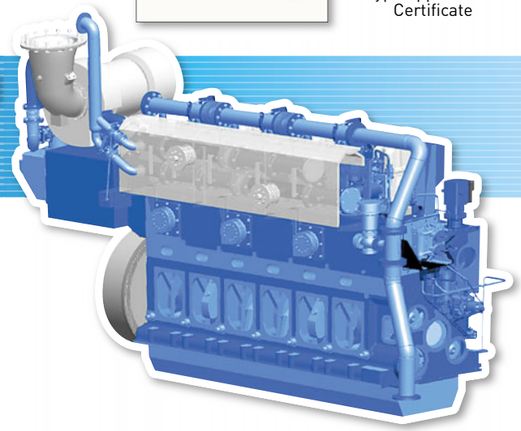
Dual Fuel Engine
DE28DF/DE35DF

To further reduce environmental impact, Daihatsu Diesel develops dual-fuel engines that use liquid fuel or gas fuel. By utilizing diesel engine design concepts and combustion technology, we have successfully reduced NOx emissions by 80% when gas fuel is used.



Type Approval Certificate



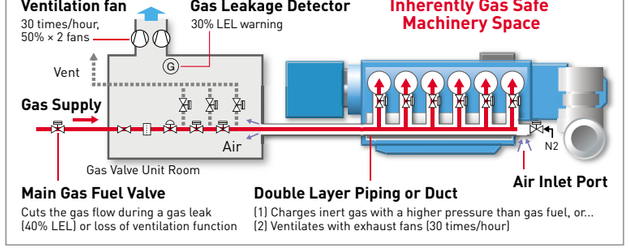
1. Complies with IMO NOx Tier III emissions regulations (when operating on gas fuel)

2. Can use liquid fuel or gas fuel, in consideration of fuel prices and procurement ease

3. Offers high fuel efficiency thanks to lean combustion technology and optimized valve timing

This research has been carried out with the support of NK (In joint research projects based on requests from the maritime industry).

■ Gas Piping



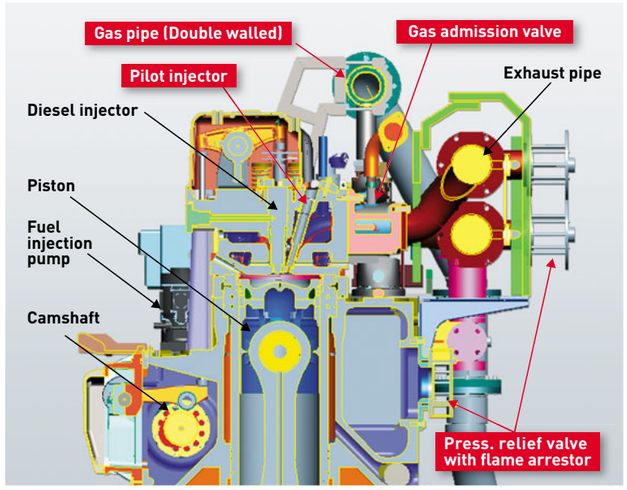
Main Gas Fuel Valve
Cuts the gas flow during a gas leak (40% LEL) or loss of ventilation function

Double Layer Piping or Duct
(1) Charges inert gas with a higher pressure than gas fuel, or...
(2) Ventilates with exhaust fans (30 times/hour)

■ Principal Particulars

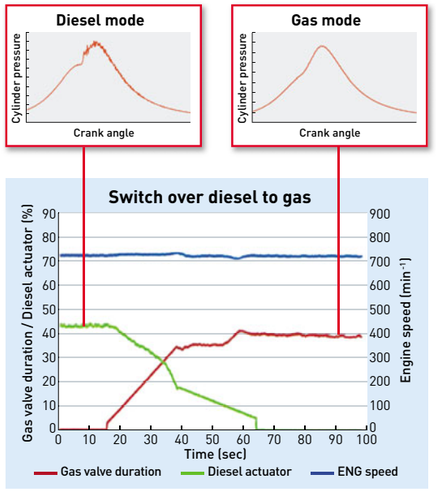
Engine model			6DE28DF	8DE28DF	6DE35DF	8DE35DF
Bore × Stroke		mm	φ280×390		φ350×440	
No. of cylinders			6	8	6	8
Engine speed		min⁻¹	720/750			
Engine output		kWm	1,730	2,300	3,060	4,080
NOx emission	Gas		Tier Ⅲ			
	Oil		Tier Ⅱ			
Fuel			Natural gas, MDO, HFO			

■ Also retrofit compatible (main added and revised parts)



* ■ indicates added parts, and others indicate revised parts for a previous diesel engine.

■ Automatic switching possible for smooth running modes



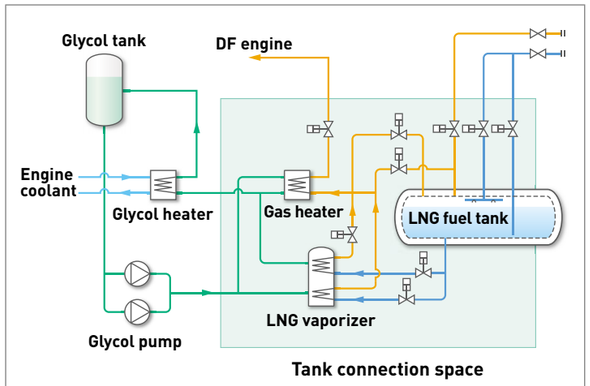
LNG Fuel Tank & Fuel Gas Supply System

Joint Developer:
Izumi Steel Works, Ltd.

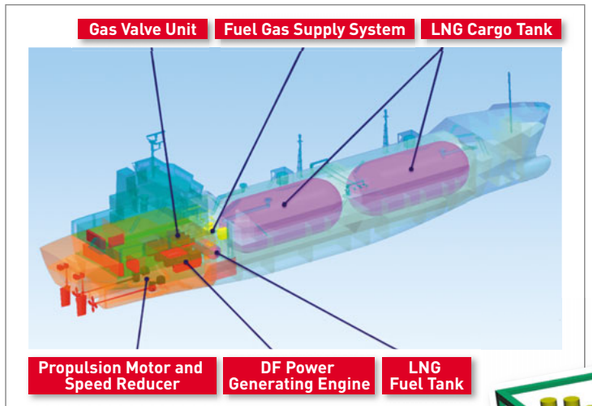
This R&D topic was selected for the "Next-Generation Marine Environmental Technologies Development Support Project" of Ministry of Land, Infrastructure, Transport and Tourism, and as a joint research theme for the Nippon Kaiji Kyokai (ClassNK).



In Compliance with the IGF Code for LNG Tank and Fuel Gas Supply System for Gas Fuel Vessels

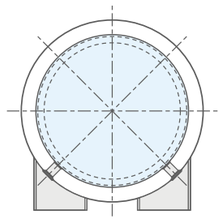


■ Application Example



LNG fuel tank

- Vacuum double shell/pressure resistant structure with -163ºC/10 bar resistance
- Outer shell/inner shell construction
- Intermediate layer charged with pearlite and air extracted (vacuum)
- Low-level boil-off rate



Gasification system

- Copes with changes in load, liquid level, and LNG characteristics

■ Specifications

Tank Shape	Cylindrical double-shell horizontal storage tank with semi-elliptic panel
Tank Capacity	27m³
Tank Dimensions (Outer Tank)	Outer diameter approx. 3.2 m × Total length approx. 6.1 m
Design Pressure	1.0MPa
Design Temperature	−196～＋40℃
Tank Material	SUS304
Heat-Resistant System	Pearlite

* The internal pressure of the LNG tank is increased to a constant 0.5-0.6 MPa, and gas is supplied to the engine with that pressure.
* Tank usage range: Approx. 22 m³ (10-90% level of 27 m³)
  22 m³ enables 38 hours under a 100% load, and 50 hours under a 75% load, when operated by a DE28DF (rating: 1730 kW)

