

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Equivalent Sprinkler System

with type designation(s)
KJ FireOff OHM nozzles

Issued to

Knaack & Jahn Schiffbau GmbH
HAMBURG, Germany

is found to comply with

DNV GL rules for classification – Ships

DNV GL rules for classification – High speed and light craft

DNV GL rules for classification – Yachts

DNV GL rules for classification – Naval vessels

DNV GL offshore standards

Application :

Approved for use as an automatic sprinkler, fire detection and fire alarm system for protection of control stations, accommodation and service spaces, including corridors and stairways.

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

This Certificate is valid until **2022-01-17**.

Issued at **Hamburg** on **2017-01-18**

DNV GL local station: **Hamburg**

for **DNV GL**

Approval Engineer: **Michael Kämpf**

Antje Fleischhauer
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.

Job Id:
Certificate No: **TAF00000JU**

Product description

The system with "KJ FireOff OHM nozzles" is an automatic, fast response, low-pressure water mist sprinkler system of wet pipe type. The system is composed of sprinkler heads, stainless steel piping, section valves incl. flow switches, pump unit, pressure tank and alarm panel.

The system is to be designed according to the principal requirements of IMO Res. A.800(19), as amended by IMO Res. MSC.265(84).

Only the sprinkler heads are type approved by this certificate.

Pipes, couplings, valves and other system components are subject to case by case approval.

The spray heads are manufactured by VID Fire-Kill ApS, Svendborg, Denmark.

Application/Limitation

Installation should be in accordance with the tables below:

Application	Sprinkler type	Spacing [m]	Distance to wall [m]
Public space (h < 2.5 m)	OHM-L1	4.0	2.0
Public space (h < 5 m) ¹⁾	OHM-L2	4.0	2.0
Cabins	OHM-SWC	Centered in front wall	0.12
Corridors ²⁾	OHM- CO	3.0	0.75
Storage areas	OHM-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.

Sprinkler head	k-factor [lpm/bar ^{1/2}]	Pressure [bar]	Min. flow [lpm]	Dwg. no.
OHM-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,
OHM-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
OHM-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
OHM- 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
OHM-PX1	23.0	9.0	69.0	80930-596D, 101116-852A rev. A, 80717-570A rev. A, 81021-607A rev. A

All sprinkler heads are made of brass.
Maximum system working pressure is 16 bar.

For all applications:

- A. All sprinklers are to be installed in the ceiling in a pendant (downward) position, except model OHM-SWC which has to be located centered in front wall.

- B. All sprinkler heads are fitted with glass bulb of type Job F2, with nominal releases temperature of 57°C (orange), 68°C (red), 79°C (yellow), 93°C (green). Bulbs with higher temperature ratings, but not more than 30° C above the maximum deckhead temperature, may be used in galleys, laundries or alike.
- C. Redundant pump arrangement is subject to approval in each case.
- D. The pump unit and pressure tank are to be delivered with DNVGL product certificate. Other system components are to be certified or inspected in accordance with DNVGL Rules.
- E. The pump unit and pressure tank shall be installed in a room having ambient temperature between +4 °C and +45 °C.
- F. Only stainless steel piping or piping of equivalent corrosion resistant material is to be applied and a system filter shall be provided for each pump unit (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.

The following items are to be submitted for approval for each project:

- System arrangement plans including location of sprinklers, pipes, section valves, control system and pump-unit.
- Specification of pipes, valves, electrical motors, pumps, pressurised tank(s) and associated components (including water supply specifications).
- Pressure drop calculations and water mist capacity calculations.
- Arrangement of power supply and control system.
- Manual containing design, installation, operation and maintenance instructions.

Installation:

- System is to be cleaned in accordance with routines outlined in the maker's system manual.
- Only water complying with maker's specification shall be used in the system. This includes testing and flushing operations.

Installation testing:

- Water to be sampled from the sprinkler tank, the pump unit and from a representative number of sections and be assessed against the manufacturer's water quality guidelines.
- Not less than 10 sprinkler heads from at least 5 different sections shall be tested. Further testing will be required in case of failures.
- Testing of automatic start and stop of pumps, automatic change over from main to emergency electric supply and other tests to be carried out as required by DNVGL Rules (pressure testing of piping, etc.) and according to maker's manual.

Periodical testing:

- The periodical testing shall comply with instructions from flag administration, DNVGL Statutory Interpretations and maker's maintenance manual. Reference is also made to DNVGL-CG-0058.
- Water to be sampled annually from sprinkler tank, pump unit and from a representative number of sections and be assessed against the manufacturer's water quality guidelines.
- Testing of sprinkler heads in accordance with the procedure stated in MSC.1/Circ.1516.

Type Approval documentation

Certification in accordance with Standard for Certification No. 1.2, Type Approval, April 2009.

Initial survey report dated 17 June 2012 from DNV Fredericia.

Fire Performance Test Reports:

- Danish Fire Laboratories No. 91210-40, dated 15 December 2009
- Danish Fire Laboratories No.100413-42, dated 15 April 2010
- Danish Fire Laboratories No.100809-44, dated 13 August 2010

Component testing of water mist spray heads:

- Danish Fire Laboratories No. 110415-5, dated 15 April 2011

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Drawings 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.

System design and installation manual submitted by VID Fire-Kill ApS.

DNV TAC F-20195 dated 2012-07-16
GL TAC 3729312 HH dated 2012-03-05

Tests carried out

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

Marking of product

The spray heads are to be marked with the name of manufacturer and type designation whereas the pump/control units are to be marked with the name of manufacturer.

Periodical assessment

The DNVGL'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 the procedure described in the Class Programme DNVGL-CP-0338, Section 4.