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## 1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

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### 1.1 Product identifier

**Product name** 13 COMPONENT HYDROCARBON MIXTURE, BALANCE METHANE  
**Synonym(s)** 2447 - SDS NUMBER • SPECIAL GAS MIXTURE

### 1.2 Uses and uses advised against

**Use(s)** CALIBRATION • INDUSTRIAL APPLICATIONS

### 1.3 Details of the supplier of the product

**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)  
**Website** <http://www.boc.com.au>

### 1.4 Emergency telephone number(s)

**Emergency** 1800 653 572 (24/7) (Australia only)

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## 2. HAZARDS IDENTIFICATION

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### 2.1 Classification of the substance or mixture

CLASSIFIED AS HAZARDOUS ACCORDING TO AUSTRALIAN WHS REGULATIONS

**GHS classification(s)** Flammable Gases: Category 1  
Gases Under Pressure: Compressed gas

### 2.2 Label elements

**Signal word** DANGER

**Pictogram(s)**



### Hazard statement(s)

H220 Extremely flammable gas.  
H280 Contains gas under pressure; may explode if heated.

### Prevention statement(s)

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.

### Response statement(s)

P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.  
P381 Eliminate all ignition sources if safe to do so.

### Storage statement(s)

P410 + P403 Protect from sunlight. Store in a well-ventilated place.

### Disposal statement(s)

None allocated.

**2.3 Other hazards**

Asphyxiant. Effects are proportional to oxygen displacement.

**3. COMPOSITION/ INFORMATION ON INGREDIENTS**

**3.1 Substances / Mixtures**

Ingredient	CAS Number	EC Number	Content
METHANE	74-82-8	200-812-7	Remainder
ETHANE	74-84-0	200-814-8	<10%
PROPANE	74-98-6	200-827-9	<5%
BUTANE	106-97-8	203-448-7	<1%
ISOBUTANE	75-28-5	200-857-2	<1%
ISOPENTANE	78-78-4	201-142-8	<1%
N-HEPTANE	142-82-5	205-562-2	<1%
N-HEXANE	110-54-3	203-777-6	<1%
NONANE	111-84-2	203-913-4	<1%
OCTANE	111-65-9	203-892-1	<1%
PENTANE	109-66-0	203-692-4	<1%
CARBON DIOXIDE	124-38-9	204-696-9	<10%
NITROGEN	7727-37-9	231-783-9	<10%

**4. FIRST AID MEASURES**

**4.1 Description of first aid measures**

<b>Eye</b>	None required.
<b>Inhalation</b>	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. Contact a Poisons Information Centre on 13 11 26 (Australia Wide) or a doctor.
<b>Skin</b>	None required.
<b>Ingestion</b>	Ingestion is not considered a potential route of exposure. Due to product form and application, ingestion is considered unlikely.
<b>First aid facilities</b>	No information provided.

**4.2 Most important symptoms and effects, both acute and delayed**

In high concentrations may cause asphyxiation. Symptoms may include loss of mobility / consciousness. Victim may not be aware of asphyxiation. Low concentrations of CO2 cause increased respiration and headache.

**4.3 Immediate medical attention and special treatment needed**

Treat symptomatically.

**5. FIRE FIGHTING MEASURES**

**5.1 Extinguishing media**

Stop flow of gas if safe to do so, such as by slowly closing the cylinder valve.

**5.2 Special hazards arising from the substance or mixture**

Extremely flammable. Eliminate all ignition sources including cigarettes, open flames, spark producing switches/tools, heaters, naked lights, pilot lights, mobile phones etc. when handling.

**5.3 Advice for firefighters**

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.

**5.4 Hazchem code**

2SE  
 2 Fine Water Spray.  
 S Risk of violent reaction or explosion. Wear full fire kit and breathing apparatus. Dilute spill and run-off.  
 E Evacuation of people in and around the immediate vicinity of the incident should be considered.

**6. ACCIDENTAL RELEASE MEASURES**

**6.1 Personal precautions, protective equipment and emergency procedures**

If the cylinder is leaking, evacuate area of personnel. Inform manufacturer/supplier of leak. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ensure adequate air ventilation. Eliminate all sources of ignition. Consider the risk of potentially explosive atmospheres.

**6.2 Environmental precautions**

Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

**6.3 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.

**6.4 Reference to other sections**

See Sections 8 and 13 for exposure controls and disposal.

**7. HANDLING AND STORAGE**

**7.1 Precautions for safe 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.

**7.2 Conditions for safe storage, including any incompatibilities**

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.

**7.3 Specific end use(s)**

No information provided.

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

**8.1 Control parameters**

**Exposure standards**

Ingredient	Reference	TWA		STEL	
		ppm	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>
Butane	SWA (AUS)	800	1900	--	--
Carbon dioxide	SWA (AUS)	5000	9000	30000	54000
Carbon dioxide in coal mines	SWA (AUS)	12500	22500	30000	54000
Ethane	SWA (AUS)	Asphyxiant			
Isobutane	SWA (AUS)	1000	--	--	--
Methane	SWA (AUS)	Asphyxiant			
Nitrogen	SWA (AUS)	Asphyxiant			
Nonane	SWA (AUS)	200	1050	--	--
Octane	SWA (AUS)	300	1400	375	1750
Pentane	SWA (AUS)	600	1770	750	2210
Propane	SWA (AUS)	Asphyxiant			
n-Heptane	SWA (AUS)	400	1600	500	2050
n-Hexane	SWA (AUS)	20	72	--	--

**Biological limits**

Ingredient	Determinant	Sampling Time	BEI
N-HEXANE	2,5-Hexanedione in urine (without hydrolysis)	End of shift at end of workweek	0.4 mg/L

Reference: ACGIH Biological Exposure Indices

**8.2 Exposure controls**

**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 gloves.
- Body** Wear safety boots.
- Respiratory** Where an inhalation risk exists, wear Self Contained Breathing Apparatus (SCBA) or an Air-line respirator.



**9. PHYSICAL AND CHEMICAL PROPERTIES**

**9.1 Information on basic physical and chemical properties**

Appearance	COLOURLESS GAS
Odour	ODOURLESS
Flammability	EXTREMELY FLAMMABLE
Flash point	NOT AVAILABLE
Boiling point	NOT AVAILABLE
Melting point	NOT AVAILABLE
Evaporation rate	NOT APPLICABLE
pH	NOT APPLICABLE
Vapour density	NOT AVAILABLE
Specific gravity	NOT APPLICABLE
Solubility (water)	NOT AVAILABLE
Vapour pressure	NOT AVAILABLE
Upper explosion limit	15.0 % (Methane)
Lower explosion limit	5.0 % (Methane)
Partition coefficient	NOT AVAILABLE
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE

**9.2 Other information**

% Volatiles	100 %
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**10. STABILITY AND REACTIVITY**

**10.1 Reactivity**

Carefully review all information provided in sections 10.2 to 10.6.

**10.2 Chemical stability**

Stable under recommended conditions of storage.

**10.3 Possibility of hazardous reactions**

Polymerization will not occur.

**10.4 Conditions to avoid**

Avoid heat, sparks, open flames and other ignition sources.

**10.5 Incompatible materials**

Moist carbon dioxide is corrosive, hence acid resistant materials are required (e.g. stainless steel). Certain properties of some plastics and rubbers may be affected by carbon dioxide (i.e. embrittlement, leaching of plasticisers, etc).

**10.6 Hazardous decomposition products**

This material will not decompose to form hazardous products other than that already present.

**11. TOXICOLOGICAL INFORMATION**

**11.1 Information on toxicological effects**

**Acute toxicity**

**Information available for the product:**

Based on available data, the classification criteria are not met. Low concentrations of carbon dioxide cause increased respiration and headache.

**Information available for the ingredient(s):**

Ingredient	Oral Toxicity (LD50)	Dermal Toxicity (LD50)	Inhalation Toxicity (LC50)
METHANE	--	--	326 gm/m3/2h (mouse)
CARBON DIOXIDE	--	--	470000 ppm/30M (rat)
PROPANE	--	--	> 800000 ppm/15M (rat)
BUTANE	--	--	658000 mg/m3/4H (rat)
N-HEPTANE	--	--	103 g/m <sup>3</sup> /4 hours (rat)
N-HEXANE	25 g/kg (rat)	3000 mg/kg (rabbit)	48000 ppm/4 hours (rat)
PENTANE	--	--	364 g/m <sup>3</sup> /4 hours (rat)

- Skin** Not classified as a skin irritant.
- Eye** Not classified as an eye irritant.
- Sensitization** Not classified as causing skin or respiratory sensitisation.
- Mutagenicity** Not classified as a mutagen.
- Carcinogenicity** Not classified as a carcinogen.
- Reproductive** Not classified as a reproductive toxin.
- STOT – single exposure** Asphyxiant. Effects are proportional to oxygen displacement. Over exposure may result in dizziness, drowsiness, weakness, fatigue, breathing difficulties and unconsciousness.
- STOT – repeated exposure** Not classified as causing organ damage from repeated exposure.
- Aspiration** Not classified as causing aspiration.

**12. ECOLOGICAL INFORMATION**

**12.1 Toxicity**

No information provided.

**12.2 Persistence and degradability**

No information provided.

**12.3 Bioaccumulative potential**

No information provided.

**12.4 Mobility in soil**

No information provided.

**12.5 Other adverse effects**

When discharged to the atmosphere, carbon dioxide may contribute to the greenhouse effect.

### 13. DISPOSAL CONSIDERATIONS

#### 13.1 Waste treatment methods

**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)
<b>14.1 UN Number</b>	1954	1954	1954
<b>14.2 Proper Shipping Name</b>	COMPRESSED GAS, FLAMMABLE, N.O.S. (Contains methane)	COMPRESSED GAS, FLAMMABLE, N.O.S. (Contains methane)	COMPRESSED GAS, FLAMMABLE, N.O.S. (Contains methane)
<b>14.3 Transport hazard class</b>	2.1	2.1	2.1
<b>14.4 Packing Group</b>	None Allocated	None Allocated	None Allocated

**14.5 Environmental hazards** No information provided

#### 14.6 Special precautions for user

**Hazchem code** 2SE  
**GTEPG** 2A1  
**EMS** F-D, S-U

**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

#### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

**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).

**Classifications** Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals.

The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].

**Hazard codes** F+ Extremely flammable  
**Risk phrases** R12 Extremely Flammable.  
**Safety phrases** S2 Keep out of reach of children.  
 S9 Keep container in a well ventilated place.  
 S16 Keep away from sources of ignition - No smoking.  
 S33 Take precautionary measures against static discharges.

**Inventory listing(s)** **AUSTRALIA: AICS (Australian Inventory of Chemical Substances)**  
 All components are listed on AICS, or are exempt.  
**NEW ZEALAND: NZIoC (New Zealand Inventory of Chemicals)**  
 All components are listed on the NZIoC inventory, 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.

**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 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
EMS	Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods)
GHS	Globally Harmonized System
GTEPG	Group Text Emergency Procedure Guide
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m <sup>3</sup>	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
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

**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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