



Marine & Offshore
Division

Certificate number: 41856/A0 BV

File number: ACM 188/0802/02

Product code: 73111

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

HKS - CZ, s.r.o.

Litomerice - CZECH REPUBLIC

for the type of product

METALLIC EXPANSION JOINTS / BELLOWS FOR LIQUEFIED GAS CARRIERS

Type AN (Axial)

Requirements:

- BUREAU VERITAS Rules for the Classification of Steel Ships
- IGC Code + Amendments IMO Resolution MSC.370(93)

This certificate is issued to attest that BUREAU VERITAS 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: 06 Oct 2020

For BUREAU VERITAS,

At BV PRAGUE, on 06 Oct 2015,

Martin Dlouhy



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. 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 Division 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 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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BV Mod. Ad.E 530 October 2014

This certificate consists of 3 page(s)

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION

Metallic Expansion Joint for liquefied gas type AN 0200 / 016 / A 006 / R / R - 220 & AN 0250 / 025 / A 007 / R / R - 250

1.1 Technical data

Nominal Size	DN 200	DN 250
Design Pressure	10 bar	20 bar
Design Temperature	-165 / 50 °C	-165 / 50 °C
Number of Convolutions	3	4

Design pressure, number of convolutions, movement, thickness and depth of convolution to be according to calculation performed by the manufacturer depending on the service conditions of expansion joints.

1.2 Material specification

Bellows	1.4541
End ring	1.4541
Welding ends	1.4541

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

2. DOCUMENTS AND DRAWINGS

- Drawing N° 3410457 Rev.0 dated 12/11/2014

- Drawing N° 3505066-2 Rev.0 dated 15/04/2015

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 carried out in presence of a BV Surveyor: cycle fatigue test (40 000 cycles), pressure test at twice the design pressure & burst test at 5 times the design pressure performed on bellows of sizes DN 200 & DN 250.

- Cycle test report N° 1530 174 dated 21/08/2015

- Pressure test report N° 6856, 6790, 6791 & 6911

4. APPLICATION / LIMITATION

4.1 The expansion joint may be used on cargo and process piping on board liquefied gas carriers.

4.2 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.

4.3 Piping system drawings and calculation notes are to be submitted for review whenever expansion bellows are fitted on board BV-classed ships.

4.4 The joints are to be installed according to manufacturer's instructions and Bureau Veritas Rules requirements.

4.5 The welding of the bellows is to be performed by qualified welders and satisfactorily tested.

5. PRODUCTION SURVEY REQUIREMENTS

5.1 The products are to be supplied by **HKS - CZ, s.r.o.** in compliance with the type and the requirements described in this certificate.

5.2 This type of product is within the category IBV of Bureau Veritas Rule Note NR320.

5.3 BV product certificate is required.

5.4 Each expansion bellow with assemblies 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.

Place of production

HKS - CZ, s.r.o.

Mlekojedska 1994/7

412 01 Litomerice

CZECH REPUBLIC

6. MARKING OF PRODUCT

Each expansion joint shall be clearly marked with at least:

- Manufacturer name or logo
- Type designation
- Maximum working pressure
- Society's brand as relevant

7. OTHERS

This approval is given on the understanding that the manufacturer will accept full responsibility for informing shipbuilders or their sub-contractors of the proper method of fitting and general maintenance of the products and of the conditions of this approval.

***** END OF CERTIFICATE *****