

TYPE APPROVAL CERTIFICATE**This is to certify:****That the Compensator, Bellow of Rubber Material**with type designation(s)
Teguflex® type P, Teguflex® type WIssued to
TRELLEBORG IZARRA, S.A.U.
Izarra, Spainis 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
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: |
|-------------------------|--------------------|----------------------|-----------------|
| Teguflex® type P | see page 2 | see page 2 | DN25-300 |
| Teguflex® type W | see page 2 | see page 2 | DN25-600 |

Issued at **Høvik** on **2018-01-31**This Certificate is valid until **2022-06-30**.for **DNV GL**DNV GL local station: **Bilbao**Approval Engineer: **Iselinn Vindstad**

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.



Product description

Rubber compensators spherical shaped with synthetic cord reinforcement.

Material for Teguflex types P and W:

| Teguflex® | Inner Tube | Outer cover | Applications |
|-----------|------------|-------------|---|
| Red | EPDM | EPDM | Water (hot water, salt water, chlorine solutions, esters and ketones) |
| Yellow | ECO | ECO | Oil (Water, saline solutions, alkalis, mineral oils, vegetable/animal oils, oil aerosols) |
| HP | EPDM HP | EPDM HP | Steam 130°C (hot water, steam, hot air up to 130°C) |
| HO | HNBR | HNBR | Oil 120°C (Oil, mix of water and oils, mix of compressed air and oils) |

Flange: S235JR (other types of material accepted by EN1092-1 may be used)
 Flanges are in accordance with EN 1092-1.

Sizes Teguflex P: DN25, 32, 40, 50, 65, 80, 100, 125, 150, 200, 250, and 300
 Sizes Teguflex W: DN25, 32, 40, 50, 65, 80, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500, and 600

Dimensional data shall be in accordance with manufacturer's datasheet.

Application/Limitation

Maximum working pressure and temperatures:

| Teguflex® | Sizes type P (DN, mm) | Sizes type W (DN, mm) | Maximum temperature | | | | |
|-----------|-----------------------|-----------------------|---------------------|--------|--------|-------|-------|
| | | | 70°C | 90°C | 100°C | 120°C | 130°C |
| Red | 25 - 300 | 25 - 300 | 16 bar | 10 bar | NA | | |
| | NA | 350 - 600 | 10 bar | 8 bar | | | |
| Yellow | 25 - 300 | 25 - 300 | 16 bar | 10 bar | | | |
| | NA | 350 - 600 | 10 bar | 8 bar | | | |
| HP | 25 - 150 | 25 - 150 | 16 bar | | 10 bar | | |
| | 200 - 300 | 200 - 600 | 10 bar | | 6 bar | | |
| HO | 25 - 150 | 25 - 150 | 16 bar | | 10 bar | | NA |
| | 200 - 300 | 200 - 600 | 10 bar | | 6 bar | | |

Minimum and maximum working temperature of rubber materials:

EPDM -35 to 90°C
 EPDM HP -35 to 130°C
 ECO -25 to 90°C
 HNBR -25 to 120°C

The fire protection cover (Teguflex® Flame Guard) shall be used if the compensator is used in systems containing flammable fluids or in sea water systems.

The compensators are not permitted used in systems where pressure pulsations may occur.

Movements shall be according to datasheet/product catalogue.

The location of the rubber compensator in the piping system shall be approved in each separate case.

Job Id: **262.1-015958-2**
Certificate No: **TAP000018F**

Type Approval documentation

Tests carried out

Oil resistance test, sea water/distilled water resistance test, ozone test, burst test, endurance test, elongation test

Production testing

Each compensator is to be hydraulic pressure tested to 1.5 times the working pressure, and delivered with the manufacturer's pressure test report with reference to this type approval certificate.

Marking of product

Each compensator shall be permanently marked in a way that enables identification versus the type approval certificate. Additional marking may be performed at the manufacturer's option.

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.