

TYPE APPROVAL CERTIFICATE

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

with type designation(s)

GFLP-B-503-F50P3, GFLP-B-505-F50P3, GFLP-B-853-F80P3, GFLP-B-855-F80P3, GFLP-B-1303-F100P3, GFLP-B-1305-F100P3, GFLC-B-2503-A4C2

Issued to

HYDAC Process Technology GmbH
Neunkirchen, Saarland, Germany

is found to comply with

DNV GL rules for classification – Ships Pt.4 Ch.7 Pressure equipment**DNV GL rules for classification – Ships Pt.5 Ch.7 Liquefied gas tankers****DNV GL rules for classification – Ships Pt.6 Ch.2 Sec.5 Gas fuelled ship installations – Gas fuelled****Application :****Product(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:
GFLP-B-503-F50P3	0 - 80°C	Natural gas	16 bar
GFLP-B-505-F50P3	0 - 80°C	Natural gas	16 bar
GFLP-B-853-F80P3	0 - 80°C	Natural gas	16 bar
GFLP-B-855-F80P3	0 - 80°C	Natural gas	16 bar
GFLP-B-1303-F100P3	0 - 80°C	Natural gas	16 bar
GFLP-B-1305-F100P3	0 - 80°C	Natural gas	16 bar
GFLC-B-2503-A4C2	-18 - 65°C	Natural gas	-1 / 28 bar

Issued at **Hamburg** on **2020-01-16**This Certificate is valid until **2025-01-15**.for **DNV GL**DNV GL local station: **Essen**Approval Engineer: **Astrid Caschube**

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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

The filters are welded pressure vessels qualified according to AD2000 with DNVGL calibrated safety factors.

Filter materials:

Type	GFLP-B-503-F50P3, GFLP-B-853-F80P3, GFLP-B-1303-F100P3	GFLC-B-2503-A4C2	GFLP-B-505-F50P3, GFLP-B-855-F80P3, GFLP-B-1305-F100P3
Filter bowl shell with nozzles	1.4571: DIN EN 10216-5, DIN EN 10217-7, DIN EN 10028-7		P235GH/P265GH: DIN EN 10216-2, DIN EN 10217-2, DIN EN 10028-2
Filter bowl head	1.4571: DIN EN 10028-7		P265GH - DIN EN 10028-2
Nozzle flanges	1.4571: DIN EN 10222-5	316Ti/F316L	P250GH: DIN EN 10222-5
Cover flanges		1.4571/1.4404: DIN EN 10222-5	
Bolt and nuts	A4-70		5.6/5

For details of the pressure vessels see Approved Drawings (listed below in "Type Approval documentation").

Places of Production

Application/Limitation

Applied Rules and Design Codes:

- DNVGL-RU-SHIP Pt.4 Ch.7 'Pressure Equipment' (Edition July 2019),
- DNVGL-RU-SHIP Pt.5 Ch.7 'Liquified gas tankers' (Edition July 2019),
- DNVGL-RU-SHIP Pt.6 Ch.2 Sec.5 'Propulsion, power generation and auxiliary systems' (Edition July 2019).

The filters are graded in pressure equipment class I according to DNVGL-RU-SHIP Pt.4 Ch.7 Sec.1 Table 2.

The pressure equipment class defines the scope of the certification requirements for the materials used (see DNVGL-RU-SHIP Pt.4 Ch.7 Sec.1 Table 5).

The filters have to be properly installed on board e.g. by suitable clamping brackets if necessary. Furthermore we want to point out that no welding work at pressure bearing parts shall be done after final inspection and pressure test.

Manufacturing, workmanship and testing shall be done according to DNV GL Rules Pt.4 Ch.7 Sec.7. Each filter shall be subjected to constructional and hydrostatic pressure test upon completion in the presence of a DNVGL Surveyor.

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 assessment will be carried out every two years.

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