Certificate No:
TAS000032B

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

Issued to
Sea Ropes LLC
Houma, LA, USA

is found to comply with
DNV GL standard DNVGL-ST-E271 – 2.7-1 Offshore containers, January 2021
DNV GL standard DNVGL-ST-E273 – 2.7-3 Portable offshore units, December 2016
ISO 10855-2:2018 Offshore containers and associated liftings sets – Part 2: Design, manufacture and testing of lifting sets
IMO/MSC Circular 860
EN 13414-1 Wire rope slings

Application :

1, 2, 3, and 4 leg lifting sets, with forerunner where fitted, for lifting of:
- offshore containers, with maximum gross mass 0 to 25000 kg,
- portable offshore units

Issued at **Aberdeen** on **2021-05-26**
This Certificate is valid until **2026-05-25** .
DNV local unit: **Houston**

Approval Engineer: **Alex Doig**

for **DNV**

Elisabeth Legg
Principal Engineer

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 AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") 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 replaces TAS0000154.

This type approval certificate covers wire rope lifting sets from 18 mm to 90 mm diameter assembled with flemish eyes by Sea Ropes LLC, in accordance with DNVGL-ST-E271 and DNVGL-ST-E273.

Note: turn back eyes with aluminium ferrules may be used once these terminations have been approved and testing witnessed by the local DNV office.

The wire rope lifting sets assembled by Sea Ropes LLC consist of components from the following sub suppliers:

Component	**Sub supplier** *(DNV to be informed and review new sub suppliers)*	**DNV Type Approval reference**
Master link & quad assembly	Crosby Group LLC	TAS00002GF TAS00002KR TAS00002T3
Wire rope [1)]	YoungHeung Iron&Steel Kiswire Limited Manho Rope & Wire Ltd. Chung Woo Rope Co. Ltd. Usha Martin Limited	N/A
Shackles [2)]	Crosby Group LLC Van Beest B.V. Gunnebo-Anja Industrier AS	TAS00002SS TAS00002T2 TAS000011V TAS00001D0 TAS00001B8
Ferrules [3)]	Wirop Industrial Company Limited Crosby Group LLC Muncy Industries	N/A
Thimbles [4)]	SeaLand Muncy Industries Crosby Group LLC Kulkoni Inc. Van Beest B.V.	N/A

1) Wire ropes used in forerunner and bottom legs of lifting sets shall be 6-stranded and of type 6x19 or 6x36 and may be fibre cored or steel cored, with wire rope grades 1770 N/mm^2 or 1960 N/mm^2, in accordance with EN 12385, or equivalent.
2) Shackles are only considered part of the lifting set if captive (i.e. can not be removed after assembly of lifting set).
3) Ferrules/sleeves shall be in accordance with EN 13411-3, or equivalent.
4) Thimbles shall be in accordance with EN 13411-1, or equivalent.

Components shall be delivered with the following certificates:

- Master Links, Quad assemblies and Shackles: Certificates based on DNV Type Approval.
- Wire Ropes: To be supplied with traceable material certificates in accordance with EN 10204, inspection certificate, type 3.1.
- Thimbles and ferrules: To be supplied with a material certificate in accordance with 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 shall 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 carried out according to Sea Ropes LLC internal procedures, to be agreed with the local DNV office.

The manufacturer shall issue product certificates, in accordance with DNV GL-ST-E271 section 8.5 and DNVGL-ST-E273 Section 7.5, using the Sea Rope LLC document SFM-C-001 revision A. These certificates shall only be used for lifting sets certified in accordance with this type approval certificate.

The WLL to be referenced in certificates and marked on lifting sets shall be the maximum working load limit (WLL) of the lifting set, as per the definition in DNVGL-ST-E271.

For lifting sets manufactured in accordance with DNVGL-ST-E271
Lifting sets shall be assembled in accordance with the strength requirements described in DNVGL-ST-E271 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 may be used.

Special lifting sets, assembled in accordance with the principles described in DNVGL-ST-E271 section 8 and appendix E, are also covered by this type approval. If unsymmetrical slings are to be assembled, the local DNV office shall be contacted to review each case, unless otherwise agreed in advance.

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

For lifting sets manufactured in accordance with DNVGL-ST-E273
Prior to selection of the lifting set, the minimum required working load limit (WLL) shall be calculated in accordance with the strength requirements in DNVGL-ST-E273 section 7.3. The resultant sling force (RSF) is provided in the DNV design verification report (DVR) for the portable offshore unit. The DVR should be made available for the lifting set manufacturer.

Type Approval documentation

Tests carried out
Prototype breaking load test of assembled wire rope sling leg.

Marking of product
For lifting sets manufactured in accordance with DNVGL-ST-E271: refer to section 8.7.
For lifting sets manufactured in accordance with DNVGL-ST-E273: refer to section 7.6.

Periodical assessment
In order to maintain the validity of the type approval certificate, periodical assessments should be carried out every 12 months.

END OF CERTIFICATE