

## TYPE APPROVAL CERTIFICATE

### This is to certify:

#### That the Butterfly Valves

with type designation(s)

**TB-70-1, WVTB-70-1, WVTB-70-1M, WVM-70-4, WVTB-ISO, WVTB-ISO-LT, WVFL-70-2, WVFL-F16, WVFL-F4, WVTB-NOVA, WVTB-NOVA-LT, WVFL-NOVA, WVTB-ISOLEX, WVTB-ISOLEX-LT, and WVFL-ISOLEX**

Issued to

**World Valve B.V.  
LOSSER, Netherlands**

is found to comply with

**Det Norske Veritas' Standards for Certification 2.9 No. 5-794.40  
Det Norske Veritas' Rules for Classification of Ships**

### Application :

**The valves may be used in cargo and fuel oil transfer, freshwater, seawater, water ballast, bilge and sanitary systems that do not require fire safe certification**

<b>Temperature range:</b>	<b>Dep. on lining material (see cert.)</b>
<b>Max. working press.:</b>	<b>PN 6/10/16/25 (dep. on type, see cert.)</b>
<b>Sizes:</b>	<b>25 - 750 mm (dep. on type, see cert.)</b>

This Certificate is valid until **2018-06-30**.

Issued at **Høvik** on **2015-02-16**

for **DNV GL**

DNV GL local station: **Rotterdam**

Approval Engineer: **Simon Ratcliffe**

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**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. If any person suffers loss or damage which is proven to have been caused by any negligent act or omission of the Society, then the Society shall pay compensation to such person for his proven direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question. The maximum compensation shall never exceed USD 2 million. In this provision the "Society" shall mean DNV GL AS as well as all its direct and indirect owners, affiliates, subsidiaries, directors, officers, employees, agents and any other person or entity acting on behalf of DNV GL AS.

Certificate No: **P-15047**  
 File No: **794.41**  
 Job Id: **262.1-010608-2**

## Product description

Short face wafer and lug types, long mono-flange types, long and short face to face double flange types. The shaft is secured to the disc by tapered pins.

A hollow disc (B03) may be delivered for the following valve types and sizes:

Types:

TB-70-1	WVFL-70-2	WVM-70-4
WVTB-70-1	WVTB-ISO	WVFL-F4
WVTB-70-1M	WVTB-ISO-LT	WVFL-F16

Sizes: DN350, 400, 450, 500, 600, 700 and 750.

The inside of the valve housing is vulcanised with the seat material, except the following valve types, which have renewable seats:

WVTB-NOVA, WVFL-NOVA, WVTB-NOVA-LT, WVTB-ISOLEX, WVTB-ISOLEX-LT, WVFL-ISOLEX

Materials:

Part	Material
Body	Cast iron, JL1040 or GG25 Ductile cast iron, JS1030 or GGG40 Cast steel 1.0619, GSC-C25, ASTM 216 WCB Cast stainless steel 1.4404, 1.4408, AISI 316 or 316L Duplex stainless steel, 1.4517 Super duplex stainless steel, 1.4469 Cast NiAl Bronze, CC333G, BS1400 gr. AB2 or 2.0975.01 Bronze, CB480K acc EN1982 or G-CuSn10Zn (RG10) acc DIN1705
Disc	Cast stainless steel 1.4404, 1.4408, AISI 316 or 316L Duplex stainless steel, 1.4517 Super duplex stainless steel, 1.4469 Hastalloy C-4 or 2.4610 Cast NiAl Bronze, CC333G, BS1400 gr. AB2 or 2.0975.01 Bronze, CB480K acc EN1982 or G-CuSn10Zn (RG10) acc DIN1705
Shaft and pins	Stainless steel, 1.4301, 1.4401, 1.4435, AISI 304, 316 or 316L Duplex stainless steel, 1.4460, 1.4462 Super duplex stainless steel, 25Cr, 1.4501 Hastelloy, C-276 Monel K-500, WNo. 2.4375 NiAl Bronze CuAl10Ni
Seat	NBR, EPDM, FPM, Hypalon, Silicone, AISI316/PTFE, Inconel/PTFE

## Application/Limitation

Valves of grey cast iron are not permitted to be fitted in/on the following:

- Class I and II piping systems
- Media having temperature below 0°C and above 120 °C
- Hydraulic piping systems
- Ship's side or bottom and on sea chest
- Collision bulkheads
- Under static head fitted on external wall of fuel oil tanks
- Ballast lines to forward tanks through cargo oil tanks
- Bilge and ballast piping in tunnels in double bottom

Valves of nodular cast iron are not permitted fitted in/on the following:

- Media having temperature below 0°C and above 350°C
- Class I piping systems

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Nodular cast iron of the ferritic type with elongation, A5, less than 12% is subject to the same limitations as grey cast iron.

Working temperature range depending on seat material:

- NBR -10°C to 90°C
- EPDM -30°C to 130°C
- FPM -10°C to 200°C
- Hypalon -10°C to 80°C
- Silicone -10°C to 180°C
- AISI316/PTFE -40°C to 220°C
- Inconel/PTFE -50°C to 220°C

EPDM may not be used for hydrocarbon services.

The valves may not be used for sea water systems or hydrocarbon services where "fire safe" application is required ref. DNV Rules for Ships Pt.4 Ch.1 Sec.3 B500. The valve may not be used as shut off or quick closing valves.

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

Butterfly valves are not to be used as stop valves on fuel oil tanks.

This approval does not include any actuation or operating gear for remote control of the valves.

Types, maximum pressure rating and sizes:

Type	Max pressure rating	Size	Type	Max pressure rating	Size
TB-70-1	PN10	50-200	WVTB-70-1	PN16 PN10 PN6	32-150 175-300 350-500
WVTB-70-1M	PN10 PN6	600-700 750	WVM-70-4	PN16 PN10	40-500 550-650
WVTB-ISO	PN16	25-500	WVTB-ISO-LT	PN16 PN10	50-500 550-600
WVFL-70-2	PN16 PN10 PN6	50-500 600-700 750	WVFL-F16	PN16 PN10 PN6	50-500 600-700 750
WVFL-F4	PN16 PN10 PN6	50-500 600-700 750	WVTB-ISOLEX	PN25 PN16	50-500 600
WVTB-NOVA	PN25 PN16	50-550 600-1200	WVTB-ISOLEX-LT	PN25 PN16 PN10	65-500 600-700 750
WVTB-NOVA LT	PN25 PN16	80-700 750-800	WVFL-ISOLEX	PN25 PN16 PN10	65-500 600-700 750
WVFL-NOVA	PN25 PN16	80-550 600-750			

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## Type Approval documentation

Manufacturer's brochure "Butterfly Valves" may 1998  
Calculation Ecc valves, EN12516-2, dated 22-11-2004  
Calculation rubber lined types, EN12516-2, dated 22-11-2004  
DNV's retention survey report 262.10-002409 dated 2007-01-22

Drawing nos:

H1-03-0350-0400-A3DL	A1-03-0450-A3	A3-02-07-0100-A4B02	D1-02-01-R-0550-0600
H1-03-0450-0500-A3DL	A1-03-0500-A3	A3-02-07-0125-A4B02	D1-02-08-R-0550-0600
H1-04-0350-0500-A3DL	A1-04-0350-A3	A3-02-07-0150-A4B02	D1-02-01-R0700-0750
H1-05-0350-0400-A3DL	A1-04-0400-A3	A3-02-07-0200-A3B02	D1-02-08-R-0700-0750
H1-05-0450-0500-A3DL	A1-04-0450-A3	A3-02-07-0250-A3B02	D1-02-01-R-0800
H1-13-0350-0500-A3DL	A1-04-0500-A3	A3-02-07-0300-A3B02	D1-02-08-R-0800
H1-14-0350-0500-A3DL	A1-04-0550-A3	A3-02-07-0350-A3B02	D1-02-01-R-0900-1000
H1-28-0050-0400-A3DL	A1-05-0350-A3	A3-02-07-0400-A3B02	D1-02-08-R-0900-1000
H1-28-0350-0500-A3	A1-05-050-A3	A3-02-07-0450-A3B02	D1-02-01-R-1200
H1-28-0350-0500-A3DL	A1-05-0450-A3	A3-02-07-0500-A3B02	D1-02-08-R-1200
H1-28-0600-1200	A1-05-0500-A3	A3-02-07-0550-A3B02	D1-02-01-VK-02-0080
H1-28-0600-1200-DL	A1-05-0550-A3	A3-02-07-0600-A3B02	D1-02-01-VK-02-0100
A1-28-0050-A3	A1-05-0650-A3	A3-02-07-0650-A3B02	D1-02-01-VK-02-0125
A1-28-0065-A3	A1-13-0350-A3	A3-02-07-0800-A3B02	D1-02-01-VK-02-0150
A1-28-0080-A3	A1-13-0400-A3	A3-02-07-0900-A3B02	D1-02-01-VK-02-0200
A1-28-0100-A3	A1-13-0450-A3	A3-02-07-1000-A3B02	D1-02-01-VK-02-0250
A1-28-0125-A3	A1-13-0500-A3	A3-02-07-1200-A3B02	D1-02-01-VK-02-0300
A1-28-0150-A3	A1-14-0350-A3	D1-02-01-VK-0050-0065	D1-02-01-R-02-0350
A1-28-0200-A3	A1-14-0400-A3	D1-01-08-R-0032-0065	D1-02-01-R-02-0400
A1-28-0250-A3	A1-14-0450-A3	D1-04-01-VK-0080-0100	D1-02-01-R-02-0450
A1-28-0300-A3	A1-14-0500-A3	D1-01-08-R-0080-0100	D1-02-01-R-02-0500
A1-28-0350-A3	A3-01-07-0050-A4	D1-13-01-VK-0125-0150-0175	D1-02-01-R-02-0600
A1-28-0400-A3	A3-01-07-0065-A4	D1-01-08-R-0125-0175	D1-02-01-R-02-0700
A1-28-0450-A3	A3-01-07-0080-A4	D1-13-01-VK-0200	D1-02-01-R-02-0800
A1-28-0500-A3	A3-01-07-0100-A4	D1-01-08-R-0200	D1-02-01-R-02-0900
A1-28-0600-A3	A3-01-07-0125-A4	D1-02-01-VK-0250-0300	D1-02-01-R-02-1000-1200
A1-28-0700-A3	A3-01-07-0150-A4	D1-01-08-R-0250-0300	A3-02-07-0750-A3B03
A1-28-0800-A3	A3-01-07-0200-A4	D1-02-01-R-0350	A3-02-07-0350-A3B03
A1-28-0900-A3	A3-02-07-0250-B01	D1-02-08-R-0350	A3-02-07-0400-A3B03
A1-28-1000-A3	A3-02-07-0300-B01	D1-10-01-R-0400-SMIT-GAS	A3-02-07-0450-A3B03
A1-28-1200-A3	A3-02-07-0350-B01	D1-02-08-R-0400	A3-02-07-0500-A3B03
A1-03-0350-A3	A3-02-07-0400-B01	D1-02-01-R-0450-0500	A3-02-07-0600-A3B03
A1-03-0400-A3	A3-02-07-0080-A4B02	D1-02-08-R-0450-0500	A3-02-07-0700-A3B03

## Type Tests carried out

None

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## Production Testing

Each valve body shall be subjected to a hydrostatic pressure test at minimum 1.5 times the design pressure. The test pressure need not be more than 70 bar in excess of the design pressure. For valves intended for ship's side or bottom the test pressure is not to be less than 5 bar.

Holding time:	0 to 100mm (0" to 4")	2 min
	125 to 250mm (5" to 10")	5 min
	300 to 450mm (12" to 18")	10 min
	500 and larger (20" and larger)	15 min

No leakage is permitted.

The valve assembly shall be subjected to a hydrostatic seat leakage test. The test pressure shall at least 1.1 times 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. For valves intended for ship's side or bottom the test pressure is not to be less than 5 bar.

Holding time:	5 minutes for all sizes
Acceptable leakage range:	Drop tight

## Certification

Each valve is to be delivered with the following documentation:

- DNV product certificates for valves with DN > 100 mm and PN > 16 bar, and for ship's side and bottom valves where DN > 100 mm regardless of pressure rating. For other valves manufacturer's certificate may be accepted.
- Material certificates according to DNV Ship Pt.4 Ch.6 Sec.2 Table A2.

## Marking of product

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

- Manufacturer's name:
- Type designation

## Periodical assessment

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