DNV·GL

Certificate No:
TAP000001J

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Butterfly Valves

with type designation(s)
HPBFV (LD, WR)

Issued to
BAC VALVES S.A.
Figures GERONA, Spain

is found to comply with
Det Norske Veritas' Rules for Classification of Ships Pt.4, Ch.6 "Piping Systems"
Det Norske Veritas' Rules for Classification of Ships Pt.5, Ch.4 "Chemical Carriers"
Det Norske Veritas' Rules for Classification of Ships Pt.5, Ch.5 "Liquefied Gas Carriers"
Det Norske Veritas' Standards for Certification 2.9 No. 5-794.40

Application :

Butterfly valves approved for use in machinery piping systems, ship piping systems and cargo handling piping systems.

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

Temperature range:	**-110 °C to +250 °C**
Max. working press.:	**50 bar**
Sizes:	**3" to 24" (80 mm to 600 mm)**

This Certificate is valid until **2019-09-24**.

Issued at **Høvik** on **2015-09-25**

for **DNV GL**

DNV GL local station: **Barcelona**

Approval Engineer: **Simon Ratcliffe**

Marianne Spæren Marveng
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.

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Product description

Wafer (WR) or lugged body (LD), double eccentric disc type butterfly valve.
Body thickness requirements according to EN 12516-1.

Valve rating: DIN 3357 PN 10, 16, 25 and 40
ANSI Class 150 and 300

Materials:

Part	**Material**
Body Cast Steel Stainless Steel	 ASTM A216 WCC or WNo. 1,0619 ASTM A351 CF8M or WNo. 1,4408
Disc, Stainless Steel	ASTM A351 CF8M or WNo. 1,4408
Stem	ASTM A564 Type 630 / UNS S17400 ASTM A276 UNS S31803
Seat	PTFE / Inconel 718
Seals	Graphite

Application/Limitation

The sizes listed in the below table have been subjected for a cryogenic test at minimum design temperature and can be used in systems with design temperatures down to:

Material	ANSI Class	DIN rating	Sizes	Minimum design temperature
ASTM A351 CF8M or WNo. 1,4408	#150	PN10, PN16, PN25	3”, 4”, 6”, 8”, 10”	-104 °C
	#300	PN40	3”, 14”	-104 °C
	#300	PN40	4”, 6”, 8”, 10”, 12”, 16”	-110 °C
	#300	PN40	Short bonnet 4”, 6”, 8”, 10”	-110 °C

Valves not subjected to a cryogenic test can be used in systems with design temperatures down to -55 or -40 °C, depending on the body material

Maximum working temperature: +250 °C

In addition to the systems mentioned on the front-page, the valves may be used in the following chemicals:

- Ammonium Nitrate Solution, 93% or less [1)]
- Carbon disulphide
- Hydrogen peroxide Solutions of 60% but not over 70% [1)]
- Diethyl Ether [1)]
- Phosphorus, yellow or white [1)]
- Propylene oxide and mixtures of ethylene oxide/propylene oxide [1)]
- Sulphuric acid [1)]
- Sulphur liquid

Notes:
[1)] - only valves of stainless steel may be used.

Job Id: **262.1-017680-3**
Certificate No: **TAP000001J**

Type Approval documentation

Tests carried out

Fire test, hydrostatic pressure test, seat leakage test and cryogenic testing (only 3”, 4”, 6”, 8”, 10”, 12”, 14” and 16”)

Production testing

Materials in body and bonnet shall be charpy tested when the thickness exceeds 6 mm. Acceptance criteria according to DNV Rules for Ships Pt.5 Ch.5 Sec.2 Tables D1 to D4.

The valve housing of each valve shall be subjected to a hydrostatic pressure test at minimum 1.5 times the design pressure. The test pressure need not be more than 70 bar in excess of the design pressure. For valves intended for ship’s side or bottom the test pressure is not to be less than 5 bar.

Holding time:	2 min. for sizes up to 100 mm/4" 5 min. for sizes 125 - 250 mm/5" -10", 10 min. for sizes 300 mm - 450 mm/12" - 16", 15 min. for sizes equal and greater than 475 mm/19",

No leakage is permitted.

The valve assembly shall be subjected to a hydrostatic seat leakage test. The test pressure shall at least be equal to the design pressure. The test shall be performed with closed valve with the other end open to atmosphere. The pressure shall be applied independently on each side. For valves intended for ship’s side or bottom the test pressure is not to be less than 5 bar.

Holding time:	5 min. for all sizes.
Acceptable leakage range:	Drop tight

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 Ship Pt.5 Ch.5 Sec.6 H300).

The following BAC test procedures have been reviewed to comply with the above requirements;
PQ-25 Rev.3 – Test Procedure for Ball Valves and Butterfly Valves
IQ-7 Rev.3 – Cryogenic Test Instruction

Certification

Each valve is to be surveyed and certified by DNV GL when required by Det Norske Veritas Rules, or by the Purchaser.

DNV product certificate is required for all valves intended to be used at working temperature below -55°C or having DN ≥ 100.

Material certificates are required in line with DNV Rules for Ship Pt.5 Ch.5 Sec.2 Table E1.

Marking of product

For traceability to this type approval, each valve is at least to be marked with:

- Manufacturer's name or trade mark
- Type designation
- Size
- Pressure class

Periodical assessment

For retention of the Type Approval, DNV GL Surveyor shall perform a survey – every second year and before the expiry date of this certificate – to verify that the conditions for the type approval are complied with.