Certificate No: TO.DEB.21-1351

TÜRK LOYDU

TYPE APPROVAL CERTIFICATE

This Certificate consists of 3 pages.

This is to certify that the

RUBBER EXPANSION JOINT

With type designations

AS-1, AS-2, RS-1, RS-2

Manufactured by

STENFLEX Rudolf Stender GmbH

Is found to comply with

"TL Rules, Part E, Chapter 107 - Naval Ship Technology, Ship Operation Installations and Auxiliary System January 2016", "TL Rules, Part B, Chapter 4, Machinery January 2021"

Application	: Product(s) approved by this certificate are accepted for installation on all vessels classed by TL
Design	: STENFLEX Rudolf Stender GmbH
Sizes	: See Following Pages.
Address of Manufacturer	: Robert-Koch-Str. 17; 22851 Norderstedt - GERMANY
Place and date	: İSTANBUL, 15.02.2022

Subject to the conditions referred to in the following pages, this certificate is valid until 09.02.2027.

Emrah SÖĞÜTÇÜ
New Building Division Manager

Product description : Spherical shaped rubber expansion joint equipped with loose flanges of carbon steel 1.0038 material. The connection between flanges and the rubber is wire reinforced, and forms a raised face of rubber on the flange.

Type Designation :

Type:	Temperature range:	Max. working press.:	Sizes:
AS-1; AS-2	up to +100°C	10bar, ANSI 150lbs	DN25, 32, 40, 50, 65, 80, 100, 125, 150, 200, 250, 300, 350, 400
RS-1; RS-2	up to +100°C	10bar, ANSI 150lbs	DN25, 32, 40, 50, 65, 80, 100, 125, 150, 200, 250, 300

Type		Reinforcement	Liner	Marking ring	Cover	Flanges	
AS, RS	Fire resistant	Steel Wire	NBR	Red	CR	Special design with profil machining to bear the bellow	Materials
			EPDM	Orange	EPDM		1.0038,1.4541, 1.4571

Design

Type designation	Description
A-2 AS-2	DN ≤150: Tie rods carried on rubber sockets. DN ≥175 : Tie rods carried on spherical washers
RS-1	Standard design for axial, lateral and angular movements. Length 130 mm.
RS-2	Unit with tie bars for lateral movements. See A-2 above. Length 130 mm.

Materials used : To be referred to the approved drawing dated 03.11.2021.

Application/ Limitation (Approval conditions):

- The rubber expansion joint 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.
- For selection of the rubber expansion joint, the manufacturers recommendations, especially in view of resistance against fluids, are to be observed.
- Rubber expansion joint shall be installed at visible and accessible positions. The quantity of rubber expansion joint is to belimited as necessary and they shall not be used to compensate pipe misalignment.
- Bellows of rubber expansion joint conveying flammable fluids shall be shielded from hot surfaces and other sources of ignition.
- Rubber expansion joint 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.

- The rubber expansion joint are type approved for application in the following piping systems. For selection and installation of the rubber expansion joint the manufacturer's instructions are to be observed.

Type AS, RS (steel wire reinforcement, fire resistant)
Ballast systems Fuel oil, lubricating oil, hydraulic oil systems (not EPDM) Bilge systems Sea water systems Permanently water filled fire extinguishing systems Compressed air systems Other piping systems where fire resistance is not required.

Documentation: To be referred to the approved drawing dated 03.11.2021 with Ref: PAE-EPAS/010851/21-1351/OE.

Test carried out (and results) :

- Visual Inspection
- Control According to Approved Drawings
- Burst- and endurance test. (Relevant IACS test reports have been reviewed.)
- Fire resistance tests performed on AS and RS type rubber expansion joint according to ISO 15540/41. (Relevant IACS test reports have been reviewed.)
- Each compensator shall be subjected to hydrostatic pressure test at 1.5 times PN.

Found Satisfactory.

Place of test carried out : STENFLEX Rudolf Stender GmbH - Robert-Koch-Str. 17; 22851 Norderstedt - GERMANY

Marking of product: According to STENFLEX quality standard and for traceability to this type approval certificate, the rubber expansion joint are to be marked as follows:

Bellow	**Example**
Manufacturer's trade mark	STENFLEX
Type	AS1
Nominal Size DN	DN125
Nominal pressue 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 pressue PN	PN16
Steel grade	1.0038
Heat no.	xxxx

S. Mahir TUĞCU
Surveyor

This certificate is subject to terms and conditions described below:

- Any significant change in design or construction may render this Certificate invalid. Type Approval Certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. This certificate is not valid for products without marking above mentioned. The manufacturer should notify TÜRK LOYDU of any modifications or changes to the equipment in order to obtain valid certificate. This certificate shows that tested specimens as representative of the product complies of the TÜRK LOYDU rules, and relevant international instruments that apply to it.