

SAFETY DATA SHEET

NITROUS OXIDE in non-refillable gas cylinders not exceeding 50 ml

ICO.SDS.003A.en | Version: 01 (New release) | Issue date: April 2025
Last revision date: - | Supersedes version of: -



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

1.1. Product identifier

Trade name : Nitrous oxide in non-refillable gas cylinders not exceeding 50 ml
Chemical description : Nitrous oxide
▪ CAS no. : 10024-97-2
▪ EG no. : 233-032-0
▪ Index no. : --
Chemical formula : N₂O
Registration number : 01-2119970538-25

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

Relevant identified uses : For various industrial and medical applications. Calibration gas for analytical equipment, propellant, inflation gas, refrigerant. Perform risk assessment prior to use.

1.3. Details of the supplier of the safety data sheet

Company identification : iSi Components GmbH Website: www.isi.com/components
Kuerschnergasse 6A E-mail: ico@isi.com
A-1210 Vienna, Austria Phone: +43 1 25099-1803

1.4. Emergency telephone number

Emergency telephone number : Poison information hotline Tel.: +43 1 406 43 43

Section 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to EC 1272/2008 (CLP / GHS)

- Physical hazards : Oxidising gas: Category 1 – H270: May cause or intensify fire; oxidizer
Gas under pressure: Liquefied gas – H280: Contains gas under pressure; may explode, if heated.
- Health hazards : Specific target organ toxicity – single exposure, Category 3, Narcosis – H336: May cause drowsiness or dizziness.

2.2. Label elements

Labelling according to EC 1272/2008 (CLP /GHS)

- Hazard pictogram(s) : 
- Hazard pictogram codes : GHS03, GHS04, GHS07
- Signal word : Danger
- Hazard statement : H270: May cause or intensify fire; oxidizer.
H280: Contains gas under pressure; may explode if heated.
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Precautionary statements

- General : P102: Keep out of reach of children.
- Prevention : P220: Keep /Store away from clothing/ .../ combustible materials.
P244: Keep cylinders, valves and fittings free from oil and grease.
P260: Do not breathe gas/vapours.
- Response : P304+P340+P315: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get immediate medical advice.
P370+P376: In case of fire: Stop leak, if safe to do so.
- Storage : P403: Store in a well-ventilated place.

2.3. Other hazards

- : Asphyxiant in high concentrations.
Contact with liquid may cause cold burns/ frost bite.
This product does not have endocrine disruptive properties.

Section 3: Composition/information on ingredients

3.1. Substance / 3.2. Mixture

Substance name	Concentration	CAS no.	EC no.	REACH registration no.	M-Factor	Classification (GHS / CLP)
Nitrous oxide	100%	10024-97-2	233-032-0	01-2119970538-25	-	Ox. Gas 1 (H270) Press. Gas (Liq.) H280

Notes:

Does not contain any other components or impurities which could affect the classification of this product.

For full text of H statements: see section 16

This substance has workplace exposure limit(s).

PBT: persistent, bioaccumulative and toxic substance.

vPvB: very persistent and very bioaccumulative substance.

Section 4: First aid measures

4.1. Description of first aid measures

- Inhalation** : Remove victim to uncontaminated area wearing self-contained respiratory equipment. Keep victim warm and rested.
Call a doctor. Attempt artificial respiration, if the victim stops breathing.
- Skin contact** : Spray any cold burns immediately with water for at least 15 minutes. Cover with a sterile dressing. Consult a doctor.
- Eye contact** : Immediately flush eyes thoroughly with water for at least 15 minutes.
- Ingestion** : Ingestion is not considered a possible route of exposure.

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

- : High concentrations may cause asphyxiation. Symptoms can include loss of mobility/ consciousness. Victim may not be aware of asphyxiation.
Low concentrations may cause narcotic effects. Symptoms can include dizziness, headache, nausea and coordination problems.

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

- : None.

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Section 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Water spray or fog.
- Unsuitable extinguishing media : Do not use water jet to extinguish.

5.2. Special hazards arising from the substance or mixture

- Specific hazards : Exposure to fire may cause cylinder to burst/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.

5.3. Advice for firefighters

- Specific methods : Adopt firefighting measures to the surroundings of the fire.
Cylinder may burst/explode if exposed to direct flame and thermal radiation by fire, respectively.
Move away from cylinder and cool with water from a safe position.
Prevent contaminated quench water from entering sewer systems, basements, work pits or any other areas
If possible, attempt to stop gas release.
- Special protective equipment for fire fighters : Wear gas tight chemically protective clothing in combination with self contained breathing apparatus.
Guidelines:
EN 943-2 – Protective clothing against liquid and gaseous chemicals, including liquid aerosols and solid particles. Performance requirements for gas-tight (Type 1) chemical protective suits for emergency teams.
EN 137 – Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking.

Section 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- : Attempt to stop gas release.
Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
Evacuate area.
Provide adequate ventilation.
Eliminate ignition sources.
Prevent from entering sewer systems, basements, work pits or any other areas where accumulation could be hazardous.

6.2. Environmental precautions

- : Attempt to stop gas release.

6.3. Methods and material for containment and cleaning up

- : Provide adequate ventilation.

6.4. Reference to other sections

- : See also section 8 and section 13.

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Section 7: Handling and storage

7.1. Precautions for safe handling

- Safe use of product** :
- Only experienced and properly instructed persons should handle gases under pressure.
 - The substance must be handled in accordance with good industrial hygiene and safety procedures.
 - Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. If in doubt, consult supplier.
 - Ensure the complete gas system was (or is regularly) checked for leaks before use.
 - Do not use oil or grease.
 - Do not breathe gas.
 - Keep away from ignition sources (including electrostatic discharge).
 - Do not smoke while handling product.
- Safe handling of pressurized cylinder** :
- Refer to supplier's handling instructions.
 - Only use equipment suitable for this product and its pressure and temperature specified. If in doubt, consult supplier.
 - Do not allow backfeed into cylinder.
 - Never use direct flame or electrical heating devices to raise the pressure of a cylinder.
 - Never attempt to refill an empty cylinder.
 - Never attempt to transfer gases from one cylinder to another.
 - Emerging gas will cause the cylinder to freeze.
 - Do not touch a discharging or recently discharged cylinder with bare hands.
 - Do not use cylinder as roller or support, or for any other purpose than to contain the gas as supplied.
 - Do not subject cylinder to mechanical shocks which may cause damage to their integrity.

7.2. Conditions for safe storage, including any incompatibilities

- :
- Keep out of reach of children.
 - Store cylinder in a well-ventilated place at less than 50°C.
 - Store cylinder in a location free from risk of fire and away from sources of heat and ignition.
 - Periodically check cylinder for general conditions and leakage.
 - Do not store cylinder in conditions likely to encourage corrosion.
 - Observe all regulations and local requirements regarding storage of gas cylinders.

7.3. Specific end use(s)

- :
- None.

Section 8: Exposure controls/personal protection

8.1. Control parameters

- OEL (Occupational Exposure Limits)** :
- | | |
|---------------------------|--|
| MAK, mean (Austria) | 100 ppm / 180g/m ³ (BGBL II no. 186/2015) |
| MAK, short term (Austria) | 400 ppm / 720g/m ³ (BGBL II no. 186/2015) |

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DNEL (Derived No-Effect Level) :

Workers – inhalation	183 mg/m ³
Systemic, long-term	183 mg/m ³

PNEC (Predicted No-Effect Concentration) : No data available.

8.2. Exposure controls

- 8.2.1. Appropriate engineering controls** : Ensure adequate air ventilation.
Provide adequate general and local ventilation to ensure that defined occupational exposure limits are not exceeded.
Systems under pressure should be regularly checked for leakages.
Oxygen detectors should be used when asphyxiating gases may be released.
Preferably use permanent leak tight connections.
- 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:
– Select PPE based on the task being performed and risks involved.
- **Eye/face protection** : Wear eye protection to EN 166 – Personal eye protection
Guideline: EN 166 – Personal eye protection
 - **Skin protection** :
 - Hand protection : Wear working gloves while handling gas cylinders.
Guideline: EN 388 – Protective gloves against mechanical risks.
 - Other : Wear safety shoes while handling gas cylinders.
Guideline: EN ISO 20345 – Personal protective equipment – Safety footwear.
 - **Respiratory protection** : Not required.
 - **Thermal hazards** : No precautionary measures are necessary.
- 8.2.3 Environmental exposure controls** : Refer to local regulations for restriction of emissions to the atmosphere.
For waste disposal see section 13.

Section 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance

- **Physical state at 20°C/ 101,03kPa** : Gas.
- **Colour** : Colourless.

Odour : Sweetish. Poor warning properties at high concentrations..

Odour threshold : Odour threshold is subjective and inadequate to warn of overexposure.

Melting point [°C] : -90.81

Boiling point [°C] : -88.5

Critical temperature [°C] : 36.4

Evaporation rate (ether = 1) : Not applicable to gases and gas mixtures.

Flammability : Non flammable.

Lower and upper explosion limit : Not applicable.

Flash point : Not applicable to gases and gas mixtures.

Autoignition temperatur [°C] : Not applicable.

Oxidizing properties : Oxidizer.

pH value : Not applicable to gases and gas mixtures.

Viscosity [20°C] : No data available.

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Solubility in water [mg/l]	: 1,500 (completely soluble)
Partition coefficient n-octanol/water [log Kow]	: 0.4
Vapour pressure at 20°C [bar]	: 50.8
Relative density, liquid (water = 1)	: 1.2
Relative density, gas (air = 1)	: 1.5
Particle characteristics:	: Not applicable

9.2. Other information

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

Molecular weight [g/mol]: 44

Section 10: Stability and reactivity

10.1. Reactivity

: No reactivity hazard other than the effects described in sub-section below.

10.2. Chemical stability

: Stable under normal conditions.
At temperatures above 575°C and at atmospheric pressure, nitrous oxide decomposes into nitrogen and oxygen.
Pressurized nitrous oxide can also decompose into nitrogen and oxygen at temperatures equal or above 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.
The decomposition of nitrous oxide is exothermic and irreversible, leading to considerable rise in pressure.

10.3. Possibility of hazardous reactions

: Violently oxidises organic material.

10.4. Conditions to avoid

: Heat.

10.5. Incompatible materials

: Can violently react with combustible materials.
Can violently react with reducing agents.
Violently oxidizes organic materials.
For additional information - see ISO 11114.

10.6. Hazardous decomposition products

: Under normal conditions of storage and use, hazardous decomposition products should not be produced. 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 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity - oral	Classification criteria are not met.
Acute toxicity - dermal	Classification criteria are not met.
Acute toxicity - inhalation	: Classification criteria are not met. LC 50 (Mouse, 4 h): > 500000 ppm Remarks: Gas Experimental result, Key study
Repeated dose toxicity	: NOAEL (Mouse(Female, Male), Inhalation, 14 Weeks): 50.000 ppm(m) Inhalation. Experimental result, key study
Skin corrosion/irritation	: Classification criteria are not met.
Serious eye damage/irritation	: Classification criteria are not met.
Respiratory or skin sensitisation	: Classification criteria are not met.
Germ cell mutagenicity	: Classification criteria are not met.
Carcinogenicity	: Classification criteria are not met.
Reproductive toxicity	: Classification criteria are not met.
Specific Target Organ Toxicity – single exposure	: May cause drowsiness or dizziness.
Specific Target Organ Toxicity – repeated exposure	: Classification criteria are not met.
Aspiration hazard	: Not applicable for gases and gas mixtures.

11.2. Information on other hazards

Endocrine disrupting properties	: No data available.
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Section 12: Ecological information

12.1. Toxicity

	: No ecological damage caused by this product.
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12.2. Persistence and degradability

	: No applicable to gases and gas mixtures.
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12.3. Bio-accumulative potential

	: The subject product is expected to biodegrade and is not expected to persist for long periods in an aquatic environment.
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12.4. Mobility in soil

	: Because of its high volatility, the product is unlikely to cause ground or water pollution.
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12.5. Results of PBT- and vPvB assessment

	: Not classified as PBT or vPvB.
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12.6. Endocrine disrupting properties

	: No data available.
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12.7. Other adverse effects

Effect on ozone layer	: None.
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Global warming potential [CO₂ = 1] : 298
Effect on the global warming : When discharged in large quantities may contribute to the greenhouse effect.

Section 13: Disposal considerations

13.1. Waste treatment information

: Do not discharge into any place where its accumulation could be dangerous.
May be vented to atmosphere in a well-ventilated place.
Dispose of emptied cylinders only.
Cylinders are made of recyclable steel and hence a valuable resource. Emptied cylinders should therefore always be recycled.
Adhere to local waste regulations when disposing of emptied cylinders.
Never dispose of cylinders in an uncontrolled manner (e.g. dumping at sea).
Consult your supplier, if you require advice.

List of hazardous waste codes (from Commission Decision 2001/118/EC) : 16 05 05: Gases in pressure containers other than those mentioned in 16 05 04.

13.2. Additional information

: None.

Section 14: Transport information

14.1 UN number

UN number : UN 2037

14.2 UN proper shipping name

Land transport (ADR/RID) : As per Special Provision 191 of the ADR:
"Receptacles, small, with a capacity not exceeding 50 ml, containing only non-toxic constituents are not subject to the requirements of ADR."

Sea transport (IMDG) : As per Special Provision 191 of the IMDG Code:
"Receptacles, with a capacity not exceeding 50 mL containing only non-toxic constituents are not subject to the provisions of this Code."

Air transport (ICAO-TI / IATA-DGR) : Transport not permitted.

14.3 Transport hazard class(es)

ADR : Class: 2 Classification code: 5O

IMDG Code : Class: 2

ICAO-TI / IATA DGR : Transport not permitted

14.4 Packing group

: Not applicable.

14.5 Environmental hazards

: Not applicable.

14.6 Special precautions for user

: Avoid transport on vehicles where the load space is not separated from the driver's compartment.

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Ensure the 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 the gas cylinders:

- Ensure there is adequate ventilation.
- Ensure the gas cylinders are firmly secured.

14.7 Maritime transport in bulk according to IMO instruments

: Not applicable.

Section 15: Regulatory information

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

EU-Regulations

Restrictions on use	: None.
Seveso III directive 2012/18/EU	: Mentioned.
National legislation	: Ensure that all national/local regulations are observed.
Water hazard class (WGK)	: 1 – slightly water-endangering

15.2. Chemical safety assessment

: A chemical safety assessment has been carried out.

Section 16: Other information

Indication of changes	: This Safety Data Sheet has been worked out to comply with Regulation (EU) 1907/2006, amended by (EU) 2020/878.
Training advice	: The hazard of asphyxiation is often overlooked and must be stressed during operator training.
Full text of H-statements in section 2 and 3	: H270: May cause or intensify fire; oxidizer. H280: Contains gas under pressure; may explode if heated. H336: May cause drowsiness or dizziness.
Further information	: This safety data sheet has been produced in accordance with the applicable European directives. It applies to all countries which have adopted these directives as part of their national legislation.
Disclaimer of liability	: The information contained in this safety data sheet has been obtained from sources which we consider reliable. Details given in this document are believed to be correct at the time of going to press. The conditions or methods for handling, storage, use or disposal of the product are not under our control and also possibly out of our information. Because of this and other reasons no liability for injury or damage resulting from its handling, storage, use or disposal can be accepted. This safety data sheet has been worked out for this specific product and may only be used in conjunction with this product. Should this product be part of another product the information contained in this document may be inappropriate.

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