

BOC Limited
ABN 95 000 029 729
10 Julius Avenue
NORTH RYDE NSW 2113
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Product Name **4 COMPONENT MIXTURE (H₂, CO₂, CO, BALANCE N₂)**

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Supplier Name BOC LIMITED (AUSTRALIA)
Address 10 Julius Avenue, North Ryde NSW, 2113, AUSTRALIA
Telephone +61 131 262, (02) 8874 4400
Fax +61 132 427 (24 hours)
Emergency 1800 653 572 (A/H) (Australia only)

Synonyms PRODUCT CODES: 285, 288, SPECIAL GAS MIXTURE.

Uses CALIBRATION, INDUSTRIAL APPLICATIONS.

2. HAZARDS IDENTIFICATION

CLASSIFIED AS HAZARDOUS ACCORDING TO NOHSC CRITERIA
CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

Risk And Safety Phrases Risk and Safety Phrases are standardised phrases allocated to Hazardous Substances. Risk phrases convey a general description of the physicochemical, environmental and health hazards of a substance. Safety phrases provide information on safe storage, handling, disposal, personal protection and first aid.

RISK PHRASES

R11 Highly flammable.
R48/23 Toxic: danger of serious damage to health by prolonged exposure through inhalation.
R61 May cause harm to the unborn child.

SAFETY PHRASES

S45 In case of accident or if you feel unwell, contact a doctor or Poisons Information Centre immediately (show the label where possible).
S53 Avoid exposure - obtain special instructions before use.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient	Formula	Conc.	CAS No.
CARBON MONOXIDE	C-O	>20%	630-08-0
HYDROGEN	H ₂	>2%	1333-74-0
CARBON DIOXIDE	CO ₂	20 - 30%	124-38-9
NITROGEN	N ₂	Remainder	7727-37-9

4. FIRST AID MEASURES

Eye Not applicable.

Inhalation Remove from area of exposure immediately. If assisting a victim avoid becoming a casualty, wear an Air-line respirator or Self Contained Breathing Apparatus (SCBA). Be aware of possible explosive atmospheres. If victim is not breathing apply artificial respiration and seek urgent medical attention. Give oxygen if available. Keep warm and rested.

Skin Not applicable.

Colour
Rating
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4. FIRST AID MEASURES cont.

Ingestion For advice, contact a Poisons Information Centre on 13 11 26 (Australia Wide) or a doctor. Due to product form and application, ingestion is considered unlikely.

Advice To Doctor Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flammability Highly flammable. Heating to decomposition produces acrid smoke and irritating fumes. Product will add fuel to a fire. Eliminate all ignition sources including cigarettes, open flames, spark producing switches/tools, heaters, naked lights, pilot lights, mobile phones etc. when handling.

Fire and Explosion Highly flammable. Temperatures in a fire may cause cylinders to rupture and internal pressure relief devices to be activated. Call fire brigade. This product will add fuel to a fire. Cool cylinders exposed to fire by applying water from a protected location. Do not approach cylinders suspected of being hot.

Extinguishing Stop flow of gas if safe to do so, such as by slowly closing the cylinder valve.

Hazchem Code 2PE

6. ACCIDENTAL RELEASE MEASURES

Spillage GAS CYLINDERS: If the cylinder is leaking, eliminate all potential ignition sources and evacuate area of personnel. Inform manufacturer/supplier of leak. Wear appropriate PPE and carefully move it to a well ventilated remote area, then allow to discharge. Do not attempt to repair leaking valve or cylinder safety devices.

7. HANDLING AND STORAGE

Handling Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas (eg. if container is damaged).

Storage 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.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Ventilation Maintain adequate ventilation. Confined areas (eg. tanks) should be adequately ventilated or gas tested. Flammable/explosive vapours may accumulate in poorly ventilated areas. Maintain vapour levels below the recommended exposure standard. Maintain vapour levels below the recommended exposure standard.

Exposure Standards CARBON MONOXIDE (630-08-0)
ES-TWA : 30 ppm (34 mg/m3)
WES-TWA : 25 ppm

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8. EXPOSURE CONTROLS / PERSONAL PROTECTION cont.

HYDROGEN (1333-74-0)

ES-TWA : Asphyxiant

WES-TWA : Asphyxiant

CARBON DIOXIDE (124-38-9)

ES-TWA : 5000 ppm (ACGIH; NIOSH; NOHSC)

ES-STEL : 30000 ppm (ACGIH; NIOSH; NOHSC)

WES-TWA : 5000 ppm (9000 mg/m³)

NITROGEN (7727-37-9)

ES-TWA : 19.5% (ACGIH)

ES-TWA# : Asphyxiant - No values assigned (NOHSC)

WES-TWA : Asphyxiant

PPE Wear safety glasses and leather gloves. When using large quantities or where heavy contamination is likely, wear coveralls. Where an inhalation risk exists, wear Self Contained Breathing Apparatus (SCBA) or an Air-line respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: COLOURLESS GAS

Odour: ODOURLESS

pH: NOT AVAILABLE

Vapour Pressure: NOT AVAILABLE

Vapour Density: NOT AVAILABLE

Boiling Point: NOT AVAILABLE

Melting Point: NOT AVAILABLE

Evaporation Rate: NOT AVAILABLE

Solubility (water): 0.035 L/L (Carbon monoxide)

Specific Gravity: NOT AVAILABLE

% Volatiles: NOT AVAILABLE

Flammability: HIGHLY FLAMMABLE

Flash Point: NOT AVAILABLE

Upper Explosion Limit: NOT AVAILABLE

Lower Explosion Limit: 20% (Carbon dioxide in nitrogen)

Autoignition Temperature: NOT AVAILABLE

Cylinder pressure (when full): 13000 kPa @ 15 C

10. STABILITY AND REACTIVITY

Reactivity Carbon monoxide can react with iron, nickel and other metals to form highly toxic carbonyls. Reacts violently with oxygen difluoride, chlorine, barium peroxide. Dust of aluminium, chrome, manganese will ignite, then explode when heated in carbon dioxide. Incompatible with acrylaldehyde, aziridine, sodium peroxide. Corrosive when moist. Stress corrosion cracking can occur in steels, especially if other acid gases (eg. carbon dioxide, sulfur compounds) are

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10. STABILITY AND REACTIVITY cont.

present. Below 3500 kPa, corrosion is negligible and common materials can be used.

Decomposition Products Heating to decomposition produces acrid smoke and irritating fumes.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary Asphyxiant gas - non irritant. 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 normally present in the air at a concentration of 340ppm by volume. Adverse health affects to 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 irritating.

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

Skin Non irritating.

Ingestion Not applicable. Due to product form, ingestion is not considered a potential exposure route.

Toxicity Data CARBON MONOXIDE (630-08-0)
LC50 (Inhalation) : 1807 ppm/4 hours (rat)

12. ECOLOGICAL INFORMATION

Environment Natural sources of carbon monoxide (CO) such as atmospheric oxidation of methane, forest fires and product from living organisms account for about 90 % of the atmosphere's carbon monoxide content. Human activity produces about 10%. Motor vehicles account for about 55 to 65 % of global man made emissions of carbon monoxide.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Cylinders should be returned to the manufacturer or supplier for disposal.

Legislation Dispose of in accordance with relevant local legislation.

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14. TRANSPORT INFORMATION

Transport Ensure cylinder is separated from driver and that outlet of relief device is not obstructed.

UN Number 1953

Shipping Name COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S.

DG Class 2.3

Subsidiary 2.1

Risk(s)

Packing Group None Allocated

Hazchem Code 2PE

15. REGULATORY INFORMATION

AICS All chemicals listed on the Australian Inventory of Chemical Substances (AICS).

Poison Schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

16. OTHER INFORMATION

Additional Information Application Method: Gas regulator of suitable pressure and flow rating fitted to cylinder valve or manifold with low pressure gas distribution to equipment.

COLOUR RATING SYSTEM: Chem Alert reports are assigned a colour rating of Green, Amber or Red for the purpose of providing users with a quick and easy means of determining the hazardous nature of a product. Safe handling recommendations are provided in all Chem Alert reports so as to clearly identify how users can control the hazards and thereby reduce the risk (or likelihood) of adverse effects. As a general guideline a Green colour rating indicates a low hazard, an Amber colour rating indicates a moderate hazard and a Red colour rating indicates a high hazard.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this Chem Alert 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 Chem Alert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

ABBREVIATIONS:

mg/m³ - Milligrams per cubic metre

ppm - Parts Per Million

TWA/ES - Time Weighted Average or Exposure Standard.

CNS - Central Nervous System

NOS - Not Otherwise Specified

pH - relates to hydrogen ion concentration - this value will relate to a scale of 0 - 14, where 0 is highly acidic and 14 is highly alkaline.

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16. OTHER INFORMATION cont.

CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds.
M - moles per litre, a unit of concentration.
IARC - International Agency for Research on Cancer.

Report 11th April 2006
Reviewed

Date Printed 12th April 2006

Report Status Chem Alert reports are compiled as an independent source of information by RMT's scientific department. The information is based on the latest chemical and toxicological research, and in compliance with relevant standards, guidance notes and legislation (where applicable). The Chem Alert report is not intended as a replacement to the manufacturer's original MSDS that is provided to Chem Alert subscribers for convenience. In many instances, Chem Alert reports are compiled on behalf of manufacturers, in which case they serve as the "Manufacturer's MSDS" and are clearly identified as such on the relevant reports.

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