

TYPE APPROVAL CERTIFICATE

This is to certify:

That the CO2 System

with type designation(s)
Fixed high-pressure CO2 fire extinguishing system

Issued to

VTI Fire Products(Shanghai) Co., Ltd.
Shanghai, China

is found to comply with

DNV GL rules for classification – Ships

DNV GL rules for classification – Naval vessels

DNV GL rules for classification – Yachts

DNV GL rules for classification – High speed and light craft

DNV GL rules for classification – Inland navigation vessels

DNV GL offshore standards

Application :

Approved for use as a total flooding fire extinguishing system for protection of machinery spaces, cargo holds, ro-ro spaces, paint stores and similar spaces.

Issued at **Hamburg** on **2017-02-23**

This Certificate is valid until **2022-02-22**.

DNV GL local station: **Shanghai CMC**

for **DNV GL**

Approval Engineer: **Michael Kämpf**

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Antje Fleischhauer
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

The high-pressure CO₂ system is a total flooding fixed fire extinguishing system for protection of machinery spaces, cargo holds, ro-ro spaces, paint stores and similar spaces. The control of the system is arranged either by pulling cable or pneumatic, electric or manual operation, as applicable.

The system is designed by VTI Fire Products (Shanghai), China.

Application/Limitation

This type approval certificate provides a general acceptance for design, manufacture, supply and installation of fixed high-pressure CO₂ systems on the basis of the documentation specified under the item "Type Approval Documentation".

For vessels subject to SOLAS, the system is to be designed in accordance with IMO FSS Code Ch.5 and DNVGL Statutory Interpretations, as amended.

Each system is subject to plan approval and final inspection by a DNVGL Surveyor after completion.

For all applications:

1. All CO₂ cylinders are to be certified according to Pt.4 Ch.7 Sec.1, 5.2. Flexible hoses are to be of approved type.
2. All CO₂ piping upstream of master valve is to be certified in accordance with DNVGL Statutory Interpretations. Section valve(s) to be at least PN 100.
3. All connections on high pressure side are to be of approved type. Restrictions apply to threaded connections (Pt.4 Ch.6 Sec.9, 5.2). Use of section valves with threads will be considered on a case by case basis for valves of sizes up to DN 25.
4. An automatic time delay unit, with the possibility to override, is to be installed for spaces that are expected to be manned occasionally.
5. The pilot cylinders shall have capacity to operate the system three times even under unfavourable temperature conditions (DNVGL Statutory Interpretations).
6. Welding is to be performed by an approved welding shop.

The following documentation is to be submitted in each case for plan approval:

1. System layout showing system functionalities and assembly of components.
2. Arrangement plan identifying position of nozzles, routing and dimension of piping and location of the release stations.
3. CO₂ capacity calculations for all protected spaces.
4. Time discharge calculations, as applicable. Isometric drawing are required in case the piping layout does not provide sufficient information.
5. Documentation of visual and audible alarms and specification of automatic time delay unit for spaces required to have such devices (spaces expected to be manned occasionally).
6. Specification and details of CO₂ manifold, including connections.
7. Specification of all components in the system, including CO₂ distribution piping and approvals for the flexible hoses.
8. Arrangements for shutdown of ventilation and stopping of fans (can be submitted separately by the yard).
9. Each system is to be supplied with a manual for design, installation, operation and maintenance.

Installation testing:

- Alarms inside protected space and switchover to emergency power to be tested.
- Other tests as required by DNVGL Statutory Interpretations (pressure and tightness testing of piping, etc.) and according to maker's manual to be carried out.

Periodical testing:

Job Id: **262.1-024464-1**
Certificate No: **TAF00000KV**

- The system should be tested and inspected acc. to IMO MSC.1/Circ.1318. Reference is also made to DNVGL-CG-0058.
- More stringent flag state requirements, if any, prevail.

Type Approval documentation

Certification in accordance with Class Programme DNVGL-CP-0338, October 2015.

- Type approval documentation submitted by VTI Fire Products
- Initial assessment report (90.02a) dated 2016-11-17
- DNVGL welding workshop approval certificate no. WWA00000MN

Marking of product

The system is to be marked with the name of manufacturer and type designation.

Periodical assessment

The DNVGL Surveyor is to be given permission to perform Periodical Assessments at any time during the validity of this certificate and at least every second year. The arrangement is to be in accordance with procedure described in the Class Programme DNVGL-CP-0338, Section 4.