

## SAFETY DATA SHEET

# 2511

Product Name **6 COMPONENT MIXTURE (AR, 0.5% TO < 5% CO, CO<sub>2</sub>, H<sub>2</sub>, O<sub>2</sub>, BALANCE N<sub>2</sub>)**

### 1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

**Supplier Name** BOC LIMITED (AUSTRALIA)  
**Address** 10 Julius Avenue, North Ryde, NSW, AUSTRALIA, 2113  
**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)** 2511 - SDS NUMBER  
**Use(s)** CALIBRATION · INDUSTRIAL APPLICATIONS  
**SDS Date** 30 January 2012

### 2. HAZARDS IDENTIFICATION

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

**RISK PHRASES**

R20 Harmful by inhalation.  
R48/20 Harmful: 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 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

<b>UN Number</b>	1956	<b>DG Division</b>	2.2
<b>Packing Group</b>	None Allocated	<b>Subsidiary Risk(s)</b>	None Allocated
<b>Hazchem Code</b>	2TE		

### 3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Formula	Cas No.	Content (v/v)
OXYGEN	O <sub>2</sub>	7782-44-7	<23%
CARBON MONOXIDE	C-O	630-08-0	0.5 - 5%
HYDROGEN	H <sub>2</sub>	1333-74-0	<5%
CARBON DIOXIDE	C-O <sub>2</sub>	124-38-9	<20%
ARGON	Ar	7440-37-1	<10%
NITROGEN	N <sub>2</sub>	7727-37-9	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 available. For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor.

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**5. FIRE FIGHTING MEASURES**

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**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. Do not approach cylinders or containers suspected of being hot.**Extinguishing** Use water fog to cool containers from protected area.**Hazchem Code** 2TE

- 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.

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**6. ACCIDENTAL RELEASE MEASURES**

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**Spillage** If the cylinder is leaking, evacuate area of personnel. Inform manufacturer/supplier of leak. Use personal protective equipment. Carefully move material to a well ventilated remote area, then allow to discharge. Do not attempt to repair leaking valve or cylinder safety devices.

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**7. STORAGE AND HANDLING**

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**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.

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**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

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**Exposure Standards**

Ingredient	Reference	TWA		STEL	
		ppm	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>
Argon	SWA (AUS)	Asphyxiant			
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	--	--
Hydrogen	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

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**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.



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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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

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## 10. STABILITY AND REACTIVITY

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<b>Chemical Stability</b>	Stable under recommended conditions of storage.
<b>Conditions to Avoid</b>	Avoid heat, sparks, open flames and other ignition sources.
<b>Material to Avoid</b>	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
<b>Hazardous Decomposition Products</b>	May evolve toxic gases if heated to decomposition.
<b>Hazardous Reactions</b>	Polymerization will not occur.

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## 11. TOXICOLOGICAL INFORMATION

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<b>Health Hazard Summary</b>	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
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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.

<b>Eye</b>	Non irritant.
<b>Inhalation</b>	Irritant. 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.
<b>Skin</b>	Non irritant.
<b>Ingestion</b>	Ingestion is considered unlikely due to product form.
<b>Toxicity Data</b>	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**

<b>Environment</b>	When discharged to the atmosphere, carbon dioxide may contribute to the greenhouse effect. Carbon monoxide is slowly oxidised in the atmosphere to carbon dioxide.
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**13. DISPOSAL CONSIDERATIONS**

<b>Waste Disposal</b>	Cylinders should be returned to the manufacturer or supplier for disposal of contents.
<b>Legislation</b>	Dispose of in accordance with relevant local legislation.

**14. TRANSPORT INFORMATION**

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	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
<b>UN Number</b>	1956	1956	1956
<b>Proper Shipping Name</b>	COMPRESSED GAS, N.O.S. (contains nitrogen)		
<b>DG Class/ Division</b>	2.2	2.2	2.2
<b>Subsidiary Risk(s)</b>	None Allocated	None Allocated	None Allocated
<b>Packing Group</b>	None Allocated	None Allocated	None Allocated
<b>GTEPG</b>	2C1		
<b>Hazchem Code</b>	2TE		
<b>Other Information</b>	Ensure cylinder is separated from driver and that outlet of relief device is not obstructed.		

**15. REGULATORY INFORMATION**

<b>Poison Schedule</b>	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)
<b>Inventory Listing(s)</b>	<b>AUSTRALIA: AICS (Australian Inventory of Chemical Substances)</b> 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 ChemAlert 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
mg/m <sup>3</sup>	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

#### Report Status

This document has been compiled by RMT on behalf of the manufacturer of the product and serves as the manufacturer's Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer 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.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

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**Revision:** 1  
**SDS Date:** 30 January 2012

**End of SDS**