Safety data sheet
Sulphur dioxide

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
Product name
Sulphur dioxide

EC No (from EINECS): 231-195-2
CAS No: 7446-09-5
Index-Nr. 016-011-00-9
Chemical formula SO2
REACH Registration number:
01-2119485028-34

1.2. Relevant identified uses of the substance or mixture and uses advised against
Relevant identified uses
Industrial and professional. Perform risk assessment prior to use.
Uses advised against
Consumer use.

1.3. Details of the supplier of the safety data sheet
Company identification
BOC, Priestley Road, Worsley, Manchester M28 2UT
E-Mail Address ReachSDS@boc.com

1.4. Emergency telephone number
Emergency phone numbers (24h): 0800 111 333

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification acc. to Regulation (EC) No 1272/2008/EC (CLP/GHS)
Press. Gas (Liquefied gas) - Contains gas under pressure; may explode if heated.
Acute Tox. 3 - Toxic if inhaled.
Skin Corr. 1B - Causes severe skin burns and eye damage.
- Corrosive to the respiratory tract.

Classification acc. to Directive 67/548/EEC & 1999/45/EC
T; R23 **|** C; R34
Toxic by inhalation.
Causes burns (to eyes, respiratory system and skin).
Risk advice to man and the environment
Liquefied gas.

2.2. Label elements
- Labelling Pictograms

- Signal word

Danger

- Hazard Statements

H280	Contains gas under pressure; may explode if heated.
H331	Toxic if inhaled.
H314	Causes severe skin burns and eye damage.
EUH071	Corrosive to the respiratory tract.

- Precautionary Statements

Precautionary Statement Prevention

P280	Wear protective gloves/protective clothing/eye protection/face protection.
P260	Do not breathe gas, vapours.

Precautionary Statement Response

P304+P340+P315	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get immediate medical advice/attention.
P303+P361+P353+P315	IF ON SKIN (or hair): Remove / Take off immediately all contaminated clothes. Rinse skin with water/shower. Get immediate medical advice/attention.
P305+P351+P338+P315	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.

Precautionary Statement Storage

P403	Store in a well-ventilated place.
P405	Store locked up.

Precautionary Statement Disposal

None.

2.3. Other hazards
Contact with liquid may cause cold burns/frost bite.

SECTION 3: Composition/information on ingredients

Substance / Mixture: Substance.

3.1. Substances
Sulphur dioxide
CAS No: 7446-09-5
Index-Nr.: 016-011-00-9
EC No (from EINECS): 231-195-2
REACH Registration number:
01-2119485028-34
Contains no other components or impurities which will influence the classification of the product.

3.2. Mixtures
Not applicable.

SECTION 4: First aid measures

4.1. Description of first aid measures
First Aid General Information:
Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
First Aid Inhalation:
Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
First Aid Skin / Eye:
May cause severe chemical burns to skin and cornea. Suitable first-aid treatment should be immediately available. Seek medical advice before using product. Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Immediately flush eyes thoroughly with water for at least 15 minutes. Obtain medical assistance.
First Aid Ingestion:

Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed
May cause severe chemical burns to skin and cornea. Suitable first-aid treatment should be immediately available. Seek medical advice before using product. May result in pulmonary oedema.

4.3. Indication of any immediate medical attention and special treatment needed
Obtain medical assistance. Treat with a corticosteroid spray as soon as possible after inhalation.

SECTION 5: Fire fighting measures

5.1. Extinguishing media
Suitable extinguishing media
Carbon dioxide. Dry powder. Foam. Use water spray or fog to control fire fumes.
Unsuitable extinguishing media
Do not use a solid water stream as it may cause corrosive liquid to splash.

5.2. Special hazards arising from the substance or mixture
Specific hazards
Exposure to fire may cause containers to rupture/explode. Do not use a solid water stream as it may cause corrosive liquid to splash.
Hazardous combustion products
If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition: Sulphur oxides

5.3. Advice for fire-fighters
Specific methods
If possible, stop flow of product. Move container away or cool with water from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems.
Special protective equipment for fire-fighters
Gas tight chemically protective clothing (Type 1) in combination with self contained breathing apparatus. EN 943-2:2002: Protective clothing against liquid and gaseous chemicals, aerosols and solid particles. Performance requirements for gas-tight (Type 1) chemical protective suits for emergency teams (ET).

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Evacuate area. Use self-contained breathing apparatus and chemically protective clothing. Ensure adequate air ventilation. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Monitor concentration of released product. EN 137 Respiratory protective devices — Self-contained open-circuit compressed air breathing apparatus with full face mask — Requirements, testing, marking.

6.2. Environmental precautions
Try to stop release. Reduce vapour with fog or fine water spray.

6.3. Methods and material for containment and cleaning up
Ventilate area. Hose down area with water. Wash contaminated equipment or sites of leaks with copious quantities of water.

6.4. Reference to other sections
See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Do not allow backfeed into the container. Refer to supplier's handling instructions. The substance must be handled in accordance with good industrial hygiene and safety procedures. Avoid exposure, obtain special instructions before use. Avoid suckback of water, acid and alkalis. Purge system with dry inert gas (e.g. helium or nitrogen) before gas is introduced and when system is placed out of service. Do not smoke while handling product. Only experienced and properly instructed persons should handle gases under pressure. Never use direct flame or electrical heating devices to raise the pressure of a container. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. Ensure the complete gas system has been (or is regularly) checked for leaks before use. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to repair or modify container valves or safety relief devices. Damaged valves should be reported immediately to the supplier. Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment. Keep container valve outlets clean and free from contaminates particularly oil and water. Protect containers from physical damage; do not drag, roll, slide or drop. Do not remove or deface labels provided by the supplier for the identification of the container contents. When moving containers, even for short distances, use appropriate equipment eg. trolley, hand truck, fork truck etc. If user experiences any difficulty operating container valve discontinue use and contact supplier. Never attempt to transfer gases from one container to another. Installation of a cross purge assembly between the container and the regulator is recommended.

7.2. Conditions for safe storage, including any incompatibilities
Keep container below 50°C in a well ventilated place. Observe all regulations and local requirements regarding storage of containers. Containers should not be stored in conditions likely to encourage corrosion. Stored containers should be periodically checked for general conditions and leakage. Container valve guards or caps should be in place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible materials. Cylinders should be stored in the vertical position and properly secured to prevent falling over.

7.3. Specific end use(s)
None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters
Exposure limit value

Value type	value	Note
Great Britain - LTEL	2 ppm	
Great Britain-STEL	5 ppm	
Ireland - OELV 8 hrs (TWA)	2 ppm	
Ireland - OELV 15 min (STEL)	5 ppm	

The exposure limits in EH40 for the UK were withdrawn in 2003. Therefore users should follow the same approach for any other hazardous substance, e.g. apply the CHIP and COSHH regulations.

Derived No Effect Levels

Type	Exposure	Value	Population	Effects
DNEL	Short term inhalation	2,7 mg/m3	Workers	Local
DNEL	Long term inhalation	1,3 mg/m3	Workers	Local
DNEL	Long term inhalation	0,53 mg/m3	Workers	Local

8.2. Exposure controls
Appropriate engineering controls
A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered. Product to be handled in a closed system. Use only permanent leak-tight installations (e.g. welded pipes). Gas detectors should be used when toxic quantities may be released. Keep concentrations well below occupational exposure limits. Provide adequate general or local ventilation. Systems under pressure should be regularly checked for leakages. The substance must be handled in accordance with good industrial hygiene and safety procedures. Consider work permit system e.g. for maintenance activities.
Personal protective equipment
Eye and face protection
Protect eyes, face and skin from liquid splashes. Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Wear a face-shield when transfilling and breaking transfer connections. Safety eyewear, goggles or face-shield to EN166 should be used to avoid exposure to liquid splashes. Wear eye protection to EN 166 when using gases. Full-face mask recommended
Guideline:
EN136 Respiratory protective devices. Full face masks. Requirements, testing, marking
Skin protection
Hand protection
Advice: Wear working gloves and safety shoes while handling containers., Chemically resistant gloves complying with EN 374 should be worn at all times when handling chemical products if a risk assessment indicates this is necessary., Materials suitable for prolonged, direct contact.
Material: Chloroprene
Min. Breakthrough time: 480 min
Guideline: EN 374-1/2/3 Protective gloves against chemicals and micro-organisms.
Protection index: 6

Body protection
Keep suitable chemically resistant protective clothing readily available for emergency use. Personal protective equipment for the body should be selected based on the task being performed and the risks involved. Protect eyes, face and skin from contact with product.
Guideline:
EN 943: Protective clothing against liquid and gaseous chemicals, including liquid aerosols and solid particles.
Other protection
Wear working gloves and safety shoes while handling containers. ISO 20345 Safety footwear.
Respiratory protection
Keep self contained breathing apparatus readily available for emergency use., Use SCBA in the event of high concentrations, The selection of the Respiratory Protective Device (RPD) must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected RPD., When allowed by a risk assessment Respiratory Protective Equipment (RPE) may be used.
Guideline:
EN136 Respiratory protective devices. Full face masks. Requirements, testing, marking
Respiratory protection
Material:
Filter ABEK
Respiratory protection
Material:
Filter E
Guideline:
EN 14387: Respiratory protective devices. Gas filter(s) and combined filter(s). Requirements, testing, marking
Thermal hazards
If there is a risk of contact with the liquid, all protective equipment should be suitable for extremely low temperatures.
Environmental Exposure Controls
Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties
General information
Appearance/Colour: Colourless gas.
Odour: Pungent
Odour threshold:
Odour threshold is subjective and inadequate to warn for over exposure.
pH value: If dissolved in water pH-value will be affected.
Melting point: -75,5 °C
Boiling point: -10 °C
Flammability range: Non flammable.
Vapour Pressure 20 °C: 3,3 bar
Relative density, gas: 2,3
Solubility in water: Hydrolyses.
Autoignition temperature: Not applicable.
Molecular weight: 64,0 g/mol
Critical temperature: 158 °C
Relative density, liquid: 1,5

9.2. Other 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
Unreactive under normal conditions.

10.2. Chemical stability
Stable under normal conditions.

10.3. Possibility of hazardous reactions
None.

10.4. Conditions to avoid
Avoid moisture in installation systems. High temperature.

10.5. Incompatible materials
Reacts with water to form corrosive acids. May react violently with alkalis. Reacts with most metals in the presence of moisture, liberating hydrogen, an extremely flammable gas. With water causes rapid corrosion of some metals. Moisture. For material compatibility see latest version of ISO-11114.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced. If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition: Sulphur oxides

SECTION 11: Toxicological information

11.1. Information on toxicological effects
Acute inhalation toxicity
Value: IDLH (Immediately Dangerous to Life or Health)
Species: Human
Exposure time: 0,08 h
Value in non-standard unit: 400 - 500 ppm

Value: IDLH (Immediately Dangerous to Life or Health)
Species: Human
Exposure time: 0,5 h
Value in non-standard unit: 50 - 100 ppm
Acute dermal toxicity
Not applicable.
Acute toxicity other routes
Not applicable.
Skin irritation
Irritant, Severe corrosion to the skin at high concentrations.
Eye irritation
Irritant, May cause severe irritation with corneal damage which may result in permanent impairment of vision, even blindness.
Sensitization
Species: Guinea-pig
Substance induces development of ovalbumin-induced asthmatic reactions.
Repeated dose toxicity
Species: Rat
Route of application: Inhalation
No known effects from this product.
Genetic toxicity in vitro
Negative.
Genetic toxicity in vivo
Result: Negative.
Assessment mutagenicity
There is no evidence of mutagenic potential.
Assessment carcinogenicity
No evidence of carcinogenic effects.
Assessment toxicity to reproduction
No indication of toxic effects.
Assessment teratogenicity
No indication of teratogenic effects.
Other relevant toxicity information
Symptoms: Shortness of breath, fatigue, vomiting, unconciousness, Exposure may result in reddening, tears and itching of the eyes and soreness in the nose and throat, together with coughing., Inhalation of vapours in high concentrations maycause shortness of breath (lung oedema)., Persons with asthma will get symptoms even in minor concentrations.
Experiences with human exposure
A cloud evolving from accidental release may be fatal

SECTION 12: Ecological information

12.1. Toxicity
Toxic to water organisms., Avoid release to the environment., Product is not allowed to be discharged into ground water or aquatic environment
Acute and prolonged toxicity fish
Species: Leuciscus idus
Exposure time: 1 h
Value type: LC50
Value in standard unit mg/l: 220 - 460 mg/l
Acute toxicity aquatic invertebrates
Species: Water flea (Daphnia magna)
Exposure time: 48 h
Value type: EC50
Value in standard unit mg/l: 89 mg/l
Toxicity aquatic plants
Species: Scenedesmus subspicatus
Exposure time: 72 h
Value type: EC50
Value in standard unit mg/l: 48,1 mg/l

12.2. Persistence and degradability

Biodegradation
Not readily biodegradable. Inorganic compound., Will be oxidised in air to Sulphur trioxide

12.3. Bioaccumulative potential
The substance has no potential for bioaccumulation.
Biological oxygen demand (BOD)
Not determined
Chemical oxygen demand (COD)
COD value in stand. unit mg/l: 250 mg/l
Method: Calculated

12.4. Mobility in soil
The substance has low mobility in soil.

12.5. Results of PBT and vPvB assessment
Not classified as PBT or vPvB.

12.6. Other adverse effects
May cause pH changes in aqueous ecological systems.Depending on local conditions and existing concentrations, disturbances in the biodegradation process of activated sludge are not likely.

SECTION 13: Disposal considerations

13.1. Waste treatment methods
Must not be discharged to atmosphere. Do not discharge into any place where its accumulation could be dangerous. Toxic and corrosive gases formed during combustion should be scrubbed before discharge to atmosphere. Refer to the EIGA code of practice (Doc.30 “Disposal of Gases", downloadable at http://www.eiga.org) for more guidance on suitable disposal methods.
Contact supplier if guidance is required. Dispose of container via gas supplier only. Gases in pressure containers (including halons) containing dangerous substances
EWC Nr. 16 05 04*

SECTION 14: Transport information

ADR/RID

14.1. UN number
1079

14.2. UN proper shipping name
Sulphur dioxide

14.3. Transport hazard class(es)
Class: 2
Classification Code: 2TC
Labels: 2.3, 8
Hazard number: 268
Tunnel restriction code: (C/D)

Emergency Action Code: 2RE

14.4. Packing group (Packing Instruction)
P200

14.5. Environmental hazards
None.

14.6. Special precautions for user
None.

IMDG

14.1. UN number
1079

14.2. UN proper shipping name
Sulphur dioxide

14.3. Transport hazard class(es)
Class: 2.3
Labels: 2.3, 8
EmS: FC,SU,

14.4. Packing group (Packing Instruction)
P200

14.5. Environmental hazards
None.

14.6. Special precautions for user
None.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
Not applicable.

IATA

14.1. UN number
1079

14.2. UN proper shipping name
Sulphur dioxide

14.3. Transport hazard class(es)
Class: 2.3
Labels: 2.3, 8

14.4. Packing group (Packing Instruction)
P200

14.5. Environmental hazards
None.

14.6. Special precautions for user
None.

Other transport information
Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers ensure that they are firmly secured. Ensure that the valve outlet cap nut or plug (where provided) is correctly fitted. Ensure that the valve protection device (where provided) is correctly fitted. Ensure adequate ventilation. Ensure compliance with applicable regulations. Ensure that the container valve is closed and not leaking.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture
Seveso Directive 96/82/EC: Covered

Other regulations
Chemical Hazards Information and Packaging for Supply (CHIP, 1994 No. 3247)
Control of Major Accident Hazards Regulations (COMAH, 1999 No. 743)
Control of Substances Hazardous to Health Regulations (COSHH, 2002 No. 2677)
Management of Health and Safety at Work Regulations (1999 No. 3242)
Personal Protective Equipment Regulations (1992 No. 2966)
Pressure Systems Safety Regulations (PER, 2000 No. 128)
Provision and Use of Work Equipment Regulations (PUWER, 1998 No. 2306)
The Regulatory Reform (Fire Safety) Order 2005 (2005 No. 1541)

15.2. Chemical safety assessment
CSA has not been carried out.

SECTION 16: Other information

Ensure all national/local regulations are observed. Ensure operators understand the toxicity hazard. Users of breathing apparatus must be trained. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.
Advice
Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted. Details given in this document are believed to be correct at the time of going to press.
Further information
Note:
When using this document care should be taken, as the decimal sign and its position complies with rules for the structure and drafting of international standards, and is a comma on the line.
As an example 2,000 is two (to three decimal places) and not two thousand, whilst 1.000 is one thousand and not one (to three decimal places).
References
Various sources of data have been used in the compilation of this SDS, they include but are not exclusive to:
European Chemical Agency: Guidance on the Compilation of Safety Data Sheets.
European Chemical Agency: Information on Registered Substances http://apps.echa.europa.eu/registered/registered-sub.aspx#search
European Industrial Gases Association (EIGA) Doc. 918/11 Classification, Labelling and Safety data sheet guide.
ISO 10156:2010 Gases and gas mixtures -- Determination of fire potential and oxidizing ability for the selection of cylinder valve outlets.
Matheson Gas Data Book, 7th Edition.
National Institute for Standards and Technology (NIST) Standard Reference Database Number 69
The ESIS (European chemical Substances 5 Information System) platform of the former European Chemicals Bureau (ECB) ESIS (http://ecb.jrc.ec.europa.eu/esis/).
The European Chemical Industry Council (CEFIC) ERICards.
United States of America's National Library of Medicine's toxicology data network TOXNET (http://toxnet.nlm.nih.gov/index.html)
Substance specific information from suppliers.

EH40 (as ammended) Workplace exposure limits.

End of document