



NATIONAL PEROXIDE LIMITED, KALYAN

MATERIAL SAFETY DATA SHEET for HYDROGEN GAS (Compressed)

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

1.1. Identification of the substance/preparation

Product name : HYDROGEN GAS, COMPRESSED
Chemical Name : Hydrogen
Synonyms : Dihydrogen, Parahydrogen, Water gas
Molecular formula : H₂
Molecular Weight : 2.016 g/mol

1.2. Use of the Substance/Preparation

Recommended use : Used for production of plastics, polyester and nylon, Hydrogenation of amines and fatty acids, various processes of heat treatment in metal industry, etc.

1.3. Company/Undertaking Identification

Address : National Peroxide Limited,
NRC Road, Village Vadavali,
P.O. Mohone, Kalyan – 421102,
Thane Dist., Maharashtra State, India.
Telephone : 091 251 2270094, 2271375, 2270672
Telefax : 091 251 2270671.

1.4. Emergency telephone number

Telephone : 091 251 3255648 (Emergency 24 Hour)

2. HAZARDS IDENTIFICATION

Appearance : Compressed Gas
Colour : Colorless
Odour : Odourless
- Extremely flammable.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hydrogen

CAS-No. : 1333-74-0
UN Number : UN1049 (gas)
Symbol(s) : F+ : Extremely flammable.
R-phrases) : R12 : Extremely flammable.
S-phrases(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.
Concentration : >99.9%

4. FIRST AID MEASURES

4.1. Inhalation

- In high concentration 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.



4.2. Ingestion

- Apply artificial respiration if breathing stopped.
- Ingestion is not considered a potential route of exposure.

5. FIRE-FIGHTING MEASURES

5.1. Flammable class

- Extremely flammable gas. Flame is nearly invisible. Lower flammable limit is 4.0% (LEL) and Upper Flammable limit is 74% (UEL) at STP.

5.2. Specific Hazards

- Exposure to fire may cause containers to rupture / explode.

5.3. Hazardous combustion products

- None.

5.4. Extinguishing media

Suitable extinguishing

Media

Specific methods

- All known extinguishants can be used.
- If possible, stop the flow of product. Evacuate all personnel from the danger area. Immediately cool container with water spray from maximum distance, taking care not to extinguish flames. Spontaneous/explosive re-ignition may occur.

Special protective

equipment for fire fighters

- In confined spaces use self-contained breathing apparatus.

5.5. Other information

- Hydrogen is easily ignited with low-ignition energy, including static electricity.
- Hydrogen is lighter than air and can accumulate in the upper sections of enclosed spaces.
- Pressure in a container can build up due to heat, and it may rupture if pressure relief devices should fail to function.

6. ACCIDENTAL RELEASE MEASURES

6.1. 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.
- If leaking from the cylinder, or valve, call emergency phone number. The presence of a hydrogen flame can be detected by approaching cautiously with an outstretched straw broom to make the flame visible.

6.2. Environmental precautions

- Try to stop the release of Hydrogen gas.

6.3. Methods for cleaning up

- Ventilate area.

7. HANDLING AND STORAGE

7.1. Handling

- Ensure equipment is adequately earthed.
- Suck back of water into the container must be prevented.
- Purge air from system with nitrogen gas 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.
- Keep away from ignition sources (including static discharges).



7.2. Storage

- Keep container below 50°C in a well ventilated place.
- Segregate from oxidant gases and other oxidants in store.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Personal protection

- Ensure adequate ventilation.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. General Information (appearance, odour)

Physical state @20°C :	Compressed gas.
Colour :	Colorless.
Odour :	None.

9.2. Important Health Safety and Environmental Information

Boiling point/range :	-253 °C.
Melting point :	-259 °C.
Critical temperature :	-240 °C.
Vapour pressure :	Not applicable @20 °C.
Relative density, gas :	0.07 (air = 1)
Relative density, liquid:	0.07 (water = 1)
Solubility in water :	1.6 mg/l
Flammability range :	4 to 75 (vol% in air at STP conditions)
Auto ignition temperature:	560 °C.

9.3. Other data

Specific Volume :	11.986 m ³ /kg @1.013 bar and 21°C.
Critical pressure :	12.98 bar
Critical Density :	30.09 kg/m ³ .

10. STABILITY AND REACTIVITY

10.1. Stability

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

11. TOXICOLOGICAL INFORMATION

11.1 Toxicological data

- No known toxicological effects from this product.

12. ECOLOGICAL INFORMATION

12.1. Ecotoxicity effects

- No known ecological damages caused by this product.

13. DISPOSAL CONSIDERATIONS

13.1. 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

IMDG

Class	2.1
Sub-risks	Flammable gas
HI/UN No.	1049
Proper shipping name:	HYDROGEN, COMPRESSED

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

15.1. Label

Symbol(s)	F+	Extremely flammable.
R-phrases(s)	R 12	Extremely flammable.
S-phrases(s)	S 9	Keep container in a well-ventilated place.
	S 16	Keep away from sources of ignition - No smoking.
	S 33	Take precautionary measures against static discharges.

16. OTHER INFORMATION

16.1.

NFPA RATINGS:	HEALTH:	=	0
	FLAMMABILITY:	=	4
	REACTIVITY:	=	0

HMIS RATINGS:	HEALTH:	=	0
	FLAMMABILITY:	=	4
	REACTIVITY:	=	0
	SPECIAL:	=	SA (CGA recommends this to designate simple asphyxiant)

16.2. General

- 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.

16.3. Revisions

- Rev. No. 00 / 28/06/2010 – First Issue
- Rev. No. 10 / 01/04/2012 – IMS First Issue.

The information given corresponds to the current state of our knowledge and experience of the product, and is not exhaustive. This applies to product which conforms to the specification, unless otherwise stated. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and protection of human welfare and the environment.

