

# Material Safety Data Sheet - MSDS

## Sulfur Dioxide

**MARSULEX**



### Section 1. Chemical Product and Company Identification

<b>Trade name</b>	: Sulfur Dioxide	<b>Headquarters</b>	: Marsulex Inc. 111 Gordon Baker Road Suite 300 North York, ON M2H 3R1 (416) 496-9655 www.marsulex.com
<b>Material uses</b>	: Used as a bleaching agent, refrigerant, solvent and in processing food products.		
<b>Validation date</b>	: 11/15/2007		
<b>In case of emergency</b>	: Canada : CANUTEC 1-613-996-6666 US : CHEMTREC: 1-800-424-9300		

### Section 2. Hazards identification

<b>Physical state and Appearance</b>	: Gas or liquified gas.	<b>This material is classified hazardous under OSHA regulations in the United States and the WHMIS Controlled Product Regulation in Canada.</b>
<b>Emergency overview</b>	: DANGER! CAUSES RESPIRATORY TRACT, EYE AND SKIN BURNS. CONTENTS UNDER PRESSURE. NON-FLAMMABLE GAS. HARMFUL IF INHALED. CAUSES DAMAGE TO THE FOLLOWING ORGANS: LUNGS, RESPIRATORY TRACT, SKIN, EYES, EYE, LENS OR CORNEA. Extremely hazardous liquid and vapor under pressure. Keep away from heat, sparks and flame. Do not get in eyes, on skin or on clothing. Do not puncture or incinerate container. Do not breathe gas/fumes/vapor/mist. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.	
<b>Routes of entry</b>	: Dermal contact. Eye contact. Inhalation.	
<b>Potential acute health effects</b>	<b>Eyes</b> : Mildly irritating at low concentrations of 5.4 ppm. Moderate to severe irritation above 8 ppm. Liquid sulfur dioxide can burn the eye and permanently affect vision. <b>Skin</b> : Liquid sulfur dioxide can cause frostbite and skin burns. Sulfur Dioxide will react with moisture on the skin and can cause skin irritation or corrosive injury if the concentration is high or exposure prolonged. <b>Inhalation</b> : Vapors are extremely irritating to throat, mucous membranes and upper respiratory tract. Short exposures to concentrations as low as 1 ppm may produce a reversible decrease in lung function. Concentrations as low as 5 ppm have produced constriction of the bronchiole tubes. About 20 ppm is objectionably irritating. In addition, about 10 to 20% of the adult population is estimated to be hypersensitive to the adverse respiratory effects of sulfur dioxide; however, workers regularly exposed to compound show an adaptation effect. Severe overexposure may result in pulmonary edema, permanent lung injury or death. The effects of pulmonary edema that include coughing and shortness of breath may be delayed for hours or days after exposure. <b>Ingestion</b> : Since material is a gas at room temperature, ingestion is unlikely to occur.	
<b>Potential chronic health effects</b>	: CARCINOGENIC EFFECTS: A4 (Not classifiable for humans or animals.) by ACGIH, 3 (Not classifiable for humans.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available.	
<b>Medical conditions aggravated by over-exposure</b>	: Asthmatic individuals are especially sensitive to sulfur dioxide. Any disorder inhibiting nasal respiration or any cardiovascular disease may preclude exposure to sulfur dioxide. Skin irritation may be aggravated in individuals with existing skin lesions.	

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**Over-exposure signs/symptoms**

: Dental caries, loss of fillings, gum disorders and the rapid and painless destruction of teeth may result from over-exposure. Corrosive effects on the skin, eyes and lungs, may be delayed, and damage may occur without the sensation or onset of pain. Several human studies have shown that repeated exposure to low levels of SO<sub>2</sub> (below 5 ppm) has caused permanent pulmonary impairment. Repeated overexposure may lead to contact dermatitis, may cause bronchitis with cough, phlegm, shortness of breath and emphysema, chronic runny nose, tearing of the eyes, nosebleeds and stomach upsets. Strict adherence to first aid measures following any exposure is essential.

[See Section 11 for Toxicological Data.](#)

### Section 3. Composition/information on ingredients

Name	CAS #	% by weight
Sulfur Dioxide	7446-09-5	99-100

[See Section 8 for Exposure Limits.](#)

[See Section 11 for Toxicological Data.](#)

### Section 4. First Aid Measures

- Eye contact** : Immediately flush eyes with lukewarm, running water for a minimum of 5 minutes for the gas or 20 minutes for the liquid. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY.
- Skin contact** : For gas, flush skin with running water for a minimum of 5 minutes. Start flushing while removing contaminated clothing. If irritation persists, repeat flushing. For liquid, briefly flush with lukewarm, gently flowing water until the chemical is removed. Do not attempt to rewarm the affected area on site. Do not rub area or apply dry heat. Carefully cut around clothing that sticks to the skin and remove the rest of the garment. Obtain medical attention IMMEDIATELY.
- Inhalation** : Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Give Cardiopulmonary Resuscitation (CPR) only if there is no pulse AND no breathing. Oxygen may be beneficial and should be administered by trained personnel. Obtain medical attention IMMEDIATELY.
- Ingestion** : Since the product is a gas, it will probably be inhaled rather than ingested. Consider first the preventive measures in case of inhalation.
- Notes to physician** : Effects of contact or inhalation may be delayed. Provide general supportive measures. Oxygen may be beneficial.

### Section 5. Fire Fighting Measures

- Flammability of the product** : Non-flammable.
- Auto-ignition temperature** : Not applicable.
- Flash points** : Not applicable.
- Flammable limits** : Not applicable.
- Products of combustion** : Not applicable.
- Fire hazards in the presence of various substances** : Not applicable.
- Explosion hazards in the presence of various substances** : Sulfur dioxide is not explosive. Cylinders and ton containers will vent through the fusible plug at 71°C (160°F). Tank cars and tank trucks are fitted with safety relief valves and will vent at 1,550 kPa (225 psig) or 944 kPa (137 psig) in a fire or when unduly high pressure is applied.
- Fire-fighting media and instructions** : Use appropriate media to extinguish source of fire. Remove sulfur dioxide containers from fire zone if possible. Apply water to cool containers unless there is a sulfur dioxide leak. In presence of sulfur dioxide, use self-contained breathing apparatus and full protective clothing. Gas tight suits are required in extreme (>1000 ppm) concentrations of sulfur dioxide. Evacuate residents who are downwind of fire. Prevent unauthorized entry to fire area. Dike area to contain runoff and prevent contamination of water sources. Neutralize runoff with lime, soda ash or other suitable neutralizing agents (see Deactivating Chemicals, Section 6). Cool containers that are exposed to flame with streams of water until fire is out.
- Protective clothing (fire)** : Not applicable.

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## Section 6. Accidental Release Measures

- Small spill and leak** : See instructions below.
- Large spill and leak** : Wear adequate respiratory protective equipment and other personal protective equipment, as required. Restrict access until completion of clean up. Move unprotected personnel upwind. If a sulfur dioxide container is leaking, try to position it so that gas, rather than liquid, leaks. Using full protective equipment, apply emergency sealing device if possible. Cover leak area with tarpaulin or plastic sheet to limit spread of sulfur dioxide. Leaking sulfur dioxide containers should never be immersed in water. Prevent material from entering waterways, sewers or confined spaces.
- Deactivating Chemicals:** Lime, limestone, soda ash, sodium bicarbonate, dilute sodium hydroxide or dilute aqua ammonia.

## Section 7. Handling and Storage

- Handling** : As a compressed gas, sulfur dioxide must be handled carefully in pressurized containers. Carbon steel meeting the required ASTM specifications is acceptable provided the sulfur dioxide is dry. Suitable relief mechanisms must be installed to protect against equipment rupture. Use corrosion-resistant transfer equipment. Regularly check storage tanks and transfer equipment for evidence of corrosion or leakage. If sulfur dioxide is accidentally released, immediately put on a suitable respirator and leave the area until the severity of the release is determined. In case of leaks or spills, escape-type respiratory protective equipment should be available in the work area.
- Storage** : Storage temperature should be at or around normal room temperature. Protect from temperature extremes. Never expose cylinders to temperatures higher than 52°C (125°F) or below -29°C (-20°F) unless they are designed for this. Maintain temperature such that the resultant vapor pressure is lower than the relief setting.

## Section 8. Exposure Controls, Personal Protection

- Engineering controls** : Ventilation is normally required when handling or using this product.

### Personal protection

- Eyes** : Splash goggles.
- Body** : Lab coat or coveralls.
- Respiratory** : A NIOSH/MSHA approved air-purifying respirator equipped with acid gas/fume, dust, mist cartridges for concentrations up to 20 ppm. A powered air-purifying respirator with acid gas cartridges or supplied air respirator (SAR) operated in a continuous flow mode for concentrations up to 50 ppm. A full-facepiece chemical cartridge respirator with cartridges to protect against sulfur dioxide; or gas mask with canister to protect against sulfur dioxide; or powered air-purifying respirator with a tight-fitting facepiece and cartridge(s) to protect against sulfur dioxide; or full-facepiece self-contained breathing apparatus (SCBA); or full-facepiece SAR; or SAR with a tight-fitting facepiece operated in a continuous-flow mode if concentrations are up to and higher than 100 ppm.
- Hands** : Gloves: Neoprene, PVC, vinyl or rubber.
- Feet** : Appropriate industrial footwear.

### Protective clothing (pictograms)



- Personal protection in case of a large spill** : Splash goggles. Full suit. Vapor respirator. Boots. Gloves. Self-contained breathing apparatus (SCBA) should be used to avoid inhalation of the product. Suggested protective clothing might not be adequate. Consult a specialist before handling this product.

### Exposure limits

**Product name**  
Sulfur Dioxide

#### Exposure limits

##### ACGIH TLV (United States, 1/2006).

STEL: 13 mg/m<sup>3</sup> 15 minute(s).

STEL: 5 ppm 15 minute(s).

TWA: 5.2 mg/m<sup>3</sup> 8 hour(s).

TWA: 2 ppm 8 hour(s).

##### NIOSH REL (United States, 12/2001).

STEL: 13 mg/m<sup>3</sup> 15 minute(s).

STEL: 5 ppm 15 minute(s).

TWA: 5 mg/m<sup>3</sup> 10 hour(s).

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TWA: 2 ppm 10 hour(s).  
**OSHA PEL (United States, 11/2006).**  
TWA: 13 mg/m<sup>3</sup> 8 hour(s).  
TWA: 5 ppm 8 hour(s).

[Consult local authorities for acceptable exposure limits.](#)

## Section 9. Physical and Chemical Properties

<b>Physical state and Appearance</b>	: Gas or liquified gas.
<b>Color</b>	: Colorless.
<b>Odor</b>	: Rotten eggs. (Strong.)
<b>Molecular weight</b>	: 64.06 g/mole
<b>Molecular formula</b>	: SO <sub>2</sub>
<b>pH</b>	: Not applicable. In water, sulfur dioxide is rapidly converted to sulfurous acid (pH less than 3).
<b>Boiling/condensation point</b>	: -9.99°C (14°F)
<b>Melting/freezing point</b>	: -75.55°C (-104°F)
<b>Specific gravity</b>	: 1.45 (Water = 1)
<b>Vapor pressure</b>	: Not applicable.
<b>Vapor density</b>	: 2.2 (Air = 1)
<b>Odor threshold</b>	: Not available.
<b>Evaporation rate</b>	: 243.2
<b>LogK<sub>ow</sub></b>	: Not available.
<b>Solubility</b>	: 11.9% by wt. in water at 15°C (60°F) and 760 mmHg. Also soluble in alcohol, chloroform, ether, acetic acid.

## Section 10. Stability and Reactivity

<b>Stability and reactivity</b>	: The product is stable.
<b>Incompatibility with various substances</b>	: Moist gas corrodes most metals. Reacts with water. Reacts violently with strong alkalis, (e.g. sodium hydroxide, fluorine), bromine pentafluoride, chlorine trifluoride, chlorates, powdered metals, (e.g. chromium, manganese, aluminum), metal oxides, metal acetylides, sodium hydride, cesium azide, silver azide and diethyl zinc.
<b>Hazardous decomposition products</b>	: Will form sulfur trioxide and sulfurous acid.
<b>Hazardous polymerization</b>	: Will not occur.

## Section 11. Toxicological Information

<b>Chronic effects on humans</b>	: See Section 2.
<b>Other toxic effects on humans</b>	: Very hazardous by the following route of exposure: of inhalation (lung corrosive). Hazardous by the following route of exposure: of skin contact (corrosive), of eye contact (corrosive). Non-sensitizer to skin.
<b>Special remarks on chronic effects on humans</b>	: Prompt medical attention is mandatory in all cases of overexposure to this gas. Rescue personnel should wear a self-contained breathing apparatus.
<b>Target organs</b>	: Causes damage to the following organs: lungs, upper respiratory tract, skin, eye, lens or cornea.

## Section 12. Ecological Information

<b>Products of degradation</b>	: Decomposition products may include the following materials: sulfur oxides (SO <sub>2</sub> , SO <sub>3</sub> etc.).
<b>Toxicity of the products of biodegradation</b>	: The products of degradation are toxic.

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## Section 13. Disposal Considerations

**Waste information** : Waste must be disposed of in accordance with federal, state and local environmental control regulations.

[Consult your local or regional authorities.](#)

## Section 14. Transport Information

**Canada (TDG)** : UN1079, SULFUR DIOXIDE, 2.3(8).

**United States (DOT)** : UN1079, SULFUR DIOXIDE, 2.3(8).

**ERG** : 125

## Section 15. Regulatory Information

**WHMIS (Canada)** : Class A: Compressed gas.  
Class D-1A: Material causing immediate and serious toxic effects (Very toxic).  
Class E: Corrosive gas.

**Canada inventory:** This material is listed or exempted.

**CEPA Toxic substances:** This material is listed.

**Canadian ARET:** This material is not listed.

**Canadian NPRI:** This material is listed.

**Alberta Designated Substances:** This material is not listed.

**Ontario Designated Substances:** This material is not listed.

**Quebec Designated Substances:** This material is not listed.

**This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.**

**HCS Classification** : Compressed gas  
Highly toxic material  
Corrosive material  
Target organ effects

**U.S. Federal Regulations** : **United States inventory (TSCA 8b):** This material is listed or exempted.  
**SARA 302/304/311/312 extremely hazardous substances:** Sulfur dioxide  
**SARA 302/304 emergency planning and notification:** Sulfur dioxide  
**SARA 302/304/311/312 hazardous chemicals:** Sulfur dioxide  
**SARA 311/312 MSDS distribution - chemical inventory - hazard identification:** Sulfur dioxide:  
Sudden release of pressure, Immediate (acute) health hazard, Delayed (chronic) health hazard

**Clean Air Act (CAA) 112 accidental release prevention:** Sulfur dioxide

**Clean Air Act (CAA) 112 regulated toxic substances:** Sulfur dioxide

**State Regulations** : **Connecticut Carcinogen Reporting:** This material is not listed.  
**Connecticut Hazardous Material Survey:** This material is not listed.  
**Florida substances:** This material is not listed.  
**Illinois Chemical Safety Act:** This material is not listed.  
**Illinois Toxic Substances Disclosure to Employee Act:** This material is not listed.  
**Louisiana Reporting:** This material is not listed.  
**Louisiana Spill:** This material is not listed.  
**Massachusetts Spill:** This material is not listed.  
**Massachusetts Substances:** This material is listed.  
**Michigan Critical Material:** This material is not listed.  
**Minnesota Hazardous Substances:** This material is not listed.  
**New Jersey Hazardous Substances:** This material is listed.  
**New Jersey Spill:** This material is not listed.  
**New Jersey Toxic Catastrophe Prevention Act:** This material is not listed.  
**New York Acutely Hazardous Substances:** This material is listed.  
**New York Toxic Chemical Release Reporting:** This material is not listed.  
**Pennsylvania RTK Hazardous Substances:** This material is listed.  
**Rhode Island Hazardous Substances:** This material is not listed.

**California Prop. 65**

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No products were found.

## Section 16. Other Information

### Hazardous Material Information System (U.S.A.)

Health	*	3
Fire hazard		0
Physical Hazard		0
Personal protection		C

### National Fire Protection Association (U.S.A.)



### References

- : - 29CFR Part1910.1200 OSHA MSDS Requirements. - 49CFR Table List of Hazardous Materials, UN#, Proper Shipping Names, PG. ANSI Z400.1, MSDS Standard, 2004. - Canada Gazette Part II, Vol. 122, No. 2. Registration SOR/88-64, 31 December 1987. Hazardous Products Act "Ingredient Disclosure List"
- Canadian Transport of Dangerous Goods, Regulations and Schedules, Clear Language version 2005. - Manufacturer's Material Safety Data Sheet.

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