

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Butterfly Valves**with type designation(s)
Dynaxe

Issued to

Wouter Witzel EuroValve B.V.
Losser Overijssel, Netherlands

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
DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018**Application :****Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV GL.****Temperature range:** See certificate
Max. working press.: Class 150 & 300 (acc. to ASME B16.34)
Sizes: DN 50 to DN 900This Certificate is valid until **2023-02-18**.Issued at **Høvik** on **2018-03-19**DNV GL local station: **Rotterdam**Approval Engineer: **Zeinab Sharifi**for **DNV GL**

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.

Job Id: **262.1-028044-1**
Certificate No: **TAP00000BZ**
Revision No: **1**

Product description

Double eccentric butterfly valves with standard end connections according to recognized standards such as EN 1092, ASME B16.5/B16.47. The face to face dimensions are according to EN 558/API609. Configurations of valve- type, body design, size and pressure class is listed in the table below. Further detail product dimensions/information is presented in submitted documentation listed in this certificate.

Type	Body design	Size range	Pressure Class
Dynaxe-W201	Flangeless wafer type with centring lugs	DN 50-900	150
Dynaxe-W162	Flangeless wafer type (lugged)	DN 50-600	150, 300
Dynaxe-W921	Flangeless wafer type	DN 80-600	150
Dynaxe-L201	Lugged type	DN 50-900	150
Dynaxe-L162	Flangeless wafer type (lugged)	DN 50-600	300
Dynaxe-F131	Double flange type	DN 50-900	150
Dynaxe-F142	Double flange type	DN 50-600	300

Materials:

Body:

Cast carbon steel: ASTM A216 WCB/ EN10213-2 GP240GH
Cast stainless steel: ASTM A351 CF8M/ EN10213-4 GX5CrNiMo 19-11-2
Cast aluminum-bronze: ASTM B148 C95800/ EN1982 CC333G
Cast Duplex SS: ASTM A 995 4A/5A/6A
Forged Titanium: ASTM B 265/348/381 Gr.2 (UNS R50400)
Cast Titanium: ASTM B367 C-2 (UNS R50400)

Body seat:

Stainless steel 1.4370, EN 12072 / Stellite 21 UNS W73041/W73021 or base material

Disc seat/seal:

RTFE/Fire Safe (RTFE / SS A182 F316)
Rubber Elastometric (Rubber FPM, NBR, EPDM/ SS A182 F316)
Metal Laminated - A182 F316 + Graphite
Metal Solid - Stainless Steel (A182 F316 / EN 10088-3 X5CrNiMo17-12-2)
Metal Solid - Inconel 718/625, Aluminium Bronze

Disc:

Forged steel: ASTM A105N
Forged stainless steel: ASTM A182 F316 / X5CrNiMo 17-12-2, EN10088-3
Cast carbon steel: ASTM A216 WCB, UNS J03002 / GP240GH EN10213-2
Cast stainless steel: ASTM A351 - J92900
Cast aluminium-bronze: ASTM B148, UNS C95800/ EN1982 CC333G
Cast Duplex SS: ASTM A 995 4A/5A/6A
Forged Titanium: ASTM B 265/348/381 Gr.2 (UNS R50400)
Cast Titanium: ASTM B 367 C-2 (UNS R50400)

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:

RTFE (fire Safe): -29°C to 204°C
Metal Laminated/solid: -29°C to 425°C
Non-metallic materials: acc. to DNVGL-CP-0186 Sec.4 Table 1, 2015 ed.

The approval is valid for ship, machinery & cargo piping systems onboard DNV GL classed ships and mobile offshore units.

Austenitic stainless steel (e.g. A351 CF8M, A182 F316) are not seawater resistant and shall not be used in direct contact with seawater.

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Valves with fire safe seat ring (RTFE 15-12-3 and A182 F316) may be installed in systems where *fire safe* is required.

EPDM sealing shall not be used in Hydrocarbon applications.

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

This certificate does not cover valves installed in LNG/LPG applications.

The valves may not be used as shut off or quick closing valves.

Type Approval documentation

Manufacturer's catalogue: Wouter Witzel EuroValve 04/2012 - revision 2.0

Technical drawings:

<i>Document no.</i>	<i>Title</i>	<i>Revision</i>	<i>Date</i>
D-CAEA010-F	Dynaxe F131 DN 50-900	F	2013-04-05
D-CAEA006-C	Dynaxe F142 DN 50-600	C	2008-06-24
D-CADA001-E	Dynaxe L162 DN 50-600	E	2018-03-19
D-CADA015-E	Dynaxe L201 DN 50-900	E	2018-03-19
D-CADA004-E	Dynaxe W162 DN 50-600	E	2018-03-19
D-CAAA027-D	Dynaxe W201 DN 50-900	D	2008-06-24
D-CAPA003-A	Dynaxe W921 DN 80-600	D	2015-03-05

Product data sheets:

PDS03.01.001, PDS03.02.001, PDS03.05.001, PDS03.08.001, dated 2015-04/08-01
PDS03.03.001, PDS03.04.001, PDS03.06.001- dated 2014-09-01.

Design Calculation notes, dated 2018-02-22:

Dynaxe F131: TB-CDE0203, TB-CDE0401, TB-CDE0803, TB-CDE1600, TB-CDE2400, TB-CDE3601.

Dynaxe F142: TB-CDE0200, TB-CDE0401, TB-CDE0800, TB-CDE1602, TB-CDE2400.

Dynaxe-W162: TB-CDB0400, TB-CDB0800, TB-CDB1600, TB-CDB2400.

Dynaxe-W201/ L201: TB-CDA0400, TB-CDA0800, TB-CDA1600, TB-CDB2400, TB-CDC0200.

Dynaxe-W921: TB-CDA0301, TB-CDA0401, TB-CDA0801, TB-CDA1601, TB-CDP2401.

Southwest Research Institute fire test reports No 6-995 (2005-08-11), 6-1012 (2006-01-06), 6-1013 (2006-01-06), 6-1024 (2006-04-06) and 01.10933.01.719

Tests carried out

Fire Test according to ISO10497 2nd edition and API 607 4th edition.

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.

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.

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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 GL 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 trade mark
- 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 GL 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.