DNV·GL

Certificate No:
TAP0000092

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Butterfly Valves

with type designation(s)
SAPAG JMC

Issued to
Pentair Valves and Controls Griss
Ham, France

is found to comply with
DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition July 2015
DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV GL class programme CP-0186 – Type Approval of valves

Application :

Butterfly valves approved for use in ship piping, machinery piping and cargo piping systems. Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Temperature range:	**Depending on seat material, see cert.**
Max. working press.:	**16 and 25 bar, depending on size, see cert.**
Sizes:	**DN 50 to DN 1600, (2" to 64").**

This Certificate is valid until **2020-12-31**.

Issued at **Høvik** on **2016-02-29**

for **DNV GL**

DNV GL local station: **Dunkerque**

Approval Engineer: **Zeinab Sharifi**

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

Butterfly valves in different types and sizes as listed in the table below:

Type of valve	Sizes	Nominal pressure
SAPAG JMC Lug	2" – 40" (DN50 – DN1000)	25 bar
SAPAG JMC Wafer	2" – 40" (DN50 – DN1000)	25 bar
SAPAG JMC Double	2" – 40" (DN50 – DN1000)	25 bar
Flanged	42" – 64" (DN1050 – DN1600)	16 bar

Materials:

Part	European standards	Other standards
Body:	EN 1563: EN GJS 400-18 EN 1563: EN GJS 400-18 LT EN 1563: EN GJS 400-15 EN 10213-2: GP 240 GH EN 10213-4: 1.4409/ 1.4408 EN 1982: CuAl10NiFe5-C	ASTM A536 Grade 60.40.18 ASTM A536 Grade 60.40.18 ISO Grade 400-12 ASTM A216 WCB ASTM A351 gr CF3M/CF8M ASTM B148.9 C95800
Disc:	EN 1563: EN GJS 400-15 EN 1563: EN GJS 400-18 EN 1982: CuAl10NiFe5-C EN 10213-4: 1.4409/ 1.4408 EN 10213-4:GX2CrNiMoCuN25-6-3-3 – 1.4517 EN 10213-4: GX2CrNiMoCuN22-5-3 – 1.4470	ISO Grade 400-12 ASTM A536 Grade 60.40.18 ASTM B148.9 C95800 ASTM A351 gr CF3M/CF8M ASTM A351 CD-4MCu ASTM A494 N-12MV ASTM A494 CW-12MW ASTM A351 M35-1 ASTM A351 CN-7M
Stem and spindle:	EN 10088-3: X20Cr13 – 1.4021 EN 10088-3: X5CrNiCuNb16-4 – 1.4542 EN 1982: CuAl10NiFe5-C EN 10272: X5CrNiMo19-11-2 – 1.4404 EN 10272: X2CrNiMo19-11-2 – 1.4401 EN 12163: CuAl10Ni5Fe4 DIN 17744: NiCr22Mo9Nb – 2.4856 DIN 17752: NiCu30Al – 2.4375	AISI 420 AISI 630 ASTM B148.9 C95800 AISI 316L AISI 316 Inconel 625 Alloy K500
Seat:	EPDM, NBR, XNBR, NBRPVC, MVQ, FPM, CSM	

Application/Limitation

The valves are approved for use in ship piping, machinery piping and cargo piping systems.

Maximum allowable pressure shall be according to the applicable flange/design standard for pressure rating and material type.

The temperature range is limited by the seat material and medium as follows:

Type of rubber	Minimum temperature	Maximum temperature
EPDM	-35°C	+130°C
NBR	-25°C	+100°C
XNBR	-25°C	+60°C
MVQ	-60°C	+190°C
FPM	-15°C	+170°C
CSM	-35°C	+140°C

EPDM and MVQ are not to be used for hydrocarbon services.

The materials shall be suitable for the medium and service for which the system is intended. Austenitic stainless steel, i.e. grade 316/316L shall not be considered as suitable material for use in seawater systems.

Nodular (ferritic/pearlitic or pearlitic) & Grey cast iron shall not to be used for piping subject to pressure shock, excessive strains and
vibration.

Nodular & Grey cast iron shall not be used for class I and II piping.

Nodular & Grey cast iron can in general be used for class III piping, with the following exceptions:

- Valves fitted on ship sides and bottom and on sea chests
- Valves fitted on collision bulkhead
- Valves under static head fitted on the external wall of fuel tanks, lub. oil tanks and tanks for other flammable oils
- Valves for fluids with temperatures in excess of 120°C.

Nodular cast iron of the ferritic type, with specified minimum elongation of 12%, may be used in class II and III piping and in valves located on the ship's side and bottom and valves on the collision bulkhead.

Nodular cast iron of the ferritic type, shall not be used for media having a temperature exceeding 350°C or below 0 °C.

For design temperature below -20°C, impact test shall be done in accordance with DNV GL ship rules Pt.2 Ch.2. (for wall thickness 6 mm or greater)

The valves may not be used for sea water systems or hydrocarbon services where "fire safe" application is required ref. DNV GL Rules for Ships Pt.4 Ch.1 Sec.3 Cl.1.4.

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

The maximum output torques from actuators must not exceed the limit at which the spindle or disc can be damaged if the disc is restrained in any position.

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

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

Bilge valves and ship side valves shall always be arranged for manual operation even if these valves are remote controlled. A portable hand pump is not accepted as equivalent to manual operation.

Type Approval documentation

Production testing

Each valve body shall be subjected to a hydrostatic pressure test at;

- 1.5 times the allowable pressure at room temperature

In addition each valve shall be subject to seat leakage testing as follows:

- 1.1 times the design pressure in the valve flow direction.
- 5 bar applied independently on each side of the disc.

Certification

A DNV GL product certificate is required for all 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.

Material certificates are required in line with DNV Rules for Ship Pt.4 Ch.6 Sec.2 Table A2.

All materials delivered with VL or works (W) certificate shall be made at works approved by the Society for the type, grade and dimension of steel being supplied and for the relevant steelmaking and processing route, e.g. delivery condition. Rolling mills without own steelmaking shall use starting material supplied by works approved by the Society.

Marking of product

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

- Manufacturer or trade mark
- Type designation
- Size
- Pressure class
- Type of material

Periodical assessment

For retention of the Type Approval, a DNV GL 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.