

APPROVAL OF MANUFACTURER CERTIFICATE

This is to certify:

That

Fritz Baumann GmbH & Co. KG
Kappelrain 4, 74363 Güglingen, Germany

is an approved manufacturer of
Steel Forgings

in accordance with
DNV GL rules for classification – Ships
DNV GL rules for classification – Naval vessels

and the following particulars:

Application area	Forgings for hull structures and equipment Forgings for shafting and machinery Forgings for gearing
Steel type(s)	Carbon and carbon-manganese, Alloy, Austenitic stainless, Martensitic stainless, Austenitic-ferritic (Duplex) stainless
Forging method	Open die forging
Max. weight	2 500 kg
Max. thickness	See page 2 ff.
Heat treatment condition	See page 2 ff
Additional approval conditions	Including free forgings in titanium alloy grade 3.7165 (TiAl6V4), 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 GL classed object shall fulfill the material requirements in the applicable DNV GL class rules.

Issued at **Hamburg** on **2020-09-15**

for **DNV GL**

This Certificate is valid until **2023-09-30**.

DNV GL local station: **Augsburg**

Approval Engineer: **Christian Wildhagen**

Thorsten Lohmann
Head of Section

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Job Id: **263.11-003291-3**
 Certificate No: **AMMM00001SA**
 Revision No: **1**

Particulars of the approval

Forgings for hull structures and equipment

Steel type	Grade	Forging method ¹⁾	Max. weight [kg]	Max. thickness [mm]	Heat treatment condition ²⁾
C and C-Mn	VL F400UW, VL F440UW, VL F480UW, VL F520UW, VL F560UW, VL F600UW	OD	2 500	1 100	N, QT
Alloy	VL F550AW, VL F600AW, VL F650AW	OD	2 500	1 100	QT

Forgings for shafting and machinery

Steel type	Grade	Forging method ¹⁾	Max. weight [kg]	Max. thickness [mm]	Heat treatment condition ²⁾
C and C-Mn	VL F400U, VL F440U, VL F480U, VL F520U, VL F560U, VL F600U, VL F640U, VL F680U, VL F720U, VL F760U	OD	2 500	1 100	N, QT
Alloy	VL F600A, VL F700A, VL F800A, VL F900A, VL F1000A, VL F1100A	OD	2 500	1 100	QT

Forgings for gearing

Steel type	Grade	Forging method ¹⁾	Max. weight [kg]	Max. thickness [mm]	Heat treatment condition ²⁾
Alloy	1.6587 (18CrNiMo7-6) acc. EN 10084	OD	2 500	1 100	QT
	1.8519 (18CrMoV9) acc. EN 10085	OD	2 500	1 100	QT
	1.7168 (18MnCrB) acc. to customer specification ³⁾	OD	2 500	1 100	QT

Stainless steel forgings

Steel type	Grade	Forging method ¹⁾	Max. weight [kg]	Max. thickness [mm]	Heat treatment condition ²⁾
Martensitic stainless	1.4057 (X17CrNi16-2) acc. EN 10250-4, EN 10088-3 or DIN 17440	OD	2 500	600	QT
Austenitic stainless	1.4571 (X6CrNiMoTi17-12-2) acc. EN 10250-4, EN 10088-3 or DIN 17440	OD	2 500	600	SHT
Duplex	1.4462 (X2CrNiMoN22-5-3) acc. EN 10250-4, EN 10088-3 or SEW 400	OD	2 500	600	SHT

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Steels acc. other standards

Grade	Forging method ¹⁾	Max. weight [kg]	Max. thickness [mm]	Heat treatment condition ²⁾
Steel acc. EN 10250-2 or EN 10083-2	OD	2 500	1 100	N, QT
Steel acc. EN 10250-3 or EN 10083-3	OD	2 500	1 100	QT

Titanium alloy forging grades

Grade	Forging method ¹⁾	Max. weight [kg]	Max. thickness [mm]	Heat treatment condition ²⁾
3.7165 (TiAl6V4) acc. DIN 17864, AMS 4928R and DNVGL-Naval Pt2 Ch5 Sect7	OD	300	250	Acc. standard

Remarks:

- 1) OD: Open die forging
- 2) QT: Quenched and tempered
SHT: Solution Heat Treated (Solution Annealing)
- 3) Possible application and certification of any material to classed object is subject to case by case approval