

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Dual Fuel Enginewith type designations(s)
6 / 8 / 9 L20DF

Issued to

Wärtsilä Finland Oy
Vaasa, Finland

is found to comply with

DNV GL Rules for classification, Ships - DNVGL-RU-SHIP-Pt4 Ch3 Sec1, 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 December, 2021**Issued at **Høvik** on **17th November, 2016**DNV GL local station: **Turku**for **DNV GL**Approval Engineer: **Dag Harald Williksen**

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.

Job Id: **262.1-010990-4**
Certificate No: **TAM00000BY**

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, valve operation by cams, dual fuel

Cylinder bore: 200 mm
Piston stroke: 280 mm

Additional place of production

not applicable

Application / Limitation

Rated power [kW/cyl.]	160	185
Rated speed [rpm]	1000	1200
Mean effective pressure [bar]	21.8	21
Max. firing pressure [bar]	200	200
Definition		

Type Approval documentation

11-032540, 11-071282, 11-123439, 12-096551, 12-142944, 13-014790, 262.1-010990-2, 262.1-010990-4

Tests carried out

Documentation:

Test report titel	Test Programme for Wärtsilä 9L20DFB
Test report reference	, 2015-02-24
Place of test	Test bed No. 23 of Wärtsilä Finland Oy, Vaasa
Date of test	2014-09-30 until 2014-09-03

Test engine:

Model	Wärtsilä 9L20DFB
Serial no.	PAAE259029
No. of cylinders	9
Power [kW/cyl.]	185
Speed [rpm]	1200

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.



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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.

Foundation arrangement to be submitted for each installation according to the Rules, Pt.4 Ch.3 Sec.1 [1.4] – Documentation of arrangement.

Torsional vibration calculations to be submitted for each installation according to the Rules Pt.4 Ch.2 Sec.2 – Torsional Vibration.

Signboards according to the Rules Pt.4 Ch.3 Sec.1 [2.3.6] – Warning Notice.

Flexible hoses to be Type Approved by DNV GL.

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 Pt.4 Ch.9 Sec.1 Table 5 and/or as listed in relevant type approval certificates.

Electric cables and cabling is not covered by this approval and must be verified to comply with the requirement of the Rules Pt.4 Ch.8 - Electrical Installation.

END OF CERTIFICATE