

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Seamless Gas Bottle**

with type designation(s)

Bladder type of accumulator

Issued to

LEEBUCC (Tianjin) Hydraulics Equipment Co. Ltd.
Tianjin, China

is found to comply with

Det Norske Veritas' Rules for Classification of Ships
Det Norske Veritas' Offshore Standards**Application :****See the certifiacte.****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.****Loading pressure: 330 bar**
Operating media: Nitrogen / Oil
Test pressure: 472 bar
Filling ratioThis Certificate is valid until **2018-06-30**.Issued at **Høvik** on **2014-05-26**for **DNV GL**DNV GL local station: **Tianjin**Approval Engineer: **Simon Ratcliffe**

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 with hemispherical end as a bladder type accumulator. (Design Code: EN14359)
Material: 34Cr Mo4 according to DNV PMA (no. 341.2-J-590 / dated 2014-05-05)
Outside diameter: 224 ± 7 mm
Shell thickness: 9.5 mm

Additional authorised manufacturing locations:

- Tianjin Tianhai High Pressure Container Co., Ltd – Accumulator workshop T09
- BUCC (Tianjin) Pressure Equipment Manufacturing Co., Ltd.

The type approval holder maintains responsibility for the products produced by subcontractors.

Application/Limitation

Design Data :

- Design Pressure: 330 bar
- Test Pressure: 472 bar
- Design Temperature: -40°C / 100°C
- Corrosion allowance: 1 mm
- Maximum load cycles: 27910 cycles between 0 – 330 bar
More than 2000000 cycles between (0 – 165 bar) or (110 bar – 220 bar)
- DNV Pressure Class: I

All used material shall fulfil requirements in EN 14359 clauses 4.1 & 4.2.

All used material shall be delivered with material certificates in accordance with DNV rules for classification of ship Pt.4 Ch.7 Sec.2 Table A1.

Each seamless gas bottle shall be hydraulically pressure tested to 472 bar.

Each seamless gas bottle is to be certified by a DNV GL Surveyor.

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

Each seamless gas bottle shall be protected on both sides by a safety device such as relief valve, fuse plug or rupture disc to prevent excess pressure if overheated. When it is an integral part of a system with such a safety device, the seamless bottle itself need not be supplied with a safety device.

Type Approval documentation

Tests carried out

N/A

Marking of product

For traceability to this type approval, the product are to be marked with:

- date of manufacture, (month/year);
- manufacturer's serial number;
- manufacturer's name/symbol;
- total shell volume in litres;
- allowable temperature range in degrees Celsius;
- maximum allowable pressure P_S ;
- test pressure P_T ;

Periodical assessment



Job Id: **262.1-017056-3**
Certificate No: **TAP000009M**

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