



APPROVAL OF MANUFACTURER CERTIFICATE

Certificate No:
AMMM00001VY
Revision No:
2

This is to certify:

That

Georg Umformtechnik GmbH
Grubenstraße 5,
56594 Willroth,
Germany

is an approved manufacturer of
Steel Forgings

in accordance with
DNV GL rules for classification – Ships
DNVGL-OS-B101 – Metallic materials

and the following particulars:

Application area	Forgings for hull structures and equipment Forgings for shafting and machinery Forgings for crankshafts Forgings for gearing
Steel type	Carbon and carbon-manganese, Alloy
Forging method	Open die forging / closed die forging
Max. weight	See page 2
Max. diameter / section	See page 2
Heat treatment condition	See page 2

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 **2021-04-21**

for **DNV**

This Certificate is valid until **2023-12-31**.

DNV local station: **Essen**

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 AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") 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.



Particulars of the approval

Forgings for hull structures and equipment

Steel type	Grade ³⁾	Forging method ¹⁾	Max. weight [kg]	Max. diameter / section [mm]	Heat treatment condition ²⁾
C and C-Mn	VL F400UW, VL F440UW, VL F480UW, VL F520UW, VL F560UW, VL F600UW	OD, CD	700	400	N, NT, QT
Alloy	VL F550AW, VL F600AW, VL F650AW	OD, CD	700	400	NT, QT

Forgings for shafting and machinery

Forgings for crankshafts

Forgings for gearing

Steel type	Grade ³⁾	Forging method ¹⁾	Max. weight [kg]	Max. diameter / section [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, CD	700	400	N, NT, QT
Alloy	VL F600A, VL F700A, VL F800A, VL F900A, VL F1000A, VL F1100A	OD, CD	700	400	NT, QT

Steels acc. other standards

Steel type	Grade ⁴⁾	Forging method ¹⁾	Max. weight [kg]	Max. diameter / section [mm]	Delivery condition ²⁾
Alloy	acc. to EN 10083	OD, CD	700	400	QT
	acc. to EN 10084				
	acc. to EN 10250				

Remarks:

- 1) OD: Open die forging
CD: Closed die forging
- 2) QT: Quenched and tempered
N: Normalised
NT: Normalised and tempered
- 3) Incl. equivalent grades in acc. to other standards
- 4) Possible application and certification of any material to classed object is subject to case by case approval