Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name
HALOCARBON 14

Synonyms
TETRAFLUOROMETHANE; MTG MSDS 40; CARBON TETRAFLUORIDE; CARBON FLUORIDE (CF4); CARBON FLUORIDE; FC 14; PERFLUOROMETHANE; R 14; R 14 (REFRIGERANT); METHANE, TETRAFLUORO--; FREON 14; TETRAFLUOROCARBON; UN 1982; CF4; RTECS: FG4920000

Chemical Family
halogenated, aliphatic

Product Use
Industrial and Specialty Gas Applications.

Restrictions on Use
None known.

Details of the supplier of the safety data sheet
MATHESON GAS PRODUCT KOREA
91-1 Samgeo-ri; Umbong-myun
Asan City, Korea
Phone: 041-539-7400 (day)
Emergency Phone #: 041-539-7488 (night/weekend/holiday)
Department in charge: SHE

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with paragraph (d) of 29 CFR 1910.1200.
Gases Under Pressure - Liquefied gas
Specific Target Organ Toxicity - Single Exposure - Category 3
Simple Asphyxiant

GHS Label Elements
Symbol(s)

Signal Word
Warning

Hazard Statement(s)
Contains gas under pressure; may explode if heated.
May displace oxygen and cause rapid suffocation.

Precautionary Statement(s)
Prevention
Use only outdoors or in a well-ventilated area.
Avoid breathing dust/fume/gas/mist/vapors/spray.

Response
IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing.
Call a POISON CENTER or doctor if you feel unwell.

Storage
Safety Data Sheet

Material Name: HALOCARBON 14

Protect from sunlight.
Store in a well-ventilated place.

Disposal
Dispose of contents/container in accordance with local/regional/national/international regulations.

Other Hazards
May cause frostbite upon sudden release of liquefied gas.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>CAS</th>
<th>Component Name</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>75-73-0</td>
<td>HALOCARBON 14</td>
<td>100</td>
</tr>
</tbody>
</table>

Section 4 - FIRST AID MEASURES

Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor if you feel unwell.

Skin
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.

Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.

Ingestion
If swallowed, get medical attention.

Most Important Symptoms/Effects
Acute
suffocation
Delayed
No data available.

Note to Physicians
For inhalation, consider oxygen.

Section 5 - FIRE FIGHTING MEASURES

Extinguishing Media
Suitable Extinguishing Media
carbon dioxide, regular dry chemical, Large fires: Use regular foam or flood with fine water spray.

Unsuitable Extinguishing Media
None known.

Special Hazards Arising from the Chemical
Negligible fire hazard.

Hazardous Combustion Products
halogenated compounds, Hydrogen fluoride

Fire Fighting Measures
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). Use extinguishing agents appropriate for surrounding fire. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Do not get water directly on material. Reduce
vapors with water spray. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Consider downwind evacuation if material is leaking.

**Special Protective Equipment and Precautions for Firefighters**
Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure.

### Section 6 - ACCIDENTAL RELEASE MEASURES

#### Personal Precautions, Protective Equipment and Emergency Procedures
Wear personal protective clothing and equipment, see Section 8. Do not eat, drink or smoke when using this product. Wash thoroughly after handling.

#### Methods and Materials for Containment and Cleaning Up
Stop leak if possible without personal risk. Do not touch or walk through spilled material. Keep unnecessary people away, isolate hazard area and deny entry. Do not direct water at spill or source of leak. Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material. Ventilate closed spaces before entering. Stay upwind and keep out of low areas.

#### Environmental Precautions
Avoid release to the environment. Prevent entry into waterways, sewers, basements, or confined areas.

### Section 7 - HANDLING AND STORAGE

#### Precautions for Safe Handling
Use only outdoors or in a well-ventilated area. Avoid breathing gas. Wash thoroughly after handling. Protect from physical damage. Damaged cylinders should be handled only by specialists.

#### Conditions for Safe Storage, Including any Incompatibilities
Protect from sunlight.
Store in a well-ventilated place.
Store and handle in accordance with all current regulations and standards. Protect from physical damage. See original container for storage recommendations. Keep separated from incompatible substances.

#### Incompatible Materials
- metals, oxidizing materials

### Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

#### Component Exposure Limits

<table>
<thead>
<tr>
<th>Material</th>
<th>Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>HALOCARBON 14</td>
<td>75-73-0</td>
</tr>
<tr>
<td>ACGIH:</td>
<td>2.5 mg/m3 TWA as F (related to Fluorides)</td>
</tr>
<tr>
<td>NIOSH:</td>
<td>250 mg/m3 IDLH as F (related to Fluorides)</td>
</tr>
<tr>
<td>OSHA (US):</td>
<td>2.5 mg/m3 TWA as F (related to Fluorides)</td>
</tr>
<tr>
<td>Mexico:</td>
<td>2.5 mg/m3 TWA VLE-PPT as F (related to Fluorides)</td>
</tr>
</tbody>
</table>

**ACGIH - Threshold Limit Values - Biological Exposure Indices (BEI)**

**HALOCARBON 14 (75-73-0)**

- 2 mg/l Medium: urine Time: prior to shift Parameter: Fluoride (background, nonspecific )
- 3 mg/l Medium: urine Time: end of shift Parameter: Fluoride (background, nonspecific ) (related to Fluorides)

**Engineering Controls**
Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.
Individual Protection Measures, such as Personal Protective Equipment

Eye/face protection
Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

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

Respiratory Protection
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 a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode. Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Glove Recommendations
Wear insulated gloves.

### Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>Odor</strong></td>
<td>odorless</td>
</tr>
<tr>
<td><strong>Odor Threshold</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>Melting Point</strong></td>
<td>-187 °C (-305 °F)</td>
</tr>
<tr>
<td><strong>Boiling Point</strong></td>
<td>-128 °C (-198 °F)</td>
</tr>
<tr>
<td><strong>Boiling Point Range</strong></td>
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</tr>
<tr>
<td><strong>Evaporation Rate</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>Autoignition Temperature</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>Lower Explosive Limit</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>Upper Explosive Limit</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>Vapor Density (air=1)</strong></td>
<td>3.05</td>
</tr>
<tr>
<td><strong>Water Solubility</strong></td>
<td>0.0015 % (@ 25 °C )</td>
</tr>
<tr>
<td><strong>Partition coefficient: n-octanol/water</strong></td>
<td>Not available</td>
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<tr>
<td><strong>Viscosity</strong></td>
<td>0.17 cp</td>
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<tr>
<td><strong>Solubility (Other)</strong></td>
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<tr>
<td><strong>Log KOW</strong></td>
<td>1.18</td>
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<tr>
<td><strong>Molecular Formula</strong></td>
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<tr>
<td><strong>Physical State</strong></td>
<td>gas</td>
</tr>
<tr>
<td><strong>Color</strong></td>
<td>colorless</td>
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<tr>
<td><strong>pH</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>Freezing Point</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>Flammability (solid, gas)</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>Flash Point</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>Decomposition temperature</strong></td>
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</tr>
<tr>
<td><strong>Vapor Pressure</strong></td>
<td>799 mmHg @ -127 °C</td>
</tr>
<tr>
<td><strong>Specific Gravity (water=1)</strong></td>
<td>1.89 at -183 °C</td>
</tr>
<tr>
<td><strong>Partition coefficient: n-octanol/water</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>Kinematic viscosity</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>Density</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>Physical Form</strong></td>
<td>gas</td>
</tr>
<tr>
<td><strong>Molecular Weight</strong></td>
<td>88.01</td>
</tr>
</tbody>
</table>
Safety Data Sheet

Material Name: HALOCARBON 14   SDS ID: 00233356

Section 10 - STABILITY AND REACTIVITY

Reactivity
No reactivity hazard is expected.

Chemical Stability
Stable at normal temperatures and pressure.

Possibility of Hazardous Reactions
Will not polymerize.

Conditions to Avoid
Protect from physical damage and heat. Containers may rupture or explode if exposed to heat.

Incompatible Materials
metals

Hazardous decomposition products
halogenated compounds, hydrogen fluoride

Section 11 - TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Inhalation
nausea, vomiting, difficulty breathing, headache, drowsiness, dizziness, convulsions, coma

Skin Contact
frostbite

Eye Contact
frostbite, Irritation, blurred vision

Ingestion
Ingestion of gas is unlikely.

Acute and Chronic Toxicity

Component Analysis - LD50/LC50
The components of this material have been reviewed in various sources and no selected endpoints have been identified.

Product Toxicity Data

Acute Toxicity Estimate
No data available.

Immediate Effects
suffocation frostbite.

Delayed Effects
No data available.

Irritation/Corrosivity Data
No animal testing data available for skin or eyes.

Respiratory Sensitization
No data available.

Dermal Sensitization
No data available.

Component Carcinogenicity

<table>
<thead>
<tr>
<th>Component</th>
<th>Carcinogenicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>HALOCARBON 14</td>
<td>75-73-0</td>
</tr>
</tbody>
</table>

ACGIH: A4 - Not Classifiable as a Human Carcinogen (related to Fluorides)

Germ Cell Mutagenicity
No data available.

Tumorigenic Data
Safety Data Sheet

Material Name: HALOCARBON 14

No data available

**Reproductive Toxicity**

No data available.

**Specific Target Organ Toxicity - Single Exposure**

No data available.

**Specific Target Organ Toxicity - Repeated Exposure**

No data available.

**Aspiration hazard**

Not applicable.

**Medical Conditions Aggravated by Exposure**

None known.

### Section 12 - ECOLOGICAL INFORMATION

**Component Analysis - Aquatic Toxicity**

No LOLI ecotoxicity data are available for this product's components.

**Persistence and Degradability**

No information available.

**Bioaccumulative Potential**

No information available.

**Mobility**

No information available.

### Section 13 - DISPOSAL CONSIDERATIONS

**Disposal Methods**

Dispose of contents/container in accordance with local/regional/national/international regulations.

**Component Waste Numbers**

The U.S. EPA has not published waste numbers for this product's components.

### Section 14 - TRANSPORT INFORMATION

**US DOT Information:**

Shipping Name: TETRAFLUOROMETHANE

Hazard Class: 2.2

UN/NA #: UN1982

Required Label(s): 2.2

**IMDG Information:**

Shipping Name: TETRAFLUOROMETHANE

Hazard Class: 2.2

UN#: UN1982

Required Label(s): 2.2

**International Bulk Chemical Code**

This material does not contain any chemicals required by the IBC Code to be identified as dangerous chemicals in bulk.

### Section 15 - REGULATORY INFORMATION

**U.S. Federal Regulations**

None of this product's components are listed under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.

**SARA Section 311/312 (40 CFR 370 Subparts B and C) reporting categories**

Gas Under Pressure; Specific Target Organ Toxicity; Simple Asphyxiant
Safety Data Sheet

Material Name: HALOCARBON 14

U.S. State Regulations
The following components appear on one or more of the following state hazardous substances lists:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS</th>
<th>CA</th>
<th>MA</th>
<th>MN</th>
<th>NJ</th>
<th>PA</th>
</tr>
</thead>
<tbody>
<tr>
<td>HALOCARBON 14</td>
<td>75-73-0</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Not listed under California Proposition 65

Canada Regulations
Canadian WHMIS Ingredient Disclosure List (IDL)
The components of this product are either not listed on the IDL or are present below the threshold limit listed on the IDL.

WHMIS Classification

A

Component Analysis - Inventory
HALOCARBON 14 (75-73-0)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>DSL</td>
<td>EIN</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Section 16 - OTHER INFORMATION

NFPA Ratings
Health: 2 Fire: 1 Reactivity: 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Summary of Changes
Updated: 05/01/2015

Key / Legend
ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CA/MA/MN/NJ/PA - California/Massachusetts/Minnesota/New Jersey/Pennsylvania*; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CFR - Code of Federal Regulations (US); CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EC – European Commission; EEC - European Economic Community; EIN - European Inventory of (Existing Commercial Chemical Substances); EINECS - European Inventory of Existing Commercial Chemical Substances; ENCS - Japan Existing and New Chemical Substance Inventory; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; F - Background (for Venezuela Biological Exposure Indices); IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; ISHL - Japan Industrial Safety and Health Law; IUCLID - International Uniform Chemical Information Database; JP - Japan; Kow - Octanol/water partition coefficient; KR KECI Annex 1 - Korea Existing Chemicals Inventory (KECI) / Korea Existing Chemicals List (KECL); KR KECI Annex 2 - Korea Existing Chemicals Inventory (KECI) / Korea Existing Chemicals List (KECL); KR - Korea; LD50/LC50 - Lethal Dose/ Lethal Concentration; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of Lists™ - ChemADVISOR’s Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; MX – Mexico; Ne- Non-
Safety Data Sheet

Material Name: HALOCARBON 14

SDS ID: 00233356

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