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**MATERIAL SAFETY DATA SHEET**

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GREAT LAKES CHEMICAL -- 1,1,1,2,3,3,3-HEPTAFLUOROPROPANE, FM-200  
NSN: 421000N078336  
Manufacturer's CAGE: 2E394  
Part No. Indicator: A  
Part Number/Trade Name: 1,1,1,2,3,3,3-HEPTAFLUOROPROPANE, FM-200

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General Information  
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Company's Name: GREAT LAKES CHEMICAL CORP  
Company's Street: ONE GREAT LAKES BLVD  
Company's P. O. Box: 2200  
Company's City: WEST LAFAYETTE  
Company's State: IN  
Company's Country: US  
Company's Zip Code: 47906  
Company's Emerg Ph #: 501-862-5141  
Company's Info Ph #: 317-497-6100  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SMJ  
Date MSDS Prepared: 01FEB96  
Safety Data Review Date: 22JUL97  
MSDS Serial Number: CFHNX  
Hazard Characteristic Code: NK

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Ingredients/Identity Information  
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Proprietary: NO  
Ingredient: 1,1,1,2,3,3,3-HEPTAFLUOROPROPANE  
Ingredient Sequence Number: 01  
Percent: >99  
NIOSH (RTECS) Number: 1015387HP  
CAS Number: 431-89-0  
OSHA PEL: N/K (FP N)  
ACGIH TLV: N/K (FP N)

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Proprietary: NO  
Ingredient: SUPDAT:LEVEL (NOAEL) TO BE 9%. LOWEST OBSERVABLE ADVERSE EFT  
LEVEL (LOAEL) FOR THIS STUDY WAS RPTD TO BE 10.5%. (ING 3)

Ingredient Sequence Number: 02  
NIOSH (RTECS) Number: 999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Proprietary: NO  
Ingredient: ING 2:A 90 DAY INHAL STUDY DID NOT FIND ANY EXPOS RELATED EFTS  
AT 105,000 PPM (10.5% VOL./VOL.), HIGHEST LEVEL (ING 4)  
Ingredient Sequence Number: 03  
NIOSH (RTECS) Number: 999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Proprietary: NO  
Ingredient: ING 3:TESTED. INHAL STUDIES LOOKING FOR DEVELOPMENTAL EFTS ON  
PREGNANT RABBITS & RATS/THEIR OFFSPRING DID NOT (ING 5)  
Ingredient Sequence Number: 04  
NIOSH (RTECS) Number: 999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Proprietary: NO  
Ingredient: ING 4:SHOW ANY EXPOS RELATED EFTS @ HIGHEST CONCS TESTED (105,  
000 PPM). SIGNS & SYMPS OF EXPOS:SYMPS SIMILAR TO (ING 6)  
Ingredient Sequence Number: 05  
NIOSH (RTECS) Number: 999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Proprietary: NO  
Ingredient: ING 5:OXYGEN DEPRIVATION (HEADACHE, NAUS, DIZZINESS/LOSS OF  
CONSCIOUSNESS) MAY RSLT FROM OVEREXP BY INHAL. HEART(ING 7)  
Ingredient Sequence Number: 06  
NIOSH (RTECS) Number: 999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Proprietary: NO  
Ingredient: ING 6:IRREGULARITIES SUCH AS IRREGULAR PULSE/HEART  
PALPITATIONS MAY INDICATE CARDIAC SENSITIVITY. COLD, WHITE/ (ING 8)  
Ingredient Sequence Number: 07  
NIOSH (RTECS) Number: 999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Proprietary: NO  
Ingredient: ING 7:DISCOLORED SKIN/IN SEV CASES BLISTERING, CAN BE SIGN OF  
FROSTBITE CAUSED BY COLD LIQ/GASES. FOR DETAILED (ING 9)  
Ingredient Sequence Number: 08  
NIOSH (RTECS) Number: 999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Proprietary: NO  
Ingredient: ING 8:TOXICOLOGICAL STUDY INFORMATION CONTACT NEHC (FP N).  
Ingredient Sequence Number: 09

NIOSH (RTECS) Number: 999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Proprietary: NO

Ingredient: MED CNDTNS:EXPOSURE TO THESE TYPES OF COMPOUNDS.

Ingredient Sequence Number: 10

NIOSH (RTECS) Number: 999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

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Physical/Chemical Characteristics

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Appearance And Odor: COLORLESS GAS, ODORLESS.

Boiling Point: 3F,-16C

Melting Point: -204F,-131C

Vapor Pressure (MM Hg/70 F): 58.8 PSIA

Vapor Density (Air=1): 6.04

Specific Gravity: 1.46 (WATER =1)

Evaporation Rate And Ref: NOT KNOWN

Solubility In Water: 260 MG/L

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Fire and Explosion Hazard Data

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Flash Point: NONFLAMMABLE GAS

Lower Explosive Limit: N/A

Upper Explosive Limit: N/A

Extinguishing Media: ALL CONVENTIONAL MEDIA ARE SUITABLE.

Special Fire Fighting Proc: NIOSH APPRVD SCBA & FULL PROT EQUIP (FP N).

KEEP CYLS COOL W/WATER SPRAY APPLIED FROM SAFE DIST. DO NOT ALLOW REENTRY INTO AREAS WHERE MATL HAS BEEN (SUPDAT)

Unusual Fire And Expl Hazrds: ALTHOUGH CNTNRS OF PROD ARE PROVIDED W/PRESS & TEMP RELIEF DEVICES, CNTNRS CAN RUPTURE IF EXPOS TO LOCALIZED HEAT. THERM DECOMP WILL GENERATE TOXIC & (SUPDAT)

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Reactivity Data

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Stability: YES

Cond To Avoid (Stability): NONE KNOWN.

Materials To Avoid: POWDERED METALS (EX. AL, MG/ZN) & STRONG ALKALIS, OXIDIZERS/REDUCING AGENTS ARE NOT COMPAT W/THIS & MOST OTHER (SUPDAT)

Hazardous Decomp Products: DECOMP BY ELEVATED TEMPS (FIRE CNDTNS, GLOWING METAL SURF) MAY GENERATE HAZ DECOMP PRODS COMMON TO OTHER CFCS, (SUPDAT)

Hazardous Poly Occur: NO

Conditions To Avoid (Poly): NOT RELEVANT.

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Health Hazard Data

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LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route Of Entry - Inhalation: YES

Route Of Entry - Skin: NO

Route Of Entry - Ingestion: NO

Health Haz Acute And Chronic: ACUTE:HUMAN HLTH HAZ OF PROD ARE EXPECTED TO BE SIMILAR TO OTHER LIQUIFIED GASES INCL N\*2, CO\*2, CFCS, HCFCS, & HBFCS. THEREFORE, DIRECT EYE/SKIN CONT W/LIQ OR COLD GAS CAN CAUSE CHILLING/ POSSIBLY FROSTBITE OF EXPOS TISS. INHAL OF HIGH CONCS CAN BE HARMFUL/FATAL DUE TO OXYG DEPRIVATION AND/OR HEART (EFTS OF OVEREXP)

Carcinogenicity - NTP: NO

Carcinogenicity - IARC: NO

Carcinogenicity - OSHA: NO

Explanation Carcinogenicity: NOT RELEVANT.

Signs/Symptoms Of Overexp: HLTH HAZ:IRREGULARITIES (ARRHY). MISUSE OF PROD BY DELIBERATELY INHALING HIGH CONCS OF GAS COULD CAUSE DEATH W/OUT WARNING. PERSONS W/PREEXISTING CARD/CNS DISORDERS MAY BE MORE SUSCEPTIBLE TO EFTS OF OVEREXP. ANIMAL STUDIES HAVE FOUND RAT 4 HR LC50 TO BE >788,696 PPM ( 80%), HIGHEST LEVEL TESTED. CARD SENSIT (SUPDAT)

Med Cond Aggravated By Exp: PERSONS W/PREEXISTING CARD, RESP/CNS DISORDERS MAY BE MORE SUSCEPTIBLE TO EFTS OF OVEREXP. USE OF EPINEPHRINE/ SIMILAR CMPDS CAN INCR SUSCEPTIBILITY TO HEART IRREGULARITIES CAUSED BY EXCESS (ING10)

Emergency/First Aid Proc: INGEST:CALL MD IMMEDIATELY (FP N). INHAL: REMOVE TO FRESH AIR; GIVE ARTIFICIAL RESPIRATION. IF BRTHG IS DIFFICULT, GIVE OXYGEN. GET MEDICAL ATTENTION. SKIN:FLUSH WITH WATER; IF FROSTBITE OCCURS, GET MEDICAL ATTENTION. EYES:FLUSH WITH WATER FOR AT LEAST 15 MINUTES. GET MEDICAL ATTENTION.

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Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: EVAC AREA & VENTILATE. DO NOT ENTER AREAS WHERE HIGH CONCS MAY EXIST (ESPECIALLY CONFINED/POORLY VENTILATED AREAS) W/ OUT APPROP PROT EQUIP INCLUDING NIOSH APPRVD SELF-CONTAINED BREATHING APPARATUS. Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Method: NON-CONTAMD PROD IS RECLAIMABLE. CONT GREAT LAKES CHEM CORP FOR INFO. OTHERWISE, DISPOSE OF WASTE IN APPRVD CHEM INCIN EQUIPPED W/SCRUBBER AS ALLOWED BY CURRENT LOCAL, STATE/PROVINCE, FED/ CANADIAN LAWS & REGULATIONS.

Precautions-Handling/Storing: USE SAME TYPE OF PRECAUTIONS AS WOULD BE USED IN HNDLG ANY CRYOGENIC GAS. PROTECT CNTNR FROM DAMAGE. HANDLE IN WELL-VENTILATED AREAS.

Other Precautions: WHEN THIS MATL IS USED AS FIRE FIGHTING AGENT IN FIXED OR PORTABLE EXTINGUISHING SYSTEMS, FOLLOW MFR'S INSTRUCTIONS FOR OPERATION, INSPECTION, MAINTENANCE & REPAIR OF THE SYSTEM.

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Control Measures

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Respiratory Protection: WEAR A NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS IN EMERGENCY SITUATIONS.  
Ventilation: LOCAL EXHAUST-USE TO MINIMIZE EXPOSURE TO GAS. MECHANICAL-USE FOR GENERAL AREA CONTROL.  
Protective Gloves: LINED NEOPRENE GLOVES.  
Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES (FP N).  
Other Protective Equipment: ANSI APPRVD EYE WASH & DELUGE SHOWER (FP N).  
Work Hygienic Practices: ENSURE PIPING IS EMPTY BEFORE DOING MAINTENANCE WORK.  
Suppl. Safety & Health Data: FIRE FIGHT PROC:RELEASED W/OUT FIRST VENTILATING TO REMOVE PRODS OF COMBUST/DECOMP. EXPLO HAZ:CORR GASES. MATLS TO AVOID:HALOGENATED ORG CMPDS. HAZ DECOMP PROD:HCFCs/HBFCs. THESE CAN INCL HYDROGEN FLUORIDE, CARBON MONOXIDE, CARBON DIOXIDE & OTHERS. EFTS OF OVEREXP:STUDY IN DOGS FOUND NO OBSERVABLE ADVERSE EFT (ING 2)

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Transportation Data

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Disposal Data

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Label Data

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Label Required: YES  
Technical Review Date: 22JUL97  
Label Date: 22JUL97  
Label Status: G  
Common Name: 1,1,1,2,3,3,3-HEPTAFLUOROPROPANE, FM-200  
Chronic Hazard: NO  
Signal Word: WARNING!  
Acute Health Hazard-Moderate: X  
Contact Hazard-Moderate: X  
Fire Hazard-None: X  
Reactivity Hazard-None: X  
Special Hazard Precautions: ACUTE:DIRECT CONTACT WITH LIQUID OR COLD GAS CAN CAUSE CHILLING OR POSSIBLY FROSTBITE OF EXPOSED TISSUE. ASPHYXIANT-SYMPTOMS INCLUDE HEADACHE, NAUSEA, DIZZINESS AND UNCONSCIOUSNESS. IRREGULAR HEARTBEATS MAY ALSO OCCUR. CHRONIC:NONE LISTED BY MANUFACTURER.  
Protect Eye: Y  
Protect Skin: Y  
Protect Respiratory: Y  
Label Name: GREAT LAKES CHEMICAL CORP  
Label Street: ONE GREAT LAKES BLVD  
Label P.O. Box: 2200  
Label City: WEST LAFAYETTE  
Label State: IN  
Label Zip Code: 47906  
Label Country: US  
Label Emergency Number: 501-862-5141