

SAFETY DATA SHEET

2636

Product Name **4 COMPONENT MIXTURE (CO, CO2 TO 50%, N2, BALANCE HE)**

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

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)
 Emergency 1800 653 572 (24/7) (Australia only)
 Web site <http://www.boc.com.au/>
 Synonym(s) 2636 - MSDS NUMBER • SPECIAL GAS MIXTURE
 Use(s) CALIBRATION • INDUSTRIAL APPLICATIONS
 SDS date 28 February 2013

2. HAZARDS IDENTIFICATION

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

RISK PHRASES

R61 May cause harm to the unborn child.

SAFETY PHRASES

S45 In case of accident or if you feel unwell seek medical advice immediately (show the label where possible).

S53 Avoid exposure - obtain special instructions before use.

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

| | | | |
|---------------|----------------|--------------------|----------------|
| UN number | 1956 | DG division | 2.2 |
| Packing group | None Allocated | Subsidiary risk(s) | None Allocated |
| Hazchem code | 2TE | | |

3. COMPOSITION/ INFORMATION ON INGREDIENTS

| Ingredient | Identification | Classification | Content |
|-----------------|---------------------------------|------------------------------------|-------------|
| CARBON MONOXIDE | CAS: 630-08-0 EC: 211-128-3 | T;R23 Repr.;R61 T;R48/23 F+;R12 | 0.2 to 0.5% |
| CARBON DIOXIDE | CAS: 124-38-9 EC: 204-696-9 | Not Available | 45% |
| NITROGEN | CAS: 7727-37-9 EC: 231-783-9 | Not Available | 45% |
| HELIUM | CAS: 7440-59-7 EC: 231-168-5 | Not Available | Remainder |

4. FIRST AID MEASURES

Eye None required.

Inhalation If inhaled, remove from contaminated area. To protect rescuer, use an Air-line respirator or Self Contained Breathing Apparatus (SCBA). Apply artificial respiration if not breathing. Give oxygen if

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available. For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor.

Skin None required.

Advice to doctor Hyperbaric oxygen treatment at 2 to 2.5 atmospheres reduces the biological half life of carboxyhaemoglobin to 24 minutes. Avoid stimulant drugs including carbon dioxide. Do not inject methylene blue. Absolute bed rest for at least 48 hours should be ensured. After recovery observe for late neurological and or cardiac complaints. Carboxyhaemoglobin levels in blood used as biological monitoring index.

5. FIRE FIGHTING MEASURES

Flammability Non flammable.

Fire and explosion 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.

Extinguishing Use water fog to cool containers from protected area.

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- 2 Water Fog (or fine water spray if fog unavailable)
- T Self Contained Breathing apparatus and protective gloves.
- E Evacuation of people in the vicinity of the incident should be considered.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions If the cylinder is leaking, evacuate area of personnel. Inform manufacturer/supplier of leak. Use personal protective equipment as detailed in Section 8 of this SDS.

Environmental precautions Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

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.

References See Sections 8 and 13 for exposure controls and disposal.

7. STORAGE AND HANDLING

Storage Do not store near 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.

Handling Use of safe work practices are recommended to avoid 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. Do not drop, roll or drag cylinders. The uncontrolled release of any gas under pressure may cause physical harm. Use a suitable hand truck for cylinder movement.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure standards

| Ingredient | Reference | TWA | | STEL | |
|------------------------------|-----------|------------|-------------------|-------|-------------------|
| | | ppm | mg/m ³ | ppm | mg/m ³ |
| Carbon dioxide | SWA (AUS) | 5000 | 9000 | 30000 | 54000 |
| Carbon dioxide in coal mines | SWA (AUS) | 12500 | 22500 | 30000 | 54000 |
| Carbon monoxide | SWA (AUS) | 30 | 34 | -- | -- |
| Helium | SWA (AUS) | Asphyxiant | | | |
| Nitrogen | SWA (AUS) | Asphyxiant | | | |

Biological limits

| Ingredient | Reference | Determinant | Sampling Time | BEI |
|-----------------|-----------|------------------------------------|---------------|--------------------|
| CARBON MONOXIDE | ACGIH BEI | Carboxyhemoglobin in blood | End of shift | 3.5% of hemoglobin |
| | ACGIH BEI | Carbon monoxide in end-exhaled air | End of shift | 20 ppm |

Engineering controls

Provide suitable ventilation to minimise or eliminate exposure. Confined areas (eg. tanks) should be adequately ventilated or gas tested. Maintain vapour levels below the recommended exposure standard.

PPE

| | |
|-------------|--|
| Eye / Face | Wear safety glasses. |
| Hands | Wear leather gloves. |
| Body | Wear safety boots. |
| Respiratory | Not required under normal conditions of use. |



9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|-------------------------------|-----------------------------|
| Appearance | COLOURLESS GAS |
| Odour | ODOURLESS |
| Flammability | NON FLAMMABLE |
| Flash point | NOT RELEVANT |
| Boiling point | NOT AVAILABLE |
| Melting point | NOT AVAILABLE |
| Evaporation rate | NOT APPLICABLE |
| pH | NOT APPLICABLE |
| Vapour density | NOT AVAILABLE |
| Specific gravity | NOT APPLICABLE |
| Solubility (water) | 0.035 L/L (Carbon monoxide) |
| Vapour pressure | NOT AVAILABLE |
| Upper explosion limit | NOT RELEVANT |
| Lower explosion limit | NOT RELEVANT |
| Autoignition temperature | NOT AVAILABLE |
| Decomposition temperature | NOT AVAILABLE |
| Viscosity | NOT AVAILABLE |
| Partition coefficient | NOT AVAILABLE |
| % Volatiles | 100 % |
| Cylinder pressure (when full) | 13,000 kPa @ 15°C |

10. STABILITY AND REACTIVITY

| | |
|----------------------------------|--|
| Chemical stability | Stable under recommended conditions of storage. |
| Conditions to avoid | Avoid heat, sparks, open flames and other ignition sources. |
| Material to avoid | At pressures above 7,000 kPa copper lining should be used to reduce corrosion. Stress corrosion cracking can occur in steels especially if other acid gases (eg. Carbon Dioxide, Sulphur compounds) are present. Can react with iron, nickel and other metals to form highly toxic carbonyls. Below 3,500 kPa corrosion is negligible and common materials can be used |
| Hazardous Decomposition Products | May evolve toxic gases if heated to decomposition. |
| Hazardous Reactions | Polymerization will not occur. |

11. TOXICOLOGICAL INFORMATION

Product Name **4 COMPONENT MIXTURE (CO, CO2 TO 50%, N2, BALANCE HE)****Health Hazard
Summary**

Asphyxiant gas - harmful. Carbon monoxide effects depend on the percentage of carboxyhaemoglobin: 10-20% mild headache and breathlessness on mild exertion; 20-30% headache, irritability, rapid fatigue and impaired memory; 30-40% severe headache, weakness, nausea, vomiting, dizziness, visual impairment and confusion; 40-50% increasing confusion, ataxia and collapse; 50-60% coma; >80% rapid death. Chronic exposure to carbon monoxide may result in an increase in cardiovascular problems. Can aggravate some diseases of the cardiovascular system such as coronary artery disease. The effect is enhanced by cigarette smoking. Adverse behavioural effects have been noted including impairment of vigilance, co-ordination, timing, behaviour, visual perception and certain cognitive functions. Some adaptation occurs in individuals repeatedly exposed to moderate concentrations. Developmental defects on foetuses can occur without maternal symptoms. Carbon dioxide is the body's regulator of the breathing function. It is normally present in the air at a concentration of 340 ppm by volume. An increase above this level may result in accelerated breathing and heart rate. Adverse health affects of long term exposure to carbon dioxide have not been reported. However, in environments such as submarines where exposure to levels of 0.5-1.0% may occur, specialist medical opinion should be sought on the effects of long term exposure.

Eye

Non irritant.

Inhalation

Harmful. Over exposure to carbon monoxide may result in rapid breathing, nausea, lack of coordination, unconsciousness and coma. Reacts with blood haemoglobin to prevent oxygen uptake.

Skin

Non irritant.

Ingestion

Ingestion is considered unlikely due to product form.

Toxicity data**CARBON MONOXIDE (630-08-0)**

LC50 (inhalation) 1807 ppm/4H (rat)

LCLo (inhalation) 5000 ppm/5M (human)

CARBON DIOXIDE (124-38-9)

LC50 (inhalation) 470000 ppm/30M (rat)

LCLo (inhalation) 9 pph/5M (human)

12. ECOLOGICAL INFORMATION

Toxicity No information provided.**Persistence and degradability** No information provided.**Bioaccumulative potential** No information provided.**Mobility in soil** No information provided.

Other adverse effects If released to the atmosphere this product will not contribute to ozone depletion or global warming. If released to soil or water this product will quickly evaporate to the atmosphere. Not toxic to plants or animals except at extremely high (asphyxiating) levels.

13. DISPOSAL CONSIDERATIONS

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**LAND TRANSPORT
(ADG)****SEA TRANSPORT
(IMDG / IMO)****AIR TRANSPORT
(IATA / ICAO)****UN number**

1956

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Proper shipping name

COMPRESSED GAS, N.O.S.

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Product Name **4 COMPONENT MIXTURE (CO, CO2 TO 50%, N2, BALANCE HE)**

| | | | |
|---------------------------|--|---|---|
| DG class/ Division | 2.2 | - | - |
| Subsidiary risk(s) | None Allocated | - | - |
| Packing group | None Allocated | - | - |
| GTEPG | 2C1 | | |
| Hazchem code | 2TE | | |
| Other information | Ensure cylinder is separated from driver and that outlet of relief device is not obstructed. Refer to Commonwealth, State and Territory Dangerous Goods Legislation which contain requirements which affect gas storage and transport. | | |

15. REGULATORY INFORMATION

| | |
|-----------------------------|--|
| Poison schedule | A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) |
| 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. |
|-------------------------------|--|

APPLICATION METHOD: Gas regulator of suitable pressure and flow rating fitted to cylinder or manifold with low pressure gas distribution to equipment.

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 ChemAlert 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 |
| | GHS | Globally Harmonized System |
| | IARC | International Agency for Research on Cancer |
| | LD50 | Lethal Dose, 50% / Median Lethal Dose |
| | mg/m ³ | Milligrams per Cubic Metre |
| | PEL | Permissible Exposure Limit |
| | pH | relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline). |
| | ppm | Parts Per Million |
| | REACH | Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals |
| | 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 |
| | TLV | Threshold Limit Value |
| | TWA/OEL | Time Weighted Average or Occupational Exposure Limit |

Revision history

| Revision | Description |
|----------|----------------------|
| 1.1 | Standard SDS Review |
| 1.0 | Initial SDS Creation |

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Report status 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