

# Safety Data Sheet

## ZYTHOR GAS FUMIGANT

Emergency Phone 1-800-424-9300 (Chemtrec)

### 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** Zythor

**Chemical Name:** Sulfuryl fluoride

**Recommended use of the chemical and restrictions on use:** End Use Fumigant

**Company:** Ensystex II, Inc.

**Address:** 2175 Village Dr., Fayetteville, NC 28304

**Daytime Phone:** 1-800-398-3772

### 2. HAZARDS IDENTIFICATION

#### Hazard classification

This material is hazardous under the criteria of the Federal OSHA Hazard Communication Standard

29CFR 1910.1200

Gases under pressure - Category 1

Acute toxicity - Category 2 - Inhalation

Specific target organ - single exposure - Category 1 - Inhalation

Specific target organ toxicity - repeated exposure - Category 2 - Inhalation

#### Label Elements

##### Hazard pictograms



**Signal Word:** DANGER!

#### Hazards

Contains gas under pressure; may explode if heated.

Fatal if inhaled.

Causes damage to organs (kidney) if inhaled

May cause damage to organs (respiratory system, nervous system, kidney) through prolonged or repeated exposure if inhaled.

#### Precautionary Statements

##### Prevention

Do not breathe dust/fume/gas/mist/vapors/spray.

Wash skin thoroughly after handling.

Do not eat, drink or smoke when using this product.

Use only outdoors or in a well-ventilated area.

Wear respiratory protection.

##### Response

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CONTROL CENTER or doctor/physician.

IF EXPOSED: Call a POISON CONTROL CENTER or doctor/physician.

##### Storage

Store in a well ventilated place. Keep container tightly closed. Store locked up.

##### Disposal

Dispose of contents/ container to an approved waste disposal facility.

##### Other hazards

No data available

### 3. COMPOSITION / INFORMATION ON INGREDIENTS

Sulfuryl fluoride 99.3% CAS# 2699-79-8 EINECS#: 220-281-5

Carbon dioxide 0.5% CAS# 124-38-9

**Balance** Not Available

## 4. FIRST-AID

In all cases of overexposure, when symptoms such as nausea, difficulty in breathing, abdominal pain, slowing of movements and speech or numbness in extremities are exhibited, get medical attention immediately. Take affected person to a doctor or emergency treatment facility.

### Description of first-aid measures

**General advice:** First-Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists, refer to Section 8 for specific personal protective equipment.

**Inhalation:** Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Excessive exposure may severely irritate upper respiratory tract. If breathing is difficult, oxygen should be administered by qualified personnel. If the 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 edema, 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. Consult a physician in all cases.

**Eye Contact:** Hold eye open and rinse slowly and gently with water for at least 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Liquid fumigant in the eye may cause damage due to refrigeration or freezing.

**Skin Contact:** Immediately apply water to contaminated area of clothing before removing. Once area has thawed, remove contaminated clothing, shoes and other items covering skin. Rinse skin immediately with plenty of water for 15-20 minutes.

**Ingestion:** Call a Poison Control Center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the Poison Control Center. Never give anything by mouth to an unconscious person.

**Most important symptoms and effects, both acute and delayed:** Aside from the information found under description of first aid measures above, and indication of immediate medical attention and special treatment needed below, any additional important symptoms and effects are described in Section: 11 Toxicology Information.

### Indication of any immediate medical attention and special treatment needed

**Notes to Physician:** Maintain adequate ventilation and oxygenation of the patient. Sulfuryl fluoride is a gas that has no warning properties such as odor, color or eye irritation. (Chloropicrin, (CAS# 76-06-2) which is used as a warning agent in conjunction with sulfuryl fluoride, is the active ingredient in tear gas and will cause tearing.) The prediction of possible human effects is based in part on observations made on laboratory animals. Treat for frostbite if present with gentle rewarming 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 (greater than 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 observation should be directed at the pulmonary, hepatic, and renal systems. Prolonged exposure can produce lung irritation, pulmonary edema, 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 overexposure to sulfuryl fluoride. May cause asthma-like (reactive airways) symptoms. Bronchodilators, expectorants, antitussives and corticosteroids may be of help. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. Consider administering a complete aerosol corticosteroid metered dose inhaler (100-150 shots) or equivalent as initial preventive treatment for incipient pulmonary edema. Consider administering 250-1000 mg prednisolone IV on the first day of treatment. Treat for frostbite if present, no specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the label with you when calling a Poison Control Center or doctor, or going for treatment. Excessive exposure may aggravate preexisting asthma and other respiratory disorders (e.g. emphysema, bronchitis, reactive airways dysfunction syndrome).

## 5. FIRE-FIGHTING MEASURES

**Extinguishing Media:** This product does not burn. All means of extinguishing are acceptable. If cylinders are in a fire area, remove them if possible. Alternately, water can be used to keep them cool to prevent discharge of product due to the melting of fusible plugs in the cylinder valves which will occur at temperatures above 158°F. Use of water may 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.

**Hazardous Combustion Products:** At temperatures above 752°F, sulfuryl fluoride will decompose into hydrogen fluoride and sulfur dioxide.

### Advice for firefighters

**Fire fighting procedures:** Keep people away. Isolate fire and deny unnecessary entry. Stay upwind. Keep out of low areas where gases can accumulate. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of re-ignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of container. Move container from fire area if this is possible without hazard. Contain firewater run-off if possible. Firewater run-off, if not contained, may cause environmental damage. Review the Accidental Release Measures and the Ecological Information sections of this SDS.

**Special protective equipment for firefighters:** Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

## 6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions:** Wear appropriate safety clothing, respiratory protection devices, and eye/face protection (see Section 8). Evacuate unprotected personnel that are nearby.

**Environmental precautions:** Prevent from entering into soil, ditches, sewers, waterways and / or groundwater. See Section 12, Ecological Information.

### Methods and materials for containment and cleanup:

Small spills: knock down and dilute vapors with water fog or spray. Apply vapor suppression foams until spill can be cleaned up. Use non-sparking tools in cleanup operations. Large spills: Contact Ensystem II for cleanup assistance. See Section 13, Disposal considerations, for additional information.

**Leak Procedure:** Evacuate immediate area of leak. Move leaking cylinder to an isolated location observing strict safety precautions. If safe to do so, try to stop leak. Work upwind from the cylinder, if possible. Entry into affected area(s) by persons not using approved respiratory protection devices is not permitted until the concentration of sulfuryl fluoride in the air of the affected area(s) is determined to be 1 ppm or less, as determined by an approved Low Fumigant Level Detection Device (such as ExplorIR, Interscan, or Miran gas analyzer).

## 7. HANDLING AND STORAGE

**Handling:** Use good personal hygiene. Follow proper cylinder handling directions. See Section 8 for control measures.

**Storage:** Keep out of reach of children. Product should be stored in compliance with local regulations. Store in a well ventilated, cool, dry area. Keep away from heat sources.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation and respiratory protection information given below is applicable to handling sulfuryl fluoride during production, packaging, transportation and storage. Applicators should refer to the product label for personal protection equipment requirements during application.

**Exposure Limits are listed below:**

Component	Regulation	Type of listing	Value/Notation
Sulfuryl fluoride	ACGIH	TWA	5 ppm
	ACGIH	STEL	10 ppm
	OSHA Z-1	TWA	20 mg/ m <sup>3</sup> 5ppm
	ACGIH	TWA	BEI
	ACGIH	STEL	BEI

These recommendations are for Manufacturing. Applicators should see the product label for proper personal protective equipment.

### Exposure controls

Provide general and/or local exhaust ventilation to control airborne levels below the exposure limits.

**Respiratory Protection:** Atmospheric levels should be maintained below the exposure guidelines. When respiratory protection is required or during emergency conditions, use a NIOSH approved positive pressure self-contained breathing apparatus or positive pressure airline with auxiliary self-contained air supply.

**Hand/Skin Protection:** No skin protection should be needed. Skin contact with the liquid may cause freeze damage if the liquid is confined to the skin. Do not wear gloves or rubber boots.

**Eye/Face Protection:** Chemical proof goggles / face shield

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance/Odor: Colorless, odorless

Relative vapor density (air=1): 3.5 at 68 °F (20 °C)

Boiling point/range: - 67 °F (-55.4 °C)

Water solubility: Practically insoluble

Vapor pressure: 15.2 atmospheres at @ 68 °F (20 °C)

## 10. STABILITY AND REACTIVITY

**Chemical Stability:** Stable under normal storage conditions.

**Conditions to Avoid:** Avoid heating product to its decomposition temperature.

**Materials to Avoid:** Strong bases.

**Hazardous Decomposition Products:** Hydrogen fluoride and sulfur dioxide upon heating above decomposition temperature.

**Additional Information:** Hazardous polymerization will not occur.

## 11. TOXICOLOGICAL INFORMATION

**Acute Toxicity:** Inhalation LC50/Rat/991 ppm Oral LD50/Rat/100mg/kg

**Irritation:** Reacts with mucous membranes

**Chronic Toxicity:** Inhalation, after repeated exposure, various species,

### Skin corrosion/irritation

Essentially nonirritating to skin

Liquid may cause frostbite upon skin contact.

### Serious eye damage/eye irritation

No hazard from gas.

Liquid may cause frostbite.

### Sensitization

For skin sensitization: No relevant data found.

For respiratory sensitization: No relevant data found.

### Target organ:

#### Single exposure:

Causes damage to organs.

Route of exposure: Inhalation

Target Organs Kidney

#### Repeated exposure:

In animals, effects have been reported on the following organs:

Central nervous system

Kidney

Lung

Respiratory tract

Thyroid,

Observations in animals include:

Convulsions

Tremors

May cause fluorosis of teeth and bones

### No teratogenic effect

### No carcinogenic effects

### No reproductive toxicity effects

### No mutagenic effects

### Sulfuryl fluoride

**Acute oral toxicity:** Single dose oral LD<sub>50</sub> has not been determined

**Acute dermal toxicity:** The dermal LD<sub>50</sub> has not been determined

## 12. ECOTOXICOLOGICAL INFORMATION

### Toxicity

#### Acute toxicity to fish

LC<sub>50</sub>, Danio rerio (zebra fish), static test 96 Hour, 0.89 mg/l

#### Acute toxicity to aquatic invertebrates

EC<sub>50</sub>, Daphnia magna (water flea), static test, 48 Hour, 0.62 mg/l

#### Acute toxicity to algae/aquatic plants

EyC50, Pseudokirchneriella subcapitata (green algae), static test, 96 Hour Growth inhibition (cell density reduction), 3.05 mg/l

EbC50, Pseudokirchneriella subcapitata (green algae), static test, 72 Hour Biomass, 0.58 mg/l

ErC50, Pseudokirchneriella subcapitata (green algae), static test, 72 Hour Growth rate inhibition, 1.13 mg/l

#### Toxicity to above ground organisms

LC<sub>50</sub>, Apis mellifera (bees), 2 hour, mortality, 6.5 mg/l

LC<sub>50</sub>, Colinus virginianus (bobwhite quail), 4 hour, 1,844 ppm.

#### Persistence and degradability

Biodegradability: Chemical degradation (hydrolysis) is expected in the environment.

#### Bioaccumulative potential

Bioaccumulation: Bioconcentration potential is low (BCF<100 or Log Pow<3)

#### Mobility in soil

Potential for mobility in soil is very high (Koc between 0 and 50).

Partition coefficient (Koc): 6 Estimated

**Other effects:** Product is known to have herbicide and insecticide properties

## 13. DISPOSAL CONSIDERATIONS

Contact Ensystem II for shipping instructions to return empty cylinders. Follow proper cylinder handling and waste disposal guidelines (see label).

## 14. TRANSPORT INFORMATION

DOT Proper Shipping Name: Sulfuryl Fluoride

Technical Shipping Name: Sulfuryl Fluoride

UN # UN2191

DOT Hazard Class: 2.3

DOT Packing Group: Inhalation Hazard Zone D Label:

#### Classification for SEA transport (IMO-IMDG):

Proper Shipping Name: Sulphuryl fluoride

UN # UN2191

Hazard Class: 2.3

Packing group

Marine pollutant: Sulphuryl fluoride

Transport in bulk according to Annex I or II of Marpol 73/78 and the IBC or IGC Code: Consult IMO regulations before transporting ocean bulk

#### Classification for AIR transport (IATA/ICAO):

Transport forbidden by regulation.

## 15. REGULATORY INFORMATION

The information herein is given in good faith, but no warranty, expressed or implied, is made. Consult Ensystem II for further information.

#### OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication standard, 29 CFR 1910.1200

#### Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Sudden Release of Pressure Hazard

Acute Health Hazard

Chronic Health Hazard

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

Components

Sulfuryl fluoride CAS# 2699-79-8

#### California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

#### Pennsylvania (Worker and Community Right-to-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are Present at levels which require reporting.

Components

Sulfuryl fluoride CAS# 2699-79-8

#### United States TSCA Inventory (TSCA)

This product contains chemical substance(s) exempt from USEPA TSCA Inventor requirements. It is regulated as a pesticide subject to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA requirements).

**Federal Insecticide, Fungicide and Rodenticide Act**

EPA Registration Number: 81824-1

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

Danger

Extremely hazardous liquid and vapor under pressure.

Fatal if inhaled

May be fatal if swallowed.

Liquid causes freeze burns on exposed skin

**16. Other Information**

**Hazard rating System**

**NFPA**

Health	Fire	Reactivity
4	0	0

**Legend**

ACGIH	USA, ACGIH Threshold Limit Values (TLV)
BEI	Biological Exposure Indices
OSHA Z-1	USA, Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
STEL	Short-term Exposure Limit
TWA	8-hour, time weighted average

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