

APPROVAL OF MANUFACTURER CERTIFICATE

Certificate No:
AMMM00000Y6
Revision No:
1

This is to certify:

That

De Haan Special Equipment B.V.
Transistorweg 3, 9503 GT Stadskanaal, Netherlands

is an approved manufacturer of
Chain Cables

in accordance with
DNVGL-OS-E302 – Offshore mooring chain, Edition July 2018

and the following particulars:

Product	Forged chain cable accessories
Grade	R5, R4 and R3
Delivery condition	See page 2
Max. diameter	See page 2
Remarks	See particulars of the approval

Manufacturer approved by this certificate is 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 **2020-08-27**

for **DNV GL**

This Certificate is valid until **2022-12-31**.

DNV GL local station: **Netherlands CMC**

Approval Engineer: **Dechun Lou**

Sondre Løken
Head of Section

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Job Id: **263.11-010455-1**
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Particulars of the approval

Particular of approvals for Offshore mooring chain cable accessories			
Grade ¹⁾	Delivery conditions ²⁾	Max. diameter or thickness (mm)	Material manufacturer ³⁾
R4 ⁴⁾	NQT	89	Buderus Edelstahl GmbH ⁵⁾
R3, R4, R5	NQT	89	Buderus Edelstahl GmbH ⁵⁾

Remarks:

- ¹⁾ For approved material specification see table S1.
²⁾ NQT: Normalized, Quenched and Tempered.
³⁾ The approval is limited to the listed raw material manufacturer.
⁴⁾ Approval valid only for the auxiliary elements of swivels type of components. Not valid for complete accessories.
⁵⁾ Forging without final heat treatment carried out by Stahlhammer Bommern GmbH.

Table S1 - Specification for chemical composition ¹⁾													
Grade, thickness (mm)			C	Si	Mn	P	S	Cr	Ni	Mo	Cu	Al	N
R3, R4, R5 ²⁾	89	Min	.30	-	.50	-	-	1.30	1.30	.20	-	.020	-
		Max	.38	.40	.80	.025	.015	1.70	1.70	.30	.25	.050	.012
R4 ²⁾	89	Min	.26	-	.50	-	-	1.80	1.80	.30	-	.020	-
		Max	.34	.40	.80	.025	.015	2.20	2.20	.50	.25	.040	.015
R5	89	Min	.26	-	.50	-	-	1.80	1.80	.30	-	.020	-
		Max	.34	.40	.60	.025	.015	2.20	2.20	.50	.25	.040	.012

Remarks:

- ¹⁾ The content of Sn, Sb, As and B may be required. In such cases, the maximum content shall be 0.020 % for Sn, 0.020 % for Sb, 0.030% for As and 0.0007% for B.
²⁾ Approval valid only for the auxiliary elements of swivels type of components. Not valid for complete accessories.

Miscellaneous:

- 1) Approval of procedures detailed in the approval letter: M-WW-NCC/RVNO/P261.1H-J-6616.