DNV·GL

Certificate No:
TAS00002SS

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Lifting set component for offshore containers

with type designation(s)
Anchor Bolt Shackles Type G-2130A

Issued to
Crosby Group LLC
Tulsa, OK, USA

is found to comply with
DNV GL standard DNVGL-ST-E271 – 2.7-1 Offshore containers, August 2017
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-271F

Application :

Shackles for use in lifting sets for offshore containers

Issued at **Aberdeen** on **2020-10-29**
This Certificate is valid until **2025-10-28** .
DNV GL local unit: **Houston**

Approval Engineer: **Elisabeth Legg**

for **DNV GL**

Alex Doig
Team Lead

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 GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") 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.

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Manufactured by

Manufacturing of the G-2130A grade 8 product is undertaken at the following locations:

Place of manufacture	Activities	Local DNV GL Office
Crosby Europe, Putte, Belgium	• forging of pins • machining of parts • assembly of parts • QC activities such as material testing and issuance of certificates.	Rotterdam
Forge France, Joigny sur Meuse, France	forging of bows	Rotterdam
Crosby Premier Stampings Limited, UK	forging of bows	Manchester

Crosby Group LLC 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 certificate replaces TAS00000HA.

Shackles for use in lifting sets for offshore containers certified in accordance with DNVGL-ST-E271.

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

Application/Limitation

Design temperature: -40°C

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.

All production testing shall be carried out in accordance with DNVGL-ST-E271 and EN 13889, in agreement with the local DNV GL office.

To comply with US Federal Specification RR-C-271F and EN 13889 an improved safety factor of "8" shall be applied with respect to the Working Load Limit (WLL) to obtain the Minimum Breaking Force (BF_{min}).

These designs are approved for the design temperature of -40°C specified above. Material to be comply with the requirements of DNVGL-ST-E271 and show a minimum charpy impact value of 42J at the test temperature of -40°C.

The manufacturer shall issue product certificates in accordance with DNVGL-ST-E271 section 8.5 using the Form No. G2130A as listed below. This certificate shall only be used for shackles certified in accordance with this type approval.

Type Approval documentation

Tests carried out
Prototypes tested in accordance with EN 13889 and DNVGL-ST-E271.

Marking of product
Marking shall be carried out in accordance with DNVGL-ST-E271 section 8, EN 13889, US Fed.Spec. RR-C-271F and Crosby Group LLC internal procedures.

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

END OF CERTIFICATE

Appendix 1

Product description and details:

Anchor Bolt Shackles Type G-2130A grade 8, generally in accordance with EN 13889

Nominal Size		Material Grade	Working Load Limit (WLL)	Proof Load (PL)	Breaking Load (BL)	Crosby Part Number
in	mm		tonnes	kN	kN	
1/2	13	8	2*	49	157	1219472
5/8	16	8	3.25*	80	255	1219491
3/4	19	8	4.75*	117	373	1219516
7/8	22	8	6.5* #	160	510	1219534
1	25	8	8.5#	209	667	1219552
1 1/8	28	8	9.5#	233	746	1219578
1 1/4	32	8	12#	295	942	1219598
1 3/8	35	8	13.5#	331	1060	1219614
1 1/2	38	8	17#	417	1334	1219632

* Shackle bow sizes manufactured at Forge France.

Shackle bow sizes manufactured at Crosby Premier Stampings.