

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Hydraulic Accumulator

with type designation(s)
EHV

Issued to

Parker Hannifin Manufacturing France SAS
Colombes Cedex Hauts de Seine, France

is found to comply with
DNV GL rules for classification – Ships Pt.4 Ch.7 Pressure equipment
DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition July 2015

Application :

Seamless bladder accumulator designed to EN 14359

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Temperature range: 330 bar to 350 bar
Operating media: Hydraulic fluids (Group 2) / N2
Design pressure: 1.43xPS (see EN14359)
Sizes:

This Certificate is valid until **2021-06-30**.

Issued at **Høvik** on **2016-06-24**

DNV GL local station: **Marseille**

Approval Engineer: **Zeinab Sharifi**

for **DNV GL**

Marianne Spæren Marveng
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

Seamless gas bottle as bladder accumulator body designed according to EN14359:2006.

Designation	Inner Diameter (mm)	Length (mm)	Min. shell thickness (mm)	Design pressure (bar)
100214-DNV	78.9	163	4.6	350
S1146-DNV	100	185 to 743	6.2	350
S1147-DNV	100	174 to 285	6.2	350
S1148-DNV	150	268 to 662.5	8.33	350
S1216-DNV	200	380 to 1820	8.35	330
S1157-DNV	200	375 to 1815	8.35	330
S1156-DNV	200	375 to 1815	8.35	330

Material: 34Cr Mo4 delivered to a European technical delivery standard with the following minimum guaranteed values:

100214-DNV	$R_m \geq 960 \text{ N/mm}^2$ $R_{e20^\circ\text{C}} \geq 850 \text{ N/mm}^2$ $R_{e80^\circ\text{C}} \geq 780 \text{ N/mm}^2$ Elongation $\geq 16 \%$
S1146-DNV S1147-DNV S1148-DNV	$R_m \geq 825 \text{ N/mm}^2$ $R_{e20^\circ\text{C}} \geq 730 \text{ N/mm}^2$ $R_{e80^\circ\text{C}} \geq 660 \text{ N/mm}^2$ Elongation $\geq 14 \%$
S1156-DNV S1157-DNV S1216-DNV	$R_m \geq 900 \text{ N/mm}^2$ $R_{e20^\circ\text{C}} \geq 790 \text{ N/mm}^2$ $R_{e80^\circ\text{C}} \geq 720 \text{ N/mm}^2$ Elongation $\geq 14 \%$

Design temperature range : -40°C / 80°C

DNV GL Pressure Class: I

Manufacturer of cylinders for the seamless bladder accumulator shells:

- 1) ROTH MIONS S.A.S
43 rue des Brosses
69780 MIONS, France
- 2) LEEBUCC (Tianjin) Hydraulics Equipment Co. Ltd.
15 Baocang Road, Junliangcheng Industrial Park, Dongli District
Tianjin, China
(Ref. to DNV GL type approval certificate no. P-14877 for limitations)

Assembly of final product:

- 1) Parker Hannifin Manufacturing France SAS
Etablissement de Colombes
16 rue de Seine Z.I. de la Prairie B.P. 7
92704 COLOMBES Cedex, France
- 2) OLAER (Tianjin) Hydraulic Manufacturing Co., Ltd
No.21-2 Hongyuan Road Xiqing Economic Development Area
300385 Tianjin, China
- 3) Parker Korea Co., Ltd,
23, Jangangongdan 1-gil, Jangan-myeon,
Hwaseong-si, Gyeonggi-do, 445-941, Korea

Application/Limitation

The materials used shall fulfill requirements given in EN 14359 Clauses 4.1 & 4.2.

The materials shall be delivered with material certificates in accordance with DNV GL Ship Rules Pt.4 Ch.7 Sec.2 Table 1 (for Pressure Class I).

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

Each accumulator manufactured to this type approval shall be certified by DNV GL, and delivered with DNV GL product certificate.

Each accumulator shell / seamless gas bottle shall be hydraulically pressure tested to minimum 1.43 times the design pressure, and certified by DNV GL Surveyor.

Final inspection of assembled product shall also be witnessed by DNV GL Surveyor.

Type Approval documentation

Drawing numbers:

100214-DNV Rev.B dated 25/04/12
S1146-DNV Rev.B dated 25/04/12
S1147-DNV Rev.B dated 25/04/12
S1148-DNV Rev.B dated 25/04/12
S1216-DNV Rev.B dated 25/04/12
S1157-DNV Rev.B dated 25/04/12
S1156-DNV Rev.B dated 25/04/12

Material datasheet CRP 1429 Rev.5 (14 pages)

Strength calculation notes

Quality management system certificates for the mentioned Parker subsidiaries.

Marking of product

Each seamless bladder accumulator is to be permanently and legibly marked with following information:

- Date of manufacture, (month/year)
- Manufacturer's serial number
- Manufacturer's name/symbol
- Total shell volume in liters
- Allowable temperature range in degrees Celsius
- Maximum allowable pressure
- Test pressure

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

Periodical assessment

For retention of the Type Approval, a DNV GL 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



Job Id: **262.1-012639-4**
Certificate No: **TAP00000AJ**

- Assurance of traceability between manufacturer's product type marking and Type Approval Certificate.

Renewal should be applied for in writing before the certificate expires.