MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATHESON TRI-GAS, INC.  Emergency Contact:
150 Allen Road Suite 302  CHEMTREC 1-800-424-9300
Basking Ridge, New Jersey 07920  Calls Originating Outside the US:
Information: 1-800-416-2505  703-527-3887 (Collect Calls Accepted)

SUBSTANCE: SULFURYL FLUORIDE

TRADE NAMES/SYNONYMS:
MTG MSDS 150; SULFURIC OXYFLUORIDE; VIKANE; VIKANE FUMIGANT; STCC 4904578; UN 2191; MAT22380; RTECS WT5075000

CHEMICAL FAMILY: inorganic, gas

CREATION DATE: Jan 24 1989
REVISION DATE: Dec 11 2008

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: SULFURYL FLUORIDE
CAS NUMBER: 2699-79-8
PERCENTAGE: >99

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=3  FIRE=0  REACTIVITY=0

EMERGENCY OVERVIEW:
COLOR: colorless
PHYSICAL FORM: gas
ODOR: odorless
MAJOR HEALTH HAZARDS: harmful if inhaled, respiratory tract irritation, eye irritation
PHYSICAL HAZARDS: Containers may rupture or explode if exposed to heat.

POTENTIAL HEALTH EFFECTS:
INHALATION:
SHORT TERM EXPOSURE: irritation, itching, nausea, vomiting, stomach pain, symptoms of drunkenness, tingling sensation, lung congestion, convulsions
LONG TERM EXPOSURE: no information on significant adverse effects
SKIN CONTACT:
SHORT TERM EXPOSURE: frostbite
LONG TERM EXPOSURE: no information is available
EYE CONTACT:
SHORT TERM EXPOSURE: irritation, blurred vision
LONG TERM EXPOSURE: no information on significant adverse effects
INGESTION:
SHORT TERM EXPOSURE: no information on significant adverse effects
LONG TERM EXPOSURE: no information is available

4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. 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: 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.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Negligible fire hazard.

EXTINGUISHING MEDIA: carbon dioxide, regular dry chemical

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

FIRE FIGHTING: Do not get water inside container. 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. Keep unnecessary people away, isolate hazard area and deny entry.

FLASH POINT: not flammable

6. ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:
Stop leak if possible without personal risk. Reduce vapors with water spray. Do not get water directly on

7. HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:
SULFURYL FLUORIDE:
5 ppm (20 mg/m3) OSHA TWA
10 ppm (42 mg/m3) OSHA STEL (vacated by 58 FR 35338, June 30, 1993)
5 ppm ACGIH TWA
10 ppm ACGIH STEL
5 ppm (20 mg/m3) NIOSH recommended TWA 10 hour(s)
10 ppm (40 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.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.
50 ppm
Any supplied-air respirator.
125 ppm
Any supplied-air respirator operated in a continuous-flow mode.
200 ppm
Any self-contained breathing apparatus with a full facepiece.
Any supplied-air respirator with a full facepiece.
Emergency or planned entry into unknown concentrations or IDLH conditions -
Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.
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.

**Escape**
Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted canister providing protection against the compound of concern.
Any appropriate escape-type, self-contained breathing apparatus.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PHYSICAL STATE</strong></td>
<td>gas</td>
</tr>
<tr>
<td><strong>COLOR</strong></td>
<td>colorless</td>
</tr>
<tr>
<td><strong>ODOR</strong></td>
<td>odorless</td>
</tr>
<tr>
<td><strong>MOLECULAR FORMULA</strong></td>
<td>F2-O2-S</td>
</tr>
<tr>
<td><strong>BOILING POINT</strong></td>
<td>-67 F (-55 C)</td>
</tr>
<tr>
<td><strong>FREEZING POINT</strong></td>
<td>-215 F (-137 C)</td>
</tr>
<tr>
<td><strong>VAPOR PRESSURE</strong></td>
<td>&gt;760 mmHg @ 20 C</td>
</tr>
<tr>
<td><strong>VAPOR DENSITY (air=1)</strong></td>
<td>3.7</td>
</tr>
<tr>
<td><strong>SPECIFIC GRAVITY (water=1)</strong></td>
<td>1.35 @ 20 C</td>
</tr>
<tr>
<td><strong>WATER SOLUBILITY</strong></td>
<td>750 ppm @ 25 C</td>
</tr>
<tr>
<td><strong>PH</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>VOLATILITY</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>ODOR THRESHOLD</strong></td>
<td>Not available</td>
</tr>
<tr>
<td><strong>EVAPORATION RATE</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>COEFFICIENT OF WATER/OIL DISTRIBUTION</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>SOLVENT SOLUBILITY</strong></td>
<td>Soluble: alcohol, toluene, carbon tetrachloride</td>
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### 10. STABILITY AND REACTIVITY

**REACTIVITY**: Stable at normal temperatures and pressure.

**CONDITIONS TO AVOID**: Minimize contact with material. Avoid inhalation of material or combustion by-products. Containers may rupture or explode if exposed to heat.

**INCOMPATIBILITIES**: oxidizing materials

**HAZARDOUS DECOMPOSITION**: Thermal decomposition products: acid halides, oxides of sulfur

**POLYMERIZATION**: Will not polymerize.

### 11. TOXICOLOGICAL INFORMATION
SULFURYL FLUORIDE:
TOXICITY DATA: 991 ppm/4 hour(s) inhalation-rat LC50; 100 mg/kg oral-rat LD50
LOCAL EFFECTS:
Irritant: inhalation, eye
ACUTE TOXICITY LEVEL:
Toxic: inhalation, ingestion
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: respiratory disorders
REPRODUCTIVE EFFECTS DATA: Available.

12. ECOLOGICAL INFORMATION

Not available

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:
PROPER SHIPPING NAME: Sulfuryl fluoride
ID NUMBER: UN2191
HAZARD CLASS OR DIVISION: 2.3
LABELING REQUIREMENTS: 2.3
QUANTITY LIMITATIONS:
PASSENGER AIRCRAFT OR RAILCAR: Forbidden
CARGO AIRCRAFT ONLY: Forbidden
ADDITIONAL SHIPPING DESCRIPTION: Toxic-Inhalation Hazard Zone D

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:
SHIPPING NAME: Sulphuryl fluoride
UN NUMBER: UN2191
CLASS: 2.3

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 Subparts B and C):
ACUTE: Yes
CHRONIC: No
FIRE: No
REACTIVE: No
SUDDEN RELEASE: Yes

SARA TITLE III SECTION 313 (40 CFR 372.65):
SULFURYL FLUORIDE


STATE REGULATIONS:
California Proposition 65: Not regulated.

CANADIAN REGULATIONS:
WHMIS CLASSIFICATION: AD1

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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