

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Metallic Expansion Joints**with type designation(s)
JYEJ/01A, JYEJ/02A

Issued to

Jingjiang Juyou Marine Facilities Co.,Ltd
Jingjiang, China

is found to comply with

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.**

Type:	Temperature range:	Max. working press.:	Sizes:
JYEJ/01A	0°C to 525°C	See certificate	DN65 to DN2800
JYEJ/02A	0°C to 200°C	see certificate	DN40 to DN400

Issued at **Hamburg** on **2019-11-20**This Certificate is valid until **2024-11-19**.for **DNV GL**DNV GL local station: **Jiangyin**Approval Engineer: **Hagen Markus**

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

Metallic expansion joints with bellows designed according to EJMA 10th Edition.

Technical data

Type	Nominal size	Nominal pressure PN (MPa)	Quantity ply x ply thickness (mm)
JYEJ/01A	DN65, 80, 100, 125, 150, 200	0,1	1 x 0,6
	DN250, 300, 350, 400		1 x 0,7
	DN450, 500, 600, 700		1 x 0,9
	DN800, 900, 1000		2 x 0,7
	DN1100, 1200	0,05	2 x 0,7
	DN1400, 1600, 1800		2 x 0,9
	DN2000		2 x 1,0
	DN2400		2 x 1,2
	DN2800		2 x 1,5
JYEJ/02A	DN40, 50, 65, 80	1,6	1 x 0,9
	DN100		1 x 1,0
	DN125		1 x 1,1
	DN150		1 x 1,3
	DN200, 250		2 x 1,1
	DN300	1,0	2 x 1,1
	DN350		2 x 1,1
	DN400		2 x 1,2

Materials

Type	Sizes	Bellows materials (Spec-Grade-Mark)	Flange material
JYEJ/01A Exhaust Gas Systems	DN65 – DN1000	SUS304-S30408-06Cr19Ni10	Q235B/SUS316
		SUS321-S32168-06Cr18Ni11Ti	
		SUS316L-S31603-022Cr17Ni12Mo2	
	DN1100 – DN2800	SUS304-S30408-06Cr19Ni10	
		SUS321-S32168-06Cr18Ni11Ti	
JYEJ/02A Pressure Pipe Systems	DN40 – DN400	SUS304-S30408-06Cr19Ni10	
		SUS316L-S31603-022Cr17Ni12Mo2	

Requirements according to pipe classes

Depending on pipe class appropriate material certificates for the bellow sheet material and flanges are to be provided.

Refer to:

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

Selection of bellow and flange materials

The materials SUS304, SUS321 are considered not corrosion resistance to sea water and sea water atmosphere and therefore not approved for application in sea water systems or for unprotected installation areas subject to sea water spray or green sea, e.g. open deck.

Further application not approved are wet exhaust gas, e.g. exhaust gas scrubber systems and similar application with high corrosive media.

The above is in general applicable for the combination of carbon steel flanges with any stainless steel bellow material.

Material SUS316L may be used in marine atmospheric environment and flowing sea water but is considered not suitable for application with longer periods of stagnant sea water.

In addition to the above it shall be noted that the selection of the materials shall always consider 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.

Range of Application / Limitation

JYEJ/01A – Metallic Expansion Joints for Exhaust Gas Systems¹

JYEJ/02A – Metallic Expansion Joints for pressure pipe systems

- Fuel oil and lubricating oil, Exhaust gas lines from combustion engines¹
- Steam and condensate, Compressed air lines
- Fresh water cooling, Cargo oil
- Non-essential piping systems according to pressure and temperature range specified on page 1.

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

Notes

¹ For installation in exhaust gas lines on diesel engines, e.g. on cylinder head or in exhaust gas manifold, the bellow design calculation shall include prove acc. to EJMA 8th Edition, Sec. C-2. Vibration for each individual application.

Expansion bellow design

This type approval is based on bellow design calculations acc. to EJMA, Edition 10th and factor $f_c = 1$.

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

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Production testing

Expansion joints included in pipe class I and II are to be hydraulically pressure tested as specified in the Rules Pt.4, Ch. 6 – Sec. 10 – 5.1 Hydrostatic testing before installation on board.
Appropriate works certificate to be issued and enclosed to each delivery.

Installation

Expansion joints shall be installed in places where they are always accessible. Possible exceptions to be considered in each case.

The pipe line is to be adequately adjusted, aligned and clamped to avoid damage of the expansion joint in service condition.

Tests carried out

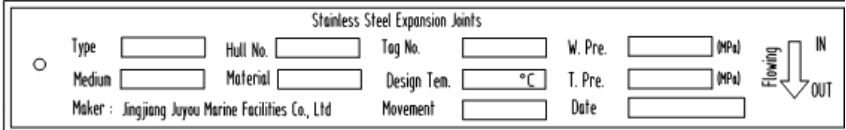
Cyclic testing of the following bellows, witnessed 2014-05-28;

- Model JYEJ/01A-01, sizes DN65, DN1400, DN2800, duration 1000 cycles, test pressure equal to MWP.
- Model JYEJ/02A-07, sizes DN40, DN200, DN400, duration 1000 cycles, test pressure equal to MWP.

Burst testing of the following bellows, witnessed 2014-05-28;

- Model JYEJ/01A-01, sizes DN65, DN1000, DN1400, DN2800, test pressure equal to 4x MWP.
- Model JYEJ/02A-07, sizes DN65, DN125, DN250, DN400, test pressure equal to 4x MWP.

Marking of product

Scope	Example
Manufacturer	
Type	
Date of manufacture	
Working pressure	
Test pressure	
Design Temperature	
Movement	
Flowing direction (if applicable)	

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.



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Type Approval documentation



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End of certificate