



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	Autronica Fire and Security AS
Address	Stalsbergveien 9 3128 Nøtterøy Norway
Type	FIXED LOCAL APPLICATION FIRE-FIGHTING SYSTEM
Description	Fixed Local Application Fire Extinguishing System - Type: "FlexiFOG® Lo-Flow - Nozzle M5 or K5"
Specified Standard	IMO MSC/Circular 913, as amended by MSC.1/Circ.1387

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 February 2017	Expiry date	7 February 2022
Certificate No.	SAS F160320	Signed	 <small>Lloyd's Register EMEA</small>
Sheet No	1 of 4	Name	B. Geary 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 Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.



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DESIGN APPRAISAL DOCUMENT

Date 1 November 2016	Quote this reference on all future communications SOUTSO/SFS/BG/WP27302384
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ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. SAS F160320

This Design Appraisal Document forms part of the Certificate.

APPROVAL DOCUMENTATION

SINTEF Energy, Norwegian Fire Research Laboratory, Norway, Fire Test Report Nos. NBL 10 F01121 dated 5 September 2001 and NBL F01135 dated 27 September 2001.

Factory Mutual Research corporation, USA, Test Report No. 3013524 dated 25 February 2002.

Heien Larssen 'Technical Data' design manuals Ref: 901020, 901022 and 901057, dated 27 April 2004, 27 April 2004 and 26 March 2004 respectively.

CONDITIONS OF CERTIFICATION

1. The system has been designed in accordance with IMO MSC/Circ. 913, Annex, "Principle Requirements for the System" and the onboard installation arrangements are to be in accordance with the revised guidelines given in IMO MSC.1/Circ.1387
2. Arrangement drawings 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 with their location in relation to the protected space(s) indicated.
3. For use in **Machinery Spaces of Category A of volume greater than 500m³ for the protection of local hazards**. The capacity and arrangement of the spray nozzles is to be as denoted in the following:
 - 3.1 Table 3-1 for Passenger Ships, Cargo Ships, Yachts, High Speed Craft and Tankers **OR**:
 - 3.2 When the system is provided on board LR Classed Inland Waterways Passenger Ships, the capacity and arrangement of the nozzles shall be specially considered in the design stages in all cases

Table 3-1 Recommended Nozzle Arrangements for Passenger Ships, Cargo Ships, Yachts, High Speed Crafts and Tankers

Nozzle Designation	Nozzle Pressure (bar)	Max. Distance from Hazard	Min. Distance from Hazard	Spacing	Lateral Distance from Hazard ⁽¹⁾
		M	M	M	M
M5/K5	3.9	8.0	0.5	3.0	-
M5/K5	9.1	14.5	8.0	3.0	-

⁽¹⁾ The outer nozzles of grid may be located at the edge of the protected area or outside the protected area.

4. See GENERAL NOTES.



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GENERAL NOTES

1. The type approval is restricted to the arrangement of the nozzles only, approval of ancillary components is to be carried out at the design stage
2. For installations which may be protected using individual nozzles or a single row of nozzles the protected area (width and length) is to be in accordance with MSC.1/Circ.1387 for a 2 x 2 nozzle grid
3. The minimum nozzle pressure being 3.9 bar and 9.1 bar, see Table 2-1
4. The as tested nozzle has a bronze body. The nozzle characteristics are delineated below:

Table 2-1 Nozzle Characteristics

Nozzle Designation	K-factor L/min*bar ^{1/2}	Flow at 3.9 bar L/min	Flow at 9.1 bar L/min
M5/K5	5.0	9.87	15.08

5. The system main pump unit, water tank and sea connection shall not be situated in any area required to be protected by the system
6. 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
7. The number of spare watermist nozzles and parts for the system being provided as indicated in the manufacturer's design, installation, operation and maintenance manual
8. The use of subject system in conjunction with or as part of a water based main fire extinguishing system (MSC/Circ. 668, as amended by MSC/Circ. 728 or MSC/Circ. 1165 as amended by MSC.1/Circs. 1269 & 1386) is acceptable and will be specially considered at the design stage provided the local protection system is capable of being isolated from the main system
9. To ensure that the system is capable of 20 minutes operation the system is to incorporate a sea water inlet via remotely operated valve, allowing for automatic change-over upon loss of fresh water unless alternative arrangements are agreed at the design stage. These connections are to be located in the same compartment as the pump unit and in a readily accessible position
10. Any fire detection and alarm system installed in conjunction with this system is outside the scope of this Fire Approval Certificate and must be a Lloyd's Register approved type
11. 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 manual
12. Nozzles are to be installed in the vertically downwards position
13. In the case of Periodically Unattended Machinery Spaces, the local application fire fighting system shall have both automatic and manual release capabilities in accordance with revised SOLAS II-2, Regulation 10.5.6.2. The automatic activation arrangements are in each case to be approved by Lloyd's Register at the design stage
14. The system pipe work including: flexible hoses, pipes, valves and fittings are to be LR approved, in accordance with Lloyd's Register Rules, Part 5, Chapter 12



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Register

Lloyd's Register EMEA

71 Fenchurch Street, London, EC3M 4BS

Telephone 020 7423 2416 Fax 020 7423 2053

Email med@lr.org

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PLACE OF PRODUCTION

Autronica Fire and Security AS
Stalsbergveien 9,
3128 Nøtterøy
Norway



Ben Geary
Technical Manager
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).