

APPROVAL OF MANUFACTURER CERTIFICATE

Certificate No:
AMMM0000103
Revision No:
2

This is to certify:

That

REINOSA FORGINGS & CASTINGS, S.L.
Alejandro Calonge 1, 39200 Reinosa, Cantabria, Spain

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
Steel type(s)	Carbon, Carbon-Manganese, Alloy
Forging method	Open die forging / closed die forging
Max. weight	See page 2
Heat treatment condition	See page 2
Additional approval conditions	Including continuous grain flow forged (CGF) crankshafts. Including clean steel forgings of grades: 18CrNiMo7-6, 42CrMo4, 34CrNiMo6 and 32CrMo12

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 **2021-08-30**

for **DNV**

This Certificate is valid until **2024-06-30**.

DNV local station: **Area NB/CMC Iberia**

Approval Engineer: **Andreas Koch**

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) 4) 6)}	Forging method ¹⁾	Max. weight [kg]	Heat treatment condition ²⁾
C and C-Mn	VL F400UW, VL F440UW, VL F480UW, VL F520UW, VL F560UW, VL F600UW	OD	84 000	N, NT, QT
Alloy	VL F550AW, VL F620AW, VL F650AW	OD	84 000	N, NT, QT

Forgings for shafting and machinery

Steel type	Grade ^{3) 4) 6)}	Forging method ¹⁾	Max. weight [kg]	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	84 000	N, NT, QT
Alloy	VL F600A, VL F700A, VL F800A, VL F900A, VL F1000A, VL F1100A	OD	84 000	N, NT, QT

Forgings for crankshafts

Steel type / grade ^{3) 5) 6)}	Forging method ¹⁾	Max. weight [kg]	Heat treatment condition ²⁾
Carbon-Manganese / Alloy	CGF (CD)	22 800	QT

Remarks:

- 1) OD: Open die forging
 CD: Closed die forging
 CGF: Continuous grain flow forged
- 2) QT: Quenched and tempered
 N: Normalised
 NT: Normalised and tempered
- 3) Including equivalent grades to other standards
- 4) Steel grades acc. to customer spec. and DNV GL approved drawings
- 5) Max. heat treatment diameter: Ø 460 mm
- 6) Including clean steel forgings of grades 18CrNiMo7-6, 42CrMo4, 34CrNiMo6 and 32CrMo12