



Marine & Offshore  
Division

Certificate number: 40133/A0 BV

File number: ACM 145/2581/02

Product code: 7333I

*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*

**BMT CO., LTD.**

YANGSAN (GYEONGNAM) - KOREA (REPUBLIC OF)

*for the type of product*

**BALL VALVES FOR LIQUEFIED GASES**

TYPE : FCB3C8SI

**Requirements:**

- BUREAU VERITAS Rules for the Classification of Steel Ships
- BUREAU VERITAS Rules for the Classification of Offshore Units
- IGC Code

*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: 26 Jan 2021**

**For BUREAU VERITAS,**

At BV PUSAN, on 26 Jan 2016,

Chang-uk HONG



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](http://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.

## THE SCHEDULE OF APPROVAL

### 1. PRODUCT DESCRIPTION

#### **Cryogenic Ball Valves 1/2" & 2"**

##### 1.1 Technical Data

|                        |             |
|------------------------|-------------|
| Design                 | Butt welded |
| Size (inch)            | 1/2" & 2"   |
| Design pressure (bar)  | 100         |
| Temperature range (°C) | -196 / 80   |

##### 1.2 Raw Material

|        |                |
|--------|----------------|
| Body   | ASTM A182-F316 |
| Bonnet | ASTM A182-F316 |
| Ball   | ASTM A276-316  |
| Stem   | ASTM A276-316  |

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

### 2. DOCUMENTS AND DRAWINGS

- General arrangement drawing N° 140221-01-113-BV001 Rev.B dated 05/08/2014
- Valve datasheet N° BMT-VDS-FCB3C8S1-8 dated 12/08/2014 for size 1/2"
- Valve datasheet N° BMT-VDS-FCB3C8S1-32 dated 12/08/2014 for size 2"
- Inspection test procedure N° BMT-ITP-1301 Rev.1 dated 11/11/2013

*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 according to manufacturer's test procedures witnessed by a Society's Surveyor:

- Tests at ambient temperature: Seat test at 1.1 times the design pressure, Shell test at 1.5 times the design pressure.
- Cryogenic tests at -196 °C: Seat and stem leakage test and 20 closing/opening cycles.

3.2 Test reports endorsed by a Society's surveyor and tests found satisfactory:

- N° BMT-TR140814-01 dated 14/08/2014 for size 2"
- N° BMT-TR140814-02 dated 14/08/2014 for size 1/2"

### 4. APPLICATION / LIMITATION

4.1 May be used on cargo and process piping on board liquefied gas carriers.

4.2 The valves intended to be used for handling of Propylene Oxide or Ethylene Oxide/ Propylene Oxide mixtures shall be of a fire safe design.

4.3 The valves belong to class I pressure piping according to the relevant requirements stated in Part D, Ch 9, Sec 5 of BUREAU VERITAS Rules.

4.4 When required in Part D, Ch 9, Sec 6 of BUREAU VERITAS Rules applicable to liquefied gas carriers, Charpy V-notch impact test shall be carried out for castings. Castings in steel grades 316 and 316L at any temperature will be impact tested at -196 °C. A reduction may be granted for design temperature above -60 °C after examination by the Society.

4.5 The materials for valves housing, disc and sealing should be of a suitable type at the temperature and pressure for use with cargoes intended to be carried.

4.6 The approval does not include any operating gear for remote control of the valves.

4.7 The valve is to be installed according to manufacturer's instructions and Society's Rule requirements.

### 5. PRODUCTION SURVEY REQUIREMENTS

5.1 The products are to be supplied by **BMT CO., LTD.** in compliance with the type and the requirements described in this certificate.

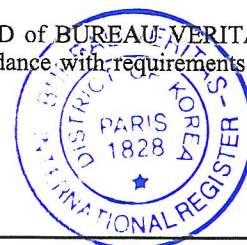
5.2 This type of product is within the category IBV of BUREAU VERITAS Rule Note NR320.

5.3 BV product certificate is required.

5.4 BV Certificates are required for materials of valve housings of Class I (DN≥50). Materials of valve housings of Class I (DN<50) and other pressure boundary parts of Class I are to be with work's certificates.

5.5 Materials are to comply with the approved drawings and the applicable requirements in Part D of BUREAU VERITAS Rules. Charpy impact test to be as per Materials Rules requirements, and where relevant, in accordance with requirements of IGC Code.

5.6 Each valve is to be tested according BUREAU VERITAS Rules Pt D, Ch 9, Sec 5 item 2.7.2.



**Place of production**

BMT CO., LTD.  
35, Sanmakgongdannam 11-gil  
YANGSAN (GYEONGNAM)  
KOREA (REPUBLIC OF)

**6. MARKING OF PRODUCT**

Each valve shall be marked with at least:

- Manufacturer name or logo
- Pressure class
- Size
- Material
- Flow direction
- Serial number
- 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 methods of fitting and general maintenance of the product and of the conditions of this approval.

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

