MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATHESON TRI-GAS, INC.
959 ROUTE 46 EAST
PARSIPPANY, NEW JERSEY 07054-0624

EMERGENCY CONTACT:
CHEMTREC 1-800-424-9300
INFORMATION CONTACT:
973-257-1100

SUBSTANCE: CHLORODIFLUOROMETHANE

TRADE NAMES/SYNONYMS:
MTG MSDS 41; MONOCHLORODIFLUOROMETHANE; DIFLUOROMONOCHLOROMETHANE;
DIFLUOROCHLOROMETHANE; FREON 22; FRIGEN 22; REFRIGERANT 22; UN 1018; CHClF2;
MAT04760; RTECS PA6390000

CHEMICAL FAMILY: halogenated hydrocarbons

CREATION DATE: Jan 24 1989
REVISION DATE: Dec 15 2003

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: CHLORODIFLUOROMETHANE
CAS NUMBER: 75-45-6
PERCENTAGE: 100.0

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=2  FIRE=0  REACTIVITY=1

EMERGENCY OVERVIEW:
COLOR: colorless
PHYSICAL FORM: liquefied gas
ODOR: sweet odor
MAJOR HEALTH HAZARDS: central nervous system depression, difficulty breathing
PHYSICAL HAZARDS: Containers may rupture or explode if exposed to heat. May decompose when heated. Releases toxic, corrosive, flammable or explosive gases.

POTENTIAL HEALTH EFFECTS:
INHALATION:
SHORT TERM EXPOSURE: irritation, nausea, vomiting, difficulty breathing, headache, drowsiness, dizziness, disorientation, difficulty speaking, emotional disturbances, tingling sensation, tremors, loss of coordination, suffocation, convulsions, coma
LONG TERM EXPOSURE: irregular heartbeat, dizziness

SKIN CONTACT:
SHORT TERM EXPOSURE: frostbite, irritation
LONG TERM EXPOSURE: no information is available

EYE CONTACT:
SHORT TERM EXPOSURE: frostbite, irritation
LONG TERM EXPOSURE: no information is available

INGESTION:
SHORT TERM EXPOSURE: ingestion of harmful amounts is unlikely, frostbite
LONG TERM EXPOSURE: ingestion of harmful amounts is unlikely

4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

SKIN CONTACT: If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115 F; 41-46 C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.

EYE CONTACT: Contact with liquid: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: If a large amount is swallowed, get medical attention.

NOTE TO PHYSICIAN: For inhalation, consider oxygen.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Negligible fire hazard. Containers may rupture or explode if exposed to heat.

EXTINGUISHING MEDIA: carbon dioxide, regular dry chemical

Large fires: Use regular foam or flood with fine water spray.

FIRE FIGHTING: Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck, evacuation radius: 800 meters (1/2 mile).
6. ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:
Stop leak if possible without personal risk. Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas.

7. HANDLING AND STORAGE


8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:
CHLORODIFLUOROMETHANE:
1000 ppm (3540 mg/m3) OSHA TWA (vacated by 58 FR 35338, June 30, 1993)
1000 ppm ACGIH TWA
1000 ppm (3500 mg/m3) NIOSH recommended TWA 10 hour(s)
1250 ppm (4375 mg/m3) NIOSH recommended STEL

VENTILATION: Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: For the gas: Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing.

GLOVES: Wear insulated gloves.

PROTECTIVE MATERIAL TYPES: neoprene, polyvinyl alcohol (PVA), Viton(R)

RESPIRATOR: Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use.

For Unknown Concentrations or Immediately Dangerous to Life or Health - Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure
mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full facepiece.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYSICAL STATE</td>
<td>gas</td>
</tr>
<tr>
<td>APPEARANCE</td>
<td>clear</td>
</tr>
<tr>
<td>COLOR</td>
<td>colorless</td>
</tr>
<tr>
<td>PHYSICAL FORM</td>
<td>liquefied gas</td>
</tr>
<tr>
<td>MOLECULAR WEIGHT</td>
<td>86.47</td>
</tr>
<tr>
<td>MOLECULAR FORMULA</td>
<td>C-H-Cl-F2</td>
</tr>
<tr>
<td>BOILING POINT</td>
<td>-42 F (-41 C)</td>
</tr>
<tr>
<td>FREEZING POINT</td>
<td>-256 to -231 F (-160 to -146 C)</td>
</tr>
<tr>
<td>DECOMPOSITION POINT</td>
<td>&gt;500 F (&gt;260 C)</td>
</tr>
<tr>
<td>VAPOR PRESSURE</td>
<td>7120 mmHg @ 21 C</td>
</tr>
<tr>
<td>VAPOR DENSITY (air=1)</td>
<td>3.11</td>
</tr>
<tr>
<td>SPECIFIC GRAVITY (water=1)</td>
<td>3.87 @ 0 C</td>
</tr>
<tr>
<td>WATER SOLUBILITY</td>
<td>0.3% @ 25 C</td>
</tr>
<tr>
<td>PH</td>
<td>neutral</td>
</tr>
<tr>
<td>VOLATILITY</td>
<td>Not applicable</td>
</tr>
<tr>
<td>ODOR THRESHOLD</td>
<td>Not available</td>
</tr>
<tr>
<td>EVAPORATION RATE</td>
<td>Not applicable</td>
</tr>
<tr>
<td>VISCOSITY</td>
<td>0.0122 cP @ 0 C</td>
</tr>
<tr>
<td>COEFFICIENT OF WATER/OIL DISTR.</td>
<td>Not applicable</td>
</tr>
<tr>
<td>SOLVENT SOLUBILITY</td>
<td>Soluble: ether, acetone, chloroform, hydrocarbons, ketones, esters, organic acids</td>
</tr>
<tr>
<td></td>
<td>Insoluble: glycols, glycerol, phenols, castor oils</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Reactivity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>REACTIVITY</td>
<td>May decompose on contact with heat and/or storage and use above room temperature. Releases toxic, corrosive, flammable or explosive gases.</td>
</tr>
<tr>
<td>CONDITIONS TO AVOID</td>
<td>Protect from physical damage and heat. Containers may rupture or explode if exposed to heat.</td>
</tr>
<tr>
<td>INCOMPATIBILITIES</td>
<td>bases, metals, oxidizing materials</td>
</tr>
<tr>
<td>HAZARDOUS DECOMPOSITION</td>
<td>Thermal decomposition products: halogenated compounds, oxides of carbon, hydrochloric acid, chlorine, phosgene</td>
</tr>
<tr>
<td>POLYMERIZATION</td>
<td>Will not polymerize.</td>
</tr>
</tbody>
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11. TOXICOLOGICAL INFORMATION

CHLORODIFLUOROMETHANE:

TOXICITY DATA:
35 pph/15 minute(s) inhalation-rat LC50

CARCINOGEN STATUS: IARC: Human Inadequate Evidence, Animal Limited Evidence, Group 3; ACGIH: A4 -Not Classifiable as a Human Carcinogen

ACUTE TOXICITY LEVEL:
Relatively Non-toxic: inhalation

TARGET ORGANS: central nervous system

MUTAGENIC DATA: Available.

REPRODUCTIVE EFFECTS DATA: Available.

ADDITIONAL DATA: Stimulants such as epinephrine may induce ventricular fibrillation.

12. ECOLOGICAL INFORMATION

FATE AND TRANSPORT:

KOW: 15135.61 (log = 4.18) (estimated from water solubility)

KOC: 8452.79 (log = 3.93) (estimated from water solubility)

HENRY'S LAW CONSTANT: 2.7 E -1 atm-m3/mol

BIOCONCENTRATION: 6.78 (estimated from water solubility)

AQUATIC PROCESSES: 2.4125737 hours (River Model: 1 m deep, 1 m/s flow, 3 m/s wind)

ENVIRONMENTAL SUMMARY: Relatively non-persistent in the environment. Not expected to leach through the soil or the sediment. Accumulates very little in the bodies of living organisms. Highly volatile from water.

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

PROPER SHIPPING NAME: Chlorodifluromethane

ID NUMBER: UN1018

HAZARD CLASS OR DIVISION: 2.2

LABELING REQUIREMENTS: 2.2
CANADIAN TRANSPORTATION OF DANGEROUS GOODS:
SHIPPING NAME: Chlorodifluoromethane
UN NUMBER: UN1018
CLASS: 2.2

15. REGULATORY INFORMATION

U.S. REGULATIONS:
CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4): Not regulated.


SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):
ACUTE: Yes
CHRONIC: No
FIRE: No
REACTIVE: No
SUDDEN RELEASE: Yes

SARA TITLE III SECTION 313 (40 CFR 372.65):
CHLORODIFLUOROMETHANE


STATE REGULATIONS:
California Proposition 65: Not regulated.

CANADIAN REGULATIONS:
WHMIS CLASSIFICATION: A.

NATIONAL INVENTORY STATUS:
U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

CANADA INVENTORY (DSL/NDSL): Not determined.

16. OTHER INFORMATION

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