

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Compensator, Bellows of Rubber Material

with type designation(s)
ERV GS, ERV

Issued to
ELAFLEX HIBY GmbH & Co. KG
Hamburg, 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 :

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

Type:	Temperature range:	Max. working press.:	Sizes:
ERV GS	up to 100°C	10bar	DN20 up to DN600
ERV	up to 130°C	10bar, 16bar, 25bar	DN20 up to DN1000

Issued at **Hamburg** on **2020-02-20**

This Certificate is valid until **2025-02-12.**

DNV GL local station: **Hamburg CMC**

Approval Engineer: **Hagen Markus**



for **DNV GL**
 Digitally Signed By: Drews, Olaf
 Location: DNV GL SE Hamburg, Germany
 Signing Date: 2020-03-04

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.



Product description

Rubber expansion joints consisting of rubber bellows with fabric or steel reinforcement and end flanges made of carbon steel, stainless steel, hot galvanised and zinc plated steel and gun metal (bronze).

Design of bellows, flanges and expansion joint configurations according to Elaflex "Rubber Expansion Joints Catalogue -Group 4".

Overview

Types	Design			Piping systems / Media
	Liner	Reinforcement	Cover	
ERV-G / ERV-G LT	NBR	PA textile cord	CR	Fuel oil, lubricating oil, hydraulic oil, bilge, sea water and freshwater cooling, ballast water, water filled fire extinguishing, compressed air, sanitary.
ERV-R	Butyl / EPDM		EPDM	Fresh and sea water, light acids, alkalis, salt solutions.
ERV-BR	NR/BR	PES textile cord	NR/BR	Abrasive media such as sludges, slurries, solid/liquid mixtures and emulsions, dust or powdering products (e.g. carbon-blacks) and all kind of non-oil containing water.
ERV-Rotex	EPDM	Polymer textile cord	EPDM	Heating water, cooling water, hot air and sanitary water.
ERV CR	CR	PA textile cord	CR	Fuel oil, lubricating oil, hydraulic oil, bilge, sea water and freshwater cooling, ballast water, water filled fire extinguishing, compressed air, sanitary.
ERV-OR	NBR		CR	
ERV-GR	CSM		CSM	
ERV-W	NBR		CR	
ERV-VITEX	FKM		ECO	
RED SPOT	Butyl EPDM		EPDM	Ballast water, sea water and fresh water cooling, water filled fire extinguishing, sanitary.
FSH–Fire sleeve for ERV		For the use in fuel oil and lubricating oil systems, sea water cooling, bilge and ballast water systems arranged in machinery spaces each compensator of type ERV is to be provided with a fire sleeve of type FSH.		

Types	Design			Piping systems / Media
	Liner ¹	Reinforcement	Cover	
ERV-GS Yellow-Steel	NBR	Steel wire cord, CR rubberised	CR	Fuel oil, lubricating oil, hydraulic oil, bilge, sea water and freshwater cooling, ballast water, water filled fire extinguishing, compressed air, sanitary. Application in ballast water lines (not through pipe tunnels and double bottom).
ERV-GS HNBR Yellow-Steel	HNBR			

Note

¹ Seamless, electrically conductive

Application/Limitation

Types	Working pressure ¹	Temperature range	Size range
ERV-OR	25bar	up to +90°C	DN20 up to DN 300, where fire resistance by the Rules is required (fire sleeve applications) > DN300 up to DN1000, where fire resistance is not required DN700 up to DN1000 ²
RED SPOT	10bar		
ERV-CR	Up to 16bar depend on size ¹	up to 90°C	
ERV-G / ERV-G LT		up to +90°C	
ERV-W		up to +90°C	
ERV-R		up to +100°C	
ERV-GR		up to +110°C	
ERV-VITEX		up to +110°C	
ERV-BR		up to +70°C	
ERV-Rotex		up to +130°C	

Note
¹ Working pressure and vacuum according to product data sheets released by Elaflex
² For installation in piping systems without vibration load

Types	Working pressure	Temperature range	Size range
ERV-GS Yellow steel	up to 10bar	up to +90°C	DN20 up to DN600
ERV-GS HNBR Yellow steel		up to +100°C (+120°C short term)	

Fire sleeve applications

Expansion joints with bellows reinforcement other than steel, intended for application in piping systems conveying flammable media or sea water, where failure may result in flooding shall be completely covered by a fire sleeve of type FSH (fire tested acc. to ISO 15540/41).

Limitations

Rubber expansion joints are to be installed at visible and accessible positions.

Installation is not permitted:

- In permanently pressurized starting air lines of diesel engines
- In cargo lines of tankers
- At the ship's side

Installation

For selection and installation of the expansion joints the Elaflex "Rubber Expansion Joints Catalogue - Group 4" is to be observed.

In piping systems conveying fuel oil, lubricating oil, sea water cooling and compressed air, a shut-off device, e.g. globe valve, is to be provided to isolate the expansion joint in case of bellows rupture.

Job Id: **262.1-031802-1**
 Certificate No: **TAP00001YN**
 Revision No: **2**

Production place of expansion joints

ELAFLEX HIBY GmbH & Co. KG ¹ , Schnackenburgallee 121, 22525 Hamburg	Bellows end connection
	Swivel flanges in carbon steel, stainless steel, hot galvanised and zinc plated steel, gun metal.

Note:

¹ Formerly ELAFLEX – Gummi Ehlers GmbH

Production testing


Every expansion joint is subject to hydrostatic pressure test with 1.5 times the maximum working pressure. Appropriate works certificate (W) to be issued.

Type Approval documentation

Tests carried out


Pressure test, Burst pressure test, Endurance tests, Pressure impulse test, Ozone and Liquid resistance test, Fire resistance test acc. to ISO15540/41.

Marking of product

Bellows	
Scope	Example
Manufacturers trade mark	
Type	ERV
Nominal pressure	PN16
Nominal size	DN50, 2 in.
Production date Year/Quarter/Week	
QR Code	
ERV-G	Yellow band
ERV-R	Red band
ERV Yellow steel – GS	Double yellow band
ERV Yellow steel – GS HNBR	Yellow-Blue-Yellow band
ERV-Rotex	Double red band
ERV-BR	Blue Spot
ERV-VITEX	White-green-white band
ERV-CR	White imprint" CR"
ERV-Red Spot	Red Spot
ERV-OR	Orange band
ERV-W	White band
ERV-GR	Green band

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Marking of product (continuation)

Flanges	
Scope	Example
Manufacturers trademark	
Batch number	
Flange manufacturer short sign	
Type of material	S235JR
DN / PN	80 / 16
Serial number / QR Code	

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 Type Approval are complied with. Refer to the Class Programme DNVGL-CP-0338, Sec.4.

End of certificate