

### SECTION 1: Identification

#### 1.1. Product identifier

Product form : Substance  
 Substance name : Hydrogen (Compressed)  
 CAS No : 1333-74-0  
 Formula : H<sub>2</sub>

#### 1.2. Recommended use and restrictions on use

Recommended uses and restrictions : Test/Calibration gas

#### 1.3. Supplier

RS Josef Group  
 201 Basaltic Rd, Concord  
 Canada L4K 1G4  
 T 416-658-1212

[www.josefgases.com](http://www.josefgases.com)

#### 1.4. Emergency telephone number

Emergency Number 1-613-996-6666 CANUTEC  
 Call emergency number 24 hours a day.  
 For routine information, contact your supplier or RS Josef Group sales representative

### SECTION 2: Hazard identification

#### 2.1. Classification of the substance or mixture

##### Classification (GHS-CA)

Flammable gases, Category 1 H220

Gases under pressure : Compressed gas H280

Full text of H statements : see section 16

#### 2.2. GHS Label elements, including precautionary statements

##### GHS-CA labelling

Hazard pictograms (GHS-CA)



Signal word (GHS-CA)

: Danger

Hazard statements (GHS-CA)

: H220 - Extremely flammable gas  
 H280 - Contains gas under pressure; may explode if heated  
 H380 - May displace oxygen and cause rapid suffocation

Precautionary statements (GHS-CA)

: 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 - Use only outdoors or in a well-ventilated area  
 P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing  
 P308+P313 - IF exposed or concerned: Get medical advice/attention  
 P377 - Leaking gas fire: Do not extinguish unless leak can be stopped safely  
 P381 - In case of leakage, eliminate all ignition sources  
 P403 - Store in a well-ventilated place  
 P410+P403 - Protect from sunlight. Store in a well-ventilated place  
 P501 - Dispose of contents/container in accordance with local/regional/national/international regulations

#### 2.3. Other hazards

No additional information available

#### 2.4. Unknown acute toxicity (GHS-CA)

No data available

### SECTION 3: Composition/information on ingredients

#### 3.1. Substances

# Hydrogen (Compressed)

## Safety Data Sheet

according to the Hazardous Products Regulation (February 11, 2015)

Name	Product identifier	%	Classification (GHS-CA)
Hydrogen (Compressed) (Main constituent)	(CAS No) 1333-74-0	> 99	Flam. Gas 1, H220 Compressed gas, H280

Full text of H-statements: see section 16

### 3.2. Mixtures

Not applicable

## SECTION 4: First-aid measures

### 4.1. Description of first aid measures

- First-aid measures after inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If you feel unwell, seek medical advice.
- First-aid measures after skin contact : Adverse effects not expected from this product.
- First-aid measures after eye contact : Adverse effects not expected from this product.
- First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

### 4.2. Most important symptoms and effects (acute and delayed)

- Symptoms/injuries after inhalation : May displace oxygen and cause rapid suffocation.
- Symptoms/injuries after skin contact : Adverse effects not expected from this product.
- Symptoms/injuries after eye contact : Adverse effects not expected from this product.
- Symptoms/injuries after ingestion : Ingestion is not considered a potential route of exposure.
- Symptoms/injuries upon intravenous administration : Not known.
- Chronic symptoms : Adverse effects not expected from this product.

### 4.3. Immediate medical attention and special treatment, if necessary

- Other medical advice or treatment : If you feel unwell, seek medical advice. If breathing is difficult, give oxygen.

## SECTION 5: Fire-fighting measures

### 5.1. Suitable extinguishing media

- Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.

### 5.2. Unsuitable extinguishing media

- Unsuitable extinguishing media : Do not use water jet to extinguish.

### 5.3. Specific hazards arising from the hazardous product

- Fire hazard : This product is flammable.
- Explosion hazard : Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries. May form flammable/explosive vapour-air mixture.

### 5.4. Special protective equipment and precautions for fire-fighters

- Firefighting instructions : In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion. Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Exposure to fire may cause containers to rupture/explode.
- Protection during firefighting : Standard protective clothing and equipment (e.g., Self Contained Breathing Apparatus) for fire fighters. Do not enter fire area without proper protective equipment, including respiratory protection.

## SECTION 6: Accidental release measures

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

- General measures : Ensure adequate ventilation.
- Personal Precautions, Protective Equipment and Emergency Procedures : EVACUATE ALL PERSONNEL FROM AFFECTED AREA. Use appropriate protective equipment. If leak is on user's equipment, be certain to purge piping before attempting repairs. If leak is on a container or container valve contact RS Josef Group.

### 6.2. Methods and materials for containment and cleaning up

- For containment : Try to stop release if without risk.
- Methods for cleaning up : Dispose of contents/container in accordance with local/regional/national/international regulations.

### 6.3. Reference to other sections

For further information refer to section 8: "Exposure controls/personal protection"

### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

- |                                   |   |
|-----------------------------------|---|
| Precautions for safe handling     | : Do not handle until all safety precautions have been read and understood. Use only outdoors or in a well-ventilated area. Keep away from heat/sparks/open flames/hot surfaces. – No smoking. Use only non-sparking tools.   |
| Hygiene measures                  | : Do not eat, drink or smoke when using this product.   |
| Additional hazards when processed | : Pressurized container: Do not pierce or burn, even after use. Use only with equipment rated for cylinder pressure. Close valve after each use and when empty. Handle empty containers with care because residual vapours are flammable. In use may form flammable vapour-air mixture. |

#### 7.2. Conditions for safe storage, including any incompatibilities

- |                        |  |
|------------------------|--|
| Technical measures     | : Comply with applicable regulations. Proper grounding procedures to avoid static electricity should be followed.  |
| Storage conditions     | : Do not expose to temperatures exceeding 52 °C/ 125 °F. Keep container closed when not in use. Protect cylinders from physical damage; do not drag, roll, slide or drop. Store in well ventilated area. |
| Incompatible products  | : None known.  |
| Incompatible materials | : Oxidizing materials. Air.  |

### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

No additional information available

#### 8.2. Appropriate engineering controls

- |                                  |   |
|----------------------------------|---|
| Appropriate engineering controls | : Ensure exposure is below occupational exposure limits (where available). Provide adequate general and local exhaust ventilation. Systems under pressure should be regularly checked for leakages. Oxygen detectors should be used when asphyxiating gases may be released. Consider work permit system e.g. for maintenance activities. |
|----------------------------------|---|

#### 8.3. Individual protection measures/Personal protective equipment

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|-------------------------------|--|
| Personal protective equipment | : Gloves. Safety glasses. Protective clothing. Safety shoes. |
|-------------------------------|--|



- |                                 |   |
|---------------------------------|---|
| Hand protection                 | : Wear working gloves when handling gas containers.   |
| Eye protection                  | : Wear safety glasses with side shields.  |
| Skin and body protection        | : Wear suitable protective clothing, e.g. lab coats, coveralls or flame resistant clothing.   |
| Respiratory protection          | : None necessary during routine operations. See Sections 5 & 6.   |
| Thermal hazard protection       | : None necessary during routine operations.   |
| Environmental exposure controls | : Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment. |
| Other information               | : Wear safety shoes while handling containers.  |

### SECTION 9: Physical and chemical properties

#### 9.1. Information on basic physical and chemical properties

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|--|--|
| Physical state                             | : Gas  |
| Appearance                                 | : Colorless gas.                             |
| Molecular mass                             | : 2.0159 g/mol                               |
| Colour                                     | : Colourless.                                |
| Odour                                      | : Odourless.                                 |
| Odour threshold                            | : No data available                          |
| pH   | : Not applicable.                            |
| pH solution                                | : No data available                          |
| Relative evaporation rate (butylacetate=1) | : No data available                          |
| Relative evaporation rate (ether=1)        | : Not applicable for gases and gas mixtures. |
| Melting point                              | : -259 °C                                    |
| Freezing point                             | : -259 °C                                    |
| Boiling point                              | : -251.75 °C                                 |
| Flash point                                | : Not applicable for gases and gas mixtures. |
| Critical temperature                       | : -238.95 °C                                 |

Auto-ignition temperature	: 560 °C
Decomposition temperature	: No data available
Flammability (solid, gas)	: See Section 2.1 and 2.2
Vapour pressure	: 6894688.342 mbar
Vapour pressure at 50 °C	: No data available
Critical pressure	: 1293 kPa
Relative vapour density at 20 °C	: 0.07
Relative density	: 0.07
Relative density of saturated gas/air mixture	: No data available
Density	: No data available
Relative gas density	: Lighter than air
Solubility	: Water: 1.6 mg/l
Log Pow	: Not applicable for inorganic gases.
Log Kow	: No data available
Viscosity, kinematic	: No data available
Viscosity, kinematic (calculated value) (40 °C)	: No data available
Explosive properties	: Without adequate ventilation formation of explosive mixtures may be possible.
Oxidising properties	: None.
Explosive limits	: No data available
Lower explosive limit (LEL)	: No data available
Upper explosive limit (UEL)	: No data available

### 9.2. Other information

Gas group	: Compressed gas
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## SECTION 10: Stability and reactivity

### 10.1. Reactivity

Reactivity	: None known.
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: Can form explosive mixture with air.
Conditions to avoid	: None under recommended storage and handling conditions (see section 7).
Incompatible materials	: Oxidizing materials. Air.
Hazardous decomposition products	: Under normal conditions of storage and use hazardous decomposition products should not be produced.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity (oral)	: Not classified
Acute toxicity (dermal)	: Not classified
Acute toxicity (inhalation)	: Inhalation:gas: Not classified.

Hydrogen (Compressed) ( \f )1333-74-0	
LC50 inhalation rat (ppm)	820000 ppm/4h
ATE CA (gases)	820000.00000000 ppmv/4h

Skin corrosion/irritation	: Not classified pH: Not applicable.
Serious eye damage/irritation	: Not classified pH: Not applicable.
Respiratory or skin sensitization	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
Specific target organ toxicity (single exposure)	: Not classified
Specific target organ toxicity (repeated exposure)	: Not classified

Aspiration hazard : Not classified

### SECTION 12: Ecological information

#### 12.1. Toxicity

Ecology - general : No ecological damage caused by this product.

#### 12.2. Persistence and degradability

Hydrogen (Compressed) (1333-74-0)	
Persistence and degradability	No ecological damage caused by this product.

#### 12.3. Bioaccumulative potential

Hydrogen (Compressed) (1333-74-0)	
BCF fish 1	(no bioaccumulation expected)
Log Pow	Not applicable for inorganic gases.
Bioaccumulative potential	No ecological damage caused by this product.

#### 12.4. Mobility in soil

Hydrogen (Compressed) (1333-74-0)	
Log Pow	Not applicable for inorganic gases.
Ecology - soil	No ecological damage caused by this product.

#### 12.5. Other adverse effects

No additional information available

### SECTION 13: Disposal considerations

#### 13.1. Disposal methods

Waste treatment methods : Contact supplier if guidance is required. Do not discharge into any place where its accumulation could be dangerous. Ensure that the emission levels from local regulations or operating permits are not exceeded. 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.

Waste disposal recommendations : Refer to the CGA Pamphlet P-63 "Disposal of Gases" available at [www.cganet.com](http://www.cganet.com) for more guidance on suitable disposal methods.

### SECTION 14: Transport information

#### 14.1. Basic shipping description

In accordance with TDG

#### Transportation of Dangerous Goods

UN-No. (TDG) : UN1049

TDG Primary Hazard Classes : 2.1 - Class 2.1 - Flammable Gas.

Transport Document Description : UN1049 HYDROGEN, COMPRESSED, 2.1

Proper Shipping Name : HYDROGEN, COMPRESSED

Hazard labels (TDG) : 2.1 - Flammable gases



ERAP Index : 3 000

Explosive Limit and Limited Quantity Index : 0.125 L

Passenger Carrying Ship Index : Forbidden

Excepted quantities (TDG) : E0

Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index : Forbidden

#### 14.2. Transport information/DOT - USA


#### Department of Transport

DOT NA no. : UN1049

# Hydrogen (Compressed)

## Safety Data Sheet

according to the Hazardous Products Regulation (February 11, 2015)

UN-No.(DOT)	: 1049
Transport Document Description	: UN1049 Hydrogen, compressed, 2.1
Proper Shipping Name (DOT)	: Hydrogen, compressed
Contains Statement Field Selection (DOT)	: DOT_TECHNICAL - Proper Shipping Name - Technical (DOT)
Class (DOT)	: 2.1 - Class 2.1 - Flammable gas 49 CFR 173.115
Division (DOT)	: 2.1
Hazard labels (DOT)	: 2.1 - Flammable gas
	
Dangerous for the environment	: No
DOT Special Provisions (49 CFR 172.102)	: N89 - When steel UN pressure receptacles are used, only those bearing the "H" mark are authorized
DOT Packaging Exceptions (49 CFR 173.xxx)	: 306
DOT Packaging Non Bulk (49 CFR 173.xxx)	: 302
DOT Packaging Bulk (49 CFR 173.xxx)	: 302;314
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	: Forbidden
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	: 150 kg
DOT Vessel Stowage Location	: E - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length, but is prohibited from carriage on passenger vessels in which the limiting number of passengers is exceeded
DOT Vessel Stowage Other	: 40 - Stow "clear of living quarters", 57 - Stow "separated from" chlorine
Emergency Response Guide (ERG) Number	: 115 (UN1049)
Special transport precautions	: 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 there is adequate ventilation. - 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.
Other information	: No supplementary information available.

### 14.3. Air and sea transport

#### IMDG

UN-No. (IMDG)	: 1049
Class (IMDG)	: 2 - Gases
MFAG-No	: 115
Ship Safety Act	: Gases under pressure/Gases flammable under pressure(Dangerous Goods Notification Schedule first second and third Article Dangerous Goods Regulations)
Port Regulation Law	: Hazardous materials/High pressure gas (Article 21, Paragraph 2 of Law, Article 12 rule, notice attached table that defines the type of dangerous goods)

#### IATA

UN-No. (IATA)	: 1049
Class (IATA)	: 2
Civil Aeronautics Law	: Gases under pressure/Gases flammable under pressure(Hazardous materials notice Appended Table 1 Article 194 of the Enforcement Regulations)

## SECTION 15: Regulatory information

### 15.1. National regulations

#### Hydrogen (Compressed) (1333-74-0)

Listed on the Canadian DSL (Domestic Substances List)

### 15.2. International regulations

#### Hydrogen (Compressed) (1333-74-0)

Listed on the AICS (Australian Inventory of Chemical Substances)  
 Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)  
 Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)  
 Listed on the Korean ECL (Existing Chemicals List)  
 Listed on NZIoC (New Zealand Inventory of Chemicals)  
 Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)  
 Listed on the United States TSCA (Toxic Substances Control Act) inventory  
 Listed on INSQ (Mexican National Inventory of Chemical Substances)

### SECTION 16: Other information

Date of issue : 31/05/2018

Full text of H-statements:

H220	Extremely flammable gas
H280	Contains gas under pressure; may explode if heated

SDS Canada (GHS)

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