



Maritime &
Coastguard
Agency

CERTIFICATE OF INSPECTION AND TESTS

Issued under the authority of
the Government of the United Kingdom of Great Britain and Northern Ireland
by the **Maritime and Coastguard Agency, an Executive Agency of the Department for Transport**
**The Secretary of State in exercise of statutory powers is satisfied that information relating to
the product below has been reviewed**

1. PRODUCT DETAILS

Product Name / Model	FirePro
Manufacturer Name	FirePro Systems
Manufacturer Address	8 Faleas Street, CY-4101, Limassol, Cyprus

2. UNDER POWERS CONFERRED BY

Statutory Instrument	1998	No.	1609	Reg 8(1)
Statutory Instrument	1998	No.	2771	Reg 6
Statutory Instrument	2001	No.	0009	Reg 7(1)
Statutory Instrument	2002	No.	2201	Reg 5(1)

The product above has been found satisfactory for the purposes of

1. MGN 280 - Small Vessels in Commercial Use for Sport or Pleasure, Workboats and Pilot Boats - Alternative Construction Standards; Section 15.6.2.
2. The Codes of Practice for the Safety of Small Commercial Motor or Sailing Vessels of up to 24 metres Load Line length; (See MGN 280 Section 15.6.2).
3. The Codes of Practice for the Safety of Small Workboats and Pilot Boats; (See MGN 280 Section 15.6.2).
4. MSN 1871 (F) - The Code of Practice for the Safety of Small Fishing Vessels of Less than 15m Length Overall (Amendment 1) - Annex 2.
5. MSN 1872 (F) - The Code of Safe Working Practice for the Construction and Use of Fishing Vessels of 15m Length Overall to Less than 24m Registered Length (Amendment 1) - Section 5.5.1.
6. The Codes of Practice for Police Boats - Annexes (PBC3) Section 12.6.

Note: The FirePro Fixed Aerosol System is considered suitable for installation in normally unoccupied spaces containing fuel having a flash point of not less than 43 degrees C (closed cup test), of vessels of less than 24 metres load line length, where the space to be protected does not exceed a deck height of 4 metres, or an area of 64 square metres.

provided that the conditions attached to the Schedule are fulfilled and the product remains satisfactory in service

3. SCHEDULE INCLUDING CONDITIONS OR TERMS, IF ANY, ON WHICH THE CERTIFICATE IS ISSUED

1.0 PERFORMANCE TESTING

1.1 The FirePro aerosol system has been accepted on the basis of its satisfactory performance during a series of trials devised to simulate typical fire scenarios that can occur in the machinery space of small craft. The trials were carried out on 14th July 2005 at the Fire Test Ground, Biggin Hill Airport, Kent. The results are contained in the document:- Fire Test Report: PC/9348 - dated 8th September 2005. Certificates can be renewed on the basis of Test reports that are less than 15 years old. This extension is provided to allow FirePro to complete new testing for subsequent approval.

1.2 A series of eight tests were requested, which were combined into four fire tests, as follows:-

- 1.2.1 Open pool fire - diesel fuel (Test 3);
- 1.2.2 Hidden spray fire- diesel fuel (Test 1);
- 1.2.3 Hidden pool fire - lube oil (Test 1);
- 1.2.4 Combined open pool/hidden spray - diesel fuel (Test 3);
- 1.2.5 Combined open pool/hidden spray - lube oil/diesel fuel (Test 2);
- 1.2.6 Combined hidden pool/hidden spray - lube oil/diesel fuel (Test 3);
- 1.2.7 Combined open pool/hidden pool/hidden spray - diesel fuel/lube oil/diesel fuel (Test 3);
- 1.2.8 Wood crib (Class A fire) (Test 4)

Note: Tests 1.2.1 - 1.2.7 are for Class B fires

1.3 The tests were carried out in a combined format agreed with the MCA as follows:

1.3.1 Fire 1: Combined hidden pool and hidden spray fire (lube oil/ diesel fuel); this test 1 - was given a 2 minute pre-burn.

1.3.2 Fire 2: Combined open pool fire, hidden pool fire and hidden spray fire (lube oil/ diesel fuel); this test 2 - was given a 2 minute pre burn.

1.3.3 Fire 3: Combined open pool fire, hidden pool fire and hidden spray fire (diesel fuel/ lube oil/ diesel fuel); this test 3 - was given a 2 minute pre burn.

1.3.4 Fire 4: Wood crib (class A fire); this test 4 - was given a 4 minute pre burn.

1.3.5 Methylated spirits were used as the accelerant agent for pre-ignition.

1.4 The test enclosure comprised a compartment (7850 mm long x 2280 mm wide x 2300 mm high) of a steel container, with a viewing window on one side and double doors at one end. The diesel engine mock-up was constructed of sheet steel, together with a floor plate system surrounding the mock-up to represent a bilge mock-up. A fuel tray was placed underneath the engine mock-up. A diesel fuel spray nozzle was situated at the forward end of the engine mock-up, aiming across the engine and hidden under a plate cover. A further steel tray was placed in the open area beyond the engine. In all four corners of the enclosure, small lit can fires were placed to check the distribution of the extinguishing agent.

1.5 Four FirePro Aerosol extinguishers were installed in the container to provide the appropriate level of protection. The FirePro extinguishers used were 2 x FP1200c and 2 x FP500 and were mounted just below the ceiling of the container.

1.6 The container doors remained open prior to, and during, the 2 minute and 4 minute pre-burn period to ensure that the fires were well established. As the system was designed as a total flooding system, the doors were closed immediately prior to the system activation. The system was activated with a discharge time of less than 10 seconds, the time of extinguishment was recorded using data recorders. No re-ignition occurred. All fires were extinguished with a design concentration of 82 grams per cubic metre.

1.7 The hidden pool fire - the tray was 500 mm x 1020 mm x 90 mm deep and was filled with a mixture of 5 litres diesel fuel and 5 litres of engine oil on a water base. The tray was located under the engine mock-up.

1.8 The hidden pool spray fire - fed from an oil pump connected to a 6 mm bundy tube to a 1 mm nozzle mounted to the engine mock-up and covered from above by a steel plate. The pump provided approximately 1 litre of diesel fuel per minute at 3 bar.

1.9 The open pool fire - the tray was 800 mm x 1200mm x 90 mm deep and was filled with 10 litres of diesel fuel on a water base. The tray was located on the floor of the container in the open area beyond the engine and bilge mock-up.

1.10 The wood crib fire - the crib was constructed of 9 pieces of kiln dried wood measuring 34 mm x 34 mm x 190 mm and placed over a steel tray. Diesel fuel was poured over the wood crib with methyated spirits to aid ignition.

2.0 PRODUCT DESCRIPTION

2.1 FirePro is a fire extinguishing aerosol system consisting of a non-pyrotechnic aerosol forming solid compound together with the non-pyrotechnic natural mineral coolant and egress chambers which are contained within a non-pressurised canister with one or two discharge outlets.

2.2 The FirePro non-pyrotechnic aerosol forming solid compound is made up mainly of potassium nitrate 77%, potassium carbonate 4%, magnesium 1% and an epoxy resin polymer 18%. Once activated the SBK solid compound is turned into a rapidly expanding aerosol gas comprising of nitrogen(N₂), Carbon dioxide (CO₂), water vapour (H₂O) and solid particles of potassium salts (K₂CO₃).

2.3 FirePro tackles fire on a molecular level, by inhibiting the chain chemical reaction present within combustion.

2.4 The FirePro aerosol generators are available in various sizes depending on the mass of aerosol forming solid compound contained in the canister. Operation of the generator is electrical, manual and thermal automatic. The aerosol gas-like medium is close in density to air and is non-toxic, non-corrosive and non-conductive.

2.5 The FirePro aerosol forming generators consist of eight main elements:

- | | |
|-----------------------------------|------------------------------------|
| 1. Canister | 2. Thermal activation port |
| 3. Electrical activation port | 4. Activator |
| 5. Non-pyrotechnic solid compound | 6. Non-pyrotechnic mineral coolant |
| 7. Egress chamber | 8. Delivery nozzle |

3.0 FIREPRO GENERATORS

Where:- E = Electrical TH = Thermocord M = Manual

Model	Activation	Dimensions	Capacity	Gross Weight Discharge	
FP20T/TH	E/TH	165* X 32 dia	20	310	3-6
FP40S/T	E/E&TH	140* X 51 dia	40	585	3-6
FP80S/T	E/E&TH	185* X 51 dia	80	830	5-10
FP100S/T	E&TH/E&TH	120* X 84 dia	100	1270	5-10
FP200M	M	150 X 84 dia	200	1620	15-20
FP200S/T	E&TH/ETH	185* X 84 dia	200	1840	5-10
FP500S/T	E&TH/ETH	295* X 84 dia	500	3340	5-10
FP1200/S	E	216 X 300 X 167	1200	10900	10-15
FP1200T/TS	E&TH	216 X 300 X 167	1200	10900	10-15
FP2000/S	E	300 X 300 X 185	2000	15500	10-15
FP2000T/TS	E&TH	300 X 300 X 185	2000	15500	10-15
FP3000/S	E	300 X 300 X 185	3000	16300	15-20
FP3000T/TS	E&TH	300 X 300 X 185	3000	16300	15-20
FP4200/S	E	300 X 300 X 300	4200	23600	15-20
FP4200T/TS	E&TH	300 X 300 X 300	4200	23600	15-20
FP5700/S	E	300 X 300 X 300	5700	26400	15-20
FP5700T/TS	E&TH	300 X 300 X 300	5700	26400	15-20
FP100EX	E	170* X 84 dia	100	1830	5-10
FP200EX	E	200* X 84 dia	200	2315	5-10
FP500EX	E	310* X 84 dia	500	3770	5-10
FP1200EX	E	365 X 450 X 310	1200	17050	10-15
FP2000EX	E	365 X 450 X 310	2000	21650	10-15
FP3000EX	E	365 X 450 X 310	3000	22450	15-20
FP4200EX	E	365 X 450 X 420	4200	30910	15-20
FP5700EX	E	365 X 450 X 420	5700	33710	15-20

4.0 DESIGN

4.1 The FirePro fire extinguishing aerosol system is to be installed in accordance with the manufacturer's design, operating and maintenance manual: Annex 2 Marine Manual Version 2.

4.2 The design of a FirePro fire extinguishing aerosol system should involve the following as a minimum:

4.2.1 Identify all possible fire hazards within the engine enclosure. Refer to the manufacturer's manual for installation requirements for use with specific hazards/fuel types that may require additional quantities of agent.

4.2.2 Identify possible points of agent loss within the engine enclosure and adjust the quantity of agent required to compensate for the calculated loss.

4.2.3 Determine the volume of the engine enclosure. Identify if the required coverage extends to the full deck-head void and raised deck, and determine the protected volume as required.

4.2.4 Calculate the quantity of agent required for the fuel type and hazards within the engine enclosure. The minimum system design quantity for Class B fires is 82 g/m³, and the minimum for surface Class A fires is 100g/m³. Factors such as non-closeable openings, forced ventilation, low altitude, low

temperature and other conditions may effect the quantity of agent required, and need to be considered when calculating the minimum system design factor.

4.2.5 Select the model and quantity of generators required and the method of activation.

5.0 SYSTEM ISOLATION SWITCH

5.1 In some cases, it will be a requirement for the discharge of a FirePro aerosol generator to be prevented by means of an isolation switch, or other means, that shall be manually operated when personnel are present within the protected engine enclosure, or adjacent areas, which could be rendered hazardous by the discharge of the system.

5.2 The system isolation switch shall be situated outside the protected area close to the system control panel, or adjacent to the main entrance to the engine enclosure, and protected for accidental operation.

5.3 While the system isolation switch is active, and the discharge of the system is inhibited, the fire detection and alarm system shall continue to function and the system shall return to manual control when the switch is reactivated.

5.4 The operation of the system isolation switch shall electrically isolate and earth each conductor of the wiring to the extinguishant discharge device and initiate a visual fault indicator at the system control panel.

5.5 The system isolation switch shall be used when there is a possibility of people entering the protected enclosure for whatever reason.

6.0 CONTROL PANELS

6.1 FPX103C control panel manufactured by Logician Ltd -Basic panel for use with automatic and manual activation of up to four FirePro aerosol generators within the engine or machinery enclosure. Installation and user manual, FPX-103C Fire Control Panel Operation and User Manual Version 4.

6.2 FPX104C control panel manufactured by Logician Ltd - Panel providing fire detection and manual activation of up to four FirePro aerosol generators within the engine or machinery enclosure. Installation and user manual, FPX104CInstall/0305.

7.0 SYSTEM MAINTENANCE

The user should carry out monthly inspections of the FirePro aerosol generator system installed. This should include looking out for obstructions of the discharge nozzles, extension/alteration of the protected enclosure, openings left unclosed that were not catered for during the design, and that the position and orientation of the FirePro aerosol generators remain in their installed position.

8.0 SERVICE LIFE

The FirePro aerosol generators have a service life and should be renewed in accordance with the manufacturer's recommendations.

9.0 IN ADDITION TO THE GENERAL SYSTEM APPROVAL DESCRIBED ABOVE, THE FOLLOWING CONDITIONS ARE TO BE COMPLIED WITH:

9.1 Plans for each intended system, together with details of components used and test certificates, are to be submitted to the Maritime and Coastguard Agency prior to installation and survey on the vessel.

9.2 The installation is to be to the satisfaction of the attending surveyor. Certificates of commissioning and acceptance testing are to be submitted on completion.

9.3 Clear and legible instructions for installation, maintenance, testing and operation, and applicable to the specific system fitted on the vessel, are to be provided onboard.

9.4 Clear and legible safety labels shall be placed at the entrance to the protected enclosure, inside the protected enclosure, at the system isolate switch and the manual release point. Also simple operating instructions are to be placed at the system operating position.

9.5 Means are to be provided to close all openings, which may admit air in to the protected enclosure.

9.6 A normally unoccupied area is an area that is not occupied by humans under normal circumstances but may be entered occasionally for brief periods. Whenever the space is entered then the isolation method is to be used to de-activate the generators within the protected enclosure.

9.7 Aerosol Fire Suppression systems may in certain circumstances carry the risk of producing potentially fatal quantities of Carbon Monoxide (CO) as the system activates and produces the aerosol. Sufficient care should be taken during installation and maintenance to ensure the risk of exposure is as low as reasonably practicable and deliberate activation must only occur when the space is confirmed to be evacuated.

ISSUE OF CERTIFICATE

This certificate is valid until **15 May 2024**

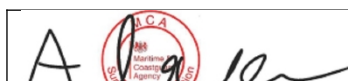
Completion date of the survey on which this Certificate is based 04 May 2023

NOTE: This certificate does not apply to a product which has been varied or modified from the product assessed. The manufacturer must submit modified products for consideration by this Agency if they wish to obtain for them a valid Certificate of Inspection and Test

Place

MCA HQ

Signed

 **Signed electronically
in accordance with**
Signature of authorised official issuing the certificate

Date

16 May 2023

Name

Allan Love