DNV·GL

Certificate No:
TAP00001GW

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Compensator, Bellow of Rubber Material

with type designation(s)
KXQ

Issued to
Jiangsu Kuize Machinery Industry Co., Ltd.
Nantong, Jiangsu, China

is found to comply with
DNV GL class programme DNVGL-CP-0183 – Type approval – Flexible hoses
DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems

Application :

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

Temperature range:	**-20°C up to 200°C. Refer to certificate.**
Max. working press.:	**25 bar at 20°C**
Sizes:	**DN20, DN25, DN32, DN40, DN50, DN60, DN65, DN80, DN100, DN125, DN150, DN200, DN250, DN300, DN350, DN400, DN450, DN500, DN550, DN600, DN650, DN700, DN750, DN800, DN850, DN900**

Issued at **Hamburg** on **2019-02-20**
This Certificate is valid until **2024-02-19**.
DNV GL local station: **Nantong**

for **DNV GL**

Approval Engineer: **Andrii Pishchanskyi**

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

Fire resistant rubber compensator fitted with loose flange on each side, which are retained on a bellow by reinforcing rings. Rubber compensator is reinforced by stainless steel wire. The components and their materials are as follows:

Component	Material	Remark
Liner	EPDM	
	NBR	
	FPM	
Reinforcement	Stainless steel	Wire
Cover	EPDM	
	NBR	
	FPM	
Flange	Q235B	Non-alloy steel
	316	Stainless steel
	316L	Stainless steel
Reinforcing ring	Q235B	Non-alloy steel
	316	Stainless steel
	316L	Stainless steel

Application/Limitation

Rubber compensator may be accepted for use in fuel systems, lubricating, hydraulic and thermal oil systems, fresh water and sea water cooling systems, compressed air systems, bilge and ballast systems, refrigeration systems and class III steam systems.

Rubber compensator may only be used when necessary to admit relative movements between machinery and fixed piping systems.

For selection of the rubber compensators, the manufacturer's recommendations, especially regearing of resistance against fluids, are to be observed.

The working temperature range depends on rubber material and is as follows:

Material	Minimal temperature [°C]	Maximal temperature [°C]
EPDM	-20	130
NBR	-20	100
FPM	-20	200

At elevated temperatures, the maximum working pressures are to be reduced as follows:

Temperature [°C]	Non-alloy steel	Stainless steel
20	1.00	1.00
50	1.00	0.95
100	1.00	0.85
150	0.89	0.77
200	0.81	0.71

Rubber compensator in high pressure fuel oil injection systems are not accepted.

The rubber compensator is not approved for use in systems subject to pressure pulsation.
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 onto the ship's side.

Selection of materials
It shall be noted that the selection of the materials considers the applicable service condition with respect to type of media, flow velocity, media temperature etc. and installation area of the piping system. In particular, the resistance to corrosion, erosion, oxidation and other deterioration during projected service life are to be taken into account. Reference is made to DNVGL Rules Pt.4, Ch.6 Section 2 – Materials.

Installation
Rubber compensator shall be accessible for inspection. The quantity of compensators is to be limited as necessary and they shall not be used to compensate pipe misalignment.

Means shall be provided to isolate rubber compensator used in systems for fuel oil, lubricating oil, sea-water cooling and compressed air.

When used in systems conveying flammable fluids rubber compensators shall be shielded from hot surfaces and other sources of ignition.

Production testing
Each compensator shall be subjected to hydrostatic pressure test at 1.5 times maximum working pressure. Appropriate pressure test report with reference to this type approval certificate is to be issued.

Type Approval documentation

Tests carried out

Marking of product
For traceability of this type approval each rubber compensator shall be marked as follows:



Periodical assessment

A condition for retention of the TA certificate in its validity period is that periodical assessments are successfully carried out. The objective of the periodical assessment is to verify that the conditions for the TA 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.

Refer to DNVGL Class Programme CP-0338 for the scope of the periodical assessment.