



Marine & Offshore

Certificate number: 76834/A0 BV

File number: .

Product code: 2101H

This certificate is not valid when presented without the full attached schedule composed of 7 sections

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TYPE APPROVAL CERTIFICATE

This certificate is issued to

TEDDINGTON ENGINEERED SOLUTIONS LIMITED

Llaneli - UNITED KINGDOM

for the type of product

METALLIC EXPANSION JOINTS / BELLOWS

Multi Ply Expansion Joints 75A-750A

Requirements:

Bureau Veritas Rules for the Classification of Steel Ships

This certificate is issued to attest that Bureau Veritas Marine & Offshore did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.

This certificate will expire on: 04 Apr 2029

For Bureau Veritas Marine & Offshore,

At BV LONDON, on 04 Apr 2024,

Jonathan WATSON

This certificate was created electronically and is valid without signature



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with Bureau Veritas Marine & Offshore. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of Bureau Veritas Marine & Offshore available on the internet site www.veristar.com. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against Bureau Veritas Marine & Offshore for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

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This certificate consists of 4 page(s)

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION

Multi Ply Expansion Joints 75A-750A

1.1. Ratings

Size range	DN75 - DN750
Design Standard	EJMA 10
Maximum Design Pressure (Bar)	10
Design Temperature (°C)	-163/+80
End connections	Flange / Butt Weld

Allowable displacement: as per drawings

1.2 Materials

Part	Material
Bellow	BS_1449_316S11 / INCONEL_625 / INCONEL_600 / INCOLOY_825
Sleeve	BS_1449_316S11 / BS_1449_321S31 / INCONEL_600 SERIES / INCOLOY_800 SERIES
Flanges	ASTM_A182_TP_316L
End pipe	ASTM_A312_TP_316L

When other choices of materials are used per manufacturer's recommendations, the BV agreement is to be obtained.

2. DOCUMENTS AND DRAWINGS

- Drawing N°45462_27 Rev.1 dated 25/08/2017
- Drawing N°M60530 Rev.4 dated 29/08/2017
- Drawing N°M52571_TA Rev.3 dated 07/01/2002
- Drawing N°M52612_TA Rev.1 dated 17/01/2002
- Drawing N°M52612 Rev.3 dated 17/01/2002
- Drawing N°M52574_TA Rev.4 dated 08/01/2002
- Drawing N°M52586_TA Rev.3 dated 10/01/2002
- Drawing N°M52609_TA Rev.3 dated 16/01/2002
- Drawing N°M52578_TA Rev.4 dated 09/01/2002
- Drawing N°M52617_TA Rev.4 dated 14/01/2002
- Drawing N°M52600_TA Rev.4 dated 15/01/2002
- Drawing N°M52624_TA Rev.3 dated 15/01/2002
- Drawing N°M52601_TA Rev.3 dated 16/01/2002
- Drawing N°M53067_TA Rev.3 dated 18/04/2002
- Drawing N°M52602_TA Rev.4 dated 16/01/2002
- Drawing N°M53069_TA Rev.3 dated 15/01/2002
- Drawing N°M53068_TA Rev.4 dated 14/01/2002
- Drawing N°M52588_TA Rev.4 dated 12/01/2002
- Drawing N°M52590_TA Rev.5 dated 14/01/2002
- Drawing N°M52603_TA Rev.3 dated 16/01/2002
- Drawing N°M53063_TA Rev.5 dated 16/04/2002
- Calculation Sheet N°45462_27 dated 16/06/2017
- Calculation Sheet N°M60530 dated 16/06/2017
- Calculation Sheet N°M52571 dated 12/11/2015
- Calculation Sheet N°M52612 dated 13/12/2016
- Calculation Sheet N°M52574 dated 12/11/2015
- Calculation Sheet N°M52586 dated 12/11/2015
- Calculation Sheet N°M52609 dated 12/11/2015
- Calculation Sheet N°M52578 dated 12/11/2015

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- Calculation Sheet N°M52588 dated 12/11/2015
- Calculation Sheet N°M52590 dated 12/11/2015
- Calculation Sheet N°M52603 dated 12/11/2015
- Calculation Sheet N°M53063 dated 12/11/2015
- Installation, Maintenance and Operating Instruction Rev.1.0 dated 12/11/2021

No departure from the above documents shall be made without the prior consent of the Society. The manufacturer must inform the Society of any modification or changes to these documents and drawings.

3. TEST REPORTS

Type tests including burst test at 5 times the design pressure, pressure test at twice the design pressure and cycle fatigue test:

- Test report N° TES-150 400 dated 01/03/2016

4. APPLICATION / LIMITATION

- 4.1 - The expansion joint may be used on cargo and process piping on board liquefied gas carriers.
- 4.2 - Reduction factors are to be taken into consideration for maximum working pressure and tolerable movement caused by temperature influence according to manufacturer's instructions.
- 4.3 - The calculated maximum values of axial and lateral movements at design full cycles are not to be exceeded.
- 4.4 - In all cases, the associated pipelines are to be suitably aligned, supported and anchored. The joints are to be at any time accessible, well visible and protected against over extension and compression and against mechanical damage.
- 4.5 - Piping system drawings and calculation notes are to be submitted for review whenever expansion bellows are fitted on board BV-classed ships.
- 4.6 - The joints are to be installed according to manufacturer's instructions and Bureau Veritas Rules requirements.
- 4.7 - The welding of the bellows is to be performed by qualified welders and satisfactorily tested.
- 4.8 - The expansion joints are not to be used in piping systems where high levels of vibration are expected to occur in service.
- 4.9 - This metallic expansion joint is not to be used if, due to the piping arrangement, ship deformation loads may be experienced.

5. PRODUCTION SURVEY REQUIREMENTS

- 5.1 - The products are to be supplied by **TEDDINGTON ENGINEERED SOLUTIONS LIMITED** in compliance with the type and the requirements described in this certificate.
- 5.2 - This type of product is within the category IBV of BV Rule Note NR320.
- 5.3 - BV product certificate is required.
- 5.4 - Each metallic expansion joint with end fittings is to be hydraulically pressure tested to 1.5 times the maximum working pressure and provided with the manufacturer's pressure test report and conformity of production.
- 5.5 - For information, **TEDDINGTON ENGINEERED SOLUTIONS LIMITED** has declared to Bureau Veritas the following production site:

TEDDINGTON ENGINEERED SOLUTIONS LIMITED
Unit 1, Heol Cropin
Dafen Park
Llaneli
SA14 8QW
UNITED KINGDOM

6. MARKING OF PRODUCT

Each expansion joint shall be permanently marked with at least:

- Manufacturer's name or trademark
- Date of manufacture (month/year)
- Designation type reference
- Nominal diameter
- Pressure rating
- Temperature rating
- Society's brand as relevant

7. OTHERS

It is **TEDDINGTON ENGINEERED SOLUTIONS LIMITED**'s responsibility to inform shipbuilders or their sub-contractors of the proper methods of fitting, use and general maintenance of the approved equipment and the conditions of this approval.

*** END OF CERTIFICATE ***