



MATHESON

ask...The Gas Professionals™

Safety Data Sheet

Material Name: Non-flammable Hydrogen in Nitrogen and Carbon Dioxide

SDS ID: 00244935

Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name

Non-flammable Hydrogen in Nitrogen and Carbon Dioxide

Product Description

Classification determined in accordance with Compressed Gas Association standards.

Product Use

Industrial and Specialty Gas Applications.

Restrictions on Use

None known.

Details of the supplier of the safety data sheet

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)

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with paragraph (d) of 29 CFR 1910.1200.

Gases Under Pressure - Compressed gas

Simple Asphyxiant

GHS Label Elements

Symbol(s)



Signal Word

Warning

Hazard Statement(s)

Contains gas under pressure; may explode if heated.

May displace oxygen and cause rapid suffocation.

Precautionary Statement(s)

Prevention

None needed according to classification criteria.

Response

None needed according to classification criteria.

Storage

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

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

Other Hazards

The rapid release of compressed gas may cause frostbite.



Safety Data Sheet

Material Name: Non-flammable Hydrogen in Nitrogen and Carbon Dioxide**SDS ID: 00244935****Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS**

| CAS | Component Name | Percent |
|-----------|----------------|---------|
| 7727-37-9 | Nitrogen | 0-100 |
| 124-38-9 | Carbon dioxide | 0-100 |
| 1333-74-0 | Hydrogen | 0-5.7 |

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 (105-115°F; 41-46°C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.

Eyes

Flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Then get immediate medical attention.

Ingestion

If swallowed, get medical attention.

Most Important Symptoms/Effects**Acute**

frostbite, suffocation

Delayed

No information on significant adverse effects.

Note to Physicians

For inhalation, consider oxygen.

Section 5 - FIRE FIGHTING MEASURES**Extinguishing Media****Suitable Extinguishing Media**

regular dry chemical, carbon dioxide

Unsuitable Extinguishing Media

Do not direct water at source of leak or safety devices; icing may occur.

Special Hazards Arising from the Chemical

Negligible fire hazard. Containers may rupture or explode if exposed to heat.

Hazardous Combustion Products

oxides of nitrogen, oxides of carbon

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. Do not direct water at source of leak or safety devices; icing may occur. Stay away from the ends of tanks.

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: Evacuation radius: 800 meters (1/2 mile). Use extinguishing agents appropriate for surrounding fire. Apply water from a protected location or from a safe distance. Reduce vapors with water spray.

Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Consider downwind evacuation if material is leaking.



Safety Data Sheet

Material Name: Non-flammable Hydrogen in Nitrogen and Carbon Dioxide

SDS ID: 00244935

Special Protective Equipment and Precautions for Firefighters

Wear personal protective clothing and equipment such as self-contained breathing apparatus (SCBA) for protection against possible exposure.

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

Wear personal protective clothing and equipment, see Section 8.

Methods and Materials for Containment and Cleaning Up

Stop leak if possible without personal risk. Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas. Do not touch or walk through spilled material. If possible, turn leaking containers so that gas escapes rather than liquid. Do not direct water at spill or source of leak. Allow substance to evaporate.

Ventilate closed spaces before entering.

Environmental Precautions

Avoid release to the environment.

Section 7 - HANDLING AND STORAGE

Precautions for Safe Handling

Avoid breathing gas. Use only outdoors or in a well-ventilated area. Wash hands thoroughly after handling.

Conditions for Safe Storage, Including any Incompatibilities

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

Store and handle in accordance with all current regulations and standards. Subject to storage and handling regulations: U.S. OSHA 29 CFR 1910.101. Keep separated from incompatible substances.

Incompatible Materials

metals, oxidizing materials, combustible materials, metal salts, reducing agents, metal carbide, bases, halocarbons, amines

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

| | |
|-----------------------|-----------------------------------------------|
| Nitrogen | 7727-37-9 |
| ACGIH: | (See Appendix F: Minimal Oxygen Content) |
| Carbon dioxide | 124-38-9 |
| ACGIH: | 5000 ppm TWA |
| | 30000 ppm STEL |
| NIOSH: | 5000 ppm TWA ; 9000 mg/m3 TWA |
| | 30000 ppm STEL ; 54000 mg/m3 STEL |
| | 40000 ppm IDLH |
| Europe: | 5000 ppm TWA ; 9000 mg/m3 TWA |
| OSHA (US): | 5000 ppm TWA ; 9000 mg/m3 TWA |
| Mexico: | 5000 ppm TWA VLE-PPT ; 9000 mg/m3 TWA VLE-PPT |



Safety Data Sheet

Material Name: Non-flammable Hydrogen in Nitrogen and Carbon Dioxide

SDS ID: 00244935

| | |
|-----------------|-------------------------------------------------------------|
| | 15000 ppm STEL [PPT-CT]; 27000 mg/m3 STEL [PPT-CT] |
| Hydrogen | 1333-74-0 |
| ACGIH: | (See Appendix F: Minimal Oxygen Content, explosion hazard) |

ACGIH - Threshold Limit Values - Biological Exposure Indices (BEI)

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

Engineering Controls

Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Individual Protection Measures, such as Personal Protective Equipment

Eye/face protection

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.

Skin Protection

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

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. 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.

Glove Recommendations

For the gas: Protective gloves are not required, but recommended. For the liquid: Wear insulated gloves.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

| | | | |
|---------------------------------|---------------|-----------------------------------|---------------|
| Appearance | colorless gas | Physical State | gas |
| Odor | Not available | Color | colorless. |
| Odor Threshold | Not available | pH | Not available |
| Melting Point | Not available | Boiling Point | Not available |
| Boiling Point Range | Not available | Freezing point | Not available |
| Evaporation Rate | Not available | Flammability (solid, gas) | Not flammable |
| Autoignition Temperature | Not available | Flash Point | Not available |
| Lower Explosive Limit | Not available | Decomposition temperature | Not available |
| Upper Explosive Limit | Not available | Vapor Pressure | Not available |
| Vapor Density (air=1) | Not available | Specific Gravity (water=1) | Not available |



Safety Data Sheet

Material Name: Non-flammable Hydrogen in Nitrogen and Carbon Dioxide**SDS ID: 00244935**

| | | | |
|---------------------------|----------------|-----------------------------------------------|---------------|
| Water Solubility | Not available | Partition coefficient: n-octanol/water | Not available |
| Viscosity | Not available | Kinematic viscosity | Not available |
| Solubility (Other) | Not available | Density | Not available |
| Physical Form | Compressed gas | Molecular Weight | Not available |

Other Information

No additional information is available.

Section 10 - STABILITY AND REACTIVITY**Reactivity**

No reactivity hazard is expected.

Chemical Stability

Stable at normal temperatures and pressure.

Possibility of Hazardous Reactions

Will not polymerize.

Conditions to Avoid

Protect from physical damage and heat. Containers may rupture or explode if exposed to heat.

Incompatible Materials

metals, oxidizing materials, combustible materials, metal salts, reducing agents, metal carbide, bases, halocarbons, amines

Hazardous decomposition products

oxides of nitrogen, oxides of carbon

Section 11 - TOXICOLOGICAL INFORMATION**Information on Likely Routes of Exposure****Inhalation**

nausea, vomiting, difficulty breathing, irregular heartbeat, headache, dizziness, fatigue, disorientation, mood swings, tingling sensation, convulsions, unconsciousness, coma

Skin Contact

frostbite

Eye Contact

frostbite, irritation

Ingestion

Ingestion of gas is unlikely.

Acute and Chronic Toxicity**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

Product Toxicity Data**Acute Toxicity Estimate**

No data available.

Immediate Effects

frostbite, suffocation.

Delayed Effects

No information on significant adverse effects.



Safety Data Sheet

Material Name: Non-flammable Hydrogen in Nitrogen and Carbon Dioxide

SDS ID: 00244935

Irritation/Corrosivity Data

No data available.

Respiratory Sensitization

No data available.

Dermal Sensitization

No data available.

Component Carcinogenicity

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

Germ Cell Mutagenicity

No data available.

Tumorigenic Data

No data available

Reproductive Toxicity

No data available.

Specific Target Organ Toxicity - Single Exposure

No target organs identified.

Specific Target Organ Toxicity - Repeated Exposure

No target organs identified.

Aspiration hazard

No data available.

Medical Conditions Aggravated by Exposure

No data available.

Section 12 - ECOLOGICAL INFORMATION

Component Analysis - Aquatic Toxicity

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

Persistence and Degradability

No data available for the mixture.

Bioaccumulative Potential

No data available for the mixture.

Mobility

No data available for the mixture.

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Methods

Dispose in accordance with all applicable regulations.

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: COMPRESSED GAS, N.O.S. , (Contains: Nitrogen , Carbon dioxide)

Hazard Class: 2.2

UN/NA #: UN1956

Required Label(s): 2.2

IMDG Information:

Shipping Name: COMPRESSED GAS, N.O.S. , (Contains: Nitrogen , Carbon dioxide)

Hazard Class: 2.2



Safety Data Sheet

Material Name: Non-flammable Hydrogen in Nitrogen and Carbon Dioxide

SDS ID: 00244935

UN#: UN1956

Required Label(s): 2.2

International Bulk Chemical Code

This material does not contain any chemicals required by the IBC Code to be identified as dangerous chemicals in bulk.

Section 15 - REGULATORY INFORMATION

U.S. Federal Regulations

None of this product's 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 Section 311/312 (40 CFR 370 Subparts B and C) reporting categories

Gas Under Pressure; Simple Asphyxiant

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 |
|-----------------------|------------------|-----|-----|-----|-----|-----|
| Nitrogen | 7727-37-9 | No | Yes | Yes | Yes | Yes |
| Carbon dioxide | 124-38-9 | Yes | Yes | Yes | Yes | Yes |
| Hydrogen | 1333-74-0 | Yes | Yes | Yes | Yes | Yes |

Not listed under California Proposition 65

Canada Regulations

Canadian WHMIS Ingredient Disclosure List (IDL)

Components of this material have been checked against the Canadian WHMIS Ingredients Disclosure List. The List is composed of chemicals which must be identified on MSDSs if they are included in products which meet WHMIS criteria specified in the Controlled Products Regulations and are present above the threshold limits listed on the IDL

| | |
|-----------------------|-----------------|
| Carbon dioxide | 124-38-9 |
| | 1 % |

Component Analysis - Inventory

Nitrogen (7727-37-9)

| US | CA | EU | AU | PH | JP - ENCS | JP - ISHL | KR KECI - Annex 1 | KR KECI - Annex 2 | KR - REACH CCA | CN | NZ | MX | TW | VN (Draft) |
|-----|-----|-----|-----|-----|-----------|-----------|-------------------|-------------------|----------------|-----|-----|-----|-----|------------|
| Yes | DSL | EIN | Yes | Yes | No | No | Yes | No | No | Yes | Yes | Yes | Yes | Yes |

Carbon dioxide (124-38-9)

| US | CA | EU | AU | PH | JP - ENCS | JP - ISHL | KR KECI - | KR KECI - | KR - REACH CCA | CN | NZ | MX | TW | VN (Draft) |
|----|----|----|----|----|-----------|-----------|-----------|-----------|----------------|----|----|----|----|------------|
| | | | | | | | | | | | | | | |



Safety Data Sheet

Material Name: Non-flammable Hydrogen in Nitrogen and Carbon Dioxide

SDS ID: 00244935

| | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|---------|---------|----|-----|-----|-----|-----|-----|
| | | | | | | | Annex 1 | Annex 2 | | | | | | |
| Yes | DSL | EIN | Yes | Yes | Yes | Yes | Yes | No | No | Yes | Yes | Yes | Yes | Yes |

Hydrogen (1333-74-0)

| | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----------|-----------|-------------------|-------------------|----------------|-----|-----|-----|-----|------------|
| US | CA | EU | AU | PH | JP - ENCS | JP - ISHL | KR KECI - Annex 1 | KR KECI - Annex 2 | KR - REACH CCA | CN | NZ | MX | TW | VN (Draft) |
| Yes | DSL | EIN | Yes | Yes | No | No | Yes | No | No | Yes | Yes | Yes | Yes | Yes |

Section 16 - OTHER INFORMATION

NFPA Ratings

Health: 1 Fire: 0 Reactivity: 0 Other: SA

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

Summary of Changes

New SDS: 07/14/2017

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CA/MA/MN/NJ/PA - California/Massachusetts/Minnesota/New Jersey/Pennsylvania*; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CFR - Code of Federal Regulations (US); CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EC - European Commission; EEC - European Economic Community; EIN - European Inventory of (Existing Commercial Chemical Substances); EINECS - European Inventory of Existing Commercial Chemical Substances; ENCS - Japan Existing and New Chemical Substance Inventory; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; F - Background (for Venezuela Biological Exposure Indices); 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; ISHL - Japan Industrial Safety and Health Law; IUCLID - International Uniform Chemical Information Database; JP - Japan; Kow - Octanol/water partition coefficient; KR KECI Annex 1 - Korea Existing Chemicals Inventory (KECI) / Korea Existing Chemicals List (KECL); KR KECI Annex 2 - Korea Existing Chemicals Inventory (KECI) / Korea Existing Chemicals List (KECL) , KR - Korea; LD50/LC50 - Lethal Dose/ Lethal Concentration; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; MX - Mexico; Ne - Non-specific; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; Nq - Non-quantitative; NSL - Non-Domestic Substance List (Canada); NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PEL- Permissible Exposure Limit; PH - Philippines; RCRA - Resource Conservation and Recovery Act; REACH- Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA -



MATHESON

ask. . .The Gas Professionals™

Safety Data Sheet

Material Name: Non-flammable Hydrogen in Nitrogen and Carbon Dioxide

SDS ID: 00244935

Superfund Amendments and Reauthorization Act; Sc - Semi-quantitative; STEL - Short-term Exposure Limit; TCCA – Korea Toxic Chemicals Control Act; TDG - Transportation of Dangerous Goods; TLV - Threshold Limit Value; TSCA - Toxic Substances Control Act; TW – Taiwan; TWA - Time Weighted Average; UEL - Upper Explosive Limit; UN/NA - United Nations /North American; US - United States; VLE - Exposure Limit Value (Mexico); VN (Draft) - Vietnam (Draft); WHMIS - Workplace Hazardous Materials Information System (Canada).

Other Information

Disclaimer:

Matheson Tri-Gas, Inc. makes no express or implied warranties, guarantees or representations regarding the product or the information herein, including but not limited to any implied warranty or merchantability or fitness for use. Matheson Tri-Gas, Inc. shall not be liable for any personal injury, property or other damages of any nature, whether compensatory, consequential, exemplary, or otherwise, resulting from any publication, use or reliance upon the information herein.