DNV·GL

Certificate No:
TAP00001TJ

TYPE APPROVAL CERTIFICATE

This is to certify:

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

with type designation(s)
TX.M.8850.50 / TX.M.8850.51, TX.M.885V.50 / TX.M.885V.51, TX.M.885S.50 / TX.M.885S.51

Issued to
Tubiflex S.P.A.
Orbassano TO, Italy

is found to comply with
DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018
DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems
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.

Type:	Temperature range:	Max. working press.:	Sizes:
TX.M.8850.50 / TX.M.8850.51 **TX.M.885V.50 / TX.M.885V.51** **TX.M.885S.50 / TX.M.885S.51**	**0 ºC to 205 ºC**	**See page 2**	**DN10, 12, 16, 20, 25, 32, 40, 50, 65, 75**

Issued at **Høvik** on **2019-04-30**
This Certificate is valid until **2024-01-23**.
DNV GL local station: **Milan**

Approval Engineer: **Iselinn Vindstad**

for **DNV GL**

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

Flexible hoses of PTFE material with permanently fitted couplings.

Hose types:
TX.M.8850.50 – one braid, white PTFE
TX.M.8850.51– one braid, white PTFE + inner layer of conductive (black) PTFE
TX.M.885V.50 – one braid, white PTFE, fiberglass sleeve
TX.M.885V.51 – one braid, white PTFE + inner layer of conductive (black) PTFE, fiberglass sleeve
TX.M.885S.50 – one braid, white PTFE, silicone fiberglass sleeve
TX.M.885S.51– one braid, white PTFE + inner layer of conductive (black) PTFE, silicone fiberglass sleeve

Couplings:
TX.R.1110 – Fixed male tapered thread
TX.R.1121T – Fixed male cylindrical thread coated in PTFE
TX.R.2221 – Swivel female with flat seat
TX.R.2221T – Swivel female with flat seat coated in PTFE. TX.R.2222 Swivel female with conical seat
TX.R.3100 – Pipe-end for cutting ring (DIN2353)
TX.R.3100S – Weld-end (gas pipe sizes)
TX.R.6101 – Flange retainer
TX.R.6101T – Flange retainer coated in PTFE
TX.R.51001 – Swivel flange

Materials:

Hoses	PTFE			
Braiding	Stainless steel	AISI 304	1.4301	EN 10088-3
		AISI 316L	1.4404	EN 10088-3
Couplings	Stainless steel	AISI 316L	1.4404	EN 10088-1
		AISI 304	1.4301	EN 10088-1
		AISI 321	1.4541	EN 10088-1
		AISI 303	1.4305	EN 10088-3
		AISI 316Ti	1.4571	EN 10088-1
	Carbon steel	SA-105		ASME
		SA-516 Gr. 60, 65, 70		ASME
		SA-350 LF2		ASME
		S235JR	1.0038	EN 10025-2
		P235GH	1.0345	EN 10028-2
		P235TR1	1.0254	EN 10216-1 / EN10217-1
		P245GH	1.0352	EN 10222-2
		P265GH	1.0425	EN 10028-2
		P280GH	1.0426	EN 10222-2
		P295GH	1.0481	EN 10028-2
		P305GH	1.0436	EN 10222-2
		P355GH	1.0473	EN 10028-2

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.

Application: hydraulic and lubricating oil, fuel oil, bilge, ballage, compressed air, fresh water, seawater, steam, condensate, scrubber, wet fire extinguishing and sanitary systems.

Hose with PTFE covered couplings may be used in seawater applications, all other hoses are not accepted to be used in seawater applications.

Maximum working pressure:

Size (DN)	All models
10	125 bar
12	105 bar
16	100 bar
20	90 bar
25	80 bar
32	64 bar
40	53 bar
50	35 bar
65	25 bar
75	20 bar

For a temperature range 50°C to 205°C working pressures shall be reduced with the following derating factors (the lowest of factor for coupling and PTFE hose to be used):
Based on coupling material:

Temperature °C		20	50	100	150	200	250
Material	1.4404	1	0.88	0.74	0.67	0.62	0.58
	1.4301	1	0.88	0.73	0.66	0.60	0.56
	1.4541	1	0.92	0.83	0.78	0.74	0.71
	1.4571	1	0.90	0.81	0.76	0.73	0.69
	1.4305	1	0.95	0.85	0.77	0.71	0.67

Based on PTFE hose material:

Temperature °C	20	50	100	150	205	250
Factor	1	0.97	0.93	0.89	0.84	0.58

Flexible hoses are only to be used where it is necessary due to vibrations or flexible mounting of the machinery. The hoses shall not replace/be used where permanent piping is possible/required. The hoses must only be fitted on places where they are always accessible for inspection.

The hoses are not to be used in systems where pressure pulsations may occur.

Hose assemblies covered by this certificate shall not be used in LNG/LPG systems.

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

The hoses TX.M.8850.50, TX.M.8850.51, TX.M.885S.50, TX.M.885S.51 are considered fire safe, and may be used in systems where fire safe application is required.

It must be possible to shut off from the system all hoses used in the fuel oil, lubricating oil and compressed air systems.

The hoses are to be mounted according to the manufacturer's instructions.

Welding shall fulfill requirements in DNV GL Rules Pt.2 Ch.4. 100% liquid penetrant inspection may be used in lieu of volumetric inspection for double walled designs.

End connections shall fulfil the restrictions in Pt.4 Ch.6 Sec.9 [5] and Pt.6 Ch.2 Sec.5 [11.2] as below:

- Flanges with their pressure-temperature ratings shall be in accordance with a recognised international standard.
- For general machinery systems: threaded joints having pipe threads where pressure-tight joints are made on the threads:

1) with parallel or tapered threads, shall comply with requirements of a recognized national or international standard.
2) Shall not be use for piping systems conveying toxic or flammable media or services where fatigue, severe erosion or crevice corrosion is expected to occur.
3) For cases other than (2), tapered threads are only to be used for outside diameters:
    - not more than 33.7 mm, for class I piping systems
    - not more than 60.3 mm, for class II and III piping systems
4) For cases other than (2), parallel thread are only allowed for class III piping systems where outside diameter is not more than 60.3 mm.

- For general machinery systems: Mechanical joints other than standard bolted flanges are not covered by this certificate and shall be type approved separately in accordance with DNVGL-CP-0185

Production testing

Each hose assembly shall be hydrostatically tested at a hydrostatic pressure of 1.5 times the maximum working pressure and shall be delivered with the pressure test report with reference to the type approval certificate. (No product certificate is required).

Type Approval documentation

Tests carried out

Dimensional check, change in length, leakage test, vacuum, fire test, burst pressure test

Marking of product

For traceability to this Type Approval, the products are at least to be marked with:

- 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.