

# Product Safety Summary



## Methyl Ethyl Ketone

(ExxonMobil MEK™, Exxon MEK™)

**This Product Safety Summary document is to provide product safety and end use information on this product. 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.**

### 1. Chemical Identity

CAS No. 78-93-3

Methyl Ethyl Ketone

**Abbreviation:** MEK

**Other Names:**

Ethyl Methyl Ketone

2-Butanone

Methyl Acetone

### 2. Product Uses

MEK is a liquid solvent used in surface coatings, adhesives, printing inks, chemical intermediates, magnetic tapes and as dewaxing agents in lubricant base oil production. MEK also is used as a solvent for fats, oils, waxes and resins. It is a highly efficient and versatile solvent for surface coatings. Because of its effectiveness as a solvent, MEK is especially valuable in formulating high solids coatings, which help to reduce emissions from coating operations. Consumer and commercial applications include:

- Lacquers for automotive/furniture finishes
- Coatings - epoxies, urethanes, cellulose and vinyls
- Printing inks
- Adhesives for PVC pipes
- Resin thinners and clean-up operations
- Reaction/Extraction solvent for pharmaceuticals

### 3. Physical / Chemical Properties

MEK is a highly flammable material in both the liquid and vapor forms, has a relatively high vapor pressure, and should be handled only with adequate ventilation and in areas where ignition sources have been removed (e.g. open flames, static electricity sources, unprotected light switches).

The flash point for MEK is 25°F /-4°C.

### 4. Health Information

MEK has been studied extensively and is generally recognized to have low acute and chronic toxicity if ingested and/or breathed. High concentrations (above 200 ppm) of MEK in the air can cause eye and lung irritation in humans. High vapor concentrations may cause drowsiness and dizziness and may cause central nervous system depression. MEK is not regarded as a carcinogen, a mutagenic chemical or a concern for chronic reproductive or neurotoxicity effects. MEK may increase the neurotoxicity of compounds such as n-hexane and methyl n-butyl ketone.

MEK is naturally present at measurable levels in a wide variety of foods, including meats, vegetables, fruits, nuts and dairy products. MEK has been rated as a GRAS (Generally Recognized as Safe) substance by the U.S. Food & Drug Administration. MEK also has been approved by the FDA as a direct food additive for use as a flavoring agent. MEK has also been recognized by the World Health Organization as a food

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additive/flavoring agent that poses “no safety concern” because it is endogenous in humans as a component of fatty acid and carbohydrate metabolism.

An extensive study was conducted on "reasonably anticipated children's exposures to MEK" from commonly found items such as the solvent in wood stain and varnish, spray paint, hobby use adhesive and hobby use model paint. Though most products that have been identified as containing MEK are not intended for use by children, exposure typically would occur, if at all, through the child's presence in the room where the product is used. The conclusion of the report was that reasonably anticipated children's exposures to MEK from intended uses of consumer products containing MEK, and from other expected sources, are unlikely to pose significant health risks. For additional information please see Voluntary Children's Chemical Evaluation Program (VCCEP) web links in Section 11.

### MEK in the Human Body

MEK is naturally present in humans as a result of its presence in various foods. MEK can also be absorbed into the body via skin contact, inhalation, or ingestion. The bulk of MEK taken into the body enters the general metabolism and is eliminated as simple compounds such as carbon dioxide and water within 24 hours.

### 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.

### 6. U.S. Food and Drug Administration (FDA) Regulated Uses

Appropriate manufacturing and distribution practices are employed to ensure the quality of MEK offered for use in either direct or indirect additives to food according to applications and restrictions of the U.S. FDA.

### 7. Environmental Information

MEK is present in the environment from natural sources such as European firs, junipers, cedars, cypress trees and ferns. MEK is not expected to present a threat to the environment because of its low toxicity, high volatility and complete solubility in water. MEK is rapidly degraded in water, soil, and air. The intent, however, is to minimize any exposure to the environment from manufacturing and use activities.

### 8. Exposure Potential

Based on the uses for MEK, the public could be exposed through:

- **Workplace exposure** – This refers to potential exposure to MEK in a manufacturing facility or through evaporation in various industrial applications. Generally, exposure to MEK of personnel in manufacturing facilities is relatively low because the process, storage and handling operations are enclosed. The US Occupational Safety and Health Administration (OSHA) permissible exposure limit (PEL) is 200 parts per million (ppm) per an 8-hour work day.

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- **Consumer use of products containing MEK** – This category of exposure is highly variable depending on the products used and the conditions under which they are used. Exposure of the majority of consumers to commercial MEK sources is likely to be infrequent and of short duration. Exposure could occur through the use of MEK in adhesives or in lacquers and paints. The best way to prevent exposure to vapors is to work in well-ventilated areas.
- **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 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** – In 2005, publicly available sources reported global production for MEK reached 1,141 thousand metric tons (2.5 billion pounds). Global demand for MEK was 1,100 thousand metric tons (2.4 billion pounds).
- **Process** – Publicly available sources report more than 85% of the U.S. MEK is produced from sec-butanol. The alcohol is obtained in a two-step process starting from butenes. Although MEK is not a hazardous air pollutant, it is a volatile organic compound (VOC), considerable measures are taken to prevent its release to the atmosphere. Processes and equipment for manufacture, transfer and storage are continuous and enclosed.

### 10. Risk Management

When using MEK or products which contain MEK, make sure that there is adequate ventilation. Always use appropriate 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 MEK is handled, processed, or stored. Wash hands and skin following contact. If MEK gets into your eyes, rinse eyes thoroughly for at least 15 minutes with tap water and seek medical attention.

### 11. Federal/Science Agency Findings

U.S. Environmental Protection Agency - Voluntary Children's Chemical Evaluation Program (VCCEP)

- <http://www.epa.gov/HPV/vccep/pubs/chem4.htm>

U.S. Environmental Protection Agency - Integrated Risk Information System (IRIS)

- <http://www.epa.gov/iris/subst/0071.htm>

U.S. Environmental Protection Agency - Technology Transfer Network Air Toxics Web Site

- <http://www.epa.gov/ttn/atw/hlthef/methylet.html>

National Institute for Occupational Safety and Health

- <http://www.cdc.gov/niosh/topics/methylethylketone/>

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

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

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### 12. Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use and/or disposal of MEK. These regulations may vary by city, state, country or geographic region. Additional helpful information may be found by consulting the relevant Material Safety Data Sheet.

### 13. Conclusion Statement

- Methyl Ethyl Ketone (MEK) is a widely used industrial solvent and chemical intermediate.
- MEK is low in toxicity. It is naturally present in the environment and is found in some dairy products (yogurt and cheese), fruits and vegetables.
- MEK does not cause adverse health or environmental effects at levels typically found in the workplace or environment.
- MEK is highly flammable with a high vapor pressure; use only with good ventilation; avoid all ignition sources.

For more business information about MEK, visit the American Chemistry Council Solvents Industry Group web site at: <http://www.americansolventscouncil.org/about/MEK.asp>

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