

# High Purity Hydrogen

PRODUCT : HYDROGEN MSDS NR: 302-00-0025 BOC VERSION : 1.02 DATE : 17 / 4 / 02 PAGE : 1 / 2

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

<b>Product name</b>	Hydrogen
<b>Chemical formula</b>	H <sub>2</sub>
<b>Company identification</b>	see footer
<b>Emergency phone Nos</b>	see footer

## 2 COMPOSITION/INFORMATION ON INGREDIENTS

<b>Substance/Preparation</b>	Substance.
<b>Components/Impurities</b>	Contains no other components or impurities which will influence the classification of the product.
<b>CAS Nr</b>	1333-74-0
<b>EEC Nr (from EINECS)</b>	215-605-7
<b>Specification</b>	
High Purity Hydrogen	99.995% minimum

## 3 HAZARDS IDENTIFICATION

<b>Hazards identification</b>	Extremely flammable. Compressed gas.
-------------------------------	---

## 4 FIRST AID MEASURES

<b>Inhalation</b>	In high concentrations may cause asphyxiation and death. 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.
<b>Ingestion</b>	Ingestion is not considered a potential route of exposure.

## 5 FIRE FIGHTING MEASURES

<b>Specific hazards</b>	Exposure to fire may cause containers to rupture/explode. Inform Fire Brigade.
<b>Hazardous combustion products</b>	None
<b>Suitable extinguishing media</b>	All known extinguishants can be used.
<b>Specific methods</b>	If possible, stop flow of product. Move away from 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.
<b>Special protective equipment for fire fighters</b>	In confined space use self-contained breathing apparatus.

## 6 ACCIDENTAL RELEASE MEASURES

<b>Personal precautions</b>	Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Evacuate area. Ensure adequate air ventilation. Eliminate ignition sources. Post warning signs (including no smoking).
-----------------------------	---

### Leak not Ignited

Extinguish all sources of ignition in the immediate area. Close the cylinder valve. If necessary tighten the gland nut. If leak continues, evacuate the area, and avoiding sources of ignition and minimising personal risk move the leaking cylinder to a safe outside area. Notify BOC. Post warning notices and prevent access to the area. DO NOT Attempt to tighten the cylinder valve in the body of the cylinder. DO NOT tamper with the safety devices.

### Leak Ignited

Raise fire alarm. Close cylinder valve if safe to do so. Call fire brigade. Evacuate the area. if possible apply copious quantities of water from a hose to the affected cylinder(s) from a protected position until the cylinder(s) are cold. DO NOT Move cylinders until cold.

<b>Environmental precautions</b>	Try to stop release.
----------------------------------	----------------------

<b>Clean up methods</b>	Ventilate area.
-------------------------	-----------------

## 7 HANDLING AND STORAGE

### Handling and storage

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. Hydrogen diffuses rapidly, and may leak from a system gas tight for other gases. Use non-spark tools. Contact BOC if in doubt. Keep away from heat and ignition sources (including static discharges). Store cylinders outside in the open air. Segregate from oxidant gases and other oxidants in store. Refer to BOC container handling instructions. Keep container below 50°C in a well ventilated place. Ventilation equipment should be hydrogen safe.

## 8 EXPOSURE CONTROLS/ PERSONAL PROTECTION

### Personal protection

Ensure adequate ventilation. Do not smoke while handling product. Before connecting the cylinder for use, the cylinder valve should be checked for cleanliness, but should not be "snifted". If there are any signs of dirt, blow it out with a jet of clean compressed air or nitrogen.

<b>Action in the event of a flashback</b>	Close the cylinder valve. Check equipment, if cylinder becomes hot take action as in leak-ignited.
---	--

## 9 PHYSICAL AND CHEMICAL PROPERTIES

<b>Molecular weight</b>	2
<b>Melting point</b>	-259 °C
<b>Boiling point</b>	-253 °C
<b>Critical temperature</b>	-240 °C
<b>Relative density, gas</b>	0.07 (air=1)
<b>Relative density, liquid</b>	0.07 (water=1)
<b>Vapour Pressure 20°C</b>	Not applicable.
<b>Solubility mg/l water</b>	1.6 mg/l
<b>Appearance/Colour</b>	Colourless gas
<b>Odour</b>	None.
<b>Autoignition temperature</b>	560 °C
<b>Flammability range</b>	4-75 vol% in air.
<b>Other data</b>	Burns with a colourless invisible flame.

# SAFETY DATA SHEET

## 10 STABILITY AND REACTIVITY

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

- cylinder valve is closed and not leaking.
- valve outlet cap nut or plug (where provided) is correctly fitted.
- valve protection device (where provided) is correctly fitted.
- adequate ventilation.
- compliance with applicable regulations.

## 11 TOXICOLOGICAL INFORMATION

### General

No known toxicological effects from this product.

## 12 ECOLOGICAL INFORMATION

### General

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 BOC if guidance is required.

## 14 TRANSPORT INFORMATION

**UN Nr** 1049  
**Class/Div** 2.1  
**ADR/RID Item Nr** 2.1°F  
**ADR/RID Hazard Nr** 23  
**Labelling ADR** Label 3: flammable gas

### 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 they are firmly secured and:

## 15 REGULATORY INFORMATION

**Number in Annex I of Dir 67/548** 001-001-00-9.  
**EC Classification** F+;R12  
**Labelling of cylinders**  
**-Symbols** Label 3: flammable gas  
**-Risk phrases** R12 Extremely flammable.  
**-Safety phrases** S9 Keep container in well ventilated place.  
 S16 Keep away from ignition sources - 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. Users of breathing apparatus must be trained. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out. Always leak check cylinders when first collected, delivered or used, using an approved leak detection fluid. 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. For further safety information please refer to "Safe Under Pressure" and "Safe handling, storage and transport of industrial gas cylinders", both of which are available from your local BOC outlet.

## NOTES

1. The MCP and each size of cylinder may not be available from all locations.
2. This is the outlet connection of the cylinder valve fitted to each cylinder, and which is designed primarily to receive the gas pressure regulator. The connection is identical on each cylinder and the MCP.
3. The manifolded cylinder pallet comprises 15 cylinders all connected to a single outlet.

## CYLINDER CHARACTERISTICS

Cylinder Size (see Note 1)	Outlet Connection (see Note 2)	Approx. Dimensions (mm)	Max. Gross Weight (kg)
B	5/8" BSP Female Left Hand Cone Recessed	140 x 850	16
K	5/8" BSP Female Left Hand Cone Recessed	230 x 1460	66

Manifolded Cylinder Pallets MCP's	Outlet Connection (see Note 2)	Approx. Dimensions Including Cylinders (mm)	Max. Gross Weight (kg)
WK (15 x K)	5/8" BSP Female Left Hand Cone Recessed	1290 x 1810 x 840	1300



A member of The BOC Group  
 The stripe symbol and the word BOC are BOC Group trademarks.  
 © The BOC Group 2002

For product and safety enquiries please phone

In the United Kingdom:  
**0800 111 333**

**BOC Gases**  
**Customer Service Centre**  
**Priestley Road, Worsley**  
**Manchester M28 2UT**  
**Fax: 0800 111 555**

In the Republic of Ireland:  
**1850 333435**

**BOC Gases**  
**P.O. Box 201**  
**Bluebell, Dublin 12**  
**Fax: 01 409 1801**

SFT/007290/AP/0602/3M(25)