

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Butterfly Valves**with type designation(s)
High-Seal (GTD/FSD/MTD)

Issued to

Korea Unicomvalve Co., Ltd.
Incheon, Republic of Koreais found to comply with
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 all vessels classed by DNV GL.****Temperature range:** -10°C +420°C(dependent on seal material)
Max. working press.: PN10, PN16, PN20, PN25 or ANSI 150 or JIS 10K, 16K, 20K
Sizes: DN 50 to DN 600This Certificate is valid until **2021-06-30**.Issued at **Høvik** on **2016-11-01**for **DNV GL**DNV GL local station: **Seoul**Approval Engineer: **Zeinab Sharifi**-----
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.

Job Id: **262.1-005935-3**
Certificate No: **TAP00000MH**

Product description

High Seal Butterfly Valve GTD, FSD & MTD, wafer, lug, double flanged type.

Model size range 2"-24"/DN50-DN600.

Pressure Rating: ANSI class 150
PN6, 10, 16, 20, 25
JIS 10K, 16K, 20K.

Materials:

Body: ASTM A216 Gr. WCB and ASTM A351 Gr. CF8/CF8M

Disc: ASTM A217 Gr. CA15, ASTM A351 Gr. CF8/CF8M and ASTM A351 Gr. CF8M+ Stellite

Spindle: ASTM A564 Tp.630 H900, ASTM A564 Tp.630 H1075, ASTM A564 Tp.630 H1100, ASTM A276 Tp.304 and ASTM A276 Tp.316

lining/seat: RTFE, PTFE, ASTM A240 Gr.316/304 and Inconel 625

Application/Limitation

The valves are approved for use in ship piping, machinery piping and cargo piping systems.

Maximum allowable pressure shall be according to the relevant tables in API 609/ASME B16.34.

Maximum permissible temperatures dependant on lining/seat materials:

Seat type	Seat material	Max. operating temp.
GTD	PTFE	+ 204°C
	RTFE	+ 204°C
FSD	PTFE + ASTM A240 Tp304	+ 240°C
	R.TFE+ ASTM A240 Tp304	+ 260°C
	PTFE + ASTM A240 Tp316	+ 240°C
	R.TFE+ ASTM A240 Tp316	+ 260°C
	PTFE + INCONEL 625	+ 240°C
	R.TFE+ INCONEL 625	+ 260°C
MTD	ASTM A240 Tp304	+ 250°C
	ASTM A240 Tp316	+ 250°C
	INCONEL 625	+ 420°C

Parts in contact with seawater shall be suitably protected. Stainless steel valves are not permitted in seawater systems.

These valves may be used for bilge suction when fitted in connection with a non-return valve.

Bilge valves and shipside valves shall be arranged for manual operation even if these valves are remote controlled. A portable hand pump is not accepted as equivalent to manual operation.

When used as shipside valves the disc must not extend outside the hull plating in open position.

The approval does not include any operating gear for remote control of the valves.

Type Approval documentation

Valve specification 2"-24", rev. 0, dated 2003/10/01

Manufacturers catalogue HIGH-SEAL (GTD/FSD/MTD) No. UNI 1000, Dec. 1996.

Drwg. No: U0307-D01-001, issue 2003.07.21, ANSI B16.5 Class 150, 2"-6" Valve Ass'y

Drwg. No: U0307-D01-002, issue 2003.07.21, ANSI B16.5 Class 150, 8"-14" Valve Ass'y

Drwg. No: U0307-D01-003, issue 2003.07.21, ANSI B16.5 Class 150, 16" Valve Ass'y

Drwg. No: U0307-D01-004, issue 2003.07.21, ANSI B16.5 Class 150, 18"-24" Valve Ass'y

Drwg. No: U0307-D01-008, issue 2003.07.21, ANSI B16.5 Class 150RF, 4"-14" V. Ass'y

Drwg. No: U0307-D01-009, issue 2003.07.21, ANSI B16.5 Class 150RF, 16"-24" V. Ass'y

Drwg. No: U0310-D01-001, issue 2003.07.22, JIS 10K, DN50-DN150 Valve Ass'y

Drwg. No: U0310-D01-002, issue 2003.07.22, JIS 10K, DN200-DN350 Valve Ass'y

Drwg. No: U0310-D01-003, issue 2003.07.22, JIS 10K, DN400 Valve Ass'y

Job Id: **262.1-005935-3**
Certificate No: **TAP00000MH**

Drwg. No: U0310-D01-004, issue 2003.07.22, JIS 10K, DN450-DN600 Valve Ass'y
Drwg. No: U0310-D01-013, issue 2003.07.22, JIS 10K, RF, DN100-DN350 Valve Ass'y
Drwg. No: U0310-D01-014, issue 2003.07.22, JIS 10K, RF, DN400-DN600 Valve Ass'y
Drwg. No: U0310-D01-005, issue 2003.07.22, JIS 16K, DN50-DN150 Valve Ass'y
Drwg. No: U0310-D01-006, issue 2003.07.22, JIS 16K, DN200-DN350 Valve Ass'y
Drwg. No: U0310-D01-007, issue 2003.07.22, JIS 16K, DN400 Valve Ass'y
Drwg. No: U0310-D01-008, issue 2003.07.22, JIS 16K, DN450-DN600 Valve Ass'y
Drwg. No: U0310-D01-015, issue 2003.07.22, JIS 16K, RF, DN100-DN350 Valve Ass'y
Drwg. No: U0310-D01-016, issue 2003.07.22, JIS 16K, RF, DN400-DN600 Valve Ass'y
Drwg. No: U0310-D01-009, issue 2003.07.22, JIS 20K, DN50-DN150 Valve Ass'y
Drwg. No: U0310-D01-010, issue 2003.07.22, JIS 20K, DN200-DN350 Valve Ass'y
Drwg. No: U0310-D01-011, issue 2003.07.22, JIS 20K, DN400 Valve Ass'y
Drwg. No: U0310-D01-012, issue 2003.07.22, JIS 20K, DN450-DN600 Valve Ass'y
Drwg. No: U0310-D01-017, issue 2003.07.22, JIS 20K, RF, DN100-DN350 Valve Ass'y
Drwg. No: U0310-D01-018, issue 2003.07.22, JIS 20K, RF, DN400-DN600 Valve Ass'y
Design & Stress Analysis Report No. DR-BTFV-001, rev. 0
Fire Test Report FTR-150-16-02, rev. 0, UNICOM
Fire Test Report FTR-150-8-01, rev.0, UNICOM
Certificate of Conformity BS6755 Part 2, API607, Fire Test. VELOSI KOREA.
Burst Pressure test, Korea Unicom, DNV witnessed 2003-10-17
Hydr. Pressure test, Korea Unicom, DNV witnessed 2003-10-17
Quality Management System manual

Tests carried out

Burst pressure test, hydraulic pressure test, fire test acc. to API 607.

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 the design code, API 609 Clause 7 (API 598).

Certification

Valve bodies shall be delivered with material certificates in accordance with DNV GL Ship Pt.4 Ch.6 Sec.2 Table 3. Materials with VL and W certificates shall be manufactured in a foundry approved by the Society.

DNV GL product certificates are required for valves with DN > 100 mm and design pressure ≥ 16 bar, and for ship side valves where DN > 100 mm regardless of pressure. For other valves a manufacturer's product certificate may be accepted.

Marking of product

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

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

Periodical assessment

For retention of the Type Approval a DNV GL surveyor shall perform a survey at the manufacturer's premises every second year and before the expiry date of this certificate, to verify that the conditions for Type Approval complied with.