Certificate No:
TAP00002E7

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Flexible hoses of metallic material with permanently fitted couplings

with type designation(s)
LNG

Issued to
ELAFLEX HIBY GmbH & Co. KG
Hamburg, **Germany**

is found to comply with
ISO 21012:2018 – Cryogenic vessels – Hoses
ISO 10380:2012 – Pipework – Corrugated metal hoses and hose assemblies

Application :

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

Temperature range:	**-196°C up to +85°C**
Max. working press.:	**40 bar**
Sizes:	**DN 10 up to DN 40**

Issued at **Hamburg** on **2021-08-30**
This Certificate is valid until **2026-08-29** .
DNV local unit: **Hamburg – CMC North/East**

Approval Engineer: **Hagen Markus**

for **DNV**

Olaf Drews
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

Hose assemblies made of stainless-steel corrugated hoses with welded end fittings, ready for installation.
Design according to ISO 10380 and ISO 21012.

Hose types	Nominal size
LNG 10	3/8" (DN10)
LNG 13	1/2" (DN12)
LNG 16	5/8" (DN15)
LNG 19	3/4" (DN20)
LNG 25	1" (DN25)
LNG 32	11/4" (DN32)
LNG 38	11/2" (DN40)

	Standard	Type designation
Hose end fittings	ISO 10806	Fittings on corrugated metal hoses
	EN 1092, ASME B17.5	Flange connections
	ISO 6761	Weld ends
	SAE J512	45° threaded connection
	SAE J514	37° threaded connection

Materials

Component	Material Codes EN / AISI	Delivery standard
Hose end fitting		
Stud	1.4404 / 316L	EN 10088-3
Nut	2.0966	EN 12163
Wire	1.4301 / 304	EN 10088-3
Hose		
Ferrule	1.4404 / 316L	EN 10088-3
Braid	1.4404 / 316L	EN 10088-3
Corrugated hose	1.4404 / 316L	EN 10088-3

Production places of hose assemblies

Manufacturing place	Workshop approval
ELAFLEX HIBY GmbH & Co. KG, Hamburg, Germany	PEDE10000003
ELAFLEX N.V. Merksemsesteenweg 192, B – 2100 Deurne, Belgium	PEDA10000022

Application/Limitation

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

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

Hose end fittings

This type approval certificate includes standard hose end fittings with pipe connection design as follows.
Reference “ELAFLEX HIBY GMBH & Co. KG. – Installation and Operating Manual” for metallic flexible hose assemblies.

Standard	Type designation
ISO 10806	Fittings corrugated metal hoses
SAE J512	45° threaded connection
SAE J514	37° threaded connection
EN 1092 / ASME B 16.5	Flange connection
ISO 6761	Weld ends

Service temperature[1] and service pressure

Application acc. to standard	
ISO 10380	**ISO 21012**
Service temperture	
-196°C up to +85°C	-196°C up to +85°C
Service pressure (gauge)	
PS 3,4MPa	PS 4,0MPa

Note
[1] For media temperatures up to 100°C no pressure reduction factors are applicable. Reference ELAFLEX LNG Truck hose Specification and verification of selected materials, ID 10100989.

Production testing

Application acc. to ISO 10380

- ISO 10380 - Section 6.5 Factory production control (FPC)

Application acc. to ISO 21012

- ISO 21021 - Section 6 Production testing

Installation

“ELAFLEX HIBY GMBH & Co. KG. – Installation and Operating Manual” for metallic flexible hose assemblies.

Type Approval documentation

Tests carried out

ISO 10380:2012
Leak tightness test, Elongation test, Burst test, Fatigue test

ISO 21012:2018
Documentation of materials, Dimensional check, Cleanliness test, Pressure test, Leak tightness, Crushing test, Hydraulic pressure cycling, Rolling bend cycling test, Hydraulic pressure test, Examination of sectional cut

Marking of product

For traceability to this type approval each hose end fitting is to be marked with:

Scope	Example
Manufacturer's name or trademark	ELAFLEX
Type	LNG 25 PN 40
Hose standard	ISO 10380 PS 3.4MPa
	ISO 21012 PT 6.0MPa
Service temperature range	TS -196/+85°C
Material Hose	316L
ELAFLEX HIBY GmbH Serial number / year / week	xxxxxxxxxx / yy / ww

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment to verify that the conditions for the Type Approval are complied with. Refer to the Class Programme DNV GL-CP-0338, Sec.4.

To check the validity of this certificate, please look it up in https://approvalfinder.dnvgl.com

End of certificate