

## Hydrogen

**AL073**


F+ : Extremely flammable



Label 2.1 : flammable gas.

### 1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

**Trade name** : Hydrogen  
**MSDS Nr** : AL073  
**Use** : Chemical reagent. Fuel.  
**Chemical formula** : H<sub>2</sub>  
**Company identification** : Air Liquide  
 Level 9, 380 St.Kilda Road  
 3004 Melbourne AUSTRALIA  
**Emergency phone nr** : 1800 812 588

### 2 HAZARDS IDENTIFICATION

**Hazard classification** : Not classified as hazardous according to NOHSC criteria.  
 Classified as a dangerous good by the criteria of the ADG code.  
**Hazards identification** : Compressed gas.  
 Extremely flammable.  
**R Phrase(s)** : R12 : Extremely flammable.  
**S Phrase(s)** : S9 : Keep container in a well-ventilated place. - S16 : Keep away from sources of ignition - No smoking. - S33 : Take precautionary measures against static discharges.

### 3 COMPOSITION/INFORMATION ON INGREDIENTS

**Substance / Preparation** : Substance.

Substance name	Contents	CAS No	EC No	Annex No	Classification
Hydrogen	100 %	1333-74-0	215-605-7	001-001-00-9	F+; R12

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

### 4 FIRST AID MEASURES

**First aid measures**  
**- Inhalation** : In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.  
**- Ingestion** : Ingestion is not considered a potential route of exposure.

### 5 FIRE-FIGHTING MEASURES

**Flammable class** : Extremely flammable.  
**Specific hazards** : Exposure to fire may cause containers to rupture/explode.



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### 5 FIRE-FIGHTING MEASURES (continued)

- Hazardous combustion products** : None.
- Extinguishing media**
- **Suitable extinguishing media** : All known extinguishants can be used.
- Specific methods** : If possible, stop flow of product.  
Move away from the container and cool with water from a protected position.  
Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire.
- Special protective equipment for fire fighters** : In confined space use self-contained breathing apparatus.

### 6 ACCIDENTAL RELEASE MEASURES

- Personal precautions** : Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.  
Evacuate area.  
Ensure adequate air ventilation.  
Eliminate ignition sources.
- Environmental precautions** : Try to stop release.
- Clean up methods** : Ventilate area.

### 7 HANDLING AND STORAGE

- Storage** : Keep container below 50°C in a well ventilated place.  
Segregate from oxidant gases and other oxidants in store.
- Handling** : 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. Contact your gas supplier if in doubt.  
Keep away from ignition sources (including static discharges).  
Refer to supplier's container handling instructions.

### 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

- Personal protection** : Ensure adequate ventilation.  
Do not smoke while handling product.

### 9 PHYSICAL AND CHEMICAL PROPERTIES

- Physical state at 20 °C** : Compressed gas.
- Colour** : Colourless.
- Odour** : None.
- Molecular weight** : 2
- Melting point [°C]** : -259
- Boiling point [°C]** : -253
- Critical temperature [°C]** : -240
- Vapour pressure [20°C]** : Not applicable.
- Relative density, gas (air=1)** : 0.07

**Hydrogen****AL073****9 PHYSICAL AND CHEMICAL PROPERTIES (continued)**

Relative density, liquid (water=1) : 0.07  
Solubility in water [mg/l] : 1.6  
Flammability range [vol% in air] : 4 to 75  
Auto-ignition temperature [°C] : 560  
Other data : Burns with a colourless invisible flame.

**10 STABILITY AND REACTIVITY**

Stability and reactivity : Can form explosive mixture with air.  
May react violently with oxidants.

**11 TOXICOLOGICAL INFORMATION**

Toxicity information : No known toxicological effects from this product.

**12 ECOLOGICAL INFORMATION**

Ecological effects information : No known ecological damage caused by this product.

**13 DISPOSAL CONSIDERATIONS**

General : 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.  
Do not discharge into any place where its accumulation could be dangerous.  
Contact supplier if guidance is required.

**14 TRANSPORT INFORMATION**

UN No. : 1049  
Labelling ADG : Label 2.1 : flammable gas.  
H.I. nr : 23  
Proper shipping name : HYDROGEN, COMPRESSED  
HAZCHEM - Emergency Action Code : 2SE  
: 2 = Fine water spray.  
S = Risk of violent reaction or explosion. Recommended personal protective equipment : Full fire kit and breathing apparatus. Appropriate measures : dilute.  
E = There may be a public safety hazard outside the immediate area of the incident, and that the following actions should be considered :  
1. People should be warned to stay indoors with all doors and windows closed, preferably in rooms upstairs and facing away from the incident. Ignition sources should be eliminated and any ventilation stopped.  
2. Effects may spread beyond the immediate vicinity. all non-essential personnel should be instructed to move at least 250 metres away from the incident.  
3. Police and fire brigade incident commanders should consult each other and with a product expert, or with a source of product expertise.  
4. The possible need for subsequent evacuation should be considered, but it should be remembered that in most cases it will be safer to remain in a building than to evacuate.

- ADG Class : 2  
- ADG Classification code : 1 F



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#### 14 TRANSPORT INFORMATION (continued)

**Other 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 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.  
- Ensure there is adequate ventilation.  
- Compliance with applicable regulations.

#### 15 REGULATORY INFORMATION

**EC Classification** : Annex No : 001-001-00-9  
F+; R12

**EC Labelling**

**Symbol(s)** : F+ : Extremely flammable

**R Phrase(s)** : R12 : Extremely flammable.

**S Phrase(s)** : S9 : Keep container in a well-ventilated place.  
S16 : Keep away from sources of ignition - No smoking.  
S33 : Take precautionary measures against static discharges.

#### 16 OTHER INFORMATION

Ensure all national/local regulations are observed.  
Ensure operators understand the flammability hazard.  
The hazard of asphyxiation is often overlooked and must be stressed during operator training.  
This Safety Data Sheet has been established in accordance with the applicable European Directives and applies to all countries that have translated the Directives in their national laws.

**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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