

TYPE APPROVAL CERTIFICATE

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

with type designation(s)

RFLD 111, RFLD 241, RFLD 261, RFLD 331, RFLD 501, RFLD 661, RFLD 851, RFLD 951, RFLD 1301, RFLD 952, RFLD 1302, RFLD 1302 GAN, RFLD 2701

Issued to

HYDAC Filtertechnik GmbH
Sulzbach Saarland, Germany

is found to comply with

DNV GL rules for classification – Ships Pt.4 Ch.7 Pressure equipment**Application :****Filter(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**

Type:	Max. working temp.:	Working media:	Design pressure:
RFLD 111	-10°C / +100°C	see application / limitation	40 bar
RFLD 241	-10°C / +100°C	see application / limitation	40 bar
RFLD 261	-10°C / +100°C	see application / limitation	40 bar
RFLD 331	-10°C / +100°C	see application / limitation	33 bar
RFLD 501	-10°C / +100°C	see application / limitation	33 bar
RFLD 661	-10°C / +100°C	see application / limitation	35 bar
RFLD 851	-10°C / +100°C	see application / limitation	35 bar
RFLD 951	-10°C / +100°C	see application / limitation	34 bar
RFLD 1301	-10°C / +100°C	see application / limitation	34 bar
RFLD 952	-10°C / +100°C	see application / limitation	40 bar
RFLD 1302	-10°C / +100°C	see application / limitation	40 bar
RFLD 1302 GAN	-10°C / +100°C	see application / limitation	50 bar
RFLD 2701	-10°C / +180°C	see application / limitation	16 bar

Issued at **Hamburg** on **2017-11-17**This Certificate is valid until **2022-11-16**.for **DNV GL**DNV GL local station: **Essen**Approval Engineer: **Stefan Wiemer**

.....

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

- Thirteen types of switchable change-over inline filters. Dimensions:

Type	Shell, external diameter (mm)	Length over all (mm)	Volume (Liter)
RFLD 111	72	263	2x 0,6
RFLD 241	98	312	2x 1,4
RFLD 261	98	366	2x 1,8
RFLD 331	124	323	2x 2,4
RFLD 501	124	400	2x 3,1
RFLD 661	166	471,5	2x 8,2
RFLD 851	166	550	2x 9,5
RFLD 951	194	596	2x 10,8
RFLD 1301	194	736,5	2x 13,2
RFLD 952	200	609	2x 13
RFLD 1302	200	708	2x 16
RFLD 1302 GAN	200	708	2x 16
RFLD 2701	291	818	2x 44

- For details of the filters (e. g. design data, materials or dimensions) see Approved Drawings (listed below in "Type Approval documentation").

Application/Limitation

- The filters are approved according to DNV GL rules ship Pt.4 Ch.7 (edition January 2017). The filter performance has not been assessed,
- All filters are also approved for a design temperature of -10°C / +180°C at a design pressure of 16 bar,
- Operating media: lube oil, hydraulic oil, fire-resistant fluids (e.g. HFA) or fuel oil,
- The filter shall be classified in pressure equipment classes (PEC) according to the following table (DNVGL Rules Ship Pt.4 Ch.7 Sec.1 Table 2):

Fluid	PEC I	PEC II	PEC III
Lube oil, flammable hydraulic oil, fuel oil	$p_d > 16 \text{ bar}$ 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 $t_d \leq 60^\circ\text{C}$
non-flammable hydraulic oil, fire resistant fluids	$p_d > 40 \text{ bar}$	$p_d \leq 40 \text{ bar}$	$p_d \leq 16 \text{ bar}$

- Materials used shall conform DNVGL Rules Pt.2 Ch.2 Sec. 3, Sec.8 or Sec.9 and shall be delivered with material certificates according to DNVGL Rules Ship Pt.4 Ch.7 Sec.1 Table 5, Table 6, or Table 7,
- Screwed socket connections with parallel or tapered threads are not permitted on filters in case of flammable media,
- Sealings shall be suitable for the design temperature and the intended media,
- The cast components of the filters subject to pressure shall be delivered by a foundry holding a valid certificate according to DNVGL CP-0346 'DNV GL approval of manufacturing scheme',
- Manufacturing, workmanship and testing shall be done according to DNV Rules Pt.4 Ch.7 Sec.7,
- Each filter is to be:
 - Hydraulic pressure tested to minimum 1.5 x design pressure,
 - Certified by DNV GL and delivered with a DNV GL product certificate.

Type Approval documentation

Marking of product

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

- the name and domicile of the manufacturer,
- the manufacturer's type designation and serial number,
- the year of manufacture,
- the design pressure,
- the design temperature in °C,
- the hydraulic test pressure, and
- 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.

End of Certificate