Lloyd's Register

CERTIFICATE OF FIRE APPROVAL

This is to certify that

The product detailed below will be accepted for compliance with the applicable Lloyd's Register Rules and Regulations and with the International Convention for the Safety of Life at Sea, (SOLAS), 1974, as amended, for use on ships and offshore installations classed with Lloyd's Register, and for use on ships and offshore installations when authorised by contracting governments to issue the relevant certificates, licences, permits etc.

Manufacturer	VID Fire-Kill ApS
Address	Svalbardvej 13 DK-5700 Svendborg Denmark
Type	**PRESSURE WATER-SPRAYING SYSTEM**
Description	Fixed Fire Extinguishing System Component – Type: "Atlantic" Nozzle head for Machinery Spaces of Category A and Cargo Pump Rooms with a deckhead height not exceeding 10 metres and maximum enclosure volume of 2862m3, equivalent to SOLAS II-2/10.4 & FSS Code, Chapter 7-2-2 (limited to nozzle head and their performance)
Specified Standard	IMO MSC/Circ. 1165 as amended by MSC.1/Circ. 1269 and MSC.1/Circ. 1386

The attached Design Appraisal Document forms part of this certificate.
This certificate remains valid unless cancelled or revoked, provided the conditions in the attached Design Appraisal Document are complied with and the equipment remains satisfactory in service.

Date of issue	7 June 2017	Expiry date	10 October 2021
Certificate No.	SAS F170001/M1	Signed	
Sheet No	1 of 5	Name	S. Abraham Surveyor to Lloyd's Register EMEA A Member of the Lloyd's Register Group

Note:

This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Lloyd's Register of any modification or changes to the equipment in order to obtain a valid Certificate.

Lloyd's Register EMEA
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Document number
SAS F170001/M1

Issue number
1

DESIGN APPRAISAL DOCUMENT

Date	Quote this reference on all future communications
7 June 2017	SOUTSO/SFS/TA/FF/SA/WP26693236

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. SAS F170001/M1

This Design Appraisal Document forms part of the Certificate.

APPROVAL DOCUMENTATION

DFL (Danish Fire Laboratories/Svendborg Denmark) Test Reports: 110630-55-2, dated 18 August 2011; 110414-2 dated 24 August 2011.

CONDITIONS OF CERTIFICATION

1. The system has been designed in accordance with IMO MSC/Circ. 1165, "Revised Guidelines for the Approval of Equivalent Water-Based Fire-Extinguishing Systems for Machinery Spaces and Cargo Pump Rooms" as amended by MSC.1/Circ. 1269 and MSC.1/Circ.1386
2. For use in Machinery Spaces of Category A and Cargo Pump Rooms with a ceiling (deckhead) height not exceeding 10 metres and a maximum floor area of 286 m2
3. Arrangement drawings detailing the means of redundancy, the water supply arrangements and components, including their location and calculations are to be submitted for acceptance in each case where it is proposed to install this system. Control panel schematics are also to be submitted. All principle components of the system are to be identified and their location indicated
4. The utilisation of the type of spray nozzles identified in the above test reports is restricted in their application to the as-tested arrangements
    - The use of overhead nozzles 'Atlantic' are restricted to a maximum deck height of 10m with one layer of nozzles at a spacing of 3.0m and to a maximum enclosure volume of 2862m^3. No approval is given to any bilge nozzle arrangement in this certificate
5. The capacity and arrangement of the spray nozzles is to be as denoted in Table 1-1 for Passenger Ships, Cargo Ships, Yachts, High Speed Craft and Tankers **OR** when the system is provided on board Lloyd's Register Classed Inland Waterways Passenger Ships, the capacity and arrangements of the nozzles shall be specially considered in the design stages in all cases
6. A separately approved type of bilge area protection system shall be fitted for all spaces with bilges. Any bilge area protection system installed in conjunction with this system is outside of the scope of this Fire Approval Certificate and must have a currently valid LR Type Approval Certificate
7. Production items are to be manufactured in accordance with a quality control system which shall be maintained to ensure that items are of the same standard as the approved prototype

NOZZLE INSTALLATION REQUIREMENTS

Table 1-1 Recommended Nozzle Arrangements for Passenger Ships, High Speed Craft, Cargo Ships, Yachts and Tankers for Machinery Spaces of Category A and Cargo Pump Rooms.

GENERAL NOTES

1. The water distribution grid(s) shall be so arranged that the 'Atlantic' nozzles are evenly distributed throughout the protected space

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	Ceiling Nozzle
Nozzle Designation	Atlantic
Maximum Installation Height (m)	9.90
Maxiumum Machinery Room Volume Tested (m3)	2862
Min. Operating Pressure (bar)	9.00
Maximum Horizontal Spacing between Nozzles (m)	3.0 x 3.0
Max. Distance from Bulkhead (m)	1.50
k Factor ($l/min.bar^{-½}$)	5.60
Flow at 9.0 bar (l/min)	16.80
Nozzle Position	Vertically Downward
Min. Volumetric Flux Density over the total volume ($l/min/m^3$	0.147
Foam concentrate	None

2. The net volume of a protected space is that part of the gross volume of the space which is accessible to the free extinguishing water mist. When calculating the net volume of a protected space, the net volume should include the volume of the bilge, the volume of the casing and the volume of free air contained in air receivers that in the event of a fire is released into the protected space. The objects that should be subtracted from the gross volume of the space include but are not necessarily limited to; -auxiliary machinery; boilers; condensers; evaporators; main engines; reduction gears; tanks; and trunks
3. The pressure of water discharge at the nozzles shall be not less than 9.0 bar throughout the space
4. The system is to be available for immediate use and capable of continuously supplying water for at least 30 minutes
5. The mechanical ventilation of the protected space(s) must be stopped simultaneously with the activation of the Water Mist system
6. Piping and water tank (where applicable) material shall be made of stainless steel having a minimum grade of AISI 304L
7. The as tested nozzle is made in NiSn plated naval brass. Each individual water spray nozzle shall be fitted with a mesh strainer (mesh size No. 16, 1200µm)
8. The pump unit shall have on the pressure side a mess strainer (mesh size No. 50, 300µm)
9. The system main pump unit and water tank shall not be situated in a Machinery Space of Category 'A' or in any space required to be protected by the water spray system
10. The electrical components of the pressure source for the system should have a minimum rating of IP 54. The system shall be supplied by both main and emergency sources of power and should be provided with an automatic change-over switch. The emergency power supply should be provided from outside the protected machinery space
11. The system shall be provided with a redundant means of pumping. The capacity of the redundant means shall be sufficient to compensate for the loss of any single supply pump. Failure of any one component in the power and control system should not result in a reduction of required pump capacity. Primary pump starting equipment may be manual or automatic. Switch over to redundant means of pumping may be manual or automatic. The system should be fitted with a permanent sea inlet and be capable of continuous operation using seawater

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12. The controls mentioned in paragraph 11 above, shall not be situated in a Machinery Space of Category 'A' or in any space required to be protected by the water spray system and should not be liable to be cut off by a fire in the protected spaces
13. Activation of any water distribution valve (e.g. section valve) should give a visual and audible alarm in the protected space and at a continuously manned central control station. An alarm in the central control station should indicate the specific valve activated
14. The number of spare water mist nozzles which are to be specified for each application is to be in accordance with manufacturer's recommendations and should be no less than shown in Table 1-2

Table 1-2 - Required Number of Spare Nozzles for each type used in system

Number of Installed Nozzles	Spare Nozzles Required
< 100	1
100 to 200	2
200 to 300	3

15. The use of Local/Point Protection Systems within Machinery Spaces of Category 'A' or Cargo Pump Rooms will be specially considered at the design stage
16. Valves and fittings in pressure piping exceeding 7 bar and all pumps are to be constructed under survey
17. The pumps and any independent power units are to be constructed under survey. Additionally, the system pipe work including; flexible hoses, pipes, valves and fittings are to be Lloyd's Register Approved, in accordance with Lloyd's Register Rules, Part 5, Chapter 12
18. Any fire detection and alarm system installed in conjunction with this system is outside of the scope of this Fire Approval Certificate and must be separately approved by Lloyd's Register
19. Construction details and constituent component of the system as well as hydraulic flow calculations are to be submitted for acceptance in each case where it is proposed to install this system. Control panel schematics and if applicable also details of any PLC (Programmable Logic Controller) are to be submitted. All principle components of the system are to be identified with their location in relation to the protected space(s)
20. On completion of the installation final acceptance of the system is dependent on satisfactory survey and testing in accordance with the manufacturer's Design, Installation, Operation and Maintenance Instructions
21. The overhead/ceiling nozzle"KJ FireOff Mk-6" was tested at a maximum deck height of 10 m with one layer of nozzles at a spacing of 3.0m and to a maximum enclosure volume of 2862 m3. Scaling from the maximum tested volume to a larger volume may be considered for individual projects, based on the guidance in MSC1/Circ. 1385 'Scientific Methods of Scaling of Test Volume for Fire Test on Water-Mist Fire Extinguishing Systems'. Using linear regression of the scaling factor for the average time to extinguishment for the three fires with the longest extinguishing times (tests 1 to 8), a scaling factor of up to 1.76 may be applied for a net volume of up to 5036m3 with this nozzle, subject to approval by the final Project Authority in all cases

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PLACE OF PRODUCTION

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Denmark

Saji Abraham
Senior Specialist
Statutory Fire & Safety
Southampton Technical Support Office, Marine & Offshore
Lloyd's Register EMEA

Supplementary Type Approval Terms and Conditions

This certificate and Design Appraisal Document relates to type approval, it certifies that the prototype(s) of the product(s) referred to herein has/have been found to meet the applicable design criteria for the use specified herein, it does not mean or imply approval for any other use, nor approval of any products designed or manufactured otherwise than in strict conformity with the said prototype(s).