DNV·GL

Certificate No:
TAM00000AY

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Diesel Engine

with type designations(s)
G60ME-C

Issued to
MAN Diesel & Turbo
2450 Copenhagen, Denmark

is found to comply with
DNV GL Rules for classification, Ships - DNVGL-RU-SHIP-Pt4Ch3Sec1, Reciprocating Internal Combustion Engines

Application:

propulsion

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

This Certificate is valid until **29th May, 2018**
Issued at **Høvik** on **16th August, 2016**

DNV GL local station: Copenhagen

for **DNV GL**

Approval Engineer: Amir Dzaferi

Oddvar Deinboll
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

two stroke, in-line engine, reversible, crosshead, with supercharging, with charge air cooling, constant-pressure charging system, direct injection, injection operation electronically controlled, valve operation electronically controlled, liquid fuel

Cylinder bore: 600 mm
Piston stroke: 2790 mm

Additional place of production

not applicable

Application / Limitation

Rated power [kW/cyl.]	2680
Rated speed [rpm]	97
Mean effective pressure [bar]	21
Max. firing pressure [bar]	185
Definition	Mk9

Type Approval documentation

13-010095, 262.1-015120-3

Tests carried out

Documentation:

Test report titel	Type Approval Test of engine Type MAN B&W G60
Test report reference	13-048251, 2013-05-08
Place of test	Korea, Ulsan, Hyundai
Date of test	2013-04-12 until 2013-04-14

Test engine:

Model	MAN B&W 6G60ME-C9.2
Serial no.	AA5152
No. of cylinders	6
Power [kW/cyl.]	2680
Speed [rpm]	97

Marking of product

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

Periodical assessment

Meetings on regularly basis and at least every second year with the Type Approval applicant (hereof: the Engine Designer) shall be arranged with the objective to verify that the conditions for the Type Approval are not altered since the Type Approval Certificate was issued, and to keep DNV GL updated with regard to:

- The latest development status and design as covered by the Type Approval certificate.
- Damages and failures of products certified by DNV GL leading to break down or other malfunctions in service. The causes and reasons for the failure and results from investigations are to be made available to DNV GL upon request. Failure to inform DNV GL may lead to suspension of this Type Approval certificate.

In cases where the Type Approved design is manufactured at other companies, DNV GL shall verify that the Type Approval applicant has a quality control system for consistent production at their licensees/subcontractors.

Other conditions

This Type Approval covers the mechanical parts of the G60ME-C engine type.

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 resquirements" and/or as listed in relevant Type Approval certificates.

Electric wiring, instrumentation and automation are not included in this Type Approval.

Torsional vibration calculations to be submitted for each installation according to the Rules Pt.4 Ch.2 Sec.2 - "Torsional vibrations". Torsional vibration dampers shall be approved by DNV GL.

Signboards to be according to the Rules Pt.4 Ch.3 Sec.1 [2.3.6] - "Warning notice".

Flexible hoses for flammable fluids to be type approved by DNV GL.

Oil fuel lines, lubrication oil lines and lines for other flammable oils are to be screened or otherwise suitable protected to avoid as far as practicable oil spray or oil leakages onto hot surfaces, into machinery air intakes, or other sources of ignition. Reference to the Rules Pt.4 Ch.3 Sec.[2.6.2] - "Screening".

Type Approval Certificate for the G60ME-C engine may upon request be issued to engine manufacturers upon approval of documentation, submitted as required by the Rules. Reference to the Rules Pt.4 Ch.3 Sec.1 [1.2] - "Documentation of the engine".

END OF CERTIFICATE