

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Metallic Expansion Joints

with type designation(s)
GB/T12522, CB1153

Issued to

Taizhou City Xinghai Pipe Co.,Ltd.
TAIZHOU, China

is found to comply with

DNV 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.

Type:	Temperature range:	Max. working press.:	Sizes:
GB/T12522	Up to 550 °C	Up to 0.1 MPa	DN 65 - DN 3200
CB1153	Up to 200 °C	Up to 1.6 MPa	DN 50 - DN 600

Issued at **Hamburg** on **2022-04-11**

This Certificate is valid until **2027-04-10**.

for **DNV**

DNV local station: **Shanghai**

Approval Engineer: **Andrii Pishchanskyi**

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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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Product description

Metallic expansion joints as per standards CB/T1153 and GB/T12522 consist of single bellows and flanges ready for installation. Bellows convolutions are U-shaped.

The main components and their material are as follows:

Component \ Design standard (flange type)	GB/T12522 (A) and (AS)	GB/T12522 (BS)
Flange	Q235	Q235
Bellows	SUS321 ¹⁾	SUS321 ¹⁾ S32205
Locating stud	Q235	Q235
Liner	SUS321 ¹⁾	SUS321 ¹⁾ S32205
Collar	N/A	SUS321 ¹⁾ S32205

Component \ Design standard (flange type)	CB1153-93 (A) and (AS)
Welded flange ring	SUS321 ¹⁾ S32205 SUS316L ²⁾
Loose flange	Q235
Bellows	SUS321 ¹⁾ S32205 SUS316L ²⁾
Locating stud	Q235B

Footnote

- 1) The stainless steel grade is not considered suitable for use in:
 - a. Wet exhaust gas and exhaust gas scrubber systems with flowing and stagnant seawater;
 - b. Seawater atmosphere, i.e. unprotected area subject to seawater spray or green water, e.g. open deck.
- 2) The stainless steel grade is not considered suitable for use in piping systems (e.g. seawater cooling) with stagnant seawater.

Application/Limitation

Expansion joints are type approved for application as follows:

Design Standard	Flange type	Nominal diameter	Design pressure [MPa]	Maximum design temperature [°C]	Bellows material	Medium	Piping class
GB/T12522	A ¹⁾	DN 65 - DN 500	0,1	550	321	Exhaust gas ³⁾	III
	AS ¹⁾	DN 65 - DN 1000	0,1	550	321		
	BS ¹⁾	DN 1200 - DN 3200	0,05	300	321, S32205 and 316L		
CB1153	A ²⁾	DN 50 - DN 600	0.6, 1.0, 1.6	200	321, S32205 and 316L	Steam, fresh water and sea water	II
	AS ²⁾	DN 50 - DN 600	0.6, 1.0, 1.6	200	321, S32205 and 316L		

Footnote

- 1) Welded flange as per GB/T12522. It falls into flange type E as per DNV-RU-SHIP Pt.4 Ch.6 Sec.9 §5.1.2;
- 2) Welded flange ring with loose flange as per CB1153;
- 3) For installation in exhaust gas lines on diesel engines, e.g. on cylinder head or in exhaust gas manifold, the bellows design calculation shall include prove acc. to EJMA 9th Ed. Sec. 4.9 - Vibration for each individual application;

The application of expansion joints in thermal-oil piping systems is subject to case by case approval. Refer to DNV-RU-SHIP Pt.4 Ch.6 Sec. 5.

The expansion joints are designed for the absorption of axial and lateral displacement. Refer to manufacturer's instruction for exact values.

Expansion bellows design

The life time of expansion bellows depends on service conditions such as working pressures, axial stroke, bending angle and lateral displacement. Accordingly, for each application bellows design shall be based on the applicable service conditions and expected lifetime which is to be specified in the bellows design drawing.

Selection of materials

The selection of the materials shall always consider the applicable service condition with respect to type of media, flow velocity, media temperature 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 considered. Reference is made to DNV-RU-SHIP Pt.4 Ch.6 Sec. 2.

Material certificate

An appropriate material certificate of the bellows and flange materials depending on class of piping system is to be provided. Refer to:

- DNV-RU-SHIP Pt.4 Ch.6 Sec.1 – Table 1 Pipe classes
- DNV-RU-SHIP Pt.4 Ch.6 Sec.2 – Table 3 Material certificates
- DNV-RU-SHIP Pt.2 Ch.1 Sec.2 - Approval of manufacturers (AoM)

Installation

Expansion joint installation shall be as per DNV-RU-SHIP Pt.4 Ch.6 Sec.9 5.3. In addition, expansion bellows shall be installed in places where they are always accessible. Possible exceptions to be considered in each case.

Production testing

Each batch of expansion joints of type CB1153 shall be pressure tested with 1.5 times M.A.W.P. The materials used in piping systems of class II shall be certified and documented according DNV-RU-SHIP Pt.4 Ch.6 Sec.2 1.8.1.

Type Approval documentation

Tests carried out

Marking of product

For traceability to this type approval each expansion joint shall be marked as follows:

Marking scope	Example
Manufacturer's name	TAIZHOU XINGHAI PIP Limited Company
Type	CB/T1153 A
Working temperature	200 °C
Working medium	Fresh water
Serial No.:	2022040001
Working pressure	1,0 MPa
Manufacturing date	20220411

Periodical assessment

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment as per DNV-CP-0338 Sec.4 to verify that the conditions for the Type Approval are complied with.

To check the validity of this certificate, please look it up in <https://approvalfinder.dnv.com>.