue boat/raft launching/15kN for provision crane

Mooring equipment  
Number: ..... 4  
Make: ..... Wuxi Delin  
Type: ..... Electric

Special lifesaving equipment  
Number of each and capacity: ..... 1  
Make: ..... Zhejiang Norsier Lifesaving Equipment Technology  
Type: ..... Totally enclosed lifeboat

Cargo/capacity  
Hatch covers  
Design: ..... Brightseas Ship Equipment Co., Ltd.  
Manufacturer: ..... Brightseas Ship Equipment Co., Ltd.  
Type: ..... Pontoon, non-sequential

Containers  
Total TEU capacity: ..... 714TEU  
On deck: ..... 448TEU  
In holds: ..... 266TEU  
Homogeneously loaded to 14tonnes: 474TEU  
Reefer plugs: ..... 109  
Tiers/rows (maximum)  
On deck: ..... 5/8  
In holds: ..... 4/7  
Hold refrigeration system: ..... Air-cooled

Ballast control system  
Make: ..... Donjun Automation Equipment Co., Ltd.  
Type: ..... Hydraulic

Complement  
Officers: ..... 10  
Crew: ..... 10

Navigation and other equipment  
Bridge control system  
Make: ..... GUANG CAI  
Type: ..... CDQY-2N1  
Is bridge fitted for one-man operation? ..No  
Integrated bridge system?: .....No  
Radars  
Number: ..... 2  
Make: ..... Furuno  
Model(s): ..... FAR-2328 / 2338S

Fire detection system  
Make: ..... Hangzhou Huayan  
Type: ..... JB-QB-2000

Fire extinguishing systems  
Cargo holds: ..... CO<sub>2</sub>, sea water  
Make/Type: .. CSSS Jiujiang Fire Equipment Co., Ltd.  
Engine room: ..... CO<sub>2</sub>  
Make/Type: ..... Seaplus, CSSS Jiujiang Fire Equipment  
Cabins: ..... Sea water  
Public spaces: ..... Sea water

Waste disposal plant  
Sewage plant  
Make: ..... Jiangsu Nanji Machinery  
Model: ..... WCMBR-20 (B+G)

Efficiency  
Installed Fuel Meters: ..... Volume

Contract date: ..... August 2018  
Launch/float-out date: ..... January 2020  
Delivery date: ..... July 2020

# ZHONG HUA FU QIANG – Ro-pax

Shipbuilder: ..... **Shandong Huanghai Shipbuilding Co., Ltd.**  
Vessel's name: ..... **Zhong Hua Fu Qiang**  
Owner/Operator: ..... **Weihai Haida Passenger Transport Co., Ltd.**  
Country: ..... **China**  
Designer: ..... **Shanghai Merchant Ship Design & Research Institute, CSSC (SDARI)**  
Country: ..... **China**  
Model test establishment used: **Shanghai Ship & Shipping Research Institute (SSRI)**  
Flag: ..... **China**  
IMO number: ..... **9899404**  
Total number of sister ships already completed (excluding ship presented): ..... **1**  
Total number of sister ships still on order: ..... **Nil**

Delivered September 2020 after an April 2020 launch by Huanghai Shipyard, *Zhong Hua Fu Qiang* was ordered by Weihai Haida in 2018 as one of a pair. The prospective owner had been working on the design for almost a year with Chinese naval architects SDARI (Shanghai Merchant Ship Design & Research Institute).

Initially, the 37,883gt ro-pax was intended to be called *Sheng Sheng 3* in line with the owner's naming policy. However, prior to the ship being completed, Bohai Ferry Group took a major stake in Weihai Haida and the vessel was renamed.

The ship is the largest in Weihai Haida's fleet and its gross tonnage almost twice that of the 2013-built *Sheng Sheng 2*. With hull dimensions of 186.02m and a beam of 28.6m, *Zhong Hua Fu Qiang* has a decidedly European look reflecting the increasing use of Chinese yards by European ro-pax operators in recent years.

*Zhong Hua Fu Qiang* has a bow and a stern ramp on its No 3 deck, giving access to 2,580 lane metres for trucks and cars over three decks. The passenger capacity is 2,256 in total with 312 cabins. It is equipped with high-end entertainment and leisure venues such as supermarkets, cinemas, open-air restaurants, barbecue bars, chess and card rooms, and is also the fastest and largest ship operating on the Weihai to Dalian route.

The vessel has a twin propulsion system each comprising a MAN 16V32/40 medium-speed engine of 8,000kW driving a controllable pitch propeller through a Reintjes gearbox. The configuration, with separate engine rooms, allows for redundancy and return to port capability. There are three Wärtsilä 6L20 gensets to provide auxiliary power. Service speed is 19.5knots.

Safety equipment comprises four 600-person chute type MES and six 120-person lifeboats along with liferafts.

## TECHNICAL PARTICULARS

Length oa: ..... 186.02m  
Length bp: ..... 171.20m  
Breadth moulded: ..... 28.60m

Depth moulded  
to main deck: ..... 9.20m  
to upper deck: ..... 15.30m  
Width of double skin  
side: ..... 4.80m  
bottom: ..... 3.30m  
Draught  
scantling: ..... 6.55m  
design: ..... 6.35m  
Gross: ..... 37,883gt  
Displacement: ..... 22,197t  
Lightweight: ..... 13,264t  
Deadweight  
scantling: ..... 8,933t  
Design: ..... 8,070t  
Block co-efficient (please state relevant draught): ..... 0.6673(design)  
Speed, service (90%MCR output): ..... 19.5knots  
Bunkers (m³)  
Heavy oil: ..... 530  
Diesel oil: ..... 267  
Water ballast (m³): ..... 2,925  
Daily fuel consumption (tonnes/day)  
Main engine only: ..... 63

Classification society and notations: ..... CCS  
★ CSA RO/RO Passenger Ship, ICE CLASS B, AMPS, EPC2 ★ CSM MCC  
% high-tensile steel used in construction: ..... 60%  
Heel control equipment: ..... Anti-heeling tank  
Roll-stabilisation equipment: ..... Fin stabiliser

Propulsion  
Main engine(s)  
Design: ..... MAN  
Model: ..... 16V32/40  
Manufacturer: ..... MAN  
Number: ..... 2  
Type of fuel: ..... HFO, MDO  
Output of each engine: ..... 8,000kW/750rpm  
Is this a diesel-electric or hybrid?: ..... No  
Gearbox(es)  
Make: ..... Reintjes  
Model: ..... SAV1200  
Number: ..... 2  
Output speed: ..... 127.8

Propeller(s)  
Material: ..... Ni-Al-Bronze  
Designer/Manufacturer: ..... MAN  
Number: ..... 2  
Fixed/Controllable pitch: ..... Controllable  
Diameter: ..... 4,800mm  
Speed: ..... 127.8rpm

Main-engine driven alternators  
Number: ..... 2  
Make/type: ..... MAN 16V32/40  
Output/speed of each set: ..... 8,000kW/750rpm  
Diesel-driven alternators  
Number: ..... 3  
Engine make/type: ..... Wärtsilä 6L20  
Type of fuel: ..... HFO & MDO

Alternator make/type: ..... Wärtsilä /TFC6 566-6SB43  
Output/speed of each set: 1,140kW/1,000rpm  
Boilers  
Number: ..... 3  
Type: ..... Oil-fired (1 set), exh.-gas (2 sets)  
Make: ..... Qingdao Marine Boilers  
Output, each boiler: ..... 3,000kg/h, 1,600kg/h  
Bow thruster(s)  
Make: ..... Kawasaki-KWJ  
Number: ..... 2  
Output (each): ..... 1,300kW  
Other cranes  
Number: ..... 2  
Make: ..... Jiangyin Senhai Shipbuilding Machinery  
Type: ..... Electrical  
Tasks: ..... Provision crane  
Performance: ..... 2t x 5m  
Mooring equipment  
Number: ..... 5  
Make: ..... Wuhan Marine Machinery Plant  
Type: ..... Hydraulic

Special lifesaving equipment  
Number of each and capacity: ..... MES 600P x 4, lifeboat 120P x 6  
Make: ..... Jiangsu Haining Marine Equipment, Jiangyinshi Beihai LSA  
Type: ..... MES-VP16.5-660-II, JYB99C  
If MES, vertical or sloping chutes?: ..... Vertical

Vehicles  
Number of vehicle decks: ..... 3(fixed)  
Total lane length: ..... 2,580m  
Doors/ramps/lifts/moveable car decks  
Number of each: ..... 2/2/0/0  
Type: ..... Electric-Hydraulic driven  
Designer: ..... TTS Hua Hai Ships Equipment

Ballast control system  
Make: ..... Nantong Navigation Machinery Group

Complement  
Officers: ..... 16  
Crew: ..... 83  
Single/double/other rooms: ..... 10(single) / 3(double) / 9 (3P) / 14(4P)

Passengers  
Total: ..... 2,256  
Number of cabins: ..... 312

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

Radars  
Number: ..... 3  
Make: ..... JRC  
Model(s): ..... JMR-9230-S3N, JMR-9225-9XN

Fire detection system  
Make: ..... Apollo  
Type: ..... Syncro ASM

Fire extinguishing systems  
Engine room  
Make/Type: ..... Shanghai Sure-safe Fire Equipment /CO<sub>2</sub>, fixed water-based local application

Vehicle spaces  
Make/Type: ..... Zhejiang Yaning Fire Fighting Equipment /CO<sub>2</sub>, Shanghai Sure-safe Fire Equipment /Water spraying

Cabins  
Make/Type: ..... Shanghai Sure-safe Fire Equipment / Water spraying

Public spaces  
Make/Type: ..... Shanghai Sure-safe Fire Equipment / Water spraying

Waste disposal plant  
Incinerator  
Make: ..... Hansun  
Model: ..... HSINC-50  
Sewage plant  
Make: ..... Jiangsu Nanji  
Model: ..... WCMBR-400(ull)

Contract date: ..... 11 November 2018  
Launch/float-out date: ..... 10 April 2020  
Delivery date: ..... 25 September 2020