



# NITROUS OXIDE

DATE: March 2008

## 1 PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT IDENTIFICATION

Product Name	Nitrous Oxide
Chemical Formula	N <sub>2</sub> O
Trade Names	Medical Nitrous Oxide, Compressed Nitrous Oxide, Instrument Grade NitroBoost
Colour Coding	Medical Nitrous Oxide French Blue (F.09) body with White stencilling. Nitrous Oxide, Instrument Grade French Blue (F.09) body with the "Instrument Grade" logo affixed centrally to the body of the cylinder. Nitroboost French Blue (F.09) body with a yellow shoulder, and "Nitroboost" Label stating "Toxic not for Medical use"
Valves	Medical & Instrument Grades 3SN – Brass 11/16 inch × 20t.p.i. male. Nitroboost 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

## 2 COMPOSITION/INFORMATION ON INGREDIENTS

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

## 3 HAZARDS IDENTIFICATION

<b>Main Hazards</b>	All cylinders are portable gas containers, and must be regarded as pressure vessels at all times. 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.
<b>Adverse Health Effects.</b>	Nitrous oxide should not be used with any condition where air is entrapped within the body, and where its expansion might be dangerous such as : Head injuries with impairment of consciousness; Artificial, traumatic or spontaneous pneumothorax air embolism; Decompression sickness; Following a recent dive; Following air encephelography; Severe bullous emphysema; During myringoplasty; Gross abdominal distension; Intoxication; Maxillofacial injuries.
<b>Chemical Hazards</b>	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.
<b>Biological Hazards</b>	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 and hypersegmentation of neutrophils
<b>Vapour Inhalation</b>	The use of nitrous oxide causes inactivation of vitamin B12 which is a co-factor of methionine synthase. Folate metabolism is consequently interfered with, and DNA synthesis is impaired following prolonged nitrous oxide administration. These disturbances result in megaloblastic bone marrow changes. Exceptionally heavy occupational exposure, and addiction have resulted in myeloneuropathy and subacute combined degeneration.
<b>Eye Contact</b>	No known effect.
<b>Skin Contact</b>	No known effect.

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

## 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. The treatment is removal to fresh air, and if necessary, the 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. The 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 NEAREST AFROX BRANCH.

**Protective Clothing** Safety goggles, gloves and safety shoes 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.** 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, and 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 <sub>2</sub> 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 and 20°C	1,8432 kg/m <sup>3</sup>
Relative density (Air = 1) @ 101,325 kPa	1,5297
Colour	None
Taste	Sweet
Odour	Sweet

## 10 STABILITY AND REACTIVITY

**Conditions to avoid** The 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 the atmosphere under controlled conditions. Large amounts should only be handled by the gas supplier.

**Disposal of packaging** The disposal of cylinders must only be handled by the gas supplier.

## 14 TRANSPORT INFORMATION

### ROAD TRANSPORTATION

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

### SEA TRANSPORTATION

IMDG	1070
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 phrases R8 Contact with combustible material may cause fire

R20 Harmful by inhalation  
R33 Danger of cumulative effects  
R44 Risk of explosion if heated under confinement  
R48 Danger of serious damage to health by prolonged exposure.  
Safety phrases S2 Keep out of reach of children  
S3 Keep in a cool place  
S9 Keep container in a well-ventilated place  
S21 When using do not smoke  
S44 If you feel unwell, seek medical advice (show the label where possible)

National Legislation: None  
Refer to SABS 0265 for explanation of the above.

## 16 OTHER INFORMATION

Bibliography  
Compressed Gas Association, Arlington, Virginia  
Handbook of Compressed Gases - 3rd Edition  
Matheson. Matheson Gas Data Book - 6th Edition

## 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.

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