DNV·GL

Certificate No:
TAS000014W

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Lifting set for Offshore containers and Portable Offshore Units

with type designation(s)
Wire Rope Lifting Sets for Offshore Containers or Portable Offshore Units

Issued to
Holloway Houston
HOUSTON TX, United States

is found to comply with
DNV 2.7-1 Offshore Containers (2013)
EN 12079-2 Offshore containers and associated lifting sets – Part 2: Lifting sets Design, manufacture and marking
IMO/MSC Circular 860
DNVGL-ST-E273 Standard 2.7-3 Portable offshore units (2016)

Application :

1-, 2-, 3-, & 4-Part Lifting Sets, with Forerunner where fitted for Lifting Offshore Containers with Maximum Gross Mass 0-25,000 kg or Portable Offshore Units

Issued at **Houston** on **2017-10-31**
This Certificate is valid until **2021-10-30**.
DNV GL local station: **Houston**

Approval Engineer: **Ronald Quiballo**

for **DNV GL**

Nick Prokopuk
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.

Product description

This certificate covers wire rope slings, described in Appendix 1, assembled by Holloway Houston, Inc., according to DNV 2.7-1 Offshore Containers and DNVGL-ST-E273.

The wire rope slings assembled by Holloway Houston, Inc. are to consist of components from the following sub suppliers:

Component	**Sub supplier** (DNV to be informed and review new sub suppliers)	**DNV TA Cert. number**
Master link & Quad assembly	- Gunnebo Industrier AB - Crosby Group - Kjættingfabriken AS	TAS00000TE S-8016, S-8355, TAS000001V TAS0000047
Wire rope [1)]	- Manho Wire Rope - DSR Wire Rope - Usha Martin - Kiswire - Phoenix - Chung Woo - Washington Wire Rope/DeAcero	N/A
Shackles [2)]	- Van Beest BV - Gunnebo-Anja Industrier AS - Crosby Group	TAS000011V S-7601 S-8357, S-8378
Ferrules [3)]	- Crosby Group - Munch Industries	N/A
Thimbles [4)]	- Van Beest BV - Crosby Group	N/A

1) Wire ropes, fore runner and bottom legs, to be used in lifting slings assembled by Holloway Houston, Inc. to be 6x19 or 6x36, Classification Wire Rope, Bright or Drawn-Galvanized, Independent Wire Rope Core (IWRC), 1770 N/mm^2 or 1960 N/mm^2 Grade or equivalent.
2) Only considered part of sling if captive (i.e. cannot be removed after assembly of sling).
3) Ferrules / sleeves: To be according to manufacturer's specification 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 product 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.

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 mill test certificate in each sling set certificate where that wire is used.

All production testing should be done according Holloway Houston, Inc.'s internal procedures and to be agreed with local DNV GL office.
The manufacturer shall issue product certificates according to Sec. 8.5 in DNV 2.7-1, using Holloway Houston, Inc. "Certificate of Conformance and Test: HHI-271-[Last 2 digits of year]-[Cert No] " for wire rope slings.

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. 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.

If using wire rope manufactured in US Customary Units sizes (inch) for DNV GL Type Approved lifting sets, care should be taken to ensure that the correct minimum breaking load is applied during the selection process.

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. The resulting sling force (RSF) can be found in the Design Verification Report (DVR) issued by DNV for the Portable Offshore Unit. The DVR shall be available for the sling manufacturer.

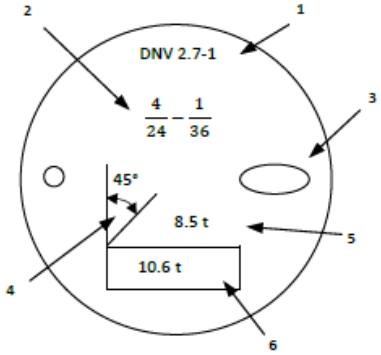
Type Approval documentation

Tests carried out

Prototype tests on single leg wire rope slings, witnessed by DNV GL.

Marking of product

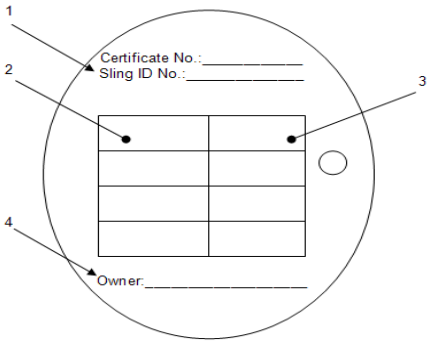
For slings manufactured according to DNV 2.7-1 Offshore Containers
Slings are to be marked with certification tag according to DNV 2.7-1 Offshore Containers, Section 8, as shown below:



Example of identification tag for a wire rope sling – Front

1) CE mark and Reference to DNV 2.7-1 or DNVGL-ST-E273 (See Note 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

Note 1. CE marking is only required for lifting sets supplied to the European Union market



Example of identification tag for a wire rope sling – Back

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 2.7-3, Chapter 7.6.
Periodical assessment

In order to maintain the validity of the type approval, certificate retention surveys are to be carried out according to DNV 2.7-1. Intervals are not to exceed 12 months.

END OF CERTIFICATE

Appendix 1

Wire rope slings with steel ferrules assembled by Holloway Houston, Inc., covered by this Type Approval Certificate:

Product Name	Applicable Standards	Material Grades	Parameter range			
			SIZE(Ø) [mm]	WLL [t]	PL [kN]	BL [kN]
Steel wire rope	EN 12385 or equivalent	1770/1960	51 max (forerunner)	25.0	644	1610
Steel wire rope	EN 12385 or equivalent	1770/1960	36 max (4-leg bridle)	25.0	362	904
Link assemblies	EN 1677-4	Grade 8	22/20~40/32 or equivalent	~28.1	~71	~112
Shackles	EN 13889	Grade 6	~35	~13.5	~27	~67.5