

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Lifting set for Offshore containers and Portable Offshore Units**with type designation(s)
Forged Master Links A-342 OC

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****EN 12079-2 Offshore containers and associated lifting sets – Part 2: Lifting sets Design, manufacture and marking****IMO/MSC Circular 860****EN 1677-4 Components for slings – Safety – Part 4: Links, Grade 8****Application :****Grade 10 Master Links for Lifting Sets for Offshore Containers and Portable Offshore Units**Issued at **Houston** on **2018-04-18**This Certificate is valid until **2023-04-17**.for **DNV GL**DNV GL local station: **Houston**Approval Engineer: **Ronald Quiballo**

Nick Prokopuk
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.



Job Id: **262.1-026756-1**
Certificate No: **TAS00001D6**

Manufactured at

Master links to be manufactured at one of the following locations:

Place of manufacture	Local DNV GL Office
Lebus Manufacturing, Longview, Texas, USA	DNV GL Houston
Elwood Forge, Navasota, Texas, USA	DNV GL Houston
Modern Forge, Merrillville, Indiana, USA	DNV GL Houston

Crosby Group Inc. 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

Links for use in Lifting Sets for Offshore Containers certified to DNVGL-ST-E271 "2.7-1 Offshore Containers" (DNV GL 2.7-1) and DNVGL-ST-E273 "2.7-3 Portable Offshore Units" (DNV GL 2.7-3).

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

DNV GL has accepted some components with internal dimensions smaller than Table 2 in EN 1677-4. These are marked in Appendix 1.

Application/Limitation

Tests to be carried out:

- Production testing: According to DNV GL 2.7-1, EN standard EN 1677-4 "Components for slings Safety - Part 4; Links, Grade 8" and Quality control procedure No. 4387, Rev. A 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.

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.

The manufacturer shall issue product certificates according to Section 8.5 in DNV GL 2.7-1, using the certificate form No. 271 Product Certificate – Master Links. This certificate form is only to be used for links certified according to this Type Approval.

For links manufactured according to DNV GL 2.7-3 Portable Offshore Units

Prior to selection of links the minimum required working load limit (WLL) shall be decided according to strength requirements for master links 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. The DVR shall be available for the link manufacturer.

Type Approval documentation

Tests carried out

Prototype strength tested in accordance with applicable standards.

Marking of product

Marking should be according to DNV GL 2.7-1, Section 8, EN 1677-4 "Components for slings Safety - Part 4; Links, Grade 8".



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Periodical assessment

In order to maintain the validity of the type approval, certificate retention assessments are to be carried out according to DNV GL 2.7-1 by DNV GL surveyor. Intervals are not to exceed 6 months.

END OF CERTIFICATE

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Appendix 1

Product description and details

Forged master links (USA):

P/N	Type	Dia. [in]	WLL [lbs]	MPF [lbs]	Min. BF [lbs]
3522213*	A342W	.875	15,200	38,000	76,000
3522214**	A342W	1.00	26,000	65,000	130,000
3522215**	A342W	1.25	39,100	97,750	195,500
3522216	A342W	1.50	61,100	152,750	305,500
3522217	A342W	1.75	84,900	212,250	424,500
3522218	A342W	2.00	102,600	256,500	513,000

* This size is only suitable for Portable Offshore Units

** Non-standard sizes, see comment under Product Description