EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate no.:
MEDB00008U2

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 AS under the authority of the Government of Norway.

This is to certify:

that the Fixed water-based fire-fighting systems for ro-ro spaces, vehicle spaces and special category spaces: Performance-based systems as per IMO MSC.1/Circ.1430, Rev.3

with type designation(s)
HF3000

issued to
Marioff Corporation Oy
VANTAA, **Finland**

is found to comply with the requirements in the following Regulations/Standards:
Regulation **(EU) 2024/1975,**
item No. MED/3.49b. SOLAS 74 as amended Regulation II-2/19, II-2/20 & X/3, 2000 HSC Code 7 and FSS Code 7, IMO MSC.1/Circ.1430, Rev 3.

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

This Certificate is valid until **2029-11-13**.

Issued at **Høvik** on **2024-11-14**

DNV local unit:
Finland CMC

Approval Engineer:
Helge Bjørnarå

Notified Body
No.: **0575**

for **DNV AS**

Mydlak-Röder, Christine
Head of Notified Body

NORWEGIAN ACCREDITATION PROD 019

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 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 This certificate remains valid unless suspended, withdrawn, recalled or cancelled.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.

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

"HF3000",
is a water mist system of sprinkler type. The system consists of nozzles and section valves, in addition to pump unit(s), stainless steel piping, control system as associated equipment.

The system is to be designed in accordance with the "Principal Requirements" of IMO MSC.1/Circ.1430, Rev.3, for performance based-systems.

Only nozzles are type approved by this certificate. Other components are to be approved and/or certified case by case.

Application/Limitation
Approved for use as a fixed water-based fire-fighting systems for ro-ro spaces and special category spaces (performance-based system).

System design and installation shall be in accordance with principal requirements and performance-based system requirements of IMO MSC.1/Circ.1430 Ch.3 and 5 and following limitations:

System type	Nozzle type	Maximum spacing [m] 1)	Min. Pressure at nozzles [bar]	Min. coverage area [m²]
Deck height up to 5.0 m 2)				
Sprinkler	GARZ-141C	3.50	55	280 3)
Deck height up to 2.5 m				
Sprinkler	DAGZ-93C	3.75	55	280 3)

Notes:
1) Distance to bulkheads should be half spacing.
2) Installations with height above 5.0 will be considered case by case.
3) According to Requirements of IMO MSC.1/Circ.1430 Ch.5.4 for type A systems (as applicable).

Nozzle information:

Nozzle type	k-factor [lpm/bar$^{1/2}$]	Flow [lpm]	Min. pressure at nozzle [bar]	Drawing
GARZ-141C	3.83	28.4	55	2000880448
DAGZ-93C	2.0	14.8	55	2001251328
Nozzles are made of nickel coated brass. Maximum operating pressure is 140 bar. Nozzles are to be installed in a pendant (downward) position.				

For all applications
A. Restrictions apply to use of this system on open ro-ro and open special category spaces (see IMO MSC.1/Circ.1430).
B. The pump unit(s) shall be delivered with product certificate. Other system components are to be certified or inspected in accordance with Class Rules (or equivalent standard as specified by the Flag Administration).
C. Redundant pump arrangement is to be approved on a case by case basis.
D. Only stainless steel piping or equivalent corrosion resistant pipes are to be applied (to avoid clogging of sprinklers). Primary water supply shall be a fresh water of potable quality.
E. Pipes, couplings and other components are regarded as "Class I" piping.
F. The pump unit and section valves shall be installed in a room having ambient temperature between 4 °C and 45 °C.

The following items are to be submitted for approval for each project:
a. System arrangement plans showing routing of pipes, location of nozzles, sections valves, release stations and pump unit.
b. Documentation of power supply and control system.
c. Specification of pipes, section valves, pumps, including drivers and associated components.
d. Pressure drop calculations and water mist capacity calculations.
e. Design, installation, operation and maintenance manual.

Installation testing:
- The system is to be cleaned in accordance with routines outlined in maker's system description manual.
- Not less than 2 sprinkler heads in each section shall be tested, except that the test program may be limited to 10 sprinkler heads in at least 5 sections.
- Manual start of pumps shall be carried out.
- Alarms at the manned control stations shall be tested.
- Other tests as required by class rules (or equivalent standard as specified by the Flag Administration) (pressure testing of piping, etc.) and according to maker's manual shall be carried out.

Periodical testing:
- The periodical testing shall comply with instructions from flag administration, statutory interpretations and maker's maintenance manual.

Type Examination documentation
Design, Installation, Operation and Maintenance Manual No. MO/ES/25/DIOM/IMO/08, Version 2.0, dated October 2023.

Fire test report:
Test report No. EUFI29-23000427-T1 dated 23 October 2023 from Eurofins, Espoo, Finland.

Component test report:
Test report No. VTT-S-03387-14 dated 3 July 2014 from VTT, Espoo, Finland.
Project No. 4786185179 and 4786185185 File NC8784 dated 4 September 2014 from UL LLC, USA.
Test report No. VTT-S-04150-14 dated 11 September 2014 from VTT, Espoo, Finland.
Test report No. VTT-S-04725-14 dated 15 October 2014 from VTT, Espoo, Finland.
Test report No. VTT-S-04708-14 dated 22 October 2014 from VTT, Espoo, Finland.
Test report No. VTT-S-05256-14 dated 11 November 2014 from VTT, Espoo, Finland.
Test report No. VTT-S-00632-15 dated 16 February 2015 from VTT, Espoo, Finland.
Test report No. VTT-S-01256-15 dated 30 March 2015 from VTT, Espoo, Finland.
Test report No. VTT-S-01440-15 dated 8 April 2015 from VTT, Espoo, Finland.
Test report No. VTT-S-01475-15 dated 15 April 2015 from VTT, Espoo, Finland.
Test report No. VTT-S-01477-15 dated 8 April 2015 from VTT, Espoo, Finland.
Test report No. VTT-S-01478-15 dated 8 April 2015 from VTT, Espoo, Finland.
Test report No. EUFI29-21003077-T1 dated 13 May 2022 from Eurofins, Espoo, Finland.

Statement No. VTT-S-01483-15 dated 15 April 2015 from VTT, Espoo, Finland.

Drawings, nozzles:
Drawing No. 2000880448 dated 25 June 2020 from manufacturer.
Drawing No. 2001251328, Rev. B dated 15 January 2021 from manufacturer.

Tests carried out
Fire performance test in accordance with IMO MSC.1/Circ.1430.

Component test in accordance with IMO Res. A.800(19) and IMO Res. MSC.265(84), and in compliance with IMO MSC.1/Circ.1430.

Marking of product
The nozzles are to be marked with manufacturer name and address, type designation and Mark of Conformity (see first page) whereas other main components are to be marked with name of manufacturer.