



Nitrous Oxide

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 09/10/2014 Version: 1.0

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Substance
Substance name : Nitrous Oxide
CAS No : 10024-97-2
Product code : SG-1001-00717

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Medical or Laboratory Purposes

1.3. Details of the supplier of the safety data sheet

Air Liquide America Specialty Gases
6141 Easton Rd
Plumsteadville, PA 18949 - USA
T 1.800.217.2688
www.airliquide.com

1.4. Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (GHS-US)

| | |
|---------------|------|
| Ox. Gas 1 | H270 |
| Liquefied gas | H280 |
| STOT SE 3 | H336 |

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2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US)



Signal word (GHS-US)

: Danger

Hazard statements (GHS-US)

: H270 - May cause or intensify fire; oxidizer
H280 - Contains gas under pressure; may explode if heated
H336 - May cause drowsiness or dizziness
OSHA-H01 - May displace oxygen and cause rapid suffocation
CGA-HG01 - May cause frostbite

Precautionary statements (GHS-US)

: P202 - Do not handle until all safety precautions have been read and understood
P220 - Keep/Store away from clothing, combustible materials
P244 - Keep reduction valves/valves and fittings free from oil and grease
P261 - Avoid breathing gas
P262 - Do not get in eyes, on skin, or on clothing
P271 - Use only outdoors or in a well-ventilated area
P280 - Wear protective clothing, protective gloves, eye protection, face protection
P302 - IF ON SKIN: Thaw frosted parts with lukewarm water. Do not rub affected area, Get immediate medical advice/attention
P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing
P312 - Call a doctor if you feel unwell
P370+P376 - In case of fire: Stop leak if safe to do so
P403 - Store in a well-ventilated place
P501 - Dispose of contents/container in accordance with local/regional/national/international regulations
CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F)
CGA-PG05 - Use a back flow preventive device in the piping
CGA-PG06 - Close valve after each use and when empty
CGA-PG10 - Use only with equipment rated for cylinder pressure
CGA-PG14 - Approach suspected leak area with caution
CGA-PG18 - When returning cylinder, install leak tight valve outlet cap or plug
CGA-PG20 - Use only with equipment of compatible materials of construction
CGA-PG21 - Open valve slowly
CGA-PG22 - Use only with equipment cleaned for oxygen service

2.3. Other hazards

Other hazards not contributing to the classification

: None.

2.4. Unknown acute toxicity (GHS-US)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substance

Name

: Nitrous Oxide

CAS No

: 10024-97-2

| Name | Product identifier | % | Classification (GHS-US) |
|---------------|--------------------|-----|---|
| Nitrous oxide | (CAS No)10024-97-2 | 100 | Ox. Gas 1, H270 Liquefied gas, H280 STOT SE 3, H336 |

3.2. Mixture

Not applicable

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SECTION 4: First aid measures

4.1. Description of first aid measures

- First-aid measures after inhalation : Remove to fresh air and keep at rest in a position comfortable for breathing. If you feel unwell, seek medical advice.
- First-aid measures after skin contact : Contact with the liquefied gas may cause frostbite. Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention.
- First-aid measures after eye contact : Adverse effects not expected from this product.
- First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

- Symptoms/injuries : Symptoms similar to those listed under inhalation and skin contact.
- Symptoms/injuries after inhalation : May displace oxygen and cause rapid suffocation. May cause drowsiness or dizziness. If you feel unwell, seek medical advice.
- Symptoms/injuries after skin contact : Contact with the liquefied gas may cause frostbite.
- Symptoms/injuries after eye contact : Adverse effects not expected from this product.
- Symptoms/injuries after ingestion : Ingestion is not considered a potential route of exposure.
- Symptoms/injuries upon intravenous administration : Not known.
- Chronic symptoms : None known.

4.3. Indication of any immediate medical attention and special treatment needed

If breathing is difficult, give oxygen. Obtain medical attention if breathing difficulty persists.

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.
- Unsuitable extinguishing media : Do not use water jet to extinguish.

5.2. Special hazards arising from the substance or mixture

- Fire hazard : The product is not flammable.
- Explosion hazard : Product is not explosive. Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries.
- Reactivity : None known.

5.3. Advice for firefighters

- Firefighting instructions : In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion. Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire.
- Protection during firefighting : Standard protective clothing and equipment (e.g., Self Contained Breathing Apparatus) for fire fighters. Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- General measures : Ensure adequate ventilation.

6.1.1. For non-emergency personnel

- Protective equipment : Wear protective equipment consistent with the site emergency plan.
- Emergency procedures : Escape the danger area by the closest safe route. Close doors and windows of adjacent premises. Keep containers closed. Mark the danger area. Seal off low-lying areas. Keep upwind.

6.1.2. For emergency responders

- Protective equipment : Standard protective clothing and equipment (e.g., Self Contained Breathing Apparatus) for fire fighters. Equip cleanup crew with proper protection.
- Emergency procedures : Evacuate and limit access. Ventilate area.

6.2. Environmental precautions

Try to stop release if safe to do so.

6.3. Methods and material for containment and cleaning up

- For containment : Try to stop release if safe to do so.
- Methods for cleaning up : Dispose of this material and its container in accordance with local regulations.

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6.4. Reference to other sections

See also Sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Additional hazards when processed : Pressurized container: Do not pierce or burn, even after use. Use equipment rated for cylinder pressure.
- Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Use only outdoors or in a well-ventilated area.
- Hygiene measures : Do not eat, drink or smoke when using this product.

7.2. Conditions for safe storage, including any incompatibilities

- Technical measures : Comply with applicable regulations.
- Storage conditions : Do not expose to temperatures exceeding 52°C (125°F). Keep container closed when not in use. Protect cylinder from physical damage. Store in well ventilated area. Store locked up.
- Incompatible products : Reducing agents.
- Incompatible materials : Flammable materials.

7.3. Specific end use(s)

See Section 1.2 Specific end use(s).

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

| Nitrous oxide (10024-97-2) | | |
|----------------------------|-----------------|--------|
| USA ACGIH | ACGIH TWA (ppm) | 50 ppm |

8.2. Exposure controls

- Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Systems under pressure should be regularly checked for leakages. Ensure exposure is below occupational exposure limits. Oxygen detectors should be used when asphyxiating gases may be released. Consider work permit system e.g. for maintenance activities.
- Hand protection : Wear working gloves when handling gas containers. 29CFR 1910.138: Hand Protection.
- Eye protection : Wear safety glasses with side shields. 29 CFR 1910.133: Eye and Face Protection.
- Skin and body protection : Wear suitable protective clothing, e.g. - lab coats, coveralls or flame resistant clothing.
- Respiratory protection : None necessary during normal and routine operations.
- Thermal hazard protection : None necessary.
- Environmental exposure controls : Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.
- Other information : Wear safety shoes while handling containers. 29 CFR 1910.136: Foot Protection.

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SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

| | |
|---|--|
| Physical state | : Gas |
| Appearance | : Clear, colorless gas. |
| Molecular mass | : 44.013 g/mol |
| Color | : Colorless |
| Odor | : Slightly sweet |
| Odor threshold | : No data available |
| pH | : No data available |
| Relative evaporation rate (butyl acetate=1) | : No data available |
| Melting point | : -90.86 °C |
| Freezing point | : No data available |
| Boiling point | : -88.48 °C |
| Flash point | : No data available |
| Auto-ignition temperature | : No data available |
| Decomposition temperature | : No data available |
| Flammability (solid, gas) | : No data available |
| Vapor pressure | : 5150 kPa |
| Relative vapor density at 20 °C | : 1.53 |
| Relative density | : No data available |
| Specific gravity / density | : 1.977 g/l |
| Relative gas density | : Heavier than air. |
| Solubility | : Water: 0.1 % |
| Log Pow | : Not applicable for gas-mixtures. |
| Log Kow | : Not applicable for gas-mixtures. |
| Viscosity, kinematic | : Not applicable. |
| Viscosity, dynamic | : Not applicable. |
| Explosive properties | : Not flammable. |
| Oxidizing properties | : May cause or intensify fire; oxidizer. |
| Explosive limits | : No data available |

9.2. Other information

| | |
|------------------------|--|
| Additional information | : Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level. |
|------------------------|--|

SECTION 10: Stability and reactivity

10.1. Reactivity

None known.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

May react violently with reducing agents.

10.4. Conditions to avoid

Refer to Section 10 on Incompatible Materials.

10.5. Incompatible materials

Flammable materials. Reducing agents.

10.6. Hazardous decomposition products

Nitrous oxide explosively decomposes at elevated temperatures (above 1200 deg. F, 650 deg. C) into nitrogen and oxygen.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

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Acute toxicity : Not classified

| Nitrous oxide (10024-97-2) | |
|----------------------------|-------------------------|
| LC50 inhalation rat (ppm) | 250000 ppm/4h |
| ATE US (gases) | 250000.00000000 ppmV/4h |

Skin corrosion/irritation : Not classified
Serious eye damage/irritation : Not classified
Respiratory or skin sensitization : Not classified
Germ cell mutagenicity : Not classified
Carcinogenicity : Not classified
Reproductive toxicity : Not classified
Specific target organ toxicity (single exposure) : May cause drowsiness or dizziness.

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified
Not applicable for gases and gas-mixtures.

Symptoms/injuries after inhalation : May displace oxygen and cause rapid suffocation. May cause drowsiness or dizziness. If you feel unwell, seek medical advice.

Symptoms/injuries after skin contact : Contact with the liquefied gas may cause frostbite.

Symptoms/injuries after eye contact : Adverse effects not expected from this product.

Symptoms/injuries after ingestion : Ingestion is not considered a potential route of exposure.

Symptoms/injuries upon intravenous administration : Not known.

Chronic symptoms : None known.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : Classification criteria are not met.

12.2. Persistence and degradability

| Nitrous Oxide(10024-97-2) | |
|-------------------------------|--------------------|
| Persistence and degradability | No data available. |

| Nitrous oxide (10024-97-2) | |
|-------------------------------|-------------------------------------|
| Persistence and degradability | Not applicable for inorganic gases. |

12.3. Bioaccumulative potential

| Nitrous Oxide(10024-97-2) | |
|---------------------------|----------------------------------|
| Log Pow | Not applicable for gas-mixtures. |
| Log Kow | Not applicable for gas-mixtures. |
| Bioaccumulative potential | No data available. |

| Nitrous oxide (10024-97-2) | |
|----------------------------|-------------------------------------|
| Log Pow | Not applicable for inorganic gases. |
| Bioaccumulative potential | No data available. |

12.4. Mobility in soil

| Nitrous Oxide(10024-97-2) | |
|---------------------------|--------------------|
| Mobility in soil | No data available. |

| Nitrous oxide (10024-97-2) | |
|----------------------------|---|
| Ecology - soil | Because of its high volatility, the product is unlikely to cause ground or water pollution. |

12.5. Other adverse effects

Effect on ozone layer : None.

Effect on the global warming : Contains greenhouse gas(es) not covered by 842/2006/EC.

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SECTION 13: Disposal considerations

13.1. Waste treatment methods

- Waste treatment methods : Contact supplier if guidance is required. Do not discharge into any place where its accumulation could be dangerous. Ensure that the emission levels from local regulations or operating permits are not exceeded.
- Waste disposal recommendations : Refer to the CGA Pamphlet P-63 "Disposal of Gases" available at www.cganet.com for more guidance on suitable disposal methods.
- Additional information : None.
- List of hazardous wastes : 16 05 04: Gases in pressure containers (including halons) containing dangerous substances.

SECTION 14: Transport information

- In accordance with DOT
- Transport document description : UN1070 Nitrous oxide, 2.2
- UN-No.(DOT) : 1070
- DOT NA no. : UN1070
- Proper Shipping Name (DOT) : Nitrous oxide
- Department of Transportation (DOT) Hazard Classes : 2.2 - Class 2.2 - Non-flammable compressed gas 49 CFR 173.115
- Hazard labels (DOT) : 2.2 - Non-flammable gas
5.1 - Oxidizer



- DOT Special Provisions (49 CFR 172.102) : A14 - This material is not authorized to be transported as a limited quantity or consumer commodity in accordance with 173.306 of this subchapter when transported aboard an aircraft.
- DOT Packaging Exceptions (49 CFR 173.xxx) : 306
- DOT Packaging Non Bulk (49 CFR 173.xxx) : 304
- DOT Packaging Bulk (49 CFR 173.xxx) : 314;315
- DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 75 kg
- DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 150 kg
- DOT Vessel Stowage Location : A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel.
- DOT Vessel Stowage Other : 40 - Stow "clear of living quarters"

Additional information

- Other information : No supplementary information available.
- Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

ADR

- Transport document description : UN 1070 NITROUS OXIDE, 2.2 (5.1), (C/E)
- Class (ADR) : 2 - Gases
- Hazard identification number (Kemler No.) : 25
- Classification code (ADR) : 20

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Hazard labels (ADR) : 2.2 - Non-flammable compressed gas
5.1 - Oxidizer



Orange plates : 

Tunnel restriction code (ADR) : C/E

LQ : 0

Excepted quantities (ADR) : E0

Transport by sea

UN-No. (IMDG) : 1070

Proper Shipping Name (IMDG) : Nitrous oxide

Class (IMDG) : 2 - Gases

Subsidiary risks (IMDG) : 5.1

Air transport

UN-No.(IATA) : 1070

Proper Shipping Name (IATA) : Nitrous oxide

Class (IATA) : 2.2 - Gases : Non-flammable, non-toxic

SECTION 15: Regulatory information

15.1. US Federal regulations

No additional information available

15.2. International regulations

CANADA

Nitrous oxide (10024-97-2)

Listed on the Canadian DSL (Domestic Substances List)

| | |
|----------------------|--|
| WHMIS Classification | Class A - Compressed Gas Class C - Oxidizing Material Class D Division 2 Subdivision A - Very toxic material causing other toxic effects |
|----------------------|--|

EU-Regulations

No additional information available

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Not classified

Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]

Not classified

15.2.2. National regulations

No additional information available

15.3. US State regulations

Nitrous oxide (10024-97-2)

| | | | | |
|---|---|---|---|-----------------------------------|
| U.S. - California - Proposition 65 - Carcinogens List | U.S. - California - Proposition 65 - Developmental Toxicity | U.S. - California - Proposition 65 - Reproductive Toxicity - Female | U.S. - California - Proposition 65 - Reproductive Toxicity - Male | No significance risk level (NSRL) |
| | Yes | Yes | | |

Nitrous oxide (10024-97-2)

U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List

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Nitrous oxide (10024-97-2)

U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

- Indication of changes : Revised safety data sheet in accordance with OSHA final rule on GHS implementation promulgated March 26, 2012.
- Other information : This Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product.

Full text of H-phrases: see section 16:

| | |
|---------------|---|
| Liquefied gas | Gases under pressure Liquefied gas |
| Ox. Gas 1 | Oxidizing gases Category 1 |
| STOT SE 3 | Specific target organ toxicity (single exposure) Category 3 |
| H270 | May cause or intensify fire; oxidizer |
| H280 | Contains gas under pressure; may explode if heated |
| H336 | May cause drowsiness or dizziness |

SDS US (GHS HazCom 2012)

This Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of Air Liquide America Corporation's knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, either express or implied, are provided. The information contained herein relates only to this specific product. If this product is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.