

APPROVAL OF MANUFACTURER CERTIFICATE

This is to certify:

That

Scana Steel Booforge AB
KARLSKOGA, Sweden

is an approved manufacturer of
Steel Forgings

in accordance with
DNVGL-OS-E302 Offshore Mooring Chain

and the following particulars:

Product	Forgings for chain cable accessories
Steel type	R4
Max. thickness	See page 2
Delivery Condition	See page 2

Manufacturer approved by this certificate is accepted to deliver according to DNV GL, DNV and GL rules.

This Certificate is valid until **2019-05-02**.

Issued at **Høvik** on **2016-05-03**

for **DNV GL**

DNV GL local station: **Stockholm**

Approval Engineer: **Gorka Lozano**

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Hanne Anita Hjerpetjønn
Head of Section

Particulars of the approval

Forgings for chain cables accessories			
Grade	Max. thickness (mm)	Delivery condition ¹⁾	Material manufacturer ²⁾³⁾
R4	380	NQT	Scana Steel Björneborg AB

Remarks:

¹⁾ NQT: Normalized, Quenched and Tempered.

²⁾ The approval is limited to the listed raw material manufacturer.

³⁾ For approved material specification see table S1

Table S1- Specification for chemical composition - Forgings for chain cables accessories													
Grade, thickness (mm)			C	Si	Mn	P	S	Cr	Ni	Mo	Cu	Al	N
R4	380	Min.	0.35	0.20	0.65	-	-	1.55	1.55	0.25	-	0.020	-
		Max.	0.38	0.35	0.80	0.020	0.005	1.70	1.70	0.30	0.25	0.045	0.011

Remarks:

The content of Sn, Sb and As may be required determined. In such cases, the maximum content shall be 0.010 % for Sn, 0.010% for As, 0.004 % for Sb and 0.001% for B.