Product Safety Summary for 1,6-Hexanediol

**SUBSTANCE NAME**
Hexanediol  
Hexane-1,6-diol  
Hexan-1,6-diol  
1,6-Hexanediol  
1,6-Hexanediol (8Cl, 9Cl)  
1,6-Hexandiol  
1,6- Dihydroxyhexane  
Hexamethyleneglycol  
Hexamethylenediol  
omega.-Hexanediol  
alpha.,omega.-Hexanediol

**GENERAL STATEMENT**
1,6-Hexanediol is a white solid with characteristic odor. It is neither hazardous for human health nor for the environment. 1,6-Hexanediol has a wide range of applications. It has two functional groups which are useful in the production of various polymers and plastic products. But it also finds application in other chemical processes and is contained in different consumer products.

**CHEMICAL IDENTITY**
EC Name: hexane-1,6-diol  
EC-No.: 211-074-0  
CAS-No.: 629-11-8  
Molecular formula: C6H14O2  
Structural formula:

![Structural formula]

**USES AND APPLICATIONS**
1,6-Hexanediol is obtained after treatment of the mixture of products resulting from the oxidation of cyclohexane with air. 1,6-Hexanediol is used to produce materials made of polyester or polyurethane, as monomer for the manufacture of polyesterpolylols, polycarbonatedioles and acrylic monomers, for the production of molecules that act as reactive diluents, for the production of halogenated substances and for the production of adhesives, putties and sealing compounds, cleaners and auxiliary agents.

1,6-Hexanediol is also used in the processes to produce hydrogen, hydrogen peroxide, sodium perborate
and peroxyacetic acid and as an intermediate for pharmaceutical products. It is used as an ingredient for
the production of polymeric thickeners, plasticizers for polyvinyl chloride, sizing agents, surfactants, for
starches and chemically modified starch for application in the paper, textile and food industry and for
personal hygiene products like shampoo, creams, as well as for paints.

**PHYSICAL CHEMICAL PROPERTIES**

1,6-Hexanediol is a white solid at room temperature. It has a characteristic odor.

**Melting point/range:** 39.5 – 42.1 °C  
**Boiling point/boiling range:** 250 °C at 1013 hPa  
**Decomposition temperature:** Not determined  
**Flashpoint:** 136 °C  
**Flammability (solid, gaseous):** Combustible, but not highly flammable solid  
**Selfignition temperature:** 320 °C  
**Explosion limits:**  
  - Lower: 6.6 %  
  - Upper: 16 %  
**Explosive properties:** Non explosive.  
**Molecular weight:** 118.1742 g/mol  
**pH value:** 7.6 at 20 °C and 500 g/l  
**log Pow:** 0 (at 25 °C)  
**Vapor pressure:** 0.000666 hPa at 25 °C  
**Vapor density:** Not determined  
**Relative density:** 0.96 g/cm³ at 20 °C  
**Solubility in/Miscibility with water:** Miscible  
**Oxidizing properties:** No oxidizing properties

**HEALTH EFFECTS**

1,6-Hexanediol has no marked health hazard properties. Its acute toxicity is very low via all tested routes of
exposure (oral, skin and inhalation). It has no irritation or sensitization effects. Repeated dose and long term
health or reproductive effects could not be established either. Its physical properties give no rise to concern.
The flammability of hexanediol is low. Therefore, 1,6-Hexanediol has a very low overall human health hazard
potential.

<table>
<thead>
<tr>
<th>EFFECT ASSESSMENT</th>
<th>RESULT</th>
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<tbody>
<tr>
<td>Acute Toxicity (oral/dermal/inhalation)</td>
<td>1,6-Hexanediol is of low acute toxicity via all routes of exposure.</td>
</tr>
<tr>
<td>Irritation/Corrosivity</td>
<td>1,6-Hexanediol is not irritating to the skin or to the eyes.</td>
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</table>
Corrosivity was not tested on the basis of the absence of irritation properties.

Based on the available data, 1,6-Hexanediol is not considered to have skin or respiratory sensitization properties.

All available in vitro test data indicates that 1,6-Hexanediol does not cause mutagenic effects.

No carcinogenicity data has been generated due to the negative mutagenicity results.

Screening test information indicates that 1,6-Hexanediol has no adverse reproductive effects.

Oral repeated dose test results with 1,6-Hexanediol suggest that no marked toxicity should be expected. Dermal and inhalation repeated dose exposure testing is considered unnecessary based on expected exposure routes and the result of the oral repeated dose test.

The results of all acute aquatic studies on fish, algae, plants and invertebrates indicate a low environmental acute hazard potential for 1,6-Hexanediol. 1,6-Hexanediol is readily biodegradable and it has a very low bioaccumulation potential. Considering all available data on biotic and abiotic degradation, bioaccumulation and toxicity, it can be stated that the substance is neither persistent nor toxic to the environment and that it will not bio-accumulate. Overall, 1,6-Hexanediol has a very low environmental hazard potential.

Fish, daphnia, algae and plant studies indicate that the aquatic toxicity of 1,6-Hexanediol is low.

1,6-Hexanediol is readily biodegradable.

1,6-Hexanediol will preferentially distribute to water. Based on the low partition coefficient it is concluded that bioaccumulation is not expected.

Based on its low toxicity, bioaccumulation potential and ready biodegradability, 1,6-Hexanediol does not meet the criteria for PBT or vPvB.
1,6-Hexanediol is used in many different applications. In industrial sites, it is used for the production of hydrogen, hydrogen peroxide, sodium perborate and peroxyacetic acid. But its main industrial use is as monomer or reactant; therefore, 1,6-Hexanediol will no longer be present as such in downstream products, practically eliminating the exposure potential for professional users and consumers.

On the other hand, 1,6-Hexanediol is contained in formulated products of usual use, such as adhesives, putties, sealing compounds, cleaners, paints and inks, synthetic resins and personal hygiene products (shampoo, creams, etc.). In all previous cases, 1,6-Hexanediol occurs in diluted form, so professionals and consumers exposure level will be very low.

Environment
1,6-Hexanediol is solid at room temperature and it has low volatility in liquid form above its boiling point. Therefore, the probability of release in pure form to any of the environmental compartments is low, under normal industrial use conditions. There may be some release to waste water streams as a result of normal use or industrial cleaning operations. Due to its readily biodegradability, 1,6-Hexanediol should not cause further environmental exposure.

RISK MANAGEMENT RECOMMENDATIONS
1,6-Hexanediol poses very low human health and environmental risks. However it is a good practice to train personnel handling the substance and to protect workers who may be exposed to 1,6-Hexanediol by taking the usual precautionary measures to protect against chemical exposure. Therefore, protective clothing, gloves and safety glasses with side shields should be worn when handling 1,6-Hexanediol. Good ventilation is required in areas where 1,6-Hexanediol is handled. Respiratory protection is not required unless 1,6-Hexanediol is released in the form of gas or in the form of aerosols. 1,6-Hexanediol is not flammable; however, it is good practice to prevent the build-up of electrostatic charge when storing it.
For environmental protection in case of accidental release: do not allow product to reach sewage system or any water course. Retain and dispose of contaminated wash water.

STATE AGENCY REVIEW
This substance has been registered under REACH (EC) No. 1907/2006.
1,6-Hexanediol is included in the OECD list of High Production Volume (HPV) chemicals.
1,6-Hexanediol is listed in the following Chemical Inventories: TSCA, EINECS, ENCS, AICS, Canadian DSL, KECl, PICCS, IECSC, and NZIoC.

REGULATORY INFORMATION/CLASSIFICATION AND LABELING
Classification of the substance according to REGULATION (EC) No 1272/2008:
Not classified.

Labeling according to REGULATION (EC) No 1272/2008:
Pictogram: none
Signal word: none
Hazard statements: none

CONTACT INFORMATION WITHIN COMPANY
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Additional information can be found at:
http://www.ube.co.jp

GLOSSARY

<table>
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<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td>Acute toxicity</td>
<td>Harmful effect resulting from a single or short term exposure to a substance.</td>
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<tr>
<td>AICS</td>
<td>Australian Inventory of Chemical Substances.</td>
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<td>Biodegradation</td>
<td>Decomposition or breakdown of a substance under natural conditions (actions of micro-organisms etc).</td>
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<td>Bioaccumulation</td>
<td>Progressive accumulation in living organisms of a chemical substance present in the environment.</td>
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<tr>
<td>Canadian DSL</td>
<td>Domestic Substances List of Canada.</td>
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<td>Carcinogenicity</td>
<td>Substance effects causing cancer.</td>
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<td>CAS</td>
<td>Chemical Abstracts Service (division of the American Chemical Society).</td>
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<td>Chronic toxicity</td>
<td>Harmful effect after repeated exposures or long term exposure to a substance.</td>
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<tr>
<td>EINECS</td>
<td>European Inventory of Existing Commercial Chemical Substances</td>
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<tr>
<td>ENCS</td>
<td>Existing Notified Chemical Substances (Japan).</td>
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<td>Flash point</td>
<td>The lowest temperature at which vapor of the substance may form an ignitable mixture with air.</td>
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<td>Genotoxicity</td>
<td>Substance effect that causes damage to genes, including mutagenicity and clastogenicity.</td>
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<td>GHS</td>
<td>Globally Harmonized System of Classification and Labeling of</td>
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<td>Term</td>
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<td>HPV</td>
<td>High Production Volume Chemicals.</td>
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<td>Hydrolyze</td>
<td>Undergo hydrolysis; decompose by reacting with water.</td>
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<td>IECSC</td>
<td>Inventory of Existing Chemical Substances Produced or Imported in China.</td>
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<td>Intermediate</td>
<td>Substance that is manufactured for and consumed in or used for chemical processing in order to be transformed into another substance.</td>
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<td>KECI</td>
<td>Korean Existing Chemical Inventory.</td>
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<td>Monomer</td>
<td>Means a substance which is capable of forming covalent bonds with a sequence of additional like or unlike molecules under the conditions of the relevant polymer-forming reaction used for the particular process.</td>
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<td>Mutagenicity</td>
<td>Substance effect that cause mutation on genes.</td>
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<td>NZIoC</td>
<td>New Zealand Inventory of Chemicals</td>
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<td>PBT</td>
<td>Persistent, bioaccumulative, toxic chemical.</td>
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<td>Persistence</td>
<td>Refers to the length of time a compound stays in the environment, once introduced.</td>
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<tr>
<td>PICCS</td>
<td>Philippine Inventory of Chemicals and Chemical Substances.</td>
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<tr>
<td>Risk Management Measures</td>
<td>Engineering controls, conditions and protective equipment needed to be implemented to ensure that the risks to human health and the environment are adequately controlled.</td>
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<td>Reproductive toxicity</td>
<td>Including teratogenicity, embryotoxicity and harmful effects on fertility.</td>
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<td>Sensitizing</td>
<td>Allergenic.</td>
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<td>Sediment</td>
<td>Topsoil, sand and minerals washed from land into water forming in the end a layer at the bottom of rivers and sea.</td>
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<td>TSCA</td>
<td>Toxic Substance Control Act (USA).</td>
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<td>Vapor pressure</td>
<td>A measure of a substance’s property to evaporate.</td>
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<td>vPvB</td>
<td>Very persistent, very bio-accumulative.</td>
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