

# TYPE APPROVAL CERTIFICATE

Certificate No:  
**TAM00000F3**

## This is to certify:

### That the Diesel Engine

with type designation(s)  
**4000 Mx3**

Issued to

**MTU Friedrichshafen GmbH**  
**88045 Friedrichshafen, Germany**

is found to comply with

**DNVGL Rules for Classification: Ships/ High Speed and Light Craft**

## Application :

propulsion, multi engine plant / auxiliary

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

This Certificate is valid until **15th February, 2022**.

Issued at **Hamburg** on **16th February, 2017**

DNV GL local station: **Augsburg**

for **DNV GL**

Approval Engineer: **Ralph Michael**

.....  
**Frank Lutz**  
**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: **262.1-024234-1**  
Certificate No: **TAM00000F3**

### Product description

four stroke, v-engine, non-reversible, trunk-piston, with supercharging, with charge air cooling, constant-pressure charging system, direct injection, injection operation electronically controlled, valve operation by cams, liquid fuel

Cylinder bore : 170  
Piston stroke : 190  
No. of cylinders : 12, 16, 20

### Additional place of production

Tognum America Inc., MTU Plant Aiken, Graniteville, SC, USA

### Application/Limitation

|                               |       |       |
|-------------------------------|-------|-------|
| Rated power [kW/cyl.]         | 215   | 195   |
| Rated speed [rpm]             | 2100  | 2100  |
| Mean effective pressure [bar] | 28.49 | 25.84 |
| Max. firing pressure [bar]    | 225   | 220   |
| Definition                    | 1DS   | cont. |

### Type Approval documentation

#### Tests carried out

Documentation:

|                   |                                                       |
|-------------------|-------------------------------------------------------|
| Test report title | Type Test MTU Diesel Engine 20V 4000 M93 (High Power) |
| Place of test     | MTU Friedrichshafen GmbH                              |
| Date of test      | 2007-11-05 until 2007-11-09                           |

Test engine:

|                  |              |
|------------------|--------------|
| Model            | 20V 4000 M93 |
| Serial no.       | 528 100719   |
| No. of cylinders | 20           |
| Power [kW/cyl.]  | 195          |
| Speed [rpm]      | 2100         |

### 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

END OF CERTIFICATE