Certificate No:
TAP00002DM

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Filter

with type designation(s)
1.58.2.220.500 DN80 GAS

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
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 LNG

Application :

Products approved by this certificate are accepted for installation on all vessels classed by DNV.

Max. working temp.:	**60°C**
Working media:	**Natural gas**
Design pressure:	**16 bar**

see 'Product desription' on page 2

Issued at **Hamburg** on **2021-11-26**
This Certificate is valid until **2026-11-25**.
DNV local station: **Essen**

Approval Engineer: **Le Loi Nguyen**

for **DNV**

Jonathan Struwe
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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

Product description

Single filter with the following technical data:

Type	Diameter/ cartridge length	In-/Outlet	Materials	Fluid	Max. pressure	Temperature range
1.58.2.	220.500	DN80	1.4571	Natural gas	16 bar	-10°C to +60°C

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:
- DNVGL-RU-SHIP Pt.4 Ch.7 'Pressure equipment' (Edition July 2020, amended August 2020)
- DNVGL-RU-SHIP Pt.5 Ch.7 Sec.1 'Liquified gas tankers' (Edition July 2020)
- DNVGL-RU-SHIP Pt.6 Ch.2 Sec.5 'Gas fuelled ship installations' (Edition July 2020)

The filter assembly shall be classified in **pressure equipment class I** (PEC) according to DNVGL-RU-SHIP Pt.4 Ch.7 Sec.1 Table 2. The corrosion allowance is 0mm.

The materials used for the design and fabrication of the filters shall be suitable for the environmental and specific service conditions as well as suitable for the applicable fluids. The materials shall be resistant to corrosion and wear during the intended service lifetime.

The materials of filters, heating chambers etc. for PEC I shall be delivered by a material manufacturer holding a valid certificate according to DNVGL CP-0346 'DNV GL approval of manufacturing scheme'.

All used materials as well as pressure equipment which form part of the filter assembly shall be delivered with product and material certificates according to DNVGL-RU-SHIP Pt.4 Ch.7 Sec.1 Table 5:

Component	PEC I
Filter assembly	DNV product certificate
Filter body	MC
Filter cover	MC
Flanges, nozzles & branches	MD
Bolts and nuts	MD
Forgings and castings	MD

The welding work shall be carried out by a welding workshop holding a valid certificate acc. to DNV class programmes:
- CP-0261 'Approval of manufacturers – Pressure equipment' and
- CP-0352 'Approval of manufacturers – Manufacture of welded products – Welding workshop'.

This type approval is related to the strength of the parts of the filter assembly subjected to pressure. The filter performance has not been assessed.

Each filter assembly is to be:
- constructional tested and hydraulic pressure tested to 1.5 times design pressure.
- certified by DNV and delivered with a product certificate.

Type Approval documentation

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
- Maximum allowable working pressure
- Maximum allowable working temperature in °C
- Hydrostatic test pressure
- DNV'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, and
- 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