

SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product Name : Hydrogen
Chemical Formula : H₂
REACH Registration No. : Exempt
EC No. : 215-605-7
CAS No. : 01333-74-0

1.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses

Industrial and professional. Perform risk assessment prior to use.

Fuel gas for specialist applications, raw material gas for chemical processes.

1.3. Details of the supplier of the SDS

Company Identification : Irish Oxygen Co Ltd,
Waterfall Road, Cork
Email : sds@irishoxygen.com

1.4. Emergency telephone number

Emergency Telephone : 021-4541821
(Mon-Fri 08:30-17:30)

2. HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture

(a) Classification according to Regulation (EC) No 1272/2008/EC [CLP/GHS]

Flam. Gas 1

H220: Extremely flammable gas

Press. Gas

H280: Contains gas under pressure; may explode if heated

(b) Classification according to Directive 67/548/EEC & 1999/45/EC

F+ Extremely flammable
R12 Extremely flammable

2.2. Label Elements

Hazard pictograms



Signal word

DANGER

Hazard statements

H220: Extremely flammable gas

H280: Contains gas under pressure; may explode if heated

Precautionary statements

Prevention

P210: Keep away from heat/sparks/open flame/hot surfaces - No smoking

Response

P377: Leaking gas fire: Do not extinguish, unless leak can be stopped safely

P381: Eliminate all ignition sources if safe to do so

Storage

P403: Store in a well-ventilated place.

Disposal

None

2.3. Other Hazards

None.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/Mixture: Substance

3.1. Substances

Substance Name : Hydrogen
CAS No. : 01333-74-0
EC No. : 215-605-7

REACH : Exempt
Registration No.

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

3.2. Mixtures

Not applicable.

4. FIRST AID MEASURES

4.1. Description of first aid measures

Following inhalation

Remove victim to uncontaminated area wearing self contained breathing apparatus. Move to fresh air. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

Following skin contact

Adverse effects not expected from this product.

Following eye contact

Adverse effects not expected from this product.

Following Ingestion

Ingestion is not considered a potential route of exposure.

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

In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation.

In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of co-ordination.

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

No data available.

5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media

All known extinguishing media can be used

Unsuitable extinguishing media

No data available.

5.2. Special hazards arising from the substance or mixture

Specific hazards

Ignitable by static electricity. Burns with an invisible flame. Gas is lighter than air and can accumulate in the upper sections of enclosed spaces. Upon exposure to intense heat or flame, cylinder will vent rapidly and or

rupture violently. Keep containers and surroundings cool with water spray. Extinguish fire only if gas flow can be stopped. If possible, shut off the source of gas and allow the fire to burn itself out. Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire. Move away from container and cool with water from a protected position. Keep adjacent cylinders cool by spraying with large amounts of water until fire burns itself out. If flames are accidentally extinguished, explosive re-ignition may occur; therefore, appropriate measures should be taken (e.g. total evacuation to protect persons from cylinder fragments and toxic fumes should a rupture occur).

5.3. Advice for fire-fighters

Specific methods

The presence of hydrogen flame can be detected by approaching cautiously with an outstretched straw broom to make flame visible.

Special protective equipment for fire-fighters

In confined space use self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Evacuate personnel to safe areas. Remove all sources of ignition. Never enter a confined space or other area where the flammable gas concentration is greater than 10% of its lower flammable limit. Ventilate the area.

6.2. Environmental precautions

Do not discharge into any place where its accumulation could be dangerous. Should not be released into the environment. Prevent further leakage or spillage if safe to do so.

6.3. Methods and material for containment and cleaning up

Ventilate area. Approach suspected leak areas with caution.

6.4. Reference to other sections

See also sections 8 and 13.

7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Safe use of the product

Take precautionary measures against static discharge. Keep away from ignition sources (including static discharges).

Consider the use of non-sparking tools.

Do not smoke while handling product.

Assess the risk of potentially explosive atmospheres and the need for explosion proof equipment.

Do not allow backfeed into the container.

Avoid suckback of water, acid or alkalis.

Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.

Purge air from system before introducing gas.

Ensure the complete gas system has been (or is regularly) checked for leaks before use.

Only experienced and properly instructed persons should handle gases under pressure.

The substance must be handled in accordance with good industrial hygiene and safety procedures.

Safe handling of the gas receptacle

Do not remove or deface labels provided by the supplier for the identification of the cylinder contents.

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.

Open valve slowly.

Do not remove valve guard from cylinder.

If user experiences any difficulty operating cylinder valve discontinue use and contact supplier.

Close container valve after each use and when empty, even if still connected to equipment.

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.

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.

Do not allow backfeed into the container.

Suck back of water into the container must be prevented.

Consider the use of flash back arrestors.

Refer to supplier's container handling instructions.

7.2. Conditions for safe storage, including any incompatibilities

Keep container below 50°C in a well ventilated place.

Segregate from oxidant gases and other oxidants in store.

Store containers in location free from fire risk and away from sources of heat and ignition.

Keep away from combustible materials.

All electrical equipment in the storage areas should be compatible with the risk of potentially explosive atmosphere.

Stored containers should be periodically checked for general condition and leakage.

Containers should not be stored in conditions likely to encourage corrosion.

Containers should be stored in the vertical position and properly secured to prevent toppling.

Container valve guards or caps should be in place.

Observe all regulations and local requirements regarding storage of containers.

7.3. Specific end use(s)

None.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure controls

The substance is not classified for human health hazards or for environmental effects, and is not PBT or vPvB so that no exposure assessment or risk characterisation is required. For tasks where the intervention of workers is required, the substance must be handled in accordance with good industrial hygiene and safety procedures.

Appropriate engineering controls

Gas detectors should be used when flammable gases/vapours may be released.

Consider the use of a work permit system, e.g. for maintenance activities.

Systems under pressure should be regularly checked for leakages.

Provide adequate general and local ventilation.

Personal protective equipment

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.

Wear safety gloves and safety shoes when handling cylinders.

Wear safety glasses with side shields.

Consider the use of flame resistant anti-static safety clothing.

Environmental exposure controls

Refer to local regulations for restrictions of emissions to the atmosphere. See section 13 for specific methods for waste gas treatments.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance

• **Physical state at 20°C / 101.3kPa** : Gas

• **Colour:** : Colourless

Odour : Odourless

Odour threshold : Nor data available.

Molar mass : 2 g/mol

Melting point / freezing point : -259°C

Boiling point (sublimation point) : -253°C (s)

Flash point	: Not applicable for gases and gas mixtures.
Evaporation rate	: Not applicable for gases and gas mixtures.
Upper/lower flammability or explosive limits	: 4% - 75% (vol. in air)
Vapour pressure	: Not applicable
Relative density, gas (air=1)	: 0.07
Solubility in water	: 1.6 mg/l
Auto-ignition temperature	: 560°C

9.2. Other information

Burns with colourless invisible flame.

10. STABILITY AND REACTIVITY

10.1. Reactivity

Can form explosive mixture with air. May react violently with oxidants.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No data available.

10.4. Conditions to avoid

Keep away from heat/sparks/open flames/hot surfaces/oxidising agents. – No smoking.

10.5. Incompatible materials

Oxygen, oxidising agents.

10.6. Hazardous decomposition products

No data available.

11. TOXICOLOGICAL INFORMATION

No known toxicological effects from this product.

12. ECOLOGICAL INFORMATION

No known ecological damage caused by this product.

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Do not discharge into any place where its accumulation could be dangerous.

Contact supplier if guidance is required.

May be vented to atmosphere in a well ventilated place.

May be vented to atmosphere.

Do not discharge into areas where there is a risk of forming an explosive mixture.

14. TRANSPORT INFORMATION

UN Number	: 1049
Proper shipping name	: HYDROGEN
Class	: 2
Classification code	: 1 F
Hazard labels	: 2.1 (Flammable gases)
Packing instructions	: P200
Hazard identification number	: 23
Tunnel restriction code	: B/D
IMDG Emergency schedule-fire	: F-D
IMDG Emergency schedule-spillage	: S-U
Environmental hazards	: None
Special provisions	: None

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.
- Ensure compliance with applicable regulations.

15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

Seveso Directive 96/82/EC : Listed

National legislation : Ensure all national/local regulations are observed.

16. OTHER INFORMATION

16.1. Training advices

The hazard of asphyxiation is often overlooked and must be stressed during operator training.

Ensure operators understand the flammability hazard.

16.2. Disclaimer

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.

