Global Product Strategy (GPS) Safety Summary

Propylene

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, nor 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, the Product Safety Bulletin and the Product Stewardship Bulletin.

Chemical Identity

Name: Propylene
Brand names: Propylene
Chemical name (IUPAC): Prop-1-ene
CAS number: 115-07-1
EC number: 204-062-1
Molecular formula: C3H6

Uses and Applications

Propylene is a light olefin that is produced as a by-product during production of ethylene, a refinery by-product, or by chemical processes such as dehydrogenation of propane. LyondellBasell is a leading producer of propylene.

Propylene is used as a monomer for the manufacturing of polypropylene, a widely used plastic. This application consumes more than half of the world's production of propylene. Polypropylene is used in food packaging, fibers for carpets, rugs, and upholstery; housewares, medical products, automotive trim, fascia, running boards, battery cases, and bumpers; toys and sporting goods; and bottles, caps, and closures.

Propylene is also used as a feedstock or intermediate in other chemical processes. A major use of propylene is production of propylene oxide, which is used as an intermediate to produce other derivative products such as propylene glycol, propylene glycol ethers, polyols and butanediol. These derivatives go into products such as polyester plastics, polyurethanes, paints, coatings, deicers, cleaners, solvents, adhesives, cosmetics and pharmaceuticals.

Physical / Chemical Properties

At ambient temperature and pressure, propylene is a colorless gas with a high vapor pressure.

Propylene is extremely flammable with a flash point of -108°C (-162°F). It is typically handled in industrial facilities where ignition sources and ventilation are adequately controlled. In industrial facilities, propylene can be refrigerated to very low temperatures and stored or shipped as a liquid.

The boiling point and freezing point of propylene are -48°C (-54°F) and -185°C (-301°F), respectively. Propylene has been classified as hazardous under the Globally Harmonized System on classification and labeling (GHS) for its extreme flammability.

Health Effects

The primary route to exposure is through inhalation. High propylene vapor concentrations may cause asphyxia (displacement of oxygen in the airways, reducing the levels of oxygen available to breath in), and drowsiness and dizziness.

The table below gives an overview of the health effects assessment results for propylene.

Effect Assessment	Result
Acute toxicity Oral / inhalation / dermal	Low acute toxicity by the inhalation route. Very high concentrations may cause anesthesia and asphyxia.
Irritation / corrosion Skin / eye/ respiratory tract	Not considered a skin or eye irritant, but rapid evaporation of the liquid may cause frost injuries.
Sensitization	Not expected to cause skin or respiratory sensitization.
Toxicity after repeated exposure Oral / inhalation / dermal	Propylene produces mild nasal inflammation and associated epithelial alterations in rodents following repeated long-term exposure to high concentrations. No adverse systemic effects to organs were reported following repeated exposures to high concentrations of propylene.
Genotoxicity / Mutagenicity	Not classified as a mutagen.
Carcinogenicity	Not classified as a carcinogen.
Toxicity for reproduction	Not classified as toxic to reproduction.

Environmental Effects

When released into the environment, propylene will volatilize rapidly and degrade by photo-degradation. Therefore, water contamination and aquatic toxicity are not expected.

The table below gives an overview of the environmental assessment results for propylene.

Effect Assessment	Result
Aquatic Toxicity	This material is expected to be non-toxic to aquatic life.

Fate and behavior	Result
Biodegradation	This material is expected to be readily biodegradable.
Bioaccumulation potential	This material has a low potential to bioaccumulate.
PBT / vPvB conclusion	Not considered to be either PBT or vPvB.

PBT = Persistent, Bio-accumulative and Toxic in the environment.
vPvB = very Persistent and very Bio-accumulative in the environment.

Exposure

Human health
Propylene is not used in a widespread or dispersive manner. Personnel exposure to propylene in manufacturing facilities is considered very low because the process, storage and handling operations are enclosed and continuous. 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 and mitigated by selecting and applying the appropriate Risk Management Measures. Exposure to commercially produced propylene of consumers is unlikely as propylene is intended for industrial applications.

Environment
Propylene is manufactured in a closed and automated process. Transfer operations such as loading/ unloading and transportation are conducted with dedicated equipment according to industrial best practices to reduce the risk of release to the environment.

Risk Management Measures

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

Propylene should only be handled by knowledgeable and trained personnel.

Flammability
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. 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 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 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, prevent entry into waterways, sewers, basements or confined areas.

Regulatory Information / Classification and Labeling

This substance is registered under REACH by relevant companies of LyondellBasell in the European Union.

For a detailed overview of the regulatory status of this substance, please refer to the Product Stewardship Bulletin on lyondellbasell.com.

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, refer to the regional Safety Data Sheet found on lyondellbasell.com.

Conclusion Statements

- Propylene is used as a chemical intermediate and/or monomer for industrial purposes.
- Propylene is classified as hazardous. The main hazard is its extreme flammability.
- Exposure to humans and environment is considered very low as the propylene manufacturing process, storage and handling operations are enclosed.

Contact Information within Company

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

Date of issue

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Disclaimer

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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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