



DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. **P-14563**

This is to certify that the
Ball Valve

with type designation(s)
Starline Floating Ball Valves (2-piece, 3-piece, Multiport)

Manufactured by
STARLINE SPA
COSTA DI MEZZATE BG, Italy

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
The valves may be used in the following systems: Fresh and sea water, Compressed air, Hydraulic oil, Fuel oil, Lubrication oil, Cargo oil and Saturated steam (see cert. for limitations)

Temperature range: Depending on materials (see cert.)
Max. working press.: Depending on size (see cert.)
Sizes: 1/4 to 4" (see cert.)

This Certificate is valid until **2016-06-30**.

Issued at **Høvik** on **2013-11-07**

DNV local station: **Milan**

Approval Engineer: **Simon Ratcliffe**

for **Det Norske Veritas AS**

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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 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.

Product description

The valves bodies are 2-piece, 3-piece and multiport bolted. The balls are forged steel ball of the floating type.

End connection configurations:

- Threaded, BSPP and BSPT acc. BS21 and NPT acc. ASME B1.20.1
- Flanged, acc. ASME B16.5
- Bevelled Weld Ends acc. ASME B16.25
- Plain and Socket Weld Ends acc. ASME B16.11

Material combinations body/trim:

Body and Flanges	Trim (Ball, Seats, Stem Trunnion and Springs)
ASTM A479 316	ASTM A479 316
ASTM A350 LF2	ASTM A182 F316
ASTM A182 F316	ASTM A182 F316

Size ranges:

2-piece	1/2" to 4" full bore	
3-piece	1/4" to 3" full bore	1/2" to 4" reduced bore
Multiport	1/4" to 2 1/2" full bore	1/2" to 3" reduced bore

Application/Limitation

System fluid/medium limitations:

Multiport type valves shall not be used in systems for hydraulic, fuel, lubrication or cargo oil.

Maximum working temperatures for valves with the following body and sealing materials:

Part and material	Temp. range
Body material:	
ASTM A350 LF2 *)	-45 to 260 °C
ASTM A182 F316	-55 to 260 °C
Sealing material:	
Virgin PTFE	-55 to 200 °C
PEEK	-55 to 250 °C
Reinforced PTFE 20% carbon and 5% graphite	-55 to 250 °C
PTFE + 60% Bronze	-55 to 260 °C
Graphite	-55 to 320 °C Max PN40

*) - Carbon steel used in body and bonnet shall be charpy tested when the thickness exceeds 6 mm, and the minimum working temperature is -10 °C or lower. Acceptance criteria according to DNV Cert. Notes 2.9 No. 101, 3.3.

3-piece valves only: maximum working pressure and flange rating is depending upon and bore and size:

DN		Max. Flange Rating	Max. Working Pressure
FB	RB		
1/4 - 3/8" 1/2" 3/4" 1" 1 1/4" 1 1/2"	1/2" 3/4" 1" 1 1/4" 1 1/2" 2"	800 lbs	138 bar
2" 2 1/2"	2 1/2" 3"	600 lbs	99,3 bar
3"	4"	400 lbs	68 bar

Multiport only:

Size	Max. Pressure
1/4 - 3/8" 1/2" 3/4" 1" 1 1/4" 1 1/2"	100 bar
2" 2 1/2" 3"	50 bar

2-piece valves only:

Maximum rating Class 150 or PN 16-25-40.

At elevated temperatures, the maximum working pressure has to be reduced with the following factors:

Temp	Carbon Steel	Stainless Steel
20 °C	1	1
50 °C	1	0,95
100 °C	1	0,85
150 °C	0,89	0,77
200 °C	0,81	0,71
260 °C	0,70	0,66

General limitations

Valves with threaded end couplings may not be used for flammable fluids within machinery spaces of Category A.

2-piece and 3-piece valves featuring bolt and nut arrangements are not considered firesafe and are therefore not approved for use as closing valves within fuel oil, cargo oil, lube oil, hydraulic oil or thermal oil systems. Neither are they permitted for use in fire mains and sprinkler systems. The same limitations also apply to the multiport valves.

Valves where the bolts screw directly into the valve body are considered firesafe.

Valves with taper threaded end couplings of sizes up to DN 25mm may be used in piping Class I and II.

In class III piping systems, both parallel and tapered threads up to DN 50mm may be accepted.

All valves larger than DN 50 for hydrocarbon service shall be fitted with an anti-static device that will ensure electrical conductivity between the ball and the valve body. For valves DN 50 and smaller, only electrical conductivity between ball and stem is required.

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

Valves used in the following systems shall be arranged for local manual operation even if these valves are remote controlled:

- Sea suction and discharge
- Bilge
- Fuel and lubrication oil tanks which are located above the double bottom tanks

For sea suction and discharge valves a portable hand pump is not accepted as equivalent to manual operation.

The valve housing of each valve shall be subjected to a hydrostatic pressure test at a 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.

In addition to hydrostatic testing of the housing, 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 the valve in the closed position and the other end open to atmosphere. The pressure shall be applied independently on each side. For valves intended for ship's side or bottom the test pressure is not to be less than 5 bar.

The test duration and acceptance criteria for both tests are as follows:

Test duration for production testing		
Size	Shell, minutes	Seat, minutes
≤ 100 mm (≤ 4")	2	5
Acceptance criterion	No leakage	Drop tight

Each valve is to be surveyed and certified by Det Norske Veritas when required by Det Norske Veritas Rules, or by the Purchaser. DNV product certificates are required for valves with DN > 100 mm having a design pressure, $p > 16$ bar and for ship side valves with DN > 100 mm regardless of pressure rating. For other valves, a manufacturer's certificate may be accepted.

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

- Class I piping, valve DN ≤ 100 mm: Work's Certificate for materials used in valve body indicating mechanical and chemical properties.
- Class II/III piping, valve DN ≤ 100 mm: Test Report for materials used in valve body indicating mechanical and chemical properties.
- Instruction manual/specification sheet.

This approval does not include actuators and/or other equipment for remote control of the valves.

Type Approval documentation

3-piece valves

Drawings no:

DNV-TAC-12010000A, DNV-TAC-12010001A, DNV-TAC-12010001, DNV-TAC-12010000, DNV-0412010002, DNV-0412010002-A

DNV survey report MIL-07-1854-1

DNV Type Approval Survey Report MIL-12-1865-1

Starline Floating Ball Valves catalogue 2012 Rev.0

2-piece valves

Drawings No.:

BS-1411070001 dated 2007-11-14

BS-1411070002 dated 2007-11-14

Burst test report BURST-T.001

Fire test reports 272/97A, 273/97A, 271/97A, 275/97A, 274/97A, 270/97A, 234/90A and 235/90A

DNV Type Approval Survey Report MIL-12-1865-1
Starline Floating Ball Valves catalogue 2012 Rev.0

Multiport valves

Drawings no:

DNV-0412010000, DNV-0412010000-A, DNV-0412010001, DNV-0412010001-A

Test report GEN-02-277 dated 2002-05-22, DNV Genoa

DNV survey report MIL-07-1854-1

DNV Type Approval Survey Report MIL-12-1865-1
Starline Floating Ball Valves catalogue 2012 Rev.0

Tests carried out

Fire test (excluding multiport valves and those featuring a bolt and nut body arrangement)

Burst pressure test

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 or pressure class.
- arrow to indicate direction of flow on one way flow valves.

Certificate Retention Survey

For retention of the Type Approval, DNV Surveyor shall perform a survey every second year, to verify that the conditions for the type approval are complied with.

END OF CERTIFICATE