

TYPE APPROVAL CERTIFICATECertificate No:
TAF0000027
Revision No:
1**This is to certify:****That the CO2 System**with type designation(s)
MARINE CO2 FIXED FIRE SUPPRESSION SYSTEMIssued to
Kidde Fire Protection
BENTHAM NR. LANCASTER, United Kingdomis found to comply with
DNV GL rules for classification – Ships
DNV GL statutory interpretations DNVGL-SI-0364 – SOLAS interpretations**Application :****Approved for use as total flooding fire extinguishing system for machinery spaces and cargo holds.****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**This Certificate is valid until **2021-03-01**.Issued at **Høvik** on **2016-07-21**DNV GL local station: **Manchester**Approval Engineer: **Ragnar Tonjer**for **DNV GL**Digitally Signed By: Langnes, Petter
Location: DNV GL Høvik, Norway
Signing Date: 2016-07-22**Petter Langnes**
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.

Job Id: **262.1-008212-3**
Certificate No: **TAF0000027**
Revision No: **1**

Product description

"Marine CO₂ fixed fire suppression system"

is a high pressure total flooding CO₂ system for protection of machinery spaces, cargo holds and similar spaces. Control of the system is by pulling cable, pneumatic, electric or manual, as applicable.

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

The system is to be designed in accordance with the IMO FSS Code Ch.5 and DNV GL Statutory Interpretations 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 shall be plan approved on an individual basis and inspected on board by a DNV GL surveyor.

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 DNV GL Statutory Interpretations. 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 threads will be considered on a case by case basis for valves of sizes up to DN25.
4. An automatic time delay unit 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. All systems installed on ships with keel laid on or after 1st July 2010 shall be delivered with a device ensuring sequential release. (IMO Res. MSC 206(81)).
7. 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.
3. CO₂ capacity calculations for all protected spaces.
4. Time discharge calculations, as applicable. Isometric drawing are required in case the piping layout do 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 closing of all ventilation and stopping of fans (can be submitted separately by the yard).
9. 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 DNV GL Statutory Interpretations, SOLAS Ch.II-2 (pressure and tightness testing of piping, etc.) and according to maker's manual shall be carried out.

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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.
- The system should also be tested and inspected as specified by the DNV GL Rules and DNV GL Statutory Interpretations, reference is made IMO MSC/Circ. 850 and IMO MSC.1/Circ. 1318.

Type Approval documentation

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

Product Design Manual No. MA-59812-101 Version 1a – June 2016.

System components:

Drawing no:	Title:
Flexible hoses:	
DS K97112 Rev. 1, 2012-05-29	Flexible Discharge Hose
DS K93433_34 Rev. 1, 2012-05-29	Pilot Line Hoses
Cylinders:	
DS 59651-430 Rev. 1, 2012-05-29	6.8 kg Cylinder & Klem valve Assembly
DS E7194-005 Rev. 2, 2013-05-13	6.8 kg Cylinder & Klem valve Assembly
DS E7194-006 Rev. 2, 2013-05-13	22.6 kg Cylinder & Klem valve Assembly
DS E7194-004 Rev. 1, 2012-05-29	45 kg Cylinder & DIN 477 Klem valve Assembly
Cylinder valves:	
DS K24509 Rev. 1, 2012-05-29	DIN 477 Klem Cylinder Valve
Other valves:	
DS K921 Rev. 1, 2012-05-29	Safety Valve Outlet
K23925-EU Rev. 5, 2016-01-28	CO2 Manifold Check Valve
Manifold:	
K21207 Rev. 14, 2011-04-11	2-Way Manifold 25 NB
Nozzles:	
DS K62461-N3-18 Rev.1, 2012-05-29	CO2 Nozzle
DS K6179X-N3-N18 Rev. 1, 2012-05-29	CO2 Nozzle with discharge horn
DS K5814-N3-N8 Rev. 1, 2012-05-29	Nozzle – CO2-Flanged Horn
DS K13045-N2-N4 Rev. 1, 2012-05-29	CO2 Duct Nozzle & Mounting Plate
Other:	
C100-200-69 Rev. A, 2015-11-25	CO2 Fire Suppression System Type Kidde Pneumatic Release Cabinet With Time Delay Unit

Marking of product

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

Periodical assessment

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.