TYPE APPROVAL CERTIFICATE

Certificate No:
TAP00000BY
Revision No:
5

This is to certify:

That the Hydraulic Accumulator

with type designation(s)
HBS 10 - 57L - 360, HBS 4 - 15L - 350

Issued to
HENNLICH - HCT GmbH
St. Ingbert, Germany

is found to comply with
DNV rules for classification – Ships Pt.4 Ch.7 Pressure equipment

Application :

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

Type:	Temperature range:	Operating media:	Design pressure:	Sizes:
HBS 10 - 57L - 360	-35°C to 80°C	Hydr. Oil or H2O/ N2	360 bar	10 - 57 L
HBS 4 - 15L - 350	-35°C to 80°C	Hydr. Oil or H2O/ N2	350 bar	4 - 15 L

Issued at **Hamburg** on **2023-03-08**

This Certificate is valid until **2028-03-07**.
DNV local unit: **Essen**

Approval Engineer: **Astrid Caschube**

for **DNV**
Digitally Signed By: Drews, Olaf
Location: DNV GL SE Hamburg, Germany
Signing Date: 2023-06-27

Olaf Drews
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

Bladder Hydraulic Accumulator, designed as assembly according to DNV Rules Pt.4 Ch.7 (Edition July 2021).
For technical details see approved documentation.

Place of production

Hennlich – HTC GmbH
Im Gewerbegebiet 8, 66386 St. Ingbert, Germany

Application/Limitation

Applied Rules and Design Codes:

- DNV-RU-SHIP Pt.4 Ch.7 'Pressure Equipment' (Edition July 2021)

All materials, forming, heat treatment, prototype testing and product testing shall meet with the requirements of EN 14359.

The pressure equipment shall be classified in pressure equipment classes I (PEC) acc. to DNV-RU-SHIP Pt.4 Ch.7 Sec.1 Table 2.

The materials of the accumulators especially of the shell (accumulator body) shall be delivered by a material manufacturer holding a valid certificate acc. to:

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

All used materials as well as pressure equipment which form part of the accumulator assembly shall be delivered with product and material certificates acc. to DNV-RU-SHIP Pt.4 Ch.7 Sec.1 [3.2].

The materials used shall meet the certificate requirements of DNV-RU-SHIP Pt.4 Ch.7 Sec.2 and the requirements as specified in the drawings. Comparable materials have to be submitted for approval.

The materials used shall conform DNV-RU-SHIP Pt.2 Ch.2 Sec.3 (steel for low temperature services). The test temperature for the impact test of the pressure bearing parts is -40 °C.

In case that the accumulator assemblies are mounted in an exposed position, the gas valve shall be protected from mechanical damage by suitable means, i.e. a metallic protection shield.

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

Cyclic loads are stated as mentioned in the corresponding drawings considering the corrosion allowance of 1 mm on the basis of customer calculation which has been taken for information.

The installation on board the ship shall be performed in a way, that for possible forced vibrations on the accumulators resulting from e.g. diesel engine or the propulsion chain will be adequately taken care for.

Each filter assembly is to be

- Constructional tested and hydraulic pressure tested with 1.5 times the design pressure or the test pressure corresponding to the "Type Approval documentation",)
- Certified by DNV and delivered with a product certificate.

Type Approval documentation

Tests carried out

Calculations

Marking of product

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

a. Name and domicile of the manufacturer
b. Manufacturer's type designation and serial number
c. Year of manufacture
d. Total shell volume
e. Maximum allowable working pressure
f. Design temperature in °C
g. Hydrostatic test pressure
h. DNV's identifying mark

The location and process of stamping of the accumulator shall not be detrimental to its strength.

Periodical assessment

The objective of periodical assessments is to verify that the conditions for the 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 with relation to ensuring continue consistent production of the type approved products at the TA applicant's own premises and at other companies that are given the responsibility for manufacturing of the products,
- Review of the TA documentation and that this is still used as basis for the production,
- Review of possible changes to the design, the material and the performance of the product,
- Verification of the product marking.

Periodical assessments for TA 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 TA 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