



**MATHESON**

ask...The Gas Professionals™

## Safety Data Sheet

Material Name: HYDROGEN

SDS ID: MAT11120

### \*\*\* Section 1 - PRODUCT AND COMPANY IDENTIFICATION\*\*\*

**Product Identifier:** HYDROGEN

#### Manufacturer Information

MATHESON TRI-GAS, INC.  
150 Allen Road, Suite 302  
Basking Ridge, NJ 07920

General Information: 1-800-416-2505  
Emergency #: 1-800-424-9300 (CHEMTREC)  
Outside the US: 703-527-3887 (Call collect)

#### Chemical Family

inorganic, gas

#### Synonyms

MTG MSDS 49; HYDROGEN GAS; HYDROGEN COMPRESSED; HYDROGEN (H<sub>2</sub>); DIHYDROGEN; UN 1049;  
H<sub>2</sub>; RTECS: MW8900000

#### Product Use

industrial

#### Usage Restrictions

None known.

### \*\*\* Section 2 - HAZARDS IDENTIFICATION\*\*\*

#### EMERGENCY OVERVIEW

**Color:** colorless

**Physical Form:** gas

**Odor:** odorless

**Health Hazards:** difficulty breathing

**Physical Hazards:** Flammable gas. May cause flash fire.

#### POTENTIAL HEALTH EFFECTS

##### Inhalation

**Short Term:** nausea, vomiting, difficulty breathing, irregular heartbeat, headache, fatigue, dizziness, disorientation, mood swings, tingling sensation, loss of coordination, convulsions, unconsciousness, coma

**Long Term:** no information is available

##### Skin

**Short Term:** frostbite

**Long Term:** no information is available

##### Eye

**Short Term:** frostbite

**Long Term:** no information is available

##### Ingestion

**Short Term:** ingestion of a gas is unlikely

**Long Term:** ingestion of a gas is unlikely

### \*\*\* Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS\*\*\*

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CAS	Component	Percent
1333-74-0	HYDROGEN	100.0

## \* \* \* Section 4 - FIRST AID MEASURES \* \* \*

### Inhalation

If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

### Skin

If frostbite or freezing occur, immediately flush with plenty of lukewarm water (100-105 F, 38-41 C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.

### Eyes

Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

### Ingestion

If a large amount is swallowed, get medical attention.

### Note to Physicians

For inhalation, consider oxygen.

## \* \* \* Section 5 - FIRE FIGHTING MEASURES \* \* \*

See Section 9 for Flammability Properties

**NFPA Ratings: Health: 3 Fire: 4 Reactivity: 0**

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

### Flammable Properties

Severe fire hazard. Severe explosion hazard. Vapor/air mixtures are explosive. Pressurized containers may rupture or explode if exposed to sufficient heat. Electrostatic discharges may be generated by flow or agitation resulting in ignition or explosion. Burns with invisible flame.

### Extinguishing Media

carbon dioxide, regular dry chemical

Large fires: water spray or fog

### Unsuitable Extinguishing Media

None known.

### Protective Equipment and Precautions for Firefighters

Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure.

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## Fire Fighting Measures

Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. 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. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: Stop leak if possible without personal risk. Let burn unless leak can be stopped immediately. For smaller tanks or cylinders, extinguish and isolate from other flammables. Evacuation radius: 800 meters (1/2 mile). Do not attempt to extinguish fire unless flow of material can be stopped first. Flood with fine water spray. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Evacuate if fire gets out of control or containers are directly exposed to fire. Evacuation radius: 500 meters (1/3 mile). Consider downwind evacuation if material is leaking. Stop flow of gas.

## \*\*\* Section 6 - ACCIDENTAL RELEASE MEASURES\*\*\*

### Occupational spill/release

Avoid heat, flames, sparks and other sources of ignition. Do not touch spilled material. Stop leak if possible without personal risk. Reduce vapors with water spray. Keep unnecessary people away, isolate hazard area and deny entry. Remove sources of ignition. Ventilate closed spaces before entering.

## \*\*\* Section 7 - HANDLING AND STORAGE\*\*\*

### Handling Procedures

Wash thoroughly after handling.

### Storage Procedures

Store and handle in accordance with all current regulations and standards. Store in a well-ventilated place. Protect from sunlight. Grounding and bonding required. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. Keep separated from incompatible substances.

## \*\*\* Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION\*\*\*

### Component Analysis

ACGIH, OSHA and NIOSH have not developed exposure limits for any of this product's components.

### Component Biological Limit Values

There are no biological limit values for any of this product's components.

### Ventilation

Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

## PERSONAL PROTECTIVE EQUIPMENT

### Eyes/Face

For the gas: Eye protection not required, but recommended. For the liquid: Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

### Protective Clothing

For the gas: Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing.

### Glove Recommendations

Wear insulated gloves.

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## Respiratory Protection

Under conditions of frequent use or heavy exposure, respiratory protection may be needed.

Respiratory protection is ranked in order from minimum to maximum.

Consider warning properties before use.

### For Unknown Concentrations or Immediately Dangerous to Life or Health -

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

## \* \* \* Section 9 - PHYSICAL AND CHEMICAL PROPERTIES \* \* \*

<b>Physical State:</b>	Gas	<b>Appearance:</b>	colorless, gas
<b>Color:</b>	colorless	<b>Physical Form:</b>	gas
<b>Odor:</b>	odorless	<b>Odor Threshold:</b>	Not available
<b>Taste:</b>	tasteless	<b>pH:</b>	Not available
<b>Melting/Freezing Point:</b>	-259 °C	<b>Boiling Point:</b>	-253 °C
<b>Flash Point:</b>	flammable	<b>Decomposition:</b>	Not available
<b>Evaporation Rate:</b>	Not available	<b>LEL:</b>	4.0 %
<b>UEL:</b>	75 %	<b>Vapor Pressure:</b>	760 mmHg @ -253 °C
<b>Vapor Density (air = 1):</b>	0.07	<b>Density:</b>	0.08987 g/L @ 0 °C
<b>Water Solubility:</b>	1.82 % @ 20 °C	<b>Log KOW:</b>	Not available
<b>Auto Ignition:</b>	400 °C	<b>Viscosity:</b>	0.008957 cP @26.8 °C
<b>Molecular Weight:</b>	2.0	<b>Molecular Formula:</b>	H <sub>2</sub>

## Solvent Solubility

**Slightly Soluble:** alcohol, ether

## \* \* \* Section 10 - STABILITY AND REACTIVITY \* \* \*

### Chemical Stability

Stable at normal temperatures and pressure.

### Conditions to Avoid

Avoid heat, flames, sparks and other sources of ignition. Minimize contact with material. Containers may rupture or explode if exposed to heat.

### Materials to Avoid

combustible materials, halocarbons, halogens, metal oxides, metal salts, metals, oxidizing materials

### Decomposition Products

miscellaneous decomposition products

### Possibility of Hazardous Reactions

Will not polymerize.

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## \*\*\* Section 11 - TOXICOLOGICAL INFORMATION\*\*\*

### Component Analysis - LD50/LC50

The components of this material have been reviewed in various sources and the following selected endpoints are published:

#### HYDROGEN (1333-74-0)

Inhalation LC50 Rat >15000 ppm 1 h

### Component Carcinogenicity

None of this product's components are listed by ACGIH, IARC, NTP, OSHA or DFG.

### Irritation

No animal testing data available for skin or eyes.

### Medical Conditions Aggravated by Exposure

None known.

### Reproductive Effects

No data available.

## \*\*\* Section 12 - ECOLOGICAL INFORMATION\*\*\*

### Component Analysis - Aquatic Toxicity

No LOLI ecotoxicity data are available for this product's components.

## \*\*\* Section 13 - DISPOSAL CONSIDERATIONS\*\*\*

### Disposal Methods

Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.

### Component Waste Numbers

The U.S. EPA has not published waste numbers for this product's components.

## \*\*\* Section 14 - TRANSPORT INFORMATION\*\*\*

### US DOT Information

Shipping Name: Hydrogen, compressed

UN/NA #: UN1049 Hazard Class: 2.1

Required Label(s): 2.1

### TDG Information

Shipping Name: Hydrogen, compressed

UN #: UN1049 Hazard Class: 2.1

Required Label(s): 2.1

## \*\*\* Section 15 - REGULATORY INFORMATION\*\*\*

### U.S. Federal Regulations

None of this products components are listed under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.

### SARA 311/312

Acute Health: Yes Chronic Health: No Fire: Yes Pressure: Yes Reactive: No

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## U.S. State Regulations

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA
HYDROGEN	1333-74-0	Yes	Yes	Yes	Yes	Yes

Not regulated under California Proposition 65

## Inventory Status

Listed on inventory.

## Component Analysis - Inventory

Component	CAS	US	CA	EU	AU	PH	JP	KR	CN	NZ
HYDROGEN	1333-74-0	Yes	DSL	EIN	Yes	Yes	No	Yes	Yes	Yes

## \* \* \* Section 16 - OTHER INFORMATION \* \* \*

### Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; RID - European Rail Transport; RTECS - Registry of Toxic Effects of Chemical Substances®; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States

### Other Information

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End of Sheet MAT11120