

Shanghai Waysmos Fine Chemical Co., Ltd.  
2501 Zhouzhu Road, Nanhui,  
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+86-21-58162351

## MATERIAL SAFETY DATA SHEET

### HEPTAFLUOROPROPANE

#### SECTION I -- PRODUCT AND DISTRIBUTOR INFORMATION

TRADE NAME / LABEL NAME	[Insert trade name] MH227
CAS NUMBER	431890
CHEMICAL FAMILY	Halogenated alkane; Hydrofluorocarbon
CHEMICAL NAME	1,1,1,2,3,3,3-Heptafluoropropane
SYNONYMS	2H-Heptafluoropropane; HFC-227ea; R-227; FM-200? ; FE-227?
DISTRIBUTOR'S NAME	Shanghai Waysmos Fine Chemical Co., Ltd.
DISTRIBUTOR'S ADDRESS	2501 Zhouzhu Road, Nanhui, Shanghai China, 201322
PHONE	+86-21-58162351
FACSIMILE	+86-21-58162299
DATE OF PREPARATION	SEPT. 24, 2007
PRODUCT USE	Fire/explosion extinguishing, suppression and prevention (inerting) agent for use in total flooding systems or portable extinguishers. <b>THIS PRODUCT IS NOT SUITABLE FOR USE AS AN ACTIVE PHARMACEUTICAL INGREDIENT, PHARMACEUTICAL EXCIPIENT OR DOSAGE AGENT.</b>

#### SECTION II -- COMPOSITION AND INGREDIENT INFORMATION

CHEMICAL NAME	1,1,1,2,3,3,3-Heptafluoropropane
CAS Number	431890
% w/w	> 99.9
OSHA PEL TWA mg/m <sup>3</sup>	Not established
OSHA PEL STEL mg/m <sup>3</sup>	Not established
OSHA PEL CEIL mg/m <sup>3</sup>	Not established
ACGIH TLV TWA mg/m <sup>3</sup>	Not established
ACGIH TLV STEL mg/m <sup>3</sup>	Not established
ACGIH TLV CEIL mg/m <sup>3</sup>	Not established
TOXICITY DATA	N/A

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**SECTION III -- PHYSICAL AND CHEMICAL CHARACTERISTICS**

GENERAL	Colorless, odorless gas
BOILING POINT	-16.4°C / 3°F
VAPOR PRESSURE (@ 21°C / 70°F)	58.8 psia
VAPOR DENSITY (AIR = 1)	6.04
WATER REACTIVE	NO
SPECIFIC GRAVITY (H <sub>2</sub> O = 1)	1.46
PERCENT VOLATILE (by volume)	N/A
EVAPORATION RATE (Butyl acetate = 1)	N/A
VISCOSITY (@ 20°C / 68°F)	N/A
MELTING POINT	-131°C / -204°F
WATER SOLUBILITY (v/v @ 20°C / 68°F)	260 mg/L

**SECTION IV -- FIRE AND EXPLOSION HAZARDS**

FLASH POINT	N/A
FLAMMABLE LIMIT (in air; % by volume)	N/A
AUTO-IGNITION TEMPERATURE	N/A
EXTINGUISHING MEDIA	All are suitable. While product is non-flammable and extinguishes fires at sufficient concentration, can undergo thermal decomposition if involved in fires where quantity of product is insufficient to extinguish. Thermal decomposition products may be toxic or corrosive.
UNUSUAL FIRE AND EXPLOSION HAZARDS	Container rupture possible if pressure and temperature relief valves should fail.
SPECIAL FIRE FIGHTING PROCEDURES	Employ water spray from a safe distance to prevent container rupture. If containers should rupture, use self contained breathing apparatus. Product is non-flammable, but denser than air, posing asphyxiation risk. Thoroughly ventilate affected area to remove product and any decomposition products before allowing re-entry.

**SECTION V -- REACTIVITY DATA**

STABILITY	Stable
CONDITIONS TO AVOID	N/A
HAZARDOUS POLYMERIZATION	N/A
INCOMPATIBLE MATERIALS	Powdered metals such as aluminum, magnesium or zinc; strong alkaline agents; oxidizing agents; reducing agents.
HAZARDOUS DECOMPOSITION PRODUCTS	Thermal decomposition products may include hydrogen fluoride, carbon monoxide and carbon dioxide.

**SECTION VI -- HEALTH HAZARD DATA**

THRESHOLD LIMIT VALUE	N/A
POTENTIAL EXPOSURE ROUTES	Inhalation -- Yes Eye contact -- Yes Skin contact - Yes Ingestion -- No
SIGNS AND SYMPTOMS OF OVEREXPOSURE	Inhalation of excessive concentrations in air may induce symptoms of hypoxia (headache, nausea, dizziness, loss of consciousness) or cardiac sensitization (irregular pulse or arrhythmia). Product is a cryogenic gas. Direct skin contact at point of release may cause symptoms of frostbite due to evaporative cooling (cold, white, discolored skin that, in severe cases, may exhibit blistering).
MEDICAL CONDITIONS POTENTIALLY AGGRAVATED BY EXPOSURE	Pre-existing cardiac, respiratory or CNS disorders may be exacerbated by

	overexposure. Epinephrine or sympathomimetic drugs may increase susceptibility to cardiac irregularities upon overexposure.
CARCINOGENICITY	NTP Program " No IARC Monographs " No OSHA " No ACGIH " No Other " No
MUTAGENICITY	S. typhimurium assay " No Mouse lymphoma assay " No Mouse micronuclei assay " No
LC <sub>50</sub>	> c. 800,000 ppm
EMERGENCY AND FIRST AID PROCEDURES	Inhalation " Move to fresh air. Artificial respiration if not breathing. Administer oxygen if breathing is labored. Seek medical attention.  Eye contact " Flush/irrigate with fresh water. Seek medical attention.  Skin contact " Flush/irrigate (spray) with water. Apply sterile dressing as necessary.. Seek medical treatment for symptoms of frostbite.  Ingestion " N/A  <b>NOTE TO PHYSICIANS:</b> In treating cases of overexposure through inhalation, use of epinephrine, sympathomimetics or other stimulants is contraindicated as such compounds increase susceptibility to cardiac sensitization (irregular pulse or arrhythmia).

**SECTION VII " SPILL/LEAK PROCEDURES AND SPECIAL PRECAUTIONS**

HANDLING AND STORAGE PRECAUTIONS	Store in a cool, dry, well-ventilated area separate from incompatible materials. Protect containers from mechanical damage. Follow fire equipment manufacturer's instructions for operation, inspection, maintenance and repair of portable extinguishers and fixed extinguishing systems.
OTHER PRECAUTIONS	Prohibit backfeed into containers.
RELEASE OR SPILL PROCEDURES	Evacuate and ventilate the affected area. Prohibit general entry into areas where high concentrations may exist, particularly confined or poorly ventilated areas. Keep in mind that this product is denser than air and that concentrations will be higher at lower levels (sewers, basements or pits). Trained personnel should use self-contained breathing apparatus when entering areas where high concentrations may exist.
WASTE DISPOSAL	Product can be reclaimed unless contaminated. Contact distributor to arrange reclamation. Otherwise, disposal should be in accordance with applicable law, generally by incineration at a qualified facility with an appropriate scrubber and other emission control technology.

**SECTION VIII " SPECIAL PROTECTION INFORMATION**

RESPIRATORY PROTECTION	NIOSH/MSHA approved self-contained breathing apparatus for entry into areas where high concentrations may exist.
VENTILATION	Passive ventilation (windows, doors, etc.) generally adequate for small areas. Mechanical ventilation for control of large areas and storage or filling facilities.
DERMAL PROTECTION	Lined, neoprene gloves for handling liquid product.
EYE PROTECTION	Shatterproof chemical splash goggles when handling liquid or working on pressurized containers.
OTHER PROTECTIVE EQUIPMENT	Clothing to minimize contact with liquid product or at potential points of release.
OTHER PROTECTIVE PRACTICES	Employ prudent confined space entry and related procedures (confirm equipment is free of product and has been ventilated, etc.). As with all chemical products, wash thoroughly after handling and wash contaminated clothing before re-use.

**HAZARDOUS MATERIAL IDENTIFICATION SYSTEM RATINGS**

HEALTH = 1	FLAMMABILITY = 0	REACTIVITY = 0
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**HAZARD INDEX:**

0 = MINIMAL HAZARD, 1 = SLIGHT HAZARD, 2 = MODERATE HAZARD,  
 3 = SERIOUS HAZARD AND 4 = SEVERE HAZARD

**SHIPPING INFORMATION \*\* U.S. DOT GENERAL**

DOT SHIPPING NAME	HEPTAFLUOROPROPANE
DOT ID NUMBER	UN3296
DOT HAZARD CLASS	2.2 NON-FLAMMABLE, COMPRESSED GAS
PACKING GROUP	N/A
PACKAGING INSTRUCTIONS	200
SPECIAL PROVISIONS	T50
NON-BULK PACKAGING	304
PASSENGER AIR/RAIL LIMIT	75 kg/package
AIR CARGO LIMIT	150 kg/package
VESSEL STOWAGE	A
REPORTABLE QUANTITY	None specified
LABEL	NON-FLAMMABLE GAS
PACKAGING EXCEPTIONS	306
BULK PACKAGING	314/315
OTHER STOWAGE	N/A

**AIR TRANSPORT \*\* ICAO OR IATA**

PROPER SHIPPING NAME	HEPTAFLUOROPROPANE
ID NUMBER	UN3296
HAZARD CLASS	2.2 NON-FLAMMABLE, COMPRESSED GAS
SUBSIDIARY RISK	N/A
PACKING GROUP	N/A
PACKAGING INSTRUCTIONS	200
PACKAGING INSTRUCTIONS ** CARGO	200
SPECIAL PROVISIONS	N/A
AIR PASSENGER LIMIT	75 kg/package
AIR CARGO LIMIT	150 kg/package
LABEL	NON-FLAMMABLE GAS

**WATER - IMDG**

PROPER SHIPPING NAME	HEPTAFLUOROPROPANE
ID NUMBER	UN3296
HAZARD CLASS	2.2 NON-FLAMMABLE, COMPRESSED GAS
SUBSIDIARY RISK	N/A
PACKING GROUP	N/A
MEDICAL/FIRST AID GUIDE	N/A

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