

TYPE APPROVAL CERTIFICATE

This is to certify:**That the CO2 System**

with type designation(s)

Fixed Type High Pressure CO2 Fire Extinguishing System

Issued to

NK Co., Ltd.**Busan, Korea**

is found to comply with

DNV GL statutory interpretations DNVGL-SI-0364 – SOLAS interpretations**DNV GL rules for classification – Ships****DNV GL offshore standards****Application :****Approved for use as a total flooding fire extinguishing system for machinery space and cargo holds.****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**Issued at **Høvik** on **2017-12-18**This Certificate is valid until **2022-12-17**.for **DNV GL**DNV GL local station: **Busan**Approval Engineer: **Marius Mørner**

Mårten Schei-Nilsson
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

"Fixed Type High Pressure CO₂ Fire Extinguishing System"

is a total flooding system for protection of machinery spaces, cargo holds, paint lockers, pump rooms and similar spaces.

Only components mentioned under Type Approval documentation are approved by this certificate, other system components are subject to case by case approval.

The system is to be designed in accordance with the FSS Code Ch.5 and DNVGL-SI-0364 – SOLAS Interpretations for SOLAS Ch. II-2.

Application/Limitation

This type approval certificate provides a general design acceptance for the components specified under the item "Type Approval Documentation".

Each system is subject to plan approval and final inspected by a DNV GL 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 DNV GL type approved. CO₂ manifold to be supplied with DNV GL Product Certificate.
2. All CO₂ piping upstream of master valve are to be certified in accordance with DNV GL Rules. Section valve(s) to be at least PN100.
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 treads will be considered on a case by case basis for valves of sizes up to DN25.
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. Non-return valves or similar arrangement are to be fitted between the separate bottles and the manifold in order that a bottle, if necessary, can be disconnected from the battery without putting the whole installation out of action.
6. The pilot cylinders shall have capacity to operate the system three times even under unfavourable temperature conditions.

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

1. The system layout showing operation philosophy and assembly of components.
2. Arrangement plan identifying position of nozzles, routing and dimension of piping and location of the release stations and CO₂ cylinders.
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 of all components in the system, including CO₂ distribution piping and approvals for the flexible hoses.
7. Arrangements for closing of all ventilation and stopping of fans (can be submitted separately by the yard).
8. Each system is to be supplied with a manual for installation, use and maintenance.

Installation testing:

- Alarms inside protected space and at a manned control stations and switchover to emergency power shall be tested.
- Other tests as required by DNVGL-SI-0364 - SOLAS Interpretations for SOLAS Ch.II-2 (pressure and tightness testing of piping, etc.) and according to maker's manual shall be carried out.

Job Id: **262.1-016039-3**
Certificate No: **TAF00000U9**

Periodical testing:

- A biennial (every 24 months) for passenger ships and at each intermediate, periodical or renewal survey for cargo ships, an inspection is to be carried out by a service supplier acceptable to DNV GL.
- The system should also be tested and inspected as specified by the DNV GL Rules and DNVGL-SI-0364 – SOLAS Interpretations, reference is made to IMO MSC/Circ.850 and IMO MSC.1/Circ.1318.

Type Approval documentation

Certification in accordance with Class Programme DNVGL-CP-0338, October 2017.

Document "Fixed Type High Pressure CO2 Fire Extinguishing System For System Approval" dated 2013-08-20 including

- Operation & Maintenance manual
- Installation manual.

from NK Co., Ltd.

Data sheet no:

Drawing no:	Title:
Flexible hoses:	
101-205-220	Flexible Hose (Straight-2A Type)
Cylinders:	
101-201-111	45 Kg CO2 Cylinder (68 litres)
101-201-110	45 kg CO2 Cylinder & Cylinder Valve Ass'y
101-225-300	Pilot Cylinder
Valves - section:	
101-207-900	Main Valve (1")
101-207-910	Main Valve (1-1/2", 2" (JIS 210K))
101-207-913	Main Valve (1-1/2", 2" (JIS 210K))
101-207-600	Main Valve (3", 4", 6")
Valves - cylinder:	
101-102-110	Cylinder Valve (1" NPT, TW, NHV-4)
101-102-120	Cylinder Valve (1" NPT, TF)
101-102-140	Cylinder Valve (W28.8, TF, NHV-7)
101-102-210	Cylinder Valve (1" NPT)
Valves – non-return:	
101-209-100	Non-Return Check Valve –Rev.1
101-206-210	Manifold Check Valve
Manifold:	
101-206-070	Detail of CO2 Main
Nozzles:	
101-233-210	CO2 Nozzle With Flange JIS-10K Flange
106-206-100	CO2 Nozzle Flangible Type
Other:	
101-218-200	Time Delay Unit Electric type
102-218-300	Time Delay Unit Pneumatic type
101-239-200	By-Pass Ball Valve
101-210-110	Safety Outlet
101-102-220	Screw Down Valve (W28.8)
101-203-100	Valve actuator
101-211-130	3/4" Ball Valve



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Marking of product

The product or packing is to be marked with name of manufacturer and type designation.

Periodical Assessment for Retention of the Type Approval Certificate

DNV GL's 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 DNVGL-CP-0338 Section 4.