

Certificate No:

S-8431

File No:

911.53

Job Id:

262.1-018623-1

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Lifting set for Offshore containers and Portable Offshore Units

with type designation(s)

50T to 320T Bow Shackle

63T to 100T Dee Shackle

Issued to

GN Rope Fittings - Grofsmederij Nieuwkoop B.V.

NIEUWKOOP, Netherlands

is found to comply with

ABNT NBR 13545 Lifting purposes-Shackle

DNV Standard for Certification No. 2.7-3 Portable Offshore Units (2011)

Application :

Grade 6, 8, 8S and R4, Group G and H

This Certificate is valid until **2018-12-31**.

Issued at **Høvik** on **2014-11-18**

DNV GL local station: **Rotterdam**

Approval Engineer: **Nina Thorvaldsen Moberg**

for **DNV GL**

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Inger-Helene Hals
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

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Product description

50T to 320T Bow Shackles are manufactured to Grade 6, 8, 8S or R4 strength, 63T to 100T Dee Shackles are manufactured to Grade 8 strength. Shackles is approved for use in Lifting Sets for Portable Offshore Units certified to DNV Standard for Certification No. 2.7-3 Portable Offshore Units.

Dimensions of shackles are in compliance with ABNT NBR 13545.

Detailed product information and range of certified products covered by this Type Approval are listed in Appendix 1 of this Type Approval Certificate.

Application/Limitation

Prior to selection of shackles the minimum required shackle working load limit (WLL) shall be decided according to the strength requirements for lifting sets on portable offshore units as given in DNV 2.7-3, Chapter 7.3.3. Resulting sling force (RSF) can be found in the Design Verification Report (DVR) issued by DNV GL for the Portable Offshore Unit. The DVR shall be available for the shackle manufacturer.

Shackle bolts shall be secured to prevent unwanted opening of the shackle.


If shackle can experience significant out-of-plane loading, then shackle WLL shall be de-rated in accordance with DNV 2.7-3, Chapter 7.3.3

Tests to be carried out:

- Production testing: According to ABNT NBR 13545 "Lifting purposes -Shackles" in agreement with the DNV surveyor.
- Material to be impact tested by Charpy impact method according to DNV 2.7-3, Chapter 7.4 or ABNT NBR 13545, whichever is stricker.

The manufacturer shall issue product certificates in accordance with DNV 2.7-3, Chapter 7.5.3 using the certificate form LET120406. This certificate form is only to be used for shackles certified according to this Type approval Certificate.

Type Approval documentation



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Tests carried out

Prototype strength and fatigue tested according to ABNT NBR 13545 "Lifting purposes -Shackles"

Marking of product

Each item to be marked according to DNV 2.7-3, Chapter 7.6.

Periodical assessment

In order to maintain the validity of this type approval certificate, retention surveys are to be carried out according to DNV 2.7-3. Intervals are not to exceed 6 months

For retention of the Type Approval, a DNV GL surveyor shall perform a survey every 6 months and before the expiry date of this certificate to verify that the type approval is complied with.

END OF CERTIFICATE

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Appendix 1

Product description and details

Bow Shackle, Grade 6

Type	WLL [t]	MPF [kN]	Min. BF [kN]	Nominal Bow Dia. [mm]	Nominal Pin Dia. [mm]
ABNT NBR 13545-6-BX-50	50	1000	2500	66	74
ABNT NBR 13545-6-BX-55	55	1100	2750	66	74
ABNT NBR 13545-6-BX-63	63	1280	3150	74	83
ABNT NBR 13545-6-BX-80	80	1600	4000	83	93
ABNT NBR 13545-6-BX-85	85	1700	4250	83	93

Bow Shackle, Grade 8

Type	WLL [t]	MPF [kN]	Min. BF [kN]	Nominal Bow Dia. [mm]	Nominal Pin Dia. [mm]
ABNT NBR 13545-8-BX-63	63	1260	3150	66	74
ABNT NBR 13545-8-BX-80	80	1600	4000	74	83
ABNT NBR 13545-8-BX-85	85	1700	4250	77	86
ABNT NBR 13545-8-BX-100	100	2000	5000	83	93
ABNT NBR 13545-8-BX-120	120	2400	6000	91	102
ABNT NBR 13545-8-BX-125	125	2500	6250	93	104
ABNT NBR 13545-8-BX-150	150	3000	7500	102	114
ABNT NBR 13545-8-BX-160	160	3200	8000	105	118
ABNT NBR 13545-8-BX-175	175	3500	8750	110	123

Bow Shackle, Grade 8S

Type	WLL [t]	MPF [kN]	Min. BF [kN]	Nominal Bow Dia. [mm]	Nominal Pin Dia. [mm]
ABNT NBR 13545-8S-BX-80	80	1600	4000	66	74
ABNT NBR 13545-8S-BX-85	85	1700	4250	66	74
ABNT NBR 13545-8S-BX-100	100	2000	5000	74	83
ABNT NBR 13545-8S-BX-120	120	2400	6000	74	83
ABNT NBR 13545-8S-BX-125	125	2500	6250	83	93
ABNT NBR 13545-8S-BX-150	150	3000	7500	83	93
ABNT NBR 13545-8S-BX-160	160	3200	8000	93	104
ABNT NBR 13545-8S-BX-175	175	3500	8750	93	104
ABNT NBR 13545-8S-BX-200	200	4000	10000	105	118
ABNT NBR 13545-8S-BX-250	250	5000	12500	117	131
ABNT NBR 13545-8S-BX-300	300	6000	15000	131	147
ABNT NBR 13545-8S-BX-320	320	6400	16000	131	147

Bow Shackle, Grade R4

Type	WLL [t]	MPF [kN]	Min. BF [kN]	Nominal Bow Dia. [mm]	Nominal Pin Dia. [mm]
ABNT NBR 13545-R4-BX-80	80	1600	4000	66	74
ABNT NBR 13545-R4-BX-85	85	1700	4250	66	74
ABNT NBR 13545-R4-BX-100	100	2000	5000	74	83
ABNT NBR 13545-R4-BX-120	120	2400	6000	74	83
ABNT NBR 13545-R4-BX-125	125	2500	6250	83	93
ABNT NBR 13545-R4-BX-150	150	3000	7500	83	93
ABNT NBR 13545-R4-BX-160	160	3200	8000	93	104
ABNT NBR 13545-R4-BX-175	175	3500	8750	93	104
ABNT NBR 13545-R4-BX-200	200	4000	10000	105	118
ABNT NBR 13545-R4-BX-250	250	5000	12500	117	131
ABNT NBR 13545-R4-BX-300	300	6000	15000	131	147
ABNT NBR 13545-R4-BX-320	320	6400	16000	131	147

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Dee Shackle, Grade 6

Type	WLL [t]	MPF [kN]	Min. BF [kN]	Nominal Bow Dia. [mm]	Nominal Pin Dia. [mm]
ABNT NBR 13545-6-DX-50	63	1260	3150	66	74
ABNT NBR 13545-6-DX-80	80	1600	4000	74	83
ABNT NBR 13545-6-DX-100	100	2000	5000	83	93