

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Flexible hoses of metallic material with permanently fitted couplings

with type designation(s)

Single braid (SCE10231), Double braid (SCE10230)

Issued to

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

is found to comply with

ISO 10380:2012 – Pipework – Corrugated metal hoses and hose assemblies

ISO 21012:2018 – Cryogenic vessels – Hoses

Application :

Metallic flexible hose assemblies used for the transfer of cryogenic fluids acc. to ISO 21012. For other media acc. to ISO 10380.

This certificate is not valid for hose assemblies which are subject to classification by DNV.

Type:	Temperature range:	Max. working press.:	Sizes:
Single braid (SCE10231)	-196°C to 120°C	See page 2	See page 2
Double braid (SCE10230)	-196°C to 120°C	See page 2	See page 2

Issued at **Høvik** on **2023-03-16**

This Certificate is valid until **2028-03-15** .

for **DNV**

DNV local unit: **Area NB/CMC Iberia**

Approval Engineer: **Andreas Hansen**

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Zeinab Sharifi
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 type 1-10 corrugated flexible metal hoses with one or two layers of wire braid reinforcement with welded swivel joint end fittings, for transfer of cryogenic fluids according to ISO 21012, and for other medium as per ISO 10380.

Materials:

Hose	: AISI 316
Braid reinforcement	: AISI 304
End pipe	: SS-304, SS-316
Ferrule	: SS-304, SS-316
End fittings	: SS-304, SS-316, Grade 6 Carbon Steel

Hose and coupling manufacturer: Aeroflex Industries Ltd
Chal, near M.I.D.C, Taloja Chot Camp, Panvel
Raigad, Maharashtra 410 208

Application/Limitation

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

Maximum working pressure of each hose assemblies shall be as follows:

Size		Design pressure [bar]	
Inch	DN	SSHCG1	SSHCG2
1/2	12	60	108
3/4	20	50	90
1	25	40	75
1 1/2	40	35	56
2	50	30	48
3	80	-	20

The flexible hoses shall not be subjected to multiple wide/significant moves when under pressure.

Materials and material protection chosen for the specific system shall be suitable for the intended medium and environmental conditions.

Fittings for corrugated metal hose assemblies shall conform to ISO 10806.

Hose assemblies arranged in LNG, gas or low flashpoint fuel piping systems and installed in enclosed spaces may require a secondary barrier.

The maximum allowable pressure for elevated temperatures shall be derated as per ISO 10380 – Table 3.

Type Approval documentation

Production Test

After manufacture every hose assembly shall be subjected to production testing as listed in standards referenced in this certificate:

- ISO 10380 [6.6.1]: Final assessment
- ISO 21012 [6]: Production testing

Tests carried out

- ISO 10380: Leak tightness, pressure resistance, elongation, electric conductivity, burst, pliability and fatigue test.
- ISO 21012: Documentation of material, dimensional check, cleanliness test, pressure test, leak tightness, hydraulic pressure cycling, hydraulic burst test and examination of sectional cut.

Marking of product

Minimum marking requirements shall be as outlined in the design standard(s) ISO 10380 [7.4] and ISO 21012 [7]

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 demonstrated at regular intervals as part of Factory Production Control with minimum frequency of tests to be carried out as per Table 13 of ISO 10380:2012.