



Certificate no.:
TAP0000328

TYPE APPROVAL CERTIFICATE

This is to certify:

that the **Hydraulic Accumulator**

with type designation(s)

Bladder type accumulator 4L, 10L

issued to

Eagle Industry Co., Ltd. AI CI Division
Takahashi, Okayama, Japan

is found to comply with

DNV rules for classification – Ships Pt.4 Ch.3 Rotating machinery – drivers

Application:

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

Temperature range: 0 to 45 °C

Operating media: Hydraulic oil

Design pressure: 315 bar

Sizes: Volumen: 4 & 10 liters

Issued at **Hamburg** on **2025-08-20**

This Certificate is valid until **2030-08-19**.

for **DNV**

DNV local unit: **Japan CMC**

Approval Engineer: **Le Loi Nguyen**

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

Bladder type accumulator designed & manufactured with corrosion allowance of 1 mm and following main data.

Designation	Inside diameter of shell	Minimum thickness of (mm)			Design Pressure (bar)
		Shell cylindrical surface	Shell spherical end	Top cover	
4L	212.13	15.1	7	5.5	315
10L	282.13	19.2	9	7.2	315

Material

- Accumulator shell, top cover & sectional ring:
SCM435 from JIS G3221 (Chromium Molybdenum Steel forging for General use, SFCM880R) with the following minimum guaranteed values:

 $R_m \geq 880 \text{ N/mm}^2$
 $R_{p0.2} 20^\circ\text{C} \geq 705 \text{ N/mm}^2$

- Gas valve : SUS 304 from JIS G4303
- Back up ring : PTFE

Application/Limitation

The Hydraulic Accumulator is a system component for 2-stroke combustion engines. Accumulators shall be delivered with material and product declaration in accordance with DNV-RU-SHIP Pt.4 Ch.3 Sec.1 Tab.9.

Each accumulator shell / seamless gas bottle shall be hydraulically pressure tested at 473 bar.

Maximum number of full pressure cycles between 0 to 315 bar: 500

Place of production

Okazaki Seisakusho Co., Ltd.
14-800 Yokouchi, Fujieda-City,
Shizuoka-Pref., Japan

Type Approval documentation

Marking of product

For traceability to this type approval, the products shall be marked with:

- Name of manufacturer
- Type designation / serial number
- Total shell volume in liters
- Allowable temperature range in degrees Celsius
- Maximum allowable working pressure
- Test pressure
- Date of manufacture (month/year)

The location and process of stamping of the accumulators shall not be detrimental to their strength.

Periodical assessment

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment every second year and before the expiry date of this certificate, to verify that the conditions for the type approval are complied with.

When possible, this assessment may be harmonised with normal surveys for product certification and / or other surveys and audits carried out.

The main elements of the certificate retention survey are:

- Verification of the TA applicant's production and quality system w.r.t. ensuring continued consistent production of the type approved products at the TA applicant's own premises
- Review of Type Approval documentation and assurance that it is still used as basis for production
- Review of possible changes in design, materials and performance
- Assurance of traceability between manufacturer's product type marking and Type Approval Certificate.