

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate No:
MEDB0000650

Application of: Directive 2014/90/EU of 23 July 2014 on marine equipment (MED). This Certificate is issued by DNV SE based on the notification of the Federal Maritime and Hydrographic Agency of Germany.

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)
VTI1230

Issued to
VTI Fire Products(Shanghai) Co., Ltd.
Shanghai, China

is found to comply with the requirements in the following Regulations/Standards:
Regulation **(EU) 2021/1158**,
item No. MED/3.45. SOLAS 74 as amended Regulation II-2/10 & X/3, IMO MSC/Circ. 848, IMO MSC.1/Circ.1313, FSS Code 5 and 2000 HSC Code 7

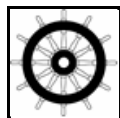
Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2026-10-12**.

Issued at **Hamburg** on **2021-10-13**

DNV local station:
Shanghai

Approval Engineer:
Andrii Pishchanskyi



Notified Body
No.: **0098**

for **DNV SE**

Christine Mydlak-Roeder
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 SE 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 This certificate remains valid unless suspended, withdrawn, recalled or cancelled.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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Product description

VTI1230 is a fixed gas fire extinguishing system using fire extinguishing agent Novec 1230 stored in gas cylinders and distributed through piping and nozzles.

The extinguishing concentration and the nozzles are covered by this Type Examination 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 in Cordova, USA and Sinochem Lantian Co., Ltd. in Hangzhou, CHINA.

Extinguishing agent parameters are as follows:

Parameter	Value
Trade name	Novec 1230 or FK-5-1-12
Molecular formula	$CF_3CF_2C(O)CF(CF_3)_2$
Agent specific vapour volume (S) at 20°C ¹⁾	0.0719 m ³ /kg
Design concentration (C)	5.85% by volume
Min. agent required (W/V) ²⁾	0.8644 kg/m ³
NOAEL ³⁾	10.0%
LOAEL ³⁾	>10.0%

Footnote

- 1) To be applied in conjunction with IMO MSC/Circ.848 Appendix §3.4.2.3.1;
- 2) When calculated at 20°C. Ambient temperature to be determined case by case;
- 3) As per NFPA 2001 (2008 Edition)

Application/Limitation

The design gas concentration (based on oil fuel) shall be minimum 5.85% (applied on a net volume) and the maximum agent discharge time shall be up to 10 seconds. The extinguishing system shall be designed and installed according to SOLAS Ch. II-2 Reg.10, IMO MSC/Circ.848 as amended and maker's manual.

The following additional limitations will apply:

- A. VTI1230 system is approved for use in engine rooms, cargo pump rooms (hydrocarbon only) and similar spaces. If system components are installed inside cargo pump or cargo compressor rooms, then they shall be certified for use in hazardous areas. The design gas concentration shall be adjusted and the system is subject to case by case approval.
- B. If extinguishing medium is to be used above its NOAEL (calculated on net volume at maximum expected ambient temperature), then means should be provided to limit exposure (IMO MSC.1/Circ.848 §6). In no case shall extinguishing medium be used in concentrations above its LOAEL.
- C. Steel storage cylinders are available with sizes up to 180 l. 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 up to 25 bar or 42 bar at 20 °C (increasing 1 bar per 10°C). The maximum fill density shall be 1.2 kg/l.
- 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 §11. When distributed within the protected space, the minimum extinguishing concentration (after any single failure) shall be at least 4.5% by volume.
- F. Gas cylinders shall be delivered on board with a product certificate of the Society or with a certificate issued by a recognized certification authority according to national regulations based on the requirements of the design standard.
- G. Piping class shall be considered for the purpose of testing, type of joint to be adopted, heat treatment and welding procedure as per Class Rules or Flag Administration requirements. Piping maximum working pressure is:
 - a. 30 bar for system with cylinders topped up with nitrogen up to 25 bar and
 - b. 50 bar for system with cylinders topped up with nitrogen up to 42 bar.
- H. The nozzles shall be installed as per maker's manual "Design, Installation, Operation and Maintenance Manual". Estimated coverage area of a single 360° nozzle for nozzle distribution is 10*10 m. A 360° nozzle is suitable for installation centrally in a protected area, whereas 180° nozzle – near bulkheads. Nozzle maximum installation height is 5 m. Nozzle maximum discharge pressure is up to 15 bar.
- I. 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 in each separate case:

1. Plans showing location of cylinders, piping, nozzles and release stations as well as the assembled system;
2. Gas 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;
6. The 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 installation and at periodical surveys.
- The system is subject to biennial (every 2nd year) inspections by an approved service supplier. The attending surveyor will also apply the Flag Administration requirements on new building and ship in operation surveys.

Type Examination documentation

- 1) VTI1230 25/42 bar total flooding fire suppression system (marine) – Design, installation, operation and maintenance manual No. AME06-D0200M dated 2019-06;
- 2) Test report No. AME06-TP02 Project No. VTIFF-848 dated 2021-06-15.

Tests carried out

The system is tested according to 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 and address of manufacturer, type designation and MED Mark of Conformity (see first page).