Certificate No:
TAP00002BU

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Valve for Liquefied Gas

with type designation(s)
FB 1" SSB class 150 and 300

Issued to
BAC VALVES S.A.
Figueres, Girona, Spain

is found to comply with
DNV GL rules for classification – Ships Pt.5 Ch.7 Liquefied gas tankers
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.

Issued at **Høvik** on **2021-04-21**
This Certificate is valid until **2026-04-20**.
DNV local station: **Barcelona FIS**

Approval Engineer: **Renata Rossi**

for **DNV**

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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

Product description
Cast Stainless steel Ball Valves designed according to ISO 17292/ASME B16.34 with flanged ends as per ASME B16.5.

Material of construction:

Body	: ASTM A351 CF8M / ASTM A479 316
Bonnet	: ASTM A479 316
Gland Bushing/Flange	: ASTM A351 CF8M / ASTM A479 316
Stud Bolt	: ASTM A 193 Gr. B8M
Nut	: ISO 3506 A4-70
Gasket and packing	: GRAPHITE + SS316

Application/Limitation
Valves covered by this certificate may be used in General machinery service or LNG/LPG applications - Cryogenic Service.

Valve Type	Pressure ratings (ASME Class)	Sizes (inches)	Temperature range
FB SSB	150	1"	+150°C down to -196°C
FB SSB	300	1"	+150°C down to -196°C

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

The valves may not be used as shut off or quick closing valves.

The valves are not to be considered fire safe.

This approval does not cover the valve actuators or operating gear for remote control of the valves.

Type Approval documentation

Tests carried out
Pneumatic and Hydrostatic leakage test (seat and body), Cryogenic leakage (seat and body)

Production testing
Each valve body shall be subjected to hydrostatic pressure test at 1.5 times the allowable pressure at room temperature; Also, each valve shall be subjected to a seat leakage testing at 1.1 times the design pressure in the valve flow direction.

Testing shall follow procedures and acceptance criteria in ISO 17292. In addition to the above tests, cryogenic testing consisting of valve operation and leakage verification (to BS 6364) for a minimum of 10% of each type and size of valve intended to be used at a working temperature below -55°C shall be undertaken (DNV GL Ship Pt.5 Ch.7. Sec.5 [13.1]).

Certification
The valves shall be delivered with DNV product certificate when minimum design temperature is less than -55C or DN$\geqslant$ 100. Otherwise manufacturer's Product Declaration may be accepted.

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.

Marking of product
For traceability to this type approval each valve is at least to be marked with:

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

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.