

NITROUS OXIDE, Compressed & Liquefied Gas (N2O)

AL612

Danger



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

1.1. Product identifier

Trade name : NITROUS OXIDE, Compressed & Liquefied Gas (N2O)
 SDS Nr : AL612
 Chemical formula : N2O

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

Relevant identified uses : Industrial and professional. Perform risk assessment prior to use.
 Test gas / Calibration gas. Laboratory use Contact supplier for more uses information
 Use : Scientific applications. Industrial applications.

1.3. Details of the supplier of the safety data sheet

Company identification : Air Liquide Australia Limited
 Level 9 / 380 St. Kilda Road
 Melbourne VIC 3004 Australia
 Tel: + 61 3 9697 9888
 Fax: + 61 3 9690 7107
 ALAEnquiries@AirLiquide.com

1.4. Emergency telephone number

Emergency telephone number : 1800 812 588

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

Hazard Class and Category Code Regulation EC 1272/2008 (CLP)

R Phrase(s) : R8 : Contact with combustible material may cause fire.
 • Physical hazards : Oxidizing gases - Category 1 - Danger - (CLP : Ox. Gas 1) - H270
 Gases under pressure - Liquefied gas - Warning - (CLP : Press. Gas) - H280

Classification EC 67/548 or EC 1999/45

: O; R8

2.2. Label elements

Labelling Regulation EC 1272/2008 (CLP)

• Hazard pictograms



• Hazard pictograms code : GHS03 - GHS04
 • Signal word : Danger
 • Hazard statements : H270 - May cause or intensify fire; oxidizer.
 H280 - Contains gas under pressure; may explode if heated.
 • Precautionary statements
 - Prevention : P244 - Keep valves and fittings free from oil and grease
 P220 - Keep away from combustible materials.
 - Response : P370+P376 - In case of fire : Stop leak if safe to do so.

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SECTION 2. Hazards identification (continued)

- Storage : P403 - Store in a well-ventilated place.

2.3. Other hazards

: None.

SECTION 3. Composition/information on ingredients
3.1. Substance / 3.2. Mixture
Substance.

| Substance name | Contents | CAS No | EC No | Annex No | | Classification |
|----------------|----------|------------|-----------|----------|-----|-------------------------------------------------------|
| Nitrous oxide | 100 % | 10024-97-2 | 233-032-0 | ---- | * 2 | O; R8 ----- Ox. Gas 1 (H270) Liq. Gas (H280) |

Contains no other components or impurities which will influence the classification of the product.

* 1: Listed in Annex IV / V REACH, exempted from registration.

* 2: Registration deadline not expired.

* 3: Registration not required: Substance manufactured or imported < 1t/y

Full text of R-phrases see chapter 16. Full text of H-statements see chapter 16

SECTION 4. First aid measures
4.1. Description of first aid measures
First aid measures

- Inhalation : In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/ consciousness. Victim may not be aware of asphyxiation.
In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of co-ordination.
Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
- Skin/eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes.
In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.
- Skin contact : Adverse effects not expected from this product.
- Eye contact : Adverse effects not expected from this product.
- Ingestion : Ingestion is not considered a potential route of exposure.

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

: Refer to section 11.

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

: None.

SECTION 5. Fire-fighting measures
5.1. Extinguishing media
Extinguishing media

- Suitable extinguishing media : All known extinguishants can be used.

5.2. Special hazards arising from the substance or mixture

- Specific hazards : Exposure to fire may cause containers to rupture/explode.
Supports combustion.
- Hazardous combustion products : If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition :
Nitric oxide/nitrogen dioxide.

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SECTION 5. Fire-fighting measures (continued)

5.3. Advice for fire-fighters

- Specific methods** : Coordinate fire measure to the surrounding fire. Cool endangered containers with water spray jet from a protected position. Do not empty contaminated fire water into drains.
If possible, stop flow of product.
Move away from the container and cool with water from a protected position.
If leaking do not spray water onto container. Water surrounding area (from protected position) to contain fire.
- Special protective equipment for fire fighters** : Use self-contained breathing apparatus and chemically protective clothing.

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- Personal precautions** : Try to stop release.
Evacuate area.
Ensure adequate air ventilation.
Eliminate ignition sources.
Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
Use protective clothing.

6.2. Environmental precautions

- : None.
: Try to stop release.
Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

6.3. Methods and material for containment and cleaning up

- Clean up methods** : None.
Ventilate area.
Keep area evacuated and free from ignition sources until any spilled liquid has evaporated. (Ground free from frost).

6.4. Reference to other sections

- : See also sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

- Safe use of the product** : Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
Only experienced and properly instructed persons should handle gases under pressure.
The product must be handled in accordance with good industrial hygiene and safety procedures.
Do not smoke while handling product.
Ensure the complete gas system was (or is regularly) checked for leaks before use.
- Safe handling of the gas receptacle** : Refer to supplier's container handling instructions.
Do not allow backfeed into the container.
Protect cylinders from physical damage; do not drag, roll, slide or drop.
When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders.
Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use.
If user experiences any difficulty operating cylinder valve discontinue use and contact supplier.
Never attempt to repair or modify container valves or safety relief devices.
Damaged valves should be reported immediately to the supplier.
Keep container valve outlets clean and free from contaminants particularly oil and water.
Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment.

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SECTION 7. Handling and storage (continued)

Handling

Close container valve after each use and when empty, even if still connected to equipment.
Never attempt to transfer gases from one cylinder/container to another.
Never use direct flame or electrical heating devices to raise the pressure of a container.
Do not remove or deface labels provided by the supplier for the identification of the cylinder contents.

: Use no oil or grease.
Open valve slowly to avoid pressure shock.
Suck back of water into the container must be prevented.
Do not allow backfeed into the container.
Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
Keep away from ignition sources (including static discharges).
Refer to supplier's container handling instructions.

7.2. Conditions for safe storage, including any incompatibilities

Storage

: Keep away from combustible materials.
Keep container below 50°C in a well ventilated place.
Observe all regulations and local requirements regarding storage of containers.
Containers should not be stored in conditions likely to encourage corrosion.
Containers should be stored in the vertical position and properly secured to prevent toppling.
Stored containers should be periodically checked for general condition and leakage.
Container valve guards or caps should be in place.
Store containers in location free from fire risk and away from sources of heat and ignition.

: Segregate from flammable gases and other flammable materials in store.
Keep container below 50°C in a well ventilated place.

7.3. Specific end use(s)

: None.

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

Occupational Exposure Limits : TWA 25ppm 45mg/m³
DNEL: Derived no effect level : None available.
PNEC: Predicted no effect concentration : None available.

8.2. Exposure controls

8.2.1. Appropriate engineering controls : Systems under pressure should be regularly checked for leakages.
Provide adequate general and local exhaust ventilation.
Consider work permit system e.g. for maintenance activities.

8.2.2. Individual protection measures, e.g. personal protective equipment : A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk.
The following recommendations should be considered.
Wear safety glasses with side shields
Wear leather safety gloves and safety shoes when handling cylinders.

Personal protection : Do not smoke while handling product.
Ensure adequate ventilation.
Protect eyes, face and skin from liquid splashes.

8.2.3. Environmental exposure controls : Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

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SECTION 9. Physical and chemical properties
9.1. Information on basic physical and chemical properties
Appearance

- Physical state at 20°C / 101.3kPa : Liquefied gas.
- Colour : Colourless liquid.
- Odour : Sweetish.
Poor warning properties at high concentrations.
- Odour threshold : Odour threshold is subjective and inadequate to warn for overexposure.
- pH value : Not applicable for gas-mixtures.
- Molar mass [g/mol] : Not applicable for gases and gas-mixtures.
- Melting point [°C] : -90.81
- Boiling point [°C] : -88.5
- Critical temperature [°C] : 36.4
- Flash point [°C] : Not applicable for gas-mixtures.
- Evaporation rate (ether=1) : Not applicable for gas-mixtures.
- Flammability range [vol% in air] : Oxidiser.
- Vapour pressure [20°C] : Not applicable.
50.8 bar
- Relative density, gas (air=1) : 1.5
- Relative density, liquid (water=1) : 1.2
- Solubility in water [mg/l] : 2.2
- Partition coefficient n-octanol/water : Not applicable for gas-mixtures.
- Auto-ignition temperature [°C] : Not applicable.
- Viscosity at 20°C [mPa.s] : Not applicable.
- Explosive Properties : Not applicable.

9.2. Other information

- Other data : Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.
- Molecular weight : 44

SECTION 10. Stability and reactivity
10.1. Reactivity
Stability and reactivity

- : No reactivity hazard other than the effects described in sub-sections below.
- : May react violently with combustible materials.
May react violently with reducing agents.
Violently oxidises organic material.
Thermal decomposition yields toxic products which can be corrosive in the presence of moisture. At temperatures over 575°C and at atmospheric pressure, nitrous oxide decomposes into nitrogen and oxygen. Pressurized nitrous oxide can also decompose at temperatures equal or greater than 300°C. In the presence of catalysts (e.g. halogen products, mercury, nickel, platinum) the rate of decomposition increases and decomposition can occur at even lower temperatures. Nitrous oxide dissociation is irreversible and exothermic, leading to a considerable rise in pressure.
Liquid spillages can cause embrittlement of structural materials.

10.2. Chemical stability

- : Stable under normal conditions.

10.3. Possibility of hazardous reactions

- : At temperatures over 575°C and at atmospheric pressure, nitrous oxide decomposes into nitrogen and oxygen.
May react violently with combustible materials.
May react violently with reducing agents.

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SECTION 10. Stability and reactivity (continued)

10.4. Conditions to avoid

: High temperature.

10.5. Incompatible materials

: Reducing agents.
Combustible material.

10.6. Hazardous decomposition products

: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11. Toxicological information

11.1. Information on toxicological effects

| | |
|---------------------------------------|-----------------------------------------------------|
| Toxicity information | : No known toxicological effects from this product. |
| Acute toxicity | : No known toxicological effects from this product. |
| Rat inhalation LC50 [ppm/4h] | : No data available. |
| Skin corrosion/irritation | : No known effects from this product. |
| Serious eye damage/irritation | : No known effects from this product. |
| Respiratory or skin sensitisation | : No known effects from this product. |
| Carcinogenicity | : No known effects from this product. |
| Germ cell mutagenicity | : No known effects from this product. |
| Toxic for reproduction : Fertility | : No known effects from this product. |
| Toxic for reproduction : unborn child | : No known effects from this product. |
| STOT-single exposure | : No known effects from this product. |
| STOT-repeated exposure | : No known effects from this product. |
| Aspiration hazard | : Not applicable for gases and gas-mixtures. |

SECTION 12. Ecological information

12.1. Toxicity

: No data available.

12.2. Persistence - degradability

: No data available.

12.3. Bioaccumulative potential

: No data available.

12.4. Mobility in soil

: No data available.

12.5. Results of PBT and vPvB assessment

: No data available.

12.6. Other adverse effects

| | |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Ecological effects information | : Can cause frost damage to vegetation. When discharged in large quantities may contribute to the greenhouse effect. |
| Effect on the global warming | : Contains greenhouse gas(es) not covered by 842/2006/EC |
| Global warming potential [CO2=1] | : 296 |

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SECTION 13. Disposal considerations

13.1. Waste treatment methods

General

- : May be vented to atmosphere in a well ventilated place.
Do not discharge into any place where its accumulation could be dangerous.
Refer to the code of practice of EIGA (Doc. 30/10 "Disposal of Gases, downloadable at <http://www.eiga.org>) for more guidance on suitable disposal methods
Contact supplier if guidance is required.
- : May be vented to atmosphere in a well ventilated place.
Do not discharge into any place where its accumulation could be dangerous.
Contact supplier if guidance is required.
Discharge to atmosphere in large quantities should be avoided.

13.2. Additional information

- : None.

SECTION 14. Transport information

UN number : 1070

Labelling ADR, IMDG, IATA



- : 2.2 : Non flammable, non toxic gas.
- : 5.1 : Oxidizing substances.

Land transport (ADR/RID)

- H.I. nr : 25
- UN proper shipping name : UN1070 NITROUS OXIDE, 2.2 (5.1), 20
NITROUS OXIDE
- Transport hazard class(es) : 2
- Classification code : 2 O
- Packing group : O
- Packing Instruction(s) : P200
- Tunnel Restriction : C/E Tank carriage: Passage forbidden through tunnels of category C, D and E; Other carriage: Passage forbidden through tunnels of category E
- HAZCHEM - Emergency Action Code : 2P
: 2 = Fine water spray.
P = Risk of violent reaction or explosion. Recommended personal protective equipment :
Liquid-tight chemical protective clothing and breathing apparatus. Appropriate measures :
dilute.

Sea transport (IMDG)

- Proper shipping name : NITROUS OXIDE
- Class : 2.2
- Emergency Schedule (EmS) - Fire : F-C S-W
- Emergency Schedule (EmS) - Spillage : S-W
- Packing instruction : P200
- IMDG-Marine pollution : NO -

Air transport (ICAO-TI / IATA-DGR)

- Proper shipping name (IATA) : NITROUS OXIDE
- Class : 2
2.2
- Passenger and Cargo Aircraft : Allowed.
- Packing instruction - Passenger and Cargo Aircraft : 200

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SECTION 14. Transport information (continued)

Cargo Aircraft only : Allowed.
Packing instruction - Cargo Aircraft only : 200

Special precautions for user

: 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.

Labelling ADR



- IMO-IMDG code
- ICAO/IATA

: 2.2 : Non flammable, non toxic gas.
5.1 : Oxidizing substances.
: Class 2
: Packaging instructions cargo : 200
Packaging instructions passenger: 200

- IATA Packing group

: O

In case of spillage and/or leakage
Other transport information

: Clean up even minor leaks or spills if possible without unnecessary risk.
: 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 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.
- Ensure there is adequate ventilation.
- Compliance with applicable regulations.

Personal precautions

: The driver shall not attempt to deal with any fire of the load.

Emergency action in case of accident

: Stop the engine.
No naked lights. No smoking.
Mark roads and warns other road users.
Keep public away from danger area.
NOTIFY POLICE AND FIRE BRIGADE IMMEDIATELY.

Additional information
General information

: None.

SECTION 15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU legislation

Seveso directive 96/82/EC : Not covered.

National legislation

: Ensure all national/local regulations are observed.

15.2. Chemical Safety Assessment

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SECTION 15. Regulatory information (continued)

: A CSA does not need to be carried out for this product.

SECTION 16. Other information

| | |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Indication of changes | : Revised safety data sheet in accordance with commission regulation (EU) No 453/2010 |
| Training advice | : Receptacle under pressure. Asphyxiant in high concentrations. May cause frostbite. The hazard of asphyxiation is often overlooked and must be stressed during operator training. Ensure all national/local regulations are observed. |
| List of full text of R-phrases in section 3. | : R8 : Contact with combustible material may cause fire. |
| List of full text of H-statements in section 3. | : H270 - May cause or intensify fire; oxidizer. H280 - Contains gas under pressure; may explode if heated. |
| Further information | : Classification in accordance with calculation methods of regulation (EC) 1272/2008 CLP / (EC) 1999/45 DPD. This Safety Data Sheet has been established in accordance with the applicable European Union legislation. |
| Note | : This Safety Data Sheet has been established in accordance with the applicable European Union legislation. |
| DISCLAIMER OF LIABILITY | : Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out. Details given in this document are believed to be correct at the time of going to press. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted. |

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