

**1. PRODUCT AND COMPANY IDENTIFICATION**

**Product Code:**  
**Product Name:** Hydrogen compressed  
**Company Name:** Gas Innovations  
  
 18005 E. Hwy 225  
 La Porte, TX 77571  
**Web site address:** www.gasinnovations.com      **Phone Number:** +1 (281)471-2200  
**Emergency Contact:** 3E (within United States)      +1 (866)303-2640  
**Intended Use:** Industrial Use      +1 (352)323-3500

**2. HAZARDS IDENTIFICATION**

**Flammable Gases:** Category 1  
**Gas Under Pressure:** Compressed gas

**Symbol:**



**GHS Signal Word:** Danger

**GHS Hazard Phrases:** H220 - Extremely flammable gas.  
 H280 - Contains gas under pressure; may explode if heated.  
 HUS1 - May displace oxygen and cause rapid suffocation.  
 CGA-HG08 - Burns with invisible flame.  
 CGA-HG04 - May form explosive mixtures with air.

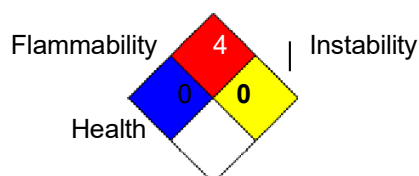
**GHS Precaution Phrases:** P202 - Do not handle until all safety precautions have been read and understood.  
 P210 - Keep away from heat/sparks/open flames/hot surfaces/other ignition sources. - No smoking.  
 P271 - Use only outdoors or in a well-ventilated area.  
 Use a back flow preventive device in the piping. Use only with equipment rated for cylinder pressure. Close valve after each use and when empty. Protect from sunlight when ambient temperature exceeds 52°C (125°F). Do not open valve until connected to equipment prepared for use.

**GHS Response Phrases:** P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.  
 P381 - Eliminate all ignition sources if safe to do so.

**GHS Storage and Disposal Phrases:** P403 - Store in well-ventilated place.

**Additional Hazards Information:** Unknown Acute Toxicity (GHS-US): No data available.

**Hazard Rating System:**



**NFPA:** Special Hazard

**Potential Health Effects (Acute and Chronic):** Chemical asphyxiant. Exposure to low concentrations for extended periods may result in dizziness or unconsciousness and may lead to death.

<b>Inhalation:</b>	Category 2 – Toxic if inhaled.
<b>Skin Contact:</b>	May be harmful if absorbed through the skin. May cause skin irritation.
<b>Eye Contact:</b>	May cause eye irritation.
<b>Ingestion:</b>	May be harmful if swallowed.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

CAS #	Hazardous Components (Chemical Name)/ REACH Registration No.	Concentration	EC No./EC Index No.	GHS Classification
1333-74-0	Hydrogen, compressed	100.0 %	215-605-7 001-001-00-9	Comp. Gas: H280 Flam. Gas 1: H220

### 4. FIRST AID MEASURES

<b>Emergency and First Aid Procedures:</b>	Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.
<b>In Case of Inhalation:</b>	Remove victims to fresh air and keep at rest in a position comfortable for breathing. If breathing is difficult, trained personnel should give oxygen. If breathing has stopped, give artificial respiration. Call a physician.
<b>In Case of Skin Contact:</b>	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. To avoid possibility of static discharges and gas ignition, soak contaminated clothing thoroughly with water before removing it. Wash clothing before reuse. Clean shoes thoroughly prior to reuse.
<b>In Case of Eye Contact:</b>	Immediately flush eyes with plenty of water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately. Get immediate medical advice/attention.
<b>In Case of Ingestion:</b>	Not expected to be a primary route of exposure
<b>Note for the Doctor:</b>	Treat symptomatically and supportively. Show this safety data sheet to the doctor in attendance.
<b>Signs and Symptoms of Exposure:</b>	Effects are due to lack of oxygen. Moderate concentration may cause headache, drowsiness, dizziness, excitation, excess salivation, vomiting, and unconsciousness. Prolonged exposure to low concentrations of carbon monoxide can be fatal.

### 5. FIRE FIGHTING MEASURES

<b>Flash Pt:</b>	NA
<b>Method Used:</b>	Not Applicable
<b>Explosive Limits:</b>	Lower level: 4% (Volume in air)      Upper-level EL: 77 % (Volume in air)
<b>Autoignition Pt:</b>	560 C (1040 F)
<b>Suitable Extinguishing Media:</b>	Water spray or fog, dry chemical powder, carbon dioxide. Use water spray or fog to knock down fire fumes if possible.
<b>Fire Fighting Instructions:</b>	As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH approved (or equivalent), and full protective gear. If venting or leaking gas catches fire, do not extinguish flames. Flammable vapors may spread from leak, creating an explosive reignition hazard. Vapors can be ignited by pilot lights, other flames, smoke, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger.

Before entering an area, especially a confined area, check the atmosphere with an appropriate device. Do not direct water at source of leak or safety devices; icing may occur. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out.

Evacuate all personnel from the danger area. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.

**Hazardous Combustion Products:**

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

**Flammable Properties and Hazards:**

Compressed gas: asphyxiant. Suffocation hazard by lack of oxygen. EXTREMELY FLAMMABLE. The hydrogen flame is nearly invisible. Hydrogen has a low ignition energy; escaping hydrogen gas may ignite spontaneously. A fireball forms if the gas cloud ignites immediately after release. Hydrogen forms explosive mixtures with air and oxidizing agents.

Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas containers to rupture. Cool endangered containers with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems.

## 6. ACCIDENTAL RELEASE MEASURES

**Protective Precautions, Protective Equipment and Emergency Procedures:**

Use proper personal protective equipment as indicated in Section 8. See Section 13

**Environmental Precautions:**

Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents and containers in accordance with local, regional, national, and international regulations. Contact supplier for any special requirements.

**Steps To Be Taken in Case Material Is Released or Spilled:**

DANGER: EXTREMELY FLAMMABLE GAS. Forms explosive mixtures with air and oxidizing agents. See section 5. Evacuate personnel to a safe area. Appropriate self-contained breathing apparatus may be required. Approach suspected leak area with caution. Remove all sources of ignition, if safe to do so. Reduce gas with fog or fine water spray. Stop flow of product if safe to do so. Ventilate area or move container to a well-ventilated area. Flammable gas may spread from leak. Before entering the area, especially a confined area, check the atmosphere with an appropriate device.

## 7. HANDLING AND STORAGE

**Precautions To Be Taken in Handling:**

Keep away from heat, sparks, and open flame. Keep away from ignition sources. NO SMOKING IN AREAS OF USE. NO SMOKING IN STORAGE AREAS. Use non-sparking tools. Use explosion-proof equipment. Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving the cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder with its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container

**Precautions To Be Taken in Storing:**

and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16. Store only where temperature will not exceed 125°F (52°C). Post "No Smoking or Open Flames" signs in storage and use areas. There must be no sources of ignition. Separate packages and protect against potential fire and/or explosion damage following appropriate codes and requirements (e.g., NFPA 30, NFPA 55, NFPA 70, and/or NFPA 221 in the U.S.) or according to requirements determined by the Authority Having Jurisdiction (AHJ). Always secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. Handle in accordance with good industrial hygiene and safety practices. When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered.

**Other Precautions:**

Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; stored and used with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit. Keep out of reach of children. Do not remove or deface labels provided by the supplier for the identification of the container contents.

**General Occupational Hygiene:**

Eating, drinking, and smoking should be prohibited in areas where this material is handled, stored, and processed. Workers should wash their hands and face before eating, drinking, and smoking. Remove contaminated clothing and protective equipment before entering eating areas.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

CAS #	Partial Chemical Name	Jurisdiction	Recommended Exposure Limits	Notations
1333-74-0	Hydrogen, compressed	ACGIH TLV	TWA: Simple asphyxiant	
<b>Recommended Exposure Limits:</b>	Not established.			
<b>Respiratory Equipment (Specify Type):</b>	An air-supplied respirator must be used while working with this product in confined spaces. The respiratory protection used must conform with OSHA rules as specified in 29 CFR 1910.134. Select per OSHA 29 CFR 1910.134 and ANSI Z88.2.			
<b>Eye Protection:</b>	Wear safety glasses with side shields. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.			
<b>Protective Gloves:</b>	Wear working gloves when handling gas containers.			
<b>Other Protective Clothing:</b>	Consider the use of flame resistant anti-static safety clothing. Wear safety shoes when handling containers.			
<b>Engineering Controls (Ventilation etc.):</b>	Use an explosion-proof local exhaust system. Local exhaust and general ventilation must be adequate to meet exposure standards. MECHANICAL (GENERAL): Inadequate - Use only in a closed system. Use explosion proof equipment and lighting.			
<b>Work/Hygienic/Maintenance Practices:</b>	Handle in accordance with good industrial hygiene and safety practice.			
<b>Environmental Exposure Controls:</b>	Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents and containers in accordance with local, regional, national, and international regulations. Contact the supplier for any special requirements.			

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Physical States:</b>	[ X ] Gas [ ] Liquid [ ] Solid
<b>Appearance:</b>	Colorless
<b>Odor:</b>	No apparent odor.
<b>Critical Temperature:</b>	-240C
<b>PH:</b>	NP
<b>Melting Point:</b>	-259.20 C (-434.6 F)
<b>Boiling Point:</b>	-253 °C
<b>Flash Pt:</b>	NA
<b>Evaporation Rate:</b>	No data.
<b>Saturated Vapor Concentration:</b>	NA
<b>Flammability (solid, gas):</b>	EXTREMELY FLAMMABLE. Forms explosive mixtures in air and with oxidizing agents. Burns with invisible flame.
<b>Explosive Limits:</b>	LEL: 4% UEL: 77%
<b>Vapor Pressure (vs. Air or mm Hg):</b>	760 mmHg at -253 °C
<b>Vapor Density (vs. Air = 1):</b>	0.07
<b>Specific Gravity (Water = 1):</b>	NA
<b>Density:</b>	0.08987 g/L at 0 °C
<b>Bulk density:</b>	NA
<b>Solubility in Water:</b>	1.62 mg/l
<b>Octanol/Water Partition Coefficient:</b>	No data
<b>Autoignition Pt:</b>	560 C (1040 F)
<b>Decomposition Temperature:</b>	No data
<b>Viscosity:</b>	0.008957 cp
<b>Explosive Properties:</b>	Not applicable.
<b>Oxidizing Properties:</b>	None
<b>Percent Volatile:</b>	NA
<b>Particle Size:</b>	NA
<b>Heat Value:</b>	NA
<b>Corrosion Rate:</b>	NA
<b>Molecular Formula &amp; Weight:</b>	H2 (2.02)

## 10. STABILITY AND REACTIVITY

<b>Reactivity:</b>	None under recommended storage and handling conditions (see section 7).
<b>Stability:</b>	Unstable [ ] Stable [ X ]
<b>Conditions To Avoid - Instability:</b>	Stable under normal conditions. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Containers may rupture or explode if exposed to heat.
<b>Incompatibility Materials to Avoid:</b>	Oxidizing materials, Lithium, Halogens, metals, metal salts, halocarbons
<b>Hazardous Decomposition or Byproducts:</b>	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
<b>Possibility of Hazardous Reactions:</b>	Will occur [ X ] Will not occur [ ]
<b>Conditions To Avoid - Hazardous Reactions:</b>	Can form explosive mixture with air. May react violently with oxidants

## 11. TOXICOLOGICAL INFORMATION

Reproductive toxicity: Not classified.  
 Specific target organ toxicity -Single exposure: Not classified.  
 Specific target organ toxicity - Repeated exposure: Not classified.  
 Aspiration hazard: Not classified.  
 Germ cell mutagenicity: Not classified.  
 Irritation or Corrosion: Skin corrosion/irritation: Not classified.  
 Serious eye damage/eye irritation: Not classified.  
 Chronic Toxicological Effects: No data available.

Carcinogenicity:	NTP - No	IARC Monographs - No	OSHA Regulated - No		
CAS #	Hazardous Components (Chemical Name)	NTP	IARC	ACGIH	OSHA
1333-74-0	Hydrogen, compressed	NA	NA	NA	NA

## 12. ECOLOGICAL INFORMATION

Toxicity: No ecological damage caused by this product  
 Persistence and Degradability: No ecological damage caused by this product  
 Bio accumulative Potential: No bioaccumulation expected.  
 Mobility in Soil: No data available.  
 Results of PBT and vPvB assessment: No ecological damage caused by this product  
 Other adverse effects: No ecological damage caused by this product

## 13. DISPOSAL CONSIDERATIONS

**Waste Disposal Method:** Dispose of contents and containers in accordance with local, regional, national, and international regulations. Contact the supplier for any special requirements. Waste gas should be flared through a suitable burner with flash back arrestor. Do not discharge into areas where there is a risk of forming an explosive mixture with air

## 14. TRANSPORT INFORMATION

**LAND TRANSPORT (US DOT):**  
 DOT Proper Shipping name: Hydrogen, compressed  
 DOT Hazard Class: 2.1 FLAMMABLE GAS  
 UN/NA number: UN1049  
 Precautionary Label: ERG Number: 115 (UN1049)

**Labels:**



**MARINE TRANSPORT (IMDG/IMO):**  
 IMDG/IMO Shipping Name: Hydrogen, compressed  
 UN Number: 1049

**Hazard Class:** 2.1 - FLAMMABLE GAS  
**IMDG Classification:** 2-Gas  
**IMDG MFAG Number:** 115  
**AIR TRANSPORT (ICAO/IATA):**  
**ICAO/IATA Shipping Name:** Hydrogen, compressed.  
**UN Number:** 1049  
**Hazard Class:** 2.1 - FLAMMABLE GAS  
**IATA Classification:** 2

**15. REGULATORY INFORMATION**

**EPA SARA (Superfund Amendments and Reauthorization Act of 1986) Lists**

CAS #	Hazardous Components (Chemical Name)	S. 302 (EHS)	S. 304 RQ	S. 313 (TRI)
1333-74-0	Hydrogen, compressed	No	No	No
CAS #	Hazardous Components (Chemical Name)	Canadian NPRI	Canadian Toxic	Canadian DSL
1333-74-0	Hydrogen, compressed	NO	NO	Yes

CAS #	Hazardous Components (Chemical Name)	Other US EPA or State Lists
1333-74-0	Hydrogen, compressed	CAA HAP, ODC: No; CWA NPDES: No; TSCA: Yes - Inventory; CA PROP.65: No; CA TAC, Title 8: Title 8; MA Oil/HazMat: Yes; MI CMR, Part 5: No; NC TAP: No; NJ EHS: Yes - 1010; NY Part 597: No; PA HSL: Yes - 1; SC TAP: No. WI Air: No

CAS #	Hazardous Components (Chemical Name)	International Regulatory Lists
1333-74-0	Hydrogen, compressed	Mexico INSQ: Yes - 1049; Australia ICS: Yes; New Zealand IOC: Yes; China IECSC: Yes; Japan ENCS: No; Japan PDSCL: No; Japan PACS: No; Japan ISHL: No; Korea ECL: Yes - KE-20137; Philippines ICCS: Yes. TH-TECI: Yes; TW: Yes; CN: Yes; VN(Draft): Yes;

**16. OTHER INFORMATION**

<b>Revision Date:</b>	09/08/2024
<b>Additional Information About This Product:</b>	<p>10/12/2020 Routine review and updates to section 2,9,11</p> <p>When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the product. Before using any plastics, confirm their compatibility with this product. Users of this product are asked to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.</p> <p>NFPA Health Hazard: 0 - Materials that, under emergency conditions, would offer no hazard beyond that of ordinary combustible materials</p> <p>NFPA Fire Hazard: 4 - Will rapidly or completely vaporize at normal pressure and temperature or is readily dispersed in air and will burn readily. NFPA Reactivity Hazard: 0 - Material that in themselves is normally stable, even under fire conditions.</p>
<b>Company Policy or Disclaimer:</b>	<p>The information, recommendations, and suggestions herein were compiled from reference material and other sources believed to be reliable. However, the SDS's accuracy or completeness is not guaranteed by Gas Innovations or its affiliates, nor is any responsibility assumed or implied for any loss or damage resulting from inaccuracies or omissions. Since conditions of use are beyond our control, no warranties of merchantability of fitness for a particular purpose are expressed or implied. This SDS is not intended as a license to operate under, or a recommendation to infringe on, any patents. Appropriate warnings and safe handling procedures should be provided to handlers and users.</p>