

## FM200 EXTINGUISHING SYSTEM

Company Name: \_\_\_\_\_

Hazard Area: \_\_\_\_\_

Installation Address: \_\_\_\_\_

Site Contact Name: \_\_\_\_\_

Site Extension No.: \_\_\_\_\_

FOT Contact No.: \_\_\_\_\_

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**RESPONSIBLE PERSON & TRAINING – SECTION 1**

Responsibilities person and staff extinguishing system training

Responsible person

Deputy

DATE	NAME	POSITION	SIGNATURE

The extinguishing system to which this guide refers has been designed and tested in accordance with BS ISO 14520.

The user is required to carry out a program of inspection. And to arrange a service and maintenance schedule.

This manual is not to be considered a detailed installation, operation and maintenance or design manual. If a copy of the installation, operation and maintenance manual is required, it may be obtained from FOT Fire Control.

This system is made up of units tested within the limitations contained in the detailed installation manual. The system designer must be consulted whenever changes are planned for the system or area of protection. An authorized installer or system designer must be consulted after the system has discharged.

**INVENTORY OF EQUIPMENT – SECTION 2**

Protected Area.....

Date of Commissioning .....

Quantity of FM200.....

Number of Containers.....

Agent per Containers.....

Weight of Containers.....

Number of Nozzles.....

Number of Pressure Switches .....

Number of Release Solenoids.....

Number of Manual Release Units.....

Number of Door Signs.....

## GENERAL GUIDANCE – SECTION 3

### General Handling

Training should be given to all personnel handling containers. All regulations and local requirements regarding their handling and storage should be observed. Ensure that you comply with all your statutory obligation in regard to maintenance and testing. Do not remove or deface labels provided by FOT for Identification of gas and operation of the container. Establish and implement plans to cover any emergency situations that might arise. When in doubt as to correct handling procedures, consult FOT Fire Control.

### Enclosure

For the extinguishing system to function effectively, the integrity of the protected area must be maintained. Therefore, it is important to ensure that there are no gaps around windows and doors, and that all entries for cables, pipes, etc. are sealed. The operation of any automatic closing devices, doors etc. should be routinely verified. All services within the area likely to impair the efficiency of the extinguishing system must be shut down prior to discharge.

At least every twelve months, the enclosure should be thoroughly inspected to determine if penetrations or other changes have occurred that could adversely affect extinguishing leakage or cause change of volume, or both.

### Storage

Containers in storage or use should be protected from direct sunlight and other severe climatic conditions. Containers should be stored in a well ventilated room. Containers should not be subjected to any direct source of heat and should be kept below 50°C.

- Containers should be stored in a well ventilated area away from source of heat.
- Containers should be protected against conditions likely to encourage corrosion
- Vertical storage is recommended and containers should be properly secured to prevent toppling or rolling.
- The storage area should be kept clear and access should be restricted to authorized persons only.
- Enter an enclosed area only after notifying a colleague nearby.
- The area should be clearly marked as a store and appropriate hazard warning signs displayed.

## GENERAL GUIDANCE – SECTION 3

### Precautions

- Wear stout gloves, shoes and suitable eye and face protection when transporting containers.
- Use a cylinder trolley or other applicable system for transporting containers even short distances.
- Before connecting the container, check the system for suitability, pressure rating and materials.
- A container should not be subjected to temperature above 50°C.
- Do not use containers for any purpose other to contain the gas originally supplied.
- Keep all valve outlets clean and free from contaminants, particularly oil and water.
- Never attempt to affect repairs or modifications to valves or safety relief devices.
- Damage to valves and safety devices should be reported to FOT immediately.
- Be aware that all the containers on a manifold must be the same size, fill and pressure.
- Never use direct flame or electrical heating devices to raise the pressure of a container.

### Health and Safety

A properly installed and maintained extinguishing system should not present any significant health and safety problems providing basic precautions are taken and staff have an understanding of the system operation.

### Emergency Action

In event of system leaks

If containers are in enclosed area, evacuate the area and arrange for it to be ventilated. Do not re-enter the area until the level of FM200 have dropped. Contact FOT regarding repair of the system.

### First Aid – Direct Contact with Vaporizing Liquid

Skin – Flush with soap and water, if frostbite occurs seek medical attention.

Eye – Flush with clear water, seek medical attention.

**GENERAL GUIDANCE – SECTION 3**

Action in the event of fire protected area

- Ensure no personnel are left in the room.
- Contact the emergency services.
- Do not re-enter the enclosure until told and you may do so by emergency service.
- Ensure the containers are refilled immediately by a competent supplier. This work can be carried out by FOT.

Action in the event of the in the container store

In general, do not take risk. Vacate the area, call the emergency services. If unable to extinguish fire, cool containers with water hosed from a safe distance. Inform emergency services of the nature of the product and, in the case of containers, the possibility of burst disc rupture. The container valve is fitted with a bursting disc which will rupture and allow the contents to completely discharge if heat causes the pressure to exceed the maximum permissible service level. Notify FOT Fire Control of any container involved in a fire.

Environmental / Toxicology

	<b>FM 200</b>
<b>Environmental</b>	
Ozone Depletion	0
Atmospheric Lifetime (yrs)	36.5
<b>Toxicology</b>	
Acute Exposure LC <sub>50</sub> (ppm)	>800,000
Cardiac Sensitization	
No observed adverse effect level (NOAEL)	90%
Lowest observed adverse effect level (LOAEL)	>10.5%

**GENERAL GUIDANCE – SECTION 3**

Agent Physical Properties

<b>Agent Physical Properties</b>	
Chemical Structure	N <sub>2</sub>
Chemical Name	Nitrogen
Molecular Weight	28.0
Boiling Point	-195.8 <sup>0</sup> C
Freezing Point	
Critical Temperature	
Critical Pressure	

<b>Agent Physical Properties</b>	<b>HFC – 227ea</b>
Chemical Structure	Cf <sub>2</sub> CHFC <sub>2</sub> F
Chemical Name	Heptafluoropropane
Molecular Weight	170.03
Boiling Point	-16.4 <sup>0</sup> C (1.9 <sup>0</sup> F)
Freezing Point	-131.1 <sup>0</sup> C (-240 <sup>0</sup> F)
Critical Temperature	101.7 <sup>0</sup> C
Critical Pressure	2912kPa (422psi)
Critical Volume	247 cc/mole (.0258cu Ft./lb)
Critical Density	621 kg/m <sup>3</sup> (38.76 ib./ft <sup>3</sup> )
Saturated Vapor Density @20 <sup>0</sup> C (68 <sup>0</sup> F)	31.18 kg/m <sup>3</sup> (1.95 ib./ft <sup>3</sup> )



## INSPECTION AND MAINTENANCE – SECTION 4

### Introduction

This section provides user inspection and maintenance guidance for FM200 engineered systems. A log book is provided to record all inspections, maintenance, measurements and actions taken. It is a legal requirement (the 1989 Pressure Systems and Transportable Gas Container Regulations) that a written plan is drawn up for servicing the installed system.

The plan should state “when pressurized vessels be inspected, ensure inspection of related pipe fittings and list all of protective devices”. It is recommended that a room integrity test is performed once a year by a qualified service engineer and this work can be carried out by FOT.

### User’s Programme of Inspection

#### Weekly

1. Inspect the hazard area against the original layout that there have been no changes that might affect the proper performance of the fire protection system. Changes might include:
  - Contents of area
  - Use of Area
  - Air handling equipment in area
  - Openings in area
  - Floor/Ceiling voids
  - Partitioning
2. Check storage container pressure gauge(s) and ambient temperature, compare the pressure(s) to the temperature correction chart to determine temperature corrected pressure. If the container has been fitted with a Watchman Weigh base, check the fault indication light. Any container that shows a loss in net content of more than 10% shall be refilled or replaced. All measurements and actions shall be recorded in the log book.
3. Make a visual inspection of the system components, distribution piping and nozzles. Check the immediate vicinity of all equipment to ensure that no accidental damage or tempering has occurred.
4. Inspect the hazard area, access routes, container storage area, floor voids and areas above suspended ceilings to ensure housekeeping is good and that no refuse has accumulated. Ensure that access to the system container assemblies and local remote controls are unobstructed.

## INSPECTION AND MAINTENANCE – SECTION 4

### User's Programme of Inspection Cont.

#### Monthly

1. Inspect the system and protected spaces to ensure that warning signs, safety precautions and operating instructions are posted and clearly visible.
2. Check that all persons who are expected to inspect, test, maintain or operate the fire extinguishing system are kept adequately trained in the function they are expected to perform.

Personnel working in an enclosure protected by FM200 shall receive training in the operation and use of the system and safety issues.

### Contracted Service & Maintenance

#### 3 Monthly

1. Test and service all actually mechanisms
2. Test and service all electrical detection and alarm system as recommended is BS 5411:2001

#### 6 Monthly

1. Externally inspect for signs of damage or unauthorized modifications.
2. Verification of the content of FM200 in the container may be achieved through either liquid level detection or container weighing.

#### Liquid Level Detection

FOT use ultrasonic or gamma radiation liquid level detection equipment. This provides a rapid measurement of the contents without disturbing the container from storage racks. If required, this special liquid level detection equipment may be purchased from FOT.

#### Container Weighing

Where a client does not wish to use a FOT maintenance contract or the specialized liquid level detection equipment, then containers must be weighed to establish the FM200 content.

## INSPECTION AND MAINTENANCE – SECTION 4

### Contracted Service and Maintenance

#### 6 Monthly count.

- 3) A check of all manual and pneumatic actuators for free movement of the piston. Replace whole unit where appropriate.
- 4) Check all control valves for correct manual function and automatic valves additionally, for correct automatic function.
- 5) An external check of the pipework to determine its condition. Pressure test and replace or repair as necessary, pipework showing corrosion or mechanical damage.
- 6) An inspection of nozzle for dust debris, clean out where necessary.

#### Yearly

- 1) All system hoses should be examined for damage. If visual examination shows any deficiency, the hose shall be replaced.
- 2) Every 12 months an integrity test should be carried out on the enclosure to determine if the leakage has changed sufficiently from that measured during installation.

### Contracted Service and Maintenance

#### Container Hydrostatic Pressure Testing

Hydrostatic pressure testing of any container is required every ten years in accordance with BS 5430 part 2 section 4 1990.

Container in fixed system may remain for twenty years providing they have not been discharged during this period and the containers have been subject to a full external examination every 6 months from the date of entry into services. However, it is advisable to remove container from services once in ten years and return then to an approved testing /recharging agent for inspection.

## COSH DATA SHEET – SECTION 5

### Identification of substance and Company

Chemical Name: Heptafluoropropane  
General Use: Fire Extinguishing  
Chemical Family: Fluorinated Alkane  
Emergency Telephone: +44 333 2244 360  
Supplier: FOT Fire Control  
Unit 3 Merchant,  
Evegate Business Park,  
Smeeth Ashford,  
Kent TN 24 9RS,  
UK

### Composition/Information on Ingredients

Component	Weight%	EEC Number
Heptafluoropropane	100%	2070792

### Hazard Identification

This material has no hazardous physio-chemical properties or health effects, based upon the criteria laid down by chemical (Hazard information and packaging regulation 1990).

### First Aid Measures

Inhalation: Remove person to fresh air and get a medical attention  
Eye Contact: Flush with water for 15 minutes. Get a medical attention  
Skin Contact: Wash with soap and water. If frost bite occurs, get a medical attention  
Ingestion: Not Applicable

### Fire Fighting Measures

General hazards: This material is designed as an extinguisher and will not sustain combustion

Firefighting instruction: Not Applicable

Firefighting equipment: Not Applicable

Unusual fire and explosion hazards: This material is stored in a pressurized container

**COSH DATA SHEET – SECTION 5**

**Accidental Release Measures**

Air Release: Evacuate area. Ventilate and allow to disperse.

Land Spill: Not Applicable

Water Spill: Not Applicable

**Handling and Storage**

Storage Temperature: Ambient. Storage: 25 bar (at 20°C)

Precautions: Store in a cool well ventilated area.

**Exposure Control/Personal Protection**

Engineering Measures: Ventilation System.

Occupational Exposure: LOAEL: >10.5%

NOAEL: 9.0%

The US EPA allows unrestricted use up to 9% for firefighting, and up to 10.5% where degree can occur within 1 minute.

**Personal Protective Clothing**

Respiratory: Self-contained breathing apparatus if concentration exceeds or is likely to exceed 10%

Hand/Skin: Lined Neoprene gloves when handling liquid

Eye Protection: Anti-splash goggles when handling liquid.

Hygiene Practices: Wash hands with soap and water after handling and before eating. Launder contaminated clothing before re-use

**Physical and Chemical Properties**

Physical State: Liquefied Compressed gas

Color: Colorless

Odor: None

Vapor Pressure: 58.8psa at 21°C

Specific gravity: 1.46

Solubility: Not available

## COSH DATA SHEET – SECTION 5

pH: Not available  
Melting Point/: -131°C  
Boiling Point: -16.4°C  
Viscosity: Not applicable  
Vapor Density: Not available  
Flash Point: None  
Flammable Limits: None  
Auto ignition Temp: None

Other

### Stability and Reactivity

Stability: Stable  
Hazardous Reactions: None Known  
Incompatibility with: None Known

### Toxicological Information

Inhalation Lc50 (rat):>788,696ppm

### Ecological Information

Details for Ecology: US EPA has confirmed the Ozone Depleting Potential (ODP) for FM200 as Zero.  
The Atmospheric Lifetime is 36.5 years.

### Disposal Considerations

This material should be incinerated in a high temperature chemical waste incinerator fitted with acid gas scrubbing systems. All disposal should be in accordance with local, state and European law.

### Transportation Information

Hazard Classification: Non-Flammable Compressed gas  
Substance Identification Number: 3296  
Packing Group: Not Applicable  
IMDG Code Page Number: 21441  
Proper Shipping Name: Heptafluoropropane  
RID/ADR: Class 2

**COSH DATA SHEET – SECTION 5**

**Regulatory Information**

Labelling: This material is not classified as hazardous for supply under the Chemical (Hazardous Information and Packaging) Regulation 1993.

“R” Phases: None

“S” Phases: 15: Keep away from heat

21: When using, do not smoke

38: In case of insufficient ventilation, wear suitable respiratory equipment.

This material is covered by the “Control of Substances Hazardous to Health Regulations 1988”

The data contained herein is based on information currently available to us and believed to be factual and the opinions expressed to be those of qualified experts: however, this data is not to be taken as a warranty or representation for which Great Lakes Chemical (Europe) Ltd assumes legal responsibility.

















