

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate no.:
MEDB0000B3X
Revision no.:
0

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)

IG-541 Inert gas Fire-Extinguishing System Oxexo CF Marine

issued to

Minimax GmbH
Bad Oldesloe, Germany

is found to comply with the Implementing Regulation (EU) 2024/1975 for
Item no. **MED/3.45 (Row 2 of 2)**

according to the following requirements:

SOLAS 74 Reg. II-2/10, IMO Res. MSC.36(63)-(1994 HSC Code) 7, IMO Res. MSC.97(73)-(2000 HSC Code) 7, IMO Res. MSC.391(95)-(IGF Code) 11, IMO MSC/Circ.848, IMO MSC.1/Circ.1313, SOLAS 74 Reg. X/3, IMO Res. MSC.98(73)-(FSS Code) 5

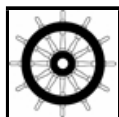
Further details of the equipment and conditions for certification are given overleaf.

Date of issue: **2025-07-01**

Expiry date: **2030-06-30**

DNV local unit:
Hamburg – CMC North/East

Approval Engineer:
Helge Bjørnara



Notified Body
no.: **0098**

for DNV SE

Christine Mydlak-Röder
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 This certificate remains valid unless suspended, withdrawn, recalled or cancelled.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 USD 300 000.

Product description

"IG-541 Inert gas Fire-Extinguishing System",
is a fixed gas fire extinguishing system using fire extinguishing agent IG-541 stored in steel cylinders as gas 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 extinguishing agent IG-541 is to be produced by a maker certified by Minimax.

Please see Appendix: Product Description

Application/Limitation

Approved for use as fixed fire extinguishing system for machinery spaces and cargo pump rooms.

The design gas concentration (oil fuel) shall be minimum 45.5% (applied on a net volume) and the maximum agent discharge time shall be 120 seconds for 85% 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 maker's manual.

The following additional limitations will apply:

- A. IG-541 is approved for use in engine rooms, cargo pump rooms (hydrocarbon only) and similar spaces. This certificate does not address use of the system for protection of cargo holds and cargo handling spaces for other cargoes than oil (alcohol, LPG, LNG). This will have to be considered by the applicable flag administration on a case by case basis.
- B. Evacuation time and warning procedures as per IMO MSC.1/Circ.1267, 6.2 should be considered for each project.
- C. Steel storage cylinders of size 2L, 5.4L, 10L, 10.7L, 20L, 30L, 40L, 67.5L, 80L, 140L. Cylinders being 81 L or larger are 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 to be delivered with 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 Reg. II-2/10.4.3 or distributed throughout the protected space in accordance with the requirements in IMO MSC/Circ.848, 11 as amended by IMO MSC.1/Circ.1267. When distributed within the protected space, the agent concentration (after any single failure) shall be 34.4%.
- F. Components in the system will be regarded as pressure class I with a maximum design pressure as per the hydraulic calculations for each project. Consideration will though be made for piping and couplings inside the protected space.
- G. The nozzles are to be located in accordance with the maker's manual.
 - 1. Nozzles type VN TFI 180°: Maximum coverage area 50 m² (5 m x 10 m): Minimum nozzle pressure 16.5 bar.
 - 2. Nozzles type RD: Maximum coverage area 25 m² (5 m x 5 m): Minimum nozzle pressure 15.2 bar.
- H. Bilges (except open bilges in small volume engine rooms) are to be protected with a dedicated nozzle network.
- I. In no case should the design concentration exceed 52% (calculated on net volume at maximum expected ambient temperature).

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) 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.



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Type Examination documentation

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).

APPENDIX

Product Description

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Physical properties of extinguishing agent

Trade name	IG-541
Composition	52% N ₂ , 40% Ar, 8% CO ₂
Design concentration (C) ¹⁾	45.5%
Design concentration ($V_{\text{agent}}/V_{\text{protected area}}$) ²⁾	0.609
Physiological Effects, No Effect Level ³⁾	43%
Physiological Effects, Low Effect Level ³⁾	52%

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) NOAEL/LOAEL equivalent