APPROVAL OF MANUFACTURER CERTIFICATE

Certificate No:
AMMM000015N
Revision No:
4

This is to certify:

That

MAN Energy Solutions SE
Stadtbachstraße 1, 86153 Augsburg,
Germany

is an approved manufacturer of
Iron Castings

in accordance with
DNV rules for classification – Ships
DNV class programme – DNV-CP-0249 Iron castings

and the following particulars:

Iron type	**Grey cast iron, Nodular cast iron**
Casting method	**Sand casting**
Max. weight	**See page 2**
Heat treatment condition	**See page 2**
Additional approval conditions	**See page 2**

Manufacturer(s) approved by this certificate is/are accepted to deliver according to DNV GL, DNV and GL rules. Materials to be applied to DNV classed object shall fulfill the material requirements in the applicable DNV class rules.

Issued at **Hamburg** on **2024-11-07**

This Certificate is valid until **2027-11-06**.
DNV local unit: **Augsburg**

Approval Engineer: **Andreas Koch**

for **DNV**

This document has been digitally signed and will therefore not have handwritten signature

Christian Wildhagen

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 300,000 USD.

Particulars of the approval

Cast iron:

Grade	Casting method [1]	Max. weight [kg]	Heat treatment condition [2]
Nodular cast iron acc. DNV Rules for Ships, Pt.2, Ch.2, Sec. 9			
NV NCI-2, NV NCI370, NV NCI400, NV NCI500-7, NV NCI600-3, NV NCI700, NV NCI800	SC	120 000	AC/F
Nodular cast iron acc. EN 1563			
EN-GJS-400-18-LT, EN-GJS-400-18-RT, EN-GJS-350-22, EN-GJS-400-18, EN-GJS-400-15, EN-GJS-450-10, EN-GJS-500-7, EN-GJS-600-3, EN-GJS-700-2 EN-GJS-800-2	SC	120 000	AC/F
Nodular cast iron acc. to MAN B&W Material Sheet AN 500 [3]			
GGG-SiMo3.08	SC	4 000	F
GGG-SiMo4.05	SC	4 000	F
Grey cast iron acc. EN 1561			
EN-GJL-200, EN-GJL-250, EN-GJL-300, EN-GJL-350	SC	120 000	AC

Remarks:

1) SC: Sand casting
2) AC: As cast
   F: Ferritizing
3) Possible application and certification of any material to classed object is subject to “case by case” approval

Special conditions:

Subject to case-by-case approval, production welding permitted according WPS approved by DNV.

- WPQR PEQAM 19 / 3892 date 2019-12-17
- WPQR PEQAM 21 / 1031 date 2022-06-01
- QM_02185 date 2002-07-24
- QM_02359 date 2002-11-27 / QM_04026 date 2004-02-04

Prior to any welding DNV is to be informed about type and location of welding. The requirements as stated in DNV-RU-SHIP Pt.2 Ch.2 Section 9 shall be complied with.