DNV·GL

Certificate No:
MEDB000010U

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Application of: Council Directive 96/98/EC of 20 December 1996 on Marine Equipment as amended by directive (EU) 2015/559, 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)
SEM-SAFE HPWM System for Accommodation

Issued to
Danfoss Semco A/S
Odense C, Denmark

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 **2019-06-27**.

Issued at **Høvik** on **2016-04-06**

DNV GL local station:
Fredericia

Approval Engineer:
Piotr Orzechowski

Notified Body
No.: **0575**

for **DNV GL AS**

Vidar Dolonen
Head of Notified Body

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Job Id: **344.1-004323-2**
Certificate No: **MEDB000010U**

Product description

"SEM-SAFE HPWM System for Accommodation"
is an automatic, fast response sprinkler system composed of spray heads, stainless steel piping, sections valves, control systems, filters, reservoir tank, sprinkler pumps and a pressure tank.

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). Only the spray heads are type approved by this certificate. Other components are to be approved and/or certified case by case.

The spray heads are produced by Danfoss Semco A/S, Denmark.

Application/Limitation

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

Application	Nozzle ID	Location	Projection	Spacing [m]	Dist. to wall [m]
Cabin, < 12 m2	AB	Ceiling	Pendent	Single	Centre
Cabin, < 24 m2	AC	Ceiling	Pendent	Single	Centre
Cabin, < 24 m2	Z	Sidewall	Horizontal	Single	- 1)
Corridor	AA	Ceiling	Pendent	5,0	Centre
Corridor	AB	Ceiling	Pendent	4,5	Centre
Public space (h < 2,5 m)	BM	Ceiling	Pendent	5,3	2,6
Public space (h < 2,5 m)	UU	Ceiling	Pendent	4,0	2,0
Public space (h < 5,0 m)(2)	BK	Ceiling	Pendent	5,0	2,5
Shopping and storage areas	Y	Ceiling	Pendent	4,3	2,1

(1) Blind zone behind nozzle, excluding the lavatory unit, is not to exceed 1.5 m^2. Max distance to ceiling is 0.15 m.
(2) Ceiling height of more than 5 meter is subject to case by case approval.

Nozzle type	Nozzle ID	k-factor [lpm/$bar^{1/2}$]	Pressure [bar]	Flow [lpm]	Data Sheet
HNDP-0-12-2.0-57	AB	2,0	60	15,5	001-01-00006
HNDP-0-12-3.4-57	AC	3,4	60	26,3	001-01-00009
HNDS-0-12-4.5-57	Z	4,5	60	34,9	001-01-00008
HNDP-0-12-2.88-57	AA	2,9	60	22,5	001-01-00010
HNDP-0-12-6.56-57	BM	6,6	60	51,1	001-01-00065
HNDP-0-12-3.19-57	UU	3,2	60	24,8	001-01-00064
HNDP-0-12-6.69-57	BK	6,7	60	51,9	001-01-00047
HNDP-0-12-6.40-57(3)	Y	6,4	60	49,6	001-01-00005

(3) When this nozzle (Y) is the dimensioning nozzle it shall cover at least 100m^2 at 60bar and 280m^2 at 30bar. The system shall be designed for 280m^2 nominal coverage. For stores one may use 100m^2 at 60bar and 280m^2 at 30bar. For all other nozzles 60bar is to be used.

For all applications

A. Minimum working pressure at the sprinkler heads is 60 bar for all applications.
B. All nozzles are comprised of parts made of coated tin-nickel, and fitted with a 57°C 2.0 mm bulb. Bulbs with higher temperature ratings, but not more than 30°C over ambient temperature, are subject to approval in each case.
C. The pumps (or pump unit) 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).
D. Redundant pump arrangement is to be approved on a case by case basis.
E. 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.
F. Pipes, couplings and other components are regarded as "Class I" piping.

G. 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:

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. Arrangement of power supply and control system.
v. Manual containing installation, operation and maintenance instructions.

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. 2 x 10 sprinkler heads if it is successful.
- Water from reservoir and all tested nozzles to be sampled and checked on board for compliance with manufacturer's specification for water quality. Dependent on the results, a further laboratory analysis of a sample from each failing section shall be conducted on shore.
- 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.

Periodical testing:

- The testing shall comply with instructions from flag administration, DNV Statutory Interpretations and maker's maintenance manual.
- Full flow test of minimum 2 sprinklers shall be carried out each year. If any sprinkler fail to operate at the minimum operating pressure (pilot pressure), extended testing in accordance with DNV GL Statutory Interpretations, Appendix A to be performed. Select sprinklers shall not recently have been tested/replaced.
- Periodical flushing, control and inspection to be in accordance with maker's system description manual and DNV GL Rules.

Type Examination documentation

Performance tests:

- Test Report No. NBL F09109 dated 2008-09-25 from SINTEF NBL, Norway
- Test Report No. NBL F11118 dated 2013-05-03 from SINTEF NBL, Norway
- Test Report No. NBL F11104 dated 2011-03-23 from SINTEF NBL, Norway
- Test Report No. NBL F11105 dated 2011-03-23 from SINTEF NBL, Norway
- Test Report No. NBL F11101 dated 2011-03-23 from SINTEF NBL, Norway
- Test Report No. PE10042b dated 2009-00-25 from DBI, Denmark
- Test Report No. SPFR A14110 dated 2014-05-20 from SP, Norway

Component tests:

- Test Report No. P805649 dated 2009-05-27 from SP, Sweden
- Test Report No. P805649-01 dated 2009-05-27 from SP, Sweden
- Test Report No. P805649-02 dated 2009-03-18 from SP, Sweden
- Test Report No. P805649-03 dated 2009-01-26 from SP, Sweden
- Test Report No. P805649B dated 2009-05-27 from SP, Sweden
- Test Report No. P805649C dated 2009-05-27 from SP, Sweden
- Test Report No. P904544rev, dated 2009-08-28 from SP, Sweden

- Assessment Report No. 4P04426 dated 2014-06-16 from SP, Sweden

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.