

# Product Safety Summary



## CYCLOHEXANE

This Product Safety Summary document 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 a discussion of all safety and health information. This document is not intended to replace the (Material) Safety Data Sheet. Warnings and handling precautions provided below are not intended to replace or supersede manufacturers' instructions and warning for their consumer products which may contain this chemical substance.

### 1. Chemical Identity

Cyclohexane is a product primarily derived from the hydrogenation of benzene with the molecular formula  $C_6H_{12}$ , arranged in a cyclic form.

<b><u>CAS No.</u></b> 110-82-7	<b><u>Chemical Name:</u></b> Cyclohexane	<b><u>Other Names:</u></b> Hexahydrobenzene
-----------------------------------	---	--

### 2. Product Uses

Cyclohexane is primarily used as a raw material or feedstock to manufacture other industrial chemicals. It is primarily used in the production of nylon-type intermediates. Other uses are as a non-polar solvent and as a reaction diluent.

### 3. Physical / Chemical Properties

Cyclohexane is a highly flammable, colorless liquid. It is handled in industrial facilities where safe conditions regarding ignition sources and ventilation are adequately controlled. It has a flash point of -4 °F / -20 °C.

### 4. Health Information

Cyclohexane is generally recognized to have low acute and chronic toxicity if ingested and/or breathed. Vapor or aerosol concentrations above the exposure limit of 100 parts per million (ppm) in the air can cause eye and lung irritation and may cause headaches, dizziness or drowsiness, or result in central nervous system depression. Prolonged or repeated skin contact may result in skin irritation and in these situations, the use of chemical resistant gloves is recommended. Cyclohexane can be handled safely in industrial facilities where safe conditions regarding ignition sources, proper storage and ventilation are adequately maintained and where exposures are essentially limited.

### 5. Additional Hazard Information

If accidentally swallowed, small amounts of liquid may be aspirated into the lungs during ingestion or from vomiting, this may cause severe lung inflammation and lung edema (an accumulation of fluid in the lungs). This is a medical emergency which must be immediately and properly treated. Do not induce vomiting.

### 6. Food Contact Regulated Uses

This product is not claimed as compliant for food contact uses.

## CYCLOHEXANE

### 7. Environmental Information

If cyclohexane is accidentally spilled in the environment, it is a potential threat to the environment due to its moderate toxicity to aquatic organisms (e.g. fish and invertebrates). Cyclohexane biodegrades at a rapid rate and will not persist in the environment. Because of its low solubility in water and volatility (tendency to move from water to air) chronic aquatic toxicity is not expected, however a significant spill may cause long-term adverse effects in the aquatic environment. Cyclohexane is a volatile organic compound (VOC) and is rapidly degraded in air, water, and soil. Considerable measures are taken to prevent its release to the atmosphere and minimize any exposure to the environment from manufacturing and use activities.

### 8. Exposure Potential

- **Workplace exposure** – This refers to potential exposure in a manufacturing facility or industrial workplace. Generally, exposure of personnel in manufacturing facilities is relatively low because the process, storage and handling operations are closed, with little potential for releases to the air. ExxonMobil recommends limiting occupational exposure to no more than 100 parts per million (ppm) as a time-weighted average over an 8-hour work day. Since Cyclohexane is used in a closed process, exposures are unlikely to approach these levels.
- **Consumer use of products containing Cyclohexane** – Cyclohexane, and products which contain Cyclohexane, are not typically sold to the general public. Exposure to consumers would be expected to be negligible, far below the recommended occupational exposure level described above.
- **Environmental releases** – Chemical manufacturers are committed to operating in an environmentally responsible manner everywhere we do business. Our efforts are guided by in-depth scientific understanding of the environmental impact of our operations, as well as by the social and economic needs of the communities in which we operate. Industrial spills or releases are rare; however a spill or release may pose a significant flammability issue. Our operational improvement targets and plans are based on driving incidents with real environmental impact to zero and delivering superior environmental performance.

### 9. Manufacture of Product

- **Capacity** – Publicly available data (2008) on Cyclohexane production capacity indicates global demand is above 5 million metric tonnes/year (>11 billion pounds).
- **Process** – Most production of Cyclohexane is based on the catalytic hydrogenation of benzene.

### 10. Risk Management

- **Workplace Risk Management** - When using this product, avoid breathing vapors from the material and make sure that there is adequate ventilation. Use non-sparking tools and explosion-proof equipment. Always use chemical resistant gloves to protect your hands and skin and always wear eye protection such as chemical goggles. Do not eat, drink, or smoke where chemicals are handled, processed, or stored. Wash hands and skin following contact. If this product gets into your eyes, flush eyes thoroughly with tap water. If irritation occurs, get medical assistance. Please refer to the (Material) Safety Data Sheet.
- **Consumer Risk Management** - This chemical is not sold directly to the public for general consumer uses. If exposure should occur, it is expected to be infrequent and of short duration. Always follow manufacturers' instructions, warnings and handling precautions when using their products. The best way to minimize exposure to vapors is to work in well-ventilated areas.

## CYCLOHEXANE

### 11. Federal/Science Agency Resources (For CAS No. searches, enter 110-82-7)

Organization for Economic Cooperation and Development (OECD) - ChemPortal web-based search tool

- <http://webnet3.oecd.org/echemportal/>

EU Risk Assessment and Summary Reports on Cyclohexane (2004)

- [http://esis.jrc.ec.europa.eu/doc/risk\\_assessment/REPORT/cyclohexanereport031.pdf](http://esis.jrc.ec.europa.eu/doc/risk_assessment/REPORT/cyclohexanereport031.pdf)
- [http://esis.jrc.ec.europa.eu/doc/risk\\_assessment/SUMMARY/cyclohexanesum031.pdf](http://esis.jrc.ec.europa.eu/doc/risk_assessment/SUMMARY/cyclohexanesum031.pdf)

EPA IRIS Toxicological Profile for Cyclohexane (August 2003)

- <http://www.epa.gov/iris/toxreviews/1005tr.pdf>

European Chemical Agency (ECHA)

- <http://apps.echa.europa.eu/registered/registered-sub.aspx>

### 12. Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use and/or disposal of this product and may vary by city, state, country or geographic region. Additional helpful information may be found by consulting the relevant ExxonMobil (Material) Safety Data Sheet at:

- <http://www.msds.exxonmobil.com/psims/psims.aspx?brand=xomcc>

### 13. Conclusion Statements

Cyclohexane ...

- is an industrial chemical used to make other industrial chemicals. It is not sold to the general public.
- is generally considered to have low toxicity to health and the health effects can be significantly avoided by applying good precautionary measures to exposures.
- is not expected to cause adverse environmental effects at levels typically found in the workplace or environment.
- is flammable; use in closed systems, and only with good ventilation and avoid all ignition sources.

©2012 Exxon Mobil Corporation. The information and recommendations contained herein are, to the best of ExxonMobil's knowledge and belief, accurate and reliable as of the date issued. You can contact ExxonMobil to insure that this document is the most current available from ExxonMobil. Users of chemical products should refer to the product labels and applicable Material Safety Data Sheets for information and recommendations as to the safe handling and use of this product. Alteration of this document is strictly prohibited. Except to the extent required by law, re-publication or retransmission of this document, in whole or in part, is not permitted. The term, "ExxonMobil" is used for convenience, and may include any one or more of ExxonMobil Chemical Company, Exxon Mobil Corporation, or any affiliates in which they directly or indirectly hold any interest. ExxonMobil, the ExxonMobil Logo and the "Interlocking X" Device, and product names used herein are trademarks or registered trademarks of Exxon Mobil Corporation and/or its affiliates, unless otherwise noted.