BOC
A Member of The Linde Group

SAFETY DATA SHEET

 # 1539

Product Name **9 COMPONENT MIXTURE (C2H2, C2H6, O2, C2H4, CO2, CO, N2, CH4, BALANCE H2)**

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)	1539 - MSDS NUMBER • PRODUCT CODES: 285, 288 • SPECIAL GAS MIXTURE
Use(s)	CALIBRATION • INDUSTRIAL APPLICATIONS
SDS Date	26 Mar 2010

2. HAZARDS IDENTIFICATION

CLASSIFIED AS HAZARDOUS ACCORDING TO ASCC CRITERIA

RISK PHRASES

R11	Highly flammable.
R23	Toxic by inhalation.
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 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 No.	1953	**DG Class**	2.3	**Subsidiary Risk(s)**	2.1
Packing Group	None Allocated	**Hazchem Code**	2PE	**EPG**	2A4

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Formula	CAS No.	Content
METHANE	C-H4	74-82-8	30%
CARBON MONOXIDE	C-O	630-08-0	9.88%
ETHYLENE	C2-H4	74-85-1	1.99%
OXYGEN	O2	7782-44-7	0.646%
ETHANE	C2-H6	74-84-0	0.515%
ACETYLENE	C2-H2	74-86-2	0.134%
HYDROGEN	H2	1333-74-0	remainder
NITROGEN	N2	7727-37-9	19.1%

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Formula	CAS No.	Content
CARBON DIOXIDE	CO2	124-38-9	3.02%

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). 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 None required.

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

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.

5. FIRE FIGHTING MEASURES

Flammability Highly flammable. 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 Temperatures in a fire may cause cylinders to rupture and internal pressure relief devices to be activated. Cool cylinders or containers exposed to fire by applying water from a protected location. Do not approach cylinders or containers suspected of being hot. This material is capable of forming explosive mixtures in air.

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 If the cylinder is leaking, eliminate all potential ignition sources and evacuate area of personnel. Prevent spreading of vapours through drains and ventilation systems. 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.

7. STORAGE AND HANDLING

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.

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.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Exposure Stds

Ingredient	Reference	TWA		STEL	
		ppm	mg/m3	ppm	mg/m3
Acetylene	ASCC (AUS)	Asphyxiant			
Carbon dioxide	ASCC (AUS)	5000	9000	30000	54000
Carbon dioxide in coal mines	ASCC (AUS)	12500	22500	30000	54000
Carbon monoxide	ASCC (AUS)	30	34	--	--
Ethane	ASCC (AUS)	Asphyxiant			
Ethylene	ASCC (AUS)	Asphyxiant			
Hydrogen	ASCC (AUS)	Asphyxiant			
Methane	ASCC (AUS)	Asphyxiant			

Ingredient	Reference	TWA		STEL	
		ppm	mg/m3	ppm	mg/m3
Nitrogen	ASCC (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. Flammable/explosive vapours may accumulate in poorly ventilated areas. Maintain vapour levels below the recommended exposure standard.

PPE Wear safety boots, leather gloves and safety glasses. Where an inhalation risk exists, wear: an Air-line respirator or self Contained Breathing Apparatus (SCBA).

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	COLOURLESS GAS	**Solubility (Water)**	0.035 cm3/cm3 (Carbon monoxide)
Odour	SWEET ODOUR	**Specific Gravity**	NOT APPLICABLE
pH	NOT APPLICABLE	**% Volatiles**	100 %
Vapour Pressure	NOT AVAILABLE	**Flammability**	HIGHLY FLAMMABLE
Vapour Density	NOT AVAILABLE	**Flash Point**	NOT AVAILABLE
Boiling Point	NOT AVAILABLE	**Upper Explosion Limit**	NOT AVAILABLE
Melting Point	NOT AVAILABLE	**Lower Explosion Limit**	5.7 % (Hydrogen in nitrogen)
Evaporation Rate	NOT APPLICABLE		
Autoignition Temperature	571°C (Hydrogen)	**Cylinder pressure (when full)**	13000 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 Carbon monoxide can react with iron, nickel and other metals. Below 3,500 kPa corrosion is negligible and common materials can be used. Incompatible with acrylaldehyde, aziridine, sodium peroxide. Corrosive when moist. Ethylene explodes spontaneously when mixed with chlorine in sunlight or UV irradiation. Phytotoxic. Carbon monoxide at pressures above 7000 kPa, copper lining should be used to reduce corrosion. Carbon monoxide may cause stress corrosion cracking in steels, especially if other acid gases (eg. carbon dioxide and sulphur compounds) are present. Below 3500 kPa, corrosion is negligible and common materials may be used. Carbon dioxide is corrosive when moist. Acetylene can undergo exothermic decomposition to carbon (soot) and hydrogen gas. Can form explosive acetylide with unalloyed copper, silver, mercury, brasses containing mort than 66% copper and brazing materials counting copper and silver. Violent polymerisation catalysted by copper above 400°C and 5400 kPa.

Decomposition May evolve toxic gases if heated to decomposition.

Hazardous Reactions Polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary Asphyxiant gas - toxic. 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.

Eye Non irritant.

Inhalation Toxic. Over exposure to carbon monoxide may result in rapid breathing, nausea, lack of coordination, unconsciousness and coma. Carbon monoxide reacts with haemoglobin in the blood to prevent oxygen uptake and release.

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)
ACETYLENE (74-86-2)
LCLo (Inhalation): 50pph/5M (human)
TCLo (Inhalation): 20 pph (human)
CARBON DIOXIDE (124-38-9)
LC50 (Inhalation): 470000 ppm/30M (rat)
LCLo (Inhalation): 9 pph/5M (human)

12. ECOLOGICAL INFORMATION

Environment When discharged to the atmosphere, carbon dioxide may contribute to the greenhouse effect. Carbon monoxide is slowly oxidised in the atmosphere to carbon dioxide.

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

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

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

Shipping Name	COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S.				
UN No.	1953	**DG Class**	2.3	**Subsidiary Risk(s)**	2.1
Packing Group	None Allocated	**Hazchem Code**	2PE	**EPG**	2A4

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 Drugs and Poisons (SUSDP).

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

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.

Product Name **9 COMPONENT MIXTURE (C2H2, C2H6, O2, C2H4, CO2, CO, N2, CH4, BALANCE H2)**

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

ABBREVIATIONS:
ADB - Air-Dry Basis.
BEI - Biological Exposure Indice(s)
CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds.
CNS - Central Nervous System.
EINECS - European INventory of Existing Commercial chemical Substances.
IARC - International Agency for Research on Cancer.
M - moles per litre, a unit of concentration.
mg/m3 - Milligrams per cubic metre.
NOS - Not Otherwise Specified.
NTP - National Toxicology Program.
OSHA - Occupational Safety and Health Administration.
pH - relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm - Parts Per Million.
RTECS - Registry of Toxic Effects of Chemical Substances.
TWA/ES - Time Weighted Average or Exposure Standard.

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.

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.

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.

Prepared By

Risk Management Technologies
5 Ventnor Ave, West Perth
Western Australia 6005
Phone: +61 8 9322 1711
Fax: +61 8 9322 1794
Email: info@rmt.com.au
Web: www.rmt.com.au

SDS Date: 26 Mar 2010

End of Report