

SECTION 1: Identification

1.1. Product identifier

Product form	: Substance
Name	: Sulfur dioxide
CAS No	: 7446-09-5
Formula	: SO ₂
Other means of identification	: Sulfur Oxide, Sulfurous acid anhydride, Sulfur oxide, Sulfurous anhydride, Sulfurous oxide, Refrigerant gas R764
Product group	: Core Products

1.2. Recommended use and restrictions on use

Recommended uses and restrictions	: Industrial use Use as directed
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1.3. Supplier

Praxair Canada inc.
1200 – 1 City Centre Drive
Mississauga - Canada L5B 1M2
T 1-905-803-1600 - F 1-905-803-1682
www.praxair.ca

1.4. Emergency telephone number

Emergency number	: 1-800-363-0042 Call emergency number 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier or Praxair sales representative.
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SECTION 2: Hazard identification




2.1. Classification of the substance or mixture

GHS-CA classification

Liquefied gas	H280
Acute Tox. 3 (Inhalation:gas)	H331
Skin Corr. 1A	H314
Eye Dam. 1	H318

2.2. GHS Label elements, including precautionary statements

GHS-CA labelling

Hazard pictograms	:   
Signal word	: DANGER
Hazard statements	: CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED TOXIC IF INHALED CAUSES SEVERE SKIN BURNS AND EYE DAMAGE CORROSIVE TO THE RESPIRATORY TRACT
Precautionary statements	: Do not handle until all safety precautions have been read and understood Avoid breathing gas Do not get in eyes, on skin, or on clothing Use and store only outdoors or in a well-ventilated area Wear protective gloves, protective clothing, eye protection, respiratory protection, and/or face

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Revision date: 08-04-2016

Supersedes: 10-15-2013

protection
Store locked up
Dispose of contents/container in accordance with container Supplier/owner instructions
Protect from sunlight when ambient temperature exceeds 52°C (125°F)
Use a back flow preventive device in the piping
Close valve after each use and when empty
Use only with equipment rated for cylinder pressure
Do not open valve until connected to equipment prepared for use
Use only with equipment of compatible materials of construction and rated for cylinder pressure
Read and follow the Safety Data Sheet (SDS) before use

2.3. Other hazards

Other hazards not contributing to the classification : None.

2.4. Unknown acute toxicity (GHS-CA)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	CAS No.	% (Vol.)	Common Name (synonyms)
Sulfur dioxide (Main constituent)	(CAS No) 7446-09-5	100	Sulphur dioxide / Sulphurous anhydride / Sulfur(IV) oxide / Sulfur dioxide, anhydrous

3.2. Mixtures

Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, trained personnel should give oxygen. Call a physician.

First-aid measures after skin contact : In case of contact, immediately flush affected areas with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash clothing before reuse. Discard contaminated shoes.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects (acute and delayed)

Symptoms/injuries after inhalation : Exposure to concentrations above the TLV of 2 ppm may irritate the eyes, nose, throat, and sinuses, resulting in choking, coughing, and sometimes bronchoconstriction.

Concentrations of 50-100 ppm are considered dangerous.

Exposures of 400-500 ppm are immediately life-threatening.

Exposure to high concentrations may result in pulmonary edema and paralysis.

4.3. Immediate medical attention and special treatment, if necessary

Other medical advice or treatment : Obtain medical assistance.

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media

Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.

5.2. Unsuitable extinguishing media

No additional information available

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5.3. Specific hazards arising from the hazardous product

- Fire hazard : Not flammable.
- Reactivity : No reactivity hazard other than the effects described in sub-sections below.
- Reactivity in case of fire : No reactivity hazard other than the effects described in sub-sections below.

5.4. Special protective equipment and precautions for fire-fighters

- Firefighting instructions : **DANGER! Toxic, corrosive, liquefied gas.**
- Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with their provincial and local fire code regulations.
- Special protective equipment for fire fighters : Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- General measures : **DANGER: Toxic. Corrosive.** Wear a self-contained breathing apparatus and appropriate personal protective equipment (PPE). (gas tight, chemical-protective) Evacuate personnel to a safe area. Approach suspected leak area with caution. Remove all sources of ignition. Toxic, corrosive vapor can spread from spill. Ventilate area or move container to a well-ventilated area. Before entering the area, especially a confined area, check the atmosphere with an appropriate device.

6.2. Methods and materials for containment and cleaning up

- Methods for cleaning up : This material is a Toxic Gas. Any leaks should be handled by Emergency Response personnel. For assistance call your supplier.

6.3. Reference to other sections

For further information refer to section 8: Exposure controls/personal protection

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Precautions for safe handling : Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g. wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.
- Safe use of the product : Do not breathe gas/vapours. Use only with adequate ventilation or respiratory protection. Do not get liquid or vapor in eyes, on skin, or on clothing. Have safety showers and eyewash fountains immediately available.

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7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a cool, well-ventilated place. Store and use with adequate ventilation. Store only where temperature will not exceed 125°F (52°C). Firmly secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Sulfur dioxide (7446-09-5)		
USA - ACGIH	ACGIH TLV-STEL (ppm)	0.25 ppm
USA - OSHA	OSHA PEL (TWA) (mg/m ³)	13 mg/m ³
USA - OSHA	OSHA PEL (TWA) (ppm)	5 ppm
Canada (Quebec)	VECD (mg/m ³)	13 mg/m ³
Canada (Quebec)	VECD (ppm)	5 ppm
Canada (Quebec)	VEMP (mg/m ³)	5.2 mg/m ³
Canada (Quebec)	VEMP (ppm)	2 ppm
Alberta	OEL STEL (mg/m ³)	13 mg/m ³
Alberta	OEL STEL (ppm)	5 ppm
Alberta	OEL TWA (mg/m ³)	5.2 mg/m ³
Alberta	OEL TWA (ppm)	2 ppm
British Columbia	OEL STEL (ppm)	5 ppm
British Columbia	OEL TWA (ppm)	2 ppm
Manitoba	OEL STEL (ppm)	0.25 ppm
New Brunswick	OEL STEL (mg/m ³)	13 mg/m ³
New Brunswick	OEL STEL (ppm)	5 ppm
New Brunswick	OEL TWA (mg/m ³)	5.2 mg/m ³
New Brunswick	OEL TWA (ppm)	2 ppm
New Foundland & Labrador	OEL STEL (ppm)	0.25 ppm
Nova Scotia	OEL STEL (ppm)	0.25 ppm
Nunavut	OEL STEL (mg/m ³)	13 mg/m ³
Nunavut	OEL STEL (ppm)	5 ppm
Nunavut	OEL TWA (mg/m ³)	5 mg/m ³
Nunavut	OEL TWA (ppm)	2 ppm
Northwest Territories	OEL STEL (ppm)	5 ppm
Northwest Territories	OEL TWA (ppm)	2 ppm
Ontario	OEL STEL (mg/m ³)	10.4 mg/m ³
Ontario	OEL STEL (ppm)	5 ppm
Ontario	OEL TWA (mg/m ³)	5.2 mg/m ³
Ontario	OEL TWA (ppm)	2 ppm
Prince Edward Island	OEL STEL (ppm)	0.25 ppm

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Sulfur dioxide (7446-09-5)		
Québec	VECD (mg/m ³)	13 mg/m ³
Québec	VECD (ppm)	5 ppm
Québec	VEMP (mg/m ³)	5.2 mg/m ³
Québec	VEMP (ppm)	2 ppm
Saskatchewan	OEL STEL (ppm)	5 ppm
Saskatchewan	OEL TWA (ppm)	2 ppm
Yukon	OEL STEL (mg/m ³)	13 mg/m ³
Yukon	OEL STEL (ppm)	5 ppm
Yukon	OEL TWA (mg/m ³)	13 mg/m ³
Yukon	OEL TWA (ppm)	5 ppm

8.2. Appropriate engineering controls

Appropriate engineering controls : Use only in a closed system. A corrosion-resistant, forced-draft fume hood is preferred. LOCAL EXHAUST: A corrosion-resistant system is acceptable.

In semiconductor process gas and other suitable applications, Praxair recommends the use of engineering controls such as gas cabinet enclosures, automatic gas panels (used to purge systems on cylinder changeout), excess-flow valves throughout the gas distribution system, double containment for the distribution system, and continuous gas monitors.

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment : Safety glasses. Face shield. Gloves.



Hand protection : Wear work gloves when handling containers. Wear heavy rubber gloves where contact with product may occur.

Eye protection : Provide readily accessible eye wash stations and safety showers. Wear goggles and a face shield when transfilling or breaking transfer connections. Select in accordance with the current CSA standard Z94.3, "Industrial Eye and Face Protection", and any provincial regulations, local bylaws or guidelines.

Respiratory protection : **Respiratory protection:** Use respirable fume respirator or air supplied respirator when working in confined space or where local exhaust or ventilation does not keep exposure below TLV. Select in accordance with provincial regulations, local bylaws or guidelines. Selection should be based on the current CSA standard Z94.4, "Selection, Care, and Use of Respirators." Respirators should also be approved by NIOSH and MSHA. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

Thermal hazard protection : Wear cold insulating gloves when transfilling or breaking transfer connections.

Other information : **Other protection** : Safety shoes for general handling at customer sites. Metatarsal shoes and cuffless trousers for cylinder handling at packaging and filling plants. Select in accordance with the current CSA standard Z195, "Protective Foot Wear", and any provincial regulations, local bylaws or guidelines. For working with flammable and oxidizing materials, consider the use of flame resistant anti-static safety clothing.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Gas
Appearance	: Colorless, non-flammable gas.
Molecular mass	: 64 g/mol
Colour	: Colourless.
Odour	: Pungent. choking.
Odour threshold	: No data available
pH	: No data available
pH solution	: No data available

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Relative evaporation rate (butylacetate=1)	: No data available
Relative evaporation rate (ether=1)	: Not applicable.
Melting point	: -75.5 °C
Freezing point	: No data available
Boiling point	: -10 °C
Flash point	: Not applicable.
Critical temperature	: 157.6 °C
Auto-ignition temperature	: Not applicable.
Decomposition temperature	: No data available
Vapour pressure	: 330 kPa
Vapour pressure at 50 °C	: No data available
Critical pressure	: 7884 kPa
Relative vapour density at 20 °C	: No data available
Relative density	: 1.5
Relative density of saturated gas/air mixture	: No data available
Density	: 1.39 g/cm ³ (at 20 °C)
Relative gas density	: 2.3
Solubility	: Water: Completely soluble.
Log Pow	: Not applicable for inorganic gases.
Log Kow	: Not applicable.
Viscosity, kinematic	: Not applicable.
Viscosity, dynamic	: Not applicable.
Viscosity, kinematic (calculated value) (40 °C)	: No data available
Explosive properties	: Not applicable.
Oxidizing properties	: None.
Flammability (solid, gas)	: Non flammable

9.2. Other information

Minimum ignition energy	: ≈
Gas group	: Compressed gas
Additional information	: Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	: No reactivity hazard other than the effects described in sub-sections below.
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: None.
Conditions to avoid	: Avoid moisture in installation systems.
Incompatible materials	: Moisture. Fluorine. Chlorine trifluoride. Chlorates. Sodium Carbide. Aluminium. (powdered). Zinc and its alloys. Manganese. Alkali metals. Metal nitrates. Rubidium carbide. Metal oxides. metal acetylides. Metal hydrides. Stannous oxide. Sodium. Acrolein (propenal).
Hazardous decomposition products	: None known.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	: Not classified
Acute toxicity (dermal)	: Not classified
Acute toxicity (inhalation)	: Inhalation:gas: TOXIC IF INHALED.



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Sulfur dioxide (1f)7446-09-5

LC50 inhalation rat (ppm)	1260 ppm/4h
ATE CA (gases)	1260.00000000 ppmv/4h

Skin corrosion/irritation	: CAUSES SEVERE SKIN BURNS AND EYE DAMAGE.
Serious eye damage/irritation	: CAUSES SERIOUS EYE DAMAGE.
Respiratory or skin sensitization	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
IARC group	: 3 - Not classifiable
Reproductive toxicity	: Not classified
Specific target organ toxicity (single exposure)	: Not classified
Specific target organ toxicity (repeated exposure)	: Not classified
Aspiration hazard	: Not classified

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : No known ecological damage caused by this product.

12.2. Persistence and degradability

Sulfur dioxide (7446-09-5)

Persistence and degradability	Not applicable for inorganic gases.
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12.3. Bioaccumulative potential

Sulfur dioxide (7446-09-5)

BCF fish 1	(no bioaccumulation expected)
Log Pow	Not applicable for inorganic gases.
Log Kow	Not applicable.
Bioaccumulative potential	No data available.

12.4. Mobility in soil

Sulfur dioxide (7446-09-5)

Mobility in soil	No data available.
Log Pow	Not applicable for inorganic gases.
Log Kow	Not applicable.
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.

12.5. Other adverse effects

Other adverse effects	: May cause pH changes in aqueous ecological systems.
Effect on the ozone layer	: None
Effect on global warming	: No known effects from this product

SECTION 13: Disposal considerations

13.1. Disposal methods

Waste disposal recommendations : Do not attempt to dispose of residual or unused quantities. Return container to supplier.

SECTION 14: Transport information

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14.1. Basic shipping description

In accordance with TDG

TDG

UN-No. (TDG) : UN1079
TDG Primary Hazard Classes : 2.3 - Class 2.3 - Toxic Gas.
TDG Subsidiary Classes : 8
Proper shipping name : SULPHUR DIOXIDE

ERAP Index : 500
Explosive Limit and Limited Quantity Index : 0
Passenger Carrying Ship Index : Forbidden
Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index : Forbidden

14.3. Air and sea transport

IMDG

UN-No. (IMDG) : 1079
Proper Shipping Name (IMDG) : SULPHUR DIOXIDE
Class (IMDG) : 2 - Gases
MFAG-No : 125

IATA

UN-No. (IATA) : 1079
Proper Shipping Name (IATA) : Sulphur dioxide
Class (IATA) : 2

SECTION 15: Regulatory information

15.1. National regulations

Sulfur dioxide (7446-09-5)

Listed on the Canadian DSL (Domestic Substances List)

15.2. International regulations

Sulfur dioxide (7446-09-5)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on the United States TSCA (Toxic Substances Control Act) inventory
Listed on INSQ (Mexican national Inventory of Chemical Substances)

SECTION 16: Other information

Date of issue : 15/10/1979
Revision date : 04/08/2016
Supersedes : 15/10/2013

Indication of changes:

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Other information

: PRAXAIR and the Flowing Airstream design are trademarks or registered trademarks of Praxair Technology, Inc. in the United States and/or other countries

Praxair asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information

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NFPA health hazard

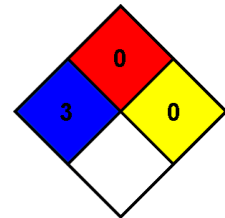
: 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.

NFPA fire hazard

: 0 - Materials that will not burn.

NFPA reactivity

: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health

: 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given

Flammability

: 0 Minimal Hazard - Materials that will not burn

Physical

: 2 Moderate Hazard - Materials that are unstable and may undergo violent chemical changes at normal temperature and pressure with low risk for explosion. Materials may react violently with water or form peroxides upon exposure to air.

SDS Canada (GHS) - Praxair

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