

TYPE APPROVAL CERTIFICATE**This is to certify:****That the Butterfly Valves**

with type designation(s)

F012 A/ (K1), F012-TS, T211, T212, T214, Z011 A/ (K1), Z011-TS, Z014 A/ (K1), Z014-TS

Issued to

**EBRO Armaturen Gebr. Bröer GmbH
Hagen Nordrhein-Westfalen, Germany**

is found to comply with

DNV GL rules for classification – Ships**DNV GL rules for classification – Yachts****DNV GL rules for classification – Offshore units****Application :****Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.****Temperature range: - 50 °C up to 150 °C****Max. working press.: 10 bar up to 16 bar (10 bar for alves with AI-housing)****Sizes: DN 20 mm up to 1800 mm (see cert.), DN 40 up to DN 2000 (see cert.)**This Certificate is valid until **2021-08-31**.Issued at **Hamburg** on **2016-09-01**DNV GL local station: **Essen**Approval Engineer: **Peter Gierhan**for **DNV GL**

**Olaf Drews
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

Design:

Z011 A/ (K1), F012 A/ (K1)/ ISO SHORT, Z014 A/ (K1), Z011-TS, F012-TS, Z014-TS:

- Concentric soft-sealing butterfly valves with divided or undivided stem. Rubber seated.
Two disc design: TS- Version, plug type or fixed by pins and version with splitted shaft. The undivided stem is locked to the disc by 2 *conical pins* or with square part in the shaft. A locking bolt locks the upper divided stem to the housing.
- Flange drilling alternatives PN 6, PN 10 and PN 16 acc. DIN 2501, JIS 5K, JIS 10K and ANSI B16.5 150 lb.

T211, T212, T214:

- PTFE-Lined Centric valves

Types:

Type	Design	Size	Max working pressure
F012 A/ (K1)/ ISO SHORT	Double flanged type	DN50- 1800	16 bar
F012-TS	Double flanged type	DN40 - 2000	16 bar
T211	Centric wafer type	DN50 - 300	10 bar
T212	Centric double flanged type	DN350 - 600	10 bar
T214	Centric lug type	DN50 - 300	10 bar
Z011 A/ (K1)	Wafer type	DN20 - 1200	16 bar
Z011-TS	Wafer type	DN40 - 1200	16 bar
Z014 A/ (K1)	Wafer lug, with tapped holes	DN20 - 600	16 bar
Z014-TS	Lug type	DN40 - 1400	16 bar

Materials:

Part / Material	Grade	Standard
Body:		
Iron	Grey Cast Iron Nodular Cast	EN-GJL-250 EN-GJS-400-15 / -18-LT WNo: 1.4408
	Stainless Steel Cast Steel	GP240GH+N ASTM A216 WCB G-CuAl10Ni
	Bronze Casting	GD-AISI9Cu3 (DN50-300)
Stem/shaft:		
	Stainless Steel	WNo: 1.4462, 1.4418, 1.4122, 1.4104, 1,4401
	Bronze	304, 316 WNo: 2.0966, 2.4883 (Hastelloy) 2.0975
		EN 10088 AISI DIN1714

Part / Material	Grade	Standard
Disc:		
Iron	Nodular Cast	EN-GJS-400-15
	Bronze	G-CuAl10Ni
	Stainless Steel	ASTM B148 9D
		304, 316
		CF-8M
		WNo: 1.4408
		1.4462, 1.4469, 1.4404, 1.4571
		1.0718
		2.4883, 2.4610 (Hastelloy)
		PTFE coated St 52.3
	Carbon steel	(1.4462/PTFE)
Seat:	NBR, EPDM, FPM, VSI, AU, PTFE or CSM	
Tapper pins:	1.4571, 144.62, 1.4462, 2.4375, 2.0975, Monel K-500	

Application/Limitation

Temperature range dependent on the rubber materials as follows:

NBR	-20°C to 90°C
NBR (Medium Heavy Fuel Oil)	Max. 80°C
EPDM	-10°C to 120°C
FPM	-25°C to 150°C
VSI (Silicon rubber)	-50°C to 150°C
CSM (Chlorosulphonated polyethylene)	-10°C to 100°C

Main parts of valve (Exclude seat) shall have melting point equal or greater than 925° C. Valves with disc material grades stainless steel 304 or 316 shall not be used in systems intended for seawater. Valves cover by this type approval certificate shall not be used in fire main and water spray, foam and sprinkler systems.

In general valves of grey cast iron are not permitted fitted in/on the following:

- Class I and II piping systems.
 - Media having temperature below 0°C and above 120 °C.
 - Hydraulic piping systems.
 - Ship's side or bottom and on sea chest.
 - Collision bulkheads and fuel oil tanks.
 - Systems subjected to pressure shock, excessive strains and vibration.
 - Under static head fitted on external wall of fuel oil tanks.
 - Ballast lines to forward tanks through cargo oil tanks.
 - Bilge and ballast piping in tunnels in double bottom.
 - Valves made of grey cast iron limited for application in pipe class III piping systems and in cargo systems on oil tankers.
 - Wafer type butterfly valves and valves made of grey cast iron are not approved at the ship's side, fuel oil tanks and collision bulkheads.
- Within machinery spaces valve bodies made of aluminium are not approved for application in fuel, bilge, seawater piping systems.
- For application in fire mains and hydrants the valve body is to be protected by type approved fire insulation.

The max. output torque from actuators must not exceed the limit at which the spindle or disc can be damaged if the disc is restrained in any position.
The approval does not include any gear operating gear for remote control of the valves.

Each product/delivery is to be accompanied by the following documents:

- Product certificate prepared by the manufacturer.
- DNV product certificates are required for valves with DN > 100 mm and PN > 16 bar and for ship side Valves DN > 100 mm regardless of pressure rating.
- Work's Certificate for materials used in valve body, stem and disc indicating mechanical and chemical properties. Valve bodies with nominal diameter 100 mm or less will be accepted with test report.
- Instruction manual/specification sheet.

The valve housing of each valve shall be subjected to a hydrostatic pressure test at minimum 1.5 times the design pressure. For valves intended for ship's side or bottom the test pressure is not to be less than 5 bar.

Holding time: 2 min. for sizes up to 100 mm
 5 min. for sizes 125 - 250 mm
 10 min. for sizes 275 mm - 450 mm
 15 min. for sizes 500 mm and larger

Acceptance criterion: No leakage is permitted.

The valve assembly shall be subjected to a hydrostatic seat leakage test. The test pressure shall at least be equal to 1.1 times the design pressure. The test shall be performed with closed valve with the other end open to atmosphere. The pressure shall be applied independently on each side of the closed disc. For valves intended for ship's side or bottom the test pressure is not to be less than 5 bar.

Holding time: 5 min. for all sizes.
Acceptable criterion: Drop tight

Type Approval documentation

Tests carried out

Body and seat leakage test, burst test
CLASS PROGRAMME DNVGL 0186
DNV GL-Cert. 12178-98 HH, 44720-07 HH

Marking of product

For traceability to this type approval, each valve is at least to be marked with:

- Manufacturer's name or trade mark
- Type designation
- Size
- Maximum design pressure or pressure class



Job Id: **262.1-003408-5**
Certificate No: **TAP00000H1**

Periodical assessment

For retention of the Type Approval, DNV GL Surveyor shall perform a periodical assessment every second year, to verify that the conditions for the type approval are complied with and to witness the following tests on a selection of sizes:

- Pressure test
- Leakage test

END OF CERTIFICATE