

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Fixed Water Based Local Application System**with type designation(s)
MICRO FOG "YMS-P1"

Issued to

Yamato Protec Corporation
Tokyo, Japan

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 fire-extinguishing 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 **Hamburg** on **2020-01-28**This Certificate is valid until **2025-01-27**.for **DNV GL**DNV GL local station: **Kobe**Approval Engineer: **Andrii Pishchanskyi**

Olaf Drews
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

MICRO FOG "YMS-P1"

is a water spray system composed of spray heads, stainless steel piping, manual and automatic section valves strainers, electrical motors and high pressure pump(s).

The system is to be designed according to principal requirements for the system, IMO MSC.1/Circ.1387 and SOLAS Ch.II-2, Reg.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 spray heads are produced by Yamato Protec Corporation Osaka Factory.

Application/Limitation

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

Spray head type YMH-30D-J8CS-H (for low levels)	
Maximum horizontal spacing:	4.0 m
Approved height above protected object	1.3 m – 2.5 m
Minimum pressure at spray head:	60 bar
Spray head type:	YMH-30D-J8CS-H
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 type YMH-28B-J8BS-H (for high levels)	
Maximum horizontal spacing:	4.0 m
Approved height above protected object	2.5 m – 13.0 m
Minimum pressure at spray head:	60 bar
Spray head type:	YMH-28B-J8BS-H
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 [lpm/bar ^{1/2}]	Flow [lpm]	Drawing no.
YMH-30D-J8CS-H	2.78	21.5 at 60 bar	Y0816
YMH-28B-J8BS-H	2.81	21.8 at 60 bar	Y0815
Spray heads are to be made of stainless steel. Max. operating pressure is 100 bar			

Alternative – inclined nozzles:

A system with nozzle type Yamato YMH-28B-J8BS-H in a 4 nozzle grid of 3.2 m by 6.0 m with nozzles inclined 50 degree towards tested object has also passed the tests. Tested height was minimum 2.5 m, maximum 5.0 m, while minimum pressure was 60 bar. The horizontal projected distance from nozzle to protected object shall be minimum 1.0 m in the direction of the inclination. This test is not defined by IMO MSC/Circ. 913 (only pendant nozzle to be used). These results will only be subject to case by case considerations.

For all systems:

- The pump(s) or the pump unit is to be delivered with a DNVGL Product Certificate. Other system components are to be inspected in accordance with the DNVGL Rules.
- Only stainless steel piping is to be applied (to avoid clogging of spray heads).
- Turbo machinery should also be covered by the system but with gentle application of water. Essential electrical equipment and air intakes should preferably not be directly exposed to the

water discharge. Electrical equipment as per DNVGL Rules (Pt.4, Ch.8, Sec.10, Table 1) shall be applied for newbuildings.

- D. Pipes, couplings and other components are regarded as "Class I" piping.
- E. Ambient room temperature for pump unit 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 nozzles, sections, release stations and pump-unit, water supply, including any heating facilities for pump-unit room.
- ii. Specification of pipes, electrical motor, pumps, valves and associated components.
- iii. Pressure calculations and mist capacity calculations.
- iv. Arrangement of power supply and control system.
- v. Arrangement of interface to fire detection and alarm system (if applicable).
- vi. Manual containing installation, operation and maintenance instructions.

Other documents:

- Documentation for other components (as per EN10204 or equivalent), including qualification of welders and approval of welding procedures (if applicable) is to be submitted to the Flag Administration/Recognized Organization in question.

Installation testing:

- A 30 seconds water mist discharge is to be carried out for at least one section.
- Test of manual and remote release of all section valves and start of pumps.
- Testing of alarms (SOLAS Ch. II-2, Reg.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.
- Other tests as required by DNV Rules (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.
- At least one section should each year be tested with full flow through the spray heads (different sections).

Type Approval documentation

- a. Full scale tests with engine running report No. 02-068(E) dated 2002-06-10.
- b. No. 01-086(E) dated 2001-06-19;
- c. No. 01-153(E) dated 2001-08-10;
- d. No. 01-195(E) dated 2001-08-10;
- e. No. 01-518(E) dated 2002-03-31;

Tests carried out

Fire performance is tested according to IMO MSC/Circ.913 and component tests are according to relevant parts of IMO MSC/Circ.668 as amended by IMO MSC/Circ. 728.

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.