

# TYPE APPROVAL CERTIFICATE

Certificate No:  
**TAP00000ZA**  
Revision No:  
**2**

## This is to certify:

**That the Flexible Hoses of Non-Metallic Material with Permanently Fitted Couplings**

with type designation(s)

**Class A Type 1, Class B Type 1, Class A Type 2, Class B Type 2**

Issued to

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

is found to comply with

**EN 13766:2018 Thermoplastic multi-layer (non-vulcanized) hoses and hose assemblies for the transfer of liquid petroleum gas and liquefied natural gas – Specification**

## Application :

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Type:	Temperature range:	Max. working press.:	Sizes:
Class A Type 1	-50 to +45 °C	25 bar(g)	Internal diameter (mm): 25,40, 50 & 80
Class B Type 1	-50 to +45 °C	20 bar(g)	Internal diameter (mm): 25, 40, 50, 80, 100, 150, 200 & 250
Class A Type 2	-196 to +45 °C	13 bar(g)	Internal diameter (mm): 25, 40, 50 & 80
Class B Type 2	-196 to +45 °C	10,5 bar(g)	Internal diameter (mm): 25, 40, 50, 80, 100, 150, 200 & 250

Issued at **Høvik** on **2023-01-11**

for **DNV**

This Certificate is valid until **2028-01-10** .

DNV local unit: **Barcelona FIS**

Approval Engineer: **Maheshraja Venkatesan**

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**Bosman van der Merwe**  
**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

Two types of thermoplastic multi-layer hose assemblies for carrying liquefied petroleum gas (Type 1) and liquefied natural gas (Type 2) with the following construction:

- Class A (for onshore applications):
  - An internal wire helix of stainless steel conforming 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 of stainless steel conforming to 1.4401 from EN 10088-3
- Class B (for offshore applications):
  - An internal wire helix of stainless steel conforming 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 of stainless steel conforming to 1.4401 from EN 10088-3

End fittings & metallic ferrules are made of:

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

## Application/Limitation

This Type Approval certificate is not valid for designs, components, equipment, systems or products which are subject to classification by DNV.

This Type Approval covers design(s) only. i.e. the Type Approval is not valid for the final product, but may be used as basis for obtaining a product certificate.

Pressure/temperature details:

Pressure/ temperature	Class A	Class B	Class A	Class B
	Type 1	Type 1	Type 2	Type 2
Maximum working pressure (bar)	25	20	13	10,5
Proof pressure (bar)	37.5	30	19.5	15.8
Minimum burst pressure (bar)	100	100	52	52,5
Temperature range (°C)	-50 to +45	-50 to +45	-196 to +45	-196 to +45

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/ Routine testing

Routine tests shall be carried out on each hose assembly and in accordance with Annex G of EN 13766:2018.

## Type Approval documentation

<u>Document No.</u>	<u>Rev.</u>	<u>Title</u>
-	-	Consolidated test reports for LNG class A sizes: 1" dated 2017-10-19; 1.5", 2" & 3" dated 2017-03-27
-	-	Consolidated test reports for LNG class B sizes: 4" dated 2017-10-23, 6" dated 2017-10-19, 8" & 10" dated 2017-03-28;
-	-	Consolidated test reports for LPG class A sizes: 1" dated 2017-03-22; 1.5", 2", 3" dated 2017-03-22
-	-	Consolidated test reports for LPG class B sizes: 4" dated 2017-10-23, 6", 8" & 10" dated 2017-03-22
-	-	Low temperature flexibility test reports rev. 1 for all variants dated 2017-06-26
GSS_LNG_13766_2018_1pulz_I Rev02	-	PROCEDURES AND RESULTS OF THE LNG HOSES 1pulz_signed V02 dated 18 Nov 2022
GSS_LNG_13766_2018_3pulz_I Rev01	-	PROCEDURES AND RESULTS OF THE LNG HOSES 3pulz_signed V01 dated 18 Nov 2022
GSS_LNG_13766_2018_10pulz_I Rev02	-	PROCEDURES AND RESULTS OF THE LNG HOSES 10pulz_signed V02 dated 18 Nov 2022
GSS_LPG_13766_2018_1pulz_I Rev02	-	PROCEDURES AND RESULTS OF THE LNG HOSES 1pulz_signed V02 dated 18 Nov 2022

GSS_LPG_13766_2018_3pulz_I Rev02	-	PROCEDURES AND RESULTS OF THE LNG HOSES 3pulz_signed V02 dated 18 Nov 2022
GSS_LPG_13766_2018_10pulz_I Rev02	-	PROCEDURES AND RESULTS OF THE LNG HOSES 10pulz_signed V02 dated 18 Nov 2022
GSS_DNV_LNG_13766_2018_1pulz_00	-	PHYSICAL PROPERTIES OF HOSE LNG 1" - Burst test report witnessed by DNV dated 2022-05-06
GSS_DNV_LNG_13766_2018_3pulz_00	-	PHYSICAL PROPERTIES OF HOSE LNG 3" - Burst test report witnessed by DNV dated 2022-05-06
GSS_DNV_LNG_13766_2018_10pulz_00	-	PHYSICAL PROPERTIES OF HOSE LNG 10" - Burst test report witnessed by DNV dated 2022-05-06
GSS_DNV_LPG_13766_2018_1pulz_00	-	PHYSICAL PROPERTIES OF HOSE LPG 1" - Burst test report witnessed by DNV dated 2022-05-06
GSS_DNV_LPG_13766_2018_3pulz_00	-	PHYSICAL PROPERTIES OF HOSE LPG 3" - Burst test report witnessed by DNV dated 2022-05-06
GSS_DNV_LPG_13766_2018_10pulz_00	-	PHYSICAL PROPERTIES OF HOSE LPG 10" - Burst test report witnessed by DNV dated 2022-05-06
22/36601526	-	Annex A – PHYSICAL PROPERTIES OF HOSE – 3 OZONE RESISTANCE dated April 11 <sup>th</sup> 2022
SPT/0594/22	-	Annex B – PHYSICAL PROPERTIES OF HOSE – 2 ELONGATION OF HOSE FABRIC dated 13/04/2022
RDP-1021-22	-	Annex C – PHYSICAL PROPERTIES OF HOSE – 2 ELONGATION OF HOSE FILM dated 21/10/2022
-	-	Document titled 'Resumen Ensayo'

### Tests carried out

Elongation on film & fabric, Diameter check, Proof pressure, bend, Security of end fittings, Change in length, burst, Twist, Crush, Ozone, Thermal ageing, Low temperature flexibility, Electrical resistance & Leak tightness

### Marking of product

Minimum marking requirements shall be as outlined in the product standard EN 13766:2018 [10].

### Periodical assessment

For retention of the Type Approval, a DNV 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 DNV-CP-0338.

Type testing shall be repeated as per Table H.1 of EN 13766:2018 at a maximum of five-year intervals or whenever a change in the materials and/or method of manufacture is made.