Ehsan International Gases

Sulphur dioxide SO_2

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

1.1. Product identifier

Name of product	Sulphur dioxide
	Art-Nr(n).: 0800 - 0805
Name of substance	sulphur dioxide
Index No	016-011-00-9
EC No	231-195-2
REACH registration number	01-2119485028-34
CAS No	7446-09-5

Manufacturer / Distributor:

Ehsan International Gases
40/9, Aurangabad, Nazimabad
#3, Karachi 74600, Pakistan.
+92 21 36612091 – 36612907
info@ehsan.com.pk
www.ehsan.com.pk

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses

Sector of uses [SU]
SU10 - Formulation [mixing] of preparations and/or re-packaging (excluding alloys)
SU13 - Manufacture of other non-metallic mineral products, e.g. plasters, cement
SU14 - Manufacture of basic metals, including alloys
SU15 - Manufacture of fabricated metal products, except machinery and equipment
SU22 - Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites SU4
- Manufacture of food products
SU6b - Manufacture of pulp, paper and paper products
SU8 - Manufacture of bulk, large scale chemicals (including petroleum products)
SU9 - Manufacture of fine chemicals

Product categories [PC]
PC14 - Metal surface treatment products, including galvanic and electroplating products
PC15 - Non-metal-surface treatment products
PC16 - Heat transfer fluids
PC19 - Intermediate
PC20 - Products such as ph-regulators, flocculants, precipitants, neutralisation agents
PC21 - Laboratory chemicals

PC26 - Paper and board dye, finishing and impregnation products: including bleaches and other processing aids
PC29 - Pharmaceuticals
PC37 - Water treatment chemicals

Process categories [PROC]
PROC1 - Use in closed process, no likelihood of exposure
PROC2 - Use in closed, continuous process with occasional controlled exposure
PROC3 - Use in closed batch process (synthesis or formulation)
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at nondedicated facilities
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC22 - Potentially closed processing operations with minerals/metals at elevated temperature; industrial setting
PROC23 - Open processing and transfer operations with minerals/metals at elevated temperature
PROC19 - Hand-mixing with intimate contact and only PPE available

Environmental release categories [ERC]
ERC7 - Industrial use of substances in closed systems
ERC2 - Formulation of preparations (mixtures)
ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)
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ERC6b - Industrial use of reactive processing aids
ERC6d - Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers

Recommended intended purpose(s)
Basic substance. Food additive.

1.3. Details of the supplier of the safety data sheet

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to 67/548/EEC or 1999/45/EC

T; R23
C; R34
R-phrases
23 Toxic by inhalation. 34 Causes burns.

Additional hints
Listed substance (Regulation (EC) No 1272/2008, Annex VI, part 3).

Hazard classes and Hazard categories	Hazard Statements	Classification procedure
Liquef. Gas	**H280**	

Acute Tox. 3	**H331**	**Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]**
Skin Corr. 1B	**H314**	

Hazard statements for physical hazards

H280 Contains gas under pressure; may explode if heated.

Hazard statements for health hazards

H314 Causes severe skin burns and eye damage. H331 Toxic if inhaled.

Additional hints

Listed substance (Regulation (EC) No 1272/2008, Annex VI, part 3).

2.2. Label elements

Labelling according to Regulation (EC) No 1272/2008 [CLP/GHS]

GHS04 GHS05 GHS06

Signal word

Danger

Hazard statements for physical hazards

H280 Contains gas under pressure; may explode if heated.

Hazard statements for health hazards

H314 Causes severe skin burns and eye damage. H331

Toxic if inhaled.

Precautionary Statements

Prevention

P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

Response

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

Storage

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

Supplemental Hazard information (EU)

Health properties

Corrosive to the respiratory tract.

Special rules for supplemental label elements for certain mixtures In case of use as a food additive: 'E 220', 'for food' and 'not for retail sale'.

2.3. Other hazards

Adverse human health effects and symptoms

Contact with liquid may cause cold burns/frostbite.

Information pertaining to special dangers for human and environment
Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

SECTION 3: Composition/ information on ingredients

3.1. Substances

CAS No 7446-09-5 **sulphur dioxide**
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REACH registration number 01-2119485028-34
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3.2. Mixtures

not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

General information
Remove contaminated soaked clothing immediately.
Adhere to personal protective measures when giving first aid.
Seek medical advice immediately.

In case of inhalation
Remove the casualty into fresh air and keep him immobile.
In case of breathing difficulties give oxygen.
In the event of pulmonary irritation treat initially with corticoid spray, e.g. Ventolair- or Pulmicort- metered-dose aerosol (Ventolair and Pulmicort are registrated trademarks).
Seek medical treatment immediately.
In case of respiratory standstill give artifical respiration by respiratory bag (Ambu bag) or respirator. Send for a doctor.

In case of skin contact
In case of contact with skin wash off with warm water.
In case of frostbite spray with lukewarm (not hot) water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.

In case of eye contact
Rinse cautiously with water for several minuts. Remove contact lenses, if present and easy to do. Continue rinsing.
Call for a doctor immediately.

In case of ingestion
Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

Physician's information / possible symptoms
Coughing
Shortness of breath

Physician's information / possible dangers
Risk of pulmonary oedema

4.3. Indication of any immediate medical attention and special treatment needed
Treatment (Advice to doctor)
Continue to monitor for pneumonia and pulmonary oedema.
Symptoms may not occur until several hours.

SECTION 5: Firefighting measures

5.1. Extinguishing media
Suitable extinguishing media
Product does not burn, fire-extinguishing activities according to surrounding.
Foam
Dry powder
Carbon dioxide
Water spray jet

Unsuitable extinguishing media
Full water jet

5.2. Special hazards arising from the substance or mixture
In case of fire formation of dangerous gases possible.
In the event of fire the following can be released:
Sulfur oxide

5.3. Advice for firefighters
Special protective equipment for fire-fighters
Use breathing apparatus with independent air supply (isolated). Wear full protective clothing.

Additional information
Cool endangered containers with water spray jet.
Exposure to fire may cause containers to rupture / explode.
Fire residues and contaminated firefighting water must be disposed of in accordance with the local regulations. Collect contaminated firefighting water separately, must not be discharged into the drains.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
See chapter 8.
Remove persons to safety.
Evacuate area.

6.2. Environmental precautions
Do not discharge into the drains or bodies of water..
Collect contaminated water / firefighting water separately.
If possible, stop flow of product.
Prevent spread over a wide area (e.g. by containment or oil barriers).
If necessary, secure leaky pressure receptacles in a salvage packaging.
Suppress gases/vapours/mists with water spray jet Do not discharge into the subsoil/soil.

6.3. Methods and material for containment and cleaning up
Ensure adequate air ventilation.
Clean contaminated objects and floor thoroughly under consideration of environment regulations.

Additional Information
No water on the leaks.

6.4. Reference to other sections
Disposal: see section 13
Informations for safe handling see chapter 7.
Informations for personal protective equipment see chapter 8.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Advice on safe handling
Use only in thoroughly ventilated areas.
Transfer and handle only in enclosed systems.
Containers' temperature may not be increased above 50 °C.
Do not heat with open flames.
The working pressure in the receptacle must not exceed the saturation vapour pressure of the pure product resulting at a temperature of 50 °C.
Provide good room ventilation even at ground level (vapours are heavier than air).
Prevent cylinders from falling over.
Ensure valve outlet cap nut or plug is correctly fitted.
Ensure valve protection device is correctly fitted.
Open valve slowly to avoid pressure shock.
Use only properly specified equipment which is suitable for this product, its supply pressure and temperature.

Do not allow backfeed into the container.
Suck back of water into the container must be prevented.
No water to valves, flanges and other fittings.
Purging of pipes and valves with inert gases - to avoid: water, solvents.

General protective measures
Do not inhale gases/vapours/aerosols.

Hygiene measures
At work do not eat, drink, smoke or take drugs.
Wash hands before breaks and after work.

Advice on protection against fire and explosion
The product is not combustible.

7.2. Conditions for safe storage, including any incompatibilities
Requirements for storage rooms and vessels
Keep in closed original container.
Ventilate store-rooms thoroughly.
Use transportable pressure equipment.
Suitable materials: Normalised steel and carbon steel, tempered steel, aluminium alloys, stainless steel. Valve:
Suitable materials: Brass, copper alloys, carbon steels, aluminium alloys, stainless steel.

Advice on storage compatibility
Do not store with combustible materials.
Do not store with spontaneously flammable materials.
Do not store together with combustible liquids or combustible solids.
Do not store together with animal feedstuffs.
Do not store together with explosives.
Do not store together with infectious substances.
Do not store together with radioactive material.
Do not store together with toxic liquids or toxic solids.
Do not store together with food.
Do not store together with oxidizing liquids or oxidizing solids.

Further information on storage conditions
Ensure valve protection device is correctly fitted.
Store closed container at cool and aired place.
Store only in original container at temperature of 50°C maximum
(=122°F). Prevent cylinders from falling over. Protect of heat.

7.3. Specific end use(s)
Recommendation(s) for intended use
See exposure scenario(s).
Use in foods in accordance with regulation (EC) No 178/2002 laying down the general principles and requirements of food law and regulation (EC) No 1333/2008 on food additives.

! SECTION 8: Exposure controls/personal protection

8.1. Control parameters
Ingredients with occupational exposure limits to be monitored

CAS No	Name	Code	[mg/m3]	[ppm]	Remark
7446-09-5	Sulfur dioxide	PEL, 8 hours	13	5	OSHA (USA)

7446-09-5		Sulfur dioxide	REL, 8 hours	5	2
		NIOSH (USA)	Short-term	13	5

7446-09-5	Sulfur dioxide	TLV, 8 hours	2	
ACGIH (USA)				
		Short-term	5	

Additional advice
DNEL (workers, inhalation, long-term, local effects): 1,3 mg/m³.
DNEL (workers, inhalation, short-term, local effects): 2,7 mg/m³.
DNEL (consumers, inhalation, long-term, local effects): 0,53 mg/m³.

8.2. Exposure controls
Respiratory protection
Short term: filter apparatus, filter E
Breathing apparatus in the event of high concentrations.
Keep self contained breathing apparatus readily available for emergency use.
In case of rescue and maintenance activities in storage containers use environment-independent breathing apparatus because of risk of suffocation by edging out of air oxygen

! Hand protection
Leather gloves
Protective gloves complying with EN 374.
In case of increased risk: Protective gloves made of CR.

Eye protection
Safety goggles, in case of increased risk add protective face shield
Safety goggles with side protection complying with EN 166.

Skin protection
Safety shoes with steel toe.
Body covering work clothing, or chemical resistant suit at increased risk.

Limitation and surveillance of the environment
PNEC: not required, because the substance is gaseous.

Additional advice on system design
Transfer and handle only in enclosed systems.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Form	**Colour**	**Odour**
compressed liquified gas	colourless	pungent

! Odour threshold
0,75 - 8 mg/m³

Important health, safety and environmental information

	Value	Temperature	at	Method	Remark
pH value in delivery state	not applicable				
Acid number	not applicable				
boiling point	-10,05 °C		1013 hPa		

melting point	-75,5 °C				
Flash point	no				
	Value	Temperature	at	Method	Remark
Flammable solid	not applicable				
Flammability (gas)	no				
Ignition temperature	no				
Autoignition	no				
Lower explosion limit	no				
Upper explosion limit	no				
Vapour pressure	3271 hPa	20 °C			
Relative density	1,46 g/cm3	-10 °C			liquid phase
Bulk density	not applicable				
Vapour density	2,27	20 °C			air = 1
Solubility in water	114 g/l	20 °C			hydrolyses
Viscosity dynamic	0,304 mPa*s	20 °C			liquid phase
Solvent concentration	not applicable				

Oxidising properties
no

Explosive properties
no

9.2. Other information
Product effects hygroscopic.
Vapours are heavier than air.

SECTION 10: Stability and reactivity

10.1. Reactivity
See section "Possibility of hazardous reactions".

10.2. Chemical stability Stable under normal conditions.

10.3. Possibility of hazardous reactions
May react violently with oxidants.
Reactions with alkalies.
Violent reactions with ammonia.

10.4. Conditions to avoid Heat sources / heat - risk of bursting.
Humidity.

10.5. Incompatible materials
! Materials to avoid
Strong oxidizing agents.
Water / moisture.
Alkalis.
Ammonia.

10.6. Hazardous decomposition products
Sulphurous oxides (SOx)
Oxygen

Thermal decomposition

Remark Above 2000 °C.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity/Irritability/Sensitization

	Value/Validation	Species	Method	Remark
LD50 acute oral	not applicable			Study technically not feasible.
LD50 acute dermal	not applicable			Study technically not feasible.
LC50 acute inhalation	2520 ppm (1 h)	rat		
Irritability skin	strong corrosive			experiences
Irritability eye	strong corrosive			experiences
Skin sensitization				Study technically not feasible.
Sensitization respiratory system	non-sensitizing	Guinea pig		

Subacute Toxicity - Carcinogenicity

	Value	Species	Method	Validation
Subacute Toxicity	NOAEL 5 ppm (24 d) Sub-acute inhalation toxicity 2 h/d, 5 d/w	rat (male / female)		

Subchronic Toxicity	LOAEC 10 ppm (0,4 a) Inhalation 6 h/d, 5 d/w	Rat

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	Value	Species	Method	Validation
Chronic Toxicity	NOAEL 1 ppm (0,33 - 0,66 a) Inhalation 5 h/d, 5 d/w	Rat		
Mutagenicity		Mouse	OECD 474	No experimental information on genotoxicity in vitro and in vivo available.
Reproduction-Toxicity	NOAEL 30 ppm Inhalation	Mouse	Directive 86/ 509/EEC	Indications of toxic effects are available from reproduction studies in animals.
Carcinogenicity				No indications of carcinogenic effects are available from long-term trials.

! Specific target organ toxicity (single exposure)
no

! Specific target organ toxicity (repeated exposure)
no

! Aspiration hazard
not applicable

! Experiences made from practice
May cause frostbite.

SECTION 12: Ecological information

12.1. Toxicity

	Value	Species	Method	Validation
Fish				Study technically not feasible.
Daphnia				Study technically not feasible.

Algae	Study technically not feasible.

12.2. Persistence and degradability

Physico-chemical	no

Ecotoxicological effects

degradability

Biological degradability not applicable

Inorganic product, cannot be eliminated from the water by biological purification processes.

Elimination rate	Method of analysis	Method	Validation

Biological eliminability no

Inorganic product, cannot be eliminated from the water by biological purification processes.

12.3. Bioaccumulative potential

Does not bioaccumulate. **12.4.**

Mobility in soil high mobility

Adsorption in the soil is not likely.

12.5. Results of PBT and vPvB assessment

This substance does not meet the PBT/vPvB criteria of REACH, annex XIII.

12.6. Other adverse effects

Not known.

! Behaviour in sewage plant

When low concentrations are discharged correctly into adapted biological sewage treatment plants, interference with the degradation activity of activated sludge is not likely.

Treat by state-of-the-art technology before discharging into drains.

Additional ecological information

	Value	Method	Remark
COD	250 mg/l	calculated	
BOD	not determined		

General regulation

Do not allow uncontrolled leakage of product into the environment.

Product is not allowed to be discharged into the ground water or aquatic environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste code No.	**Name of waste**
16 05 04*	gases in pressure containers (including halons) containing dangerous substances

Wastes marked with an asterisk are considered to be hazardous waste pursuant to Directive 91/689/EEC on hazardous waste.

Recommendations for the product
Dispose of as hazardous waste.

Recommendations for packaging
Transportable pressure equipment (empty, residual pressure): Return to supplier / manufacturer.

SECTION 14: Transport information

Land and inland navigation transport ADR/RID
UN 1079 SULPHUR DIOXIDE, 2.3 (8), (C/D), Classification code: 2TC
Marine transport IMDG
UN 1079 SULPHUR DIOXIDE, 2.3 (8)
Ems: F-C, S-U
Air transport ICAO/IATA-DGR
UN 1079 Sulphur dioxide, 2.3 (8)
FORBIDDEN

Special precautions for user
The protective measures listed in Sections 6, 7 and 8 of the Safety Data Sheet have to be considered.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
not applicable
No transport as bulk according IBC - Code.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture
Other regulations (EU)
Regulation (EC) No 1333/2008 on food additives.
Directive 96/82/EC on the control of major-accident hazards involving dangerous substances.

15.2. Chemical Safety Assessment
For this substance a chemical safety assessment has been carried out.
Exposure scenarios (ESs) see http://www.ghc.de/media/en/downloads/expo/0800.pdf.

SECTION 16: Other information

Recommended uses and restrictions
National and local regulations concerning chemicals shall be observed.

Further information
All declarations of safety-data-sheet refer to pure substance.
The information contained herein is based on the state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product. Indication of changes: "!" = Data changed compared with the previous version.

Wording of the R/H-phrases specified in chapter 3 (not the classification of the mixture!)

R 23 Toxic by inhalation.
R 34 Causes burns.

H280 Contains gas under pressure; may explode if heated.
H314 Causes severe skin burns and eye damage.
H331 Toxic if inhaled.