

APPROVAL OF MANUFACTURER CERTIFICATE

This is to certify:

That

**Westley Group - Spunalloys Ltd,
Doulton Road, Cradley Heath West Midlands B64 5QN, United Kingdom**

is an approved manufacturer of
Copper Alloy Castings

in accordance with
DNV GL rules for classification – Ships

and the following particulars:

Application area	Propellers and propeller parts such as blades and bosses made of cast copper alloys
Alloy type	Mn-bronze (Cu1), Ni-Mn-bronze (Cu2), Ni-Al-bronze (Cu3), Mn-Al-bronze (Cu4)
Casting method	Sand casting / centrifugal casting
Max. weight	See page 2
Max. diameter	See page 2
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 GL classed object shall fulfill the material requirements in the applicable DNV GL class rules.

Issued at **Hamburg** on **2018-03-06**

for **DNV GL**

This Certificate is valid until **2020-11-30**.

DNV GL local station: **Sheffield**

Approval Engineer: **Enno Brück**

Thorsten Lohmann
Head of Section



Job Id: **263.11-008597-1**
Certificate No: **AMMM00001ZG**

Particulars of the approval

Alloy type	Grade	Casting method ¹⁾	Max. weight [kg]	Max. diameter [mm]	Heat treatment condition²⁾
Mn-bronze	VL Cu1	SC/CC	10 000	2500	AC
Mn-Ni-bronze	VL Cu2	SC/CC	10 000	2500	AC
Ni-Al-bronze	VL Cu3	SC/CC	10 000	2500	AC
Mn-Al-bronze	VL Cu4	SC/CC	10 000	2500	AC

Remarks:

- 1) SC: Sand Casting
CC: centrifugal casting
- 2) AC: As cast