APPROVAL OF MANUFACTURER CERTIFICATE

Certificate no.:
AMMM0000147
Revision No:
5

This is to certify:

that

BGH Edelstahl Siegen GmbH
site "Eintracht",
Stumme-Loch-Weg 1–5, 57076 Siegen, Germany

is an approved manufacturer of
Steelmaking

in accordance with

DNV rules for classification – Ships
DNV rules for classification – Naval vessels
DNV class programme – DNV-CP-0242 Semi-finished steel products
DNV class programme – DNV-CP-0247 Steel forgings

and the following particulars:

Application area	**Forgings for hull structures and equipment** **Forgings for shafting and machinery** **Forgings for gearing** **Forgings for boilers, pressure vessels and piping systems** **Ferritic steel forgings for low temperature service** **Stainless steel forgings,** **Non-magnetizable steels** **Steelmaking (Semi-finished products for rolling or forging stock)**
Steel type	**Carbon and carbon-manganese, alloy,** **Stainless (ferritic, martensitic, austenitic),** **22Cr duplex, 25Cr duplex, non-magnetizable steels**
Manufacturing method	**Electric arc furnace, Ingot casting, open die forging**
Deoxidation	**Killed**
Additional approval conditions	**See page 2 ff.**

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

Issued at **Hamburg** on **2026-03-09**

This Certificate is valid until **2029-02-28**.
DNV local unit: **Essen**

Approval Engineer: **Stefan Röhr**

for **DNV**

This document has been digitally signed and will therefore not have handwritten signature
Christian Wildhagen

Particulars of the approval

Semi-finished products

Steel type	Product	Steel making [1]	Max weight [kg]	Heat treatment condition [2]
Carbon and carbon-manganese	Ingot Castings, Forged Blanks, Bars	EAF, IC	50 000	AC
Alloy [4]				
Ferritic Stainless				
Martensitic Stainless				
Austenitic Stainless				
22Cr duplex, 25Cr duplex				
Non-magnetizable steels [3]				

Forgings for hull structures and equipment

Steel type	Grade [5]	Forging method [6]	Max. weight [kg]	Heat treatment condition [2] [8]
C and C-Mn	NV F400UW, NV F440UW, NV F480UW, NV F520UW, NV F560UW, NV F600UW	OD	32 000	N, NT, QT
Alloy	NV F550AW, NV F600AW, NV F650AW	OD	32 000	QT

Forgings for shafting and machinery
Forgings for gearing

Steel type	Grade [5]	Forging method [6]	Max. weight [kg]	Heat treatment condition [2] [8]
C and C-Mn	NV F400U, NV F440U, NV F480U, NV F520U, NV F560U, NV F600U, NV F640U, NV F680U, NV F720U, NV F760U	OD	32 000	N, NT, QT
Alloy	NV F600A, NV F700A, NV F800A, NV F900A, NV F1000A, NV F1100A	OD	32 000	QT

Forgings for boilers, pressure vessels and piping systems

Steel type	Grade [5]	Forging method [6]	Max. weight [kg]	Heat treatment condition [2] [8]
C and C-Mn	NV F450H, NV F490H	OD	32 000	N, NT, QT
Alloy	NV F0.5Mo, NV F1Cr0.5Mo	OD	32 000	NT, QT
	NV F2.25Cr1Mo	OD	32 000	N, QT [6]

Ferritic steel forgings for low temperature service

Steel type	Grade [5]	Forging method [6]	Max. weight [kg]	Heat treatment condition [2] [8]
C and C-Mn	NV F450L, NV F490L	OD	32 000	N, NT, QT
Ni	NV F3.5Ni, NV F5Ni, NV F9Ni	OD	32 000	NT, QT

Stainless steel forgings

Steel type / grade [7]	Forging method [1]	Max. weight [kg]	Heat treatment condition [2] [8]
Austenitic stainless	OD	32 000	SHT
Ferritic stainless	OD	32 000	A
Martensitic stainless	OD	32 000	QT [5]
22 Cr Duplex	OD	32 000	SHT
25 Cr Duplex	OD	32 000	SHT

Non-magnetizable steel forgings

Steel type	Grade [3]	Forging method [1]	Max. weight [kg]	Heat treatment condition [2] [8]
Non-magnetizable	1.3964 acc. to SEW 390 / BWB WL 1.3964-2, -3	OD	32 000	SHT
	1.3974 acc. to SEW 390 / BWB WL 1.3974-2, -3	OD	32 000	SHT

Forgings of liquid quenched and tempered structural steels

Steel type / grade [3]	Forging method [1]	Max. weight [kg]	Heat treatment condition [2] [8]
NV-M550S 1.6780 (HY-80) acc. to MIL-S-23009C / BWB WL 1.6780-2, -3	OD	32 000	SHT
NV-M700S 1.6782 (HY-100) acc. to MIL-S-23009C / BWB WL 1.6782-2, -3	OD	32 000	SHT

Remarks:

1) EAF: Electric arc furnace; IC: Ingot casting
2) QT: Quenched and tempered; N: Normalised; NT: Normalised and tempered;
SHT: Solution Heat Treated (Solution Annealing); A: Annealed; AC: As cast
3) Grade 1.3964 acc. to SEW 390 / BWB WL 1.3964 and grade 1.3974 acc. to SEW 390 / BWB WL 1.3974
4) Including grades NV-M550S, 1.6780 (HY-80) acc. to MIL-S-23009C / BWB WL 1.6780-2, -3 and NV-M700S, 1.6782 (HY-100) acc. to MIL-S-23009C / BWB WL 1.6782-2, -3
5) Incl. equivalent grades in acc. to other standards
6) OD: Open die forging
7) Stainless steel forgings shall be in accordance with recognized standards, e.g. EN 10222, ASTM A473/A965/A1049 and JIS G 3214, provided that supplementary requirements contained herein are also met. Recognition of other standards is subject to submission to the Society for evaluation
8) Including approved Direct Quenching Process from forging heat with optional inductive heating and optional tempering qualified by BGH document “Approval Application Report Rev.2, March 2020” for steel forgings/forged steel bars up to max. weight of 8 000 kg and the following maximum heat treatment diameters:
400 mm for Carbon, Carbon-Manganese, Alloy and Martensitic Stainless grades;
350 mm for Austenitic Stainless Steel grades;
300 mm for Duplex Stainless Steel grades

Additional approval conditions

- Including ‘clean steel forged bars’ as pre-material for crankshafts up to maximum diameter 650 mm;
- Including ‘clean steel forged bars’ as blanks for case hardened gear transmissions and short shafts with “specially approved forging process” up to maximum diameter 650 mm;
- Including Premium Clean Steel according to customer specification PR DL for application in forged crankshafts;

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This is to certify:

that

BGH Edelstahl Siegen GmbH
site "Weidenau"
Industriestraße 9, 57076 Siegen, Germany

is an approved manufacturer of
Steel Forgings

in accordance with

DNV rules for classification – Ships
DNV rules for classification – Naval vessels
DNV class programme – DNV-CP-0242 Semi-finished steel products
DNV class programme – DNV-CP-0247 Steel forgings

and the following particulars:

Application area	**Forgings for hull structures and equipment** **Forgings for shafting and machinery** **Forgings for gearing** **Forgings for boilers, pressure vessels and piping systems** **Ferritic steel forgings for low temperature service** **Stainless steel forgings** **Non-magnetizable steels**
Steel type(s)	**Carbon and carbon-manganese, alloy,** **Stainless (ferritic, austenitic, martensitic),** **22Cr duplex, 25Cr duplex**
Forging method	**Open die forging**
Max. weight	**32 000 kg**
Heat treatment condition	**See page 2 ff.**
Additional approval conditions	**See page 2 ff.**

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Forgings for hull structures and equipment

Steel type	Grade [3]	Forging method [1]	Max. weight [kg]	Heat treatment condition [2] [5]
C and C-Mn	NV F400UW, NV F440UW, NV F480UW, NV F520UW, NV F560UW, NV F600UW	OD	32 000	N, NT, QT
Alloy	NV F550AW, NV F600AW, NV F650AW	OD	32 000	QT

Forgings for shafting and machinery
Forgings for gearing

Steel type	Grade [3]	Forging method [1]	Max. weight [kg]	Heat treatment condition [2] [5]
C and C-Mn	NV F400U, NV F440U, NV F480U, NV F520U, NV F560U, NV F600U, NV F640U, NV F680U, NV F720U, NV F760U	OD	32 000	N, NT, QT
Alloy	NV F600A, NV F700A, NV F800A, NV F900A, NV F1000A, NV F1100A	OD	32 000	QT

Forgings for boilers, pressure vessels and piping systems

Steel type	Grade [3]	Forging method [1]	Max. weight [kg]	Heat treatment condition [2] [5]
C and C-Mn	NV F450H, NV F490H	OD	32 000	N, NT, QT
Alloy	NV F0.5Mo, NV F1Cr0.5Mo	OD	32 000	NT, QT
	NV F2.25Cr1Mo	OD	32 000	N, QT [6]

Ferritic steel forgings for low temperature service

Steel type	Grade [3]	Forging method [1]	Max. weight [kg]	Heat treatment condition [2] [5]
C and C-Mn	NV F450L, NV F490L	OD	32 000	N, NT, QT
Ni	NV F3.5Ni, NV F5Ni, NV F9Ni	OD	32 000	NT, QT

Stainless steel forgings

Steel type / grade [4]	Forging method [1]	Max. weight [kg]	Heat treatment condition [2] [5]
Austenitic stainless	OD	32 000	SHT
Ferritic stainless	OD	32 000	A
Martensitic stainless	OD	32 000	QT [5]
22 Cr Duplex	OD	32 000	SHT
25 Cr Duplex	OD	32 000	SHT

Non-magnetizable steel forgings

Steel type	Grade [3]	Forging method [1]	Max. weight [kg]	Heat treatment condition [2] [5]
Non-magnetizable	1.3964 acc. to SEW 390 / BWB WL 1.3964-2, -3	OD	32 000	SHT
	1.3974 acc. to SEW 390 / BWB WL 1.3974-2, -3	OD	32 000	SHT

Forgings of liquid quenched and tempered structural steels

Steel type / grade [3]	Forging method [1]	Max. weight [kg]	Heat treatment condition [2] [5]
NV-M550S 1.6780 (HY-80) acc. to MIL-S-23009C / BWB WL 1.6780-2, -3	OD	32 000	SHT
NV-M700S 1.6782 (HY-100) acc. to MIL-S-23009C / BWB WL 1.6782-2, -3	OD	32 000	SHT

Remarks:

1) OD: Open die forging
2) QT: Quenched and tempered; N: Normalised; NT: Normalised and tempered;
SHT: Solution Heat Treated (Solution Annealing); A: Annealed
3) Incl. equivalent grades in acc. to other standards
4) Stainless steel forgings shall be in accordance with recognized standards, e.g. EN 10222, ASTM A473/A965/A1049 and JIS G 3214, provided that supplementary requirements contained herein are also met. Recognition of other standards is subject to submission to the Society for evaluation
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Additional approval conditions

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