TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate No:
MERB00004G7
Revision No:
0

This Certificate is issued by DNV UK Limited based on authorisation of the Maritime & Coast Guard Agency (MCA) as an UK Approved Body to undertake conformity assessments on marine equipment in accordance with the requirements of the Merchant Shipping (Marine Equipment) Regulations 2016 as amended.

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)
MX-1230

Issued to
Minimax GmbH
Bad Oldesloe, **Germany**

is found to comply with the requirements in the following Regulations/Standards:
Regulation **MSN 1874 Amendment 7,**
item No. UK/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 **2024-02-07**.

Issued at **London** on **2023-11-14**

for **DNV UK Ltd.**

DNV local unit:
Hamburg

Approval Engineer:
Tessa Biever

Approved Body No.: **0097**

Christine Mydlak-Roeder
MER Service Responsible

Maritime & Coastguard Agency
UK Approved Body Authorised by the MCA

This certificate will not be valid if the manufacturer makes any changes or modifications to the approved type of equipment, which have not been notified to, and agreed with the approved body named on this certificate.
During the period of validity of this certificate the applicable regulations (international conventions and the relevant resolutions and circulars of the IMO) and testing standards may change, therefore the product conformity may need to be re-assessed by the Approved 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-control phase module (D, E or F) of Schedule 2 of the Merchant Shipping (Marine Equipment) Regulations 2016, as amended is fully complied with and controlled by a written inspection agreement with an approved body. In case limitations of use apply, these should be indicated in the Annex.

Product description

"MX-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 the "Principal Requirements" in IMO MSC/Circ.848 as amended by IMO MSC.1/Circ.1267.

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

Physical properties of extinguishing agent

Trade name	MX-1230
Other trade name	FK-5-1-12
Molecular formula	$CF_3CF_2C(O)CF(CF_3)_2$
Agent specific vapour volume (S) [1)]	0.07188 m^3/kg
Design concentration (C)	5.85%
Min. agent required (W/V) [2)]	0.8644 kg/m^3
NOAEL [3)]	10.0%
LOAEL [3)]	>10.0%

1) To be applied in conjunction with IMO MSC/Circ.848, 3.4.2.3.1
2) When calculated at 20°C. Ambient temperature to be determined case by case for each project
3) NFPA 2001 (2008 Edition)

Application/Limitation

Approved for use as "total flooding" fire extinguishing system in machinery spaces and cargo pump rooms. 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 for 95% of the extinguishing concentration. 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 maker's manual.

The following additional limitations will apply:

A. MX-1230 is approved for use in engine rooms, cargo pump rooms (hydrocarbon only) and similar spaces. If Novec MX-1230 systems are installed inside cargo pump or cargo compressor 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 MX-1230 is to be 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 MX-1230 be used in concentrations above its LOAEL.
C. Steel storage cylinders are available with sizes of 22 l 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 to 25 bar, 42 bar or 50 bar at 20 °C (increasing 1 bar per 10 °C). The fill density shall be maximum 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 item 11 as amended by IMO MSC.1/Circ.1267. When distributed within the protected space, the minimum extinguishing concentration (after any single failure) shall be 4.5%.
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. Components in the system shall be of pressure class II with a maximum design pressure of 35 bar (at 55 °C). To be certified according to Flag Administration requirements. Consideration will though be made for piping and couplings inside the protected space.
H. The nozzles are to be located in accordance with maker's manual MX 1230 Fire Extinguishing System for Marine Application (D10.60e Rev 05). A basic rule is that one nozzle has a maximum cover area of 50m². A NCD (2") 360° nozzle shall be located centrally in this area, the NCD (2") 180° nozzles on the sides (as applicable). The maximum coverage height for a row of nozzles is 5 m. The average pressure at the nozzles under discharge is 6.2 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 to the flag administration in each case:

a. Plans showing location of cylinders, piping, nozzles and release stations as well as the assembled system.
b. Capacity calculations, including hydraulic flow calculations.
c. Plans defining release lines and alarm system.
d. Material specification and dimensions for piping and specifications for all other components.
e. Ship specific release procedures and post discharge ventilation procedures.
f. Manual containing design, inspection, operation and maintenance procedures.
g. 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, flag administration and class requirements.
- The system is subject to biennial (every 2nd year) inspection 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

Minimax system manual, Rev. 05 dated October 2018.

Test report No. F17 20355:1 version 2 issued by RISE Fire Research dated 07 April 2018.
Test report No. TB 2008-13 Rev.2 issued by Minimax dated 28 May 2008.
USCG Test Report No. HAI Project #5087 issued by Hughes Associates, Inc dated 28 June 2002.

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 and address of manufacturer, type designation and MED Mark of Conformity (see first page).