

Material Safety Data Sheet

Printing date 08/14/2008

Version 4

Reviewed on 08/14/2008

1 Identification of substance

- **Product details**

- **Trade name:** Cis-2-Butene

- **Article number:** 058-01-0003

- **Creation date:** 08/30/2006

- **Manufacturer/Supplier:**

Linde Canada Limited

5860 Chedworth Way

Mississauga, Ontario L5R 0A2

Telephone (905) 501-1700

24-HOUR EMERGENCY TELEPHONE NUMBER:

(905) 501-0802

Linde

575 Mountain Avenue

Murray Hill, NJ 07974

Telephone (908) 464-8100

24-HOUR EMERGENCY TELEPHONE NUMBER:

CHEMTREC (800) 424-9300

- **Information department:** Customer Service Centre: 1-866-385-5349

2 Composition/Data on components

- **Chemical characterization:**

- **CAS No. Description**

590-18-1 Cis-2-Butene

- **Identification number(s)**

- **EINECS Number:** 209-673-7

601-012-00-4

3 Hazards identification

- **Hazard description:**

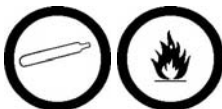


Extremely flammable

- **WHMIS-symbols:**

Liquified gas.

B1 - Flammable gas



- **HMIS-ratings (scale 0 - 4)**

HEALTH 0

Health = 0

FIRE 4

Fire = 4

REACTIVITY 0

Reactivity = 0

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- **NFPA ratings (scale 0 - 4)**



Health = 0
Fire = 4
Reactivity = 0

- **Information pertaining to particular dangers for man and environment:**

Extremely flammable.

- **Classification system:**

The classification is in line with internationally approved calculation standards. It is expanded, however, by information from technical literature and by information furnished by supplier companies.

- **GHS label elements**



Danger

2.2/1 - Extremely flammable gas.



Warning

2.5/L - Contains gas under pressure; may explode if heated.

- **Prevention:**

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

- **Response:**

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

- **Storage:**

Store in a well-ventilated place.

Protect from sunlight. Store in a well-ventilated place.

4 First aid measures

- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Generally the product does not irritate the skin.
- **After eye contact:** Rinse opened eye for at least 15 minutes under running water. Then consult a doctor.
- **After swallowing:** Not applicable

5 Fire fighting measures

- **Suitable extinguishing agents:**
CO₂, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Protective equipment:** Wear self-contained respiratory protective device.

6 Accidental release measures

- **Person-related safety precautions:**
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation.

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Eliminate ignition sources

Stop leak - ONLY if possible to do so without risk.

- **Measures for environmental protection:** Prevent seepage into sewage system, workpits and/or cellars.
- **Measures for cleaning/collecting:** Ensure adequate ventilation.

* 7 Handling and storage

- **Handling:** Do not mix with air or oxygen above atmospheric pressure.
- **Information for safe handling:**
 - Open and handle cylinder with care.
 - Handle with care. Avoid jolting, friction, and impact.
 - Use only in well ventilated areas.
 - Store cylinders upright with valve protection cap in place and firmly secured to prevent falling or being knocked over.
 - If difficulty with operating cylinder valve is experienced discontinue use and contact supplier.
- **Information about protection against explosions and fires:**
 - Keep ignition sources away - Do not smoke.
 - Protect against electrostatic charges.
 - Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50°C. Do not pierce or burn, even after use.
- **Storage:**
- **Requirements to be met by storerooms and receptacles:**
 - Store in a cool location.
 - Do not expose cylinder to temperatures higher than 50°C (122 °F)
- **Information about storage in one common storage facility:**
 - Store away from oxidizing agents.
 - Store separately from cylinders containing oxygen or oxidants by a minimum distance of 20' or by a barrier of non-combustible material at least 5' high having a fire resistant rating of at least 30minutes.
 - Sources of ignition should be removed from storage area.
- **Further information about storage conditions:**
 - Keep cylinder valve tightly closed.
 - Store in cool, dry conditions in well sealed receptacles.
 - Protect from heat and direct sunlight.
 - Store cylinder in a well ventilated area.
 - Store in accordance with local fire code and/or building code or any pertaining regulations.

* 8 Exposure controls and personal protection

- **Additional information about design of technical systems:**
 - Adequate local ventilation.
 - Safety showers and eyewash stations should be nearby.
- **Components with limit values that require monitoring at the workplace:** Not required.
- **Additional information:** The lists that were valid during the creation were used as basis.
- **Personal protective equipment:**
- **General protective and hygienic measures:**
 - Wash hands before breaks and at the end of work.
 - Protective clothing should be kept free of oil and grease.

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PPE should be inspected and maintained regularly to retain its effectiveness.

- **Breathing equipment:**

Use atmosphere-supplying respirators (e.g. supplied-air: demand, pressure-demand, or continuous-flow or self-contained breathing apparatus: demand or pressure-demand or combination supplied-air with auxiliary self-contained air supply atmosphere-supplying respirator) in case of insufficient ventilation.

- **Protection of hands:**



Protective gloves.

- **Material of gloves**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

- **Eye protection:** Safety glasses

9 Physical and chemical properties

- **General Information**

Form:	Gaseous.
Color:	Not applicable
Odor:	Odorless

- **Change in condition**

Melting point/Melting range:	-138.9°C
Boiling point/Boiling range:	3°C

- **Flash point:** < 0°C

- **Ignition temperature:** 324°C

- **Danger of explosion:** In use, may form flammable/explosive vapour-air mixture.

- **Explosion limits:**

Lower:	1.6 Vol %
Upper:	10 Vol %

10 Stability and reactivity

- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.

- **Dangerous reactions**

May form explosive gas mixture with air.

May react with oxidizing agents.

- **Dangerous products of decomposition:** No dangerous decomposition products known.

11 Toxicological information

- **Acute toxicity:**

- **LD/LC50 values that are relevant for classification:** LC50 > 5000ppm

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- **Primary irritant effect:**
- **on the skin:** No irritating effect.
- **on the eye:** No irritating effect.
- **Sensitization:** No sensitizing effects known.

13 Disposal considerations

- **Product:**
- **Recommendation:** Unused product should be returned to vendor.
- **Uncleaned packagings:**
- **Recommendation:** Cylinder and unused product should be returned to vendor. Disposable cylinder must be disposed of in accordance with local regulations.
- **Recommended cleansing agent:** None applicable.

14 Transport information

- **TDG and DOT regulations:**



- **Hazard class:** 2
- **Identification number:** UN1012
- **Packing group:** -
- **Proper shipping name (technical name):** BUTYLENE
- **Label:** 2.1
- **Packaging group:** -

- **Maritime transport IMDG:**



- **IMDG Class:** 2.1
- **UN Number:** 1012
- **Label:** 2.1
- **Packaging group:** -
- **EMS Number:** F-D,S-U
- **Marine pollutant:** No
- **Proper shipping name:** BUTYLENE

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· Air transport ICAO-TI and IATA-DGR:


- **ICAO/IATA Class:** 2
- **UN/ID Number:** 1012
- **Label:** 2.1
- **Packaging group:** -
- **Propper shipping name:** BUTYLENE

· UN "Model Regulation": UN1012; CIS-BUT-2-ENE; 2.1; -

15 Regulations

 · **Sara**

 · **Section 355 (extremely hazardous substances):**

Substance is not listed.

 · **Section 313 (Specific toxic chemical listings):**

Substance is not listed.

 · **TSCA (Toxic Substances Control Act):**

Substance is listed.

 · **Proposition 65**

 · **Chemicals known to cause cancer:**

Substance is not listed.

 · **Chemicals known to cause reproductive toxicity for females:**

Substance is not listed.

 · **Chemicals known to cause reproductive toxicity for males:**

Substance is not listed.

 · **Chemicals known to cause developmental toxicity:**

Substance is not listed.

 · **Carcinogeny categories**

 · **EPA (Environmental Protection Agency)**

Substance is not listed.

 · **NTP (National Toxicology Program)**

Substance is not listed.

 · **TLV (Threshold Limit Value established by ACGIH)**

Substance is not listed.

 · **NIOSH-Ca (National Institute for Occupational Safety and Health)**

Substance is not listed.

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· OSHA-Ca (Occupational Safety & Health Administration)

Substance is not listed.

· Canadian substance listings:
· Canadian Domestic Substances List (DSL)

Substance is listed.

· Canadian Ingredient Disclosure list (limit 0.1%)

Substance is not listed.

· Canadian Ingredient Disclosure list (limit 1%)

Substance is not listed.

· Product related hazard informations:

The product was classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

· Hazard symbols:

Extremely flammable

· Risk phrases:

Extremely flammable.

· Safety phrases:

Keep out of the reach of children.

Keep container in a well-ventilated place.

Keep away from sources of ignition - No smoking.

Take precautionary measures against static discharges.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Please refer to the section 3 for NFPA and HMIS Hazard Codes.

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· **Department issuing MSDS:** Customer Service Centre: 1-866-385-5349

· Abbreviations and Acronyms:

HMIS: Hazardous Materials Identification System

NFPA: National Fire Protection Association

IMDG: International Marine Code for Dangerous Goods

N/A: Not Applicable

LC50: Lethal Concentration, 50 Percent

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LD50: Lethal Dose, 50 Percent

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)

ICAO: International Civil Aviation Organization

ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

ACGIH: American Conference of Governmental Industrial Hygienists

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

WHMIS: Workplace Hazardous Materials Information System (Canada)

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