

TYPE APPROVAL CERTIFICATE

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

with type designation(s)

Automatic filter type 6.21, 6.22, 6.46, 6.46.1, 6.48, 6.48.1

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.****Automatic filter type see 'Product description' on page 2**Issued at **Hamburg** on **2017-04-24**This Certificate is valid until **2022-04-23**.DNV GL local station: **Essen**for **DNV GL**Approval Engineer: **Matthias Schmidt**

**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

Automatic filter for fuel, oil, flammable hydraulic fluids with the following technical data :

Type	Size	Material	Fluid	Filter		Heating chamber	
				Max. pressure	Max. temperature	Max. pressure	Max. temperature
6.21	DN50	5.3106	Fuel	16 bar	160°C	none	none
6.22	DN50	5.3106	Fuel	16 bar	160°C	14 bar	200°C
6.46	DN50	5.3106	Oil	10 bar	100°C	none	none
	DN65						
	DN80						
	DN100						
	DN125						
	DN150						
6.46.1	DN65	5.3106	Oil, hydraulic fluid	10 bar	100°C	none	none
	DN80						
	DN100						
	DN150						
	DN200						
	DN250						
6.48	DN50	5.3106	Oil	10 bar	100°C	none	none
	DN65						
	DN80						
	DN100						
	DN125						
	DN150						
	170-200						
	DN250						
6.48.1	DN300	5.3106	Oil	10 bar	100°C	none	none

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

Location of manufacture:

- Bool & 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 $t_d \leq 60^\circ\text{C}$
Water,	$p_d > 40 \text{ bar}$	$p_d \leq 40 \text{ bar}$	$p_d \leq 16 \text{ bar}$

non-flammable hydraulic fluids	or $t_d > 300^\circ\text{C}$	and $t_d \leq 300^\circ\text{C}$	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
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
6.21	DN50	PL 0631000 + booklet	B05/2014, B07/2014, B16/2015
6.22	DN50	PL 0631001 + booklet	B05/2014, B07/2014, B16/2015
6.46	DN50	PL 0630003 + booklet	B13/2006
	DN65	PL 0630034 + booklet	B10/2007
	DN80	PL 0630041 + booklet	B05/2006
	DN100	PL 0639919 + booklet	B41/2008, B03/2011
	DN125	PL 0630465 + booklet	B56/2009, B13/2008
	DN150	PL 0630468 + booklet	B57/2009, B14/2006
6.46.1	DN65	PL 0630522 + booklet	B10/2007, B52/2010, B04/2010
	DN80	PL 0631031 + booklet	B05/2006, B12/2015, B12/2014
	DN100	PL 0630880 + booklet	B41/2008, B03/2011, B02/2014, B16/2014, B02/2013
	DN150	PL 0630834 + booklet	B57/2009, B14/2006
	DN200	PL 0630788 + booklet	B21/2013, B13/2008, B22/2013
	DN250	PL 0630848 + booklet	B18/2013, B14/2006, B19/2013
6.48	DN50	PL 0630707 + booklet	B49/2010
	DN65	PL 0630722 + booklet	B03/2013
	DN80	PL 0630877 + booklet	B04/2014
	DN100	PL 0630143 + booklet	B41/2010
	DN125	PL 0630149 + booklet	B25/2013

	DN150	PL 0630171 + booklet	B15/2010
	170-200	PL 0630726 + booklet	B29/2012
	DN250	PL 0630093 + booklet	B15/2006
	DN300	PL 0631112 + booklet	B15/2016
6.48.1	DN300	PL 0631113 + booklet	B15/2016, B16/2016

Tests carried out

Burst pressure tests

Marking of product

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

- 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.