DNV·GL

Certificate No:
TAP00000ZN

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Expansion Joint for Pipe, Slide Type and Flexible Type

with type designation(s)
Link-Flex S-10, Link-Flex S-15, Link-Flex S-10R

Issued to
Lien Foo (Dongtai) Rubber and Metal Products Co., Ltd.
Dongtai City Jiangsu, China

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. Refer to certificate.

Type:	Temperature range:	Max. working press.:	Sizes:
Link-Flex S-10	**-10°C to 90°C**	**10 bar**	**DN25 to DN300**
Link-Flex S-15	**-10°C to 90°C**	**10 bar**	**DN25 to DN300**
Link-Flex S-10R	**-10°C to 90°C**	**10 bar**	**DN25 to DN300**

Issued at **Hamburg** on **2017-07-10**
This Certificate is valid until **2022-07-09**.
DNV GL local station: **Nantong**

Approval Engineer: **Christian Kaemmer**

for **DNV GL**

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.

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Product description

Rubber compensator spherical shaped with synthetic cord reinforcement. Fitted with loose flanges made of carbon steel ready for installation (standard flanges PN10).
This type approval certificate includes three types, Link-Flex S-10, S-15 and S-10R, which are different in view compensator overall length and movement date. For further details refer to product catalogue.

For application where fire resistance is required by the DNVGL Rules the compensator is to be provided with a fire protection cover of type SL.

Materials

Bellow (liner and cover):	FPM / NBR
Flanges:	S235JR
Reinforcement:	Nylon tire chord with Hard steel wire (A36)

Overview

Liner material	Size DN[1]	PN [2]	M.A.W.T.
			+90°C
FPM	25 up to 300	10	+90°C
		10	+90°C
NBR	25 up to 300	10	+90°C
		10	+90°C

Notes

[1] Overall length for each size refer to product catalogue
[2]Appropriate service pressure according to product data sheets released by Lien Foo (Dongtai) Rubber and Metal Products Co., Ltd.

Application/Limitation

The rubber compensators of type Link-Flex 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. Compensators shall not be used to compensate misalignments.

- The compensators shall only be fitted on places where they are always accessible and are to be mounted in accordance with the manufacturer's instructions.
- When installed in fuel oil, lubricating oil, sea-water cooling and compressed air means for isolating of the compensator shall be provided.
- For selection of the rubber compensators, the manufacturers recommendations, especially in view of resistance against fluids, are to be observed.
- Bellows of compensators conveying flammable fluids shall be shielded from hot surfaces and other sources of ignition.
- The compensators shall not be installed in systems subject to pressure pulsation or vacuum.
- The below compensators with fire protection covers of type SL are considered fire safe:
  - S-10 and S-10R with FPM (Viton) or NBR body
  - S-15 with NBR body

  The fire protection cover shall be used for compensators where fire resistance is required. (e.g. for compensators used in flammable fluids and gases, bilge and ballast systems, Sea water systems, Hydraulic or pneumatic power and control systems of steering gear).
  The entire compensator, including flanges, is to be protected.

Application/Limitation (continuation)

Compensators are in general 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.

Production testing

All compensators delivered under the DNV GL type approval scheme shall be subject to a pressure test at 1.5 times the maximum working pressure and shall be delivered with the pressure test report with reference to the type approval certificate.

Type Approval documentation

Tests carried out

Marking of product

For traceability to this Type Approval, the products are to be marked with:

- Manufacturer's name or trade mark, LINK-FLEX
- Type designation
- Maximum working pressure
- Size in mm
- If fire resistance is required: type designation marked on fire protection cover

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 Certificate