

Nitrous Oxide

1. Product Identification

GHS product identifier	: Nitrous Oxide
Chemical name	: Nitrous Oxide
Other means of identification	: Nitrogen oxide; Nitrous oxide; Nitrogen oxide (N ₂ O); Laughing gas; Hypo nitrous acid anhydride; Dinitrogen monoxide, Nitrous Oxide USP : Synthetic/Analytical chemistry.
Product use Synonym	: Nitrogen oxide; Nitrous oxide; Nitrogen oxide (N ₂ O); Laughing gas; Hypo nitrous acid anhydride; Dinitrogen monoxide, Nitrous Oxide USP
SDS #	

Manufacturer / Distributor:

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Section 2. Hazards identification

OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture GHS label elements	: OXIDIZING GASES - Category 1 GASES UNDER PRESSURE - Liquefied gas SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) Category 3



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

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- 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.

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 displace **classified** oxygen and cause rapid suffocation.

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; Hypo nitrous acid anhydride; Dinitrogen monoxide, Nitrous Oxide USP

CAS number/other identifiers

CAS number : 10024-97-2

Product code : 001042

Ingredient name	%	CAS number
nitrous oxide	99.99%	10024-97-2

3.1 Therapeutic indications

Nitrous oxide is used: • when an inhalation anesthetic is required, the administration of nitrous oxide is usually accompanied by simultaneous administration of a volatile agent such as halothane, ethane, etc. • in the relief of severe pain, usually in emergency situations, by inhalation with 50% oxygen • in short-term procedures which inevitably involve pain, such as wound and burn dressing, wound debridement and suturing. Administered usually with 50% oxygen • in dental work to provide short-term analgesia for tooth extraction and other brief procedures, administered with 50% oxygen • occasionally as an insufflating agent in laparoscopy • in cryosurgery as a refrigerant.

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3.2 Posology and method of administration

Nitrous oxide is administered through a face mask or tracheal tube by means of an anesthetic apparatus. The gas is breathed in by the patient and absorbed through the lungs. Where the clinical indication is the production of general anesthesia, it should be noted that:

- in the average adult, nitrous oxide is administered by inhalation through a suitable anesthetic apparatus in concentrations up to 80% with oxygen as the balance
- as people age, there is a steady reduction in the indices of cardiac and respiratory function evinced by a lowering of cardiac output and in lung

Ventilation and perfusion. In addition, there is an increase in dead space in the lung which increases minute ventilation. Cerebral blood flow is reduced by up to 30%. The result of these changes means that susceptibility to anesthesia is increased. Nitrous oxide is, therefore, more useful in the elderly and the depressant effects of added agents are reduced

- there are no essential differences in clinical indications between the adult and child
- nitrous oxide is strongly recommended in the anesthesia of neonates
- in obstetrical anesthesia, the nitrous oxide level is kept below 70% to allow a substantial oxygen level to be provided. Nitrous oxide plays a major role because injected agents depress the breathing of the infant and volatile agents depress uterine contraction
- as a general rule, the more ill the patient, the more susceptible is the patient to other anesthetic agents and the more nitrous oxide is relied upon.

Nitrous oxide should not be used for more than a total of 24 hours, or more frequently than every 4 days, without close clinical supervision and hematological monitoring (see sections 3.4 and 3.8).

Nitrous oxide is usually not sufficient to create an adequate anesthetic effect on its own, and should therefore be used in combination with appropriate doses of another anesthetic when used for general anesthesia. Nitrous oxide has additive interaction with most other anesthetics (see interactions 3.5).

3.3 Contraindications

Nitrous oxide should not be used with any condition where gas is entrapped within a body and where its expansion might be dangerous, such as:

- head injuries with impairment of consciousness
- artificial, traumatic or spontaneous pneumothorax
- air embolism
- decompression sickness
- following a recent underwater dive
- following air encephalography
- severe bullous emphysema
- during myringoplasty
- gross abdominal distension
- intoxication
- maxillofacial injuries
- in patients having received recent intraocular injection of gas (such as SF₆).

3.4 Special warnings and precautions for use

Nitrous oxide causes inactivation of vitamin B₁₂, which is a co-factor of methionine synthase. Folate metabolism is consequently interfered with and DNA synthesis is impaired following prolonged administration of nitrous oxide. Prolonged or frequent use of nitrous oxide may result in megaloblastic marrow changes, myeloneuropathy and sub acute combined degeneration of the spinal cord. Nitrous oxide should not be used for more than a total of 24 hours, or more frequently than every 4 days, without close clinical supervision and haematological monitoring. Specialist advice should be sought from a haematologist in such cases. Haematological assessment should include an assessment for megaloblastic change in red cells and hypersegmentation of neutrophils. Neurological toxicity can occur without anaemia or macrocytosis and with B₁₂ levels in the normal range. In patients with undiagnosed subclinical deficiency of vitamin B₁₂, neurological toxicity has occurred after single exposures to nitrous oxide during general anesthesia. Assessment of vitamin B₁₂ levels should be considered in people with risk factors for vitamin B₁₂ deficiency prior to using nitrous oxide anesthesia. Risk

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factors include the elderly, those with poor or vegetarian diet, and previous history of anaemia. Nitrous oxide should never be given with less than 21% oxygen, but a maximum of 30% oxygen should be used during anesthesia (except when used in combination with a volatile anaesthetic agent) and more at altitude and in the presence of disorders affecting oxygenation. Reduced fertility in healthcare personnel has been reported where they have been repeatedly exposed to high levels of nitrous oxide above the specified occupational exposure limits in inadequately ventilated rooms. There is no documented evidence to confirm or exclude the existence of any causal connection between these cases and exposure to nitrous oxide. Scavenging of waste nitrous oxide gas should be used to reduce operating theatre and equivalent treatment room levels to a level below 100 ppm of ambient nitrous oxide. In patients taking other centrally acting medicinal products, such as morphine derivatives and/or benzodiazepines, concomitant administration of nitrous oxide may result in increased sedation, and consequently have effects on respiration, circulation and protective reflexes. If nitrous oxide is to be used in such patients, this should take place under the supervision of appropriately trained personnel (see Section 3.5).

At the end of a nitrous oxide/oxygen anaesthesia, withdrawal of the mask leads to an outpouring of nitrous oxide from the lung and consequent dilution of oxygen in incoming air. This results in "diffusion hypoxia" and is counteracted by giving 100% oxygen for a few minutes when the flow of nitrous oxide is stopped. Nitrous oxide is non-flammable but strongly supports combustion and should not be used near sources of ignition. Smoking should be prohibited when using nitrous oxide. Under no circumstances should oils or grease be used to lubricate any part of the nitrous oxide cylinder or the associated equipment used to deliver the gas to the patient. Where moisturising preparations are required for use with a facemask, oil based creams should not be used. Check that hands are clean and free from any oils or grease. Where alcohol gels are used to control microbiological cross-contamination, ensure that all alcohol has evaporated before handling nitrous oxide cylinders or equipment. Nitrous oxide is stored in high pressure gas cylinders as a liquid under pressure. Rapid opening of the valve can cause the discharged gas to re-liquefy. This liquid can cause cold burns if in contact with the skin. Cylinders should only be used in the vertical position with the valve uppermost. If not, liquid may be discharged when the valve is opened.

3.5 Interaction with other medicinal products and other forms of interaction

Nitrous oxide inactivates vitamin B12 and potentiates the effects of methotrexate on folate metabolism. There are additive effects when nitrous oxide is used in combination with other inhaled anaesthetics or drugs having a central depressant action (e.g. opiates, benzodiazepines and other psychotropics). These interactions have clear effects in clinical practise, decreasing the dose needed for the other agents combined with nitrous oxide, causing less cardiovascular and respiratory depression and increasing speed of emergence.

3.6 Pregnancy and lactation

Pregnancy Mild skeletal teratogenic changes have been observed on pregnant rat embryos when the dam has been exposed to high concentrations of nitrous oxide during the period of organogenesis. However, no increased incidence of foetal malformation has been discovered in 8 epidemiological studies and case reports in human beings. There is no published material which shows that nitrous oxide is toxic to the human foetus. Therefore, there is no absolute contraindication to its use in the first 16 weeks of pregnancy. **Lactation** There are no known adverse effects to using nitrous oxide during the breastfeeding period.

3.7 Effects on ability to drive and use machines

Nitrous oxide is rapidly eliminated but driving, use of machinery and other psycho-motor activities should not be undertaken until 12 hours have elapsed after nitrous oxide anaesthesia.

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3.8 Undesirable effects

Events such as euphoria, disorientation, sedation, nausea, vomiting, dizziness and generalised tingling are commonly described. These events are generally minor and rapidly reversible. Prolonged or frequent use of nitrous oxide, including heavy occupational exposure and addiction, may result in megaloblastic anaemia. Agranulocytosis has been reported following prolonged nitrous oxide administration (see section 4.4). Myeloneuropathy and sub acute combined degeneration have also been reported following prolonged or frequent use. However in patients with undiagnosed subclinical deficiency of vitamin B12, neurological toxicity has occurred after a single exposure to nitrous oxide for anaesthesia (see section 3.4).

Addiction may occur. Nitrous oxide passes into all gas containing spaces in the body faster than nitrogen passes out. Prolonged exposure may result in bowel distension, middle ear damage and rupture of ear drums.

3.9 Overdose

Inappropriate, unwitting or deliberate inhalation of nitrous oxide will ultimately result in unconsciousness, passing through stages of increasing light-headedness and intoxication, and, if the victim were to be within a confined space, death from anoxia could result. The treatment is removal to fresh air, mouth-to-mouth resuscitation and, if necessary, the use of an oxygen resuscitator.

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.

Description of necessary first aid measures

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4. 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.
- : As this product is a gas, refer to the inhalation section.

Ingestion

Most important symptoms/effects, acute and delayed Potential acute health effects

- 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/symptoms

- Eye contact** : No specific data.
- Inhalation** : Adverse symptoms may include the following: nausea or vomiting, headache, drowsiness/fatigue, dizziness/vertigo, unconsciousness : No specific data.
- Skin contact** : No specific data.

Ingestion

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.

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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

Hazardous thermal decomposition products : 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.

: 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.

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 nonemergency 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.

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7. Handling and storage

Precautions for safe handling

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, alkalis, 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).

8. Exposure controls/personal protection

Control parameters

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.

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Individual protection measures

- 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.
- 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 sideshields.
- Skin 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.
- Hand protection** : 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.

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9. Physical and chemical properties

Appearance

Physical state	: Gas. [Compressed gas.] Colorless.	
Color	: 44.01 g/mole	
Molecular weight	: N ₂ -O	
Molecular formula	: -88.5 °C (-127.3°F)	
Boiling/condensation point	: -90.8 °C (-131.4°F)	
Melting/freezing point	: 36.55 °C (97.8°F)	
Critical temperature	: Characteristic.	
Odor	: Not available.	
Odor threshold pH	: Not available.	
Flash point	: [Product does not sustain combustion.] Not applicable.	
Burning time 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 (flammable) limits	: Not available.	
Vapor pressure	: 745 (psig)	
Vapor density	: 1.53 (Air = 1)	Liquid Density@BP: 76.8 lb/ft ³ (1230 kg/m ³)
Specific Volume (ft³/lb)	: 8.6957	
Gas Density (lb/ft³)	: 0.115	
Relative density	: Not applicable.	
Solubility	: Not available.	
Solubility in water	: 1.2 g/l	
Partition coefficient: noctanol/water	: 0.36	
Auto-ignition temperature	: Not available.	
Decomposition temperature	: Not available.	
SADT	: Not available.	
Viscosity	: Not applicable.	

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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 : No specific data.
- Conditions to avoid** : Highly reactive or incompatible with the following materials:
combustible materials reducing materials
grease
- Incompatible materials** : oil
- : Under normal conditions of storage and use, hazardous decomposition products should not be produced.
- Hazardous decomposition products**
- Hazardous polymerization** : Under normal conditions of storage and use, hazardous polymerization will not occur.

11. Toxicological information

Information on toxicological effects

Acute toxicity

Not available.

Irritation/Corrosion

Not available.

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

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Not available.

Classification

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

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
nitrous oxide	Category 3	Not applicable.	Narcotic effects

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

- 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.
- Ingestion** : Can cause central nervous system (CNS) depression. As this product is a gas, refer to the inhalation section.

Symptoms related to the physical, chemical and toxicological characteristics

- Eye contact** : No specific data.
- Inhalation** : Adverse symptoms may include the following: nausea or vomiting, headache, drowsiness/fatigue, dizziness/vertigo, unconsciousness : No specific data. : No specific data.
- Skin contact** : No specific data.
- Ingestion** : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

- Potential immediate effects** : Not available.
- Potential delayed effects** : Not available.

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Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards. **Fertility effects** : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates Not available.

12. Ecological information

Persistence and degradability

Not available.

Bio accumulative potential

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

Mobility in soil

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

Other adverse effects : No known significant effects or critical hazards.

Disposal methods : 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. Empty Airgas-owned pressure vessels should be returned to Airgas. 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 product.”

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13. Disposal considerations

Not available

14. Transport information

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL : Not available.

15. Regulatory information

73 /78 and the IBC Code

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption:** Not determined
United States inventory (TSCA 8b): This material is listed or exempted.

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) DEA List II Chemicals : Not listed

(Essential Chemicals)

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Sudden release of pressure

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Immediate (acute) health hazard **Composition/information on**

ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
nitrous oxide	99.99%	No.	Yes.	No.	Yes.	No.

State regulations

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	Reproductive	No significant risk level	Maximum acceptable dosage level
Nitrous Oxide	No.	Yes.	No.	No.

International regulations

International lists

National inventory

- Australia** : This material is listed or exempted.
- Canada** : This material is listed or exempted.
- China** : This material is listed or exempted.
- Europe** : This material is listed or exempted.
- Japan** : This material is listed or exempted.
- Malaysia** : Not determined.
- New Zealand** : This material is listed or exempted.
- Philippines** : Not determined.
- Republic of Korea** : This material is listed or exempted.
- Taiwan** : This material is listed or exempted.

Canada

WHMIS (Canada)

:Class A: Compressed gas.
 Class C: Oxidizing material.
 Class D-2A: Material causing other toxic effects (Very toxic).
CEPA Toxic substances: This material is listed.
Canadian ARET: This material is not listed.
Canadian NPRI: This material is listed.
Alberta Designated Substances: This material is not listed.
Ontario Designated Substances: This material is not listed.
Quebec Designated Substances: This material is not listed.

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16. Other information

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

Hazardous Material Information System (U.S.A.)

Health	1
Flammability	0
Physical hazards	3

Classification	Justification
Ox. Gas 1, H270	Expert judgment
Press. Gas Liq. Gas, H280	Expert judgment
STOT SE 3, H336	Expert judgment