DNV·GL

Certificate No:
TAM0000153

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Turbocharger

with type designation(s)
METxxSD

Issued to
Mitsubishi Heavy Industries Marine Machinery & Equipment Co., Ltd.
Nagasaki City, Nagasaki Pref., Japan

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

Application :

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

Issued at **Høvik** on **2020-04-03**
This Certificate is valid until **2024-11-11**.
DNV GL local station: **Kobe**

for **DNV GL**

Approval Engineer: **Tage Olav Alexander Strøm**

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.

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Product description

Exhaust driven turbochargers served by cylinder groups with combined power in the range from 1300 kW up to 19000 kW

Application/Limitation

Type	MET33SD		MET42SD	
Impeller type	2	3	2	3
Impeller tip dia. [mm]		373		462
Max rated speed (RPM)	25400	24000	20600	19400
Max temperature (^{0}C)	580		580	

Type	MET53SD		MET66SD	
Impeller size	2	3	2	3
Impeller tip dia. [mm]		586		730
Max rated speed (RPM)	16700	15700	13400	12600
Max temperature (^{0}C)	580		580	

Type	MET83SD	
Impeller size	2	3
Impeller tip dia. [mm]		924
Max rated speed (RPM)	10500	10000
Max temperature (^{0}C)	580	

Maximum momentary speed is 110% of maximum rated speed.

ALARM LEVELS:
Overspeed, maximum alarm level: 105% of maximum rated speed

High exhaust temperature at turbine entry, maximum alarm level: 550 ºC.

Low lubrication oil pressure at turbocharger inlet, minimum alarm level: 0.6 bar (gauge pressure)

Maximum lubrication oil outlet temperature (alarm level): 85 ºC
Application constraints:

Maximum allowed inclinations for MET turbochargers:
Static: ± 15º
Dynamic (momentary): ± 22.5º

Engine induced vibrations to be within the specified limits given in instruction manuals for MET turbochargers.

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, a DNV GL surveyor shall perform an assessment after 2 years and after 3.5 years, both referring to the issue date of the type approval certificate to verify that the conditions of the type approval are complied with. A renewal assessment will be performed at renewal of the certificate.

In cases 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.

END OF CERTIFICATE