DNV·GL

Certificate No:
TAS00002GE

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Lifting set for Offshore containers and Portable Offshore Units

with type designation(s)
Master links A1343 and Master link assemblies A1346

Issued to
The Crosby Group LLC
Tulsa, OK, USA

is found to comply with
DNV GL standard DNVGL-ST-E271 – 2.7-1 Offshore containers, August 2017
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
EN 1677-4 Components for slings – Safety – Part 4: Links, Grade 8
IMO/MSC Circular 860

Application :

Grade 10 links for lifting sets for Offshore Containers and Portable Offshore Units

Issued at **Høvik** on **2020-05-27**
This Certificate is valid until **2025-05-26**.
DNV GL local station: **Houston**

Approval Engineer: **Dag Steensen**

for **DNV GL**

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.

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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Product description

This Type Approval Certificate covers Links for use in Lifting Sets certified to DNVGL-ST-E271 standard DNV GL 2.7-1 Offshore Containers or according to DNV GL-ST-E273 standard DNV GL 2.7-3 Portable Offshore Units.

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

Manufactured by

Gunnebo Industries AB, Växjö, Sweden
Local office: DNV GL Malmö

The Crosby Group LLC takes responsibility that both design and production are in compliance with the Rules, Standards and/or Regulations listed on page 1 of this Type Approval Certificate.

Application/Limitation

Design temperature: - 40°C

Tests to be carried out:

- Production testing: According to DNV GL 2.7-1 and EN 1677-4 in agreement with the DNV GL surveyor.
- Material to be impact tested by Charpy impact method according to DNV GL 2.7-1, Section 8.4 or DNV GL 2.7-3 Section 7.4.

For application of links the minimum working load limit (WLL) shall be decided according to the strength requirements for lifting sets on offshore containers as given in DNV GL 2.7-1, Section 8 or DNV GL 2.7-3 Section 7.

The manufacturer shall issue product certificates according to Section 8.5 in DNV GL 2.7-1, using the applicable certificate Form no: 001 rev 3. This certificate form is only to be used for links certified according to this Type Approval.

Application for links certified according to DNV GL 2.7-3
Prior to selection of links the minimum required working load limit (WLL) shall be decided according to the strength requirements for lifting sets on portable offshore units as given in DNV GL 2.7-3, Section 7.3.5. Resulting sling force (RSF) can be found in the Design Verification Report (DVR) issued by DNV GL for the Portable Offshore Unit.

Type Approval documentation

Tests carried out

Prototypes tested according to DNV GL 2.7-1 and EN 1677-4, ref. the prototype test reports listed above.

Marking of product

Marking should be according to DNV GL 2.7-1 Section 8 or DNV GL 2.7-3 Section 7 and EN 1677-4. As specified in Gunnebo instructions "Description of product, production flow and quality flow", the components are to be marked Grade 10 and painted silver.

Periodical assessment

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

Appendix 1 - Product description and details

A1343: Welded Single Master links: Painted Silver. Marked grade 10

Art. No.	Size designation (D x W x L)	WLL (t)	MPF (kN)	MBF (kN)	Manufac-turer's Safety factor
1247051	13x60x120	3.2*	78.5	157.0	5
1247087	17x90x160	4.1*	100.6	201.1	5
1247096	19x90x160	6.7*	164.3	328.6	5
1247120	22x100x180	8.8	215.8	431.6	5
1247122	22x145x275	7.0	171.7	343.4	5
1247124	25x115x210	11.5	282.0	564.0	5
1247126	25x145x275	8.9	218.3	436.5	5
1247133	28x145x275	13.0	318.8	637.7	5
1247142	32x145x275	17.0	416.9	833.9	5
1247151	36x155x285	24.0	588.6	1177.2	5
1247163	40x140x270	31.5	772.5	1545.1	5
1247164	45x180x340	38.3	939.3	1878.6	5
1247166	51x215x390	45.0	1103.6	2207.3	5
1247175	55x203x406	67.0	1643.2	3286.4	5

* According to DNV GL 2.7-1 links with WLL < 7t are not allowed to be used as master links in lifting sets for offshore containers.

Appendix 1 (contd) - Product description and details

A1346: Welded Master link assemblies: Painted Silver. Marked grade 10

Art. No.	Size designation (D x W x L)/ (D x W x L)	WLL (t) Assembly	MPF (kN) Main Link	MBF (kN) Main link	WLL (t) Sublink	MPF (kN) Sublink	MBF (kN) Sublink	Manufac-turer's Safety factor
1256865	13x60x120/ 13x60x120	3.2*	78.5	157.0	2.4	58.9	117.7	5
1256868	17x90x160/ 13x60x120	4.1*	100.6	201.1	3.1	75.4	150.8	5
1256874	19x90x160/ 13x60x120	4.25*	104.2	208.5	3.2	78.2	156.3	5
1256878	22x100x180/ 17x90x160	7.0	171.7	343.4	5.25	128.8	257.5	5
1256880	22x145x275/ 17x90x160	7.0	171.7	343.4	5.25	128.8	257.5	5
1256876	22x100x180/ 19x90x160	8.5	208.5	417.0	6.4	156.3	312.7	5
1256882	25x115x210/ 19x90x160	8.9	218.3	436.5	6.7	163.7	327.4	5
1256892	25x145x275/ 19x90x160	8.9	218.3	436.5	6.7	163.7	327.4	5
1256917	28x145x275/ 22x100x180	14.5	355.6	711.2	10.875	266.7	533.4	5
1256926	32x145x275/ 25x115x210	17.0	417.0	833.9	12.75	312.7	625.4	5
1256929	36x155x285/ 28x110x190	23.6	578.8	1157.6	17.7	434.1	868.2	5
1256930	40x140x270/ 32x145x275	28.1	689.2	1378.3	21.08	516.9	1033.7	5
1256953	45x180x240/ 36x155x285	38.3	939.3	1878.6	28.7	704.5	1409.0	5
1256958	51x215x390/ 40x140x270	45.0	1103.6	2207.3	33.75	827.7	1655.4	5
1256973	55x203x406/ 51x215x390	67.0	1643.1	3286.4	50.25	1232.4	2464.8	5

* According to DNV GL 2.7-1 master link assemblies with WLL < 7t are not allowed to be used in lifting sets for offshore containers.