

MATERIAL  
SAFETY  
DATA SHEET

PRODUCT NAME Sulfur Dioxide	CAS # 7446-09-5
TRADE NAME AND SYNONYMS Sulfur dioxide, liquefied (D.O.T.)	DOT I.D. No.: UN 1079; RQ 500/227
CHEMICAL NAME AND SYNONYMS Sulfur Dioxide; Sulfurous Acid Anhydride	DOT Hazard Class: Division 2.3
ISSUE DATES AND REVISIONS Revised May 1998	Formula SO <sub>2</sub>
	Chemical Family: Inorganic Acid Anhydride

### HEALTH HAZARD DATA

TIME WEIGHTED AVERAGE EXPOSURE LIMIT	2 Molar PPM with an A4 (Not Classifiable as a Human Carcinogen) carcinogen rating. STEL = 5 Molar PPM with an A4 (Not Classifiable as a Human Carcinogen) carcinogen rating (ACGIH 1997). OSHA 1995 (Continued on Page 4)
SYMPTOMS OF EXPOSURE	Corrosive and irritating to the upper and lower respiratory tracts, skin and eyes. Symptoms depend on the concentration and duration of exposure and vary from mild irritation to severe destruction of tissues. They may also include burning sensations, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. If the sulfur dioxide penetrates the lower airway, (Continued on Page 4)
TOXICOLOGICAL PROPERTIES	Inhalation TFL <sub>0</sub> = 3 ppm/5 days  Exposure to atmospheres contaminated with sulfur dioxide is extremely irritating. Its odor and prompt irritant action provide a warning of exposure to toxic conditions. High concentrations are extremely destructive to tissues of the airway, eyes and skin. Inhalation may have fatal consequences as a result of spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema. Exposure of the eyes to high concentrations may result in ulceration of the conjunctive and cornea and destruction of all ocular tissues. Contact with the skin causes severe burns. Systemic toxicity due to sulfur dioxide is not known to occur. Frostbite effects are a change in (Continued on Page 4)
RECOMMENDED FIRST AID TREATMENT	<b>PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO SULFUR DIOXIDE. RESCUE PERSONNAL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS.</b>  <u>Inhalation:</u> Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Unconscious persons should be moved to an uncontaminated area and given assisted respiration and supplemental oxygen. Keep the victim warm and quiet. Assure that mucus or vomited material does not obstruct the airway by positional drainage. The physician should be informed that the patient has inhaled acidic vapors.  <u>Eye Contact:</u> PERSONS WITH POTENTIAL EXPOSURE TO SULFUR DIOXIDE SHOULD NOT WEAR CONTACT LENSES. (Continued on Page 4)

Information contained in this material safety data sheet is offered without charge for use by technically qualified personnel at their discretion and risk. All statements, technical information and recommendations contained herein are based on tests and data which we believe to be reliable, but the accuracy or completeness thereof is not guaranteed and no warranty of any kind is made with respect thereto. This information is not intended as a license to operate under or a recommendation to practice or infringe any patent of this Company or others covering any process, composition of matter or use.  
Since the Company shall have no control of the use of the product described herein, the Company assumes no liability for loss or damage incurred from the proper or improper use of such product.

SULFUR DIOXIDE

**HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES**

Sulfur dioxide reacts violently with peroxides, chromates, bichromates, permanganates, and oxygen difluoride. It also reacts with chlorates to form chlorine which at elevated temperatures may become an explosive reaction.

**PHYSICAL DATA**

BOILING POINT 14.0°F (-10.1°C)	LIQUID DENSITY AT BOILING POINT 91.1 lb/ft <sup>3</sup> (1460 kg/m <sup>3</sup> )
VAPOR PRESSURE @ 70°F (21.1°C) = 49.1 psia (339 kPa)	GAS DENSITY AT 70°F, 1 atm .169 lb/ft <sup>3</sup> (2.71 kg/m <sup>3</sup> )
SOLUBILITY IN WATER Soluble	FREEZING POINT -103.9°F (-75.5°C)
EVAPORATION RATE N/A (Gas)	SPECIFIC GRAVITY (AIR=1) @ 70°F (21.1°C) = 2.26
APPEARANCE AND ODOR Colorless gas with highly irritating, pungent odor	

**FIRE AND EXPLOSION HAZARD DATA**

FLASH POINT (Method used) N/A	AUTO IGNITION TEMPERATURE N/A	FLAMMABLE LIMITS % BY VOLUME (See Page 4) LEL N/A UEL N/A
EXTINGUISHING MEDIA Nonflammable Gas		ELECTRICAL CLASSIFICATION Nonhazardous
SPECIAL FIRE FIGHTING PROCEDURES If cylinders are involved in a fire, safely relocate or keep cool with water spray.		
UNUSUAL FIRE AND EXPLOSION HAZARDS None		

**REACTIVITY DATA**

STABILITY Unstable		CONDITIONS TO AVOID None
Stable	X	
INCOMPATIBILITY (Materials to avoid) Strong oxidizers (fluorine, peroxides, etc.). Forms explosive chlorine with chlorates.		
HAZARDOUS DECOMPOSITION PRODUCTS Since SO <sub>2</sub> boils at 14°F, gaseous SO <sub>2</sub> vapor is nearly always present.		
HAZARDOUS POLYMERIZATION May Occur		CONDITIONS TO AVOID
Will Not Occur	X	Avoid zinc or galvanized metals

**SPILL OR LEAK PROCEDURES**

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with an inert gas prior to attempting repairs. If leak is in container or container valve, contact your closest supplier location or call the emergency telephone number listed herein
WASTE DISPOSAL METHOD Do not attempt to dispose of waste or unused quantities. Return in the shipping container properly labeled with any valve outlet plugs or caps secured and valve protection cap in place to your supplier. For emergency dispose assistance, contact your closest supplier or call the emergency telephone number listed herein.

**SPECIAL PROTECTION INFORMATION**

RESPIRATORY PROTECTION (Specify type)	Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use.		
VENTILATION  Hood with forced ventilation	LOCAL EXHAUST To prevent accumulation above the TWA	SPECIAL	N/A
	MECHANICAL (Gen.)  N/A	OTHER	N/A
PROTECTIVE GLOVES Plastic or rubber			
EYE PROTECTION Safety goggles or glasses			
OTHER PROTECTIVE EQUIPMENT Safety shoes, safety shower, eyewash "fountain," face shield			

**SPECIAL PRECAUTIONS\***

SPECIAL LABELING INFORMATION	
DOT Shipping Name: Sulfur dioxide, liquefied	DOT Hazard Class: Division 2.3
DOT Shipping Label: Toxic Gas; Corrosive	I.D. No.: UN 1079 (RQ 500/227)
SPECIAL HANDLING RECOMMENDATIONS	
<p>Use only in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure (c150 psig) piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.</p> <p>For additional handling recommendations, consult Compressed Gas Association's Pamphlets P-1 and G-3.</p>	
SPECIAL STORAGE RECOMMENDATIONS	
<p>Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125F (52C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in - first out" inventory system to prevent full cylinders being stored for excessive periods of time.</p> <p>For additional storage recommendations, consult Compressed Gas Association's Pamphlets P-1 and G-3.</p>	
SPECIAL PACKAGING RECOMMENDATIONS	
Most metals corrode rapidly with wet sulfur dioxide.	
OTHER RECOMMENDATIONS OR PRECAUTIONS	
Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with his (written) consent is a violation of Federal Law (49CFR). (Continued on Page 4)	

\*Various Government Agencies (i.e. Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation, handling, storage or use of this product which will not be reflected in this data sheet. The customer should review these regulations to ensure that he is in full compliance.

## SULFUR DIOXIDE

### HEALTH HAZARD DATA

#### TIME WEIGHTED AVERAGE EXPOSURE LIMIT: (Continued)

PEL (8 hr. TWA)= 5 Molar PPM.

#### SYMPTOMS OF EXPOSURE: (Continued)

it can produce bronchitis, chemical pneumonitis and pulmonary edema. Eye contact results in pain, lacrymation, inflammation, swelling of tissue and possible destruction of the eye. Skin contact causes irritation or chemicallike burns. Contact with rapidly evaporating liquid can cause cryogenic burns or frostbite.

#### TOXICOLOGICAL PROPERTIES: (Continued)

color of the skin to gray or white, possibly followed by blistering.

Sulfur dioxide is not listed in the IARC, NTP or by OSHA as a carcinogen or potential carcinogen.

Persons in ill health where such illness would be aggravated by exposure to sulfur dioxide should not be allowed to work with or handle this product.

#### RECOMMENDED FIRST AID TREATMENT: (Continued)

Flush contaminated eye(s) with copious quantities of water. Part eyelids to assure complete flushing. Continue for a minimum of 15 minutes.

Skin Contact: Flush affected area with copious quantities of water. Remove affected clothing as rapidly as possible.

Dermal Contact or Frostbite: Remove contaminated clothing and flush affected.

areas with lukewarm water. DO NOT USE HOT WATER. A physician should see the patient promptly if the cryogenic burn has resulted in blistering of the dermal surface or deep tissue freezing.

### SPECIAL PRECAUTIONS

#### OTHER RECOMMENDATIONS OR PRECAUTIONS: (Continued)

Always secure cylinders in an upright position before transporting them. NEVER transport cylinders in trunks of vehicles, enclosed vans, truck cabs or in passenger compartments. Transport cylinders secured in open flatbed or in open pick-up type vehicles.

Reporting under SARA, Title III, Section 313 not required.

NFPA 704 No. for sulfur dioxide = 2 0 0 None