DNV·GL

Certificate No:
TAP00000EW

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Ball Valve

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

Issued to
STARLINE SPA
COSTA DI MEZZATE, Italy

is found to comply with
DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV GL class programme DNVGL-CP-0186 – Type approval – Valves

Application :

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

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 **2021-07-26**.

Issued at **Høvik** on **2016-10-10**

DNV GL local station: **Milan**

Approval Engineer: **Mehdi Rowshan**

for **DNV GL**

Digitally Signed By: Marveng, Marianne Spæren
Location: DNV GL Høvik, Norway
Signing Date: 13.10.2016

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.

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 A350 LF2 ASTM A182 F316	ASTM A479 316 ASTM A182 F316 ASTM A182 F316

Size ranges:

2-piece	½" to 4" full bore	
3-piece	¼" to 3" full bore	½ " to 4" reduced bore
Multiport	¼" to 2½" full bore	½ " to 3" reduced bore

Application/Limitation

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

Part and material	**Temp. range**
Body material:	
ASTM A350 LF2 *) ASTM A105 S.S. 316	-45 to 260 °C -29 to 260 °C -55 to 260 °C
Sealing material:	
Virgin PTFE PEEK Reinforced PTFE 20% carbon and 5% graphite PTFE + 60% Bronze	-55 to 200 °C -55 to 250 °C -55 to 250 °C -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.

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 50 °C 100 °C	1 1 1	1 0,95 0,85
150 °C 200 °C 260 °C	0,89 0,81 0,70	0,77 0,71 0,66

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" ½” ¾” 1" 1 1/4" 1 1/2"	1/2" ¾” 1" 1 ¼" 1 ½" 2"	800 lbs	138 bar
2" 2 1/2"	2 ½" 3"	600 lbs	99,3 bar
3"	4"	400 lbs	68 bar

Multiport only:

Size	**Max. Pressure**
1/4 - 3/8" ½” ¾” 1" 1 ¼" 1 ½"	100 bar
2" 2 1/2" 3”	50 bar

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 and multiport valves.
Valves where the bolts screw directly into the valve body are considered firesafe.
Multiport type valves shall not be used in fire safe applications.

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

All valve bodies shall be subjected by the manufacturer to a hydrostatic test at a pressure equal to 1.5 times the nominal pressure (The nominal pressure is the maximum allowable working pressure at room temperature). The test pressure need not be more than 70 bar in excess of the nominal pressure.
For valves fitted on ship's side and bottom the test pressure shall not be less than 5 bar.

The Society's 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 manufacturers certificate be accepted.

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

Valves shall be delivered with material certificates in accordance with Part 4 Chapter 6 Section 2 Table 3.

Type Approval documentation

3-piece valves
Drawings no:
DNV-TAC-12010000A-Rev.01, DNV-TAC-12010001A-Rev.01, DNV-TAC-12010001-Rev.01, DNV-TAC-12010000-Rev.01, DNV-0412010002-Rev.01, DNV-0412010002-A-Rev.01
Starline Floating Ball Valves catalogue 2012 Rev.0

2-piece valves
Drawings No.:
BS-1411070001-Rev.01 dated 2016-09-05
BS-1411070002-Rev.01 dated 2016-09-05
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
Starline Floating Ball Valves catalogue 2012 Rev.0

Multiport valves
Drawings no:
DNV-0412010000-Rev.01, DNV-0412010000-A, DNV-0412010001-Rev.01, DNV-0412010001-A-Rev.01
Test report GEN-02-277 dated 2002-05-22, DNV Genoa
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

For traceability to this type approval the valves are to be marked as a minimum with:

- Manufacturers name or trade mark
- Type designation
- Pressure rating
- Size
- Temperature range
- Medium

Periodical assessment

For retention of the Type Approval a DNV GL Surveyor shall perform a periodical assessment every second Year. The objective of the periodical assessment is to verify that the conditions for the TA are not altered since the TAC was issued.
The main scope of the periodical assessment will normally include:

- Verification of the TA applicant’s production and quality system w.r.t. ensuring continued consistent production of the type approved products at the TA applicant’s own premises
- Review of the TA documentation and that this is still used as basis for the production
- Review of possible changes to the design, the material and the performance of the product
- Verification of the product marking.