

**MATERIAL SAFETY DATA SHEET (MSDS)
NITROUS OXIDE**

Please ensure that this MSDS is received by an appropriate person

DATE: March 2023
Ref. No.: MS013

Version 3

1 PRODUCT AND COMPANY IDENTIFICATION

Product Name NITROUS OXIDE
Chemical Formula N₂O
Trade Names Medical Nitrous Oxide
 Compressed Nitrous Oxide
 Instrument Grade Nitro-Boost
Colour coding *Medical Nitrous Oxide*
 French Blue (F.09) body, white stencilling
Nitrous Oxide, Instrument Grade
 French Blue (F.09) body, with the
 "Instrument Grade" logo affixed centrally
 to the body of the cylinder
Nitro-Boost
 French Blue (F.09) body, with yellow
 shoulder, and "Nitro-boost" Label stating
 "Toxic not for Medical Use"
Valve Medical and Instrument Grades 3SN:
 Brass 11/16 inch x 20 tpi male.
 Nitro-boost Neriki: Brass 5/8 inch left
 hand female, positive pressure
Company Identification Les Gaz Industriels Ltd
 Pailles Road
 G.R.N.W. Republic of Mauritius
 Tel No: (+230) 212-8306
 Fax No: (+230) 212-0235
EMERGENCY NUMBER (+230) 800 1133

2 COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name Nitrous Oxide
Chemical Family Oxidant
CAS No. 10024-97-2
UN No. 1070
ERG No. 122
Hazard Warning 5 A Non-flammable Gas

3 HAZARDS IDENTIFICATION

Main Hazards

Nitrous oxide is non-flammable, but readily supports combustion. Never permit oil, grease or other readily combustible substance to come into contact with high concentrations of nitrous oxide.

Adverse Health Effects

Nitrous oxide should not be used with any condition where air is entrapped within body, and where its expansion might be dangerous such as: head injuries with impairment of consciousness; artificial, traumatic/spontaneous pneumothorax air embolism; decompression sickness; following a recent dive; following air encephalography; severe bullous emphysema; during myringoplasty; gross abdominal distension; intoxication; maxillofacial injuries.

Chemical Hazards

Nitrous oxide is non-flammable, but strongly supports combustion (including some materials which do not normally burn in air). Since dry nitrous oxide is non-corrosive, most materials of construction are suitable. Avoid all combustible materials.

Biological Hazards

Administration of nitrous oxide, more frequently than every 4 days should be accompanied by routine blood cell counts for evidence of megaloblastic change in red cells, hyper segmentation of neutrophils.

Vapour Inhalation

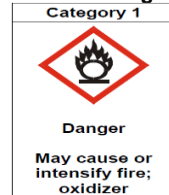
Use of nitrous oxide causes inactivation of vitamin B12 which is a co-factor of methionine synthase. Folate metabolism is consequently interfered with DNA synthesis is impaired following prolonged nitrous oxide administration, disturbances result in megaloblastic bone marrow change. Exceptionally heavy occupational exposure or additions have resulted in myeloneuropathy and subacute combined degeneration.

Ingestion

Depletion of methionine has been implicated in the neurological deficit seen in chronic abusers of nitrous oxide.

Label Elements

Hazard Pictograms



Precautionary statements:

P220: Keep/store away from clothing/ combustible materials
 P244: Keep reduction valves free from grease and oil
 P370+P376: In case of fire, stop leak if safe to do so
 P403: Store in well ventilated space

4 FIRST AID MEASURES

Prompt medical attention is mandatory in all cases of overexposure to nitrous oxide. Rescue personnel should be cognisant of extreme fire hazard associated with nitrous oxide-rich atmospheres. Inapplicable, unwitting or deliberate inhalation of nitrous oxide will result in unconsciousness, passing through stages of increasing light-headedness and intoxication, and, if the victim were to be within a confined space, death from anoxia could result. Treatment is removal to fresh air, and if necessary, use of an oxygen resuscitator.

Eye Contact No known effect

Skin Contact No known effect

Ingestion

Inapplicable, unwitting or deliberate inhalation of nitrous oxide will result in unconsciousness, passing through stages of increasing light-headedness and intoxication, and, if the victim were to be within a confined space, death from anoxia could result. Treatment is removal to fresh air, and if necessary, the use of an oxygen resuscitator.

5 FIRE FIGHTING MEASURES

Extinguishing Media

As nitrous oxide is non-flammable but strongly supports combustion, the correct type of extinguishing media should be used depending on the combustible material involved.

Specific Hazards

Nitrous oxide vigorously accelerates combustion. Materials that would not normally burn in air could combust vigorously in atmospheres having high concentrations of nitrous oxide.

Emergency Actions

If possible, shut off the source of escaping Nitrous oxide. Evacuate area. All cylinders should be removed from the vicinity of the fire. Cylinders that cannot be removed should be cooled with water from a safe distance. Cylinders which have been exposed to excessive heat should be clearly identified and returned to supplier. CONTACT THE SUPPLIER.

Protective Clothing

Safety gloves and shoes, or boots, should be worn when handling cylinders.

Environmental Precautions

As the gas is heavier than air, pockets of nitrous oxide-enriched air could occur. These could lead to the fire spreading rapidly. If possible, ventilate the affected area.

6 ACCIDENTAL RELEASE MEASURES

Personal Precautions

Although nitrous oxide is not itself combustible, it supports and accelerates combustion. Clothes and other materials, not normally considered flammable, will burn fiercely in the presence of nitrous oxide, and can be set alight by a single spark, or even hot cigarette ash.

Environmental Precautions

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Nitrous oxide is known to have an ozone depleting potential. It is a "greenhouse gas" and may contribute to global warming. Beware of nitrous oxide-enriched atmospheres coming into contact with readily combustible materials.

Small Spills

Shut off the source of escaping nitrous oxide. Ventilate the area.

Large Spills

Evacuate the area. Shut off the source of the spill if this can be done without risk. Ventilate the area using forced draught if necessary.

7 HANDLING AND STORAGE

Do not allow cylinders to slide or come into contact with sharp edges. Cylinders of nitrous oxide should not be stored near cylinders of acetylene or other combustible gases. Nitrous oxide cylinders should only be stacked vertically and be firmly secured. Prevent dirt, grit of any sort, oil or any other lubricant from entering the cylinder valves, store cylinders well clear of any corrosive influence, e.g. battery acid. Compliance with all relevant legislation is essential. Use a "first in - first out" inventory system to prevent full cylinders from being stored for excessive periods of time. Keep out of reach of children.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Hazards

Scavenging of waste nitrous oxide gas should be used to reduce operating theatre and equivalent treatment room levels to a level below 200vpm of ambient nitrous oxide.

Engineering Control Measures

Engineering control measures are preferred to reduce exposure to nitrous oxide-enriched atmospheres. General methods include forced-draught ventilation, separate from other exhaust ventilation systems. Ensure that sufficient fresh air enters at, or near, floor level.

Personal Protection

Safety goggles, gloves and shoes should be worn when handling cylinders.

Skin

No known effect.

9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DATA

Chemical Symbol	N ₂ O
Molecular Weight	44.01
Specific volume @ 20°C & 101,325 kPa	543.1 ml/g
Boiling point @ 101,325 kPa	- 88.5°C
Density, gas @ 101,325 kPa & 20°C	1.8432 kg/m ³
Relative density (Air=1) @ 101,325 kPa	1.5297
Colour	None
Taste	Sweet
Odour	Sweet

10 STABILITY AND REACTIVITY

Conditions to avoid

Build-up of nitrous oxide-enriched atmospheres. Never use cylinders as rollers or supports, or for any other purpose than the storage of Nitrous oxide. Never expose cylinders to excessive heat, as this may cause sufficient build-up of pressure to rupture the cylinders.

Incompatible Materials

Since dry nitrous oxide is non-corrosive, most materials of construction are suitable. Avoid all flammable materials.

Hazardous Decomposition Products

When involved in a fire the higher oxides of nitrogen can be formed. Both nitric oxide and nitrogen dioxide are highly toxic.

11 TOXICOLOGICAL INFORMATION

Acute Toxicity	See Section 3
Skin & eye contact	No known effect
Chronic Toxicity	See Section 3
Carcinogenicity	No known effect
Mutagenicity	No known effect

Reproductive Hazards See Section 3
(For further information see Section 3. Adverse Health effects)

12 ECOLOGICAL INFORMATION

Nitrous oxide is heavier than air and care should be taken to avoid the formation of nitrous oxide-enriched pockets. It does not pose a hazard to the ecology.

13 DISPOSAL CONSIDERATIONS

Disposal Methods

Small amounts may be blown to atmosphere under controlled conditions. Large amounts should only be handled by gas supplier.

Disposal of Packaging

The disposal of containers must only be handled by the gas supplier.

14 TRANSPORT INFORMATION

ROAD TRANSPORTATION

UN No	1070
ERG No	122
Hazchem warning	5 A Non-flammable Gas

SEA TRANSPORTATION

IMDG	1070
Class	
Packaging group	
Label	Non-flammable Gas

AIR TRANSPORTATION

ICAO/IATA Code	1070
Class	2.2
Packaging group	
Packaging instructions	
- Cargo	200
- Passenger	200
Maximum quantity allowed	
- Cargo	150kg
- Passenger	75kg

15 REGULATORY INFORMATION

EEC Hazard class Non-flammable

Risk Phrase	Description	Safety Phrase	Description
R8	Contact with combustible material may cause fire	S2	Keep out of reach of Children
R20	Harmful by inhalation	S3	Keep in a cool place
R33	Danger of cumulative effects	S9	Keep container in a well-Ventilated place
R44	Risk of explosion if heated under confinement	S21	When using do not smoke
R48	Danger of serious damage to health by prolonged exposure	S44	If you feel unwell, seek medical advice

National legislation: None
Refer to SANS 10265 for explanation of the above.

16 OTHER INFORMATION

Bibliography

SANS 10265 - Labelling of Dangerous Substances

17 EXCLUSION OF LIABILITY

Information contained in this publication is accurate at the date of publication. The company does not accept liability arising from the use of this information, or the use, application, adaptation or process of any products described herein.