

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Butterfly Valves

with type designation(s)

Fig. V30 Wafer Type / Fig. V32 Lug Type / Fig. V34 Flanged Type

Issued to

Keystone Valve Korea LLC
Anseong-si Gyeonggi-do, Republic of Korea

is found to comply with

Det Norske Veritas' Rules for Classification of Ships Pt.4, Ch.6 "Piping Systems"
Offshore Standard DNV-OS-D101, Marine and Machinery Systems and Equipment
Det Norske Veritas' Standards for Certification 2.9 No. 5-794.40

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL. The valves may be used for the following services: Ship piping systems, machinery piping systems and cargo piping systems class II and III. (see limitations in certificate).

Temperature range:	See certificate
Max. working	Rating: JIS 5K / JIS 10K/ JIS 16K/ ANSI Class 150 / PN 6 / PN 10 / PN
press.:	16
Sizes:	DN50 to DN900 (2" to 36")

This Certificate is valid until **2019-06-29**.

Issued at **Høvik** on **2015-07-22**

DNV GL local station: **Seoul**

for **DNV GL**

Approval Engineer: **Adel Samiei**

On behalf of 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.

Product description

- Butterfly Valves, eccentric, rubber seat: Wafer, lug and flanged types.
- Design code:
ASME B16.5-B16.10-B16.34
API 598
MSS SP-25, SP-55, SP-67, SP-68
- Materials:

Part	Material
Body	Grey cast iron JIS G5501 FC, ASTM A126 Class B
	Nodular cast iron JIS G5502 FCD, ASTM A536 DCI
	Steel casting JIS G5101 SC480, ASTM A216 Gr. WCB
	Stainless steel ASTM A351 CF8, CF8M, CF3, CF3M
	ASTM A352 Gr LCB, LCC
	Alu-Bronze ASTM B148 C95500, C95800
	Duplex ASTM A890 Gr. 5A
Disc	Alu-bronze ASTM B148 C95200, C95500, C95800
	Stainless steel ASTM A351 CF8, CF8M ,CF3,CF3M
	MONEL
Stem	Stainless steel ASTM A276 Gr 304, Gr 304L, Gr 316, Gr 316L,Gr431 (Not seawater resistant materials)
	Stainless steel ASTM A564 Type 630
	MONEL
Seat	NBR -25 °C to + 100 °C, FKM(VITON) -20 °C to +200 °C EPDM -35 °C to +130 °C PTFE -60 °C to +190 °C

Limitation

- Installation of the valves shall comply with the DNV Rule requirements.
- Body material Al-Bronze shall not be used in temperature higher than 200°C.
- Copper and copper alloy pipes for classes I and II shall be seamless drawn.
- Nodular cast Iron is not be used for service temp. below 0°C and above 300°C
- Nodular cast Iron may be used in Class II and III piping systems.
- Grey cast iron may only be used in Class III piping systems.
- The valves are not approved for Fire mains and water spray, foam, sprinkler.
- The valves may not be used as shut off or quick closing valve on oil tanks.
- The approval does not include remote operated device.
- Hand lever on steel valves shall be steel.
- The lining material must be ensured to be compatible with fluid in the system. This shall be documented.
- EPDM shall not be used for hydrocarbon service
- These valves are not fire tested.
- Used material shall be delivered with certificate according to DNV ship rules Pt.4 Ch.6 Sec.2 Table A2. All materials with NV or W certificate have to be supplied from an approved manufacturer of DNV GL for the type and grade of steel being supplied and for the relevant steelmaking and processing route.

Fabrication Testing

- Each valve is to be tested according to the design standard, and as required in the DNV GL Type Approval Program

- Each valve body is to be subjected to a hydrostatic pressure test at minimum 1.5 times design pressure at room temp or as part of valve assembly test.
- Each valve assembly is to be subjected to a hydrostatic pressure test at minimum 1.5 times the design pressure.
No leakage is permitted.
- Each valve assembly shall be subjected to a hydrostatic seat leakage test at minimum 1.1 times the design pressure, according to the applied valve standard.
Acceptable leakage range: Drop tight
- Each valve is to be function tested as required by the standard.

Delivery conditions/Marking of product

- DNV product certificates are required for valves with DN > 100 mm and PN > 16 bar and for ship side valves DN > 100mm regardless of pressure rating.
- For other valves manufacturer's certificate can be accepted.
- For traceability to this type approval the valves are to be marked with:
 - Pressure rating
 - Manufacturer's name or trade mark
 - Type designation
 - Size
 - Direction of flow
 - Compatibility report with medium.
 - Serial numbers

Type Approval documentation

Manufacturer's inspection and test plan ITP-V30 Rev.0 dated 2010-11-15
Type Approval Document No.: 11-13690 dated 2011-01-14

Drawing No.	Rev.	Drawing No.	Rev.	Drawing No.	Rev.
000-V30-000-001	0	000-V32-000-002	0	000-V34-000-003	0
000-V30-000-004	0	000-V32-000-005	0	000-V34-000-006	0
000-V30-000-007	0	000-V32-000-008	0	000-V34-000-009	0
000-V30-000-010	0	000-V32-000-011	0	000-V34-000-012	0
000-V30-000-013	0	000-V32-000-014	0	000-V34-000-015	0
000-V30-000-016	0	000-V32-000-017	0	000-V34-000-018	0
000-V30-000-019	0	000-V32-000-020	0	000-V34-000-021	0

Tests carried out

- Burst, Shell and seat leakage test witnessed by DNV Surveyor on 2011-01-14.
- Type Tested Valves

Type designation	Test size
F.V32 Lugged (JIS 16K)	DN200 (8"), DN450 (18"), DN650 (26"), DN900 (36")
Materials: Body: ASTM A216 Gr. WCB Disc: ASTM A351-CF8M	

Job Id: **262.1-010951-3**
Certificate No: **TAP000000W**

Stem: ASTM A276 T431 Seat: NBR

Periodical assessment

For retention of the Type Approval a DNV GL Surveyor shall perform a periodical assessment every second Year. The objective of the periodical assessment is to verify that the conditions for the TA are not altered since the TAC was issued.

The main scope of the periodical assessment will normally include:

- verification of the TA applicant's production and quality system w.r.t. ensuring continued consistent production of the type approved products at the TA applicant's own premises
- review of the TA documentation and that this is still used as basis for the production
- review of possible changes to the design, the material and the performance of the product
- Verification of the product marking.

END OF CERTIFICATE