1. PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT: ProFume™ Gas Fumigant

PURPOSE: Fumigant for insect control.

COMPANY IDENTIFICATION:

Dow AgroSciences Australia Ltd.
ABN 24 003 771 659
Level 5, 20 Rodborough Road,
Frenchs Forest NSW 2086

Customer Service Toll Free Number:
1800 700 096
(Mon-Fri, 8am–5pm EST)

Emergency Telephone Numbers:
Australia: 1800 033 882
Global: +61 3 9663 2130
(24 hours) (EMERGENCIES ONLY)

Transport Emergency Only Dial 000

2. HAZARDOUS IDENTIFICATION:

EMERGENCY OVERVIEW

Classified as hazardous according to the criteria of NOHSC
Classified as Dangerous Goods for Land Transport

Potential Health Effects: Toxic liquid under pressure – forms gas on release. High concentrations of gas can be fatal. Lower concentrations can be irritating to the respiratory system and lungs. Escaping liquid and gas can cause frostbite like burns.

RISK PHRASES:
R23/25: Gas is toxic by inhalation and liquid is toxic if swallowed.
R34 (liquid): Causes burns.
R41 (liquid): Risk of serious damage to eyes.
R37 (gas): Irritating to respiratory system.

SAFETY PHRASES:
S1/2: Keep locked up and out of reach of children.
S23: Do not breathe gas.

S24/25: Avoid contact with skin and eyes.
S39: Wear eye/face protection.
S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

NOTE: Do not wear open top gloves or boots – see section 8 skin protection.

3. COMPOSITION/INFORMATION ON INGREDIENTS:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS #</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuryl fluoride</td>
<td>2699-79-8</td>
<td>99.8%</td>
</tr>
<tr>
<td>Impurities associated with</td>
<td></td>
<td>0.2%</td>
</tr>
</tbody>
</table>

4. FIRST AID:

Consult the Poisons Information Centre (Australia 131126) or a doctor in every case of suspected chemical poisoning. Never give fluids or induce vomiting if a patient is unconscious or convulsing regardless of cause of injury. If breathing difficulties occur seek medical attention immediately.

EYE: In case of contact by the liquid, immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes, then continue flushing eyes for at least 15 minutes. Obtain medical attention promptly preferably from an ophthalmologist.

SKIN: If shoes, gloves, or clothing covering skin become wet with sulfuryl fluoride, immediately apply water to contaminated clothing before removing. Once area has thawed, remove contaminated items covering skin. Wash thoroughly or shower.

INGESTION: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

INHALATION: Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc.). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility. If person is not breathing and has no pulse, consider cardiopulmonary resuscitation (CPR); use pocket resuscitation mask, bag valve mask, etc., to avoid risk of poisoning rescuer. To prevent pulmonary oedema have the person inhale 5 shots...
of an aerosol corticosteroid metered dose inhaler (if available), such as beclomethasone or fluticasone, etc., every 10 minutes until the person is evaluated by a physician.

NOTE TO PHYSICIAN: Sulfuryl fluoride is a gas, which has no warning properties such as odour or eye irritation. The prediction of possible human effects is based in part on observations made on laboratory animals. Treat frostbite if present (eyes, skin) with gentle re-warming by water irrigation for at least 15 minutes. It is predicted that persons exposed to sulfuryl fluoride will show little evidence of intoxication at first, unless the concentration is very high (>400 ppm). Early symptoms of exposure to sulfuryl fluoride are respiratory irritation and central nervous system depression. Excitation may follow. Slowed movement, reduced awareness, and slow or garbled speech may be noted. It is essential to keep such an individual at bed rest for at least 24 hours. Clinical observations should be directed at the pulmonary, hepatic, and renal systems. Prolonged exposure can produce lung irritation, pulmonary oedema, nausea, and abdominal pain. Repeated exposure to high concentrations can result in significant lung and kidney damage. Convulsions may ensue with respiratory arrest being the terminal event. Assisted respiration may be necessary. Clinical observation is essential. There is no known antidote for over-exposure to sulfuryl fluoride. Consider administering a complete aerosol corticosteroid metered dose inhaler (100 – 150 shots) or equivalent as initial preventive treatment for incipient pulmonary oedema. Consider administering 250 – 1,000 mg prednisolone IV on the first day of treatment. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIRE FIGHTING MEASURES:

FLASH POINT: Not applicable – Not combustible.

FLAMMABLE LIMITS
LFL: Not combustible
UFL: Not combustible

EXTINGUISHING MEDIA: Sulfuryl fluoride is not combustible. However, if cylinders are in a fire area, water should be used to keep them cool to help prevent discharge of product caused by melted fusible plugs on the cylinders. Use of water will also help to scrub out part of any hydrofluoric acid and sulfur dioxide, which may be formed by decomposition of the product in a fire.

FIRE AND EXPLOSION HAZARDS: Cylinders exposed to fire may vent and release toxic gas through melted fusible plugs on cylinders. Although sulfuryl fluoride is not combustible, in temperatures exceeding 400°C, it will degrade to form hydrogen fluoride and sulfur dioxide.

FIRE-FIGHTING EQUIPMENT: Wear positive-pressure, self-contained breathing apparatus and full protective clothing. When fighting fires in atmospheres containing potentially high concentrations of sulfuryl fluoride, encapsulating protective suits should be worn due to possible formation of hydrofluoric acid. Protective suit material should be compatible with exposure to hydrofluoric acid.

HAZCHEM: 2RE

6. ACCIDENTAL RELEASE MEASURES:

ACTION TO TAKE FOR SPILLS/LEAKS: Evacuate immediate area if cylinder begins to leak. Use approved positive-pressure, self-contained breathing apparatus (SCBA) or combination air-supplied/SCBA respirator, such as manufactured by Ranger, Survivair, Scott, or MSA, for entry into affected areas to correct problem. For leaking cylinders occurring near structure being fumigated, place the cylinder inside the designated structure if it can be done safely. If leaking cylinder occurs elsewhere, move leaking or damaged cylinder outdoors or to an isolated location, observing strict safety precautions. Work upwind if possible. Do not permit entry into leakage area by unprotected persons until concentration of fumigant is determined to be 1 ppm or less, as determined by a detection device with sufficient sensitivity such as an INTERSCAN or MIRAN gas analyzer. For detailed information on the source and use of air monitoring devices or respirators, consult Dow AgroSciences at 1800-033-882.

7. HANDLING AND STORAGE:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

HANDLING: Keep out of reach of children. Do not breathe gas. Keep all unnecessary people and pets out of area containing sulfuryl fluoride gas.
SAFETY DATA SHEET

PROFUME™ GAS FUMIGANT

STORAGE: Store in original container away from heat and dwellings.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION:

These precautions are suggested for conditions where the potential for exposure exists. Emergency conditions may require additional precautions.

EXPOSURE GUIDELINES: Sulfuryl fluoride: ACGIH and the Australian NOHSC TLV is 5 ppm (21 mg/m³) TWA, 10 ppm (42 mg/m³) STEL.

Based on monitoring data from mills the Australian Office of Chemical Safety has recommended an air level below 3 ppm as a safe re-entry level after fumigation.

ENGINEERING CONTROLS: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines. Lethal concentrations may exist in areas with poor ventilation.

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

EYE/FACE PROTECTION: Use a face shield or chemical goggles.

SKIN PROTECTION: Skin contact with the liquid may cause freeze injury if the liquid is confined to the skin. The use of protective clothing that may entrap the liquid next to the skin (e.g. unsealed encapsulating suits, exposed open topped boots or open-cuffed gloves) must be avoided.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below exposure guidelines. When respiratory protection is required, use an approved self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. For emergency and other conditions where the exposure guideline may be exceeded, use an approved positive-pressure self-contained breathing apparatus or positive pressure airline with auxiliary self-contained air supply. In confined or poorly ventilated areas, use an approved self-contained breathing apparatus or positive pressure airline with auxiliary self-contained air supply.

APPLICATORS AND ALL OTHER HANDLERS: Refer to the product label for personal protective clothing and equipment.

9. PHYSICAL AND CHEMICAL PROPERTIES:

BOILING POINT: -55°C
VAPOUR PRESSURE: 15.2 atmospheres @ 20°C
VAPOUR DENSITY: 4.3 g/L @ 20°C
SOLUBILITY IN WATER: Practically insoluble
SPECIFIC GRAVITY: 1.35 @ 20°C
APPEARANCE: Colourless
ODOR: Odourless compressed gas

10. STABILITY AND REACTIVITY:

STABILITY: (conditions to avoid) Cylinders may leak or rupture in a fire. Stable under normal storage conditions.

INCOMPATIBILITY: (specific materials to avoid) Strong bases.

HAZARDOUS DECOMPOSITION PRODUCTS: Sulphur dioxide and hydrogen fluoride under fire conditions in the presence of hydrocarbons.

HAZARDOUS POLYMERIZATION: Not known to occur.

11. TOXICOLOGICAL INFORMATION:

POTENTIAL HEALTH EFFECTS: This section includes possible adverse effects, which could occur if this material is not handled in the recommended manner.

EYE: Liquid will cause severe eye damage due to its very cold temperature when released. The gas is non-irritating to eyes.

SKIN: Liquid may cause frostbite. The gas is non-irritating to skin. No adverse effects anticipated by skin absorption.

INGESTION: Moderate toxicity if swallowed. The oral LD₅₀ for rats is 100 mg/kg. Swallowing is unlikely because of the physical state (gas).

INHALATION: Vapour concentrations that are fatal with a single exposure can be attained. Excessive exposure may cause severe irritation to upper respiratory tract (nose and
throat) and lungs. The LC$_{50}$ for a 4-hour exposure for rats is 991-1,122 ppm.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: In animals, effects have been reported on the following organs: brain, central nervous system, kidney, lung, respiratory tract and thyroid gland. Observations in animals include convulsions and tremors. May cause fluorosis of teeth and bones.

CANCER INFORMATION: Did not cause cancer in laboratory animals.

TERATOLOGY (BIRTH DEFECTS): Birth defects are unlikely. Exposures having no effect on the mother should have no effect on the foetus. Did not cause birth defects in animals; other effects were seen in the foetus only at doses which caused toxic effects to the mother.

REPRODUCTIVE EFFECTS: In animal studies, did not interfere with reproduction.

MUTAGENICITY: In-vitro and animal genetic toxicity studies were negative.

12. ECOLOGICAL INFORMATION:

ENVIRONMENTAL DATA:

MOVEMENT & PARTITIONING: Bioconcentration potential is low (BCF <100 or Log Pow <3). Potential for mobility in soil is very high (soil organic carbon/water partition coefficient (Koc) estimated to be 6.124). Moderately volatile in water based on Henry's Law Constant (H) estimated to be 3.28E-02 atm-m$^3$/mole.

DEGRADATION & PERSISTENCE: The hydrolysis half-life is 18 minutes to 3 days. Expected to biodegrade readily based on a Log octanol/water partition coefficient (Log Pow) estimated using a structural fragment method of 0.41.

ECOTOXICOLOGY: Material is highly toxic to aquatic invertebrates on an acute basis (LC$_{50}$ or EC$_{50}$ is between 0.1 and 1 mg/L.)

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHOD: If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulations. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION:

ROAD AND RAIL TRANSPORT: Classified as dangerous goods under the ADG 7.

SEA AND AIR TRANSPORT: Classified as dangerous goods for transport by sea and air in accordance with the International Maritime Dangerous Goods Code (IMDG) and the International Air Transport Association (IATA) Dangerous Goods Regulation.

UN No: UN2191
Class: 2.3
Packing group: Not applicable
SHIPPING NAME: SULPHUROYL FLUORIDE Marine Pollutant

15. REGULATORY INFORMATION:

APVMA APPROVAL NUMBER: 59952

16. OTHER INFORMATION:

Glossary
ACGIH: American Conference of Governmental Industrial Hygienists.
AIHA WEEL: American Industrial Hygiene Association’s Workplace Environmental Exposure Level.
ASCC: Australian Safety and Compensation Commission.
BCF: Bioconcentration Factor - a measure for the characterization of the accumulation of a chemical in an organism. It is defined as the concentration of a chemical in...
an organism (plants, microorganisms, animals) divided by the concentration in a reference compartment (e.g. food, surrounding water).

**Dow AgroSciences Industrial Hygiene Guideline:** An internal company standard based on an 8 hour TWA.

**ECso:** median effective concentration. Statistically derived concentration of a substance in an environmental medium expected to produce a certain effect in 50% of test organisms in a given population under a defined set of conditions.

**Explosive Limits** - The range of concentrations (% by volume in air) of a flammable gas or vapour that can result in an explosion for ignition in a confined space.

**Koc** - the organic carbon partition coefficient (mL soil water /g organic carbon).

**LCso** - Lethal Concentration 50%. A concentration of chemical in air or water that will kill 50% of the test organisms.

**LDso** - Lethal Dose-50%. The dose of a chemical that will kill 50% of the test animals receiving it.


**OSHA:** American Occupational Safety and Health Administration.

**PEL:** Permissible Exposure Level, a maximum allowable exposure level by law.

**pH** - Measure of how acidic or alkaline a material is using a 1 - 14 scale. pH 1 is strongly acidic and pH 14 strongly alkaline.

**Polymerisation** - a chemical reaction in which small molecules 9monomers) combine to form much larger molecules (polymers). A hazardous polymerisation reaction is one that occurs at a fast rate and releases large amounts of energy.

**P ow** - The octanol-water partition coefficient is the ratio of the concentration of a chemical in octanol and in water at equilibrium and at a specified temperature. Octanol is an organic solvent that is used as a surrogate for natural organic matter. This parameter is used in many environmental studies to help determine the fate of chemicals in the environment.

**STEL:** Short-Term Exposure Limit. A term used to indicate the maximum average concentration allowed for a continuous 15 minute exposure period.

**TLV:** Threshold Limit Value, an exposure limit set by a competent authority

**TWA** - Time Weighted Average. The average concentration of a chemical in air over the total exposure time - usually an 8 hour work day.

**References**
- Australian Dangerous Goods Code
- International Maritime Dangerous Goods Code
- International Air Transport Association (IATA) Dangerous Goods Regulation
- NOHSC Hazardous Substances Information System.

**VERSION CONTROL**
- Replaces version dated: 1 December 2007
- Sections amended: 2, 6, 14
- Formulation Number: NA

**FOR FURTHER PRODUCT INFORMATION CALL DOW AGROSCIENCES CUSTOMER SERVICE REPRESENTATIVES TOLL FREE 1800 700 096 DURING BUSINESS HOURS.**

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