

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 Masker link assemblies A1346

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**DNV GL standard DNVGL-ST-E273 – 2.7-3 Portable offshore units, December 2016****IMO/MSC Circular 860****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****Application :****Grade 10 links for lifting sets for Offshore Containers and Portable Offshore Units**Issued at **Høvik** on **2020-09-23**This Certificate is valid until **2025-09-22** .for **DNV GL**DNV GL local unit: **Houston**Approval Engineer: **Dag Steensen**

**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.



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

Crosby Zimmerman, Boulay-Moselle, France

Local office: DNV GL Antwerp

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 "DNV GL Product Certificate - A1343/A1346 Master link". 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 platinum.

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.



Job Id: **262.1-034270-1**
Certificate No: **TAS00002R5**

END OF CERTIFICATE

Appendix 1 - Product description and details

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

| Drawing | Rev | Size designation | Dimensions (mm) (D x W x L) | WLL (t) | MPF (kN) | MBF (t) | Manufacturer's Safety Factor |
|---------|-----|------------------|--------------------------------|---------|----------|---------|------------------------------|
| 1247069 | A | 12 X 1 | 12 x 60 x 120 | 1.6** | 39.5 | 8.0 | 5 |
| 1247076 | A | 13 X 2 | 13 x 60 x 120 | 2.5** | 63.0 | 12.5 | 5 |
| 1247087 | A | 17 X 3 | 17 x 90 x 160 | 4.1** | 101 | 20.5 | 5 |
| 1247096 | A | 19 X 4A | 19 x 90 x 160 | 6.7** | 164 | 33.5 | 5 |
| 1247115 | A | 22 X 4B | 22 x 90 x 170* | 8.5 | 208 | 42.5 | 5 |
| 1247124 | A | 25 X 5 | 25 x 115 x 210 | 11.5 | 282 | 57.5 | 5 |
| 1247133 | A | 28 X 6 | 28 x 145 x 275 | 13.0 | 319 | 65.0 | 5 |
| 1247142 | A | 31 X 7 | 31 x 145 x 275 | 17.0 | 417 | 85.0 | 5 |
| 1247151 | A | 36 X 8 | 36 x 155 x 285 | 24.0 | 588 | 120.0 | 5 |
| 1247160 | A | 38 X 9 | 38 x 140 x 270 | 31.5 | 772 | 157.5 | 5 |
| 1247165 | A | 50 X 10A | 50 x 200 x 380 | 45.0 | 1103 | 225.0 | 5 |
| 1247172 | A | 57 X 10B | 57 x 203 x 406 | 65.3 | 1601 | 326.5 | 5 |

*) This size has smaller dimensions than table 2 in EN 1677-4.

**) In accordance with DNVGL-ST-E271 links with WLL <7 tonnes are not allowed to be used as master links in lifting sets for offshore containers. This size is only suitable for portable offshore units.

Appendix 1 (contd) - Product description and details

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

| Drawing | Rev | Size Designation | Size | Dimensions (mm) (D x W x L) | WLL (t) | Main Link MPF (kN) | Coupler MPF (kN) | Min. BF (t) | Manuf. Safety Factor |
|-------------------|-----|------------------|---------|-----------------------------|---------|--------------------|------------------|-------------|----------------------|
| 3573489 / 1256868 | A | 17 X 1 | 17 / 13 | 17X90X160/ 13X60X120 | 4.1** | 101 | 76 | 20.5 | 5 |
| 3573489 / 1256874 | A | 19 X 2A | 19 / 13 | 19X90X160/ 13X60X120 | 4.25** | 104 | 78 | 21.25 | 5 |
| 3573491 / 1256883 | A | 22 X 2B | 22 / 17 | 22X100X180/ 17X90X160 | 6.7** | 164 | 123 | 33.5 | 5 |
| 3573493 / 1256892 | A | 25 X 3 | 25 / 19 | 25X145X275/ 19X90X160 | 8.9 | 218 | 163.5 | 44.5 | 5 |
| 3573495 / 1256917 | A | 28 X 4A | 28 / 22 | 28X145X275/ 22X100X180 | 14.5 | 355 | 266 | 72.5 | 5 |
| 3573496 / 1256926 | A | 31 X 4B | 31 / 25 | 31X145X275/ 25X115X210 | 17.0 | 417 | 313 | 85.0 | 5 |
| 3573308 / 1256935 | A | 36 X 5 | 36 / 28 | 36X145X275/ 28X100X190 | 23.6 | 579 | 434 | 118.0 | 5 |
| 3573499 / 1256944 | A | 40 X 6 | 40 / 31 | 40X160X300/ 31X145X275 | 28.1 | 689 | 517 | 140.5 | 5 |
| 3573500 / 1256953 | A | 45 X 7 | 45 / 36 | 45X180X340/ 36X155X285 | 38.3 | 939 | 704 | 191.5 | 5 |
| 3573501 / 1256962 | A | 50 X 8 | 50 / 38 | 50X200X380/ 38X140X270 | 45.0 | 1103 | 827 | 225.0 | 5 |
| 3573502 / 1256971 | A | 57 X 9 | 57 / 50 | 57X203X406/ 50X200X380 | 67.0 | 1643 | 1232 | 335.0 | 5 |

**) In accordance with DNVGL-ST-E271 master link assemblies with WLL <7 tonnes are not allowed to be used in lifting sets for offshore containers. This size is only suitable for portable offshore units.