

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Ball Valve

with type designation(s)
170329-115-01, 170329-115-02

Issued to
BMT Co., Ltd.
Yongsan-si, Gyeongsangnam-do, Republic of Korea

is found to comply with
Det Norske Veritas' Rules for Classification of Ships Pt.4, Ch.6 "Piping Systems"
DNV GL rules for classification – Ships Pt.5 Ch.7 Liquefied gas tankers
DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018
DNV GL class programme DNVGL-CP-0186 – Type approval – Valves

Application :

Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV GL.

Type:	Temperature range:	Max. working press.:	Sizes:
170329-115-01	-196°C to 80°C	19 bar @ ambient temperature	4"
170329-115-02	-196°C to 80°C	19 bar @ ambient temperature	6"

Issued at **Høvik** on **2019-05-09**

This Certificate is valid until **2024-05-08**.

for **DNV GL**

DNV GL local station: **Gimhae Station**

Approval Engineer: **Iselinn Vindstad**

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Zeinab Sharifi
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.



Job Id: **262.1-025731-1**
Certificate No: **TAP00001TH**

Product description

Two piece flanged end ball valve designed in accordance with ASME B16.34.
Valve ends: Flanged according to ASME B16.5
Rating: class 150

The pressure/temperature ratings shall be in accordance with ASME B16.34.

Materials:

Part	Material
Body	ASTM A182 F316
Bonnet	ASTM A182 F316
Stem	ASTM A276 316
Ball	ASTM A182 F316
Gasket	SS316 + graphite
Packings	Graphite

Application/Limitation

Valves covered by this certificate may be used in general machinery service and LNG/LPG applications - cryogenic service.

Materials and material protection chosen for the specific system shall be suitable for the intended medium and environmental conditions.

The valves covered by this certificate shall not be used in direct contact with seawater.

Type Approval documentation

Tests carried out

Cryogenic leakage test (seat and body)

Production Testing

Each valve body shall be subjected to:

- hydrostatic pressure test at 1.5 times the maximum working pressure at room temperature.
- seat leakage testing at 1.1 times the maximum working pressure in the valve flow direction.

Testing shall follow procedures and acceptance criteria in EN12266-1 (leakage rate A).

For cryogenic valves:

In addition to the above tests, cryogenic testing consisting of valve operation and leakage verification (to BS6364) for a minimum 10% of each type and size of valve intended to be used at working temperature below -55°C shall be undertaken. (Reference is made DNV GL Ship Rules Pt.5 Ch.7 Sec.5 [13.1.1])

Production testing for valves that require DNV GL product certificate shall be witnessed by DNV GL surveyor.

Certification

The valves for LNG/LPG applications shall be delivered with DNV GL product certificate. Valve bodies shall be delivered with material certificates in accordance with DNVGL-RU-SHIP Pt.5 Ch.7 Sec.1 Table 8. Approval of manufacturer is required for VL and W material certificates.

For other applications:

DNV GL product certificate is required for valves with $DN > 100$ mm having a design pressure $p > 16$ bar and for ship side valves with $DN > 100$ mm regardless of pressure rating.

For other valves, works certificate will be accepted.

Valve bodies shall be delivered with material certificates in accordance with DNVGL-RU-SHIP Pt.4 Ch.6 Sec.2 Table 3. Approval of manufacturer is required for VL and W material certificates.

Marking of product

For traceability to this type approval the valves are to be marked as a minimum with:

- manufacturer's name or trade mark
- valve type designation
- size
- maximum design pressure and temperature
- arrow to indicate direction of flow

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNVGL-CP-0338.