



Certificate No. 02-002689/024446

TYPE APPROVAL CERTIFICATE

This is to certify that this product, on the basis of the Rules for the classification of ships, Part 1 - General requirements, Chapter 3 - Type approval of products.

TYPE AND DESCRIPTION OF PRODUCT:

**DIESEL ENGINE,
type S60ME-C10, stroke 2400 mm**

MANUFACTURER:

**MAN Energy Solutions
Teglholmsgade 41
2450 Copenhagen SV
Denmark**

THE PRODUCT MEETS FOLLOWING RULES/REGULATIONS:

Rules for the Classification of Ships, Part 9-Machines

FURTHER DETAILS OF THE PRODUCT AND CONDITIONS FOR CERTIFICATION ARE GIVEN OVERLEAF.

APPROVAL IS VALID UNTIL: 2023-04-19

Place and date: Split, 2019-04-19

Seal

Marinko Popović, dipl.ing.

NOTE: This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Croatian Register of Shipping of any modification or changes to the product in order to obtain a valid certificate.

DETAILED PRODUCT DESCRIPTION:

| | |
|-------------------------------|---|
| <i>Number of cylinders:</i> | 5, 6, 7, 8 |
| <i>Cylinder bore (mm):</i> | 600 |
| <i>Stroke (mm):</i> | 2400 |
| <i>Mechanical design:</i> | 2- stroke, in-line cylinder arrangement, with cross-head |
| <i>Turbocharging system:</i> | Constant pressure, single-stage, with charge air cooling |
| <i>Valve operation:</i> | Electronic control |
| <i>Kind of fuel:</i> | Liquid |
| <i>Fuel injection:</i> | Direct, electronically controlled |
| <i>Fuel injection system:</i> | Pump+Pipe+Injector |

APPLICATION / LIMITATIONS:

| | |
|---------------------------------------|---|
| <i>Application:</i> | Propulsion (Single engine and Multi engine installation) |
| <i>Rated power (kW/cyl.):</i> | 1993 |
| <i>Rated speed (rpm):</i> | 98,5 |
| <i>Mean effective pressure (bar):</i> | 17,9 |
| <i>Max firing pressure (bar):</i> | 190 |

TYPE APPROVAL DOCUMENTATION:

Approved by the Croatian Register of Shipping with letter No.(dated): 2123/TSEv/KF/024446 (2018-09-12)

MARKING OF PRODUCT:

- *manufacturer's mark*
- *location and year of manufacture*
- *CRS mark*

CONDITIONS FOR CERTIFICATION:

Minimal tensile strength of crankshaft material: 610 N/mm² (S34MnV).

Torsional vibration calculation shall be submitted for each installation in accordance with the CRS Rules.

Schematic diagrams of piping systems containing data necessary for approval of the entire system are to be submitted to consideration for each particular installation.