

SEA-Japan

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Season's Greetings

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JMU completes G-Series Dunkirkmax bulk carrier, KAURI

Japan Marine United Corporation (JMU) delivered the 181,000DWT bulk carrier KAURI at the Ariake Shipyard on September 22, 2021. This vessel is the second vessel of the newly developed Dunkirkmax bulk carriers of G-Series, called G181BC, which successfully combines both economical and environmentally friendly designs. The G181BC series conforms

with MARPOL ANNEX VI NO_x Tier III regulations as well as H-CSR (Harmonized Common Structural Rules).

The vessel has increased deadweight and cargo hold capacity suitable for bulk coal and iron ore in its nine cargo holds, achieved by JMU's expertise and vast experience. The SSD[®] (Super Stream Duct[®]) and SURF-BULB[®] equipped at the fore

and the aft of the propeller, respectively, greatly improve the propulsion performance. The ALV-Fin[®] (Advanced Low Viscous Resistance Fin) equipped in the

fore of the propeller controls stern water flow to gain better propulsive efficiency. Furthermore, a unique bow shape, LEADGE-Bow[®], can reduce the added resistance due to waves, and the well-refined shape of the superstructure has low wind resistance. This vessel is also equipped with a SO_x scrubber to comply with MARPOL ANNEX VI Regulations 14.

Principal particulars

L (o.a.) x B (mld.) x D (mld.) x d (mld.):	292.00m x 45.00m x 24.55m x 18.20m
DWT/GT:	182,327t/93,298
Main engine:	MAN B&W 7S65ME-C8.5-HPSCR diesel x 1 unit
Speed:	15.05kt
Complement:	25
Classification:	ClassNK



SKDY-Sanoyas delivers Panamax bulker, EVER MAJESTY

Shin Kurushima Sanoyas delivered the Panamax bulk carrier, EVER MAJESTY, on September 22, 2021, after construction at its Mizushima Shipyard. This is the eighth vessel of a series of the Sanoyas newly developed 82,000DWT type Panamax bulk carriers.

The vessel satisfies the latest rules such as the CSR B&T, NO_x Tier III regulations and SO_x emission regulations, and has the equivalent deadweight with shallower draft than the previous design. In addition, the vessel exceeds 20% reduction of CO₂ emissions based on the IMO EEDI (Energy Efficiency Design Index, grams CO₂ per ton nautical mile) regulation in advance and nearly equivalent to the 30% reduction required for ships ordered on or after 2025.

For improvement of propulsion efficiency, the vessel is equipped with a low-speed long-stroke, electronically controlled main engine combined with a high-efficiency propeller and rudder appendages. Furthermore, the vessel uses patented energy saving devices such as the Sanoyas developed STF (Sanoyas-Tandem-Fin) and ACE

DUCT (Sanoyas Advanced flow Controlling and Energy saving DUCT). These energy saving devices have achieved about 8% reduction of energy consumption and CO₂ emissions.

Eco-friendly countermeasures include the main engine with SCR compliant with the NO_x emission Tier III limit for the prevention of air pollution, dedicated low sulphur gas oil tank to cruise in ECAs (Emission Control Areas), and classification code IHM (Inventory of Hazardous Materials) concerning the inventory of hazardous materials. In addition, countermeasures such as a ballast water treatment system and independent holding tanks for rainwater on the upper deck for protection of the marine environment are also incorporated.

For improvement of vessel maintenance, access trunks are arranged to allow access from the upper deck to the double bot-

tom even under laden conditions. Accommodation compliant with the latest IMO noise reduction regulation helps to improve the comfortable working and living environment for officers and crew in the vessel.

Principal particulars

Hull No.:	1377
L (o.a.) x B (mld.) x D (mld.) x d (summer):	229.00m x 32.24m x 20.15m x 14.594m
DWT/GT:	81,936t/43,453
Cargo hold capacity:	97,019m ³ (grain)
Speed, service:	about 14.2kt
Complement:	24
Classification:	ClassNK
Delivery:	September 22, 2021



Mitsubishi Shipbuilding receives AiP for LCO₂ carrier cargo tank from France's BV

- Project part of MHI Group's effort to expand businesses for the CCUS value chain, based on the advanced gas handling technologies of Mitsubishi Shipbuilding.
- With the acquisition of this AiP, MHI Group will focus on developing and offering the technologies needed to bring LCO₂ carriers to the market.



Image of an LCO₂ carrier

Mitsubishi Shipbuilding, a part of Mitsubishi Heavy Industries (MHI) Group, has been granted Approval in Principle (AiP)^(Note1) from the French Classification Society Bureau Veritas (BV) for a cargo tank system to be mounted in a liquefied CO₂ (LCO₂) carrier.

MHI Group is pursuing a range of strategic measures to strengthen businesses related to energy transition, and establishing a CO₂ ecosystem is a key part of that effort. Carbon dioxide capture, utilization, and storage (CCUS) may become important worldwide as an effective approach to achieve decarbonization. LCO₂ carriers are pivotal in transporting CO₂ from the emission sources to storage sites or facilities for utilization, and demand for these vessels is expected to increase in the future. Mitsubishi Shipbuilding is responding to this demand by actively pursuing development and commercialization of LCO₂ carriers.

LCO₂ carriers transport liquefied CO₂ gas as a liquid in a low temperature, high pressure state. Accordingly, independent Type C tanks as defined

by the IGC Code^(Note2) are typically used for the cargo tank system. A structural design for a Type C tank must be based on standards for pressure containers. Various structural types are possible for these tanks, including cylindrical, bilobed, and trilobed. A further important factor is to select the steel material for the LCO₂ tanks with exceptional high strength and low temperature properties.

Mitsubishi Shipbuilding previously conducted studies on CO₂ carriers in 2004 as a participant in the International Energy Agency (IEA) Greenhouse R&D program, utilizing advanced techniques for structural

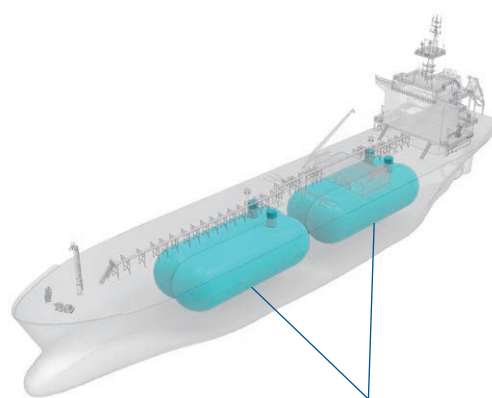
analysis, material evaluation, gas handling, and other expertise accumulated in the construction of liquefied petroleum gas (LPG) and liquefied natural gas (LNG) carriers.

With this acquisition of an AiP for the LCO₂ cargo tank system, MHI Group will continue to develop and offer a wide range of technologies related to the LCO₂ carriers essential to building a CCUS value chain, important for the realization of a decarbonized society.

(Note)

1. Approval in Principle (AiP) indicates that a certification body has reviewed the basic design, and confirmed that it meets the technical requirements and standards for safety. The inspection of this system was conducted based on the IGC Code that applies to marine vessels that transport liquefied gas in bulk, and the BV ship classification regulations.
2. The International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code) is an international regulation stipulating the safety requirements for ships that transport LCO₂, LNG, or other liquefied gases as cargo in bulk.

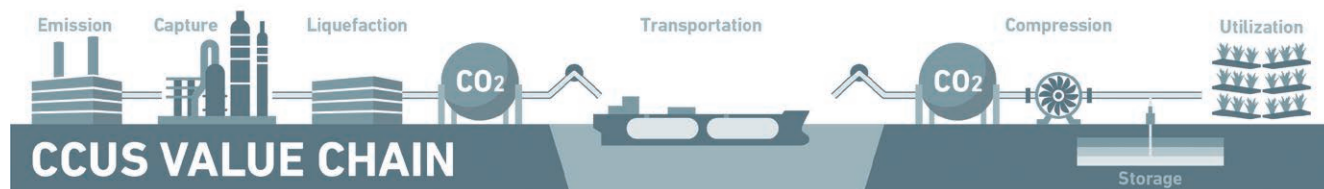
AiP for the LCO₂ carrier cargo tank



LCO₂ Cargo tanks
(Independent Type C tanks)



Image of CCUS value chain



NAMURA completes Dunkirkmax type bulk carrier, AWAJISAN MARU

Namura Shipbuilding Co., Ltd. delivered the AWAJISAN MARU, a 181,994 DWT bulk carrier, to MTO MARITIME, S.A. at its Imari Shipyard & Works on October 14, 2021. The vessel is the first of the newly-developed 182,000 DWT type bulk carrier with the principal dimensions optimized for the restrictions of the Port of Dunkirk in France.

Further improvement of propulsion performance and fuel saving were achieved with adoption of energy saving devices, the Namura flow Control Fin (NCF) and the Rudder-Fin developed by Namura, the electronically controlled main engine, the latest model of high efficiency propeller, and low friction type anti-fouling paint.

For environmental protection, the vessel is equipped with the main engine and generator engines compliant with the Annex VI of MARPOL 73/78 regulations to reduce NO_x emissions,

and an air seal type stern tube sealing device is adopted to reduce the risk of lubricating oil leakage. In addition, the vessel also complies with the SOLAS

Chapter II-1 Regulation 3-12, Code on noise levels on board ships to improve the environment of the crew living quarters.

The ballast water treatment system to control the quality of ballast water is equipped for protection of the marine environment to comply with the International Convention for the Control and Management of Ships' Ballast Water and Sediments. The vessel has several storage tanks for appropriate management and discharge of drainage, sewage, rain wa-



ter, and water used for cleaning cargo holds. This will satisfy port restrictions on such discharges.

Principal particulars

L (o.a.) x B (mld.) x d (mld.):	291.92m x 45.00m x 18.20m
DWT/GT:	181,994t/93,719
Main engine:	MAN B&W 6G70ME-C9.5 diesel x 1 unit
Complement:	25
Registry:	Panama
Classification:	ClassNK
Completion:	October 14, 2021

Naikai completes RO-RO cargo ship, HARUMARU No. 6

Naikai Zosen Corporation completed construction of the 12,500GT Roll-on/Roll-off cargo ship, HARUMARU No. 6, at the Innoshima Shipyard for Shunzan Kaiun Co., Ltd. on September 16, 2021. The HARUMARU No. 6 is now providing transportation of trailers and passenger automobiles in Japanese coastal areas.

The HARUMARU No. 6 is mainly designed to carry trailers and passenger automobiles. The cargo hold consists of four decks: one deck for only passenger automobiles and three decks allotted for trailers and passenger automobiles. Roll-on/Roll-off op-

eration can be achieved through shore ramps provided at the bow and stern on the port side, and inboard ramps allow access to assigned bays on the car decks.

The ship was designed for effective cargo-handling performance with pillarless arrangement of the cargo hold to minimize the car deck space without losing cargo-loading capacity as well as increasing the types of vehicles that can be accommodated.

The hull form of the HARUMARU No. 6 was based on repeated water tank tests, and now demonstrates excellent propulsion performance. Adoption of a rudder-bulb type rudder and an energy-

saving device STEP (Spray Tearing Plate) decreases fuel consumption greatly. The STEP attached to the bow above the water line is a device to de-

crease wave resistance under rough sea conditions. The ship uses fin stabilizers to reduce rolling of the ship during navigation, and thrusters installed at the bow and stern can easily attain maneuvering of the ship in a port.

For environmental conservation, the fuel oil tank uses a double-bottom structure to help suppress possible leakage of fuel oil during a collision.

Principal particulars

L (o.a.) x L (b.p.) x B x D x d (scantling):	179.90m x 170.00m x 27.40m x 23.30m x 6.75m
Gross tonnage:	about 12,500
Vehicle loading capacity	162 trailers (13m L x 2.5m W) 258 automobiles (4.7m L x 1.7m W)
Main engine:	Hitachi Zosen MAN B&W 9S50ME-C8.5 diesel x 1 unit
MCR (derating):	13,580kW x 127.0min ⁻¹
Speed, service:	about 21.0kt
Classification:	ClassNK
Registry:	Japan
Completion:	September 16, 2021



JSEA Digital Pavilion now ready for “NOR-SHIPPING 2022”

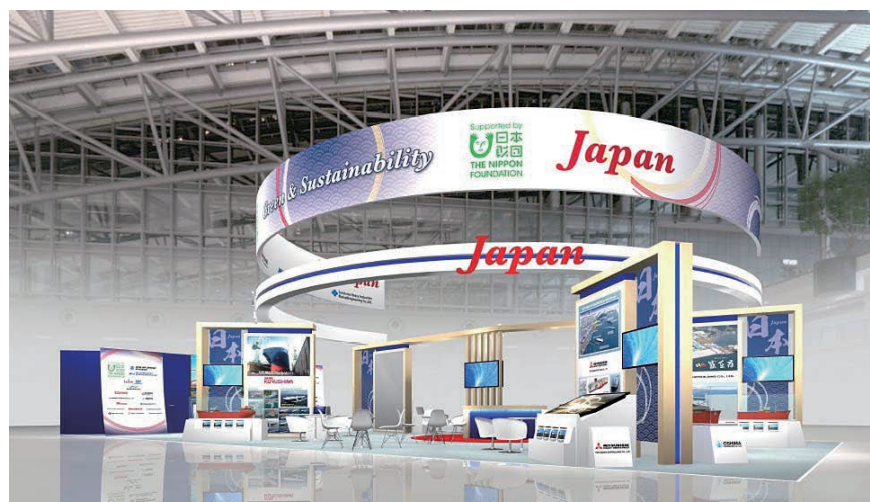
The Japan Ship Exporters' Association (JSEA) will participate in NOR-SHIPPING 2022 to be held in January 2022 using the JSEA Digital Platform. JSEA has been obliged to abandon conventional attendance at NOR-SHIPPING 2022 due to the present situation with COVID-19.

The JSEA Digital Platform is used

to construct the JSEA Digital Pavilion, which will demonstrate advanced ships and shipbuilding technologies as “challenges by the Japanese shipbuilding industry” which will be available online.

We are planning to show you the publicity materials sequentially after December 2021, and all contents will be

Please visit JSEA Digital Platform with: <https://dp.jsea.or.jp>, or QR code



disclosed at the opening day of the NOR-SHIPPING 2022 on January 10, 2022. Therefore, we are eager for visitors to our website, JSEA Digital Pavilion, during the period of the NOR-SHIPPING exhibition.

Moreover, the contents of the JSEA Digital Pavilion will be displayed on a large screen installed in Hall B, B02-14 (The Lillestrom Exhibition Center) of the exhibition site during the period of the NOR-SHIPPING 2022. We invite visitors to the exhibition to come to Hall B and see our exhibition on the screen.

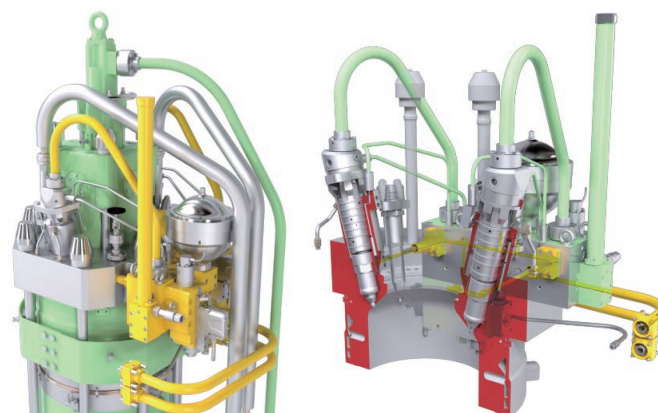
Order for low-speed gas fuel engines (ME-LGIP) using LPG as fuel

Mitsui E&S Machinery Co., Ltd. announced that the company has recently received an order for "6G60ME-C10.5-LGIP-EGRBP" low-speed LPG fuel engines from Mitsubishi Shipbuilding Co., Ltd. of Yokohama, Japan. The engines will be installed in the very large gas carriers (VLGC) designed to transport LPG and ammonia and constructed by Namura Shipbuilding Co., Ltd. of Osaka, Japan for Phoenix Tankers Pte. Ltd. of Singapore, a group company of Mitsui O.S.K. Lines, Ltd. of Tokyo, Japan.

The number of vessels, LPG carriers in particular, that use the ME-LGIP engine has increased rapidly in recent years because LPG both reduces the carbon dioxide (CO₂) emissions from combusted fuels and significantly lowers the emissions of sulfur oxides (SO_x) and particulate matter (PM).

The company will exploit the experience accumulated through the manufacture of gas fuel engines to increase its efforts to adopt alterna-

tive fuels such as ammonia, to provide customers with safe, environmentally friendly, and economical propulsion engines.



Left: LPG fuel injection equipment (external view of the cylinder cover)

Right: LPG fuel injection valve

Installations of low-speed gas fuel engines of the Company

Engine types	Usable fuels	Installations	Project outline
ME-GI	LNG, fuel oil	7 engines	3 LNG-fueled vessels and 2 LNG carriers ^{*1}
ME-GIE	Ethane and fuel oil	3 engines	3 liquefied ethylene gas carriers
ME-LGIM	Methanol and fuel oil	3 engines	3 methanol fuel oil carrier
ME-LGIP	LPG and fuel oil	2 engines	LPG/ammonia carriers ^{*2}

^{*1} Twin-engine twin-screw vessel ^{*2} One of the two vessels is optional.

YM TOPMOST

Builder: Imabari Shipbuilding Co., Ltd.
 Ship type: 11,000TEU type container carrier
 L (o.a.) x B x D: 333.95m x 48.40m x 22.88m
 DWT/GT: 136,899t/118,523
 Main engine: 9S90ME-C10.5 diesel x 1 unit
 Speed, service: 23.0kt
 Classification: ABS
 Completion: September 28, 2021

**CRYSTAL ASTERIA**

Owner: Kumiai Navigation (Pte.) Ltd.
 Builder: Kawasaki Heavy Industries, Ltd.
 Hull No.: 1748
 Ship type: LPG carrier
 L (b.p.) x B x D: 229.90m x 37.20m x 21.90m
 DWT/GT: 54,922t/49,145
 Main engine: Kawasaki MAN B&W 7S60ME-C10.5-LGIP diesel x 1 unit
 Speed, service: 17.0kt
 Classification: ClassNK
 Registry: Singapore
 Completion: August 31, 2021

**WORLD RUBY**

Owner: BW Dry Cargo Pte. Ltd.
 Builder: Oshima Shipbuilding Co., Ltd.
 Hull No.: 10976
 Ship type: Bulk carrier
 L (o.a.) x B x D x d (ext.): 199.995m x 32.260m x 18.970m x 13.348m
 DWT/GT: 62,496t/34,762
 Main engine: Mitsui MAN B&W 6S50ME-C9.5 diesel x 1 unit
 Speed, service: 14.50kt
 Registry: Isle of Man
 Classification: DNV
 Completion: August 31, 2021

**SILVER BREEZE**

Owners: JRJT and Tsugaru Kaikyo Ferry Co. Ltd.
 Builder: Naikai Zosen Corporation
 Ship type: Passenger/car ferry
 L (o.a.) x B x D x d: 144.13m x 23.00m x 14.10m x 6.00m (scantling draft)
 DWT/GT: 3,440t/8,900
 Complement: 28
 Main engine: Hitachi Zosen MAN B&W 6S50MC-C8.2 diesel x 1 unit
 MCR: 9,945kW x 127.0min⁻¹
 Speed, service: 20.0kt
 Classification: JG Class II (coastal area)
 Registry: Hachinohe City, Aomori
 Completion: June 10, 2021



Shipbuilding and Marine Engineering in Japan 2022 to be released next March

The Japan Ship Exporters' Association (JSEA) will publish Shipbuilding and Marine Engineering in Japan 2022 (SME) in March 2022. However, the digital edition will be available from the JSEA website (<https://www.jsea.or.jp/en/publications/>) instead of being included with the book edition on a CD-ROM as previously.

The principal contents include the current status of the Japanese shipbuilding industry, new completions by ship types, new shipbuilding technologies, navigation systems, energy-saving equipment and

systems, software for shipbuilding rationalization, and building and repairing facilities, focusing on the achievements during the last two years.

JSEA is now providing digital publications for our readers, which include Shipbuilding and Marine Engineering in Japan (biennial edition) and SEA-Japan (bimonthly).

