



APPROVAL OF MANUFACTURER CERTIFICATE

Certificate No:
AMMM00002M3
Revision No:
1

This is to certify:

That

Otto Piening Schiffspropeller und Wellenanlagen GmbH
Am Altendeich 83, 25348 Blomesche Wildnis,
Germany

is an approved manufacturer of
Copper Alloy Castings

in accordance with
DNV rules for classification – Ships

and the following particulars:

Application area	Castings for propellers
Alloy type	Mn-Ni-bronze (NV Cu2), Ni-Al-bronze (NV Cu3), Mn-Al-bronze (NV Cu4)
Manufacturing method	Sand casting
Max. weight	4 000 kg
Heat treatment condition	As cast
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 **2022-10-12**

for **DNV**

This Certificate is valid until **2025-10-09**.

DNV local station: **Hamburg – CMC North/East**

Approval Engineer: **Enno Brück**

Thorsten Lohmann
Head of Section

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

Castings for propellers

Alloy type	Grade	Casting method ¹⁾	Max. weight [kg]	Max. diameter [mm]	Heat treatment condition ²⁾
Mn-Ni-bronze	NV Cu2	SC	4 000	3 500	AC
Ni-Al-bronze	NV Cu3	SC	4 000	3 500	AC
Mn-Al-bronze	NV Cu4	SC	4 000	3 500	AC

Remarks:

- ¹⁾ SC: Sand Casting
- ²⁾ AC: As cast

Special conditions:

Repair welding is in general permitted in accordance with welding procedures approved by DNV and according DNV welding workshop approval.

The requirements for repair welding as stated in DNV-RU-SHIP Pt.2 Ch.2 Section 11 shall be complied with; propeller weld repairs in zone A and zone B require the approval of the Society before the repair is commenced.

Permission for transfer of stamping of metallic materials during production granted, see MSARC0000B8T.