



MATERIAL SAFETY DATA SHEET **ISOPROPYL ALCOHOL 99%**

SECTION 1: IDENTIFICATION

Product Name: ISOPROPYL ALCOHOL 99%

Product Number: 00000000000499149

Internal ID: 168

Chemical Family: C3 Alcohol

CAS Number: 67-63-0

Chemical Name: Isopropyl Alcohol

Synonyms: IPA, Isopropanol, 2-Propanol, Secondary propyl alcohol

Company Business Contact

Chemical Resources, Inc.

20 Nassau Street

Suite 100A

Princeton, NJ 08542

24 Hour Emergency Contact

CHEMTREC 800 424-9300

SECTION 2: HAZARD IDENTIFICATION

Emergency Overview

This material is HAZARDOUS by OSHA Hazard Communication definition.

Signal Word -DANGER.

Hazards

Extremely flammable liquid. Moderate to severe eye irritant. Mucous membrane irritant. Ingestion hazard. Inhalation hazard. CNS depressant. Slight skin irritant - defatting action.

Physical State-Liquid.

Color-Clear, colorless.

Health 2

Flammability 3

Physical Hazard 0

HMIS® NFPA® 3 0 1

Odor-Medicinal odor analogous to rubbing alcohol.

Odor Threshold-- 200 ppm

Potential Health Effects

Routes of Exposure

Eye. Inhalation. Skin.

Signs and Symptoms of Acute Exposure

See component summary.

Isopropyl Alcohol 67-63-0

Moderate to severe eye irritant. Exposure could cause central nervous system depression and liver and kidney damage.

Skin

Liquid slightly irritating to skin. Repeated contact with neat product may dry the skin causing cracking and/or fissuring.

Inhalation

High vapor concentrations may cause irritation of the eyes, nose, and/or throat, changes to the liver, lung, spleen, and brain, and central nervous system depression (ataxia, dizziness, narcosis, and muscle relaxation, with respiratory arrest and death in cases of severe over exposure).

Eye

Moderate to severe eye irritant.

Ingestion

Ingestion may cause gastrointestinal effects (pain, nausea, vomiting, hemorrhage), hypothermia, cardiac effects (low blood pressure, shock and cardiac arrest), liver changes, kidney damage, and CNS effects (headache, dizziness, sleepiness, coma and death).

Chronic Health Effects

See component summary.

Isopropyl Alcohol 67-63-0

Repeated or prolonged exposure to isopropanol can be irritating to mucosal membranes. Repeated or prolonged exposure may cause respiratory irritation. Repeated or prolonged contact may cause skin irritation. Repeated exposure may cause liver and kidney damage.

Conditions Aggravated by Exposure

This material or its emissions may affect mucous tissue and/or aggravate mucous membrane dysfunction. Persons with pre-existing chronic respiratory disease or skin disorders should minimize their exposure to this material. This material or its emissions may aggravate pre-existing eye disease.

SECTION 3 : COMPOSITION/INFORMATION ON INGREDIENTS

Component Name CAS # EU Inventory Concentration Wt. %

Isopropyl Alcohol 67-63-0 200-661-7 >= 99.0

Compositions given are typical values not specifications.

See section 16 for full text of risk phrases.

SECTION 4: FIRST AID MEASURES

General

Take proper precautions to ensure your own health and safety before attempting rescue and providing first aid. For specific information refer to the Emergency Overview in Section 2 of this MSDS.

Skin

Promptly remove soiled clothing/wash thoroughly before reuse. Wash skin thoroughly with mild soap and water. Flush with lukewarm water for 15 minutes. If sticky, use waterless cleaner first. Seek medical attention if ill effect or irritation develops.

Inhalation

If overcome by exposure, remove victim to fresh air immediately. Give oxygen or artificial respiration as needed. Seek medical attention if discomfort persists.

Eye

Immediately flush the eyes with large amounts of clean low-pressure water for at least 15 minutes, occasionally lifting the upper and lower lids. If pain or irritation persists, promptly obtain medical attention.

Ingestion

Do not induce vomiting. If large quantity swallowed, give lukewarm water (pint/ 1/2 litre) if victim completely conscious/alert. Obtain emergency medical attention.

Note to Physician

Administer an aqueous slurry of activated charcoal followed by a cathartic such as magnesium citrate or sorbitol. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

SECTION 5: FIRE FIGHTING MEASURES

Flammable Properties

Classification

OSHA/NFPA Class IB Flammable Liquid.

Flash Point

~ 12 °C (53.6 °F) (TCC)

Auto-Ignition Temperature

~ 399 °C (750.2 °F)

Lower Flammable Limit

~ 2 vol%

Upper Flammable Limit

~ 12 vol%

Extinguishing Media

Suitable: SMALL FIRE: Use dry chemicals, CO₂, water spray or alcohol-resistant foam. LARGE FIRE: Use water spray, water fog or alcohol-resistant foam.

Unsuitable: WARNING - Water may be ineffective unless used under favorable conditions by experienced fire fighters trained in fighting all types of flammable liquid fires. Water can be used to cool and protect exposed material.

Protection of Firefighters

Protective Equipment/Clothing: Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters protective clothing will only provide limited protection.

Fire Fighting Guidance: Releases flammable vapors below normal ambient temperatures. Fine sprays/mists may be combustible at temperatures below normal flash point. Vapors may be heavier than air. May travel long distances along the ground before igniting and flashing back to vapor source. When mixed with air and exposed to ignition source, vapors can burn in open or explode if confined. Diluting with water may not suffice to raise flash point above ambient temperatures.

Water may be ineffective in firefighting due to low flash point. Although water soluble, may not be practical to extinguish fire by water dilution. Move containers from fire area if you can do it without risk. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out.

Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. Always stay away from tanks engulfed in fire. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

Hazardous Combustion Products: Incomplete combustion will form carbon monoxide and other toxic vapors.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Release Response

Extremely flammable liquid. Release causes immediate fire/explosion hazard. Liquids/vapors may ignite. Extinguish all ignition sources. All equipment used when handling this product must be grounded. Do not touch or walk through spilled material. Stop leak if you can do it without risk. Prevent entry into waterways, sewers, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Use clean non-sparking tools to collect absorbed material. Dike large spills and place materials in salvage containers. Water spray may reduce vapor; but may not prevent ignition in closed spaces.

SECTION 7: HANDLING AND STORAGE

Handling

For industrial use only. Keep container tightly closed when not in use. Check atmosphere for explosiveness and oxygen deficiencies. Extinguish all ignition sources. Containers must be properly grounded before beginning transfer. Use only non-sparking tools. Carefully vent any internal pressure before removing closure. Wear recommended personal protective equipment. All equipment must conform to applicable electrical code. Isolate, vent, drain, wash and purge systems or equipment before maintenance or repair. Handle empty containers with care; vapor residue may be flammable/explosive.

Storage

Steel drums are recommended for packaging. Store only in tightly closed, properly vented containers away from heat, sparks, open flame and strong oxidizing agents. Store closed drums with bung in up position. Do not store this material in aluminum containers. Material may attack some forms of plastic, aluminum, rubber and coatings.

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering Controls

No special ventilation is recommended under anticipated conditions of normal use beyond that needed for normal comfort control.

Personal Protection

Inhalation A respiratory protection program that meets OSHA's 29 CFR 1910.134 or ANSI Z88.2 requirements must be followed whenever workplace conditions warrant respirator use.

Skin Wear chemical resistant gloves such as: Butyl rubber. Nitrile. or Viton(TM). Not normally considered a skin hazard. Where use can result in skin contact, practice good personal hygiene. The equipment must be cleaned thoroughly after each use.

Eye Eye protection, including both chemical splash goggles and face shield, must be worn when possibility exists for eye contact due to splashing/spraying liquid, airborne particles, or vapor.

Additional Remarks

Selection of appropriate personal protective equipment should be based on an evaluation of the performance characteristics of the protective equipment relative to the task(s) to be performed, conditions present, duration of use, and the hazards and/or potential hazards that may be encountered during use. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Use good personal hygiene practices. Wash hands before eating, drinking, smoking, or using toilet facilities. Promptly remove soiled clothing/wash thoroughly before reuse.

Occupational Exposure Limits

Component Name	Source	Type	Value	Notation
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Isopropyl Alcohol	US (ACGIH)	STEL	400 ppm	
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None.

US (ACGIH)	TWA	200 ppm		
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None.

US (OSHA)	TWA	400 ppm		
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980 mg/m³

None.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Liquid. Clear, colorless.

Odor: Medicinal odor analogous to rubbing alcohol.

Odor Threshold: ~ 200 ppm

pH: Not applicable.

Boiling Point/Boiling Range: ~ 82 °C (179.6 °F) @ 760 mm Hg

Freezing Point/Melting Point: ~ -88 °C (-126.4 °F)

Flash Point: ~ 12 °C (53.6 °F) (TCC)

Auto-ignition: ~ 399 °C (750.2 °F)

Flammability: OSHA/NFPA Class IB Flammable Liquid.

Lower Flammable Limit: ~ 2 vol%

Upper Flammable Limit: ~ 12 vol%

Explosive Properties: No Data Available.

Oxidizing Properties: No Data Available.

Vapor Pressure: ~ 33 mm Hg @ 20 °C (68 °F)

Evaporation Rate: 2.3 (butyl acetate = 1)

Relative Density: ~ 0.78 @ 20 °C (68 °F) (Water = 1.0 at 4°C (39.2°F))

Relative Vapor Density: ~ 2.07 @ 15 - 20 °C (59 - 68 °F) (Air = 1.0)

Viscosity: 2.4 mPa.s @ 20 °C (68 °F)

Solubility (Water): Complete (In All Proportions).

Partition Coefficient (Kow): No Data Available.

Additional Physical and Chemical Properties: No additional information available.

SECTION 10: STABILITY AND REACTIVITY

Chemical Stability

No additional information available.

Conditions to Avoid

Heat, sparks, open flame, other ignition sources, and oxidizing conditions.

Substances to Avoid

Strong oxidizing agents. Acetaldehyde. Chlorine. Ethylene Oxide. Acids. Isocyanates.

Hazardous Polymerization

Not expected to occur.

Reactions with Air and Water

Not expected to occur.

SECTION 11: TOXICOLOGICAL INFORMATION

PRODUCT INFORMATION

Product Summary

This product is of low acute toxicity by the dermal and inhalation routes and moderately toxic by the oral route. High vapor concentrations may cause irritation of the eyes, nose, and/or throat, changes to the liver, lung, spleen, and brain, and central nervous system depression (ataxia, dizziness, narcosis, and muscle relaxation, with respiratory arrest and death in cases of severe over exposure). Ingestion may cause gastrointestinal effects (pain, nausea, vomiting, hemorrhage), hypothermia, cardiac effects (low blood pressure, shock and cardiac arrest), liver changes, kidney damage, and CNS effects (headache, dizziness, sleepiness, coma and death). Aspiration into the lungs may cause fatal chemical pneumonitis. Contact with the undiluted liquid may cause moderate to severe eye irritation and slight skin irritation while prolonged or repeated skin contact may cause drying/cracking of the skin. This product has a low potential to cause dermal sensitization although skin reactions have been reported in some hypersensitive individuals. Repeated exposure studies in animals indicate that this product may cause transient CNS effects, decreased body weights, increased liver and kidney weights, and species-specific, age-related changes in the kidneys following prolonged oral or inhalation exposures. Reversible increases in motor activity were observed in female animals exposed to very high vapor concentrations of Isopropanol for up to 13 weeks, with no microscopic changes in the nervous system. This product is an animal reproductive toxicant but only at high inhalation or oral exposures that also caused maternal toxicity. Results from oral and inhalation studies in which Isopropanol was administered to pregnant rats and rabbits during gestation demonstrate that Isopropanol is not teratogenic and is not selectively toxic to the fetus. May be toxic to embryo/fetal development at very high exposures that also cause maternal toxicity. Isopropanol is not genotoxic in standardized in vitro and in vivo mutagenicity test and there was no evidence of carcinogenicity in rats or mice exposed to high vapor concentrations of Isopropanol for up to 2 years.

COMPONENT INFORMATION

□ *Isopropyl Alcohol 67-63-0*

Acute Toxicity - Lethal Doses

LC50 (vapor) Rat 19,000 PPM 8 HOURS

LD50 (Oral) Rat 4396 MG/KG BWT

Mouse 3600 MG/KG BWT

LD50 (Skin) Rabbit. 12,870 MG/KG BWT

Acute Toxicity - Effects

Inhalation This substance has a low order of acute toxicity by the inhalation route. High vapor concentrations may cause irritation of the eyes, nose, and/or throat, changes to the liver, lung, spleen, and brain, and central nervous system depression (ataxia, dizziness, narcosis, and muscle relaxation, with respiratory arrest and death in cases of severe over exposure).

Ingestion This substance is moderately toxic by the oral route. Ingestion may cause gastrointestinal effects (pain, nausea, vomiting, hemorrhage), hypothermia, cardiac effects (low blood pressure, shock and cardiac arrest), liver changes, kidney damage, and CNS effects (headache, dizziness, sleepiness, coma and death). Aspiration into the lungs may cause fatal chemical pneumonitis.

Skin Contact This material may be absorbed through the skin. Considered to be of low toxicity by the dermal route of exposure. However, very high exposures may cause skin injury or systemic toxicity. (CNS depression and death).

Irritation

Skin Liquid slightly irritating to skin. Repeated contact with neat product may dry the skin causing cracking and/or fissuring.

Eye Moderate to severe eye irritant. Isopropanol vapor is mildly irritating to the eyes at an airborne concentration of 400 ppm and becomes objectionable, but not severely irritation, at 800 ppm.

Sensitization

Low potential to cause skin sensitization.

Target Organ Effects

Eye. Skin. Respiratory system. Mucous membrane irritant. Liver. Kidneys.

Repeated Dose Toxicity

This substance is a low concern to health following prolonged oral, inhalation, or dermal exposures. No effects were observed in a limited study in which rats were exposed daily by the dermal route for 27 weeks. In animals receiving ≥ 1000 mg/kg bwt/day Isopropanol by the oral route for up to 7 months, systemic effects included clinical signs of transient CNS depression, decreased body weight, an increase in liver and kidney weights, and a dose-dependent increase in microscopic changes in the kidneys of male rats. A reversible increase in motor activity was observed in female rats exposed to 5000 ppm Isopropanol by the inhalation route for up to 13 weeks. No exposure-related lesions were found in the nervous system of animals in either the 13-week study or a 2-year study conducted at similar exposure levels. In a chronic inhalation exposure study in which rats and mice were exposed to ≥ 2500 ppm Isopropanol for 2 years, adverse effects were limited to transient signs of CNS depression (ataxia, hypoactivity, narcosis) during exposure, increased liver weights in the absence of clinical chemistry or microscopic changes, seminal vesicle enlargement (mice only), and kidney effects of a type commonly observed in aging animals.

Reproductive Effects

May be toxic to reproduction at exposure levels that are toxic to parents. No adverse effects were seen in reproductive organs of male and female rodents in repeat exposure studies at inhalation exposures up to 5000 ppm for up to 2 years, one and two generation reproductive toxicity studies at drinking water concentrations up to 2%, or oral gavage administration of 1000 mg/kg bwt/day. There were no adverse effects on mating or fertility in a rat one-generation reproductive toxicity study

in which parental animals received up to 2% Isopropanol in the drinking water or a two-generation study in which parental animals received up to 1000 mg/kg bwt/day by oral gavage. Parental toxic effects included decreases in food and water consumption, decreases in body weight, mild anemia, and kidney and liver effects in the drinking water study and maternal mortality, increased weight gain during lactation, and kidney and liver effects in the oral gavage study. Effects on offspring were limited to doses that also caused parental toxicity and included increases in pre-implantation losses, decreases in pups/litter, pup survival, pup weight gain, average pup weight, mean litter and mean fetal body weights, increased relative liver weights and edema in the one-generation study and decreases in live birth index, survival indices, pup weights, and lactation index in the two-generation study. In a developmental toxicity study, pregnant rats were exposed to vapor concentrations of up to 10000 ppm Isopropanol throughout gestation, with maternal effects (CNS depression, reduced food intake/weight gain at 7000 and 10000 ppm) and increased pregnancy loss at 10000 ppm. Fetal effects, including a reduction in body weights, were predominantly seen at exposure levels that were also toxic to the dam.

Developmental Effects

May be toxic to embryo/fetal development at very high exposures that also cause maternal toxicity. Results from oral and inhalation studies in which Isopropanol was administered to pregnant rats and rabbits during gestation demonstrate that Isopropanol is not teratogenic and is not selectively toxic to the fetus. At high vapor concentrations (≥ 7000 ppm) of Isopropanol that were maternally toxic (central nervous system depression, decreased food consumption, and maternal weight gain), increased pregnancy loss (at 10000 ppm only) and an increase in skeletal malformations was noted. There was also a dose-dependent decrease in fetal body weights. Administration of $\geq 1.25\%$ Isopropanol in the drinking water caused a dose-dependent reduction in food and water consumption in parental rats; fetal toxicity was limited to a dose-related decrease in mean litter weights and mean fetal body weights and slightly retarded ossification only at 2.5%. Except for a reduction in rat fetal body weights at doses that also resulted in maternal lethality and other signs of maternal toxicity for both rats and rabbits, there were no other signs of fetal toxicity when Isopropanol was administered by oral gavage during gestation.

Genetic Toxicity

This substance is a low concern for genetic toxicity. There was no evidence of genotoxicity in standard bacterial and non-bacterial in vitro tests or in an in vivo micronucleus assay.

Carcinogenicity

Not expected to be carcinogenic. Long-term exposure (2 years) to Isopropanol via inhalation at concentrations up to 5000 ppm caused no exposure related increases in tumors in animals. This substance is not classified for carcinogenicity by IARC, OSHA, NTP, or the EPA.

SECTION 12: ECOLOGICAL INFORMATION

PRODUCT INFORMATION

Ecotoxicity

See component summary.

Environmental Fate and Pathway

See component summary.

COMPONENT INFORMATION

□ *Isopropyl Alcohol 67-63-0*

Ecotoxicity

Acute toxicity to fish

LC50 / 96 HOURS *Pimephales promelas* 9,640 mg/l

Summary: Acute toxicity to fish is very low.

Acute toxicity to aquatic invertebrates

EC50 / 48 HOURS *Daphnia magna*. > 10,000 mg/l

Summary: Low acute toxicity to aquatic invertebrates.

Toxicity to aquatic plants

EC50 / 72 HOURS *Scenedesmus subspicatus* > 1,000 mg/l

Summary: Low toxicity to algae.

Toxicity to microorganisms

EC50 / 3 HOURS Activated sludge > 1,000 mg/l

Summary: Low toxicity to bacteria.

Chronic toxicity to fish

NOEC / 14 d *Oryzias latipes* > 100 mg/l

Summary: Low chronic toxicity to fish.

Chronic toxicity to aquatic invertebrates

NOEC / 16 d *Daphnia magna*. 141 mg/l

Summary: Low chronic toxicity to aquatic invertebrates.

Other Adverse Effects

Lactuca sativa, 3-day EC50 (seed germination) = 2100 mg/l. Low toxicity to terrestrial plants.

Environmental Fate and Pathway

Mobility

Transport between environmental compartments: Volatilization from water or soil surfaces is expected to be limited. Initially partitioning mainly to water and air.

Persistence and Degradability

Biodegradation: Readily biodegradable (77% degraded in 10 days). Expected to be hydrolytically stable, but rapidly degraded following atmospheric release.

Bioaccumulation: Significant bioaccumulation is not expected based on predicted BCF of 3.16.

SECTION 13: DISPOSAL CONSIDERATIONS

Contaminated product/soil/water may be U.S. Resource Conservation and Recovery Act (RCRA)/U.S. Occupational Safety and Health Administration (OSHA) hazardous waste due to potentially low flash point. (See 40 U.S. Code of Federal Regulations (CFR) 261 and 29 CFR 1910). Comply with federal, state, or local regulations for disposal.

SECTION 14: TRANSPORT INFORMATION

Special Requirements

If you reformulate or further process this material, you should consider re-evaluation of the regulatory status of the components listed in the composition section of this sheet, based on final composition of your product.

Proper Shipping Name Isopropanol

ID No. UN1219

Hazard Class 3

PG II

SECTION 15: REGULATORY INFORMATION

Regulatory Status

Country Inventory

Australia AICS X

Canada DSL X

Canada NDSL

China IECS X

European Union EINECS X

X = All components are included or are otherwise exempt from inclusion on this inventory.

European Union ELINCS

European Union NLP

Japan ENCS X

Korea ECL X

Philippines PICCS X

United States TSCA X

If identified components of this product are listed under the TSCA 12(b) Export Notification rule, they will be listed below.

SARA 302/304

No chemicals in this material with known CAS numbers are subject to the reporting requirements of CERCLA.

SARA 311/312

Based upon available information, this material is classified as the following health and/or physical hazards according to Section 311 & 312:

Immediate (Acute) Health Hazard.

Fire Hazard.

SARA 313

This material does not contain any chemical components with known CAS numbers that exceed the De Minimis reporting levels established by SARA Title III, Section 313 and 40 CFR 372.

Component Reporting Threshold

State Reporting

This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins under California Proposition 65 at levels which would be subject to the proposition.

Massachusetts Substances List (MSL) - Hazardous substances on the MSL must be identified when present in materials at levels greater than state specified criterion. The criterion is: $\geq 1\%$. Components with CAS numbers present in this material at a level which could require reporting under the statute are:

Isopropyl Alcohol / CAS# 67-63-0.

Hazardous Substances listed by the State of Pennsylvania must be identified when present in materials at levels greater than the state specified criterion. The criterion is $\geq 1\%$. Components with CAS numbers in this material at a level which could require reporting under the statute are:

Isopropyl Alcohol / CAS# 67-63-0.

Environmentally Hazardous Substances listed by the State of Pennsylvania must be identified when present in materials at levels greater than the state specified criterion. The criterion is $\geq 1\%$. Components with CAS numbers in this material at a level which could require reporting under the statute are:

Isopropyl Alcohol / CAS# 67-63-0.

SECTION 16: OTHER INFORMATION

DISCLAIMER OF RESPONSIBILITY

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Numerical Data Presentation

The presentation of numerical data, such as that used for physical and chemical properties and toxicological values, is expressed using a comma (,) to separate digits into groups of three and a period (.) as the decimal marker. For example,

1,234.56 mg/kg = 1 234,56 mg/kg

Language Translations

This document may be available in languages other than English.