DNV·GL

Certificate No:
TAP00001HX

TYPE APPROVAL CERTIFICATE

This is to certify:

That the LNG/LPG Loading hoses

with type designation(s)
GASSOFLEX LNG CRYOGENIC

Issued to
GASSO EQUIPMENTS S.A.
Sant Boi de Llobregat, Barcelona, Spain

is found to comply with
DNV GL rules for classification – Ships Pt.5 Ch.7 Liquefied gas tankers
DNV GL class programme DNVGL-CP-0183 – Type approval – Flexible hoses

Application :

Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV GL.

Temperature range:	**-196 to 50 °C**
Max. working press.:	**21 bar(g)**
Sizes:	**DN 80, 100, 150 & 200**

Issued at **Høvik** on **2019-01-16**
This Certificate is valid until **2024-01-15**.
DNV GL local station: **Barcelona**

for **DNV GL**

Approval Engineer: **Maheshraja Venkatesan**

Marianne Spæren Marveng
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.

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Product description

Thermoplastic multi-layer flexible hose assemblies for carrying liquefied natural gas tested according to IGC Code Chapter 5.11.7 with the following construction:

- An internal wire helix of stainless steel confirming to 1.4401 from EN 10088-3
- A multi-ply wall of layers of films and fabrics made of thermoplastics to provide a complete seal
- An external wire helix if stainless stell confirming to 1.4401 from EN 10088-3

End fittings & metallic ferrules made of:

- stainless steel 1.4401 from EN 10088-3 for both type 1 & type 2 hoses

Hoses and end fittings are manufactured by:
GASSO EQUIPMENTS S.A., Sant Boi de Llobregat, Barcelona, Spain

Application/Limitation

This certificate is valid for the specific assembly of hose and coupling type as specified, assembled and delivered by the holder (named as manufacturer) of this certificate.

The transfer hoses may be used for temporary filling and discharge of LNG and not to be permanently fitted.

The scope of approval does not cover the hose handling device(s) (padeye or lifting lugs, collars, etc.)

Hoses covered by this certificate shall not be subject to axial load during operation.

For all types of end fittings, that part of the fitting that enters the hose and forms the means by which the fitting is connected to the hose shall be provided with scrolls or protrusions on the surface that correspond to the pitch of the internal helix wire of the hose.

When assembled to a hose there shall be electrical continuity between the end fitting and the internal and external wires.

Production testing

Each hose assembly covered by this certificate shall be hydrostatically tested at ambient temperature to a pressure equal to 1.5 times maximum working pressure before being placed in service.

Type Approval documentation

Tests carried out

Cyclic test followed by burst testing at minimum & maximum design temperatures (IGC Code Ch. 5.11.7.3), LNG exposure testing on hose materials (IGC Code Ch. 5.11.7.1), Corrosion testing, Elongation on film & fabric, Diameter check, Proof pressure, bend, Security of end fittings, Change in length, Twist, Crush, Ozone, Thermal ageing, Low temperature flexibility, Electrical resistance & Leak tightness

Marking of product

Each hose assembly shall be permanently marked by the manufacturer with the following details:

- Hose manufacturer’s name or trademark;
- Date of manufacture (month/year);
- Designation type reference;
- Nominal diameter;
- Pressure rating;
- Temperature rating

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNVGL-CP-0338.