

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Fixed Water Based Local Application System**with type designation(s)
KJ FireOff MK-6 LA

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 a fixed water-based local application fire-extinguishing system for category A machinery spaces.****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**This Certificate is valid until **2022-01-15**.Issued at **Hamburg** on **2017-01-16**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.

Product description

"KJ FireOff MK-6 LA" is a water mist system using fresh water which is composed of spray heads, stainless steel piping, manual or automatic section valves, control panel and pump unit.

The system is to be designed according to the principal requirements of 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, couplings and other system components are subject to case by case approval.

The MK-6 spray heads are manufactured by VID Fire-Kill ApS, Svendborg, Denmark.

Application/Limitation

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

Spray head type MK-6	
Maximum horizontal spacing	1.5 m
Approved height above protected object	0.75 - 11.0 m
Minimum pressure at spray head	12.5 bar
The spray heads are to be installed in a pendant (downward) position. The outer nozzles are to be installed with a min. lateral distance of 0.375 m from the protected object (MSC.1/Circ.1387, appendix, 3.4.2.1). Single spray heads or single rows are accepted if the max. horizontal spacing does not exceed 0.75 m (half spacing) and width/length of the protected object do not exceed 0.75 m (MSC.1/Circ.1387, appendix, 3.4.2.4).	

Spray head information

Spray head	k-factor ($Q = k \times p^{1/2}$)	Flow	Drawings
MK-6	5.6 lpm/bar ^{1/2}	19.8 lpm (at 12.5 bar)	100714-836, appendix E
Spray heads are made of naval brass or stainless steel AISI316, incl. NiSn coating. Maximum operating pressure is 16 bar.			

For all systems:

1. 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.
2. Turbo machinery equipment, air intakes and essential electrical equipment shall preferably not be directly exposed to the water discharge. For equipment enclosure and ingress protection of electrical equipment for newbuildings, see DNVGL Rules Pt.4 Ch.8 Sec.10 Table 1.
3. 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:

- System arrangement plans including location of nozzles, section valves, release stations, pump unit and water supply, including any heating facilities for the pump unit room, if any
- Documentation of power supply and control system
- Specification of pipes, valves, pumps, electrical motors, 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, operating 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 pump unit
- Testing of automatic release of system (in case of unattended machinery spaces)

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- Testing of alarms (SOLAS Ch. II-2, Reg.10.5.6.4)
- Other tests as required by DNVGL Rules (pressure testing of piping, etc.) and according to maker's manual shall be carried out
- Upon completion of all testing, the system is to be cleaned in accordance with routines outlined in the maker's system manual and be reset into the normal operational condition

Periodical testing:

- The periodical testing shall comply with instructions from flag administration, DNVGL Statutory Interpretations and maker's system manual. Reference is also made to DNVGL-CG-0058.

Type Approval documentation

Certification in accordance with Certification Note 1.2, Type Approval, April 2009.

Initial Type Approval Survey Report, June 2012, issued by DNV Fredericia.

Fire Test Report No. 100623-43 dated 15 September 2010 from Danish Fire Laboratories.

Fire-Kill ApS component Test Report No. 110414-2 dated 24 August 2011 and No. 110415-5 dated 15 April 2011, each from Danish Fire Laboratories.

Design, Installation and Maintenance Manual No. 120716-01-01 from VID Fire-Kill ApS.

DNV TAC F-20196 dated 2012-07-16
GL TAC 3729512 HH dated 2012-03-05

Tests carried out

The system is tested according to IMO MSC/Circ.1387.

Marking of product

The spray heads are to be marked with the name of manufacturer and the 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.