



# MATERIAL SAFETY DATA SHEET

**MSDS Number:** 00057  
**Product Name:** FM-200®

**Effective Date:** 06/09/2006  
**Page:** 1 of 6

## SECTION I - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** FM-200®  
**Supplier:** Chemtura USA Corporation  
**Address:** 199 Benson Road **City:** Middlebury  
**State:** Connecticut **Zip:** 06749  
**Emergency Telephone Number:** 1-800-949-5167  
**Information Telephone Number:** 1-765-497-6100 **Fax:** 1-765-497-6123  
**Chemtrec Phone:** 1-800-424-9300; **Internationally call 703-527-3887**  
**Effective Date:** 06/09/2006 **Supersede Date:** 01/12/2006  
**MSDS Prepared By:** Chemtura Product Safety Group  
**Synonyms:** 1,1,1,2,3,3,3-Heptafluoropropane, 2H-Heptafluoropropane  
**Product Use:** Fire extinguishing, fire suppression, explosion suppression and inerting agent  
**Chemical Name:** 1,1,1,2,3,3,3-Heptafluoropropane  
**Chemical Family:** Halogenated alkane

### *Additional Information*

Manufacturer:  
Great Lakes Chemical Corporation, A Chemtura Company  
P.O. Box 2200  
West Lafayette, Indiana 47996-2200

## SECTION II - COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS NO.	%	EXPOSURE LIMITS
1,1,1,2,3,3,3-Heptafluoropropane	431890	> or = 99.9	Y (Hazardous) Not established (OSHA PEL TWA) Not established (OSHA PEL STEL) Not established (OSHA PEL CEIL) Not established (ACGIH TLV TWA) Not established (ACGIH TLV STEL) Not established (ACGIH TLV CEIL)

\*Indented chemicals are components of previous ingredient.

### *Additional Information*

No information available

## SECTION III - HAZARDS IDENTIFICATION

**Emergency Overview:** Colorless gas  
Odorless  
Direct eye or skin contact with the liquid or cold gas can cause chilling or possibly frostbite of exposed tissues.  
May cause central nervous system effects.  
Inhalation of high concentrations can be harmful or fatal due to oxygen deprivation and/or heart irregularities.

**Relevant Routes of Exposure:** Inhalation

**Signs and Symptoms of Overexposure:** Symptoms similar to oxygen deprivation (headache, nausea, dizziness or loss of consciousness) may result from overexposure by inhalation. Heart irregularities such as irregular pulse or heart palpitations may indicate cardiac sensitivity.

# MATERIAL SAFETY DATA SHEET

MSDS Number: 00057  
Product Name: FM-200®

Effective Date: 06/09/2006  
Page: 2 of 6

## SECTION III - HAZARDS IDENTIFICATION

	Cold, white or discolored skin or in severe cases blistering, can be a sign of frostbite caused by cold liquids or gases.		
<b>Medical Conditions Generally Aggravated By Exposure:</b>	Persons with preexisting cardiac, respiratory, or central nervous system disorders may be more susceptible to effects of an overexposure. The use of epinephrine or similar compounds can increase susceptibility to heart irregularities caused by excessive exposure to these types of compounds.		
<b>Potential Health Effects:</b>	See Section XI for additional information.		
<b>Eyes:</b>	Direct eye contact with the liquid or cold gas can cause chilling or possibly frostbite of exposed tissues.		
<b>Skin:</b>	Direct skin contact with the liquid or cold gas can cause chilling or possibly frostbite of exposed tissues.		
<b>Ingestion:</b>	Not expected to be a hazard in normal industrial use.		
<b>Inhalation:</b>	Inhalation of high concentrations can be harmful or fatal due to oxygen deprivation and/or heart irregularities (arrhythmias). Misuse of the product by deliberately inhaling high concentrations of this gas could cause death without warning.		
<b>Chronic Health Effects:</b>	None known		
<b>Carcinogenicity:</b>			
<b>NTP:</b>	No	<b>ACGIH:</b>	No
<b>IARC:</b>	No	<b>OTHER:</b>	No
<b>OSHA:</b>	No		

### *Additional Information*

No information available

## SECTION IV - FIRST AID MEASURES

<b>Eyes:</b>	Flush with water. Get medical attention.
<b>Skin:</b>	Flush with water; if frostbite occurs get medical attention.
<b>Ingestion:</b>	No information available
<b>Inhalation:</b>	Remove person to fresh air; if not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
<b>Antidotes:</b>	No information available
<b>Notes to Physicians and/or Protection for First-Aiders:</b>	The use of epinephrine or similar compounds can increase susceptibility to heart irregularities caused by excessive exposure to these types of compounds.

### *Additional Information*

No information available

## SECTION V - FIRE FIGHTING MEASURES

<b>Flammable Limits in Air (% by Volume):</b>	Not applicable
<b>Flash Point:</b>	Nonflammable gas
<b>Autoignition Temperature:</b>	Not available
<b>Extinguishing Media:</b>	All conventional media are suitable.
<b>Fire Fighting Instructions:</b>	Keep cylinders cool with a water spray applied from a safe distance. Use a self-contained breathing apparatus if containers rupture or release under fire conditions. Do not allow reentry into areas where this material has been released without first ventilating to remove products of combustion/decomposition.
<b>Unusual Fire and Explosion Hazards:</b>	Although containers of our product are provided with pressure and temperature relief devices, containers can rupture if exposed to localized heat. Thermal decomposition will generate toxic and corrosive gases.
<b>Flammability Classification:</b>	Nonflammable gas

# MATERIAL SAFETY DATA SHEET

MSDS Number: 00057  
Product Name: FM-200®

Effective Date: 06/09/2006  
Page: 3 of 6

## SECTION V - FIRE FIGHTING MEASURES

### Known or Anticipated Hazardous

#### Products of Combustion:

Decomposition by elevated temperatures (fire conditions, glowing metal surfaces) may generate hazardous decomposition products common to other CFCs, HCFCs or HBFCs. These can include hydrogen fluoride (ACGIH TLV = 3 ppm), carbon monoxide, carbon dioxide and others.

#### *Additional Information*

No information available

## SECTION VI - ACCIDENTAL RELEASE MEASURES

### Accidental Release Measures:

Evacuate the area and ventilate. Do not enter areas where high concentrations may exist (especially confined or poorly ventilated areas) without appropriate protective equipment including a self-contained breathing apparatus.

### Personal Precautions:

See Section VIII.

### Environmental Precautions:

No information available

#### *Additional Information*

No information available

## SECTION VII - HANDLING AND STORAGE

### Handling:

Use the same type of precautions as would be used in handling any cryogenic gas. Protect container from damage. Handle in well-ventilated areas. When this material is used as a firefighting agent in fixed or portable extinguishing systems, follow manufacturer's instructions for operation, inspection, maintenance and repair of the system.

### Storage:

Store in a cool, dry, well-ventilated area away from incompatible materials. Keep container tightly closed.

### Other Precautions:

No information available

#### *Additional Information*

No information available

## SECTION VIII - EXPOSURE CONTROLS/PERSONAL PROTECTION

### Engineering Controls:

No information available

### Ventilation Requirements:

Use local ventilation to minimize exposure to gas.  
Use mechanical ventilation for general area control.

### Personal Protective Equipment:

#### Eye/Face Protection:

Chemical splash goggles when handling liquid

#### Skin Protection:

Use lined neoprene gloves if handling liquid.

Clothing designed to minimize skin contact

#### Respiratory Protection:

Wear a NIOSH/MSHA approved self-contained breathing apparatus in emergency situations.

Consult the OSHA respiratory protection information located at 29CFR 1910.134 and the American National Standard Institute's Practices of Respiratory Protection Z88.2.

#### Other Protective Clothing or Equipment:

No information available

### Exposure Guidelines:

See Section II.

### Work Hygienic Practices:

Wash thoroughly after handling.

Wash contaminated clothing before reuse.

Make sure piping is empty before doing maintenance work.

#### *Additional Information*

No information available

# MATERIAL SAFETY DATA SHEET

MSDS Number: 00057  
Product Name: FM-200®

Effective Date: 06/09/2006  
Page: 4 of 6

## SECTION IX - PHYSICAL & CHEMICAL PROPERTIES

<b>Appearance:</b>	Colorless gas	<b>Percent Volatile:</b>	Not available
<b>Boiling Point:</b>	-16.4 degrees C (2.5 degrees F)	<b>pH Value:</b>	Not available
<b>Bulk Density:</b>	See Below	<b>pH Concentration:</b>	Not available
<b>Color:</b>	Colorless	<b>Physical State:</b>	Gas
<b>Decomposition Temperature:</b>	Not available	<b>Reactivity in Water:</b>	Not water reactive
<b>Evaporation Rate:</b>	Not available	<b>Saturated Vapor Concentration:</b>	Not available
<b>Freezing Point:</b>	-131 degrees C (-204 degrees F)	<b>Softening Point:</b>	Not available
<b>Heat Value:</b>	See Below	<b>Solubility in Water:</b>	260 mg/L
<b>Melting Point:</b>	-131 degrees C (-204 degrees F)	<b>Specific Gravity or Density (Water=1):</b>	1.46 (liquid)
<b>Molecular/Chemical Formula:</b>	C3HF7	<b>Vapor Density:</b>	6.04
<b>Molecular Weight:</b>	170	<b>Vapor Pressure:</b>	58.8 psia at 70 degrees F (21 degrees C)
<b>Octanol/Water Partition Coefficient:</b>	Not available	<b>Viscosity:</b>	Not available
<b>Odor:</b>	Odorless	<b>Volatile Organic Compounds:</b>	Not available
<b>Odor Threshold:</b>	Not available	<b>Water/Oil Distribution Coefficient:</b>	Not available
<b>Particle Size:</b>	Not available	<b>Weight Per Gallon:</b>	Not available

### Additional Information

Bulk density of liquid = 87.6 lb/ft<sup>3</sup> at 70 degrees F (21 degrees C)  
Bulk density of gas = 2.01 lb/ft<sup>3</sup> at 70 degrees F (21 degrees C)  
Heat of vaporization at boiling point = 57.0 Btu/lb

## SECTION X - STABILITY AND REACTIVITY

<b>Stability:</b>	Stable under normal conditions of handling and use.
<b>Conditions to Avoid:</b>	None
<b>Incompatibility With Other Materials:</b>	Powdered metals (ex. Al, Mg, or Zn) and strong alkalis, oxidizers or reducing agents are not compatible with this and most other halogenated organic compounds.
<b>Hazardous Decomposition Products:</b>	Thermal decomposition may produce the following: Hydrogen fluoride Carbon monoxide and carbon dioxide
<b>Hazardous Polymerization:</b>	Will not occur
<b>Conditions to Avoid:</b>	None

### Additional Information

No information available

## SECTION XI - TOXICOLOGICAL INFORMATION

VALUE (LD50 OR LC50)	ANIMAL	ROUTES	COMPONENTS
>788,696 ppm/4H	Rat	Acute Inhalation	1,1,1,2,3,3,3-Heptafluoropropane

### Toxicological Information:

The human health hazards of this product are expected to be similar to other liquified gases including N<sub>2</sub>, CO<sub>2</sub>, CFCs, HCFCs, and HBFCs. Therefore, direct eye or skin contact with the liquid or cold gas can cause chilling or possibly frostbite of exposed tissues. Inhalation of high concentrations can be harmful or fatal due to oxygen deprivation and/or heart irregularities (arrhythmias). Misuse of the product by deliberately inhaling high concentrations of this gas could cause death without warning. Persons with preexisting cardiac or central nervous system disorders may be more susceptible to effects of an overexposure.

# MATERIAL SAFETY DATA SHEET

MSDS Number: 00057  
Product Name: FM-200®

Effective Date: 06/09/2006  
Page: 5 of 6

When tested with and without metabolic activation over a concentration range of 43.9-93.5%, heptafluoropropane was not mutagenic in *S. typhimurium*. Neither toxicity nor mutagenicity was observed in a mouse lymphoma assay when heptafluoropropane was tested to a concentration of 56.8%. Neither toxicity nor an increase in micronuclei was observed in mice exposed to 10.5% heptafluoropropane. Therefore, there is no evidence that heptafluoropropane is capable of inducing gene or chromosomal mutations in vitro or chromosomal effects in vivo. In other studies, heptafluoropropane did not show genotoxicity or cytotoxicity.

Animal studies have found the rat 4 hour LC50 to be >788,696 ppm (~80%), the highest level tested. A cardiac sensitization study in dogs found the No Observable Adverse Effect Level (NOAEL) to be 9.0%. The Lowest Observable Adverse Effect Level (LOAEL) for this study was reported to be 10.5%. A 90 day inhalation study did not find any exposure related effects at 105,000 ppm (10.5% vol./vol.), the highest level tested. Inhalation studies looking for developmental effects on pregnant rabbits and rats or their offspring did not show any exposure related effects at the highest concentrations tested (105,000 ppm).

## Additional Information

No information available

## SECTION XII - ECOLOGICAL INFORMATION

**Ecological Information:** No information available

## Additional Information

No information available

## SECTION XIII - DISPOSAL CONSIDERATIONS

**Disposal Considerations:** Non-contaminated product is reclaimable. Contact Great Lakes Chemical Corporation for information. Otherwise, dispose of waste in an approved chemical incinerator equipped with a scrubber as allowed by current Local, State/Province, Federal/Canadian laws and regulations.

## Additional Information

No information available

## SECTION XIV - TRANSPORT INFORMATION

### U.S. DOT

<b>Proper Shipping Name:</b>	Heptafluoropropane	<b>ID Number:</b>	UN3296
<b>Hazard Class:</b>	2.2	<b>Labels:</b>	Nonflammable gas
<b>Packing Group:</b>	N/A	<b>Packaging Exceptions:</b>	306
<b>Special Provisions:</b>	T50	<b>Bulk Packaging:</b>	314, 315
<b>Non-Bulk Packaging:</b>	304	<b>Air Cargo Limit:</b>	150 kg
<b>Passenger Air/Rail Limit:</b>	75 kg	<b>Other Stowage:</b>	N/A
<b>Vessel Stowage:</b>	A		
<b>Reportable Quantity:</b>	N/A		

### AIR - ICAO OR IATA

<b>Proper Shipping Name:</b>	Heptafluoropropane	<b>ID Number:</b>	UN3296
<b>Hazard Class:</b>	2.2	<b>Packing Group:</b>	N/A
<b>Subsidiary Risk:</b>	N/A	<b>Packing Instructions:</b>	200
<b>Hazard Labels:</b>	Nonflammable gas	<b>Packing Instruction -</b>	
<b>Air Passenger Limit Per Package:</b>	75 kg	<b>Cargo:</b>	200
		<b>Special Provisions Code:</b>	N/A
<b>Air Cargo Limit Per Package:</b>	150 kg		

### WATER - IMDG

<b>Proper Shipping Name:</b>	Heptafluoropropane	<b>ID Number:</b>	UN3296
<b>Hazard Class:</b>	2.2	<b>Subsidiary Risk:</b>	N/A
<b>Packing Group:</b>	N/A		
<b>Medical First Aid Guide Code:</b>	NA		

## Additional Information

Emergency Procedures Code: F-C, S-V

# MATERIAL SAFETY DATA SHEET

MSDS Number: 00057  
Product Name: FM-200®

Effective Date: 06/09/2006  
Page: 6 of 6

## SECTION XV - REGULATORY INFORMATION

### U.S. Federal Regulations:

The components of this product are either on the TSCA Inventory or exempt (i.e. impurities, a polymer complying with the exemption rule at 40 CFR 723.250) from the Inventory.

### State Regulations:

None known

### International Regulations:

This material (or each component) is listed on the following inventories:

Canada - NDSL

EU - EINECS

Australia - AICS

Japan - ENCS

Korea - ECL

China - List I

Canadian WHMIS Hazard Class and Division = A.

### SARA Hazards:

<b>Acute:</b>	Yes	<b>Chronic:</b>	No
<b>Reactive:</b>	No	<b>Fire:</b>	No
<b>Pressure:</b>	No		

### Additional Information

The above regulatory information represents only selected regulations and is not meant to be a complete list.

## SECTION XVI - OTHER INFORMATION

### NFPA Codes:

<b>Health:</b>	1	<b>Flammability:</b>	0
<b>Reactivity:</b>	0	<b>Other:</b>	0

### HMIS Codes:

<b>Health:</b>	1	<b>Flammability:</b>	0
<b>Reactivity:</b>	0	<b>Protection:</b>	X

### Label Statements:

Not available

### Other Information:

Abbreviations:

(L) = Loose bulk density in g/ml

LOEC = Lowest observed effect concentration

MATC = Maximum acceptable toxicant concentration

NA = Not available

N/A = Not applicable

NL = Not limited

NOAEL = No observable adverse effect level

NOEC = No observed effect concentration

NOEL = No observable effect level

NR = Not rated

(P) = Packed bulk density in g/ml

PNOR = Particulates Not Otherwise Regulated

PNOS = Particulates Not Otherwise Specified

REL = Recommended exposure limit

TS = Trade secret

### Additional Information

Information on this form is furnished solely for the purpose of compliance with OSHA's Hazard Communication Standard, 29CFR 1910.1200 and the Canadian Hazardous Products Act and associated Controlled Products Regulations and shall not be used for any other purpose.

Revision information:

General review and update