BOC
A Member of The Linde Group

SAFETY DATA SHEET

 # 2277

Product Name **16 COMPONENT MIXTURE IN ETHYLENE**

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)	2277 - SDS NUMBER · PRODUCT CODE: 288-3691 · SPECIAL GAS MIXTURE
Use(s)	CALIBRATION · INDUSTRIAL APPLICATIONS
SDS Date	07 February 2012

2. HAZARDS IDENTIFICATION

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

RISK PHRASES

R12	Extremely Flammable.
R45	May cause cancer.
R46	May cause heritable genetic damage.
R67	Vapours may cause drowsiness and dizziness.

SAFETY PHRASES

S9	Keep container in a well ventilated place.
S16	Keep away from sources of ignition - No smoking.
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	1954	**DG Division**	2.1
Packing Group	None Allocated	**Subsidiary Risk(s)**	None Allocated
Hazchem Code	2SE		

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Formula	Cas No.	Content
ETHYLENE	C2-H4	74-85-1	30%
HYDROGEN	H2	1333-74-0	20%
ETHANE	C2-H6	74-84-0	17%
METHANE	C-H4	74-82-8	15%
PROPANE	C3-H8	74-98-6	5%
PROPYLENE	C3-H6	115-07-1	5%
1,3-BUTADIENE	C4-H6	106-99-0	1%
1-BUTENE	C4-H8	106-98-9	1%
ACETYLENE	C2-H2	74-86-2	1%

ISOBUTENE	C4-H8	115-11-7	1%
TRANS-2-BUTENE	C4-H8	624-64-6	1%
BUTANE	C4-H10	106-97-8	0.5%
ISOBUTANE	C4-H10	75-28-5	0.5%
CIS-2-BUTENE	C4-H8	590-18-1	1%
METHYL ACETYLENE	C3-H4	74-99-7	0.5%
PROPADIENE	C3-H4	463-49-0	0.5%

4. FIRST AID MEASURES

Eye If in eyes, hold eyelids apart and flush the eye continuously with running water. Continue flushing for 15 minutes.

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 Poison 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 Treat for asphyxia and cold burns.

5. FIRE FIGHTING MEASURES

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

Extinguishing Dry agent, carbon dioxide, foam or water fog. Prevent contamination of drains or waterways.

Hazchem Code 2SE

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

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 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.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m³	ppm	mg/m³
1,3-Butadiene	SWA (AUS)	10	22	--	--
Acetylene	SWA (AUS)	Asphyxiant			
Butane	SWA (AUS)	800	1900	--	--
Ethane	SWA (AUS)	Asphyxiant			
Ethylene	SWA (AUS)	Asphyxiant			
Hydrogen	SWA (AUS)	Asphyxiant			
Isobutane	SWA (AUS)	1000	--	--	--
Methane	SWA (AUS)	Asphyxiant			
Methyl acetylene	SWA (AUS)	1000	1640	--	--
Propane	SWA (AUS)	Asphyxiant			
Propylene	SWA (AUS)	Asphyxiant			

Biological Limits

Ingredient	Reference	Determinant	Sampling Time	BEI
1,3-BUTADIENE	ACGIH BEI	1,2-Dihydroxy-4-(N-acetylcy steinyl)-butane in urine	End of shift	25 mg/g creatinine
	ACGIH BEI	Mixture of N-1 and N-2-(hydroxybutenyl)valine hemoglobin (Hb) adducts in blood	Not critical	2.5 pmol/g Hb

Engineering Controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical explosion proof extraction ventilation is recommended. Flammable/explosive vapours may accumulate in poorly ventilated areas. Maintain vapour levels below the recommended exposure standard.

PPE

Eye / Face Wear safety glasses.

Hands Wear leather or cotton gloves.

Body Wear safety boots.

Respiratory If spraying, wear Self Contained Breathing Apparatus (SCBA) or an Air-line respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance COLOURLESS GAS
Odour HYDROCARBON ODOUR
Flammability HIGHLY FLAMMABLE
Flash point < 0°C
Boiling point NOT RELEVANT
Melting point NOT RELEVANT
Evaporation rate NOT APPLICABLE
pH NOT APPLICABLE
Vapour density 0.77 (Air = 1)
Specific gravity NOT APPLICABLE
Solubility (water) INSOLUBLE
Vapour pressure NOT APPLICABLE
Upper explosion limit NOT AVAILABLE
Lower explosion limit 3 % (Estimated)
Autoignition temperature NOT AVAILABLE
Decomposition temperature NOT AVAILABLE

Viscosity	NOT AVAILABLE
Partition coefficient	NOT AVAILABLE
% Volatiles	100 %

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	Explodes spontaneously when mixed with chlorine in sunlight. Reacts vigorously with some oxidising agents.
Hazardous Decomposition Products	May evolve toxic gases if heated to decomposition.
Hazardous Reactions	Violent polymerisation catalysed by copper above 400°C and 5,400 kPa.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary	1,3-Butadiene is classified as probably carcinogenic to humans (IARC Group 1).
Inhalation	Asphyxiant. Effects are proportional to oxygen displacement. Vapours may cause dizziness or drowsiness.
Ingestion	Ingestion is considered unlikely due to product form.
Toxicity Data	METHANE (74-82-8) LC50 (inhalation) 326 gm/m3/2h (mouse) PROPANE (74-98-6) LC50 (inhalation) > 800000 ppm/15M (rat) 1,3-BUTADIENE (106-99-0) LC50 (inhalation) 270 g/m³/2 hours (mouse) ACETYLENE (74-86-2) LCLo (inhalation) 50pph/5M (human) TCLo (inhalation) 20 pph (human) BUTANE (106-97-8) LC50 (inhalation) 658000 mg/m3/4H (rat)

12. ECOLOGICAL INFORMATION

Environment	Avoid release of this material to the environment. When discharged into the atmosphere, methane may contribute to the greenhouse effect. Methane has a global warming potential of 21 (CO2 = 1).

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	1954	-	-
Proper Shipping Name	COMPRESSED GAS,	-	-

Product Name	**16 COMPONENT MIXTURE IN ETHYLENE**		
	FLAMMABLE, N.O.S.		
DG Class/ Division	2.1	-	-
Subsidiary Risk(s)	None Allocated	-	-
Packing Group	None Allocated	-	-
GTEPG	2A1		
Hazchem Code	2SE		

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 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/m³	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
1.0	Standard SDS Review

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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End of SDS