

APPROVAL OF MANUFACTURER CERTIFICATE

This is to certify:

That

**Mittelrheinische Metallgießerei
Heinrich Beyer GmbH & Co. KG
Koblenzerstraße 69
Andernach, Germany**

is an approved manufacturer of
Copper Alloy Castings

in accordance with

**GL Rules for Classification and Construction II - Materials and Welding Part 1 - Metallic
Materials**

and the following particulars:

Alloy type(s)	Phosphor Bronze Leaded Gunmetal Leaded Bronze Aluminium Bronze
Max. weight	4380 kg
Remarks	Particulars of the approval

Manufacturer(s) approved by this certificate is/are accepted to deliver according to DNV GL, DNV and GL rules.

This Certificate is valid until **2018-11-12**.

Issued at **Hamburg** on **2015-11-13**

DNV GL local station: **Essen**

Approval Engineer: **Oliver Krömer**

for **DNV GL**

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**Marcus von Busch
Head of Section**

Job Id: **263.11-005363-1**
 Certificate No: **AMMM0000071**

Particulars of the approval

Copper Alloy Castings:

Alloy Type	Product	Supply Condition	Casting Method	Thickness [mm], max.	Weight [kg], max.	O.D. [mm], max.
G-CuSn10	RO	AC	CC	79	2154	404
G-CuSn10	ST	AC	CC	457	4380	-
G-CuSn10	B	AC	ZC	-	2000	1344
G-CuSn12	RO	AC	CC	79	2154	404
G-CuSn12	ST	AC	CC	457	4380	-
G-CuSn12	B	AC	ZC	-	2000	1344
G-CuSn12Ni	RO	AC	CC	79	2154	404
G-CuSn12Ni	ST	AC	CC	457	4380	-
G-CuSn12Ni	B	AC	ZC	-	2000	1344
G-CuSn5ZnPb	RO	AC	CC	79	2154	404
G-CuSn5ZnPb	ST	AC	CC	457	4380	-
G-CuSn5ZnPb	B	AC	ZC	-	2000	1344
G-CuSn7ZnPb	RO	AC	CC	79	2154	404
G-CuSn7ZnPb	ST	AC	CC	457	4380	-
G-CuSn7ZnPb	B	AC	ZC	-	2000	1344
G-CuAl10Ni	RO	AC	CC	79	2154	404
G-CuAl10Ni	ST	AC	CC	457	4380	-
G-CuAl10Ni	B	AC	ZC	-	2000	1344
G-CuAl11Ni	RO	AC	CC	79	2154	404
G-CuAl11Ni	ST	AC	CC	457	4380	-
G-CuAl11Ni	B	AC	ZC	-	2000	1344
Copper-tin alloys acc. to EN 1982	RO	AC	CC	79	2154	404
Copper-tin alloys acc. to EN 1982	ST	AC	CC	457	4380	-
Copper-tin alloys acc. to EN 1982	B	AC	ZC	-	2000	1344
Copper-tin-lead alloys acc. to EN 1982	RO	AC	CC	79	2154	404

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Alloy Type	Product	Supply Condition	Casting Method	Thickness [mm], max.	Weight [kg], max.	O.D. [mm], max.
Copper-tin-lead alloys acc. to EN 1982	ST	AC	CC	457	4380	-
Copper-tin-lead alloys acc. to EN 1982	B	AC	ZC	-	2000	1344
Copper-aluminium alloys acc. to EN 1982	RO	AC	CC	79	2154	404
Copper-aluminium alloys acc. to EN 1982	ST	AC	CC	457	4380	-
Copper-aluminium alloys acc. to EN 1982	B	AC	ZC	-	2000	1344

RO: pipes ST: bars (round, flat, square) B: bushes AC: as cast CC: continuous casting ZC: centrifugal casting