DNV·GL

Certificate No:
TAM000009N

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Dual Fuel Engine

with type designations(s)
M34DF

Issued to
Caterpillar Motoren GmbH & Co. KG
Kiel, Germany

is found to comply with
DNV GL Rules for classification, Ships - DNVGL-RU-SHIP Pt.4 Ch.3 Sec.1, Reciprocating Internal Combustion Engines

Application:

electrical propulsion, multi engine plant / auxiliary

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL

This Certificate is valid until **23rd June, 2021**
Issued at **Hamburg** on **24th June, 2016**

DNV GL local station: Hamburg

for **DNV GL**

Approval Engineer: Jan Sell

Frank Lutz
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.

Product description

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

Cylinder bore: 340 mm
Piston stroke: 460 mm

Additional place of production

Caterpillar Motoren Rostock GmbH, Rostock, Germany

Application / Limitation

Rated power [kW/cyl.]	500
Rated speed [rpm]	720
Mean effective pressure [bar]	19.95
Max. firing pressure [bar]	
Definition	

Type Approval documentation

14-022625, 14-027307, 14-033847, 15-073472, 16-000981, 16-004248, 262.1-017325-1

Tests carried out

Documentation:

Test report titel	M34DF Inline Engine Type Approval Test
Test report reference	262.1-017325-1, 2016-06-22
Place of test	Kiel
Date of test	2016-02-22 until 2016-02-24

Test engine:

Model	6M34DF
Serial no.	89001
No. of cylinders	6
Power [kW/cyl.]	500
Speed [rpm]	720

Marking of product

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

Periodical assessment

For retention of the Type Approval, DNV GL shall perform a Periodical Assessment every second year and before the expiry date of this certificate.

The objective of the Periodical Assessment is to verify that the conditions for the Type Approval are not altered since the Type Approval certificate was issued.

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

1. For installation, operation, and service of the engine, the relevant instructions of the engine manufacturer are to be observed (e.g. regarding load acceptance capability, piping connections to ship's systems, control & monitoring input and output interfaces, etc.).
2. Engine complies with "gas safe machinery space" configuration; DNV GL Rules Pt.6 Ch.2 Sec.5.
3. At type approval test of the engine, the following electronic systems/components for engine control were used and tested during integration test: Caterpillar MACS and Caterpillar ADEM V A5E4v2 However, 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 DNV GL Rules Pt.4 Ch.9 Sec.1 Table 5 and/or as listed in relevant Type Approval certificates.
4. Electric cables and cabling are not covered by this Type Approval certificate and shall be verified to comply with DNV GL Rules Pt.4 Ch.8.
5. Individual product certification is required for each engine; DNV GL Rules Pt.4 Ch.3 Sec.1 [1.1.14].
6. Gas Valve Unit is not covered by this Type Approval certificate.
7. For 9-cylinder version equipped with wet oil pan, 10 crankcase explosion relief valves with free relief area of 143 cm^2 each shall be installed as long as no other approval is available.
8. Pressure gauges shall be installed with isolating valves; DNV GL Rules Pt.4 Ch.1 Sec.3 [1.1.4].

END OF CERTIFICATE