



CERTIFICATE NUMBER	23-2371883-1-PDA
EFFECTIVE DATE	01-Apr-2026
EXPIRY DATE	30-Apr-2028
ABS TECHNICAL OFFICE	Houston ESD

CERTIFICATE OF Product Design Assessment

This is to certify that a representative of this Bureau did, at the request of

BELLOWS SYSTEMS, INC.

located at

**10950 BRITTMOORE PARK DR, , HOUSTON, TX, United States,
77041**

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product: Expansion Joint, Bellows Type
Model: Expansion Joints Type 01, Type 63, and Type 722
Endorsements:
Tier: 2 - PDA Issued

This Product Design Assessment (PDA) Certificate remains valid until 30/Apr/2028 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

American Bureau Of Shipping

Electronically signed by:

John Vincent B. Ulep
Senior Principal Engineer

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010)

BELLOWS SYSTEMS, INC.

10950 BRITTMOORE PARK DR

HOUSTON TX

United States 77041

Telephone: 1-281-271-2947

Fax: N/A

Email: info@bellows-systems.com

Web: www.bellows-systems.com

Tier: 2 - PDA Issued

Product: Expansion Joint, Bellows Type
Model: Expansion Joints Type 01, Type 63, and Type 722
Endorsements:

Intended Service:
Engine Exhaust, Marine and offshore applications

Description:
Stainless-steel Gr. 316/316L expansion joints with two floating flanges
Hastelloy C22 expansion joints with two floating flanges
321 Stainless Steel expansion joints with two fixed flanges
321 Stainless Steel expansion joints with two fixed flanges and fixed x floating flanges

Rating:
Stainless-steel Gr. 316/316L expansion joints
Design Pressure (psig): 150
Design Temperature (F): 100
Rated Fatigue Life (cycles): 5000 at rated movement per Datasheets
Number of Plies: 2
Bellows Material: ASTM A240 Gr 316/316L
Collar Material (if included): ASTM A240 Gr 316/316L
Flange Material: A-36 (or equiv.) Hot-Dip Galvanized
Flanges are based on 150# Flat Face Slip On per ANSI B16.5, hub-less.

Hastelloy C22 expansion joints
Design Pressure (psig): 150; (12" expansion joint is jointly rated for 225 psig)
Design Temperature (F): 100
Rated Fatigue Life (cycles): 5000 at rated movement per Datasheets
Number of Plies: 1
Bellows Material: Hastelloy C-22 (N06022)
Collar Material (if included): Hastelloy C-22 (N06022)
Flange Material: A-36 (or equiv.) Hot-Dip Galvanized
Flanges are based on 150# Flat Face Slip On per ANSI B16.5, hub-less.

Stainless steel 321 expansion joints - Exhaust series
Design Pressure (psig): 15
Design Temperature (F): 800
Rated Fatigue Life (cycles): 5000 at rated movement per Datasheets
Number of Plies: 2
Bellows Material: ASTM A240 321 (AMS 5510)
Flange Material: A-36 (or equiv.)
Flanges are 150# light-weight plate flanges, 1/2" thick per ANSI B16.5

Stainless steel 321 expansion joints - Exhaust series
Design Pressure (psig): 15
Design Temperature (F): 800
Rated Fatigue Life (cycles): 5000 at rated movement per Datasheets
Number of Plies: 2
Bellows Material: ASTM A240 321 (AMS 5510)
Flange Material: A-36 (or equiv.)
Flanges are 150# light-weight plate flanges, 1/2" thick per ANSI B16.5,
CAT Exhaust Flanges, Square and Round special flanges

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Service Restriction:

1. Unit Certification is not required for this product.
2. If the manufacturer or purchaser's request an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.

Comments:

1. The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.
2. Expansion joints are to bear permanent identification, such as manufacturer's name or trademark, standard of compliance, material identity, pressure rating, etc., as required by the standard of compliance or the manufacturer's specification. Such markings may be cast or forged integral with, stamped on, or securely affixed by nameplate on the component, and are to serve as a permanent means of identification of the component throughout its service life in accordance with 4-6-1/7.1.4 & Table 2 of the Marine Vessel Rules.
3. After assembly on board, each fuel gas piping system including the subject expansion bellows should be subjected to a leak test using air, halides, or other suitable medium to a pressure depending on the leak detection method applied.
4. After assembly on board, each fuel gas piping system including the subject expansion bellows is to be hydrostatically tested to 1.5 times the design pressure in the presence of the Surveyor in accordance with 4-6-2/7.3.3 b) of the Marine Vessel Rules.
5. The installation of the bellow type expansion joints is to be in accordance with 4-6-2/9.5 of the Marine Vessel Rules and manufacturer's instructions.
6. The expansion joints are to bear the trademark of the manufacturer legibly stamped or cast on the exterior of the expansion joint and also the primary pressure rating at which the manufacturer guarantees the expansion joint to meet the requirements of the standards on which the design has been based.
7. Material test data is to be provided by the manufacturer in accordance with 5C-8-6/2.2 & 5C-13-16/1.1 of the Marine Vessels Rules.

Notes/Drawing/Documentation:

- Drawing No. 110-DOC-0001, Single Expansion Joint Type 63_4 to 24 Hastelloy C22 GA Drawings
Drawing No. 110-DOC-0002, Single Expansion Joint Type 63_4 to 24 SS Gr 316 316L GA Drawings
Drawing No. 110-DOC-0003, Single Expansion Joint Type 63_4 to 24 Hastelloy C22 Datasheets
Drawing No. 110-DOC-0004, Single Expansion Joint Type 63_4 to 24 SS Gr 316 316L Datasheets
Drawing No. 110-DOC-0005, Single Expansion Joint Type 01_4 to 24 321SS GA Drawings
Drawing No. 110-DOC-0006, Single Expansion Joint Type 01_4 to 24 321SS Datasheets
Drawing No. 110-DOC-0007, Single Expansion Joint Type 722_4 to 14 321SS GA Drawings
Drawing No. 110-DOC-0008, Single Expansion Joint Type 722_4 to 14 321SS Datasheets
Drawing No. BSI-110-WPS-0214 Welding Procedure Specification signed with pqr and test documents
Drawing No. BSI-110-WPS-0217 Welding Procedure Specification Combined and Signed
Drawing No. Cert 23-169247-PT Liquid Penetrant Inspection Report, Tested on 03-28-2023
Drawing No. Cert 23-169247-RT Radiographic Inspection Report, Tested on 03-29-2023
Drawing No. WPS-023 Welding Test Report, Tested on 9-23-08
Drawing No. Hydro Test Report 03 Hydro Test Report 997-022-1069-03-HT, Tested on 26/04/2023
Drawing No. Hydro Test Report 04 Hydro Test Report 997-022-1069-04-HT, Tested on 26/04/2023
Drawing No. Hydro Test Report 05 Hydro Test Report 997-022-1069-05-HT, Tested on 26/04/2023
Drawing No. Hydro Test Report 06 Hydro Test Report 997-022-1069-06-HT, Tested on 26/04/2023
Drawing No. Air Leak Test Report 07 Air Leak Test Report 969-722-0812-ALT, Tested on 3/18/2026
Drawing No. Air Leak Test Report 08 Air Leak Test Report 969-722-0612-ALT, Tested on 3/16/2026

Terms of Validity:

This Product Design Assessment (PDA) Certificate remains valid until 30/Apr/2028 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

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Tier: 2 - PDA Issued

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STANDARDS

ABS Rules:

2023 Rules for Conditions of Classification 1-1-4/7.7, 1-1-A3 and 1-1-A4, which covers the following :

2023 Rules for Building and Classing Marine Vessel Rules: 4-6-2/5.8.2, 4-6-2/7.3.3, 4-6-2/9.5, 4-6-5/11.9

2023 Rules for Conditions of Classification - Offshore Units and Structures 1-1-4/9.7, 1-1-A2, 1-1-A3, which covers the following:

2023 Rules for Building and Classing Mobile Offshore Units:4-2-1/11.9

National:

N/A

International:

N/A

Government:

N/A

EUMED:

N/A

OTHERS:

EU RO Mutual Recognition Technical Requirements for EXPANSION JOINTS Version 0.3, Application Date 1 October 2016



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EFFECTIVE DATE 01- Apr- 2026
EXPIRATION DATE 30-Apr-2028
ABS TECHNICAL OFFICE Houston ESD Piping

CERTIFICATE OF

European Union Recognized Organization (EU RO) Mutual Recognition Design Evaluation (in accordance with Article 10.1 of EU Regulation 391/2009)

This is to certify to the Manufacturer named below, that the Product referred to herein has been inspected for the Manufacturer, pursuant to the relevant requirements of the European Union Recognized Organization Mutual Recognition procedure, required by Article 10.1 of EU Regulation 391/2009, and has been found in accordance with those requirements. The most demanding and rigorous standard from all EU ROs has been taken as a reference for the development of the Technical Requirement on which present certificate is based.

BELLOWS SYSTEMS, INC.

who maintains a plant at

**10950 BRITTMOORE PARK DR, , HOUSTON, TX, United States,
77041**

Product Expansion Joint, Bellows Type

Model Expansion Joints Type 01, Type 63, and Type 722

This certificate, by itself does not reflect that the product is Type Approved. The scope and limitations of this evaluation are detailed on the pages attached to this certificate.

When a product is presented with this EU RO MR Type Approval Certificate for given application, its acceptability with regards to the limitations stated in the certificate conditions defined in 1b, 1c and 1d of the applied Technical Requirement will be evaluated by the EU RO in charge of classing the ship or being in charge of the unit/system certification.

In accordance with Article 10 of Regulation (EC) No 391/2009 of the European Parliament and of the Council of 23 April 2009 "on common rules and standards for ship inspection and survey organizations", the following organizations, recognized by the EU on this date, have agreed on the technical and procedural conditions under which they will mutually recognize this certificate:

- American Bureau of Shipping (ABS);
- Bureau Veritas (BV);
- China Classification Society (CCS);

NOTE: This certificate evidences compliance with one or more of the ABS Rules and the EU Regulations 391/2009. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product or manufacturing process without approval from ABS will result in this certificate becoming null and void. This certificate is governed by the terms and conditions as contained in ABS Rules and Conditions of the request for EU Product Type Approval and Agreement.



ABS

- Croatian Register of Shipping (CRS);
- DNV;

- Indian Register of Shipping (IRS);
- Korean Register (KR);
- Lloyd's Register Group Ltd. (LR);
- Nippon Kaiji Kyokai General Incorporated Foundation (ClassNK);
- Polish Register of Shipping (PRS);
- RINA Services S.p.A. (RINA)

The scheme for the mutual recognition of class certificates for materials, equipment and components laid down by Article 10(1) of Regulation (EC) No 391/2009 is only enforceable within the Union in respect of ships flying the flag of a Member State. As far as foreign vessels are concerned, the acceptance of relevant certificates remains at the discretion of relevant non-EU flag States in the exercise of their exclusive jurisdiction, notably under the United Nations Convention on the Law of the Sea (UNCLOS). (In accordance with COMMISSION IMPLEMENTING REGULATION (EU) No 1355/2014 amending Regulation (EC) No 391/2009 - recital (25)).

This EU RO Mutual Recognition Design Evaluation Certificate remains valid until <DD-MM-YYYY> or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

American Bureau of Shipping

John Vincent B. Ulep
Senior Principal Engineer

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