SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

GHS Product Identifier	: Hydrogen
Other means of identification	: Dihydrogen; o-Hydrogen; p-Hydrogen; Molecular hydrogen; H2; UN 1049
Additional identification	
- Chemicalname	: Hydrogen
- Chemical formula	: H2
- INDEX No.	: I001-001-00-9
- CAS-No.	: 1333-74-0
- UN	: 1049

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

Identified uses :	Aerosol propellant. Balance gas for mixtures. Calibration gas. Carrier gas. Chemical synthesis. Combustion, melting and cutting processes. Fuel cells. Fuel gas for welding, cutting, heating, brazing and soldering applications. Laboratory use. Laser gas. Process gas. Test gas.
Uses advised against	None.

1.3. Details of the supplier

BayoTech, Inc.
8601 Paseo Alameda
Suite C
Albuquerque, NM 87113
Telephone: 1-800-370-BAYO (2296)
E-mail:servicerequest@bayotech.us

1.4. Emergency telephone number:

1-800-370-BAYO (2296)

SECTION 2: Hazards identification

2.1. Classification of the substanceor mixture

OSHA/HCS Status

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture

FLAMMABLE GASES Category 1

Hazard Statement(s):

Extremely flammable gas.
Contains gas under pressure; may explode if heated
May displace oxygen and cause rapid suffocation
Burns with invisible flame.
May form explosive mixtures with air.

Precautionary Statements

- General:	Read and follow all Safety Data Sheets (SDS'S) before use. Close valve after each use and when empty. Use only equipment of compatible materials of construction. Approach suspected leak area with caution
- Prevention:	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- Response:	Leaking gas fire: Do not extinguish, unless leak can be stoppedsafely. In case of leakage,eliminate all ignitionsources.
- Storage:	Protect from sunlight
- Disposal:	None

2.3. Other hazards

None

SECTION 3: Composition/information on ingredients

3.1. Substances

Chemicalname:	Hydrogen
Chemical formula:	H2
INDEX No.	001-001-00-9
CAS-No.	1333-74-0
UN	1049
Purity:	100% The purity of the substance in this section is used for classification only, and does not represent the actual purity of the substance as supplied, for which other documentation should be consulted.

SECTION 4: First aid measures

4.0. General

In high concentrations 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. Apply artificial respiration if breathing stopped.

4.1. Description of first aid measures

Inhalation:	Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
Eye contact:	Adverse effects not expected from this product.

Skin Contact: Remove contaminated clothing and shoes. To avoid the risk of static discharges and gas ignition, soak contaminated clothing thoroughly with water before removing it. Get medical attention if symptoms occur. Wash clothing before reuse.

Ingestion: Ingestion is not considered a potential route of exposure.

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

Respiratory arrest.

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

Hazards: None.

Treatment: None.

SECTION 5: Firefighting measures

5.0. General Fire Hazards:

Heat may cause the containers to explode.

5.1. Extinguishing media

Suitable extinguishing media: Heat may cause the containers to explode.

1Unsuitable extinguishing media: Carbon Dioxide.

5.2. Special hazards arising from the substance or mixture:

Suitable extinguishing media: Contains gas under pressure. Extremely flammable gas. In a fire or if heated, a pressure increase will occur, and the container may burst, with the risk of a subsequent explosion.

Hazardous Combustion Products: None.

5.3. Advice for firefighters

Special firefighting procedures: In case of fire: Stop leaking if safe to do so. Do not extinguish flames at leak because possibility of uncontrolled explosive reignition exists. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk. If this is impossible, withdraw from area and allow fire to burn. Fight fire from protected location or maximum possible distance. Eliminate all ignition sources if safe to do so.

5.4. Special protective equipment for fire-fighters:

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment, and emergency procedures:

Accidental releases pose a serious fire or explosion hazard. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing gas. Provide adequate ventilation. Wear an appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

6.2. Environmental Precautions:

Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment.

6.3. Methods and material for containment and cleaning up:

Provide adequate ventilation. Eliminate sources of ignition.

6.4. Reference to other sections:

Refer to sections 8 and 13.

SECTION 7: Handling and storage:

7.1. Precautions for safe handling:

Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid breathing gas. Use only with adequate ventilation. Wear an appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement. Use only non-sparking tools. Avoid contact with eyes, skin and clothing. Empty containers retain product residue and can be hazardous. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment.

7.2. Conditions for safe storage, including any incompatibilities:

Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Eliminate all ignition sources.
See Section 10 for incompatible materials before handling or use.

SECTION 8: Exposure controls/personal protection:

8.1. Control Parameters Occupational Exposure Limits:

California PEL for Chemical Contaminants (Table AC-1) (United States).
Oxygen Depletion [Asphyxiant].
ACGIH TLV (United States, 3/2019). Oxygen
Depletion [Asphyxiant]. Explosive potential.

8.2. Exposure controls:

Appropriate engineering controls:

Consider a work permit system e.g. for maintenance activities. Ensure adequate air ventilation. Provide adequate general and local exhaust ventilation. Keep concentrations well below lower explosion limits. Gas detectors should be used when quantities of flammable gases or vapors may be released. Provide adequate ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded. Systems under pressure should be regularly checked for leakages. Take precautionary measures against static discharges.

8.3. Individual protection measures, such as personal protective equipment

General information:	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. Keep self contained breathing apparatus readily available for emergency use. Personal protective equipment for the body should be selected based on the task being performed and the risks involved. Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment. Do not eat, drink or smoke when using the product.
Eye/face protection:	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shield.
Skin protection Hand Protection:	Wear protective gloves against mechanical risks.
Body protection:	Wear fire-resistant or flame-retardant clothing.
Other:	Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved.
Respiratory Protection:	Not required.
Thermal hazards:	No precautionary measures are necessary.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	
Physical state:	Gas
Form:	Compressed gas
Color:	Colorless
Odor:	Odorless
Odor Threshold:	Not available.
pH:	Not available.
Melting Point:	-259,2 °C
Boiling Point:	-253 °C
Sublimation Point:	Not applicable.
Critical Temp. (°C):	-240,0 °C
Flash Point:	Not applicable to gases and gas mixtures.

Evaporation Rate:	Not applicable to gases and gas mixtures.
Flammability (solid, gas):	Extremely flammable in the presence of the following materials or conditions: oxidizing materials
Flammability Limit - Upper (%):	76 %(V)
Flammability Limit - Lower (%):	4 %(V)
Vapor pressure:	Not available.
Vapor density (air=1):	0.069
Relative density:	Not available
Solubility(ies)	
Solubility in Water:	Not available
Partition coefficient (n-octanol/water):	Not available
Autoignition Temperature:	500-571 C
Decomposition Temperature:	Not available.
Viscosity	
Kinematic viscosity:	No data available.
Dynamic viscosity:	No data available.
Other information:	None.
Molecular weight:	2,02 g/mol (H2)

SECTION 10: Stability and reactivity

10.1. Reactivity:

No specific test data related to reactivity available for this product.

10.2. Chemical Stability:

Stable under normal conditions.

10.3. Possibility of hazardous reactions:

Can form a potentially explosive atmosphere in air. May react violently with oxidants.

10.4. Conditions to avoid:

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking

10.5. Incompatible Materials:

Oxidizers.

10.6. Hazardous Decomposition Products:

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

SECTION 11: Toxicological information

11.1. General information:

Acute toxicity	Not available.
Carcinogenicity	Not available.
Mutagenicity	Not available.
Teratogenicity	Not available.
Reproductive toxicity	Not available.
Irritation/Corrosion	Not available.
Sensitization	Not available.
Specific target organ toxicity	Not available.
Aspiration hazard	Not available.

11.2. Information on the likely routes of exposure:

Potential acute health effects	Not available.
Inhalation	Not available.
Skin contact	Not available.
Eye contact	Not available.

Symptoms related to physical, chemical, and toxicological characteristics.

Ingestion	Not available.
Inhalation	Not available.
Skin contact	Not available.
Eye contact	Not available.

Delayed and immediate effects and chronic effects from short- and long-term exposure

Short term exposure

Potential immediate effects	Not available.
Potential delayed effects	Not available.

Long term exposure

Potential immediate effects	Not available.
Potential delayed effects	Not available.
Potential chronic health effects	Not available
General	No known significant effects or critical hazards
Carcinogenicity	No known significant effects or critical hazards
Mutagenicity	No known significant effects or critical hazards.
Teratogenicity	No known significant effects or critical hazards
Developmental effects	No known significant effects or critical hazards Fertility

11.3. Numerical measures of toxicity Acute toxicity estimate

Not available.

SECTION 12: Ecological information

Toxicity	**Not available**
Persistence and Degradability	**Not applicable to gases and gas mixtures.**
Bioaccumulative potential	**Not available**
Mobility in soil	**Not Available**
Other adverse effects:	**No known significant effects or critical hazards**

SECTION 13: Disposal considerations

13.1. Waste treatment methods

General information: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

SECTION 14: Transport information

	DOT	TDG	Mexico	IMDG	IATA
UN number	UN1049	UN1049	UN1049	UN1049	UN1049
UN proper shipping name	HYDROGEN, COMPRESSED	HYDROGEN, COMPRESSED	HYDROGEN, COMPRESSED	HYDROGEN, COMPRESSED	HYDROGEN, COMPRESSED
Transport hazard class(es)	2.1 	2.1 	2.1 	2.1 	2.1 
Packing group	-	-	-	-	-
Environmental hazards	No	No	No	No	No

Additional information

DOT Classification

Limited quantity **Yes**

Quantity limitation **Passenger aircraft/rail: Forbidden. Cargo aircraft: 150 kg**

TDG Classification Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.13-2.17 (Class 2).

Explosive Limit and Limited Quantity Index **0.125**

ERAP Index **3000**

Passenger Carrying Vessel Index **Forbidden**

Passenger Carrying Road or Rail Index **Forbidden**

IATA

Quantity limitation Passenger and Cargo Aircraft: Forbidden. Cargo Aircraft Only: 150Kg.

Special precautions for user Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that personnel transporting the product know what to do in the event of an accident or spillage.

SECTION 15: Regulatory information

15.1. Regulatory information

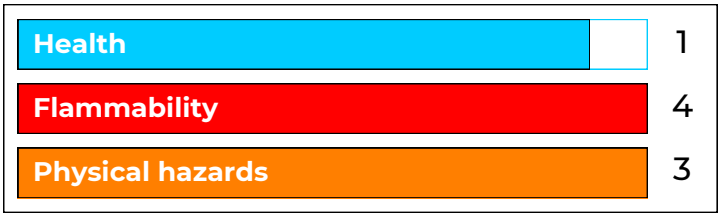
TSCA 8(a) CDR Exempt/Partial exemption	This material is listed.
Clean Air Act (CAA) 112 regulated flammable substances:	Hydrogen
Clean Air Act Section 602 Class I Substances	Not listed
Clean Air Act Section 602 Class II Substances	Not listed
DEA List I Chemicals (Precursor Chemicals)	Not listed
DEA List II Chemicals (Essential Chemicals)	Not listed
SARA 302/304 Composition/information on Ingrédients	No products were found
SARA 304 RQ	Not applicable
SARA 311/312 Classification	Refer to Section 2: Hazards Identification of this SDS for classification of substance

15.2 State Regulations

Massachusetts	This material is listed
New York	This material is not listed.
New Jersey	This material is listed.
Pennsylvania	This material is listed
California Prop. 65	This product does not require a Safe Harbor warning under California Prop. 65

SECTION 16: Other information

16.1 Hazardous Material Information System (U.S.A.)



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.
The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

16.2. National Fire Protection Association (U.S.A.)

Health
Flammability
Instability/Reactivity
Special

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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

16.3 Procedure used to derive the classification

Classification	Justification
FLAMMABLE GASES - Category 1 GASES UNDER PRESSURE - Compressed gas	Expert judgment According to package

16.4 History

Date of printing	07/17/2024
Date of issue/Date of revision	07/17/2024
Date of previous issue Version	N/A

16.5 Key to abbreviations

ATE	Acute Toxicity Estimate
BCF	Bioconcentration Factor
GHS	Globally Harmonized System of Classification and Labelling of Chemicals
IATA	International Air Transport Association
IBC	Intermediate Bulk Container
IMDG	International Maritime Dangerous Goods
LogPow	Logarithm of the octanol/water partition coefficient
MARPOL	International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
LIN	United Nations

16.6 References

Not available.

16.7 Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.