DNV·GL

Certificate No:
**TAP000025M**

# TYPE APPROVAL CERTIFICATE

## This is to certify:

**That the Metallic Expansion Joints**

with type designation(s)
**ASMM Axial Expansion Joints**

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

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

## Application :

**Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV GL.**

| | |
|---|---|
| **Temperature range:** | **-40 to +450°C** |
| **Max. working press.:** | **FV/0.03 bar** |
| **Sizes:** | **DN100 & DN150** |

Issued at **Høvik** on **2020-07-31**

This Certificate is valid until **2025-07-30**.

for **DNV GL**

DNV GL local station: **Italy/Malta CMC**

Approval Engineer: **Maheshraja Venkatesan**

**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 GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") 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.



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## Product description

Metallic expansion bellows designed according to EJMA 10th edition with the following dimensions welded directly to the piping system:

| Size | Code | Diameter | Pitch | Height | Ply x thk. | Convolutions |
|---|---|---|---|---|---|---|
| DN100 | T30101(1) | 114.3 mm | 11.8 mm | 13 mm | 3x0.3 mm | 10 |
| DN150 | T30473 (2) | 168.3 mm | 13.9 mm | 16 mm | 3x0.3 mm | 9 |

(1) with collar – 0.7 mm thickness and 15 mm length
(2) with collar – 1 mm thickness and 15 mm length

Material of bellow & collar : 1.4541 (EN 10028-7)
Material of pipe : 1.4301 (EN 10217-7 & EN 10216-5)

## Application/Limitation

Expansion bellows covered by this certificate are found to be in compliance with the given design standard and may be installed in exhaust systems.

| Size | Code | Movement | | | Lifetime | Design Pressure |
|---|---|---|---|---|---|---|
| | | Axial | Lateral | Angular | | |
| DN100 | T30101 | +0 /-50 mm | 0 mm | 0° | 3000 cycles | 0.03 bar |
| DN150 | T30473 | +0 /-50 mm | 0 mm | 0° | 3000 cycles | 0.03 bar |

The installation shall be done according to type approval holder's procedures.

## Production testing

Each expansion bellow shall be subjected to hydrostatic pressure test upon completion to at least 1.5 times the design pressure.

## Certification

Whenever the piping system is subject to approval by the society, the below limitations shall be considered:

- Bellows covered by this certificate shall be delivered with test report with reference to this type approval certificate (see to DNVGL-RU-SHIP Pt.4 Ch.6 Sec.1 Table 4).
- Welding shall fulfill requirements in DNVGL-RU-SHIP Pt.2 Ch.4.
- Material of bellow shall have material certificates in accordance with DNVGL-RU-SHIP Pt.4 Ch.6 Sec.2 Table 3. Approval of manufacturer is required for VL or W material certificates.

Product Certificate is not required.

## Type Approval documentation

## Marking of product

For traceability to this type approval, the compensators are to be marked with:

- Manufacturer's trademark
- Type designation (as stated in the submitted drawings)
- Size
- Maximum working pressure
- Temperature range
- The flow direction, if applicable

## 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.