

## Safety Data Sheet

Material Name: NITROUS OXIDE, REFRIGERATED LIQUID

SDS ID: 00244869

### Section 1 - PRODUCT AND COMPANY IDENTIFICATION

**Material Name**

NITROUS OXIDE, REFRIGERATED LIQUID

**Synonyms**

DINITROGEN MONOXIDE; HYPONITROUS ACID ANHYDRIDE; NITROGEN OXIDE; UN 2201;  
DINITROGEN OXIDE; N<sub>2</sub>O

**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.

909 Lake Carolyn Parkway

Suite 1300

Irving, TX 75039

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.**

Oxidizing Gases - Category 1

Gases Under Pressure - Refrigerated liquefied gas

Specific Target Organ Toxicity - Single Exposure - Category 3

**GHS Label Elements**

**Symbol(s)**



**Signal Word**

Danger

**Hazard Statement(s)**

May cause or intensify fire; oxidizer.

Contains refrigerated gas; may cause cryogenic burns or injury.

May cause drowsiness or dizziness.

**Precautionary Statement(s)**

**Prevention**

Keep valves and fittings free from oil and grease.

Keep/Store away from clothing/combustible materials.

Use only outdoors or in a well-ventilated area.

Wear cold insulating gloves/face shield/eye protection.

Avoid breathing dust/fume/gas/mist/vapors/spray.

## Safety Data Sheet

**Material Name: NITROUS OXIDE, REFRIGERATED LIQUID**

**SDS ID: 00244869**

**Response**

In case of fire: stop leak if safe to do so.  
 IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing.  
 Call a POISON CENTER or doctor if you feel unwell.  
 Thaw frosted parts with lukewarm water. Do not rub affected area.  
 Get immediate medical advice/attention.

**Storage**

Store in a well-ventilated place. Keep container tightly closed.  
 Store locked up.

**Disposal**

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

**Other Hazards**

Contact with liquid may cause frostbite.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS		
CAS	Component Name	Percent
10024-97-2	NITROUS OXIDE	>99
Section 4 - FIRST AID MEASURES		

**Inhalation**

Remove person to fresh air and keep comfortable for breathing. 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**

Rinse cautiously with water for several 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, central nervous system depression

**Delayed**

No information on significant adverse effects.

**Note to Physicians**

For inhalation, consider oxygen.

Section 5 - FIRE FIGHTING MEASURES
------------------------------------

**Extinguishing Media**

**Suitable Extinguishing Media**

Carbon dioxide, regular dry chemical

**Unsuitable Extinguishing Media**

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

**Special Hazards Arising from the Chemical**

May cause or intensify fire; oxidizer. Containers may rupture or explode if exposed to heat.

**Hazardous Combustion Products**

## Safety Data Sheet

**Material Name: NITROUS OXIDE, REFRIGERATED LIQUID**

**SDS ID: 00244869**

oxides of nitrogen

**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). 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. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Consider downwind evacuation if material is leaking. Use extinguishing agents appropriate for surrounding fire. Cool containers with water spray until well after the fire is out.

**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. Avoid contact with combustible materials. 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. Reduce vapors with water spray. Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed spaces before entering. When in contact with refrigerated liquids, many materials become brittle and are likely to break without warning.

**Environmental Precautions**

Avoid release to the environment.

**Section 7 - HANDLING AND STORAGE**

**Precautions for Safe Handling**

Keep valves and fittings free from oil and grease. Keep/Store away from clothing/combustible materials. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Avoid breathing gas, fumes, vapors, mist.

**Conditions for Safe Storage, Including any Incompatibilities**

Store in a well-ventilated place. Keep container tightly closed.

Store locked up.

Store and handle in accordance with all current regulations and standards. Store below 52 C. Protect from physical damage. Damaged cylinders should be handled only by specialists. Keep separated from incompatible substances.

**Incompatible Materials**

combustible materials, metals, bases, reducing agents, peroxides, metal salts, metal oxides

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

**Component Exposure Limits**

<b>NITROUS OXIDE</b>	<b>10024-97-2</b>
ACGIH:	50 ppm TWA
NIOSH:	25 ppm TWA (over the time exposed to waste anesthetic gas ); 46 mg/m3 TWA (over the time exposed to waste anesthetic gas )

## Safety Data Sheet

**Material Name: NITROUS OXIDE, REFRIGERATED LIQUID**

**SDS ID: 00244869**

Mexico:	50 ppm TWA [VLE-PPT ]
---------	-----------------------

**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 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. For Unknown Concentrations or Immediately Dangerous to Life or Health -. Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode. 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.

**Glove Recommendations**

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

**Section 9 - PHYSICAL AND CHEMICAL PROPERTIES**

<b>Appearance</b>	clear, colorless gas	<b>Physical State</b>	gas
<b>Odor</b>	slightly sweet odor	<b>Color</b>	clear, colorless
<b>Odor Threshold</b>	Not available	<b>pH</b>	Not available
<b>Melting Point</b>	-90.81 °C	<b>Boiling Point</b>	-87.45 °C
<b>Boiling Point Range</b>	Not available	<b>Freezing point</b>	-90.81 °C
<b>Evaporation Rate</b>	Not available	<b>Flammability (solid, gas)</b>	Not flammable
<b>Autoignition Temperature</b>	Not available	<b>Flash Point</b>	Not available
<b>Lower Explosive Limit</b>	Not available	<b>Decomposition temperature</b>	Not available
<b>Upper Explosive Limit</b>	Not available	<b>Vapor Pressure</b>	51.3 bar @ 23 °C
<b>Vapor Density (air=1)</b>	(Heavier than air )	<b>Specific Gravity (water=1)</b>	1.2
<b>Water Solubility</b>	Not available	<b>Partition coefficient: n-octanol/water</b>	Not available
<b>Viscosity</b>	Not available	<b>Kinematic viscosity</b>	Not available

## Safety Data Sheet

**Material Name: NITROUS OXIDE, REFRIGERATED LIQUID**

**SDS ID: 00244869**

<b>Solubility (Other)</b>	Not available	<b>Density</b>	1.977 g/l
<b>Physical Form</b>	refrigerated liquid	<b>Molecular Weight</b>	44.02
<b>Critical Temperature</b>	37.45 °C		

### Section 10 - STABILITY AND REACTIVITY

**Reactivity**

May intensify fire; oxidizer.

**Chemical Stability**

Stable at normal temperatures and pressure.

**Possibility of Hazardous Reactions**

Will not polymerize.

**Conditions to Avoid**

Avoid contact with combustible materials. Protect from physical damage and heat. Containers may rupture or explode if exposed to heat. Keep separated from incompatible substances.

**Incompatible Materials**

combustible materials, metals, bases, reducing agents, peroxides, metal salts, metal oxides

**Hazardous decomposition products**

oxides of nitrogen

### Section 11 - TOXICOLOGICAL INFORMATION

**Information on Likely Routes of Exposure**

**Inhalation**

Frostbite, suffocation, nausea, vomiting, headache, drowsiness, dizziness, loss of coordination

**Skin Contact**

Frostbite, burns

**Eye Contact**

Frostbite

**Ingestion**

Ingestion of a gas is unlikely

**Acute and Chronic Toxicity**

Gas mixture inhalation acute toxicity determined according to Compressed Gas Association Standard P-20.

**Component Analysis - LD50/LC50**

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

**NITROUS OXIDE (10024-97-2)**

Inhalation LC50 Mouse >500000 ppm 4 h (no deaths occurred )

**Product Toxicity Data**

**Acute Toxicity Estimate**

No data available.

**Immediate Effects**

Frostbite, depression of central nervous system

**Delayed Effects**

No information on significant adverse effects.

**Irritation/Corrosivity Data**

May cause cryogenic burns.

**Respiratory Sensitization**

No information on significant adverse effects.

## Safety Data Sheet

Material Name: NITROUS OXIDE, REFRIGERATED LIQUID

SDS ID: 00244869

### Dermal Sensitization

No information on significant adverse effects.

### Component Carcinogenicity

NITROUS OXIDE	10024-97-2
ACGIH:	A4 - Not Classifiable as a Human Carcinogen

### Germ Cell Mutagenicity

No information on significant adverse effects.

### Tumorigenic Data

No information on significant adverse effects.

### Reproductive Toxicity

No information on significant adverse effects.

### Specific Target Organ Toxicity - Single Exposure

central nervous system

### Specific Target Organ Toxicity - Repeated Exposure

No target organs identified.

### Aspiration hazard

Not expected to be an aspiration hazard.

### Medical Conditions Aggravated by Exposure

No information on significant adverse effects.

### Additional Data

No information on significant adverse effects.

## Section 12 - ECOLOGICAL INFORMATION

### Ecotoxicity

Avoid release to the environment.

### Component Analysis - Aquatic Toxicity

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

### Persistence and Degradability

No information available for the product.

### Bioaccumulative Potential

No information available for the product.

### Mobility

No information available for the product.

### Other Toxicity

No additional information is available.

## Section 13 - DISPOSAL CONSIDERATIONS

### Disposal Methods

Dispose of contents/container in accordance with local/regional/national/international 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:** NITROUS OXIDE, REFRIGERATED LIQUID

**Hazard Class:** 2.2

**UN/NA #:** UN2201

**Required Label(s):** 2.2, 5.1

## Safety Data Sheet

**Material Name:** NITROUS OXIDE, REFRIGERATED LIQUID

**SDS ID:** 00244869

**IMDG Information:**

**Shipping Name:** NITROUS OXIDE, REFRIGERATED LIQUID

**Hazard Class:** 2.2

**UN#:** UN2201

**Required Label(s):** 2.2, 5.1

**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; Oxidizer; Specific Target Organ Toxicity

**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
<b>NITROUS OXIDE</b>	<b>10024-97-2</b>	Yes	Yes	Yes	Yes	Yes

**California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)**



**WARNING**

This product can expose you to chemicals including NITROUS OXIDE, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

<b>NITROUS OXIDE</b>	<b>10024-97-2</b>
Repro/Dev. Tox	developmental toxicity, 8/1/2008
	female reproductive toxicity, initial date 8/1/08

**Component Analysis - Inventory**

**NITROUS OXIDE (10024-97-2)**

US	CA	AU	CN	EU	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2
Yes	DSL	Yes	Yes	EIN	Yes	Yes	Yes	No

KR - REACH CCA	MX	NZ	PH	TH-TECI	TW, CN	VN (Draft)
No	Yes	Yes	Yes	Yes	Yes	Yes

## Safety Data Sheet

Material Name: NITROUS OXIDE, REFRIGERATED LIQUID

SDS ID: 00244869

### Section 16 - OTHER INFORMATION

#### NFPA Ratings

Health: 3 Fire: 0 Instability: 0 Other: OX

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

#### Summary of Changes

Updated: 08/16/2017

#### 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; KR REACH CCA - Korea Registration and Evaluation of Chemical Substances Chemical Control Act; 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 - Superfund Amendments and Reauthorization Act; Sc - Semi-quantitative; STEL - Short-term Exposure Limit; TCCA - Korea Toxic Chemicals Control Act; TDG - Transportation of Dangerous Goods; TH-TECI - Thailand - FDA Existing Chemicals Inventory (TECI); 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.