Global Product Strategy (GPS) Safety Summary

Piperylene

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: Piperylene
Brand names: Piperylene Concentrate (Stabilized)
Chemical name (IUPAC): 1,3-Pentadiene
CAS number: 68477-35-0
EC number: 270-726-2
Molecular formula: Not Applicable

Uses and Applications

Piperylene is an important intermediate used to form plastics, adhesives and resins. Piperylene resin is widely used in many applications including adhesives, inks and building materials. Piperylene based resin has unique properties that allows it to be used in hot melting and pressure sensitive applications such as road marking paint, rubber traffic equipment and waterproof coatings.

Physical / Chemical Properties

At ambient temperature piperylene concentrate is a colorless liquid with a faint, petroleum-like odor. The substance is considered to be highly flammable. The flash point for piperylene concentrate is -48 °C (-55 °F). The boiling and freezing points of piperylene are 41 °C (106 °F) and -146 °C (-230.8 °F), respectively.

Piperylene is classified as hazardous under the Globally Harmonized System for Classification and Labeling (GHS) for its high flammability.

Piperylene concentrate is supplied in a stabilized form with an appropriate level of BHT inhibitor (Butylated Hydroxytoluene).

Health Effects

Piperylene is classified as hazardous to health under GHS as a potential carcinogen and mutagen.

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

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	Toxic via the oral, dermal, ingestion and inhalation routes of exposure. Ingestion of this material, followed by vomiting and aspiration of the more volatile components of this material into the lungs, may lead to chemical pneumonia and even death.
Irritation / corrosion Skin / eye/ respiratory tract	May be irritating to the eyes, skin, and respiratory system.
Sensitization	Not expected to cause sensitization by skin contact. Not expected to cause respiratory tract sensitization.
Toxicity after repeated exposure Oral / inhalation / dermal	May be toxic following repeated exposure to high doses. May cause dermatitis by defatting the skin from prolonged or repeated contact.
Genotoxicity / Mutagenicity	May be genotoxic.
Carcinogenicity	This product contains isoprene, which is a carcinogen.
Toxicity for reproduction	May be toxic to reproduction. May be toxic to embryo/fetal development.

Environmental Effects

Substantive aquatic exposure is not likely based on the volatile nature of this chemical. When released into the environment, this material will volatilize rapidly.

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

Effect Assessment	Result
Aquatic Toxicity	Toxic to aquatic life.

Fate and Behavior	Result
Biodegradation	This material is not expected to be readily biodegradable.
Bioaccumulation potential	This material is not expected to bioaccumulate.
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 piperylene is used predominantly in industrial systems as raw material or intermediate, direct consumer contact is expected to be low.

Personnel exposure can occur either in a piperylene manufacturing facility or in industrial or manufacturing facilities that use piperylene. 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
Piperylene is predominantly used in closed industrial processes. Therefore emissions and environmental exposure to piperylene are very low.

Risk Management Measures

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

Piperylene should only be handled by knowledgeable and trained personnel.

Flammability
Flammable materials should be stored in a separate safety storage cabinet or room. Vapors may form explosive mixtures with air. Vapor space above stored liquid may be flammable/explosive unless blanketed with inert gas. Bonding and grounding measures may not be enough if nonconductive flammable liquids are involved. Refer to NFPA 77 for relevant consensus guidance. 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 at 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 (GPS) on classification and labeling, 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 found on the LyondellBasell corporate website.

Conclusion Statements

- Piperylene is used in the production of certain plastics, adhesives, resins, inks and building materials.
- Piperylene has been classified as hazardous under GHS. The main hazards are high flammability, carcinogenicity, genotoxicity and reproductive toxicity.
- 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 or consult your regional Sales contact (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.
SELLER MAKES NO WARRANTY; EXPRESS OR IMPLIED (INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY WARRANTY) OTHER THAN AS SEPARATELY AGREED TO BY THE PARTIES IN A CONTRACT.

This product(s) may not be used in:
(i) any U.S. FDA Class I, Health Canada Class I, and/or European Union Class I medical devices, without prior notification to Seller for each specific product and application; or
(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.

All information ("Information") contained herein is provided without compensation and is intended to be general in nature. You should not rely on it in making any decision. LyondellBasell accepts no responsibility for results obtained by the application of this Information, and disclaims liability for all damages, including without limitation, direct, indirect, incidental, consequential, special, exemplary or punitive damages, alleged to have been caused by or in connection with the use of this Information. LyondellBasell disclaims all warranties, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose, that might arise in connection with this information.

Piperylene is a product of Equistar Chemicals, LP.