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<b>Nitrous oxide</b>		<b>SDS_N2O</b>



2.2 : Non-flammable, non-toxic gases



5.1 : Oxidizing substances

**Danger**



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

#### 1.1. Product identifier

Trade name	: Nitrous oxide
SDS Nr	: SDS_N2O
Chemical description	: Nitrous oxide
	CAS No: 10024-97-2
	EC No: 233-032-0
	Index No :---
Registration-No.	: Registration deadline not expired.
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. Aerosol propellant. Test gas/Calibration gas. Chemical reaction / Synthesis. Laboratory use. Use for manufacture of electronic/photovoltaic components. Contact supplier for more information on uses.
Uses advised against	: Do not inhale product on purpose.

#### 1.3. Details of the supplier of the safety data sheet

Company identification	: STEELMAN GASES PVT LTD Rajkot Highway, Vill. Shekhpar Surendranagar info@steelmangas.com <a href="http://www.steelmangas.com">www.steelmangas.com</a>
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#### 1.4. Emergency telephone number

Emergency telephone number	: +91 9978952152
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### SECTION 2. Hazards identification

#### 2.1. Classification of the substance or mixture

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

• 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 Not included in Annex VI.

#### 2.2. Label elements

Labelling Regulation EC 1272/2008 (CLP)

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## SECTION 2. Hazards identification (continued)

## • Hazard pictograms



- Hazard pictograms code : GHS03 - GHS04
- Signal word : Danger
- Hazard statements : H270 - May cause or intensify fire; oxidiser. 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.
- 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. Substance / 3.2. Mixture

Substance name	Contents	CAS No, EC No, Index No, Registration no	Classification(DSD)	Classification(CLP)
Nitrous oxide	100 %	10024-97-2, 233-032-0, ----- * 2	O; R8	Ox. Gas 1 (H270) Press. Gas Liquefied (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 section 16. Full text of H-statements see section 16.

## 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. For liquid spillage - flush with water for at least 15 minutes.
- 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.

## 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 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.

##### 5.3. Advice for fire-fighters

- Specific methods** : If possible, stop flow of product. Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from Use water spray or fog to knock down fire fumes if possible.

- Special protective equipment for fire Fighters**

- : Wear gas tight chemically protective clothing in combination with self contained breathing apparatus. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask. EN 943-2: Protective clothing against liquid and gaseous chemicals, aerosols and solid particles. Gas-tight chemical protective suits for emergency teams.

#### SECTION 6. Accidental release measures

##### 6.1. Personal precautions, protective equipment and emergency procedures

- : Try to stop release. Monitor concentration of released product. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Evacuate area. Ensure adequate air ventilation. Eliminate ignition sources. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

##### 6.2. Environmental precautions


- : Try to stop release.

##### 6.3. Methods and material for containment and cleaning up

- : Ventilate area.

##### 6.4. Reference to other sections

- : See also sections 8 and 13.

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## SECTION 7. Handling and storage

### 7.1. Precautions for safe handling

#### Safe use of the 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. Contact your gas supplier if in doubt. Use no oil or grease. Do not smoke while handling product. Keep equipment free from oil and grease. Ensure the complete gas system was (or is regularly) checked for leaks before use. Avoid suck back of water, acid and alkalis. Consider pressure relief device(s) in gas installations.

#### Safe handling of the gas receptacle

: Refer to supplier's container handling instructions. Open valve slowly to avoid pressure shock. 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.

### 7.2. Conditions for safe storage, including any incompatibilities

: Keep container below 50°C in a well ventilated place. Segregate from flammable gases and other flammable materials in store. 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. Observe all regulations and local requirements regarding storage of containers. Containers should not be stored in conditions likely to encourage corrosion. Keep away from combustible materials.

### 7.3. Specific end use(s)

: None.

## SECTION 8. Exposure controls/personal protection

### 8.1. Control parameters

#### Occupational Exposure Limits Nitrous oxide

: Value 15min. (CZ) [mg/m<sup>3</sup>] : 360  
: Value 8h (CZ) [mg/m<sup>3</sup>] : 180  
: LTEL - UK [mg/m<sup>3</sup>] : 183  
: LTEL - UK [ppm] : 100  
: AGW (8h) - Germany [mg/m<sup>3</sup>] TRGS 900 : 180  
: AGW (8h) - Germany [ppm] TRGS 900 : 100  
: Exceeding factor AGW - Germany TRGS 900 : 2  
: MAK (AU) Tagesmittelwert (ml/m<sup>3</sup>) : 100  
: MAK (AU) Tagesmittelwert (mg/m<sup>3</sup>) : 180  
: MAK (AU) Kurzzeitwerte (ml/m<sup>3</sup>) : 400  
: MAK (AU) Kurzzeitwerte (mg/m<sup>3</sup>) : 720  
: VLA-ED - Spain [ppm] : 50

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**Nitrous oxide****SDS\_N2O****SECTION 8. Exposure controls/personal protection (continued)**

: VLA-ED - Spain [ppm] : 50  
: VLA-ED - Spain [mg/m<sup>3</sup>] : 92  
: NGV - [ppm] : 100  
: NGV - [mg/m<sup>3</sup>] : 180  
: KTV - [ppm] : 500  
: KTV - [mg/m<sup>3</sup>] : 900  
: HTP-värden (FI) - 8 H - [ppm] : 100  
: HTP-värden (FI) - 8 H - [mg/m<sup>3</sup>] : 180  
: Grenseverdi (NO) 8 timers [ppm] : 50  
: Grenseverdi (NO) 8 timers [mg/m<sup>3</sup>] : 90  
: VLE-CH [mg/m<sup>3</sup>] : 364  
: VLE-CH [ppm] : 200  
: VME-CH [mg/m<sup>3</sup>] : 182  
: 8-Hour TWA (PL) (NDS) (mg/m<sup>3</sup>) : 90  
: TLV-TWA (Belgium) (ppm) : 50  
: TWA BE 8h [mg/m<sup>3</sup>] : 91  
: TWA LT 8h [ppm] : 100  
: TWA LT 8h [mg/m<sup>3</sup>] : 180  
: STEL LT 15min [ppm] : 500  
: STEL LT 15min [mg/m<sup>3</sup>] : 900  
: TWA EE 8h [ppm] : 100  
: TWA EE 8h [mg/m<sup>3</sup>] : 180  
: STEL EE 15min [ppm] : 500  
: STEL EE 15min [mg/m<sup>3</sup>] : 900  
: TLV© -TWA [ppm] : 50  
: No data available.  
: any data available.

**DNEL: Derived no effect level (Workers)****PNEC: predicted no effect concentration****8.2. Exposure controls****8.2.1. Appropriate engineering controls**

: Systems under pressure should be regularly checked for leakages. Ensure exposure is below occupational exposure limits (where available). Gas detectors should be used when oxidising gases may be released. 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**

: PPE compliant to the recommended EN/ISO standards should be selected. 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:

**• Eye/face protection**

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

**• Skin protection****- Hand protection**

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

**- Other**

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

**• Respiratory protection**

: None necessary.

**• Thermal hazards**

: None necessary.

**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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**Nitrous oxide****SDS\_N2O****SECTION 9. Physical and chemical properties****9.1. Information on basic physical and chemical properties**

Appearance	
Physical state at 20°C / 101.3kPa	: Gas.
Colour	: Colourless.
Odour	: Sweetish. Poor warning properties at high concentrations
Odour threshold	: Odour threshold is subjective and inadequate to warn for overexposure.
pH value	: Not applicable.
Molar mass [g/mol]	: 44
Melting point [°C]	: -90.81
Boiling point [°C]	: -88.5
Critical temperature [°C]	: 36.4
Flash point [°C]	: Not applicable for gases and gas-mixtures.
Evaporation rate (ether=1)	: Not applicable for gases and gas-mixtures.
Flammability range [vol% in air]	: Non flammable.
Vapour pressure [20°C]	: 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 [log Kow]	: Not applicable for inorganic gases.
Auto-ignition temperature [°C]	: Not applicable.
Viscosity at 20°C [mPa.s]	: Not applicable.
Explosive Properties	: Not applicable.
Oxidizing Properties	: Oxidizer.
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	: Nitrous oxide dissociation is irreversible and exothermic, leading to a considerable rise in pressure. 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. Pressurized nitrous oxide can also decompose at temperatures equal or greater than 300°C.
10.3. Possibility of hazardous reactions	: Violently oxidises organic material.
10.4. Conditions to avoid	: Heat.
10.5. Incompatible materials	: May react violently with combustible materials. May react violently with reducing agents. Keep equipment free from oil and grease. 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.

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**Nitrous oxide****SDS\_N2O****SECTION 11. Toxicological information****11.1. Information on toxicological effects**

Acute toxicity	: No known toxicological effects from this product.
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.
Reproductive toxicity	: 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 and degradability	: Not applicable for inorganic gases.
12.3. Bioaccumulative potential	: No data available.
12.4. Mobility in soil	: Because of its high volatility, the product is unlikely to cause ground or water pollution.
12.5. Results of PBT and vPvB assessment	: Not classified as PBT or vPvB.
12.6. Other adverse effects	
Effect on ozone layer	: None.
Global warming potential [CO <sub>2</sub> =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 methods	: May be vented to atmosphere in a well ventilated place. Discharge to atmosphere in large quantities should be avoided. Do not discharge into any place where its accumulation could be dangerous. Refer to the EIGA code of practice Doc.30 "Disposal of Gases", downloadable at <a href="http://www.eiga.org">http://www.eiga.org</a> for more guidance on suitable disposal methods. Ensure that the emission levels from local regulations or operating permits are not exceeded.
List of hazardous wastes	: 16 05 04: Gases in pressure containers (including halons) containing dangerous substances.
13.2. Additional information	: None.



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**Nitrous oxide****SDS\_N2O****SECTION 14. Transport information**

UN number	: 1070
Labelling ADR, IMDG, IATA	 
	: 5.1: Oxidizing substances 2.2: Non-flammable, non-toxic gases
<b>Land transport (ADR/RID)</b>	
H.I. nr	: 25
UN proper shipping name	: NITROUS OXIDE
Transport hazard class(es)	: 2
Classification code	: 2 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
<b>Environmental hazards</b>	: None.
<b>Sea transport (IMDG)</b>	
Proper shipping name	: NITROUS OXIDE
Class	: 2.2
Emergency Schedule (EmS) - Fire	: F-C
Emergency Schedule (EmS) - Spillage	: S-W
Packing instruction	: P200
IMDG-Marine pollutant	: No
<b>Air transport (ICAO-TI / IATA-DGR)</b>	
Proper shipping name (IATA)	: NITROUS OXIDE
Class	: 2.2
Passenger and Cargo Aircraft	: Allowed.
Packing instruction - Passenger and Cargo Aircraft	: 200
Cargo Aircraft only	: Allowed.
Packing instruction - Cargo Aircraft only	: 200
<b>Special precautions for user</b>	: 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. : Not applicable.
<b>Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code</b>	

**SECTION 15. Regulatory information****15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****EU legislation**

Restrictions on use

: None.

Seveso directive 96/82/EC

: Covered.

**National legislation**

National legislation


: Ensure all national/local regulations are observed.

**15.2. Chemical safety assessment**

: This product is either exempt from REACH, does not meet the minimum volume threshold for a CSR or the CSA has not yet been carried out.

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<b>SECTION 16. Other information</b>
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<b>Indication of changes</b>	: Revised safety data sheet in accordance with commission regulation (EU) No 453/2010.
<b>Training advice</b>	: The hazard of asphyxiation is often overlooked and must be stressed during operator training.
<b>List of full text of R-phrases in section 3.</b>	: R8 : Contact with combustible material may cause fire.
<b>List of full text of H-statements in section 3.</b>	: H270 - May cause or intensify fire; oxidiser. H280 - Contains gas under pressure; may explode if heated.
<b>Further information</b>	: This Safety Data Sheet has been established in accordance with the applicable European Union legislation.
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