



ACCORDING TO US CFR 1910.1200

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

1.1 Product identifier

Product Name	HYDROGEN, COMPRESSED
Synonym(s)	HYDROGEN, TECHNICAL
CAS No.	1333-74-0
EC No.	215-605-7

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

Identified Use(s)	Industrial gas.
Uses Advised Against	Not known.

1.3 Details of the supplier of the safety data sheet

Company Identification	Hudson Technologies Company
Address	PO Box 1541 One Blue Hill Plaza Pearl River, New York USA
Postal code	10965
Telephone	+1 (800) 953 2244
Fax	+1 (845) 512 6070
E-mail	information@hudsontech.com

1.4 Emergency telephone number

Company	+1 (800) 501 4376
CHEMTREC (U.S.)	+1 (800) 424 9300
INTERNATIONAL	+1 (703) 527 3887

2. SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

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Flam. Gas 1: Extremely flammable gas.
Gases under pressure; Press. Gas; Compressed gas.

2.2 Label elements

Product Name

HYDROGEN, COMPRESSED

Hazard Pictogram(s)



GHS02



GHS04

Signal Word(s)

Danger.

Hazard Statement(s)

H220: Extremely flammable gas.
H280: Contains gas under pressure; may explode if heated.
OSHA-H01: MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION.
CGA-HG04: MAY FORM EXPLOSIVE MIXTURES WITH AIR.
CGA-HG08: BURNS WITH INVISIBLE FLAME.

Precautionary Statement(s)

P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P271+P403: Use and store only outdoors or in a well-ventilated place.
P304, P340, P313: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get medical advice/attention.
P377: Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381: Eliminate all ignition sources if safe to do so.
P410+P403: Protect from sunlight. Store in a well-ventilated place.

2.3 Other hazards

Can form explosive mixture with air.
May cause asphyxiation when concentrations are sufficient to

reduce oxygen below safe breathing levels.

May cause frost-bite.

2.4 Additional Information

CGA-PG05: Use a back flow preventive device in the piping.

CGA-PG10: Use only with equipment rated for cylinder pressure.

CGA-PG12: Do not open valve until connected to equipment prepared for use.

CGA-PG06: Close valve after each use and when empty.

CGA-PG02: Protect from sunlight when ambient temperature exceeds 52 °C (125 °F).

CGA-PG27: Read and follow the Safety Data Sheet (SDS) before use.

This SDS is available in languages other than English.

3. SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENT(S)	CAS No.	%W/W	Hazard Statement(s)	Hazard Pictogram(s)
Hydrogen	1333-74-0	100	Flam. Gas 1; H220 Press. Gas; Compressed gas; H280	GHS02 GHS04

4. SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

Inhalation	If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Administer oxygen if necessary. If breathing has stopped, apply artificial respiration.
Skin Contact	Flush skin with large amounts of water. Thaw frosted parts with lukewarm water. Do no rub affected area. If symptoms persist, obtain medical attention.
Eye Contact	Flush eyes with water for at least 15 minutes.

- Ingestion Unlikely route of exposure.
- 4.2 Most important symptoms and effects, both acute and delayed
Inhalation: High concentrations: Loss of coordination,
Unconsciousness.
- 4.3 Indication of any immediate medical attention and special treatment needed
Treat symptomatically.

5. SECTION 5: FIREFIGHTING MEASURES

Extremely flammable gas. Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

5.1 Extinguishing media

- Suitable Extinguishing media Extinguish preferably with foam, dry chemical or waterspray or fog.
Unsuitable extinguishing media None known.

5.2 Special hazards arising from the substance or mixture

Contains gas under pressure; may explode if heated. Can form explosive mixture with air. Burns with an invisible flame.
Spontaneous/explosive re-ignition may occur.

5.3 Advice for fire-fighters

Evacuate area and fight fire remotely due to the risk of explosion. Eliminate all ignition sources if safe to do so. Fire fighters should wear complete protective clothing including self-contained breathing apparatus. If it is safe to do so, containers should be removed from fire area because they are likely to rupture under fire conditions. Keep containers cool by spraying with water if exposed to fire.

6. SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Evacuate area. Eliminate sources of ignition. Ensure adequate ventilation. Avoid breathing gas. Wear suitable respiratory protection.

6.2 Environmental precautions

Do not allow to enter drains, sewers or watercourses.

6.3 Methods and material for containment and cleaning up

Stop leak if safe to do so. Allow small spillages to evaporate

provided there is adequate ventilation. Ventilate area.

6.4 Reference to other sections

See Also Section 8, 13.

7. SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Provide adequate ventilation. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take precautionary measures against static discharge. Use non-sparking hand tools and explosion proof electrical equipment. Avoid breathing gas. Avoid contact with skin and eyes. Wear protective gloves/protective clothing/eye protection/face protection. Do not drag, roll, slide or drop cylinders. Use a suitable hand truck design for cylinder movement. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. Never insert an object into valve cap openings. Doing so may damage valve causing a leak to occur. Secure cylinders in an upright position at all times, close all valves when not in use. Keep closed even when empty. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product.

7.2 Conditions for safe storage, including any incompatibilities

Protect from sunlight. Store in a well-ventilated place.

Storage temperature < 125 °F (52 °C)

Storage life Stable under normal conditions.

Incompatible materials Air, Oxidizing agents.

8. SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Occupational Exposure Limits None assigned.

8.2 Exposure controls

Appropriate engineering controls Ensure adequate ventilation.

Personal protection equipment

Wear suitable eye/face protection.



Eye Protection



Skin protection

Wear suitable gloves.



Respiratory protection

Wear suitable respiratory protective equipment if exposure to high levels of material is likely.

Thermal hazards

Not applicable.

9. SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Gas.
	Color: Colorless.
Odor	Odorless.
Odor threshold	Not established.
pH	Not applicable.
Melting point/freezing point	-434.56 °F (-259.2 °C)
Initial boiling point and boiling range	-422.99 °F (-252.77 °C)
Critical Temperature	-400 °F (-240 °C)
Flash Point	Not applicable.
Evaporation rate	Not applicable.
Flammability (solid, gas)	Extremely flammable gas.
Upper/lower flammability or explosive limits	4 – 77 Vol-%
Vapor pressure	Not available.
Vapor density	0.069 (Air = 1)
Relative density	0.07
Solubility(ies)	Solubility (Water): Slightly soluble. (1.62 mg/l) Solubility (Other): Not available.
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature	1040 °F (560 °C)
Decomposition Temperature (°C)	Not available.
Viscosity	Not applicable.
Explosive properties	Can form explosive mixture with air.
Oxidizing properties	Not oxidizing.

9.2 Other information

Molecular weight 2.02 g/mol

10. SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

Stable under normal conditions.

10.2 Chemical Stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Can form explosive mixture with air.

10.4 Conditions to avoid

Keep away from heat and sources of ignition.

10.5 Incompatible materials

Air, Oxidizing agents.

10.6 Hazardous decomposition product(s)

No hazardous decomposition products known.

11. SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity - Ingestion	Low acute toxicity.
Acute toxicity - Skin Contact	Low acute toxicity.
Acute toxicity - Inhalation	Low acute toxicity.
Skin corrosion/irritation	Contact with rapidly expanding gas may cause burns or frostbite.
Serious eye damage/irritation	Contact with rapidly expanding gas may cause burns or frostbite.
Skin sensitization data	Not classified.
Respiratory sensitization data	Not classified.
Germ cell mutagenicity	There is no evidence of mutagenic potential.
Carcinogenicity	No evidence of carcinogenicity.
Reproductive toxicity	Not classified.
Lactation	Not classified.
STOT - single exposure	None anticipated.
STOT - repeated exposure	None anticipated.
Aspiration hazard	Not classified.

11.2 Other information

Not known.

12. SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity - Aquatic invertebrates Low toxicity to invertebrates.

Toxicity - Fish Low toxicity to fish.

Toxicity - Algae Low toxicity to algae.

Toxicity - Sediment Not classified.

Compartment

Toxicity - Terrestrial Not classified.

Compartment

12.2 Persistence and Degradation

No adverse ecological effects are expected.

12.3 Bioaccumulative potential

No adverse ecological effects are expected.

12.4 Mobility in soil

Not applicable.

12.5 Other adverse effects

None anticipated.

13. SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Containers must not be punctured or destroyed by burning, even when empty. Refer to manufacturer/supplier for information on recovery/recycling.

13.2 Additional Information

Disposal should be in accordance with local, state or national legislation.

14. SECTION 14: TRANSPORT INFORMATION

14.1 UN number


UN No. 1049

14.2 UN proper shipping name

UN proper shipping name HYDROGEN, COMPRESSED

14.3 Transport hazard class(es)

ADR/RID Class 2.1

IMDG Class	2.1
IMDG EMS	Not available.
ICAO/IATA	
Excepted Quantities	E0
Passenger and Cargo Aircraft	Forbidden for transport by air.
Limited Quantities Packing	
Instructions	
Passenger and Cargo Aircraft	Forbidden for transport by air.
Limited Quantities Max net Qty	
Cargo Aircraft Max net Qty	150kg
Special Provisions	
Emergency Response	A1
Guidebook (ERG) Code	
ADR Classification Code	10L
ADR HIN	1F
ADR Transport Category	23
Tunnel Restriction Code	2
Emergency Action Code	B/D
Advice on Additional Personal Protection (APP)	2SE
	Not applicable.
14.4 Packing group	
Packing group	Not applicable.
Labels	2.1
	
Special Provisions	660
Limited Quantities	0
Excepted Quantities	E0
Mixed Packing Instructions for Packages	P200
Special Packing Provisions for Packages	Not applicable.
Mixed Packing Instructions for Packages	MP9

**14.5 Environmental hazards**

Environmental hazards Not classified as a Marine Pollutant.

14.6 Special precautions for user

Special precautions for user Not known.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Packing Instructions for Portable (M)

Tanks

Special Provisions for Portable Not applicable.

Tanks

Tank Code for Tanks CxBN(M)

Special Provisions for Tanks TA4 TT9

Vehicle for Tank Carriage FL

Special Provisions for Carriage - Not applicable.

Packages

Special Provisions for Carriage - Not applicable.

Bulk

Special Provisions for Carriage - CV9 CV10 CV36

Loading, Unloading and Handling

Special Provisions for Carriage - S2 S20

Operation

15. SECTION 15: REGULATORY INFORMATION**15.1 Federal**

Toxic and hazardous substances Not listed.

(29 CFR 1910; Subpart Z)

National emission standards for Not listed.

hazardous air pollutants (40 CFR

61.01)

Title III Consolidated List of Lists Hydrogen (CAS No.: 1333-74-0)

TSCA (Toxic Substance Control Hydrogen (CAS No.: 1333-74-0)

Act)

CAA 602 - Ozone Depleting Not listed.

Substances (ODS)

15.2 State

State Right to Know Lists Listed in: New Jersey, Pennsylvania, Rhode Island, Minnesota.

Proposition 65 (California) Not listed.
 15.3 Other
 OSPAR List of Chemicals for Not listed.
 Priority Action
 NTP (National Toxicology Not listed.
 Program)
 OSHA Not listed.
 (List of Highly Hazardous
 Chemicals, Toxics and
 Reactives)
 IARC (International Agency for Not listed.
 Research on Cancer)

16. SECTION 16: OTHER INFORMATION

The following sections contain 1-16.
 revisions or new statements:

NFPA		HMIS	
Health	0	Health	0
Fire	4	Flammability	4
Instability	0	Physical hazards	3

LEGEND:

Hazard Pictogram(s)



GHS02

Hazard Statement(s)

Precautionary Statement(s)



GHS04

H220: Extremely flammable gas.

H280: Contains gas under pressure; may explode if heated.

P210: Keep away from heat, hot surfaces, sparks, open flames and



SAFETY DATA SHEET

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other ignition sources. No smoking.

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

P381: Eliminate all ignition sources if safe to do so.

P410+P403: Protect from sunlight. Store in a well-ventilated place.

Additional Information required by Federal Standard 313 Rev. E:

Contract or Solicitation Number: SPE4A6-16-D-0226

Primary Contractor: Hudson Technologies, Inc.

Primary Contractor CAGE: 7DSQ0

National Stock Number (NSN): 6830004745789

Specification Reference:

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