MINERVA

FM 200® Gaseous Fire Fighting Systems

Fire systems

Features

- **Zero ozone depleting potential**
- **Safe for use in occupied areas**
- **Suitable for the protection of a range of high value risks**
- **Existing Halon/CO_2 control systems can be adapted for use with FM200®**
- **Requires minimal storage space**
- **Like Halon, no clean-up required after discharge**
- **Low pressure system**
- **Over 30,000 systems installed worldwide**
- **Listed in BFPSA Code of Practice, NFPA 2001 and draft ISO standard**
- **Listed in the US Environmental Protection Agency (EPA) Significant New Alternatives Policy (SNAP) programme for the total flooding of occupied spaces**
- **UL and FM approved as a component in approved systems**

THORN SECURITY

Introduction

Our systems are based on many years' experience in the design, supply, installation and commissioning of gaseous fire fighting systems.

We were a major supplier of Halon fire fighting systems for over 20 years. During this time Halons have provided industry and commerce with a unique and versatile extinguishant to respond to most fire protection needs.

The Montreal Protocol presented the fire protection industry with a most demanding challenge - to find a replacement for Halons.

We have evaluated a large number of candidate agents over several years before selecting FM200® .

FM200®

FM200® (HFC 227ea) is known chemically as Heptafluoropropane and is manufactured by Great Lakes Chemical Corporation.

FM200® is a colourless gas which is liquified under pressure for storage. Like Halon 1301 it has a low toxicity level and is super-pressurised with Nitrogen to 24.8bar (360psi). It rapidly extinguishes most commonly found fires through a combination of chemical and physical mechanisms.

Environmental Features

FM200® contains no bromine or chlorine and therefore has zero Ozone Depleting Potential (ODP).

The atmospheric lifetime of FM200® is between 31 and 42 years which along with its zero ODP presents a long-term solution to fire protection requirements.

Safety

FM200® has been found to be less toxic than Halon 1301, which makes it safe for use in the fully automatic mode in occupied areas.

Typically FM200® requires a design concentration of 7%, which is well below the 9% No Observable Adverse Effect Level (NOAEL) on cardiac sensitisation. The NOAEL for Halon 1301 is only 5% (the same as its design concentration).

Applications

FM200® is immediately available to protect most hazards traditionally protected using Halon 1301.

It is effective in the protection of data processing, telecommunications and electronic equipment as well as most flammable liquids and gases.

Replacing Halon with FM200

Existing Halon and CO_2 control systems meeting the requirements of the relevant national or international standards are ideally suited for use with FM200 and can be modified to operate as part of an FM200 system.

Due to the differences in concentration and physical characteristics between the gases it will be necessary to change the container valve and nozzles and probably the pipework and storage containers in carrying out a retrofit of an existing system. However, due to the similarities in the equipment, changing from Halon or CO_2 to FM200® can be accomplished with minimal disruption and little or no system downtime.

Storage

Compared with Halon 1301, FM200® systems require minimal additional floor storage space, if any.

The physical properties of FM200® together with its efficient extinguishing capabilities allow it to be used in similar types of equipment to Halon. As the extinguishing abilities of FM200® determine that only 70% more agent by weight is required, the demands for additional storage space requirements are minimal.

Halon Recycling

We have invested in Halon recycling facilities and are able to decommission existing systems in an environmentally responsible manner.

Room Integrity Testing

Room Integrity Testing has become an important feature of the commissioning of gaseous fire fighting systems. The Integrity Test is performed to check that rooms can maintain a sufficient extinguishing agent concentration for the required holding time.

Room Integrity Testing can also be included as part of servicing agreements and is very strongly recommended on new installations.

ENVIRONMENTAL DATA AND PHYSICAL PROPERTIES

FM200® versus HALON 1301

	FM200®	HALON 1301
Ozone Depleting Potential	0	16
Atmospheric Lifetime	31-41 years	87-110 years
Class A Hazards Extinguishing Concentration	5.8%*	<4.1%
Class B Hazards Extinguishing Concentration	5.8 - 6.6%**	4.1%***
Inerting Concentration (explosion sphere, 70 joules ignition energy) Methane Propane	 8.0% 11.6%	 7.0% 6.1%
Class A Hazards Minimum Design Concentration	7%	5%
Class B Hazards Minimum Design Concentration	8%	5%
CARDIAC SENSITISATION No Observed Adverse Effect Level (NOAEL) Lowest Observed Adverse Effect Level (LOAEL)	 9% 10.5%	 5% 7.5%
Acute Toxicity (4-hour-rat) LC50 - ppm	>800,000****	800,000****
Chemical Structure	CF_3CHFCF_3	CF_3Br
Molecular Weight	170.03	148.93
Boiling Point	-16.4°C	-57.8°C
Freezing Point	-131°C	-168°C
Vapour Pressure @ 20°C	3.91bar	14.63 bar
Vapour Density @ 20°C	31.176kg/m^3	115.6kg/m^3
Liquid Density @ 20°C	1407 kg/m^3	1575kg/m^3
Maximum Recommended Filling Density	1153 kg/m^3	1121kg/m^3

* Established during UL/FM testing.
** Ref: NFPA 2001:1996 (Values for Heptane: other class B hazards will produce different values.)
*** Ref: BS5306 Section 5.1: 1992 (Value for Heptane: other class B hazards will produce different values.)
**** With added oxygen.

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