TYPE APPROVAL CERTIFICATE

Certificate No:
TAM00000E3

This is to certify:

That the Dual Fuel Engine

with type designation(s)
L51/60 DF

Issued to
MAN Diesel & Turbo SE
Augsburg, Germany

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

Application :

propulsion / auxiliary

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

This Certificate is valid until **31st August, 2019**.

Issued at **Hamburg** on **1st September, 2017**
DNV GL local station: **Augsburg** for **DNV GL**

Approval Engineer: **Ralph Michael**

Burkhard Lilienthal
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.

Job Id: **262.1-003218-6**
Certificate No: **TAM00000E3**

Product description
four stroke, in-line engine, non-reversible, trunk-piston, with supercharging, with charge air cooling, constant-pressure charging system, valve operation by cams, dual fuel

Cylinder bore	[mm]	:	510
Piston stroke	[mm]	:	600
No. of cylinders		:	6, 7, 8, 9

Additional place of production
not applicable

Application/Limitation

Rated power [kW/cyl.]	1000	975
Rated speed [rpm]	514	500
Mean effective pressure [bar]	19.05	19.09
Definition	cont.	cont.

Type Approval documentation

Tests carried out

Documentation:		
Test report titel	L51/60 DF Type Approval Test + Fuel sharing mode	
Place of test	Augsburg	
Date of test	2012-03-29 until 2012-03-30	
Test engine:		
Model	7L 51/60 DF, 9L 51/60 DF	
Serial no.	1 130 300, 1 140 014	
No. of cylinders	7, 9	
Power [kW/cyl.]	1000	975
Speed [rpm]	514	500

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.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
Engine safety, control and monitoring systems, including sensors, cables 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 Rule Pt.4 Ch.9 Sec.1

The explosion protection of the gas admission valves is not in compliance with the hazardous area zone definition of the IGF Code, paragraph 12.5.1 and -2. However, the applied measures, documented in the existing safety concept, in addition to the existing explosion protection level of the valve are suitable for the intended use. Final acceptance shall be confirmed by the relevant flag state administration for ships subject to the IGF Code.

END OF CERTIFICATE