



DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. P-13192
This Certificate consists of 4 pages

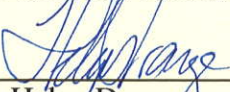
This is to certify that the
Compensator, Bellow of Rubber Material
with type designation(s)
TEGUFLEX P-yellow, P-red, P-white and P-green, HP

Manufactured by
TRELLEBORG IZARRA, S.A.U.
Izarra, Spain

is found to comply with
Det Norske Veritas' Rules for Classification of Ships
Offshore Standard DNV-OS-D101, Marine and Machinery Systems and Equipment
Det Norske Veritas' Standards for Certification 2.9 No. 5-791.70

Application
See certificate.

Place and date
Høvik, 2009-10-19
for DET NORSKE VERITAS AS

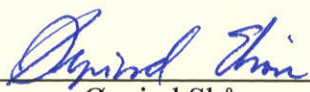


Helge Drange
Head of Section



Local Office
DNV Bilbao

This Certificate is valid until
2013-06-30



Øyvind Skåra
Surveyor

Notice: 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.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.



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 File No.: 792.70
 Job No.: 262.1-008039

Product description

Rubber compensators spherical shaped with synthetic cord reinforcement. Equipped with loose flanges of carbon steel.

Material:

Type	Inner Tube	Reinf.	Outer Cover	Flange
P-yellow	ECO	Nylon	ECO	Steel (zinc plated)
P-red	EPDM		EPDM	
P-white	Nitrile		Neoprene	
P-green	Hypalon		Neoprene	
HP	EPDM	Armide	EPDM	

Application/Limitation

Maximum working pressure and temperatures:

Type	Size	70 °C	90 °C	100 °C	130 °C
P-yellow, P-white, P-green	25 to 300 mm	16 bar	10 bar	N/A	
P-red	25 to 300 mm	16 bar	10 bar	N/A	
HP	25 to 150 mm	16 bar	16 bar		10 bar
	200 to 300 mm	16 bar	10 bar		6 bar

Min. and max. working temp. of rubber materials:

EPDM	-35 to 90 °C
EPDM spec.	-30 to 130 °C
Nitrile	-20 to 90 °C
Hypalon	-15 to 90 °C
ECO	-40 to 90 °C

May be used in the following systems:

Type P-yellow: Fresh & seawater/lub.oil/fuel oil/alkaline/comp.air/sanitary

Type P-red: Fresh & seawater/sanitary/alkaline

Type P-white: Drinking water

Type P-green: Acids

Type HP: Hot water/ steam/air

The fire protection cover shall be used if the compensator is used in systems containing flammable fluids (type P-yellow) or in sea water systems (type P-yellow and P-red), only sizes up to and including DN150 are to be used in such systems.

The compensators shall only be fitted on places where they are always accessible.

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Compensators are only to be used where it is necessary due to vibrations or flexible mounting of the machinery.

EPDM are not to be used in hydrocarbon service.

It must be possible to shut off from the system all compensators in sea water systems connected to the sea through ship side or bottom.

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

The compensators are to be mounted in accordance with the manufacturer's instructions.

Flanges to be made of normalised carbon steel material if the min. working temperature is below -10°C.

Type Approval documentation

- Test results from Trelleborg dated 20.12.90.
- Drawing no. 26241-00223 dated 1998-6.24
- Manufacturers catalogue "Kompensator typ HP för Hetvatten" 1:2 97.01-SE
- Manufacturers catalogue "Teguflex expansion joints" 1:1 97:01-GB
- Manufacturers catalogue Teguflex P, Trelleborg TF BL120, No. 1:1 2003.10 GB
- DNV witnessed test report dated 2003-10-30
- Trelleborg Teguflex Type "Yellow", Comparison on different materials
- Fire test reports WTA 61427 dated 2007-01-27

Tests carried out

Oil Resistance test, Ozone test, Fire test up to DN 150, Burst test, Brittle point test.

Marking of product

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

- Manufacturer's trade mark.
- Type designation
- Size
- Max. working pressure

Original



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Certificate retention survey

For retention of the Type Approval, DNV Surveyor shall perform a survey every second year, to verify that the conditions for the type approval are complied with and to witness a burst test on a selection of sizes.

END OF CERTIFICATE



Original