

## SAFETY DATA SHEET

# 037

Product Name **CIS AND TRANS 2-BUTENE**

### 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)** 037 - SDS NUMBER • CIS & TRANS 2-BUTENE • DIMETHYLETHYLENE • ISOBUTYLENE • PRODUCT CODES: 160, 175  
**Use(s)** CHEMICAL REAGENT  
**SDS Date** 26 Mar 2010

### 2. HAZARDS IDENTIFICATION

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO ASCC CRITERIA

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

|                      |                |                     |     |                           |                |
|----------------------|----------------|---------------------|-----|---------------------------|----------------|
| <b>UN No.</b>        | 1055           | <b>DG Class</b>     | 2.1 | <b>Subsidiary Risk(s)</b> | None Allocated |
| <b>Packing Group</b> | None Allocated | <b>Hazchem Code</b> | 2WE | <b>EPG</b>                | 2A2            |

### 3. COMPOSITION/ INFORMATION ON INGREDIENTS

| Ingredient     | Formula | CAS No.  | Content |
|----------------|---------|----------|---------|
| TRANS-2-BUTENE | C4-H8   | 624-64-6 | <95%    |
| CIS-2-BUTENE   | C4-H8   | 590-18-1 | <95%    |

### 4. FIRST AID MEASURES

**Eye** Cold burns: Immediately flush with tepid water or with sterile saline solution. Hold eyelids apart and irrigate for 15 minutes. Seek medical attention.

**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 Poisons 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

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**5. FIRE FIGHTING MEASURES**

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|---------------------------|---|
| <b>Flammability</b>       | Highly flammable. Heating to decomposition produces acrid smoke and irritating fumes. 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.   |
| <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 in 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>       | 2WE   |

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**6. ACCIDENTAL RELEASE MEASURES**

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|                 |  |
|-----------------|--|
| <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**

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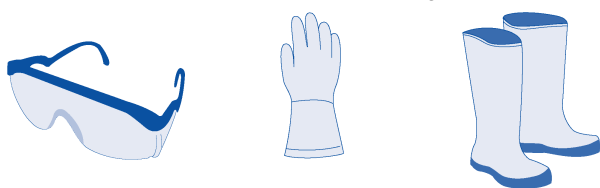
|                 |  |
|-----------------|--|
| <b>Storage</b>  | Do not store near sources of ignition or incompatible materials. Cylinders should be stored below 45°C in a secure area, upright and restrained to prevent cylinders from falling. Cylinders should also be stored in a dry, well ventilated 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 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.   |

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**8. EXPOSURE CONTROLS/ PERSONAL PROTECTION**

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|                             |   |
|-----------------------------|---|
| <b>Exposure Std's</b>       | No exposure standard(s) allocated.  |
| <b>Biological Limits</b>    | No biological limit allocated.  |
| <b>Engineering Controls</b> | Provide suitable ventilation to minimise or eliminate exposure. Confined areas (eg. tanks) should be adequately ventilated or gas tested.                         |
| <b>PPE</b>                  | Wear safety boots, leather gloves and safety glasses. Where an inhalation risk exists, wear: an Air-line respirator or self Contained Breathing Apparatus (SCBA). |



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**9. PHYSICAL AND CHEMICAL PROPERTIES**

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|                                 |                      |                              |   |
|---------------------------------|----------------------|------------------------------|---|
| <b>Appearance</b>               | COLOURLESS GAS       | <b>Solubility (Water)</b>    | 0.0003 cm <sup>3</sup> /cm <sup>3</sup> |
| <b>Odour</b>                    | ODOURLESS            | <b>Specific Gravity</b>      | NOT APPLICABLE                          |
| <b>pH</b>                       | NOT APPLICABLE       | <b>% Volatiles</b>           | 100 %                                   |
| <b>Vapour Pressure</b>          | 210 - 240 kPa @ 20°C | <b>Flammability</b>          | HIGHLY FLAMMABLE                        |
| <b>Vapour Density</b>           | NOT AVAILABLE        | <b>Flash Point</b>           | NOT AVAILABLE                           |
| <b>Boiling Point</b>            | 0.9°C to 3.7°C       | <b>Upper Explosion Limit</b> | 9.7 %                                   |
| <b>Melting Point</b>            | NOT AVAILABLE        | <b>Lower Explosion Limit</b> | 1.6 %                                   |
| <b>Evaporation Rate</b>         | NOT APPLICABLE       |                              |   |
| <b>Autoignition Temperature</b> | 325°C                | <b>Critical Pressure</b>     | 4080 - 4207 kPa                         |
| <b>Critical Temperature</b>     | 155°C to 160°C       | <b>Density</b>               | 2 (Air = 1)                             |

## 10. STABILITY AND REACTIVITY

|                            |  |
|----------------------------|--|
| <b>Chemical Stability</b>  | Stable under recommended conditions of storage.  |
| <b>Conditions to Avoid</b> | Avoid heat, sparks, open flames and other ignition sources.  |
| <b>Material to Avoid</b>   | 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. |
| <b>Decomposition</b>       | Heating to decomposition produces acrid smoke and irritating fumes.  |
| <b>Hazardous Reactions</b> | Polymerization will not occur.   |

## 11. TOXICOLOGICAL INFORMATION

|                              |   |
|------------------------------|---|
| <b>Health Hazard Summary</b> | 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. |
| <b>Eye</b>                   | Non irritant. However, direct contact may result in cold burns with possible permanent damage.  |
| <b>Inhalation</b>            | Non irritant - Asphyxiant. Effects are proportional to oxygen displacement. The manufacturer reports that this product has a moderate anesthetic action at high concentrations.   |
| <b>Skin</b>                  | Non irritant. However, direct contact with the liquefied material or escaping compressed gas may cause frostbite injury.  |
| <b>Ingestion</b>             | Ingestion is considered unlikely due to product form.   |
| <b>Toxicity Data</b>         | No LD50 data available for this product.  |

## 12. ECOLOGICAL INFORMATION

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|--------------------|---|
| <b>Environment</b> | No known ecological damage is caused by this product. |
|--------------------|---|

## 13. DISPOSAL CONSIDERATIONS

|                       |  |
|-----------------------|--|
| <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.                              |

## 14. TRANSPORT INFORMATION

|                  |  |
|------------------|--|
| <b>Transport</b> | Ensure cylinder is separated from driver and that outlet of relief device is not obstructed. |
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### CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

|                      |                |                     |     |                           |                |
|----------------------|----------------|---------------------|-----|---------------------------|----------------|
| <b>Shipping Name</b> | ISOBUTYLENE    |                     |     | <b>Subsidiary Risk(s)</b> | None Allocated |
| <b>UN No.</b>        | 1055           | <b>DG Class</b>     | 2.1 |                           |                |
| <b>Packing Group</b> | None Allocated | <b>Hazchem Code</b> | 2WE | <b>EPG</b>                | 2A2            |

## 15. REGULATORY INFORMATION

|                        |   |
|------------------------|---|
| <b>Poison Schedule</b> | A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP). |
| <b>AICS</b>            | All chemicals listed on the Australian Inventory of Chemical Substances (AICS).   |

## 16. OTHER INFORMATION

|                               |  |
|-------------------------------|--|
| <b>Additional Information</b> | 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.

**ABBREVIATIONS:**

ADB - Air-Dry Basis.

BEI - Biological Exposure Indice(s)

CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds.

CNS - Central Nervous System.

EINECS - European INventory of Existing Commercial chemical Substances.

IARC - International Agency for Research on Cancer.

M - moles per litre, a unit of concentration.

mg/m<sup>3</sup> - Milligrams per cubic metre.

NOS - Not Otherwise Specified.

NTP - National Toxicology Program.

OSHA - Occupational Safety and Health Administration.

pH - relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).

ppm - Parts Per Million.

RTECS - Registry of Toxic Effects of Chemical Substances.

TWA/ES - Time Weighted Average or Exposure Standard.

**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 Chem Alert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

**PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:**

The recommendation for protective equipment contained within this Chem Alert 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.

**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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**SDS Date:** 26 Mar 2010

**End of Report**