

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Fixed Water Based Local Application System

with type designation(s)

Hyper - LP

Issued to

Kashiwa Co., Ltd., Tsukuba Works
Bando Ibaraki Pref., Japan

is found to comply with

DNV GL statutory interpretations DNVGL-SI-0364 – SOLAS interpretations

DNV GL offshore standards

DNV GL rules for classification – Ships

Application :

Approved for use as a fixed water based local application system for machinery spaces of category A

Product approved by this certificate is accepted for installation on all vessels classed by DNV GL.

This Certificate is valid until **2021-12-31**.

Issued at **Høvik** on **2017-01-10**

for **DNV GL**

DNV GL local station: **Yokohama**

Approval Engineer: **Tomasz Werchowicz**

Petter Langnes
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

"Kashiwa Hyper – LP",
is a water spray system, composed of WN3 spray heads, steel piping, manual or automatic section valves, test valves, control system 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 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 Kashiwa, Tsukuba Works at Ibaraki, Japan.

Application/Limitation

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

For heights between 1.5 to 3.0 m	
Maximum horizontal spacing:	3.0 m
Approved height above protected object	1.5 m – 3.0 m
Minimum pressure at spray head:	8.0 bar
Spray head type:	WN3
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 0.5 to 1.5 m and between 3.0 to 14.0 m	
Maximum horizontal spacing:	3.0 m
Approved height above protected object	0.5 m to 1.5 m 3.0 m to 14.0 m
Minimum pressure at spray head:	8.0 bar
Spray head type:	WN3
Spray heads are to be installed out to a position being minimum 0.75 m outside 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.	

Alternative: inclined spray heads	
A system with an 8 spray head configuration (two rows) with spray heads in angled position towards a test area measuring 3.0 m by 3.0 m has also passed the tests. The following specifications are defined:	
Minimum height above protected object:	3.0 m
Maximum height above protected object:	8.0 m
Horizontal distance between rows:	9.0 m (spray head to spray head)
Horizontal distance to protected object:	3.0 m (spray head to engine, each side)
Maximum spacing between spray heads:	3.0 m (along row), except: 1.5 m for last spray head on each row
Spray head type:	WN3
Minimum pressure:	8.0 bar (at spray heads)
The number of spray heads per row shall be determined according to length of protected object and spacing between spray heads. Further, the outmost spray heads on each row shall extend 1.5 m (half-spacing) outside the edge of the object.	
This test is not finally defined by IMO MSC/Circ. 1387, (pending final approval). These results will thus only be subject to case by case considerations.	

Job Id:
Certificate No: **TAF00000J0**

Spray head information

Spray head	k-factor ($Q = k \times p^{1/2}$)	Rated flow	Drawing no.
WN3	5.73 lpm/bar ^{1/2}	16.2 lpm at 8 bar	KAN-6702 (October 2003)
Spray heads are to be made of stainless steel. Maximum operating pressure is 16 bar.			

For all systems:

1. 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
2. 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 B1) shall be applied for newbuildings
3. 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:

- System arrangement plans including location of nozzles, sections, release stations and pump-unit, water supply, including any heating facilities for pumpunit room
- Documentation of power supply and control system
- Specification of pipes, electrical motor, valves, pumps and associated components
- Pressure drop calculations and water mist capacity calculations
- Arrangement of interface to fire detection and alarm system (if applicable)
- 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 Ch. II-2, Reg.10.5.6.4)
- Testing of automatic start of system (in case of unattended machinery spaces)
- Pressure testing of water pipe system to at least 1.5 times maximum working pressure
- 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 makers test manual

Type Approval documentation

Tests carried out

Tested according to IMO Circ. IMO MSC/Circ.913 and in compliance with IMO MSC/Circ.1387.

Marking of product

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

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 Standard for certification No. 1.2 Type Approval Item 4.