



Certificate no.:
TAP000033B

TYPE APPROVAL CERTIFICATE

This is to certify:

that the **Hydraulic Accumulator**

with type designation(s)
Hydraulic accumulator

issued to

Roth Hydraulics GmbH
Biedenkopf, Hessen, Germany

is found to comply with

DNV rules for classification – Ships Pt.4 Ch.7 Pressure equipment
DNV-OS-D101 – Marine and machinery systems and equipment, Edition July 2021

Application:

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

Temperature range: -40 to 80°C
Operating media: Nitrogen / Hydraulic fluid
Design pressure: 500 bar
Sizes: 0.5 L to 12 L

Issued at **Hamburg** on **2026-02-03**

This Certificate is valid until **2031-02-02**.

for **DNV**

DNV local unit: **Essen**

Approval Engineer: **Le Loi Nguyen**

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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 USD 300 000.

Product description

Dimensions of the piston accumulator:

Type	Shell external diameter (mm)	Length overall (mm)	Volume (Liter)	Min. shell thickness (mm)
AK 12-500-10	140	1170	12	19
AK 0.5-500-10	140	310	0.5	19

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

Application/Limitation

Applied Rules:

- DNV-RU-SHIP Pt.4 Ch.7 'Pressure Equipment' (Edition July 2021),
- DNV-OS-D101 'Marine and machinery systems and equipment' (Edition July 2021)

The accumulators are graded as pressure equipment class I according to DNV-RU-SHIP Pt.4 Ch.7 Sec.1 Table 2.

Materials:

Materials of the accumulator parts shall be delivered by a material manufacturer holding a valid certificate according to:

- DNV-CP-0346 'DNV approval of manufacturer scheme'.

All used materials shall be delivered with material certificates acc. to DNV-RU-SHIP Pt.4 Ch.7 Sec.1 Table 5.

The corrosion allowance is 1 mm (carbon steel).

All manufacturing, workmanship and testing shall be done in accordance with EN 14359.

The installation on board the ship shall be performed in a way, that for possible forced vibrations on the accumulators and their nozzles resulting from e.g. 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 accumulator assembly subjected to pressure. The accumulator function has not been assessed.

Type Approval documentation

Tests carried out

Each accumulator manufactured to this type approval is to be:

- Constructionally checked and hydraulic pressure tested to 1.5 times design pressure
- Certified by DNV and delivered with a product certificate.

Place of production

Roth Hydraulics GmbH
Lahnstraße 34, 35216 Biedenkopf, Germany

Marking of product

For traceability to this type approval the products are at least to be marked following EN 14359:2017 [7.7.3] with:

- Name and domicile of the manufacturer,
- Manufacturer's type designation and serial number,
- Total shell volume in liters,
- Year of manufacture,
- Maximum allowable working pressure,
- Allowable temperature range in °C,
- Hydraulic 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 material and the performance of the product,
- Verification of the product marking.

Periodical assessments for type approvals with a validity period of five years will be required after two years (+/- 90 days) and after 3.5 years (+/- 90 days).

Unscheduled assessments for retention of the certificate may be carried out when there is reason to believe that the TA applicant has not adhered to the obligations stipulated in the TA certificate or in the applicable requirements.

END OF CERTIFICATE