

# Product Stewardship Summary

## *Isopropanol*

### General Statement

Isopropanol is a colorless liquid alcohol found in many consumer products. Most consumers will be familiar with isopropanol in the form of rubbing alcohol for disinfection of wounds. It is also used as a solvent in a number of consumer and industrial products including antifreeze, lotions, car care products, and cosmetics. Significant consumer toxicity from isopropanol exposure has been reported due to ingestion or overapplication on skin. Exposure to low levels of isopropanol is not expected to be hazardous.

### Chemical Identity

Name: Isopropanol

Brand Names: Ashland uses isopropanol as a solvent in some water treatment, car care, and cleaning products

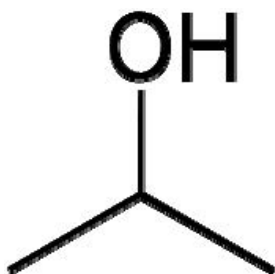
Chemical name (IUPAC): Propan-2-ol

CAS number(s): 67-63-0

EC number: 200-661-7

Molecular formula: C<sub>3</sub>H<sub>8</sub>O

Structure:



### Uses and Applications

Isopropanol is used in many different applications, including as a solvent, cleaning, and medical products. Consumers are often exposed to isopropanol in the form of rubbing alcohol. Isopropanol is also found in antifreeze, hand lotions, water treatment products, car care products, and cosmetics.



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## Physical/Chemical Properties

### Phys/Chem Safety Assessment

Property	Value
Form	Clear liquid
Physical state	Liquid
Color	Colorless
Odor	Alcoholic
Density	0.79 g/cm <sup>3</sup> @ 20°C
Melting / boiling point	-88.5°C / 82.3°C
Flammability	H225: Highly flammable liquid and vapor
Explosive properties	Not classified
Self-ignition temperature	399°C
Vapor pressure	60.2 hPa @ 25°C
Mol weight	60.09502 g/mol
Water solubility	Miscible
Flash point	11.7°C
Octanol-water partition coefficient (Log <sub>K<sub>ow</sub></sub> )	0.05

### Exposure, Hazard and Safety Assessment

The following section describes possible exposures scenarios and hazards associated with isopropanol. The exposure assessment describes both the amount of and the frequency with which a chemical substance reaches a person, a population of people, or the environment. Hazard refers to the inherent properties of a substance that make it capable of causing harm to human health or the environment. The safety assessment reports the possibility of a harmful event arising from exposure to a chemical or physical agent under specific conditions. Just because a substance may possess potentially harmful properties does not mean that it automatically poses a risk. It is not possible to make that determination without understanding the exposure.

### Human Health Effects

#### Human Exposure Assessment

**Consumer:** Isopropanol exposure commonly occurs through both inhalation and skin absorption. Consumers are exposed to isopropanol through many home products, including cosmetics and rubbing alcohol.

**Worker:** Industrial exposure to isopropanol is regulated by the US Occupational Safety and Health Administration (OSHA). OSHA has set a permissible exposure limit (PEL) for isopropanol of 400 ppm as an 8-hour time-weighted average. The National Institute for Occupational Safety and Health (NIOSH) and the American Conference of Governmental Industrial Hygienists (ACGIH) further recommend a short term exposure limit of 500 ppm for periods not to exceed 15 minutes. Many EU member states apply an 8-hour TWA of 200 ppm and a short term exposure limit of 400 ppm.

## Human Hazard Assessment

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	H336: May cause drowsiness or dizziness
Irritation / corrosion Skin / eye / respiratory test	H319: Causes serious eye irritation
Sensitization	Not classified
Toxicity after repeated exposure Oral / inhalation / dermal	Prolonged or repeated exposure does not cause any harmful effects
Genotoxicity / Mutagenicity	Does not affect genetic system
Carcinogenicity	Not considered as a carcinogen
Reproductive / Developmental Toxicity	Not toxic to reproduction or to unborn children
Aspiration hazard	Not applicable

## Human Health Safety Assessment

**Consumer:** While exposure to small amounts of isopropanol is relatively harmless, it has similar toxicities to ethanol. Acute overexposure to isopropanol may cause central nervous system (CNS) depression, liver, kidney, and brain damage as well as cardiovascular depression. In addition to the systemic effects, isopropanol is a defatting agent and may cause dermatitis with prolonged skin contact. At high vapor concentrations, isopropanol is irritating to eyes, throat, and nose. Isopropanol exposure may be lethal at doses above 240 ml (12 fluid ounces or one standard drink can) for adults or 100 ml for children. No toxicity from chronic exposure has been identified in humans.

**Worker:** In addition to the toxicity to consumers, the International Agency for Research on Cancer has listed manufacture of isopropanol using strong acids as a group 1 carcinogenic activity. Isopropanol itself is listed as a group 3 carcinogen.

## Environmental Effects

### Environmental Exposures

With the exception of large scale spills, environmental concentrations of isopropanol are unlikely to be sufficient to cause ecotoxicity.

### Environmental Hazard Assessment:

Effect Assessment	Result
Aquatic toxicity	Not toxic to aquatic organisms

Fate and behavior	Result
Biodegradation	Readily biodegradable
Bioaccumulation potential	Low potential to bioaccumulate.
PBT / vPvB conclusion	This substance is not considered to be persistent, bioaccumulating and toxic (PBT) or very persistent and very bioaccumulating (vPvB)

## Environmental Safety Assessment

Isopropanol is dangerous to terrestrial and aquatic life in high concentrations. At low concentrations, isopropanol is quickly metabolized and causes minimal toxicity. Accordingly, Isopropanol is not expected to bioaccumulate.

## Risk Management Recommendations

While normal consumer exposure to isopropanol presents minimal danger, overexposure may cause effects up to lethality. Parents should be mindful of the amount of isopropanol used to cool feverish children, and avoid excessive application. Isopropanol should not be swallowed. Workers exposed to isopropanol in the workplace should wear appropriate protective equipment, including gloves, sleeve protectors, and other barrier equipment as appropriate. Respirators should be worn if working in an area with a high concentration of isopropanol vapor. In the event of eye or excessive skin contact, wash the area with lukewarm water for at least 15 minutes. Seek medical attention if the exposed individual displays any signs of acute toxicity, including behavior similar to drunkenness.

Exposure to ethanol in the workplace is covered by established exposure limits. A partial list of references follows:

US OSHA PEL: 400 ppm (8h TWA)

ACGIH TLV: 200 ppm (8h TWA)

EU and member states: <http://osha.europa.eu/en/topics/ds/oel/index.stm/members.stm>

China: 350 mg/m<sup>3</sup> (8h TWA)

## Regulatory Agency Review

Isopropanol:

- is on the list of REACH registered substances (EC) 1907/2006
- is on the US TSCA inventory
- is listed on Canada's DSL list
- is on the Australia Index of Chemical Substances
- is on the China Inventory of Existing Chemical Substances
- is on the Japan Inventory of Existing and New Chemical Substances
- is on the Korea Existing Chemicals Inventory
- is on the New Zealand Inventory of Chemicals
- is on the Philippines Inventory of Chemicals and Chemical Substances
- is listed as a Group 3 carcinogen by the International Agency for Research on Cancer (IARC)

## Regulatory Information / Classification and Labeling

Under the Globally Harmonized System for classification and labeling (GHS), substances are classified according to their physical, health, and environmental hazards. The hazards are communicated via specific labels and the (Extended) SDS. 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.

## GHS Classification:

Flammable liquids: Category 2

Serious eye damage/eye irritation: Category 2A

Specific target organ toxicity (single exposure): Category 3

## Hazard Statements:

H225: Highly flammable liquid and vapor.

H319: Causes serious eye irritation.

H333: May be harmful if inhaled.

H336: May cause drowsiness or dizziness.

## Signal Word:

Danger

## Precautionary Statements:

P210: Keep away from heat/sparks/open flames/hot surfaces. – No smoking

P233: Keep container tightly closed

P240: Ground/bond container and receiving equipment

P243: Take precautionary measures against static discharge

P280: Wear protective gloves/ protective clothing/ eye protection/ face protection

P303+P361+P353: IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower

P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P403+P235: Store in a well-ventilated place. Keep cool

## Hazard Pictograms:



## Conclusion

In the vast majority of uses, isopropanol is a very safe component in a variety of consumer products. In large quantities, it can be hazardous. Parents should carefully control the exposure of their children to isopropanol, and ensure it is stored in an inaccessible location.

## Contact Information with Company

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## Additional Information

For more information on GHS, visit <http://www.osha.gov/dsg/hazcom/ghsguideoct05.pdf> or [http://live.unece.org/trans/danger/publi/ghs/ghs\\_welcome\\_e.html](http://live.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html).

Ashland product stewardship summaries are located at <http://www.ashland.com/sustainability/product/product-stewardship>

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*REACH registration is specific to Importers/Manufacturers that place the chemical on the EU market, and is specific to registered uses. Inclusion on the list of REACH Registered Substances does not automatically imply registration by Ashland.*

*Inclusion on the New Zealand Inventory of Chemicals applies only to the pure substance listed. The importer of record must determine whether or not their substances are in compliance.*