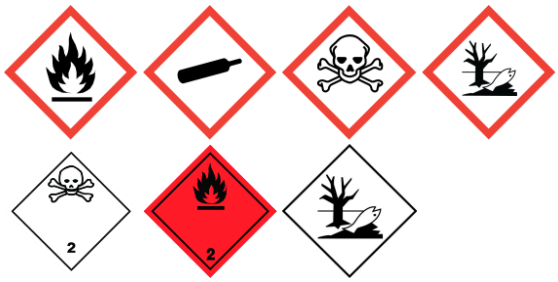
Safety Data Sheet

Hydrogen sulphide

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
Reference number: 073
Revision date: 14/11/2023
Supersedes version of: 14/03/2023
Version: 6.0

Danger



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

1.1. Product identifier

Trade name	:	Hydrogen sulphide
SDS no	:	073
Other means of identification	:	hydrogen sulphide
		CAS-No. : 7783-06-4
		EC-No. : 231-977-3
		EC Index-No. : 016-001-00-4
REACH registration No	:	Registration deadline not expired.
Chemical formula	:	H2S

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

Relevant identified uses	:	Industrial and professional uses. Perform risk assessment prior to use. Test gas/Calibration gas. Laboratory use. Contact supplier for more information on uses.
Uses advised against	:	Consumer use.

1.3. Details of the supplier of the safety data sheet

Company identification	:	SOL SpA Via G. Borgazzi 27 20900 MONZA - Italia T +39 039 23.96.1 http:\\www.sol.it msds@sol.it
E-Mail address (competent person)	:	msds@sol.it

1.4. Emergency telephone number

Emergency telephone number	:	Linea verde SET - 800452661 (24h/24h, 365 giorni l'anno); Dall'estero +39 0283421263

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Physical hazards	Flammable gases, Category 1A	H220
	Gases under pressure : Liquefied gas	H280
Health hazards	Acute toxicity (inhal.), Category 2	H330
	Acute toxicity (inhalation:gas) Category 2	H330
Environmental hazards	Hazardous to the aquatic environment – Acute Hazard, Category 1	H400

2.2. Label elements

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

Hazard pictograms (CLP) :

GHS02 GHS04 GHS06 GHS09

Signal word (CLP) : Danger

Hazard statements (CLP) : H220 - Extremely flammable gas.
H280 - Contains gas under pressure; may explode if heated.
H330 - Fatal if inhaled.
H400 - Very toxic to aquatic life.

Precautionary statements (CLP)

- Prevention : P271 - Use only outdoors or in a well-ventilated area.
P273 - Avoid release to the environment.
P260 - Do not breathe dust/fume/gas/mist/vapours/spray.
P284 - Wear respiratory protection.
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

- Response : P391 - Collect spillage.
P320 - Specific treatment is urgent (see supplemental first aid instruction on this label).
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P310 - Immediately call a POISON CENTER or doctor.
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 - In case of leakage, eliminate all ignition sources.

- Storage : P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
P405 - Store locked up.
P403 - Store in a well-ventilated place.
P410+P403 - Protect from sunlight. Store in a well-ventilated place.

- Disposal considerations : P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

2.3. Other hazards

Contact with liquid may cause cold burns/frostbite.

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	%	Product identifier	Classification according to Regulation (EC) No. 1272/2008 [CLP]
hydrogen sulphide	100	CAS-No.: 7783-06-4 EC-No.: 231-977-3 EC Index-No.: 016-001-00-4 REACH registration No: *2	Flam. Gas 1A, H220 Press. Gas (Liq.), H280 Acute Tox. 2 (Inhalation), H330 Acute Tox. 2 (Inhalation:gas), H330 Aquatic Acute 1, H400

Contains no other components or impurities which will influence the classification of the product.
**1: Listed in Annex IV / V REACH, exempted from registration.*
**3: Registration not required: Substance manufactured or imported < 1t/y.*

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

- Inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Perform cardiopulmonary resuscitation if breathing stopped.
- Skin contact : Adverse effects not expected from this product.
  For liquid spillage - flush with water for at least 15 minutes.
- Eye contact : Adverse effects not expected from this product.
  Immediately flush eyes thoroughly with water for at least 15 minutes.
- Ingestion : Ingestion is not considered a potential route of exposure.

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

In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation.
May cause damaging effects to central nervous system, metabolism and gastrointestinal tract.
Prolonged exposure to small concentrations may result in pulmonary oedema.
Irritation to the respiratory tract.
See section 11.

4.3. Indication of any immediate medical attention and special treatment needed

Obtain medical assistance.
None.

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Water spray or fog.
  Dry powder.
- Unsuitable extinguishing media : Do not use water jet to extinguish.
  Carbon dioxide.

5.2. Special hazards arising from the substance or mixture

Specific hazards : Exposure to fire may cause containers to rupture/explode.
Hazardous combustion products : If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition: Sulphur dioxide.

5.3. Advice for firefighters

Specific methods : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems.
If possible, stop flow of product.
Use water spray or fog to knock down fire fumes if possible.
Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire.
Move containers away from the fire area if this can be done without risk.

Special protective equipment for fire fighters : Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.
Standard EN 469 - Protective clothing for firefighters. Standard - EN 659: Protective gloves for firefighters.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Try to stop release.
Evacuate area.
Monitor concentration of released product.
Consider the risk of potentially explosive atmospheres.
Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
Eliminate ignition sources.
Ensure adequate air ventilation.
Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
Act in accordance with local emergency plan.
Stay upwind.

6.2. Environmental precautions

Try to stop release.

6.3. Methods and material for containment and cleaning up

Hose down area with water.
Ventilate area.

6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Safe use of the product : The product must be handled in accordance with good industrial hygiene and safety procedures.
Only experienced and properly instructed persons should handle gases under pressure.
Consider pressure relief device(s) in gas installations.
Ensure the complete gas system was (or is regularily) checked for leaks before use.
Do not smoke while handling product.
Avoid exposure, obtain special instructions before use.
Protect eyes, face and skin from liquid splashes.
Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
Installation of a cross purge assembly between the container and the regulator is recommended.
Purge system with dry inert gas (e.g. helium or nitrogen) before gas is introduced and when system is placed out of service.
Avoid suck back of water, acid and alkalis.
Assess the risk of potentially explosive atmospheres and the need for explosion-proof equipment.
Purge air from system before introducing gas.
Take precautionary measures against static discharge.
Keep away from ignition sources (including static discharges).
Consider the use of only non-sparking tools.
Do not breathe gas.
Avoid release of product into work area.

Safe handling of the gas receptacle	:	Refer to supplier's container handling instructions. Do not allow backfeed into the container. Protect containers from physical damage; do not drag, roll, slide or drop. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. 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. If user experiences any difficulty operating valve discontinue use and contact supplier. Never attempt to repair or modify container valves or safety relief devices. Damaged valves should be reported immediately to the supplier. Keep container valve outlets clean and free from contaminants particularly oil and water. Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to transfer gases from one cylinder/container to another. Never use direct flame or electrical heating devices to raise the pressure of a container. Do not remove or deface labels provided by the supplier for the identification of the content of the container. Containers should be stored in the vertical position and properly secured to prevent them from falling over.

7.2. Conditions for safe storage, including any incompatibilities

Observe all regulations and local requirements regarding storage of containers.
Containers should not be stored in conditions likely to encourage corrosion.
Container valve guards or caps should be in place.
Containers should be stored in the vertical position and properly secured to prevent them from falling over.
Stored containers should be periodically checked for general condition and leakage.
Keep container below 50°C in a well ventilated place.
Store containers in location free from fire risk and away from sources of heat and ignition.
Keep away from combustible materials.
Segregate from oxidant gases and other oxidants in store.
All electrical equipment in the storage areas should be compatible with the risk of a potentially explosive atmosphere.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Hydrogen sulphide (7783-06-4)	
EU - Indicative Occupational Exposure Limit (IOEL)	
IOEL TWA	7 mg/m³
IOEL TWA [ppm]	5 ppm
IOEL STEL	14 mg/m³
IOEL STEL [ppm]	10 ppm
Italy - Occupational Exposure Limits	
OEL TWA	7 mg/m³
OEL TWA [ppm]	5 ppm
OEL STEL	14 mg/m³
OEL STEL [ppm]	10 ppm

8.2. Exposure controls

8.2.1. Appropriate engineering controls

Product to be handled in a closed system and under strictly controlled conditions.
Provide adequate general and local exhaust ventilation.
Preferably use permanent leak-tight installations (e.g. welded pipes).
Systems under pressure should be regularly checked for leakages.
Ensure exposure is below occupational exposure limits (where available).
Gas detectors should be used when toxic gases may be released.
Keep concentrations well below lower explosion limits.
Consider the use of a work permit system e.g. for maintenance activities.

8.2.2. Individual protection measures, e.g. personal protective equipment

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:
PPE compliant to the recommended EN/ISO standards should be selected.

• Eye/face protection :
Wear safety glasses with side shields.
Wear goggles when transfilling or breaking transfer connections.
Wear goggles and a face shield when transfilling or breaking transfer connections.
Standard EN 166 - Personal eye-protection - specifications.

• Skin protection

- Hand protection :
Wear working gloves when handling gas containers.
Wear chemically resistant protective gloves.
Standard EN 388 - Protective gloves against mechanical risks, performance level 1 or higher.
Standard EN 374 - Protective gloves against chemicals.
Permeation time: minimum >480min long term exposure: material / thickness [mm] Nitrile rubber (NBR) 0,7.
Consult glove manufacturer´s product information on material suitability and material thickness.
The breakthrough time of the selected gloves must be greater than the intended use period.

- Other :
Consider the use of flame resistant anti-static safety clothing.
Standard EN ISO 14116 - Limited flame spread materials.
Standard EN 1149-5 - Protective clothing: Electrostatic properties.
Wear safety shoes while handling containers.
Standard EN ISO 20345 - Personal protective equipment - Safety footwear.

• Respiratory protection :
Gas filters may be used if all surrounding conditions e.g. type and concentration of the contaminant(s) and duration of use are known.
Use gas filters with full face mask, where exposure limits may be exceeded for a short-term period, e.g. connecting or disconnecting containers.
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.
Recommended: Filter B (grey).
Consult respiratory device supplier´s product information for the selection of the appropriate device.
Gas filters do not protect against oxygen deficiency.
Standard EN 14387 - Gas filter(s), combined filter(s) and standard EN136, full face masks .
Keep self contained breathing apparatus readily available for emergency use.
Self contained breathing apparatus is recommended, where unknown exposure may be expected, e.g. during maintenance activities on installation systems.

• Thermal hazards :
Wear cold insulating gloves when transfilling or breaking transfer connections.
Standard EN 511 - Cold insulating gloves.
None necessary.

8.2.3. 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

Appearance		
- Physical state at 20°C / 101.3kPa	:	Gas.
- Colour	:	Colourless.
Odour	:	Odour can persist. Rotten eggs. Poor warning properties at low concentrations. Odour threshold is subjective and inadequate to warn of overexposure. Odour threshold is subjective and inadequate to warn of overexposure.
Melting point / Freezing point	:	-86 °C -86 °C
Boiling point	:	-60.2 °C
Flammability	:	Flammability range not available.
Lower explosion limit	:	Not available
Upper explosion limit	:	Not available
Flash point	:	Not applicable for gases and gas mixtures.
Auto-ignition temperature	:	Not known.
Decomposition temperature	:	Not available
pH	:	Not applicable.
Viscosity, kinematic	:	Not applicable.
Water solubility [20°C]	:	3980 mg/l
Partition coefficient n-octanol/water (Log Kow)	:	Not applicable for gas mixtures.
Vapour pressure [20°C]	:	No reliable data available.
Vapour pressure [50°C]	:	No reliable data available.
Density and/or relative density	:	Not applicable.
Relative vapour density (air=1)	:	1.2
Particle characteristics	:	Not applicable.

9.2. Other information

9.2.1. Information with regard to physical hazard classes

Explosive properties	:	Not applicable.
Explosion limits	:	Flammability range not available.
Oxidising properties	:	None.
Tci	:	8.9 %
Critical temperature [°C]	:	100 °C

9.2.2. Other safety characteristics

Molar mass	:	34 g/mol
Evaporation rate	:	Not applicable for gases and gas mixtures.
Gas group	:	Press. Gas (Liq.).
Other data	:	Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

SECTION 10: Stability and reactivity

10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

May react violently with oxidants.
Can form explosive mixture with air.

10.4. Conditions to avoid

Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
Avoid moisture in installation systems.

10.5. Incompatible materials

With water causes rapid corrosion of some metals.
Moisture.
Air, Oxidisers.
For additional information on compatibility refer to ISO 11114.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity : Very toxic by inhalation.

LC50 Inhalation - Rat [ppm]	356 ppm/4h

Skin corrosion/irritation : No known effects from this product.
Serious eye damage/irritation : No known effects from this product.
Respiratory or skin sensitisation : No known effects from this product.
Germ cell mutagenicity : No known effects from this product.
Carcinogenicity : No known effects from this product.
Toxic for reproduction : Fertility : No known effects from this product.
Toxic for reproduction : unborn child : No known effects from this product.
STOT-single exposure : Irritation to the respiratory tract.
STOT-repeated exposure : Damage to central nervous system.
Aspiration hazard : Not applicable for gases and gas mixtures.

11.2. Information on other hazards

No additional information available

SECTION 12: Ecological information

12.1. Toxicity

Assessment : Very toxic to aquatic life.
EC50 48h - Daphnia magna [mg/l] : 0.12 mg/l
EC50 72h - Algae [mg/l] : 1.87 mg/l
LC50 96 h - Fish [mg/l] : 0.007 - 0.019 mg/l

12.2. Persistence and degradability

Assessment : Not applicable for inorganic products.
No data available.

12.3. Bioaccumulative potential

Assessment : No data available.

12.4. Mobility in soil

Assessment : No data available.
Assessment : Because of its high volatility, the product is unlikely to cause ground or water pollution.

12.5. Results of PBT and vPvB assessment

Assessment : Not classified as PBT or vPvB.

12.6. Endocrine disrupting properties

Assessment :

12.7. 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. Waste treatment methods

Contact supplier if guidance is required.
Must not be discharged to atmosphere.
Toxic and corrosive gases formed during combustion should be scrubbed before discharge to atmosphere.
Gas may be scrubbed in alkaline solution under controlled conditions to avoid violent reaction.
Ensure that the emission levels from local regulations or operating permits are not exceeded.
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.

List of hazardous waste codes (from Commission Decision 2000/532/EC as amended) : 16 05 04 *: Gases in pressure containers (including halons) containing hazardous substances.

13.2. Additional information

None.

SECTION 14: Transport information

14.1. UN number or ID number

In accordance with ADR / RID / IMDG / IATA / ADN
UN-No. : 1053

14.2. UN proper shipping name

Transport by road/rail (ADR/RID)	:	LIQUEFIED GAS, FLAMMABLE, N.O.S. (HYDROGEN SULPHIDE)
Transport by air (ICAO-TI / IATA-DGR)	:	Liquefied gas, flammable, n.o.s. (HYDROGEN SULPHIDE)
Transport by sea (IMDG)	:	LIQUEFIED GAS, FLAMMABLE, N.O.S. (HYDROGEN SULPHIDE)

14.3. Transport hazard class(es)

Labelling :

2.3 : Toxic gases.
2.1 : Flammable gases.
Environmentally hazardous substances

Transport by road/rail (ADR/RID)

Class	:	2
Classification code	:	2F
Hazard identification number	:	23
Tunnel Restriction	:	B/D - Tank carriage: Passage forbidden through tunnels of category B, C, D and E. Other carriage: Passage forbidden through tunnels of category D and E

Transport by air (ICAO-TI / IATA-DGR)

Class / Div. (Sub. risk(s))	:	2.3 (2.1)

Transport by sea (IMDG)

Class / Div. (Sub. risk(s))	:	2.3 (2.1)
Emergency Schedule (EmS) - Fire	:	F-D
Emergency Schedule (EmS) - Spillage	:	S-U

14.4. Packing group

Transport by road/rail (ADR/RID)	:	Not applicable.
Transport by air (ICAO-TI / IATA-DGR)	:	Not applicable.
Transport by sea (IMDG)	:	Not applicable.

14.5. Environmental hazards

Transport by road/rail (ADR/RID) : Environmentally hazardous substance / mixture.
Transport by air (ICAO-TI / IATA-DGR) : Environmentally hazardous substance / mixture.
Transport by sea (IMDG) : Marine pollutant.

14.6. Special precautions for user

Packing Instruction(s)

Transport by road/rail (ADR/RID) : P200.
Transport by air (ICAO-TI / IATA-DGR)
Passenger and Cargo Aircraft : Forbidden.
Cargo Aircraft only : 200.
Transport by sea (IMDG) : P200.

Special transport precautions : 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 there is adequate ventilation.
- Ensure that containers are firmly secured.
- Ensure valve is closed and not leaking.
- Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
- Ensure valve protection device (where provided) is correctly fitted.

14.7. Maritime transport in bulk according to IMO instruments

Not applicable.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU-Regulations

Restrictions on use : None.
Other information, restriction and prohibition regulations : Ensure all national/local regulations are observed.
Not listed on the PIC list (Regulation EU 649/2012).
Seveso Directive : 2012/18/EU (Seveso III) : Listed.
Covered.

National regulations

No additional information available

15.2. Chemical safety assessment

A CSA has not yet been carried out.

SECTION 16: Other information

Indication of changes : Revised safety data sheet in accordance with commission regulation (EU) No 2015/830.

Training advice : Users of breathing apparatus must be trained.
Ensure operators understand the flammability hazard.
Ensure operators understand the toxicity hazard.
Receptacle under pressure.

Further information : This Safety Data Sheet has been established in accordance with the applicable European Union legislation.
Classification in accordance with the procedures and calculation methods of Regulation (EC) 1272/2008 (CLP).

Full text of H- and EUH-statements	
Acute Tox. 2 (Inhalation)	Acute toxicity (inhal.), Category 2

Acute Tox. 2 (Inhalation:gas)	Acute toxicity (inhalation:gas) Category 2
Aquatic Acute 1	Hazardous to the aquatic environment – Acute Hazard, Category 1
Flam. Gas 1A	Flammable gases, Category 1A
H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.
H330	Fatal if inhaled.
H400	Very toxic to aquatic life.
Press. Gas (Liq.)	Gases under pressure : Liquefied gas

DISCLAIMER OF LIABILITY : Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.
Details given in this document are believed to be correct at the time of going to press.
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.

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