

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 and Portable Offshore Units

Issued to

**Redaelli Tecna S.p.A. - Divisione TECI
Castegnato BS, Italy**

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****IMO/MSC Circular 860****EN 13414-1 Wire rope slings****Application :****1-, 2-, 3- & 4- Part Lifting Sets, with Forerunner where fitted for Lifting of Offshore Containers or Portable Offshore Units**This Certificate is valid until **2020-12-19**.Issued at **Høvik** on **2016-12-20**DNV GL local station: **Milan**Approval Engineer: **Igor Antonijevic**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.

Product description

The Type Approval Certificate covers wire rope slings from 18 mm to 52 mm assembled with turn back eye by Redaelli Tecna S.p.A. - Divisione TECI, according to DNV 2.7-1 Offshore Containers or DNVGL-ST-E273 Standard 2.7-3 Portable Offshore Units.

Those wire rope slings assembled by Redaelli Tecna S.p.A. - Divisione TECI consist of components from the following sub suppliers

Component	Sub supplier (DNV GL to be informed and review new sub suppliers)	DNV GL Type Approval Certificate number
Master link & Quad assembly	- Crosby Europe N.V. - Gunnebo Industrier AB	S-7895 S-7154
Wire rope ¹⁾	- Redaelli Tecna SpA - Hascelik Halat - ZDB Dravotna A.S.	NA
Shackles ²⁾	- Gunnebo Anja Industrier AS - Van Beest B.V - Crosby Group LLC	S-7601 S-7593 S-8357
Ferrules ³⁾	- Sahn Splice GmbH	NA (Aluminium)
Thimbles ⁴⁾	- Sahn Splice GmbH - GN Rope Fittings	NA

1) Wire ropes used in fore runner and bottom legs of lifting slings shall be 6-stranded and of type 6x19 or 6x36 and may be fibre cored or steel cored, with wire rope grades 1770 N/mm² or 1960 N/mm², in accordance to 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: According to EN 13411-1 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.

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 report in each sling set certificate where that wire is used.

All production testing should be done according to Redaelli Tecna S.p.A. - Divisione TECI internal procedures IO13.QC.T001_E Rev.3 dated 28.11.2016 and to be agreed with local DNV GL office.

The manufacturer shall issue product certificate according to Section 8.5 in DNV 2.7-1, using the certificate form MP13.QC.T001_E. 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.

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, Sec. 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

Document no.	Rev.	Title
N.LRC 6016946/QMS/A/IT	2016-06-25	Quality Management System Certificate ISO 9001:2008 by Lloyd's Register
IO13.QC.T001_E (7 pages)	3	Instruzione Operativa Type approval DNV – Lifting sets for offshore containers for Certification No. 2.7-1
MP13.QC.T001_E	-	Certificate for Offshore Container Lifting Slings

Initial audit report endorsed by DNV GL Milan dated 2016-06-27.

Breaking test report for 18mm, 28mm, 30mm and 44mm A0207615 witnessed by DNV GL Milan dated 2016-03-29.

Fatigue test report 2016/0872 for 18mm, 28mm, 30mm and 44mm by Politecnico issued in Milan on 2016-05-10.

Additional documents have been used for information only:

List of components suppliers, Declaration of asbestos free product, Ferrule certificate by RINA

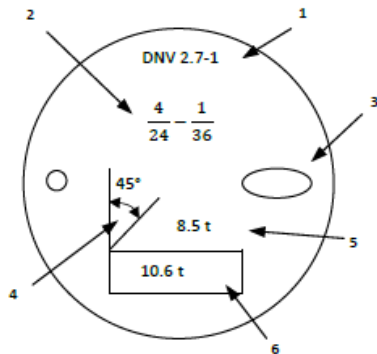
Tests carried out

Prototype test to Breaking Load of assembled wire sling leg.

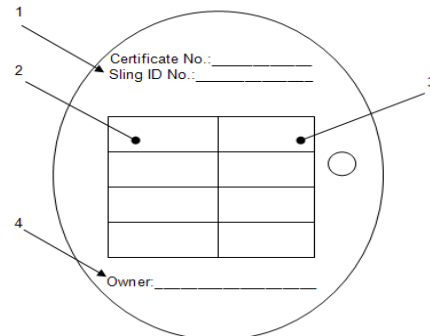
Marking of product

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