

TYPE APPROVAL CERTIFICATE

This is to certify:

That the lifting set component for offshore containers and portable offshore units

with type designation(s)
Green Pin Standard and Green Pin Polar shackles

Issued to

Van Beest B.V.
Slidrecht, Zuid-Holland, Netherlands

is found to comply with

DNV GL standard DNVGL-ST-E271 – 2.7-1 Offshore containers, January 2021
DNV GL standard DNVGL-ST-E273 – 2.7-3 Portable offshore units, December 2016
ISO 10855-2:2018 Offshore containers and associated liftings sets – Part 2: Design, manufacture and testing of lifting sets
IMO/MSC Circular 860
EN 13889 Forged steel shackles for general lifting purposes - Dee shackles and Bow shackles - Grade 6 - Safety
Federal Specification Chains and Attachments, Carbon and Alloy Steel, RR-C-271G

Application :

Shackles for lifting sets for offshore containers and portable offshore units

Issued at **Aberdeen** on **2021-06-30**

This Certificate is valid until **2026-06-29** .

for **DNV**

DNV local unit: **Rotterdam**

Approval Engineer: **Elisabeth Legg**

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Brendan Ward
Delivery Lead - Offshore Containers

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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Manufactured by

Manufacturing of the products are undertaken at the following locations:

Place of manufacture	Activities	Local DNV office
Van Beest B.V. Sliedrecht, Netherlands	• forging of shackle bows • forging of shackle pins • machining of parts • quenching and tempering shackle bows and pins • coating the parts • assembly of parts • QC activities: inspection, testing and issuance of product certificates.	Rotterdam, Netherlands

Responsibility

Van Beest B.V. takes responsibility that both design and production at all places of manufacture are in compliance with the Rules, Standards and/or Regulations listed on page 1 of this type approval certificate.

Product description

This type approval certificate replaces TAS000011V.

This type approval covers shackles for use in lifting sets for offshore containers certified in accordance with DNVGL-ST-E271 or portable offshore units certified in accordance with DNVGL-ST-E273:

Type	Grade	Green Pin Standard	Green Pin Polar	Dee shackle	Bow shackle	Safety bolt	Safety bolt with fixed pin
G-4133	6	X		X			X
G-4143	6	X			X		X
G-4153	6	X		X		X	
G-4163	6	X			X	X	
G-5133	8		X				X
G-5143	8		X		X		X
G-5153	8		X			X	
G-5163	8		X		X	X	

With the following exemptions from EN13889 for the Green Pin Polar shackles, dee and bow shackles:

- Green Pin Polar shackles, Type G-5133, G-5143, G-5153 and G-5163 are manufactured to Grade 8 strength.
- Green Pin Polar shackles, Type G-5133, G-5143, G-5153 and G-5163 are approved for design temperature -40°C.

Implementation of RFID on Green pin shackles from 17 t and upward.

Dimensions of shackles are in compliance with Federal Specification Chains and Attachments, Carbon and Alloy Steel, RR-C-271G.

Detailed product information and range of certified products covered by this type approval are listed in Appendix 1.

Application/Limitation

The minimum shackle working load limit (WLL_s) shall be calculated in accordance with the strength requirements for lifting sets on offshore containers as given in DNV GL-ST-E271 section 8.

Shackles shall be of bolt type with hexagon nut and split pin. Screw pin shackles shall not be used.

Testing to be carried out:

- All production testing shall be carried out in accordance with DNVGL-ST-E271 and EN 13889, in agreement with the local DNV office.
- Material shall be Charpy impact tested in accordance with DNVGL-ST-E271 section 8.4.

The manufacturer shall issue product certificates in accordance with DNVGL-ST-E271 section 8.5, using the certificate form no KF-10-490B. This certificate shall only be used for shackles certified in accordance with this type approval.

For shackles manufactured in accordance with DNVGL-ST-E273

Prior to selection of shackles, the minimum required working load limit (WLL) shall be determined in accordance with the strength requirements for lifting sets on portable offshore units as given in DNVGL-ST-E273 section 7.3.3 and must be



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Certificate No: **TAS000033J**

approved by DNV. Resultant sling force (RSF) can be found in the design verification report (DVR) issued by DNV for the portable offshore unit.

Shackles that will experience significant out-of-plane loading, shall be derated in accordance with the guidance provided in DNVGL-ST-E273 section 7.3.3.

Type Approval documentation

Tests carried out

Prototype testing shall be carried out in accordance with DNVGL-ST-E271 and EN 13889.



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Marking of product

Components shall be marked in accordance with DNVGL-ST-E271 section 8, EN 13889 and Van Beest B.V. internal procedures.

Periodical assessment

In order to maintain the validity of this type approval, periodic assessments shall be carried out by a DNV surveyor. Intervals between assessments shall not exceed 12 months.

END OF CERTIFICATE

Appendix 1

Product description and details

Grade 6 Green Pin Standard and Grade 8 Green Pin Polar Shackles:

- dee and bow with safety bolt / dee and bow with safety bolt and fixed nut.

Type								Nominal size [mm]	Working Load Limit (WLL) [t]	Manufacturing Proof Force ²⁾ (MPF) [kN]	Minimum Breaking Force ²⁾ (BF) [kN]	Safety Factor ¹⁾
G-4133	G-4143	G-4153	G-4163	G-5133	G-5143	G-5153	G-5163					
X	X	X	X	X	X	X	X	13.5	2.0	39.2	98.1	6
X	X	X	X	X	X	X	X	16	3.25	63.8	160	6
X	X	X	X	X	X	X	X	19	4.75	93.2	233	6
X	X	X	X	X	X	X	X	22	6.5	127.5	319	6
X	X	X	X	X	X	X	X	25	8.5	166.8	417	6
X	X	X	X	X	X	X	X	28	9.5	186.4	466	6
X	X	X	X	X	X	X	X	32	12.0	235.4	589	6
X	X	X	X	X	X	X	X	35	13.5	264.9	662	6
X	X	X	X	X	X	X	X	38	17.0	333.5	834	6
X	X	X	X	X	X	X	X	45	25.0	490.5	1226	6
X	X	X	X	X	X	X	X	50	35.0	686.8	1717	6
X	X	X	X	X	X	X	X	57	42.5	834.0	2085	6
X	X	X	X	X	X	X	X	65	55.0	1079.2	2698	6
X	X	X	X	X	X	X	X	75	85.0	1667.7	4169	6

1) Manufacturer's factor of safety against breaking

2) In accordance with EN 13889