

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Lifting set for Offshore containers and Portable Offshore Units**

with type designation(s)

Wire Rope Slings for Offshore Containers and Portable Offshore Units

Issued to

**Hercules SLR Inc.
DARTMOUTH NS, Canada**

is found to comply with

DNV 2.7-1 Offshore Containers (2013)**DNVGL-ST-E273 Standard 2.7-3 Portable offshore units (2016)****EN 12079-2 Offshore containers and associated lifting sets – Part 2: Lifting sets Design, manufacture and marking****EN 13414-1 Wire rope slings****IMO/MSC Circular 860****Application :****1-, 2-, 3- & 4-Part Lifting Sets for Lifting of Offshore Containers and Portable Offshore Units.**This Certificate is valid until **2020-12-31**.Issued at **Høvik** on **2017-04-25**DNV GL local station: **Halifax**for **DNV GL**Approval Engineer: **Igor Antonijevic**

**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.

Job Id:
Certificate No: **TAS00000GC**

Manufactured by

Hercules SLR Inc. 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.

Product description

This Type Approval Certificate replaces S-7152.

The Type Approval Certificate covers wire rope slings assembled with flemish eyes by Hercules SLR Inc. according to DNV 2.7-1 Offshore Containers or DNVGL-ST-E273 Standard 2.7-3 Portable Offshore Units.

The wire rope slings assembled by Hercules SLR Inc. consist of components from the following the following sub suppliers:

Component	Sub supplier (DNV to be informed and review new sub suppliers)	DNV TA Cert. number
Master link & Quad assembly	- SCAW Metals Group/William Hackett - Kjættingfabrikken - Crosby Group Inc. - Yoke Industrial Corp.	S-7732 TAS0000047 TAS000001V TAS000005Z
Wire rope ¹⁾	- Wire Rope Industries - Celik Halat - Guizhou Wire rope Inc. - Young Heung Iron & Steel Co. Ltd. - USHA Martin Limited - Britx Wire Rope Industry Corp	N/A
Shackles ²⁾	- Van Beest BV - Crosby Group Inc. - Yoke Industrial Corp.	S-7593 S-8015 S-8059
Ferrules ³⁾	- Crosby Group Inc.	N/A
Thimbles ⁴⁾	- Crosby Group Inc.	N/A

¹⁾ Wire ropes used in fore runner and bottom legs of lifting slings assembled by Hercules SLR Inc. shall be 6x26 or 6x36 –Independent Wire Rope Core (IWRC), with wire rope grades 1770 N/mm² and 1960 N/mm², in accordance with ANSI/API 9A, EN12385 or equivalent.

²⁾ Shackles are only considered part of sling if captive (i.e. can not be removed after assembly of sling).

³⁾ Ferrules/sleeves: According to EN 13411-3 or equivalent.

⁴⁾ Thimbles: Federal Specification FF-T-276b, Type III, or equivalent.

Components should be delivered with the following certificates:

- Master Links, Quad assemblies and Shackles: Certificates based on DNV GL Type Approval.
- Wire Ropes: To be supplied with traceable material certificates according to EN 10204, inspection certificate, type 3.1.
- Thimbles and ferrules: To be supplied with a material certificate to EN 10204, test report, type 2.2.

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Application/Limitation

For each delivered drum of wire rope, a test leg with one eye in each end to be prepared and tested to breaking. A reference should be made to the wire drum test certificate in each sling set certificate where that wire is used.

All production testing should be done according Hercules SLR Inc.'s internal procedures and to be agreed with local DNV GL office.

The manufacturer shall issue product certificate according to Sec. 8.5 in DNV 2.7-1, using the certificate form WI.HERC-OS-023-DNVCERT for Hercules SLR Inc. Dartmouth and Hercules.Mfg.Certificate-001, edition March 2008 for Hercules SLR Inc. Mount Pearl. This certificate form is only to be used for slings certified according to this Type Approval Certificate.

For slings manufactured according to DNV 2.7-1 Offshore Containers

Lifting sets shall be assembled according to the strength requirements for lifting sets on Offshore Containers as described in DNV 2.7-1 Offshore Containers, Section 8 and Hercules SLR Inc.'s internal procedures. The angle of the sling legs from vertical should be taken into account when choosing slings. This angle should normally be 45°, but smaller angles can be used.

Special slings, assembled according to the principles described in DNV 2.7-1 Offshore Containers, Section 8 and Appendix E, are also covered by this Type Approval. However, if unsymmetrical slings are to be assembled, local DNV GL office has to be contacted for reviewing in each case, unless otherwise is agreed with local DNV GL office.

Note: The sling leg is not necessarily the weakest part of the lifting set. Master link assemblies selected for slings with legs at 45° may not be suitable for slings with a smaller angle.

The WLL to be used in certificates and marked on lifting sets shall be the maximum rating of an offshore container on which the sling can be used, at the given sling leg angle.

For slings manufactured according to DNVGL-ST-E273 Portable Offshore Units

Prior to selection of sling set 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 DNVGL-ST-E273, Section 7.3.2 and must be approved by DNV GL. 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 sling manufacturer.

Type Approval documentation

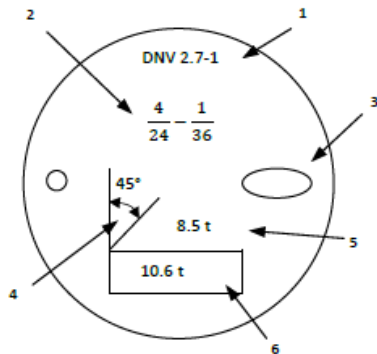
Tests carried out

Prototype test to Breaking Load of wire rope sling leg.

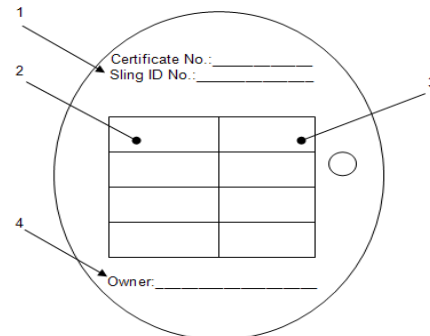
Marking of product

For slings manufactured according to DNV 2.7-1 Offshore Containers

Slings are to be marked with certification tag according to DNV 2.7-1 Offshore Containers, Section 8, as shown below:



Example of identification tag for a wire rope sling – Front



Example of identification tag for a wire rope sling – Back

- 1) Reference to DNV 2.7-1
- 2) 4 legs of 24 mm, 1 forerunner of 36 mm (example)
- 3) Manufacturer's mark
- 4) Sling angle
- 5) Shackle size
- 6) WLL

- 1) Certificate number (and unique identification number if applicable)
- 2) Column 1: inspectors mark, inspection suffix and date of periodic inspections (shall be of format YY-MM-DD)
- 3) Column 2: shackle ID number
- 4) The owner's name may optionally be included

For slings manufactured according to DNVGL-ST-E273 Portable Offshore Units

Each item to be marked according to DNVGL-ST-E273, Section 7.6.

Periodical assessment

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

END OF CERTIFICATE