PUREGAS	SAFETY DATA SHEET	Version: 4 Revision date: 2025-04-25
	Hydrogen	PG-SDS-13

This SDS conforms to the Globally Harmonised System (GHS), South African Regulations on Hazardous Chemical Agents, and SANS 10234, SANS 11014 & SANS 10228.

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product name	Hydrogen, Hydrogen, compressed, Molecular hydrogen
Chemical Name	Hydrogen
Other means of identification	Hydrogen, Hydrogen, compressed, Molecular hydrogen, Dihydrogen, parahydrogen, refrigerant gas R702, water gas
Recommended Intended Purpose	Industrial use; Use as directed.
Company Information	**Puregas (Pty) Ltd** PO Box 123884, Alrode, 1451, Gauteng, South Africa **Tel:** (011) 903 9760 **Fax:** (011) 903 9766 **Cellphone:** 082 889 6946 (1st) 082 885 7475 (2nd) **Email:** info@puregas.co.za Website: www.puregas.co.za
Emergency Telephone	0800 172 743 Rapid Spill Response - 24 hours, 7 days a week

SECTION 2. HAZARDS IDENTIFICATION

Classification of the substance - GHS classification

Hazard Classification	Category	Hazard Statement	
Flammable Gas Gases under pressure	1 2.2	H220 H280	Extremely flammable gas. Contains gas under pressure; may explode if heated
Hazard Pictograms	 **GHS02**  **GHS04**		
Signal Word	**Danger**		

Precautionary Statements

General:	P101 P102 P103	If medical advice is needed, have product container or label at hand Keep out of reach of children Read carefully and follow all instructions
Prevention	P202 P210	EXTREMELY FLAMMABLE GAS Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
Response	P377 P381 P304 + P340 + P313	Leaking gas fire: Do not extinguish, unless leak can be stopped safely. In case of leakage, eliminate all ignition sources IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get medical advice/attention
Storage	P271 + P403 P405	Use and store only outdoors or in a well-ventilated place. Store locked up.
Disposal	P501	Dispose of contents/ container to an approved facility in accordance with local, regional, national and international regulations.
Main Hazard	Extremely flammable	
Other Hazards	Asphyxiation, by displacement of oxygen. The liquefied gas can cause frostbite on any contaminated tissue.	

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

CAS No	Name	%
1333-74-0	Hydrogen, compressed	99.5 – 100
UN Number:	1049	

See Section 8 for Exposure Guidelines and Section 15 for Regulatory Classifications.

SECTION 4. FIRST AID MEASURES

Eye contact	Not applicable
Skin contact	In the case of frostbite, place the frostbitten part in warm water. Do not use hot water. If warm water is not available or is impractical to use, wrap the affected parts gently in blankets. Alternatively, if the fingers or hands are frostbitten, place the affected area in the armpit. Encourage the victim to gently exercise the affected part while being warmed. Seek medical attention.
Ingestion	Not applicable
Inhalation	Rescuers should not attempt to retrieve victims of exposure to this product without adequate personal protective equipment. At a minimum, self-contained breathing apparatus and fire retardant personal protective equipment should be worn. Adequate fire protection must be provided during rescue situations.
Treatment (Advice to doctor or first aider)	Remove victim(s) to fresh air, as quickly as possible. Trained personnel should administer supplemental oxygen and/or cardiopulmonary resuscitation, if necessary. Only trained personnel should administer supplemental oxygen.

SECTION 5. FIRE-FIGHTING MEASURES

Extinguishing Media	Dry chemical, carbon dioxide, water spray, foam, fog
Special Hazards	The container may explode in fire.
Protective Clothing	Wear suitable protective clothing
Firefighting instructions	Do not extinguish a leaking gas flame unless the leak can be securely plugged. Stop the flow of gas and move containers from the fire area without risk. Use water to keep fire-exposed containers cool. The container may explode in fire.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	Restrict access to the area until completion of clean-up. Ensure clean-up is conducted by trained personnel only. Wear adequate personal protective equipment. Extinguish or remove all ignition sources. Ventilate area
Environmental Precautions	No data available
Small spills / Large spills	Stop the leak if it can be done without risk. Use water spray to reduce vapour. Isolate the area until the gas has dispersed

SECTION 7. HANDLING AND STORAGE

Suitable material	N/A
Handling/storage precautions	Do not use near welding operations, flames, or hot surfaces. Move cylinders by hand-truck or cart designed for that purpose. Do not lift cylinders by their caps. Do not handle them with oily hands. Secure the cylinder in place in an upright position at all times. Do not drop cylinders or permit them to bang against each other. Leave the valve cap on the cylinder until the cylinder is secured and ready for use. Close all valves when not in actual use. Use the smallest possible amounts in designated areas with adequate ventilation. Have emergency equipment (for fires, spills, leaks, etc.) readily available Comply with all applicable regulations for the storage and handling of compressed gases and flammable materials. Store at or above ground level, in a cool, dry, well-ventilated area, out of direct sunlight, and away from heat and ignition sources. Cylinder temperature should never exceed 51ºC. Label empty cylinders. Store full cylinders separately from empty ones. Empty containers may be hazardous due to residual material. Limit the quantity of material in storage. Restrict access to the storage area. Post appropriate warning signs. Keep storage area separate from populated work areas. Consider leak detection and alarm equipment for the storage area

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Contains no substances with occupational exposure limit values.

Exposure controls	As vapourised hydrogen is a simple asphyxiant, avoid any areas where spillage has taken place. Only enter once testing has proved the atmosphere to be safe.
Respiratory protection	Maintain oxygen levels above 19.5% in the workplace. Use supplied air respiratory protection if oxygen levels are below 19.5% or during emergency response to a release of this product.
Hand protection	Wear mechanically-resistant gloves when handling cylinders of this product. Use low-temperature protective gloves (i.e. kevlar) when working with containers of liquid hydrogen.
Eye protection	Splash goggles or safety glasses, for protection from rapidly expanding gases and splashes of liquid hydrogen.
Skin and body protection	Use body protection appropriate for the task. Transfer of large quantities under pressure may require protective equipment appropriate to protect employees from splashes of liquefied product, as well as fire-retardant items.
Engineering Controls	Engineering control methods to reduce hazardous exposures are preferred. Methods include mechanical ventilation (dilution and local exhaust), process or personnel enclosure, control of process conditions, and process modification (e.g. substitution of a less hazardous material). Administrative controls and personal protective equipment may also be required. Provide adequate local exhaust and dilution (general) ventilation to control airborne hydrogen below 4000 ppm (10% of the lower explosive limit). Exhaust directly to the outside. Supply sufficient replacement air to make up for air removed by exhaust systems.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	Colourless liquified gas
Colour	Colourless
Odour	Odourless
pH	Not applicable
Melting / freezing point	-259.2°C
Boiling point	- 252.8°C
Flash point	Burns at ambient temperatures
Auto flammability / self-ignition	571.2°C
LEL	4.0%
UEL	75%
Density	0.0695 (air = 1)
Solubility : solvent	Slightly soluble in ethanol, ether
Solubility : Water	Slightly soluble (1.8% v/v at 20ºC)

SECTION 10. STABILITY AND REACTIVITY

Conditions to Avoid	Contact with incompatible materials and exposure to heat, sparks and other sources of ignition. Cylinders exposed to high temperatures or direct flame can rupture o burst
Incompatible materials	Strong oxidizers (i.e. chlorine, bromine, pentafluoride, oxygen, oxygen difluoride, and nitrogen trifluoride). Oxygen/hydrogen mixtures can explode on contact with a catalyst such as platinum
Hazardous decomposition products	Hydrogen. When ignited in the presence of oxygen, water will be produced

SECTION 11. TOXICOLOGICAL INFORMATION

Not classified

Acute inhalation toxicity:	No Data
Germ cell mutagenicity:	No Data
Carcinogenicity:	No Data
Reproductive toxicity:	No Data

SECTION 12. ECOLOGICAL INFORMATION

Hydrogen occurs naturally in the atmosphere. The gas will be dissipated rapidly in well-ventilated areas
Any adverse effect on animals would be related to oxygen-deficient environments. No adverse effect is anticipated to occur to plant life, except for frost produced in the presence of rapidly expanding gases
No evidence is currently available on this product's effects on aquatic life

SECTION 13. DISPOSAL CONSIDERATIONS

Waste treatment methods:
Waste disposal must be in accordance with appropriate local regulations.
Packaging: The disposal of cylinders must only be handled by the gas supplier

SECTION 14. TRANSPORT INFORMATION

UN Pictogram

Land and inland navigation transport ADR/RID
UN No. 1049, Shipping Name Hydrogen, compressed, Class 2.1, Subsidiary Risk: Flammable Gas 1, Hazchem Warning 2A-Flammable gas.

Marine transport IMDG
MDG 1049, Shipping Name hydrogen, compressed, Class 2.1, Subsidiary Risk: Flammable Gas 1, Hazchem Warning Flammable gas.

Air transport ICAO/IATA-DGR
ICAO/IATA Code 1049, Class 2.1, Subsidiary risk Flam gas 1

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

SECTION 15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture:
Occupational Health and Safety Act, Hazardous Chemical Agents Regulations
SANS 11014:2010 Edition 1
SANS 10228:2012 Edition 6
SANS 10234:2019 Edition 2
SUPPLEMENT TO SANS 10234 Edition 1
National Road Traffic Act
Dangerous Goods Regulations

SECTION 16. OTHER INFORMATION

SELECTED BIBLIOGRAPHY

1. Data sheets as supplied by various Suppliers and Manufacturers
2. Emergency Response Handbook - Annex A of SABS 0232-3
3. GHS Purple booklet
4. Handling Chemicals Safety, 2nd. Ed. Dutch Association of Safety Experts, Dutch Chemical Industry Association, Dutch Safety Institute, 1980
5. NIOSH Pocket Guide to Chemical Hazards, NIOSH, June 1990
6. ECHA
7. Occupational Health and Safety Act, Hazardous Chemical Agents Regulations
8. SANS 11014:2010 Edition 1
9. SANS 10228:2012 Edition 6
10. SANS 10234:2019 Edition 2
11. SUPPLEMENT TO SANS 10234 Edition 1
12. National Road Traffic Act
13. Dangerous Goods Regulations

Disclaimer:
This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety, and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.