

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Fixed Water Based Local Application System**with type designation(s)
Fine-Fog TM

Issued to

Desmi Pumping Technology (Suzhou)Co.,Ltd
Suzhou, China

is found to comply with

DNV GL rules for classification – Ships**DNV GL offshore standards****DNV GL statutory interpretations DNVGL-SI-0364 – SOLAS interpretations****Application :****Approved for use as a fixed water based local application system for machinery spaces of category A.****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**Issued at **Høvik** on **2018-08-31**for **DNV GL**This Certificate is valid until **2023-08-30**.DNV GL local station: **Shanghai**Approval Engineer: **Aleksandr Jegorov****Mårten Schei-Nilsson**
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.



Product description

"Fine-Fog TM" is a water mist system, composed of spray heads, steel piping, manual or automatic section valves, test valves, control panel and water supply pump(s).

The system is to be designed according to principal requirements for the system, IMO MSC.1/Circ.1387 and SOLAS Reg.II-2/10.5.6.

Only the spray heads are type approved by this certificate. Pumps, pipes, valves, couplings and other systems components are subject to case by case approval.

The M5 spray heads are manufactured by GW-Sprinkler AS, Glamsbjerg, Denmark.

Application/Limitation

The spray heads are to be installed above the protected objects according to the following specifications:

For heights between 0.5 and 8.0 m	
Maximum horizontal spacing:	3.0 m
Approved height above protected object	0.5 m to 8.0 m
Minimum pressure at spray head:	4.0 bar (at spray heads)
Spray head type:	M5
Spray heads are to be installed out to a position being at the periphery of the protected object (see IMO MSC.1/Circ.1387, annex 3.4.2.2). The spray heads are to be installed in a pendant (downward) position. Single spray heads or single rows are accepted when half spacing is used.	

For heights between 8.0 and 14.5 m	
Maximum horizontal spacing:	3.0 m
Approved height above protected object	8.0 m to 14.5 m
Minimum pressure at spray head:	9.0 bar (at spray heads)
Spray head type:	M5
Spray heads are to be installed out to a position being at the periphery of the protected object (see IMO MSC.1/Circ.1387, annex 3.4.2.2). The spray heads are to be installed in a pendant (downward) position. Single spray heads or single rows are accepted when half spacing is used.	

Spray head information

Spray head	k-factor ($Q = k \times p^{1/2}$)	Flow	Drawings
GW M5	5.0 lpm/bar ^{1/2}	10 lpm at 4 bar 15 lpm at 9 bar	140191, rev. B, January 2004 140190, rev. C, April 2003 140243, rev. B, June 2003
Spray heads are to be made of naval brass. Maximum operating pressure is 16 bar.			

For all systems:

- The pump(s) or the pump unit is to be delivered with a DNV GL product certificate. Other system components are to be inspected in accordance with the DNV GL Rules.
- Turbo machinery equipment, air intakes and preferably also essential electrical equipment shall not be directly exposed to the water discharge. Electrical equipment as per DNV GL Rules (Pt.4 Ch.8 Sec.10, Table 1) shall be applied for newbuildings.
- Ambient room temperature for pump unit and section valves should be 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 spray heads, sections valves, release stations and pump-unit (including water supply)
- ii. Documentation of power supply and control system
- iii. Specification of pipes, electrical motor, valves, pumps and associated components
- iv. Pressure drop calculations and water mist capacity calculations
- v. Arrangement of interface to fire detection and alarm system (where applicable)
- vi. Manual with design, installation, operation, test and maintenance instructions

Installation testing:

- At least one section should be tested with full flow through the spray heads
- Test of manual and remote release of all section valves and start of pumps
- Testing of alarms (SOLAS Reg.II-2/10.5.6.4)
- Testing of automatic start of system (in case of unattended machinery spaces)
- System to be cleaned in accordance with routines outlined in makers installation manual
- Testing of automatic release of system (in case of unattended machinery spaces)
- Other tests as required by DNV GL Rules (pressure testing of piping, etc.) and according to maker's manual shall be carried out

Periodical testing:

- Periodical control and inspection to be in accordance with type approval manual

Type Approval documentation

Certification in accordance with Class Programme DNVGL-CP-0338, October 2017.

Test reports: No. NBL10 F01121 dated 05 September 2001 and No. NBL10 F01135 dated 27 September 2001, both from SINTEF NBL, Trondheim, Norway.

Drawings from GW Sprinkler:

140191 rev. B (Assembly watermist M5), 140190 rev. C (Deflector for M5 nozzle) and 140243 rev. B (Watermist M5 nozzle).

Component testing of water mist nozzles: FM Project ID. 3009895, January 2002.

Desmi type approval documentation dated 12 and 15 March 2010.

Authorization letter from Angus Fire dated 28 April 2010.

Tests carried out

The system is tested according to IMO MSC/Circ. 913 and in compliance with IMO MSC/Circ.1387.

Marking of product

The spray head is to be marked with manufacturer name and type designation, whereas pump / control unit is to be marked with name of manufacturer.

Periodical assessment

DNV GL's surveyor is to be given permission to perform Periodical Assessments at any time during the validity of this certificate and at least every second year. The arrangement is to be in accordance with procedure described in Class Programme DNVGL-CP-0338, Section 4.