

# APPROVAL OF MANUFACTURER CERTIFICATE

**This is to certify:**

That

**Pleiger Maschinenbau GmbH & Co. KG**  
**Im Hammertal 51, 58456 Witten,**  
**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 valves, fittings and general application</b>
<b>Alloys</b>	<b>Phosphor bronze, Leaded gunmetal, Leaded bronze, see page 2</b>
<b>Manufacturing method</b>	<b>Sand casting</b>
<b>Max. Weight</b>	<b>700 kg</b>
<b>Max. wall thickness</b>	<b>400 mm</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 **2018-08-15**

for **DNV GL**

This Certificate is valid until **2021-04-30**.

DNV GL local station: **Essen**

Approval Engineer: **Christian Wildhagen**

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



## Particulars of the approval

### Castings for valves, fittings and general application

Alloy type	Grade <sup>3)4)</sup>	Casting method <sup>1)</sup>	Max. weight [kg]	Max. section / wall thickness [mm]	Heat treatment condition <sup>2)</sup>
Phosphor bronze	CuSn10-C acc. EN 1982	SC	700	400	AC
	CuSn12-C acc. EN 1982	SC	700	400	AC
Leaded gunmetal	CuSn5Zn5Pb5-C acc. EN 1982	SC	700	400	AC
	CuSn7Zn4Pb7-C acc. EN 1982	SC	700	400	AC
Leaded bronze	CuSn10Pb10-C acc. EN 1982	SC	700	400	AC

Remarks:

- 1) SC: Sand Casting
- 2) AC: As cast
- 3) Certification of any material applied to classed object shall fulfil the applicable material requirements in the DNV GL class rules
- 4) Incl. equivalent grades in acc. to other standards