



DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. P-13088
This Certificate consists of 4 pages

This is to certify that the
Butterfly Valves
with type designation(s)
Tripple Offset Metal Seat Butterfly Valve (DWV-MSB)

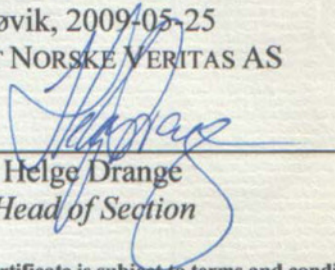
Manufactured by
DWVALVE Co., Ltd.
Pusan, Republic of Korea

is found to comply with
Det Norske Veritas' Rules for Classification of Ships
Det Norske Veritas' Standards for Certification 2.9 No. 5-794.40

Application
Fresh water systems

Temperature range:	-29 to 38°C
Max. working press.:	10 bar
Sizes:	50A to 600A

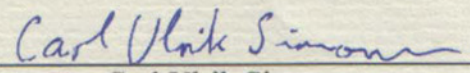
Place and date
Høvik, 2009-05-25
for DET NORSKE VERITAS AS


Helge Drange
Head of Section



Local Office
DNV Pusan Station

This Certificate is valid until


Carl Ulrik Simonsen
Surveyor

Notice: 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.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.



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Product description

Metal seated butterfly valve. Designed according to ASME B 16.34.

Materials:

Body: SC480, FCD 450
Body seat: STS 316L
Disc: SC480, FCD450
Disc seat: 316+Graphite
Shaft: STS 420J2
O-ring: EPDM

Application/Limitation

Cast and forged carbon steel and carbon manganese steels shall be charpy impact tested when the thickness exceed 6 mm and the minimum working temperature is -10°C or lower.

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

The maximum output torque from actuators used on butterfly valves must not exceed the limit at which the valve spindle or disc can be damaged if the disc is restrained in any position.

Butterfly valves fitted on ship's side and bottom is to be hydrostatically tested at a pressure equal to 5 bar applied independently on each side of the closed disc.

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

Each product/delivery is to be accompanied by the following documents:

- DNV product certificates are required for valves with $D_N > 100$ mm having a design pressure, $p > 16$ bar and for ship side valves with $D_N > 100$ mm regardless of pressure rating. For other valves manufacturer's certificate may be accepted.
- Work's Certificate for materials used in valve body, stem and disc indicating mechanical and chemical properties. For valves $D_N > 100$ in Class I piping systems the materials used in the valve body is to be delivered with NV certificate. Valve bodies with nominal diameter 100 mm or less will be accepted with test report.
- Instruction manual/specification sheet.

CSI



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The valve housing of each valve shall be subjected to a hydrostatic pressure test at minimum 1.5 times the design pressure.

Holding time: 2 min for sizes up to 100 mm/4"

5 min. for sizes 125 - 250 mm/5" -10",

10 min. for sizes 300 mm - 450 mm/12" - 18",

15 min. for sizes 500 and larger/20" and larger.

No leakage is permitted.

The valve assembly shall be subjected to a hydrostatic seat leakage test. The test pressure shall at least be equal to the design pressure. The test shall be performed with closed valve with the other end open to atmosphere. The pressure shall be applied independently on each side of the closed disc.

Holding time: 5 min. for all sizes.

Acceptable leakage range: Drop tight

Valves with nominal diameter of more than 50 mm intended for Class I and II piping, and valves intended for ship's side or bottom, must be tested in presence of a DNV Surveyor.

Type Approval documentation

- Dukwon valves documentation booklets including design data, drawings, etc.
- Drawing nos: DWV-BFV-20133-1, DWV-BFV-20133-A, DWV-BFV-20133-3

Marking of product

For traceability to this Type Approval the valves are to be marked:

- Manufacturer's name
- Type designation
- Size
- Max. design pressure or pressure class
- Direction of flow

CS1

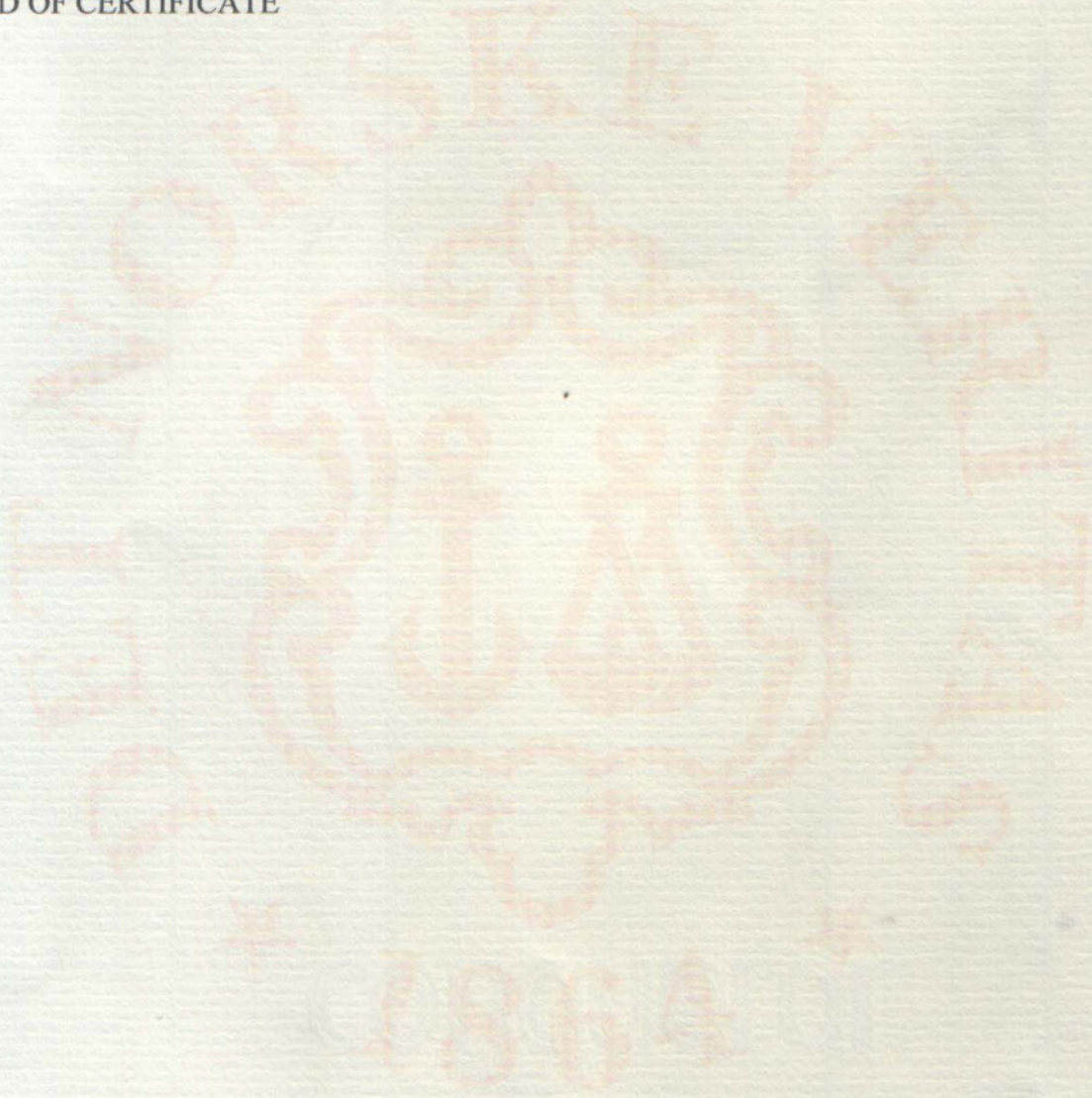


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Certificate retention survey

For retention of the Type Approval, a DNV Surveyor shall perform a survey - every second year and before the expiry date of this certificate - to verify that the conditions for the type approval are complied with.

END OF CERTIFICATE



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