DNV·GL

Certificate No:
TAP00001BW

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Butterfly Valves

with type designation(s)
HWE73 and HWE75

Issued to
Westad Industri AS
Geithus, Norway

is found to comply with
DNV GL rules for classification – Ships Pt.5 Ch.7 Liquefied gas tankers
DNV GL class programme DNVGL-CP-0186 – Type approval – Valves
DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018

Application :

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

Temperature range:	**-110°C to 400°C**
Max. working press.:	**22 and 35 bar**
Sizes:	**DN100, DN150 & DN200**

Issued at **Høvik** on **2018-04-27**
This Certificate is valid until **2023-06-30**.
DNV GL local station: **Oslo Maritime and CAP**

Approval Engineer: **Zeinab Sharifi**

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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Product description

High Performance Butterfly Valves (HPBV)- Triple offset wafer type with standard end connections.
Type designation: HWE73 and HWE75
Size (ANSI 300): DN100, DN150 and DN200

Materials:

Valve part	*Material*
Body (Stainless Steel)	ASTM A351 CF3M
Disk (Stainless Steel)	ASTM A351 CF3M
Shaft (Iron Base Superalloy)	ASTM A638 Gr.660
Seat (Stainless Steel)	ASTM A276 S32760
Packing (Flexible Graphite)	Grafoil

Application/Limitation

Valves covered by this certificate may be used in LNG/LEG applications and fire systems.

Maximum working pressure: 22 bar (HWE73) and 35 bar (HWE75)

For use at elevated temperature, the following pressure reduction factors shall be applied to the MAWP:

Temperature (°C)	50	100	150	200	250	300	350	400
MAWP reduction factor	0,95	0,85	0,77	0,71	0,67	0,63	0,60	0,58

This type approval does not cover the valve actuators or operating gear for remote control of the valves.

Certification

Valve bodies shall be delivered with VL material certificate for sizes greater than 4" (DN>100) and minimum design temperature less than -55°C. Otherwise, it shall be delivered with work certificate (W). Materials with VL and W certificates shall be manufactured in an approved manufacturer by the Society.

All valves which DN≥100 (sizes not smaller than 4") or working temperature below -55 °C shall be delivered with DNV GL product certificate. Otherwise manufacturer's certificate is required.
(Reference is made to DNV GL ship rules Pt.5 ch.7 Sec.1 Table 7 and 8)

Production Test

Each valve housing shall be subjected to:

- Hydrostatic testing at a pressure equal to 1.5 times the design pressure.
- Seat and stem leakage test at a pressure equal to 1.1 times the design pressure.

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. Ref. DNV GL Ship Rules P.5 Ch.7 Sec.5 [13.1.1].

All valves requiring certification are to be tested at the plant of manufacturer in the presence of the Society's representative.

Type Approval documentation

Tests carried out

Burst testing of valve bodies.
Cryogenic prototype testing acc. to BS 6364.
Fire testing acc. to API 607.

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 nonstressed 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 design 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.