



CERTIFICATE NUMBER 19-GE1826122-PDA

EFFECTIVE DATE 05-Feb-2019

EXPIRATION DATE 04-Feb-2024

ABS TECHNICAL OFFICE GENOVA ENGINEERING

CERTIFICATE OF

## Product Design Assessment

This is to certify that a representative of this Bureau did, at the request of

**TUBIFLEX S.P.A.**

located at

**Strada Torino, 25  
Orbassano (TO), ITALY**

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

**Product Stainless Steel Corrugated Metal Hoses**

**Model PARFLEX  
SP.M.9600 – SP.M.9650 – SP.M.9655 / SP.M.9700 – SP.M.9750 – SP.M.9755**

This Product Design Assessment (PDA) Certificate remains valid until 4 February 2024 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

American Bureau of Shipping

  
Cristina Generale, Senior Engineering

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010)

## **TUBIFLEX S.P.A.**

FABBRICA TUBI METALLICI FLESSIBILI

STRADA TORINO, 25

ORBASSANO

Italy 10043

Telephone: +39 011 9033201

Fax: +39 011 9033215

Email: [direzione@tubiflex.com](mailto:direzione@tubiflex.com)

Web: [www.tubiflex.com](http://www.tubiflex.com)

**Tier: 3 - Type Approved, unit certification not required**

---

**Product:** Stainless Steel Corrugated Metal Hose

**Model:** PARFLEX

**SP.M.9600 - SP.M.9650 - SP.M.9655 / SP.M.9700 - SP.M.9750 - SP.M.9755**

**Intended Service:**

Fuel oil, lube oil, fresh and sea water, sanitary, steam, condensate, compressed air, inert gas, compressed gases and technical gases systems.

Fixed fire-fighting systems including sprinkler and carbon dioxide systems.

Cryogenic systems including liquid natural gas (LNG) system.

Refrigerant systems including ammonia system.

**Description:**

Annular corrugated stainless steel flexible hoses, unbraided or reinforced with one or two s/s wire braids.

Size range: from DN10 (3/8") to DN300 (12").

Corrugated hose materials are 1.4541 (AISI 321), 1.4404 (AISI 316L) EN 10028-7 or 2.4819 DIN 17750 (Hastelloy C276).

All flexible hoses are provided with end fittings TIG welded to the corrugated hose and to the wire braids as per MC TF 001 Specification.

**Rating:**

Maximum Working Pressure: up to 105 bar depending on the hose size and on the number and type of braids. For additional details see technical data sheets in Attachment.

Temperature rating: from -200° to +550°C.

**Service Restriction:**

1) For working temperatures above 50°C, design pressure has to be reduced by applying relevant derating factor provided at table B205 in Attachment.

2) When flexible hoses are intended to be used for cryogenic services (working temperature below -55°C), only sizes from DN10 (3/8") to DN150 (6") are to be used and maximum working pressure has to be reduced to 80% of rated design pressure.

3) Flexible hoses are not to be used for following services:

- High pressure fuel oil injection systems
- Cryogenic systems where hoses are arranged to compensate ship deformation loads
- Cargo transfer systems

4) Unit Certification is not required for this product. If the manufacturer or purchaser requests an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.

**Comments:**

- Flexible hoses are to be complete with factory assembled end fittings or factory supplied end fittings installed in accordance with Manufacturer's specifications as per Par. 4-6-2/5.7.3(b) of ABS Marine Vessel Rules.

- End connections are to comply with the applicable requirements and limitations of ABS Marine Vessel Rules (e.g. 4-6-2/5.5.4, 4-6-2/5.5.5, 4-6-7/3.5.1, 4-6-7/5.3.2).

- As per 4-6-2/5.7.4 of ABS Marine Vessel Rules, hose assemblies are to be installed only where flexibility is required, in clearly visible and readily accessible locations and are not to be subject to torsional deflection under normal conditions. Hose length is to be limited to that required by flexibility only.

- According to 4-6-2/5.7.6 of ABS Marine Vessel Rules, flexible hoses are to be permanently marked by the manufacturer with the following details:

- Hose manufacturer's name or trademark
- Date of manufacturer (month/year)
- Designation type reference
- Nominal diameter
- Pressure and temperature rating

## **TUBIFLEX S.P.A.**

FABBRICA TUBI METALLICI FLESSIBILI

STRADA TORINO, 25

ORBASSANO

Italy 10043

Telephone: +39 011 9033201

Fax: +39 011 9033215

Email: direzione@tubiflex.com

Web: www.tubiflex.com

---

### **Tier: 3 - Type Approved, unit certification not required**

---

- Suitability of flexible hose materials for intended fluid service has to be verified on a case-by-case basis.
- The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.
- The scope of Type Approval is to comply with MSC.1/Circ.1221 dated 11 December 2006.

#### **Notes/Drawing/Documentation:**

Bend Test Reports No. from 2311/B to 2332/B dated September-1998 at Tubiflex Laboratory;  
Burst Test Report No. GEM9601033 dated 11-Mar-1997 at Tubiflex Laboratory;  
Burst Test Report No. 57000948 dated 13-Dec-2006 at Tubiflex Laboratory;  
Burst Test Report No. MIL-11-1706-1 dated 6-Dec-2011 at Tubiflex Laboratory;  
Burst Test Report No. 2014/MI/01/208 dated 17-Apr-2014 at Tubiflex Laboratory;  
Burst Test Report NO. 2017CS01188 dated 19-Jan-2018 at Tubiflex Laboratory;  
Cryogenic Test Report No. QTP CRYO9700 dated 21-Jan-2019 at Omeco Laboratory;  
Fatigue Test Reports No. from 2311/C to 2332/C dated September-1998 at Tubiflex Laboratory;  
Impulse Test Report No. 53017216-A/2001 dated 28-Sep-2001 at Det Norske Veritas Laboratory;  
Specification No. MC TF 001, Corrugated Metallic Flexible Hoses, Revision 01;  
Document SP.T.9700.9750.9755.9770.XX.XXX, Tubiflex datasheets, Rev. 0;  
Document SP.T.9600.9650.9655.XX.XXX, Tubiflex datasheets, Rev. 0.

#### **Terms of Validity:**

This Product Design Assessment (PDA) Certificate 19-GE1826122-PDA, dated 05/Feb/2019 remains valid until 04/Feb/2024 or until the Rules or specifications used in the assessment are revised (whichever occurs first).

This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product.

Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA.

Use of the Product for non ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

## **STANDARDS**

#### **ABS Rules:**

- Rules for Condition of Classification (2019): 1-1-4/7.7, 1-1-A3 and A4, which covers the following:
- Rules for Building and Classing Steel Vessels (2019): 4-6-2/5.7, 4-6-7/7.5.1(e), 5C-8-5/13.1.2 and 5C-13-16/7.1.2
- Rules for Building and Classing Offshore Support Vessels (2019): 4-6-2/5.7
- Rules for Building and Classing Steel Vessels Under 90 Meters (295 Feet) in Length (2019): 4-4-1/9.19
- Rules for Building and Classing Marine Vessels (2019): 4-6-2/5.7, 4-6-7/7.5.1(e), 5C-8-5/13.1.2 and 5C-13-16/7.1.2
- Guide for Building and Classing Yachts (2018): 4-1-1/3.3 and 4-4-1/9.19
  
- Rules for Conditions of Classification – High-Speed Craft (2019): 1-1-4/11.9, 1-1-A2 and A3, which covers the following:
- Rules for Building and Classing High Speed Craft (2019): 4-4-1/9.19
  
- Rules for Conditions of Classifications – Offshore Units and Structures (2019): 1.1.4/9.7, 1-1-A2 and A3, which covers the following:
- Rules for Building and Classing Mobile Offshore Drilling Units (2019): 4-2-1/11.29
- Rules for Building and Classing Mobile Offshore Units (2019): 4-2-1/11.29

**TUBIFLEX S.P.A.**

FABBRICA TUBI METALLICI FLESSIBILI

STRADA TORINO, 25

ORBASSANO

Italy 10043

Telephone: +39 011 9033201

Fax: +39 011 9033215

Email: [direzione@tubiflex.com](mailto:direzione@tubiflex.com)

Web: [www.tubiflex.com](http://www.tubiflex.com)

**Tier: 3 - Type Approved, unit certification not required**

---

**National:**

NA

**International:**

NA

**Government:**

NA

**EUMED:**

NA

**OTHERS:**

NA