

APPROVAL OF MANUFACTURER CERTIFICATE

Certificate No:
AMMM00000DW
Revision No:
1

This is to certify:

That
BGH Edelstahl Freital GmbH
Am Stahlwerk 1
Freital, Germany

is an approved manufacturer of
Steelmaking and Rolled Steel Products

in accordance with
DNV GL rules for classification – Ships

and the following particulars:

Product	Hot rolled steel bars Semi-finished products used for construction of (naval) vessels incl. their equipment
Grade(s)	Rolled steel for structural application Rolled steel for boilers, pressure vessels and special applications Forgings for hull structures and equipment Forgings for shafting and machinery Forgings for gearing Stainless steel forgings Special materials for naval ships
Steelmaking Deoxidation Fine grain elements Delivery conditions	Electric arc furnace and continuous / ingot casting killed acc. to standard
Max. thickness/diam.	As cast, as rolled, as forged, normalized, normalized + tempered, annealed, quenched + tempered, solution annealed + quenched, 160 mm (rolled) / 2000 mm (semi-finished)
Remarks	see 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 **2019-02-24**.

Issued at **Hamburg** on **2016-02-25**

for **DNV GL**

DNV GL local station: **Magdeburg**

Approval Engineer: **Oliver Krömer**

Thorsten Lohmann
Head of Section

Job Id: **263.11-003441-2**
 Certificate No: **AMMM00000DW**
 Revision No: **1**

Particulars of the approval

Semi-finished products:

Grade ¹⁾	Product	Supply Condition	Casting Method	Thickness/Diam. [mm], max.	Weight [kg], max.
C and C-Mn Steels	HZ	AC	CC	330	5500
C and C-Mn Steels	HZ	AC	IC	2000	42000
C and C-Mn Steels	HZ	AF ²⁾	CC, IC	900	32000
C and C-Mn Steels	HZ	AR	CC, IC	160	2000
Alloy Steels	HZ	AC	CC	330	5500
Alloy Steels	HZ	AC	IC	2000	42000
Alloy Steels	HZ	AF ²⁾	CC, IC	900	32000
Alloy Steels	HZ	AR	CC, IC	160	2000
Stainless Steels	HZ	AC	CC	330	5000
Stainless Steels	HZ	AC	IC	2000	42000
Stainless Steels	HZ	AF ²⁾	CC, IC	900	32000
Stainless Steels	HZ	AR	CC, IC	160	2000

HZ: raw ingots / blooms / semi-finished bars (rolled, forged)
 CC: continuous casting

IC: ingot casting

AC: as cast

AF: as forged

AR: as rolled

Remarks:

- Grades of non-alloy and alloy steels as well as stainless steels (austenitic, ferritic, martensitic and ferritic-austenitic (duplex) steels) cover the supply of semi-finished products for materials used for construction of vessels incl. their equipment. The final processing mill is responsible for ordering steel which complies with their approved chemical composition and enables them to achieve the required mechanical properties.
- Semi-finished steel products by forging process are produced by BGH Freital GmbH approved with certificate no. AMMM00000DX.

Job Id: **263.11-003441-2**
 Certificate No: **AMMM00000DW**
 Revision No: **1**

Rolled steel products:

Grade	Product	Supply Condition	Casting Method	Diameter [mm], max.	Length [mm], max.
Forgings for hull structures and equipment					
F400UW, F440UW, F480UW, F520UW, F560UW, F600UW	ST	N, N+T, Q+T	CC, IC	160	12000
F550AW, F600AW, F650AW	ST	Q+T	CC, IC	160	12000
Forgings for shafting and machinery					
F400U, F440U, F480U, F520U, F560U, F600U, F640U, F680U, F720U, F760U	ST	N, N+T, Q+T	CC, IC	160	12000
F600A, F700A, F800A, F900A, F1000, F1100A	ST	Q+T	CC, IC	160	12000
Stainless steels					
VL 304L, VL 316L, VL 316LN, VL 317L, VL 317LN, VL 321, VL 347 UNS S31803, UNS S32750	ST	S+Q	CC, IC	150	12000
Non-magnetizable steels					
1.3964.9 acc. to WL 19364-2	ST	S+Q	CC, IC	160	12000
1.3964 acc. to SEW 390	ST	S+Q	CC, IC	160	12000
Non-alloy structural steels acc. to EN 10025-2					
S235JR, S235J0, S235J2 S275JR, S275J0, S275J2 S355JR, S355J0, S355J2, S355K2	ST	AR, N	CC, IC	160	12000
Normalized/normalized rolled weldable fine grain structural steels acc. to EN 10025-3					
S275N, S355N S275NL, S355NL	ST	N	CC, IC	160	12000
Non-alloy steels					
C & C-Mn steels acc. to EN 10083-2	ST	N, N+T, Q+T	CC, IC	160	12000
C & C-Mn steels acc. to EN 10084	ST	N+T, Q+T	CC, IC	160	12000
Alloy steels					
Alloy steels acc. to EN 10083-3	ST	Q+T	CC, IC	160	12000
Alloy steels acc. to EN 10084	ST	Q+T	CC, IC	160	12000

Job Id: **263.11-003441-2**
 Certificate No: **AMMM00000DW**
 Revision No: **1**

Grade	Product	Supply Condition	Casting Method	Diameter [mm], max.	Length [mm], max.
Stainless steels					
Austenitic steels acc. to EN 10088-3	ST	S+Q	CC, IC	160	12000
Austenitic steels acc. to EN 10272	ST	S+Q	CC, IC	160	12000
Duplex steels acc. to EN 10088-3	ST	S+Q	CC, IC	160	12000
Duplex steels acc. to EN 10272	ST	S+Q	CC, IC	160	12000
Ferritic steels acc. to EN 10088-3	ST	A	CC, IC	160	12000
Ferritic steels acc. to EN 10272	ST	A	CC, IC	160	12000
Martensitic steels acc. to EN 10088-3	ST	Q+T	CC, IC	160	12000
Martensitic steels acc. to EN 10272	ST	Q+T	CC, IC	160	12000

ST: rolled bars AR: as rolled N: normalized N+T: normalized + tempered Q+T: quenched + tempered
 S+Q: solution annealed + quenched A: annealed CC: continuous casting IC: ingot casting