

## SAFETY DATA SHEET

# 0184

Product Name **VAPORMATE**

### 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)** 0184 - MSDS NUMBER • ETHYL FORMATE IN CARBON DIOXIDE • PRODUCT CODE: 0279  
**Use(s)** FUMIGANT • INDUSTRIAL APPLICATIONS  
**SDS date** 29 October 2013

### 2. HAZARDS IDENTIFICATION

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

#### RISK PHRASES

R10 Flammable.  
R36 Irritating to eyes.  
R52 Harmful to aquatic organisms.

#### SAFETY PHRASES

S23 Do not breathe gas/fumes/vapour/spray (where applicable).  
S25 Avoid contact with eyes.  
S35 This material and its container must be disposed of in a safe way.

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

**UN number** 3161 **DG division** 2.1  
**Packing group** None Allocated **Subsidiary risk(s)** None Allocated  
**Hazchem code** 2YE

### 3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Identification	Classification	Content (w/w)
ETHYL FORMATE	CAS: 109-94-4 EC: 203-721-0	F;R11 Xn;R20/22 Xi;R36/37	16.7%
CARBON DIOXIDE	CAS: 124-38-9 EC: 204-696-9	Not Available	Remainder

### 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). 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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**Skin** If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

**Ingestion** Ingestion is not considered a potential route of exposure. Due to product form and application, ingestion is considered unlikely.

**Advice to doctor** Treat symptomatically.

## 5. FIRE FIGHTING MEASURES

**Flammability** Flammable liquefied gas mixture.

**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. Remove cool cylinders from the path of the fire. Evacuate the area if unable to keep cylinders cool. Do not approach cylinders or containers suspected of being hot.

**Extinguishing** Use water fog to cool containers from protected area.

**Hazchem code** 2YE

2 Water Fog (or fine water spray if fog unavailable)

Y Self Contained Breathing apparatus and protective gloves.

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 of this SDS.

**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 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. The treated storage area should be equipped with a suitable system monitoring for air levels of ethyl formate, formic acid and carbon dioxide.

**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 <sup>3</sup>	ppm	mg/m <sup>3</sup>
Carbon dioxide	SWA (AUS)	5000	9000	30000	54000
Ethyl formate	SWA (AUS)	100	303	--	--

**Biological limits** No biological limit allocated.

**Engineering controls** During application this product is vapourised into a gas tight fumigation space, therefore ventilation is not normally required. Maintain vapour levels below the recommended exposure standard.

**PPE**

<b>Eye / Face</b>	Wear splash-proof goggles.
<b>Hands</b>	Wear leather or cotton gloves.
<b>Body</b>	Wear long sleeved shirt, long pants and safety boots.
<b>Respiratory</b>	Wear a type AX (Organic Vapour) respirator where levels of ethyl formate are above 100ppm and carbon dioxide lower than 5000ppm. Where Self Contained Breathing Apparatus (SCBA) where levels of Carbon Dioxide above 5000 ppm (at any level of ethyl formate).



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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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<b>Appearance</b>	COLOURLESS GAS
<b>Odour</b>	SLIGHT ODOUR
<b>Flammability</b>	FLAMMABLE
<b>Flash point</b>	NOT AVAILABLE
<b>Boiling point</b>	-78.5°C (Carbon dioxide)
<b>Melting point</b>	-56.6°C (Carbon dioxide)
<b>Evaporation rate</b>	NOT APPLICABLE
<b>pH</b>	NOT APPLICABLE
<b>Vapour density</b>	1.63 (Air = 1)
<b>Specific gravity</b>	NOT APPLICABLE
<b>Solubility (water)</b>	0.759 cm <sup>3</sup> /cm <sup>3</sup> (Carbon dioxide)
<b>Vapour pressure</b>	NOT AVAILABLE
<b>Upper explosion limit</b>	NOT AVAILABLE
<b>Lower explosion limit</b>	NOT AVAILABLE
<b>Partition coefficient</b>	NOT AVAILABLE
<b>Autoignition temperature</b>	NOT AVAILABLE
<b>Decomposition temperature</b>	NOT AVAILABLE
<b>Viscosity</b>	NOT AVAILABLE
<b>Explosive properties</b>	NOT AVAILABLE
<b>Oxidising properties</b>	NOT AVAILABLE
<b>Odour threshold</b>	NOT AVAILABLE
<b>% Volatiles</b>	100 %

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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 shock, friction, heavy impact, heat, sparks, open flames and other ignition sources.
<b>Material to avoid</b>	Moist carbon dioxide is corrosive, hence acid resistant materials are required (stainless steel). Incompatible with oxidising agents (nitrates, oxygen), halogens (chlorine, bromine), acids (nitric acid) and some chlorides. Most rubbers and plastics are affected by carbon dioxide.
<b>Hazardous Decomposition Products</b>	This material will not decompose to form hazardous products other than that already present.
<b>Hazardous Reactions</b>	Polymerization will not occur.

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## 11. TOXICOLOGICAL INFORMATION

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<b>Health Hazard Summary</b>	Harmful to respiratory system. May be irritating to eyes and skin. Carbon dioxide is normally present in the air at a concentration of 340ppm by volume. Accelerated breathing and heart rate may occur with exposure above the normal level. Carbon dioxide can be fatal with exposure to very high concentrations. Long term exposure to CO <sub>2</sub> has no known health effects. Exposure to high concentrations of ethyl formate may cause toxic effects, including dizziness or suffocation, dyspnea and pulmonary oedema.
<b>Eye</b>	Irritant. Contact may result in irritation.
<b>Inhalation</b>	Harmful. Inhalation of vapours may cause dizziness or suffocation.

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<b>Skin</b>	Irritant. Contact may result in irritation.	
<b>Ingestion</b>	Ingestion is considered unlikely due to product form.	
<b>Toxicity data</b>	ETHYL FORMATE (109-94-4)	
	LCLo (inhalation)	8000 ppm/4 hours (rat)
	LD50 (ingestion)	1110 mg/kg (guinea pig)
	LDLo (subcutaneous)	1 g/kg (rabbit)
	CARBON DIOXIDE (124-38-9)	
	LC50 (inhalation)	470000 ppm/30M (rat)
	LCLo (inhalation)	9 pph/5M (human)

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**12. ECOLOGICAL INFORMATION**

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<b>Toxicity</b>	Harmful to aquatic organisms.
<b>Persistence and degradability</b>	No information provided.
<b>Bioaccumulative potential</b>	No information provided.
<b>Mobility in soil</b>	No information provided.
<b>Other adverse effects</b>	This product is used as an insect fumigant. Uncontrolled release of this product may cause damage to the environment. Do not allow product to enter waterways. When discharged to the atmosphere, carbon dioxide may contribute to the greenhouse effect. When discharged to the atmosphere, carbon dioxide may contribute to the greenhouse effect.

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**13. DISPOSAL CONSIDERATIONS**

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<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.

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**14. TRANSPORT INFORMATION**

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



	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
<b>UN number</b>	3161	-	-
<b>Proper shipping name</b>	LIQUEFIED GAS, FLAMMABLE, N.O.S. (ethyl formate)	-	-
<b>DG class/ Division</b>	2.1	-	-
<b>Subsidiary risk(s)</b>	None Allocated	-	-
<b>Packing group</b>	None Allocated	-	-
<b>GTEPG</b>	2A2		
<b>Hazchem code</b>	2YE		
<b>Other information</b>	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.		

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**15. REGULATORY INFORMATION**

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<b>Poison schedule</b>	Classified as a Schedule 6 (S6) Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).
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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. PVMA approval number: 56186. ACVM approval number: P007023. GENERAL INSTRUCTIONS: All entrances to the fumigated area must be placarded with "DANGER, area under fumigation, DO NOT ENTER, unless wearing appropriate personal protective equipment". The placard should also carry a skull & crossbones pictogram.

APPLICATION SYSTEM: Vapourmate is vapourised into an enclosed gas tight fumigation space to allow the fumigant to penetrate deep into the commodity being treated for the recommended exposure time period. Only BOC approved (20 M pa) dispensing equipment can be used with Vapourmate.

#### 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
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m <sup>3</sup>	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
2.2	Standard SDS Review
2.1	Standard SDS Review.
2.0	Standard SDS Review.
1.5	Standard SDS Review
1.4	Standard SDS Review
1.3	Standard SDS Review
1.0	Initial SDS Creation

**Product Name**      **VAPORMATE**

**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**