SIGNIFICANT SHIPS OF 2023

A PUBLICATION OF THE ROYAL INSTITUTION OF NAVAL ARCHITECTS www.rina.org.uk/sigships

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Published by:
The Royal Institution of Naval Architects

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Printed by:
Stephens and George, Goat Mill Road, Dowlais, Merthyr Tydfil, CF48 3TD, Wales.

Sig Ships: 978-1-911649-27-4

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SIGNIFICANT SHIPS OF 2023

Welcome to the 2023 edition of RINA's *Significant Ships*. As customary the following is a selection of some of the most significant ships over 100m in length delivered during 2023. By significant we mean ships that are the first in a series or type for a particular shipowner or builder, vessels that may be one-offs or those which differ in some important way from an earlier sister ship.

Unless a shipbuilder or owner agrees to provide the information that is contained in the technical specifications, a ship that would otherwise merit inclusion will unfortunately be omitted. Each year a number of ships slip the net in this way but that does not detract from those that are included.

Ships identified early as candidates for inclusion may sometimes be omitted as their delivery date slips into the following year. On the other hand a ship may sometimes have been delivered earlier than expected and handed over in the final days of the previous year. Rather than omit these altogether they will be included in the following year's selection, which is why a very small number of the vessels in this year's edition were delivered in 2022.

Like many industries, shipping is coming to terms with a transition away from fuels that produce CO_2. Although some would like it to be an instantaneous process, the reality is that fossil fuels will be with us for decades and for all we know forever. We saw at COP 28 that the consensus statement issued at the end of proceedings left transport out of the transition process and similarly the EU has accepted that fuels such as LNG and LPG have a role to play in the transition even though they are fossil fuels.

NGOs may not appreciate the EU's action as they see little difference between fossil fuels but from the technical point of view LNG and LPG are indeed a step in the right direction. An engine which can run on such fuels can in most cases be adapted to run on ammonia and will already have some elements of the fuel supply and storage systems in place because of the similar needs of both fuel types.

Shipowners and operators may be conservative, but they are not dinosaurs and pioneers among them have been ordering ships capable of running on several types of fuel. There are probably more dual-fuel ships of more ship types in this issue of *Significant Ships* than in any previous issue.

In this year's selection many ship types are represented. There are many container ships including *Laura Maersk* the first container ship to run on methanol, *ALS Ceres* running on oil at delivery but ammonia and methanol ready and several vessels that are scrubber fitted recognising that some owners are more pragmatic about the use of oil and the attractiveness of such ships for keeping costs low in challenging times.

There is a good selection of gas carriers, LNG/LPG bunker vessels and tankers of all types many of which are either dual-fuel or dual-fuel ready. Bulk carriers are represented by just one vessel, *Chang Hang Bei Hai* the first in a new series of 50,000dwt gearless vessels.

Two multipurpose ships are included, Cosco Shipping's *Green Kemi*, first of a new class and methanol ready, and Langh Ship's *Lovisa*, built to run on LNG but with a future use of methanol and ammonia built into the design. PCTCs are represented by NYK's *Jasmine Leader*, the first of four dual-fuel vessels. Once again there are no new oil and gas offshore ships but representing the offshore wind sector is *Green Jade*, an innovative and powerful WTIV.

Ferries both ro-ro and ro-pax are well represented. There is *Finnsirius*, the first of Finnlines' Superstar class, *P&O Pioneer*, claimed to be the world's longest double-ender, *Sunflower Kurenai*, Japan's first LNG-fuelled ro-pax, *Nerea*, built in Turkey for Siremar and the owner's first diesel-electric LNG hybrid vessel, and *Ferrymar*, a ro-ro built in China for Marflet and specially designed for inter-island trade in the Caribbean. Two cruise ships feature, Swan Hellenic's extended Vega class vessel *SH Diana* and *Explora 1*, the first vessel for newcomer luxury operator Explora.

Unusual for *Significant Ships* is the inclusion of a cable layer – *Sophie Germain*. Cable layers are a niche market, and the ships are usually converted from some other type. Building a new ship does mean a larger investment but has the advantage of a ship with a minimal environmental footprint that is fully equipped to meet growing global connectivity needs. The vessel is also a reminder that small countries such as Sri Lanka are as capable of turning out innovative and interesting ships as the big three.

Other unusual ship types are represented by *Bakkafossur* – the world's largest live fish carrier built in Turkey for operation in Norway – and *Xiang Tai Kou*, a semi-submersible heavy-lift carrier. One of the 'ships' in this year's selection is not actually a ship at all being a purpose built pontoon but is included for its innovative features. The *MPP*, as the craft is unimaginatively called, was built in Poland and will be used in the Baltic Sea for constructing the bed for a prefabricated concrete combined road and rail tunnel between Denmark and Germany and then covering the underwater structure with gravel and aggregate. The Fehmarnbelt Tunnel will be the longest combined rail and road tunnel anywhere in the world when it is completed in 2029.

Malcolm Latarche
Associate Editor, March 2024

Notes

In the tables which form part of each ship description, all dimensions, also deadweight and displacement tonnages, are metric unless otherwise stated. Machinery powers have been specified as 'bhp' or 'kW' in accordance with information received from the shipbuilder or owner. Emergency alternators are not normally included in the number of alternators. The number of sister ships completed or on order does not include the ship presented. Some ships shown as 'on order' may have been delivered by the time this publication appears.

A GALEOTTA – RO-PAX

Shipbuilder:.. **Cantiere Navale Visentini SRL**
Vessel's name:..... ***A Galeotta***
Owner/Operator:..... **Corsica Linea**
Country:..... **France**
Designer:..... **NAOS**
Country:..... **Italy**
Flag:..... **France**
IMO number:..... **9891749**
Total number of sister ships already completed (excluding ship presented):..... **Nil**
Total number of sister ships still on order: **1**

Built for Corsica Linea by Cantiere Navale Visentini to a design by NAOS, the 38,282gt ro-pax *A Galeotta* will be the first dual-fuel ferry to operate on the line between mainland France and Corsica and the largest vessel in terms of gross tonnage yet constructed at the Italian yard.

Hull dimensions of *A Galeotta* are a length of 206.6m, a beam of 28.2m and a draught of 6.7m. The vessel has 220 passenger cabins with a total of 878 berths, but it can accommodate more passengers up to 930 in pullman seating. All of the public spaces are located on Deck 5 and comprise restaurants, snack bars, a play area and amusement arcade spaces and a sundeck and bar. LED lighting in accommodation is installed to improve energy efficiency.

Vehicle access is over a straight stern ramp to two cargo holds under the main deck with separate access for parallel loading. One hold dedicated to cars and the other dedicated to trucks and two garage decks above the main deck (Deck 3 and Deck 4). In total there are 2,559lane-metres for trucks and space for 149 cars. Decks 3 and 4 also have 40 reefer plugs each for refrigerated trucks.

The twin propulsion system is mechanical rather than electric with a pair of Wärtsilä 12V50DF engines outputting 11,500kW each at 514rpm. Drive goes through two Renk reduction gearboxes to 5m diameter fully feathering controllable pitch propellers turning at 130rpm. Service is speed is 23knots. Manoeuvrability is enhanced by two 1,500kW Kongsberg bow thrusters. The propulsion setup can be configured to be able to operate on bioLNG in the future.

There are two main engine driven generators each producing 2,000kW and four auxiliary generators. Two are 1,665kW units powered by Wärtsilä 9L20DF engines that can run on LNG or MDO and two 2,000kW sets with oil burning Caterpillar 3516C engines.

TECHNICAL PARTICULARS

Length oa:..... 206.60m
Length bp:..... 200.98m
Breadth moulded:..... 28.20m
Depth moulded
to main deck:..... 9.60m
to upper deck:..... 21.80m, Deck 5
to other decks:..... 30.60m, Deck 8
Width of double skin
side:..... 5.75m (SOLAS B/5)
bottom:..... 1.85m
Draught
scantling:..... 7.00m
design:..... 6.70m
Gross (tonnage):..... 38,282t
Displacement:..... 22,322t
Lightweight:..... 14,128t
Deadweight
design:..... 8,193t
Block co-efficient:..... 0.571
Speed, service:..... 23knots
Cargo capacity (m^3)
Lanemeters:..... 2,559 +149 CARS
Bunkers (m^3)
LNG:..... 2 x 250
Diesel oil:..... 597
Water ballast (m^3):..... 4,970
Daily fuel consumption (tonnes/day)
Main engine only:..... abt. 1.6t/h each (Gas Mode at 85% MCR)
Auxiliaries:..... abt. 170kg/h each (Gas Mode at 85%)
Classification society and notations:..... RINa; Ro-Ro Passenger Ship, Unrestricted Navigation, AUT-PORT, AUT-UMS, Gas Fuelled, SRTP, IWS
% high-tensile steel used in construction:..... 75%
Heel control equipment:..... Heeling tanks, FRAMO system
Roll-stabilisation equipment:..... Fin stabilisers, SKF System

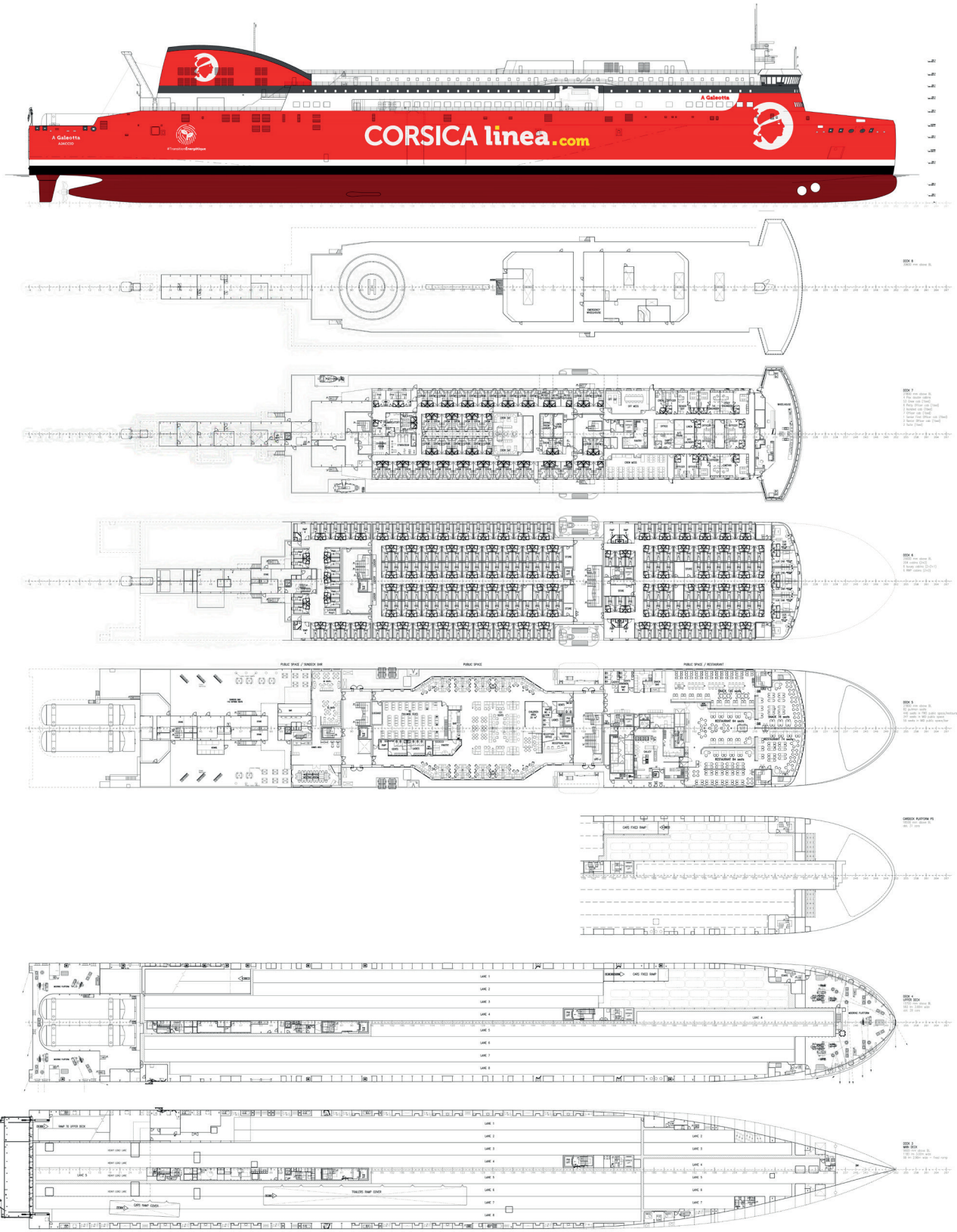
Propulsion
Main engine(s)
Design:..... Wärtsilä
Model:..... W12V50DF
Manufacturer:..... Wärtsilä
Number:..... 2
Type of fuel:..... Dual fuel (Gas/MDO)
Output of each engine:..... 11,500kWx514rpm
Is this a diesel-electric or hybrid?:..... N
Gearbox(es)
Make:..... Renk
Model:..... RSV-1120
Number:..... 2
Output speed:..... 130
Propeller(s)
Material:..... Ni-Al-Bronze
Designer/Manufacturer:..... Kongsberg
Number:..... 2
Fixed/Controllable pitch:..... Controllable
Diameter:..... 5,000mm
Speed:..... 130
Special adaptations:..... Fully feathering
Main-engine driven alternators
Number:..... 2
Make/type:..... Leroy Somer
Output/speed each set:..... 2,000kW x 1,800rpm

Diesel-driven alternators
Number:..... 4
Engine make/type:..... 2 x Caterpillar type 3516C + 2 x Wärtsilä type 9L20DF
Type of fuel:..... MDO Caterpillar – Dual fuel Wärtsilä (Gas – MDO)
Output/speed of each set:..... Caterpillar 2,000kW x 1,800rpm; Wärtsilä 1,665kW x1,200rpm
Boilers
Number:..... 1
Type:..... Alborg OS TCI
Make:..... Alfa Laval
Output, each boiler:..... Steam 2,500kg/h
Stern appendages/special rudders:.. Rudders supplier:..... Mariner
Bow thruster(s)
Make:..... Kongsberg
Number:..... 2
Output (each):..... 1,500kW
Mooring equipment
Number:..... 2 x Combined mooring winch / windlass + 5 x mooring winch
Make:..... Kongsberg
Type:..... Electric
Special lifesaving equipment
Number of each and capacity:..... 2 x partially enclosed lifeboat + 2 x MES
Make:..... Lifeboat: Palfinger; MES: Viking
Type:..... Lifeboat: MPC32 (150 person); MES: VEMC
If MES, vertical or sloping chutes?:... Mini chutes
Reefer plugs:..... 80
Vehicles
Total lane length:..... 2,259m
Total cars:..... 149 on dedicated decks
Doors/ramps/lifts/moveable car decks
Number of each:.... Stern ramp + 2 x hatch cover
Type:..... Custom
Designer:..... SP Consultores
Ballast water treatment system
Make:..... Alfa Laval (Pureballast)
Capacity:..... 500m^3/h
Complement
Officers:..... 12 in single cabins
Crew:..... 59 in single cabins
Single/double/other rooms:..... 2 x isolated cabins

Passengers
Total:..... 1,000/400 (short/long int. voyages)
Number of cabins:..... 220 (878 berths)
Navigation and other equipment
Bridge control system
Make:..... Kongsberg
Type:..... CPP CanMan touch
Is bridge fitted for one-man operation?..... Y
Integrated bridge system:..... Y
If yes, make:..... Fincantieri NexTech
Model:..custom (integrated automation system + safety management and monitoring system)
Radars
Number:..... 3 (2 x X-Band + 1 x S-Band)
Make/Model:..... Sperry / Visionmaster
Fire detection system
Make:..... Autronica
Fire extinguishing systems
All systems:..... Marioff, water mist
Waste shredder/crusher
Make:..... EVAC
Model:..... VU30 + LMU
Sewage plant
Make:..... EVAC
Model:..... ECOVAC 240 (vacuum collecting tank) + ECOSCREEN 200 (sewage screening unit) + MBR70KN (sewage treatment unit)
Efficiency
Attained EEDI value:..... 17.85
Required EEDI value:..... 23.31
Installed Fuel Meters:..... Volume
Energy Saving Technologies:..... LED lighting in accommodation areas, economisers (exhaust gas heat recovery for steam production), fully feathering pitch propellers (reduced resistance during one shaft sail)
Hull coatings:..... Siliconic paint - side shell (Jotun SeaQuest), antifouling - bottom (Jotun SeaForce)

Contract date:..... September 2019
Launch/float-out date:..... September 2021
Delivery date:..... December 2022

A GALEOTTA



ALKIVIADIS – CHEMICAL/PRODUCT TANKER

Shipbuilder: ....**Hyundai Vietnam Shipbuilding**
Vessel's name: ....***Alkiviadis***
Owner/Operator: ....**Capital Ship Management**
Country: ....**Greece**
Designer: ... **Hyundai Mipo Dockyard Co. Ltd**
Country: ....**Republic of Korea**
Flag: ....**Marshall Islands**
IMO number: **9953406**
Total number of sister ships already completed (excluding ship presented): **5**
Total number of sister ships still on order: ....**Nil**

Alkiviadis is the first in a series of six ships built by Hyundai Vietnam for Greece-based Capital Ship Management. It was delivered at the beginning of January 2023.

The ship is a 50,113dwt eco MR chemical/product tanker. It has a length of 183.06m, beam of 32.5m and a scantling draught of 13.3m. It has six pairs of cargo tanks and two slop tanks. The tanks are coated for carriage of IMO Type 2 and 3 cargoes.

The ship's significance as delivered is not immediately obvious but is has been designed for future modifications. The MAN B&W engine is a type that can be converted to dual-fuel operation and there are spaces reserved on deck for future installation of two IMO C-type tanks for LNG and an LNG fuel supply system. It would also be possible for an ammonia fuel system to be installed instead of the LNG system.

Also planned for future installation are a wind assist system and a high-voltage shore connection. The ship is the first ever tanker assigned with Wind-Assisted Ready and HVSC-Ready notations by ABS.

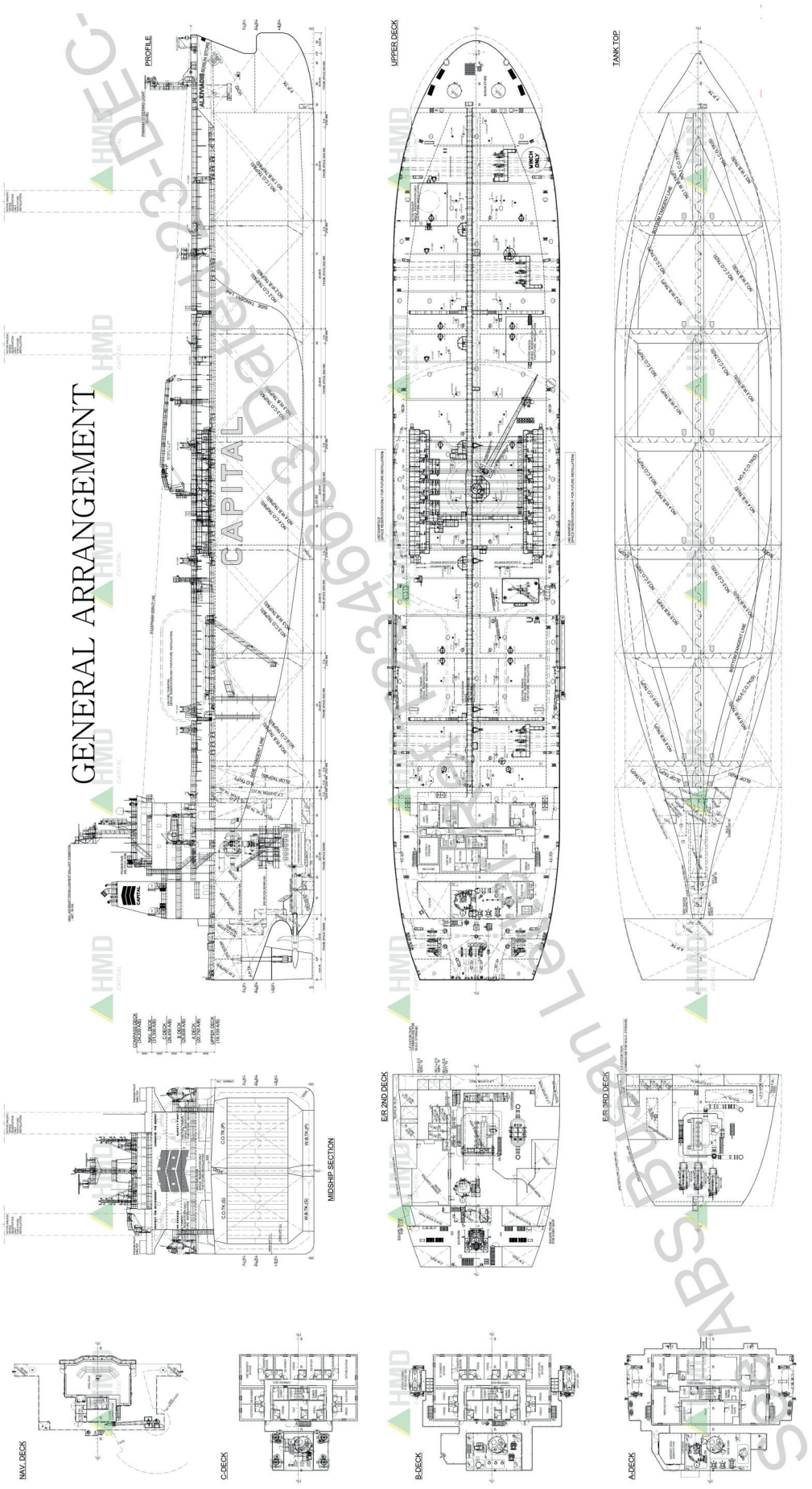
The main engine is a 6G50ME-C9.6-HPSCR unit with the HPSC suffix denoting it has high pressure selective catalytic reduction to meet IMO Tier III NOx standards. Power output is 7,080kW which allows for a service speed of 14.15knots.

TECHNICAL PARTICULARS

Length oa: 183.06m
Length bp: 175.00m
Breadth moulded: 32.20m
Depth moulded
to main deck: 19.10m
to upper deck: 19.10m
Width of double skin
side: 2.00m
bottom: 2.15m
Draught
scantling: 13.30m
design: 11.00m
Gross: 29,565t
Displacement: ....60,377t (scantling)
Lightweight: 10,264t
Deadweight
scantling: 50,113t
design: 37,939t
Block co-efficient: ....0.7842 at 13.316 (extreme draught)
Speed, service: ....14.15knots at 75% MCR (scantling draught)
Cargo capacity (m^3)
Liquid volume: 54,753
Bunkers (m^3)
Heavy oil: ....1,316.8 (LFO)
Diesel oil: ....349.0 (MGO)
Water ballast (m^3): 21,862.0
Tankers – percentage segregated ballast: 43.6%
Daily fuel consumption (tonnes/day)
Main engine only: 19.0t/day
Auxiliaries: ....3.5t/day (1 genset)
Classification society and notations: .... ABS +A1(E), Oil and Chemical Carrier, ESP, IMO Ship Type 2 and 3, +AMS, +ACCU, CSR, AB-CM, TCM, UWILD, IHM, CPS, BWT, BWE, SPMA, RRDA, CRC (SC, SP), PMA, POT, LNG FUEL READY LEVEL 1C, HVSC-READY, WIND ASSISTED READY, VEC, EGC-SCR, ENVIRO, EEDI-Ph3, SUSTAIN-1(2020), NOx-TIER III, RW
% high-tensile steel used in construction: ....60% of total steel hull weight
Roll-stabilisation equipment: ....Bilge keel

Propulsion
Main engine(s)
Design: .... MAN B&W & HHI-EMD
Model: 6G50ME-C9.6-HPSCR
Manufacturer: .... HHI-EMD
Number: 1
Type of fuel: .... LSFO & MGO
Output of each engine: 7,080kW
Is this a diesel-electric or hybrid?: .... N
Propeller(s)
Material: .... Ni-Al-Bronze
Designer/Manufacturer: .... HHI-EMD
Number: 1
Fixed/Controllable pitch: .... Fixed
Diameter: 7,000mm
Speed: 83.0rpm
Diesel-driven alternators
Number: 3
Engine make/type: Hyundai-HiMSEN/6H21/32
Type of fuel: .... LSFO & MGO
Alternator make/type: ....Hyundai-Electric HFC7 506-08P
Output/speed of each set: ... 1,065kW x 900rpm
Boilers
Number: ..1x composite boiler, 1x auxiliary boiler
Type: .... PC0201P001 & PB0301AS12
Make: .... Kangrim Heavy Industries Co., Ltd
Output, each boiler: .... 2,000 x 300 x 100 (2set)kg/hr & 20,000kg/hr
Stern appendages/special rudders: .... Full spade with rudder bulb

Deck machinery
Cargo cranes/cargo gear
Number: 1
Make: ... Oriental Precision & Engineering Co. Ltd
Type: .... HHC 420-1024 (with personal transfer system) electric-hydraulic
Performance: .... Hoisting 10m/min, slewing: 0.5rpm, hoisting height: 35m (max)
Other cranes
Number: 1
Make: .... Sangsangin Industry Co., Ltd
Type: .... 3t x 10m electric-hydraulic
Tasks: .... Provision crane
Performance: Hoisting: .... 10m/min, slewing: 0.5rpm, Luffing: 135sec
Mooring equipment
Number: .... 2 x mooring windlass & 6 x mooring winch
Make: .... Flutek Ltd
Type: .... Electric-hydraulic
Special lifesaving equipment
Number of each and capacity: 2/30P
Make: .... Jiangyinshi Beihai LSA Co., Ltd
Type: ....5.7m totally enclosed fire protected
Cargo tanks
Number: ....12 cargo + 2 slop
Grades of cargo carried: 7
Product range: .... Oil products & chemicals IMO Ship Type 2, Type 3
Coated tanks – make/type of coating: .... Jotun – Tankguard Special Ultra, phenolic epoxy 300µm
Stainless steel – structure/piping: ....Piping SUS 316L
Cargo pumps
Number: 15
Type: ....1 x SD100 & 2 x SD150 & 12 x SD200 submersible centrifugal hydraulic
Make: .... Frank Mohn Fusa Norway
Stainless steel: ....AISI 316L
Capacity (each): .... SD100 x 75m^3/h & SD150 x 300m^3/h & SD200 x 600m^3/h
Cargo control system
Make: .... Kongsberg Maritime Co., Ltd
Type: .... K-Chief 600
Ballast control system
Make: .... Kongsberg Maritime Co., Ltd
Type: .... K-Chief 600
Ballast water treatment system
Make: .... Erma First Engineering Solutions A.E.
Capacity: ....1,500m^3/h
Complement
Officers: 9
Crew: 13
Supernumaries/Spare: 2
Suez/Repair Crew: 6
Single/double/other rooms: 7/4/1
Navigation and other equipment
Bridge control system
Make: .... Dongyang Industries Electric Co., Ltd
Type: .... Console
Is bridge fitted for one-man operation? .... Y
Integrated bridge system: .... N
Radars
Number: 2
Make: .... Furuno Electric Co., Ltd
Model(s): FAR-2838S-NXT, FAR-2827
Fire detection system
Make: .... B-I Industrial
Type: BDS-4000
Fire extinguishing systems
Cargo holds: .... Deck foam fire extinguishing
Make/Type: .... Fain
Engine room: .... Fixed local fire extinguishing / CO_2 fire extinguishing
Make/Type: .... Fain
Waste disposal plant
Waste handled: .... Sludge/solid waste/garbage/sewage
Incinerator
Make: .... HMMCO Co., Ltd
Model: .... Maxi NG100SL WS
Waste compactor
Make/model: .... Metos / SX-50LA6040
Waste shredder/crusher
Make/model: .... Metos / MJ/WD-441
Sewage plant
Make: .... Il Seung
Model: .... ISB-02 Biological Aeration
Efficiency
Attained EEDI value: .... 4.04g CO_2/t nm
Required EEDI value: ....4.96g CO_2/t nm
Installed Fuel Meters: ....Coriolis mass type Endress & Hauser 8E3B25-6V93/0
Other installed monitoring tools: .... Hyundai Integrated Smart Ship Solution
Energy Saving Technologies: .... Wind-assisted ready, HVSC-ready, LED lighting, VFD for electric motors, composite boiler economizer energy control
Hull coatings: ... S.P.C. anti-fouling 140µm (2 pass)
Performance Monitoring Regime: ....Noon reporting, e-PMS
Contract date: .... 04 June 2021
Launch/float-out date: .... 04 October 2022
Delivery date: .... 03 January 2023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A-DECK
CAPITAL
HMD
SEABASED DIESEL LOW SPEED 2-STROKE ENGINE

ALS CERES – CONTAINER SHIP

Shipbuilder:.....**Dalian Shipbuilding Industry Co., Ltd**
Vessel's name: .....***ALS Ceres***
Owner/Operator:.....**AI Container I Shipping Pte. Ltd**
Country:.....**Germany**
Designer:..**Shanghai Merchant Ship Design & Research Institute**
Country:.....**China**
Model test establishment used:.....**SSSRI**
Flag:.....**Singapore**
IMO number:.....**9938303**
Total number of sister ships already completed (excluding ship presented):.....**4**
Total number of sister ships still on order:..**4**

Delivered as the first of a series of six, *ALS Ceres* is an ECO type 7,165TEU post-Panamax container vessel designed by SDARI, built by Dalian Shipbuilding and owned by Germany-based Asiatic Lloyd. Two other vessels of the same type along with two options have been ordered by Danaos.

The vertical bow hull form of the 255m loa and 42.8m beam has been optimised through a large-scale CFD calculation. Energy saving measures including rudder bulb, and highly efficient 9.2m fixed pitch propeller are also applied to further improve efficiency.

ALS Ceres is the owner's first ABS-classed vessel and has been assigned with the ABS Ammonia Fuel Ready Level 1C and Methanol Fuel Ready Level 1C Class notations, indicating that a concept-level design study has been carried out for future conversion of the MAN B&W 6G80ME-C10.5-HPSCR main engine to ammonia and/or methanol fuelling. Main engine power output at MCR is 25,600kW at 72rpm with the service speed of 20.7knots being attained at 90% MCR. The attained EEDI value is 8.64 against a required 10.74.

The vessel is not scrubber fitted so until any future conversion to methanol or ammonia takes place, the ship is required to run on VLSFO and ULSFO or MGO.

The ship's container capacity of 7,165TEU is split with 3,001 in the holds and 4,164 on deck. Boxes can be stowed nine tiers high under most of the deck and nine tiers reducing to six on deck forward and 11 tiers high on deck aft of the superstructure. There is room for 15 rows under deck and 17 above. The vessel is also fitted with 850 reefer plugs.

TECHNICAL PARTICULARS

Length oa:.....255.00m
Length bp:.....250.50m
Breadth moulded:.....42.80m
Depth moulded
to main deck:.....24.60m
Draught
scantling:.....14.00m
design:.....12.00m
Gross:.....72,896t
Deadweight
scantling:.....82,488.7t
design:.....64,185.0t
Speed, service:..... 20.7knots (90%SMCR)
Bunkers (m^3)
Heavy oil:.....4,400
Diesel oil:.....720
Water ballast (m^3):..... 27,500

Daily fuel consumption (tonnes/day)
Main engine only:.....88.2
Classification society and notations:..... ABS
Heel control equipment:..... Anti-heeling pump (Hoppe)

Propulsion
Main engine(s)
Design:..... 6G80ME-C10.5-HPSCR
Manufacturer:..... DMD
Number:.....1
Type of fuel:..... VLSFO, ULSFO, MGO
Output of each engine:.....25,600kW at MCR 72rpm
Propeller(s)
Designer/Manufacturer:.....Shanghai Marine Propeller Design Co., Ltd
Number:.....1
Fixed/Controllable pitch:.....Fixed
Diameter:..... 9.2
Diesel-driven alternators
Number:..... 4
Engine make/type:.....CMP-MAN 7L27/38
Type of fuel:..... VLSFO, ULSFO, MGO
Output/speed of each set:..... 2,200kW x 720rpm
Boilers
Number:.....1
Type:..... Composite boiler
Make:.....Kangrim
Output, each boiler:..... 3,500/2,500(oil side/gas side) kg/h
Bow thruster(s)
Make:..... Wuhan Kawasaki Marine Machinery Co. Ltd
Number:.....1
Output (each):..... 1,500kW

Deck machinery
Other cranes
Number:.....1
Make:..... Concrane
Type:.....Monorail crane
Tasks:.....Provision handling
Performance:.....10t SWL, 7m/min

Mooring equipment
Number:6 x mooring winches, 2 x combined windlass and mooring winches
Make:..... MacGregor
Type (electric/hydraulic/steam):..... Electric

Special lifesaving equipment
Number of each and capacity:..... 2 x 25P
Make:.....Qingdao Beihai
Type:..... Fully enclosed, davit launching type

Cargo/capacity
Hatch covers
Design:..... TTS-Huahai
Manufacturer:.....DSIC
Type:..... Upper deck lift-away type

Containers
Total TEU capacity:.....7,165TEU
On deck:..... 4,164TEU
In holds:..... 3,001TEU

Homogeneously loaded to 14tonnes:..... 5,141TEU
Reefer plugs:.....850

Tiers/rows (maximum)
On deck:.....11/17
In holds:.....9/15
Cargo tanks
Number:.....7

Ballast control system
Make:.....Headway
Type:..... HMT-800
Ballast water treatment system
Make:.....Headway
Capacity:..... 1,040m^3/h(PSU≥1), 800m^3/h(PSU<1)

Complement
Officers:..... 10
Crew:..... 15
Suez/Repair Crew:..... 6
Single/double/other rooms:..... 25 x single + 1 Suez
Navigation and other equipment
Bridge control system
Make:..... JRC
Is bridge fitted for one-man operation?.....N
Integrated bridge system:.....N
Radars
Number:..... 2
Make:..... JRC
Model(s):.....NKE-1130 / NKE-1125-9

Fire extinguishing systems
Cargo holds:..... Mobile water monitor & water mist lance;
Make/Type:.....Firetec (water monitor) Fain (CO_2)
Engine room:..... Local water mist CO_2 fire extinguishing sys.
Make/Type:.....Seaplus (water mist) Fain (CO_2)
Sewage plant
Make:..... TAIKO
Model:.....SBH-25

Efficiency
Attained EEDI value:..... 8.64
Required EEDI value:.....10.74
Energy Saving Technologies:.....Rudder with twisted leading edge and rudder bulb

Contract date:..... May 2021
Delivery date:.....May 2023

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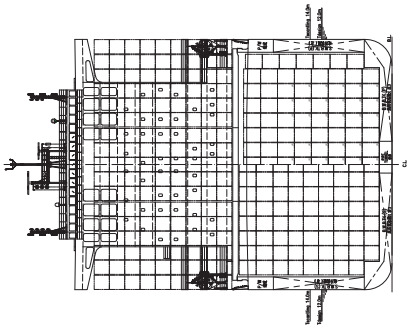
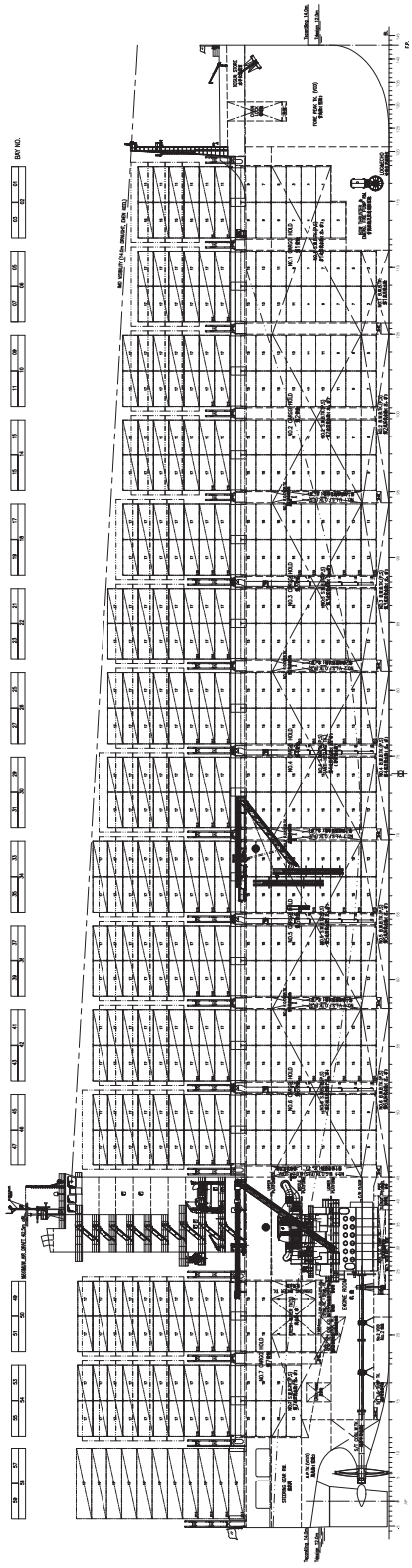
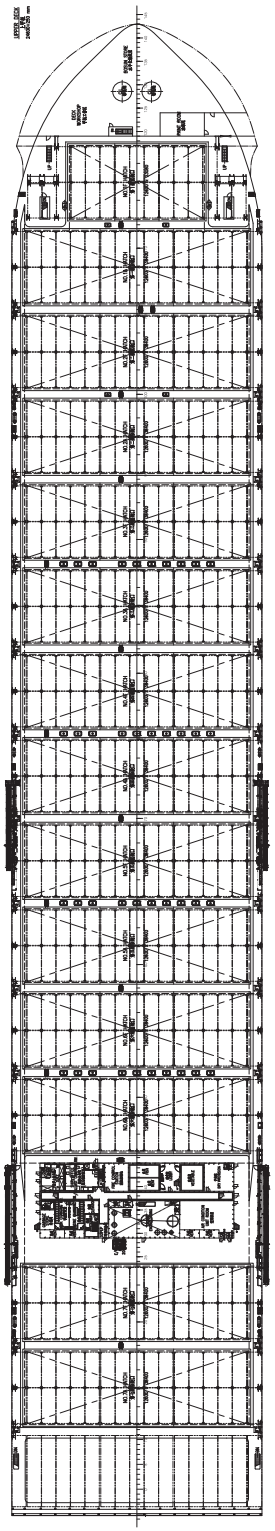
ALS CERES







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ANTONIS I. ANGELICOUSSIS – VLCC

Shipbuilder: **Samsung Heavy Industries Co., Ltd**
Vessel's name: ***Antonis I. Angelicoussis***
Owner/Operator: **Maran Tankers Management Inc**
Country: **Greece**
Designer: **Samsung Heavy Industries Co., Ltd**
Country: **Republic of Korea**
Model test establishment used: **Samsung Ship Model Basin**
Flag: **Greece**
IMO number: **9930777**
Total number of sister ships already completed (excluding ship presented): **3**
Total number of sister ships still on order: **Nil**

Named after the founder of the Angelicoussis Shipping Group, the dual-fuel VLCC *Antonis I. Angelicoussis* was delivered to group subsidiary Maran Tankers by Samsung Heavy Industries in January 2023.

The ship is the first dual-fuel VLCC in the owner's fleet. The second vessel in the four-ship series, *Maria A. Angelicoussis* named after Antonis's wife was delivered a month later. The third and fourth vessels, *Maran Danae* and *Maran Dione* were delivered in April and July 2023 respectively.

Notching up another significant first, *Antonis I. Angelicoussis* was the first dual-fuelled VLCC to receive Green Award certification. The environmental programme has been strongly supported by the Angelicoussis Group which has been participating in it for over 27 years. The certification includes the Green Award greenhouse gas labels CO_2 (level 1) and CH4. As well as demonstrating an owner's commitment to environmental matters, there is a financial benefit as tankers can receive discounts on charges in a number of ports.

The vessels' dimensions are an overall length of 329.9m, a beam of 60m and draught of 23m. Deadweight is 320,900tonnes. Their dual-fuel capability is made obvious by the two-deck mounted IMO Type C LNG fuel tanks forward of the superstructure and the fuel gas supply system housed between them.

Cargo is carried in five sets of port, centre and starboard tanks and two slop tanks. Pumping is by the ubiquitous vertical, centrifugal Shinko suction pumps found on most VLCCs. In this case there are three with a pumping rate of 5,500m^3 per hour each.

Propulsion is provided by a seven-cylinder MAN B&W G80ME-GI engine with an output of 22,500kW at 64.2rpm. A directly linked fixed-pitch propeller gives a speed of 15.6knots. Auxiliary power comes from three HiMSEN gensets each rated at 1,450kW and a main engine shaft generator rated at 1,536kW.

Samsung has fitted a number of in-house ESDs including a SAVER Fin, SAVER Stator, and a SARB (Samsung Advanced Rudder Bulb).

TECHNICAL PARTICULARS

Length oa: 329.90m
Length bp: 323.40m
Breadth moulded: 60.00m
Depth moulded
to main deck: 30.70m
to upper deck: 30.70m
Draught
scantling: 23.00m
design: 21.00m
Gross: 165,000t
Deadweight
scantling: 320,900t
design: 285,300t
Speed, service (90.0% MCR output): 15.6knots
Cargo capacity (m^3)
Liquid volume: 353,500
Bunkers (m^3)
Heavy oil: 4,000
Diesel oil: 1,000
Water ballast (m^3): 97,000
Tankers – percentage segregated ballast: 100%

Classification society and notations: ABS +A1(E), Oil Carrier, CSR, ESP, CPS, AB-CM, +AMS, +ACCU, ENVIRO, POT, VEC-L, BWT, UWILD, TCM, IHM, CRC(SP, SC-PL), GFS(DFD), BWE, SPMA, RW, RES, CPP, PMP, ESA
% high-tensile steel used in construction: 80% approx.

Propulsion
Main engine(s)
Design: MAN ES
Model: MAN B&W 7G80ME-GI
Manufacturer: HSD Engine320,900
Number: 1
Type of fuel: LNG / VLSFO / MGO
Output of each engine: 22,500kW x 64.2rpm MCR
Is this a diesel-electric or hybrid?: N
Propeller(s)
Material: Ni-Al-Bronze
Designer/Manufacturer: Samsung / MMG
Number: 1
Fixed/Controllable pitch: Fixed
Speed: 64.2rpm
Main-engine driven alternators
Number: 1
Make/type: ABB/PM
Output/speed of each set: 1,536kW
Diesel-driven alternators
Number: 3
Engine make/type: HHI-EMD / 7H21/32 & 8H22CDF
Type of fuel: LNG or VLSFO or MGO
Alternator make/type: HE/Synchronous
Output/speed of each set: 1.45MW x 900rpm
Boilers
Number: 2 x aux. boilers, 1 x composite boiler
Type: Dual fuel for aux. boiler, conventional for composite boiler
Make: Alfa Laval
Output, each boiler: 2 x 40t/h for aux. boiler, 1 x 2t/h + 1 x 2t/h for composite boiler
Stern appendages/special rudders: 1 set of full spade rudder with bulb

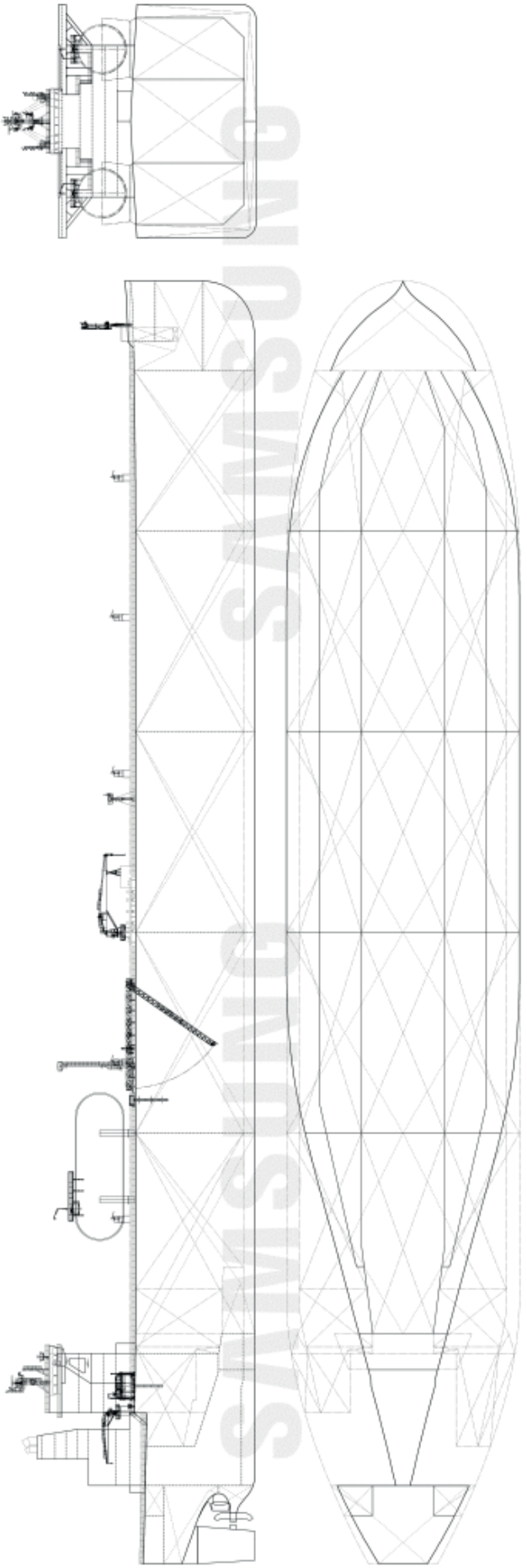
Deck machinery
Cargo cranes/cargo gear
Number: 2
Make: SSII
Type: High-pressure, self-contained electric-hybrid single jib
Performance: 20t SWL
Other cranes
Number: 2
Make: SSII
Type: High-pressure, self-contained electric-hybrid single jib
Tasks: Provision and equipment handling
Performance: 1 x 10t SWL, 1 x 3t SWL
Mooring equipment
Number: 12
Make: Flutek
Type: Hydraulic
Cargo tanks
Number: 17 tanks including slop tanks
Grades of cargo carried: Crude oil
Coated tanks: Jotun and Epoxy system of 2coats 320mic.(PSPC)
Cargo pumps
Number: 3
Type: Vertical, single stage, centrifugal, double suction
Make: Shinko
Stainless steel: Nil
Capacity (each): 5,500m^3/h
Cargo control system
Make: Shinko
Type: Steam turbine
Ballast control system
Make: Shinko
Type: Vertical, single stage, centrifugal
Ballast water treatment system
Make: Techcross
Capacity: 3,000m^3/h x 2 sets
Complement
Officers: 14
Crew: 20
Suez/Repair Crew: 6
Single/double/other rooms: Single

Navigation and other equipment
Bridge control system
Make: HME
Is bridge fitted for one-man operation? N
Integrated bridge system: N
Radars
Number: 2
Make: JRC
Model(s): X-Band (JMR-9296-6X), S-Band (JMR-9298-S)
Fire detection system
Make: Consilium
Fire extinguishing systems
Engine room: High expansion foam fire extinguishing system
Make/Type: NK
Cabins: Sea water fire extinguishing system and/or portable fire extinguishers
Make/Type: NK
Public spaces: Sea water fire extinguishing system and/or portable fire extinguishers
Make/Type: NK

Efficiency
Attained EEDI value: Phase 3 satisfied
Other installed monitoring tools: Torque meter, ballast and draught monitoring system, vision guidance system (cameras)
Energy Saving Technologies: SAVER Fin, SAVER Stator, SARB (Samsung Advanced Rudder Bulb)
Hull coatings: Silyl acrylate tin free self-polishing coating
Performance Monitoring Regime: Ship performance monitoring system (shaft rpm, torque measurement, fuel flow measurement)

Contract date: 17 February 2021
Delivery date: 03 January 2023

ANTONIS I. ANGELICOUSSIS



AXIS RIVER – GAS CARRIER

Shipbuilder:..... **Kawasaki Heavy Industries, Ltd. Sakaide Shipyard**
Vessel's name:..... ***Axis River***
Owner/Operator:..... **Axis River Shipping S.A**
Country:..... **Panama**
Designer:.... **Kawasaki Heavy Industries, Ltd**
Country:..... **Japan**
Flag:..... **Panama**
IMO number:..... **9949704**
Total number of sister ships already completed (excluding ship presented):..... **Nil**
Total number of sister ships still on order: **Nil**

An evolution of a successful series design of 84,000 LPG carrier, *Axis River* was delivered by builder Kawasaki Heavy Industries to K Line in June 2023 as the first of the builder's new LPG-fuelled LPG/ammonia carriers. Further orders for the type have since been placed by other owners.

Within the same hull dimensions of 229.9m length, 37.20m beam, depth of 21.9m and draught of 11.65m, cargo capacity has been increased to 86,919m^3 and the four cargo tanks allowing for loading of LPG or ammonia.

The ship can carry both LPG and ammonia simultaneously, a feature that could add to its employment opportunities if ammonia takes off as a marine fuel. Cargo is handled using eight (two per tank) Svanehøj centrifugal deep-well pumps with a capacity of 600m^3/h each.

There is potential for the ship's engine to be modified to run on ammonia in future. *Axis River* is the eighth of the Kawasaki run of LPG carriers to be equipped with a dual-fuel MAN B&W LGIP so can use LPG from the cargo as fuel rather than oil and significantly reduce CO_2 emissions by doing so. There is 2,700tonnes of bunker capacity for oil fuels.

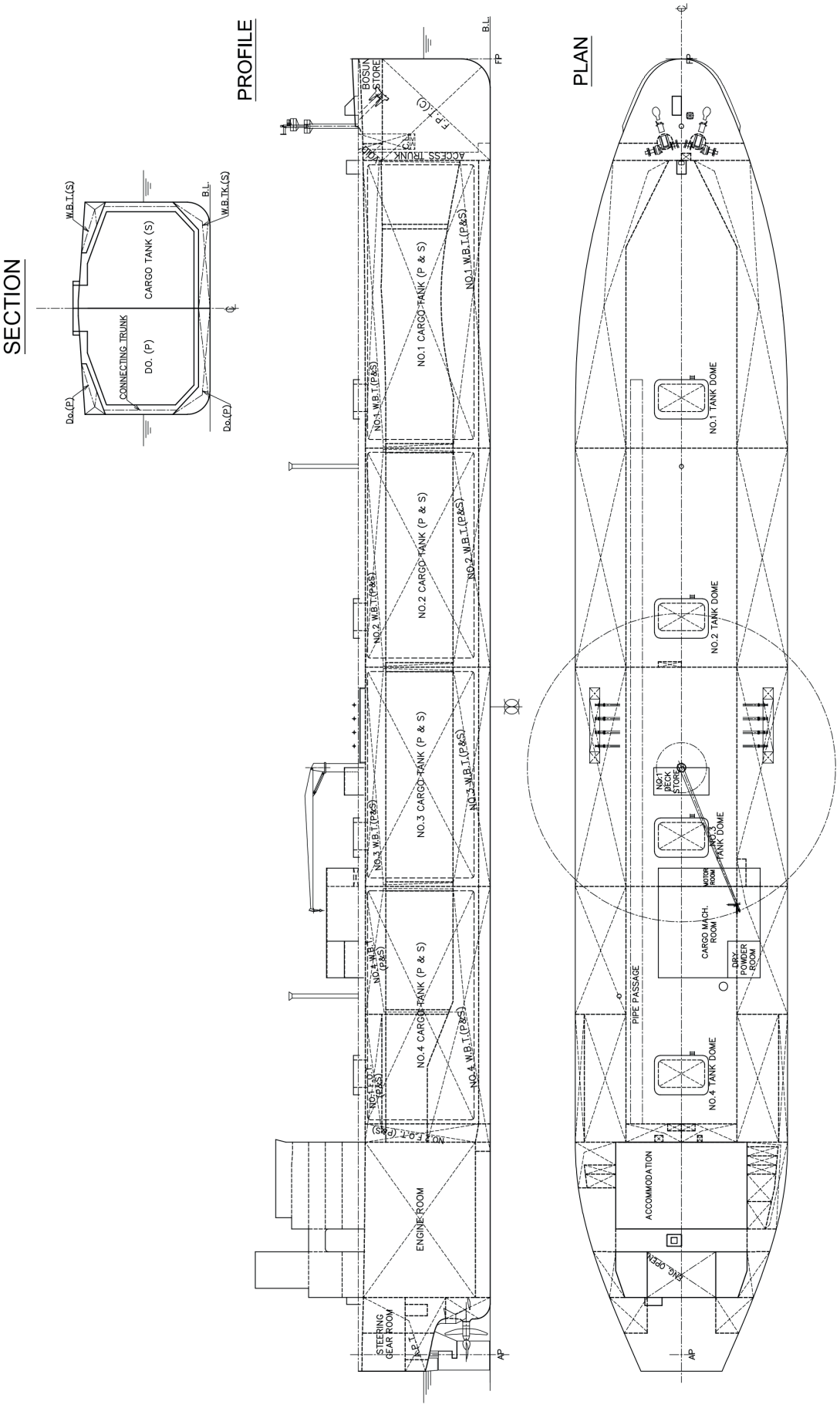
Axis River's main engine is a derated 6G60ME-C10.5-LGIP producing 12,150kW at 84rpm. SOx regulations are met by running on LPG fuel or MGO/VLSFO if preferred. The ship can seamlessly switch between different fuel types. NOx rule compliance is achieved by way of EGR and high-pressure SCR. The engine is directly linked to a fixed pitch propeller to give a service speed of 17knots.

Axis River has a Phase 3 EEDI rating of 4.72 against a required rating of 6.10. Efficiency has been aided by the use of the builder's in-house ESD technologies including a Kawasaki RBS-F (rudder bulb system with fins) and SDS-F (semi-duct system with contra-fins), and energy-saving fins around the propeller.

TECHNICAL PARTICULARS

Length oa:..... 229.90m
Breadth moulded:..... 37.20m
Depth moulded
to main deck:..... 21.90m
to upper deck:..... 21.90m
Width of double skin bottom:..... 2.01m
Draught
scantling:..... 11.65m
design:..... 11.20m
Gross:..... 49,542t
Deadweight
scantling:..... 56,503t (summer)
design:..... 53,206t
Speed, service:.... about 16.8knots at 85% MCR output with 20% S.M
Cargo capacity (m^3)
Liquid volume:..... 86,919 (100% full at 20°C, including dome)
Water ballast (m^3):..... about 22,700
Tankers – percentage segregated ballast:.... 100%
Classification society and notations:..... NK, NS*(LGC 2G, PSPC-WBT, NC, AM FR(C, S, T, B), 1C)(PSCM)(IHM)(EEDI-p3)(NOx-III(SCR, EGR))(SOx(LFF))(GF/DF)MNS*
% aluminium used in hull/superstructure:..... Nil
Propulsion
Main engine(s)
Design:.... Dual-fuel LPG marine diesel engine
Model:... Kawasaki-MAN B&W 6G60ME-C10.5 LGIP
Manufacturer:.... Kawasaki Heavy Industries, Ltd
Number:..... 1
Type of fuel:..... LSHFO, MDO, MGO, LPG
Output of each engine:..... 12,150kW at MCO 84rpm
Is this a diesel-electric or hybrid?:..... N
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:.... Yanmar Power Technology Co., Ltd
Type of fuel:..... LSHFO, MDO, MGO
Alternator make/type:.. Taiyo Electric Co., Ltd/FE 653B-8
Output/speed of each set:.. 1,300kW x 900rpm
Boilers
Number:..... 1
Type:..... Oil-fired and exhaust gas heating marine composite type
Make:..... Osaka Boiler MFG. Co. Ltd
Output, each boiler:..... Oil-fired section: 1,600kg/h, exhaust gas section: 1,100kg/h
Deck machinery
Cargo cranes/cargo gear
Number:..... 1 x hose handling crane
Make:.. Oriental Precision & Engineering Co., Ltd
Type:..... Electro-hydraulic
Performance:..... 5t(49kN)
Other cranes
Number:..... 2 x engine parts and provisions handling crane
Make:..... Oriental Precision & Engineering Co., Ltd
Type:..... Electric
Performance:..... Port side 4t(39.2kN), Starboard side 1.5t(14.7kN)
Mooring equipment
Number:..... 2 x windlass/mooring winch, 6 x mooring winch
Make:..... Kawasaki Heavy Industries, Ltd
Type:..... Electro-hydraulic
Special lifesaving equipment
Number of each and capacity:.... 2 x 35-person
Make:..... Mansei Inc
Type:..... Fire protected type, totally enclosed type
Cargo tanks
Number:..... 4
Grades of cargo carried:..... LPG, NH3
Product range:... Propane, butane, propylene, ammonia
Cargo pumps
Number:..... 8
Type:..... Centrifugal deep-well
Make:..... Svanehøj Danmark A/S
Capacity (each):..... 600m^3/h
Cargo control system
Make:..... JRCS Co., Ltd
Type:..... Integrated into data logger
Ballast control system
Make:..... JRCS Co., Ltd
Type:..... Integrated into data logger
Ballast water treatment system
Make:..... Techcross
Capacity:..... 2,000m^3/h
Complement
Officers:..... 10
Crew:..... 15
Supernumaries/Spare:..... 10
Navigation and other equipment
Bridge control system
Make:..... Nabtesco Corporation
Type:..... M-800-V
Is bridge fitted for one-man operation?:..... Y
Integrated bridge system:..... N
Radars
Number:..... 2
Make:..... Japan Radio Co., Ltd
Model(s):..... JMR-9225-9X3 JMR-9272-S
Fire detection system
Make:..... Consilium Nittan Marine Ltd
Type:..... Salwico CCP
Fire extinguishing systems
Engine room
Make/Type:..... Johnson Controls International Korea, Inc. / fixed local application fire extinguishing system, high expansion foam system
Cabins
Make/Type:..... Shinko, Ltd / fire & wash deck system / Yamato Protec / portable fire extinguishers
Waste disposal plant
Incinerator
Make:..... Sunflame Co., Ltd
Model:..... OSV-600SAI
Sewage plant
Make:..... Sasakura Engineering Co., Ltd
Model:..... SD-4R
Efficiency
Attained EEDI value:..... 4.72
Required EEDI value:..... 6.10
Installed Fuel Meters:..... Volume type flow meter(FO) / mass type flow meter(FO, LPG)
Energy Saving Technologies:..... Semi-duct system with contra fins, rudder bulb system with fins, energy-saving fins
Hull coatings:..... Antifouling paint
Contract date:..... 30 July 2021
Launch/float-out date:..... 13 January 2023
Delivery date:..... 30 June 2023

AXIS RIVER


SECTION
W.B.T.(S)
B.L.
W.B.TK.(S)
CARGO TANK (S)
CONNECTING TRUNK
DO. (P)
Do.(P)
Do.(P)
PROFILE
B.L.
FP
BOSUN STORE
F.P.T.(C)
ACCESS TRUNK
NO.1 W.B.T.(P&S)
NO.1 CARGO TANK (P & S)
NO.1 W.B.T.(P&S)
NO.2 W.B.T.(P&S)
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NO.4 W.B.T.(P&S)
NO.4 CARGO TANK (P & S)
NO.4 W.B.T.(P&S)
NO.4 W.B.T.(P&S)
ENGINE ROOM
STEERING GEAR ROOM
A.P.T.
AP
PLAN
FP
NO.1 TANK DOME
NO.2 TANK DOME
NO.1 DECK STORE
NO.3 TANK DOME
MOTOR ROOM
CARGO MACH. ROOM
DRY POWDER ROOM
PIPE PASSAGE
NO.4 TANK DOME
ACCOMMODATION
AP

BAKKAFOSUR – WELLBOAT

Shipbuilder: **Sefine Shipyard**
Vessel's name: ***Bakkafossur***
Owner/Operator: **Bakkafrost**
Country: **Faroe Island**
Designer: **Knud E. Hansen A/S**
Country: **Denmark**
Flag: **Faroe Island**
IMO number: **9911915**
Total number of sister ships already completed (excluding ship presented): **Nil**
Total number of sister ships still on order: **Nil**

A highly interesting specialist vessel with several unorthodox features, the hybrid-power DP2 wellboat *Bakkafossur* was delivered to Faroese owner Bakkafrost by Turkish builder Sefine Shipyard in January 2023.

Designed by Knud E. Hansen, the ship is 109m in length, 22.2m wide and with a draught of 8.2m and one of the largest live fish carriers in operation. The external appearance is similar to many wellboats or live fish carriers having wheelhouse and accommodation forward, a covered focsle and machinery and other superstructure aft.

Bakkafossur has four cargo tanks in the fish hold with a combined capacity of 7,000m^3 allowing the vessel to transport 1,000tonnes of live fish from offshore farms to processing facilities ashore.

The holds can also be used at the farms for treatment for lice in fresh water and for gill rinsing which is claimed to promote fish health.

Capacity for production of fresh water through reverse osmosis is 6,000tonnes per day with storage tanks for 3,000m^3. MMC First Process supplied the handling, sorting, and treatment systems, which also include two 600mm lines for loading live fish into the wells.

The ship has a diesel-electric propulsion system vessel incorporating a 1,056kWh battery pack supplied by Corvus Energy. A shore power connection allows for low-noise operation at the berth.

Power is supplied by five MGO-burning Cummins QSK50-DM gensets each producing 1,628kW. Unusually for any vessel these are housed in the aft shelter deck. This has been done to allow for a future quick and easy change of engine and/or fuel type as and when carbon free fuels become readily available.

On top of the machinery deck house there is place for 16 x 20ft containers which gives space for future green fuel. The batteries will be recharged by way of peak shaving with power being readily available for propulsion or dynamic position as required.

The propulsion motors for the single main 4.0m diameter controllable pitch propeller are located on the tank top. Manoeuvrability is conferred by a pair of Brunvoll FU74 tunnel thrusters located forward and another pair aft. The output of each thruster is 1,000kW.

With a dynamic positioning system and far-reaching deck cranes the ship is made ready for operating towards future cages on the open sea.

TECHNICAL PARTICULARS

Length oa: 109.00m
Length bp: 104.30m
Breadth moulded: 22.20m
Depth moulded: 11.20m
Draught: 8.20m

Gross: 5,000t
Deadweight: 4,800t
Speed, service: 13.5knots

Cargo capacity (m^3): 7,000 gross, 6,600 net
Bunkers (m^3)
Diesel oil: 400

Classification society and notations: DNV ✠1A BIS Battery(Safety) Clean(Design) E0 NAUT(OC) Recyclable TMON(oil lubricated) ER(SCR)

Propulsion
Main engine(s)
Model: QSK50 – DM Prime Mover
Manufacturer: Cummins
Number: 5
Type of fuel: Diesel – MGO
Output of each engine: 1,628kWm
Is this a diesel-electric or hybrid?: Y

Propeller(s)
Material: Cu-Ni-Al
Designer/Manufacturer: Brunvoll
Number: 1
Fixed/Controllable pitch: Controllable
Diameter: 4m
Speed: Low speed (0-135)

Special adaptations: Variable frequency driver, electric motor

Diesel-driven alternators
Number: 5
Engine make/type: Cummins - QSK50 – DM Prime Mover
Type of fuel: MGO
Alternator make/type: AVK Type DSG 74 L2/4W (IP44)
Output/speed of each set: 1,400kWe x 1,800rpm

Exhaust-gas scrubbing equipment
Manufacturer: Cummins
On main engines?: Yes
On auxiliary engines?: No

Boilers
Number: 1
Type: Electric heater
Make: Ulmatech Pyro
Output, each boiler: 300kW

Bow thruster(s)
Make: Brunvoll FU74
Number: 2
Output (each): 955kW

Stern thruster(s)
Make: Brunvoll FU74
Number: 2
Output (each): 955kW

Deck machinery
Cargo cranes/cargo gear
Number: 4
Make: Redrock
Type: Knuckle – jib shipboard crane (RCK 250, 8-15 / 3-25)

Other cranes
Number: 1
Make: Redrock
Type: Knuckle – jib shipboard crane (RCK 80, 1-15)
Tasks: Handling of provision

Mooring equipment
Number: 4
Make: THR Marine
Type: Electric

Special lifesaving equipment
Number of each and capacity: 24 persons
Make: Viking Norsafe
Type: Free-fall lifeboat GES 21

Hold refrigeration system: Heinen Hopman

Cargo tanks: MMC live fish tanks
Number: 4
Product range: Live fish
Cargo pumps
Number: 4
Type: Vertical inline centrifigal pump
Make: Desmi
Capacity (each): 400m^3/h

Complement
Crew: 12
Single/double/other rooms: 12 single cabins

Passengers
Total: 12

Navigation and other equipment
Bridge control system
Make: Furuno

Is bridge fitted for one-man operation?: Y
Integrated bridge system: Y
If yes, make: Can Makina

Radars
Number: 2
Make: Furuno
Model(s): X-Band, S-Band

Fire detection system
Make: Marsis
Type: 811F MX

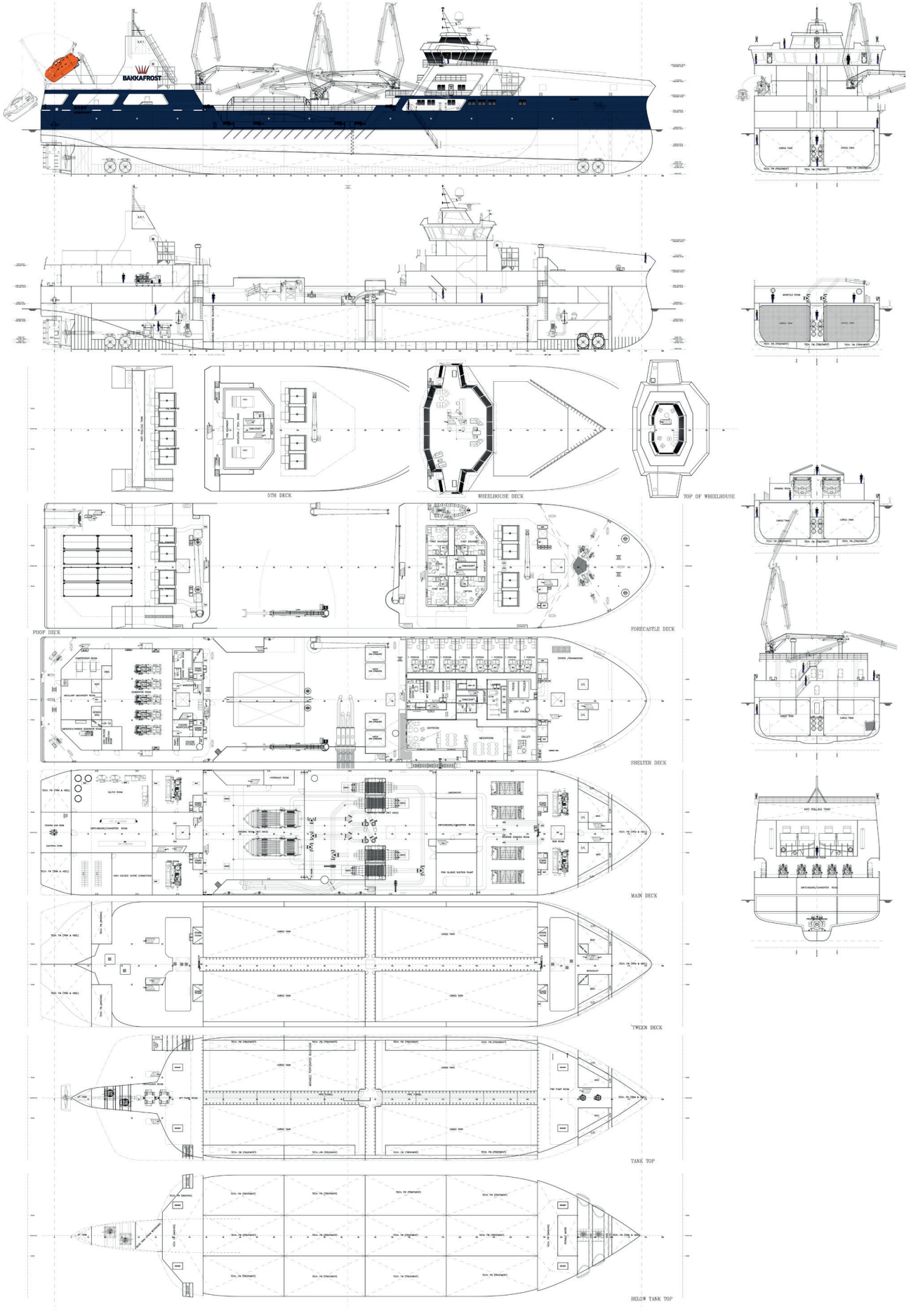
Fire extinguishing systems
Cargo holds
Make/Type: Marsis – water mist
Engine room
Make/Type: Marsis – water mist
Cabins
Make/Type: Marsis – water mist
Public spaces
Make/Type: Marsis – water mist

Sewage plant
Make: Jets
Model: Ecomotive 1.11

Efficiency
Hull coatings: Cathodic protection

Contract date: May 2020
Delivery date: January 2023

BAKKAFOSUR


BAKKAFROST
5TH DECK
WHEELHOUSE DECK
TOP OF WHEELHOUSE
POOP DECK
FORECASTLE DECK
SHELTER DECK
MAIN DECK
TWEEN DECK
TANK TOP
BELOW TANK TOP

BERLIN EXPRESS – CONTAINER SHIP

Shipbuilder: **Hanwha Ocean Co., Ltd**
Vessel's name: ***Berlin Express***
Owner/Operator: **Hapag-Lloyd AG**
Country: **Germany**
Designer: **Hanwha Ocean Co., Ltd**
Country: **Republic of Korea**
Flag: **Germany**
IMO number: **9540118**
Total number of sister ships already completed (excluding ship presented): **2**
Total number of sister ships still on order: **9**

Berlin Express with a length of 300.9m is Hapag-Lloyd's first dual-fuel LNG ultra large container ship and the first ship of Hapag-Lloyd's 23,660TEU Hamburg Express class which will comprise of 12 ships when deliveries are completed in 2025. The ship is also significant as being the largest cargo ship ever to sail under the German flag. The vessel was built and designed by Hanwha Ocean (formerly DSME) and was delivered in June 2023.

The ship's nominal cargo capacity of 23,664TEU is a significant step up from the previous largest vessels in the company's fleet the A-class series of six 19,870TEU ships acquired from UASC in the merger of 2017.

Berlin Express's maximum cargo is split 14,144TEU on deck and 9,520TEU under deck. There are 1,500 reefer plugs all on deck. Typical of the ULCS type, the accommodation and bridge superstructure is moved forward and sited between No. 3 and No. 4 cargo holds. The two Type B LNG cargo tanks are located under the superstructure with the fuel gas supply room sited above the tanks at main deck level. A total of 18,900m^3 of LNG can be carried.

The machinery spaces housing the main engine is located between Holds 9 and 10. The main engine is a derated, 11-cylinder MAN B&W G95ME-C10.5-GI unit that has a power output of 58,270kW at 76.5rpm. The propeller is a 10.3m diameter MMG fixed-pitch type that allows a service speed of 22knots at design draught at 90% MCR.

In addition to being the largest German Flag cargo ship it is also the world's first vessel to utilise high-manganese steel, following the approval of the German flag in accordance with the IMO interim guideline for "the application of high manganese austenitic steel for cryogenic service".

Initially intended for running on LNG, the owner has a strategy to become net zero by 2045 and in future the vessel could well be running on bio-methane and e-methane. When running on LNG, the ship's attained EEDI rating of 5.18 is less than half the permitted 11.66.

TECHNICAL PARTICULARS

Length oa: approx. 399.90m
Length bp: 383.30m
Breadth moulded: 61.00m
Depth moulded
to upper deck: 33.20m
to other decks: 25.878m (Aft mooring deck (L62 STR.))
Width of double skin
side: 2.45m
bottom: 2.55m
Draught
scantling: 16.50m
design: 14.50m

Gross: 229,376t
Displacement: 296,191.9t
Lightweight: 66,844.0t
Deadweight
scantling: 229,347.9t
design: 187,231.0t
Block co-efficient: 0.747 at scantling draught
Speed, service (90%MCR output): 22knots at designed draught
Bunkers (m^3)
Heavy oil: 5,327.5
LNG fuel: 18,925.4
Diesel oil: 1,134.3
Water ballast (m^3): 69,262.4
Container ships – water ballast in loaded condition (tonnes): 511.0m^3 at homogeneously loaded to 14tonnes

Classification society and notations: DNV / +1A Container ship, BIS, BWM(T), Clean, COAT-PSPC(B), Cyber secure, DG(P), E0, ECO, ER(SCR, TIER III), FCS(C, FF), Gas fuelled LNG, LCS, NAUT(OC), Recyclable, RSCS+, RSD, SAFELASH, Shore power, TMON(oil lubricated)

Propulsion
Main engine(s)
Model: MAN B&W 11G95ME-C10.5-GI Derated
Manufacturer: HD Hyundai Heavy Industries (HHI)
Number: 1
Type of fuel: VLSFO, LSMGO and FG
Output of each engine: 58,270kW x 76.5rpm
Is this a diesel-electric or hybrid?: N

Propeller(s)
Designer/Manufacturer: Mecklenburger Metallguss GmbH (MMG)
Number: 1
Fixed/Controllable pitch: Fixed
Diameter: 10.3m
Speed: 58,270kW at propeller speed of 76.5rpm (MCR)

Diesel-driven alternators
Alternator make/type: HD Electric / HSJ9 913-10P, HSJ9 805-10P
Output/speed of each set: 5,200kVA, 3,866.7kVA / 720rpm, 720rpm

Exhaust-gas scrubbing equipment
Manufacturer: HD Hyundai Heavy Industries (HHI) / Daihatsu
Type: LP SCR / SCR
On main engines?: No
On auxiliary engines?: No

Boilers
Number: 1
Type: Water tube
Make: Kangrim
Output, each boiler: 8,500kg/h (oil-fired)
Bow thruster(s)
Make: Kawasaki
Number: 2
Output (each): 3,000kW x 900min-1

Deck machinery
Other cranes
Number: 2 / 1
Make: Oriental
Type: HPC 070-0410 / SMC-125
Tasks: Provision cranes / engine spare part cranes
Performance: SWL 4t 2.8-10m (P) / SWL 12.5/3t
Mooring equipment
Number: 16
Make: MacGregor
Type: Electric

Special lifesaving equipment
Number of each and capacity: 2 (36 persons each)
Make: Viking
Type: JYN-65 MKI
Cargo/capacity
Hatch covers
Design: MacGregor
Manufacturer: Hanwha Ocean Echotek
Type (upper deck/other decks): Lift-away type weather deck
Containers
Total TEU capacity: 23,664TEU
On deck: 14,144TEU
In holds: 9,520TEU
Homogeneously loaded to 14tonnes: 15,384TEU
Reefer plugs: 1,500 gangs
Tiers/rows (maximum)
On deck: 15 tiers / 24 rows, 1,500 gangs
In holds: 12 tiers / 22 rows, N/A

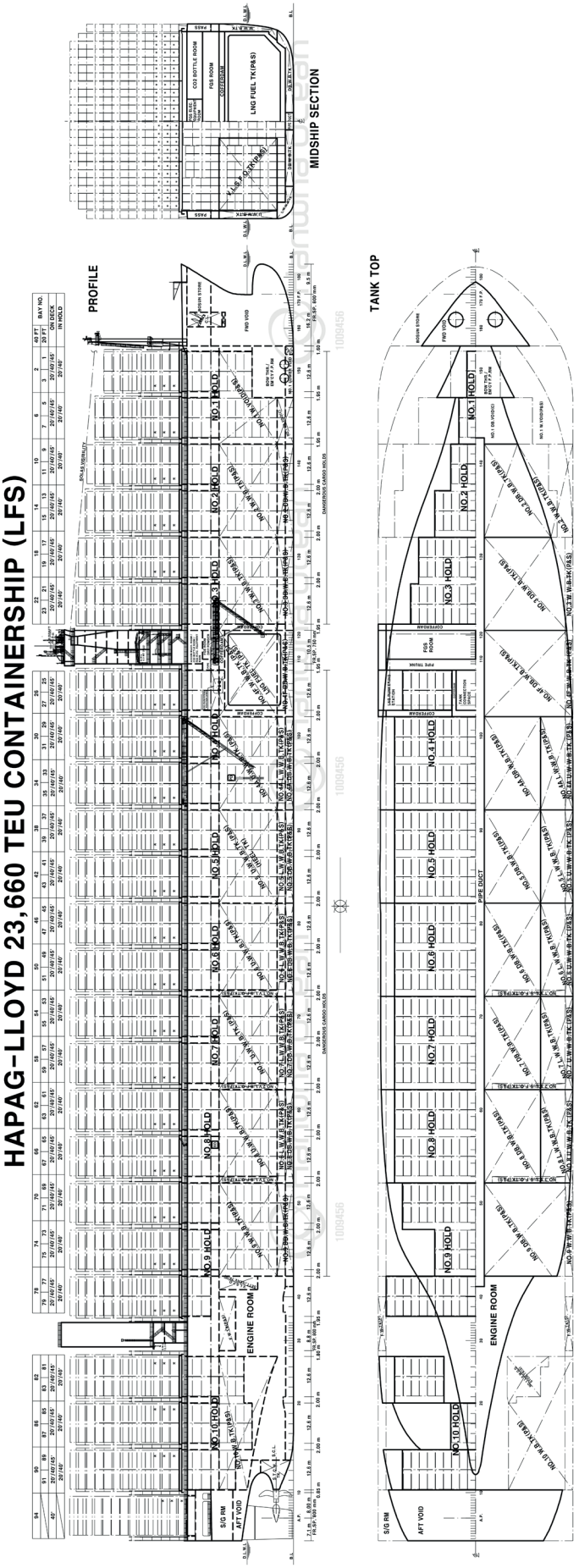
Ballast control system
Make: Alfa Laval
Capacity: 1,000m^3/h
Complement
Officers: 18
Crew: 14
Suez/Repair Crew: 6
Single/double/other rooms: Single: 29 / double: 4
Navigation and other equipment
Bridge control system
Make: Kongsberg
Type: Autochief 600
Is bridge fitted for one-man operation? Y
Radars
Number: 3
Make: Furuno
Model(s): FAR-3330S-SSD, FAR-3320-NXT, FAR-2218(X)
Fire detection system
Make: Consilium
Type: Salwico Cargo
Fire extinguishing systems
Cargo holds: Fixed fire water monitor
Make/Type: Tanktech / long jet
Engine room: CO_2
Make/Type: NK / high pressure

Waste compactor
Make: Delitek
Model: DT-200MCP
Sewage plant
Make: Jonghap Machinery Co., Ltd
Model: JMC-BIO AEROB-35N (for deckhouse) JMC-BIO AEROB-12N (for E/R)

Efficiency
Attained EEDI value: 5.18 g/ton-mile
Required EEDI value: 11.66 g/ton-mile

Energy Saving Technologies: Rudder bulb

Contract date: 22 December 2020
Launch/float-out date: 17 December 2022
Delivery date: 14 June 2023


HAPAG-LLOYD 23,660 TEU CONTAINERSHIP (LFS)
PROFILE
MIDSHIP SECTION
TANK TOP
NO.1 HOLD
NO.2 HOLD
NO.3 HOLD
NO.4 HOLD
NO.5 HOLD
NO.6 HOLD
NO.7 HOLD
NO.8 HOLD
NO.9 HOLD
NO.10 HOLD
ENGINE ROOM
APT VOID
S/G RM
LNG FUEL TK (P&S)
FWD VOID
PIPE DUCT

BOCHEM HOUSTON – CHEMICAL/PRODUCT TANKER

Shipbuilder: **China Merchants Jinling Shipyard (Yangzhou) Dingheng Co., Ltd /CMJL(YZ)**
Vessel's name: ***Bochem Houston***
Owner/Operator: **Compagnie Maritime Belge (CMB)**
Country: **Belgium**
Designer: **Shanghai Odely Marine Engineering Co., Ltd**
Country: **China**
Model test establishment used: **Shanghai Ship & Shipping Research Institute (SSSRI)**
Flag: **Portugal**
IMO number: **9955428**
Total number of sister ships already completed (excluding ship presented): **1**
Total number of sister ships still on order: **6**

Ordered in 2021, *Bochem Houston* is the first of six 26,600dwt chemical tankers built for Belgian shipowner Compagnie Maritime Belge (CMB) by China Merchants Jinling Shipyard to a design from Shanghai ODELY Marine. A sister ship, *Bochem Rotterdam*, was delivered in October 2023 and in December CMB added two further ships to the order bringing the series number to eight. *Bochem Houston* is an IMO Type 3 tanker and was delivered into a long-term charter and pooling agreement with Stolt Tankers. The original five sisters are also included in that deal.

The vessel is 158.98m in length, has a beam of 27m and a scantling draught of 10.4m. Space has been reserved on deck for the future installation of two ammonia fuel tanks. The 900m^3 tanks will be placed one each side of the vessel above Holds 2, 3 and 4.

It has 18 stainless steel cargo tanks reinforced for high density cargoes in nine pairs and two stainless steel slop tanks. It can carry liquid product oil, vegetable oil and IMO II & III chemicals up to SG 1.85. There are 20 cargo pumps a mix of Framo SD150 type capable of pumping at 330m^3/h and small Framo SD125 units that can pump at 220m^3/h.

The main engine is a Yuchai Marine Power-built MAN B&W five cylinder S50ME-C9.7-LPSCR. Output at MSC 85rpm is 5,260kW but ship will mainly operate at 64.1rpm with power of 4,734kW. The ship will run on 2020 compliant fuels for SOx emission rules and employs low pressure SCR to meet NOx Tier III requirements. The engine has been specified for possible future conversion to run on ammonia hence the possible installation of ammonia fuel tanks. The engine drives a directly linked 6.2m fixed pitch propeller. Service speed at 64.1rpm is 14knots.

TECHNICAL PARTICULARS

Length oa: 158.98m
Length bp: 149.90m
Breadth moulded: 27.00m
Depth moulded: 14.20m
to main deck: 14.70m
to upper deck: 18.20m
to other decks: 21.0m / 23.80m / 26.60m / 29.50m
Width of double skin
side: 1.80m
bottom: 1.80m
Draught
scantling: 10.40m
design: 10.20m
Gross: 18,082t
Displacement: 26,599.6t
Lightweight: 7,628.71t
Deadweight
scantling: 26,599.6t
design: 25,843.6t
Block co-efficient: 0.792 (10.4m/10.4m)
Speed, service: 5,260kW x 85rpm MCR, 14knots at CSR: 4,734kW x 64.1rpm
Cargo capacity (m^3)
Liquid volume: 28,611.92
Bunkers (m^3)
Heavy oil: 1,131.49 (100% full)
Diesel oil: 324.47 (100% full)
Water ballast (m^3): 10,363.54
Tankers - percentage segregated ballast: 100%
Daily fuel consumption (tonnes/day)
Main engine only: 17.93
Auxiliaries: 4.5
Classification society and notations: ABS +A1, (E),Oil Carrier, Chemical Carrier, SPMA, ESP, FL(25), UWILD, +AMS, +ACCU, TCM, VEC, BWE, BWT, CPS, IHM, RRDA, ENVIRO, CRC(SC, SP), Ammonia Fuel Ready Level 2D(S)
% high-tensile steel used in construction: 34.3%
Propulsion
Main engine(s)
Design: MAN B&W
Model: 5S50ME-C9.7-LPSCR
Manufacturer: Yuchai Marine Power Co., Ltd
Number: 1
Type of fuel: HFO, MDO
Output of each engine: 5,260kW
Is this a diesel-electric or hybrid?: N
Propeller(s)
Material: Ni-Al-Bronze
Designer/Manufacturer: Zhenjiang Tongzhou Propeller Co., Ltd
Number: 1
Fixed/Controllable pitch: Fixed
Diameter: 6.2m
Speed: 85rpm
Diesel-driven alternators
Number: 3
Engine make/type: Daihatsu/6DE-20
Type of fuel: HFO, MDO
Alternator make/type: Taiyo/FE-674C-8
Output/speed of each set: 950kW x 900rpm
Boilers
Number: 2
Type: Aalborg OL / Aalborg OC-TCi
Make: Alfa Laval Aalborg
Output, each boiler: 16,000kg/h, 1,500/450kg/h
Bow thruster(s)
Make: Wuhan Kawasaki
Number: 1
Output (each): 800kW
Deck machinery
Cargo cranes/cargo gear
Number: 1
Make: CSSC Luzhou Zhenjiang Marine Auxiliary Machinery Co., Ltd
Type: HDC10-20
Performance: Hydraulic slewing
Other cranes
Number: 1
Make: CSSC Luzhou Zhenjiang Marine Auxiliary Machinery Co., Ltd
Type: HDC5-9
Performance: Hydraulic slewing
Mooring equipment
Number: 6
Make: Jiangsu Masada Heavy Industries Co., Ltd
Type: Electric/hydraulic
Special lifesaving equipment
Number of each and capacity: 1
Make: Jiangsu Jiaoyan Marine Equipment Co., Ltd
Type: GJ4.5/JYM-FF-6.65
Cargo/capacity
Hatch covers
Design: Shipyard
Manufacturer: Shipyard
Cargo tanks
Number: 18 cargo tanks, 2 slop tanks
Stainless steel – structure/piping: ASTM S31803/SUS 316L
Cargo pumps
Number: 20
Type: SD150/SD125
Make: Framo AS
Stainless steel: SUS316L
Capacity (each): 330m^3/h at 120mlc, 220m^3/h at 120mlc
Cargo control system
Make: Framo AS
Ballast control system
Make: Framo AS
Ballast water treatment system
Make: ERMA FIRST
Capacity: 1,000m^3/h
Navigation and other equipment
Bridge control system
Make: Furuno
Is bridge fitted for one-man operation?: N
Radars
Number: 2
Make: JRC
Model(s): JMR-9225-6X/JMR-9282-S
Fire detection system
Make: Tyco
Type: T2000
Fire extinguishing systems
Engine room: CO_2 and local water mist
Make/Type: Seaplus
Sewage plant
Make: Wärtsilä
Model: STC02-13
Efficiency
Attained EEDI value: 5.62
Required EEDI value 6.75
Contract date: 13 May 2021
Launch/float-out date: 07 March 2023
Delivery date: 26 June 2023

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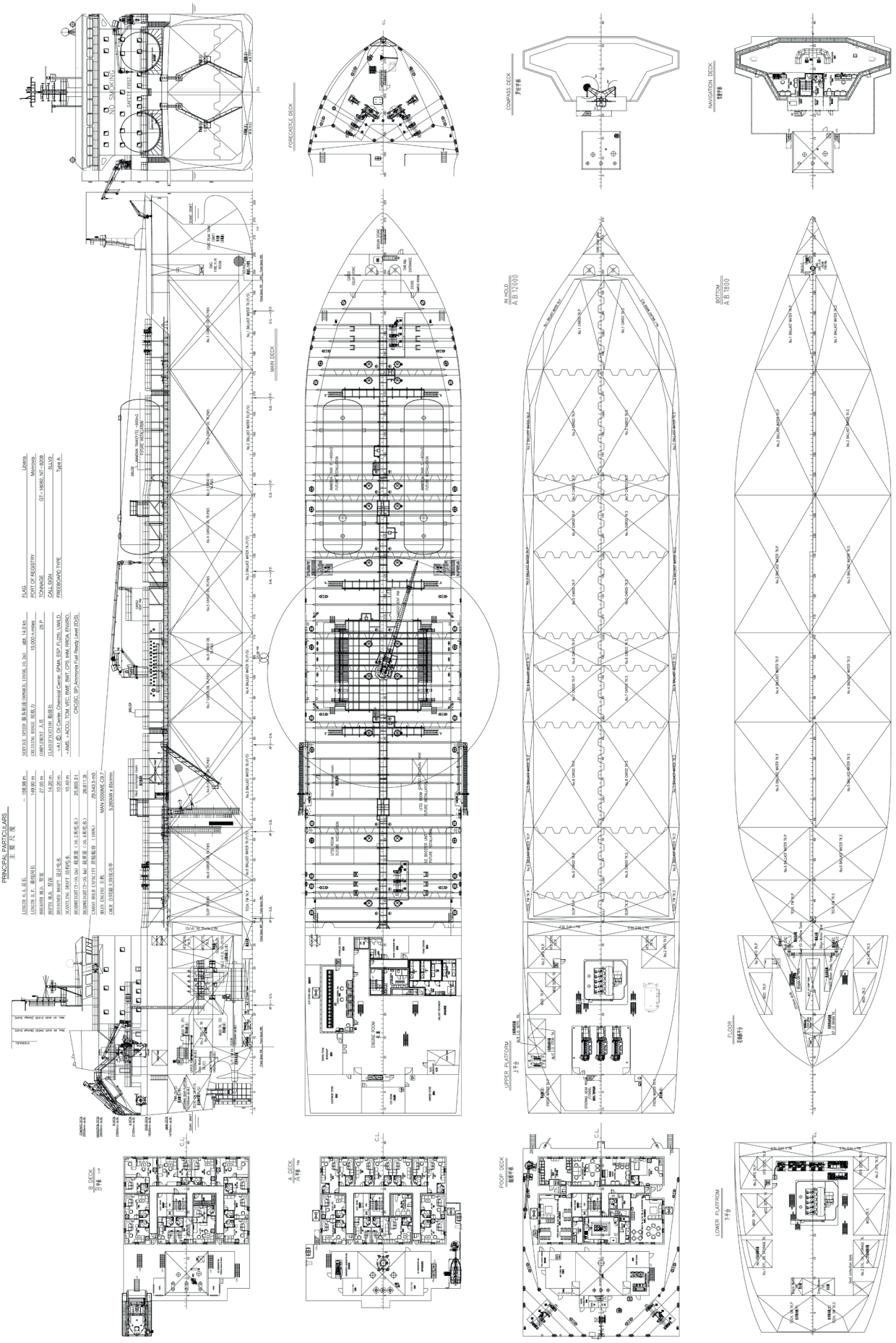
BOCHEM HOUSTON



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CASSIUS – VERY LARGE CRUDE CARRIER

Shipbuilder:.....**Hyundai Samho Heavy Industries Co., Ltd**
Vessel's name:..***Cassius* (now *Front Gander* and owned by Frontline)**
Owner/Operator:.....**Euronav**
Country:.....**Belgium**
Designer:.....**Hyundai Samho**
Country:.....**Republic of Korea**
Flag:.....**Belgium (now Marshall Islands)**
IMO number:.....**9937098**
Total number of sister ships already completed (excluding ship presented):.....**2**
Total number of sister ships still on order: **Nil**

Ordered in 2021 by Belgian tanker operator Euronav, the 300,000dwt VLCC *Cassius* was delivered by its builder Hyundai Samho in January 2023. The order for the ship and its two sisters was part of Euronav's strategy to rejuvenate its tanker fleet with modern vessels that would replace ships coming to the end of their working lives with the company. It said at the time that there were no suitable purchase acquisitions in the then current fleet of VLCCs.

Cassius's stay with Euronav was to last less than a year as it was one of the 24 VLCCs transferred to Frontline in December 2023 after the merger between the two turned sour and was renamed to *Front Gander*. The sister ship *Camus* was named in a joint ceremony with *Cassius* just prior to delivery. Both ships were designed and built as LNG ready and in a belt and braces approach were also equipped with hybrid scrubbers.

The vessel is 328m in length and has a beam of 60m and draught of 21.7m. The deck has been strengthened on both sides of the vessel over the whole length of Tank 4 and extending aft over Tank 5 for future placement of a pair of 3,500m^3 Type C LNG tanks if the owner decides to convert the ship to dual fuel.

The main engine is a Hyundai-built MAN B&W 7G80ME-C9.5-HPSCR, with the suffix indicating high pressure selective catalytic reduction is used to meet NOx Tier III requirements. Output is 22,200kW at 64rpm and its directly connected 10.4m propeller gives at service speed of 14.8knots. A hybrid scrubber operates on the main engine to meet SOx rules. There are three HiMSEN 8H21/32 gensets each producing 1,620kW at 900rpm. Energy saving devices include a full spade rudder with bulb and skirt and a pre-swirl duct.

TECHNICAL PARTICULARS

Length oa:.....328.00m
Length bp:.....318.00m
Breadth moulded:.....60.00m
Depth moulded
to main deck:.....29.60m
to upper deck:.....29.60m
to other decks:.....26.70m
Width of double skin
side:.....3.00m
bottom:.....2.80m
Draught
scantling:.....21.70m
design:.....20.50m
Gross:.....153,486t
Deadweight
scantling:.....300,018t
design:.....280,000t
Block co-efficient:.....0.7977
Speed, service:.....14.8knots at NCR
Cargo capacity (m^3)
Liquid volume:.....340,800
Water ballast (m^3):.....87,000
Tankers – percentage segregated ballast:..84,700
Daily fuel consumption (tonnes/day)
Main engine only:.....60
Auxiliaries:.....7
Classification society and notations:.....LR +100A1, Double Hull Oil Tanker, CSR, ESP, Occasional Helicopter Landing Area, ShipRight(CM, ACS(B,C)), *IWS, LI, DSPM4, ECO(BWT, IBTS, NOx3, P, SEEMP, SOx-EGCS, VECS-L) +LMC, IGS, UMS, BWTS, EGCS(Open, Partial), EGCN(SCR), CAC3, Descriptive notes COW(LR), 'EGCS-R(Hybrid,T), ETA, ShipRight(BWMP(T,S),DIST(I),IHM-EU,SCM,SERS)

Propulsion
Main engine(s)
Design:.....MAN Energy Solutions
Model:.....Hyundai-MAN B&W 7G80ME-C9.5-HPSCR
Manufacturer:.....HHI-EMD
Number:.....1
Type of fuel:.....HFO/LFO/MGO
Output of each engine:...22,200kW x 64rpm
Is this a diesel-electric or hybrid?:.....N

Propeller(s)
Material:.....Ni-Al-Bronze
Designer/Manufacturer:.....Hyundai Heavy Industries
Number:.....1
Fixed/Controllable pitch:.....Fixed
Diameter:.....10.4m
Speed:.....64rpm
Diesel-driven alternators
Number:.....3
Engine make/type:.....3 x HiMSEN/8H21/32
Type of fuel:.....LFO / MGO
Alternator make/type:....3 x HHI-EES / Marine design IP 23 enclosure brushless
Output/speed of each set:.....1,620kW x 900rpm
Boilers
Number:.....1
Type:...Automatic, forced draught, heavy fuel oil burning, marine boiler
Make:.....Kangrim
Output, each boiler:.....40,000kg/h
Stern appendages/special rudders:....Full spade rudder with bulb & skirt & pre-swirl duct
Deck machinery
Cargo cranes/cargo gear
Number:.....2
Make:.....Sangsangin Industry Co., Ltd
Type:.....Electro-hydraulic driven
Performance:.....SWL 20t, working radius max. 21m ~ min. 4.3m
Other cranes
Number:.....2
Make:.....Sangsangin Industry Co., Ltd
Type:.....Electro-hydraulic driven
Tasks:.....Provision crane
Performance:.....SWL 10t, working radius max. 67m
Mooring equipment
Number:.....10 sets
Make:.....Flutek
Type:.....Electro-hydraulic

Special lifesaving equipment
Number of each and capacity:...x2, 30-person
Make:.....Oriental
Type:.....Gravity

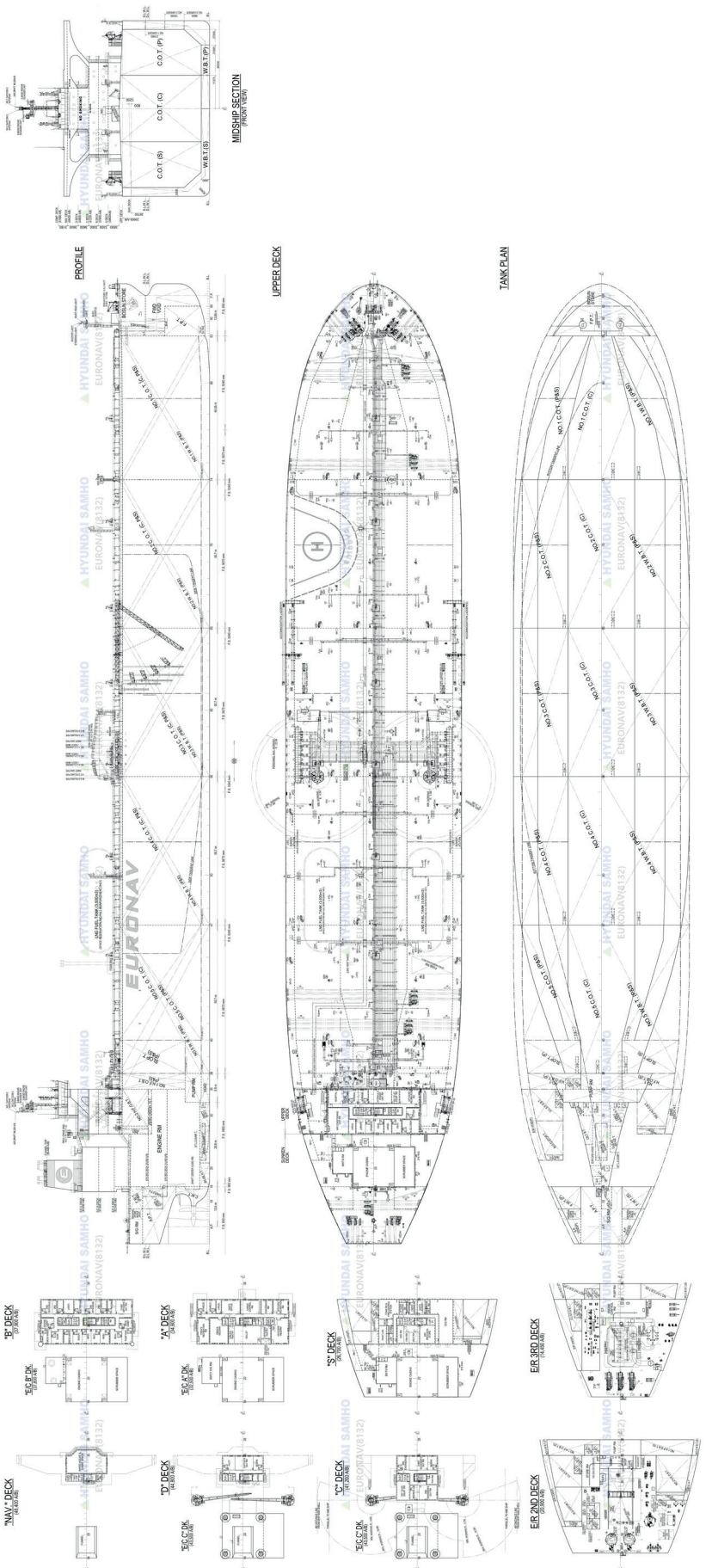
Cargo tanks
Number:.....17
Grades of cargo carried:.....Crude oil carrier
Cargo pumps
Number:.....3
Type:.....Vertical, centrifugal, single stage
Make:.....HHI-TMC
Capacity (each):.....5,000m^3/h x 150mth
Cargo control system
Make:.....Musasino
Type:.....CMS
Ballast control system
Make:.....Hanla IMS
Type:.....Hydraulic valve control
Ballast water treatment system
Make:.....Hyundai welding
Capacity:.....3,000m^3/h x 2

Complement
Officers:.....11
Crew:.....19
Navigation and other equipment
Bridge control system
Make:.....HGS
Is bridge fitted for one-man operation?:.....N
Integrated bridge system:.....Y
If yes, make:.....HGS
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:.....HGS
Type:.....HGS-100
Fire extinguishing systems
Cargo holds:.....Low expansion foam/sea water hydrants
Make/Type:.....Fain
Engine room:.....High pressure CO_2
Make/Type:.....Fain
Cabins:.....Foam fire extinguisher/hydrants
Make/Type:.....Fain/Movitec VF15 FP 250

Waste disposal plant
Incinerator
Make:.....HMMCO
Model:.....Sludge oil & solid waste burning
Sewage plant
Make:.....Il Seung
Model:.....Biological type

Efficiency
Attained EEDI value:.....1.96
Required EEDI value:.....2.07
Other installed monitoring tools:.....Integrated smart solution
Energy Saving Technologies:.....Full spade rudder with bulb & skirt & pre-swirl duct
Contract date:.....16 April 2021
Launch/float-out date:.....11 November 2022
Delivery date:.....11 January 2023

CASSIUS (FRONT GANDER)



CHANG HANG BEI HAI – BULK CARRIER

Shipbuilder: **China Merchants Jinling Shipyard (Nanjing) Co., Ltd**
Vessel's name: ***Chang Hang Bei Hai***
Owner/Operator: **Shanghai Changjiang Shipping Co., Ltd**
Country: **China**
Designer: **SDARI**
Country: **China**
Model test establishment used: **SSSRI**
Flag: **China**
IMO number: **None**
Total number of sister ships already completed (excluding ship presented): **3**
Total number of sister ships still on order: **Nil**

Delivered in January 2023, *Chang Hang Bei Hai* is the first vessel in a four-ship series of next generation gearless 50K "DOLPHIN" bulk carriers, developed by SDARI for China domestic trade and optimised for high flexibility in terms of target ports and cargoes. The sister ships *Chang Hang Huang Hai*, *Chang Hang Dong Hai* and *Chang Hang Nan Hai* were delivered in February, May and July 2023 respectively. All are named after Chinese seas – North Sea, Yellow Sea, East China Sea and South China Sea in order of delivery.

The vessels are effectively a slightly widened Supramax type with a length of 199.95m, beam of 34.2m and draught of 11.5m. They have a deadweight of 59,068tonnes and a grain capacity of 80,800m^3. The hull is optimised to achieve a higher propulsive efficiency and lower resistance in order to reduce fuel consumption and emission. The superstructure layout has been optimised using to reduce wind resistance especially in winter.

The bow form is a vertical parabolic type with no bulb. They have the five-hold, five-hatch configuration and hopper shaped holds which is standard for this size and type of ship. Hatch covers are of the folding type and were designed and supplied by Brightseas Ships Equipment Co., Ltd.

The main engine is a MAN B&W 6S50ME-C9.7 type built by China Shipbuilding Industry Corporation Diesel Engine Co., Ltd. It produces 6,063kW at 88rpm and is directly coupled to a fixed pitch propeller of 6.7m diameter. Auxiliary engines are four Anqing CSSC Diesel Engine Co-built Daihatsu 6DK-20e units producing 600kW at 750rpm.

The attained EEDI is 3.1483 and 44% below Chinese domestic mandatory requirements which come into force on 1 July 2024.

TECHNICAL PARTICULARS

Length oa: 199.95m
Length bp: 197.00m
Breadth moulded: 34.20m
Depth moulded
to main deck: 18.20m
to upper deck: 18.20m
Width of double skin bottom: 1.78m
Draught
scantling: 11.50m
design: 11.00m
Gross: 37,697t
Deadweight
scantling: 59,086t
design: 55,785t
Speed, service (81.6%SMCR output): 13.4knots

Cargo capacity (m^3)
Grain: 80,800
Bunkers (m^3)
Heavy oil: 400
Diesel oil: 110
Water ballast (m^3): 21,480
Daily fuel consumption (tonnes/day)
Main engine only: 18.3

Classification society and notations: CCS ★CSA Bulk Carrier; R1; Ice Class B; Loading Computer(S, I, G); In-Water Survey ★ CSM MCC; Gd-EP; Gd-ECO(CD28)
% high-tensile steel used in construction: 70%

Propulsion
Main engine(s)
Design: MAN B&W
Model: 6S50ME-C9.7
Manufacturer: China Shipbuilding Industry Corporation Diesel Engine Co., Ltd
Number: 1
Type of fuel: HFO & ULSFO & MGO
Output of each engine: SMCR: 6063kW x 88rpm
Is this a diesel-electric or hybrid?: N

Propeller(s)
Material: Cu3, Ni-Al-Bronze
Designer/Manufacturer: SDARI
Number: 1
Fixed/Controllable pitch: Fixed
Diameter: 6.7m
Diesel-driven alternators
Number: 3
Engine make/type: Anqing CSSC Diesel Engine Co., Ltd / 6DK-20e
Type of fuel: HFO & ULSFO & MGO
Alternator make/type: CSIEM / 1FC5 506-8TA42-Z
Output/speed of each set: 600kW x 750rpm

Boilers
Number: 1
Type: LYF1.5/240-0.7 (vertical cylindrical smoke tube)
Make: Hailu Shazhou
Output, each boiler: Oil-fired section: 1,500kg/h; exh. gas section: abt. 550kg/h (at CSR of M/E), abt. 135kg/h each A/E (at 80% power, totally from two A/Es)

Deck machinery
Other cranes
Number: 5
Make: Jiangyin Chengjiang Ship Equipment Co., Ltd
Type: Electric
Tasks: Sludge davit

Mooring equipment
Number: 4
Make: Jiangsu Masada Heavy Industries Co., Ltd
Type: Electro-hydraulic

Special lifesaving equipment
Number of each and capacity: 1 x 25 person
Make: Zhejiang Norsier Lifesaving Equipment Technology Co., Ltd
Type: Free-fall lifeboat

Cargo/capacity
Hatch covers
Design: Brightseas Ships Equipment Co., Ltd
Manufacturer: China Merchants Jinling Shipyard (Nanjing) Co., Ltd
Type: Upper deck

Complement
Officers: 10
Crew: 11
Supernumaries/Spare: 3
Suez/Repair Crew: 1
Single/double/other rooms: 25 / 0 / 0

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

Radars
Number: 2
Make: Furuno
Model(s): FAR-2328 & FAR-2338S

Fire detection system
Make: Hangzhou Huayan Digital Electron Co., Ltd
Type: JB-QB-2000
Fire extinguishing systems
Cargo holds: Sea water system
Engine room: Sea water system, CO_2 fixed system, portable fire extinguishers
Make/Type: Wuhan Moder Changjiang Morgan Technology Co., Ltd
Cabins: Sea water system, portable fire extinguishers
Public spaces: Sea water system, portable fire extinguishers

Sewage plant
Make: Shanghai Shijiu Marine Equipment Co., Ltd
Model: CSWE-30

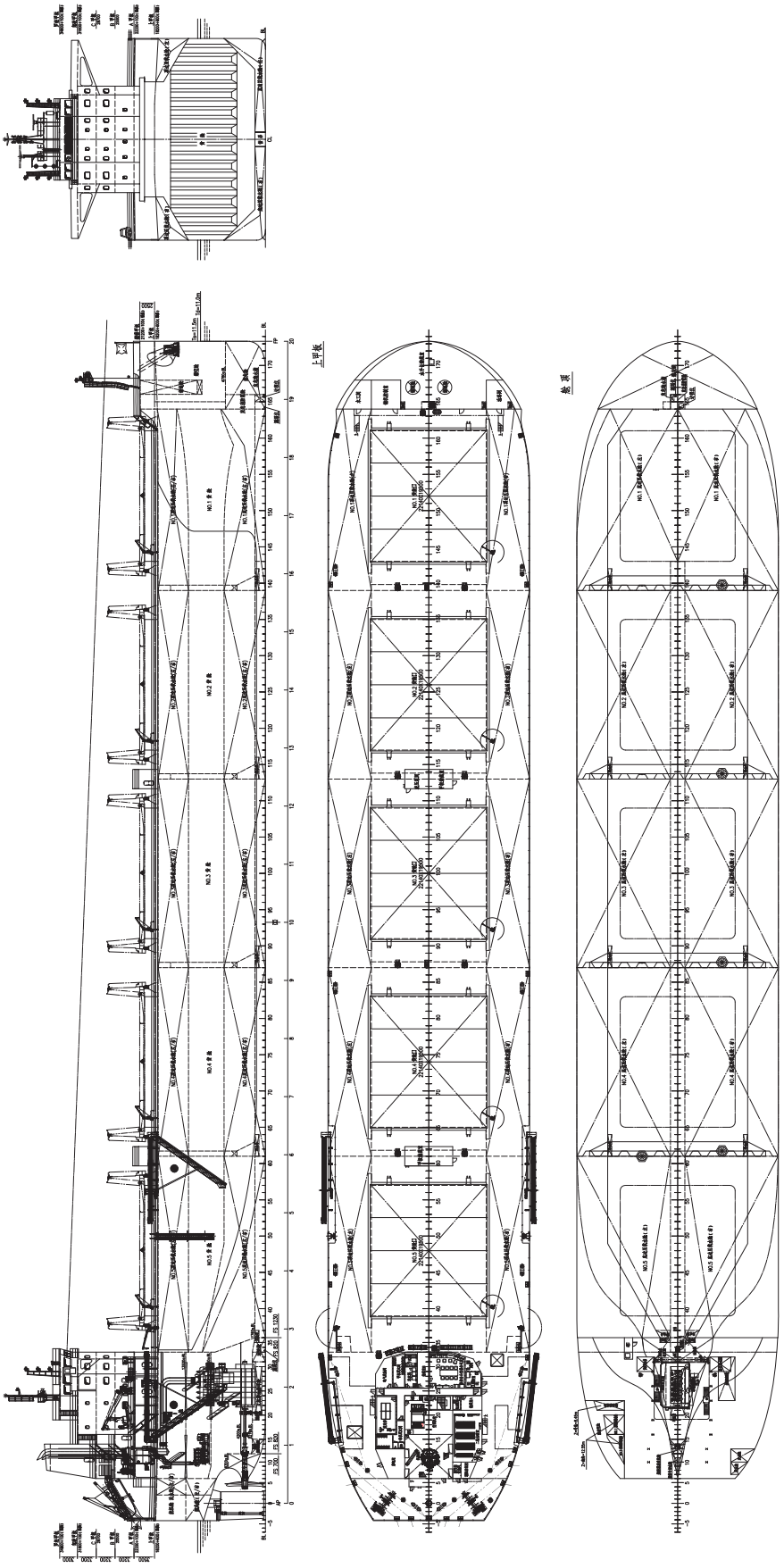
Efficiency
Attained EEDI value: 3.1483
Required EEDI value: 5.6482

Installed Fuel Meters: Mass flow

Other installed monitoring tools: Shaft power meter, electronic inclinometers (motion sensors)
Energy Saving Technologies: LED lighting
Hull coatings: Self-polishing anti-fouling paint

Contract date: March 2021
Delivery date: January 2023

CHANG HANG BEI HAI



ENERGY FIDELITY – LNG CARRIER

Shipbuilder: **Hyundai Samho Heavy Industries Co., Ltd**
Vessel's name: ***Energy Fidelity***
Owner/Operator: **Alpha Gas**
Country: **Greece**
Designer: **HSHI**
Country: **Republic of Korea**
Flag: **Marshall Islands**
IMO number: **9540089**
Total number of sister ships already completed (excluding ship presented): **1**
Total number of sister ships still on order: **Nil**

The 174,000m^3 LNG carrier *Energy Fidelity* was delivered in April 2023 by Hyundai Samho to Greek operator Alpha Gas as the first of a series of three energy efficient vessels.

This size of vessel has become a staple in the world LNG carrier fleet and there are several designs from different builders all basically similar. *Energy Fidelity* was developed by the Hyundai Maritime Research Institute and is at first glance typical of the breed.

However, the eye is drawn to an unusual design element forward of the cargo tanks. This is the air resistance shield which is located on both sides of the hull and is aimed at giving the ship improved air resistance. Underwater and invisible is the builder's proprietary air lubrication system to reduce friction and save more energy. The ship also brings a new first for Alpha Gas as it is propelled by WinGD dual-fuel engines with two shaft generators. All previous vessels were propelled by MAN B&W engines.

Dimensions are an overall length of 289.9m, a beam of 46.1m and a draught of 12.5m. Cargo is stored in four tanks and there is a reliquefaction plant located above Tank 4 on the starboard side of the vessel.

A twin propulsion system with each side comprising a WinGD 5X72DF engine rated at 16,125kW at 89rpm and an 8.4m fixed pitch propeller gives a service speed of 19.5knots at NCR. Auxiliary power is provided by three HiMSEN gensets. Two are seven-cylinder units of the H35/40DF type and the third a six-cylinder variant. High-pressure SCR is applied to the main engine and low-pressure SCR to the auxiliaries in order to meet NOx Tier III requirements.

Claims for the energy efficiency of the vessel are borne out by its EEDI rating of 3.84 which is less than half the 7.87 required.

TECHNICAL PARTICULARS

Length oa: 289.90m
Length bp: 281.30m
Breadth moulded: 46.10m
Depth moulded
- to main deck: 26.30m
- to upper deck: 26.30m
- to other decks: 47.24m

Width of double skin
- side: 2.40m
- bottom: 3.00m

Draught
- scantling: 12.50m
- design: 11.50m

Gross: 111,089t
Deadweight
- scantling: 95,165t
- design: 84,030t

Block co-efficient: 0.7567
Speed, service: 19.5knots at NCR
Cargo capacity (m^3)
- Liquid volume: 173,960

Bunkers (m^3)
- Light oil: 2,978
- Diesel oil: 1,790

Water ballast (m^3): 56,460
Daily fuel consumption (tonnes/day)
- Main engine only: 75.7
- Auxiliaries: 7.2

Classification society and notations: DNV, +IA, TANKER FOR LIQUEFIED GAS, SHIP TYPE 2G(-163˚C, 500kg/m3, 0.35bar), GF, FL(40, WW), E0, BIS, TMON, COAT-PSPC(B), CMON, LCS, BWM(T), CLEAN, COMP(V-3), RECYCLABLE

Propulsion
Main engine(s)
- Design: WinGD
- Model: Hyundai-WinGD 5X72DF
- Manufacturer: HHI-EMD
- Number: 2
- Type of fuel: LFO/MGO/MDO/Gas
- Output of each engine: 16,125kW x 89rpm

Is this a diesel-electric or hybrid?: N
Propeller(s)
- Material: Ni-Al-Bronze
- Designer/Manufacturer: Hyundai Heavy Industries
- Number: 2
- Fixed/Controllable pitch: Fixed
- Diameter: 8.4m
- Speed: 69rpm

Diesel-driven alternators
- Number: 3
- Engine make/type: 2 x HiMSEN 7H35DF + 1 x 6H35DF
- Type of fuel: LFO / MGO / MDO / GAS

Exhaust-gas scrubbing equipment
- Manufacturer: HHI-EMD
- Type: HP SCR for main engine / LP SCR for auxiliary engine
- On main engines?: 1 x SCR on main engine
- On auxiliary engines?: 3 x SCRs on auxiliary engines

Boilers
- Number: 1 x auxiliary boiler 4 x exhaust gas economiser
- Type: Automatic, forced draught, light fuel oil burning & marine boiler type of auxiliary boiler / forced circulating, smoke tube type of exhaust gas economiser
- Make: Alfa Laval
- Output, each boiler: 7,500kg/hr (auxiliary boiler) / abt. 600kg/h (M/E exhaust gas economiser in Gas mode) / abt. 700kg/h (M/E exhaust gas economiser in F.O mode, Tier II mode) /abt. 1,000kg/h (G/E exhaust gas economiser)

Stern appendages/special rudders: Full spade rudder with bulb & skirt & pre-swirl duct
Deck machinery
Cargo cranes/cargo gear
- Number: 2
- Make: Oriental
- Type: Electro-hydraulic driven
- Performance: SWL 5t, working radius max 25m ~ min. 5.2m

Other cranes
- Number: 3
- Make: Sangsangin Industry Co., Ltd
- Type: Electro-hydraulic driven
- Tasks: Provision crane(2 sets) / compressor room service crane(1 set)
- Performance (provision crane): SWL 8t(P) / 2t(S), working radius max. 19m(P) / 15m(S)
- Performance (compressor room service crane): SWL 6t, working radius max. 20m

Mooring equipment
- Number: 11
- Make: Kongsberg
- Type: Electric

Special lifesaving equipment
- Number of each and capacity: 2, 34 person
- Make: HLB
- Type: Gravity

Cargo tanks
- Number: 4
- Grades of cargo carried: LNG

Cargo pumps
- Number: 8
- Type: SM350
- Make: Sinko Ind. Ltd
- Capacity (each): 1,850m^3/h x 165mlc

Cargo control system
- Make: Kongsberg
- Type: Radar

Ballast water treatment system
- Make: Techcross
- Capacity: 2,400m^3/h x 2 sets

Complement
- Officers: 19
- Crew: 15

Navigation and other equipment
Bridge control system
- Make: Kongsberg
- Type: K-600

Is bridge fitted for one-man operation?: N
Integrated bridge system: Y
If yes, make: HD Hyundai Marine Solution
- Model: HiWMS-PE

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: Salwico Cargo

Fire extinguishing systems
Cargo compressor/motor room: High pressure CO_2
- Make/Type: JCI

Engine room: High pressure CO_2
- Make/Type: JCI

Cabins: Foam fire extinguisher/hydrants
- Make/Type: Fain/Movitec VF15 FP 250

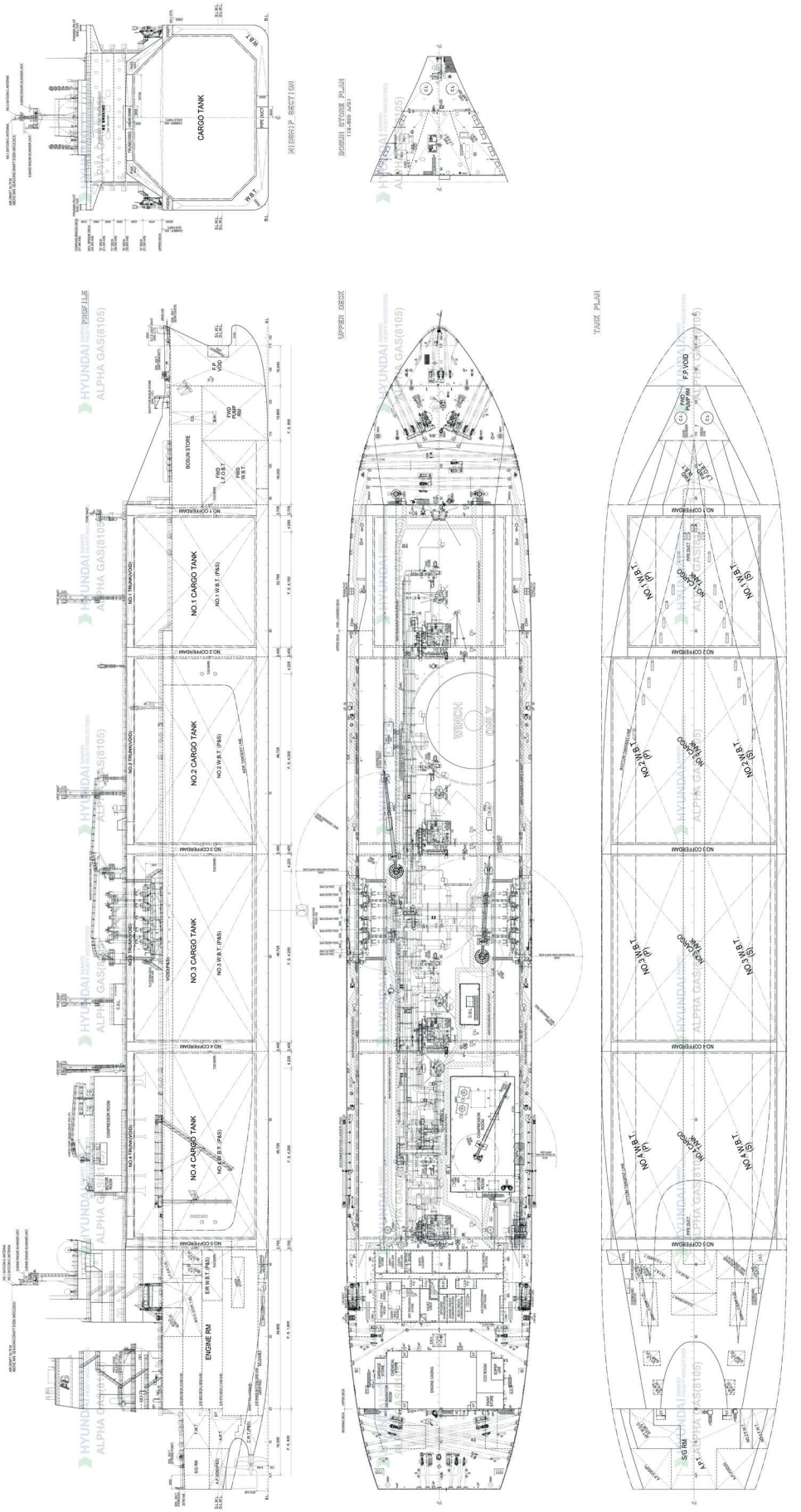
Waste disposal plant
Incinerator
- Make: Teamtec
- Model: Sludge oil & solid waste burning

Sewage plant
- Make: Il Seung
- Model: Biological type

Efficiency
Attained EEDI value: 3.84
Required EEDI value: 7.87
Other installed monitoring tools: Integrated-smart solution
Energy Saving Technologies: Full spade rudder with bulb & skirt & pre-swirl duct

Contract date: 08 January 2021
Launch/float-out date: 29 July 2022
Delivery date: 27 April 2023

ENERGY FIDELITY



EXPLORA I – CRUISE SHIP

Shipbuilder:	**Fincantieri**
Vessel's name:	***Explora I***
Owner/Operator:	**Explora Journeys**
Country:	**Panama**
Designer:	**Fincantieri**
Country:	**Italy**
Flag:	**Malta**
IMO number:	**9869875**
Total number of sister ships already completed (excluding ship presented):	**Nil**
Total number of sister ships still on order:	**1**

Explora I built and designed by Finacntieri was delivered from the Monfalcone yard in Italy as the first of the fleet for MSC Cruises new luxury Explora Journeys brand. The second in the series is due for delivery in 2024 from Fincantieri's Sestri-Ponente with four further options spread over 2026 to 2028.

At 248m and with a 69,400gt, the ship is considerably smaller than the MSC Group's most recent ships and is comparable in size to the older Lirica series of the early 2000s. However, the similarity ends there and whereas the older ships have just under 1,000 cabins and accommodate almost 2,000 passengers, the Explora class have just 461 sea-facing cabins for a maximum 996 guests. The ship has 14 decks with passenger accommodation and facilities spread over 12 decks. As befits a luxury brand it has high crew to guest ratio of 1:1.25.

Explora 1 has a diesel electric power and propulsion system comprising of four Wärtsilä 46F8L medium speed engines each outputting 9,600kW. The twin 4.8m fixed pitch propellers allow a service speed of 20knots. NOx requirements are met by use of SCR and SOx by using appropriate low sulphur fuels.

The power system of *Explora I* may not seem especially environmentally friendly, but this element is set to evolve over the course of the series. Both *Explora I* and *II* can already connect to shore power when alongside and are planned for future addition of a battery pack. *Explora III* and *IV* will be longer by 19m to allow for LNG dual-fuel engines and fuel systems. The final two vessel are planned to feature the LNG dual-fuel system and also to be equipped with a 6MW fuel cell.

All of the series will feature an underwater noise management system to help protect marine life, and a comprehensive range of onboard energy efficient equipment to optimise engine use to further reduce emissions. These considerations are reflected in the assignment of RINa's Dolphin Quiet Ship notation.

TECHNICAL PARTICULARS

Length oa: 248.00m
Length bp: 241.60m
Breadth moulded: 32.60m
Depth moulded
to main deck: 9.80m
to upper deck: 50.40m
Width of double skin
bottom: 1.65m

Draught
scantling: 7.10m
design: 6.90m
Gross: 69,400t
Displacement: 34,250t
Lightweight: 30,350t
Deadweight: 3,900t

Block co-efficient (please state relevant draught): 0.706 (6.9m)
Speed, service: 20knots

Bunkers (m^3)
Diesel oil: 1,260
Water ballast (m^3): 230

Daily fuel consumption (tonnes/day)
Main engine only: 150t

Classification society and notations: RINa C+ Unrestricted. AUT-CCS; AUT-PORT; COMF-NOISE-A-PAX; COMF-NOISE-B-CREW; COMF-NOISE (DP)-A-PAX; COMF-NOISE (DP)-B-CREW; COMF-VIB-A-PAX; COMF-VIB (DP)-A-PAX; COMF-VIB-B-CREW; DMS; DOLPHIN QUIET SHIP; DYNAPOS SAM; EGCS-NOX; GREEN PLUS; INWATERSURVEY; MLCDESIGN; MON-SHAFT; REF-STORE; SYS-NEQ

% high-tensile steel used in construction: 0%
% aluminium used in hull/superstructure: 0%
Heel control equipment: Heeling tank
Roll-stabilisation equipment: Fin stabiliser
Propulsion
Main engine(s)
Design: 38,400kW
Model: Wärtsilä 46F8L
Manufacturer: Wärtsilä
Number: 4
Type of fuel: MDO
Output of each engine: 9,600kW
Is this a diesel-electric or hybrid?: Y

Propeller(s)
Material: Ni-Al-Bronze
Designer/Manufacturer: MMG
Number: 2
Fixed/Controllable pitch: Fixed
Diameter: 4.8m
Speed: 22

Main-engine driven alternators
Number: 4x 110,44 kVA 6,600 440 220 V 60Hz Ac

Boilers
Number: 2 + 4
Type: 2 x oil-fired + 4 x EGB
Make: Alfa Laval
Output, each boiler: 2 x 8t/h + 4 x 2.5t/h

Stern appendages/special rudders: Bulb rudder - Beker

Bow thruster(s)
Make: Fincantieri DSC
Number: 3
Output (each): 2.8MW

Stern thruster(s)
Make: Fincantieri DSC
Number: 2
Output (each): 2.4MW

Deck machinery
Other cranes: 5 x engine/bosun/gangways/garbage crane

Mooring equipment
Number: 4
Type: Electric

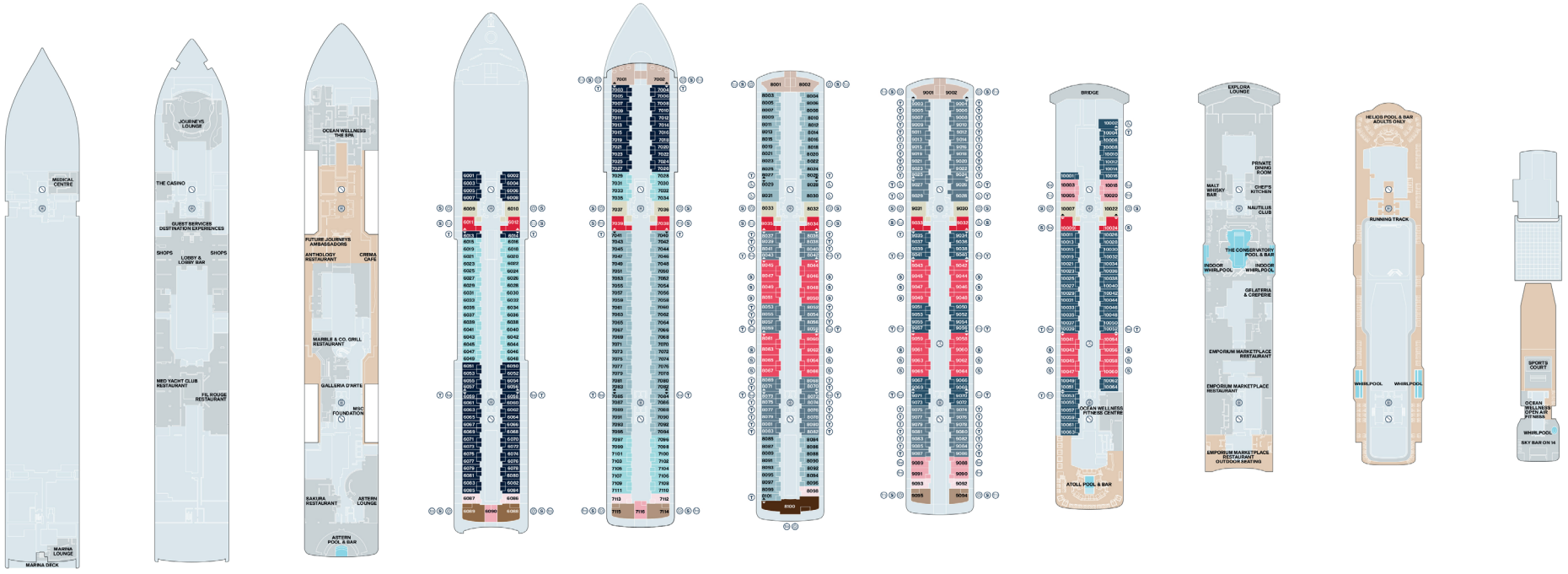
Special lifesaving equipment
Number of each and capacity: 8 x lifeboat (150 persons) + 2 x rescue boat (38 persons) + 2 x MES
Make: Hatecke

Passengers
Total: 996
Number of cabins: 461
Percentage/number outboard: 1.55

Navigation and other equipment
Bridge control system
Make: Wärtsilä APSS

Waste disposal plant
Incinerator
Make: Scanship

Contract date: 13 March 2019
Launch/float-out date: 30 May 2022
Delivery date: 20 July 2023



DECK 03 DECK 04 DECK 05 DECK 06 DECK 07 DECK 08 DECK 09 DECK 10 DECK 11 DECK 12 DECK 14

Legend

OT1	OCEAN TERRACE SUITE
OT2	OCEAN TERRACE SUITE
OT3	OCEAN TERRACE SUITE
OT4	OCEAN TERRACE SUITE
GT	OCEAN GRAND TERRACE SUITE
PH	PENTHOUSE
DP	DELUXE PENTHOUSE
PP	PREMIER PENTHOUSE
GP	GRAND PENTHOUSE
CO	COVE RESIDENCE
RR	RETREAT RESIDENCE
SR	SERENITY RESIDENCE
CR	COCOON RESIDENCE
OR	OWNER'S RESIDENCE

- PRIVATE WHIRLPOOL
- DOUBLE SOFA BED
- TWIN BEDS
- GUEST LAUNDRY
- ACCESSIBLE SUITES
- BATH
- LIFT
- STAIRCASE
- CONNECTING SUITES

EXPLORA I

FERRYMAR – RO-RO

Shipbuilder:... **Jiangsu Dajin Heavy Industry Co., Ltd**
Vessel's name:... ***Ferrymar***
Owner/Operator:... **Marfret**
Country:... **France**
Designer:... **Shanghai Merchant Ship Design & Research Institute, CSSC (SDARI)**
Country:... **China**
Model test establishment used:... **Shanghai Ship & Shipping Research Institute (SSSRI)**
Flag:... **France**
IMO number:... **9966805**
Total number of sister ships already completed (excluding ship presented):... **1**
Total number of sister ships still on order: **Nil**

Designed by SDARI and build by China Jiangsu Dajin Heavy Industry, Marfret's new flagship and first ro-ro multi-purpose vessel *Ferrymar* developed for inter-island operation in the Caribbean was delivered on 4 November 2023. The ship will operate between Marigot in Saint-Martin, Gustavia in Saint-Barthélemy, Pointe-à-Pitre in Guadeloupe and Fort-de-France in Martinique. It replaces an older vessel – *Marin* – and brings more capacity to the service.

With its length of 120m and 22m beam, *Ferrymar* has a maximum draught of 6m but can make river voyages at a lower draught of 3.8m even keel. The ship has SDARI's S-Bow with a vertical stem and invisible bulb.

With 1,170lane-metres, 84 trailers can be loaded in two holds and on the weather deck. Access is by a 16m wide stern ramp. There are two 19m long elevator platforms connecting tank top, main deck and weather deck for vehicle loading and unloading. A total of 234TEU can be loaded on weather deck further increasing the flexibility of the ship. There are 95 plugs for reefer cargoes. *Ferrymar* has a 9.5m clear height for vehicles and a strengthened tank top allowing for carriage of high and heavy cargoes.

Accommodation public areas and navigation spaces are located aft above the 9.5m height cargo hold. In addition to a complement of 22 crew, the ship also offers 12 single cabins for up to 12 drivers.

Power is supplied by a pair of MAN 6L27/38 medium-speed engines of 2,100kw output each driving a controllable pitch propeller and a shaft generator via a reduction gearbox with PTO. The low-pressure selective catalytic reduction system connected with main engine and auxiliary engine allows the ship to meet NOx Tier III levels. Service speed at 85% MCR is 13.8knots. With its optimised hull form and efficiency further improved by twisted rudder with bulb, Ferrymar's attained EEDI is 38% lower than EEDI reference line.

Ferrymar has been fitted with sockets on both port and starboard sides for connection to shore power. Marfret is also planning to reduce the vessel's fuel consumption by fitting it with a wind assist rotor system as part of its collaboration with Farwind Energy.

TECHNICAL PARTICULARS

Length oa:... 120.00m
Length bp:... 117.20m
Breadth moulded:... 22.00m
Depth moulded
to main deck:... 7.50m
to upper deck:... 13.85m
Width of double skin
side:... 3.35m
bottom:... 2.00m
Draught
scantling:... 6.00m
design:... 5.50m
Gross:... 11,124t
Deadweight
scantling:... 6,726.9t
design:... 5,593.6t
Speed, service (85%MCR output): abt. 13.5knots (85%MCR, 15% sea margin, with PTO)
Bunkers (m^3)
Heavy oil:... 620
Diesel oil:... 288
Water ballast (m^3):... 3,965
Classification society and notations:... BV I ✠ HULL, Ro-ro cargo ship, Equipped for carriage of containers, SDS, SYS-NEQ-1, VERISTAR-HULL FAT25, INWATERSURVEY, CLEANSHIP, BWT, Unrestricted navigation ✠ MACH, AUT-UMS, AUT-PORT, MON-SHAFT, GREEN PASSPORT EU
% high-tensile steel used in construction:... 57%
Heel control equipment:... Ballast tanks with pump
Roll-stabilisation equipment:... Bilge keels
Propulsion
Main engine(s)
Design:... MAN
Model:... 6L27/38
Manufacturer:... CSSC Marine Power Zhenjiang Co., Ltd
Number:... 2
Type of fuel:... VLSFO & MGO
Output of each engine:... 2,100kW
Is this a diesel-electric or hybrid?:... N
Gearbox(es)
Make:... Berg
Model:... 2768-mk
Number:... 2
Output speed:... 160rpm
Propeller(s)
Material:... Cu-Ni-Al Bronze
Designer/Manufacturer:... Berg
Number:... 2
Fixed/Controllable pitch:... Controllable
Diameter:... 3.35m
Main-engine driven alternators
Number:... 2
Make/type:... AVK
Output/speed of each set:... 500kW x 1,800rpm
Diesel-driven alternators
Number:... 3
Engine make/type:... Fujian Kyling Power Co., Ltd
Type of fuel:... MGO
Alternator make/type:... Volvo
Output/speed of each set:... 350kW x 180rpm & 500kW x 1,800rpm
Boilers
Number:... 1+2
Type:... 1 x aux boiler, 2 x exhaust gas boiler
Make:... GESAB
Output, each boiler:... 1 x 900kW + 2 x 200kW
Bow thruster(s)
Make:... Ruiyi (Shanghai)
Number:... 2
Output (each):... 350kW
Mooring equipment
Number:... 4
Make:... Jiangsu Masada Heavy Industries Co., Ltd
Type:... Electric
Special lifesaving equipment
Number of each and capacity:... 1
Make:... Jiangyin Neptune Marine Appliance Co., Ltd
Type:... Free-fall lifeboat

Cargo/capacity
Containers
Lengths:... 20ft, 40ft, 45ft
Heights:... 8ft 6inches, 9ft 6inches
Total TEU capacity:... 234TEU
On deck:... 234TEU
Reefer plugs:... 95
Tiers/rows (maximum)
On deck:... 3/8
Vehicles
Number of vehicle decks (fixed/moveable):... 3
Total lane length:... 1,170m
Doors/ramps/lifts/moveable car decks
Number of each:... 1 x vertical stern ramp for vehicles, 2 x elevating platform
Type:... Hydraulic cylinder for stern ramp, electric for elevating platform
Designer:... SMS-SME Pte. Ltd
Cargo tanks
Number:... 2
Ballast control system
Make:... Pleiger
Type:... Electric-hydraulic
Ballast water treatment system
Make:... DESMI
Capacity:... 340m^3/h
Complement
Officers:... 10
Crew:... 24
Supernumaries/Spare:... 12 x drivers
Suez/Repair Crew:... 6

Navigation and other equipment
Bridge control system
Make:... Wärtsilä
Is bridge fitted for one-man operation:... Y
Radars
Number:... 2
Make:... Wärtsilä
Model(s):... NACOS Platinum

Fire detection system
Make:... Autronica
Type:... Autrosafe4
Fire extinguishing systems
Cargo holds:... CO_2
Make/Type:... NK Co., Ltd
Engine room:... CO_2
Make/Type:... NK Co., Ltd
Vehicle spaces:... CO_2
Make/Type:... NK Co., Ltd
Waste compactor
Make:... TGA-ENERPAT
Model:... RC-5XL
Sewage plant
Make:... Hansun
Model:... ST-20U

Efficiency
Attained EEDI value:... 12.871
Required EEDI value:... 16.739 (Phase 2)
Energy Saving Technologies:... Twisted rudder with bulb
Contract date:... 26 August 2021
Launch/float-out date:... 06 May 2023
Delivery date:... 04 November 2023

SIGNIFICANT SHIPS OF 2024

The 35th edition of our annual Significant Ships series, Significant Ships of 2024, will be published in March 2025. As in previous editions we shall be including up to 50 of the most innovative and interesting commercial ship designs (of mostly 100m length and above) which will be delivered during the forthcoming year.

The Editor invites shipbuilders, designers and owners to submit details of vessels for possible inclusion in Significant Ships of 2024. Presentation will follow on the established two-page format, with a colour photograph, descriptive text and tabular details (including major equipment suppliers) on the first page, followed by a full page of technical general arrangement plans. Initial potential entries should comprise a short technical description (100 words) of the proposed vessel highlighting the special features and the delivery date.

All entries should be addressed to:

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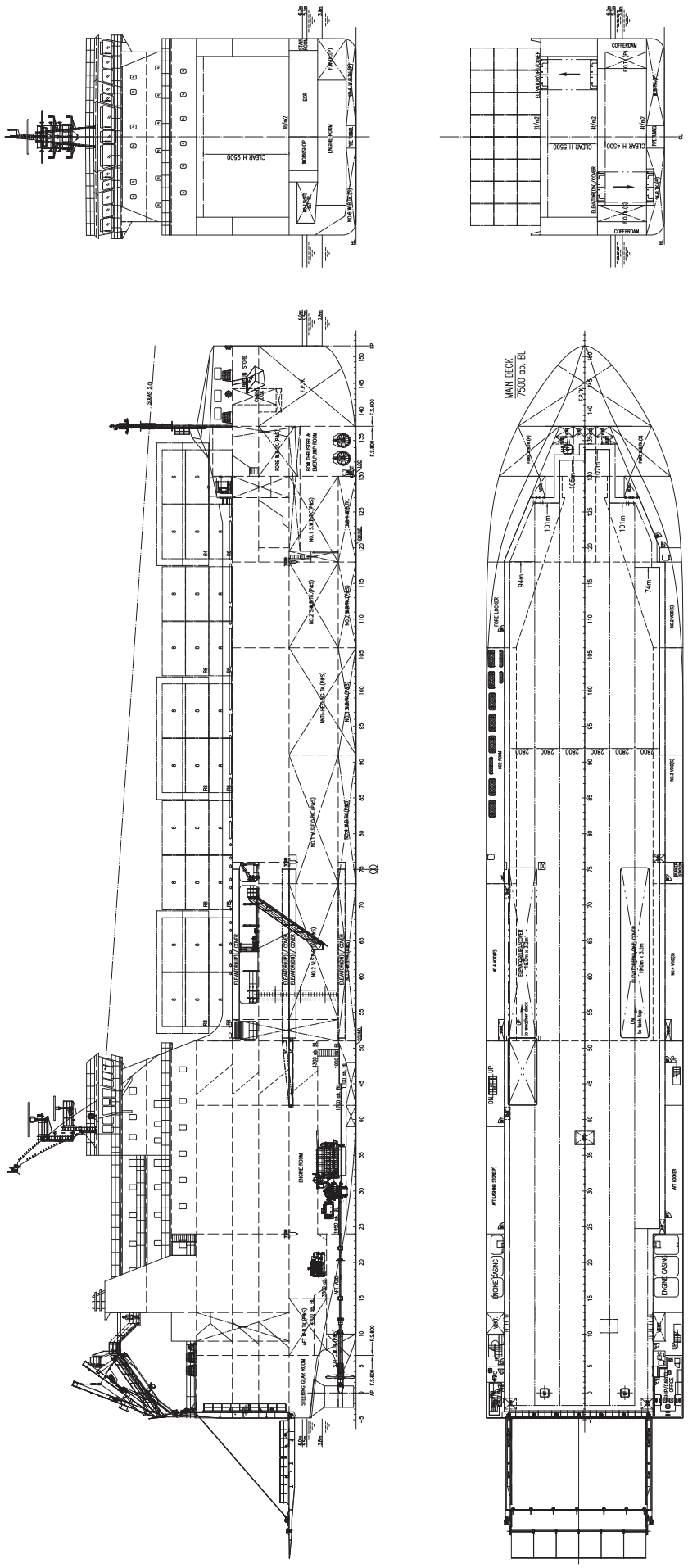

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FINNSIRIUS – RO-PAX

Shipbuilder:.....**China Merchants Jinling Shipyard (Weihai) Co., Ltd**
Vessel's name:.....***Finnsirius***
Owner/Operator:.....**Finnlines Plc**
Country:.....**Finland**
Designer:.....**Deltamarin**
Country:.....**Finland**
Model test establishment:.....**MARIN**
Flag:.....**Finland**
IMO number:.....**9902419**
Total number of sister ships already completed (excluding ship presented):.....**1**
Total number of sister ships still on order: **Nil**

Ordered in 2020 as part of Finnlines Green investment Programme, *Finnsirius* is the largest vessel in the Finnlines fleet and the first of two new Superstar class ro-paxes. Finnlines' new ships are presently the largest passenger ships to be built by the China Merchants Jinling shipyard at Weihai.

Designed by Knud E. Hansen and Deltamarin, *Finnsirius* is 235m in length, has a beam of 33m and a design draught of 7m. It can accommodate 1,100 passengers in 323 cabins and 5,200lane-metres of freight over four fixed and one moveable deck. Access is by two stern ramps on Deck 3, a further stern ramp on Deck 5 and a bow ramp to give flexibility in berthing arrangements.

Diesel electric power is provided by four Wärtsilä 6L46F engines in a twin propeller system. Each pair of engines powering one generator. Total power output is 7.2MW. Speed is a comparatively modest 16.25knots which is a design feature for operation in the sensitive archipelago. The ship runs on HFO and is equipped with a Langh Tech hybrid scrubbing system to meet SOx regulations. Power in port is provided either by shore power or from the ship's 5MWh battery storage system.

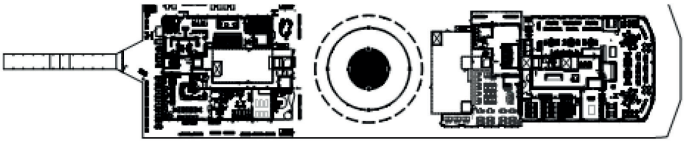
The hull is optimised for the narrow and shallow waters on its route and hydrodynamic performance is improved by an air lubrication system. The ship also features an auto-mooring system for faster mooring.

TECHNICAL PARTICULARS

Length oa:.....235.60m
Length bp:.....217.70m
Breadth moulded:.....33.30m
Depth moulded
to main deck:.....10.20m (Deck 3)
to upper deck:.....16.10m (Deck 5)
to other decks:.....22.00m (Deck 7)
Width of double skin
side:.....7.05m
bottom:.....1.70m
Draught
scantling:.....7.10m
design:.....7.00m
Gross:.....65,692t
Deadweight
scantling:.....12,602t
design:.....11,967t
Speed, service:.....16.25knots x 7,874kW
Bunkers (m^3)
Heavy oil:.....1,334
Diesel oil:.....424
Water ballast (m^3):.....2,892
Daily fuel consumption (tonnes/day)
Main engine only:.....87t
Auxiliaries:.....10.5t
Classification society and notations:.....RINa C+, RO-RO PASSENGER SHIP, ICE 1A SUPER, INWATERSURVEY, COMF-NOISE PAX B, CREW B, COMF-VIB PAX B, CREW B, AUT-UMS, SYS-NEQ-1, SYS IBS, UNRESTRICTED NAVIGATION, TAS, SRTP, BWM-T, PMS, GREEN PLUS
% high-tensile steel used in construction:.....99%
Heel control equipment:.....2 pairs of heeling tanks and 2 dedicated heeling pumps
Roll-stabilisation equipment:.....fin stabilisers, 1 pair
Propulsion
Main engine(s)
Design:.....Wärtsilä
Model:.....6L46F
Number:.....4
Type of fuel:.....HFO
Output of each engine:.....7.2MW(MCR)
Is this a diesel-electric or hybrid?:.....Y
Gearbox(es)
Make:.....Renk
Model:.....NDSHL-3200
Number:.....2
Output speed:.....130 x 96rpm
Propeller(s)
Material:.....Ni-Al-Bronze
Designer/Manufacturer:.....Kongsberg Marine
Number:.....2
Fixed/Controllable pitch:.....Controllable
Diameter:.....5.4m
Speed:.....130rpm x 96rpm
Main-engine driven alternators
Number:.....2
Make/type:.....Alconza / MDH-063DDB-J088F
Output/speed of each set:.....2,550kW x 675rpm
Diesel-driven alternators
Number:.....3
Engine make/type:.....HHI/9H25/33
Type of fuel:.....MDO
Alternator make/type:.....Hyundai Electric/HFC7 718-6P
Output/speed each set:.....2,610kWe x 1,000rpm
Exhaust-gas scrubbing equipment
Manufacturer:.....Langh Tech
Type:.....LT Hybrid in-line scrubber
On main engines?:.....Y
On auxiliary engines?:.....N
Boilers
Number:.....2 x FMB
Type:.....FMB-VS
Make:.....SAACKE GmbH
Output, each boiler:.....Steam capacity oil fired 6,500kg/h
Stern appendages/special rudders:.....High lift streamlined flap rudders
Bow thruster(s)
Make:.....Wärtsilä
Number:.....3
Output (each):.....1,700kW
Deck machinery
Mooring equipment
Number:.....10
Make:.....Jiangsu Masada Heavy Industries Co., Ltd
Type:.....Electric-hydraulic
Special lifesaving equipment
Number of each and capacity:.....4 pieces/150 persons
Make:.....Jiangsu Jiaoyan Marine Equipment Co., Ltd
Type:.....Partially enclosed lifeboats with gravity type davits
If MES, vertical or sloping chutes?:.....Viking vertical chutes
Cargo/capacity
Reefer plugs:.....150
Tiers/rows (maximum)
On deck:.....15 (Deck 7 after)
In holds:.....135
Vehicles
Number of vehicle decks:.....4 x fixed / 1 x moveable
Total lane length:.....5,191
Total cars:.....cars: 161 / trailer: 263 / motorcycles: 74
Doors/ramps/lifts/moveable car decks
Number of each:.....1 bow door, 3 stern ramps/doors, 1 bow ramp, 2 tiltable ramps, 2 ramp covers, 5 hoistable car decks, 2 hoistable car deck ramps
Type:.....Electric car decks and car deck ramps, Other equipments are hydraulically operated
Designer:.....MacGregor
Ballast water treatment system
Make:.....Alfa Laval
Capacity:.....1,500m^3/h
Complement
Officers:.....16
Crew:.....48
Single/double/other rooms:.....64 x single
Passengers
Total:.....1,148
Number of cabins:.....323
Percentage/number outboard:.....31.3%
Navigation and other equipment
Bridge control system
Make:.....Nortrop Grumman Sperry Marine B.V.
Type:.....VisionMaster Net System
Is bridge fitted for one-man operation?:.....Y
Integrated bridge system:.....Y
If yes, make:.....Nortrop Grumman Sperry Marine B.V
Model:.....VisionMaster Net System
Radars
Number:.....4
Make:.....Nortrop Grumman Sperry Marine B.V
Model(s):.....VisionMaster Net 340 APPA, Chart Radar
Fire detection system
Make:.....Consilium
Type:.....Salwico Cruise(Central 1 ECR) / Salwico CCP(Central 2 Safety Center)
Fire extinguishing systems
All systems:.....Marioff, water mist
Waste disposal plant
Make/Type:.....Loipart, chute system D400x2/D600x1
Waste compactor
Make:.....Loipart
Model:.....LB50S /LB150
Waste shredder/crusher
Make:.....Loipart
Model:.....16m^3 vacuum dispopsal system
Sewage plant
Make:.....Evac Oy
Model:.....MBR 95KN
Efficiency
Attained EEDI value:.....16.823
Required EEDI value:.....18.906
Installed Fuel Meters:.....AE and ME: mass flow meter
Energy Saving Technologies:.....Extended propeller hub caps and rudder bulbs, twisted leading edge high lift flap rudders, air lubrication, cold ironing, waste heat recovery, LED lighting
Hull coatings:.....abrasion resistant ice coating, antifouling paint
Performance Monitoring Regime:.....In house performance data collection system

Contract date:.....16 December 2019
Launch/float-out date:.....30 August 2022
Delivery date:.....18 July 2023

FINNSIRIUS



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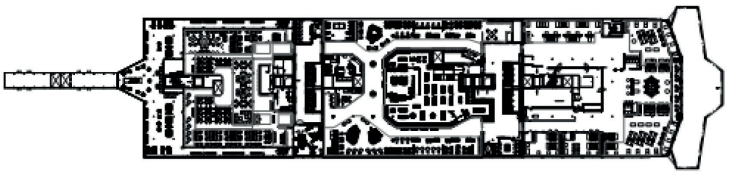

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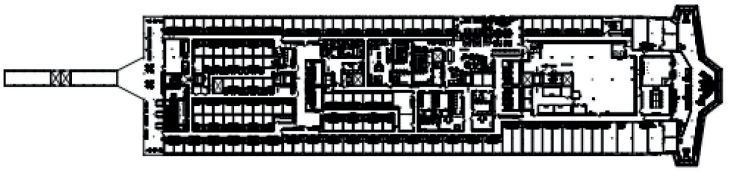

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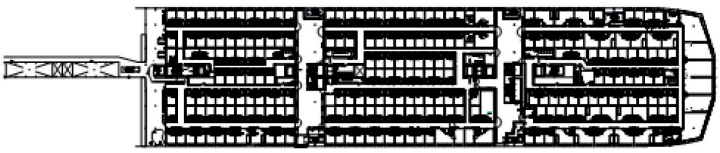

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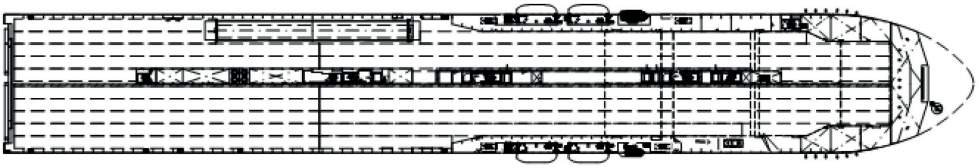

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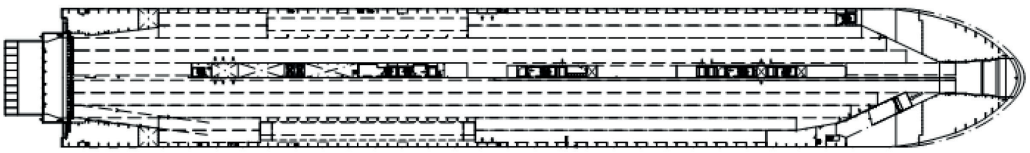

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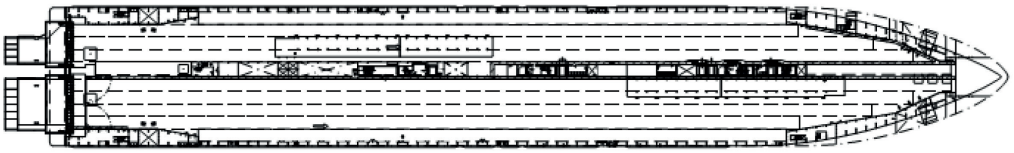

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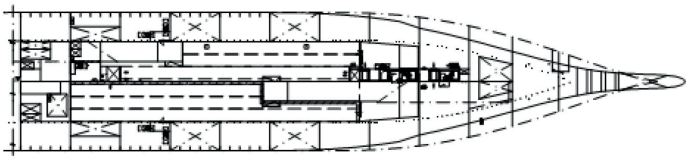


DECK 01

FUELNG VENOSA – LNG BUNKER VESSEL

Shipbuilder:.....**Hyundai Mipo Dockyard Co., Ltd**
Vessel's name:.....***FueLNG Venosa***
Owner/Operator:.....**Korea Line**
Country:.....**Republic of Korea**
Designer:..**Hyundai Mipo Dockyard Co., Ltd**
Country:.....**Republic of Korea**
Flag:.....**Singapore**
IMO number:.....**9937115**
Total number of sister ships already completed (excluding ship presented):.....**1**
Total number of sister ships still on order: **Nil**

As LNG as a fuel takes off and breaks into different vessel segments, the need for LNG bunker vessels grows. *FueLNG Venosa* is part of that growth and was delivered into charter with FueLNG by Hyundai Mipo as being the largest LNG bunker vessel in South East Asia in April 2023. FueLNG is a joint venture between Keppel Offshore & Marine and Shell Singapore. The ship is owned by Korea Line LNG.

FueLNG Venosa is a state-of-the-art LNG bunker vessel with a total capacity of 18,000m^3. Besides carrying out bunkering operations, the vessel will also be employed providing gas-up and cool-down services to LNG carriers and LNG-fuelled vessels after drydocking in Singapore or enroute to loading operations.

In outward appearance the 166.08m-long and 24.4m-wide *FueLNG Venosa* resembles a small scale membrane type LNG carrier with added plant forward of the accommodation. However, the bunker fuel cargo is contained in three equal sized cylindrical Type C tanks rather than the Moss or GTT tanks a larger vessel would have. The plant room is for the gas up and cool down systems. A custom designed bunker boom with two liquid lines allows for rapid transfer of cargo. The six cargo pumps, two in each tank, are made by Cryostar and each has a 300m^3/h pumping capacity.

The ship's power comes from a trio of gensets powered by HiMSEN 6H35DF units each capable of producing 2,779kW at 720rpm. Propulsion is provided by two stern mounted Kongsberg azimuthing thrusters operating at 250rpm which, combined with a 1.500kW Kawasaki bow thruster, give the vessel the manoeuvrability essential to bunker vessels.

The required EEDI value of 20.8 is comfortably met as *FueLNG Venosa*'s attained EEDI is just 14.25.

TECHNICAL PARTICULARS

Length oa:.....166.08m
Length bp:.....159.00m
Breadth moulded:.....24.40m
Depth moulded
to upper deck:.....12.90m
Width of double skin
side:.....2.90m
Draught
scantling:.....6.80m
design:.....6.40m
Gross:.....18,750t
Deadweight
scantling:.....12,300t
design:.....10,800t

Speed, service:.....12.0knots
Cargo capacity (m^3)
Liquid volume:.....18,000
Bunkers (m^3)
Diesel oil:.....260
Water ballast (m^3):.....6,600

Daily fuel consumption (tonnes/day)
Auxiliaries:.....17.1 on Gas (50,035kJ/kg), 19.7 on MGO (42,600kJ/kg)

Classification society and notations:.....LR/KR LR +100A1, Liquefied Gas Carrier, Ship Type 2G, Methane(LNG) in independent Tanks Type C, Max. S.G 0.5, Max. Vapour Pressure 0.36 Mpa, Min. Cargo Temperature -163 deg.C, LI, *IWS, +LMC, UMS, PSMR, ShipRight(CM, SDA, ACS(B)), BWTS, LFPF(GC, NG), +Lloyd's RMC(LG)
Descriptive note:...ShipRight (BWMP(T), IHM-EU) KR +KRS1-Liquefied Gas Carrier 2G 1C (P) / 3.6 bar, -163 deg.C 0.5SG(IGC) CLEAN1 IWS IHM PSPC RP2 LG PA LI +KRM1-UMA BWT LNG Bunker DFDE

Propulsion
Propeller(s)
Material:.....Ni-Al-Bronze
Designer/Manufacturer:...Kongsberg Maritime
Number:..2 EA / 4 blades on each propellers
Fixed/Controllable pitch:.....Fixed
Diameter:.....2.60m
Speed:.....250rpm
Special adaptations:...Part of Azimuth thruster
Diesel-driven alternators
Number:.....3
Engine make/type:.....HiMSEN / 6H35DF
Type of fuel:.....LNG / MGO
Output/speed of each set:.....2,779kW x 720rpm
Stern appendages/special rudders:.....Azimuth thruster

Bow thruster(s)
Make:.....Kawasaki
Number:.....1
Output (each):.....1,500kW
Deck machinery
Cargo cranes/cargo gear
Number:.....1
Make:.....Tech Flower
Type:.....Electro-hydraulic driven, cylinder luffing type jib crane
Performance:.....SWL 4t / working radius 6.8~25.5m
Other cranes
Number:.....1
Make:.....Masada
Type:.....Electro-hydraulic driven, cylinder luffing type jib crane
Tasks:....Provision and machinery part handling in engine room
Performance:.....SWL 1t / working radius 2.2~9m
Mooring equipment
Number:.....4
Make:.....Fluteck
Type:.....Hydraulic

Special lifesaving equipment
Number of each and capacity:.....1 x 24P
Make:.....Jiangyinshi Beihai
Type:.....Free-fall type

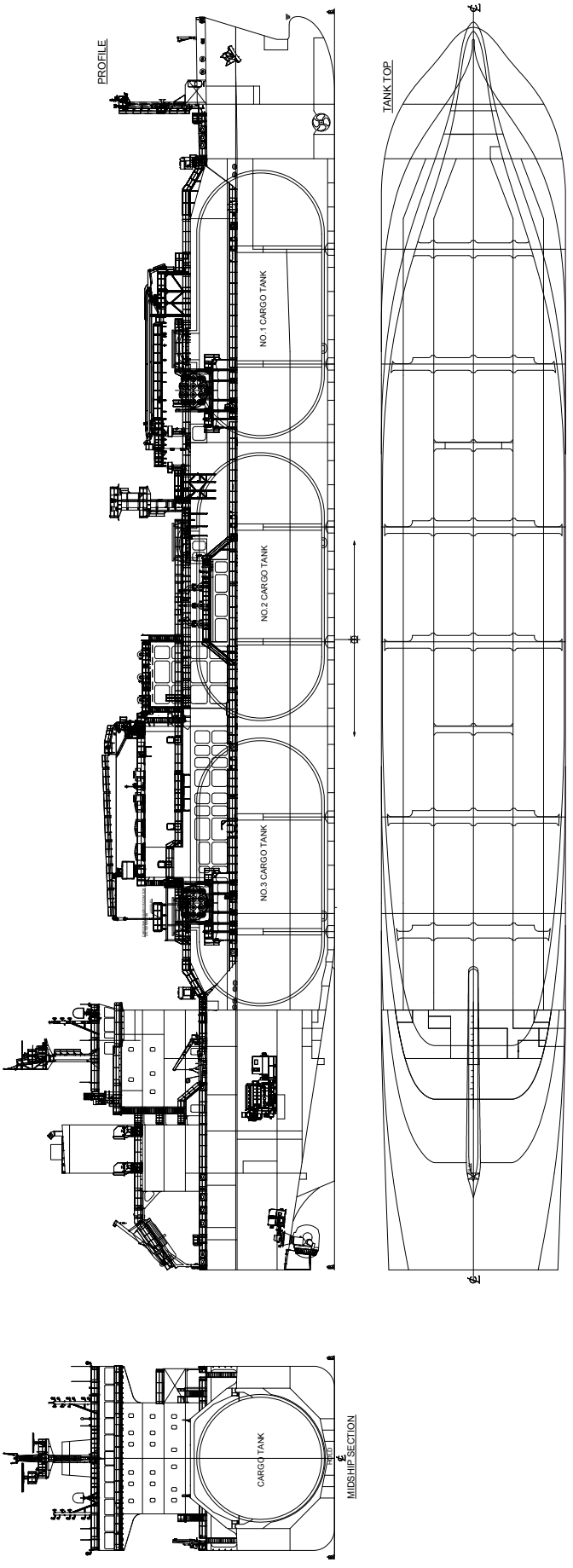
Cargo tanks
Number:.....3
Grades of cargo carried:.....1
Product range:.....LNG
Stainless steel – structure/piping:.....Piping (SUS304L)
Cargo pumps
Number:.....6 (2/tank)
Type:.....Submergible
Make:.....Cryostar
Capacity (each):.....300m^3/h
Cargo control system
Make:.....Wärtsilä
Type:.....Hydraulic control(VRC)
Ballast control system
Make:.....Hanla IMS(VRC)
Type:.....Hydraulic control(VRC)
Ballast water treatment system
Make:.....Techcross
Capacity:.....600m^3/h

Navigation and other equipment
Bridge control system
Make:.....HGS
Is bridge fitted for one-man operation?:.....N
Integrated bridge system:.....N
Radars
Number:.....2
Make:.....Furuno
Model(s):....FAR-2338S-NXT / FAR-2329-NXT
Fire detection system
Make:.....Consilium
Type:.....Fire Alarm System Salwico Cargo
Fire extinguishing systems
Engine room:.....Fixed local fire extinguishing system
Make/Type:.....NK/high-pressure CO_2 SEAPLUS / water-based type
Cabins:.....Accomodation
Make/Type:.....Hydrant & port. fire extinguisher
Public spaces:
Make/Type:....Hydrant & port. fire extinguisher

Sewage plant
Make:.....Jonghap
Model:.....AEROB-12N

Efficiency
Attained EEDI value:.....14.35
Required EEDI value:.....20.8
Installed Fuel Meters:.....For MGO: Positive displacement type. For LNG: mass flow
Other installed monitoring tools:.....Electro pneumatic type tank & draught gauge
Hull coatings:.....EGISPACIFIC(L)
Type:.....Silyl methacrylate antifouling coating
Contract date:.....15 April 2021
Launch/float-out date:.....16 November 2022
Delivery date:.....27 April 2023

FUELNG VENOSA



GAS JUSTESEN – VERY LARGE GAS CARRIER

Shipbuilder:... **HD Hyundai Heavy Industries Co., Ltd**
Vessel's name:... ***Gas Justesen***
Owner/Operator:... **KSS Line**
Country:... **Republic of Korea**
Designer:... **HD Hyundai Heavy Industries Co., Ltd**
Country:... **Republic of Korea**
Model test establishment used:... **HD Hyundai Maritime Research Institute**
Flag:... **Panama**
IMO number:... **9940992**
Total number of sister ships already completed (excluding ship presented):... **1**
Total number of sister ships still on order: **Nil**

Gas Justesen is the first of a pair of dual-fuel 86,000m^3 VLGCs built by Hyundai Heavy for Korean operator KSS Line. It was delivered in October 2023 and its sister vessel *Gas Kaiserin* in November 2023. Both are part of the owner's decarbonisation strategy and 2050 carbon neutral ambitions. The two ships are operating under charter to European energy organisation BGN.

The two vessels are developments of an earlier Hyundai design of 84,000m^3 capacity of which the KSS fleet has several examples. The new vessels are around 6m longer than the earlier type and have a length of 229.96m, a beam of 32.25m and a draught of 12.25m. Although the outward appearance of the two generations of design are very similar as regards hull lines, the addition of an LPG cylindrical fuel tank on the starboard side of the vessel above tank two easily identifies the vessels' dual-fuel power arrangements.

The main engine of *Gas Justesen* is a Hyundai-built MAN B&W six-cylinder G60ME-C10.5-LGIP-HPSCR of 11,900kW at 92.3rpm. The G suffix indicates the vessel is a 'Green' ultra-long stroke engine, LGIP denotes it is a dual-fuel LPG burner and the HPSCR suggesting high-pressure selective catalytic reduction is used to meet NOx Tier III requirements. Daily consumption is 40.4tonnes in oil mode and 35.8tonnes LPG plus 1.8tonnes MDO for pilot fuel. A 7.2m propeller allows a service speed of 16.8knots at 85% MCR. The three auxiliaries are HiMSEN 6H21/32 units burning LFO or MDO and each outputting 1,550kW.

Cargo arrangements are four pairs of tanks and Wärtsilä Svanehoj electric deep-well pumps of 600m^3/h capacity. The vessel has a reliquefaction plant to return boil off gas back to the tanks.

Energy saving features include Hyundai's in-house Hi Pre-Swirl Duct and Hi-Rudder Bulb. The ship also features Hyundai-ISS (Integrated Smart Ship) monitoring tools.

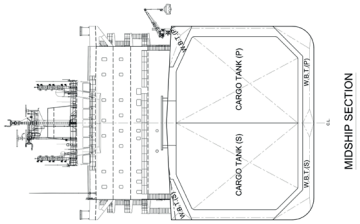
TECHNICAL PARTICULARS

Length oa:... 229.96m
Length bp:... 223.45m
Breadth moulded:... 32.25m
Depth moulded
to main deck:... 23.75m
to upper deck:... 23.75m
to other decks:... 18.61~18.825m (sunken)
Width of double skin bottom:... 1.85m
Draught
scantling:... 12.25m
design:... 11.75m
Gross:... 48,855t
Deadweight
scantling:... 55,076t
design:... 51,719t
Speed, service:... 16.8knots (90% of MCR with 15% sea margin)
Cargo capacity (m^3)
Liquid volume:... 85,998
Bunkers (m^3)
Heavy oil:... 2,183.7 (LFO)
Diesel oil:... 250.8 (MGO)
Water ballast (m^3):... 20,116.3
Daily fuel consumption (tonnes/day)
Main engine only:... 40.4(FO Mode) / 35.8/1.8(LPG/Pilot fuel)
Classification society and notations:...
+KRS1 - Liquefied Gas Carrier, 2G 1A(R)/0.275 bar, -52°C, 0.61SG(NIGC), IWS, SeaTrust(HCM, DSA1, FSA1[WW, 25 years]), PSPC, LI, ERS, +KRM1 - UMA, STCM, Reliquefaction, LG, BWT, CLEAN1, IHM, IGS, CEmN-SCR, DFDE(LPG)
% high-tensile steel used in construction:... 21%
Propulsion
Main engine(s)
Design:... MAN
Model:... Hyundai-MAN B&W 6G60ME-C10.5-LGIP-HPSCR
Manufacturer:... HHI-EMD
Number:... 1
Type of fuel:... LFO / MGO / LPG
Output of each engine:... MCR: 11,900kW x 92.3rpm
Is this a diesel-electric or hybrid?):... N
Propeller(s)
Material:... Ni-Al-Bronze
Designer/Manufacturer:... HHI
Number:... 1
Fixed/Controllable pitch:... 5,622.49mmm (mean pitch, fixed)
Diameter:... 7.20m
Speed:... 92.3rpm (MCR)
Diesel-driven alternators
Number:... 3
Engine make/type:... HHI-EMD/6H21/32
Type of fuel:... LFO/MGO
Alternator make/type:... HD Hyundai Electric, HFC7 564-08P
Output/speed of each set:... 1,550kVA x 900rpm
Boilers
Number:... 1
Type:... Water / smoke tube
Make:... KanGrim
Output, each boiler:... Oil-fired section: 3,000kg/h / exh. gas section: 850kg/h
Stern appendages/special rudders:... Hi Pre-Swirl Duct, Hi-Rudder Bulb
Deck machinery
Cargo cranes/cargo gear
Number:... 1
Make:... Oriental
Type:... Electro-hydraulic driven
Performance:... SWL 5t
Other cranes
Number:... 2
Make:... Oriental
Type:... Electro-hydraulic driven
Tasks:... Provision crane
Performance:... 4t, 2t
Mooring equipment
Number:... 2 x windlass, 6 x mooring winch
Make:... Flutek
Type:... Electro-hydraulic
Special lifesaving equipment
Number of each and capacity:... 1, 26P
Make:... HLB
Type:... Free-fall
If MES, vertical or sloping chutes?:... Sloping
Cargo tanks
Number:... 4
Coated tanks:... High volume solids aluminium pure epoxy primer
Cargo pumps
Number:... 2
Type:... Electric motor driven, deep-well type
Make:... Wärtsilä Svanehoj A/S
Stainless steel:... Shaft and pump pipe
Capacity (each):... 600m^3/h
Cargo control system
Make:... Babcock LGE
Type:... Piano type control console
Ballast control system
Make:... HD Hyundai Heavy Industries Co., Ltd
Type:... Piano type control console
Ballast water treatment system
Make:... HD Hyundai Heavy Industries Co., Ltd
Capacity:... 1,300m^3/h (filter unit)
Complement
Officers:... 14
Crew:... 12
Suez/Repair Crew:... 6

Navigation and other equipment
Bridge control system
Make:... MRC
Is bridge fitted for one-man operation?:... N
Integrated bridge system?:... N
Radars
Number:... 2
Make:... JRC
Model(s):... JMR-9225-6X(X-Band) & JMR-9282-S(S-Band)
Fire detection system
Make:... Consilium
Type:... Salwico Cargo
Fire extinguishing systems
Cargo holds:... Fire hydrant
Engine room:... High-pressure CO_2
Make/Type:... Fain
Cabins:... Fire hydrant
Waste disposal plant
Incinerator
Make:... HMMCO
Model:... MAXI T50 SL WS
Sewage plant
Make:... Jonghap
Model:... JMC BIO AEROB 12N(A)

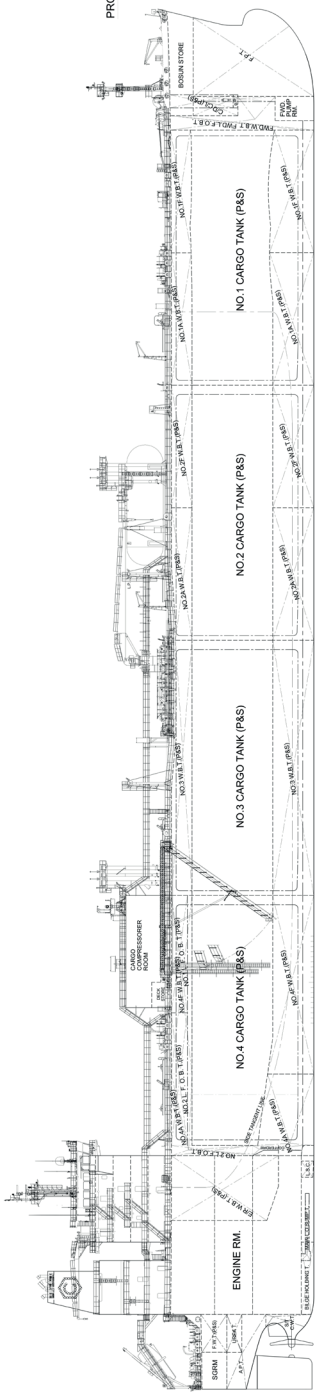
Efficiency
Attained EEDI value:... 4.92
Required EEDI value:... 6.17
Installed Fuel Meters:... Coriolis type flow meter
Other installed monitoring tools:... Hyundai-ISS (Integrated Smart Ship Solution)
Energy Saving Technologies:... Hi Pre-Swirl Duct, Hi-Rudder Bulb
Hull coatings:... Self-polishing antifouling with copper acrylate
Contract date:... 13 May 2021
Launch/float-out date:... 09 December 2022
Delivery date:... 10 March 2023

GAS JUSTESEN

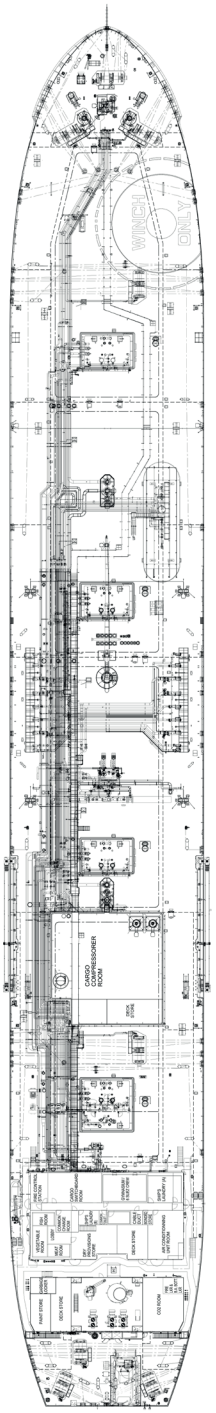


MIDSHIP SECTION

PROFILE



UPPER DECK PLAN



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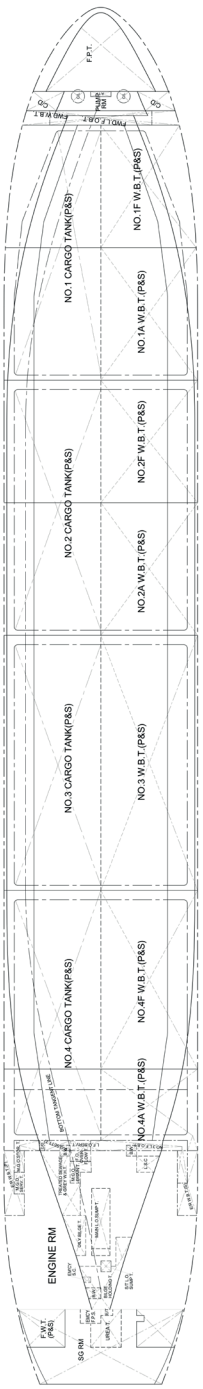


GREEN JADE – WIND TURBINE INSTALLATION VESSEL

Shipbuilder: ..... **CSBC Corporation, Taiwan**
Vessel's name: ..... ***Green Jade***
Owner/Operator: ..... **CSBC-DEME Wind Engineering Co., Ltd**
Country: ..... **ROC (Taiwan)**
Designer: ..... **CSBC Corporation, Taiwan**
Country: ..... **ROC (Taiwan)**
Flag: ..... **ROC (Taiwan)**
IMO number: **9915038**
Total number of sister ships already completed (excluding ship presented): ..... **Nil**
Total number of sister ships still on order: **Nil**

A one-off wind turbine installation vessel built for Belgium construction company DEME to a design by Dutch naval architects C-Job, *Green Jade* was delivered by Taiwanese builder CSBC in July 2023. The ship is the first WTIV to be built in Taiwan and represents DEME's largest ever foreign investment. *Green Jade* will initially be employed installing offshore wind turbine components in Taiwanese waters.

A state-of-the-art vessel, the 61,908dwt *Green Jade* has an overall length of 216.5m, a beam of 49m and a maximum draught of 11m. In anticipation of future environmental regulations, the vessel has reserved space LNG fuel storage tanks and fuel supply system.

The large open deck of 8,200m^3 will be used for wind turbine components and can transport several structures simultaneously reducing time and costs and the need for support vessels. The deck is dominated by the 4,000tonne SWL Huisman mast crane located on the starboard side of the vessel. The crane is equipped with a boom uplift preventer, which effectively absorbs the reactive force caused by the sudden release of the boom load, preventing severe damage to the crane and the vessel and reducing the operating risks significantly. Located immediately behind the main crane is a Huisman knuckle boom crane of 65tonne capacity.

Green Jade is a DP3 class ship with a quartet of Wärtsilä 9L46DF units each producing 10,305kW at 900rpm. Until an LNG fuel system is fitted the ship will run on MGO. Speed is 14knots. Propulsion and manoeuvrability systems are also from Wärtsilä and comprise four azimuthing stern thrusters of 4,500kW each and two retractable thrusters of 4,500kW and two tunnel thrusters of 2,500kW. Wärtsilä also supplied the 1,000m^3/h ballast water treatment systems.

TECHNICAL PARTICULARS

Length oa: 216.57m
Length bp: 213.13m
Breadth moulded: 49.00m
Depth moulded
to main deck: 16.80m
to upper deck: 16.80m
Draught
scantling: 11.00m
design: 8.50m

Gross: 59,715t
Deadweight
scantling: ..... abt. 62,000t
Speed, service (100%Load output): 14.0knots

Bunkers (m^3)
Diesel oil: ..... abt. 4,200 (MGO)
Water ballast (m^3): ..... abt. 61,600
Daily fuel consumption (tonnes/day)
Main engine only: 95.7

Classification society and notations:
ABS: +A1, (E), Offshore Support Vessel (Heavy Lift), SPS, CRC(OC-PL, SP), +AMS, +ACCU, +DPS-3, HDC(20 t/m2, Main Deck), HAB(WB), UWILD, BWT, CPS, NBLES, ENVIRO+, EGC-SCR, LNG Ready (AE), IHM
CR: CR100+E Crane Vessel, HLA, PSPC, NR-II, SPS, IWS, DPS-III, LCS, BWM, SEEMP, SRE, CMS(CAU)+ Gas Fuel Ready-1, NAV0, SCR

Propulsion
Main engine(s)
Design: ..... Wärtsilä
Model: 9L46DF
Number: 4
Type of fuel: ..... MGO
Output of each engine: ..... 10,305kW x 600rpm
Is this a diesel-electric or hybrid?: ..... Y

Retractable/ Tunnel bow thruster(s)
Make: ..... Wärtsilä
Number: 2/ 2
Output (each): 4,200kW/ 2,500kW

Azimuth stern thruster(s)
Make: ..... Wärtsilä
Number: 4
Output (each): 4,500kW

Deck machinery
Cargo cranes/cargo gear
Number: 1
Make: ..... Huisman
Type: ..... OMC
Performance: 4,000t

Other cranes
Number: 1
Make: ..... Huisman
Type: ..... KBC
Performance: 65t

Mooring equipment
Number: 2
Make: ..... Industias Ferri S.A.
Type: ..... Electric

Special lifesaving equipment
Number of each and capacity: ..... 2 x 80 persons
Make: ..... Jiangyin Neptune Marine Appliance
Type: ..... Diesel engine
If MES, vertical or sloping chutes?: ..... Vertical

Ballast water treatment system
Make: ..... Wartsila Water Systems Ltd
Capacity: ..... 1,000m^3/h

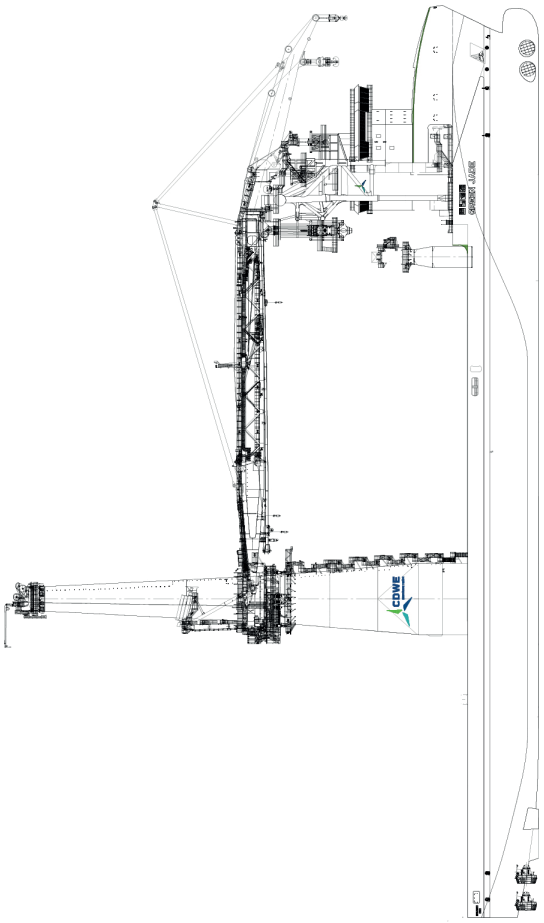
Complement
Crew: 32
Supernumaries/Spare: 116
Passengers
Total: 12
Number of cabins: 12

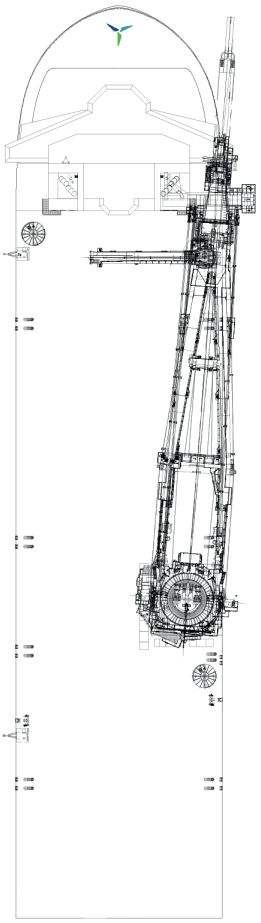
Fire extinguishing systems
Engine room:
Make/Type: ..... Survitec Fire Solutions (OEM)
Cabins:
Make/Type: ..... Survitec Fire Solutions (OEM)

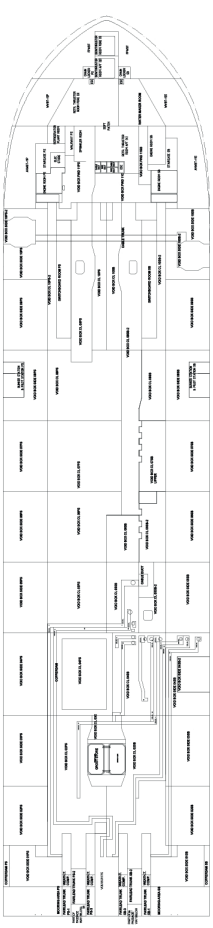
Efficiency
Energy Saving Technologies: ..... Stern thrusters with tilted angle

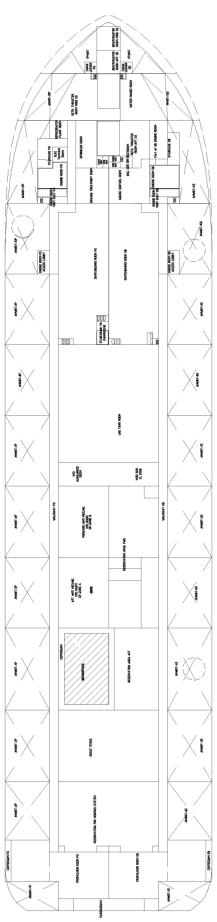
Contract date: ..... 30 June 2020
Launch/float-out date: ..... 07 July 2022
Delivery date: ..... 14 July 2023

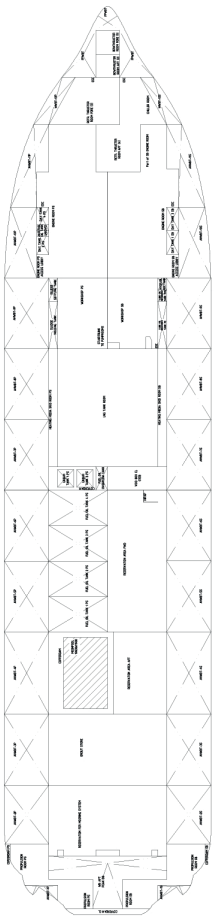
GREEN JADE

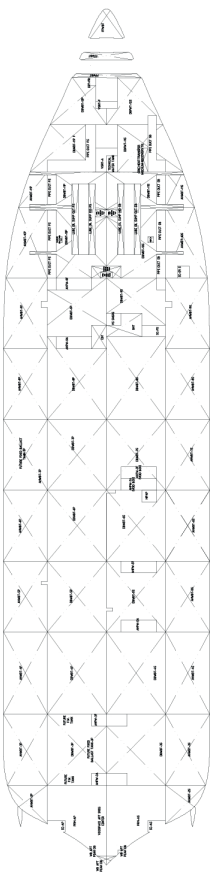












GREEN KEMI – GENERAL CARGO VESSEL

Shipbuilder: **COSCO Shipping Heavy Industry (Dalian) Co., Ltd**
Vessel's name: ***Green Kemi***
Owner/Operator: **Sea 274 Leasing Co. Ltd**
Country: **China**
Designer: **Shanghai Merchant Ship Design & Research Institute, CSSC**
Country: **China**
Flag: **Panama**
IMO number: **9976044**
Total number of sister ships already completed (excluding ship presented): **5**
Total number of sister ships still on order: **Nil**

Designed by SDARI, built by COSCO Dalian and operated by COSCO shipping, the 68,000dwt *Green Kemi* has been claimed as the world's largest ice-class multipurpose general cargo and pulp carrier. It is the first in a series of six vessels.

The vessel has an additional deadweight of 6,000tonnes over older vessels in the fleet and has typical old Panamax dimension of 226.8m in length, 32.26m beam and a draught of 13.3m. It is built to meet the requirements of CCS B1 Ice Class and Polar Code Category C, enabling it to navigate polar regions and in ice up to 80cm thick.

The seven cargo holds are box shaped to allow loading of containers and project cargo and strengthened for heavy cargoes. There are also rotary dehumidifiers for use when carrying pulp cargoes which the owner is keen to attract. The largest hold is 36m long and is equipped with a moveable tween deck.

Container capacity is 2,374TEU of which 1,442 can be carried underdeck in six tiers. Deck containers can be loaded four tiers high. There are four deck cranes, three have a capacity of 100tonnes at 26m reach and the fourth 75tonnes at 26m. *Green Kemi*'s initial cargo was a consignment of 2,797 containerised electric cars from Taicang Port in Jiangsu province to South America.

Power is supplied by a MAN B&W 6S60ME-C10.5 main engine of 9,582kW with a high-pressure SCR system that meets the NOx Tier III emission requirements. Service peed is 14.8knots. The ship has proactively adopted methanol fuel-related systems and obtained the methanol dual fuel AIP certificate from the classification society, making sufficient technical preparations for a low-carbon fuel transformation.

TECHNICAL PARTICULARS

Length oa: 226.80m
Length bp: 222.70m
Breadth moulded: 32.26m
Depth moulded
to main deck: 19.30m
to upper deck: 19.30m
Width of double skin
side: 2.50m
bottom: 1.78m
Draught
scantling: 13.30m
Gross: 44,715t
Displacement: 85,010
Lightweight: 16,950t
Deadweight
scantling: 68,000t

Cargo capacity (m^3)
Bale: 78,672
Grain: 78,672
Bunkers (m^3)
Heavy oil: 2,800
Diesel oil: 2,100
Water ballast (m^3): 23,800
Daily fuel consumption (tonnes/day)
Main engine only: 24.00
Auxiliaries: 2.50

Classification society and notations:
CCS ★CSA General Dry Cargo Ship, Double Side Skin; Strengthened for Heavy Cargoes; Grab*(20);PSPC(B,D); Ice Class B1;Equipped with Container Securing Arrangements; Loading Computer(S,I,G,D); In-Water Survey ★CSM AUT-0; SCM; PMS; AMPS; G-EP(EAL,NEC2,AFS,GPR(EU)); G-ECO(CDx, BWM(T))

Propulsion
Main engine(s)
Design: MAN B&W
Model: MAN B&W 6S60ME-C10.5
Manufacturer: Dalian Marine Diesel Co., Ltd
Number: 1
Type of fuel: HFO, ULSFO, MGO
Output of each engine: 9,582
Is this a diesel-electric or hybrid?: N
Propeller(s)
Material: Ni-Al-Bronze
Designer/Manufacturer: Shanghai Marine Propeller Design Co., Ltd
Number: 1
Fixed/Controllable pitch: Fixed
Diesel-driven alternators
Number: 3
Engine make/type: Shaanxi Diesel Engine Heavy Industry Co., Ltd / 6DK-20e
Type of fuel: HFO, ULSFO, MGO
Output/speed of each set: 960kW x 900rpm

Boilers
Number: 1
Type: Composite boiler
Make: Saacke
Output, each boiler: 2,000kg/h, 300kg/h, 190kg/h
Stern appendages/special rudders: Semi-balanced type rudder

Deck machinery
Cargo cranes/cargo gear
Number: 4
Make: TTS NMF
Type: Single cargo cranes
Performance: 3 x 100t at 26m + 1 x 75t at 26m
Other cranes
Number: 1
Make: Shanghai Hengyuan Marine Equipment Co., Ltd
Type: Electro-operated monorail provision crane
Tasks: Hoist provision
Performance: 4t with outreach ~ 4m beyond the max. beam of the ship
Mooring equipment
Number: 2 sets of combined windlass / mooring winches and 2 mooring winches
Make: SEC
Type: Electric-hydraulic

Special lifesaving equipment
Number of each and capacity: 1 x 25 persons
Make: Jiangyin Neptune Marine Appliance Co., Ltd
Type: Free-fall lifeboat
If MES, vertical or sloping chutes?: Lifeboat davit system (sloping chute)

Cargo/capacity
Hatch covers
Design: TTS
Manufacturer: TTS
Type (upper deck/other decks): Folding electric hydraulic type & piggy-back type hatch covers
Containers
Total TEU capacity: 2,374
On deck: 932
In holds: 1,442
Tiers/rows (maximum)
On deck: 4
In holds: 6

Ballast water treatment system
Make: COSCO Shipping Heavy Industry Marine Technology (WeiHai) Co., Ltd
Capacity: 1 x 1,600m^3/h

Complement
Officers: 12
Crew: 13
Suez/Repair Crew: 6
Single/double/other rooms: 25 single rooms

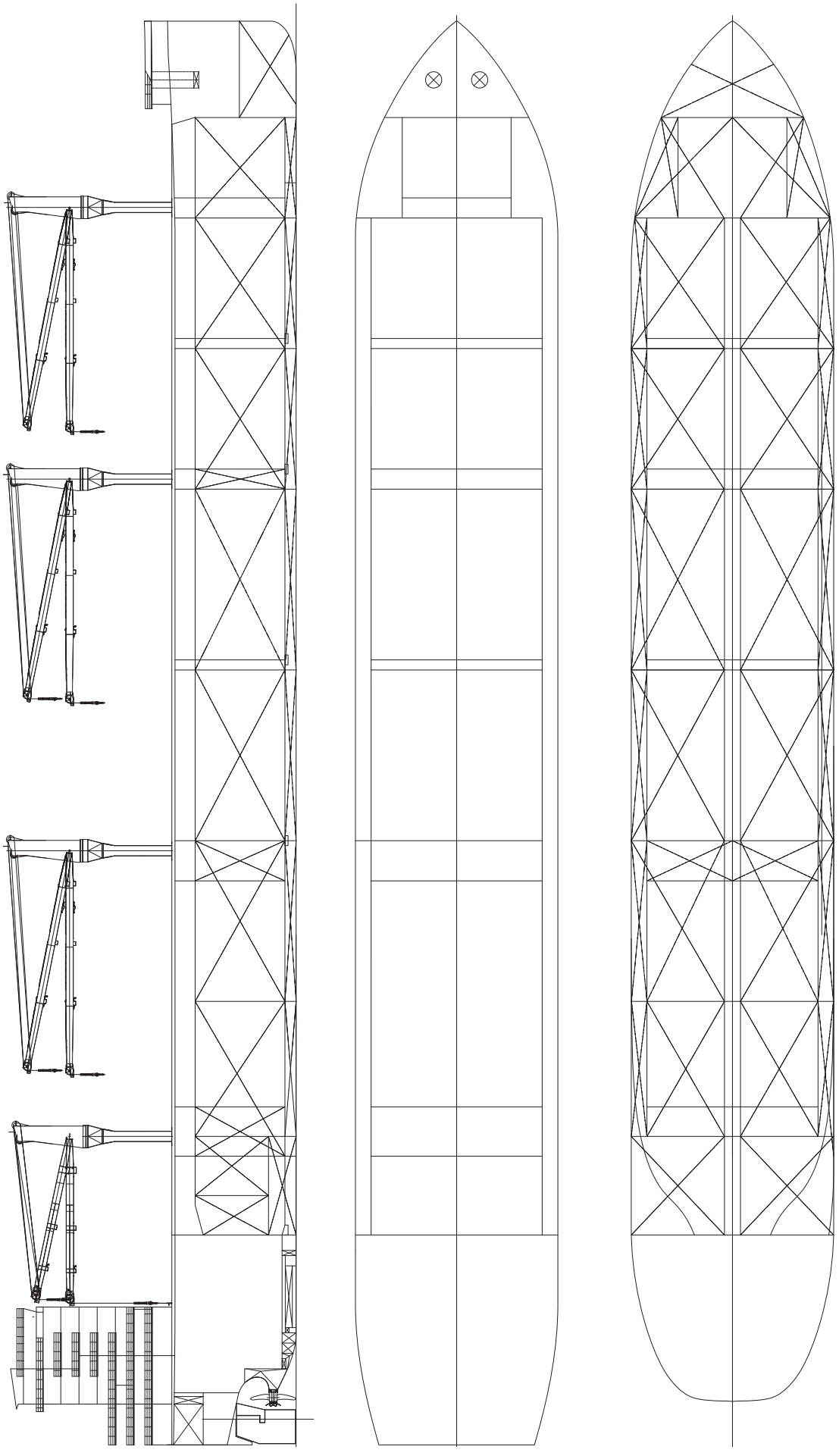
Navigation and other equipment
Bridge control system
Make: Furuno, TKC
Type: Furuno, TKC
Is bridge fitted for one-man operation?: N
Integrated bridge system: N
Radars
Number: 3
Make: JRC
Model(s): NDC-1590/NWZ-208

Fire detection system
Make: KEXUN
Type: K1302A
Fire extinguishing systems
Cargo holds: CO_2 fixed system
Make/Type: JiuJiang
Engine room: CO_2 fixed system
Make/Type: JiuJiang

Waste disposal plant
Sewage plant
Make: HanSun
Model: HanSun

Efficiency
Attained EEDI value: 3.75
Required EEDI value: 6.80 (Phase 3), 9.71 (base line)
Installed Fuel Meters: Mass flow, 27-28t/d HFO
Energy Saving Technologies: HVAF
Contract date: November 2021
Launch/float-out date: April 2023
Delivery date: July 2023

GREEN KEMI



GREGOS – CONTAINER SHIP

Shipbuilder:.....**Hyundai Mipo Dockyard Co., Ltd**
Vessel's name: .....***Gregos***
Owner/Operator: .....**Euroseas**
Country: .....**Greece**
Designer: ..**Hyundai Mipo Dockyard Co., Ltd**
Country: .....**Republic of Korea**
Flag:.....**Marshall Islands**
IMO number: **9955533**
Total number of sister ships already completed (excluding ship presented): **1**
Total number of sister ships still on order: **4**

Ordered originally in 2021 as one of a pair of 2,782TEU feeder container ships, *Gregos* was delivered in April 2023 to Greece-based Euroseas by Hyundai Mipo. Following its handover, the ship began a 36- to 40-month charter with Oman-based Asyad Lines at a reported daily rate of US$48,000.

Since then, the second vessel has been delivered and Euroseas has extended its order to six of the type, although there are some modifications to the new orders. The six ships along with three smaller 1,800TEU vessels are the first newbuildings in the Euroseas fleet and will reduce the average age significantly as some of the vessels in the 20-strong fleet date to the late 1990s.

Gregos is 185.97m in length and has a 35m beam and an 11m draught. Typical for feeder container ships it has superstructure and machinery all aft. Containers can be loaded 1,070 under deck and 1,712 on deck.

Euroseas describes the ships as eco feeders and claims that they are more than 40% more efficient than older similar sized vessels. *Gregos*'s attained EEDI of 9.94 against a required 16.67 means that the ship is EEDI Phase 3 compliant even though it is only required to meet Phase 2.

The propulsion system comprises a MAN B&W 6S60ME-C10.5-HPSCR main engine of 14,940kW output at 105rpm directly linked to a 7m fixed pitch propeller. Running at 91.1rpm, service speed is 18.5knots. NOx Tier III requirements are met by the high-pressure SCR system evident in the engine designation suffix.

The ship has cold ironing capability when in port and has been designed to be hybrid ready. Auxiliary power comes from three HiMSEN 7H25/33 gensets each producing 2,080kW.

TECHNICAL PARTICULARS

Length oa:.....185.97m
Length bp: 177.00m
Breadth moulded:.....35.00m
Depth moulded
to upper deck: 17.40m
Draught
scantling:.....11.00m
design: 8.50m
Gross:.....29,421t
Deadweight
scantling:.....39,000t
design: 25,000t
Speed, service:.....18.5knots
Bunkers (m^3)
Heavy oil:.....1,820
Diesel oil: 410
Water ballast (m^3):.....11,900
Daily fuel consumption (tonnes/day)
Main engine only:.....39.4 (42,700kjg/kg)

Classification society and notations:.....BV I, +HULL, +MACH. Container Ship, Tier III, SW-Registry, Unrestricted navigation, ESA, +VeriSTAR-HULL CM, CPS(WBT), ELECTRIC HYBRID PREPARED(PM), +AUT-UMS, MON-SHAFT, BWT, CLEANSHIP, GREEN PASSPORT, LASHING-WW, LI-LASHING, INWATERSURVEY, LI HG-S2

Propulsion
Main engine(s)
Design:.....Hyundai-MAN B&W diesel engine
Model: 6S60ME-C10.5-HPSCR
Manufacturer: ... HD Hyundai Heavy Industries Co., Ltd
Number:.....1 EA
Type of fuel: .....LFO, MGO
Output of each engine: ..14,940kW x 105rpm
Is this a diesel-electric or hybrid?:.....N
Propeller(s)
Material:.....Ni-Al-Bronze
Designer/Manufacturer:..... HMD/HD HHI-EMD
Number:.....1 EA
Fixed/Controllable pitch:.....Fixed
Diameter:.....7.0m
Speed:.....91.10rpm at MCR
Diesel-driven alternators
Number:.....3 EA
Engine make/type:.....HD Hyundai Heavy Industries / 7H25/33
Type of fuel: .....LFO, MGO
Alternator make/type:...HD Hyundai Electric / HFC7 638-08P
Output/speed of each set: .....2,080kW x 900rpm

Boilers
Number:.....1 EA
Type: .....Composite boiler
Make: ..... KangRim Heavy Industries Co., Ltd
Output, each boiler: .....2,000kg/h (Oil-fired side) / 1,400kg/h (exh. gas side of ME) / 300kg/h (exh. gas side of No.1 GE) / 300kg/h (exh. gas side of No.2 GE)
Bow thruster(s)
Make: .....KTE
Number:.....1
Output (each):....1,000kW AC 6,600V 3Ø 60Hz

Other cranes
Number:.....1
Make: .....Oriental
Type: SMC-040
Tasks: .....Monorail crane
Performance:..... Electric driven
Mooring equipment
Number:.....6
Make: .....Flutek
Type: .....Electro-hydraulic

Special lifesaving equipment
Number of each and capacity: ...1 x 25 persons
Maker:.....Viking Norsafe
Type: .....GES-21 MKI

Cargo/capacity
Hatch covers
Design:.....MacGregor
Manufacturer: .....MacGregor
Type: ..... Weather tight, pontoon type
Containers
Lengths: ..... 6,058mm/12,192mm(20ft/40ft)
Heights: ..... 2591mm/2896mm(8'6"/9'6")
Cell guides: .....150x150x12 E.A
Total TEU capacity:.....2,782TEU
On deck:.....1,712TEU
In holds: 1,070TEU
Doors/ramps/lifts/moveable car decks
Number of each:.....Number of lifts – 1ea / Number of doors – 113 (only accommodation part)
Ballast control system
Make: .....Scantec
Type: .....Hydraulic
Ballast water treatment system
Make: .....Alfa Laval
Capacity: .....500m^3/h (UV type)

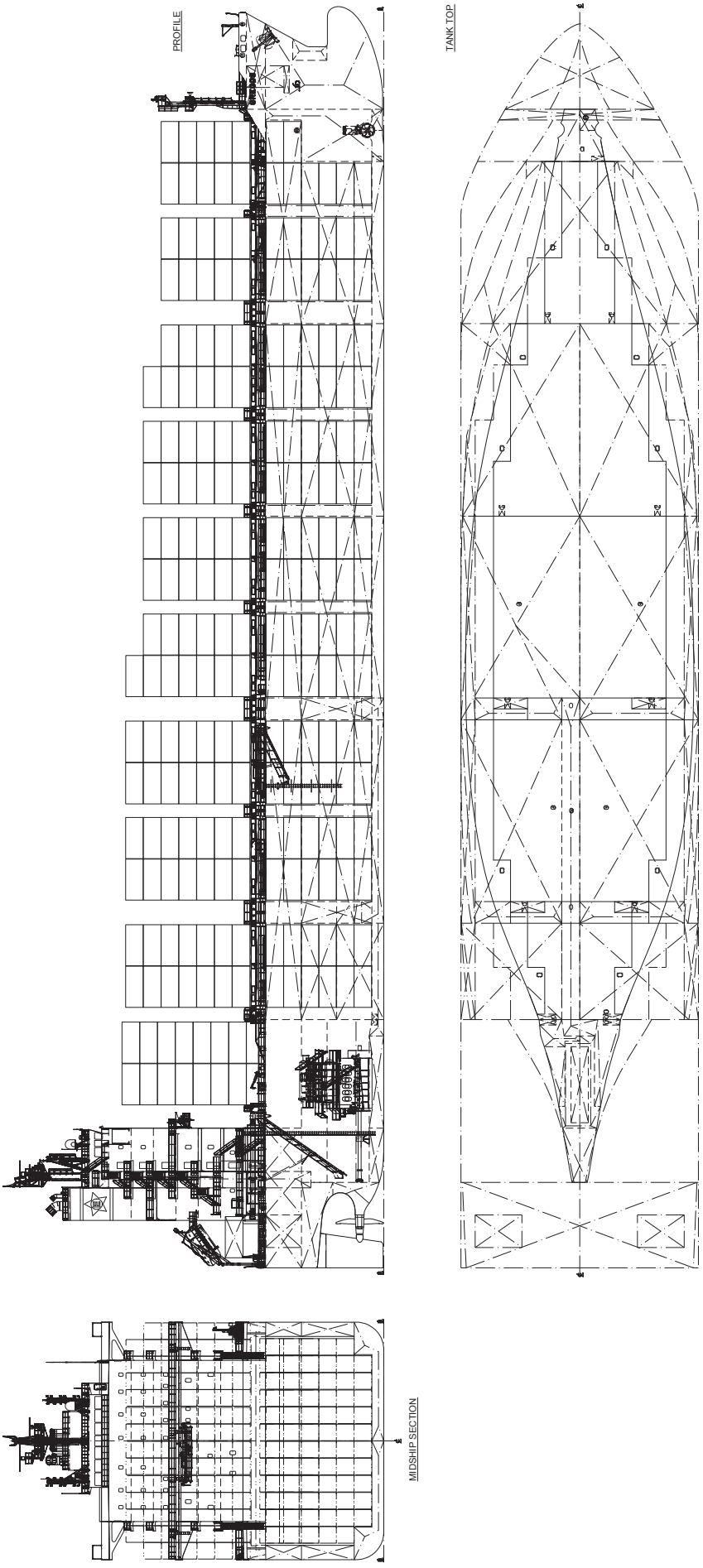
Complement
Officers:.....10
Crew:.....13
Suez/Repair Crew:.....6

Navigation and other equipment
Bridge control system
Make: ..... Hyundai Global Service
Type: .....One-man Bridge
Is bridge fitted for one-man operation?: ..... Y
Integrated bridge system:.....N
Radars
Number:.....2
Make: ..... Furuno
Model(s):.....FAR-2338S-NXT / FAR-2328

Fire detection system
Make: .....Autronica
Type: .....Autroprime 2
Fire extinguishing systems
Cargo holds:
Make/Type:.....Fain/high pressure CO_2
Engine room:
Make/Type:.....Fain/high pressure CO_2

Waste disposal plant
Incinerator
Make: .....Hyundai Marine Machinery
Model: .....MAXI NG50SL WS
Sewage plant
Make: .....Jonghap Machinery
Model: .....JMC – BIO AEROB – 12N(A)

Efficiency
Attained EEDI value:.....9.94 g/ton-nm
Required EEDI value: ...16.67 g/ton-nm (Phase 2)
Contract date: .....June 2021
Delivery date:.....April 2023


PROFILE
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MIDSHIP SECTION

HAFEET – VERY LARGE CRUDE CARRIER

Shipbuilder: **Hanwha Ocean**
Vessel's name: ***Hafeet***
Owner/Operator: **Abu Dhabi Marine Operations and Services Company LLC (trading as ADNOC Logistics & Services)**
Country: **United Arab Emirates**
Designer: **Hanwha Ocean**
Country: **Republic of Korea**
Flag: **Liberia**
IMO number: **9928009**
Total number of sister ships already completed (excluding ship presented): **3**
Total number of sister ships still on order: **Nil**

In June 2023, UAE state-owned operator ADNOC Logistics & Services (L&S) took delivery of the first of four LNG dual-fuel VLCCs to be delivered by Hanwha Ocean. The series of vessels is part of ADNOC L&S's smart growth strategy and US$2 billion commitment to building more environmentally efficient vessels.

The vessel's dimension and tonnages include an overall length of 336m, a beam of 60m and a deadweight of 299,425tonnes. The basic design of the ship is a staple of Hanwha Ocean's predecessor DSME but has been brought up to date with the choice of a dual-fuel propulsion system intended to run mostly on LNG. *Hafeet*'s dual-fuel ability is evidenced by the two cylindrical LNG fuel tanks mounted on deck above Tank 5. The fuel gas supply system room is housed on deck aft of the tanks and just forward of the superstructure.

The cargo capacity of 340,803.9m^3 is spread over 15 tanks – five sets of port, centre and starboard and two slop tanks. Pumping is performed by three Shinko reciprocating pumps of 5,500m^3 per hour capacity and one 400m^3/h stripping pump.

The main engine is a Hyundai-built MAN B&W 7G80ME-C10.5-GI diesel unit with a power output of 22,210kW at 64.3rpm. The engine is directly connected to a 10.6m diameter fixed-pitch propeller to give a service speed of 14.8knots at 74.7% MCR. The engine is fitted with a 1,500kW output shaft generator. Auxiliary power is provided by three 1,250kW gensets.

When running on LNG the ship meets SOx rules and for Tier III NOx compliance low pressure selective catalytic reduction is used on the main engines and auxiliaries.

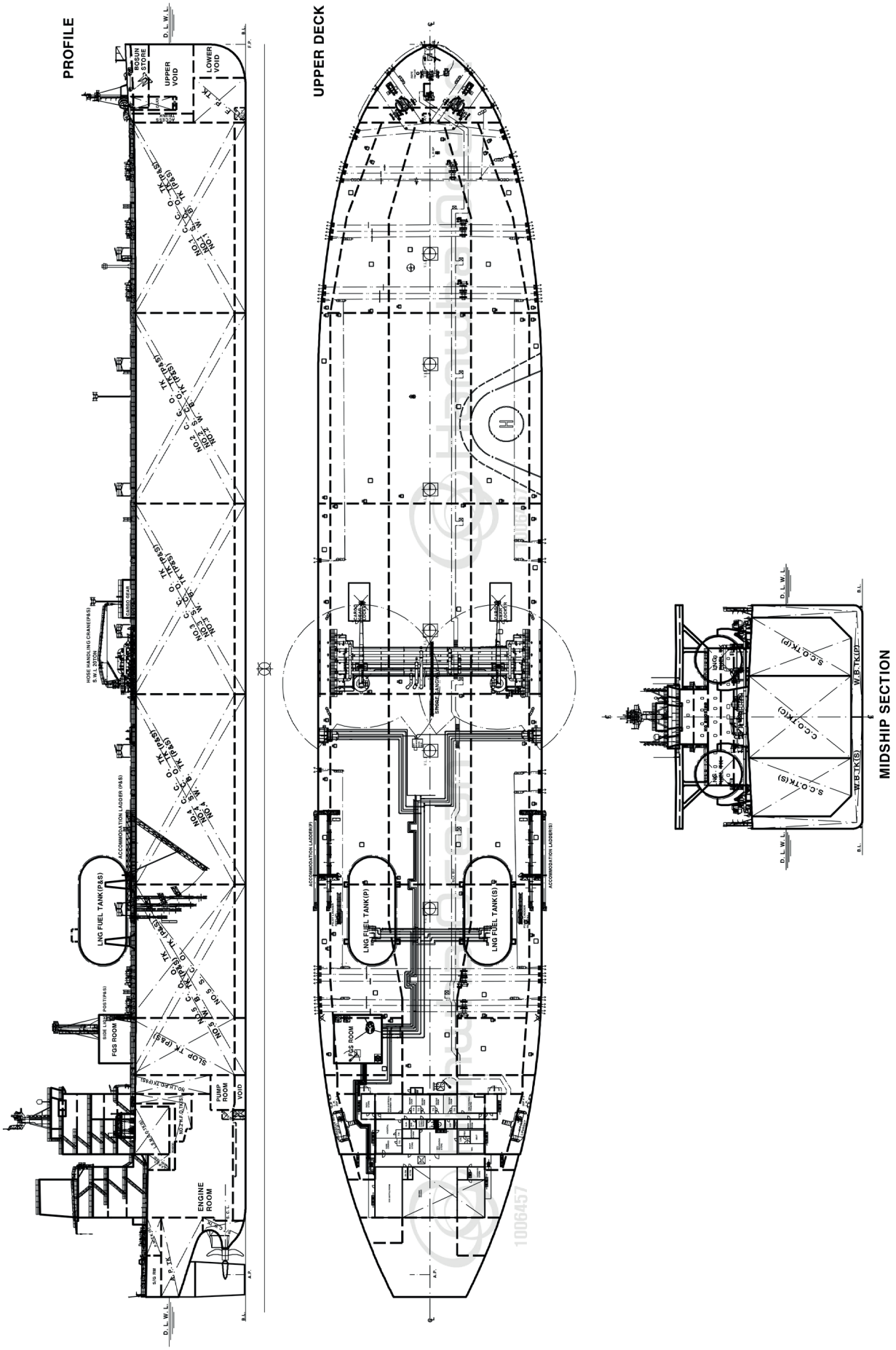
TECHNICAL PARTICULARS

Length oa: 336.00m
Length bp: 330.00m
Breadth moulded: 60.00m
Depth moulded: 29.50m
Draught
  scantling: 21.70m
  design: 20.50m
Gross: 156,673t
Displacement: 322,735t at design draught
Lightweight: 44,584t
Deadweight
  scantling: 344,009t
  design: 322,735t
Speed, service (74.7%MCR output): 14.8knots
Cargo capacity (m^3)
  Liquid volume: 340,803.9
Bunkers (m^3)
  Heavy oil: 5,232.4 (HFO)
  Diesel oil: 1,032.1 (LSMGO)
Water ballast (m^3): 93,143.1
Classification society and notations: LR +100A1 Double Hull Oil Tanker, ESP, CSR, ShipRight(CM, ACS(B, C)), LI, +LMC, UMS, ECO(P, VECS-L#3), *IWS, IGS, DSPM4, NAV1 with the descriptive notes of ShipRight (SCM, IHM-*EU, BWMP(T), SERS#2), COW(LR), LFPF(GF, NG) , *BWTS, *EGCN(SCR)

Propulsion
Main engine(s)
  Model: MAN B&W 7G80ME-C10.5-GI
  Manufacturer: HSD Engine
  Number: 1 set
  Type of fuel: HFO, LSMGO and FG
  Output of each engine: 22,210kW x 64.3rpm
  Is this a diesel-electric or hybrid?: N
Propeller(s)
  Material: Ni-Al-Bronze
  Designer/Manufacturer: HD Hyundai Heavy Industries Co., Ltd
  Number: 1
  Fixed/Controllable pitch: Fixed
  Diameter: 10.6m
  Speed: 22,210kW at propeller speed of 64.3rpm (MCR)
Main-engine driven alternators
  Number: 1
  Make/type: C&A / three-phase induction type generator
  Output/speed of each set: 1,500kW
Diesel-driven alternators
  Number: 3
  Engine make/type: HD Hyundai Heavy Industries Co., Ltd / vertical in-line, 4-cycle, direct injection, single acting, trunk piston type
  Type of fuel: HFO, LSMGO
  Alternator make/type: Taiyo Electric / synchronous type
  Output/speed of each set: 1,250kW
Exhaust-gas scrubbing equipment
  Manufacturer: HSD Engine / HD Hyundai Heavy Industries Co., Ltd
  Type: LP SCR / LP SCR
  On main engines?: No
  On auxiliary engines?: No
Boilers
  Number: 2
  Type: Vertical, dual fuel
  Make: Alfa Laval
  Output, each boiler: 45,000kg/h
Deck machinery
Cargo cranes/cargo gear
  Number: 2
  Make: Oriental
  Type: Electro-hydraulic
  Performance: SWL 20t
Other cranes
  Number: 2
  Make: Oriental
  Type: Electro-hydraulic
  Tasks: Provision crane
  Performance: SWL 10t (port), SWL 3t (starboard)
Mooring equipment
  Number: 11
  Make: Flutek
  Type: Hydraulic
Special lifesaving equipment
  Number of each and capacity: 2 sets - 40 persons
  Make: Viking Norsafe
  Type: Totally enclosed davit launching type
Cargo tanks
  Number: 15
  Grades of cargo carried: Crude oil
Cargo pumps
  Number: 3 x Cargo pumps, 1 x cargo stripping pump
  Type: Reciprocating (cargo pump), Centrifugal (cargo stripping pump)
  Make: Shinko Ind., Ltd
  Stainless steel: Impeller shaft
  Capacity (each): 5,500m^3/h x 150mth (cargo pump), 400m^3/h x 150mth (cargo stripping pump)
Cargo control system
  Make: KSB Seil
  Type: Conventional type
Ballast control system
  Make: KSB Seil
  Type: Conventional type
Ballast water treatment system
  Make: Techcross
  Capacity: 6,000m^3/h (3,000m^3/h x 2)
Complement
  Officers: 15
  Crew: 15
  Suez/Repair Crew: 6
Navigation and other equipment
Bridge control system
  Make: Kongsberg Maritime
  Type: AutoChief 600
  Is bridge fitted for one-man operation: Y
  Integrated bridge system: N
Radars
  Number: 2 (S-Band, X-Band)
  Make: JRC
  Model(s): JMR-9282-S(S-Band), JMR-9225-6X(X-Band)
Fire detection system
  Make: B-I Industrial Co., Ltd
  Type: BDS-4000
Fire extinguishing systems
  Cargo holds: (Cargo deck area) deck foam system, SW hydrant
  Make/Type: NK (deck foam system)
Engine room: SW hydrant, high pressure CO_2
  Make/Type: NK (high pressure CO_2 system)
Cabins: SW hydrant
  Make/Type: NK
Waste disposal plant
Waste compactor
  Make: Samjoo Eng. Co., Ltd
  Model: SYCOM-100
Waste shredder/crusher
  Make: Samjoo Eng. Co., Ltd
  Model: BS510A
Sewage plant
  Make: Il Seung Co., Ltd
  Model: ISB-03

Efficiency
Attained EEDI value: 1.78 g/ton-mile
Required EEDI value: 2.07 g/ton-mile
Energy Saving Technologies: Duct / long cap and full spade rudder with bulb; shaft generator, LNG-fuelled ship
Performance Monitoring Regime: Ship performance monitoring system

Contract date: 30 November 2020
Launch/float-out date: 29 October 2022
Delivery date: 31 May 2023


PROFILE
UPPER DECK
MIDSHIP SECTION
LNG FUEL TANK(P&S)
LNG FUEL TANK(P)
LNG FUEL TANK(S)
ENGINE ROOM
PUMP ROOM
VOID
FGS ROOM
UPPER VOID
LOWER VOID
D. L. W. L.
B.L.
A.P.
F.P.
S.C.O.TK(P)
C.C.O.TK(C)
S.C.O.TK(S)
W.B.T.K(P)
W.B.T.K(S)

HAFNIA LANGUEDOC – CHEMICAL/PRODUCT TANKER

Shipbuilder:	**Guangzhou Shipyard International Co., Ltd**
Vessel's name:	***Hafnia Languedoc***
Owner/Operator:	**VISTA**
Country:	**Singapore**
Flag:	**Singapore**
IMO number:	**9941685**
Total number of sister ships already completed (excluding ship presented):	**5**
Total number of sister ships still on order:	**1**

One of four dual-fuel LR2 product tankers to be owned by a joint venture of Hafnia and CSSC, the 109,999dwt *Hafnia Languedoc* was delivered by Guangzhou Shipyard International in March 2023. *Hafnia Languedoc* and one of the other sisters will operate on charter to Total and the other two will operate for Equinor.

At 249.9m in length, 44m in beam and with a draught of 14.5m, the ship falls in the middle of the range for typical LR2 tankers. What marks the vessel as something different are the two IMO C Type LNG tanks mounted on deck just forward of the superstructure. The fuel gas handling room is sited between the two tanks. Total LNG fuel capacity is 3,600m^3 which confers a sailing range of around 13,500nm at 13.5knots.

The main engine is a 6G60ME-C10.5-GI-HPSCR unit with a power output of 11,494kW at 77rpm. Intended to run mostly on LNG the ship easily meets SOx regulations and the NOx requirements are met by the use of high pressure SCR.

The high-pressure dual-fuel engine incorporates a flexible design that not only ensures close to zero methane slip but also makes them adaptable to ammonia or methanol. The fuel gas supply system has full redundancy on all supply systems and can handle boil-off gas from the LNG tanks under any condition.

Auxiliary engines are a trio of 7L28/32DF medium-speed engines each producing 1,400kW at 720rpm. The DF designation indicates that these engines can also run on LNG as can three boilers.

The cargo arrangements are a typical set up for such a vessel with six pairs of tanks for crude or products, one pair of slop tanks and a residual tank. Pumping is provided by three vertical, centrifugal steam turbine driven each capable of moving 3,000m^3/h.

TECHNICAL PARTICULARS

Length oa: 249.90m
Length bp: 245.40m
Breadth moulded: 44.00m
Depth moulded
  to main deck: 21.10m
  to upper deck: 21.10m
Width of double skin
  side: 2.30m
  bottom: 2.30m
Draught
  summer: 14.558m
  design: 13.50m
Displacement: 130,181.2t (summer draught) / 119,490t (design draught)
Lightweight: 20,182.2t
Deadweight
  design: 109,999t
Speed, service: (CSR output): 14.45knots with 15% sea margin
Cargo capacity (m^3)
  Liquid volume: 132,758.5
Bunkers (m^3)
  LNG: 3,600
  Diesel oil: HFO: 1,571.5 / MGO: 527.1
Water ballast (m^3): 36,743.7
Tankers – percentage segregated ballast: 100%
Daily fuel consumption (tonnes/day)
  Main engine only: SFOC 157.5g/kWh

Classification society and notations: DNV +1A Tanker for oil ESP, COAT-PSPC(B,C), CSR, EO,NAUT(NAV), TMON(oil lubricated), BIS, Clean, VCS(2), BWM(T),Crane*,SPM,Recyclable, LCS, Shaft align(1),Gas fuelled LNG, CMON
Crane*: applied for cargo hose handling crane only.
For Emergency Response Service (ERS): The necessary documents made by the Builder to be prepared to the Buyer, the Buyer is responsible for registering and obtaining Emergency Response Service.

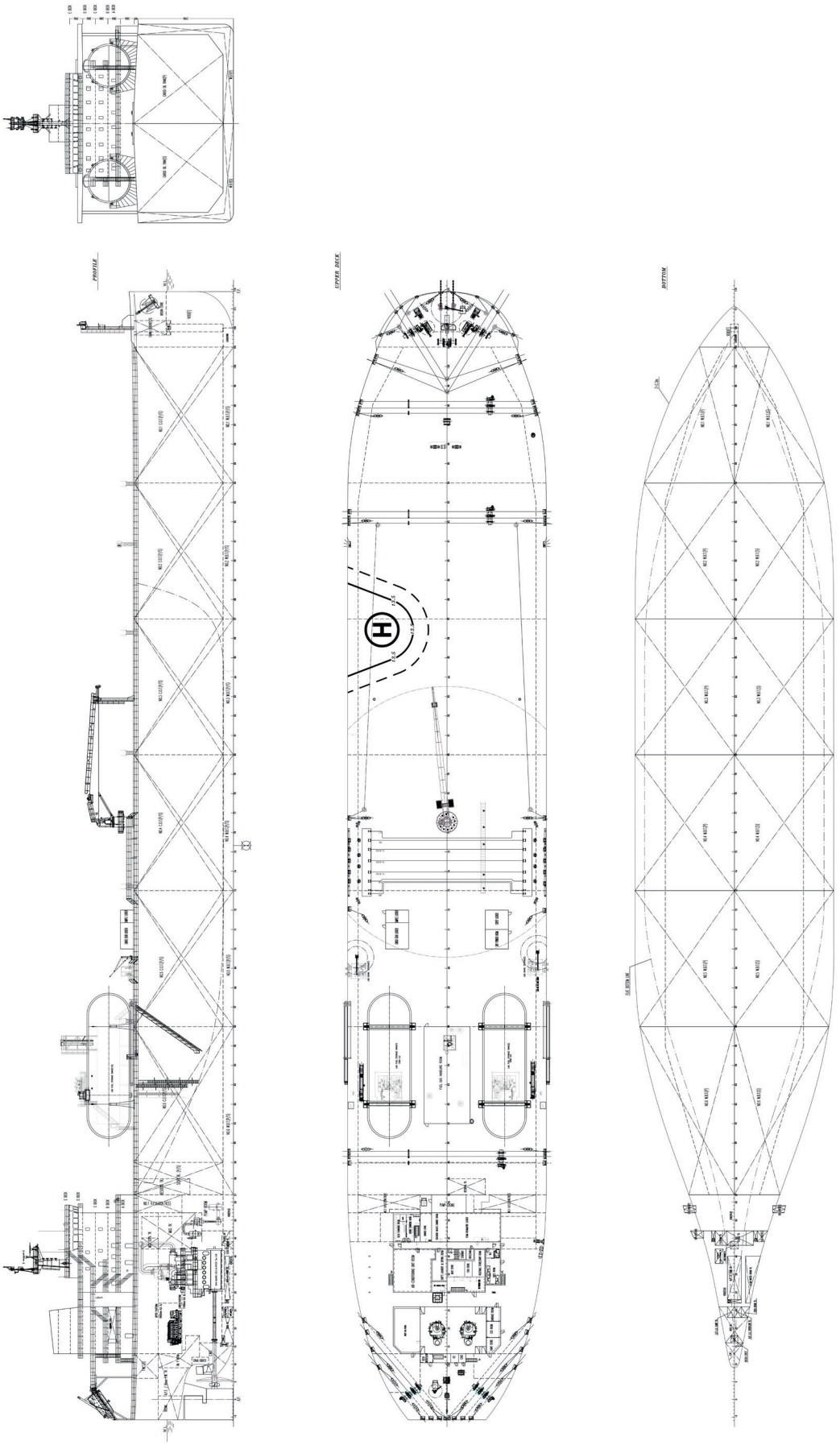
Propulsion
Main engine(s)
  Design: CSE
  Model: 6G60ME-C10.5-GI-HPSCR (Tier II/III)
  Number: 1
  Type of fuel: HFO, MGO & LNG
  Output of each engine: SMCR 11,494kW x 77rpm
Propeller(s)
  Material: Ni-Al-Bronze
  Number: 4
  Fixed/Controllable pitch: Fixed
  Diameter: 8.1m
  Speed: 77rpm
Main-engine driven alternators
  Number: 3
  Type: 3x 7L28/32DF
  Output/speed of each set: 1,400kW x 720rpm
Boilers
  Number: 3
  Type: HFO, MGO & LNG
  Output, each boiler: Fuel mode 2,500kg/h, Gas mode 2,500kg/h
Deck machinery
Cargo cranes/cargo gear
  Number: 1
  Type: Electro-hydraulically driven
  Performance: 4t, outreach 4m beyond max. beam of the vessel P/S
Other cranes: Engine room crane
  Number: 1
  Type: 4t engine room crane
  Performance: 4t SWL
Mooring equipment
  Number: 2 x windlasses, 5 x winches, 1 x SPM winch
  Type: Driven by high hydraulic power station
Special lifesaving equipment
  Number of each and capacity: Single arm rescue boat/raft davit and YH4.5R FRP rescue boat
Cargo tanks
  Number: 15 - 6 pairs of COT, 1 pair of SLOP, 1 Res, 1 dual
  Grades of cargo carried: Crude oil and product oil
Cargo pumps
  Number: 3
  Type: Vertical, centrifugal type, steam turbine driven, with vacuum self-priming
  Stainless steel: Cargo pump casing shall be ductile cast iron, impeller shall be stainless steel material
  Capacity (each): 3000m^3/h x 125mlc
Cargo control system
  Type: Electro-hydraulic
Ballast control system
  Type: Electro-hydraulic
Ballast water treatment system
  Capacity: 2 sets, each 2,000m^3/h, totally 4,000m^3/h for segregated ballast water in cargo area; 1 set 300m^3/h for aft peak tank in engine room
Complement
  Officers: 12
  Crew: 16
  Suez/Repair Crew: 6
Navigation and other equipment
Radars
  Number: 1
  Model(s): JMR-9225-9X,JMR-9282-S

Fire detection system
  Type: Salwico Cargo
Fire extinguishing systems
Engine room: Foam firefighting system
  Type: Foam liquid
Cabins: Fixed water system
  Type: Fixed water system
Public spaces: Fixed water system
  Type: Fixed water system

Waste disposal plant
Incinerator
  Model: TITAN X910 SL WS
Waste compactor
  Model: DZ08T08-5 Marine
Sewage plant
  Model: STD-2 marine sewage treatment unit

Contract date: 21 August 2020
Launch/float-out date: 10 September 2022
Delivery date: 16 March 2023

HAFNIA LANGUEDOC



JASMINE LEADER – VEHICLE CARRIER

Shipbuilder: **China Merchants Jinling Shipyard (Nanjing) Co. Ltd**
Vessel's name: ***Jasmine Leader***
Owner/Operator: **Hoshinoyume Maritima S.A**
Country: **Japan**
Designer: **Shanghai Merchant Ship Design and Research Institute (SDARI)**
Country: **China**
Model test establishment used: **Akishima Laboratories (Mitsui Zosen) Inc**
Flag: **Liberia**
IMO number: **9925368**
Total number of sister ships already completed (excluding ship presented): **3**
Total number of sister ships still on order: **Nil**

Jasmine Leader was delivered in January 2023 by China Merchants Jinling Shipyard (Nanjing) to Nippon Yusen Kaisha (NYK). It is the first of the four LNG-fuelled PCTCs ordered by NYK and is part of the company's plan to replace its existing fleet with 40 new LNG-fuelled PCTCs over the next decade. At delivery, *Jasmine Leader* was said to be the world's largest LNG-fuelled, battery hybrid car carrier.

The SDARI designed vessel has a loa of 199.9m, a beam of 38.0m, a gross tonnage of 71,850 and capacity for 7,050 vehicles over 12 decks, four of which are hoistable. The beam of 6m above the old Panama maximum provides for enhanced cargo capacity and additional space for two large type C LNG fuel tanks of 2,000m^3 each.

Access to the vehicle decks is through a starboard stern quarter ramp. Although capacity is quoted for cars, *Jasmine Leader* is designed for worldwide service to carry cars, buses, vans as well as dangerous goods and freight containers loaded on MAFI trailers.

Outwardly the ship follows convention PCTC lines but it is its efficiency and power system that confers significance. At the heart of *Jasmine Leader*'s power system is a WinGD 7X62DF-2.1 two-stroke main engine operating on the Otto low pressure cycle. It is rated at 15,400kW at 99rpm and connected directly to a 7m diameter fixed pitch propeller to give a service speed at 83% MCR of 19.5knots.

The ship is further significant in that it is the first to make use of WinGD's X-DF2.0 iCER technology. This is designed to cool and recirculate part of the exhaust gas through a low-pressure path in gas mode. The iCER configuration is claimed to reduce methane slip – more prevalent in Otto engines than those using the diesel cycle – by up to 50%. Auxiliary power is provided by a trio of HiMSEN H22CDF gensets each rated at 1,500kW at 900rpm.

The ship also features a Nishishiba 1,240kW in-line shaft generator, a 570kWh energy storage system recharged using peak shaving when at sea, DC links and bow thruster drives. The vessel has an attained EEDI rating of 12.7 against a required 15.9 due to it using LNG as fuel and its optimised hull form.

TECHNICAL PARTICULARS

Length oa: 199.90m
Length bp: 195.60m
Breadth moulded: 38.00m
Depth moulded to main deck: 15.50m

Draught
scantling: 10.10m
design: 8.60m

Gross: 71,850t
Deadweight
scantling: 19,360t

Speed, service (83%MCR output): 19.5knots

Bunkers (m^3)
Diesel oil: 2,000
LNG: 4,000
Water ballast (m^3): 6,700

Classification society and notations: DNV +1A, Car Carrier, Gas fuelled LNG, MCDK, EO, NAUT(OC), BIS, BWM(T), DG(P), COAT-PSPC(B), LCS, Recyclable, TMON(Oil Lubricated), ER(Tier III), Battery(Safety)

Propulsion
Main engine(s)
Design: WinGD
Model: 7X62DF-2.1 with iCER system
Manufacturer: CSSC-MES
Number: 1
Type of fuel: LNG / MGO
Output of each engine: 15,400kW x 99rpm
Is this a diesel-electric or hybrid?: Y

Propeller(s)
Material: Ni-Al-Bronze
Designer/Manufacturer: Nakashima
Number: 1
Fixed/Controllable pitch: Fixed
Diameter: 7m

Diesel-driven alternators
Number: 3
Engine make/type: Hyundai / H22CDF
Type of fuel: LNG, MGO
Alternator make/type: Hyundai
Output/speed of each set: 1,500kW x 900rpm

Boilers
Number: 1
Type: MC-30D
Make: CSSC Jiujiang Boiler Co., Ltd
Output, each boiler: 1,200kg/h

Bow thruster(s)
Make: Nakashima
Number: 1
Output (each): 1,800kW

Deck machinery
Mooring equipment
Number: Nippon Pusnes Co., Ltd
Type: electric

Special lifesaving equipment
Number of each and capacity: 30 persons
Make: Viking
Type: Free-fall lifeboat

Vehicles
Number of vehicle decks (fixed/moveable): 12 (8/4)
Total cars: 7,050
Doors/ramps/lifts/moveable car decks
Number of each: 1 x stern ramp, 1 x side ramp
Type: Electric
Designer: MacGregor

Ballast control system
Make: Alfa Laval
Type: Filtration + UV
Ballast water treatment system
Make: Alfa Laval
Capacity: 500m^3/h

Complement
Officers: 10
Crew: 20

Supernumaries/Spare:
Suez/Repair Crew: 6

Navigation and other equipment
Bridge control system
Make: JRC
Is bridge fitted for one-man operation?: Y
Integrated bridge system: Y
If yes, make: JRC

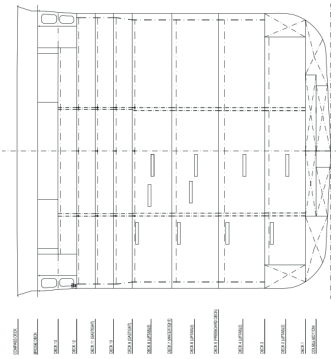
Radars
Number: 2
Make: JRC
Model(s): JMR

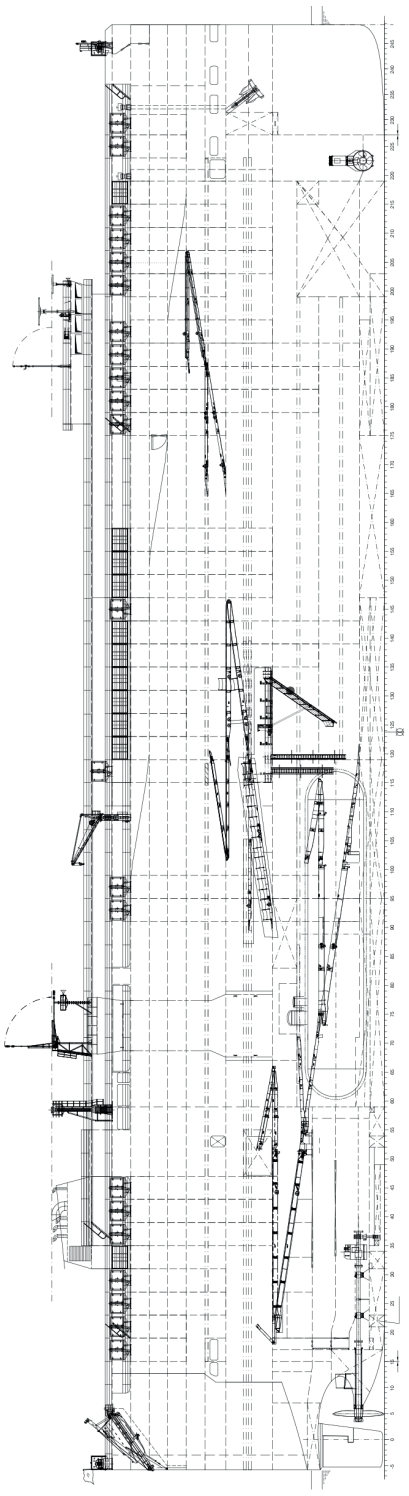
Fire detection system
Make: Autronica
Fire extinguishing systems
Engine room: CO_2, sea water
Make/Type: LP-CO_2, water hydrants, portable extinguishers, local mist
Vehicle spaces: CO_2, sea water
Make/Type: LP-CO_2, water hydrants, portable extinguishers
Cabins: Sea water
Make/Type: Water hydrants, portable extinguishers
Public spaces: Sea water
Make/Type: Water hydrants, portable extinguishers

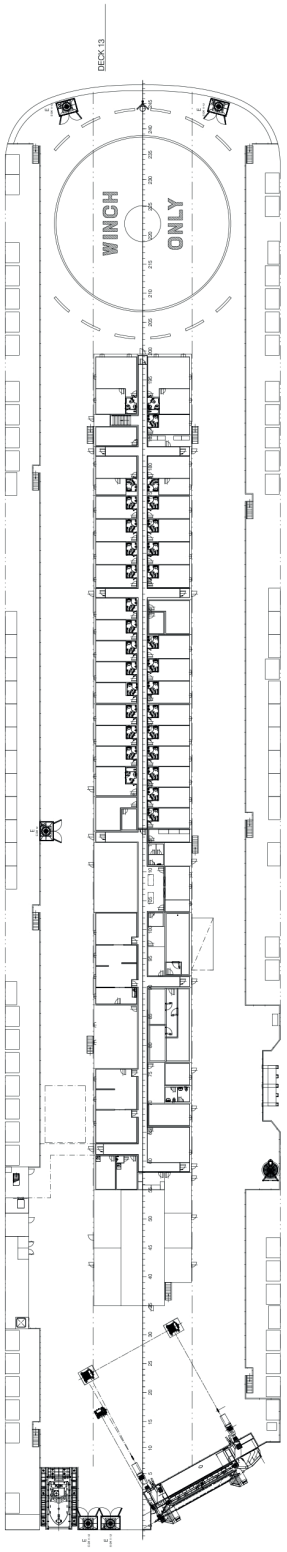
Efficiency
Attained EEDI value: 12.7g-CO_2/(ton-nm)
Required EEDI value: 15.9 g-CO_2/(ton-nm) (at Phase 2)
Energy Saving Technologies: Eco stator, eco cap, twist rudder

Contract date: October 2020
Launch/float-out date: July 2022
Delivery date: January 2023

JASMINE LEADER







LAURA MAERSK – CONTAINER SHIP

Shipbuilder: **Hyundai Mipo Dockyard Co., Ltd**
Vessel's name: ***Laura Maersk***
Owner/Operator: **AP Moller Maersk**
Country: **Denmark**
Designer: **Hyundai Mipo Dockyard Co., Ltd**
Country: **Republic of Korea**
Flag: **Denmark**
IMO number: **9944546**
Total number of sister ships already completed (excluding ship presented): **Nil**
Total number of sister ships still on order: **Nil**

One of the most talked about vessels of 2023, the *Laura Maersk* is the world's first methanol-enabled container vessel. Built by Hyundai Mipo for AP Moller Maersk, the ship was handed over in July 2023. However, it was two months later when the name was revealed as *Laura Maersk* by EU Commission President Ursula von der Leyen at a ceremony in Copenhagen.

As with most of the alternative fuel container carriers, there is little in the outward appearance of the vessel to highlight its significance. Although in *Laura Maersk*'s case the slogan 'All the Way to Zero' is emblazoned along the hull and across the breakwater behind the focsle.

With a capacity of 2,136TEU (1,310TEU on deck and 826TEU under deck), *Laura Maersk* is a typical modern feeder container ship. Hull dimensions are a loa of 172.06m, beam of 32.2m and draught of 11m. All machinery and accommodation is aft.

The vessel's significance comes in the choice of fuel. Methanol is now being used in many ship types and the owner has committed to a series of 18 much larger 16,000TEU methanol burning ships the first of which was delivered in January 2024.

Laura Maersk's main engine is a Hyundai-built MAN B&W 6G50ME-C 9.6-LGIM unit of 10,320kW output at 100rpm. This drives a 6.7m fixed pitch propeller to give a service speed of around 17.4knots.

Auxiliary power comes from a trio of HiMSEN engines; two are H32DF-LM units and the other is a smaller 6H21M model. These are also capable of running on methanol and mark the South Korean engine makers first foray into methanol fuel operation.

Once the long-term supplier of green methanol in Denmark begins production of e-methanol in the second half of 2024 and supplying the vessel, the *Laura Maersk* is expected to achieve a 95% reduction of greenhouse gas emissions, as measured on a well-to-wake basis.

TECHNICAL PARTICULARS

Length oa: 172.06m
Length bp: 167.335m
Breadth moulded: 32.20m
Depth moulded
to upper deck: 16.80m
to other decks: 18.50m
Draught
scantling: 11.00m
design: 8.50m
Gross: 27,958t
Deadweight
scantling: 32,600t
design: 20,500t
Speed, service: 17.4knots
Bunkers (m^3)
Heavy oil: 1,800
Diesel oil: 250
Water ballast (m^3): 10,300
Daily fuel consumption (tonnes/day): Diesel Mode
Main engine only: 38.0t/d (42,700kjg/kg)

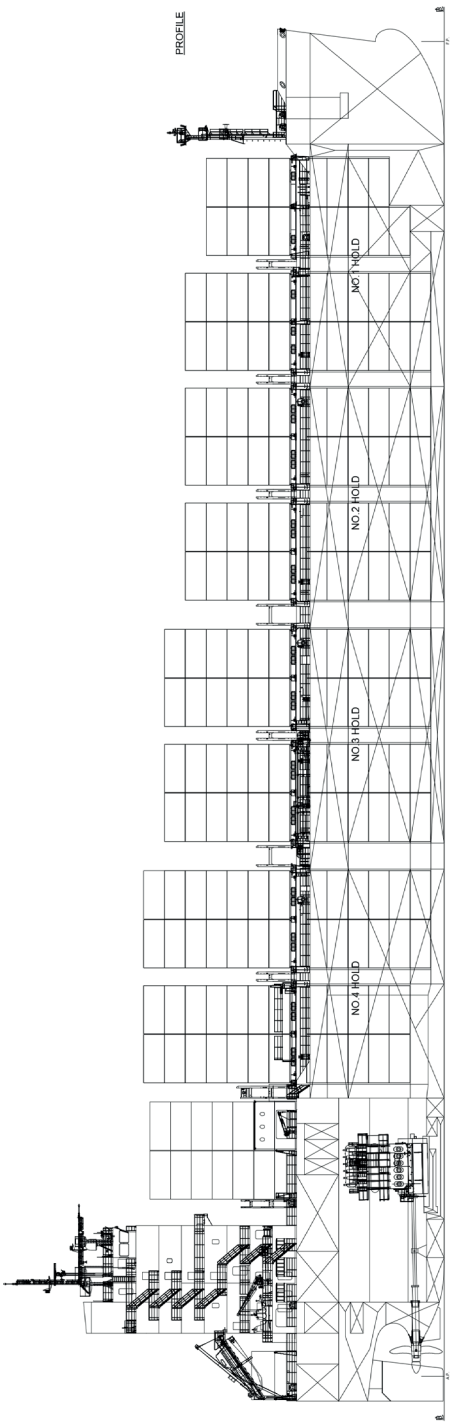
Classification society and notations: ABS +A(E), Container Carrier, +AMS, +ACCU, RW, SH, SHCM, IHM, CPS, BWT, TCM, ESA, NIBS, UWILD, RRDA, POT, FOC, CRC(SP), SLAM-B, SLAM-S, Ice Class 1A, LFFS(DFD-Methanol), HVSC, SElev

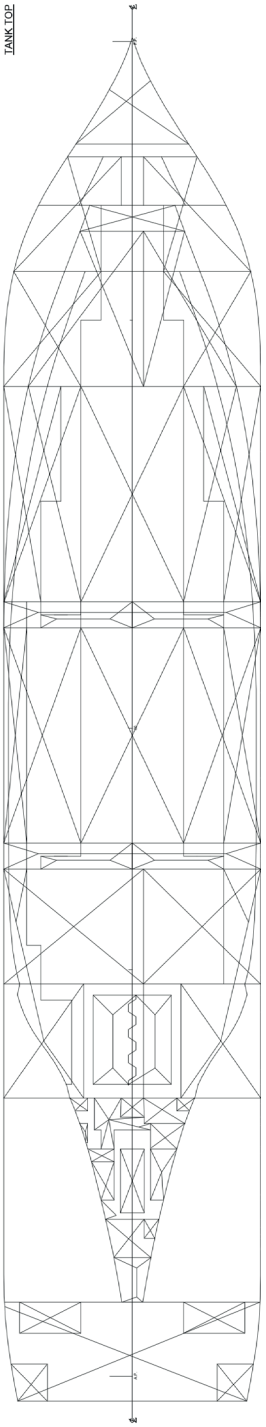
Propulsion
Main engine(s)
Design: Electronically controlled 2-stroke, direct reversible, crosshead type diesel engine
Model: Hyundai-MAN B&W 6G50ME-C 9.6-LGIM
Manufacturer: HD Hyundai Heavy Industries Co., Ltd
Number: 1
Type of fuel: Methanol, LFO, MGO, MDO & Biofuel
Output of each engine: 10,320kW x 100rpm
Is this a diesel-electric or hybrid?: N
Propeller(s)
Material: Ni-Al-Bronze
Designer/Manufacturer: HMD/HHI-EMD
Number: 1 EA
Fixed/Controllable pitch: Fixed
Diameter: 6.7m
Speed: 100rpm at MCR
Diesel-driven alternators
Number: 3
Engine make/type: HD Hyundai Heavy Industries Co., Ltd / 2 x 6H32DF-LM, 1 x 6H21M
Type of fuel: LFO, MGO, MDO, biofuel & methanol
Output/speed of each set: 2 x 2,820kW, 1 x 1,240kW
Boilers
Number: 3
Type: 1 x aux. boiler, 1 x M/E exh. gas boiler, 1 x D/G exh. gas economiser
Make: Alfa Laval
Output, each boiler: 2,000kg/h, 550kg/h, 400kg/h
Stern appendages/special rudders: Skeg / full-spade
Bow thruster(s)
Make: Kawasaki
Number: 1
Output (each): 1,200kW
Other cranes
Number: 1
Make: Oriental
Type: Electric driven, monorail crane
Tasks: Provision crane
Performance: SWL 4.0t, outreach from max. breadth 4m
Mooring equipment
Number: 10
Make: Kongsberg
Type: Electric type
Special lifesaving equipment
Number of each and capacity: 1 x 34 persons
Make: HLB
Type: Free-fall type lifeboat
Cargo/capacity
Hatch covers
Design: Weather-tight
Manufacturer: MacGregor
Type (upper deck/other decks): Pontoon
Containers
Lengths: 6,058mm/12,192mm/13,716mm
Heights: 2,591mm/2,896mm
Total TEU capacity: 2,136TEU
On deck: 1,310TEU
In holds: 826TEU
Tiers/rows (maximum)
On deck: 05/13
In holds: 06/11
Ballast water treatment system
Make: DESMI
Capacity: 1,000m^3/h
Complement
Officers: 12
Crew: 16
Navigation and other equipment
Bridge control system
Make: Hyundai Global Service
Type: One-man Bridge
Is bridge fitted for one-man operation?: Y
Integrated bridge system: Y
If yes, make: JRC
Model: JRD-9201
Radars
Number: 2
Make: JRC
Model(s): JMR-9282-S/JMR-9296-6X

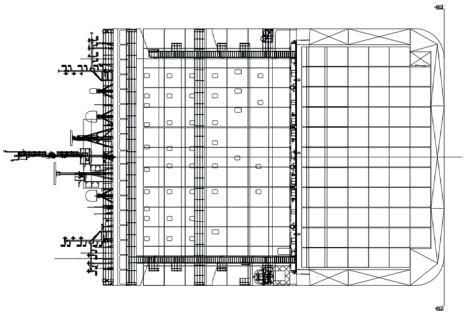
Fire detection system
Make: Consilium
Type: Salwico Cargo
Fire extinguishing systems
Cargo holds: CO_2 fire extinguishing system
Make/Type: Fain/high pressure, fixed
Engine room: CO_2 fire extinguishing system
Local firefighting system
Deck foam fire extinguishing system
Make/Type: Fain/high pressure, fixed
Fain/water mist
Fain/foam & water nozzle, fixed
Cabins: Fire extinguisher
Make/Type: Fain/portable
Public spaces: Fire extinguisher
Make/Type: Fain/portable

Sewage plant
Make: Evac
Model: Evac Eco Treat 5C
Efficiency
Attained EEDI value: 10.79 g/ton-nm
Required EEDI value: 17.26 g/ton-nm(Phase 2)
Installed Fuel Meters: 5 x Coriolis type for M/E, G/E, G/E MGO inlet/outlet, boiler
Energy Saving Technologies: VFD for C.S.W. pump, F.W. circ. pump, E/R ventilation fan, LFO purifier supply pump
Contract date: 28 June 2021
Launch/float-out date: 04 April 2023
Delivery date: 10 July 2023

LAURA MAERSK







LECH KACZYNSKI – LNG CARRIER

Shipbuilder:... **HD Hyundai Heavy Industries**
Vessel's name:... ***Lech Kaczyński***
Owner/Operator:... **Knutsen**
Country:... **Norway**
Designer:... **Hyundai Heavy Industries**
Country:... **Republic of Korea**
Model test establishment used:... **Hyundai Maritime Research Institute (HMRI)**
Flag:... **France**
IMO number:... **9922976**
Total number of sister ships already completed (excluding ship presented):... **1**
Total number of sister ships still on order: **Nil**

Built for Knutsen OAS Shipping to satisfy a 2021 charter signed with PGNiG (now PKN Orlen) the 174,023m^3 LNG carrier *Lech Kaczyński* was delivered by Hyundai Heavy Industries at the very end of 2022.

It is also the first vessel in PKN Orlen's fleet which is planned to grow to eight vessels and to help Poland's energy security.

Lech Kaczyński is 298.97m in overall length, has a 46.4m beam and a scantling draught of 12.5m. The vessel is a series design of Hyundai's, and its true significance lies in it being the first of a new fleet operator's vessels.

Cargo is carried in four GTT Mark III Flex corrugated membrane tanks and pumping is performed by eight Shinko vertical centrifugal submerged pumps – two per tank – each capable of pumping at a rate of 1,850m^3 per hour.

Lech Kaczyński is a twin engined ship with twin propellers. The main engines are five cylinder WinGD X72DF types each producing 10,171kW. Running on LNG there are no SOx issues and NOx Tier III is met by way of SCR. Auxiliaries are three HiMSEN 7H35DF units rated at 3,360kW each.

The propellers are 8.4m diameter fixed pitch types and the rudders are Hyundai's proprietary Hi-Rudder with bulb and skirt. Operational speed is 19.5knots and maximum speed of 21.5knots.

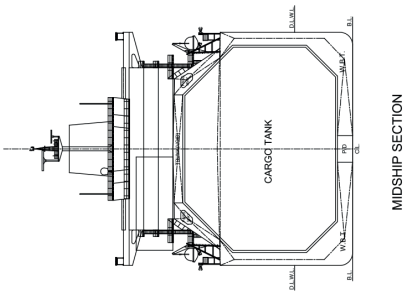
TECHNICAL PARTICULARS

Length oa:... 298.97m
Length bp:... 291.00m
Breadth moulded:... 46.40m
Depth moulded
to main deck:... 26.30m (upper deck)
to upper deck:... 26.30m
to other decks:... 35.30m (trunk deck)
Width of double skin
side:... 2.557m
bottom:... 3.00m
Draught
scantling:... 12.50m
design:... 11.50m
Gross:... 114.100t
Deadweight
scantling:... 95.428t
design:... 83,974t
Speed, service:... 19.5knots at NCR with 20% sea margin
Cargo capacity (m^3)
Liquid volume:... 174,024
Bunkers (m^3)
Light fuel oil:... 4,792
Marine gas oil:... 608
Water ballast (m^3):... 62,564
Daily fuel consumption (tonnes/day)
Main engine only:... 85.2
Auxiliaries:... 7.8
Classification society and notations:... LR, +100A1 Liquefied Gas Tanker, Ship Type 2G, Methane (LNG) in Membrane Tanks, Maximum Vapour Pressure 0.035 MPa, Minimum Cargo Temperature minus 163°C, ShipRight(SDA, FDA plus (40, WW), CM, ACS(B)), ECO(BWT), *IWS, LI, +LMC, BWTS, PSMR, LFPF(GC, NG), EGCN(SCR), UMS, NAV1, +Lloyd's RMC(LG), Descriptive Note: ShipRight(BWMP(T), IHM, SCM)
% high-tensile steel used in construction:.. 44%

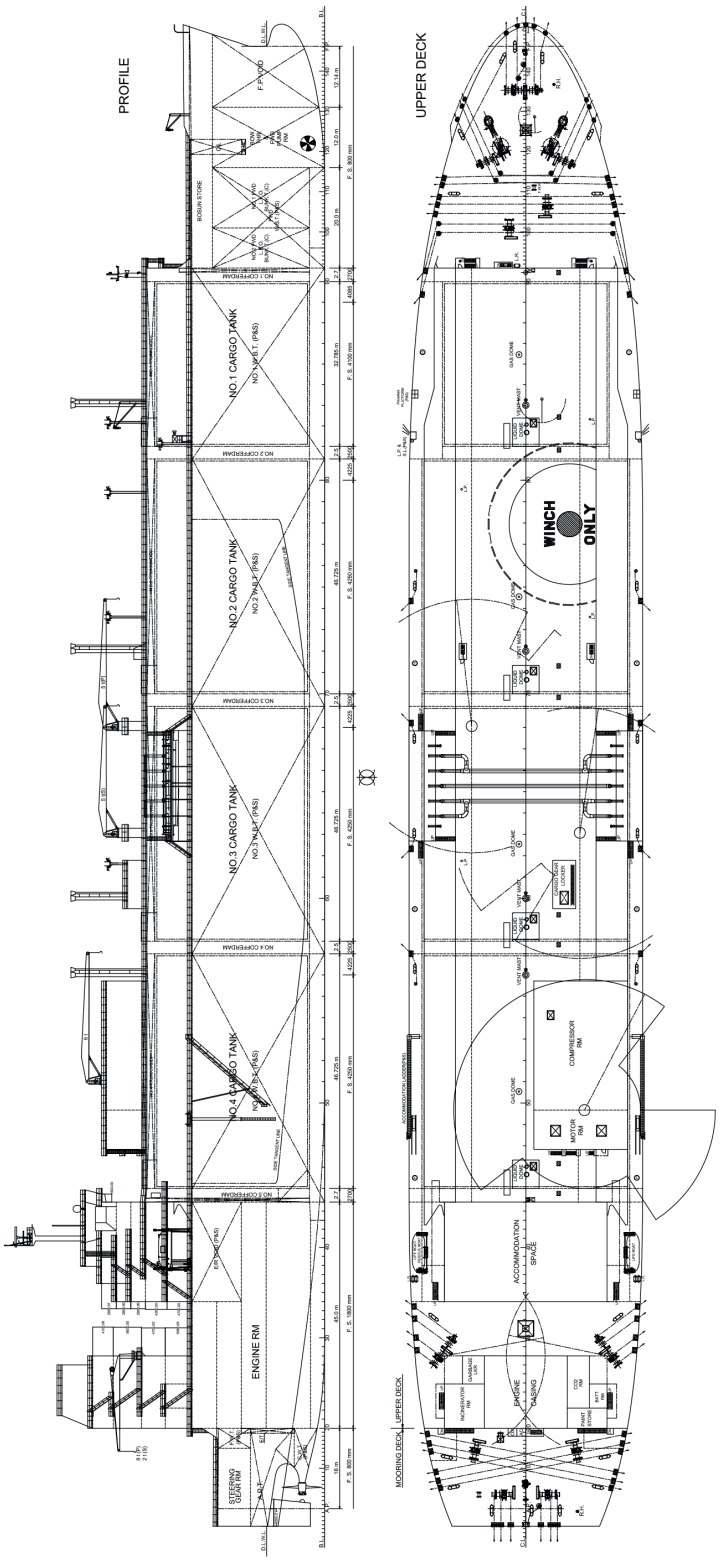
Propulsion
Main engine(s)
Model:... Hyundai-WinGD 5X72DF
Manufacturer:... HHI-EMD
Number:... 2
Type of fuel:... LFO, MGO & Gas
Output of each engine:... 10,171kW at NCR
Is this a diesel-electric or hybrid?:... N
Propeller(s)
Material:... Ni-Al-Bronze
Designer/Manufacturer:... HMRI (Hyundai Maritime Research Institute) / HHI-EMD
Number:... 2 (port & starboard)
Fixed/Controllable pitch:... Fixed
Diameter:... 8.4m
Speed:... 75.452rpm
Diesel-driven alternators
Number:... 3
Engine make/type:... HHI-EMD / 7H35DF
Type of fuel:... LFO, MGO & Gas
Alternator make/type:... HHI-EES / HSJ9 807-10P
Output/speed of each set:... 3,360kW
Exhaust-gas scrubbing equipment
Manufacturer:... HHI-EMD
Type:... Selective catalytic reduction
On main engines?:... 2
On auxiliary engines?:... 3
Boilers
Number:... 2
Type:... Oil-fired boiler
Make:... Alfa Laval
Output, each boiler:... 7,500kg/h
Stern appendages/special rudders:... Hi-rudder with rudder bulb & skirt
Bow thruster(s)
Make:... KTE Co., Ltd
Number:... 1
Output (each):... 2,500kW
Deck machinery
Cargo cranes/cargo gear
Number:... 2 (manifold service crane)
Make:... Sangsangin Industry Co., Ltd
Type:... Electro-hydraulic
Performance:... SWL 5t x max. working radius 25m
Other cranes
Number:... 3
Make:... Sangsangin Industry Co., Ltd
Type:... Electro-hydraulic
Tasks:... 2 (provision crane), 1 (compressor room service crane)
Performance:... 1 x SWL 8t x max. working radius 18.5m (provision crane-port side)
1 x SWL 2t x max. working radius 18.5m (provision crane-starboard)
1 x SWL 6.0t x max. working radius 21m (compressor room service crane)
Mooring equipment
Number:... 2 x windlass, 9 x winch
Make:... Kongsberg Maritime Finland OY
Type:... Electro-hydraulic
Special lifesaving equipment
Number of each and capacity:... 2 set/ship, 34 persons each
Make:... HLB
Type:... Totally enclosed lifeboat, hinged gravity type davit-launched
Cargo tanks
Number:... 4 x GTT Mark III Flex
Product range:... LNG
Coated tanks:... Corrugated membrane (1.2t SUS304L)
Cargo pumps
Number:... 8 (2 per tank)
Type:... Vertical centrifugal, submerged
Make:... Shinlo Ind. Ltd
Material:... Aluminum alloy casting (casing & impeller), 9% nickel steel (shaft)
Capacity (each):... 1,850m^3/h x 165mlc
Cargo control system
Make:... Kongsberg
Type:... Intergrated automation system
Ballast control system
Make:... Kongsberg
Type:... Intergrated automation system
Ballast water treatment system
Make:... KBAL
Capacity:... 6,000m^3/h (3,000m^3/h x 2)
Complement
Officers:... 19
Crew:... 15
Navigation and other equipment
Bridge control system
Make:... Kongsberg
Type:... AutoChief 600
Is bridge fitted for one-man operation?:... Y
Integrated bridge system:... Y
If yes, make:... Furuno Electric Co., Ltd
Model:... FMD-3300
Radars
Number:... 2
Make:... Furuno Electric Co., Ltd
Model(s):... FAR-2338S-NXT, FAR-2328
Fire detection system
Make:... Autronica Fire & Security AS
Type:... AutroSafe 4
Fire extinguishing systems
Cargo tank deck:... Dry chemical powder
Make/Type:... Fain Co., Ltd
Engine room:... High pressure CO_2
Make/Type:... Fain Co., Ltd
Cabins:... Portable fire extinguishers
Make/Type:... NK Co., Ltd
Waste disposal plant
Incinerator
Make/Model:... HMMCO / MAXI T150 SL WS
Waste compactor
Make/Model:... Samjoo E&G / GC5000
Sewage plant
Make/Model:... Il Seung / ISB-03
Efficiency
Attained EEDI value:... 4.15
Required EEDI value:... 7.86
Installed Fuel Meters:... Mass flow
Energy Saving Technologies:... Hi-Fin, Hi-Rudder, Hi-ALS
Hull coatings:... Silyl methacrylate S.P.C. A/F

Contract date:... October 2020
Launch/float-out date:... January 2022
Delivery date:... December 2022

LECH KACZYNSKI



MIDSHIP SECTION



LISELOTTE ESSBERGER – CHEMICAL/PRODUCT TANKER

Shipbuilder: **China Merchants Jinling Shipyard (Yangzhou) Dingheng Co., Ltd**
Vessel's name: ***Liselotte Essberger***
Owner/Operator: **Tankreederei GmbH**
Country: **Germany**
Designer: **FKAB Marine Design**
Country: **Sweden**
Flag: **Portugal**
IMO number: **9939785**
Total number of sister ships already completed (excluding ship presented): **3**
Total number of sister ships still on order: **1**

Delivered in August 2023 as the first of four dual-fuel Type 2 chemical tankers, *Liselotte Essberger* was built by China Merchants Jinling Shipyard for E&S Tankers, a Germany-based joint venture between shipping companies Essberger Tankers and Stolt Tankers.

Claimed to be some 30% more energy efficient than typical vessels of their size and type, the vessel and its sisters feature MAN HyProp ECO–AKA propulsion systems built around a MAN 6L35-44DF medium-speed engine producing 3,180kW at 750rpm. The power system features a shaft generator/motor with PTO/PTI capabilities. A 4.5m diameter controllable pitch propeller runs at 110rpm connected through a Renk gearbox and confers a service speed of 12.9knots. The efficiency claim is borne out by the ship having an assigned EEDI of 9.64 which is well below the maximum 15.46.

As well as the dual-fuel main engine there is a MAN 6L23/30DF auxiliary with a power output of 850kW complemented by a pair of Lindenberg Scania gensets running on MGO. The ship's two Heatermaster boilers are also capable of running on LNG. Running on LNG allows the ship to be NOX Tier III compliant and when running on oil fuels a SCR system is employed.

Germany's Federal Ministry for Digital and Transport subsidised construction of the series as part of the implementation of the German government's Mobility and Fuels Strategy with funding of €1.58 million per vessel.

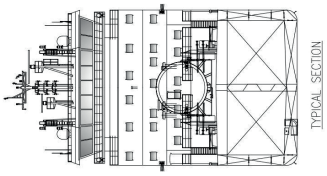
The 119.9m loa and 18m beam vessel is built to Finnish/Swedish ice class 1A and features eight pairs of stainless steel cargo tanks suited to a wide variety of cargoes. LNG fuel for the ship's propulsion is stored in a deck-mounted tank with a capacity of 350m^3.

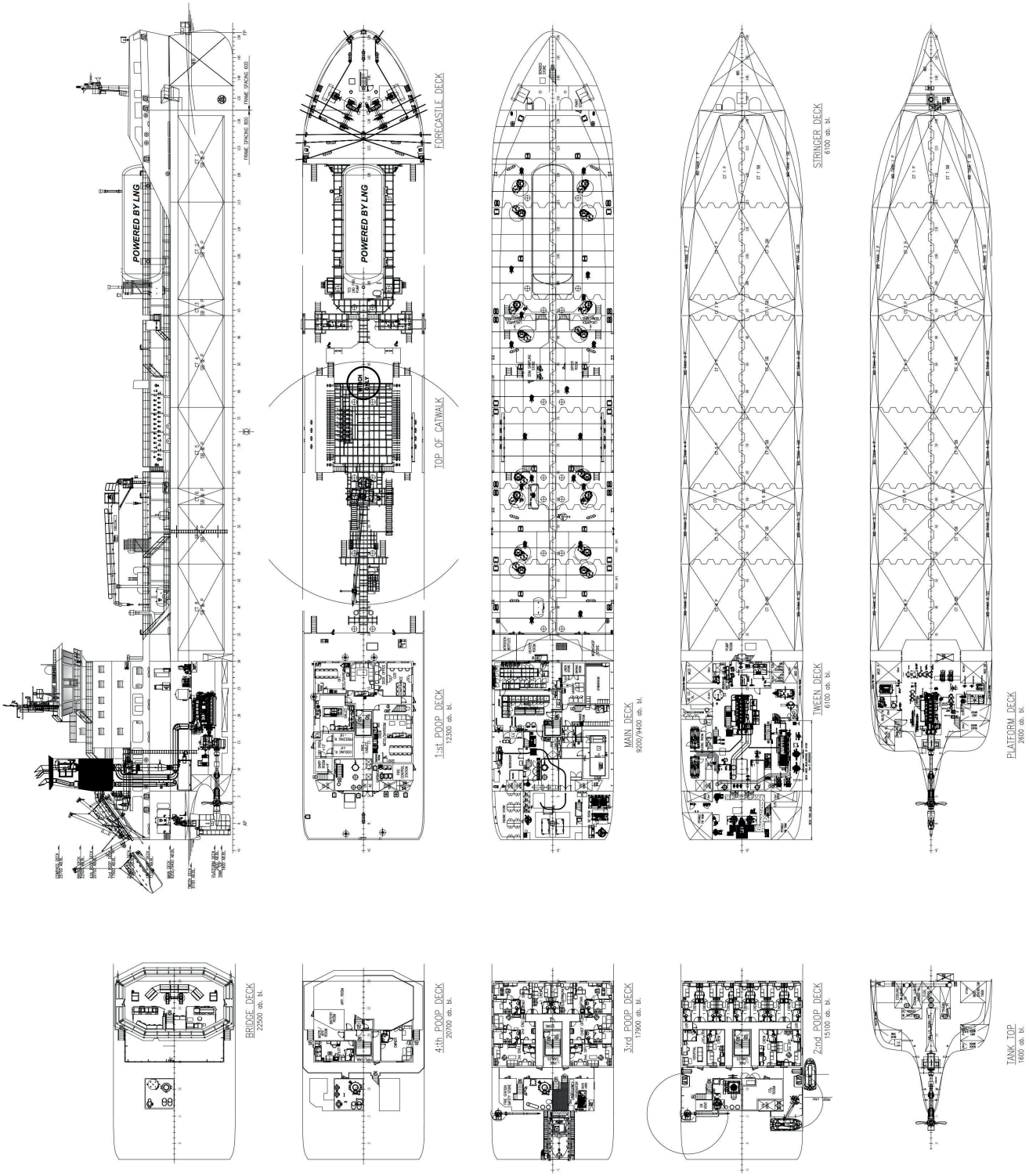
TECHNICAL PARTICULARS

Length oa: 119.90m
Length bp: 117.11m
Breadth moulded: 18.00m
Depth moulded
to main deck: 9.20m
Width of double skin
side: 1.20mm
bottom: 1.25m
Draught
scantling: 6.50m
design: 6.50m
Gross: 6,377t
Displacement: 11,028t
Lightweight: 3,894.2t
Deadweight
scantling: 7,134t
design: 7,134t
Speed, service: 12.89knots
Cargo capacity (m^3)
Liquid volume: 7,682.6
Bunkers (m^3)
LNG: 350
Diesel oil: 118.3
Water ballast (m^3): 3,496.2
Tankers – segregated ballast: 13 ballast tanks
Daily fuel consumption (tonnes/day)
Main engine only: 13.3
Auxiliaries: 9.9
Classification society and notations: DNV +1A, Tanker for Oil and Chemicals ESP BIS BWM(T) Clean EO ER(SCR TierIII) Gas fuelled LNG ICE(1A) LCS Naut(Nav) Recyclable Shore Power TMON(oil lubricated) VCS(2)

% high-tensile steel used in construction: 19.3%
Heel control equipment: Bilge keel
Propulsion
Main engine(s)
Design: 3,180kW x 750rpm
Model: 6L35-44DF
Manufacturer: MAN
Number: 1
Type of fuel: MGO / LNG
Output of each engine: 3,180kW
Is this a diesel-electric or hybrid?: DF
Gearbox(es)
Make: Renk
Model: RSVL-1120
Number: 1
Output speed: 110.6rpm
Propeller(s)
Material: Ni-Al-Bronze
Designer/Manufacturer: MAN
Number: 1
Fixed/Controllable pitch: CPP
Diameter: 4.5m
Speed: 110.6rpm
Main-engine driven alternators
Number: 1
Make/type: AKA
Output/speed of each set: 800kW
Diesel-driven alternators
Number: 3
Engine make/type: 1 x MAN 6L23/30DF + 2 x Lindenberg/Scania DI16
Type of fuel: MGO, LNG & MGO
Alternator make/type: Leroy-Somer / LSA 49.3; CSSC / HFC6 564-84K
Output/speed of each set: 850kW + 500kW
Boilers
Number: 2
Type: Thermal oil boiler
Make: Heatermaster
Output, each boiler: 3,000kW
Stern appendages/special rudders: Empire rudder
Bow thruster(s)
Make: LYEN Marine
Number: 1
Output (each): 450kW
Deck machinery
Cargo cranes/cargo gear
Number: 1
Make: Wuxi Haidelong Marine Equipment Co., Ltd
Type: HDLY0318
Performance: SWL 3t, max. outreach 18m
Other cranes
Number: 1
Make: Wuxi Haidelong Marine Equipment Co., Ltd
Type: HDLY0206
Tasks: Provision crane
Performance: SWL 2t, max. outreach 6m
Mooring equipment
Number: 4
Make: SEC
Type: Electric
Special lifesaving equipment
Number of each and capacity: 20P
Make: Jiangyinshi Beihai LSA Co., Ltd
Type: JYB66FF 6.6m free-fall lifeboat
Cargo/capacity
Cargo tanks
Number: 16
Grades of cargo carried: Type 2
Product range: Max 2.2t/m^3
Stainless steel – structure/piping: Duplex 2205 Mo≥2.75%/316L Mo≥2.5%
Cargo pumps
Number: 16
Type: Deep-well electric driven
Make: Marflex
Stainless steel: Yes
Capacity (each): 12 x 200m^3/h + 4 x 100m^3/h
Cargo control system
Make/Type: Scanjet / Radar
Ballast control system
Make/Type: Scanjet / Elec-Penu
Ballast water treatment system
Make: Wuxi Blue Sky
Capacity: 520m^3/h
Complement
Officers: 8
Crew: 10
Supernumaries/Spare: 1
Suez/Repair Crew: 1
Single/double/other rooms: Hospital
Navigation and other equipment
Bridge control system
Make: Furuno
Type: Naut(nav)
Is bridge fitted for one-man operation?: Y
Radars
Number: 2
Make: Furuno
Model(s): FAR-3320 & FAR3330S
Fire detection system
Make/Type: BKSY / JB-QBC-BS10
Fire extinguishing systems
Cargo holds: Foam
Make/Type: VTI
Engine room: CO_2, water mist
Make/Type: VTI
Waste disposal plant
Waste compactor
Make/Model: Delitek / DT-200MC
Waste shredder/crusher
Make/Model: DMA / SS-100-35
Sewage plant
Make: RWO
Model: Sewage Treatment Plant CS-BIO
Efficiency
Attained EEDI value: 9.64
Required EEDI value: 15.46
Installed Fuel Meters: Mass flow
Other installed monitoring tools: Shaft torque
Energy Saving Technologies: Engine room fan & sea water pump & LT FW cooling pump VFD control energy saving; LED lighting; LNG fuel; trim optimisation
Hull coatings: Anti-abrasion Pure Epoxy; Chugoku Marine Paints (Shanghai) Ltd
Performance Monitoring Regime: Ship performance monitoring system
Contract date: 11 May 2021
Launch/float-out date: 06 April 2023
Delivery date: 30 August 2023

LISELOTTE ESSBERGER





LOVISA – GENERAL CARGO VESSEL

Shipbuilder: **WuHu Shipyard Co., Ltd**
Vessel's name: ***Lovisa***
Owner/Operator: **Oylangh Ship AB**
Country: **Finland**
Designer: **Shanghai Merchant Ship Design and Research Institute (SDARI)**
Country: **China**
Model test establishment used: **HSVA**
Flag: **Portugal (Madeira)**
IMO number: **9957397**
Total number of sister ships already completed (excluding ship presented): **1**
Total number of sister ships still on order: **1**

First of three dual-fuel 7,800dwt multipurpose vessels built at Wuhu Shipyard in China for Finnish operator Langh Ship, *Lovisa* was delivered in November 2023. The second ship, *Olivia L*, was delivered in January 2024 and the final vessel, *Sofia*, is scheduled for an April 2024 handover.

The ships were designed by SDARI with input from Langh Ship and the charterer of the vessels, Finnish steel producer Outokumpu. Planned operations are to carry newly produced cargoes of stainless steel coils from Tornio, Finland, to Terneuzen, the Netherlands, with back cargoes of steel scrap for recycling.

Lovisa is double hull vessel 119.9m in length and 16.5m wide. It has three box shape holds three hatches, moveable tween decks and a grain capacity of 10,380m^3. MacGregor pontoon hatch covers are shifted with a MacGregor travelling gantry crane. It can load a maximum of 470TEUs with 260 on deck and 210 under deck. At a homogenous 14tonnes, intake is limited to 295TEU. Deck cargo is loaded on the hatch covers and with the gantry stowed just aft of No. 3 hold, two further stacks can be loaded between it and the superstructure.

A notable feature is Langh Ship's patented pontoon-type coil cradle tween deck. This system allows for loading coils at two levels in the ship giving better weight distribution and reduced rolling in heavy seas. Unsurprisingly, the ship's ballast treatment system is Langh Ship's own design and production.

The power and propulsion have been supplied by Wärtsilä and includes a 9L34DF main engine with a power output of 4,500kW at 750rpm and associated fuel gas supply system. Fuel is stored in a 360m^3 Type C tank under deck between the engine room and Hold 3. The tank is both methanol and ammonia ready.

A SCV 85-P51 gearbox gives a propeller shaft speed of 1,607rpm and a PTO speed of 1,812.5rpm. The propeller is a controllable pitch type with a 4.1m diameter. The auxiliary generators are a pair of Volvo Penta D16MG units. Speed is 14.25knots and manoeuvrability helped by a 600kW Wärtsilä bow thruster. There is provision for a future shore connection to be installed and space reserved for a battery energy storage system.

TECHNICAL PARTICULARS

Length oa: 119.90m
Length bp: 118.00m
Breadth moulded: 16.50m
Depth moulded
to upper deck: 10.40m
Width of double skin
side: 1.70m
bottom: 1.30m
Draught
scantling: 7.20m
design: 7.20m
Gross: 6,402t
Deadweight
scantling: 7,800t
design: 7,800t
Speed, service 85%MCR output): 14.52knots
Cargo capacity (m^3)
Grain: 10,380
Bunkers (m^3)
Type C LNG tank: 360
Diesel oil: 250
Tankers – percentage segregated ballast: 3,450
Daily fuel consumption (tonnes/day)
Main engine only: 17
Auxiliaries: 5

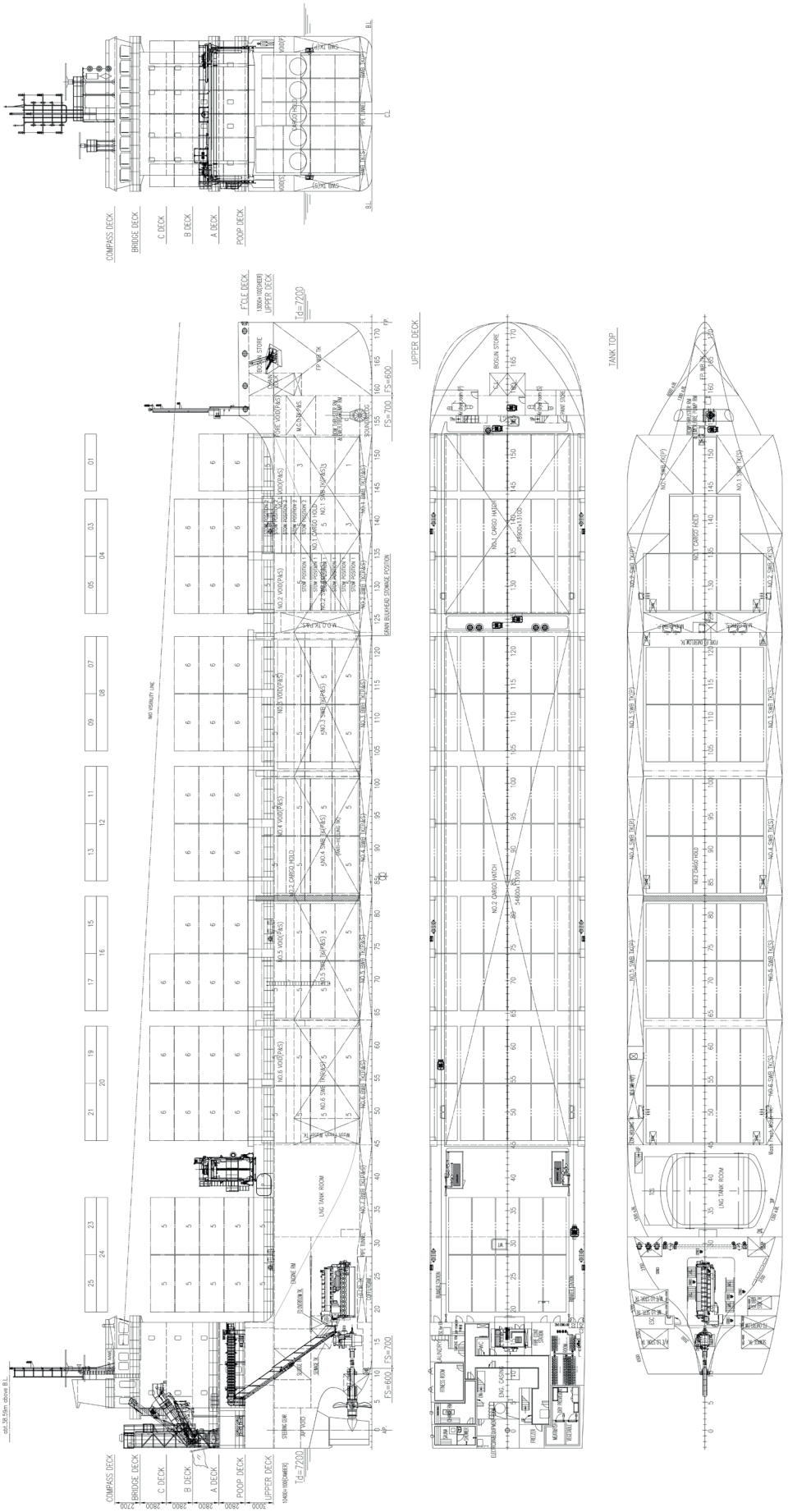
Classification society and notations: DNV + 1A, Multi-purpose dry cargo ship,DAT-B(-25), DG(B,P),DBC,Strengthened(IB),Container,LCS,C OAT-PSPC(B),Grab(1-20), Gas Fuelled LNG,Ice(1A),BIS,TMON(oil lubricated),EO,Clean, Recyclable
% high-tensile steel used in construction: 42%
Propulsion
Main engine(s)
Design: Wärtsilä
Model: 9L34DF
Manufacturer: Wärtsilä
Number: 1
Type of fuel: MDO, MGO
Output of each engine: 4,500kW x 750rpm
Is this a diesel-electric or hybrid?: N (Diesel-LNG double fuel)
Gearbox(es)
Make: Wärtsilä
Model: SCV 85-P51
Number: 1
Output speed: Propeller speed: 160.7rpm, PTO speed: 1,812.5rpm
Propeller(s)
Material: Ni-Al-Bronze
Designer/Manufacturer: Wärtsilä
Number: 1
Fixed/Controllable pitch: Controllable
Diameter: 4.1m
Speed: 160.7rpm

Main-engine driven alternators
Number: 1
Make/type: Wärtsilä / PTO
Output/speed of each set: 1,812.5rpm
Diesel-driven alternators
Number: 2
Engine make/type: Volvo / D16MG
Type of fuel: MDO / MGO
Alternator make/type: Leroy-Somer/ LSAM 47.2 M7 / 4p
Output/speed of each set: 1,800rpm
Bow thruster(s)
Make: Wärtsilä
Number: 1
Output (each): 600kW
Deck machinery
Cargo cranes/cargo gear
Number: 1
Make: MacGregor
Type: Gantry
Performance: SWL 25t
Other cranes
Number: 1
Make: Viking-Norsafe
Type: Davit
Tasks: Provisions
Performance: SWL 0.9t
Mooring equipment
Number: 4
Make: SEC
Type: Electric
Special lifesaving equipment
Number of each and capacity: 1/16P
Make: Viking-Norsafe
Type: Free-fall lifeboat
Cargo/capacity
Hatch covers
Design: MacGregor
Manufacturer: Wuhu Shipyard
Type: Upper deck
Total TEU capacity: 470
On deck: 260
In holds: 210
Homogeneously loaded to 14tonnes: 295
Ballast control system
Make: TANKTEC
Ballast water treatment system
Make: Langh
Capacity: 400m^3/h
Complement
Officers: 4
Crew: 8
Single/double/other rooms: Single room
Passengers
Total: 4
Number of cabins: 2

Navigation and other equipment
Bridge control system
Make: Wärtsilä
Type: Protouch
Is bridge fitted for one-man operation?: N
Integrated bridge system: N
Radars
Number: 2
Make: Furuno
Model(s): FAR-2328 / FAR-2338S
Fire detection system
Make: Consilium
Type: Salwico Cargo
Fire extinguishing systems
Cargo holds: CO_2, C/H water spray
Make: Jiujiang (CO_2), NK (C/H water spray)
Engine room: CO_2, E/R water mist
Make: Jiujiang (CO_2), NK (E/R water mist)
Sewage plant
Make: Hansun
Model: ST-20U

Efficiency
Attained EEDI value: 8.22 g-CO_2/(ton.nm)
Required EEDI value: 14.5 g-CO_2/(ton.nm)
Installed Fuel Meters: 2 x volume fuel meters
Energy Saving Technologies: Flap rudder with bulb
Hull coatings: Super strong glass flakes, polyamide/polyamine cured epoxy paint

Launch/float-out date: May 2023
Delivery date: November 2023


COMPASS DECK
BRIDGE DECK
C DECK
B DECK
A DECK
POOP DECK
UPPER DECK
F'CSLE DECK
TANK TOP
LNG TANK ROOM
ENGINE ROOM
ACCOMMODATION
BOSUN STORE
PAINT STORE
CARGO CONTROL ROOM
ELECTRONIC EQUIPMENT ROOM
ENG. CASING
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FR.No.10
FR.No.20
FR.No.30
FR.No.40
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FR.No.680
FR.No.690
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FR.No.720
FR.No.730
FR.No.740
FR.No.750
FR.No.760
FR.No.770
FR.No.780
FR.No.790
FR.No.800
FR.No.810
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MILD ORCHID – CONTAINER SHIP

Shipbuilder: **Yangfan Group Co., Ltd**
Vessel's name: ***Mild Orchid***
Owner/Operator: **Shanghai Jinjiang Shipping (Group) Co., Ltd**
Country: **China**
Designer: **Shanghai Merchant Ship Design & Research Institute (SDARI)**
Country: **China**
Model test establishment used: **SSSRI**
Flag: **Hong Kong**
IMO number: **9945411**
Total number of sister ships already completed (excluding ship presented): **1**
Total number of sister ships still on order: **2**

Mild Orchid is the first vessel of a series consisting of four Bangkok Max-class 1,900TEU container ships. The ship was built to a SDARI design by Yangfan Group and delivered to Shanghai Jinjiang Shipping (better known as JJ Shipping) in October 2023.

Bangkokmax vessels typically boasts an intake from 1,700 to 1,900TEU and were designed to access the city port of Bangkok on the Chao Phraya River. In recent years the size has become popular globally. *Mild Orchid* is the first Bangkokmax vessel in the company fleet it was ordered in June 2021 as one of a pair with two options which were exercised five months later. The initial order was the first time in eight years that Shanghai Jinjiang had commissioned newbuildings. The previous largest vessel in its fleet was below 1,200TEU.

SDARI's design has a strong emphasis on safety, fuel efficiency, and environmental sustainability. It also incorporates advanced technology, including high-voltage shore power facilities for energy efficiency and an intelligent ship operating system known as DOSS.

Mild Orchid has hull dimensions of 171.95m length, 27.5m beam and draught of 10m. Its nominal capacity is 1,956TEU although at a 14tonne homogenous load the figure drops to 1,300TEU. There is space in the fully cellular holds for 596TEU and 1,396TEU on deck. 200 reefer plugs allow for a reasonable number of cooled boxes. There are four cargo holds forward of the superstructure and none aft, although containers can be loaded on the aft deck.

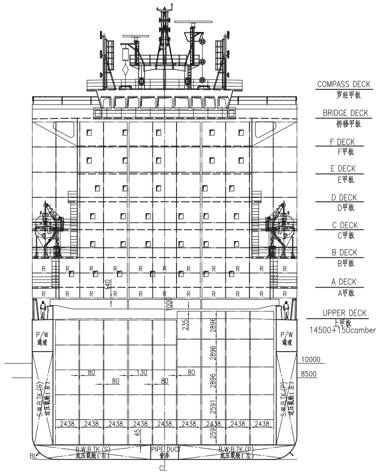
The propulsion system comprises a HSD-built MAN B&W 6S60ME-C10.5 unit of 11,500kW output and a single fixed pitch propeller. The ship runs on 2020 sulphur compliant fuels but as intended operation is only in Tier II NOx waters, no SCR system is needed. Some 3,300kW of auxiliary power can be provided by a trio of Yanmar 6EY22ALWS gensets.

TECHNICAL PARTICULARS

Length oa: 171.95m
Length bp: 169.00m
Breadth moulded: 27.50m
Depth moulded to main deck: 14.50m
Width of double skin
side: 2.15m
bottom: 1.50m
Draught
scantling: 10.00m
design: 8.50m
Gross: 18,166t
Deadweight
scantling: 24,250t
design: 18,260t
Speed, service: 19.5knots at 8.5m draught, NCR, Bft.0, with 15% sea margin
Bunkers (m^3)
Heavy oil: 1,190
Diesel oil: 200
Water ballast (m^3): 9,760
Container ships – water ballast in loaded condition (tonnes): 4,540
Daily fuel consumption (tonnes/day)
Main engine only: 39.4
Auxiliaries: 2.5
Classification society and notations: CCS ★CSA Container Ship; COMPASS(R,D,F); CLC; ECL; SOLAS II-2 Reg.19; PSPC(B); In-Water Survey; Loading computer(S,I); Ice Class B ★CSM AUT-0; SCM; AMPS; G-EP(GPR); G-ECO(BWM(T),CD30)
% high-tensile steel used in construction: 57%
Heel control equipment: Anti-heeling pump
Propulsion
Main engine(s)
Design: MAN
Model: 6S60ME-C10.5 Tier II
Manufacturer: HSD Engine Co., Ltd
Number: 1
Type of fuel: VLSFO, ULSFO, MGO
Output of each engine: 11,500kW
Is this a diesel-electric or hybrid?: N
Propeller(s)
Material: Ni-Al-Bronze (Cu3)
Designer/Manufacturer: SDARI
Number: 1
Fixed/Controllable pitch: Fixed
Diameter: 6.6m
Speed: 101.4rpm at CSR
Diesel-driven alternators
Number: 3
Engine make/type: Yanmar Power Technology Co., Ltd / 6EY22ALWS
Type of fuel: VLSFO, ULSFO, MGO
Alternator make/type: Taiyo Electric Co., Ltd / FE 653A-8
Output/speed of each set: 1,100kW x 900rpm
Boilers
Number: 1
Type: Exhaust gas & oil-fired composite
Make: Saacke Marine Systems
Output, each boiler: Oil-fired side 1,800kg/h / exhaust gas side 1,200kg/h
Stern appendages/special rudders: Free hanging full spade rudder, twisted edge with rudder bulb
Bow thruster(s)
Make: Kawasaki
Number: 1
Output (each): 1,000kW
Deck machinery
Cargo cranes/cargo gear
Other cranes
Number: 2
Make: Wuxi Huahai Marine Equipment Co., Ltd
Type: Electric slewing crane
Tasks: For provision
Performance: 4t-4.7m
Mooring equipment
Number: 4
Make: SEC
Type: Electric
Special lifesaving equipment
Number of each and capacity: 2 x 23 persons
Make: Zhejiang Norsier Lifesaving Equipment Technology Co., Ltd
Type: Gravity
Cargo/capacity
Hatch covers
Design: TTS
Manufacturer: Yangfan Group Co., Ltd (China)
Type: Upper deck
Containers
Lengths: 20ft / 40ft / 45ft
Heights: 8'6" / 9'6"
Cell guides: All cargo holds
Total TEU capacity: 1,956
On deck: 1,360
In holds: 596
Homogeneously loaded to 14tonnes: 1,300
Reefer plugs: 200
Tiers/rows (maximum)
On deck: 2 tiers / 11 rows
Cargo tanks
Number: 4
Ballast control system
Make: Emerson
Type: Hydraulic
Ballast water treatment system
Make: Wuxi Brightsky Electronic Co.,Ltd
Capacity: 400m^3/h
Complement
Officers: 11
Crew: 11
Supernumaries/Spare: 1
Suez/Repair Crew: 6
Single/double/other rooms: 23/1
Navigation and other equipment
Bridge control system
Make: Kongsberg
Type: AC600
Is bridge fitted for one-man operation?: N
Integrated bridge system: N
Radars
Number: 2
Make: Furuno
Model(s): FAR-2328/2338S
Fire detection system
Make: Consilium
Type: Salwico Cargo
Fire extinguishing systems
Cargo holds: CO_2 fixed system
Make/Type: NK Co., Ltd
Engine room: CO_2 fixed system & fixed fresh water mist system
Make/Type: NK Co., Ltd

Waste disposal plant
Incinerator
Make: CSSC Nanjing Luzhou Machine Co., Ltd
Model: OG 200CS
Sewage plant
Make: Chongqing Taiko Kangda Environmental Protection Technology Co., Ltd
Model: SBHC-40
Efficiency
Attained EEDI value: 14.611
Required EEDI value: 16.026 (Phase 3)
Installed Fuel Meters: Volumetric fuel meter installed in fuel supply module
Mass fuel meters installed at the inlet and outlet of fuel supply pipe of M/E, A/Es and boiler
Energy Saving Technologies: Twisted edge rudder with rudder bulb
Hull coatings: Antifouling paint
Delivery date: September 2023

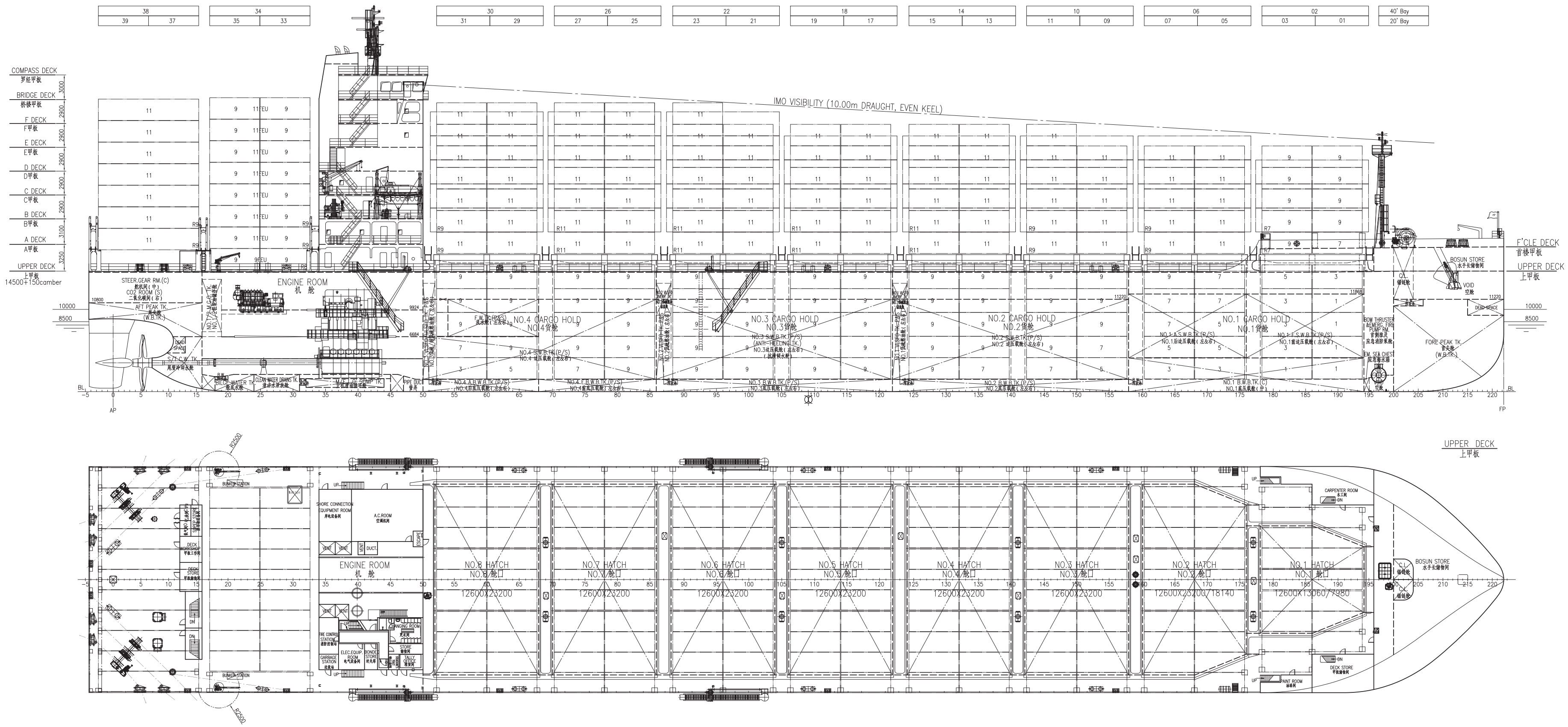
MILD ORCHID



PRINCIPAL PARTICULARS

主要尺度要素

总　长	LENGTH O.A		abt. 171.95 m
垂线间长	LENGTH B.P		169.00 m
型　宽	BREADTH MLD.		27.50 m
型　深	DEPTH MLD.		14.50 m
吃　水	DRAUGHT DESIGN/SCANTLING		8.50 / 10.00 m
装 箱 量	CONTAINER CAPACITY	ON DECK	1,360 TEU
		IN HOLD	596 TEU
		TOTAL	1,956 TEU
冻 插 数	REEFER PLUGS	ON DECK	abt. 200 FEU
载 重 量	DEADWEIGHT AT DESIGN DRAUGHT		abt. 17,980 t
载 重 量	DEADWEIGHT AT SCANTLING DRAUGHT		abt. 23,980 t
主　机	MAIN ENGINE		MAN B&W 6S60ME-C10.5 Tier II
	MCR		14,940kW x 105r/min
	SMCR		11,500kW x 105r/min
	NCR(90%SMCR)		10,350kW x 101.4r/min
航　速	SERVICE SPEED(AT 8.5m DRAUGHT, NCR, Bft.0, WITH 15% SEA MARGIN)		abt. 19.5Kn
船员定额	COMPLEMENT		22 P
船级符号	CLASS NOTATION		
	CCS ★CSA Container Ship; COMPASS(R,D,F); CLC; ECL; SOLAS II-2 Reg.19;		
	PSPC(B); In-Water Survey; Loading computer(S,I); Ice Class B		
	★CSM AUT-0; SCM; AMPS; G-EP(GPR); G-ECO(BWM(T),CD30)		



MOBY FANTASY – RO-PAX

Shipbuilder:	**Guangzhou Shipyard International Co., Ltd**
Vessel's name:	***Moby Fantasy***
Owner/Operator:	**Moby S.p.A**
Country:	**Italy**
Designer:	**MARIN**
Country:	**The Netherlands**
Flag:	**Italy**
IMO number:	**9837509**
Total number of sister ships already completed (excluding ship presented):	**1**
Total number of sister ships still on order:	**0**

Moby Fantasy, the new flagship of the Moby fleet and claiming the title of world's largest passenger ferry, was completed by Guangzhou Shipyard International in June 2023. Its sister *Moby Legacy* followed in December. The new ships are designed by OSK-Shiptech.

At 237m in length, 33m beam and a draught of 7.4m the 12-deck ship comes in at 70,016gt. By those measures the ship is indeed longer than Color Line's 223.7m *Color Magic* but falls short of its 75,156 gross tonnage. There are several other ro-pax ferries with longer hulls but those all have lower gross tonnages.

Capacity wise, the ship has 3,850lane-metres and 2,370 in passenger numbers. Vehicles are loaded and discharged by three stern ramps on Deck 3 and accommodated on eight vehicle decks. The central ramp provides access to the main garage deck whereas the port and starboard side ramps lead directly to the three upper garage decks. This configuration ensures faster and more streamlined loading and unloading compared to ro-ro vessels with multiple vehicle decks but with ramps leading only to the lower deck. Hoistable decks allow for carriage of high vehicles as necessary. There are 592 passenger cabins and 10,000m^3 of public spaces.

It is in terms of the power and propulsion systems that *Moby Fantasy* gains its environmental credentials and class society RINa's GREEN STAR 3 environmental protection notation.

Power for the ship comes from four 9L46F medium-speed engines producing 10,800kW each and capable of running on HFO or MGO. When running on fuel oil, hybrid scrubbers operating on all main and auxiliary engines and boilers allow compliance with SOx regulations. The ship has twin skegs and the main engines work through two reduction gearboxes to turn a pair of 6.0m diameter controllable pitch propellers. Three forward bow thrusters allow for the extra manoeuvrability required by large ferries.

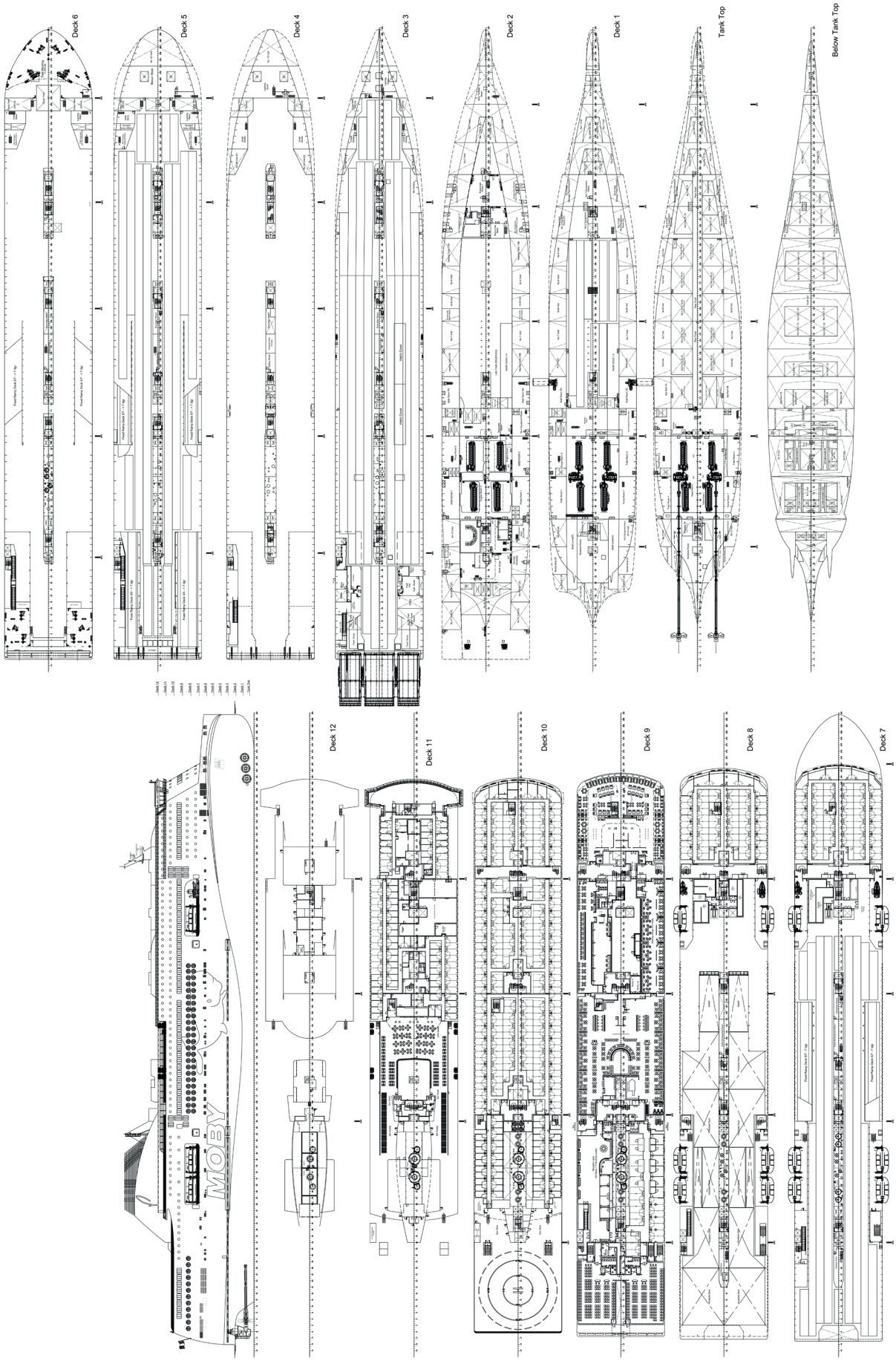
The ship has been designed for later conversion to LNG and has a Gas-ready notation. With a 23.5knot service speed *Moby Fantasy* and its sister will be slower than the current vessels on the service but much more fuel efficient and will burn around 30% less fuel.

The central ramp provides access to the main garage deck whereas the port and starboard side ramps lead directly to the three upper garage decks. This configuration ensures faster and more streamlined loading and unloading compared to ro-ro vessels with multiple vehicle decks but with ramps leading only to the lower deck.

TECHNICAL PARTICULARS

Length oa:	237.00m
Length bp:	232.20m
Breadth moulded:	33.00m
Depth moulded:	9.65m
Draught	
scantling:	7.40m
design:	7.20m
Gross:	70,016t
Displacement:	35,402.9t
Lightweight:	23,446.6t
Deadweight	
design:	11,956.3t
Speed, service:	23.5knots (85%MCR, 11.5% sea margin, total 2,500kW load at shaft generator poles)
Bunkers (m^3)	
Heavy oil:	1,300
Water ballast (m^3):	2,000
Daily fuel consumption (tonnes/day)	
Main engine only:	SFOC 4 x 175g/kWh
Classification society and notations:	RINa C✠HULL ✠MACH, RORO PASSENGER SHIP, STAR HULL, STAR MACH, AUT UMS, SYS IBS, MON SHAFT, COMF NOISE B, COMF VIB B, COMF AIR, GREEN STAR 3, ICE CLASS IB, INWATERSURVEY, MLCDESIGN, GAS READY (Design, Users (MErr, AErr, Brr))
Propulsion	
Main engine(s)	
Model:	9L46F
Number:	4
Type of fuel:	HFO, MGO
Output of each engine:	100% MCR 10,800kW x 600rpm
Gearbox(es)	
Make:	NGC
Number:	2
Output speed:	25,200kW
Propeller(s)	
Material:	Ni-Al-Bronze
Number:	2
Fixed/Controllable pitch:	Controllable
Diameter:	6.0m
Main-engine driven alternators	
Number:	4
Make/type:	9L20
Output/speed of each set:	MCR 1,710kW x 1,000rpm
Shaft Generator(s)	
Number:	2
Output of each PTO:	2,500kW
Boilers	
Number:	2
Type:	Oil-fired
Output, each boiler:	2,500kg/h
Bow thruster(s)	
Number:	3 (2 x CPP + 1 x FPP)
Output (each):	2,200kW
Deck machinery	
Mooring equipment	
Number:	10
Type:	Electric
Special lifesaving equipment:	
9.6m Partially Enclosed Lifeboat	
Portside:	3 x 9.6m partially enclosed lifeboat (include equipment/spare parts of engine)
Starboard:	3 x 9.6m partially enclosed lifeboat (include equipment/spare parts of engine)
Type:	JY-BF-9.6A
Single track chute MES unit	
Portside:	2 x MES unit (chute storage with 150P life raft)
Starboard:	2 x MES unit (chute storage with 150P life raft)
Type:	VEMC-1x150 DKS
Vehicles	
Total lane length:	3,850m
Doors/ramps/lifts/moveable car decks	
Type:	Stern ramp / ramp cover / ramp door / hoistable car deck
Ballast control system	
Type:	Electro-hydraulic
Ballast water treatment system	
Capacity:	500m^3/h
Complement	
Crew:	130
Passengers	
Total:	2,370
Navigation and other equipment	
Radars	
Number:	2
Model(s):	12ft&30kW 65830 MHR 430290 / 8ft&25kW UM X-Band 703038&371084
Fire detection system	
Type:	Salwico
Fire extinguishing systems	
Engine room:	Total flooding system
Type:	XFLOW mist system
Vehicle spaces:	Drencher system
Type:	Deluge firefighting system
Cabins:	Low pressure water mist system
Type:	XFLOW mist system
Waste disposal plant:	1 x KY-CPA11
Sewage plant	
Model:	3 x MBR 70K
Contract date:	11 February 2018
Launch/float-out date:	05 November 2021
Delivery date:	14 April 2023

MOBY FANTASY



MULTI PURPOSE PONTOON (MPP) – PONTOON

Shipbuilder:.....**CRIST S.A**
Vessel's name:.....***MPP* (*Multi Purpose Pontoon*)**
Owner/Operator:..**Femern Link Contractors**
Country:.....**Denmark**
Designer:.....**StoGda Ship Design & Engineering**
Country:.....**Poland**
Flag:.....**Belgium**
Total number of sister ships already completed (excluding ship presented):.....**Nil**
Total number of sister ships still on order: **Nil**

Technically not a ship but a highly interesting and innovative structure that deserves its place here having been constructed using traditional shipbuilding techniques at the CRIST shipyard in Gdynia. The *Multi Purpose Pontoon*, or *MPP* for short, will be used in the construction of the Femer Link a project to connect Germany and Denmark by way of the world's longest immersed tunnel. This combined road and rail link is part of the Trans European Network.

The tunnel will carry road and rail traffic in four separated chambers with a fifth chamber being used for servicing purposes. It will be built in stages, the first of which involves the dredging of a 12m deep tunnel trench between Puttgarden in Germany and Rødbyhavn in Denmark.

After this the *MPP* will lay the gravel bed for the tunnel which is comprised of 89 sections each 217m long and weighing 73,000 tonnes. The concrete tunnel sections are being made on shore at a special facility in Puttgarden.

The *MPP* itself comprises two parts, a 139m long, 44.8m wide hull and a Submersible Dumping Tool (SDT). The hull is effectively segmented into three parts. At each end is a section containing a hold for carrying around 7,000tonnes of gravel and in the centre is a section that houses the generators, accommodation and other equipment as well as the system for raising and lowering the SDT.

The SDT is a 700tonne framework structure that when not in use is secured under and around the centre section of the hull. It is the main key performance element of the *MPP* vessel. Its task is to prepare the ground for the tunnel elements by driving a layer of specially prepared gravel with very high accuracy before the foundation of the prefabricated concrete tunnel segments.

The *MPP* has no propulsion system and is towed into place for working. The vessel can accommodate a crew of 19, sufficient for two work shifts. It is equipped with two Sennebogen grab cranes each with a SWL of 16tonnes for loading the gravel from shore into the 7,000tonne capacity tanks. The cranes will also be used to transfer the gravel into SDT. Power is supplied by two Caterpillar C32 gensets each outputting 874kW.

For holding position over the working area, for raising and lowering the SDT and for towing the *MPP* is equipped with no less than 27 different winches supplied by SH Group.

TECHNICAL PARTICULARS

Length oa:.....139.00m
Length bp:.....130.20m
Breadth moulded:.....48.00m
Depth moulded
to main deck:.....7.70m
Draught
design:.....5.07m
Gross:.....17,577t
Displacement:.....23,215t
Lightweight:.....8,344t
Deadweight
design:.....14,871t
Bunkers (m^3)
Fuel oil:.....254.1 + 0.5
Water ballast (m^3):.....2x 1996.7, 2x 1553.0

Classification society and notations:.....BV +Hull +Mach, Special Service/Offshore Utility Vessel Coastal Area, GREEN PASSPORT EU, CLEANSHIP

Propulsion
Main engine(s)
Design:.....Caterpillar
Model:.....C32
Manufacturer:.....Caterpillar
Number:.....2
Output of each engine:.....874kW
Deck machinery
Cranes
Number:.....2
Make:.....Sennebogen
Type:.....875.7.1102 & 875.7.1104
Performance:.....16t each

Winch(es)
Number:.....27
Make:.....SH Group
Type:.....875.7.1102 & 875.7.1104
Model/Capacities:
- 2x Fall pipe winch/SWL 530kN
- 4x Mooring winch PS/SB/SWL 900kN
- 4x Mooring winch bow & stern/SWL 900kN
- 4x Nautical mooring/SWL 135kN
- 4x Screed mouth/SWL 110kN
- 2x SDT hoist PS/SWL 1,100 kN
- 2x SDT hoist SB/SWL 530 kN
- 1x Towing gear/SWL 30kN
- 2x Umbilical winch/SWL 25kN
- 2x FPT chain drive winch/SWL 140kN

Roller(s):
Number:.....10x guide rollers/8x fairleads/8x horizontal sheaves
Make:.....Hippo/Pikasoma/Ropeblock

Deck space
Number of decks:.....2
Deck capacity (tonnes/m^2):.....Inside gravel bunkers 15t/m^2, Outside gravel bunkers 5t/m^2

Pumps
Number:.....8
Type:.....2x GS pump/1x Potable water transfer pump/2x LT cooling water pump/1x Ballast pump/1x Fuel transfer pump/1 x Bilge transfer pump
Make:.....Azcue/Desmi/Desmi/Desmi/Desmi/Desmi

Complement
Crew:.....19
Single/double/other rooms:.....20

Navigation and other equipment
GPS
Make:.....JRC
Model(s):.....JLR-8400 (GNSS)

Fire detection system
Make:.....FirePro/Consilium/Minimax

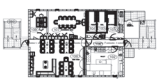
Contract date:.....26 October 2021
Delivery date:.....09 October 2023

MULTI PURPOSE PONTOON (MPP)

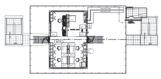
TOP DECK

LEVEL 3
ACCOMMODATION

LEVEL 1
RESTAURANT UNIT

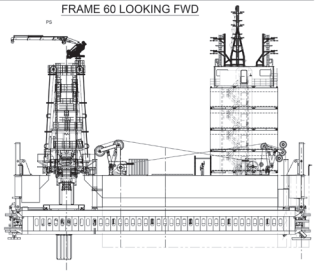


CONTROL ROOM

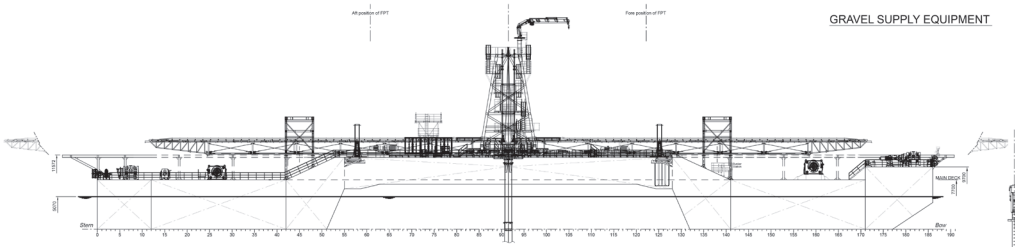


LEVEL 2
ACCOMMODATION

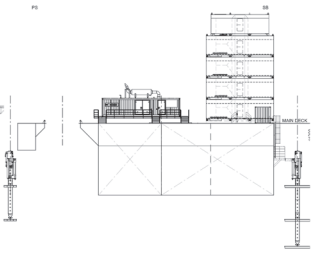
FRAME 60 LOOKING FWD



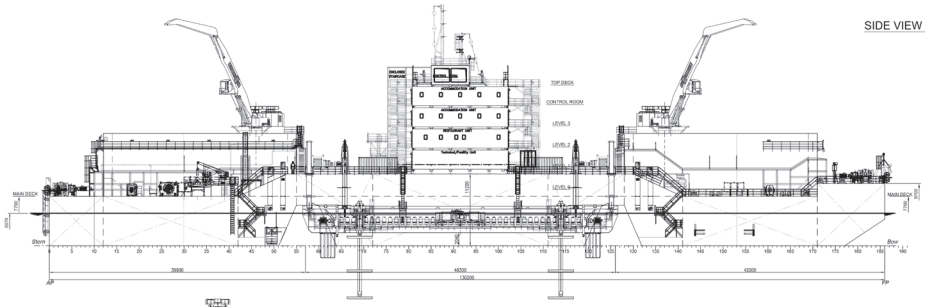
GRAVEL SUPPLY EQUIPMENT



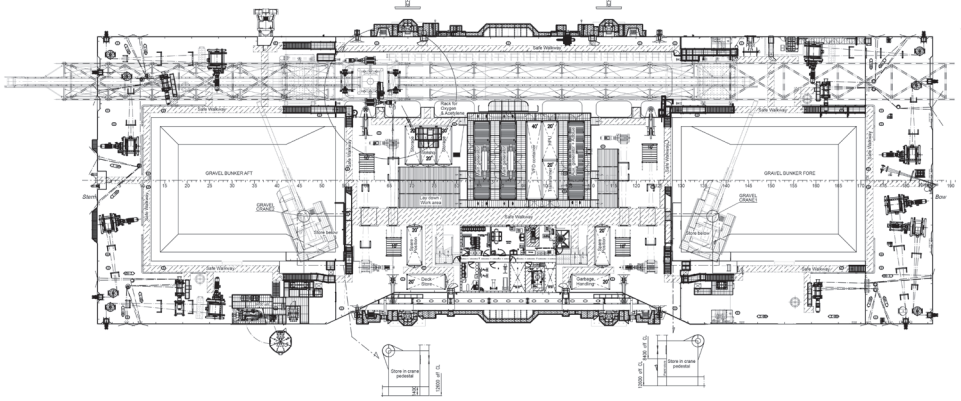
FRAME 80 LOOKING FWD



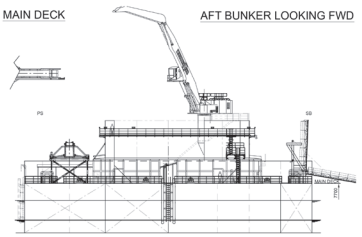
SIDE VIEW SB



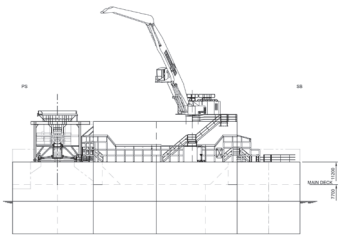
MAIN DECK



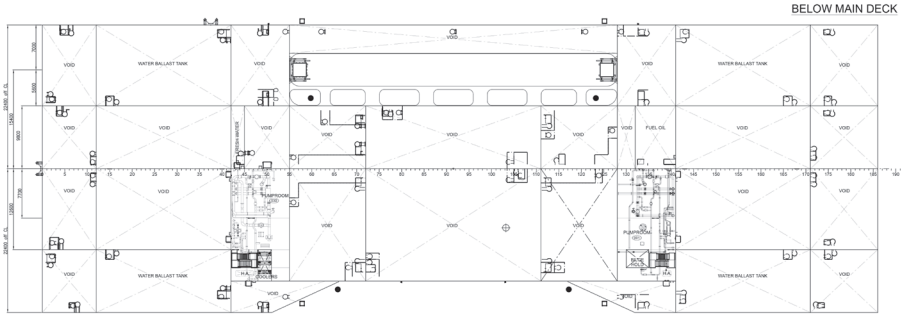
AFT BUNKER LOOKING FWD



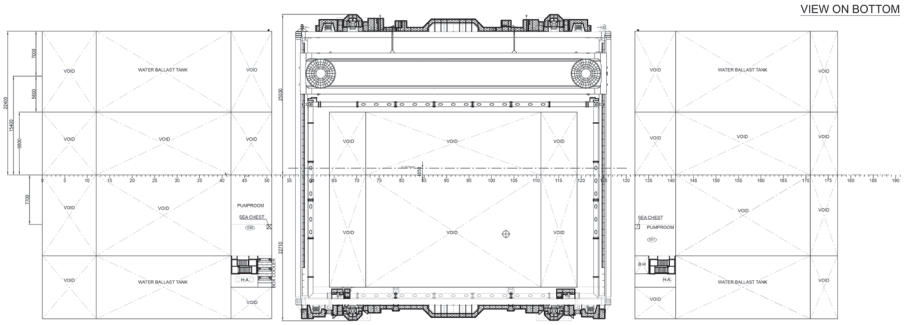
FRAME 125 LOOKING FWD



BELOW MAIN DECK



VIEW ON BOTTOM



MSC NOA ARIELA – CONTAINER SHIP

Shipbuilder:	**Guangzhou Shipyard International Co., Ltd**
Vessel's name:	***MSC Noa Ariela***
Owner/Operator:	**MSC**
Country:	**Italy**
Model test establishment used:	**MARIN**
Flag:	**Liberia**
IMO number:	**9946843**
Total number of sister ships already completed (excluding ship presented):	**3**
Total number of sister ships still on order:	**3**

At the time of its delivery to MSC in June 2023, the 16,616TEU *MSC Noa Ariela* was the largest container vessel to have been built in Southern China. It was designed by the Marine Design and Research Institute of China (MARIC) and built by Guangzhou Shipbuilding International as the first of eight ships that will be spread between Guangzhou and Dalian Shipbuilding.

A new Panamax ship, it has a length of 366m, a beam of 51m and a draught of 14.5m. To meet line of sight regulations and to maximise box capacity, the bridge and accommodation are located between Holds 3 and 4 while the engine and stack structure are located aft of Hold 9.

MSC has adopted a flexible approach to meeting environmental regulations current and future in its choice of power plants and energy saving technologies. *MSC Noa Ariela* and the next five ships in the series have been built as LNG ready although the engines will need to be modified. The final two ships in the series along with options will be built as LNG dual-fuel ships. All of the ships have an air lubrication system to aid efficiency.

Instead of running on ULSFO to meet SOx regulations, *MSC Noa Ariela* has been fitted with a hybrid scrubber system from Shanghai Marine Diesel Research Institute that operates on the main engine and the auxiliaries. NOx rules are met by EGR for Tier II and high-pressure SCR for Tier III.

The main engine is a WinGD 9X92-B, LLT, Tier III, HPSCR with a maximum rating of 58,050kW at 80rpm down rated to 45,300kW at 72rpm. NCR is 40,770kW at 90% and 69.5rpm. A shaft generator is included that can output 4,000kW.

Auxiliary power is high as is normal for container ships with reefer box capacity and comprises three MAN nine-cylinder L32/40CD gensets rated at 4,320kW at 720rpm and two seven-cylinder units of the same type rated at 3,320kW.

TECHNICAL PARTICULARS

Length oa: 366.00m
Length bp: 355.40m
Breadth moulded: 51.00m
Depth moulded to main deck: 30.20m
Draught
- scantling: 17.00m
- design: 14.50m

Displacement: 219,554.3t
Lightweight: 48,897t
Deadweight
- scantling: 170,657.5t
- design: 130,621t

Speed, service: 22knots with 15% sea margin without shaft generator engaged and without air lubrication system engaged
Bunkers (m^3)
- Heavy oil: (incl. HFO tanks, VLSFO tanks, settling and service tanks for HFO and VLSFO): Apprx. 10,000

Water ballast (m^3): 45,000
Daily fuel consumption (tonnes/day)
- Main engine only: 150.1t

Classification society and notations: DNVGL +1A, Container Ship, RSD, BIS, COAT-PSPC(B), LCS, EO, RSCS+, SAFELASH, NAUT(OC), BWM(E(s,d),T), Clean, Recyclable, TMON (oil lubricated), DG(P), FCS (C,HA,FF,HF), WIV, GAS Ready(D, MEc), ECA(SOx-A),Shore Power, ER(EGCS Hybrid, SCR)

Propulsion
Main engine(s)
- Design: WinGD
- Model: WinGD 9X92-B, LLT, Tier III, HPSCR
- Number: 1
- Output of each engine: Nominal maximum continuous rating (NMCR): 58,050kW x 80rpm / Specified maximum continuous rating (SMCR): 45,300kW x 72rpm / Normal continuous rating (NCR, 90% SMCR): 40,770kW x 69.5rpm

Propeller(s)
- Material: Ni-Al-Bronze
- Designer/Manufacturer: MMG
- Number: 1
- Fixed/Controllable pitch: Aerofoil, solid, fixed pitch, keyless, right-handed
- Diameter: 10.3m
- Speed: 72rpm

Main-engine driven alternators
- Number: 5
- Make/type: CMP / In-line, 4-stroke, direct injection, trunk piston. NOx emission approved type according to MARPOL Annex VI regulation, Tier III, SCR
- Output/speed of each set:
  - 3 sets x abt. 4,320kW x 720rpm
  - 2 sets x abt. 3,320kW x 720rpm
  - AC 6600V, 3PH, 60HZ

Exhaust-gas scrubbing equipment
- Manufacturer: Shanghai Marine Diesel Engine Research Institute (SMDERI)
- Type: Scrubber Hybrid system operating on main engine and generators

Boilers
- Number: 1
- Type: Vertical, cylindrical, forced draught, marine boiler
- Make: Kangrim Heavy Industries Co., Ltd
- Output, each boiler: 5,500kg/h

Stern thruster(s)
- Type: Tunnel type, controllable pitch propeller
- Number: 2
- Capacity (each): Apprx. 2,500kW input power

Deck machinery
Cargo cranes/cargo gear
- Number: 1 (for provision and equipment handling)
- Make: Taizhou Kaixing
- Type: Electric motor driven, monorail type
- Performance: SWL 15t

Other cranes
- Number: 2 (engine room crane)
- Make: Taizhou Kaixing
- Type: EMD, overhead travelling
- Tasks: Hoisting, travelling & traversing: two speed for hoisting
- Performance: SWL 15t

Mooring equipment
- Number: 10
- Make: MacGregor
- Type: Electric motor driven, auto-tension type

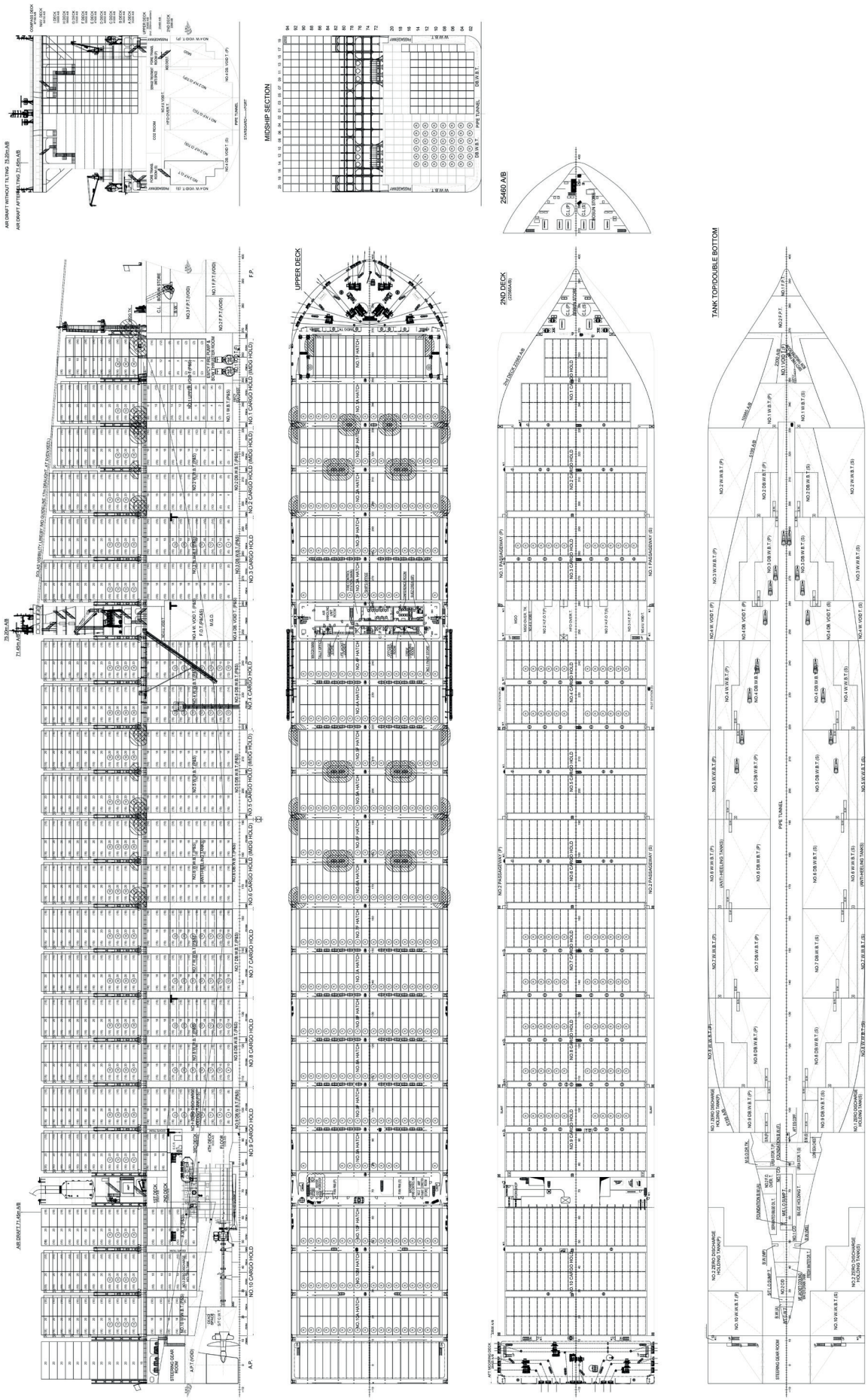
Ballast water treatment system
- Make: 2 x Panasia / Vertical single stage, centrifugal with self-priming units
- Capacity: 1,200m^3/h × 35mwc

Complement
- Officers: 20
- Crew: 12
- Suez/Repair Crew: 6

Fire extinguishing systems
Cargo holds: Fixed fire water monitor
- Make/Type: VTI / single nozzle type
- Capacity: 250m^3/h / Jet length: max. 110m with inlet pressure of 15bar

Efficiency
Energy Saving Technologies: Shaft generator, 4,000kW
Contract date: 31 March 2021
Launch/float-out date: 30 December 2022
Delivery date: 24 July 2023

MSC NOA ARIELA



NEREA – RO-PAX

Shipbuilder: **Sefine Shipyard**
Vessel's name: ***Nerea***
Owner/Operator: **Carronte & Tourist**
Country: **Italy**
Designer: **Naos Ship & Design**
Country: **Italy**
Flag: **Italy**
IMO number: **9945538**
Total number of sister ships already completed (excluding ship presented): **Nil**
Total number of sister ships still on order: **Nil**

Nerea is a one-off ro-pax vessel designed by NAOS and built by the Sefine Shipyard in Turkey for Sicilian ferry operator Siremar, part of the Caronte & Tourist group. It was delivered in October 2023.

The 109.95m long and 19.5m beam vessel will connect Milazzo on the northeast coast of Sicily with the Aeolian Islands and Naples replacing an older 1992-built vessel as part of the owner's fleet renovation strategy that includes a very different design of double-ended ferry being built at the same Turkish yard. The intended service for the vessel does not require a particularly large vessel but the 8,250gt *Nerea* is nonetheless an innovative replacement being the first LNG dual-fuel hybrid vessel in the Siremar fleet.

Nerea is an eight-deck vessel with a single vehicle deck with a slightly raked bow with bulb which should enhance stability. Vehicular access is over a straight stern ramp on Deck 3 which has 520lane-metres (lm) for cars and 420lm for trucks of which 70lm are on the open deck to be used for trucks carrying hazardous cargo.

Passenger capacity is 800 when operating on domestic service (EU Class B) and half that number if operating internationally as an EU Class A navigation compliant vessel. There are just 20 passenger cabins located on Deck 6 accommodating a maximum 78 passengers but for the planned service that should be sufficient. Public seating restaurants and bars are located across Decks 5, 6 and 7. Seating on Deck 7 is partially beneath the 250m^2 50kW array of solar panels located across the area between the two side funnel casings. Lifesaving equipment comprises four Viking Norsafe vertical chutes for a total 1,032 persons.

The vessel is a diesel-electric LNG hybrid capable of a service speed of 16.5knots. Propulsion is by a pair of Schottel azimuthing EcoPropellers of type SRE 560 LE FP. Power comes from four Wärtsilä engines. Two of these are 6L34DF units producing 2,890kWe and two 8L20DF types rated at 1,373kWe each. A 1,000kWh battery pack is also installed.

TECHNICAL PARTICULARS

Length oa: 110.00m
Length bp: 101.68m
Breadth moulded: 19.50m
Depth moulded: 19.20m
to main deck: 7.50m
to upper deck: 13.00m
Draught: 8.20m
Gross: 8,250t
Deadweight: 1,400t
Speed, service: 16.5knots - 80% of the nominal propulsion

Bunkers (m^3)
MDO: 180
LNG: 150

Classification society and notations: RINa AUT-UMS; Battery Powered (susp.)1017[kWh]; DYNAPOS SAM (susp.); GAS FUELLED; GREEN PLUS; INWATERSURVEY

Heel control equipment: Framo
Roll-stabilisation equipment: Hoppe

Propulsion
Model: 2 x Wärtsilä 6L34DF + 2 x Wärtsilä 8L20DF
Manufacturer: Wärtsilä
Number: 4
Type of fuel: MDO, LNG
Output of each engine: 3,000kW & 1,280kW
Is this a diesel-electric or hybrid?: Y

Propeller(s)
Material: Cu-Al-Fe-Ni
Designer/Manufacturer: Schottel / 2 x EcoPropeller SRE 560 LE FP
Number: 2
Fixed/Controllable pitch: Fixed
Diameter: 3.1m
Speed: 207rpm
Special adaptations: Variable frequency driver

Diesel-driven alternators
Number: 4
Engine make/type: Wärtsilä 6L34DF / Wärtsilä 8L20DF
Type of fuel: MDO, LNG
Alternator make/type: AVK Type DSG 125 K2/8W (IP44) - 2 x Cummins DSG 86 L1 6W
Output/speed of each set: 2,890kWe x 750rpm / 1,373kWe x 1,000rpm

Exhaust-gas scrubbing equipment
Manufacturer: Volvo Penta
Type: SCR
On main engines?: No
On emergency/harbour engines?: Yes

Boilers
Number: 1
Type: Electrical boiler
Make: Ulmatec Pyro
Output, each boiler: 350kW

Bow thruster(s)
Make: Schottel
Number: 2
Output (each): 800kW

Mooring equipment
Number: 4
Make: Gürdesan
Type: Electric

Special lifesaving equipment
Number of each and capacity: 4 (total 1,032 persons)
Make: Viking Norsafe
Type: VEMC System
If MES, vertical or sloping chutes?: Vertical

Cargo/capacity
Hold refrigeration system: Aeron

Vehicles
Total lane length: 520lm for cars + 420lm for trailers
Total cars: 115

Doors/ramps/lifts/moveable car decks
Number of each: 1 stern ramp
Designer: Denizsan

Complement
Crew: 28
Single/double/other rooms: 8 x double cabins + 12 x single cabins

Passengers
Total: 776
Number of cabins: 20

Navigation and other equipment
Bridge control system
Make: JRC
Is bridge fitted for one-man operation?: Y
Integrated bridge system: Y
If yes, make: Elkon

Radars
Number: 2
Make: Furuno
Model(s): X-Band, S-Band

Fire detection system
Make: Marsis
Type: 811F MX

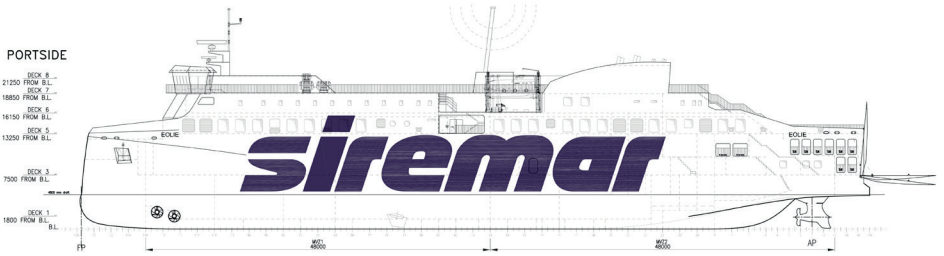
Fire extinguishing systems
Engine room:
Make/Type: Marsis - water mist system
Vehicle spaces:
Make/Type: Marsis - drencher system
Cabins:
Make/Type: Marsis – water mist system
Public spaces:
Make/Type: Marsis – water mist system

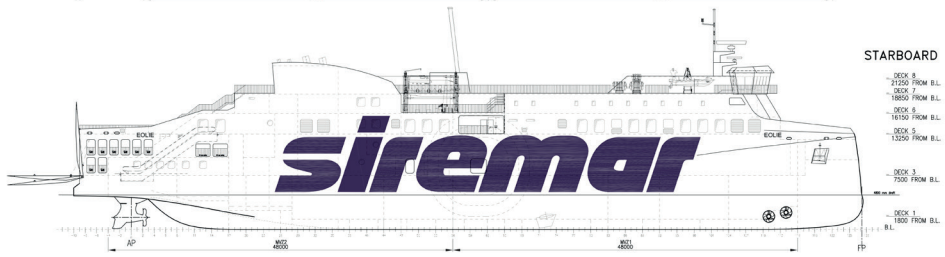
Waste disposal plant
Waste compactor
Make: Delitek
Model: DeliVac - 940

Sewage plant
Make: Techni
Model: Biocon III

Efficiency
Energy Saving Technologies: Finn stabiliser
Hull coatings: Cathodic protection

Contract date: 01 February 2021
Launch/float-out date: May 2023
Delivery date: October 2023


PORTSIDE
DECK 8
21250 FROM B.L.
DECK 7
18850 FROM B.L.
DECK 6
16150 FROM B.L.
DECK 5
13250 FROM B.L.
DECK 3
7500 FROM B.L.
DECK 1
1800 FROM B.L.
B.L.
siremar
EOLIE
FP
AP


STARBOARD
DECK 8
21250 FROM B.L.
DECK 7
18850 FROM B.L.
DECK 6
16150 FROM B.L.
DECK 5
13250 FROM B.L.
DECK 3
7500 FROM B.L.
DECK 1
1800 FROM B.L.
B.L.
siremar
EOLIE
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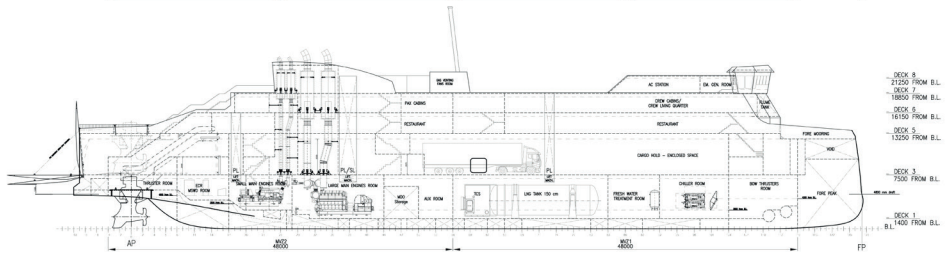
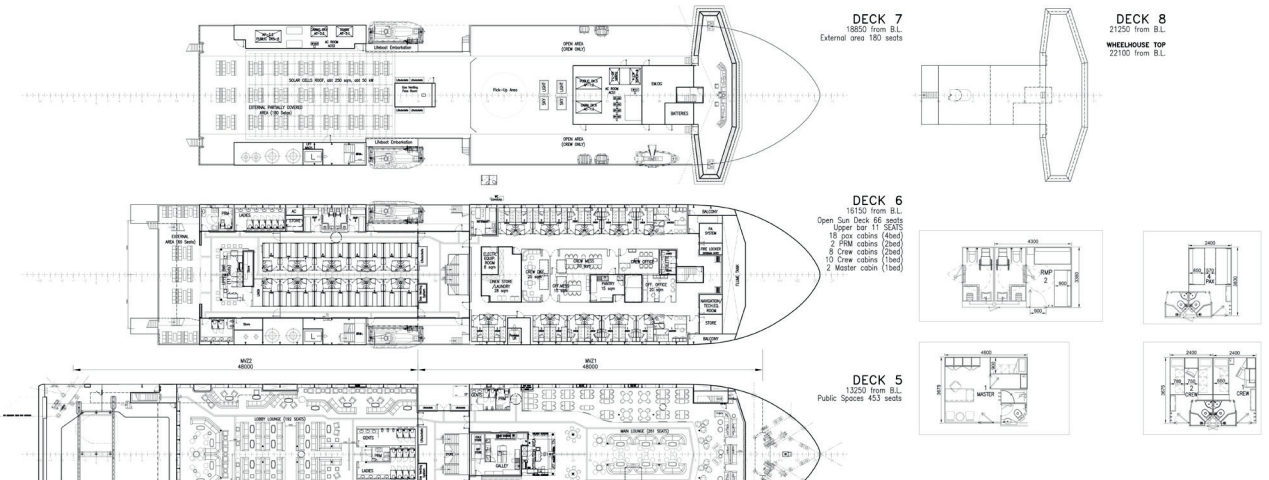
FP


DECK 8
21250 FROM B.L.
DECK 7
18850 FROM B.L.
DECK 6
16150 FROM B.L.
DECK 5
13250 FROM B.L.
DECK 3
7500 FROM B.L.
DECK 1
1400 FROM B.L.
B.L.
AP
FP


DECK 7
18850 from B.L.
External area 180 seats
DECK 8
21250 from B.L.
WHEELHOUSE TOP
22100 from B.L.
DECK 6
16150 from B.L.
Open Sun Deck 66 seats
Upper bar 11 SEATS
18 pax cabins (4bed)
2 PRM cabins (2bed)
8 Crew cabins (2bed)
10 Crew cabins (1bed)
2 Master cabin (1bed)
DECK 5
13250 from B.L.
Public Spaces 453 seats
DECK 3
7500 from B.L.
420 lm (3m)
DECK 1
1400 from B.L.

OCEAN BLUE – CHEMICAL/PRODUCT TANKER

Shipbuilder:... **HD Hyundai Heavy Industries**
Vessel's name:... ***Ocean Blue***
Owner/Operator:... **AMPTC**
Country:... **Kuwait**
Designer:... **HD Hyundai Heavy Industries**
Country:... **Republic of Korea**
Flag:... **Panama**
IMO number:... **9955997**
Total number of sister ships already completed (excluding ship presented):... **1**
Total number of sister ships still on order: **2**

Delivered in November 2023 as the first newbuilding for five years and the first dual-fuel vessel in the Arab Maritime Petroleum Transport Company (AMPTC) fleet, *Ocean Blue* is an LR2 product tanker built by Hyundai Heavy Industries. The ship is the first of four vessels ordered in 2021 with its three sisters, *Seahorse*, *Saqr* and *Crystal*, all scheduled for delivery in the first half of 2024.

At 113,386dwt and with dimensions of 239.52m length and 44m beam, *Ocean Blue* and its sisters are towards the upper end of the LR2 dimension range.

With six pairs of cargo tanks and two slop tanks *Ocean Blue* can carry three grades of crude oil or petroleum products.

The vessels are easily distinguished from conventional LR2 tankers by the 2,900m^3 Type C LNG fuel tank located on the starboard side of the ship just forward of the accommodation. The engine which powers the ship is a Hyundai-built, lean burn, Otto cycle WinGD 5X72DF. It is rated at 12,000kW at CMCR and is directly linked to an 8.3m fixed-pitch propeller. Service speed at 75.08rpm and 85% MCR is 14.5knots. The auxiliary engines, three HiMSEN 6H22CDF, are also dual-fuel types and produce 1,200kW each at 900rpm.

Running on LNG and combined with Hyundai's in-house energy saving technology in the form of a pre-swirl duct and rudder bulb help the ship to achieve an EEDI rating of 2.36 well below the 3.33 required.

TECHNICAL PARTICULARS

Length oa:... 239.52m
Length bp:... 232.50m
Breadth moulded:... 44.00m
Depth moulded
to main deck:... 21.80m (upper deck)
to upper deck:... 21.80m
Width of double skin
side:... 2.30m
bottom:... 2.40m
Draught
scantling:... 15.20m
design:... 13.60m
Gross:... 63,684t
Deadweight
scantling:... 113,386t
design:... 98,022t
Speed, service:... 14.5knots at NCR with 15% sea margin
Cargo capacity (m^3)
Liquid volume:... 130,419
Bunkers (m^3)
LNG:... 2,903
Marine gas oil:... 1,551
Water ballast (m^3):... 36,807
Tankers – percentage segregated ballast:... 100%
Daily fuel consumption (tonnes/day)
Main engine only:... 36.9
Auxiliaries:... 5.4
Classification society and notations:... ABS +A1, OIL CARRIER, (E), RW, CSR, AB-CM, ESP, UWILD, SPMA, VEC-L, +AMS, +ACCU, TCM, BWT+, CPS, IHM, ENVIRO, POT, PMA, EEDI-PH3, PORT, CPS-COT, GFS(DFD), CRC(SC-PL, SP), RRDA
% high-tensile steel used in construction:... 71%

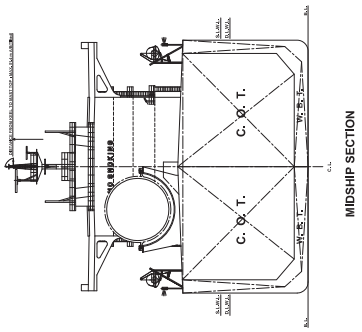
Propulsion
Main engine(s)
Design:... WinGD
Model:... Hyundai-WinGD 5X72DF
Manufacturer:... HD Hyundai Heavy Industries Co., Ltd
Number: 1
Type of fuel:... MGO, Gas
Output of each engine:... 12,000kW (CMCR)
Is this a diesel-electric or hybrid?:... No
Propeller(s)
Material:... Ni-Al-Bronze
Designer/Manufacturer:... HMRI (Hyundai Maritime Research Institute) / HHI-EMD
Number:... 1
Fixed/Controllable pitch:... Fixed
Diameter:... 8.3m
Speed:... 75.08rpm
Diesel-driven alternators
Number:... 3
Engine make/type:... HD Hyundai Heavy Industries Co., Ltd/ Hyundai HiMSEN 6H22CDF
Type of fuel:... MGO, Gas
Alternator make/type:... HD Hyundai Electric / three-phase synchronous generator
Output/speed of each set:... 1,200kW x 900rpm
Boilers
Number:... 2 x aux. boiler, 1 x composite boiler
Type:... Marine gas oil burning, marine boiler (aux. boiler) / DF burning, marine boiler (composite boiler)
Make:... Alfa Laval
Output, each boiler:... 25,000kg/h (aux. boiler), 3,000kg/h (comp. boiler – fuel-fired section) 850kg/h (comp. boiler – exhaust gas section)
Stern appendages/special rudders:... Hi-rudder with rudder bulb & skirt

Deck machinery
Cargo cranes/cargo gear
Number:... 1
Make:... OPCO
Type:... Electro-hydraulic driven, cylinder luffing type jib crane
Performance:... SWL 15t
Other cranes
Number:... 2
Make:... OPCO
Type:... Electro-hydraulic driven, cylinder luffing type jib crane
Tasks:... Provision & engine room spare part handling
Performance:... SWL 8t (port) / SWL 2t (starboard)
Mooring equipment
Number:... 9
Make:... Flutek
Type:... Hydraulic
Cargo tanks
Number:... 12
Grades of cargo carried:... 3
Product range:... Crude oil and Petroleum product having flash points at or below 60°C and specific gravity up to 1.025
Coated tanks:... Pure Epoxy
Cargo pumps
Number:... 3
Type:... Vetrical, centrifugal, single stage
Make:... Shinko
Stainless steel:... Pump casing, impeller, impeller shaft
Capacity (each):... 3,000m^3/h x 130mth
Cargo control system
Make:... Scana
Type:... Console
Ballast control system
Make:... Scana
Type:... Console
Ballast water treatment system
Make:... Hyundai-EMD
Capacity:... Non-filter electrolysis type
Complement
Officers:... 12
Crew:... 16
Suez/Repair Crew:... 6

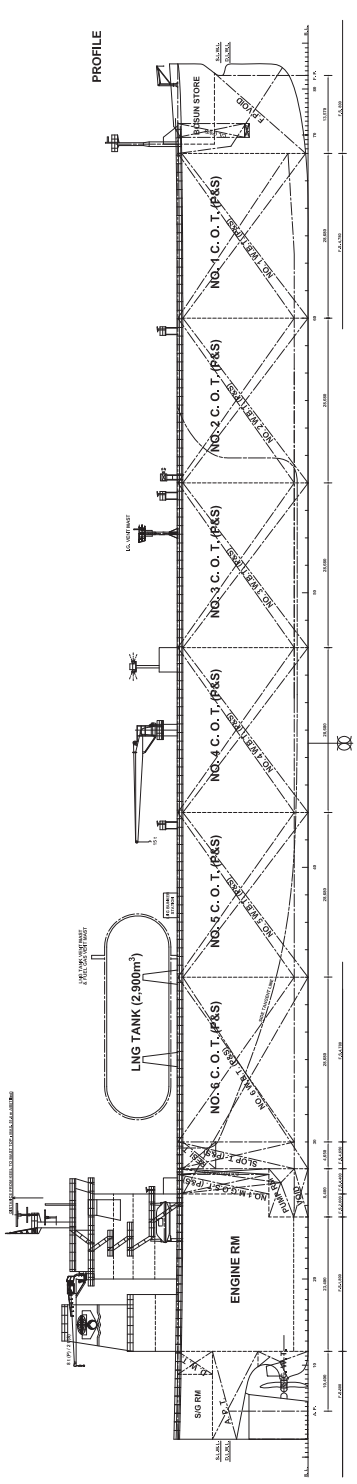
Navigation and other equipment
Bridge control system
Make:... Kongsberg
Type:... Autochief 600
Is bridge fitted for one-man operation?:... N
Integrated bridge system:... N
Radars
Number:... 3
Make:... JRC
Model(s):... JMR-9282-S, JMR-9296-6X
Fire detection system
Make:... Consilium
Type:... Salwico Cargo
Fire extinguishing systems
Cargo holds:... Foam firefighting system
Make/Type:... NK
Engine room:... CO_2 system
Make/Type:... NK
Cabins:... Portable fire extinguisher
Make/Type:... NK
Public spaces:... Portable fire extinguisher
Make/Type:... NK

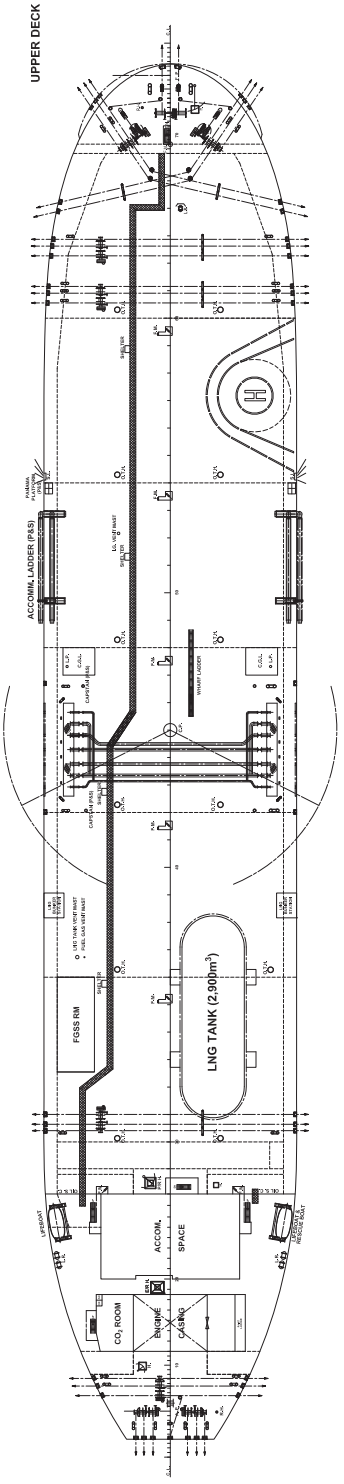
Waste disposal plant
Incinerator
Make:... Hyundai Marine Machinery Co., Ltd
Model:... MAXI T50 SL WS
Waste compactor
Make:... Samjoo Eng. Co., Ltd
Model:... GC3000
Waste shredder/crusher
Make:... Samjoo Eng. Co., Ltd
Model:... BS515A
Sewage plant
Make:... Jonghap Machinery Co., Ltd
Model:... AEROB – 12N(A)
Efficiency
Attained EEDI value:... 2.36
Required EEDI value:... 3.33
Installed Fuel Meters:... Coriolis type flow meter
Energy Saving Technologies:... Hi-PSD, rudder bulb
Hull coatings:... Silyl acrylate S.P.C. A/F
Performance Monitoring Regime:... Noon reporting
Contract date:... 22 October 2021
Launch/float-out date:... 07 July 2023
Delivery date:... 09 November 2023

OCEAN BLUE



MIDSHIP SECTION





ONE INNOVATION – CONTAINER SHIP

Shipbuilder: **Japan Marine United Corporation, Kure shipyard**
Vessel's name: ***ONE Innovation***
Owner/Operator: **Shoei Kisen Kaisha, Ltd**
Country: **Japan**
Designer: **Nihon Shipyard Co., Ltd, Japan Marine United Corporation**
Country: **Japan**
Flag: **Liberia**
IMO number: **9939137**
Total number of sister ships already completed (excluding ship presented): **1**
Total number of sister ships still on order: **Nil**

ONE Innovation built by JMU at its Kure shipyard is the first of six Megamax (24,000TEU+) container ships to join the ONE fleet following delivery in June 2023. Its delivery makes the ONE operation only the fourth operator to join the Megamax club.

In terms of length at 399.95m and with a beam of 61.4m it could actually claim the title of world's largest box ship although the difference is a matter of a few centimetres. Its nominal container capacity is 24,136TEU.

The maximum dimensions of container ships have so far been limited by Suez Canal regulations and despite problems in the Red Sea through 2024 meaning many ships are avoiding Suez, it is unlikely that ships will grow much beyond the Megamax size for some time.

Efficiency has been a major driver in the design with the ship featuring a bow windshield to reduce wind resistance, and JMU's proprietary Rupas rudder, Surf-Bulb and ALV-fin all featuring along with the optimised hull design.

The main engine is a Mitsui-built, nine-cylinder MAN B&W G95ME-C10.6 unit. Auxiliary power come from five gensets of which three are six-cylinder versions and the other two eight-cylinder variants. A shore power connection facility is included allowing for lower emissions in port. For SOx requirements the vessel is equipped with a SOx scrubber.

Cargo on *ONE Innovation* is accommodated in 13 tiers and 24 rows on deck and 12 tiers 22 rows under deck. The addition of the windshield has allowed for cargo to be accommodated further forward on the mooring deck. There are eight stacks forward of the accommodation and bridge superstructure and four stacks after of the funnels and machinery spaces. There are 2,300 reefer plugs.

ONE Innovation and its sisters also feature the first use in a vessel above 22,000TEU of "brittle crack arrest technology" allowing for extra-thick, high-strength steel which improves safety without sacrificing loading efficiency.

TECHNICAL PARTICULARS

Length oa: 399.95m
Breadth moulded: 61.40m
Depth moulded to upper deck: 33.20m
Draught scantling: 16.50m

Classification society and notations: DNV ✠1A, Container ship, BIS, BWM(T), COAT-PSPC(B), CMON, DG(P), E0, ER(EGCS hybrid), RSCS+, RSD, Safelash, TMON(Oil Lubricated), LCS, Recyclable, WIV, FCS(C, FF, HF), Cyber Secure, Shore power
Heel control equipment: Auto heeling system

Propulsion
Main engine(s)
Design: MAN Energy Solutions SE
Model: 9G95ME-C10.6
Manufacturer: Mitsui E&S Co., Ltd
Number: 1
Type of fuel: HFO, MGO
Is this a diesel-electric or hybrid?: N
Propeller(s)
Material: Ni-Al-Bronze
Designer/Manufacturer: JMU
Number: 1
Fixed/Controllable pitch: Fixed

Diesel-driven alternators
Number: 5
Type of fuel: HFO, MGO
Exhaust-gas scrubbing equipment
Type: SOx scrubber
On main engines?: Yes
On auxiliary engines?: Yes
Boilers
Number: 1
Type: Vertical cylindrical composite type
Bow thruster(s)
Number: 2
Output (each): 3,000kW

Other cranes
Number: Provision crane (2 sets) / Monorail crane (1 set)
Type: Electric motor driven
Tasks: Provision handling / Engine parts handling
Mooring equipment
Number: 2 x windlass & mooring winch, 9 x mooring winch
Type: Electric-hydraulic driven

Special lifesaving equipment
Number of each and capacity: 2 sets

Cargo/capacity
Hatch covers
Type: Pontoon type
Containers
Lengths: 6,058mm (20ft), 12,192mm (40ft), 14,631mm (45ft)
Heights: 2,591mm (8ft 6inch), 2,896mm (9ft 6inch)
Cell guides: 40ft cell guide
Total TEU capacity: 24,136TEU

Reefer plugs: over 2,000 units
Tiers/rows (maximum)
On deck: 13 tiers/24rows
In holds: 12 tiers/22rows

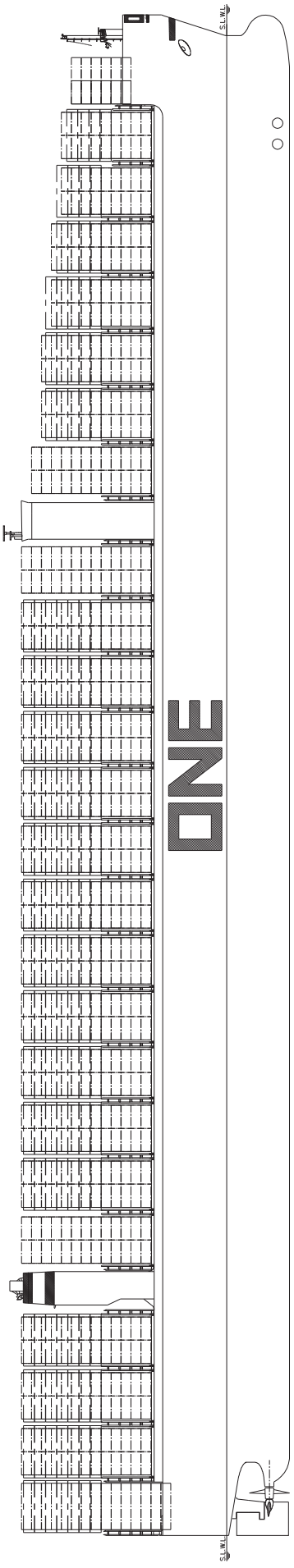
Ballast control system
Type: Remote hydraulic control
Complement
Officers: 14
Crew: 18
Supernumaries/Spare: 2
Suez/Repair Crew: 6

Navigation and other equipment
Bridge control system
Integrated bridge system: Y
Radars
Number: 3
Fire extinguishing systems
Cargo holds: CO_2
Engine room: CO_2

Efficiency
Energy Saving Technologies*: Surf-Bulb®, ALV-Fin® (Advanced Low Viscous Resistance Fin), Rupas® rudder, bow wind cover
Hull coatings: Low-friction type of antifouling paint

Delivery date: 2 June 2023

ONE INNOVATION



P&O PIONEER – RO-PAX

Shipbuilder:.....**Guangzhou Shipyard International Co., Ltd**
Vessel's name:..... ***P&O Pioneer***
Owner/Operator:..... **DP World France SAS**
Country:.....**France**
Model test establishment used:.....**MARIN**
Flag:.....**Cyprus**
IMO number: **9895161**
Total number of sister ships already completed (excluding ship presented): **1**
Total number of sister ships still on order: **Nil**

Designed and built by Guangzhou Shipyard International, *P&O Pioneer* is the first of a pair in P&O Ferries' Fusion class. The ship was delivered in February 2023 but then had to make the voyage to Calais to begin operations on the short Dover-Calais service. The second vessel *P&O Liberté* is scheduled to enter service in 2024.

At 230.5m in length and with a gross tonnage of 47,653, the vessel is claimed as the world's largest double-ended ferry. *P&O Pioneer* is notable as the first double-ended ferry to be deployed on English Channel services and is also the owner's first diesel-electric hybrid. Designed for saving time, the double-ended design eliminates the need for manoeuvring in port.

The ship can accommodate 1,427 passengers on Decks 8 and 9 but has no passenger cabins due to the short crossing. There are sufficient seats and vehicle capacity is 3,580lane-metres spread over Decks 3 to 7. As a double-ended ferry there is a ramp at each end but due to differences in the port facilities that at the bow (Calais end) is narrower than that at the stern (Dover end). The end can be distinguished by the lifeboats pointing towards the Calais end.

Power for the ship comes from four engines each rated at 9,760kW at 750rpm. Propulsion is provided by four Azipod 7.5MW units located in pairs at either end.

P&O Pioneer has what is currently one of the highest capacity battery ESS ever installed on a ship. Intended for future connection to shore power and capacity enlargement, which is not yet available in either port, the battery will be recharged by its diesel generators during operations underway. Battery power can then be used to achieve emissions-free operations alongside and during ferry manoeuvring. The efficiency of the system and the design of the vessels allows the owner to claim that *P&O Pioneer* will consume up to 40% less fuel than previous Dover Strait ferries.

TECHNICAL PARTICULARS

Length oa:.....230.50m
Breadth moulded:.....30.80m / Breadth, including fenders: abt. 31.40m
Depth moulded to main deck: 9.80m
Draught
scantling:.....6.70m
design: 6.235m

Gross:.....47,653t
Lightweight: 17,886t
Deadweight:.....8,850t

Speed, service:.....17.6knots at design draught with delivered power (Pd) of 12,250kW
20.8knots at scantling draught with delivered power (Pd) of 24,800kW

Daily fuel consumption (tonnes/day)
Main engine only:....171.0 g/kwh at 85% load base according to ISO 15550 with engine driven pumps for ULSHFO and correcting to a net calorific value of 427kj/kg

Classification society and notations:
✠ DNV/GL+, 1A, Ferry A, E0, BIS, NAUT (AW, ICS), LCS (DC), Recyclable*, COMF (C-2, V-2), Clean, Battery (power), HMON (C,G4,O2,W) LR Hull notation +100A1 Passenger/Vehicle Ferry, *IWS, LI, LR Machinery notation +LMC, UMS, Hybrid Power, NAV1, IBS, CAC2

Propulsion
Main engine(s)
Number:.....4
Type of fuel:.....MGO, ULSHFO
Output of each engine:....9,760kW x 750rpm

Propulsion and Steering
Propulsion Module:.....Azipods (Azimuth thruster system including Propulsion Module and Steering Module)
Power applied to input shaft:.....7,500kW
Propeller:.....Fixed mono block type
Propeller diameter:.....4m

Boilers
Number:.....2 x oil-fired boilers / 4 x exhaust gas boilers
Type: .....Aalborg OS-TCi / Aalborg XS-2V

Deck machinery
Mooring equipment
Number:.....2 x combined windlass / winch / 8 x winch
Type: .....Electric

Vehicles
Number of vehicle decks (fixed/moveable):
Total lane length:.....3,580lm
Deck 3.....Gross lm 1,314 for 7 lorries and 69 trailers
Deck 5:.....Gross lm 1,278 for 12 lorries and 64 trailers
Deck 7:.....Gross lm 1,066 for 182 private cars
Doors/ramps/lifts/moveable car decks
Number of each:
- 2 x outer bow door
- 2 x Inner bow door
- 1 x trailer lift cover
- 1 x trailer lift
- 2 x end door DK5
- 4 x ramp way door DK7

Type:.....Hydraulic

Ballast pumps
Number:.....2
Type: NSL250-330/D14
Capacity (each):.....500m^3/h
Ballast water treatment system
Capacity:.....500m^3/h

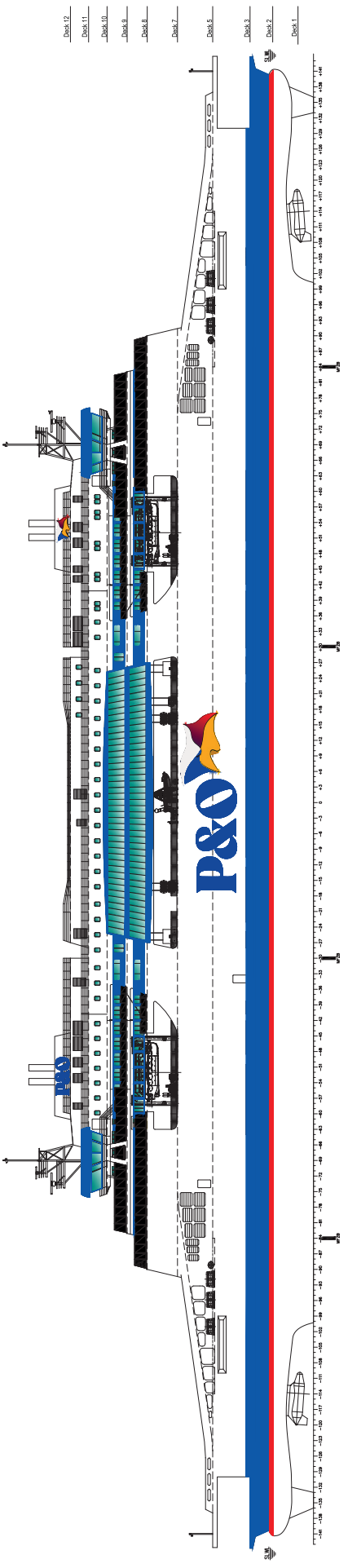
Complement
Crew:.....63
Passengers
Total:.....1,437

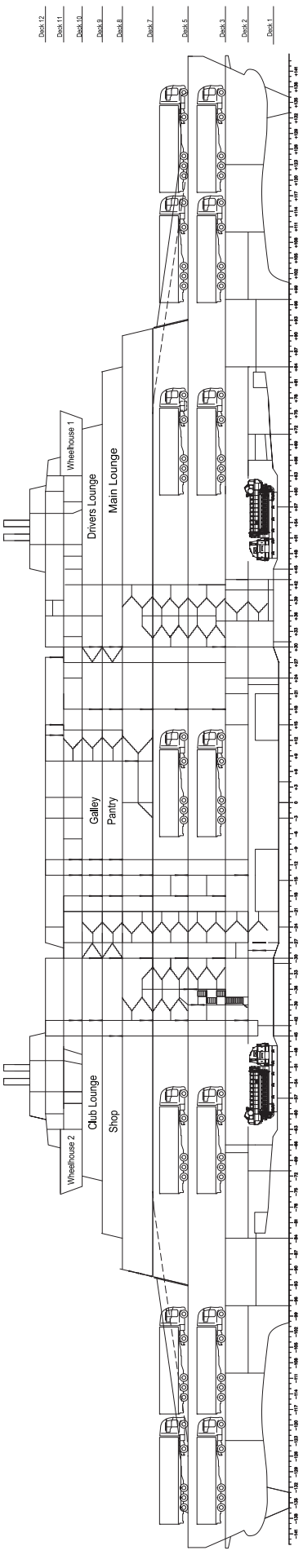
Navigation and other equipment
Radars
Number:.....2 x X-Band / 2 x S-Band
Model(s):.....MC330
Fire detection system
Type: .....Saiwico CCP

Sewage plant
Model: .....BR 70K

Contract date: .....23 September 2019
Launch/float-out date:.....30 December 2021
Delivery date:.....28 February 2023

P&O PIONEER


Deck 12
Deck 11
Deck 10
Deck 9
Deck 8
Deck 7
Deck 5
Deck 3
Deck 2
Deck 1
P&O


Deck 12
Deck 11
Deck 10
Deck 9
Deck 8
Deck 7
Deck 5
Deck 3
Deck 2
Deck 1
Wheelhouse 1
Drivers Lounge
Main Lounge
Galley
Pantry
Club Lounge
Shop
Wheelhouse 2

PELION – CONTAINER SHIP

Shipbuilder: **Shanghai Waigaoqiao Shipbuilding Co., Ltd**
Vessel's name: ***Pelion***
Owner/Operator: **X-Press**
Country: **Singapore**
Designer: **Shanghai Merchant Ship Design & Research Institute (SDARI)**
Country: **China**
Model test establishment used: **Shanghai Ship & Shipping Research Institute**
Flag: **Liberia**
IMO number: **9967407**
Total number of sister ships already completed (excluding ship presented): **10**
Total number of sister ships still on order: **1**

Ordered by Sea Consortium owners of Singapore-based X-Press feeders in 2021, designed by SDARI, built by CSSC Shanghai Waigaoqiao Shipbuilding (SWS) and operating under charter to CMA CGM's subsidiary CNC, and delivered in June 2023, *Pelion* is the first in a series of 12 fully cellular 7,000TEU ships. It is also the first container ship ordered at SWS by Sea Consortium.

Pelion is 272.5m length and 42.8m wide with a draught of 15m. Nominal capacity is 7,092TEU split 2,976TEU under deck and 4,116TEU above including 800 reefer points. At 14tonnes homogenous maximum intake would be 5,457TEU.

As a relatively – by modern standards – medium-sized container ship, the vessel has no need to move the superstructure forward to meet line of sight rules. For this vessel it is situated between Holds 6 and 7. The 7,000TEU size is quite popular and this new generation design has notched up more than 40 orders. The final vessel in the X-Press series was due for delivery in March 2024.

Pelion and its sisters feature an eco-friendly design concept with an optimised hull line, shock and noise reduction, low-consumption main engines, and high-efficiency propeller. Along with other energy saving measures such as a full-spade twisted leading edge rudder and rudder bulb, it has been possible to comfortably meet EEDI Phase 3 requirements with a rating of 8.10 against a maximum 14.19.

The main engine is a CSSC-MES Diesel-built MAN B&W 7G80ME-C10.5-HPSCR unit producing 26,280kW linked to a 9.5m fixed pitch propeller to give a service speed of 21.6knots at 72rpm. Auxiliaries are a trio of STX-MAN 8L27/38 units producing 2,495kW and a smaller 6L27/38 producing 1,870kW. A ContiOcean open loop scrubber operating on main and auxiliaries ensures SOx requirements when burning HFO.

TECHNICAL PARTICULARS

Length oa: 272.00m
Length bp: 267.50m
Breadth moulded: 42.80m
Depth moulded:
to main deck: 24.60m
Width of double skin
side: 2.20m
bottom: 2.00m
Draught
scantling: 15.00m
design: 13.00m
Gross: 73,172t
Deadweight
scantling: 86,400t
Speed, service: 21.6knots
Cargo capacity (m^3)
Bale: 144,900
Bunkers (m^3)
Heavy oil: 4,200
Diesel oil: 650
Tankers – segregated ballast: 27,500
Daily fuel consumption (tonnes/day)
Main engine only: 88.8
Auxiliaries: 7.6
Classification society and notations: ABS +A1, (E), Container carrier, +AMS, SH, SHCM, +ACCU, TCM, UWILD, CSC, CLP-V, CPS, BWT, ENVIRO, IHM, RW, RRDA
% high-tensile steel used in construction: 80%

Propulsion
Main engine(s)
Design: MAN
Model: 7G80ME-C10.5-HPSCR
Manufacturer: CSSC-MES Diesel Co., Ltd
Number: 1
Type of fuel: HFO, ULSFO & MGO
Output of each engine: 26,280kW
Is this a diesel-electric or hybrid?: N
Propeller(s)
Material: Ni-Al-Bronze
Designer/Manufacturer: Shanghai Marine Propeller Design Co., Ltd
Number: 1
Fixed/Controllable pitch: Fixed
Diameter: 9.5m
Speed: 72rpm
Diesel-driven alternators
Number: 4
Engine make/type: STX-MAN / 1 x Ocean & 1 x 6L27/38
Type of fuel: HFO, ULSFO & MGO
Alternator make/type: Hyundai, synchronous generator / 3 x HFC7 718-10P & 1 x HFC7 712-10P
Output/speed of each set: 2,495kWe & 1,870kWe
Exhaust-gas scrubbing equipment
Manufacturer: ContiOcean Environment Technology Co., Ltd
Type: U-type open-loop SOx scrubber
On main engines?: Yes
On auxiliary engines?: Yes
Boilers
Number: 1
Type: Composite steam boiler
Make: KangRim
Output, each boiler: 3,000kg/h at oil-fired section, 2,300kg/h at exhaust gas section
Stern appendages/special rudders: full-spade type twisted rudder with rudder bulb
Bow thruster(s)
Make: Wuhan Kawasaki Marine Machinery Co., Ltd
Number: 1
Output (each): abt. 277kN (abt. 28t)

Deck machinery
Other cranes
Number: 1
Make: Zhenjiang Marine Auxiliary Machinery Works/PR
Type: Electric traversing signal beam crane
Tasks: Lifting engine room spares and provisions
Performance: SWL 9.5t
Mooring equipment
Number: 2 x windlass, 6 x mooring winches, 4 x capstan
Make: Jiangsu Masada Heavy Industries Co., Ltd
Type: Electric
Cargo/capacity
Hatch covers
Design: TTS Huahai
Manufacturer: Shanghai Waigaoqiao Shipbuilding Co., Ltd
Type (upper deck/other decks): Upper deck
Containers
Lengths: 20ft /40ft/45ft
Heights: 8'6"/9'6"
Total TEU capacity: 7,092TEU
On deck: 4,116TEU
In holds: 2,976TEU
Homogeneously loaded to 14tonnes: 5,457TEU
Reefer plugs: 800
Tiers/rows (maximum)
On deck: 10 tiers, 17 rows
In holds: 9 tiers, 15 rows
Hold refrigeration system: Air cooling

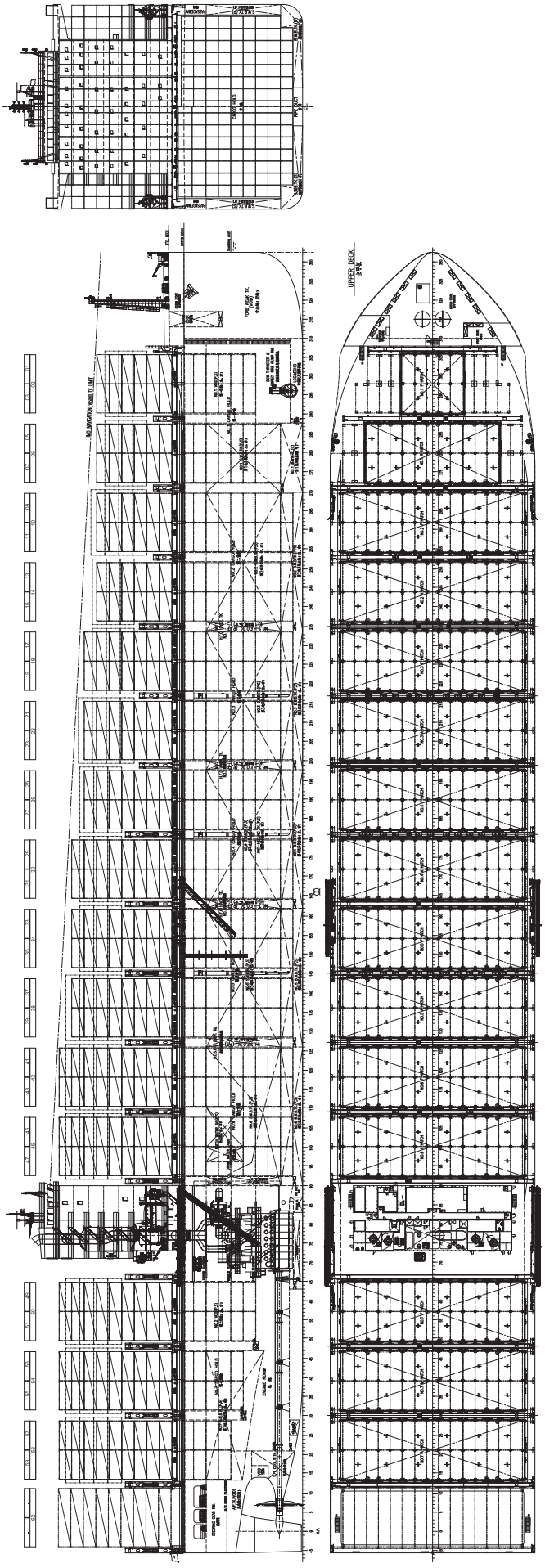
Ballast water treatment system
Make: Alfa Laval
Capacity: 750m^3
Complement
Officers: 10
Crew: 17
Suez/Repair Crew: 6

Navigation and other equipment
Bridge control system
Make: Hengyi Marine
Is bridge fitted for one-man operation?: N
Integrated bridge system: N
Radars
Number: 2
Make: JRC
Model(s): JMR-9282-SN/JMR-9225-9XN

Fire detection system
Make: Consilium
Type: Salwico Cargo
Fire extinguishing systems
Cargo holds: CO_2 fixed system
Make/Type: VFP/AM21097~104
Engine room: CO_2 fixed system, water mist system
Make/Type: VFP/AM21097~104, VFP/AM21089~96
Waste disposal plant
Sewage plant
Make: CSSC Nanjing Luzhou Machine Co., Ltd
Model: STC-2

Efficiency
Attained EEDI value: 8.10
Required EEDI value: 14.19
Installed Fuel Meters: Mass flow meter for fuel oil system
Other installed monitoring tools: Shaft torque, remote sounding
Energy Saving Technologies: Full-spade twisted leading edge rudder and rudder bulb

Contract date: April 2021
Delivery date: June 2023



SEAWAYS ENDEAVOR – VERY LARGE CRUDE CARRIER

Shipbuilder: **Hanwha Ocean Co., Ltd**
Vessel's name: ***Seaways Endeavor***
Owner/Operator: **International Seaways, Inc**
Country: **United States of America**
Designer: **Hanwha Ocean Co., Ltd**
Country: **Republic of Korea**
Model test establishment used: **KRISO**
Flag: **Marshall Islands**
IMO number: **9933573**
Total number of sister ships already completed (excluding ship presented): **8**
Total number of sister ships still on order: **1**

Built by Hanwa Ocean (ex DSME) and delivered to International Seaways in March 2023, *Seaways Endeavor* is the first of three dual-fuel VLCCs ordered by the US-based operator and the first dual-fuel VLCC in the owner's fleet. The two sister ships *Seaways Enterprise* and *Seaways Excelsior* followed in April and May respectively. The ship is part of a 10-ship series with AET and Advantage Tankers being the owners of the other vessels. All ships will be operating under charter to Shell.

As well as being the first dual-fuel vessels for International Seaways, the full 10-ship class represents a breakthrough into the VLCC sector MAN B&W's ME-GI Mk9.5 high pressure dual-fuel main engines. The ship's seven-cylinder unit was built by Hyundai and can run on oil fuels or LNG. It produces 24,510kW at 66.4rpm driving a directly connected 10.6m fixed-pitch propeller. Service speed at 68.5% MCR is 14.9knots. Compliance with NOx requirements is met through a combination of exhaust gas recirculation and low-pressure SCR.

With a deadweight of 299,365tonnes, a loa of 336m and beam of 60m, the ship is typical of its type, but the two Type C deck tanks mounted one each side on deck above tanks four and five give highlight its dual-fuel propulsion system. The tanks are made of high manganese steel and each hold 3,750m^3 of LNG.

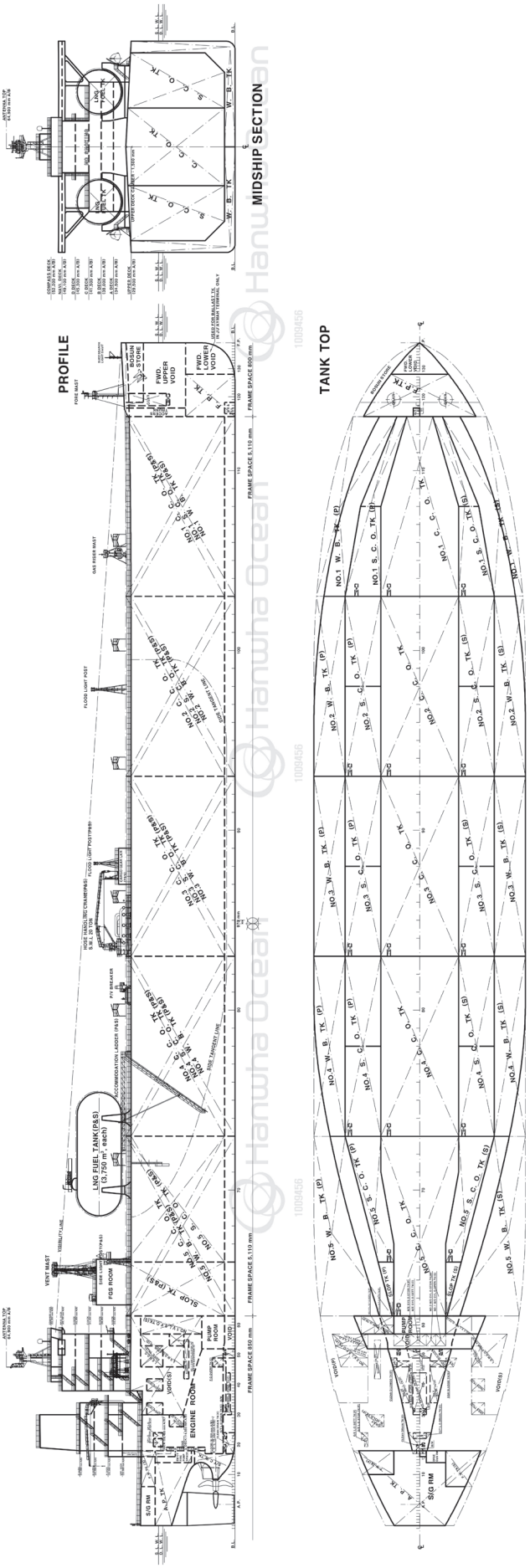
TECHNICAL PARTICULARS

Length oa: 336.00m
Length bp: 330.00m
Breadth moulded: 60.00m
Depth moulded: 29.50m
to main deck: 29.50m
to upper deck: 29.50m
to other decks: 26.00m to freeboard deck (sunken deck)
Width of double skin
side: 2.041m (min.)
bottom: 2.002m (min.)
Draught
scantling: 21.70m
design: 20.50m
Gross: 156,186t
Displacement: 344,018.6t at scantling draught
Lightweight: 44,653.6t
Deadweight
scantling: 299,365.0t
design: 27,8091.0t
Block co-efficient: 0.7798 at scantling draught (summer load draught)
Speed, service (68.5%MCR output): 14.9knots at design draught with 15% sea margin
Cargo capacity (m^3)
Liquid volume: 339,961.6
Bunkers (m^3)
Heavy oil: 2,180.2 (100%, VLSFO)
Diesel oil: 815 (100%, LSMGO)
Water ballast (m^3): 93,143
Tankers – percentage segregated ballast: 95.8% (89,196.9/93,143)
Daily fuel consumption (tonnes/day)
Main engine only: 60.1 (oil mode)
Auxiliaries: 48.6 (gas mode)
Classification society and notations: LR ✠100A1, Double Hull Oil Tanker, CSR, ESP, ShipRight (ACS(B, C), CM), *IWS, LI, DSPM4, ECO(EAL, EEDI–3, VECS-L, NOX3, OW, P) ✠LMC, IGS, BWTS, LFPF(GF, NG), EGCN(SCR,EGR), UMS, NAV1, COW(LR), ShipRight(BWMP(T), SCM, SERS, IHM, ShaftRight(N,D))
% high-tensile steel used in construction: Abt. 65%

Propulsion
Main engine(s)
Design: MAN Energy Solutions
Model: MAN B&W 7G80ME-C9.5-GI
Manufacturer: HSD Engine
Number: 1
Type of fuel: VLSFO, LSMGO & FG
Output of each engine: 24,510kW x 66.4rpm
Is this a diesel-electric or hybrid?: N
Propeller(s)
Material: Ni-Al-Bronze
Designer/Manufacturer: HD Hyundai Heavy Industries (HHI)
Number: 1
Fixed/Controllable pitch: Fixed
Diameter: 10.6m
Speed: 66.4rpm (MCR)
Dual fuel-driven alternators
Number: 2
Engine make/type: 7H22CDF
Type of fuel: VLSFO, LSMGO and LNG
Alternator make/type: HFJ7 568-08P
Output/speed of each set: 1,420kW x 900rpm
Diesel-driven alternators
Number: 1
Engine make/type: 7H21/32
Type of fuel: VLSFO, LSMGO
Alternator make/type: HFJ7 634-08P
Output/speed of each set: 1,460kW x 900rpm
Exhaust-gas scrubbing equipment
Manufacturer: HHI / HSD Engine
Type: LP-SCR / ME EGR
On main engines?: Y
On auxiliary engines?: N
Boilers
Number: 2
Type: Aalborg OC-TCi
Make: Alfa Laval
Output, each boiler: 45,000kg/h
Deck machinery
Cargo cranes/cargo gear
Number: 2
Make: Oriental
Type: Single jib, cylinder luffing
Performance: SWL 20t, 4.6-21.3m
Other cranes
Number: 2
Make: Oriental
Type: Single jib, cylinder luffing
Tasks: Provision cranes
Performance: SWL 10t, 4.4-20m (P) / SWL 3t, 5.1-20m (S)
Mooring equipment
Number: 11
Make: Flutek
Type: Electro-hydraulic driven, high-pressure
Special lifesaving equipment
Number of each and capacity: 2 x 32 persons each
Make: HLB
Type: FRP totally enclosed with water spray protection
Cargo tanks
Number: 15
Grades of cargo carried: Crude oil
Cargo pumps
Number: 3
Type: Steam turbine driven, centrifugal
Make: Shinko Ind., Ltd
Stainless steel: N-A (casing: bronze, impeller: phosphor bronze)
Capacity (each): 5,500m^3/h X 150mlc
Cargo control system
Make: Emerson
Type: Conventional console with mimic diagram
Ballast control system
Make: Emerson
Type: Conventional console with mimic diagram
Ballast water treatment system
Make: Techcross
Capacity: 2 x 3,000m^3/h
Complement
Officers: 16
Crew: 14
Suez/Repair Crew: 6
Passengers
Total: 36
Number of cabins: 31
Navigation and other equipment
Bridge control system
Make: Kongsberg
Type: AutoChief 600
Is bridge fitted for one-man operation?: Y
Integrated bridge system: N
Radars
Number: 2
Make: Furuno
Model(s): FAR-2338SNXT / FAR-2328NXT
Fire detection system
Make/Type: Consilium / Salwico Cargo
Fire extinguishing systems
Cargo holds: Deck foam, CO_2
Make/Type: NK (foam), JCI (CO_2)
Engine room: High-pressure foam
Make/Type: NK
Waste disposal plant
Incinerator
Make/Model: KangRim Co., Ltd / KFB-110S
Waste compactor
Make: Samjoo Eng. Co., Ltd
Model: SYCOM-100
Waste shredder/crusher
Make/Model: Samjoo Eng. Co., Ltd / BS510A
Sewage plant
Make/Model: Il Seung / ISB-02
Efficiency
Attained EEDI value: 1.66 g/ton-mile
Required EEDI value: 2.07 g/ton-mile (Phase 2)
Installed Fuel Meters: Coriolis type
Other installed monitoring tools: Ship performance monitoring system
Energy Saving Technologies: Full LED lighting, duct & long cap and rudder bulb, VFD for LNG feed pump & hp pump, energy storage system
Hull coatings: High performance, low friction self-polishing anti-fouling paint

Contract date: 11 March 2021
Launch/float-out date: 17 September 2022
Delivery date: 07 March 2023

SEAWAYS ENDEAVOR



SH DIANA – CRUISE SHIP

Shipbuilder: **Helsinki Shipyard Oy**
Vessel's name: ***SH Diana***
Owner/Operator: **Swan Hellenic**
Country: **United Arab Emirates**
Designer: **Tillberg Design of Sweden**
Country: **Sweden**
Flag: **Panama**
IMO number: **9921740**
Total number of sister ships already completed (excluding ship presented): **Nil**
Total number of sister ships still on order: **Nil**

Constructed at the Helsinki Shipyard in Finland, *SH Diana*, was delivered in March 2023 to German adventure cruise operator Swan Hellenic as its new flagship. The vessel is Swan Hellenic's third ice-class ship and the largest of the three 'sisters' built by Helsinki Shipyard. The earlier vessels were the *SH Minerva* and *SH Vega* launched in 2021 and 2022 respectively.

As with most of the latest generation of expedition cruise ships, *SH Diana* is ice-classed and in this case to Polar Class 6. The earlier two sisters had a slightly higher ice class (PC5) and a different bow form. All three have a vertical bow but SH Diana's is fitted with a bulb that is absent in the earlier vessels.

The vessel is of modest size and its 125m length – 12m longer than its sisters – and gross tonnage of just 12,100 make for an intimate experience for the 192 guests that can be accommodated in the 96 cabins spread over Decks 4, 5 and 6 of the ship's nine decks. The cabins on Decks 5 and 6 have balconies whilst those on Deck 4 have fixed non-opening windows. A crew complement of 141 means passengers can expect a fairly high standard of service.

The top open deck is used for viewing scenery and wildlife spotting opportunities by day and as a stargazing deck at night. There are also extensive outdoor deck areas that offer additional observation points. Unlike many of the expedition cruise ships which make use of zodiacs for passenger excursions into shallow waters, *SH Diana* has two tenders which are boarded from the marina at the stern on Deck 3.

The ship's power system is a quite conservative diesel electric set up and comprises four oil-burning Wärtsilä 8L20 medium-speed engines each outputting 1,760kW. The propulsion system is a twin propeller set up with electric power turning two 2,300kW Alconza propulsion motors at 900rpm connected through a pair of Wärtsilä WSH75 reduction gearboxes to twin 3.6m diameter fixed pitch propellers revolving at 161rpm to give a service speed of 12knots. Manoeuvrability is conferred by two Kongsberg 6,650kW bow thrusters and a 750kW Kongsberg stern thruster.

The engines will run on MDO and will meet SOx rules using compliant fuels. A SCR system allows compliance with NOx Tier III. The ship carries sufficient fuel for 40 days at sea or 8,000nm. There is an intention to install a 3mWh battery back at a later date that would allow for some zero-emission operation.

TECHNICAL PARTICULARS

Length oa: 124.90m
Length bp: 119.70m
Breadth moulded: 20.20m
Depth moulded
to main deck: 8.00m
Draught
scantling: 5.75m
design: 5.45m
Gross: 12,255t
Deadweight
scantling: 2,224t
design: 1,678t
Speed, service: 12knots
Daily fuel consumption (tonnes/day)
Main engine only: 22 (at cruise speed of 12knots)
Classification society and notations: LR ✠ 100A1, Passenger Ship ShipRight ACS(B), *IWS ECO(BWT, OW, P), Ice Class PC6 ✠ LMC, UMS, CCS, PCAC 2,2 ShipRight (IHM, SCM)
Roll-stabilisation equipment: Mitsubishi Heavy Industries retractable fin stabilisers

Propulsion
Main engine(s)
Design: 4-stroke medium speed engine
Model: 8L20
Manufacturer: Wärtsilä
Number: 4
Type of fuel: MDO
Output of each engine: 1,760kW (MCR)
Is this a diesel-electric or hybrid?: Yes
Gearbox(es)
Make: Wärtsilä
Model: WSH75
Number: 2
Output speed: 161rpm
Propeller(s)
Material: Ni-Al-Bronze
Number: 2
Fixed/Controllable pitch: Fixed
Diameter: 3.6m
Speed: 161rpm
Special adaptations: Ice Class PC6
Propulsion motors
Number: 2
Make/type: Alconza
Output of each motor: 2,300kW
Output speed: 900rpm
Exhaust-gas scrubbing equipment
Manufacturer: Wärtsilä
Type: Selective catalytic reduction
On main engines?: Yes

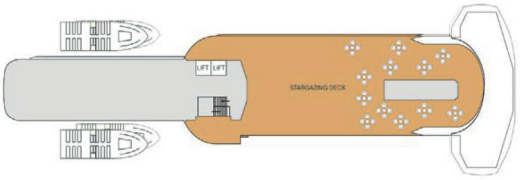
Boilers
Number: 2
Type: Low temperature oil/gas boiler
Make: Viessmann
Output, each boiler: 900kW
Stern appendages/special rudders: 2 x Kongsberg steering gears, individual rudder area 8.9m^2
Bow thruster(s)
Make: Kongsberg
Number: 2
Output (each): 650kW
Stern thruster(s)
Make: Kongsberg
Number: 1
Output (each): 750kW
Deck machinery
Cargo cranes/cargo gear
Number: 1
Make: Heila
Type: Telescopic boom crane
Performance: 1.5t at 5m
Other cranes
Number: 2
Make: Heila
Type: Knuckle boom crane
Tasks: Zodiac loading
Performance: 2.2t at 12m, 2.5t at 7.6m
Mooring equipment
Number: 4
Make: Kongsberg
Type: Electric/hydraulic

Special lifesaving equipment
Number of each and capacity: 2 x lifeboats, each 150 persons. 4 x 20-person life rafts
Make: Hatecke
Type: PEL 150R
Ballast control system
Make: Alfa Laval
Ballast water treatment system
Make: Alfa Laval
Capacity: 85m^3/h
Complement
Crew: 141
Passengers
Total: 209
Number of cabins: 96

Navigation and other equipment
Bridge control system
Make: Wärtsilä SAM Electronics GmbH
Type: Nacos Platinum
Is bridge fitted for one-man operation? N
Integrated bridge system: Y
If yes, make: Wärtsilä SAM Electronics GmbH
Model: Nacos Platinum
Radars
Number: 3
Make: Wärtsilä SAM Electronics GmbH
Model(s): Radarpilot X-Band x- 2 pcs, Radarpilot S-Band x 1 pc
Fire detection system
Make: Consilium
Type: Salwico Cruise
Fire extinguishing systems
Engine room: Fire pumps, water mist, sprinklers
Make/Type: Iron, Marioff
Cabins: Water mist
Make/Type: Marioff
Public spaces: Water mist
Make/Type: Marioff
Waste disposal plant
Waste compactor
Make: Loipart
Model: LB502
Waste shredder/crusher
Make: Loipart
Model: LGC
Sewage plant
Make: Evac
Model: OnlineMax
Efficiency
Hull coatings: Jotun

Contract date: December 2020
Launch/float-out date: September 2022 / January 2023
Delivery date: March 2023

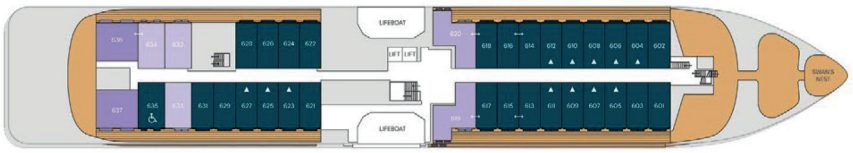
SH DIANA



Deck 9
Stargazing Deck

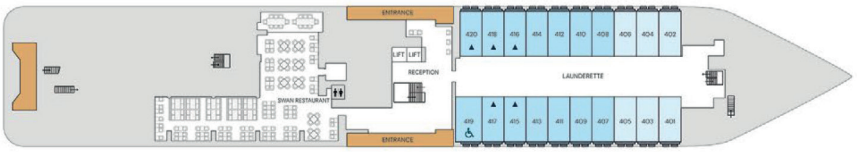
Deck 8
Gym
Sauna
Jacuzzi
Spa
Beauty Salon
Bridge

Deck 7
Swimming Pool
Pool Bar & Grill
Club Lounge
Events Room
Observation Lounge

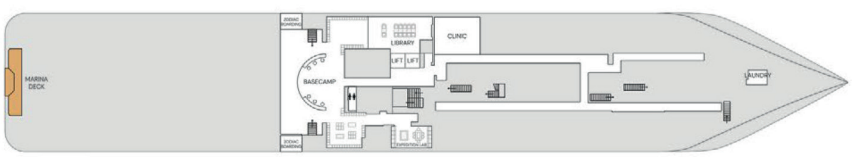


Deck 6
Premium Suites
Suites
Junior Suites
Balcony Staterooms D6
Swan's Nest

Deck 5
Balcony Staterooms D5, M5
Junior Suites
Suites



Deck 4
Swan Restaurant
Reception
Oceanview Staterooms D4, M4
Launderette



Deck 3
Marina Deck
Zodiac Boarding
Basecamp
Library
Expedition Lab
Clinic
Laundry

SITC RUIMING – CONTAINER SHIP

Shipbuilder: **Jiangsu New Yangzi Shipbuilding Co., Ltd**
Vessel's name: ***SITC Ruiming***
Owner/Operator: **SITC Shipping Management Co., Ltd**
Country: **China**
Designer: **Shanghai Merchant Ship Design & Research Institute (SDARI)**
Country: **China**
Model test establishment used: **HSVA**
Flag: **Hong Kong**
IMO number: **9941087**
Total number of sister ships already completed (excluding ship presented): **9**
Total number of sister ships still on order: **Nil**

The first of a series of 10 SDARI designed 2,600TEU container ships, *SITC Ruiming* was delivered to Chinese owner SITC by Jiangsu New Yangzi Shipbuilding in June 2023. All of the nine sister vessels have since been delivered. As with many container ship operators, a desire to rely less on chartered tonnage was a factor in the order.

Nominally a 2,600TEU ship, *SITC Ruiming* actually has capacity for 2,698TEU spread 1,070TEU under deck and 1,628TEU above deck. Its capacity at 14tonnes homogenous is a respectable 2,408TEU or more than 89%. There are 400 reefer plugs.

To ensure flexibility and high container intake, the design is a wide-beam vessel able to load 13 rows on deck and 12 under. This allows for a minimum ballast water need. The ship has a vertical stem and typical of this size of vessel the accommodation and engine room is aft of the holds, but two stacks of containers can be accommodated on the aft deck. With hull dimensions of 185.9m, beam of 35.2m and draught of 11m, the length has been set so as to allow the vessel to call at Chittagong in Bangladesh.

Although built for global trading, the size of the ship means that it will not likely encounter and NOx emission control areas in its intended operation in Asian waters. It therefore only need meet NOx Tier II rules, but space has been reserved for a future SCR installation if needed. To meet SOx requirements the ship is fitted with a U-type scrubber operating on main and auxiliary engines.

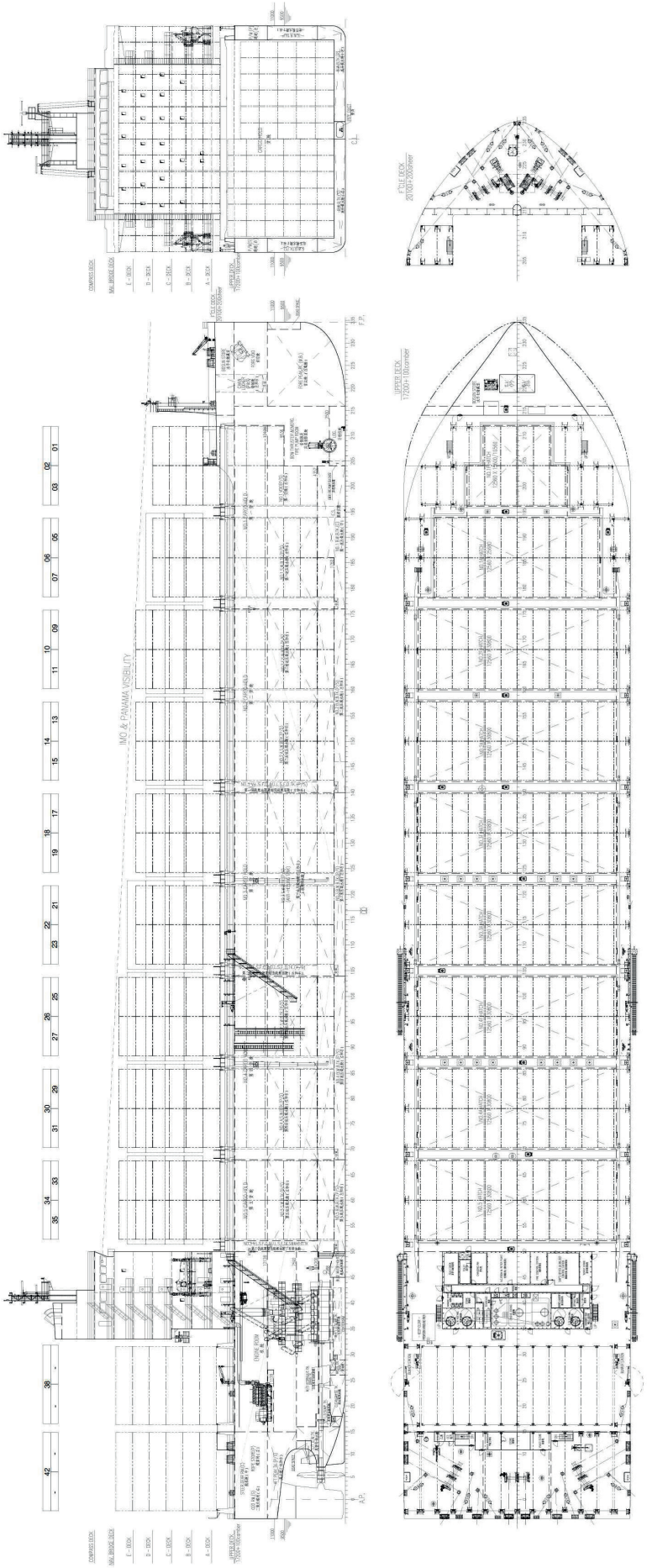
The main engine is a HSD-built MAN B&W 7S60ME-C10.5 unit producing 14,800kW at 100rpm. Drive is via a mechanically linked 7.2m fixed pitch propeller allowing a service speed of 18.9knots at 85% MCR. Application of various energy saving technologies such as twisted leading edge rudder, rudder bulb and fan duct, brings the vessel into compliance with EEDI IMO Phase 3, with a rating of 12.5 some 40.4% lower than the required 18.9.

TECHNICAL PARTICULARS

Length oa: 185.90m
Length bp: 182.90m
Breadth moulded: 35.20m
Depth moulded to main deck: 17.20m
Width of double skin
side: 2.20m
bottom: 1.76m
Draught
scantling: 11.00m
design: 9.50m
Gross: 29,426t
Displacement: 48,113.2t
Lightweight: 10,632.7t
Deadweight
scantling: 37,480.5t
design: 29,289.3t
Block co-efficient: 0.6350/design draught
Speed, service (85%SMCR output): 18.94knots
Cargo capacity (m^3)
Bale: 53,322.2
Bunkers (m^3)
Heavy oil: 1,500
Diesel oil: 250
Water ballast (m^3): 12,500
Daily fuel consumption (tonnes/day)
Main engine only: 48.8
Classification society and notations: NK NS * (CNC)(EQ C DG, PSPC-WBT, NC)(PS-DA)(HCM) (IWS)(PSCM) (EA) (IHM) (EEDI-p3) (SOx(EGCS)) (CSSA-R) (SDCL), MNS*
Installation Characters: CHG, MPP, LSA, RCF, M0, AFS, BWM
% high-tensile steel used in construction: 56.83%
Heel control equipment: Anti-heeling tank and pump

Propulsion
Main engine(s)
Design: MAN B&W
Model: 7S60ME-C10.5
Manufacturer: HSD Engine
Number: 1
Type of fuel: HFO
Output of each engine: 14,880kW x 100 rpm
Is this a diesel-electric or hybrid?: N
Propeller(s)
Material: Ni-Al-Bronze
Designer/Manufacturer: Shanghai Marine Propeller Design Co., Ltd
Number: 1
Fixed/Controllable pitch: Fixed
Diameter: 7.2m
Speed: 100rpm
Diesel-driven alternators
Number: 3
Engine make/type: YANMAR Engine/YANMAR 6EY22ALW
Type of fuel: HFO
Output/speed of each set: 1,280kW x 900rpm
Exhaust-gas scrubbing equipment
Manufacturer: Shanghai Marine Diesel Engine Research Institute
Type: U-TYPE
On main engines?: 85% ME
On auxiliary engines?: 3 x 90% GE
Boilers
Number: 1
Type: Cylindrical vertical type
Make: Kangrim
Output, each boiler: 1,800/1,200kg/h
Stern appendages/special rudders: Full-spade twisted leading edge rudder and rudder bulb
Bow thruster(s)
Make: Wuhan Kawasaki Marine Machinery Co., Ltd
Number: 1
Output (each): 1,100kW
Deck machinery
Other cranes
Number: 1
Make: Shanghai Hengyuan Marine Equipment Co., Ltd
Type: Electric motor driven sliding type monorail crane
Tasks: Provision and engine parts handing crane
Performance: 4t SWL
Mooring equipment
Number: 5
Make: Yoowon Industries Co. Ltd
Type: Electric-hydraulic
Special lifesaving equipment
Number of each and capacity: 2 x lifeboats
Make: Jiangyinshi Beihai LSA Co., Ltd
Type: Gravity luffing arm type
Cargo/capacity
Hatch covers
Design: TTS HuaHai
Type: Pontoon
Total TEU capacity: 2,698TEU
On deck: 1,628TEU
In holds: 1,070TEU
Homogeneously loaded to 14tonnes: 2,408TEU
Reefer plugs: 400
Tiers/rows (maximum)
On deck: 6 tiers, 13 rows
In holds: 6 tiers, 12 rows
Hold refrigeration system: Air cooling
Ballast water treatment system
Make: Headway Technology Group (Qingdao) Co., Ltd
Capacity: 585m^3/h(PSU≥1), 450m^3/h(PSU<1)
Complement
Officers: 13
Crew: 9
Suez/Repair Crew: 6
Navigation and other equipment
Bridge control system
Make: Furuno
Type: RCU-026
Is bridge fitted for one-man operation?: N
Integrated bridge system: N
Radars
Number: 2 sets
Make: Furuno
Model(s): FAR-2328/FAR-2338S
Fire detection system
Make: Tyco
Type: T2000CV
Fire extinguishing systems
Cargo holds: CO_2
Make/Type: NK
Engine room: CO_2
Make/Type: NK
Efficiency
Attained EEDI value: 12.5
Required EEDI value: 18.9
Installed Fuel Meters: Mass flow meter for fuel oil system
Other installed monitoring tools: Shaft torque, remote sounding
Energy Saving Technologies: Full-spade twisted leading edge rudder and rudder bulb, fan duct
Contract date: 29 December 2015
Launch/float-out date: 27 April 2023
Delivery date: 30 June 2023

SITC RUIMING



SONANGOL KULUMBIMBI – CRUDE OIL TANKER

Shipbuilder: **Hyundai Samho Heavy Industries Co., Ltd**
Vessel's name: ***Sonangol Kulumbimbi***
Owner/Operator: **Sonangol**
Country: **Angola**
Designer: **HSHI**
Country: **Republic of Korea**
Flag: **Bahamas**
IMO number: **9938482**
Total number of sister ships already completed (excluding ship presented): **1**
Total number of sister ships still on order: **Nil**

South Korean shipbuilder Hyundai Samho delivered the 157,663dwt Suezmax crude tanker *Sonangol Kulumbimbi* to state-owned Angolan energy company Sonangol in April 2023 as the first of two sister ships. *Sonangol Njinga Mbande* the sister ship was delivered in September 2023. The ships are named for Angolan cultural icons; the *Kulumbimbi* after the first catholic church in sub-Saharan Africa founded in the 16th century and a UNESCO heritage site and the other after a warrior queen of the Kingdom of Matamba (now part of Angola) of the 17th century.

At 274.08m in length, with a beam of 48m and scantling draught of 17.2m, the ship is a fairly typical Suezmax type. It will operate in the Stena Sonangol Suezmax Pool, a joint venture between Stena Bulk and Sonangol.

Cargo is carried in six pairs of cargo tanks and there is also a pair of slop tanks. Pumping arrangements comprise three Shinko vertical, centrifugal, single stage double suction steam turbine driven pumps with a capacity of 3,500m^3/h each.

Power is provided by a Hyundai-built MAN B&W 6G70ME-C10.5-HPSCR main engine of 14,500kW output at 72rpm and linked to a 9.0m propeller gives a service speed of 14.5knots. The ship runs on 2020 SOx compliant fuel with NOx requirements being met by way of a high pressure SCR system. Auxiliary power comes from three HiMSEN 6H21/32 gensets each producing 1,250kW at 900rpm.

Energy saving devices include Hyundai's proprietary full spade rudder with bulb and skirt and a pre-swirl duct.

TECHNICAL PARTICULARS

Length oa: 274.08m
Length bp: 269.00m
Breadth moulded: 48.00m
Depth moulded
to main deck: 23.20m
to upper deck: 23.20m
to other decks: 35.48m
Width of double skin
side: 2.50m
bottom: 2.70m
Draught
scantling: 17.20m
design: 16.00m
Gross: 80,540t
Deadweight
scantling: 157,663t
design: 167,000t

Block co-efficient: 0.7950
Speed, service: 14.50knots at NCR
Cargo capacity (m^3)
Liquid volume: 169,800
Water ballast (m^3): 51,500
Tankers – segregated ballast: 51,500
Daily fuel consumption (tonnes/day)
Main engine only: 37.0
Auxiliaries: 5.0

Classification society and notations: DNV, +1A, Tanker for oil, BIS, BWM(T), CSR, CLEAN, COAT-PSPC (B,C),EO, ESP, NAUT-OC, SPM, TMON(oil lubricated), VCS(2B), LCS, Recyclable, CMON, ECA(SOx-A), BMON, Cyber Secure, Shaft align(1)*, ER(SCR Tier III), SmartShip(OE, PE, RSE, CME)**

Propulsion
Main engine(s)
Design: MAN Energy Solutions
Model: Hyundai-MAN B&W 6G70ME-C10.5-HPSCR
Manufacturer: HHI-EMD
Number: 1
Type of fuel: HFO, LFO, MGO
Output of each engine: 14,500kW x 70.2rpm
Is this a diesel-electric or hybrid?: N
Propeller(s)
Material: Ni-Al-Bronze
Designer/Manufacturer: Hyundai Heavy Industries
Number: 1
Fixed/Controllable pitch: Fixed
Diameter: 9.0m
Speed: 70.2rpm
Diesel-driven alternators
Number: 3
Engine make/type: HHI-EMD / HiMSEN 6H21/32
Type of fuel: LFO, MGO
Alternator make/type: HE / Marine design IP 23 enclosure brushless
Output/speed of each set: 1,250kW x 900rpm
Boilers
Number: 1 set
Type: Automatic, forced draught, heavy fuel oil burning, marine boiler
Make: Kangrim
Output, each boiler: 35,000kg/h
Stern appendages/special rudders: Full spade rudder with bulb & Hi-PSD & Hi-Fin
Deck machinery
Cargo cranes/cargo gear
Number: 2
Make: Oriental
Type: Electro-hydraulic driven
Performance: SWL 20t, working radius max. 21m ~ min. 4.3m
Other cranes
Number: 2
Make: Sangsangin Industry Co., Ltd
Type: Electro-hydraulic driven
Tasks: Provision crane
Performance: SWL 20t, working radius max. 19.5m
Mooring equipment
Number: 9 sets
Make: Flutek
Type: Electro-hydraulic
Special lifesaving equipment
Number of each and capacity: 2, 30P
Make: Oriental
Type: Gravity

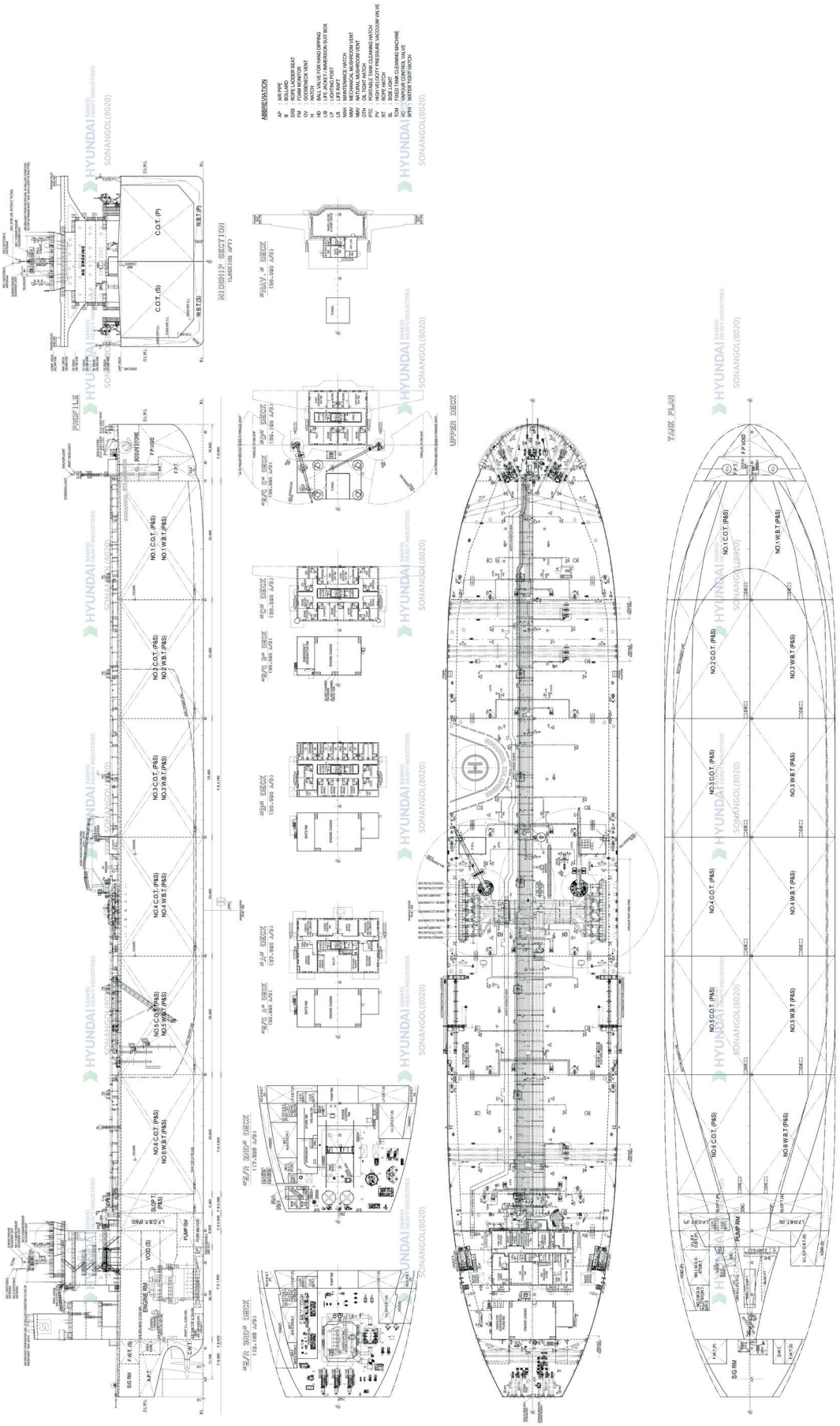
Cargo oil pumps
Number: 3
Type: Vertical, centrifugal, single stage double suction steam turbine driven type
Make: Shinko
Capacity (each): 3,500m^3/h x 135mth
Cargo control system
Make: Stantec
Type: Piano type
Ballast control system
Make: Scantec
Type: Hydraulic valve control
Ballast water treatment system
Make: Hyundai Welding
Capacity: 4,000m^3/h
Complement
Crew: 19

Navigation and other equipment
Bridge control system
Maker: JRC
Model: JAN-9201 (ECDIS), JAN-9202 (Conning&BAM)
Is bridge fitted for one-man operation?: N
Integrated bridge system: Y
Maker: JRC
Model: JAN-9201(ECDIS), JAN-9202(Conning&BAM)
Radars
Number: 2 x X-Band, 1 x S-Band
Maker: JRC
Model(s): S-Band (JMR-9282-S), X-Band (JMR-9225-6X)

Fire detection system
Make: Consilium
Type: Analogue addressable
Fire extinguishing systems
Engine room: High expansion foam
Make/Type: NK
Cabins: Portable fire extinguisher / hydrant
Make/Type: Fain
Public spaces: Deck foam fire extinguishing system /hydrant
Make/Type: NK
Waste disposal plant
Incinerator
Make: HMMCO
Model: Sludge oil & solid waste burning
Sewage plant
Make: Il Seung
Model: Biological type
Efficiency
Attained EEDI value: 2.52
Required EEDI value: 2.83
Other installed monitoring tools: Integrated-smart solution
Energy Saving Technologies: Full spade rudder with bulb & skirt & pre-swirl duct

Contract date: 22 April 2021
Launch/float-out date: 17 February 2023
Delivery date: 10 April 2023

SONANGOL KULUMBIMBI



SOPHIE GERMAIN – CABLE LAYER

Shipbuilder: **Colombo Dockyard PLC**
Vessel's name: ***Sophie Germain***
Owner/Operator: **FT Marine SAS / Orange Marine**
Country: **France**
Designer: **Vard Design AS**
Country: **Norway**
Model test establishement used: **Vienna Model Basin Ltd**
Flag: **France**
IMO number: **9930507**
Total number of sister ships already completed (excluding ship presented): **Nil**
Total number of sister ships still on order: **Nil**

Built by Colombo Dockyard in Sri Lanka, designed by Vard Design in Norway and owned by French telecommunications specialist Orange Marine, *Sophie Germain* was delivered in July 2023 as a one-off cable layer.

At 100m in length, with a beam of 18m and a draught of 5.8m, the ship is only the second cable layer built in Sri Lanka and the first destined for a European operator. It is also a technically advanced vessel and the first of its generation designed specifically for the repair of different types of submarine cables, either fibre optic telecommunications cables or wind farm inter-array power cables.

A state-of-the-art 450kW ROV for cutting, inspecting and burying cables is stored on board in a dedicated hangar.

Cable layers are a niche market, and the ships are usually converted from some other type. Building a new ship does mean a larger investment but has the advantage of a ship with a minimal environmental footprint that is fully equipped to meet growing global connectivity needs. The owner claims the ship has a 20% reduction in CO_2 and an 82% reduction in NOx emissions.

As well as repair, the ship's capabilities include cable laying and inspection. The vessel has a deadweight capacity of 1,800dwt and features three cable tanks.

Sophie Germain is a diesel electric hybrid ship with twin engine rooms and ABB Azipod D propulsion systems. A pair of tunnel thrusters forward combine with the Azipods to provide manoeuvrability.

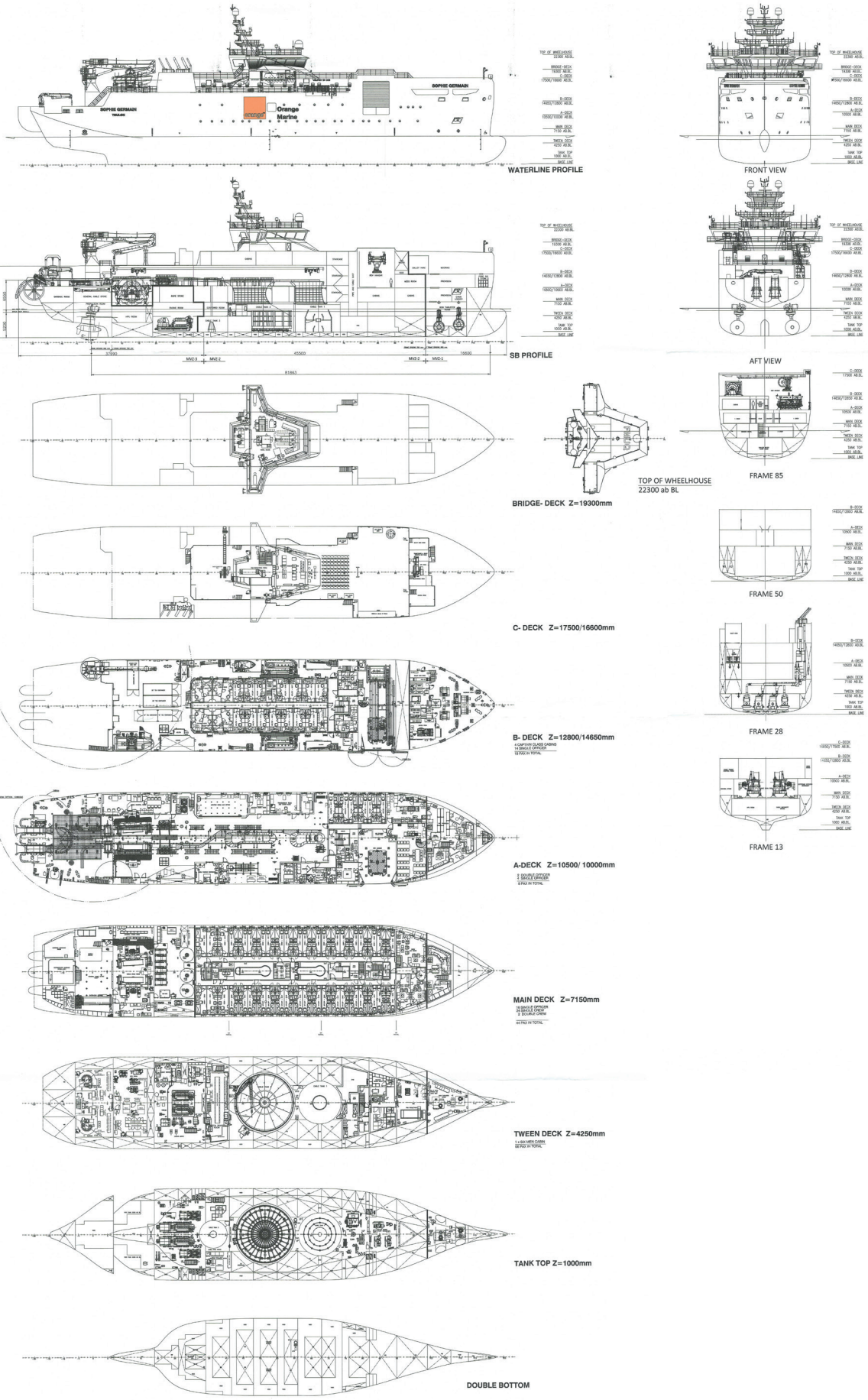
Each engine room is equipped with a Bergen C25:33L6A engine producing 1,920kW and a Caterpillar C32 engine producing 994kW. SCR is used on all engines to meet NOx Tier III requirements. The ship is also equipped with a Corvus Energy battery system of 500kWh capacity. The ship also has the ability to be connected to an onshore power supply.

TECHNICAL PARTICULARS

Length oa: 100.00m
Length bp: 82.00m
Breadth moulded: 18.80m
Depth moulded
to main deck: 7.15m
to upper deck: B deck 12.80m/14.65m
to other decks: Tween deck 4.25m, A deck 10.00m/10.50m, C deck 17.50m
Draught
scantling: 5.80m
design: 5.70m
Gross: 6,461t
Displacement: 6,281t at 5.7m draught
Lightweight: 4,064t
Deadweight
scantling: 2,216t
design: 1,800t
Block co-efficient: 0.645 at 5.7m draught
Speed, service (70%MCR output): 14.64knots
Bunkers (m^3)
Diesel oil: 602
Water ballast (m^3): 1,715
Daily fuel consumption (tonnes/day)
Main engine only: 12.1
Classification society and notations: BV I, *HULL, *MACH, Cable laying, SW-Registry, SP76, Unrestricted Navigation, *ALM, *ALM MR, *ALM SUBSEA, *AUT-UMS, *DYNAPOS-AM/AT-R, *AVM-DPS, ICE CLASS IC, COMF-NOISE 2, COMF-VIB 3, INWATERSURVEY, GREENPASSPORT EU, CLEANSHIP, NDO-7 Days
% high-tensile steel used in construction: 75%
Roll-stabilisation equipment: Passive roll reduction tank

Propulsion
Main engine(s)
Design: Bergen Engines AS / Caterpillar INC
Model: Bergen C25:33L6A / CAT C32
Manufacturer: Bergen and Caterpillar
Number: 2 x Bergen C25:33L6A / 2 x CAT C32
Type of fuel: MDO
Output of each engine: Bergen – 1,920kW each / CAT – 994kW each
Is this a diesel-electric or hybrid?: Diesel-electric
Propeller(s)
Material: Ni-Al-Bronze
Designer/Manufacturer: ABB Azipod D
Propulsor
Number: 2
Fixed/Controllable pitch: Fixed
Diameter: 2.8m
Speed: 0–263rpm
Exhaust-gas scrubbing equipment
Manufacturer: GESAB and Caterpillar
Type: SCR_V48_2L / CATCEM (Z-flow after-treatment)
On main engines?: Yes
Bow thruster(s)
Make: Kongsberg
Number: 2
Output (each): 1,000kW
Deck machinery
Cargo cranes/cargo gear
Number: 1
Make: Melcal
Type: Knuckle boom
Performance: 10t capacity with 20.5m radius offshore crane
Other cranes
Number: 5
Make: Melcal, Fucsh, Munck
Type: Melcal: Provision crane (FL80T8), aft auxiliary crane (FL50T2); Fucsh: ROV hanger overhead crane; Munck: gantry cranes
Tasks:
Provision crane: Provision handling
Aft auxiliary crane: Cable laying works
ROV hanger overhead crane: ROV maintenance
Gantry crane A deck: Cable deck works, Cable laying
Gantry crane main deck: Weight handling on general cable store
Performance:
Provision crane: 2t, 20m radius
Aft auxiliary crane: 1t, 8m radius
ROV hanger overhead crane: 1.5t, 5m radius
Gantry crane A deck: 3t
Gantry crane main deck: 3t
Mooring equipment
Number: 2x windless, 2 x mooring winches, 2 x chain stoppers, 2 x captans
Make: EME – Taixing Expansion Marine Equipment Co. Ltd
Type: Electric
Special lifesaving equipment
Number of each and capacity: 2 x davit launch type lifeboats, 35 persons each
Make: Palfinger
Type: Totally enclosed lifeboat
Cargo/capacity
Containers
Lengths: 3 x 20ft, 2 x 10ft
Cargo tanks
Number: 2 x cable tanks + 1 x spare cable tank
Cargo carried: Cables
Product range: Power and optic cables - Tank 1: 500t of optical cable capacity; Tank 2 (with carousel and spooling arm); 500t of power cables/300t of optical cables capacity; Tank 3: 80m^3 of spare cable capacity
Ballast control system: Ballast water management system available in IAS
Make: ABB
Ballast water treatment system
Make: Alfa Laval
Capacity: 170m^3/hour
Complement
Officers: 12
Crew: 36
Passengers
Total: Maximum 12
Navigation and other equipment
Bridge control system
MakeType/: Wärtsilä SAM / NACOS Platinum
Is bridge fitted for one-man operation?: Y
Integrated bridge system: Y
If yes, make: Wärtsilä SAM
Model: Wartsila NACOS Platinum
Radars
Number: 2
Make: Wärtsilä
Model(s): 14ft S-Band, 8ft X-Band
Fire detection system
Make: Autronica
Type: AUTROSAFE 4/116-BS-420M
Fire extinguishing systems
Cargo holds: Cable tank 1, cable tank 2 and spare cable tank – Water spray system
Make/Type: Minimax
Engine room: Total flooding system + local application system
Make/Type: Minimax
Waste disposal plant
Waste compactor
Make: Imperial Machine Co., Ltd
Model: Waste Compactor IMC IP400
Efficiency
Installed Fuel Meters: Inlet/outlet fuel oil meters for main engines: fuel oil meter for bunker line
Energy Saving Technologies: Corvus Energy energy storage system, 500kWh capacity
Hull coatings: PPG coating system
Contract date: 05 February 2021
Launch/float-out date: 03 November 2022
Delivery date: 27 July 2023

SOPHIE GERMAIN



SUMER – PRODUCT TANKER

Shipbuilder:... **Penglai Zhongbai Jinglu Ship Industry Co., Ltd**
Vessel's name:... ***Sumer***
Owner/Operator:... **Batservice Mandal Verft A/S**
Country:... **Iraq**
Designer:... **Shanghai Merchant Ship Design and Research Institute (SDARI)**
Country:... **China**
Model test establishment used:... **SSSRI**
Flag:... **Iraq**
IMO number:... **9948968**
Total number of sister ships already completed (excluding ship presented):... **1**
Total number of sister ships still on order: **Nil**

Delivered in August 2023 for operation by Iraqi Oil Tankers, *Sumer* was designed by SDARI and built at Penglai Zhongbai Jinglu Ship Industry. It is the first of a pair of new small MR product oil tankers optimised for operation in the Arabian Gulf. The sister ship *Akkad* was delivered in November 2023. The order for the two vessels is part of a strategy to grow the state-owned company's fleet following many years of conflict left it in a much reduced condition and size.

With hull dimensions of 184m length, 30.8m beam and 9m draught and a deadweight of 30,830tonnes, the vessel has been designed with maximum flexibility in mind with regard to the number of ports it can navigate to. Special attention to the design has been paid for the vessel navigated at north of Arabian Gulf with ambient conditions of extremely high temperatures.

Sumer is designed for carrying seven grades of black and white oil products simultaneously. She has seven pairs of cargo tanks the aftmost of which can be used as slop tanks. The cargo handling system includes a Framo submerged hydraulic driven cargo pump for each tank to avoid contamination.

The ship's hull lines have been optimised by use of CFD calculations to obtain better power performance, while the rudder form has been optimised to achieve good balance between power performance and manoeuvring performance.

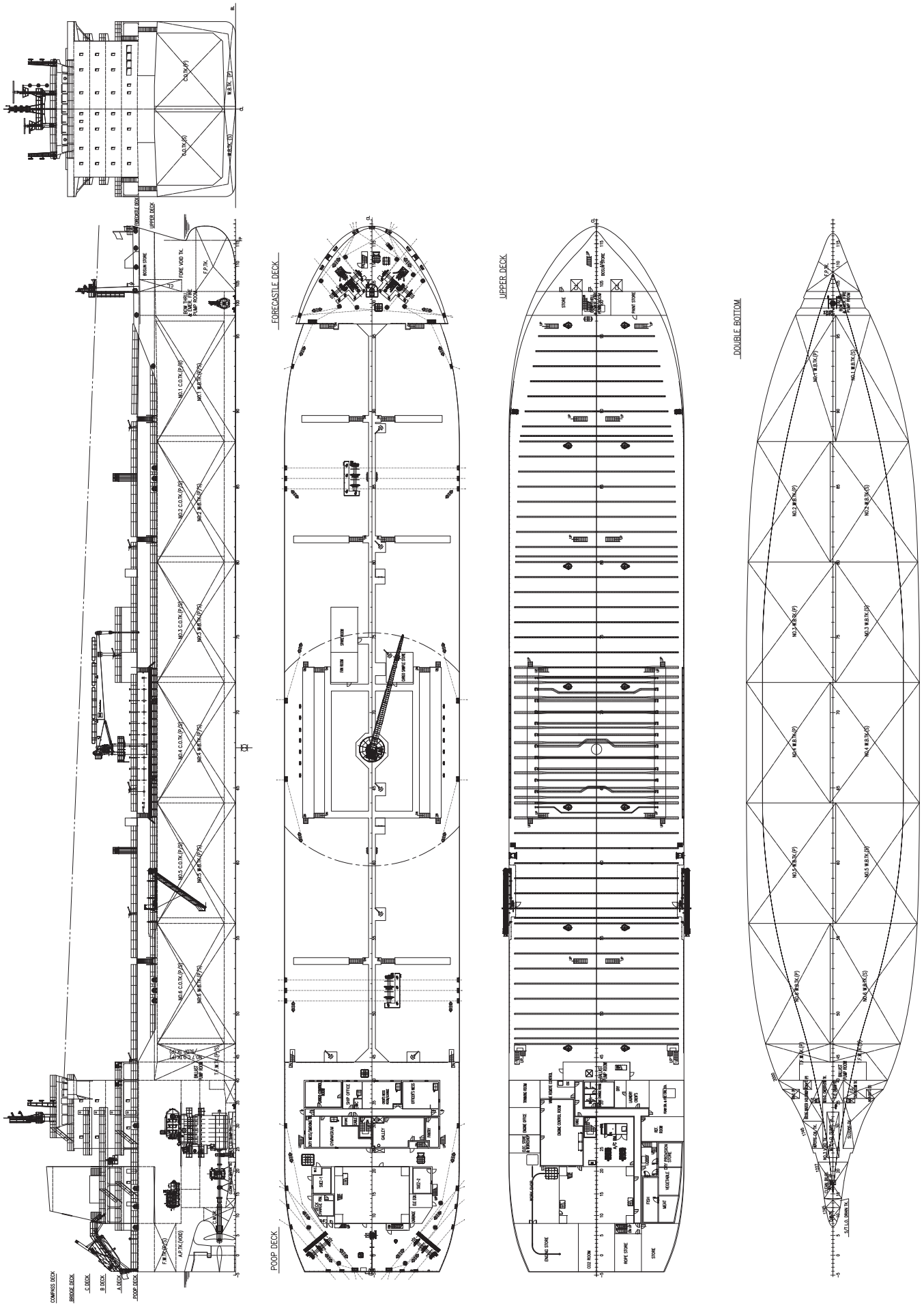
Sumer's main engine is a Yuchai Marine Power Company-built MAN 6S46ME-C8.6 rated at 6,460kW. It has a shaft generator capable of 1,125kWe at 118rpm. The three Yanmar 6EY21ALWS gensets produce 950kW each. With shaft generator running, the daily fuel oil consumption for propulsion and electric power supply at service speed 13.2knots is 19.7t/d. Against a required EEDI of 7.86, *Sumer* comfortably satisfies this requirement with an attained rating of 5.70.

TECHNICAL PARTICULARS

Length oa:... 184.00m
Length bp:... 178.60m
Breadth moulded:... 30.80m
Depth moulded to upper deck:... 13.80m
Width of double skin
side:... 2.00m
bottom:... 2.00m
Draught
scantling:... 9.00m
design:... 8.80m
Gross:... 22,449t
Deadweight
scantling:... 30,830t
design:... 29,810t
Speed, service (CSR output):... 14knots with 15% sea margin
Cargo capacity (m^3)
Liquid volume:... 38,500
Bunkers (m^3)
Heavy oil:... 1,000
Diesel oil:... 350
Water ballast (m^3):... 15,200
Tankers – percentage segregated ballast:... 100%
Daily fuel consumption (tonnes/day)
Main engine only:... 19.7
Auxiliaries:... PTO
Classification society and notations:... BV I ✠ HULL, Oil tanker CSR CPS(WBT) ESP, unrestricted navigation, CLEANSHIP, INWATERSURVEY ✠ MACH, ✠ AUT-UMS, Tier III, SYS-NEQ, MON-SHAFT, VCS, BWT, SEEMP, LI-HG-S3, CARGOCONTROL
% high-tensile steel used in construction:... ~65%
Propulsion
Main engine(s)
Design:... MAN ES
Model:... 6S46ME-C8.6 with HPSCR
Manufacturer:... Yuchai Marine Power Co., Ltd
Number:... 1
Type of fuel:... LSHFO, MGO
Output of each engine:... 6,460kW
Is this a diesel-electric or hybrid?:... N
Propeller(s)
Material:... Ni-Al-Bronze
Designer/Manufacturer:... Shanghai Marin Propeller Design Co., Ltd
Number:... 1
Fixed/Controllable pitch:... Fixed
Diameter:... 5.50m
Main-engine driven alternators
Number:... 1
Make/type:... PTO
Output/speed of each set:... 1,125kWe x 92~118rpm
Diesel-driven alternators
Number:... 3
Engine make/type:... Yanmar Power Technology Co., Ltd / 6EY21ALWS
Type of fuel:... LSHFO, MGO
Make/type:... Taiyo Electric Co., Ltd
Output/speed of each set:... 950kW x 900rpm
Boilers
Number:... 2
Type:... 1 x oil-fired, 1 x composite boiler
Make:... Alfa Laval
Bow thruster(s)
Make:... Schottel
Number:... 1
Output (each):... 750kW

Deck machinery
Cargo cranes/cargo gear
Number:... 1
Make:... TTS Bohai
Type:... Electro-hydraulic cylinder luffing jib crane
Performance:... 10t at 30m
Other cranes
Number:... 1
Make:... Jiangyin Chengjiang Ship Equipment Co., Ltd
Type:... Monorail type
Tasks:... Electric provision crane
Performance:... 2t at 4.5m out of ship side
Mooring equipment
Number:... 6
Make:... MacGregor
Type:... Electric hydraulic type
Special lifesaving equipment
Number of each and capacity:... 1 x free-fall lifeboat, capacity of 29 persons
Make:... Ningbo New Marine Lifesaving Equipment Co., Ltd
Type:... Free-fall type
Cargo tanks
Number:... 14
Grades of cargo carried:... 7
Product range:... Black & white oil products
Coated tanks – make & type of coating:... Epoxy
Cargo pumps
Number:... 12+2
Type:... Submerged, hydraulic motor driven, centrifugal pump
Make: Framo
Capacity (each):480m^3/h x 110mlc +150m^3/h x 110mlc
Cargo control system
Make:... Framo
Type:... Hydraulic power pack unit
Ballast control system
Make:... A.P.I. Marine
Type:... Electro-hydraulic
Ballast water treatment system
Make:... Panasia
Capacity:... 2 x 750m^3/h
Complement
Officers:... 11
Crew:... 18
Suez/Repair Crew:... 6
Navigation and other equipment
Bridge control system
Make:... Wärtsilä
Type:... EMS 2200
Is bridge fitted for one-man operation?... N
Integrated bridge system:... N
Radars
Number:... 2
Make:... Furuno
Model(s):... FAR2338S & FAR2328
Fire detection system
Make:... Tyco
Type:... T2000CV
Fire extinguishing systems
Cargo holds:... Foam
Make/Type:... Johnson Controls
Engine room:... CO_2
Make/Type:... Johnson Controls
Waste disposal plant
Incinerator
Make:... Hansun
Model:... HSINC-50
Waste shredder/crusher
Make:... Anqing Dongzhou
Model:... CSJ-15
Sewage plant
Make:... Taiko
Model:... SBH-40
Efficiency
Attained EEDI value:... 5.70 g-CO_2/(ton.mile)
Required EEDI value:... 7.86 g-CO_2/(ton.mile)
Installed Fuel Meters:... Mass flow
Other installed monitoring tools:... Draught measuring
Energy Saving Technologies:... Shaft generator with frequency converter
Hull coatings:... Antifouling paint

Contract date:... December 2020
Launch/float-out date:... December 2022
Delivery date:... August 2023


FORECASTLE DECK
UPPER DECK
DOUBLE BOTTOM
POOP DECK
COMPASS DECK
BRIDGE DECK
C DECK
B DECK
A DECK
POOP DECK

SUNFLOWER KURENAI – RO-PAX

Shipbuilder:.....**Mitsubishi Shipbuilding Co., Ltd**
Vessel's name:.....***Sunflower Kurenai***
Owner/Operator:.....**Mitsui O.S.K. Lines, Ltd**
Country:.....**Japan**
Designer:...**Mitsubishi Shipbuilding Co., Ltd**
Country:.....**Japan**
Model test establishment used:.....**MHI Nagasaki R&D Center**
Flag:.....**Japan**
IMO number:.....**9900112**
Total number of sister ships already completed (excluding ship presented):.....**1**
Total number of sister ships still on order: **Nil**

Sunflower Kurenai is Japan's first LNG-fuelled ro-pax ferry designed and built at Mitsubishi Shipbuilding and delivered to Mitsui O.S.K. Lines (MOL) in late December 2022 to begin operations in January 2023. A sister ship, *Sunflower Murasaki*, has also been delivered. MOL also has orders for other LNG-fuelled ferries as it looks to replace an ageing fleet.

Compared to the 1991-built vessel it replaces, the new ferry offers greater transport capacity and convenience for both cargo and passengers. There is capacity for 137 trucks and 100 cars over four decks and accommodation for 763 passengers. Vehicle access is via a starboard stern quarter ramp and discharge through a starboard side ramp. The side ramp is recessed into the hull just aft of the bows and gives a distinctive shape to the 199.9m long vessel.

An improvement over earlier vessels running on the Osaka-Beppu route there is a more spacious lounge for truck drivers, and substantially greater space per passenger. Expansive public areas include enlarged bathing facilities, a more spacious restaurant, and an atrium extending through three stories. Some cabins and public spaces are equipped with various barrier-free facilities for handicapped passengers. The new vessel is intended to promote and enhance the operator's "Casual Cruise Concept".

Sunflower Kurenai is a twin-screw vessel with the controllable pitch propellers having shaft brackets. The power comes from a pair of Wärtsilä 16V31DF engines each outputting 8,800kW and driving through two reduction gearboxes also supplied by Wärtsilä. The engines can run on LNG or HFO. Service speed is 22.5knots.

Both engines are equipped with shaft generator/motors and there are also three Yanmar 8EY26LDF dual-fuel gensets which supply load for the hotel services and can provide extra boost for the propulsion system.

TECHNICAL PARTICULARS

Length oa:.....abt. 199.90m
Length bp:.....187.00m
Breadth moulded:.....28.00m
Depth moulded
  to main deck:.....20.90m (Deck 6)
  to other decks:.....9.75m (Deck 4)
Draught
  scantling:.....7.00m
  design:.....6.80m
Gross:.....35,471t
Deadweight
  scantling:.....7,741t
  design:.....6,918t
Speed, service:.....22.5knots
Bunkers (m^3)
  Heavy oil (low sulfur):.....477
Water ballast (m^3):.....4,607
Classification society and notations:.....JG, MO
Heel control equipment:...Auto heeling control system

Propulsion
Main engine(s)
  Design:.....Wärtsilä
  Model:.....16V31DF
  Manufacturer:.....Wärtsilä
  Number:.....2
  Type of fuel:.....LNG & HFO (Low Sulfur)
  Output of each engine:.....8,800kW
Gearbox(es)
  Make:.....Wärtsilä
  Number:.....2
Propeller(s)
  Material:.....CAC703
  Designer/Manufacturer:.....Kawasaki Heavy Industries, Ltd
  Number: 2
  Fixed/Controllable pitch:.....Controllable
  Diameter:.....5.2m
Main-engine driven alternators
  Number:.....2
  Make/type:.....Nishishiba Electric Co., Ltd
Diesel-driven alternators
  Number:.....3
  Engine make/type:.....Yanmar Co., Ltd / 8EY26LDF
  Type of fuel:.....LNG & HFO (low sulfur)

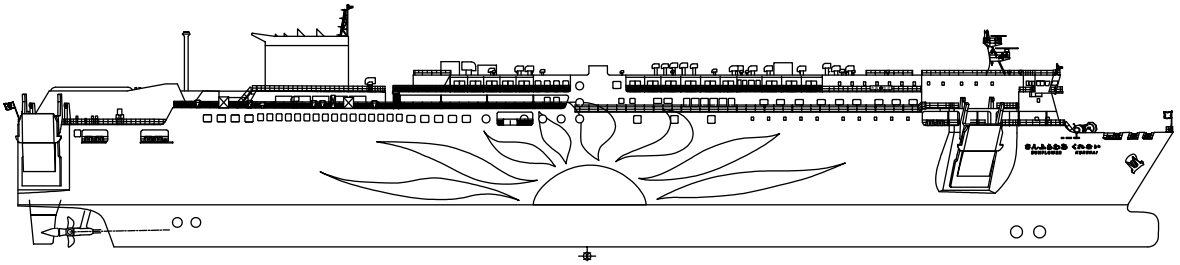
Boilers
  Number:.....1
  Make:.....Osaka Boiler Mfg. Co., Ltd
  Output, each boiler:.....abt. 4,000kg/h

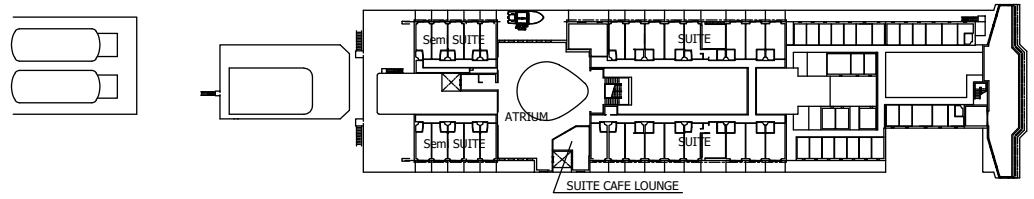
Stern appendages/special rudders:.....Reaction rudder with bulb
Bow thruster(s)
  Make:.....Kawasaki Heavy Industries, Ltd
  Number:.....2
  Output (each):.....17t
Stern thruster(s)
  Make:.....Kawasaki Heavy Industries, Ltd
  Number:.....2
  Output (each):.....12t
Deck machinery
Mooring equipment
  Number:.....6 x mooring winch, 2 x windlass
  Make:.....Kawasaki Heavy Industries, Ltd
  Type:.....Electric-hydraulic
Special lifesaving equipment
  Number of each and capacity:.....4 x MES
  Make:.....Fujikura Composites Inc.
  Type:.....FSMES-180 · N, FSMES-200 · N, FSMES-220 · N, FSMES-240 · N
  If MES, vertical or sloping chutes?:.....Vertical
Vehicles
  Number of vehicle decks:.....4 (fixed)
  Total cars:.....137 trucks, 100 cars
Doors/ramps/lifts/moveable car decks
  Type:1 x bow side ramp, 1 x stern side ramp, 2 x moveable internal ramps
  Designer:.....MacGregor
Ballast control system
  Make:.....NYK Trading Corporation
Complement
  Officers:.....9
  Crew:.....17
  Supernumaries/Spare:.....17
Passengers
  Total:.....716

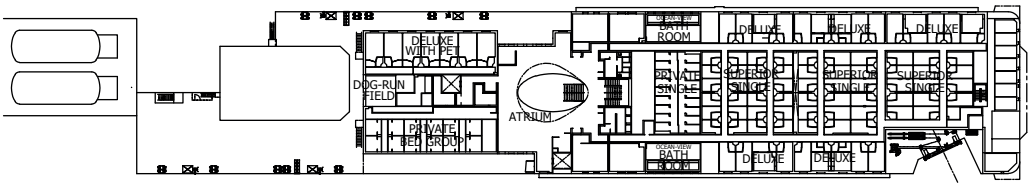
Navigation and other equipment
Bridge control system
  Make:.....Chugoku Electric Service Co., Ltd
  Type:.....Electric
Radars
  Number:.....2
  Make:.....Furuno
  Model(s):.....FAR-3320-NXT/FAR-3330S-SSD
Fire detection system
  Make:.....Consilium
  Type:.....Smoke detector type and temperature type
Fire extinguishing systems
Engine room:
  Make/Type:.....Yamato Protec Corporation
Vehicle spaces:
  Make/Type:.....Kashiwa Co. Ltd/inside air

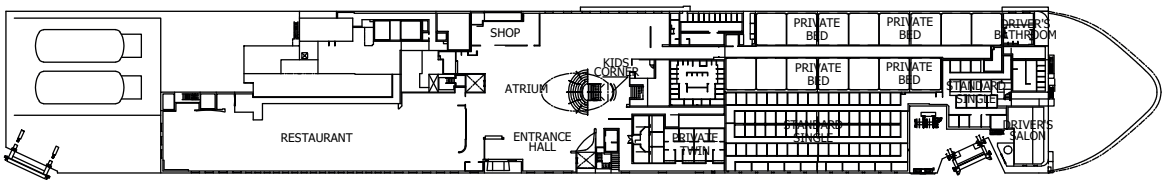
Contract date:.....December 2019
Launch/float-out date:.....March 2022
Delivery date:.....December 2022

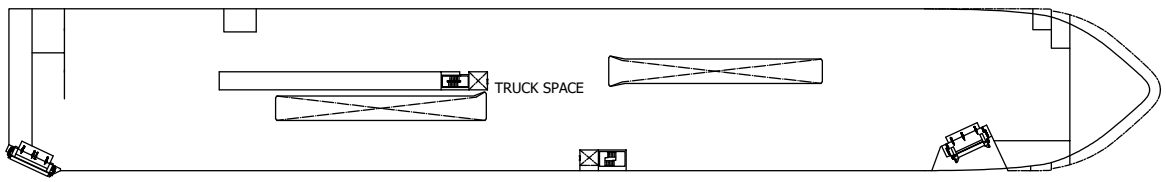
SUNFLOWER KURENAI

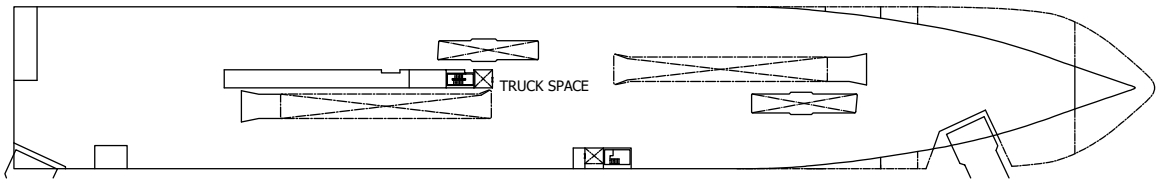


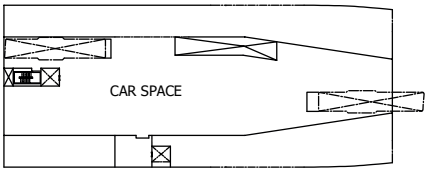


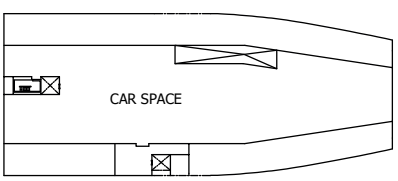












TS MAWEI – CONTAINER SHIP

Shipbuilder: **Fujian Mawei Shipbuilding Co., Ltd**
Vessel's name: ***TS Mawei***
Owner/Operator: **TS Lines**
Country: **China**
Designer: **Shanghai Merchant Ship Design and Research Institute (SDARI)**
Country: **China**
Model test establishment used: **Shanghai Ship & Shipping Research Institute (SSSRI)**
Flag: **Marshall Islands**
IMO number: **9947653**
Total number of sister ships already completed (excluding ship presented): **6**
Total number of sister ships still on order: **1**

TS Mawei delivered in January 2023 is the first in a series of eight 1,100TEU container vessels built at Fujian Mawei Shipbuilding for Taiwanese shipowner TS Lines. The vessels were ordered as part of the company's strategy to grow its owned fleet instead of relying on chartered tonnage.

Designed by SDARI, the new Super 1,100TEU has further optimised and upgraded on the original design, with improved economy, comfort, energy conservation and environmental protection. The 9,981gt has been deliberately kept under 10,000 for Sino-Japanese trade operations.

TS Mawei has a nominal capacity of 1,182TEU with 850TEU on deck and 332TEU under and a total of 145 reefer plugs. The ship is designed in conjunction with ClassNK notation "CSSA-R" for specific route lashing calculations. Compared with other ships of the same basic type, the ship has a larger deadweight, more capacity for heavy, reefer and high cube containers.

The main engine is a Yuchai Marine Power-built MAN B&W super long stroke 6S50ME-C9.7 unit outputting 9,000kW at 116rpm. It drives a directly connected fixed pitch 5.5m diameter propeller. Service speed is 19.31knots at 85% MCR.

The ship has a SDARI S-bow and low resistance lines. A full spade rudder with twisted leading edge, rudder bulb and high efficiency propeller improve propulsion efficiency and reduce fuel consumption. EEDI rating is 20.9 which fulfils the requirements of Phase 3.

TECHNICAL PARTICULARS

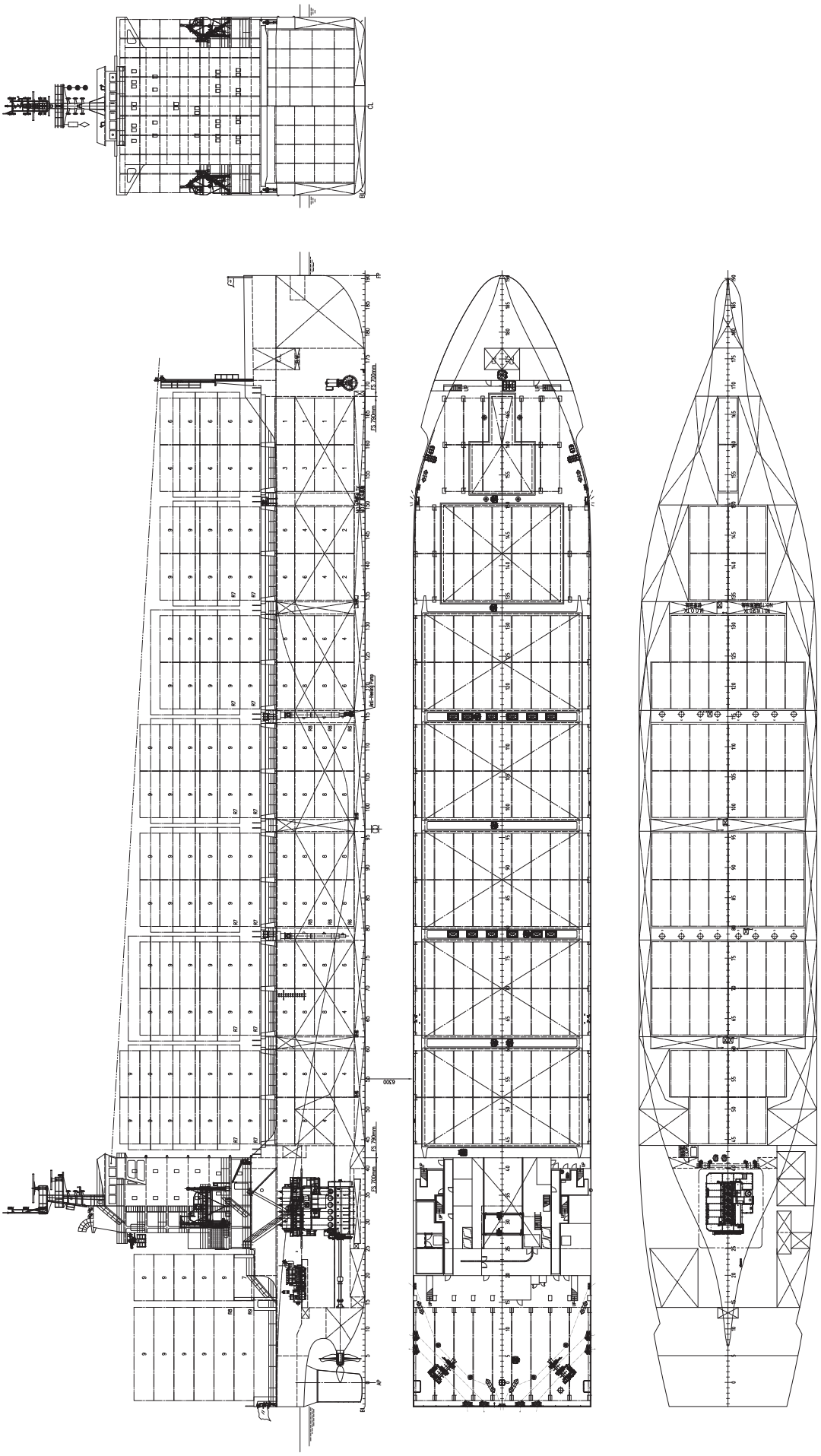
Length oa: 147.90m
Length bp: 144.75m
Breadth moulded: 23.25m
Depth moulded
to upper deck: 11.50m
Width of double skin
side: 1.525m
bottom: 1.40m
Draught
scantling: 8.50m
design: 7.30m
Gross: 9,981t
Deadweight
scantling: 13,320t
Speed, service (85% MCR output): 19.31knots with 15% sea margin
Bunkers (m^3)
Heavy oil: 700
Diesel oil: 100
Water ballast (m^3): 5,400
Daily fuel consumption (tonnes/day)
Main engine only: 28.8 (CSR)
Auxiliaries: 4.3 (100% MCR)

Classification society and notations: NK NS* (CNC, EQ C DG, PSPC-WBT, NC)(IWS) (PSCM) (EA)(IHM)(CSSA-R)(SDCL)(DSS(EE2)), MNS*
Installation Character(s): CHG, MPP, LSA, RCF, M0, AFS, BWM
% high-tensile steel used in construction: 40%
Heel control equipment: Anti-heeling pump
Propulsion
Main engine(s)
Design: MAN B&W
Model: 6S50ME-C9.7
Manufacturer: Yuchai Marine Power Co. Ltd
Number: 1
Type of fuel: HFO & MGO
Output of each engine: SMCR: 9,000kW x 116rpm
Is this a diesel-electric or hybrid?: N
Propeller(s)
Material: Ni-Al-Bronze
Designer/Manufacturer: Shanghai Merchant Ship Design and Research Institute
Number: 1
Fixed/Controllable pitch: Fixed
Diameter: 5.5m
Diesel-driven alternators
Number: 3
Engine make/type: Anqing-Daihatsu / 6DK-20e
Type of fuel: HFO & MGO
Alternator make/type: Anqing-Daihatsu / HFC6 506-84K
Output/speed of each set: 850kWe x 900rpm
Boilers
Number: 1
Type: MJC-250T (vertical cylindrical smoke tube)
Make: Jiujiang Mitsubishi
Output, each boiler: Oil-fired section: 1,200kg/h; Exh. Gas section: abt. 750kg/h (at CSR of M/E), abt. 250kg/h each A/E (at 80% power, totally from two A/Es)
Stern appendages/special rudders: One full spade rudder with twisted leading edge and rudder bulb
Bow thruster(s)
Make: Nakashima Propeller Co. Ltd
Number: 1
Output (each): 1,000kW
Deck machinery
Other cranes
Number: 1
Make: Taizhou Kainxin Shipping Machine Co., Ltd
Type: Electric, monorail
Tasks: Provision crane
Performance: 4t
Mooring equipment
Number: 5
Make: Wuhan Marine Machinery Plant Co., Ltd
Type: Electric
Special lifesaving equipment
Number of each and capacity: 2 x 21 persons each
Make: Zhejiang Norsier lifesaving Equipment Technology Co., Ltd
Type: Totally enclosed gravity luffing arm type lifeboat
Cargo/capacity
Hatch covers
Design: CSSC Huahai Marine Co., Ltd
Manufacturer: Fujian Mawei Shipbuilding Co., Ltd
Type (upper deck/other decks): Upper deck
Containers
Lengths: 20ft / 40ft
Heights: 8'6"/9'6"
Cell guides: Y
Total TEU capacity: 1,182
On deck: 850
In holds: 332
Homogeneously loaded to 14tonnes: 723
Reefer plugs: 145
Tiers/rows (maximum)
On deck: 7 tiers, 9 rows
In holds: 4 tiers, 8 rows
Ballast water treatment system
Make: COSCO (Weihai) Shipbuilding Marine Technology Co., Ltd
Capacity: 250m^3/h
Complement
Officers: 9
Crew: 12
Single/double/other rooms: 21 single rooms

Navigation and other equipment
Bridge control system
Make: Kongsberg
Type: AC600
Is bridge fitted for one-man operation?: N
Integrated bridge system: N
Radars
Number: 2
Make: JRC
Model(s): JMR-9225-9X/JMR-9282-S
Fire detection system
Make: Consilium
Type: Salwico Cargo
Fire extinguishing systems
Cargo holds: Sea water system, CO_2 fixed system
Make/Type: Jiujiang CSSC
Engine room: Sea water system, CO_2 fixed system, localised fire suppression in E/R
Make/Type: Jiujiang CSSC
Vehicle spaces:
Make/Type: Jiujiang CSSC
Cabins: Sea water system, portable extinguisher
Make/Type: Jiujiang CSSC
Public spaces: Sea water system, portable extinguisher
Make/Type: Jiujiang CSSC
Waste disposal plant
Incinerator
Make: Luzhou Machine Co., Ltd
Model: OG200C
Sewage plant
Make: Taiko Kikai Industries Co. Ltd
Model: SBH-25
Efficiency
Attained EEDI value: 20.9 g-CO_2/(ton nm)
Required EEDI value: 22.4 g-CO_2/(ton nm)
Installed Fuel Meters: Mass flow
Energy Saving Technologies: Full spade rudder with twisted leading edge and rudder bulb
Hull coatings: Self-polishing anti-fouling paint

Contract date: August 2021
Launch/float-out date: October 2022
Delivery date: January 2023

TS MAWEI



WAN HAI 331 – CONTAINER SHIP

Shipbuilder: **CSBC Corporation, Taiwan**
Vessel's name: ***Wan Hai 331***
Owner/Operator: **Wan Hai Lines (Singapore) Pte. Ltd**
Country: **Singapore**
Designer: **CSBC Corporation**
Country: **ROC (Taiwan)**
Model test establishment used: **HSVA, Germany**
Flag: **Singapore**
IMO number: **9951355**
Total number of sister ships already completed (excluding ship presented): **3**
Total number of sister ships still on order: **Nil**

The first of four 2,988TEU vessels, *Wan Hai 331* was designed and built by CSBC Corporation of Taiwan for Singapore-based operator Wan Hai Lines and delivered in April 2023. Its three sister vessels were all delivered later in 2023.

The new 3,000TEU series container ship is designed with a length overall of 209.75m, a breadth of 32.8m, a draught of 11.2m and a service speed of 20.2knots. The wide beam is a design feature that provides extra stability and allows for minimum water ballast. The vessel is equipped with a full balanced rudder with twisted leading edge and asymmetry rudder bulb, as well as CSBC's vertical and bulb less Sea Sword Bow. Together the features result in a highly efficient and economic vessel.

Cargo capacity is split between 1,040TEU under deck and 1,948TEU on deck. If homogenously loaded to 14tonnes the capacity falls to 2,160TEU. For reefer cargoes, 353 reefer points have been included. There are 10 stacks forward of the superstructure and two aft. The ship has been designed to allow for mixed or 'Russian' stowage on deck to permit for the most flexible stowage possible. In addition, the ship's ABS CSC&CLP-V notation enables it to load more cargoes according to different weather and trading routes.

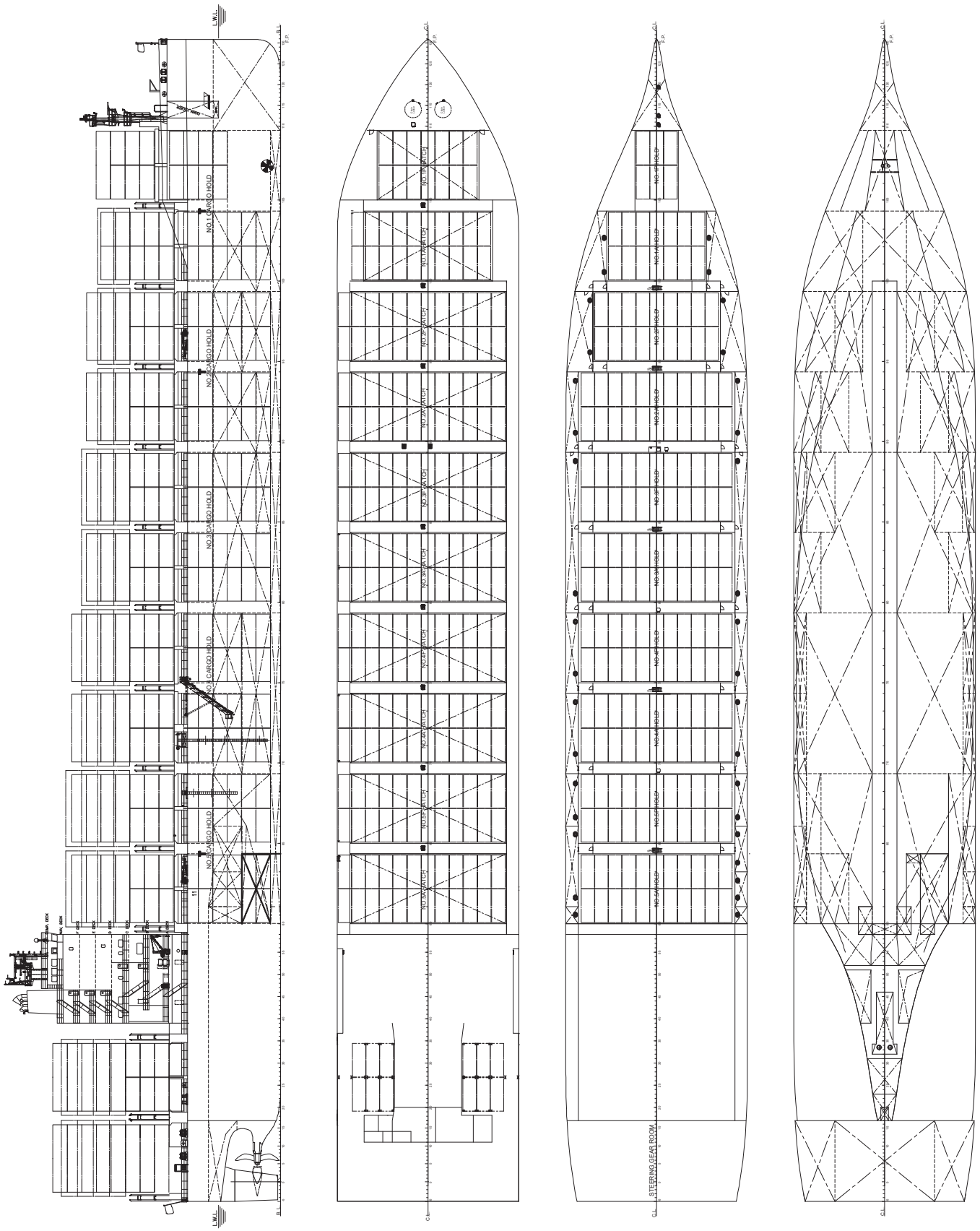
The ship's main engine is a HSD-built MAN B&W super long stroke 7S70ME-C10.5 rated at 18,060kW at 91rpm. By installing environmental protection equipment including part load tuning and EGB (Exhaust Gas Bypass) system, the owner aims to save energy and reduce carbon emissions. Space has been set aside for an AMP connection to enable cold ironing when in port.

ABS Class smart-ship notations SMART (INF) has been assigned highlighting the performance monitoring and decision-making support systems that have been installed on board.

TECHNICAL PARTICULARS

Length oa: 209.75m
Breadth moulded: 32.80m
Depth moulded: 16.80m
to upper deck: 16.80m
Draught
scantling: 11.20m
design: 9.50m
Gross: 3,2120t
Deadweight
scantling: abt. 38,000t
Speed, service: 20.2knots
Cargo capacity (m^3)
Refrigerated storage: 353FEU
Bunkers (m^3)
Heavy oil: abt. 2,700
Diesel oil: abt. 200
Water ballast (m^3): abt. 11,200
Daily fuel consumption (tonnes/day)
Main engine only: 62.0
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., RRDA, RW, SMART(INF), CRC(SP)
Propulsion
Main engine(s)
Design: MAN B&W
Model: 7S70ME-C10.5
Manufacturer: HSD
Number: 1
Type of fuel: HFO
Output of each engine: 18,060kW x 91rpm
Is this a diesel-electric or hybrid?: N
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
Alternator make/type: Hyundai Electric & 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
Deck machinery
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: Jiangsu Jiaoyan
Type: Diesel engine
Cargo/capacity
Hatch covers
Design: MacGregor
Manufacturer: CSBC
Type (upper deck/other decks): Upper deck
Containers
Lengths: 20ft/40ft
Heights: 8.6ft/9.6ft
Total TEU capacity: 2,988TEU
On deck: 1,948TEU
In holds: 1,040TEU
Homogeneously loaded to 14tonnes: abt. 2,160TEU
Reefer plugs: 353
Tiers/rows (maximum)
On deck: 9 tiers, 13 rows
In holds: 6 tiers, 11 rows
Complement
Officers: 13
Crew: 13
Suez/Repair Crew: 6
Fire extinguishing systems
Cargo holds: CO_2 fire extinguishing system
Make/Type: NK Co., Ltd
Waste disposal plant
Incinerator
Make: Sunflame
Model: OSV-600SAI
Sewage plant
Make: Il Seung
Model: ISB-03
Efficiency
Attained EEDI value: 13.77
Required EEDI value: 16.74
Installed Fuel Meters: Mass flow meter
Energy Saving Technologies: Energy saving Sea Sword, twisted rudder with symmetry rudder bulb
Contract date: 19 October 2022
Launch/float-out date: 31 December 2022
Delivery date: 28 April 2023

WAN HAI 331


L.W.L.
NO.1 CARGO HOLD
NO.2 CARGO HOLD
NO.3 CARGO HOLD
NO.4 CARGO HOLD
NO.5 CARGO HOLD
NO.1 WATCH
NO.2 WATCH
NO.3 WATCH
NO.4 WATCH
NO.5 WATCH
NO.6 WATCH
NO.7 WATCH
NO.1 HOLD
NO.2 HOLD
NO.3 HOLD
NO.4 HOLD
NO.5 HOLD
NO.6 HOLD
NO.7 HOLD
STEERING GEAR ROOM

WAN HAI A01 – CONTAINER SHIP

Shipbuilder:... **HD Hyundai Heavy Industries Co., Ltd**
Vessel's name:... ***Wan Hai A01***
Owner/Operator:... **Wan Hai Lines Ltd**
Country:... **ROC (Taiwan)**
Designer:... **HD Hyundai Heavy Industries Co., Ltd**
Country:... **Republic of Korea**
Model test establishement used:... **HD Hyundai Maritime Research Institute**
Flag:... **Singapore**
IMO number:... **9935088**
Total number of sister ships already completed (excluding ship presented):... **4**
Total number of sister ships still on order: **Nil**

Wan Hai A01 is the first vessel in a series of five 13,200TEU Neo-Panamax container ships built by Hyundai Heavy Industries for Taiwan-based Wan Hai Lines. The ship was delivered in March 2023 and the four sister ships also debuted the same year. The series of ships is part of Wan Hai Lines' fleet renewal programme which has seen it order ships at several yards while simultaneously reducing the number of chartered in vessels in its operation.

The 13,200TEU series is designed with a length overall of 335.77m, a beam of 51m and a draught of 16m. Typical for a modern ship of this size, the vessel has a bulbous bow bridge and accommodation superstructure is located seven stacks behind the bow with engine room and funnels located back three stacks from the stern. This gives better loading figures whilst complying with line-of-sight rules. *Wan Hai A01* is a fully cellular ship and has a nominal capacity of 13,216TEU of which 8,216TEU are on deck and 5,000TEU stowed under deck.

Power for *Wan Hai A01* comes from a Hyundai-built WinGD 7X92-B engine operating on the Otto cycle. Its power output is 37,660kW. The propeller is a 9.6m diameter fixed pitch type and at 75.8rpm allows for a service speed of 22.0knots. Auxiliary power is supplied by five HiMSEN gensets. To meet SOx requirements the ship burns compliant fuels as it has no scrubber. For NOx Tier III compliance the ship is equipped with SCR.

A number of Hyundai Heavy's proprietary technologies are included including a Hi-PSD pre-swirl duct and Hi-Rudder. So as to achieve the DNV SmartShip Notation, the vessel has been equipped with Hyundai ISS (Integrated Smart ship Solution).

TECHNICAL PARTICULARS

Length oa:... 335.77m
Length bp:... 320.00m
Breadth moulded:... 51.00m
Depth moulded
to main deck:... 27.30m
to upper deck:... 27.30m
Width of double skin
side:... 2.50m
bottom:... 2.20m
Draught
scantling:... 16.00m
design:... 13.00m
Gross:... 123,104t
Deadweight
scantling:... 142,148t
design:... 100,337t
Speed, service (abt. 85%MCR output):... 22knots

Cargo capacity (m^3)
Bale:... abt. 13,216TEU
Bunkers (m^3)
Heavy oil:... 9,153
Diesel oil:... 1,111
Water ballast (m^3):... 38,507
Daily fuel consumption (tonnes/day)
Main engine only:... 115.9

Classification society and notations:... DNV, +1A Container Ship, RSD, WIV, DG(P), EO, BIS, TMON, COAT-PSPC(B), CMON, LCS, BWM(T), RSCS+, SAFELASH, ER(SCR, Tier III), Cyber secure, Shore Power, Recyclable, Smartship(OE, PE, RSE)

Propulsion
Main engine(s)
Design:... Hyundai-WinGD
Model:... Hyundai-WinGD 7X92-B
Manufacturer:... Hyundai-WinGD
Number:... 1
Type of fuel:... LFO, MGO
Output of each engine:... 37,660kW
Is this a diesel-electric or hybrid?:... N

Propeller(s)
Material:... Ni-Al-Bronze
Designer/Manufacturer:... HD Hyundai Heavy Industries (Engine & Machinery Division)
Number:... 1
Fixed/Controllable pitch:... Fixed
Diameter:... 9.6m
Speed:... 75.8rpm

Diesel-driven alternators
Number:... 5
Engine make/type:... HHI-HiMSEN
Type of fuel:... LFO, MGO
Boilers
Number:... 1
Type:... Automatic, forced draught, light fuel oil burning, marine boiler
Make:... Kangrim
Output, each boiler:... 4,500kg/h
Stern appendages/special rudders:... Hi-Rudder RS

Bow thruster(s)
Make:... Kawasaki
Number:... 1
Output (each):... 3,000kW
Deck machinery
Other cranes
Number:... 2
Make:... Oriental
Type:... Electro-hydraulic driven, cylinder luffing type jib crane
Tasks:... Provision handling
Performance:... SWL 4.0t (P&S)
Mooring equipment
Number:... 10
Make:... Towimor
Type:... Electric

Special lifesaving equipment
Number of each and capacity:... 2 x lifeboats, 29 persons each
Make:... Jiangsu Jiaoyan Marine Equipment Co., Ltd
Type:... Fiberglass reinforced plastic totally enclosed type
Cargo/capacity
Hatch covers
Design:... SMS-SME
Manufacturer:... SMS-SME
Type (upper deck/other decks):... Pontoon, non-sequential operation type
Containers
Lengths:... 20ft/40ft
Heights:... 8'6"/9'6"
Cell guides:... 40ft
Total TEU capacity:... 13,216TEU
On deck:... 8,216TEU
In holds:... 5,000TEU
Tiers/rows (maximum)
On deck:... 11 tiers, 20 rows
In holds:... 1 tier, 18 rows

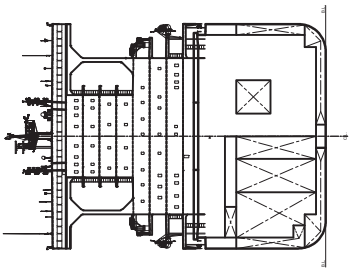
Ballast control system
Make:... Shinko
Type:... Electric motor driven vertical, centrifugal
Ballast water treatment system
Make:... SunRui
Capacity:... 2 x 2,200m^3/h
Complement
Officers:... 11
Crew:... 16
Single/double/other rooms:... 1

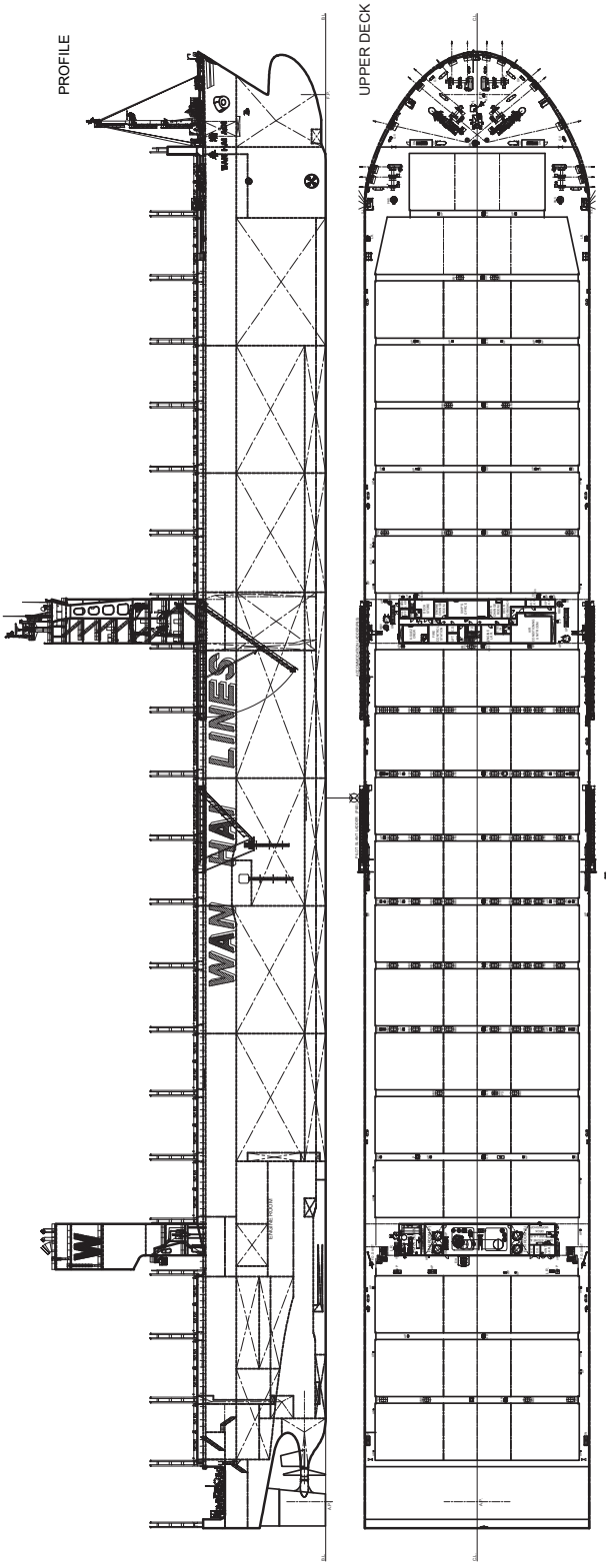
Navigation and other equipment
Bridge control system
Make:... Nabtesco
Type:... M-800-V
Is bridge fitted for one-man operation?... N
Integrated bridge system?:... N
Radars
Number:... 3 (S-Band / No.1 X-Band / No.2 X-Band)
Make:... JRC
Model(s):... JMR-9282-S / JMR-92256X

Fire detection system
Make:... Consilium
Type:... Salwico Cargo
Fire extinguishing systems
Cargo holds:... Fixed CO_2 system & SW hydrants
Make/Type:... Fain/high pressure CO_2
Engine room:... Fixed CO_2 system & SW hydrants & portable fire extinguishers
Make/Type:... Fain/high pressure CO_2, Fain/portable extinguisher
Cabins:... SW hydrants/portable fire extinguishers
Make/Type:... Fain/portable extinguisher
Public spaces:... SW hydrants/portable fire extinguishers
Make/Type:... Fain/portable extinguisher
Efficiency
Energy Saving Technologies:... Hi-PSD, Hi-Rudder RS
Performance Monitoring Regime:... Hyundai ISS (Integrated Smart Ship Solution)

Contract date:... 25 March 2021
Launch/float-out date:... 24 December 2022
Delivery date:... 02 March 2023

WAN HAI A01





XIANG TAI KOU – HEAVY-LIFT VESSEL

Shipbuilder: **Guangzhou Shipyard International Co., Ltd**
Vessel's name: ***Xiang Tai Kou***
Owner/Operator: **COSCOL (HK) Investment & Development Co., Ltd**
Country: **China**
Designer: **Shanghai Merchant Ship Design & Research Institute (SDARI)**
Country: **China**
Model test establishment used: **SSSRI**
Flag: **Liberia**
IMO number: **9982134**
Total number of sister ships already completed (excluding ship presented): **Nil**
Total number of sister ships still on order: **Nil**

Xiang Tai Kou is a 65000dwt semi-submersible heavy-lift vessel tailor-made for Chinese owner COSCO (HK) Investment & Development and delivered in December 2023. This unique vessel was designed by SDARI, constructed by CSSC Guangzhou Shipyard International and registered under CCS class.

It is designated as COSCO 46 I Super X type and is a development of the X class ships built in 2021 but is wider by 3m than the X class and has a longer open deck area. The vessel has an overall length of 231.10m and a beam of 46m. All accommodation and engine rooms of the DP2 type vessel are located forward and on each stern quarter there is a water ballast tower and equipment room. Total open deck length is 192m but from accommodation to the towers the length is 179.2m. Overall deck width of 46m narrows to 32.5m between the towers. *Xiang Tai Kou* has a vertical stem and transom stern.

The vessel can carry non-buoyant cargo of 23,000tonnes with a vertical centre of gravity (VCG) of 23m above the ship's main deck and buoyant cargo of 36,000tonnes and a VCG of 25m above the ship's main deck. When loading float on/off cargoes the ship can submerge to give a depth of 13m above the main deck and is able to de-ballast in about five hours from maximum submerged draught to design draught.

Power for the diesel-electric system is provided by four Shaanxi Diesel Engine-built medium speed MAN 8L32/40 engines. The engines are intended to be run on 2020 SOx compliant fuels and the vessel has an SCR system for meeting NOx Tier III requirements.

The two Siemens 6,000kW propulsion motors are housed aft and connected to the twin 6.4m diameter fixed-pitch propellers through a reduction gearbox. Service speed of the vessel is 14.1knots. The vessel has two bow thrusters rated at 2,300kW each and two stern thrusters rated at 1,500kW each to give the DP2 dynamic positioning capability.

TECHNICAL PARTICULARS

Length oa: 231.10m
Length bp: 226.86m
Breadth moulded: 46.00m
Depth moulded to main deck: 14.50m
Draught scantling: 10.90m

Gross: 47,124t
Deadweight scantling: 66,069.8t
Speed, service: 14.1knots

Bunkers (m^3)
Heavy oil: 4,700
Diesel oil: 400
Water ballast (m^3): 116,000

Classification society and notations: CCS ★CSA, Semi-Submersible Vessel, ERS, PSPC(B), Loading Computer(S,I), Ice Class B, In-Water Survey, ★CSM, AUT-0, G-EP(GPR(EU),NEC2), G-ECO(BWM(T)), PR-2, DP-2, SCM

Propulsion
Main engine(s)
Model: Electric propulsion motor
Manufacturer: Siemens
Number: 2
Type of fuel: LSFO, MGO
Output of each engine: 6000kW
Is this a diesel-electric or hybrid?: Diesel-electric

Gearbox(es)
Make: Nanjing High Accurate Marine Equipment Co., Ltd
Model: Horizontal
Number: 2
Output speed: 94.7rpm

Propeller(s)
Designer/Manufacturer: SDARI
Number: 2
Fixed/Controllable pitch: Fixed
Diameter: 6.4m
Speed: 94.7rpm

Main-engine driven alternators
Number: 4
Make/type: Shaanxi Diesel Engine Heavy Industry Co., Ltd / MAN 8L32/40
Output/speed of each set: 720rpm

Diesel-driven alternators
Number: 4
Engine make/type: Shaanxi Diesel Engine Heavy Industry Co., Ltd /MAN 8L32/40
Type of fuel: HFO, ULSFO, MGO
Alternator
Output/speed of each set: 720rpm

Boilers
Number: 1+4
Type: Oil-fired thermal oil heater/exhaust gas thermal oil heater
Make: Heat Master
Output, each boiler: 400kW

Stern appendages/special rudders: Semi-spade rudder with rudder bulb
Bow thruster(s)
Make: SMMC
Number: 2
Output (each): 2,300kW
Stern thruster(s)
Make: SMMC
Number: 2
Output (each): 1,500kW

Deck machinery
Other cranes
Number: 3
Make: K&R
Type: Electro-hydraulic crane
Tasks: Service and provision handling/handling the forklift truck on buoyancy casing
Performance: SWL147kN/3.5m-18m PERSONNEL 19.6kN; SWL29.4kN/1.5m-6m
Mooring equipment
Number: 12
Make: Jiangsu Masada Heavy Industries Co., Ltd
Type: Hydraulic

Special lifesaving equipment
Number of each and capacity: 2, 50 persons
Make: LJSafe Technology Co., Ltd
Type: Gravity luffing arm davit and totally enclosed lifeboat
Ballast water treatment system
Make: Ocean Guard
Capacity: 2 x 1,560m^3/h(PSU≥1), 2 x 1,200m^3/h(PSU<1)

Complement
Officers: 14
Crew: 12
Supernumaries/Spare: 11
Suez/Repair Crew: 6
Passengers
Total: 12
Number of cabins: 3

Navigation and other equipment
Is bridge fitted for one-man operation?: N
Integrated bridge system?: N
Radars
Number: 2
Make: Furuno
Model(s): FAR-2338S / FAR-2328

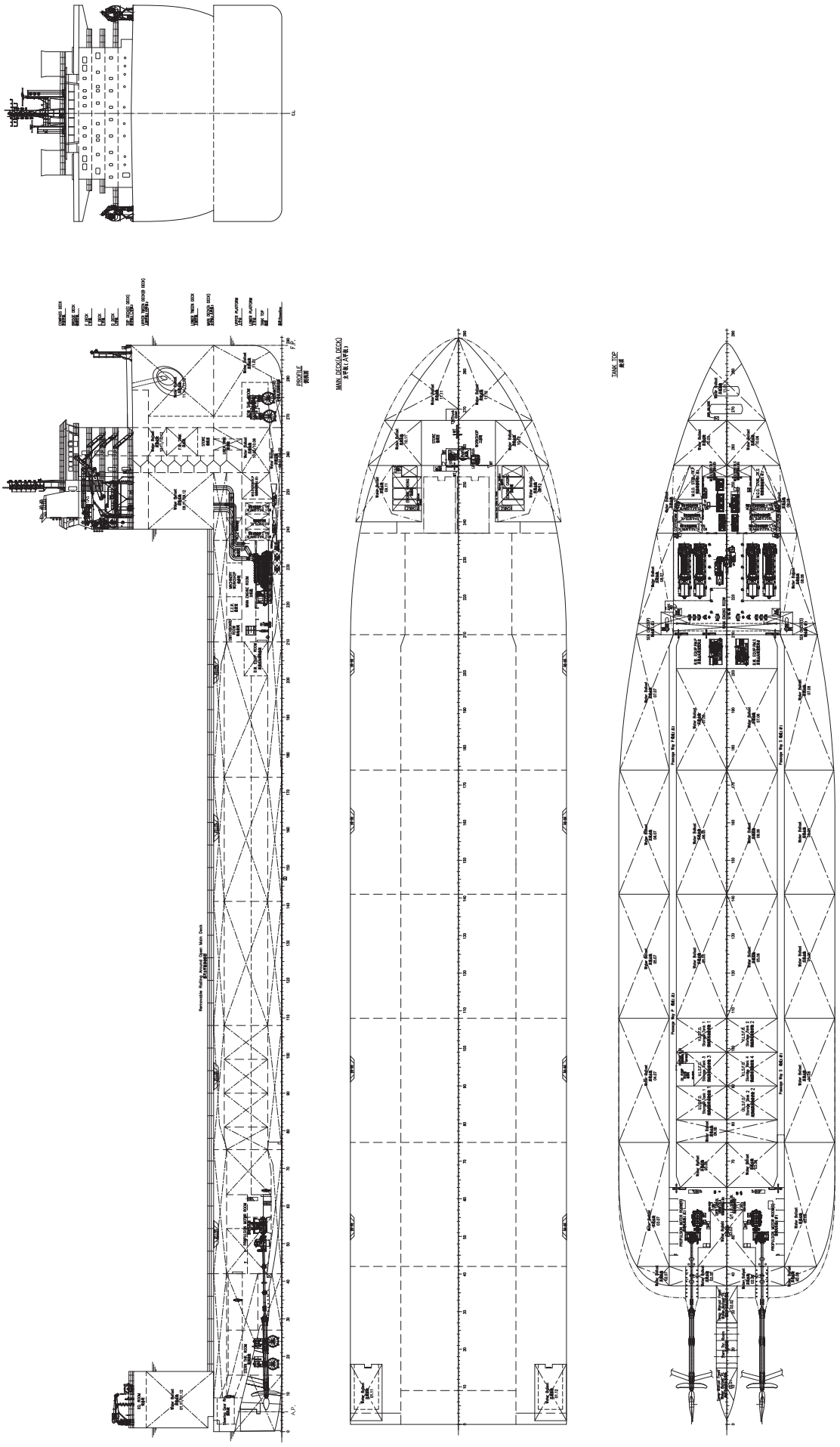
Fire detection system
Make: Consilium
Type: Salwico Cargo
Fire extinguishing systems
Engine room: Fixed CO_2 extinguishing system (SSF) / fixed fresh water mist system (SSF)

Waste disposal plant
Sewage plant
Make: Hansun
Model: ST-50U

Efficiency
Installed Fuel Meters: Mass flow

Contract date: April 2022
Delivery date: December 2023

XIANG TAI KOU



XIN HUI HAI – CONTAINER SHIP

Shipbuilder: **New Dayang Shipbuilding Co., Ltd**
Vessel's name: ***Xin Hui Hai***
Owner/Operator: **Trawind Shipping Logistics**
Country: **China**
Designer: **Shanghai Merchant Ship Design & Research Institute (SDARI)**
Country: **China**
Model test establishment used: **CSSRC**
Flag: **China**
Total number of sister ships already completed (excluding ship presented): **4**
Total number of sister ships still on order: **Nil**

Xin Hui Hai is the lead ship of a new 4,500TEU container ship class designed by SDARI for operation in Chinese domestic waters and the first of five ordered by Dalian Trawind Shipping from New Dayang Shipbuilding. The vessel was delivered in September 2023 as the first newbuilding in the owner's history since the company was founded in the 1990s. A pair of similar sized but different design vessels have also been ordered by Trawind from another Chinese yard.

The ship's hull dimensions of loa 226m, beam of 40m and draught of 13.7m are fairly typical for a ship of this capacity as is the general configuration of machinery and accommodation aft just forward of the final stacks of boxes loaded above Hold 7. The vessel is fully cellular and has a nominal capacity of 4,504TEU of which 2,156TEU are stowed on deck and 2,348TEU in the ship's seven holds. At a 14tonnes homogenous loading capacity drops to 4,189TEU. There are reefer plugs for 240 boxes.

Xin Hui Hai is powered by a Dalian Marine Diesel six-cylinder super long stroke MAN B&W S60ME-C10.5 main engine rated at 10,274kW at 79.6rpm driving a 7.6m fixed pitch propeller to give a service speed at 85%MCR of 15.1knots. The propeller has a boss cap fin and duct for improved efficiency.

The ship runs on VLSFO or MGO to meet SOx rules but being intended for domestic Chinese operation it need only comply with NOx Tier II requirements, so no SCR treatment is necessary. The auxiliary engines are all MAN 23/30H types built by CSSC Marine Power. There are two six-cylinder variants and two eight-cylinder units producing 810kW and 1,080kW respectively.

The vessel is equipped with high voltage shore power system, which is conducive to reducing emissions and protecting the environment when in port. Against a required EEDI rating of 7.518, the ship achieve a rating of 4.729.

TECHNICAL PARTICULARS

Length oa: 226.00m
Length bp: 222.60m
Breadth moulded: 40.00m
Depth moulded
to main deck: 19.20m
to upper deck: 19.20m
Width of double skin
side: 2.10m
bottom: 2.00m
Draught
scantling: 13.70m
design: 13.50m
Gross: 50,545t
Displacement: 98,600t
Lightweight: 15,300t
Deadweight
scantling: 83,300t
design: 81,600t
Block co-efficient: 0.7854 at 13.5m draught
Speed, service (85%MCR output): 15.1knots at 13.5m draught, NCR, Bft.0, with 15% sea margin
Cargo capacity (m^3)
Bale: 111,065.5
Bunkers (m^3)
Heavy oil: 950
Diesel oil: 399
Water ballast (m^3): 21,900
Daily fuel consumption (tonnes/day)
Main engine only: 34.2
Auxiliaries: 3.1
Classification society and notations: CCS ★CSA Container Ship; R1; Ice Class B; Loading computer(S,I); In-Water Survey ★CSM MCC; SCM; AMPS; Gd-EP; Gd-ECO(CD30)
% high-tensile steel used in construction: 80%
Heel control equipment: Anti-heeling pump

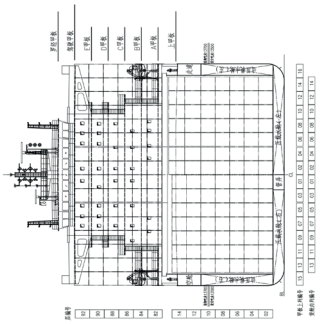
Propulsion
Main engine(s)
Design: MAN B&W
Model: 6S60ME-C10.5 Tier II
Manufacturer: Dalian Marine Diesel Co., Ltd
Number: 1
Type of fuel: VLSFO, MGO
Output of each engine: 10,274kW
Is this a diesel-electric or hybrid?: N
Propeller(s)
Material: Ni-Al-Bronze
Designer/Manufacturer: SDARI
Number: 1
Fixed/Controllable pitch: Fixed
Diameter: 7.6m
Speed: 79.6rpm at CSR
Diesel-driven alternators
Number: 4
Engine make/type: CSSC Marine Power Co., Ltd /2 × 6L23/30H & 2 × 8L23/30H
Type of fuel: VLSFO, MGO
Alternator make/type: ZhenJiang China Marine-XianDai Generating Co., Ltd /2 × HFC6 564-84K & 2 × HFC5 632-84E
Output/speed of each set: 2 × 810kW & 2 × 1,080kW / 750rpm
Boilers
Number: 1
Type: Exhaust gas & oil-fired composite boiler
Make: Zhangjiagang Hailu Shazhou Technology Co., Ltd
Output, each boiler: Oil-fired side 1,800kg/h / exhaust gas side 1,000kg/h & 315kg/h & 235kg/h
Stern appendages/special rudders: Free hanging full spade rudder, twisted edge with rudder bulb
Deck machinery
Other cranes
Number: 2
Make: CSSC Nanjing Luzhou Machine Co., Ltd
Type: Electro-hydraulic slewing type with cylinder luffing
Tasks: For provision
Performance: 4t at 8m
Mooring equipment
Number: 7
Make: Jiangsu Masada Industries Co., Ltd
Type: Hydraulic
Special lifesaving equipment
Number of each and capacity: 2 x 25 persons
Make: Zhejiang Norsier Lifesaving Equipment Technology Co., Ltd
Type: Gravity
Cargo/capacity
Hatch covers
Design: TTS Hua Hai Ships Equipment Co., Ltd
Manufacturer: New Dayang Shipbuilding Co., Ltd
Type: Upper deck
Containers
Lengths: 6,058mm
Heights: 2,591mm
Cell guides: full cell guides in cargo hold
Total TEU capacity: 4,504TEU
On deck: 2,156TEU
In holds: 2,348TEU
Homogeneously loaded to 14tonnes: 4,189TEU
Reefer plugs: 240FEU
Tiers/rows (maximum)
On deck: 6 tiers, 16 rows
In holds: 7 tiers, 14 rows
Ballast control system
Make: Shanghai Rongde Engineering Equipment Co., Ltd
Type: Hydraulic
Complement
Officers: 11
Crew: 14
Single/double/other rooms: 25

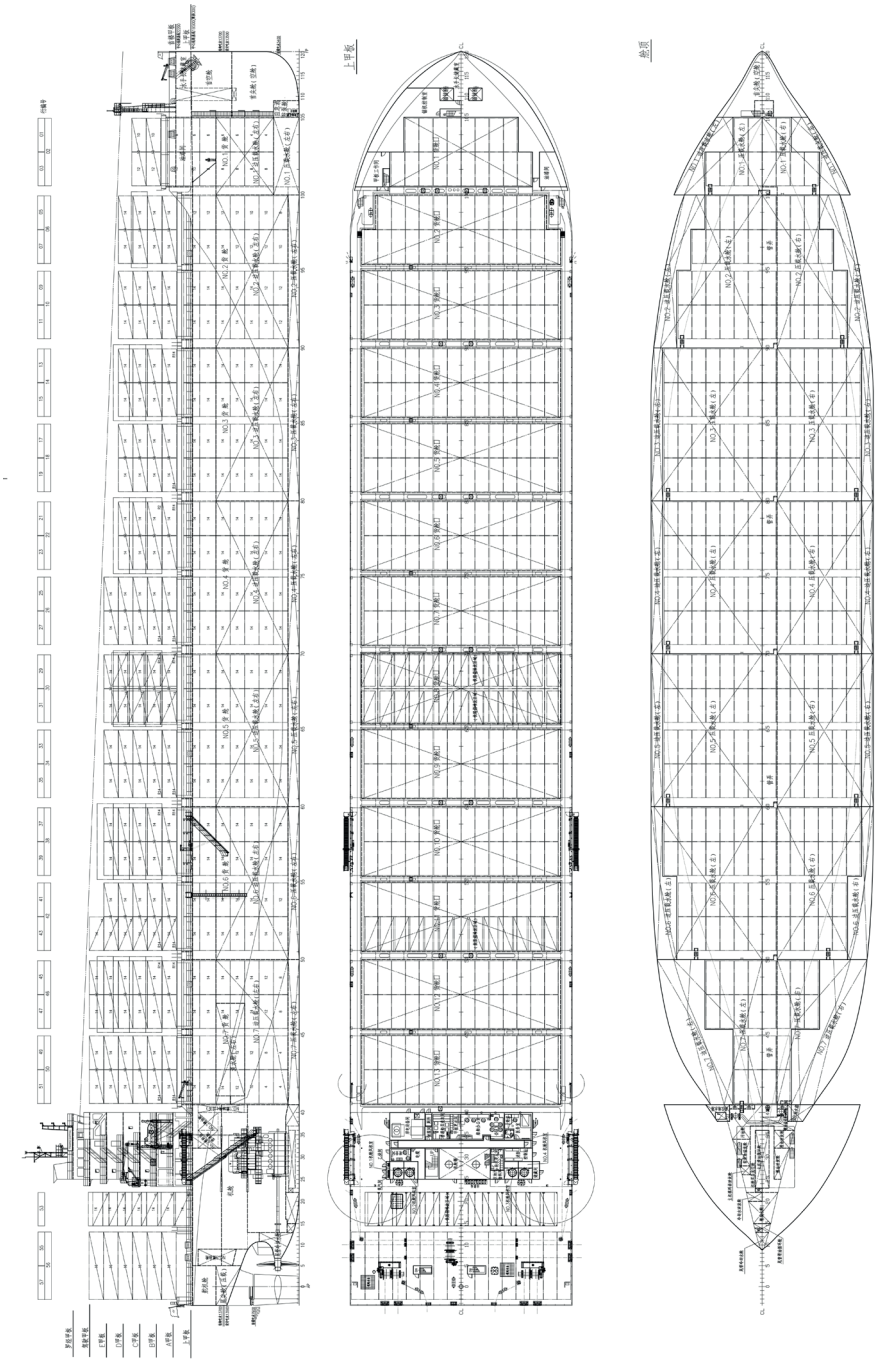
Navigation and other equipment
Bridge control system
Make: Kongsberg
Type: AC600
Is bridge fitted for one-man operation?: N
Integrated bridge system: N
Radars
Number: 2
Make: Furuno
Model(s): FAR-2328/2338S

Fire detection system
Make: Kexun
Type: K1302
Fire extinguishing systems
Cargo holds: CO_2 fixed system
Make/Type: Jiujiang CSSC Fire Equipment Co., Ltd
Engine room: CO_2 fixed system
Make/Type: Jiujiang CSSC Fire Equipment Co., Ltd
Waste disposal plant
Sewage plant
Make: Jiangsu Nanji Machinery Co., Ltd
Model: WCMBR-30(U)
Efficiency
Attained EEDI value: 4.729
Required EEDI value: 7.518
Installed Fuel Meters: Volumetric fuel meter installed in fuel supply module; mass fuel meters installed at the inlet and outlet of fuel supply pipe of M/E, A/Es and boiler.
Energy Saving Technologies: Fan cap & fan duct
Hull coatings: Antifouling paint

Contract date: October 2020
Launch/float-out date: May 2023
Delivery date: September 2023

XIN HUI HAI





ZIM SAMMY OFER – CONTAINER SHIP

Shipbuilder:..... **Samsung Heavy Industries Co., Ltd**
Vessel's name:..... ***Zim Sammy Ofer***
Owner/Operator:..... **Seaspan Ship Management**
Country:..... **Canada**
Designer:..... **Samsung Heavy Industries Co., Ltd**
Country:..... **Republic of Korea**
Model test establishment used:..... **Samsung Ship Model Basin**
Flag:..... **Hong Kong**
IMO number:..... **9931094**
Total number of sister ships already completed (excluding ship presented): **7**
Total number of sister ships still on order: **2**

Initiating Israeli container operator ZIM's entry into the LNG-fuelled container ship sector, *Zim Sammy Ofer* was delivered by Samsung Heavy Industries to owner Seaspan Corporation in February 2023.

It is the first of a 10-ship series of 15,000TEU vessels chartered by ZIM from Seaspan and is named after the late Sammy Ofer, the shipping magnate and one time owner of ZIM. Seven of the sister ships had been delivered by February 2024 with just two remaining for delivery expected to be in March and May 2024.

The ships are Neo-Panamax types with a length of 366m, beam of 51m and draught of 16.1m. Nominal cargo capacity is 15,124TEU with facility for 1,600 reefer boxes. Boxes can be carried 11 tiers high both under and on deck except for the six stacks forward of the superstructure which gradually decrease to meet line of sight rules.

Machinery is located aft with four stacks of boxes behind the funnels at deck level. LNG fuel for the ship's main and auxiliary engines is stored under deck so there are no tell-tale tanks on deck to advertise the dual-fuel capability but the message is emblazoned along the hull. The two LNG fuel pumps are Svanehoj deep-well types.

Zim Sammy Ofer has a service speed of 22.5knots permitted by the MAN B&W 8G90ME-C10.5-GI dual-fuel main engine with an output of 46,000kW at 80rpm and the single fixed pitch propeller. Auxiliary engines are two nine-cylinder and two eight-cylinder HiMSEN H35/40DF dual-fuel units. The larger producing 4,160kW each and the smaller 3,700kW each both at 720rpm.

Samsung's proprietary energy saving technologies of SAVER Fin, SAVER Stator, and SARB (Samsung Advanced Rudder Bulb) are complemented by waste heat recovery for main engine and generator engines and the use of variable frequency drives for the main cooling sea water pumps and engine room supply fan.

TECHNICAL PARTICULARS

Length oa:..... abt. 366.00m
Length bp:..... 360.00m
Breadth moulded:..... 51.00m
Depth moulded
to main deck:..... 30.00m
Draught
scantling:..... 16.10m
design:..... 14.50m
Gross:..... 152,200t
Deadweight
scantling:..... 160,900t
design:..... 135,500t
Speed, service:..... 22.5knots
Bunkers (m^3):..... LNG DF

Classification society and notations:..... DNV +A1 Container ship, RSD, FL(25,WW), WIV, EO, BIS, TMON, COAT-PSPC(B), LCS, CMON, BWM(T), CLEAN, NAUT(NAV), RSCS+, Recyclable, Gas fuelled LNG, DG(P), SAFELASH, SHORE POWER
high-tensile steel used in construction:... abt. 80%

Propulsion
Main engine(s)
Design:..... 2-stroke engine
Model:..... 8G90ME-C10.5-GI
Manufacturer:..... MAN ES
Number:..... 1
Type of fuel:..... LNG, VLSFO, ULSFO, MGO
Output of each engine: 46,000kW at 80rpm
Is this a diesel-electric or hybrid?:..... N
Propeller(s)
Material:..... Ni-Al-Bronze
Designer/Manufacturer:..... Samsung / MMG
Number:..... 1
Fixed/Controllable pitch:..... Fixed
Speed:..... 80rpm
Diesel-driven alternators
Number:..... 4
Engine make/type:..... HD Hyundai Heavy Industries / 4-stroke HiMSEN H35/40DF / 2 x 9- and 2 x 8-cyinder units
Type of fuel:..... LNG, VLSFO, ULSFO, MGO
Alternator make/type:..... HE/synchronous
Output/speed of each set:.... 2 x 4,16MW, 2 x 3.7MW x 720rpm
Boilers
Number:..... 1
Type:..... Dual fuel
Make:..... Kangrim
Output, each boiler:..... 10t/h
Stern appendages/special rudders:..... 1 set of full spade rudder with bulb
Bow thruster(s)
Make:..... Kawasaki
Number:..... 2
Output (each):..... 1,800kW
Deck machinery
Other cranes
Number:..... 3
Make:..... SSII
Type:..... 2 x electro-hydraulic cylinder luffing-jib type, 1 x electric motor driven, monorail type
Tasks:..... Provision and engine room equipment handling
Performance:..... 4/2t SWL for provision handling, 12.5/2t SWL for engine room handling
Mooring equipment
Number:..... 10
Make:..... Towimor
Type:..... Electric

Cargo/capacity
Hatch covers
Design:..... Steel pontoon type, non-weather tight, 4 panels/bay
Manufacturer:..... SHI (Design by MacGregor)
Type:..... Upper deck
Total TEU capacity:..... 15,124TEU
Reefer plugs:..... 1,600 plugs
Tiers/rows (maximum)
On deck:..... 11 tiers
In holds:..... 11 tiers
LNG fuel pumps
Number:..... 2
Type:..... Deep-well type
Make:..... Svanehøj
Stainless steel:..... SUS304L/316L
Capacity (each):..... $20m^3/h$
Ballast water treatment system
Make:..... Alfa Laval
Capacity:..... $1,500m^3/h$
Complement
Officers:..... 14
Crew:..... 16
Suez/Repair Crew:..... 6

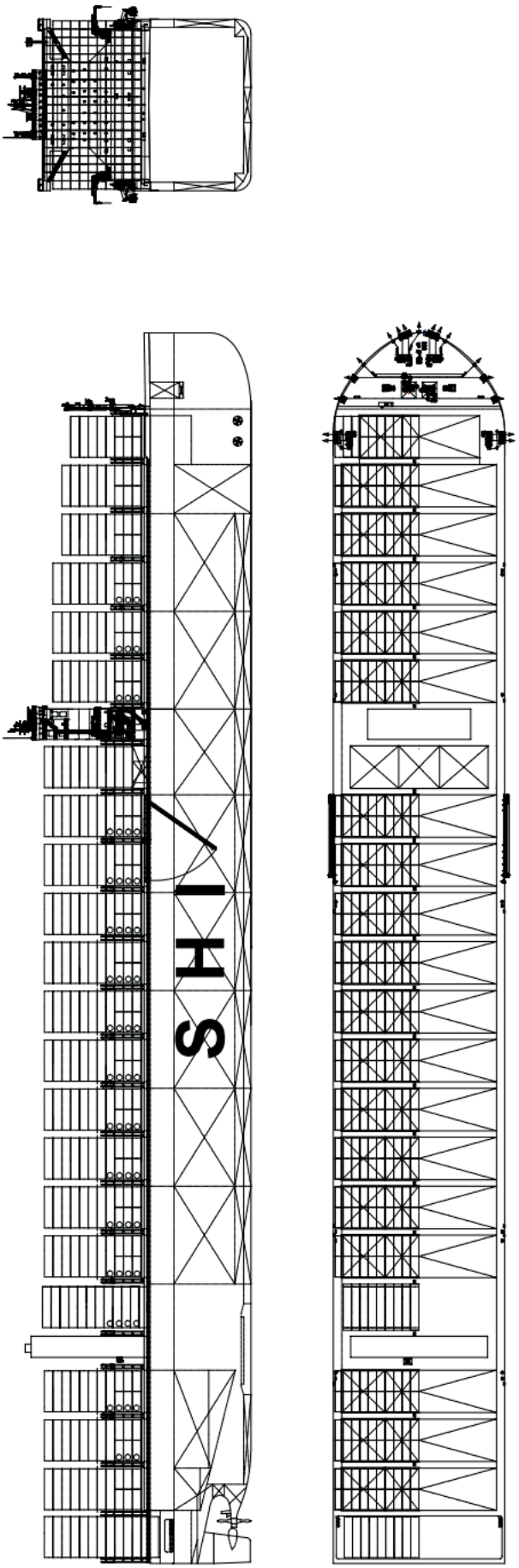
Navigation and other equipment
Bridge control system
Make:..... Nasan
Radars
Number:..... 3
Make:..... JRC
Model(s):..... 2 x X-Band(JMR-9296-6X), 1 x S-Band(JMR-9282-S)
Fire detection system
Make:..... Consilium
Fire extinguishing systems
Cargo holds:..... CO_2 fire extinguishing system
Make/Type:..... NK/high pressure type
Engine room:..... CO_2 fire extinguishing system
Make/Type:..... NK/high pressure type
Cabins:..... Sea water fire extinguishing system and/or portable fire extinguishers
Make/Type:..... Fain
Public spaces:..... Sea water fire extinguishing system and/or portable fire extinguishers
Make/Type:..... Fain

Waste disposal plant
Incinerator
Make:..... HMMCO
Model:..... MAXI 1500SL WS
Sewage plant
Make:..... Il Seung
Model:..... 1 x ISB-03, 1 x ISB-01

Efficiency
Attained EEDI value:..... Phase 3 satisfied
Other installed monitoring tools:.... Torque meter, draught measuring system, vision guidance system (cameras)
Energy Saving Technologies:..... SAVER Fin, SAVER Stator, SARB (Samsung Advanced Rudder Bulb); waste heat recovery for main engine and generator engines; VFD for main cooling sea water pumps and engine room supply fan
Hull coatings:..... Silyl methacrylate type antifouling paint
Performance Monitoring Regime:..... Ship performance monitoring system (shaft rpm, torque measurement, fuel flow measurement)

Contract date:..... 12 February 2021
Delivery date:..... 24 February 2023

ZIM SAMMY OFER



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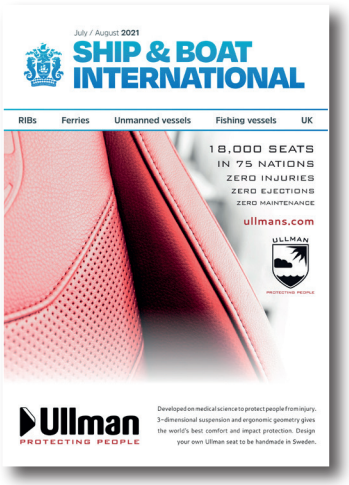

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