

# APPROVAL OF MANUFACTURER CERTIFICATE

**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 GL rules for classification – Ships**

and the following particulars:

<b>Application area</b>	<b>Castings for propellers</b>
<b>Alloy type</b>	<b>Ni-Mn-bronze (VL Cu2), Ni-Al-bronze (VL Cu3), Mn-Al-bronze (VL Cu4)</b>
<b>Manufacturing method</b>	<b>Sand casting</b>
<b>Max. weight</b>	<b>4 000 kg</b>
<b>Heat treatment condition</b>	<b>As cast</b>
<b>Additional approval conditions</b>	<b>See page 2</b>

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 GL classed object shall fulfill the material requirements in the applicable DNV GL class rules.

Issued at **Hamburg** on **2019-10-10**

for **DNV GL**

This Certificate is valid until **2022-10-09**.

DNV GL local station: **Hamburg CMC**

Approval Engineer: **Christian Wildhagen**

**Thorsten Lohmann**  
**Head of Section**



Job Id: **263.11-009617-1**  
Certificate No: **AMMM00002M3**

## Particulars of the approval

### Castings for propellers

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

#### Remarks:

- <sup>1)</sup> SC: Sand Casting
- <sup>2)</sup> AC: As cast

#### Special conditions:

Repair welding is in general permitted in accordance with welding procedures approved by DNV GL and according welding workshop approval WWA00001C6.

The requirements for repair welding as stated in DNVGL- 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.