MATERIAL SAFETY DATA SHEET (MSDS)
RH5
(Please ensure that this MSDS is received by an appropriate person)

DATE: March 2023 Version: 2
Ref. No.: MS H01

1 PRODUCT AND COMPANY IDENTIFICATION

Product Name	RH5
Chemical Formula	5% H_2 bal N_2
Trade Names	RH_5
Colour coding	Peach colour body with Signal Red Shoulder
Valve	Brass, ¾ inch BSP right hand female valves.
Company Identification	Les Gaz Industriels Ltd Pailles Road G.R.N.W. Republic of Mauritius Tel No: (+230) 212-8306 Fax No: (+230) 212-0235
EMERGENCY NUMBER	(+230) 800 1133

2 COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Hydrogen
CAS No.	133-74-0
UN No.	1049
ERG No.	115
Hazard Warning	2 A Flammable Gas
Chemical Name	Nitrogen
Chemical Family	Inert gas
CAS No.	7727-37-9
UN No.	1066
ERG No.	121
Hazchem Warning	2 C Non-flammable Gas

3 HAZARDS IDENTIFICATION

Main Hazards
All cylinders are transportable gas container. Hydrogen which forms part of the gas mixture is highly flammable and is the lightest gas known. It burns in air with an intensely hot, almost invisible flame. The flammability limits of hydrogen in the air are between 4.0-75.0% by volume and flammable explosive gas-air mixtures may be formed.

Adverse Health Effects
Hydrogen is non-toxic but could act as a simple asphyxiant under confine space.

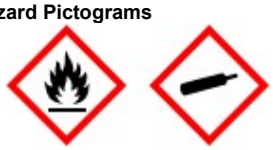
Chemical Hazards
RH_5 is relatively inert under standard condition. However it becomes highly reactive under excessive temperature and pressure. Ignition of RH_5 in air can occur with very small energy sources such as heat static electricity or sparks.

Biological Hazards
Hydrogen has a smallest density compare to the other element known and disperses very rapidly into the atmosphere. Hydrogen has unknown biological hazards.

Vapour Inhalation
Hydrogen is a simple asphyxiant but disperses rapidly into the atmosphere.

Label Elements

Hazard Pictograms



Precautionary Statements

P210:	Keep away from heat/sparks/open flames/hot surfaces – no smoking
P377:	Leaking gas fire: Do not extinguish unless leak can be stopped safely
P381:	Eliminate all ignition sources if safe to do so
P410+P403:	Protect from sunlight and store in a well-ventilated place.

4 FIRST AID MEASURES

Prompt medical attention is mandatory in all cases of overexposure to Gas mixtures. Rescue personnel should be equipped with self-contained breathing apparatus. Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be removed to an uncontaminated area, and given mouth-to-mouth resuscitation and supplemental oxygen.

Eye contact	No known effect.
Skin contact	No known effect.
Ingestion	(See Section 3 above)

5 FIRE FIGHTING MEASURES

Extinguishing Media
Although the nitrogen component of these Gas mixtures is inert, the hydrogen component could separate and form pockets of highly flammable or explosive hydrogen/air mixtures. These could be found entrapped in high-lying enclosed areas.

Specific Hazards
Do not extinguish the fire unless the leakage can be stopped immediately. May form explosive gas mixtures with air. Is a simple asphyxiant.

Emergency Actions
If possible, shut off the ignition at source. Evacuate area. Post warnings to prevent persons from approaching with lit cigarettes or open flames. Using water, keep all cylinders in the vicinity of the fire cool. Remove cylinders from the vicinity of the fire if possible. Remove all cylinders with signs of overheating to a safe area. Keep cool.

Protective Clothing
Self-contained breathing apparatus, safety gloves and shoes/boots should be worn when handling containers.

Environmental Precautions
As the hydrogen component in the gas mixture is lighter than air, ensure that hydrogen gas is not trapped in confine space. Otherwise this could lead to the formation of a highly explosive gas-air mixture. Ventilate all confined area using forced draught if necessary. Ensure that all electrically powered equipment is flameproof.

6 ACCIDENTAL RELEASE MEASURES

Personal Precautions
As this gas mixture is a simple asphyxiant, care should be taken when entering confined areas where leaks have occurred. Do not enter any potentially hazardous area with any source of ignition such as lit cigarette or non-flame proof equipment including matches and powered equipment.

Environmental Precautions
This gas mixture does not pose a hazard to the environment. Explosive gas-air mixture could be formed when leaks occur, so eliminate all forms of ignition.

Small Spills
Small leaks should be extinguished by shutting off the source of supply, e.g., closing the cylinder valve or tightening the gland nut. If unable to stop the small leaks, the cylinder should be moved to an open well ventilated area, away from any source of ignition.

Large Spills
Stop the source if it can be done without risk. Eliminate all sources of ignition and static discharges. Restrict access to the affected area until completion of the clean-up procedure. Post relevant warning signs. Wear adequate protective clothing when working near the source of leak. Ventilate the area using forced draught if necessary. Ensure that all electrically powered equipment are flameproof.

LES GAZ INDUSTRIELS
UNE VALEUR SÛRE
EST. 1952

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7 HANDLING AND STORAGE

Do not store RH5 cylinder with oxygen or other oxidant cylinders. Do not allow cylinder to slide or come into contact with sharp edge objects. RH5 cylinders may be stacked horizontally provided that they are firmly secured at each end to avoid rolling. Ensure equipment is adequately earthed. Conspicuous signs should be posted in the storage area forbidding smoking or use of naked flame. Use a first in-first out inventory system to prevent full cylinders from being stored for excessive period of time. Compliance with all relevant legislation is essential. Keep out of reach of children.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Hazards No known effect

Engineering Control Measures

Engineering control measures are preferred to reduce exposures. General methods include mechanical ventilation, process or personal enclosure & control of process conditions. Administrative control and personal protective equipment may also be required. Use a suitable flameproof ventilation system separate from other exhaust ventilation systems. Exhaust directly to outside environment. Supply sufficient replacement air to make up for air removed by exhaust system.

Personal Protection

Use self-contained breathing apparatus when fighting large fire.

Eyes

Use safety glasses when working with cylinders.

Hands

Use suitable protective gloves when working with cylinder.

Skin

No known effect

9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DATA

Hydrogen

Chemical Symbol	H_2
Molecular weight	2.016 g/mol
Specific volume@20^{0}C&101,325pka	11976ml/g
Auto ignition temperature	570^{o}C
Relative density (air=1) @ 1atm	0.08989g/ml
Flammable limits in air (by volume)	4.0-75.0%
Colour	Unknown
Taste	Unknown
Odour	Unknown

Nitrogen

Chemical Symbol	N2
Molecular Weight	28
Relative density of gas @ 101,325 kPa (Air=1)	1,160
Flammable limits in air (by volume)	----
Colour	None
Taste	None
Odour	None

10 STABILITY AND REACTIVITY

Conditions to avoid

Overheating of cylinders. Keep sparks & flames away from cylinders and under no circumstances allow a torch flame to come into contact with any part of the cylinder. Never test leaks with flame. Use a soapy water when testing for leaks. Never use cylinders as rollers or supports or for any other purpose other than the storing of hydrogen.

Incompatible Materials

Hydrogen is non-corrosive and may be contained in ambient temperature by most common metals used in installations design to have sufficient strength for the working pressure involved.

Hazardous Decomposition Products

No hazardous compounds are formed when hydrogen/air mixture burn.

11 TOXICOLOGICAL INFORMATION

Acute Toxicity	No known effect
Skin & eye contact	No known effect
Chronic Toxicity	No known effect
Carcinogenicity	No known effect
Mutagenicity	No known effect
Reproductive Hazards	No known effect

(For further information see Section 3. Adverse Health effects)

12 ECOLOGICAL INFORMATION

As hydrogen is lighter than air it will disperse rapidly in open areas. It does not pose a hazard to the ecology. As nitrogen is heavier than air they can cause pockets of oxygen-depleted atmosphere in low-lying areas. They do not pose a hazard to the ecology.

13 DISPOSAL CONSIDERATIONS

Disposal Methods

Small amounts may be blown to the atmosphere under controlled conditions. No source of ignition should be in the vicinity. Large amounts should only be handled by the gas supplier.

Disposal of Packaging

The disposal of cylinders must only be handled by the gas supplier.

14 TRANSPORT INFORMATION

ROAD TRANSPORTATION

UN No	1954
Class	2A Flammable
Subsidiary Risk	2.1 Flammable
ERG No	115
Hazchem warning	2A Flammable Gas

SEA TRANSPORTATION

IMDG	1954
Class	
Packaging group	
Label	Flammable Gas

AIR TRANSPORTATION

ICAO/IATA Code	1954
Class	2.1 Flammable
Packaging group	
Packaging instructions	
- Cargo	200
- Passenger	Forbidden
Maximum quantity allowed	
- Cargo	500kg
- Passenger	Forbidden

15 REGULATORY INFORMATION

EEC Hazard class Flammable Gas

Risk Phrase	Description	Safety Phrase	Description
R12	Extremely flammable	S2	Keep out of reach of Children
R18	In use may form flammable explosive vapour-aid mixture	S15	Keep away from heat source
R44	Risk of explosion if heated under confinement	S16	Keep away from source of ignition
		S21	When using do not smoke
		S37	Wear suitable gloves
		S51	Use only in well ventilated areas

National legislation None
Refer to SABS 0265 for explanation of the above.

16 OTHER INFORMATION

Bibliography

Compressed Gas Association, Arlington, Virginia
Handbook of Compressed Gases – 3rd Edition
Matheson. Matheson Gas Data Book – 6th Edition
SABS 0265 - Labelling of Dangerous Substances

17 EXCLUSION OF LIABILITY

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