

Air Liquide New Zealand Limited
19 Maurice Road
Penrose
Auckland 1061

Phone: (09) 622 3880
Fax: (09) 622 3881
Emergency: 0800 156 516

MATERIAL SAFETY DATA SHEET

Product Name:

Hydrogen Sulphide,
(H₂S)

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IDENTIFICATION

Chemical Name:

Hydrogen Sulphide (H₂S)

Synonyms:

Dihydrogen Monosulphide, Dihydrogen Sulphide,
Sewer Gas, Stink Damp, Sulphur Dihydride
1053

UN Number:

Use: As a Metal Annealing Agent.

HAZARDS IDENTIFICATION

Dangerous Goods Class and Subsidiary Risk:

2.3 sub 2.1

HSNO Classification:

2.1.1A, 6.1B, 6.3B, 6.4A, 6.9A, 9.1A

Hazard Statement:

Extremely Flammable Gas.
Explosive; fire, blast or projection hazard.
Fatal if inhaled.
Causes mild skin irritation.
Causes serious eye irritation.
Very toxic to aquatic life.

Precautionary Statements:

Keep out of reach of children.
Read label before use.
Read Material Safety Data Sheet before use.
Keep away from all ignition sources.
No smoking.
Do not breathe gas.
Use only outdoors or in a well-ventilated area.
Avoid release to the environment.
Collect spillage.
Wash hands thoroughly after use.
Wear protective, gloves, clothing, eye and face protection.
Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
Eliminate all sources of ignition.
Explosion risk in case of fire.
Fight fire with normal precautions from a reasonable distance.
Take precautionary measures against static discharges.
Use self contained breathing apparatus.
If INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
If skin irritation occurs: Get medical advice/attention.
If IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.
IF exposed: Call a POISON CENTRE or doctor.
Do NOT induce vomiting.
Store in a well –ventilated place. Keep container tightly closed.
Store locked up.

COMPOSITION

Ingredients

Chemical Entity	CAS Number	Proportion
Hydrogen Sulphide	7783-06-04	100%

Contains no other components or impurities that will influence the classification of the product.

FIRST AID MEASURES

Health Effects

Acute

Swallowed: Not applicable to gases.

Eye: Immediately flush contaminated area with lukewarm, gently running water for at least 15 minutes, after removing contact lenses and holding eyes open. Contact with liquid H₂S may freeze the eye and cause severe damage or blindness.

Skin: Contact with liquid H₂S can cause frostbite. Immediately flush contaminated are with lukewarm, gently running water for at least 15 minutes.

Inhaled:

May cause damaging effects to central nervous system, metabolism and gastrointestinal tract, and can be highly toxic at very low concentrations.

0.13 ppm to 30 ppm: The odour is obvious and unpleasant.

50 ppm: Marked dryness and irritation of the nose and throat occurs. Prolonged exposure may cause a runny nose, cough, hoarseness, shortness of breath and pneumonia.

100 – 150 ppm: There is a temporary loss of smell.

200 – 250 ppm: H₂S causes severe irritation as well as symptoms such as nausea, vomiting and dizziness. Prolonged exposure may cause lung damage. Exposure for 4 to 8 hours can cause death.

300 -500 ppm: H₂S causes the same effects sooner and more severely. Death can occur in 1 – 4 hours.

500 ppm: Excitement, headache, dizziness, staggering, unconsciousness and respiratory failure in 5 minutes to 1 hour. Death can occur in 30 minutes to 1 hour.

Above 500 ppm: Rapidly cause unconsciousness and death. Severe exposures that do not result in death may cause long term symptoms such as memory loss, paralysis of facial muscles or nerve tissue damage.

By diluting the oxygen concentration in air below the level necessary to support life; it can act as an asphyxiant. Effects of oxygen deficiency are:

16%: breathing and pulse rate increased, impaired thinking and attention, reduced coordination;

14%: Abnormal fatigue upon exertion, emotional upset, faulty coordination, poor judgement;

12.5%: Very poor judgement and coordination, impaired respiration that can cause permanent hearing damage, nausea and vomiting;

below 10%: Inability to perform various movements, loss of consciousness, convulsions, and death.

Chronic

Prolonged exposure to small concentrations may result in pulmonary oedema.

First Aid

Inhalation:

Very toxic by inhalation. May cause damaging effects to central nervous system, metabolism and gastrointestinal tract. Prolonged exposure to small concentrations may result in pulmonary oedema. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

Eye Contact:

If eyes become affected gently flood with tap water for at least 15 minutes. Call a doctor.

Advice to Doctor

Treat symptomatically and advise exposure to Hydrogen Sulphide has occurred.

General:

Rescuers should not enter an oxygen deficient atmosphere without using self-contained full face positive pressure breathing equipment. Contact national poisons centre for further advice.

FIRE FIGHTING MEASURES

Flammability:

Extremely Flammable Liquefied Gas. May form explosive mixtures with air. Avoid all ignition sources.

Fire/Explosion Hazard:

Container may rupture when heated Exposure to fire may cause container to rupture/explode. Cylinders involved in a fire/explosion may rocket. Move cylinders from fire if safe to do so. Cool cylinders by spraying flooding quantities of water from a protected location. If unable to keep cylinders cool, evacuate area. If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition: Sulphur dioxide.

Extinguishing Media:

Water jets or water fog. Cool cylinders if possible to do so safely.

Hazchem Code:

2 W E

Recommended Protective Clothing:

Full chemical protection suit and breathing apparatus should be worn.

ACCIDENTAL RELEASE MEASURES

Personal Protection:

Personnel engaged in the movement of cylinders shall be provided with safety footwear, safety glasses and leather or PVC gloves. Full cover overalls are recommended. In areas where equipment failure may cause an immediate high concentration of hydrogen sulphide, ensure adequate ventilation and have approved self-contained, full face respiratory equipment readily available for emergencies.

Spills and Disposal:

Ventilate area. Stop leak if it can be done without risk. Allow gas to dissipate to atmosphere. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

Reference Guide:

Standard SNZ HB 76:2008 Dangerous Goods – Initial Emergency Response Guide.

AS/NZS 1337 – Eye Protection for Industrial Applications

AS/NZS 2161.1 – Occupational Protective Gloves – Selection, use and maintenance

AS/NZS 1715 – Selection, Use and Maintenance of Respiratory Protective Devices

AS/NZS 1716 – Respiratory Protective Devices

General:

Only experienced and properly instructed personnel should handle compressed gases. Open valve slowly to avoid pressure shock. Cylinder contents and identification labels provided by the supplier must not be removed or defaced. Colour coding should not be the only criterion used for content identification.

HANDLING AND STORAGE**Handling****Flammability:**

Extremely Flammable Liquefied Gas. May form explosive mixtures with air. Avoid all ignition sources.

General:

Only experienced and properly instructed personnel should handle compressed gases. Cylinder contents and identification labels provided by the supplier must not be removed or defaced. Colour coding should not be the only criterion used for content identification. Ensure equipment is adequately earthed. Suck back of water into the container must be prevented. Purge air from system before introducing gas. Do not allow backfeed into the container. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Keep away from ignition sources (including static discharges).

Approved Handlers:

Approved handlers are required if more than 100 kg is stored on site.

Storage:

Storage of compressed gas cylinders shall be in compliance with New Zealand HSNO Regulations.

Always keep hydrogen sulphide cylinders upright to avoid getting liquid in the valve.

Cylinders must be kept away from ignition sources (including static discharges).

Cylinders shall be stored in a cool, dry, well ventilated area out of direct sunlight and away from heat.

No part of cylinders shall be exposed to temperatures above 50°C.

Cylinders shall be stored upright on a level, fireproof floor, secured in position and protected from damage.

Full cylinders shall be stored separately from empties.

Cylinders should be moved by hand-truck or cart designed for that purpose.

Separation:

Avoid any contact with oil or grease particularly to the cylinder valve.

Location Test certificate is required if more than 100kg is store on site.

Keep hydrogen sulphide cylinders a minimum of 5 meters away from ignition sources and from incompatible materials (e.g. HSNO classes 1, 3, 4 and 5).

Keep hydrogen sulphide cylinders a minimum of 5 meters away from edge of the controlled zone.

A controlled zone is an area surrounding a hazardous substance location; beyond the controlled zone members of the public are provided with reasonable protection from adverse events.

Spills and Disposal:

Avoid discharge to atmosphere. Do not discharge into areas where there is a risk of forming an explosive mixture with air. Waste gas should be flared through a suitable burner with flash back arrestor. Toxic and corrosive gases formed during combustion should be scrubbed before discharge to atmosphere. Evacuate Area.

EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Standards:

TWA 10 ppm (5 mg/m³) STEL 15 ppm (10 mg/m³)

Engineering Controls:

Use only materials compatible with hydrogen sulphide. Hydrogen sulphide is corrosive in the presence of water. Most plastics are compatible.

Mechanical ventilation that is non-sparking, corrosion resistant separate from other exhaust ventilation systems.

Personal Protection:

Personnel engaged in the movement of cylinders shall be provided with safety footwear, safety glasses and leather or PVC gloves. Full cover overalls are recommended. In areas where equipment failure may cause an immediate high concentration of hydrogen sulphide ensure adequate ventilation and have approved self-contained, full face respiratory equipment readily available for emergencies.

Reference Guide:

AS/NZS 1337 – Eye Protection for Industrial Applications

AS/NZS 2161.1 – Occupational Protective Gloves – Selection, use and maintenance

AS/NZS 1715 – Selection, Use and Maintenance of Respiratory Protective Devices

AS/NZS 1716 – Respiratory Protective Devices

PHYSICAL AND CHEMICAL PROPERTIES

Physical Properties

Appearance: Colourless, liquid at low temperature or under high pressure which vapourises to a colourless gas, with offensive rotten egg odour.

Odour Threshold:	0.13 ppm to 100 ppm	Auto Ignition Temp:	270 °C
Boiling Point:	-60.2°C	Flammability Limits:	4% to 44%
Vapour Pressure (at 21°C):	18.2 bar	Gas Solubility in Water (at 0°C):	4.67 vol/vol

Other Properties

Relative Density (at 15°C) (Air = 1):	1.189	Density of Gas (101.3 kPa, 15°C):	1.45 kg/m ³
Density of Liquid (B.P.):	914.9 kg/m ³		
Molecular Weight:	34.08 g/mol	Critical Temperature:	100°C

STABILITY AND REACTIVITY

Flammability:

Extremely Flammable Liquefied Gas. May form explosive mixtures with air. Avoid all ignition sources.

Materials Compatibility:

Use only materials compatible with hydrogen sulphide. Hydrogen sulphide is not compatible with most elastomers.

Hydrogen sulphide can be used with EPDM and most plastics such as PTFE & nylon.

Hydrogen sulphide is not compatible with most lubricants.

Hydrogen sulphide may be used with steels and aluminium, however it is corrosive in the presence of moisture. It is not compatible with copper or brass.

TOXICOLOGY INFORMATION

Damage to central nervous system. LC50 (ppm/1h): 712

ECOLOGICAL INFORMATION

May cause pH changes in aqueous ecological systems. Endangering to drinking water.

DISPOSAL CONSIDERATIONS

Avoid discharge to atmosphere. Do not discharge into areas where there is a risk of forming an explosive mixture with air. Waste gas should be flared through a suitable burner with flash back arrestor. Toxic and corrosive gases formed during combustion should be scrubbed before discharge to atmosphere. Evacuate Area.

TRANSPORT INFORMATION

UN Number: 1053
Proper Shipping Name: HYDROGEN SULPHIDE
Dangerous Goods Class and Subsidiary Risk: 2.3 sub 2.1
Packing Group: Not applicable
Hazchem Code: 2 W E
Other Information: Avoid transport on vehicles where the load 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 containers are firmly secured.
- Ensure cylinder valve is closed and not leaking.
- Ensure there is adequate ventilation.
- Compliance with applicable regulations.

REGULATORY INFORMATION

ERMA Register Approval No: HSR001061

HSNO Controls: Hazardous Substances (Classes 1 to 5 Controls) Regulations 2001.
Hazardous Substances (Classes 6, 8, and 9 Controls) Regulations 2001.
Hazardous Substances (Disposal) Regulations 2001.
Hazardous Substances (Personnel Qualifications) Regulations 2001.
Hazardous Substances (Emergency Management) Regulations 2001.
Hazardous Substances (Tracking) Regulations 2001.
Hazardous Substances (Identification) Regulations 2001.
Hazardous Substances (Compressed Gases) Regulations 2004.
Hazardous Substances (Tank Wagon and Transportable Containers) Regulations 2004.
Schedule 10 of the Hazardous Substances (Dangerous Goods and Scheduled Toxic Substances) Transfer Notice 2004.
Schedule 12 of the Hazardous Substances (Dangerous Goods and Scheduled Toxic Substances) Transfer Notice 2004.

Approved Handlers: Approved handlers are required if more than 100 kg is stored on site.

OTHER INFORMATION

Hydrogen Sulphide is supplied as liquefied gas in cylinders.

Cylinder Colour: Grey with an orange band on the shoulder or Grey or Red or Grey with a green band on the shoulder.

Cylinder Valve Outlet: CGA 330 or Type E valves with a 6°52minutes Pitch.

- References:
- . L'Air Liquide Gaz Encyclopaedia - Elsevier Scientific Publishing Co. Amsterdam
 - . NZS 5433:2007 Transport of Dangerous Goods on Land
 - . ERMA Website – Approvals Register – www.erma.govt.nz
 - . SNZ HB76:2008 Dangerous Goods – Initial Emergency Response Guide
 - . Air Liquide Group MSDS – Hydrogen Sulphide AL073A Rev. 1
 - . ISO 10156 Gases and Gas mixtures – Determination of Fire Potential and Oxidising Ability for the Selection of Cylinder Valve Outlets
 - . Air Liquide Australia "Hydrogen Sulphide" MSDS June 2008
 - . AS1678 2C1 Emergency Procedure Guide – Transport – Non-Flammable, Compressed Gas
 - . AS 4484-2004 - Gas Cylinders for Industrial, Scientific, medical and refrigerant use - labelling and colour coding
 - . AS 2473.2-2007 - Valves for compressed gas outlets - Part 2 Outlet connections (threaded) and stem (inlet) threads
 - . Air Liquide New Zealand Document - DOPM-Z-TECH-0060 Cylinder Reference Manual for Cylinder Identification
 - . CGA Safety bulletin SB2-2007 Oxygen Deficiency
 - . Operators Handbook for the Transport of Dangerous Goods by Road – NZ Road Transport & Logistics Industry Training Organisation
 - . ALNZ - Transport of Gas cylinders in Non-Dedicated Vehicles Customer Information Guide
 - . Work Place Exposure Standards Effective From 2002, Department of Labour, New Zealand
 - . NZCIC Code of Practice – Preparation of Safety Data Sheets

END MSDS

This MSDS summarises to our best knowledge, at the date of issue, the health and safety hazard information regarding this product and general guidance on how to safely handle the product in the workplace. All due care has been taken to include accurate and up-to-date information in this MSDS.

Each user should read this MSDS and consider the information in the context of how the product will be handled and used in the workplace in conjunction with other products. If clarification or further information is needed to ensure that an appropriate risk assessment can be made, the user should contact Air Liquide New Zealand.

As far as lawfully possible, no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this MSDS can be accepted.

Our responsibility for products sold is subject to our standard terms and conditions, a copy of which is available on request.

This MSDS has been prepared in accordance with NZCIC Code of Practice – Preparation of Safety Data Sheets.

This MSDS is subject to change without notice. For the latest version of this MSDS visit <http://www.airliquide.com.au/en/technical/new-zealand-msds.html>

Air Liquide regional offices contact details on following page

Regional Offices

Auckland

PO Box 12846
19 Maurice Road
Penrose
Phone: 09 622 3888
Fax: 09 622 3882

Hamilton

PO Box 10 394
2 Tawn Place
Pukete
Phone: 07 849 2969
Fax: 07 849 2968

Mt Maunganui

Unit 4, 12 – 18 Aerodrome Road
Mt Maunganui
Phone: 07 574 8475
Fax: 07 574 8476

Palmerston North

PO Box 10 010
5 Connolly Place
Palmerston North
Phone: 06 355 5216
Fax: 06 354 7104

Wellington

PO Box 36 092
205 Gracefield Road
Seaview
Phone: 04 568 6142
Fax: 04 568 6141

Christchurch

PO Box 16453
7 Canterbury St
Hornby
Phone: 03 344 6033
Fax: 03 344 6031

**Emergency 24hr Phone
Number 0800 156 516**