

MATERIAL SAFETY DATA SHEET



NITROUS OXIDE (LIQUID, REFRIGERATED)

SSI/MSDS/N2O/1
Issue No. : 2; Rev. No. 1
Date : 10.12.2018

Danger



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

1.1. Product identifier

Trade name : Nitrous oxide (refrigerated)
 SDS no SSI/MSDS/N2O/1
 Chemical description Nitrous oxide (refrigerated)
 CAS No : 10024-97-2
 EC no : 233-032-0
 EC Index-No. : 008-001-00-8
 Registration-No. 01-2119970538-25
 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. Medical applications. Contact supplier for more information on uses.
 Uses advised against : Consumer use.

1.3. Details of the supplier of the safety data sheet

Company identification : SICGILSOL India Pvt Ltd
 Plot S-2, Phase III, Sipcot industrial complex,
 Nellikuppam, Walajapet Taluk, Ranipet-632405
 Mob.No : 09677237866
<http://www.sicgilsol.com/>

1.4. Emergency telephone number

Emergency telephone number : Mob.No : 09677237866

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Physical hazards Oxidising Gases, Category 1 H270
 Gases under pressure : Refrigerated liquefied gas H281
 Health hazards Specific target organ toxicity — Single exposure, Category 3, Narcosis H336

2.2. Label elements

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

Hazard pictograms (CLP) :



Signal word (CLP) :

Danger

Hazard statements (CLP) :

H270 - May cause or intensify fire; oxidizer
 H281 - Contains refrigerated gas; may cause cryogenic burns or injury
 H336 - May cause drowsiness or dizziness.

Precautionary statements (CLP)

Prevention

P220 - Keep away from combustible materials
 P282 - Wear cold insulating gloves, face shield, eye protection
 P244 - Keep valves and fittings free from oil and grease

Response

P304+P340+P315 - IF INHALED : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get immediate medical advice / attention
 P336+P315 - Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice / attention
 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/frostbite

SECTION 3: Composition/information on ingredients

3.1. Substances

:

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
NITROUS OXIDE, REFRIGERATED LIQUID	(CAS No) 10024-97-2 (EC no) 233-032-0 (EC index no) --- (Registration-No.) 01-2119970538-25	100	Ox. Gas 1, H270 Press. Gas (Ref. Liq.), H281 STOT SE 3, H336

MATERIAL SAFETY DATA SHEET



NITROUS OXIDE (LIQUID, REFRIGERATED)

SSI/MSDS/N2O/1

Issue No. : 2; Rev. No. 1

Date : 10.12.2018

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

Full text of H-statements see section 16.

3.2. Mixtures : Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

- Inhalation : 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 contact : In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.
- Eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes.
- Ingestion : Ingestion is not considered a potential route of exposure.

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

- : 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 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

- 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 : Supports combustion., Exposure to fire may cause containers to rupture/explode.
- 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 : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heatradiation may cause gas receptacles to rupture. Cool endangered receptacles with water sprayjet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems. If possible, stop flow of product. Use water spray or fog to knock down fire fumes if possible. Move containers away from the fire area if this can be done without risk.
- Special protective equipment for fire fighters : Standard protective clothing and equipment (Self Contained Breathing Apparatus) for firefighters. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with fullface mask. Standard EN 469 - Protective clothing for firefighters. Standard - EN 659: Protective gloves for firefighters.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- : Try to stop release. Evacuate area. Monitor concentration of released product. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ensure adequate air ventilation. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Act in accordance with local emergency plan. Stay upwind.

6.2. Environmental precautions

- : Try to stop release.

6.3. Methods and material for containment and cleaning up

- : Ventilate area, Liquid spillages can cause embrittlement of structural materials, 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 : The product must be handled in accordance with good industrial hygiene and safety procedures Only experienced and properly instructed persons should handle gases under pressure Consult supplier for specific recommendations Consider pressure relief device(s) in gas installations Ensure the complete gas system was (or is regularly) checked for leaks before use Do not smoke while handling product Protect eyes, face and skin from liquid splashes Keep equipment free from oil and grease Use no oil or grease Use only properly specified equipment which is suitable for this product, its supply pressure and temperature.

MATERIAL SAFETY DATA SHEET



NITROUS OXIDE (LIQUID, REFRIGERATED)

SSI/MSDS/N2O/1

Issue No. : 2; Rev. No. 1

Date : 10.12.2018

Contact your gas supplier if in doubt Avoid suck back of water, acid and alkalis Keep away from ignition sources (including static discharges) Do not breathe gas Avoid release of product into atmosphere For more guidance on safe use, refer to the EIGA Doc.176 "Safe practices for storage and handling of Nitrous oxide", downloadable at <http://www.eiga.org> and consult your supplier Temperatures above 150°C (300°F) shall be avoided by all practical means, to reduce the likelihood of an explosive decomposition of the nitrous oxide Clean all surfaces in direct contact with nitrous oxide as for oxygen service Nitrous oxide transfer pumps shall be provided with an interlock to prevent dry running Use self-limiting heating devices. Direct contact electric immersion heaters are not allowed.

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. 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. Containers should be stored in the vertical position and properly secured to prevent them from falling over.

7.2. Conditions for safe storage, including any incompatibilities

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

7.3. Specific end use(s)

: None

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

OEL (Occupational Exposure Limits) : No data available.

DNEL (Derived-No Effect Level) : No data available.

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

8.2. Exposure controls

8.2.1. 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 (where available). Oxygen detectors should be used when asphyxiating gases may be released. Consider the use of a 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: PPE compliant to the recommended EN/ISO standards should be selected.

• Eye/face protection

: Wear safety glasses with side shields. Wear goggles and a face shield when transfilling or breaking transfer connections. Standard EN 166 - Personal eye-protection - specifications

• Skin protection

- Hand protection

: Wear working gloves when handling gas containers. Standard EN 388 - Protective gloves against mechanical risk.

- Other

: Consider the use of flame resistant safety clothing. Standard EN ISO 14116 - Limited flame spread materials. Wear safety shoes while handling containers. Standard EN ISO 20345 - Personal protective equipment - Safety footwear.

• Respiratory protection

: None necessary.

• Thermal hazards

: Wear cold insulating gloves when transfilling or breaking transfer connections. Wear cold insulating gloves. Standard EN 511 - Cold insulating gloves.

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.

MATERIAL SAFETY DATA SHEET



NITROUS OXIDE (LIQUID, REFRIGERATED)

SSI/MSDS/N2O/1
Issue No. : 2; Rev. No. 1
Date : 10.12.2018

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state at 20°C / 101.3kPa	: Gas.
Colour	: Colourless liquid.
Odour	: Sweetish. Poor warning properties at high concentrations.
Odour threshold	: Odour threshold is subjective and inadequate to warn of overexposure.
pH value	: Not applicable.
Molar mass	44 g/mol
Melting point	-90.81 °C
Boiling point	-88.5 °C
Flash point	: Not applicable for gases and gas mixtures.
Critical temperature [°C]	36.4 °C
Evaporation rate (ether=1)	: Not applicable for gases and gas mixtures.
Flammability range	: Non flammable.
Vapour pressure [20°C]	50.8 bar(a)
Vapour pressure [50°C]	: Not applicable.
Relative density, gas (air=1)	1.5
Relative density, liquid (water=1)	1.2
Solubility in water	1500 mg/l
Partition coefficient n-octanol/water	0.4
Auto-ignition temperature	: Not applicable.
Viscosity [20°C]	: Not applicable.
Explosive Properties	: Not applicable
Oxidising Properties	: Oxidiser
- Coefficient of oxygen equivalency (Ci)	0.6

9.2. Other information

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

SECTION 10: Stability and reactivity

10.1. Reactivity

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

10.2. Chemical stability

: Stable under normal conditions, At temperatures over 575°C and at atmospheric pressure, nitrous oxide decomposes into nitrogen and oxygen. 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. Temperatures above 150°C (300°F) shall be avoided by all practical means, to reduce the likelihood of an explosive decomposition of the nitrous oxide.

10.3. Possibility of hazardous reactions

Violently oxidises organic material, May react violently with reducing agents

10.4. Conditions to avoid

: None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

May react violently with combustible materials, May react violently with reducing agents. For additional information on compatibility refer to ISO 11114

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

Acute toxicity

: Classification criteria are not met, Inhalation causes narcotic effects. Toxicological effects not expected from this product if occupational exposure limit values are not exceeded. LC50 inhalation rat (ppm) 500000 ppm/4h

Skin corrosion/irritation

: No known effects from this product.

eye damage/irritation

: No known effects from this product.

Respiratory or skin

: No known effects from this product.

sensitisation

: No known effects from this product.

Germ cell

: No known effects from this product.

mutagenicity

: No known effects from this product.

Carcinogenicity

: Classification criteria are not met, Reduced fertility in occupationally exposed personnel (healthcare) has been reported in some epidemiological studies. The effect was related to repeated exposure to levels of nitrous oxide above the specified occupational exposure limits in inadequately ventilated rooms

Toxic for reproduction : Fertility

: Classification criteria are not met, Reduced fertility in occupationally exposed personnel (healthcare) has been reported in some epidemiological studies. The effect was related to repeated exposure to levels of nitrous oxide above the specified occupational exposure limits in inadequately ventilated rooms

Toxic for reproduction : unborn child

: No known effects from this product.

STOT-single exposure

: No known effects from this product. In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of co-ordination

: Classification criteria are not met, At low concentrations: Neurologic effect, Hemotoxic effect,

STOT-repeated exposure

Target Organs

Erythrocytes, Kidneys, liver, Central nervous system

Aspiration hazard

: Not applicable for gases and gas mixtures.

MATERIAL SAFETY DATA SHEET



NITROUS OXIDE (LIQUID, REFRIGERATED)

SSI/MSDS/N2O/1
Issue No. : 2; Rev. No. 1
Date : 10.12.2018

SECTION 12: Ecological information

12.1. Toxicity

Assessment : Classification criteria are not met.
EC50 48h - Daphnia magna [mg/l] : Study scientifically unjustified
EC50 72h - Algae [mg/l] : Study scientifically unjustified
LC50 96 h - Fish [mg/l] : Study scientifically unjustified

12.2. Persistence and degradability

Assessment : Not applicable for inorganic gases. Study scientifically unjustified. No data available

12.3. Bioaccumulative potential

Assessment : Product / Substance is a gas. Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9. Partition into water is unlikely

12.4. Mobility in soil

Assessment : Product / Substance is a gas. Because of its high volatility, the product is unlikely to cause ground or water pollution. Partition into soil is unlikely.

12.5. Results of PBT and vPvB assessment

Assessment : Not classified as PBT or vPvB.

12.6. Other adverse effects

Effect on the ozone layer : None.
Effect on global warming : When discharged in large quantities may contribute to the greenhouse effect
Contains greenhouse gas(es)

SECTION 13: Disposal considerations

13.1. Waste treatment 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. Ensure that the emission levels from local regulations or operating permits are not exceeded. Refer to the EIGA code of practice Doc.30 "Disposal of Gases", downloadable at <http://www.eiga.org> for more guidance on suitable disposal methods.

List of hazardous waste codes (from Commission Decision 2001/118/EC)

: 16 05 04 : 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

: 2201

14.2. UN proper shipping name

Transport by road/rail (ADR/RID)

: NITROUS OXIDE, REFRIGERATED LIQUID

Transport by air (ICAO-TI / IATA-DGR)

: NITROUS OXIDE, REFRIGERATED LIQUID

Transport by sea (IMDG)

: NITROUS OXIDE, REFRIGERATED LIQUID

14.3. Transport hazard class(es)

Labelling



2.2 : Non-flammable, non-toxic gases
5.1 : Oxidizing substances

Transport by road/rail (ADR/RID)

Class : 2
Classification code : 30
Hazard identification number : 225
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

Transport by air (ICAO-TI / IATA-DGR)

Class / Div. (Su) : 2.2 (5.1)

Transport by sea (IMDG)

Class / Div. (Su) : 2.2 (5.1)
Schedule (EmS) - Fire Emergency : F-C
Schedule (EmS) - Spillage : S-W

14.4. Packing group

Transport by road/rail (ADR/RID) : Not applicable
Transport by air (ICAO-TI / IATA-DGR) : Not applicable
Transport by sea (IMDG) : Not applicable

14.5. Environmental hazards

Transport by road/rail (ADR/RID) : None.
Transport by air (ICAO-TI / IATA-DGR) : None.
Transport by sea (IMDG) : None.

MATERIAL SAFETY DATA SHEET



NITROUS OXIDE (LIQUID, REFRIGERATED)

SSI/MSDS/N2O/1
Issue No. : 2; Rev. No. 1
Date : 10.12.2018

14.6. Special precautions for user

Packing Instruction(s)

Transport by road/rail (ADR/RID) : P203
Transport by air (ICAO-TI / IATA-DGR)
Passenger and Cargo Aircraft : Forbidden
Cargo Aircraft only : Forbidden
Transport by sea (IMDG) : P203
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.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

: 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 Directive : 2012/18/EU (Seveso III) Covered.

National regulations

National legislation : Ensure all national/local regulations are observed.
Water hazard cl : -
Kenn- Nr : 767

15.2. Chemical safety assessment

: 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 2015/830.
Training advice : The hazard of asphyxiation is often overlooked and must be stressed during operator training. Receptacle under pressure.
Further information : This Safety Data Sheet has been established in accordance with the applicable European Union legislation. Classification in accordance with the calculation methods of Regulation (EC) 1272/2008 CLP.

Full text of H- and EUH-statements

Ox. Gas 1	Oxidising Gases, Category 1
Press. Gas (Ref. Liq.)	Gases under pressure : Refrigerated liquefied gas
STOT SE 3	Specific target organ toxicity — Single exposure, Category 3, Narcosis
H270	May cause or intensify fire; oxidizer
H281	Contains refrigerated gas; may cause cryogenic burns or injury
H336	May cause drowsiness or dizziness

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.

End of document