



Certificate No:
TAP000024B

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Metallic Expansion Joints

with type designation(s)
DZUF6, DZUF10, DZUF16, DZUF25

Issued to

Jiangsu Hongyuan Pipes Co., Ltd.
Taizhou City, 100, 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:
DZUF6	Up to 400°C.	0.6 MPa	DN 100 up to DN 1200
DZUF10	Up to 400°C.	1 MPa	DN 100 up to DN 500
DZUF16	Up to 400°C.	1.6 MPa	DN 100 up to DN 500
DZUF25	Up to 400°C.	2.5 MPa	DN 100 up to DN 500

Issued at **Hamburg** on **2023-05-22**

This Certificate is valid until **2028-05-21**.

for **DNV**

DNV local station: **Nantong**

Approval Engineer: **Andre Pischanski**

.....
Sven Klinger
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.



Form code: TA 251

Revision: 2021-03

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Product description

DZUF6, DZUF10, DZUF16 and DZUF25 expansion joints are made of metallic bellows with U-shape convolutions with welded slip-on flange on both sides. It falls into flange type E as per DNV-RU-SHIP Pt.4 Ch.6 Sec.9 [5.1.2]. Type DZUF25 is of reinforced type and utilizes an integrated ring.

The main components and their material are as follows:

Component	Material
Bellow	S30408/SUS304/304 ¹ (austenitic stainless steel)
	S31603/SUS316L/316L ² (austenitic stainless steel)
	S31608/SUS316/316 ¹ (austenitic stainless steel)
	S32168/SUS321/321 ¹ (austenitic stainless steel)
	S30403/SUS304L/304L ¹ (austenitic stainless steel)
Liner	S30408/SUS304/304 ¹ (austenitic stainless steel)
	S31603/SUS316L/316L ² (austenitic stainless steel)
	S31608/SUS316/316 ¹ (austenitic stainless steel)
	S32168/SUS321/321 ¹ (austenitic stainless steel)
	S30403/SUS304L/304L ¹ (austenitic stainless steel)
	Q235 (structural steel)
Flange	S30408/SUS304/304 ¹ (austenitic stainless steel)
	S31603/SUS316L/316L ² (austenitic stainless steel)
	S31608/SUS316/316 ¹ (austenitic stainless steel)
	S32168/SUS321/321 ¹ (austenitic stainless steel)
	S30403/SUS304L/304L ¹ (austenitic stainless steel)
	20 (structural steel)
Collar	16Mn (structural steel)
	S30408/SUS304/304 ¹ (austenitic stainless steel)
	S31603/SUS316L/316L ² (austenitic stainless steel)
	S31608/SUS316/316 ¹ (austenitic stainless steel)
	S32168/SUS321/321 ¹ (austenitic stainless steel)
	S30403/SUS304L/304L ¹ (austenitic stainless steel)
Integrated ring ³	20 (structural steel)
	16Mn (structural steel)
	S30408/SUS304/304 ¹ (austenitic stainless steel)

Footnote

1. The stainless steel grade is not considered suitable for use in:
 - a. Piping systems (e.g. seawater cooling or wet exhaust gas) 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 or wet exhaust gas) with stagnant seawater.

Application/Limitation

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

Application scope

1. Expansion joints of type:
 - a. DZUF25 are type approved for application in class I piping systems;
 - b. DZUF10 and DZUF16 – in class II piping systems;
 - c. DZUF6 – in class III piping systemsfor fuel oil, lubricating oil, freshwater cooling, compressed air and auxiliary steam piping systems as per DNV-RU-SHIP Pt.4 Ch.6 Sec.9 – [5.3];
2. Moreover, expansion joints of types DZUF6, DZUF10, DZUF16 and DZUF25 are type approved for application in exhaust gas piping systems. Vibration influence is not assessed. A piping system design shall insure that vibration loads will not be detrimental to function of a bellow as per EJMA Sec.4 §9 (Edition 10);
3. 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.

Expansion bellow design

The type approval is based on EJMA Standard 9th Edition with specific service parameters and life expectations of 1000 cycles.

The lifetime 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 lifetime which is to be specified in the bellows design drawing.

Selection of materials

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 considered. Refer to DNV-RU-SHIP Pt.4 Ch.6 Sec.2.

A combination of stainless steel bellows with flanges made of carbon steel is not approved for seawater systems.

It is the manufacturer's responsibility to ensure that the materials applied in specific piping systems are suitable for the intended service conditions.

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 for fuel oil, lubricating oil, freshwater cooling, compressed air and auxiliary steam piping systems shall be pressure tested as per *Manufacturing Program* and delivered with a corresponding test report.

Type Approval documentation



Job Id: 262.1-033947-1
Certificate No: TAP000024B

Tests carried out

1. Fatigue life test;
2. Pressure test;
3. Burst pressure test.

Marking of product

For traceability of products, marking shall be legible and indelible. Products are to be marked at least as follows:

Marking content
Product name
Type
Serial number
Design temperature
Design pressure
Class No.
Manufacturing date

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>.