

## SAFETY DATA SHEET

# 2298

Product Name **10 COMPONENT MIXTURE (BALANCE HYDROGEN) (# 2298)**

### 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)** 2298 - MSDS NUMBER • PRODUCT CODE: GM17176 • SPECIAL GAS MIXTURE  
**Use(s)** CALIBRATION • INDUSTRIAL APPLICATIONS  
**SDS date** 10 September 2014

### 2. HAZARDS IDENTIFICATION

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

**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.

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

**UN Number** 1954 **Transport Hazard Class** 2.1  
**Packing Group** None Allocated **Hazchem Code** 2SE

### 3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Identification	Classification	Content
PROPANE	CAS: 74-98-6 EC: 200-827-9	F+;R12	10%
BUTANE	CAS: 106-97-8 EC: 203-448-7	F+;R12	8%
ETHANE	CAS: 74-84-0 EC: 200-814-8	F+;R12	5%
ISOBUTANE	CAS: 75-28-5 EC: 200-857-2	F+;R12	5%
ISOPENTANE	CAS: 78-78-4 EC: 201-142-8	F+;R12, N;R51/53, Xn;R65, Xi;R66, Xn;R67	1%
METHANE	CAS: 74-82-8 EC: 200-812-7	F+;R12	<1%

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N-HEXANE	CAS: 110-54-3 EC: 203-777-6	F;R11, Xi;R38, Xn;R48/20, N;R51/53, Repr.;R62, Xn;R65, Xn;R67	<1%
PENTANE	CAS: 109-66-0 EC: 203-692-4	F+;R12, N;R51/53, Xn;R65, Xi;R66, Xn;R67	<1%
HYDROGEN	CAS: 1333-74-0 EC: 215-605-7	F+;R12	Remainder
CARBON DIOXIDE	CAS: 124-38-9 EC: 204-696-9	Not Available	<0.1%

**4. 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). 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.
<b>Skin</b>	None required.
<b>Ingestion</b>	Due to product form and application, ingestion is considered unlikely.
<b>Advice to doctor</b>	Treat symptomatically.

**5. FIRE FIGHTING MEASURES**

<b>Flammability</b>	Highly flammable. Eliminate all ignition sources including cigarettes, open flames, spark producing switches/tools, heaters, naked lights, pilot lights, mobile phones etc. when handling.
<b>Fire and explosion</b>	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 with air.
<b>Extinguishing</b>	Stop flow of gas if safe to do so, such as by slowly closing the cylinder valve. If the gas source cannot be isolated, do not extinguish the flame, since re-ignition and explosion could occur. Await arrival of emergency services or manufacturer's advisor. Drench and cool cylinders with water spray from protected area at a safe distance. If it is absolutely necessary to extinguish the flame, use only a dry chemical powder extinguisher. Do not move cylinders for at least 24 hours. Avoid shock and bumps to cylinders.
<b>Hazchem code</b>	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**

<b>Spillage</b>	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.
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**7. STORAGE AND HANDLING**

<b>Storage</b>	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.
<b>Handling</b>	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 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			
Hydrogen	SWA (AUS)	Asphyxiant			
Isobutane	SWA (AUS)	1000	--	--	--
Methane	SWA (AUS)	Asphyxiant			
Pentane	SWA (AUS)	600	1770	750	2210
Propane	SWA (AUS)	Asphyxiant			
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

**Engineering controls**

Provide suitable ventilation to minimise or eliminate exposure. Confined areas (eg. tanks) should be adequately ventilated or gas tested. 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**

<b>Appearance</b>	COLOURLESS GAS
<b>Odour</b>	ODOURLESS
<b>Flammability</b>	HIGHLY FLAMMABLE
<b>Flash point</b>	NOT APPLICABLE
<b>Boiling point</b>	NOT APPLICABLE
<b>Melting point</b>	NOT APPLICABLE
<b>Evaporation rate</b>	NOT APPLICABLE
<b>pH</b>	NOT APPLICABLE
<b>Vapour density</b>	0.5 (Air = 1)
<b>Specific gravity</b>	NOT APPLICABLE
<b>Solubility (water)</b>	INSOLUBLE
<b>Vapour pressure</b>	NOT APPLICABLE
<b>Upper explosion limit</b>	25 % (calc.)
<b>Lower explosion limit</b>	3.2 % (calc.)
<b>Partition coefficient</b>	NOT AVAILABLE
<b>Autoignition temperature</b>	NOT AVAILABLE
<b>Decomposition temperature</b>	NOT AVAILABLE
<b>Viscosity</b>	NOT AVAILABLE

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**Explosive properties** NOT AVAILABLE  
**Oxidising properties** NOT AVAILABLE  
**% Volatiles** 100 %

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**10. STABILITY AND REACTIVITY**

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**Chemical stability** Stable under recommended conditions of storage.  
**Conditions to avoid** Avoid heat, sparks, open flames and other ignition sources.  
**Material to avoid** Incompatible with oxidising agents (eg. hypochlorites), acids (eg. nitric acid), heat and ignition sources. Do not use natural rubber flexible hoses. Also incompatible (potentially violently) with oxygen, halogens and metal halides.  
**Hazardous Decomposition Products** This material will not decompose to form hazardous products other than that already present.  
**Hazardous Reactions** Polymerization will not occur.

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**11. TOXICOLOGICAL INFORMATION**

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**Health Hazard Summary** Asphyxiant gas. Symptoms of exposure are directly related to displacement of oxygen. As the amount of oxygen inhaled is reduced from 21-14% volume, the pulse rate may accelerate and the rate and volume of breathing may increase. The ability to maintain attention and think clearly is diminished, muscular co-ordination is somewhat disturbed. As oxygen decreases from 14-10% volume, judgement becomes faulty, severe injuries may result in no pain. Muscular effort may lead to rapid fatigue. Further reduction to 6% may result in nausea and vomiting. Ability to move may be lost. Permanent brain damage may result even after resuscitation from exposure to this low level of oxygen. Below 6% breathing is in gasps and convulsions may occur. Inhalation of a mixture containing no oxygen may result in unconsciousness from the first breath and death may follow in minutes.

**Eye** Non irritant.

**Inhalation** Asphyxiant. Effects are proportional to oxygen displacement.

**Skin** Non irritant.

**Ingestion** Ingestion is considered unlikely due to product form.

**Toxicity data**

PROPANE (74-98-6)	
LC50 (inhalation)	> 800000 ppm/15M (rat)
BUTANE (106-97-8)	
LC50 (inhalation)	658000 mg/m <sup>3</sup> /4H (rat)
METHANE (74-82-8)	
LC50 (inhalation)	326 gm/m <sup>3</sup> /2h (mouse)
N-HEXANE (110-54-3)	
LC50 (inhalation)	48000 ppm/4 hours (rat)
LD50 (ingestion)	25 g/kg (rat)
LD50 (skin)	3000 mg/kg (rabbit)
PENTANE (109-66-0)	
LC50 (inhalation)	364 g/m <sup>3</sup> /4 hours (rat)
LCLo (inhalation)	325 g/m <sup>3</sup> /2 hours (mouse)
LD50 (intravenous)	446 mg/kg (mouse)
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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**Toxicity** No information provided.  
**Persistence and degradability** No information provided.  
**Bioaccumulative potential** No information provided.

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Mobility in soil No information provided.

Other adverse effects No known ecological damage is caused by this product.

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### 13. DISPOSAL CONSIDERATIONS

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Waste disposal Cylinders should be returned to the manufacturer or supplier for disposal of contents.

Legislation 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)
UN Number	1954	-	-
Proper Shipping Name	COMPRESSED GAS, FLAMMABLE, N.O.S.	-	-
Transport Hazard Class	2.1	-	-
Packing Group	None Allocated	-	-

Environmental hazards No information provided

Special precautions for user

Hazchem code 2SE

GTEPG 2A1

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.

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### 15. REGULATORY INFORMATION

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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.

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### 16. OTHER INFORMATION

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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 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 <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
3.0	Standard SDS Review.
2.0	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.

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**End of SDS**