

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Seamless Gas Bottle

with type designation(s)
CXTZ03-22003

Issued to

Chasing Technology (Changxing) Co., Ltd.
Huzhou City, Zhejiang, China

is found to comply with

DNV rules for classification – Ships Pt.4 Ch.7 Pressure equipment
ISO 9809-1 – Gas cylinders – Refillable seamless steel gas cylinders

Application :

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

Loading pressure: 166.7 bar

Operating media: O2, Ar, N2 and CO2

Test pressure: 250 bar

Filling ratio

Issued at **Hamburg** on **2023-09-18**

This Certificate is valid until **2028-09-17**.

DNV local unit: **Shanghai**

Approval Engineer: **Le Loi Nguyen**

for **DNV**

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.

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 300,000 USD.



Product description

Dimensions of the seamless gas cylinder

Designation	Outer Diameter (mm)	Length (mm)	Water capacity (L)	Design / test pressure (bar)
CXTZ03-22003	267	1270	60	166.7 / 250
CXTZ03-22003	267	1460	68	166.7 / 250
CXTZ03-22003	267	1500	70	166.7 / 250
CXTZ03-22003	267	1720	80	166.7 / 250
CXTZ03-22003	267	1750	82	166.7 / 250
CXTZ03-22003	267	1760	82.5	166.7 / 250
CXTZ03-22003	267	1810	85	166.7 / 250

For details see approved drawing, listed below in "Type Approval Documentation".

Application/Limitation

The seamless gas cylinders are approved according to DNV-RU-SHIP Pt.4 Ch.7 'Pressure Equipment' (Edition July 2021) and designed acc. to ISO 9809-1: 2019 'Gas cylinder'. They are graded as DNV pressure equipment class I (Pt.4 Ch.7 Sec.1 Tab. 2), the corrosion allowance is 1 mm (Pt.4 Ch.7 Sec.1 [4.1.2]).

The design pressure is 166.7 bar, the design temperature range -40 °C to 55 °C. The accumulators are approved for maximum 14053 pressure load cycles (0 bar to 330 bar).

The material is 37Mn (quenched and tempered), with following guaranteed values (see approved drawings):

$$R_m \geq 820 \text{ N/mm}^2$$

$$R_e \geq 697 \text{ N/mm}^2$$

$$\text{Elongation} \geq 14 \%$$

The material shall be delivered with material certificates according to DNV-RU-SHIP Pt.4 Ch.7 Sec.1 Tab. 5.

The manufacturer of the seamless gas cylinder shall hold a valid certificate according to DNV-CP-0261 "Pressure equipment", the prematerial (seamless steel pipe) shall be delivered by a manufacturer holding a valid certificate according to DNV-CP-0252 "Steel pipes and steel pipe fittings".

Manufacturing, workmanship, and testing of cylinders shall be done according to above-mentioned rules.

Each cylinder manufactured to this type approval is to be

- Hydraulic pressure tested to 1.5 times of the design pressure, and
- certified by DNV and delivered with a product certificate.

Place of production

Chasing Technology (Changxing) Co., Ltd.
No.1209, Chenwang Road, Taihu Street, Changxing Country
Huzhou City, Zhejiang Province, P.R. China

Type Approval documentation

Marking of product

For traceability to this type approval the gas bottles are at least to be marked with the following:

- manufacturer's name and address
- manufacturer's type designation and serial number,
- year of manufacture,
- maximum allowable working pressure
- design temperature in °C,
- hydraulic test pressure, and
- DNV's identifying mark.

For details see approved drawing, listed above in "Type Approval Documentation".

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