

TYPE APPROVAL CERTIFICATE

This is to certify:

That the **Lifting Gear**

with type designation(s)
TubeLock® accessories

Issued to

Global Gravity ApS
Esbjerg N, Syddanmark, Denmark

is found to comply with

Application :

NORSOK R-002, 2017 "Lifting equipmnet" Annex C – Group R5 – Spreader and special design for offshore lifting

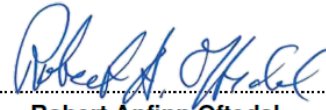
Issued at **Bergen** on **2021-03-26**

This Certificate is valid until **2026-03-26**.

DNV local station: **Bergen & Stavanger - Cranes & Lifting Operations**

Approval Engineer: **Valentyn Skudra**

for DNV



Robert Anfinn Oftedal
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.

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

The TubeLock system is reviewed with the following main design parameters:

- Categorization: Annex C – Group R5 – “Spreader and special design”
for offshore lifting (Annex F, group F5 “Lifted object” is used in design)
- WLL lifting system: 8.6 tonne
- DAF: 2.07
- DF (Structure): 1.48
- DF (Lifting points): 1.68
- Longitudinal sling angle: 65 deg
- Transverse sling angle: 60 deg
- Design temperature: - 20 deg C

The system can be configured from the following components:

<i>Product description</i>			<i>Operational limitations</i>	
<i>Accessory¹</i>	<i>Description</i>	<i>Reference document</i>	<i>WLL^{2,3,4}</i>	<i>Max. DAF</i>
Lifting poles	Length range 570 – 1270mm	DS-LP-Product program	2.23 tonne	2.07
Lifting beams TL-Profiles 1000 - H profiles	fit for pipes diameter range 90,7- 278,5mm	DS-1000-H-Profile Product program	4.5 tonne	2.07
Lifting beams TL-Profiles 1200 - H profiles	fit for pipes diameter range 61,5- 362,7mm	DS-1200-H-Profile Product program	4.3 tonne	2.07

1) see TL-TU-Combination-0001-1 Rev. 4 and TL-TU-Combination-0001- Rev. 4 for the identification of all TubeLock assemblies' configurations (combinations between the lifting poles and the lifting beams) covered by this Type approval.
 2) SWL = Safe Working Load
 3) see Lifting arrangement drawing no. T-0001-0000-GG-X-0003 Rev. B for description of the lifting configurations covered by this Type approval.

- No. of slings per lifting assembly: 4
- Max sling angle to vertical (in plane with the padeyes): 25deg

4) The lifting system SWL = 8.6t (for the TubeLock assembly as shown in the Lifting arrangement drawing no. T-0001-0000-GG-X-0003 Rev. B).

Application/Limitation

1. The design of lifting set (hook, slings, shackle) is not covered.
2. The structural integrity of the tubular payload is not covered.
3. Each pipe size can be delivered with different wall thickness, hence weight of elementary pipe cannot be exactly defined. The operator is responsible to control that the total weight of the system in assembly will not be higher than WLL. This may require limiting the amount of pipes.
4. Position of COG is considered to be right below the lifting point. The operator is to ensure that no transverse COG repositioning occurs due to payload positioning within the system.
5. Review is based on existing Type approval certificate no. BGN19-9379
6. The system is valid for tube size between 2 2/8" and 14"

Type Approval documentation

Documents listed in approval letter no. O-NM-CLOB/VALSK/346.1-J-5090 are used for this type approval

Tests carried out

Following test reports are used as the basis for the type approval:
 DNV GL visit report no. 7491



Job Id: 262.1-035723-1
Certificate No: BGN21-9488

Certification by Enterprise of Competence

This certificate covers only design of the equipment.

If equipment is to be used in NORSOK R-003 regulated object – a certificate by DNV Enterprise of Competence is to be issued.

In order to obtain the certificate initial control/testing by enterprise of competence is to be undertaken.

Marking of product

Product is to be marked as per NORSOK R-002:2017, p. 5.26.