

APPROVAL OF MANUFACTURER CERTIFICATE

Certificate No:
AMMM0000103
Revision No:
1

This is to certify:

That
SIDENOR FORGINGS & CASTINGS S.L.U.
Reinosa, Spain

is an approved manufacturer of
Steel Forgings

in accordance with
DNV GL rules for classification – Ships
DNV GL offshore standards

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

Issued at **Hamburg** on **2018-01-31**

for **DNV GL**

This Certificate is valid until **2021-06-30**.

DNV GL local station: **Bilbao**

Approval Engineer: **Stefan Röhr**

Thorsten Lohmann
Head of Section



Job Id: **263.11-002854-4**
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Particulars of the approval

Forgings for hull structures and equipment

Steel type	Grade ^{3) 4) 7)}	Forging method ¹⁾	Max. weight [kg]	Delivery 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) 7)}	Forging method ¹⁾	Max. weight [kg]	Delivery condition ²⁾
C and C-Mn	VL C400U, VL C440U, VL C480U, VL C520U, VL C560U, VL C600U, VL F640U, VL F680U, VL F720U, VL F760U	OD	84 000	N, NT, QT
Alloy	VL C600A, VL C700A, VL C800A, VL C900A, VL F1000A, VL F1100A	OD	84 000	N, NT, QT

Forgings for crankshafts

Steel type / grade ^{3) 5)}	Forging method ¹⁾	Max. weight [kg] ⁶⁾	Delivery 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) Certification of any material applied to classed object shall fulfill the applicable material requirements in the DNV GL class rules
- 4) Including equivalent grades to other standards
- 5) Steel grades acc. to customer spec. and DNV GL approved drawings
- 6) Max. heat treatment diameter: Ø 460 mm
- 7) Including clean steel forgings of grades 18CrNiMo7-6, 42CrMo4, 34CrNiMo6 and 32CrMo12