DNV·GL

Certificate No:
MEDB00000UY

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Application of: Council Directive 96/98/EC of 20 December 1996 on Marine Equipment as amended by directive 2014/93/EU, issued as "Forskrift om Skipsutstyr" by the Norwegian Maritime Directorate. This Certificate is issued by DNV GL AS under the authority of the Government of the Kingdom of Norway.

This is to certify:

That the Sprinkler systems components for accommodation spaces, service spaces and control stations equivalent to that referred to in SOLAS 74 Regulation II-2/12

with type designation(s)
Heien Larsen FlexiFOG micro-model OH water mist fire suppression system

Issued to
Autronica Fire and Security AS
NØTTERØY, Norway

is found to comply with the requirements in the following Regulations/Standards:
Annex A.1, item No. A.1/3.9 and Annex B, Module B in the Directive. SOLAS 74 as amended, Regulation II-2/7, II-2/9 & II-2/10, FSS Code 8

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

This Certificate is valid until **2021-04-10**.

Issued at **Høvik** on **2016-04-11**

DNV GL local station:
Sandefjord

Approval Engineer:
Piotr Orzechowski

Notified Body
No.: **0575**

for **DNV GL AS**

Digitally Signed By: Hoff, Øyvind
Location: DNV GL Høvik, Norway
Signing Date: 02.05.2016, on behalf of

Vidar Dolonen
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 Council Directive 96/98/EC, as amended.
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.
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.

Job Id: **344.1-005268-1**
Certificate No: **MEDB00000UY**

Product description

"Heien Larsen FlexiFOG micro-model OH water mist fire suppression system"
is an automatic, fast response, low-pressure sprinkler system of wet pipe type. The system composed of sprinkler heads, stainless steel piping, sections valves, pump units, filter units and alarm panel.

Only the sprinklers are type approved by this certificate. Other components are to be approved and/or certified case by case. The system is to be designed in accordance with the "Principal Requirements for the System" in IMO Res. A.800(19) as amended by IMO Res. MSC.265(84).

Application/Limitation

Approved for use as an automatic water sprinkler system for accommodation areas, public spaces, service spaces and store rooms.

Installation shall be in accordance with table 1, appendix 2, IMO Res. MSC.265(84):

Application	Sprinkler head	Spacing [m]	Distance to wall [m]
Cabins < 12 m²	OH-CA1	One per room	0.9
Cabins < 18 m²	OH-SWC	On centred located in front wall[3)]	
Cabins < 20 m²	OH-CA	Two per room	0.9
Corridors [2)]	OH-CO	3.0	0.75
Public space (h < 2.5 m)	OH-L0	2.5	1.3
Public space (h < 2.5 m)	OH-L1	4.0	2.0
Public space (h < 5 m) [1)]	OH-L2	4.0	2.0
Storage areas	OH-PX1	4.0	2.0

Notes:
1) Ceiling height of more than 5 meter is subject to case by case approval.
2) Maximum width of corridor should not exceed 1.5 m.
3) Installed 0.12 m beneath the ceiling.

All sprinklers are to be installed in the ceiling in a pendant (downward) position, except model OH-SWC which has to be placed sideways located centred in front wall.

Sprinkler head	k-factor [lpm/bar$^{1/2}$]	Pressure [bar]	Min. flow [lpm]	Drawings
OH-L0	7.0	6.0	17.0	151203-4107A rev. A
OH-L1	13.5	6.0	33.1	91104-737B rev. C, 71016-459D rev. D, 71114-468B rev. B, 80115-494, 80220-524A rev. A
OH-L2	14.5	6.0	35.5	81201-624B rev. B, 71114-468B rev. B, 80115-494, 80125-518F rev. E-F, 71212-488C rev. C
OH-CA1	13	6.0	31.8	151202-4106A
OH-SWC	23.0	6.0	56.3	100519-830, 100519-828A rev. A, 100519-829A rev. A, 100519-827A rev. A, 100519-826D rev. D
OH-CA	10	6.0	24.0	151203-4109A
OH-CO	15.5	6.0	38.0	110420-857B, rev. B, 71112-466C rev. C, 71121-471A rev. A, 71112-467d rev. D, 71114-468C, rev. C
OH-PX1	23.0	9.0	69.0	80930-596D, 101116-852A rev. A, 80717-570A rev. A, 81021-607A rev. A

For all applications

A. Maximum system working pressure is 16 bars, while the minimum working pressure at the sprinkler heads is 6 bars, except for stores which are 9 bars.
B. All sprinklers are to be installed in the ceiling in a pendant (downward) position, except model OH-SWC which has to be placed sideways located centred in front wall.
C. All sprinklers are made of brass and are fitted with Job F2 bulbs, with nominal releases temperature of 57 °C (orange). Bulbs with higher temperature ratings, but not more than 30 °C above ambient temperature, are subject to approval in each case.
D. The pumps (or pump unit) and gas cylinders shall be delivered with DNV GL product certificate, whereas other system components are to be certified or inspected in accordance with DNV GL Rules (or equivalent standard as specified by the Flag Administration).
E. Redundant pump arrangement is to be approved on a case by case basis.
F. Only stainless steel piping or equivalent fire and corrosion resistant pipes are to be applied (to avoid clogging of sprinklers). Primary water supply shall be fresh water of potable quality.
G. Pipes, couplings and other components are regarded as "Class III" piping.
H. 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 approved and filed by the flag administration for each project:

I. System arrangement plans including location of sprinklers, pipes, sections valves, control system and pump-unit
II. Specification of pipes, valves, electrical motor, pumps, pressurised tank(s) and associated components (including water supply specifications)
III. Pressure drop calculations and water capacity calculations
IV. Manual containing installation, operation and maintenance instructions
V. Arrangement of power supply and control system

Installation

- Water to be in accordance with manufacturer's specification for water quality. No chemicals shall be added to the water, for the purpose of e.g. cleaning, bacterial control, corrosion inhibition, etc., without the acceptance from the Manufacturer.

Installation testing:

- Not less than 2 sprinkler heads in each section shall be tested. Testing may be limited to 10 sections. i.e. 2x10 sprinkler heads if it is successful.
- Automatic start and stop of pumps.
- Automatic change over from main to emergency electric supply
- Other tests as required by DNV GL Rules (pressure testing of piping, etc.) and according to maker's manual (or equivalent standard as specified by the Flag Administration).

Periodical testing:

- Not less than 2 sprinkler heads shall be tested annually.
- Other tests and inspection to be in accordance with DNV GL's procedures and maker's manual (or equivalent standard as specified by the Flag Administration)

Type Examination documentation

Fire Performance Test Reports:

- 111014-58 dated 15 December 2009 from Danish Fire Laboratories
- 111014-57 dated 15 April 2010 from Danish Fire Laboratories
- 110110-48 dated 13 August 2010 from Danish Fire Laboratories
- 150918-161A dated 6 November 2015 from Danish Fire Laboratories
- 150918-161B dated 23 October 2015 from Danish Fire Laboratories
- 150918-161C dated 26 November 2015 from Danish Fire Laboratories

Component testing of water mist spray heads:
- 110415-5, dated 15 April 2011
- 150918-161 D, dated 2 December 2015
  Both from "DFL" Danish Fire Laboratories

Component testing of Model OH-Poseidon nozzles statement from DFL dated 1 October 2015.

VID authorization for "Cross listing of water mist nozzles, type Neptun OH" dated 25 February 2016.

Drawing from manufacturer: 91104-737B rev. C, 71016-459D rev. D, 71114-468B rev. B, 80115-494, 80220-524A rev. A, 81201-624B rev. B, 71114-468B rev. B, 80115-494, 80125-518F rev. E-F, 71212-488C rev. C, 100519-830, 100519-828A rev. A, 100519-829A rev. A, 100519-827A rev.A, 100519-826D rev. D, 110420-857B, rev. B, 71112-466C rev. C, 71121-471A rev. A, 71112-467d rev. D, 71114-468C, rev. C, 80930-596D, 101116-852A rev. A, 80717-570A rev. A, 81021-607A rev. A, 151203-4109A, 151202-4106A, 151203-4107A.

Design manual – FlexiFOG micro No. 4-1162011-400 Design MSC265 Acc RG.

Tests carried out
Tested according to IMO Res. A.800(19) as amended by IMO Res. MSC.265(84).

Marking of product
The product is to be marked with name of manufacturer, type designation, the MED Mark of Conformity, Notified Body No. and the year of manufacturing.