DNV·GL

Certificate No:
TAP00001C3

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Butterfly Valves

with type designation(s)
Fire Safe Butterfly Valves PN6, PN10, PN16, PN25, Class 150

Issued to
KB Valve Technology Co., Ltd.
Gimhae-si, Gyeongsangnam-do, Korea

is found to comply with
DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018
DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems
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.

Temperature range:	**-29°C up to 260°C**
Max. working press.:	**See page 2**
Sizes:	**DN50 to DN400**

Issued at **Høvik** on **2018-05-08**
This Certificate is valid until **2018-06-30**.
DNV GL local station: **Changwon**

Approval Engineer: **Maheshraja Venkatesan**

for **DNV GL**

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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Job Id: **262.1-015641-3**
Certificate No: **TAP00001C3**

Product description

Wafer, lug, flanged and double flanged butterfly valves designed to EN 593 and EN 12516-1.

Materials

Body (Casting)		
Carbon Steel	ASTM A216	WCB
	ASTM A352	LCB, LCC
Austenitic Stainless Steel	ASTM A351	CF3, CF3M, CF8, CF8M
Duplex Steel	ASTM A890	4A, 5A, 6A
	ASTM A995	4A, 5A, 6A
Disc (Casting)		
Austenitic Stainless Steel	ASTM A351	CF3, CF3M, CF8, CF8M
Duplex Stainless Steel	ASTM A890	4A, 5A, 6A
	ASTM A995	4A, 5A, 6A
Al-Ni Bronze	ASTM B62	C83600
	ASTM B148	C95400, C95500, C95800
Stem (Forging)		
Austenitic Stainless Steel	ASTM A182	F304, F316, F304L, F316L
Martensitic Stainless Steel	ASTM A182	F6a
Duplex Stainless Steel	ASTM A182	F51, F55
Stem (Round Bar)		
Austenitic Stainless Steel	ASTM A276	304, 304L, 316, 316L
Martensitic Stainless Steel	ASTM A276	410
Duplex Stainless Steel	ASTM A276	S31803, S32205, S32760
Precipitation hardened steel	ASTM A564	630
Non-ferrous steel	ASTM B564	N04400, N06626, N08825
Seat		
Soft	Thermoplastic	PTFE, RTFE
Metal	Stainless Steel	304, 304L, 316, 316L
Gaskets		
Graphite		

Application/Limitation

Butterfly valves approved for use as closing or regulation valves in cargo, fuel, lubrication, hydraulic and thermal oil systems, inert gas systems, fresh and seawater systems, miscellaneous air systems.

Maximum Working Pressure (bar) depending on rating and body material from EN 12516-1.

Body material	MWP depending on rating (bar)				
	PN6	PN10	PN16	PN25	Class 150
WCB	6.05	10.08	16.1	25.2	19.6
LCB	5.67	9.45	15.1	23.6	19.8
LCC	6.12	10.21	16.3	25.5	18.4
CF8, CF8M	5.88	9.80	15.7	24.5	19.0
CF3, CF3M	5.88	9.80	15.7	24.5	15.9
4A, 5A, 6A	6.12	10.21	16.3	25.5	20.0

For use at elevated temperatures the following pressure reduction factors shall apply:

Temperature (°C)	Carbon steels, unalloyed	Low alloyed steels	Stainless steels
20	1.00	1.00	1.00
50	1.00	1.00	0.95
100	1.00	1.00	0.85
150	0.89	0.93	0.77
200	0.81	0.87	0.71
250	0.72	0.81	0.67

300	0.65	0.75	0.63

Valves featuring Austenitic stainless steel material grades by this certificate are not approved for use in seawater systems.
Materials chosen for the specific system shall be suitable for the intended medium and environmental conditions.
Valves made from carbon steel intended for seawater systems shall be protected from corrosion by suitable coatings.

This type approval certificate does not cover the valve operation mechanism, ancillaries or any remote actuation device.

Production testing

Each valve body shall be subjected to a hydrostatic pressure test at:
- 1.5 times the allowable pressure at room temperature

In addition each valve shall be subject to seat leakage testing as follows:
- 1.1 times the design pressure in the valve flow direction.
- 5 bar applied independently on each side of the disc.

Testing shall follow procedures and acceptance criteria in EN 12266-1.

Certification

DNV GL product certificates are required for valves with DN > 100 mm and PN > 16 bar and for ship side valves with DN > 100 mm regardless of pressure rating. For other valves the manufacturer's certificate may be accepted.

Valve bodies shall be delivered with material certificates according to DNV GL Ship Pt.4 Ch.6 Sec.2 Table 3.

Type Approval documentation

Tests carried out

Fire testing to API 607 / ISO 10497

Marking of product

Each valve shall be clearly marked for identification. The identification marking may be performed on the body or on a plate of non-corrosive material. When a metallic plate is used, the plate shall be permanently fixed to the body.

Identification marking on the body shall be located to non-stressed areas and shall be clearly legible. The identification marking shall as a minimum include the following:
- manufacturer's name or trade mark
- valve type designation
- size
- Maximum working Pressure
- 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.