

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

SIVA IND E COM DE ARTEFATOS DE ARAME E ACO LTDA
Itaquaquecetuba, Brazil

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

ISO 10855:2018 Offshore containers and associated liftings sets – Design, manufacture, testing, inspection and marking

EN 13414-1 Wire rope slings

IMO/MSC Circular 860

Application :

1, 2, 3, and 4 leg lifting sets, with forerunner where fitted, for lifting of:

- offshore container, with maximum gross mass 0 to 25000 kg,
- portable offshore units

Issued at **Aberdeen** on **2020-05-20**

for **DNV GL**

This Certificate is valid until **2025-05-19** .

DNV GL local unit: **Macaé**

Approval Engineer: **Ronald Quiballo**

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.



Job Id: **262.1-013931-5**
Certificate No: **TAS00002J3**

Product description

This Type Approval Certificate replaces TAS000005E.

The Type Approval Certificate covers wire rope lifting sets described in Appendix 1, assembled by SIVA IND E COM DE ARTEFATOS DE ARAME E ACO LTDA, in accordance with DNVGL-ST-E271 or DNVGL-ST-E273.

The wire rope lifting sets assembled by SIVA IND E COM DE ARTEFATOS DE ARAME E ACO LTDA consist of components from the following sub suppliers:

Component	Sub supplier (DNV GL to be informed and review new sub suppliers)	DNV GL TAC number
Master link & quad assembly	Gunnebo Industrier AB THIELE GmbH & Co. KG Scaw South Africa (Pty) Limited – McKinnon Chain	TAS00000TE TAS00001JS TAS000013Z
Wire rope ¹⁾	SIVA IND E COM DE ARTEFATOS DE ARAME E ACO LTDA	N/A
Shackles ²⁾	Van Beest B.V. Yoke Industrial Corp. THIELE GmbH & Co. KG Gunnebo-Anja Industrier AS	TAS000011V TAS0000241 TAS00000XJ TAS00001B8
Ferrules ³⁾	Qingdao Highton Machinery Co. Ltd. Presstécnica Industria e Comercio Ltda	N/A
Thimbles ⁴⁾	Qingdao Highton Machinery Co. Ltd. Presstécnica Industria e Comercio Ltda	N/A

- 1) Wire ropes used in fore runner 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/mm² or 1960 N/mm², in accordance to 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 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 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 done in accordance with SIVA IND E COM DE ARTEFATOS DE ARAME E ACO LTDA procedures, to be agreed with the local DNV GL office.

The manufacturer shall issue product certificates in accordance with DNVGL-ST-E271 Section 8.5, using the certificate SIVA IND E COM DE ARTEFATOS DE ARAME E ACO LTDA form F-01 Rev. 00. This certificate form is only to 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 GL 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 Resulting Sling Force (RSF) is provided in the DNV GL Design Verification Report (DVR) for the Portable offshore unit. The DVR should be made available for the lifting set manufacturer.

Type Approval documentation

Document No.	Rev.	Title
PIT-007	03	Test Inspection Plan
TB-008	00	Manual De Construção De Lingas
F-01	00	Certificate for Offshore Container Lifting Slings Form
ME-002	01	Inspeção Dimensional Em Arames, Pernas, Almas Cabos e Cordoalhas Com / Sem Revestimento
ME-004	00	Ensaio De Resistência A Tração Em Arames
ME-009	00	Determinação Da Carga De Ruptura Dos Cabos e Cordoalhas
ME-022	01	Inspeção Visual e Dimensional De Cabos e Cordoalhas (Auto-Controle)
ME-024	00	Inspeção Visual e Dimensional De Pernas e Almas Para Cabos e Cordoalhas (Auto-Controle)
ME-025	14	Inspeção Visual e Dimensional De Lingas De Cabo De Aço (Auto-Controle)
IO-034	01	Máquina De Ensaio De Tração Emic DL 100TH
IO-035	00	Prensa Wirop
ISO 9001:2015 QA Certificate for SIVA IND E COM DE ARTEFATOS DE ARAME E ACO LTDA, Cert. No. BR029759 issued by Bureau Veritas.		
Prototype Test Reports No. VRRio.09.091.5.02-0 dated 2009-09-24 and 2009-10-05 endorsed by DNV Rio.		

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In addition the following documents are also used as information:

- Prototype test reports
- Test certificates for:
 - Wire ropes
 - Ferrules
 - Shackles
 - Links
- DNV GL Form CTO 601 "Checklist for Assessment of Manufacturers of Liftings Sets", completed by YANNVI, dated 2019-12-05.
- DNV GL Form CTO 401 "Assessment Report for Lifting Sets", completed by YANNVI, dated 2019-12-05.

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.

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

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Appendix 1

Wire rope slings with Steel ferrules assembled by SIVA IND E COM DE ARTEFATOS DE ARAME E ACO LTDA covered by this Type Approval Certificate:

Product name	Applicable standards	Material grades	Parameter range – typical values			
			SIZE(Ø) [mm]	WLL [t]	PL [t]	BL [t]
Steel wire rope	EN 13414-1 NBR-13541-1 API 9A	1960 N/mm ² EIPS	48 max (fore runner) 32mm (sling legs)	25 for assembly	~131.4 ~29.0	164 72.9
Link assemblies	EN 1677-4	Grade 8	~25/20~40/33	~28.1	~71	~112
Shackles	EN 13889	Grade 6	~35	~13.5	~27	~67.5