



TYPE APPROVAL CERTIFICATE

Certificate No:
TAP000022F
Revision No:
2

This is to certify:

That the **Butterfly Valves**

with type designation(s)
EVS-i, EVFS-i, EVTLS-i, EVCS-i, EVCLS-i

Issued to

Wouter Witzel EuroValve B.V.
Losser, Overijssel, Netherlands

is found to comply with

DNV rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV-OS-D101 – Marine and machinery systems and equipment, Edition July 2021
DNV class programme DNV-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:
EVS-i	see certificate	PN10 or PN16	DN400 thru DN1000
EVFS-i	see certificate	PN10 or PN16	DN40 thru DN1400
EVTLS-i	see certificate	PN10 or PN16	DN40 thru DN1000
EVCS-i	see certificate	PN16	DN40 thru DN350
EVCLS-i	see certificate	PN16	DN40 thru DN300

Issued at **Høvik** on **2023-08-22**

for **DNV**

This Certificate is valid until **2025-04-21**.

DNV local unit: **Netherlands CMC**

Approval Engineer: **Rob Oerlemans**

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

Five (5) types of butterfly valves designed in accordance with EN 12516-2/-4.

Type	Size	Pressure rating	Type
EVS-i	DN 400, 450, DN 500, 600, 700, 800, 900, 1000	PN16 PN10 or PN16	Wafer
EVFS-i	DN 40, 50, 65, 80, 100, 125, 150, 200, 250, 300, 350, 400, 450, DN 500, 600, 800, 900, 1000, 1200, 1400	PN16 PN10 or PN16	Double flange
EVTLS-i	DN 40, 50, 65, 80, 100, 125, 150, 200, 250, 300, 350, 400, 450, DN 500, 600, 700, 800, 900, 1000	PN16 PN10 or PN16	Wafer Lug
EVCS-i	DN 40, 50, 65, 80, 100, 125, 150, 200, 250, 300, 350	PN16	Wafer Semi Lug
EVCLS-i	DN 40, 50, 65, 80, 100, 125, 150, 200, 250, 300	PN16	Wafer Semi Lug

Note:

EVCLS-i has a long neck for insulating purpose.

EVFS-i is in accordance with various parts of EN 1092, as appropriate to the materials used.

Material:

Body:	Group	Design temperature
60-40-18, ASTM A395:2015	Cast iron, nodular ferritic	0°C – 350°C
60-40-18, ASTM A536:2006	Cast iron, nodular ferritic/pearlitic	0°C – 350°C
EN-GJS-400-15, EN 1563:2011	Cast iron, nodular ferritic	0°C – 200°C
EN-GJS-400-18-LT, EN 1563:2011	Cast iron, nodular ferritic	0°C – 350°C
GP240GH (1.0619), EN 10213:2014	Cast steel	-20°C – 450°C
WCB, ASTM A216:2015	Cast steel	-20°C – 450°C
LCB, ASTM A352:2015	Cast steel	-46°C – 371°C
EN-GJL-250, EN1561:2011	Grey cast iron	0°C – 120°C
CuSn10-C, EN1982:2008	Copper alloy	0°C – 20°C
UNS C95800, ASTM SB-148:2015	Al-Bronze casting	-29°C – 350°C

Disc:

1.4057, EN 10088-3, stainless steel
 1.4462, EN 10088-3, stainless steel
 1.4469, EN 10213:2007, stainless steel
 1.4408, EN 10213:2007, stainless steel
 1.4517, EN 10213:2007, stainless steel
 1.4470, EN 10213:2007, stainless steel
 F51 S31803, ASME SA-182:2015, stainless steel
 CF8M UNS J92900, ASME SA-351:2015, stainless steel
 5A UNS J93404, ASTM A 890:2003, cast iron
 CuAl10FeNi5-C, CC333G, EN 1982:2008, copper alloy
 UNS C95800/C95500, ASTM B 148:2015, Al-bronze casting
 60-40-18, ASTM A395:2015/ASTM A536:2006, cast iron
 UNS J26625, ASTM A494:2003 nickel alloy
 EN-GJS-400-18-LT, EN 1563, cast iron
 CW-6MC (Inconel Alloy 625) UNS J26625 ASME SA-494 : 2015

Shaft:

1.4057, EN 10088-3, stainless steel
 1.4462, EN10088-3, stainless steel
 1.4501, EN 10272, stainless steel
 1.4021, EN 10088-3, stainless steel
 CW307G, EN 1653, copper alloy
 NA 18 (Monel K-500), BS 3076:1999, nickel alloy

Seat:

EPDM
 NBR
 FPM
 VMQ (silicone)

Application/Limitation

Pressure-temperature ratings shall be in accordance with the design standard(s) for the selected metallic material of the valve, also limited to the temperature ranges for sealings as following:

EPDM: -29°C – 120°C
 NBR: 0°C – 80°C
 FPM: 0°C – 200°C
 VMQ: -40°C – 200°C

EPDM may not be used for hydrocarbon services.

Valves covered by this certificate may be used in general machinery service.

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

Materials and material protection chosen for the specific system shall be suitable for the intended medium and environmental conditions. Valves of austenitic stainless steel shall not be used in direct contact with seawater.

Nodular cast iron (Grey Cast Iron) of the ferritic/pearlitic type (ASTM A536 60-40-18) shall not to be used subject to pressure shock, excessive strains, and vibration.

Nodular cast iron shall not be used for class I and II piping with the following exceptions:

- valves in hydraulic piping systems where failure would not render the system inoperative or introduce a fire risk.

Nodular cast iron of the ferritic/pearlitic may be used for class III piping, with the following exceptions:

- pipes and 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 more than 120°C.

Nodular cast iron of the ferritic type (ASTM A395 Gr 60-40-18, EN-GJS-400-15, and EN-GJS-400-18-LT), with specified minimum elongation of 12%, may be used in class II and III piping and in pipes and valves located on the ship's side and bottom and valves on the collision bulkhead.

The valves covered by this certificate are not to be considered fire safe and therefore shall not be installed wherever fire safe application is required, e.g. as shut off or quick closing valves.

Type Approval documentation

Drawing No	Rev.	Title
6709e	09.2016	Silicone Rubber guidelines - Wacker
VV708D	14.02.2018	Silicone Rubber - VMQ
SPP9602/20	12.05.2017	Technical Data Sheet NBR
	09.06.2015	Datablad NGW-70
	11.01.2007	Datablad ESW-70
	11.01.2007	Datablad EDJ-70
	27.07.2004	Datablad EAF-70
<i>PDS01.61.001</i>	<i>2023-05-22</i>	<i>Product Data Sheet - EVS-I - DN 400-1000</i>
<i>DTAFA000</i>	<i>C</i>	<i>GA Drawing - EVS-i - DN 400-1000</i>
<i>PDS01.63.001</i>	<i>2023-05-22</i>	<i>Product Data Sheet - EVTLS-i - DN 40-1000</i>
<i>DTAFA010</i>	<i>B</i>	<i>GA Drawing - EVTLS-i - DN 40-350</i>
<i>DTAFA001</i>	<i>D</i>	<i>GA Drawing - EVTLS-i - DN 400-1000</i>
<i>PDS01.62.001</i>	<i>2023-05-22</i>	<i>Product Data Sheet - EVFS-i - DN 40-1400</i>
<i>DTAFA011</i>	<i>B</i>	<i>GA Drawing - EVFS-i - DN 40-350</i>

DTAFA002	C	GA Drawing - EVFS-i - DN 400-1000
DTAFA023	A	GA Drawing - EVFS-i - DN 1200-1400
PDS01.64.001	2023-05-22	Product Data Sheet - EVCS-i - DN 40-350
DTAFA012	B	GA Drawing - EVCS-i - DN 40-350
PDS01.65.001	2023-06-06	Product Data Sheet - EVCLS-i - DN 40-300
DTAFA013	B	GA Drawing - EVCLS-i - DN 40-300
-	01	Survey Documentation EV-i - DNV - rev01 (2023-08-14) Reference to drawings, product datasheets and calculations covered by Rev.2 of this type approval
FBA1601	A	Body casted - EVS-i - DN 400
FBA1800	B	Body casted - EVS-i - DN 450
FBA2000	A	Body casted - EVS-i - DN 500
FBA2400	A	Body casted - EVS-i - DN 600
FBC1600	A	Body casted - EVFS-i - DN 400
FBC1800	A	Body casted - EVFS-i - DN 450
FBC2000	B	Body casted - EVFS-i - DN 500 / PN16
FBC2001	B	Body casted - EVFS-i - DN 500 / PN10
FBC2401	A	Body casted - EVFS-i - DN 600 / PN16
FBC2402	A	Body casted - EVFS-i - DN 600 / PN10
FBB1600	A	Body casted - EVTLS-i - DN 400
FBB1800	A	Body casted - EVTLS-i - DN 450
FBB2001	A	Body casted - EVTLS-i - DN 500
FBB2400	A	Body casted - EVTLS-i - DN 600
FBB2800	A	Body casted - EVTLS-i - DN 700
FCA1601	B	Body machined - EVS-i - DN 400
FCA1800	B	Body machined - EVS-i - DN 450
FCA2000	B	Body machined - EVS-i - DN 500
FCA2400	B	Body machined - EVS-i - DN 600
FCC1600	B	Body machined - EVFS-i - DN 400
FCC1800	B	Body machined - EVFS-i - DN 450
FCC2000	C	Body machined - EVFS-i - DN 500 / PN16
FCC2001	C	Body machined - EVFS-i - DN 500 / PN10
FCC2401	B	Body machined - EVFS-i - DN 600 / PN16
FCC2401	B	Body machined - EVFS-i - DN 600 / PN10
FCB1600	B	Body machined - EVTLS-i - DN 400 / PN16
FCB1601	A	Body machined - EVTLS-i - DN 400 / PN10
FCB1800	B	Body machined - EVTLS-i - DN 450 / PN16
FCB1801	A	Body machined - EVTLS-i - DN 450 / PN10
FCB2001	B	Body machined - EVTLS-i - DN 500 / PN16
FCB2002	A	Body machined - EVTLS-i - DN 500 / PN10
FCB2400	B	Body machined - EVTLS-i - DN 600 / PN16
FCB2401	A	Body machined - EVTLS-i - DN 600 / PN10
FCB22802	A	Body machined - EVTLS-i - DN 700 / PN10
FCB22803	A	Body machined - EVTLS-i - DN 700 / PN16
FHB6000	A	Bottom cover RD 60
TB- FCC1600	2020-04-09	Calculation - Body EV-i -Series - Double Flange _ DN 400
TB- FCC1800	2020-04-09	Calculation - Body EV-i -Series - Double Flange _ DN 450

TB- FCC2000	2020-04-09	Calculation - Body EV-i -Series - Double Flange _ DN 500
TB- FCC2001	2020-04-09	Calculation - Body EV-i -Series - Double Flange _ DN 500
TB- FCC2401	2020-04-09	Calculation - Body EV-i -Series - Double Flange _ DN 600
TB- FCC2402	2020-04-09	Calculation - Body EV-i -Series - Double Flange _ DN 600
TB- FCA1601	2020-04-09	Calculation - Body EV-i -Series - Wafer _ DN 400
TB- FCA1800	2020-04-09	Calculation - Body EV-i -Series - Wafer _ DN 450
TB- FCA2000	2020-04-09	Calculation - Body EV-i -Series - Wafer _ DN 500
TB- FCA2400	2020-04-09	Calculation - Body EV-i -Series - Wafer _ DN 600
TB-FCB2802	C	Calculation - Body EV-i -Series - Wafer _ DN 700
MDS - M03	F	Material Data Sheet - Spheroidal Graphite Cast Iron
MDS - M14	I	Material Data Sheet - Austenitic Stainless Steel Cast
MDS – M20	E	Material Data Sheet - Aluminium - Bronze Casting
MDS – M22	F	Material Data Sheet - Carbon Steel Casting
MDS – M79	D	Material Data Sheet - Aluminium - Bronze Castings
MDS – M97	G	Material Data Sheet – Ferretic Austenitic Stainless Steel Cast
MDS – M103	C	Material Data Sheet - Spheroidal Graphite Cast Iron
MDS – M122	C	Material Data Sheet - Spheroidal Graphite Cast Iron
MDS – M11	B	Material Data Sheet - Bronze Casting (Rg 5)
MDS – M29	B	Material Data Sheet - Bronze Casting (Rg 10)
MDS – M89	E	Material Data Sheet - Austenitic Stainless Steel Casting
MDS – M148	B	Material Data Sheet - Stainless Steel Casting (Av -28 °C)
MDS – M149	B	Material Data Sheet - Carbon Steel Casting (Av -28 °C)
MDS – M159	B	Material Data Sheet - Carbon Steel Cast - Norsok
MDS – M89	B	Material Data Sheet - Austenitic Stainless Steel Cast
MDS – M217	B	Material Data Sheet - Austenitic Stainless Steel Casting
MDS – M218	A	Material Data Sheet - Carbon Steel Cast - Norsok

Production Testing and Certification

Production Testing and Certification for the actual intended application shall follow the latest applicable edition of the Rules (as mentioned on the front page of this certificate).

Marking of product

Minimum marking requirements shall be as outlined in the valve design standard i.e., EN 19

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 DNV-CP-0338.