

# TYPE APPROVAL CERTIFICATE

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**This is to certify:**

**that the lifting set component for offshore containers and portable offshore units**

with type designation(s)  
**Shackles (M1106)**

issued to

**PROVEEDOR INDUSTRIAL QUALITY, S.A. DE C.V.**  
**VILLAHERMOSA, TABASCO, Mexico**

is found to comply with

**DNV standard DNV-ST-E271 – 2.7-1 Offshore containers, March 2023**  
**DNV standard DNV-ST-E273 – 2.7-3 Portable offshore units, April 2016 (Amended May 2022)**  
**ISO 10855-2:2018 Offshore containers and associated liftings sets – Part 2: Design, manufacture and testing of lifting sets**  
**EN 13889 Forged steel shackles for general lifting purposes - Dee shackles and Bow shackles - Grade 6 - Safety**

**Application:**

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Issued at **Aberdeen** on **2024-01-23**

This Certificate is valid until **2029-01-22**.

for **DNV**

DNV local unit: **Shanghai**

Approval Engineer: **Elisabeth Legg**

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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.



**Manufactured by**

Manufacturing of the products is undertaken at the following location:

Place of manufacture	Activities	Local DNV office
	<ul style="list-style-type: none"> <li>• forging of shackle bows</li> <li>• forging of shackle pins</li> <li>• machining of parts</li> <li>• quenching and tempering shackle bows and pins</li> <li>• coating the parts</li> <li>• assembly of parts</li> <li>• QC activities: inspection, testing and issuance of product certificates.</li> </ul>	Shanghai

**Responsibility**

Provedor Industrial Quality S.A. de C.V. takes responsibility that both design and production at all places of manufacture are in compliance with the Rules, Standards and/or Regulations listed on page 1 of this type approval certificate.

**Product description**

This type approval covers shackles for use in lifting sets for offshore containers certified in accordance with DNV-ST-E271 or portable offshore units certified in accordance with DNV-ST-E273:

Detailed product information and range of certified products covered by this type approval are listed in Appendix 1.

**Application/Limitation**

Minimum design temperature: -40°C (Grade 6)

The shackles are approved for use in lifting sets that comply with DNV-ST-E271 or DNV-ST-E273. The company performing the assembly of the lifting sets is considered to be the lifting set manufacturer.

The minimum shackle working load limit (WLL<sub>s</sub>) shall be carried out in accordance with the requirements for lifting sets of offshore containers in DNV-ST-E271 section 8.

Tests to be carried out:

- Production testing: in accordance with DNV-ST-E271 and EN 13889 in agreement with the local DNV office.
- Material to be impact tested by Charpy impact method in accordance with DNV-ST-E271 section 8.4.

Provedor Industrial Quality S.A. de C.V. shall issue product certificates in accordance with DNV-ST-E271 section 8.5 and DNV-ST-E273 section 7.5, using the certificate form no. TA-M2-F1. This certificate shall only be used for shackles certified in accordance with this type approval.

**Application of shackles certified in accordance with DNV-ST-E271**

The required Working Load Limit (WLL) for a given container rating should be determined in accordance with DNV-ST-E271 Table 8-1. In no case should an offshore container lifting set WLL be less than 7.0 tonnes.

**Application of shackles certified in accordance with DNV-ST-E273**

Prior to selection of shackles, the minimum required working load limit (WLL) shall be determined in accordance with the strength requirements for lifting sets on portable offshore units as given in DNV-ST-E273 section 7.3.2 and must be approved by DNV. Resultant sling force (RSF) can be found in the design verification report (DVR) issued by DNV for the portable offshore unit.

Shackles that will experience significant out-of-plane loading, shall be de-rated in accordance with the guidance provided in DNV-ST-E273 section 7.3.3.



Job ID: **262.1-040190-1**  
Certificate no.: **TAS000040X**

## Type Approval documentation

### Tests carried out

Prototype testing shall be carried out in accordance with DNV-ST-E271 and EN 13889.

### Marking of product

Components shall be marked in accordance with DNV-ST-E271 section 8, EN 13889 and Provedor Industrial Quality S.A. de C.V. internal procedures.

### Periodical assessment

In order to maintain the validity of the type approval certificate, periodical assessments should be carried out at all manufacturing locations every **6 months** in accordance with DNV-SE-0284. Periodical assessments will, when possible, be harmonised with other surveys and audits carried out.

This certificate is only valid if required periodical assessments are carried out with satisfactory results. To check the validity of this certificate, please look it up in <https://approvalfinder.dnv.com>

## Appendix 1

Product description and details

Item No.	Working Load Limit (WLL) [t]	Manufacturing Proof Force <sup>1)</sup> (MPF) [kN]	Minimum Breaking Force <sup>1)</sup> (BF) [kN]	Safety Factor
M1106-5/8	3.25	63.7	160	5
M1106-3/4	4.75	93.1	233	5
M1106-7/8	6.5	128	319	5
M1106-1	8.5	167	417	5
M1106-1 1/8	9.5	187	466	5
M1106-1 1/4	12	236	589	5
M1106-1 3/8	13.5	265	662	5
M1106-1 1/2	17	334	834	5
M1106-1 3/4	25	491	1226	5

1) In accordance with EN 13889 Table 4 (up to 25 tonnes).