1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name: NITROUS OXIDE, COMPRESSED
Synonym(s): 072 - SDS NUMBER ● NITROSOL ● NITROUS OXIDE ● PRODUCT CODES: 620, 621, 624

1.2 Uses and uses advised against

Use(s): FUEL ADDITIVE

1.3 Details of the supplier of the product

Supplier name: BOC LIMITED (AUSTRALIA)
Address: 10 Julius Avenue, North Ryde, NSW, 2113, AUSTRALIA
Telephone: 131 262, (02) 8874 4400
Fax: 132 427 (24 hours)
Website: http://www.boc.com.au

1.4 Emergency telephone number(s)

Emergency: 1800 653 572 (24/7) (Australia only)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

GHS classification(s):

- Oxidizing Gases: Category 1
- Gases Under Pressure: Liquefied gas

2.2 Label elements

Signal word: DANGER

Pictogram(s):

- Oxidizing Gases: Category 1
- Gases Under Pressure: Liquefied gas

Hazard statement(s):

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

Prevention statement(s):

- P202: Do not handle until all safety precautions have been read and understood.
- P220: Keep/Store away from clothing/incompatible materials/combustible materials.
- P244: Keep reduction valves free from grease and oil.

Response statement(s):

- P370 + P376: In case of fire: Stop leak if safe to do so.

Storage statement(s):

- P410 + P403: Protect from sunlight. Store in a well-ventilated place.

Disposal statement(s):

None allocated.
NITROUS OXIDE, COMPRESSED

2.3 Other hazards
Asphyxiant. Effects are proportional to oxygen displacement.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS Number</th>
<th>EC Number</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>NITROUS OXIDE</td>
<td>10024-97-2</td>
<td>233-032-0</td>
<td>98%</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

4.1 Description of first aid measures

**Eye**
Cold burns: Immediately flush with tepid water or with sterile saline solution. Hold eyelids apart and irrigate for 15 minutes. Seek medical attention.

**Inhalation**
If inhaled, remove from contaminated area. To protect rescuer, use an Air-line respirator or Self Contained Breathing Apparatus (SCBA). Be aware of possible explosive atmospheres. Apply artificial respiration if not breathing. Give oxygen if available. For advice, contact a Poisons Information Centre on 13 11 26 (Australia Wide) or a doctor.

**Skin**
Cold burns: Remove contaminated clothing and gently flush affected areas with warm water (30°C) for 15 minutes. Apply sterile dressing and treat as for a thermal burn. For large burns, immerse in warm water for 15 minutes. DO NOT apply any form of direct heat. Seek immediate medical attention.

**Ingestion**
Due to product form and application, ingestion is considered unlikely.

**First aid facilities**
None allocated.

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. Direct contact with the liquefied material or escaping compressed gas may cause cold burns similar to frostbite injury.

4.3 Immediate medical attention and special treatment needed
Treat symptomatically.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media
Use water fog to cool containers from protected area.

5.2 Special hazards arising from the substance or mixture
Non flammable - oxidising agent. Supports combustion and may cause fire/explosion in contact with incompatible substances, strong acids, reducing agents, combustibles and flammables.

5.3 Advice for firefighters
Temperatures in a fire may cause cylinders to rupture. Cool cylinders or containers exposed to fire by applying water from a protected location. Remove cool cylinders from the path of the fire. Evacuate the area if unable to keep cylinders cool. Do not approach cylinders or containers suspected of being hot.

5.4 Hazchem code

- 2P
- 2 Fine Water Spray.
- P Risk of violent reaction or explosion. Wear liquid-tight chemical protective clothing and breathing apparatus. Dilute spill and run-off.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
If the cylinder is leaking, evacuate area of personnel. Inform manufacturer/supplier of leak. Use Personal Protective Equipment (PPE) as detailed in Section 8 of the SDS.

6.2 Environmental precautions
Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
6.3 Methods of cleaning up
Carefully move material to a well ventilated remote area, then allow to discharge if safe to do so. Do not attempt to repair leaking valve or cylinder safety devices.

6.4 Reference to other sections
See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Do not drag, drop, slide or roll cylinders. The uncontrolled release of a gas under pressure may cause physical harm. Use a suitable hand truck for cylinder movement.

7.2 Conditions for safe storage, including any incompatibilities
Do not store near sources of ignition or incompatible materials. Cylinders should be stored below 45°C in a secure area, upright and restrained to prevent cylinders from falling. Cylinders should also be stored in a dry, well ventilated area constructed of non-combustible material with firm level floor (preferably concrete), away from areas of heavy traffic and emergency exits.

7.3 Specific end use(s)
No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Reference</th>
<th>TWA ppm</th>
<th>TWA mg/m³</th>
<th>STEL ppm</th>
<th>STEL mg/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrous oxide</td>
<td>SWA (AUS)</td>
<td>25</td>
<td>45</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

Biological limits
No biological limit values have been entered for this product.

8.2 Exposure controls

Engineering controls
Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Maintain vapour levels below the recommended exposure standard.

PPE

- **Eye / Face**: Wear safety glasses.
- **Hands**: Wear leather or insulated gloves.
- **Body**: Wear safety boots.
- **Respiratory**: Where an inhalation risk exists, wear a Type NO (Nitrogen Oxides) respirator. At high vapour levels, wear Self Contained Breathing Apparatus (SCBA) or an Air-line respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

- **Appearance**: COLOURLESS GAS (LIQUEFIED UNDER PRESSURE)
- **Odour**: SLIGHT SWEET ODOUR
- **Flammability**: NON FLAMMABLE
- **Flash point**: NOT RELEVANT
- **Boiling point**: -88.5°C
- **Melting point**: NOT AVAILABLE
- **Evaporation rate**: NOT APPLICABLE
- **pH**: NOT APPLICABLE
- **Vapour density**: NOT AVAILABLE
**9.1 Information on basic physical and chemical properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific gravity</td>
<td>NOT APPLICABLE</td>
</tr>
<tr>
<td>Solubility (water)</td>
<td>0.59 L/L</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>5700 kPa @ 25°C</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>NOT RELEVANT</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>NOT RELEVANT</td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>Viscosity</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>OXIDISING GAS</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>NOT AVAILABLE</td>
</tr>
</tbody>
</table>

9.2 Other information

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Volatiles</td>
<td>100 %</td>
</tr>
<tr>
<td>Critical pressure</td>
<td>7254 kPa</td>
</tr>
<tr>
<td>Critical temperature</td>
<td>36.4°C</td>
</tr>
<tr>
<td>Density</td>
<td>1.53 (Air = 1)</td>
</tr>
</tbody>
</table>

**10. STABILITY AND REACTIVITY**

10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

10.2 Chemical stability

Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions

Polymerization will not occur.

10.4 Conditions to avoid

Avoid heat, sparks, open flames and other ignition sources.

10.5 Incompatible materials

Incompatible with powerful reducing agents such as phosphine, stannous chloride and hydrogen. Nitrous oxide will react with powerful reducing agents such as phosphine. Ensure that all materials and lubricants in contact with this product are oxygen compatible. Rust and scale may cause ignitions.

10.6 Hazardous decomposition products

May evolve nitrogen oxides when heated to decomposition.

**11. TOXICOLOGICAL INFORMATION**

11.1 Information on toxicological effects

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Oral Toxicity (LD50)</th>
<th>Dermal Toxicity (LD50)</th>
<th>Inhalation Toxicity (LC50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NITROUS OXIDE</td>
<td>--</td>
<td>--</td>
<td>1068 mg/m³ (rat)</td>
</tr>
</tbody>
</table>

**Acute toxicity**

Based on available data, the classification criteria are not met. Nitrous oxide passes into all gas containing spaces in the body faster than nitrogen passes out, thus it should not be used with any condition where its expansion might be dangerous. May induce vomiting in susceptible individuals.

**Information available for the ingredient(s):**

Skin: Not classified as a skin irritant. Contact with the liquefied material or escaping compressed gas may cause frostbite injury.

Eye: Not classified as an eye irritant. Contact with the liquefied material or escaping compressed gas may cause frostbite injury.

Sensitisation: Not classified as causing skin or respiratory sensitisation.

Mutagenicity: Not classified as a mutagen.

Carcinogenicity: Not classified as a carcinogen.

Reproductive: Reduced fertility in healthcare personnel has been reported where they have been repeatedly exposed to levels of nitrous oxide above the specified occupational exposure limits in inadequately ventilated rooms. There is no documented evidence to confirm or exclude the existence of any causal connection between...
NITROUS OXIDE, COMPRESSED

Asphyxiant - anaesthetic. May have short term effects on the central nervous system, including drowsiness, dizziness, euphoria and anxiolytic and analgesic effects.

Chronic exposure to nitrous oxide can result in some symptoms of pernicious anaemia: Megaloblastic bone-marrow depression or peripheral and central neuropathy (tingling, numbness, impairment of equilibrium, difficulty in thinking clearly).

Aspiration Not classified as causing aspiration.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No information provided.

12.2 Persistence and degradability
No information provided.

12.3 Bioaccumulative potential
No information provided.

12.4 Mobility in soil
No information provided.

12.5 Other adverse effects

ATMOSPHERE: Nitrous oxide is toxic and is considered an air pollutant. Fairly stable in the atmosphere. May be toxic to terrestrial animals. SOIL: Due to its very low boiling point it is expected to quickly evaporate if released on soil. WATER: May dissolve in water, although evaporation will be a major removal factor.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods
Waste disposal Cylinders should be returned to the manufacturer or supplier for disposal of contents.
Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

<table>
<thead>
<tr>
<th></th>
<th>LAND TRANSPORT (ADG)</th>
<th>SEA TRANSPORT (IMDG / IMO)</th>
<th>AIR TRANSPORT (IATA / ICAO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.1 UN Number</td>
<td>1070</td>
<td>1070</td>
<td>1070</td>
</tr>
<tr>
<td>14.2 Proper Shipping Name</td>
<td>NITROUS OXIDE</td>
<td>NITROUS OXIDE</td>
<td>NITROUS OXIDE</td>
</tr>
<tr>
<td>14.3 Transport hazard classes</td>
<td>2.2, 5.1</td>
<td>2.2, 5.1</td>
<td>2.2, 5.1</td>
</tr>
<tr>
<td>14.4 Packing Group</td>
<td>None allocated.</td>
<td>None allocated.</td>
<td>None allocated.</td>
</tr>
</tbody>
</table>

14.5 Environmental hazards
No information provided.

14.6 Special precautions for user
Hazchem code 2P
GTEPG 2C8
EMS F-C, S-W
Other information Ensure cylinder is separated from driver and that outlet of relief device is not obstructed.
15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Poison schedule  Classified as a Schedule 4 (S4) Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Classifications  Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals.

The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].

Hazard codes  O  Oxidising

Risk phrases  R8  Contact with combustible material may cause fire.

Safety phrases  S9  Keep container in a well ventilated place.
               S17  Keep away from combustible material.
               S51  Use only in well ventilated areas.

Inventory listing(s)  AUSTRALIA: AICS (Australian Inventory of Chemical Substances)
                      All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional information  The storage of significant quantities of gas cylinders must comply with AS4332. The storage and handling of gases in cylinders.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:
The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:
It should be noted that the effects from exposure to this product will depend on several factors including; frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Abbreviations

ACGIH  American Conference of Governmental Industrial Hygienists
CAS #  Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS   Central Nervous System
EC No.  EC No - European Community Number
EMS   Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods)
GHS   Globally Harmonized System
GTEPG Group Text Emergency Procedure Guide
IARC International Agency for Research on Cancer
LC50  Lethal Concentration, 50% / Median Lethal Concentration
LD50  Lethal Dose, 50% / Median Lethal Dose
mg/m³  Milligrams per Cubic Metre
OEL  Occupational Exposure Limit
pH   relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm  Parts Per Million
STEL  Short-Term Exposure Limit
STOT-RE Specific target organ toxicity (repeated exposure)
STOT-SE Specific target organ toxicity (single exposure)
SUSMP Standard for the Uniform Scheduling of Medicines and Poisons
SWA  Safe Work Australia
TLV  Threshold Limit Value
TWA  Time Weighted Average
This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

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[ End of SDS ]