



Marine & Offshore

Certificate number: 43916/B0 BV

File number: ACM 188/0802/03

Product code: 21011

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

Axial Double-Wall Metallic Expansion Joint Type AD

Requirements:

- Bureau Veritas Rules for the Classification of Steel Ships
- IGC Code as amended by IMO Resolution MSC.370(93)
- NR529 Gas Fuelled Ships
- IGF Code

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: 27 Apr 2026

For Bureau Veritas Marine & Offshore,

At BV PRAGUE, on 27 Apr 2021,

Pavel Jr. Stepanek



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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BV Mod. Ad.E 530 June 2017

This certificate consists of 3 page(s)

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION

Axial Double-Wall Metallic Expansion Joint Type AD

1.1 Design Specifications

Size (mm)	DN 100 / DN 125
Design	Double-wall
Design pressure (bar)	10
Design temperature (°C)	+ 60
Length (mm)	400 ± 2
End connection	Flanged
Flange size (mm)	DN 100
Pipe wall thickness (mm)	3
Axial movement (mm)	± 8
Lateral movement (mm)	+5
Number of plies	3

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 Materials

Part	Material
Bellow	1.4571/ AISI 316 Ti DIN EN 10028-7
Flange	1.4301/ AISI 304 DIN EN 10028-7
Pipe	1.4571/ AISI 316 Ti DIN EN 10028-7

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

2. DOCUMENTS AND DRAWINGS

- HKS-Axial drawing N° 3503095-1 dated 31/03/2015
- EJMA-Standard, 9th Edition data sheets reference N° 150465-3503095 dated 12/02/2016
- Operating instructions for HKS corrugated tube compensators Rev 2.0 dated 24/02/2016

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

3.1 Type tests carried out in presence of a BV Surveyor: cycle test (40 000 cycles), pressure test at twice the design pressure & burst test at 5 times the design pressure and leakage test

- cycle test report N° 1530 253 dated 24/09/2015
- Inspection certificate 3.2 N° 19633 dated 02/09/2015
- Pressure test report N° 6972 dated 02/09/2015
- Leakage test report N° 18838 dated 02/09/2015

3.2 Cycle fatigue test not performed

4. APPLICATION / LIMITATION

4.1 - The double-wall expansion joint may be used on liquefied gases cargo piping, on board ships having to comply with the IGC Code or the IGF Code.

4.2 - Double-wall type belong to Class II piping according to BUREAU VERITAS Rule Note NR 529, Part A-1, table C7.3(a).

4.3 - The air space between the gas pipe and the double-wall is to be provided with a mechanical exhaust ventilation system and a continuous gas detection in accordance with the applicable rules.

4.4 - Electrical equipment located in the air space in 4.3 above is to be of a suitable safe type complying with the applicable

rules.

4.5 - The calculated maximum values of axial and/or lateral movements at design full cycles are not to be exceeded.

4.5 - In case of high level of vibrations in the piping systems, care shall be taken in order to avoid that the natural frequency of bellows doesn't coincide with the system frequency.

4.6 - In all cases, the associated pipelines are to be suitably aligned, supported and anchored. The expansion joints are to be at any time accessible, well visible and protected against over extension and compression and against mechanical damage.

4.7 - The expansion joints are to be installed according to manufacturer's instructions and BUREAU VERITAS Rules.

4.8 - The welding of the expansion joints 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 - Charpy impact test is to be carried out on the used materials in accordance with the applicable requirement of IGC Code and BUREAU VERITAS Rules if used for liquefied gas.

5.5 - 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.

5.6 - For information, **HKS - CZ, s.r.o.** has declared to Bureau Veritas the following production site:

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
- Date of manufacture
- Nominal Diameter
- Design pressure
- Design temperature
- Society's brand as relevant

7. OTHERS

It is **HKS - CZ, s.r.o.**'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.

This certificate supersedes the Type Approval Certificate N° 43916/A0 BV issued by the Society.

*** END OF CERTIFICATE ***