



TYPE APPROVAL CERTIFICATE

Certificate No. : BSN35101-VV012

Initial Approval : 11th September, 2019

Product : Cryogenic Valve

Manufacturer : BMT Co., Ltd.

35, Sanmakgongdannam 11-gil, Yangsan-si, Gyeongsangnam-do, Korea

Product Description : Cryogenic Ball Valve

- Model : FCB2(Bi-Direction) / FCB2-U1(Uni-directional) Series
- Intended for : General Water, Oil, Gas, Cryogenic Fluid

" See Appendix 1 "

Approval Condition : " See Appendix 1 "

THIS IS TO CERTIFY that the above-mentioned product has been approved in accordance with the relevant requirement of this Society's Rules and / or of the recognized standards as follows and entered in the "List of Approved Manufacturers and Type Approved Equipment".

Pt 7, Ch 5, Art 513 of the Rules for the Classification of Steel Ships and IGC Code, ASME B16.5, B16.10, B16.11, B16.34 & BS6364.

This Certificate is valid until 10th September, 2024

Issued at Busan, Korea on 11th September, 2019



This certificate is signed electronically in accordance with IMO FAL.5/Circ.39/Rev.2. Validation and authentication of the certificate can be confirmed from "http://e-cert.krs.co.kr" by using the tracking No (ME19025540212) and certificate No.(BSN35101-VV012).



KOREAN REGISTER OF SHIPPING

*General Manager of
Marine & Ocean Equipment Team*

- Note :**
1. This certificate will be valid subject to complying with the approval conditions described on the certificate and/or on the Rules of this Society.
 2. This certificate will be invalid from the expiry date aforementioned unless the extension or renewal has been granted to the applicant or the manufacturer.
 3. Any significant modifications or changes in design or construction to the above product without approval from this Society will render this certificate invalid.
 4. Should the specified rules, regulations or standards be amended during the validity of this certificate, the product is to be re-approved by this Society in accordance with the requirements as amended.

Appendix 1

Product Description and/or Approval Condition

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Date of Issue : 11th September, 2019

A. Product Description

1. Product Specification

- 1) Cryogenic Ball Valve
 - Design Temp. : -196°C to +80°C
 - Pressure Class : ANSI Class 150
 - Size : 1/2", 4"
 - Design Pressure : 15.9 bar at 38°C(1/2"), 19 bar at 38°C(4")
 - Valve Connection : Flange Connection per ASME B16.5
 - Material
 - Shell Material : ASTM A182 F316L / A351 CF3M
 - Stem : Stainless Steel 316(L) Grade

2. Approved Drawings and Documents

- 1) 190410-01-124-01, 190410-01-124-03, 190410-01-124-04, 190718-01-124-01, 190718-01-124-01

3. Test Reports, etc.

- 1) Type test report No.BMT-CTR-19070-01/-02/-03 dated 25 July 2019 witnessed by KR Surveyor.

B. Approval Condition

1. Application & Limitation

- 1) The materials used for valve body are to be supplied by the approved manufacturers and is to be of certified by this Society or to be satisfactory to the surveyor.
- 2) Gaskets and packings are to be suitable for the condition of use and to have a construction specified in Korean Industrial Standards or equivalent construction thereto.

2. Individual Product Cert. and Drawing Approval Requirement

- 1) Individual Product Certification is required.
- 2) The minimum average energy for Charpy V-notch impact test should be complied with the relevant requirements of the Rules, Pt.7, Ch.5.
- 3) The following tests are to be applicable for each size of the valves as individual product certification.
 - Hydrostatic test of the valve body at a pressure equal to 1.5 times the design pressure
 - Cryogenic testing consisting of valve operation and leakage verification for a minimum of 10% of each type and size of valve for valves
 - Proving testing at ambient temperature consisting of leakage test at a pressure equal to 1.1 times the design pressure

3. Marking

- 1) The product is to be permanently marked with manufacturer name and type designation on a suitable position.

4. Others

Not applicable.

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