

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Compensator, Bellow of Rubber Material

with type designation(s)
MS

Issued to

STENFLEX Rudolf Stender GmbH
Norderstedt Schleswig-Holstein, Germany

is found to comply with

DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems

DNV GL class programme DNVGL-CP-0183 – Type approval – Flexible hoses

Application :

Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.

Temperature range: Refer to certificate.

Max. working press.: 16 bar

Sizes: DN65 up to DN250

Issued at **Hamburg** on **2017-06-23**

This Certificate is valid until **2022-06-22**.

DNV GL local station: **Hamburg**

for **DNV GL**

Approval Engineer: **Hagen Markus**

.....
Olaf Drews
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.



Job Id: **262.1-023570-1**
Certificate No: **TAP00000WF**

Product description

Fire resistant rubber compensator with double bellows, reinforcement made of steel wire cord, fitted with loose flanges made of carbon steel ready for installation.
Optional with guide tube and vacuum support ring. Refer to STENFLEX product catalogue.

Bellow design

Liner	Cover	Colour ring	Reinforcement	Flanges ¹	Materials
EPDM	EPDM	Orange / blue	Steel wire	Special design with profil machining to bear the rubber bellow	1.0038 (S235JR)
NBR	CR	Red / Blue			1.4541 1.4571

Notes

¹ Standard design acc. to EN 1092. Optional ANSI, BS etc.

Overview

Liner material	Size DN ²	PN ¹	M.A.W.P.		
			70°C	90°C	100°C
EPDM	65 up to 150	16	15bar	12bar	10bar
	200 up to 250	16	15bar	12bar	10bar
NBR ³	65 up to 150	16	15bar	12bar	10bar
	200 up to 250	16	15bar	12bar	10bar

Notes

¹ For application where fire resistance is required pressure class PN 10 respectively ANSI 150lbs is applicable to all sizes

² Overall length BL for each size refer to STENFLEX product catalogue

³ NBR resistant to hot water up to 70°C

Application / Limitation

The rubber compensators of type MS are type approved in piping systems for the compensation of vibration load or to admit relative movements between flexible mounted machinery and fixed piping or components.

The MS compensator series is further type approved for impulse pressure peaks up to 15bar at 90°C. Refer to DNV GL Rules-SHIP Pt.4 Ch.6 Piping.

For selection of the rubber compensators, the manufacturers recommendations, especially in view of resistance against fluids, are to be observed.

Refer to STENFLEX catalogue "Flexible Rohrverbindungen" and data sheet MS-1/1-H16.

Compensators shall be installed at visible and accessible positions. The quantity of compensators is to be limited as necessary and they shall not be used to compensate pipe misalignment.

Bellows of compensators conveying flammable fluids shall be shielded from hot surfaces and other sources of ignition.

When installed in fuel oil, lubricating oil, sea-water cooling and compressed air means for isolating of the compensator shall be provided.

Compensators are not approved for installation:

- in diving systems or drilling equipment.
- in permanently pressurized starting air lines of diesel engines.
- in cargo lines of tankers.
- fitted directly at the ship's side.

Job Id: **262.1-023570-1**
Certificate No: **TAP00000WF**

Production testing

Each compensator shall be subjected to hydrostatic pressure test at 1.5 times PN.
Refer to MSA0000ASE.

Type Approval documentation

Tests carried out

Marking of product

According to STENFLEX quality standard and for traceability to this type approval certificate, the compensators are to be marked as follows:

Bellow	Example
Manufacturer's trade mark	STENFLEX
Type	MS
Nominal Size DN	DN125
Nominal pressure PN	PN16
Compensator overall length BL	275
Rubber material designation by colour ring	EPDM orange/blue NBR red/blue
Flange	Example
Manufacturer's trade mark	STENFLEX
Nominal Size DN	125
Nominal pressure PN	PN16
Steel grade	1.0038
Heat no.	xxxx

Job Id: **262.1-023570-1**
Certificate No: **TAP00000WF**

Periodical assessment

For retention of the type approval certificate periodical assessments shall be carried out at production places in co-ordination with the DNVGL local station Hamburg.
The objective of the periodical assessment is to verify that the design and production conditions for the type approval have not been altered.

Main scope of the assessment:

- verification of the production and quality control system
- review of quality control documentation of recent deliveries
- review of drawings in production to verify any design changes which may have an impact on data specified in the type approval certificate, performance and range of application
- verification of the product marking

Periodical assessment is to be performed after 2 years and after 3.5 years and a renewal assessment at renewal of the certificate.

In connection with the renewal assessment, a surveyor shall witness / review test reports with respect to the following tests on every 3rd size:

- visual inspection, dimensional check and marking
- pressure test with 1.5 times PN and burst test

End of the certificate