

APPROVAL OF MANUFACTURER CERTIFICATE

Certificate No:
AMMM000012W
Revision No:
1

This is to certify:

That

SIDENOR FORGINGS & CASTINGS, S.L.U.
Calle Alejandro de Calonge 1, 39200 Reinosa, Cantabria, Spain

is an approved manufacturer of
Steel Forgings

in accordance with
DNVGL-OS-E302 – Offshore mooring chain, Edition July 2015

and the following particulars:

Steel types	R3 R3S R4 R4S R5
Max. thickness	See page 2
Delivery Condition	See page 2
Remarks	See page 2

Manufacturer 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 **Høvik** on **2018-09-18**

for **DNV GL**

This Certificate is valid until **2020-12-31**.

DNV GL local station: **Bilbao**

Approval Engineer: **Shylate Mahachi**

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Hanne Anita Hjerpetjønn
Head of Section



Job Id: **263.11-003845-5**
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Particulars of the approval

Forgings for chain cables accessories		
Grade ¹⁾	Max. thickness [mm]	Delivery condition ²⁾
R3	260	Hydrogen degassed ³⁾
R3S		
R4	310	
R4S	307	
R5	307	

Remarks

¹⁾ Specification for chemical composition according to table S1

²⁾ Intermediate heat treatment.

³⁾ Final heat treatment will be carried out by the chain cable supplier.

Table S1 - Specification for chemical composition - Forgings for chain cables accessories														
Grade, thickness (mm)			C	Si	Mn	P	S	Cr	Ni	Mo	Cu	Al	V	N
VL R3	260	Min.												
VL R3S		Max.												
VL R4	310	Min.												
		Max.												
VL R4S	307	Min.												
		Max.												
VL R5	307	Min.												
		Max.												

Remarks:

The content of Sn, Sb and As may be required determined. In such cases, the maximum content shall be 0.030 % for Sn, 0.025% for As, 0.005 % for Sb and 0.001% for B.