



DNV

TYPE APPROVAL CERTIFICATE

Certificate No:
TAM00001C8

This is to certify:

That the Dual Fuel Engine

with type designation
DE23DF

Issued to

Daihatsu Diesel Mfg. Co. Ltd Moriyama Division
Shiga Pref. Moriyama, Japan

is found to comply with

DNV Rules for classification, Ships - DNV-RU-SHIP-Pt4 Ch3 Sec1, Reciprocating Internal Combustion Engines

Application :

Auxiliary

Issued at **Høvik** on **8th December, 2023**

This Certificate is valid until **7th December, 2028**.

DNV local station: **Kobe**

for **DNV**

Approval Engineer: **Tage Olav Alexander Strøm**

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Olaf Drews
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

Product description

Four stroke, in-line engine, non-reversible, trunk-piston, with supercharging, with charge air cooling, pulsating pressure charging system, direct injection, injection operation by cams, injection operation electronically controlled, valve operation by cams, dual fuel

Cylinder bore [mm]	230
Piston stroke [mm]	320
No. of cylinders	6

Application/Limitation

Rated power [kW/cyl.]	200
Rated speed [rpm]	900
Mean effective pressure [bar]	20.1
Max. firing pressure [bar]	175

Type Approval documentation

Tests carried out

Documentation:

Test report title	Report of Type Approval Testing	Integration Test Procedure & Result
Place of test	Moriyama, Japan	Moriyama, Japan
Date of test	2021-12-15 until 2021-12-17	2022-06-01

Test engine:

Model	DE23DF	No. of cylinders: 6	Serial no.: DET623F0001
Power [kW]	1200 @900rpm		

Marking of product

The product to be marked with manufacturer's name or trademark and type number identification.

Periodical assessment

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

In case where the Type Approved product is manufactured at other companies, the Periodical Assessment shall verify that the Type Approval applicant has a quality control system for consistent production at their licensees/subcontractors. Furthermore Periodical Assessment shall be carried out randomly at these companies.

Other Conditions

The engine type is approved for use in both gas safe and emergency shutdown protected (ESD) machinery spaces as specified in the Rules, Pt.6 Ch.2 Sec.5 [3.2.2] - ESD protected machinery spaces and [3.2.3] - Gas safe machinery spaces.

Flexible hoses with couplings to be type approved by DNV.

Engine safety, control and monitoring systems, including sensors and actuators are not covered by this type approval certificate. Documentation for engine safety, control including speed governing and monitoring systems shall be submitted for approval according to the rules Pt.4 Ch.9 Sec.1 Table 5 - Documentation requirements.

The explosion protection of the gas admission valves does not comply with the hazardous area zone definition of the IGF Code, paragraph 12.5.1 and -2. For installation of engines on ships subject to that Code, proof of suitability for the intended use, either by (a) explosion protection certification, or (b) any other suitable measures in addition to the existing explosion protection level of the valve, shall be documented in the safety concept and approved accordingly. Additional measures (b) are subject to final acceptance by the relevant flag state administration for ships subject to the IGF Code.

Electric cables and cabling are not covered by this approval and must be verified to comply to the rules Pt.4 Ch.8 - Electrical Installation.

END OF CERTIFICATE