

EC TYPE EXAMINATION (MODULE B) CERTIFICATE

This is to certify that :

LLOYD'S REGISTER VERIFICATION LIMITED (LRV), specified as a "notified body" under the terms of The Merchant Shipping (Marine Equipment) Regulations S.I. 1999 No. 1957, did undertake the relevant type approval procedures for the equipment identified below which was found to be in compliance with the essential Fire protection requirements of Marine Equipment Directive (MED) 96/98/EC as modified by Commission Directives 98/85/EC, 2001/53/EC, 2002/75/EC and 2002/84/EC subject to any conditions in the Design Appraisal Document attached hereto.

Manufacturer	Catef s.r.l
Address	Via Dei Lecci, 145 Viareggio, 55049 Italy
Annex A1 Item	A.1/3.45 - EQUIVALENT FIXED GAS FIRE EXTINGUISHING SYSTEMS COMPONENTS FOR MACHINERY SPACES AND CARGO PUMP ROOMS
Product Type	FIXED GAS FIRE EXTINGUISHING SYSTEM
Product Description	Fixed Fire Extinguishing System - Type: "FM-200 Marine MFE Series Engineered Fire Suppression System" for Machinery Spaces of Category A and Cargo Pump Rooms equivalent to Fire Extinguishing Systems Required by SOLAS 1974 as amended Chapter II-2/10.5 and 10.9
Specified Standard	IMO MSC/Circ. 848

The attached Design Appraisal Document (schedule) forms part of this certificate.

This certificate remains valid unless cancelled or revoked, provided the conditions in the attached schedule are complied with and the equipment remains satisfactory in service.

Date of issue	11 January 2007	Expiry date	10 January 2012
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Certificate No.	MED 0750032
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Signed	
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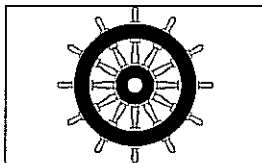
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Name	M. Farrier
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For and on behalf of Lloyd's Register Verification
LRV EC Distinguishing No. 0038

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 the notified body named on this certificate of any modification or changes to the equipment in order to obtain a valid Certificate.



0038/yy

Subject to compliance with the conditions in the attached Design Appraisal Document (schedule), which forms part of this certificate, and those of Articles 10.1(i) and 11 of the Directive, the Manufacturer is allowed to affix the "Mark of Conformity" to the Product described herein.

yy Last two digits of year mark affixed.

This certificate is issued under the authority of the MCA.

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Registration number 4929226.
Registered office 71 Fenchurch Street, London EC3M 4BS, England

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Document number	MED 0750032
Issue number	1

DESIGN APPRAISAL DOCUMENT

Date	11 January 2007	Quote this reference on all future communications	LDSS/PAS/FITA/MF/PG
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ATTACHMENT TO EC TYPE EXAMINATION (MODULE B) CERTIFICATE No.MED 0750032

The undernoted documents have been appraised for compliance with the relevant requirements of International Conventions and European Union legislation for the EC Type Examination of Marine Equipment for use on Merchant Ships Registered in the European Economic Area.

This Design Appraisal Document (schedule) forms part of the Certificate.

APPROVAL DOCUMENTATION

U.S. Coast Guard Research and Development Center, Connecticut, United States of America, Test Report No. CG-D-02-99, "An Evaluation of the International Maritime Organization's Gaseous Agents Test Protocol with Halocarbon Agents and an Inert Gas, 180° Nozzles, and Low Temperature Conditioned Cylinders", dated December 1998.
Catef Marine Fire: FM-200 Marine MFE Series Engineered Fire Suppression System, Design, Installation, Operation and Maintenance Manual Document P/N CTF FM200M-001, dated September 2006.
Lloyd's Register Audit Letter Ref: LDSS 1-APPUQ.

CONDITIONS OF CERTIFICATION

1. The National Authorities of the vessel concerned are to accept the use of FM200 as being acceptable for compliance with The International Code for Fire Safety Systems (Fire Safety Systems Code), Chapter 1, paragraph 4 and Chapter 5, paragraph 2.5 at the design stage. The manufacturers of the system are to advise, whoever they are contracted to, of this requirement at the earliest opportunity.
2. If the system is to be of the modular type, i.e. with the cylinders distributed within the machinery space, the National Authorities are to accept the arrangements with due reference to the Fire Safety Systems Code, Chapter 5, paragraph 2.1.1.4. and MSC/Circular 848, paragraph 11 of the Annex. (Reference is made to arrangements in accordance with Chapter II-2 of the SOLAS 2001 Consolidated Edition, Regulations 5.1, 5.3.1, 5.3.2 to 5.3.3, except where modified by the MSC/Circ.848 guidelines)
3. The computation of the discharge time for each application is to be produced by Kidde ECS Series FM-200 Flow Calculation Program and is to be independently verified at the design stage. The system should be designed so that 95% of the extinguishing agent can be discharged in 10 seconds.
4. The quantity of FM200 for the protected space is to be calculated at the minimum expected ambient temperature (which is to be no greater than zero degrees Celsius) with a minimum design concentration of 8.7%. The maximum concentration is not to exceed 10.5% (LOAEL Limit) at the maximum expected ambient temperature, (not less than 50 degrees Celsius). Other temperature ranges may be considered on a project by project basis, subject to agreement by the National Administration.
5. The design concentration is to be based on the net volume of the protected space, including the casing, the bilge and the volume of free air contained in air receivers that in the event of a fire is released into the protected space. All objects that occupy volume in the protected space should be subtracted from the gross volume of the space. They include, but are not necessarily limited to: auxiliary machinery, boilers, condensers, evaporators, main engines, reduction gears, tanks and trunks.
6. The discharge of FM200 is to be evenly distributed over the protected space and the nozzle spacing is not to exceed 5 metres for a 360 degree nozzle or 5 metres for a 180 degree nozzle or equivalent nozzle coverage arrangement. The maximum nozzle vertical spacing is not to be greater than 5 metres.

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7. The average minimum pressure at each nozzle is to be not less than 5.1 bar, at a maximum cylinder fill density of 1121 kg/m³, for nozzle types: 360 degrees (PART No. 90-19402X -XXX) and 180 degrees (PART No. 90-19401X-XXX). The drill sizes of each nozzle orifice and the quantity of agent to be discharged from each nozzle is to be determined by the software calculation program. Nozzles to be manufactured from ASTM B16 Brass.
8. The arrangements and parts used in the system are to be in accordance with the Catef Marine Fire - Design, Installation, Operation and Maintenance Manual Document P/N CTF FM200M-001, dated September 2006.
9. 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 and their location indicated.
10. Two separate controls shall be provided for releasing FM200 into a protected space and to ensure the activities of the audible and visual alarms. One control shall be used to discharge the gas from its storage containers. A second control shall be used for opening the valve of the piping which conveys the gas into the protected space. The two controls shall be located inside a release box clearly identified for the particular space. If the box containing the controls is to be locked, a key to the box shall be in a break-glass-type enclosure conspicuously located adjacent to the box.
11. The arrangement of containers, electrical circuits and piping essential for the release of the system are to be such that in the event of damage to any one power release line through fire or explosion in the protected space, at least five-sixths of the fire-extinguishing charge can still be discharged. The arrangement is to have regard to the requirement for uniform distribution of medium throughout the space. The arrangements in respect of systems for spaces requiring less than 6 containers will be assessed to National Administration requirements.
12. Production items of the subject equipment are to be manufactured in accordance with either an approved Production Quality Assurance system (Module D), a Product-Quality assurance system (Module E), a Product Verification Process (Module F) or Unit Verification (Module G). The wheelmark cannot be affixed to the product until a conformity assessment module is in place.
13. Each item, batch or lot of the equipment is to be issued with a "Declaration of Conformity" and have the "Mark of Conformity" affixed after a conformity assessment module is in place.

GENERAL NOTES

1. The system is to be designed in accordance with the Annex of IMO MSC/Circ. 848.
2. The mechanical ventilation of the protected space(s) must be stopped before the activation of the fixed gas system and compartment closure arrangements should be designed to provide an agent hold time of at least 15 minutes.
3. The system should be supplied by both main and emergency sources of power, with the emergency power supply being provided from outside the protected machinery space.
4. The system pipe work including: pipes, valves and fittings are to be in accordance with the requirements of the approval authority.
5. 10% of the distribution piping is to be tested to 1.25 times the maximum pressure likely to be experienced in service. For the Catef Marine Fire FM-200 Marine MFE Series Engineered Fire Suppression System, this equates to 1.25 x 34.5 bar (at 50 deg. C) = 43.5 bar. The manifold pipework is to be tested to at least 1.5 times the setting of the manifold relief valve. The manifold relief valve is to be set at a minimum pressure of 52 bar and the minimum manifold test pressure is to be 78 bar. All pipework and fittings should be of suitable galvanised steel or stainless steel construction. Threaded joints in fixed gas systems shall be allowed only inside protected spaces and in cylinder storage spaces.

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6. The system storage containers and associated pressure components are to be designed and tested to codes of practice recognised by the approval authority, indicating that they can withstand the pressure expected in service, having regard to their installed location and that they are suitable for the agent identified.
7. Recommended procedures for the control of products of agent decomposition are to be provided. In particular, on passenger ships, the decomposition products should not be discharged in the vicinity of muster (assembly) stations.
8. Provisions should also be made to ensure that escape routes which may be exposed to leakage from the protected space are not rendered hazardous during or after discharge of the agent. Control Stations and other locations that require manning during a fire situation should have provisions to keep HF and HCl below 5 ppm at that location. The concentrations of other products should be kept below concentrations considered hazardous for the required duration of exposure.
9. Warning signs and audible and visual alarms should be located outside each entry to the protected space(s).
10. Suitable means of checking storage cylinder pressure and weight to be provided.
11. On completion of the installation final acceptance of the system is dependent on satisfactory survey.

PLACE OF PRODUCTION

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Italy



Martin Farrier
Lead Specialist
For and on behalf of Lloyd's Register Verification
LRV EC Distinguishing No. 0038