

TYPE APPROVAL CERTIFICATE

This is to certify:

That the **Butterfly Valves**

with type designation(s)

Wafer, Lug, Flanged, Double Flanged

Issued to

TTV-JC Valve Group

Leganes, Madrid, Spain

is found to comply with

DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems

DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018

DNV GL class programme DNVGL-CP-0186 – Type approval – Valves

Application :

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

Type:	Temperature range:	Max. working press.:	Sizes:
Wafer	See Certificate	See Certificate	See Certificate
Lug	See Certificate	See Certificate	See Certificate
Flanged	See Certificate	See Certificate	See Certificate
Double Flanged	See Certificate	See Certificate	See Certificate

Issued at **Høvik** on **2021-06-28**

This Certificate is valid until **2026-06-27**.

for **DNV**

DNV local station: **Area NB/CMC Iberia**

Approval Engineer: **Mehdi Rowshan**

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Zeinab Sharifi
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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Product description Butterfly valves of types: Lug, Wafer, flanged, double flanged, Wafer & Lug Bi-eccentric with the following specifications:

<i>Types</i>	<i>Size range</i>	<i>Pressure rating</i>
Wafer Body	DN32-DN1600	#150 & PN10/16/25
Lug Body	DN32-DN1600	#150 & PN10/16/25
Flanges Body	DN50-DN1600	#150 & PN10/16/25
Double Flanges Body	DN40- DN1600	#150 & PN10/16/25
Wafer & Lug Bi-eccentric	DN40-DN600	#150 & PN10/16/25

Material for body:

Nodular	EN1563 EN-GJS-500.7/7U
	EN1563 EN-GJS-400.15/15U
Carbon Steel	ASTM 216 WCB/EN10213 GP240GH
Stainless Steel	ASTM A351 CF-8M/EN10213 GX5CrNiMo 19-11-1
	EN 10088-3 1.4539/ AISI 904 L/ URANUS B6
	ASTM A351 CF8/ EN10213 1.4308
	EN 10088-3 1.4305/ AISI 303
	EN 10088-3 1.4021 /AISI 420
	EN 10088-3 1.4460 /AISI 329
	EN 10088-3 1.4462 /AISI 318
	ASTM A351 CF3M/AISI 316L
	ASTM A217 CA15
	ASTM A494 CW6M/ HASTELLOY C
Aluminium Bronze	ASTM B148 C95500, C95800
	EN 1982 CC33G
Aluminium	EN1706 AC47100
Copper Alloy	DIN 17670 2.0872 CUNIFE

Design Pressure: 25 bar / (16 bar for Aluminum and Cupro-Nickle Alloy group)

Design basis for pressure parts: AD 2000 Merkblatt

Application/Limitation

Valves are approved for ship piping systems, machinery piping systems and cargo piping systems onboard ships and offshore mobile units (considering below limitations):

Maximum working temperatures for valves with the following seats:

Sealing	Temperature
FPM (VITON):	- 5°C to +180°C
Hypalon:	-20°C to +120°C
NBR	-10°C to +90°C
EPDM	-20°C to +110°C
EPDM high temperature	-20°C to +130°C
Nordel	-40°C to +95°C
Silicon	-30°C to +150°C
Silicone food	-30°C to +150°C

EPDM sealing shall not be used in hydrocarbon systems.
The valves may not be used where "fire safe" application is required.
Carbon steel shall be normalized for use below -10°C.

Valves of grey cast iron are not permitted fitted in the following systems:

- Class I and II piping systems

- Service temperatures 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 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:

- Class I piping systems
- Service temperatures below 0 °C and above 350°C

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

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.

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

In seawater applications, surface preparation and coating of cast iron and cast steels shall be approved by society. Stainless steels AISI 420 and SUS 304 & 316 are not considered as seawater resistant material.

Lining material used, shall be resistant to the fluid carried through the valves.

Type Approval documentation

- Wafer Bi-eccentric valves of size range between DN40-DN600 with pressure ratings #150 & PN10/16/25 (drawing no. 14985-15935-010-A3 Rev. 0)
- Lug Bi-eccentric valves of size range between DN40-DN600 with pressure ratings #150 & PN10/16/25 (drawing no. 14986-15936-010-A3 Rev. 0)
- Wafer valves of size range between DN450-DN1600 with pressure ratings #150 & PN10/16/25 (drawing no. 14949-15899-010-A3 Rev. 0)
- Wafer valves of size range between DN32-DN200 with pressure ratings #150 & PN10/16/25 (drawing no. 14947-15897-010-A3 Rev. 0)
- Wafer valves of size range between DN250-DN400 with pressure ratings #150 & PN10/16/25 (drawing no. 14948-15898-010-A3 Rev. 0)
- Lug valves of size range between DN450-DN1600 with pressure ratings #150 & PN10/16/25 (drawing no. 14958-15908-010-A3 Rev. 0)
- Lug valves of size range between DN32-DN200 with pressure ratings #150 & PN10/16/25 (drawing no. 14956-15906-010-A3 Rev. 0)
- Lug valves of size range between DN250-DN400 with pressure ratings #150 & PN10/16/25 (drawing no. 14957-15907-010-A3 Rev. 0)
- Double flange valves of size range between DN32-DN200 with pressure ratings #150 & PN10/16/25 (drawing no. 14967-15917-010-A3 Rev. 0)
- Double flange valves of size range between DN450-DN1600 with pressure ratings #150 & PN10/16/25 (drawing no. 14969-15919-010-A3 Rev. 0)
- Double flange valves of size range between DN250-DN400 with pressure ratings #150 & PN10/16/25 (drawing no. 14968-15918-010-A3 Rev. 0)
- Flange valves of size range between DN32-DN200 with pressure ratings #150 & PN10/16/25 (drawing no. 14963-15913-010-A3 Rev. 0)
- Flange valves of size range between DN450-DN1600 with pressure ratings #150 & PN10/16/25 (drawing no. 14965-15919-010-A3 Rev. 0)
- Flange valves of size range between DN250-DN400 with pressure ratings #150 & PN10/16/25 (drawing no. 14964-15914-010-A3 Rev. 0)
- Technical data sheets for EPDM-HT, EPDM EP-AT, Rev 01
- Technical data sheets for EPDM, EPDM EP-70, Rev.01
- Technical data sheets for PTFE, PTFE, Rev.00
- Technical data sheets for Alimentary Silicone, Silicona-AL, Rev.00.
- Technical data sheets for Silicone, Silicone, Rev.00

- Technical data sheets for FKM fluorelastomer (VitónR), VT-70, Rev 00
- Technical data sheets for CSM HYPALON, HY- 70, Rev 00
- Technical data sheets for NITRILE, NBR- 70, Rev 00
- Calculations, CALCPODNV, Rev 0, date: 11.09.2020

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.

Testing shall follow procedures and acceptance criteria in EN 12266-1 (leakage rate A).

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

Certification

Valve bodies shall be delivered with material certificates in accordance with DNV GL Ship Pt.4 Ch.6 Sec.2 Table 3. Materials with VL and W certificates shall be manufactured in a foundry approved by the Society.

DNV product certificates are required for valves with DN>100 and design pressure ≥ 16 bar, and for ship side valves where DN>100 regardless of pressure. For other valves a manufacturer's product certificate may be accepted.

Marking of product

For traceability to this type approval, the final products are to be marked with:

- manufacturer's name or trademark
- valve type designation
- size
- maximum design pressure and temperature
- arrow to indicate direction of flow on one-way flow valves.

Periodical assessment

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNVGL-CP-0338.