

SAFETY DATA SHEET

046

Product Name **FUMIGAS 1000 FUMIGANT/ETHYLENE OXIDE**

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) 046 - SDS NUMBER • EPOXYETHANE • ETHYLENE OXIDE • ETO • OXIRANE • PRODUCT CODE: 100
Use(s) ANALYTICAL REAGENT • FUMIGANT • INDUSTRIAL APPLICATIONS • MANUFACTURING • STERILISER
SDS date 20 June 2014

2. HAZARDS IDENTIFICATION

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

Risk Phrases

R6 Explosive with or without contact with air.
R12 Extremely Flammable.
R23 Toxic by inhalation.
R36/37/38 Irritating to eyes, respiratory system and skin.
R45 May cause cancer.
R46 May cause heritable genetic damage.

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 1040 **Transport Hazard Classes** 2.3, 2.1
Packing Group None Allocated **Hazchem Code** 2PE

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Identification	Classification	Content
ETHYLENE OXIDE	CAS: 75-21-8 EC: 200-849-9	F+;R12 T;R23 Xi;R36/37/38 Carc.;R45 Muta.;R46 E;R6	99.7%

4. FIRST AID MEASURES

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 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

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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	Cold burns: Remove contaminated clothing and gently flush affected areas with warm water (30°C) for 15 minutes. Apply sterile dressing and treat as for a thermal burn. For large burns, immerse in warm water for 15 minutes. DO NOT apply any form of direct heat. Seek immediate medical attention.
Ingestion	Due to product form and application, ingestion is considered unlikely.
Advice to doctor	Treat symptomatically.
First aid facilities	Eye wash facilities and safety shower should be available.

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. If safe, extinguish fire using dry chemical. Cool cylinders with water spray from protected area. Contact manufacturer for further advice.
Hazchem code	2PE 2 Water Fog (or fine water spray if fog unavailable) P Full protective equipment including Self Contained Breathing apparatus. 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. Ventilate area where possible and eliminate ignition sources.
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 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. Drums need to be stored horizontally in cradles. Cylinders and drums should be stored away from direct sunlight and heat sources for prolonged periods.
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/m ³	ppm	mg/m ³
Ethylene Oxide	SWA (AUS)	1	1.8	--	--

Biological limits	No biological limit allocated.
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Engineering controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Flammable/explosive vapours may accumulate in poorly ventilated areas. Vapours are heavier than air and may travel some distance to an ignition source and flash back. Maintain vapour levels below the recommended exposure standard.

PPE

Eye / Face	Wear safety glasses.
Hands	Wear leather gloves.
Body	Wear coveralls and safety boots.
Respiratory	Wear Self Contained Breathing Apparatus (SCBA) or an Air-line respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	COLOURLESS GAS OR LIQUID
Odour	SWEET ODOUR (ABOVE 100 PPM)
Flammability	HIGHLY FLAMMABLE
Flash point	< 23°C
Boiling point	10.5°C
Melting point	NOT AVAILABLE
Evaporation rate	NOT APPLICABLE
pH	NOT APPLICABLE
Vapour density	1.49 (Air = 1)
Specific gravity	NOT APPLICABLE
Solubility (water)	195 cm ³ /cm ³
Vapour pressure	NOT AVAILABLE
Upper explosion limit	100 %
Lower explosion limit	3 %
Partition coefficient	NOT AVAILABLE
Autoignition temperature	429°C
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE
Critical temperature	195.8°C
% Volatiles	100 %

10. STABILITY AND REACTIVITY

Chemical stability	Potential for exothermic hazard.
Conditions to avoid	Avoid heat, sparks, open flames and other ignition sources.
Material to avoid	Incompatible with bases, alcohols, air, m-nitro-aniline, trimethyl amine, copper, iron chlorides, iron oxides, magnesium perchlorate, mercaptans, potassium, trichlorides, contaminants, alkane thiols, bromomethane. The storage life of this product is 6 months. After 6 months, polymerisation may occur and progresses rapidly once started.
Hazardous Decomposition Products	May evolve toxic gases if heated to decomposition.
Hazardous Reactions	Exposure to heating and cooling (eg. fire) may continue to polymerise exothermically leading to container pressurisation and explosion. Explosive decomposition may be suppressed by many diluents. Liquid phase decomposition has been observed. Violent polymerisation occurs on contact with ammonia, alkali hydroxides, amines, metallic potassium, acids, covalent halides.

11. TOXICOLOGICAL INFORMATION

Health Hazard Carcinogen - toxic. Symptoms are usually delayed, except for serious exposure, and include general

Summary	anaesthesia, nausea, vomiting, coughing, irritation to eyes and nose, loss of sense of smell and, progressively, stupor and coma. Low level inhalation may result in irritation with coughing and broncho spasm. High level inhalation (above 1,000 ppm) may result in irritation and damage to the upper respiratory system, hoarseness, cough, headache, nausea and recurring vomiting, fatigue and pulmonary oedema. Less frequently reported effects include muscular weakness, abdominal discomfort and diarrhoea and acute encephalopathy. Chronic exposure may result in cataract development, nerve cell damage in animal systems and suspected leukaemia and stomach cancer. Ethylene oxide is classified as carcinogenic to humans (IARC Group 1). May cause genetic defects.										
Eye	Irritant. Gas and liquid are extremely irritating. Contact lenses should not be worn when using this product. Conjunctivitis and cataracts have been reported.										
Inhalation	Toxic - irritant. Symptoms are usually delayed, except for serious exposure, and include general anaesthesia, nausea, vomiting, coughing, irritation to eyes and nose, loss of sense of smell and, progressively, stupor and coma. Low level inhalation may result in irritation with coughing and broncho spasm. High level inhalation (above 1,000 ppm) may result in irritation and damage to the upper respiratory system, hoarseness, cough, headache, nausea and recurring vomiting, fatigue and pulmonary oedema. Less frequently reported effects include muscular weakness, abdominal discomfort and diarrhoea and acute encephalopathy. Chronic exposure may result in cataract development, nerve cell damage in animal systems and suspected leukaemia and stomach cancer. Ethylene oxide is classified as carcinogenic to humans (IARC Group 1). May cause genetic defects.										
Skin	Irritant. Low temperature evaporating liquid can cause cold burns.										
Ingestion	Ingestion is considered unlikely due to product form. Contact with liquid may cause burns to mouth or lips.										
Toxicity data	<table><tr><td colspan="2">ETHYLENE OXIDE (75-21-8)</td></tr><tr><td>LC50 (inhalation)</td><td>800 ppm/4 hours (rat)</td></tr><tr><td>LD50 (ingestion)</td><td>72 mg/kg (rat)</td></tr><tr><td>TCLo (inhalation)</td><td>33 ppm/6 hours/2 years intermittently (rat)</td></tr><tr><td>TDLo (ingestion)</td><td>1186 mg/kg/2 years intermittently (rat)</td></tr></table>	ETHYLENE OXIDE (75-21-8)		LC50 (inhalation)	800 ppm/4 hours (rat)	LD50 (ingestion)	72 mg/kg (rat)	TCLo (inhalation)	33 ppm/6 hours/2 years intermittently (rat)	TDLo (ingestion)	1186 mg/kg/2 years intermittently (rat)
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12. ECOLOGICAL INFORMATION

Toxicity	The following ecotoxicity value has been reported for ethylene oxide: LC50; Species: Daphnia magna (Water flea); Conditions: freshwater, static; Concentration: 260000 ug/L for 24 hr (formulated product).
Persistence and degradability	The importance of biodegradation of ethylene oxide in aquatic environments is not able to be accurately assessed, as ethylene oxide hydrolyzes to ethylene glycol which is readily biodegraded.
Bioaccumulative potential	Low potential to bioaccumulate.
Mobility in soil	Ethylene oxide is expected to have very high mobility in soil, but is not expected to adsorb to suspended solids and sediment. Volatilisation of ethylene oxide from moist soil surfaces, dry soil surfaces and water surfaces is expected.
Other adverse effects	No information provided.

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	1040	-	-
Proper Shipping Name	ETHYLENE OXIDE or ETHYLENE OXIDE WITH NITROGEN up to a total pressure of 1 MPa (10 bar) at 50°C	-	-
Transport Hazard Classes	2.3, 2.1	-	-
Packing Group	None Allocated	-	-

Environmental hazards No information provided

Special precautions for user

Hazchem code 2PE

GTEPG 2A4

Other information Ensure cylinder is separated from driver and foodstuffs.

15. REGULATORY INFORMATION

Poison schedule Classified as a Schedule 7 (S7) 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: Liquid vapourised and gas distributed to application 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
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m ³	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
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
STEL	Short-Term Exposure Limit
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
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA	Time Weighted Average

Revision history

Revision	Description
1.1	Standard SDS Review
1.0	Initial SDS creation

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.

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