

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Filter**

with type designation(s)
Duplex filter type BFD

Issued to

Boll & Kirch Filterbau GmbH
Kerpen Nordrhein-Westfalen, Germany

is found to comply with
DNV GL rules for classification – Ships Pt.4 Ch.7 Pressure equipment

Application :

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

Duplex filter type BFD see 'Product description' on page 2

Issued at **Hamburg** on **2017-06-27**

This Certificate is valid until **2022-06-26**.

DNV GL local station: **Essen**

Approval Engineer: **Matthias Schmidt**

for **DNV GL**

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Harald Pauli
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

Duplex filter type BFD for fuel, oil, water or sea water with the following technical data:

Type designation	Material	Filter	
		Max. pressure	Max. temperature
BFD 100 260/350 25 02 GGG	5.3105	40	120°C
BFD 110 330/550 40 04 GGG			
BFD 140 420/660 50 05 GGG			
BFD 180 570/880 65 06 GGG			
BFD 180 580/900 80 08 GGG			
BFD 220 630/990 100 10 GGG		16	
BFD 330 670/980 125 12 GGG			
BFD 360 700/1010 150 15 GGG			
BFD 100 260/350 25 02 GS	1.0619	32	120°C
BFD 110 330/550 40 04 GS			
BFD 140 420/660 50 05 GS			
BFD 180 580/900 80 08 GS			
BFD 220 630/990 100 10 GS			
BFD 330 670/980 125 12 GS		16	
BFD 360 700/1010 150 15 GS			
BFD 100 260/350 25 02 GX	1.4408	32	120°C
BFD 110 330/550 40 04 GX			
BFD 140 420/660 50 05 GX			
BFD 180 580/900 80 08 GX			
BFD 220 630/990 100 10 GX			
BFD 330 670/980 125 12 GX		16	
BFD 360 700/1010 150 15 GX			

For details of the filters (e.g. dimensions and material particulars) see approved documentation.

Location of manufacture:

- Boll & Kirch Filterbau GmbH, Kerpen, Germany

Application/Limitation

Applied Rules and Design Codes:

- DNV GL SHIP Pt.4 'Pressure Equipment' (Edition January 2017)
- AD2000-Merkblatt

The cast components subject to pressure of the filters shall be delivered by a foundry holding a valid certificate according to DNVGL CP-0346 'DNV GL approval of manufacturing scheme'.

The pressure equipment shall be classified in pressure equipment classes (PEC) according to the following table:

Fluid	PEC I	PEC II	PEC III
Liquid fuels, oils, flammable hydraulic fluids	$p_d > 16$ bar or $t_d > 150^\circ\text{C}$	$p_d \leq 16$ bar and $t_d \leq 150^\circ\text{C}$	$p_d \leq 7$ bar and $t_d \leq 60^\circ\text{C}$
Water, Non-flammable hydraulic fluids	$p_d > 40$ bar or $t_d > 300^\circ\text{C}$	$p_d \leq 40$ bar and $t_d \leq 300^\circ\text{C}$	$p_d \leq 16$ bar and $t_d \leq 200^\circ\text{C}$

All used materials as well as pressure equipment which form a part of the filter assembly shall be delivered with product and material certificates according to DNV GL Ship Rules Pt.4 Ch.7 Sec.1:

Component	PEC I	PEC II	PEC III
Filter assembly	VL product certificate		
Filter body	VL	W	TR
Filter cover	VL	W	TR
Bolts and nuts	W	W	TR
Forgings and castings	W	W	TR

The installation on board the ship shall be performed in such a way that for possible forced vibrations on the filters and their nozzles resulting from e.g. the diesel engine or the propulsion chain will be adequately taken care for.

This type approval is related to the strength of the parts of the filter assembly subjected to pressure. Each filter assembly is to be

- the filter body material to be chosen depending on the operating fluid,
- constructional tested and hydraulic pressure tested to minimum 1,5 times design pressure,
- certified by DNV GL and delivered with a product certificate.

The filter function has not been assessed.

Type Approval documentation

Type	Document
BFD 100 260/350 25 02 GGG	PL 0230720/0230724 + booklet
BFD 110 330/550 40 04 GGG	PL 0230729/0230734 + booklet
BFD 140 420/660 50 05 GGG	PL 0230742/0230749 + booklet
BFD 180 570/880 65 06 GGG	PL 0230758/0230764 + booklet
BFD 180 580/900 80 08 GGG	PL 0230771/0230776 + booklet
BFD 220 630/990 100 10 GGG	PL 0230780/0230784 + booklet
BFD 330 670/980 125 12 GGG	PL 0230789/0230795 + booklet
BFD 360 700/1010 150 15 GGG	PL 0230803/0230809 + booklet
BFD 100 260/350 25 02 GS	PL 0200831/0200834 + booklet
BFD 110 330/550 40 04 GS	PL 0200839/0200842 + booklet
BFD 140 420/660 50 05 GS	PL 0200846/0200850 + booklet
BFD 180 580/900 80 08 GS	PL 0200854/0200857 + booklet
BFD 220 630/990 100 10 GS	PL 0200859/0200863 + booklet
BFD 330 670/980 125 12 GS	PL 0200868/0200871 + booklet
BFD 360 700/1010 150 15 GS	PL 0200874/0200879 + booklet
BFD 100 260/350 25 02 GX	PL 0210498/0210500 + booklet
BFD 110 330/550 40 04 GX	PL 0210503/0210505 + booklet

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BFD 140 420/660 50 05 GX	PL 0210509/0210511 + booklet
BFD 180 580/900 80 08 GX	PL 0210513/0210515 + booklet
BFD 220 630/990 100 10 GX	PL 0210517/0210519 + booklet
BFD 330 670/980 125 12 GX	PL 0210522/0210525 + booklet
BFD 360 700/1010 150 15 GX	PL 0210528/0210531 + booklet

Tests carried out

Recalculation, constructional tests and hydrostatic pressure tests

Marking of product

For traceability to this type approval the products are at least to be marked with:

- Name and domicile of the manufacturer
- Manufacturer's type designation and serial number
- Year of manufacture
- Design pressure
- Design temperature(s) in °C
- Hydraulic test pressure
- DNV GL's identifying mark

Periodical assessment

The objective of the periodical assessment is to verify that the conditions for the type approval (TA) have not been altered.

The main scope of the periodical assessment will normally include:

- verification of the TA applicant's production and quality system w.r.t. ensuring continued consistent production of the TA products at the TA applicant's own premises and at other companies that are given the responsibility for manufacturing of the products
- review of TA documentation and that this is still used as basis for the production
- review of possible changes in the design, the materials and the performance of the product
- verification of the product marking

For retention of the TA certificate in its validity period the periodical assessments will be carried out bi-yearly.

Unscheduled assessments for retention of the certificate may be carried out when there is reason to believe that the type approval applicant has not adhered to the obligations stipulated in the type approval certificate.