DNV·GL

Certificate No:
MEDB00002NN

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Application of: Directive 2014/90/EU of 23 July 2014 on marine equipment (MED), issued as "Forskrift om Skipsutstyr" by the Norwegian Maritime Authority. This Certificate is issued by DNV GL AS under the authority of the Government of the Kingdom of Norway.

This is to certify:

That the Equivalent fixed gas fire extinguishing systems components (extinguishing medium, head valves and nozzles) for machinery spaces and cargo pump rooms

with type designation(s)
Novec 1230

Issued to
Kidde-Fenwal
ASHLAND MA, United States

is found to comply with the requirements in the following Regulations/Standards:
Regulation **(EU) 2017/306,**
item No. MED/3.45. SOLAS 74 as amended Regulation II-2/10 & X/3, IMO MSC/Circ. 848, IMO MSC.1/Circ.1313, IMO MSC.1/Circ.1316, FSS Code 5 and 2000 HSC Code 7

Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2022-08-31**.

Issued at **Høvik** on **2017-09-01**

DNV GL local station:
Certification & Inspection Services

Approval Engineer:
Synnøve Bolstad Eri

Notified Body
No.: **0575**

for **DNV GL AS**
Digitally Signed By: Hoff, Øyvind
Location: DNV GL Høvik, Norway
on behalf of

Vidar Dolonen
Head of Notified Body

The mark of conformity may only be affixed to the above type approved equipment and a Manufacturer's Declaration of Conformity issued when the production-surveillance module (D, E or F) of Annex B of the MED is fully complied with and controlled by a written inspection agreement with a Notified Body. The product liability rests with the manufacturer or his representative in accordance with Directive 2014/90/EU.
This certificate is valid for equipment, which is conform to the approved type. The manufacturer shall inform DNV GL AS of any changes to the approved equipment. This certificate remains valid unless suspended, withdrawn, recalled or cancelled.
Should the specified regulations or standards be amended during the validity of this certificate, the product is to be re-approved before being placed on board a vessel to which the amended regulations or standards apply.

Product description

"Novec 1230"
is a fixed gas fire extinguishing system using fire extinguishing agent Novec 1230 stored in steel cylinders as liquid and pressurized with nitrogen and distributed through pipes and nozzles.

The extinguishing concentration and nozzles are covered by this type approval certificate. Documentation for the other system components shall be submitted and approved for each project.

The extinguishing agent, Novec 1230, is produced by 3M, Cordova, Illinois, USA.

The system is to be designed in accordance with IMO MSC/Circ.848 as amended by IMO MSC.1/Circ.1267.

The following associated companies are authorised by Kidde-Fenwal to apply this certificate:

- Kidde-Fenwal Inc., Ashland, USA
- Kidde Fire Protection, Stokenchurch, UK

Novec 1230 physical properties

Other trade name:	FK-5-1-12
Molecular formula:	$CF_3CF_2C(O)CF(CF_3)_2$
Agent specific vapour volume (S) at 20°C [1]:	0,07188 m^3/kg
Design concentration (C):	5,85 %
Min. agent required (W/V) [2]:	0,8644 kg/m3
NOAEL [3]:	10,0 %
LOAEL [3]:	>10,0 %

1) To be applied in conjunction with IMO MSC/Circ.848, 3.4.2.3.2
2) When calculated at 20°C. Ambient temperature to be determined case by case for each project
3) NFPA 2001 (2008 Edition)

Application/Limitation

The design gas concentration (diesel) shall be minimum 5,85% (applied on a net volume) and the maximum agent discharge time shall be 10 seconds. The extinguishing system shall be designed and installed according to SOLAS Ch. II-2, IMO MSC/Circ.848 as amended by IMO MSC.1/Circ.1267 and the Kidde manual.

The following additional limitations will apply:

A. Novec 1230 systems are not suitable for the ship's cargo holds. If Novec 1230 systems are installed inside cargo pump rooms, all components shall be certified for use in hazardous areas, the design gas concentration shall be adjusted and the system is subjected to case by case approval.
B. If Novec 1230 is used above its NOAEL (calculated on net volume at max expected ambient temperature), means should be provided to limit exposure (IMO MSC.1/Circ.1267, 6). In no case should Novec 1230 be used in concentrations above its LOAEL.
C. Steel storage cylinders of size 10 lb (4,5 kg) to 900 lb (408 kg). Cylinders being 81 L or larger is only accepted when arrangements are provided on board to ensure that cylinders can be easily moved (even to shore) for service and recharging. All cylinders shall be of the same size.
D. Cylinders are topped up with nitrogen to 25 bar at 21°C. The fill density shall be maximum 1.12 kg/L. Cylinders are to be delivered with DNV product certificate or equivalent certificates acceptable to the flag administration and class.
E. Cylinders to be located in a separate room in accordance with SOLAS Ch. II-2 Reg. 10.4.3, or distributed throughout the protected space in accordance with the requirements in IMO MSC/Circ.848 item 11 as amended by IMO MSC.1/Circ.1267. When distributed within the protected space, the min extinguishing concentration (after any single failure) shall be 4,5 %.

F. Components in the system will be regarded under pressure class II with a maximum design pressure of 35 bar (at 54 °C). Consideration will though be made for piping and couplings inside the protected space.
G. The nozzles are to be located in accordance with the Kidde manual. A basic rule is that one nozzle can as a maximum cover an area of 5 m x 10 m. A 360° nozzle shall be located centrally in this area, the 180° nozzles on the sides (as applicable). The maximum cover height is 5 m. The minimum average nozzle pressure is 5,5 bar.
H. Bilges (except open bilges in small volume engine rooms) are to be protected with a dedicated nozzle network.

The following documentation is to be submitted to the flag administration in each case:

1. Plans showing location of cylinders, piping, nozzles and release stations as well as the assembled system
2. Capacity calculations, including hydraulic flow calculations.
3. Plans defining release lines and alarm system.
4. Material specification and dimensions for piping and specifications for all other components.
5. Ship specific release procedures and post discharge ventilation procedures.
6. Manual containing design, inspection, operation and maintenance procedures.
7. Control arrangements for closure of openings and stop of fans and any pressure relief devices as per IMO MSC/Circ. 848, 13. These plans can also be supplied by yard.

Testing at installations and periodical surveys

- The system shall be tested as per maker's manual both at installations and at periodical surveys, except that DNV GL do not require monthly content check of cylinders. The test pressure is minimum 53 bar for any closed sections, whereas open section shall be tightness tested at minimum 7 bar.
- The system is subject to biennual (every 2nd year) inspections by an approved service supplier. The attending surveyor will also apply requirement relevant for flag administration and / or class on newbuilding and ship in operation surveys.

Type Examination documentation

Design, Installation, Operation and Maintenance Manual – Novec 1230, No. P/N 45-NOVMAR-001, dated June 2012 from Kidde.

Supplement to Kidde Engineered Marine Fire Suppression System Designed for use with 3M™ Novec™ 1230 Fire Protection Fluid Design, Installation, Operation and Maintenance Manual P/N 06-236559-003 dated January 2013 From Kidde.

Report No. HAI Project #5087, dated 28 June 2002, from Hughes Associates, Inc., Baltimore, USA. (tested on U.S. Coast Guard's Fire & Safety Test Detachment in Mobile, AL)

Report No. 04-CRADA-RDC-001, dated 16 November 2004, from Kidde-Fenwal Inc., Massachusetts, USA. (tested on U.S. Coast Guard's Fire & Safety Test Detachment in Mobile, AL, witnessed by UL)

Report File EX4674, Project 04NK23160, dated February 2005, from UL, Northbook, USA.

Report No. 3026502, dated 24 March 2006, from FM Approvals, Norwood, USA.

Kidde Fenwal component sheets, stamped July 2005.

Tests carried out

Tested in accordance with IMO MSC/Circ.848 as amended by IMO MSC.1/Circ.1267.

Marking of product

Main components in the system are to be marked with name of manufacturer, type designation and Mark of Conformity (see first page).