DNV·GL

Certificate No:
**TAP000005A**

# TYPE APPROVAL CERTIFICATE

## This is to certify:

**That the Butterfly Valves**

with type designation(s)
**FIG.1, FIG.V10 and FIG. V11**

Issued to
## Keystone Valve Korea LLC
**Anseong-si Gyeonggi-do, Republic of Korea**

is found to comply with
**DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems**

## Application :

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

| | |
|---|---|
| **Temperature range:** | **Dep. on body and seat material (see cert.)** |
| **Max. working press.:** | **10 bar** |
| **Sizes:** | **DN 50 to 1800 mm (dep. type, see cert.)** |

This Certificate is valid until **2020-12-31**.

Issued at **Høvik** on **2016-02-15**

for **DNV GL**

DNV GL local station: **Seoul**

Approval Engineer: **Tom Berg-Nielsen**

**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

Soft seated butterfly valves.

| Type Designation | Size |
|---|---|
| FIG.1, Wafer<br>FIG.1, Flanged tap | DN50 - 1000 (2”-40”)<br>DN50 (2”) |
| FIG.V10, Flanged | DN50 – 850 (2”-34”) |
| FIG.V11, Flanged | DN65 – 1800 (2”-72”) |

Materials:

| Part | Material |
|---|---|
| Body | JIS G5501 FC, ASTM A126 Class.B |
| | JIS G5502 FCD, ASTM A536 |
| | JIS G5101 SC480, ASTM A216 Gr WCB |
| | ASTM A351CF8, CF8M ,CF3,CF3M |
| | ASTM A352 Gr LCB, LCC |
| | ASTM B148 C95500,C95800 |
| Disc | ASTM B148 C95200 |
| | ASTM B148 C95500,C95800 |
| | ASTM A351 CF8, CF8M ,CF3,CF3M |
| | MONEL |
| Stem | ASTM A276 Gr 304, Gr 304L, Gr 316, Gr 316L |
| | MONEL |
| Seat | NBR, PTFE, EPDM, FKM |

## Application

The approval is valid for ship, machinery & cargo piping systems onboard DNV GL classed ships and mobile offshore units

## Limitations

Nodular & Grey cast iron shall not to be used for piping subject to pressure shock, excessive strains and vibration.
Nodular & Grey cast iron shall not be used for class I and II piping.

Nodular & Grey cast iron can in general be used for class III piping, with the following exceptions:

- valves fitted on ship sides and bottom and on sea chests
- valves fitted on collision bulkhead
- valves under static head fitted on the external wall of fuel tanks, lub. oil tanks and tanks for other flammable oils
- valves for fluids with temperatures in excess of 120°C.

Nodular cast iron of the ferritic type, with specified minimum elongation of 12%, may be used in class II and III piping and in valves located on the ship's side and bottom and valves on the collision bulkhead.

Nodular cast iron shall not be used for media having a temperature exceeding 350°C or below 0 °C.

The valves are not considered to be fire safe.

**SEAL/LINING MATERIALS TEMP RATING. :**

Working temperature range depending on seat material:

| Type of rubber | Minimum temperature | Maximum temperature | | |
|---|---|---|---|---|
| | | Dry air | Sea water/steam | Hydrocarbons |
| EPDM | -35°C | +121°C | +130°C | N/A |
| NBR | -18°C | +100°C | +90°C | +90°C |
| FKM | -20°C | +176°C | +80°C | +80°C |
| PTFE | -40°C | +190°C | +150°C | +150°C |

EPDM may not be used for hydrocarbon services.

- Installation of the valves shall comply with the Rule requirements.
- The approval does not include any remote operating device.
- Hand lever for valves with steel body shall be steel.
- Lining material used, shall be compatible with the fluid in the system. This shall be documented.

## Type Approval documentation

- Application for Type Approval
- Drawings:
  Fig. 1 Wafer type: 001-000-001 to 029
  Fig. 1 Flanged Tap type: T0-000-001 to 003
  Fig. V10 Flanged type: V10-000-001 to 014
  Fig. V11 Flanged type: V11-000-001 to 074
- Manufacturer's document No. K1511127 for DNVGL type approval renewal dated 2015-11-27.

## Fabrication Testing

- Each valve is to be tested according to EN 12266-1
- Each valve body is to be subjected to a hydrostatic pressure test at minimum 1,5 times the design pressure at room temp, or in combination with test of valve assembly.
- Each valve assembly is to be subjected to a seat leakage test at minimum 1,1 times the design pressure.
- Each valve shall be subjected to an operability test.
- Butterfly valves fitted on ship's side and bottom are also to be hydraulically pressure tested to 5 bar applied independently on each side of the closed disc.

All testing and acceptance criteria ref. EN 12266-1

## Tests carried out

None

## Delivery Conditions

- DNV GL product certificates are required for valves with DN>100mm and PN>16 bar, and for ship side valves with DN>100 regardless of pressure rating. Other valves may be delivered with manufacturers certificate.
- Valves shall be delivered with material certificates according to Pt. 4, Ch. 6, Sec. 2 Table 3.
- For materials required with DNV GL or Works material certificates the foundry has to be a DNV GL approved foundry

## Marking of product

For traceability to this type approval the valves are to be marked as a minimum with:
- Manufacturers name or trade mark
- Type designation
- Size
- Maximum design pressure or pressure class

## Periodical assessment

Periodical assessment after 2 years:
For retention of the Type Approval, DNV GL Surveyor shall perform an assessment 2 years after issue of the Type Approval Certificate, to verify that the conditions for the type approval are complied with.

Renewal assessment after 5 years:
Application for renewal shall be submitted to DNV GL not later than 3 months before expiry date of the certificate.Upon receipt of the application a periodical assessment will be carried out to verify the conditions for the type approval is still complied with. Any changes to the design are to be handled as for initial Type Approval, with regards to additional documentation and testing requirements.