



APPROVAL OF MANUFACTURER CERTIFICATE

Certificate no.:
AMMM00002M3
Revision No:
2

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
DNV class programme – DNV-CP-0251 Copper alloy castings

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 **2026-01-12**

This Certificate is valid until **2028-10-09**.

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

Approval Engineer: **Christian Wildhagen**



for **DNV**

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

Stefan Röhr

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 USD 300 000.

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 to 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.