Certificate No: LR21300547SF
Issue Date: 15/01/2021
Expiry Date: 14/01/2026

Certificate Of Fire Approval

This is to certify that the product detailed below will be accepted for compliance with the applicable Lloyd's Register Rules and Regulations and with the International Convention for the Safety of Life at Sea, (SOLAS), 1974, as amended, for use on ships and offshore installations classed with Lloyd's Register, and for use on ships and offshore installations when authorised by contracting governments to issue the relevant certificates, licences, permits etc.

Manufacturer	**Kidde-Fenwal Inc.**
Address	400 Main Street, Ashland, MA 01721, United States of America (USA)
Type	Carbon Dioxide System
Description	Fixed Gas Fire Extinguishing System – Type: “High Pressure CO2 System”
Trade Name	Kidde High Pressure CO2 System
Specified Standard	SOLAS 1974 Chapter II-2, Regulation 10 and Fire Safety Systems Code, Chapter 5, as amended

This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Lloyd's Register EMEA of any modification or changes to the equipment in order to obtain a valid Certificate.

The Design Appraisal Document and its supplementary Type Approval Terms and Conditions form part of this Certificate.

This certificate remains valid unless cancelled or revoked, provided the conditions in the attached Design Appraisal Document are complied with and the equipment remains satisfactory in service.

Saji Abraham

Surveyor to Lloyd's Register EMEA
A member of the Lloyd's Register group

71 Fenchurch Street, London, EC3M 4BS, United Kingdom

DESIGN APPRAISAL DOCUMENT

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR21300547SF

The undernoted documents have been appraised for compliance with the relevant requirements of International Conventions, and this Design Appraisal Document forms part of the Certificate.

This Design Appraisal Document forms part of the Certificate.

This Certificate is a Renewal and Amendment of Certificate No: LR2001685SF

EXAMINED DOCUMENTATION

The "Fixed Fire Extinguishing System" is to be designed to comply with the International Convention for the Safety of Life at Sea (SOLAS) 1974, as amended, Chapter II-2, Regulation 10 and the Fire Safety Systems Code Chapter 5 and generally in accordance with:

- 220610 Rev DB – Marine Carbon Dioxide Design, Installation, Operation and Maintenance Manual
- 06-237745-001 Rev AA - Addendum, HPCO2, Hose, Reel, Rack, Discharge Hose
- 06-237577-001 Rev AA - Control head Addendum

Note: The Design Installation Manual and addendums are for reference only; system installation to be in accordance with the conditions of certification and general notes and to the satisfaction of the design plan approval authority and the attending surveyor. Additionally, where differences exist between the Installation Manual and the Certificate, the information in the Certificate must be considered correct and applied.

Only the main system concept is approved under this certificate. Cylinders, valves, pipes, couplings and all other components and system arrangements onboard are subject to case-by-case approval.

CONDITIONS OF CERTIFICATION

1. For use in cargo spaces, machinery spaces of category A and cargo pump rooms.
2. Application in each case to be approved by Lloyd's Register at the design stage. Arrangement drawings and calculations are to be submitted for acceptance in each case where it is proposed to install this system. Control panel schematics are also to be submitted. All principle components of the system are to be identified and their location indicated.
3. This certificate of approval provides a general design acceptance of the system, that the system components have been designed to suitable pressures and/or codes of practice, having regard to their locations and maximum ambient temperatures expected in service. All system components are to be in accordance with the manufacturer's Design, Installation, Operation and Maintenance Manual.
4. The attending surveyor is to verify that the system components have been manufactured, tested and inspected in accordance with the appropriate standards and Lloyd's Register Rules, Part 5, Chapter 12.
5. A manifold pressure relief valve is required and should be set at not less than 126 bar. The manifold pipework should be pressure tested to at least 190 bar.
6. Storage rooms for the CO2 fire extinguishing medium shall comply with SOLAS Chapter II-2, Regulation 10.4.3.

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7. Pressure containers required for the storage of the CO2 fire extinguishing medium shall be located outside the protected spaces. Storage cylinders are to be designed for a test pressure of at least 200 bar and shall be fitted with a bursting disc arrangement set below the cylinder test pressure, but not less than 190 bar.
8. The quality of CO2 supplied by the system shall comply with the following requirements of NFPA 12 or an equivalent internationally recognised standard, if agreed by the final the project authority.
   a) The vapor phase shall be not less than 99.5 percent carbon dioxide with no detectable off-taste or odour.
   b) The water content of the liquid phase shall comply with CGA G6.2, Commodity Specification for Carbon Dioxide.
   c) Oil content shall be not more than 10 ppm by weight.
9. Screw type pipe fittings are only permitted in the CO2 storage room and the protected spaces.
10. The quantity of CO2 fire extinguishing medium for cargo and machinery spaces should comply with the requirements of the Fire Safety Systems Code, Chapter 5, 2.2.
11. The controlled release of CO2 into protected space(s) shall comply with the requirements of the Fire Safety Systems Code, Chapter 5.2.2.2 and a positive means of ensuring opening of the manifold discharge valve occurs before opening of the cylinder discharge valve(s) shall be provided.
12. The CO2 system alarms/sirens are not to be directly operated by the discharging CO2 fire extinguishing medium.
13. For cylinder head valves or actuators or other components of marine safety critical systems, which use retainer screws or similar arrangements for torque setting or other critical applications that are likely to change from its set position due to vibration, thus adversely affecting system functionality:
   a) Screwed fastenings that are subject to vibration require a locking device to prevent them working loose.
   b) If stroke length is determined by external stroke end stops, means shall be provided for locking the adjustable end stops.
   c) For critical operations, positive locking arrangements are to be utilised.
14. When the system has been installed, pressure-tested and inspected, a test of the free air flow in all pipes and nozzles and a functional test of the alarm equipment shall be conducted. All such arrangements are to be to the satisfaction of the Surveyors attending on board.
15. Production items are to be manufactured in accordance with a quality control system which shall be maintained to ensure that items are of the same standard as the approved prototype.
16. The certificate holder is solely responsible for the products supplied under this Certificate and to ensure that their products, whether manufactured by themselves or their licensee manufacturers, if agreed by Lloyd's Register, are designed, manufactured and installed in full compliance with the relevant statutory regulations, Lloyd's Register Class rules and/or acceptable Codes of practice, including components that are designed and manufactured by third parties.

DESIGN APPRAISAL DOCUMENT

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PLACE OF PRODUCTION

Kidde-Fenwal Inc.
400 Main Street
Ashland
MA 01721
United States of America (USA)

Saji Abraham
Senior Specialist
Fire & Safety, Statutory Discipline Team
UK&I Technical Support Office,
Marine & Offshore Lloyd's Register EMEA

Supplementary Type Approval Terms and Conditions

This certificate and Design Appraisal Document relates to type approval, it certifies that the prototype(s) of the product(s) referred to herein has/have been found to meet the applicable design criteria for the use specified herein, it does not mean or imply approval for any other use, nor approval of any products designed or manufactured otherwise than in strict conformity with the said prototype(s).