

Material Name: Nitrous Oxide

* * *Section 1 - IDENTIFICATION* * *		
GHS product identifier Chemical name	:	Nitrous Oxide Nitrous Oxide
Other means of identification	:	Nitrogen oxide; Nitrous oxide; Nitrogen oxide (N2O); Laughing gas; Hyponitrous acid anhydride; Dinitrogen monoxide,Nitrous Oxide USP
Product use	1	Synthetic/Analytical chemistry.
Synonym	:	Nitrogen oxide; Nitrous oxide; Nitrogen oxide (N2O); Laughing gas; Hyponitrous acid anhydride; Dinitrogen monoxide,Nitrous Oxide USP
Supplier's details	:	Electronic Fluorocarbons 3266 Bergey Road Hatfield PA 19440
Emergency Telephone # Outside the US (call collect)	:	1-800-535-5053 1-352-323-3500

* * *Section 2 - HAZARDS IDENTIFICATION* * *

OSHA/HCS status Classification of the substance or mixture	 This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200). OXIDIZING GASES - Category 1 GASES UNDER PRESSURE - Liquefied gas SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) -
	Category 3
GHS label elements	
Hazard pictograms	
Signal word	: Danger
Hazard statements	: May cause or intensify fire; oxidizer. Contains gas under pressure; may explode if heated. May cause frostbite. May displace oxygen and cause rapid suffocation. May cause drowsiness and dizziness.
Precautionary statements	
General	: Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction. Open valve slowly. Use only with equipment cleaned for Oxygen service. Always keep container in upright position.
Prevention	 Keep away from clothing, incompatible materials and combustible materials. Keep reduction valves, valves and fittings free from oil and grease. Use only outdoors or in a well-ventilated area. Avoid breathing gas.
Response	: In case of fire: Stop leak if safe to do so. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or physician if you feel unwell.
Storage	: Store locked up. Protect from sunlight when ambient temperature exceeds 52°C/125°F. Store in a well-ventilated place.

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Disposal	: Dispose of contents and container in accordance with all local, regional, national and international regulations.
Hazards not otherwise	: In addition to any other important health or physical hazards, this product may

Hazards not otherwise classified : In addition to any other important health or physical hazards, this product may displace oxygen and cause rapid suffocation.

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

Substance/mixture	:	Substance
Chemical name	:	Nitrous Oxide
Other means of identification	:	Nitrogen oxide; Nitrous oxide; Nitrogen oxide (N2O); Laughing gas; Hyponitrous
	а	cid anhydride; Dinitrogen monoxide,Nitrous Oxide USP

CAS number/other identifiers

CAS number	10024-97-2		
Product code	001042		
Ingredient name		%	CAS number
nitrous oxide		100	10024-97-2

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

* * *Section 4 - FIRST AID MEASURES* * *

Description of necessary first aid measures

Eye contact	: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.	
Inhalation	: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. 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 necessary, call a poison center or physician. 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. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.	
Skin contact	: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.	
Ingestion	: As this product is a gas, refer to the inhalation section.	
Most important symptoms/effects, acute and delayed		

Potential acute health ef	fects
Eye contact	: No known significant effects or critical hazards.
Inhalation	: Can cause central nervous system (CNS) depression. May cause drowsiness and dizziness.
Skin contact	: No known significant effects or critical hazards.
Frostbite	: Try to warm up the frozen tissues and seek medical attention.
Ingestion	: Can cause central nervous system (CNS) depression. As this product is a gas, refer to the inhalation section.
Over-exposure signs/sy	mptoms

Over-exposure signs/symptoms

Eye contact	: No specific data.
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Inhalation	: Adverse symptoms may include the following:, nausea or vomiting, headache, drowsiness/fatigue, dizziness/vertigo, unconsciousness	
Skin contact	: No specific data.	
Ingestion	: No specific data.	
Indication of immediate medical attention and special treatment needed, if necessary		

Notes to physician	: In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
Specific treatments	: No specific treatment.
Protection of first-aiders	: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

	* * *Section 5 - FIRE FIGHTING MEASURES* * *
Extinguishing media	
Suitable extinguishing media	: Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media	: None known.
Specific hazards arising from the chemical	: Contains gas under pressure. Oxidizing material. This material increases the risk of fire and may aid combustion. Contact with combustible material may cause fire. In a fire or if heated, a pressure increase will occur and the container may burst or explode.
Hazardous thermal decomposition products	: Decomposition products may include the following materials: nitrogen oxides
Special protective actions for fire-fighters	: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. 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.
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

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	:	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 appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders	:	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Environmental precautions	:	Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill	: Immediately contact emergency personnel.	Stop leak if without risk. Use spark-proof
	tools and explosion-proof equipment.	

Large spill

: Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

* * *Section 7 - HANDLING AND STORAGE* * *

Precautions for safe handling	Į	
Protective measures	:	Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid contact with eyes, skin and clothing. Avoid breathing gas. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep away from clothing, incompatible materials and combustible materials. Keep reduction valves free from grease and oil. Empty containers retain product residue and can be hazardous. 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.
Advice on general occupational hygiene	:	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
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). Store locked up. Separate from acids, alkalies, reducing agents and combustibles. Keep container tightly closed and sealed until ready for use. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

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

Occupational exposure limits

Ingredient name	Exposure limits
nitrous oxide	ACGIH TLV (United States, 3/2015).
	TWA: 90 mg/m ³ 8 hours.
	TWA: 50 ppm 8 hours.
	NIOSH REL (United States, 10/2013).
	TWA: 46 mg/m ³ 10 hours.
	TWA: 25 ppm 10 hours.

Appropriate engineering controls	: Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
Environmental exposure controls	: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.
Individual protection measu	res

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before
eating, smoking and using the lavatory and at the end of the working period.
Appropriate techniques should be used to remove potentially contaminated clothing.
Wash contaminated clothing before reusing. Ensure that eyewash stations and safety
showers are close to the workstation location.

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Material Name: Nitrous Oxide	
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-shields.
Skin protection	
Hand protection :	Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
Body protection :	Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Other skin protection	Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Respiratory protection :	Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

'*Section - - D\ mg]WU`UbX'7 \ Ya]WU`DfcdYf]h]Yg*

Appearance

Appearance	
Physical state	: Gas. [Compressed gas.]
Color	: Colorless.
Molecular weight	: 44.01 g/mole
Molecular formula	: N2-O
Boiling/condensation point	: -88.5°C (-127.3°F)
Melting/freezing point	: -90.8°C (-131.4°F)
Critical temperature	: 36.55°C (97.8°F)
Odor	Characteristic.
Odor threshold	Not available.
рН	Not available.
Flash point	: [Product does not sustain combustion.]
Burning time	: Not applicable.
Burning rate	: Not applicable.
Evaporation rate	: Not available.
Flammability (solid, gas)	: Extremely flammable in the presence of the following materials or conditions: reducing materials and combustible materials.
Lower and upper explosive	: Not available.
(flammable) limits	
Vapor pressure	: 745 (psig)
Vapor density	: 1.53 (Air = 1) Liquid Density@BP: 76.8 lb/ft3 (1230 kg/m3)
Specific Volume (ft ³/lb)	: 8.6957
Gas Density (lb/ft ³)	: 0.115
Relative density	: Not applicable.
Solubility	: Not available.
Solubility in water	: 1.2 g/l
Partition coefficient: n-	: 0.36
octanol/water	

Auto-ignition temperature	: Not available.
Decomposition temperature	: Not available.
SADT	: Not available.
Viscosity	: Not applicable.
*	* *Section 10 - STABILITY AND REACTIVITY* * *
Reactivity	: No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	: The product is stable.
Possibility of hazardous reactions	: Hazardous reactions or instability may occur under certain conditions of storage or use. Conditions may include the following: contact with combustible materials Reactions may include the following: risk of causing fire
Conditions to avoid	: No specific data.
Incompatible materials	: Highly reactive or incompatible with the following materials: combustible materials reducing materials grease oil
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

* * *Section 11 - TOXICOLOGICAL INFORMATION* * *

Information on toxicological effects

Acute toxicity

Not available.

Irritation/Corrosion

Not available.

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Classification

Product/ingredient name	OSHA	IARC	NTP
nitrous oxide	-	3	-

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Material Name: Nitrous Oxide

Specific target organ toxicity (single exposure)

Name		Category	Route of exposure	Target organs	
nitrous oxide		Category 3	Not applicable.	Narcotic effects	
Specific target organ toxici	ity (repeated exposure)				
Not available.					
Aspiration hazard					
Not available.					
nformation on the likely outes of exposure	: Not available.				
Potential acute health effect	<u>s</u>				
Eye contact	: No known significan	t effects or critical hazar	ds.		
Inhalation	: Can cause central n dizziness.	ervous system (CNS) de	epression. May cause	e drowsiness and	
Skin contact	•	t effects or critical hazar			
Ingestion	: Can cause central n to the inhalation sec	ervous system (CNS) de tion.	epression. As this pro	oduct is a gas, refe	
Symptoms related to the phy		cicological characteris	tics		
Eye contact	: No specific data.				
Inhalation	: Adverse symptoms may include the following:, nausea or vomiting, headache, drowsiness/fatigue, dizziness/vertigo, unconsciousness				
Skin contact	: No specific data.				
Ingestion	: No specific data.				
Delayed and immediate effe	cts and also chronic off	ects from short and lo	na term exposure		
Short term exposure					
Potential immediate effects	: Not available.				
	: Not available.				
effects					
effects Potential delayed effects					
effects Potential delayed effects Long term exposure Potential immediate	: Not available.				
effects Potential delayed effects Long term exposure Potential immediate effects Potential delayed effects	Not available.Not available.Not available.				
effects Potential delayed effects Long term exposure Potential immediate effects	Not available.Not available.Not available.				
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effects Potential delayed effects Long term exposure Potential immediate effects Potential delayed effects Potential chronic health eff Not available. General	 Not available. Not available. Not available. Fects No known significant No known significant 		ds.		
effects Potential delayed effects Long term exposure Potential immediate effects Potential delayed effects Potential chronic health eff Not available. General Carcinogenicity	 Not available. Not available. Not available. iects No known significan No known significan No known significan 	t effects or critical hazar	ds. ds.		
effects Potential delayed effects Long term exposure Potential immediate effects Potential delayed effects Potential chronic health eff Not available. General Carcinogenicity Mutagenicity	 Not available. Not available. Not available. Not available. No known significan 	t effects or critical hazard t effects or critical hazard	ds. ds. ds.		

Numerical measures of toxicity

Acute toxicity estimates

Not available.

* * *Section 12 - ECOLOGICAL INFORMATION* * *

Toxicity

Not available.

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
nitrous oxide	0.36	-	low

Mobility in soil

Soil/water partition coefficient (K _{oc})	: Not available.

: No known significant effects or critical hazards.

* * *Section 13 - DISPOSAL CONSIDERATIONS* * *

Disposal methods

Other adverse effects

: 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. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

* * *Section 14 - Transport Information* * *

	DOT	TDG	Mexico	IMDG	ΙΑΤΑ
UN number	UN1070	UN1070	UN1070	UN1070	UN1070
UN proper shipping name	NITROUS OXIDE	NITROUS OXIDE	NITROUS OXIDE	NITROUS OXIDE	NITROUS OXIDE
Transport hazard class(es)	2.2 (5.1)	2.2 (5.1)	2.2 (5.1)	2.2 (5.1)	2.2 (5.1)
Packing group	-	-	-	-	-
Environment	No.	No.	No.	No.	No.
Additional information	Limited quantity Yes. Packaging instruction Passenger aircraft Quantity limitation: 75 kg Cargo aircraft Quantity limitation: 150	Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.13-2.17 (Class 2), 2.23-2.25 (Class 5). Explosive Limit and	-	-	Passenger and Cargo AircraftQuantity limitation: 75 kg Cargo Aircraft Only Quantity limitation: 150 kg

kg	Limited Quantity Index 0	
	ERAP Index 3000	
	Passenger Carrying <u>Ship Index</u> 450	
	Passenger Carrying <u>Road or Rail Index</u> 75	

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Special precautions for user	• :	Transport within upright and secure the event of an ac	e. Ensure th	nat persons tra			
Fransport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	:	Not available.					
*	* *	Section 15 - RE	GULAT	ORY INFOR	MATION* * *	¥	
J.S. Federal regulations	:	TSCA 8(a) CDR E United States inv	-	-			
Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)	:	Not listed					
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	ingredients					
No products were found.							
SARA 304 RQ <u>SARA</u> <u>311/312</u>	:	Not applicable.					
Classification	:	Sudden release of	f pressure,	Immediate (ac	cute) health haz	ard	
Composition/information	on	ingredients					
Name		%	Fire	Sudden	Reactive	Immediate	Delayed

Name	%	hazard	Sudden release of pressure	Reactive	(acute) health	Delayed (chronic) health hazard
nitrous oxide	100	No.	Yes.	No.	Yes.	No.

State regulations

Massachusetts

: This material is listed.

New Yor	k :	TI	his ma	ate	ria	l is	n	ot I	isted.	

New Jersey : This material is listed.

Pennsylvania

: This material is listed.

California Prop. 65

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Ingredient name	Cancer	•	J	Maximum acceptable dosage level	
Nitrous Oxide	No.	Yes.	No.	No.	

International regulations

* * *Section 16 - OTHER INFORMATION* * *

Canada Label requirements	: Class A: Compressed gas.
	Class C: Oxidizing material.
	Class D-2A: Material causing other toxic effects (Very toxic).

NFPA Ratings

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

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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