FERRY I 2,800 GT Passenger/Car Ferry 5

Shin Kurushima Sanoyas Shipbuilding Co., Ltd.

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FERRY I 2,800 GT Passenger/Car Ferry 5

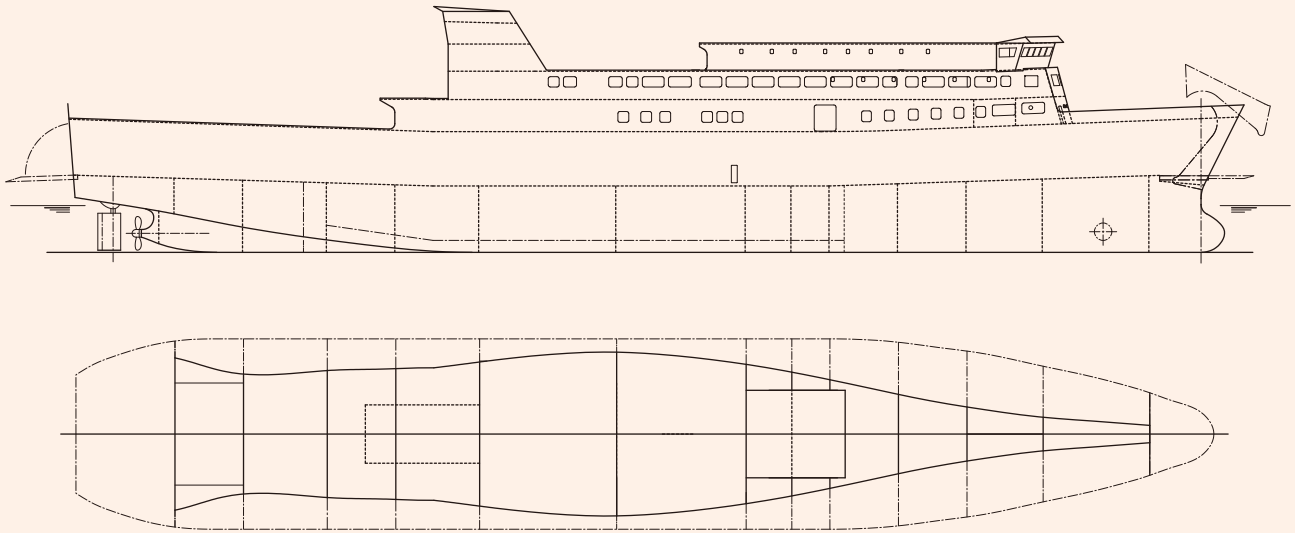
Sanoyas Shipbuilding Corporation completed the 2,800 GT-Passenger/Car Ferry "Ferry I" in December 2019.

Features

1. "Ferry I" is 2,800 GT car ferry which can accommodate 427 passengers normally, or 546 passengers in the high season and load 37 trucks.
   The vessel was built as the replacement of "FERRY TSURUGI" which engaged in the regular service between Wakayama port and Tokushima port, and entered service on December 15, 2019. The vessel is named "Ferry I" based on 3 key words of "I: myself", "Ai: love in Japanese" and "Ai-zome: indigo dyeing that is a famous product of Tokushima in Japanese".
2. The vessel's propulsion system uses two engines and two propellers, the biaxial stern catamaran hull shape provides energy saving performance, and the combined control of the controllable pitch propellers, flap rudders, and bow thruster allows safe passage, and easy berthing and unberthing.
3. The vessel has an upper navigation deck, A-deck, passenger deck, and lower car deck. A lift equipped on the starboard side enables passengers to easily access the passenger deck from the car deck. LED lighting is adopted in the passenger accommodation, crew accommodation, car deck, engine room, and elsewhere to reduce energy consumption.
4. For passenger comfort, many facilities are equipped such as first class seats (green seats), seating mat areas, a nursing room, driver area with shower, seats with lighting and AC100V outlets for business persons, and an observation deck providing great views of the Kii Channel. The anti-rolling tank installed in the funnels stabilizes the rolling of the vessel and provides a comfortable trip.
5. Car roll-on/roll-off ramp doors are provided at the bow and stern. The car deck has 4.3m height for loading high cube container trailer.

PRINCIPAL PARTICULARS

Length (o.a.)	108.01 m
Breadth (mld.)	17.50 m
Depth (mld.)	11.10 m
Draft (mld.)	4.4 m
Gross tonnage	2,825 (Japanese domestic ton)
Deadweight	1,172 mt
Main engine	6DKM-36e × 2 sets
Speed (service)	abt. 18.4 knots
Classification	JG
Loading capacity (passenger)	427 Persons (546 Persons in busy season)
(car/vehicle)	37 Trucks
Builder	Sanoyas Shipbuilding Corporation



BRILLIANT SAKURA 82,000 DWT Bulk Carrier 57

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BRILLIANT SAKURA 82,000 DWT Bulk Carrier 57

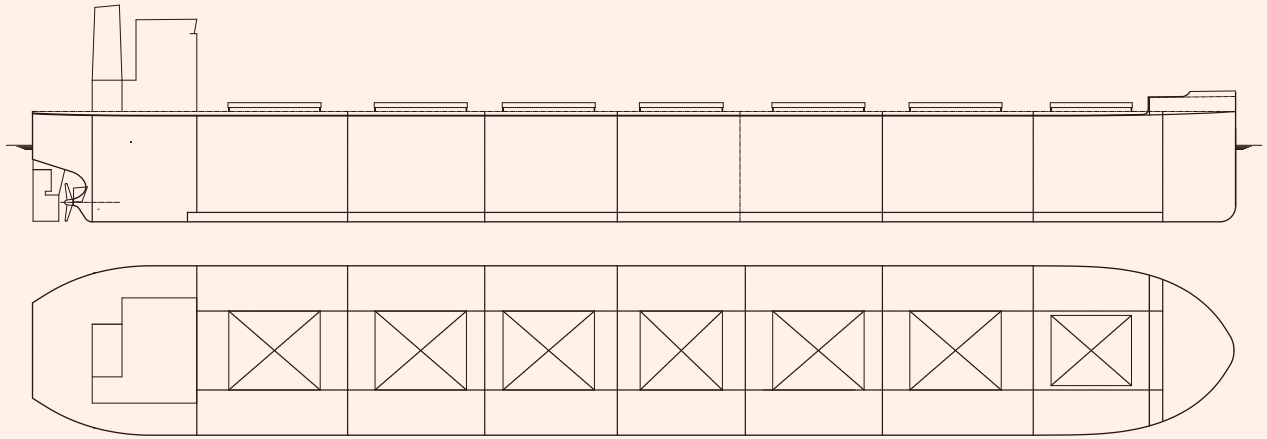
Sanoyas Shipbuilding Corporation delivered the 81,800-DWT bulk Carrier "BRILLIANT SAKURA" in October 2020.

Features

1. This is the memorable 1st vessel of a series of the SANOYAS newly developed 82,000DWT type PANAMAX bulk carriers. The vessel not only applies latest rules such as CSR B&T, NOx Tier Ⅲ regulations, but also has the equivalent level of deadweight with shallower draft than builder's previous design. And the vessel exceeds 20% reduction of CO_2 emission by IMO's EEDI (Energy Efficiency Design Index : the grams CO_2 per ton nautical mile) regulation in advance and mostly approaching 30% reduction that shall apply to ships for which the building contract is placed on or after 2025.
2. For improvement of propulsion efficiency, the vessel is equipped with low-speed & long-stroke electronically controlled main engine combined with a high-efficiency propeller and rudder appendages. Furthermore, the company's patented energy saving devices such as SANOYAS developed "STF" (Sanoyas-Tandem-Fin) and ACE DUCT (Sanoyas Advanced flow Controlling and Energy saving DUCT) are applied. These energy saving devices have achieved about 8 % reduction of energy consumption and CO_2.
3. Considering eco-friendly features, various countermeasures such as main engine with SCR complied with NOx emission Tier Ⅲ limit for the prevention of air pollution, SOx scrubber for SOx emission control in global area and dedicated low Sulphur gas oil tank to cruise in ECA(Emission Control Area). In addition, various countermeasures such as Ballast Water Treatment System and independent holding tanks for rainwater on upper deck for the protection of marine environment, are also incorporated.
4. Furthermore, for improvement of the vessel's maintenance, access trunks are arranged to make it possible to gain access from upper deck to double bottom even at laden condition. Accommodation complied with the latest IMO noise reduction regulation makes a contribution to improve comfortable working and living environment for officers/crews in the vessel.

PRINCIPAL PARTICULARS

Length (o.a.)	229.00 m	Deadweight	81,800 MT
Breadth (mld.)	32.24 m	Main engine	WIN GD 6X52
Depth (mld.)	20.15 m	Speed (service)	abt. 14.2 knots
Draft (mld.)	14.57 m	Classification	NK
Gross tonnage	43,509	Loading capacity (grain)	97,034 m^3
		Builder	Sanoyas Shipbuilding Corporation



THERESA GRACE 64,000 DWT Bulk Carrier 65

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THERESA GRACE 64,000 DWT Bulk Carrier 65

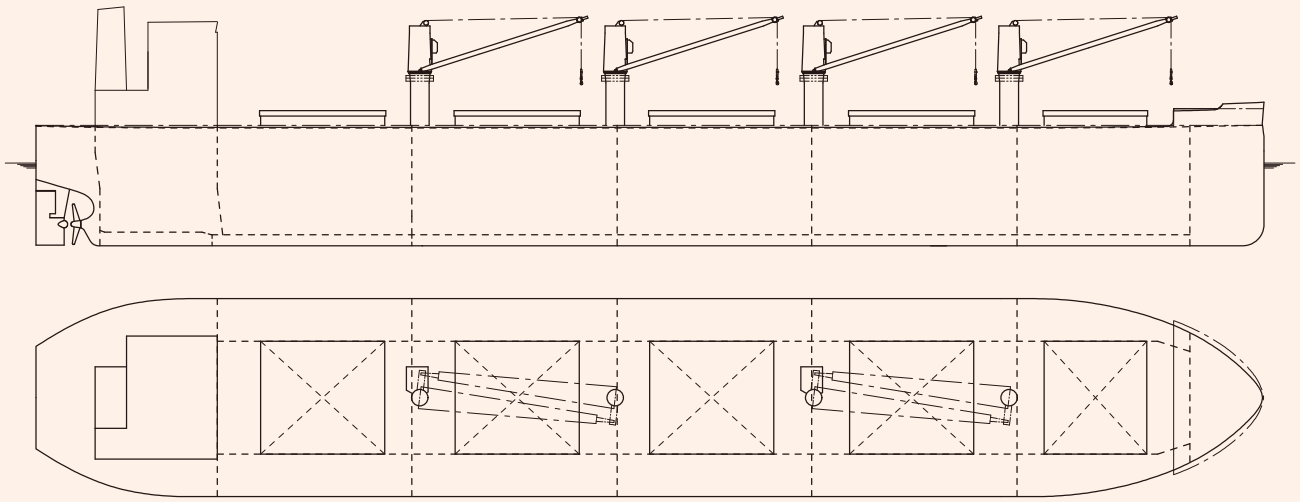
Sanoyas Shipbuilding Corporation delivered the 63,916-DWT bulk Carrier "THERESA GRACE" in October 2019.

Features

1. The vessel achieves large deadweight with Panamax beam and highest fuel efficiency under the limitation of the length less than 200 m.
2. Efficient energy consumption using Sanoyas energy-saving device called "STF" (Sanoyas-Tandem-Fin（patent）; max. 6% energy saving) fixed on stern shell and highly efficient appendages on rudder, together with low-speed & long-stroke electronically controlled main engine and high-efficiency propeller, which also contribute to the reduction of CO_2 emission.
3. The vessel achieves in advance Phase Ⅱ level of EEDI (Energy Efficiency Design Index, the grams CO_2 per ton nautical mile) regulation that shall apply to ships for which the building contract is placed on or after 1st January, 2020.
4. Considering eco-friendly features, various countermeasures such as main engine complied with NOx emission Tier Ⅱ limit for the prevention of air pollution, dedicated low sulfur fuel oil tank for operation in ECA (Emission Control Area) and Ballast Water Treatment System for the protection of marine environment, are incorporated. In addition, independent holding tanks for accommodation discharges, dirty hold bilge and rainwater on upper deck are arranged.
5. The vessel has five (5) cargo holds with hatch opening which is maximized to load various cargos such as grain, ore, coal and steel products. Four (4) 36-ton deck cranes are installed for handling cargo at ports where there are not any available loading and unloading facilities.
6. For improvement of the vessel's maintenance, access trunks are arranged to make it possible to gain access from upper deck to double bottom even at laden condition.
7. SOx scrubber for main engine and main generator engines as an alternative to low sulfur fuel to be installed.

PRINCIPAL PARTICULARS

Length (o.a.)	199.99 m	Main engine	MAN B&W 6G50ME-B9.3
Breadth (mld.)	32.24 m	Speed (service)	abt. 14.5 knots
Depth (mld.)	19.22 m	Classification	NK
Draft (mld.)	13.466 m	Handling gear	36 T × 26 mR × 4 sets
Gross tonnage	35,868	Loading capacity (grain)	81,240 m^3
Deadweight	63,916 MT	Builder	Sanoyas Shipbuilding Corporation



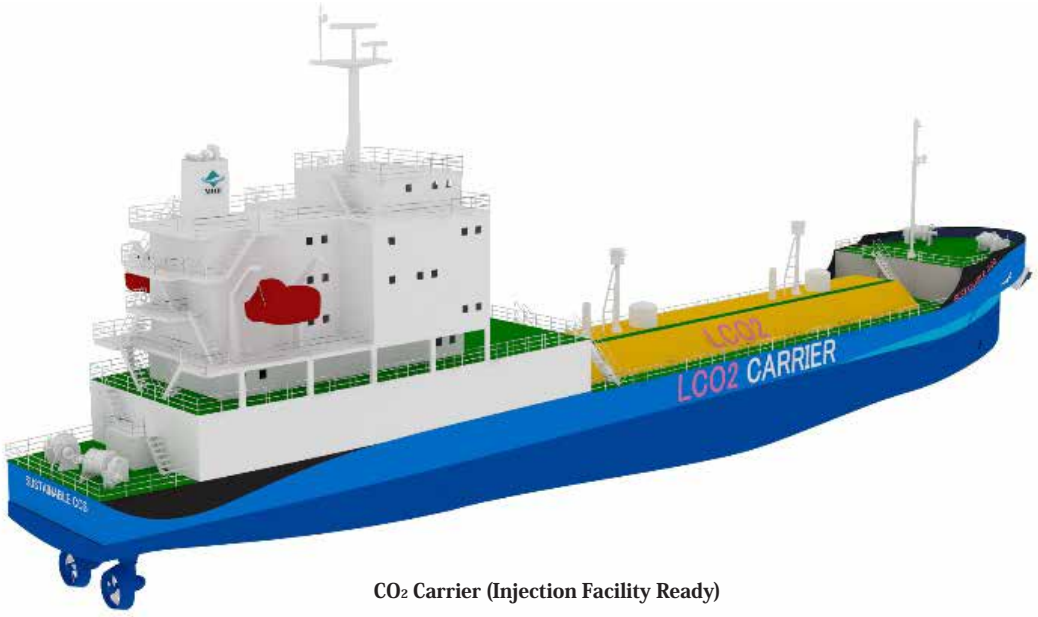
CO_2 Carrier (Injection Facility Ready) 125

Shin Kurushima Sanoyas Shipbuilding Co., Ltd. has obtained an Approval in Principle (AiP) from ClassNK for the design of "CO_2 carrier (Injection Facility Ready)" as part of "Sustainable CCS (Carbon dioxide Capture and Storage) project" by the Ministry of the Environment, Government of Japan. This project is in the background of reducing Greenhouse Gas, and it is for technical study and verification of CCS which separates and captures CO_2 in exhaust gas from thermal power plants and stores it underground. The company has developed the CO_2 carrier, under the commissioned of Uyeno Transtech, a member of the demonstration project consortium, and also carried out the risk assessment (HAZID : Hazard Identification Study) of "CO_2 carrier (Injection Facility Ready)" in anticipation of future conversion to CO_2 carrier with injection system, which led to obtainment of the AiP.

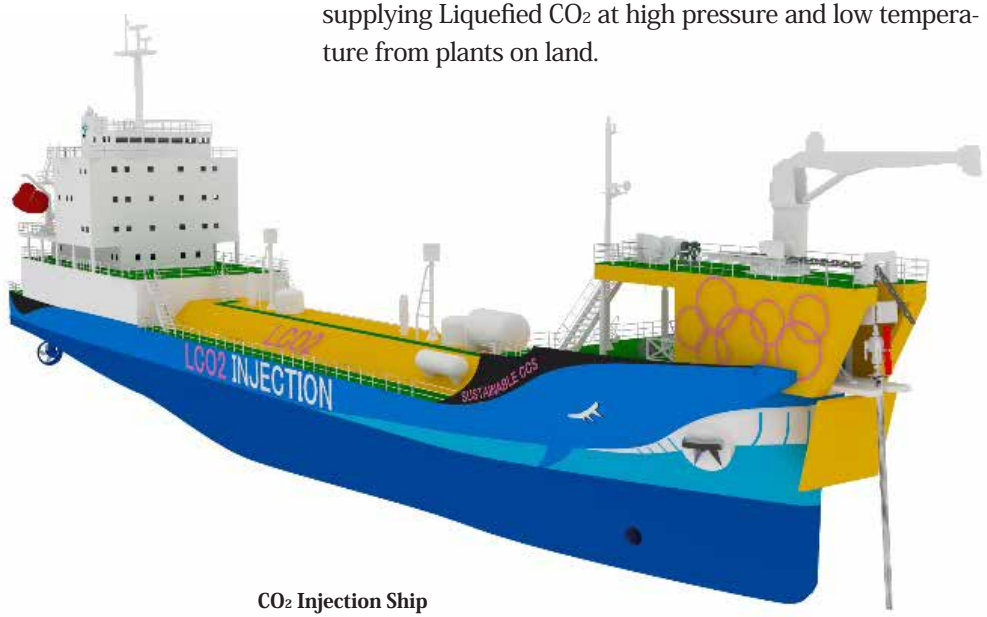
This ship design has been developed to enable CO_2 transportation, and also future conversion to injection operation. The space for the injection system including the fitting facility to an offshore storage site has been secured in front of the CO_2 cargo tank as shown in right figure.

This ship has two-axis azimuth propulsion system and buttock flow stern hull form to reduce hull resistance. As a result, it satisfies the position keeping performance required for CO_2 injection operations on the ocean, and also ensures propulsion performance suitable for ocean voyages.

Liquefied CO_2 requires high pressure and low temperature to maintain its liquefied state, which is a strict requirement for the design and manufacture of CO_2 cargo tanks. However, based on our accumulated LPG cargo tank design and manufacturing technologies, the company have developed a new TYPE-C tank suitable for receiving, transporting, and supplying Liquefied CO_2 at high pressure and low temperature from plants on land.



CO_2 Carrier (Injection Facility Ready)



CO_2 Injection Ship