

## Global Product Strategy (GPS) Safety Summary

### Isoprene

This GPS Safety Summary is a high-level summary intended to provide the general public with an overview of product safety information on this chemical substance. It is not intended to provide emergency response, medical or treatment information, or to provide an overview of all safety and health information. This summary is not intended to replace the Safety Data Sheet. For detailed guidance on the use or regulatory status of this substance, please consult the Safety Data Sheet.

#### Chemical Identity

**Name:** Isoprene  
**Brand names:** Dilute Isoprene  
**Chemical name (IUPAC):** 2-Methyl-1,3-Butadiene  
**CAS number:** 78-79-5  
**EC number:** 201-143-3  
**Molecular formula:** C<sub>5</sub>H<sub>8</sub>

#### Uses and Applications

Isoprene is an important chemical used in a variety of applications as a chemical intermediate or monomer. About 95 percent of all industrially produced isoprene is polymerized to polyisoprene, which is a synthetic version of natural rubber. Polyisoprene is used in premium tires, adhesive sealants and in many other applications where synthetic rubber is used.

There are no supported direct consumer uses of isoprene.

#### Physical / Chemical Properties

At ambient temperature Isoprene is a colorless, liquid organic compound with a mild aromatic odor. The substance is of low molecular weight and is considered to be highly flammable. The flash point for Isoprene is -54 °C (-65 °F). The boiling and freezing points of Isoprene are 34 °C (93 °F) and -146 °C (-231 °F), respectively.

Isoprene is classified as hazardous under the Globally Harmonized System on Classification and Labeling (GHS) for its extreme flammability.

Isoprene is supplied in a stabilized form with an appropriate level of TBC inhibitor (4-tert-Butylcatechol).

## Health Effects

Isoprene is harmful if swallowed and may be irritating to the eyes, skin and respiratory tract. Isoprene is classified under GHS as a possible human carcinogen and is suspected of causing genetic defects.

The table below gives a full overview of the health effects assessment results for Isoprene.

<b>Effect Assessment</b>	<b>Result</b>
Acute Toxicity Oral / inhalation / dermal	Harmful if swallowed. May cause respiratory tract irritation (cough and difficulty breathing).
Irritation / corrosion Skin / eye/ respiratory tract	May be irritating to the eyes, skin and respiratory tract.
Sensitization	Not expected to cause sensitization by skin contact or to cause respiratory tract sensitization.
Toxicity after repeated exposure Oral / inhalation / dermal	May be toxic following repeated exposure.
Genotoxicity / Mutagenicity	Isoprene is genotoxic to mice.
Carcinogenicity	Listed by IARC as possibly carcinogenic to humans, and by NTP as reasonably expected to be a human carcinogen.
Toxicity for reproduction	May be toxic to reproduction. May be toxic to embryo/fetal development.

IARC = International Agency for Research on Cancer  
NTP = National Toxicology Program

## Environmental Effects

Isoprene is harmful to aquatic life with long lasting effects and is classified accordingly under GHS as hazardous.

The table below gives a full overview of the environmental assessment results for isoprene.

<b>Effect Assessment</b>	<b>Result</b>
Aquatic Toxicity	Toxic to aquatic life.

  

<b>Fate and Behavior</b>	<b>Result</b>
Biodegradation	Not expected to be readily biodegradable.
Bioaccumulation potential	Not expected to be bioaccumulative.
PBT / vPvB conclusion	Not considered to be either PBT or vPvB.

PBT = Persistent, Bioaccumulative and Toxic in the environment.  
vPvB = very Persistent and very Bioaccumulative in the environment.

## **Exposure**

### **Human health**

Because isoprene is used predominantly in industrial systems as a raw material or intermediate, direct consumer contact is expected to be low.

Personnel exposure can occur either in an isoprene manufacturing facility or in industrial or manufacturing facilities that use isoprene. It is usually produced, distributed, stored and consumed in closed systems. However, worker exposure can potentially occur during operations such as product transfer, product sampling, or maintenance/ repair activities on product-containing systems. The risk of accidental exposure should be controlled by selecting and applying the appropriate Risk Management Measures.

### **Environment**

Isoprene is predominantly used in closed industrial processes. Therefore emissions and environmental exposure to isoprene are very low.

## **Risk Management Measures**

For detailed guidance on the use of isoprene, the Safety Data Sheet should always be consulted.

Isoprene should only be handled by knowledgeable and trained personnel.

### **Flammability**

Because of its extreme flammability potential, isoprene should not be handled or stored near heat, sparks or flame. Bonding and grounding measures may not be enough if nonconductive flammable liquids are involved. This liquid may accumulate static electricity even when transferred into properly grounded containers. Static electricity accumulation may be significantly increased by the presence of small quantities of water.

### **Human health**

When using chemicals, make sure that there is adequate ventilation. Always use appropriate chemical-resistant gloves to protect your hands and skin, wear eye protection such as chemical goggles, and wear flame-retardant clothing. Do not eat, drink, or smoke where chemicals are handled, processed, or stored. Wash hands and skin following contact. If the substance gets into your eyes, rinse eyes thoroughly for at least 15 minutes with tap water and seek medical attention.

In the case of transfer or maintenance operations, clear transfer lines prior to decoupling, and flush/drain to a closed system for recycle prior to opening equipment.

In cases where engineering controls cannot maintain airborne substance concentrations below exposure limits, or in cases with a risk of accidental exposure, additional risk management measures may be necessary for safe use, such as the use of a complete suit protecting against chemicals and supplied air, a self-contained breathing apparatus or respirator.

### Environmental

In case of accidental release or spill, do not allow the product to enter sewers, surface or ground water. Clean up contamination/spills as soon as they occur. Sludge should be incinerated, contained or reclaimed. Do not use clay-based absorbent materials for clean-up.

### Regulatory Information / Classification and Labeling

Under the Globally Harmonized System on classification and labeling (GHS), substances are classified according to their physical, health and environmental hazards. The hazards are communicated via specific labels on the product packaging and the Safety Data Sheet. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers, and emergency responders) can better understand the hazards of the chemicals in use.

For a detailed overview of the classification and labeling of this substance, reference is made to the regional Safety Data Sheet, which can be found on the LyondellBasell corporate website.

### Conclusion Statements

- Isoprene is a component of premium tires, adhesive sealants and other synthetic rubber products. It has no supported uses in consumer products.
- Isoprene is classified as hazardous under GHS for its extreme flammability, carcinogenicity, mutagenicity and chronic toxicity to aquatic life.
- Exposure to human health and environment is considered low if properly handled. Also the manufacturing process, storage and handling operations are predominantly enclosed.

### Contact Information within Company

For further information on this product in general, please consult the LyondellBasell corporate website ([www.lyb.com](http://www.lyb.com)).

### Date of issue

Date of issue: 4 June 2015

### Disclaimer

Before using a product sold by a company of the LyondellBasell family of companies, users should make their own independent determination that the product is suitable for the intended use and can be used safely and legally.

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This product(s) may not be used in:

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(ii) the manufacture of any of the following, without prior written approval by Seller for each specific product and application: U.S. FDA Class II Medical Devices; Health Canada Class II or Class III Medical Devices; European Union Class II Medical Devices; film, overwrap and/or product packaging that is considered a part or component of one of the aforementioned medical devices; packaging in direct contact with a pharmaceutical active ingredient and/or dosage form that is intended for inhalation, injection, intravenous, nasal, ophthalmic (eye), digestive, or topical (skin) administration; tobacco related products and applications, electronic cigarettes and similar devices, and pressure pipe or fittings that are considered a part or component of a nuclear reactor. Additionally, the product(s) may not be used in: (i) U.S. FDA Class III Medical Devices; Health Canada Class IV Medical Devices; European Class III Medical Devices; (ii) applications involving permanent implantation into the body; (iii) life-sustaining medical applications; and (iv) lead, asbestos or MTBE related applications. All references to U.S. FDA, Health Canada, and European Union regulations include another country's equivalent regulatory classification.

Users should review the applicable Safety Data Sheet before handling the product.

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Isoprene is a product of Equistar Chemicals, LP.