

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

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 GL AS under the authority of the Government of Norway.

This is to certify:

That the Nozzles for equivalent water-mist fire extinguishing systems for machinery spaces and cargo pump rooms

with type designation(s)
Marioff Bilge Foam System

Issued to
MARIOFF CORPORATION OY
VANTAA, Finland

is found to comply with the requirements in the following Regulations/Standards:
Regulation **(EU) 2017/306**,
item No. MED/3.39. SOLAS 74, Regulation II-2/10 & X/3, 2000 HSC Code 7, FSS Code 7, IMO MSC.1/Circ.1313, IMO MSC.1/Circ.1458 and IMO MSC/Circ.1165 as amended

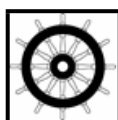
Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2022-12-06**.

Issued at **Høvik** on **2017-12-07**

DNV GL local station:
Helsinki

Approval Engineer:
Tessa Biever



Notified Body
No.: **0575**

for **DNV GL AS**

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 This certificate remains valid unless suspended, withdrawn, recalled or cancelled.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



Product description

"Marioff Bilge Foam System"

is a water mist system with a 1% AFFF (Aqueous Film-Forming Foam) foam concentrate additive, composed of nozzles, stainless steel piping, section valves, electric monitoring system in the control station, electrically driven pumps and a foam proportioned system for delivering water-foam mixture.

Only the nozzles are type approved by this certificate. Pumps, pipes, couplings, valves and other systems components are subject to case by case approval. The system is to be designed in accordance with the "Principal Requirements for the System" in IMO MSC/Circ. 1165.

The nozzles are manufactured by Marioff at Vantaa, Finland.

Application/Limitation

The bilge system does not incorporate the full fire protection of the engine room. In addition to the bilge nozzle system, an approved ceiling mounted nozzle arrangement shall be installed.

The nozzles of the bilge system are to be installed to the following specifications:

Bilge system information	Description
Maximum nozzle spacing	3.2 m x 3.2 m ¹⁾
Maximum distance to bulkhead:	1.6 m
Maximum coverage area per nozzle	10.2 m ²
Height of nozzle above tank top/floor level	0.2 m – 0.45 m
Height of bilge plate	0.6 m – 1.5 m
Minimum pressure at nozzle	8 bar
Nozzle type	FH20
Nozzle orientation	Downward
Notes:	
1) Example: Spacing between nozzles is 3.2 m along the row and 3.2 m between rows.	

Nozzle type	k-factor [lpm/bar ^{1/2}]	Flow [lpm]	Operating pressure [bar]	Data Sheet
HI-FOG FH20	5.5	15.6	8	K0008025
Nozzles are made of brass with chrome finish. Maximum nozzle operating pressure is 16 bar.				

For all applications

- The pump(s) unit shall be delivered with product certificate, whereas other system components are to be inspected in accordance with Class Rules (or equivalent standard as specified by the Flag Administration);
- The back-up pump arrangement is to be approved on a case by case basis;
- The pump unit and section valves shall be installed in a room having ambient temperature between +4°C and +45°C;
- Only stainless steel piping or equivalent corrosion resistant pipes are to be applied (to avoid clogging of sprinklers). Primary water supply shall be fresh water of potable quality.
- Water is to be applied continuously for at least 30 minutes at full pressure. Filtrated (<100 µm filter) fresh water from the ship's water supply to be used. AFFF foam concentrate of approved type is to be applied with 1% admixture to water. Foam concentrate for at least 22 minutes discharge is to be provided.

The following items are to be approved and filed by the flag administration for each project:

- System arrangement plans including routing of pipes, location of nozzles, section valves, release stations, pump unit with back-up capacity and water supply;
- Documentation of power supply and control system;
- Specification of pipes, section valves, electrical motors, pumps and associated components;
- Pressure drop calculations and water mist capacity calculations;
- Design, installation, operation and maintenance manual.

Job Id: **344.1-003637-4**
Certificate No: **MEDB00003G6**

Installation testing:

- System to be cleaned in accordance with routines outlined in maker's installation manual;
- All sections should be tested with full flow of water through the nozzles;
- Manual release of all section valves and start of pumps shall be carried out;
- Alarms inside protected space and at a manned control stations and switchover to emergency power shall be tested;
- Other tests as required by Class Rules (pressure testing of piping, etc.) or a similar standard acceptable to the Flag Administration and according to maker's manual shall be carried out.

Periodical testing:

- The periodical testing shall comply with instructions from flag administration and maker's maintenance manual;
- At least one section should each year be tested with full flow through the nozzles (not the same section each year).

Type Examination documentation

Fire test report No. VTT-S-02839-12 dated 16 April 2012 from VTT Technical Research Centre of Finland.

Contract Examination Report Project Id:3011392, dated 18 June 2001 from Factory Mutual Research Corporation, USA.

Design, Installation, Operation & Maintenance Manual dated August 2012 from Marioff Corporation Oy.

Dwg. No. K0008025, dated 6 August 2012 from Marioff Corporation Oy (nozzle material in brass with chrome finish).

Tests carried out

Fire performance testing according to IMO MSC/Circ.1165. Component testing according to IMO Res. A.800(19).

Marking of product

The nozzles and other main component in the system are to be marked with type designation and Mark of Conformity.