

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Seamless Gas Bottle

with type designation(s)
ISO267-Mn-01, ISO229-34CrMo-04

Issued to

Tianjin Tianhai High Pressure Container Co., Ltd.
Tianjin City, China

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

Application :

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

Loading pressure: See Certificate
Operating media: See Certificate
Test pressure: See Certificate
Filling ratio 0.76 kg/litre (Only for CO2)

Issued at **Høvik** on **2017-09-18**

This Certificate is valid until **2019-06-30**.

DNV GL local station: **Tianjin**

for **DNV GL**

Approval Engineer: **Mehdi Rowshan**

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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 cylinders for the fire extinguishing systems according to ISO 9809-1:2010

Type	Water capacity (l)	Outside Diameter (mm)	Length (mm)	Minimum shell thickness (mm)
ISO267-Mn-01	50 to 82.5	267	1140 to 1790	6.5
ISO229-34CrMo-04	50	229	1485	5.5

Seamless gas bottles are graded as class I pressure vessel according to DNV GL Rules Pt.4 Ch.7 with zero (mm) corrosion allowance.

Material:

37Mn according to GB18248: with minimum guarantee values 610 MPa and 730 Mpa for yield strength and tensile strength respectively.

34CrMo4 according to GB18248: with minimum guarantee values 820 MPa and 985 Mpa for yield strength and tensile strength respectively.

Where there is a risk of hydrogen embrittlement (See ISO 11114-1), the maximum value of the tensile strength shall be 950 MPa.

Application/Limitation

Design Data:

Type	Loading Pressure (bar)	Test Pressure (bar)	Temperature °C
ISO267-Mn-01	150	250	-50 to 65
ISO229-34CrMo-04	200	300	-40 to 65

The cylinders are not approved to be used in systems required corrosion allowance.

The combined content of the following elements: vanadium, niobium, titanium, boron and zirconium shall not exceed 0,15 %.

Sulfur and phosphorus (S+P) in the cast analysis of material used for the manufacture of gas cylinders shall not exceed acceptance limits specified by the design codes (Clause 6.2.2).

In connection with certification the gas cylinders, manufacturing, workmanship and testing of cylinders shall be done according to design code clauses: 8, 9, 10 and 11.

Type Approval documentation

Tests carried out

Material certificate, Heat treatment certification, UT report, hardness test, thickness measurements, hydrostatic test, tensile test, bend test, impact test, base check, burst test and pressure cycling test

Marking of product

Each cylinder shall be permanently and legibly marked on the shoulder or on a reinforced part of the cylinder or on a permanently fixed collar or neck ring, in accordance with ISO 13769.

Periodical assessment



Job Id: **262.1-018668-2**
Certificate No: **TAP0000121**

For renewal of TA certificate periodical assessment shall be done by DNV GL surveyor to verify that the conditions for the TA are not altered since the certificate was issued.

The main scope of the periodical assessment shall be:

- review of the TA documentation and verification that this documentation is still used as basis for the production
- review of possible changes in design, material and performance of the product
- verification of the company's production and quality systems w.r.t. ensuring continued consistent production of the type approved products to the required quality
- verification of that the product marking for identification and traceability to the TA Certificate is not altered.