Certificate no.:
TAM00001DN

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Dual-Fuel Engine (LFL)

with type designation(s)
DZD-MeOH

issued to
Anglo Belgian Corporation NV
Gent, Oost-Vlaanderen, **Belgium**

is found to comply with
DNV rules for classification – Ships Pt.4 Ch.3 Sec.1 Reciprocating internal combustion engines

Application:

Propulsion (multi engine plant), Auxiliary

Issued at **Hamburg** on **2024-10-24**
This Certificate is valid until **2029-10-23**.
DNV local unit: **Belgium CMC, Antwerpen**

Approval Engineer: **Jan Sell**

for **DNV**

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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 USD 300 000.

Product description

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

MDO, HFO: direct injection, injection operation mechanically controlled

Methanol: cylinder-individual injection before compression stroke (port injection), methanol admission valve operation electronically controlled, ignition system mechanically controlled (main fuel oil injection system)

Cylinder bore [mm]	256
Piston stroke [mm]	310
No. of cylinders	6, 8

Application/Limitation

Rated power [kW/cyl.]	221
Rated speed [rpm]	1000
Mean effective pressure [bar]	16.6
Firing pressure [bar]	135

Type Approval documentation

Tests carried out

2023-09-14, Anglo Belgian Corporation NV, Gent, Initial Type Approval Test,
test engine 8DZD-1000-166-A, serial no. 14523, 221 kW/cyl. At 1000 rpm,
DNV reference 262.1-039333-1

Marking of product

The product is to be marked with the manufacturer's name or trademark, the engine model designation, the engine serial no. and the output rating (kW at rpm).

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

1. Engine safety, control and monitoring systems, including sensors and actuators, are not covered by this certificate. Documentation for engine safety, control (including speed governing), and monitoring systems shall be submitted for approval according to DNV Rules Ships Pt.4 Ch.9 Sec.1 Table 5 and/or as listed in relevant Type Approval certificates.
2. Flexible hose assemblies and expansion bellows for connection to the ship's piping systems shall comply with the requirements for type approval according to DNV Rules Ships Pt.4 Ch.3 Sec.1 [2.6.3.2].
3. The double walled expansion bellow for the connection to the ship's methanol supply system shall be type approved according to DNV Rules Ships Pt.4 Ch.3 Sec.1 [10.2.8.6]. Case by case approval for each installation may be accepted as an alternative.