

APPROVAL OF MANUFACTURER CERTIFICATE

This is to certify:

That

Scana Steel Björneborg AB
BJÖRNEBORG, Sweden

is an approved manufacturer of
Steelmaking

in accordance with
DNVGL-OS-E302 Offshore Mooring Chain

and the following particulars:

Product	Semi-finished products; Ingots and Forged bars for chain cables
Grade	R4
Steelmaking	Electric Arc Furnace, Ingot casting
Deoxidation	Killed
Fine grain elements	See page 2
Delivery conditions	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 **2019-06-01**.

Issued at **Høvik** on **2016-06-02**

DNV GL local station: **Stockholm**

Approval Engineer: **Gorka Lozano**

for **DNV GL**

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Hanne Anita Hjerpetjønn
Head of Section

Job Id: **263.11-005059-1**
Certificate No: **AMMM00000JR**

Particulars of the approval

Ingots for offshore chain cables			
Grade ³⁾	Steelmaking ¹⁾	Fine grain elements	Delivery condition
R4	EAF, VD, IC	Al	Hydrogen degassed (Annealed)

Remarks:

¹⁾ EAF: Electric Arc Furnace; VD: Vacuum Degassing; IC: Ingot Casting

²⁾ Specification for chemical composition according to table S1

Table S1- Specification for chemical composition - Ingots and Forged bars for chain cables accessories												
Grade		C	Si	Mn	P	S	Cr	Ni	Mo	Cu	Al	N
R4	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.