

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Filter

with type designation(s)
Duplex filter type 2.04.5, 2.04.5.6

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 see 'Product description' on page 2

Issued at **Hamburg** on **2017-04-11**

This Certificate is valid until **2022-04-10**.

DNV GL local station: **Essen**

for **DNV GL**

Approval Engineer: **Matthias Schmidt**

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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 for fuel, oil, thermal oil or water with the following technical data:

Type	Size	Material	Fluid	Filter		Heating chamber	
				Max. pressure	Max. temperature	Max. pressure	Max. temperature
2.04.5	DN25	5.3106	Fuel, oil, thermal oil, water	25 bar	160°C	none	none
	DN32						
	DN40						
	DN50						
	DN65						
	DN80						
2.04.5.6	DN25	5.3106	Fuel, oil, thermal oil, water	25 bar	160°C	14 bar	200°C
	DN32						
	DN40						
	DN50						
	DN65						
	DN80						

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

Location of manufacture:

- Boll & Kirch Filterbau GmbH, Kerpen, Germany
- BOLLFILTER China Manufacturing Ltd., Jiaxing City, China

Application/Limitation

Applied Rules and Design Codes:

- DNV GL SHIP Pt.4 Ch.7 'Pressure Equipment' (Edition January 2017)
- AD2000-Merkblatt – S5 'Calculation of Pressure Vessels – Experimental Design Method'

The cast components subject to pressure of the filters and heating chambers 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	$p_d > 16 \text{ bar}$ or $t_d > 150^\circ\text{C}$	$p_d \leq 16 \text{ bar}$ and $t_d \leq 150^\circ\text{C}$	$p_d \leq 7 \text{ bar}$ and $t_d \leq 60^\circ\text{C}$
Thermal oils	$p_d > 16 \text{ bar}$ or $t_d > 300^\circ\text{C}$	$p_d \leq 16 \text{ bar}$ and $t_d \leq 300^\circ\text{C}$	$p_d \leq 7 \text{ bar}$ and $t_d \leq 150^\circ\text{C}$
Water, Non-flammable hydraulic fluids	$p_d > 40 \text{ bar}$ or $t_d > 300^\circ\text{C}$	$p_d \leq 40 \text{ bar}$ and $t_d \leq 300^\circ\text{C}$	$p_d \leq 16 \text{ bar}$ and $t_d \leq 200^\circ\text{C}$
Steam	$p_d > 16 \text{ bar}$ or $t_d > 300^\circ\text{C}$	$p_d \leq 16 \text{ bar}$ and $t_d \leq 300^\circ\text{C}$	$p_d \leq 7 \text{ bar}$ and $t_d \leq 170^\circ\text{C}$

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
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Job Id: **262.1-025054-1**
Certificate No: **TAP00000V1**

Filter assembly	VL product certificate		
Filter body	VL	W	TR
Filter cover	VL	W	TR
Heating chamber	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

- 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	Size	Document	Burst pressure test report
2.04.5	DN25	PL 0231890 + booklet	B17/2016
	DN32	PL 0239764 + booklet	B18/2016
	DN40	PL 0236344 + booklet	B19/2016
	DN50	PL 0232580 + booklet	B20/2016
	DN65	PL 0238973 + booklet	B21/2016
	DN80	PL 0235036 + booklet	B06/2004
2.04.5.6	DN25	PL 0237296 + booklet	B17/2016
	DN32	PL 0239609 + booklet	B18/2016
	DN40	PL 0239520 + booklet	B19/2016
	DN50	PL 0236026 + booklet	B20/2016
	DN65	PL 0238974 + booklet	B21/2016

Tests carried out

Burst pressure tests

Marking of product

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

- a. Name and domicile of the manufacturer
- b. Manufacturer's type designation and serial number
- c. Year of manufacture
- d. Design pressure
- e. Design temperature(s) in °C
- f. Hydraulic test pressure
- g. 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:

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- 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.