



# DET NORSKE VERITAS

## TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. **F-20254**

This is to certify that the  
**Equivalent Fixed Gas Fire Extinguishing System**

with type designation(s)  
**Novec 1230**

Manufactured by  
**Kidde-Fenwal**  
**ASHLAND MA, United States**

is found to comply with  
Det Norske Veritas' Interpretation of SOLAS 1974 Convention as Amended  
Det Norske Veritas' Rules for Classification of Ships  
Det Norske Veritas' Offshore Standards

Application

**Approved for use as "total flooding" fire extinguishing system in machinery spaces and cargo pump rooms. Minimum design gas concentration: 5.85%**

**Høvik, 2012-09-29**  
for **Det Norske Veritas AS**



This Certificate is valid until  
**2016-12-31**

  
**Petter Langnes**  
Head of Section

DNV local office:  
**New York**

  
**Helge Bjørnara**  
Surveyor

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.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.



Certificate No.: F-20254  
File No.: 474.81  
Job Id.: 262.1-007221-2

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

The gas is produced by 3M, Cordova, Illinois, USA.

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

- Ajax Fire Protection System, Amsterdam, Holland
- Autronica Fire & Security, Spikkestad, Norway
- Ginge Kerr, Hvidovre, Denmark
- Kidde-Fenwal Inc., Ashland, USA
- Kidde Fire Protection, Thame, UK

## Novec 1230 physical properties

Other trade name:	FK-5-1-12
Molecular formula:	$\text{CF}_3\text{CF}_2\text{C}(\text{O})\text{CF}(\text{CF}_3)_2$
Agent specific vapour volume (S) at 20°C <sup>1)</sup> :	0,07188 m <sup>3</sup> /kg
Design concentration (C):	5,85 %
Min. agent required (W/V) <sup>2)</sup> :	0,8644 kg/m <sup>3</sup>
NOAEL <sup>3)</sup> :	10,0 %
LOAEL <sup>3)</sup> :	>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:

- 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 increased and the system is subjected to case by case approval.
- 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.
- 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.
- 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.
- 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 %.
- 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.
- 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.
- Bilges (except open bilges in small volume engine rooms) are to be protected with a dedicated nozzle network.



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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 do not require monthly content check of cylinders. The minimum 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 biennial (every 2<sup>nd</sup> 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 Approval documentation**

Certification in accordance with Standard for Certification No. 1.2, Type Approval, April 2009.

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

Periodical audit (MED-D) dated 2012-05-10 from DNV New York.

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, Northbrook, 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**

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

**Certificate Retention Survey**

Det Norske Veritas' surveyor is to be given permission to perform Certification Retention Surveys at any time during the validity period of this certificate and at least every second year. The arrangement is to be in accordance with procedure described in Standard for Certification No. 1.2 item 4.

