Nitrous Oxide

Section 1, Identification

Product Name	:	Nitrous Oxide
Formula	:	N2O
Other means of identification	:	Nitrous oxide
Product use	:	Industrial use, medical applications, laughing gas.
Supplier's details	:	WKS INDUSTRIAL GAS PTE LTD 22 Tuas Avenue 10 Singapore 639145 T-6898 2292, F-6898 2202 info@wks.com.sg / www.wks.com.sg

Section 2, Hazard(s) identification

Classified as Hazardous under OSHA Hazard Communication Standard (29 CFR 1910.1200)

GHS Classification	:	Oxidizing gas.	
	:	Gases under pressure.	
Hazard pictogram(s)	:		
Signal word	:	Danger.	
Hazard statement(s)	:	H270	May cause or intensify fire; oxidiser.
	:	H280	Contains gas under pressure; may explode if heated.
	:	H336	May cause drowsiness or dizziness.
Precautionary statement(s)	:	P220	Keep /store away from combustible materials.
	:	P244	Keep reduction valves free from grease and oil.
	:	P271+P403	Use only outdoors or in a well-ventilated area / Store in a well-ventilated area.
	:	P370+P376	In case of fire: stop leak if safe to do so.
Disposal	:	P501	Dispose of contents/container in accordance with container supplier/owner instructions.
Hazards not otherwise classified	:	Asphyxiant in high concentration. Contact with liquid may cause cold burns/frostbite.	
Hazchem code	:	2P	
H S code	:	28112930	

Section 3, Composition/information on ingredients

Name	:	Nitrous oxide
CAS No.	:	10024-97-2
%	:	100%

Section 4, First-aid measures

Description of First-Aid measures

Inhalation	:	Move victim to fresh air wearing self-contained breathing apparatus and keep at rest in a comfortable position. Seek medical advice/attention.
Skin contact	:	Exposure to liquid may cost frostbite. Flush contaminated skin with plenty of water.
Eye contact	:	Rinse immediately with plenty of water. Seek medical attention if needed.
Ingestion	:	Ingestion is not considered a potential route of exposure.

Most important symptoms and effects, both acute and delayed

In high concentrations may cause asphyxiation. Symptoms may include loss of mobility or consciousness. Victim may not be aware of asphyxiation. In low concentrations, may cause dizziness, headache, nausea and loss of co-ordination.

Indication of any immediate medical attention and special treatment needed

None.

Section 5, Fire-fighting measures

Extinguishing media

Use an extinguishing agent appropriate for surrounding fire.

Special hazards arising from the substance or mixture

Exposure to fire may cause cylinder to rupture/explode. Oxidizing materials, support combustion.

Advice for firefighters

Evacuate all personnel. Heat from fire will increase temperatures in cylinder and may cause cylinder to rupture. Cool cylinders or containers by applying water from a safe distance. Stop flow of gas if safe to do so. Remove cylinders from path of fire if safe to do so. Do not approach cylinders suspected of being hot. This material can form explosive mixtures in air. Use self-contained breathing apparatus and protective clothing.

Section6, Accidental release measures

Personal precautions, protective equipment and emergency procedures

Non-emergency personnel : Evacuate area. Eliminate ignition sources. Ensure adequate air ventilation and wear appropriate respirator when ventilation is inadequate. Wear PPE.

For emergency responders : If specialised clothing is required to deal with spillage, refer to Section 8 on suitable and unsuitable materials. See also information in “Non-emergency personnel”.

Environmental precautions : Try to stop release. Prevent from entering sewers, basement, work pits or any place where its accumulation can be dangerous.

Methods and materials used for containment cleaning up

Stop leak if without risk. Carefully move cylinder to well-ventilated remote area and allow discharge if safe to do so.

Section 7, Handling and storage

Precautions for safe handling

Contain under pressure. Do not drag, roll, drop or slide cylinder. Store or use cylinder away from heat, open flame, sparks or any other ignition source. Do not puncture or incinerate cylinder. Open valve slowly and close after use. Use equipment rated for cylinder pressure. Keep cylinders in well-ventilated place. Use trolley when moving cylinder.

Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store cylinders only where temperature will not exceed 52°C. Keep cylinder tightly closed until ready for use. Keep full and empty cylinders separately. Never attempt to repair or modify the valves or safety relief devices.

Section 8, Exposure controls/personal protection

Control parameters

Exposure limits : ACGIH TLV-TWA (ppm) 50 ppm

Exposure controls

Engineering controls : Provide adequate ventilation. Do not breathe fumes or gases. Use explosion-proof exhaust system or a mechanical system or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Individual protection measures

Eye / face : Safety glasses with side shields.
Hand : Gloves.

Body	:	Safety boots and consider the use of flame-resistant clothing.
Respiratory	:	When a risk assessment indicates respirator use, use a properly fitted, air-purifying or air-fed respirator complying with an approved standard.

Section 9, Physical and chemical properties

Physical state	:	Gas.
Colour	:	Colourless.
Odour	:	sweetish.
Odour threshold	:	Not available.
Molecular mass	:	44 g/mol
pH	:	Not applicable.
Melting point	:	-90.8°C
Boiling point	:	-88.48°C
Flash point	:	Not applicable.
Evaporation rate	:	Not available.
Flammability (solid, gas)	:	Non-flammable gas but support combustion at elevated temperatures.
Upper/lower explosive limits	:	Not available.
Vapour pressure	:	745 (psig)
Vapour density	:	1.53 (Air = 1)
Relative density	:	1.2
Solubility (water)	:	1.5 g/l
Oxidizing properties	:	Oxidiser.
Partition coefficient: n-octanol/water	:	0.36
Auto-ignition temperature	:	Not applicable
Decomposition temperature	:	Not available
Viscosity	:	Not available.

Other information
Liquefied gas
Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level.

Section 10, Stability and reactivity

Reactivity	:	No specific test data related to reactivity available.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	May react violently with combustible materials and reducing agents.
Conditions to avoid	:	Heat.
Incompatible materials	:	Combustible materials and reducing materials.
Hazardous decomposition products	:	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11, Toxicological information

Acute toxicity	:	Not classified.
Corrosion/irritation	:	Not classified.
Sensitization	:	Not classified.
Mutagenicity	:	Not classified.
Carcinogenicity	:	Not classified.
Reproductive toxicity	:	Not classified.
STOT (single exposure)	:	Not classified.
STOT (repeated exposure)	:	Not available.
Aspiration hazard	:	Not available.

Section 12, Ecological information

Toxicity	:	Not available.
Persistence and degradability	:	Not available.

Bioaccumulative potential : Not available.
Mobility in soil : Not available.
Other adverse effects : Global warming potential: 298
When discharged in large quantity may contribute to the greenhouse effect.

Section 13, Disposal considerations

Disposal : Do not attempt to dispose of residual or unused quantities.
Return container to supplier.

Section 14, Transport information

	Land Transport	Sea transport	Air Transport
UN number	UN1070	UN1070	UN1070
UN proper shipping name	NITROUS OXIDE	NITROUS OXIDE	NITROUS OXIDE
Transport hazard class(es)	2.2 (5.1) 	2.2 (5.1) 	2.2 (5.1) 
Packing group	None allocated	None allocated	None allocated
Environmental hazards	No	No	No

Additional information : Ensure cylinder is separated from driver's compartment. Ensure driver is aware of the potential hazards of product and know what to do in the event of an accident or an emergency. Ensure that cylinders are properly secured and valves are closed.

Section 15, Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture : Ensure all local regulations or legislations are observed.

Section 16, Other information

Ensure operator / user understand the POTENTIAL hazard of the product. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

R5: Heating may cause an explosion.
R8: Contact with combustible materials may cause fire.

H270: May cause or intensify fire; oxidiser.
H280: Contains gas under pressure; may explode if heated.

S2: Keep out of reach of children.
S17: Keep away from combustible material.

Whilst all due care has been taken in the preparation of this document and since the company shall have no control of the use of the product described herein, the Company assumes no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person because of their reliance on the information contained in this SDS.