

### SECTION 1: Identification

#### 1.1 Product Identifier

Trade name	Hydrogen
MSDS No.	0052
Chemical description	Hydrogen
CAS No.	1333-74-0
EC No.	215-605-7
Chemical formula	H <sub>2</sub>
Synonyms	Alphagaz™ I - Hydrogen,

#### 1.2 Relevant identified uses and uses advised against

Relevant identified uses	Test/Calibration gas. Laboratory use. Chemical reaction / Synthesis. Use as a fuel. Shield gas for welding processes. Use for manufacture of electronic/photovoltaic components. Laser gas.
Uses advised against	Do not inflate in party balloons because of the risk of explosion.

#### 1.3 Details of the supplier

Name	Air Liquide New Zealand Limited
Address	19 Maurice Road, Penrose Auckland 1061, New Zealand
Phone	Phone: (09) 622 3880

#### 1.4 Emergency telephone number

0800 156 516

### SECTION 2: Hazards identification

#### 2.1 Classification of the substance or mixture

Classification according to Hazardous Substances [Classification] Regulations 2001

HSNO classification(s)	2.1.1A - Extremely flammable gas Explosive; fire, blast or projection hazard Compressed Gases - Contains gas under pressure; may explode if heated
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Physical Hazards

#### 2.2 Label Elements

Hazard pictograms



Signal word	Danger
Hazard statements	H280 - Contains gas under pressure; may explode if heated H220 - Extremely flammable gas

Precautionary statements

<u>Prevention</u>	P103 - Read label before use P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking P282 - Wear cold insulating gloves/face shield/eye protection.
<u>Response</u>	P377 - Leaking gas fire: Do not extinguish unless leak can be stopped safely P381 - Eliminate all ignition sources if safe to do so.
<u>Storage</u>	P403 - Store in a well ventilated place. P410+P403 - Protect from sunlight. Store in a well ventilated space.
<u>Disposal</u>	None allocated

#### 2.3 Other Hazards

No additional information available

### SECTION 3: Composition/information on ingredients

#### 3.1 Substance/Mixtures

Name	Chemical Formula	Percent (%)	Product Identifier
Hydrogen Gas	H <sub>2</sub>	100	(Cas No) 1333-74-0
			(EC No) 215-605-7

### SECTION 4: First-aid measures

#### 4.1 Description of first-aid measures

Inhalation	Remove victim to uncontaminated area.
Skin contact	Adverse effects not expected from this product.
Eye contact	Adverse effects not expected from this product.
Ingestion	Ingestion is not considered a potential route of exposure.

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

Continuous inhalation of concentrations higher than 75% may cause nausea, dizziness, respiratory difficulty and convulsion.

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

None

### SECTION 5: Firefighting measures

#### 5.1 Extinguishing media

Suitable extinguishing media	Water spray or fog.
Unsuitable extinguishing media	Do not use water jet to extinguish.

#### 5.2 Specific hazards arising for the substance or mixture

Specific hazards	Exposure to fire may cause containers to rupture/explode. Supports combustion.
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Hazardous combustion products

#### 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. Move containers away from the fire area if this can be done without risk.
Special protective equipment for firefighters	Standard protective clothing and equipment (Self Contained Breathing Apparatus) for firefighters. Do not enter fire area without proper personal protective equipment, including respiratory protection.
Hazchem code	2SE 2 Fine Water Spray Use fog or fine spray S Risk of violent reaction or explosion. Wear full fire kit and breathing apparatus. Dilute spill and run-off. Use breathing apparatus E Evacuate vicinity

### 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.  
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

Ventilate area

#### 6.4 References 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	<p>The substance must be handled in accordance with good industrial hygiene and safety procedures. Only experienced and properly instructed persons should handle gases under pressure. Consult supplier for specific recommendations. Consider pressure relief device(s) in gas installations. Ensure the complete gas system was (or is regularly) checked for leaks before use. Do not smoke while handling product. Use no oil or grease. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Use only oxygen approved lubricants and oxygen approved sealings. Use only with equipment cleaned for oxygen service and rated for cylinder pressure. Do not breathe gas. Avoid release of product into atmosphere.</p>
Safe handling of the gas receptacle	<p>Refer to supplier's container handling instructions. Do not allow backfeed into the container. Protect cylinders 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 cylinder 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 cylinder contents. Suck back of water into the container must be prevented. Open valve slowly to avoid pressure shock.</p>

#### 7.2 Conditions for safe storage, including any incompatibilities

General	<p>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.</p>
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Keep container below 50°C in a well ventilated place.  
Segregate from flammable gases and other flammable materials in store.  
Store containers in location free from fire risk and away from sources of heat and ignition.  
Keep away from combustible materials.

Approved handlers Approved handlers and locations certificates are required if more than 200m<sup>3</sup> is stored on site

### 7.3 Specific use(s)

None

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

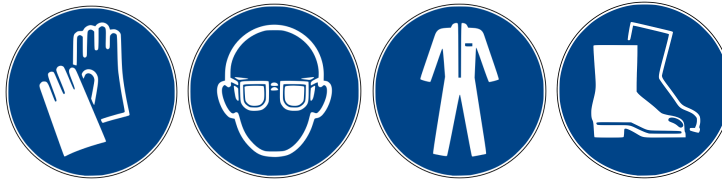
OEL (Occupational Exposure Limits)	No data available
DNEL (Derived-No Effect Level)	No data available
PNEC (Predicted No-Effect Concentration)	No data available

### 8.2 Appropriate engineering controls

Provide adequate general and local exhaust ventilation.  
Systems under pressure should be regularly checked for leakages.  
Avoid oxygen rich (>23.5%) atmospheres.  
Gas detectors should be used when oxidising gases may be released.  
Consider work permit system e.g. for maintenance activities.

### 8.3 Individual protection measures

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:  
Wear suitable hand, body and head protection. Wear goggles with suitable filter lenses when use is cutting/welding.  
PPE compliant to the recommended EN/ISO standards should be selected.



Eye/face protection

Wear safety glasses with side shields.

Skin protection

Wear working gloves when handling gas containers.  
Consider the use of flame resistant safety clothing.  
Wear safety shoes while handling containers.

Respiratory protection

None necessary.

Thermal hazards

None necessary.

### 8.4 Environmental exposure controls

None necessary.

## SECTION 9: Physical and chemical properties

### 9.1 information on basic physical and chemical properties

Appearance

Physical state 20°C/101.3kPa	Gas
Colour	Colourless
Odour	No odour warning properties
Odour threshold	Odour threshold is subjective and inadequate to warn of overexposure.
pH value	Not applicable
<u>Molar mass [g/mol]</u>	32 g/mol
Melting point [°C]	-259 °C
Boiling point [°C]	-253 °C
Flash point [°C]	Not applicable for gases and gas mixtures.
<u>Critical temperature [°C]</u>	-240 °C

Evaporation rate (ether=1)	Not applicable for gases and gas mixtures.
Flammability range	4 - 77 vol %
Vapour pressure [20°C]	Not applicable
Vapour pressure [50°C]	Not applicable
Relative density, gas (air=1)	0.7
Relative density, liquid (water=1)	0.7
Solubility in water [mg/l]	1.6 mg/l
Partition coefficient n-octanol/water [log Kow]	Not applicable for inorganic gases
Autoignition temperature	560 °C
Decomposition temperature	Not applicable
Viscosity [20°C]	Not applicable
<u>Explosive properties</u>	Not applicable
<u>Oxidising properties</u>	Oxidiser

### 9.2 Other information

Burns with an invisible flame

## SECTION 10: Stability and reactivity

### 10.1 Reactivity

No reactivity hazard other than the effects described in subsections 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.

### 10.5 Incompatible materials

Air, Oxidiser. 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 toxicological effects

Acute toxicity	No known toxicological effects from this product.
Skin corrosion/irritation	No known effects from this product.
Serious eye damage/irritation	No known effects from this product.
Respiratory/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.
Specific target organ toxicity - Single exposure	No known effects from this product.
Specific target organ toxicity - Repeated exposure	No known effects from this product.
Aspiration hazard	Not applicable for gases and gas mixtures.

### SECTION 12: Ecological information

#### 12.1 Toxicity

No ecological damage caused by this product.

#### 12.2 Persistence and degradability

No ecological damage caused by this product.

#### 12.3 Bioaccumulative potential

No ecological damage caused by this product.

#### 12.4 Mobility in soil

No ecological damage caused by this product.

#### 12.5 Other adverse effects

Effect on ozone layer                      None.

Effect on global warming                  None.

### SECTION 13: Disposal consideration

#### 13.1 Waste treatment methods

Cylinders should be returned to the manufacturer for disposal of contents

Vent to atmosphere in a well ventilated place. Do not discharge into any place where its accumulation could be dangerous

#### 13.2 Additional information

None.

### SECTION 14: Transport information



2.1 Flammable gas

#### 14.1 Land transport

Land Transport Rule: Dangerous Goods 2005: NZS 5433:2012

UN Number	1049
UN proper shipping name	HYDROGEN, COMPRESSED
Transport hazard class(es)	2.1
Packing group	Not applicable
Environmental hazards	None

#### 14.2 Transport by sea

IMDG - International Maritime Dangerous Goods

UN Number	1049
UN proper shipping name	HYDROGEN, COMPRESSED
Transport hazard class(es)	2.1
Packing group	Not applicable
Environmental hazards	None
Emergency Schedule (EmS)	Fire F-D Spillage S-U

### 14.3 Transport by air

ICAO - International Civil Aviation Organisation/IATA - International Air Transport Association

UN Number	1049
UN proper shipping name	HYDROGEN, COMPRESSED
Transport hazard class(es)	2.1
Packing group	Forbidden
Environmental hazards	None

### 14.4 Special precautions for user

Hazchem code	2SE
Special transport information	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 cylinder 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.

## SECTION 15: Regulatory information

### 15.1 Safety, health and environmental regulation/legislation specific for the substance or mixture

HSNO approval code HSR001002  
Listed on the New Zealand Inventory of Chemicals (NZIoC)

### 15.2 Chemical safety assessment

A chemical safety assessment does not need to be carried out for this product.

## SECTION 16: Other information

### 16.1 Indication of changes

Update to reflect GHS requirements  
Date of first issue May 2014  
Revised date April 2019  
Superseeds Version 9  
Version 10

### 16.2 Training advice

Ensure operators understand the hazard of oxygen enrichment.

### 16.3 Full text of H-statements

H220 Extreme flammable gas  
H280 Contains gas under pressure; may explode if heated

### 16.4 Cylinder features

Colour AS4484-2004 Signal Red PMS 485C  
Valve outlet AS2473 Type 20

### 16.5 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.