

MATERIAL SAFETY DATA SHEET

ISOPROPANOL, 60 - 100%

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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WHMIS Number: 00060266
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Website: <http://www.brenntag.ca>

EMERGENCY TELEPHONE NUMBERS (FOR EMERGENCIES INVOLVING CHEMICAL SPILLS OR RELEASE)

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Edmonton, AB (780) 424-1754	Calgary, AB (403) 263-8660	Vancouver, BC (604) 685-5036

PRODUCT IDENTIFICATION

Product Name: Isopropanol 60 - 100%.
Chemical Name: Isopropanol.
Synonyms: Isopropanol, 60 - 100 %; I.P.A. 99; Isopropyl Alcohol, Anhydrous; Isopropyl Alcohol; Rubbing Alcohol; Dimethyl Carbinol; sec-Propyl Alcohol; 2-Propanol; IPA.
Chemical Family: Alcohol.
Molecular Formula: C₃H₈O; CH₃-CHOH-CH₃.
Product Use: Industrial solvent, cleaner, degreaser.
CAS #: 67-63-0.
WHMIS Classification / Symbol: B-2: Flammable Liquid, D-2B: Toxic (Eye Irritant).



READ THE ENTIRE MSDS FOR THE COMPLETE HAZARD EVALUATION OF THIS PRODUCT.

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Causes severe eye irritation. Vapours are extremely irritating to eyes and respiratory tract. At elevated temperatures may cause irritation of the eyes and respiratory tract. High vapour concentrations may cause drowsiness. See "Other Health Effects" Section. Flammable liquid and vapour. May cause flash fire or explosion. Can decompose at high temperatures forming toxic gases. Contents may develop pressure on prolonged exposure to heat.

POTENTIAL HEALTH EFFECTS

- . Inhalation: Product is irritating to the nose, throat and respiratory tract. See "Other Health Effects" Section.
- . Skin Contact: This product may cause mild, transient irritation. Skin contact can cause irritation, especially under the finger nails (and other confined spaces such as under rings or watch bands). May cause defatting, drying and cracking of the skin. Prolonged and repeated contact may lead to dermatitis.
- . Skin Absorption: May be absorbed through intact skin.

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- . Eye Contact: Causes severe eye irritation. May cause corneal damage and conjunctivitis. Vapours from this product are irritating to the eyes.
 - . Ingestion: This product causes irritation, a burning sensation of the mouth and throat and abdominal pain.

Other Health Effects: Effects (irritancy) on the skin and eyes may be delayed, and damage may occur without the sensation or onset of pain. Strict adherence to first aid measures following any exposure is essential.

May cause central nervous system (CNS) depression, liver damage, kidney damage, dizziness, headache, diarrhea, nausea and vomiting. CNS depression is characterized by headache, dizziness, drowsiness, nausea, vomiting and incoordination. Severe overexposures may lead to coma and possible death due to respiratory failure. Liver damage is characterized by the loss of appetite, jaundice (yellowish skin colour), and occasional pain in the upper left-hand side of the abdomen. Signs and symptoms of kidney damage generally progress from oliguria, to blood in the urine, to total renal failure.

3. COMPOSITION, INFORMATION ON INGREDIENTS (Not Intended As Specifications)

Hazardous Ingredients	CAS No.	ACGIH TLV	%
Isopropanol	000067-63-0	200 ppm *A4	60 - 100

A4 = Not classifiable as a human carcinogen. (ACGIH-A4)

4. FIRST AID MEASURES

FIRST AID PROCEDURES

- . Inhalation: Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Give cardiopulmonary resuscitation (CPR) if there is no breathing AND no pulse. Obtain medical attention IMMEDIATELY.
- . Skin Contact: Start flushing while removing contaminated clothing. Wash affected areas thoroughly with soap and water. If irritation, redness, or a burning sensation develops and persists and obtain medical advice.
- . Eye Contact: Immediately flush eyes with running water for a minimum of 20 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY.
- . Ingestion: Do not attempt to give anything by mouth to an unconscious person. If victim is alert and not convulsing, rinse mouth out and give 1/2 to 1 glass of water to dilute material. IMMEDIATELY contact local Poison Control Centre. Vomiting should only be induced under the direction of a physician or a poison control centre. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. IMMEDIATELY transport victim to an emergency facility.

Note to Physicians: This product contains materials that may cause severe pneumonitis if aspirated. If ingestion has occurred less than 2 hours earlier, carry out careful gastric lavage; use endotracheal cuff if available, to prevent aspiration. Observe patient for respiratory difficulty from aspiration pneumonitis. Give artificial resuscitation and appropriate chemotherapy if respiration is depressed.

Isopropanol: Metabolism of isopropanol forms acetone, which may be detected in the urine and expired air. In contrast to diabetic acidosis, acidosis will occur in the absence of hyperglycemia. Haemodialysis should be considered in severe, acute intoxications. (3)

Medical conditions that may be aggravated by exposure to this product include neurological and cardiovascular disorders, diseases of the skin, eyes or respiratory tract, preexisting liver and kidney disorders.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

Flammability Class (WHMIS): B-2: Flammable Liquid.
Flash Point (TCC, Deg. Celsius): 11.7 to 14. (3)
Autoignition Temperature (Deg. Celsius): 425. (3)
Flammability Limits in Air (%): LEL: 2.0. (3) UEL: 12.0. (3)

Hazardous Combustion Products: Thermal decomposition products are toxic and may include oxides of carbon.

Unusual Fire or Explosion Hazards: Vapours from this product are heavier than air, and may "travel" to a source of ignition (eg. pilot lights, heaters, electric motors) some distance away, and then "flash back" to the point of product discharge causing an explosion and fire. Closed containers exposed to heat may explode. Spilled material may cause floors and contact surfaces to become slippery.

Sensitivity to Mechanical Impact: Not expected to be sensitive to mechanical impact.
Rate of Burning: 2.3 mm / min. (4)
Explosive Power: Not available.
Sensitivity to Static Discharge: Expected to be sensitive to static discharge when vapours are present between the lower and upper explosive limits.

EXTINGUISHING MEDIA

Fire Extinguishing Media: Use carbon dioxide or dry chemical media for small fires. If only water is available, use it in the form of a fog. This material may produce a floating fire hazard in extreme fire conditions.

FIRE FIGHTING INSTRUCTIONS

Instructions to the Fire Fighters: Use water spray to cool fire-exposed containers or structures. Use water spray to disperse vapours; re-ignition is possible. Isolate materials that are not involved in the fire and protect personnel. Cool containers with flooding quantities of water until well after the fire is out.

Fire Fighting Protective Equipment: Use self-contained breathing apparatus and protective clothing.

6. ACCIDENTAL RELEASE MEASURES

Information in this section is for responding to spills, leaks or releases in order to prevent or minimize the adverse effects on persons, property and the environment. There may be specific reporting requirements associated with spills, leaks or releases, which change from region to region.

Containment and Clean-Up Procedures: In all cases of leak or spill contact vendor at Emergency Number shown on the front page of this MSDS. Wear protective clothing. Do not use combustible materials such as sawdust as an absorbent. Eliminate all sources of ignition. Collect product for recovery or disposal. For release to land, or storm water runoff, contain discharge by constructing dykes or applying inert absorbent; for release to water, utilize damming and/or water diversion to minimize the spread of contamination. Ventilate enclosed spaces. Notify applicable government authority if release is reportable or could adversely affect the environment.

7. HANDLING AND STORAGE

HANDLING

Handling Practices: Ground and bond equipment and containers to prevent a static charge buildup. Use spark-resistant tools and avoid "splash-filling" of containers. Use normal "good" industrial hygiene and housekeeping practices. Containers exposed to heat may be under internal pressure. These should be cooled and carefully vented before opening. A face shield and apron should be worn. Vent container frequently, and more often in warm weather, to relieve pressure. Enforce NO SMOKING rules in area of use.

Ventilation Requirements: Ventilation should be explosion proof.

Other Precautions: Use only with adequate ventilation and avoid breathing vapours or mists. Avoid contact with eyes, skin or clothing. Wash thoroughly with soap and water after handling. Wash contaminated clothing thoroughly before re-use. Do not use cutting or welding torches on empty drums that contained this material/product. Store wiping rags and similar material in metal cans with tight fitting lids.

STORAGE

Storage Temperature (Deg Celsius): See below.
Ventilation Requirements: Ventilation should be explosion proof.

Storage Requirements: Store in a cool, well-ventilated area. Keep away from heat, sparks and flames. Keep containers closed. Do not expose sealed containers to temperatures above 40 Deg. Celsius. Protect from direct sunlight. Protect against physical damage.

Special Materials to be Used for Packaging or Containers: At elevated temperatures: Aluminum and its alloys should not be used in equipment for storage, handling or transportation. Attacks some types of rubber, plastics and coatings. Confirm suitability of any material before using.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Recommendations listed in this section indicate the type of equipment, which will provide protection against overexposure to this product. Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at your workplace.

ENGINEERING CONTROLS

Engineering Controls: Local exhaust ventilation required. Ventilation should be explosion proof. Make up air should be supplied to balance air that is removed by local or general exhaust ventilation. Ventilate low lying areas such as sumps or pits where dense vapours may collect.

For personnel entry into confined spaces (i.e. bulk storage tanks) a proper procedure must be followed. It must include consideration of, among other things, ventilation, testing of tank atmosphere, provision and maintenance of SCBA, and emergency rescue. Use the "buddy" system. The second person should be in view and trained and equipped to execute a rescue.
(4)

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Contact with skin, eyes and mucous membranes can contribute to the overall exposure and may invalidate the TLV. Consider measures to prevent absorption by these routes.

Eye Protection: Safety glasses with side shields. Use full face-shield or chemical safety goggles when there is potential for contact. Contact lenses should not be worn when working with this material.

Skin Protection: Gloves and protective clothing made from nitrile rubber, viton, neoprene, PVC, rubber or plastic should be impervious under conditions of use. Attacks some types of rubber, plastics and coatings. Prior to use, user should confirm impermeability. Discard contaminated gloves.

Respiratory Protection: No specific guidelines available. Do not use compressed oxygen in hydrocarbon atmospheres. A NIOSH/MSHA-approved air-purifying respirator equipped with organic vapour cartridges for concentrations up to 1,000 ppm. An air-supplied respirator if concentrations are higher or unknown.

Immediately Dangerous to Life and Health (IDLH) value: 2,000 ppm. The purpose of establishing an IDLH value is to ensure that the worker can escape from a given contaminated environment in the event of failure of the most protective respiratory equipment. In the event of failure of respiratory protective equipment, every effort should be made to exit immediately. (4)

If while wearing a respiratory protection, you can smell, taste or otherwise detect anything unusual, or in the case of a full facepiece respirator you experience eye irritation, leave the area immediately. Check to make sure the respirator to face seal is still good. If it is, replace the filter, cartridge or canister. If the seal is no longer good, you may need a new respirator. (4)

Other Personal Protective Equipment: Wear an impermeable apron and boots. Locate safety shower and eyewash station close to chemical handling area. Take all precautions to avoid personal contact. Clothing and footwear that is fire retardant and dissipates static electrical charges should be worn when handling flammable materials. Natural fibers (cotton, wool, leather and linen) should be selected in favour of synthetic materials (rayon, nylon and polyester).

EXPOSURE GUIDELINES

	ACGIH TLV (STEL)	OSHA PEL (TWA)	(STEL)	NIOSH REL (TWA)	(STEL)
Isopropanol	400 ppm	400 ppm	----	400 ppm	500 ppm

9. PHYSICAL AND CHEMICAL PROPERTIES (Not intended as Specifications)

Physical State: Liquid.
Appearance and Odour: Clear, colourless liquid. Mild alcohol odour.
Odour Threshold (ppm): 22 to 200.
Boiling Range (Deg Celsius): 82 to 83.
Melting/Freezing Point (Deg Celsius): -89 to -86.
Vapour Pressure (mm Hg at 20 Deg. Celsius): Above 33.
Vapour Density (Air = 1.0): 2.1.
Relative Density (g/cc): 0.780 to 0.790 (Neat).
Bulk Density: 780 to 790 Kg/M3 (Neat).
Viscosity: Not available.
Evaporation Rate (Butyl Acetate = 1.0): 1.44 to 2.88 (Neat).
Solubility: Soluble in water. Soluble in ethanol, acetone, chloroform, diethyl ether and benzene.
% Volatile by Volume: 100.
pH: Not available.
Coefficient of Water/Oil Distribution: 0.05. (4)
Volatile Organic Compounds (VOC): 100 %.

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY

Under Normal Conditions: Stable.
Under Fire Conditions: Flammable.
Hazardous Polymerization: Will not occur.

Conditions to Avoid: High temperatures, sparks, open flames and all other sources of ignition.

Materials to Avoid: Strong oxidizers. Lewis or mineral acids. Aldehydes. Halogens.
Mixtures or reactions of alcohols with the following materials may cause explosions: barium perchlorate, chlorine, hypochlorous acid, ethylene oxide, hexamethylene diisocyanate and other isocyanates, nitrogen tetroxide, permonosulfuric acid and tri-isobutyl aluminum.
(4) At elevated temperatures: Aluminum and its alloys.

Decomposition or Combustion Products: Thermal decomposition products are toxic and may include oxides of carbon.

11. TOXICOLOGICAL INFORMATION

Toxicological Data:

Isopropanol	LD50 (Oral, Rat)	= 4,700 - 5,840 mg/Kg (1,3)
	LD50 (Dermal, Rabbit)	= 12,800 - 13,000 mg/Kg (1,3)
	LC50 (Inhal'n, Rat, 4h)	= 16,900 - 31,820 ppm (3)

Carcinogenicity Data: The ingredient(s) of this product is (are) not classed as carcinogenic by ACGIH, IARC, OSHA or NTP. See "Other Studies Relevant to Material".

Reproductive Data: May cause reproductive effects based on studies in laboratory animals.

Mutagenicity Data: Mutagenicity tests in animals have been negative.

Teratogenicity Data: Teratogenicity tests in animals have been negative or inconclusive.

Respiratory / Skin Sensitization Data: A female worker who had been occupationally exposed to commercial Isopropanol, demonstrated a positive reaction when closed patch tested with chemically pure Isopropanol in concentrations from 2.5% to 99%. Past medical history indicated that she had previously had a slight case of eczema. (4)

Synergistic Materials: Alcohols may interact synergistically with chlorinated solvents (example - carbon tetrachloride, chloroform, bromotrichloromethane), dithiocarbamates (example - disulfiram), dimethylnitrosamine and thioacetamide. (4)

Other Studies Relevant to Material: Large doses (above 800 mg/Kg/day) of Isopropanol given orally to pregnant rats during the critical period of gestation produced slight decreases in foetal weight. These doses also caused evidence of toxicity in the mothers. Oral doses as high as 480 mg/Kg/day caused evidence of toxicity in pregnant rabbits but did not produce evidence of embryo or foetal toxicity. Isopropanol did not produce an increased incidence of malformations (teratogenicity) in either species. (3)

An indication of reduced mating performance in second generation male rats was noted at oral doses of 1,000 mg/Kg/day in a two-generation reproductive study. Increased neonatal mortality was also seen at doses of 500 mg/Kg/day and greater in this study. (3)

No evidence of neurotoxic effects was observed in studies specifically designed to assess neurobehavioral functions in neonatal rats after oral dosing of mothers during gestation and lactation. In an acute vapour inhalation study, high concentrations of Isopropanol (1,500 ppm and greater) caused a spectrum of transient effects, high vapour concentrations (5,000 ppm) produced an increase in motor activity in rats first noted after 4 weeks of exposure. The effect was reversible completely resolving within 14 days after 13 weeks of exposure. (3)

Isopropanol vapours did not produce hyaline droplet nephropathy in male rats, an effect considered not to have relevance to human health hazard assessment. No other target organ effects were seen in either rats or mice after 3 months of exposure to vapour concentrations up to 5,000 ppm. (3)

No evidence suggestive of carcinogenic activity was noted in chronic vapour inhalation studies with Isopropanol in rats and mice. Isopropanol tested negative in two mutagenicity assays: the mouse micronucleus and Chinese hamster ovary assays. (3)

Isopropanol is not irritating or mildly irritating to the skin, based on human and animal evidence. Isopropanol caused moderate to severe eye irritation when tested in animals. (4)

12. ECOLOGICAL INFORMATION

Ecotoxicity: May be harmful to aquatic life. No food chain concentration potential. (3)

Environmental Fate: This product is biodegradable. (3) Volatilizes rapidly. (3) Can be dangerous if allowed to enter drinking water intakes. Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds, or rivers.

13. DISPOSAL CONSIDERATIONS

Deactivating Chemicals: None required.

Waste Disposal Methods: Dispose of waste material at an approved (hazardous) waste treatment/disposal facility in accordance with applicable local, provincial and federal regulations. Do not dispose of waste with normal garbage, or to sewer systems. Reevaluation of the product may be required by the user at the time of disposal since the product uses, transformations, mixtures and processes may influence waste classification.

Safe Handling of Residues: See "Waste Disposal Methods".

Disposal of Packaging: Empty containers retain product residue (liquid and/or vapour) and can be dangerous. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. Do not expose such containers to heat, flame, sparks, static electricity, or other sources of ignition; they may explode and cause injury or death. Do not dispose of package until thoroughly washed out.

14. TRANSPORTATION INFORMATION

Please consult the North American Emergency Guidebook, via the UN#, for guidance on addressing spills.

CANADIAN TDG ACT SHIPPING DESCRIPTION:

Isopropanol, Class 3, UN1219, Pk Gp II.
Label(s)/Placard(s): Flammable Liquid. Exemptions: None known.
ERAP Index: Not applicable.

US DOT CLASSIFICATION (49CFR 172.101, 172.102):

Isopropanol, Class 3, UN1219, Pk Gp II.
Label(s)/Placard(s): Flammable Liquid.
Reportable Quantity (CERCLA-RQ): Not available. Exemptions: Not applicable.

15. REGULATORY INFORMATION

CANADA

CEPA - NSNR: This material is included on the DSL under the CEPA.
CEPA - NPRI: Isopropanol.
Controlled Products Regulations Classification (WHMIS): B-2: Flammable Liquid, D-2B: Toxic (Eye Irritant).

USA

Environmental Protection Act: This material is included on the TSCA Inventory.
OSHA Hazard Communication (29CFR 1910.1200) Classification: Flammable Liquid, Eye Irritant.

NFPA: 1 Health, 3 Fire, 0 Reactivity. (6)

INTERNATIONAL: The following component or components of this product appear on the European Inventory of Existing Commercial Chemical Substances: Isopropanol.

16. OTHER INFORMATION

ADDITIONAL INFORMATION AND SOURCES USED

1. RTECS-Registry of Toxic Effects of Chemical Substances, Canadian Centre for Occupational Health and Safety RTECS database.
 2. Clayton, G.D. and Clayton, F.E., Eds., Patty's Industrial Hygiene and Toxicology, 3rd ed., Vol. IIA,B,C, John Wiley and Sons, New York, 1981.
 3. Supplier's Material Safety Data Sheet(s).
 4. "CHEMINFO", through "CCINFODisc", Canadian Centre for Occupational Health and Safety, Hamilton, Ontario, Canada.
 5. Guide to Occupational Exposure Values, 2004, American Conference of Governmental Industrial Hygienists, Cincinnati, 2004.
 6. NFPA 325M Fire Hazard Properties of Flammable Liquids, Gases, and Volatile Solids, 1994 Edition, Quincy, MA, 1994.
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The information contained herein is offered only as a guide to the handling of this specific material and has been prepared in good faith by technically knowledgeable personnel. It is not intended to be all-inclusive and the manner and conditions of use and handling may involve other and additional considerations. No warranty of any kind is given or implied and Brenntag Canada Inc. will not be liable for any damages, losses, injuries or consequential damages which may result from the use of or reliance on any information contained herein. This Material Safety Data Sheet is valid for three years.

To obtain revised copies of this or other Material Safety Data Sheets, contact your nearest Brenntag Canada Regional office.

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