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Safety Data Sheet

1. PRODUCT IDENTIFICATION

Name **Isopropyl Alcohol**
 Synonyms **2-propanol, isopropanol, 2-hydroxypropane, sec-propyl alcohol, IPA**
 CAS# **67-63-0**
 Europe EC# **200-661-7**
 Product Uses **solvent, disinfectant, organic synthesis, pharmaceuticals**

EMERGENCY INFORMATION

Canada Call CANUTEC (collect) (613) 996-6666
 U.S.A. Call CHEMTREC (800) 424-9300

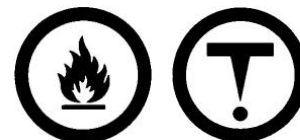
2. HAZARDS

GHS Class (Category)	<i>flammable (2)</i>	<i>eye irritant (2A)</i>	<i>STOT (3)</i>
Signal Words	DANGER	WARNING	WARNING
Hazard Statements	<i>highly flammable liquid & vapour (H225)</i>	<i>causes serious eye irritation (H319)</i>	<i>may cause drowsiness or dizziness (H336)</i>



Canada – WHMIS Key:

B 2, D 2B
B 2 – Flash Point <38°C, **B 3** – Flash Point >38°C & <93°C
D 1 – Immediately Toxic, **D 2** – Chronic Toxicity
C – Oxidising Substance, **E** – Corrosive, **F** – Reactive Substance



3. COMPOSITION

	%	TWAEV / TLV ppm / mg/m ³	LD ₅₀ (mg/kg) ORAL	LD ₅₀ (mg/kg) SKIN	LC ₅₀ ppm INHALATION
2-propanol	100%	200 / 490	>4400	12,900	>5920

4. FIRST AID

SKIN: Wash with plenty of water. Remove contaminated clothing and do not reuse until thoroughly laundered.
EYES: Wash eyes with plenty of water, holding eyelids open. Seek medical assistance promptly if there is irritation.
INHALATION: Remove from contaminated area promptly. **CAUTION: Rescuer must not endanger himself!** If breathing stops, administer artificial respiration and seek medical aid promptly.
INGESTION: Give plenty of water to dilute product. Do not induce vomiting (NOTE below). Keep victim quiet. If vomiting occurs, lower victim's head below hips to prevent inhalation of vomited material. Seek medical help promptly.

Inadvertent inhalation of vomited material may seriously damage the lungs. The danger of this is greater than the risk of poisoning through absorption of this relatively low-toxicity substance. The stomach should only be emptied under medical supervision, and after the installation of an airway to protect the lungs.

Please ensure that this MSDS is given to, and explained to people using this product.

5. FIRE FIGHTING & FLAMMABILITY

Flash Point	12°C / 53°F (closed cup)
Autoignition Temperature	399°C / 750°F
Flammable Limits	2.0% – 12%
Combustion Products	carbon monoxide, nitrogen oxides, smoke, part oxidised hydrocarbon fragments
Firefighting Precautions	foam, dry chemical, water fog or spray to cool & dilute; firefighters must wear SCBA
Static Discharge	cannot accumulate a static charge

6. ACCIDENTAL RELEASE MEASURES

Serious Fire Potential: blanket spill with foam as a precaution against accidental ignition. Take extreme care to avoid sparks – do not operate (turn on OR off) electrical appliances near spill, unless explosion proof.

Leak Precaution	dyke to control spillage and prevent environmental contamination
Handling Spill	ventilate contaminated area; recover free liquid with suitable pumps; absorb residue on an inert sorbent, sweep & pick up using plastic or aluminium shovel, & store in closed containers for recycling or disposal

7. HANDLING & STORAGE

Store and use in a cool dry environment, away from sources of ignition, heat and oxidising agents. **Take great care to avoid sparks – use non-sparking bronze or aluminum hand tools. All electrical and mechanical equipment (lighting, switchgear, forklift trucks, etc) used with or around this product must be explosion-proof.**

Although this product does not accumulate a static charge on agitation or transfer, in view of the low flash point it is prudent to ground containers, mixers, and transfer equipment before handling to prevent static discharge. On transfer, ensure that the delivery nozzle is below the surface in the receiving container to prevent splash.

Empty containers may contain a flammable/explosive vapour. Never cut, drill, weld or grind on or near this container, whether empty or full. Always replace drum, pail or IBC cap prior to moving the container!

Avoid breathing product vapour. Use with adequate ventilation to maintain airborne concentration of the product below the TLV (see IX above). If dealing with a spill, and ventilation is impractical, wear a respirator with organic vapour cartridge. *If the spill is extensive, use an air-supplied respirator.* Avoid prolonged contact with skin and wash work clothes frequently. An eye bath and safety shower should be available near the workplace.

8. EXPOSURE CONTROL & PERSONAL PROTECTION

Ontario TWAEV	200ppm / 490mg/m ³ ;	Ontario STEV	400ppm / 980mg/m ³
ACGIH TLV	200ppm / 491mg/m ³	ACGIH STEL	400ppm / 983mg/m ³
OSHA PEL	400ppm / 980mg/m ³	OSHA STEL	500ppm / 1225mg/m ³
Ventilation	mechanical ventilation may be required to maintain airborne vapour or mist concentrations below TLV; a respirator with organic vapour cartridge should be available for escape purposes, should ventilation fail (<i>always store respirator in an airtight container [eg: "Tupperware"] to maintain cartridge "freshness"</i>)		
Hands	butyl, neoprene or nitrile gloves – <i>always confirm suitability with supplier</i>		
Eyes	safety glasses with side shields – <i>always protect eyes</i>		
Clothing	no special protective clothing required		

9. PHYSICAL PROPERTIES

Odour & Appearance	clear, colourless, mobile liquid with strong odour of rubbing alcohol
Odour Threshold	~40ppm – <i>varies widely</i>
Vapour Pressure	33mmHg / 4.4kPa (20°C/ 68°F)
Vapour Density (air = 1)	2.1
Evaporation Rate (<i>Butyl Acetate=1</i>)	1.5
Boiling Point	82°C / 180°F
Freezing Point	-88.5°C / -127°F

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9. PHYSICAL PROPERTIES, cont'd

Specific Gravity	0.786 (20/20°C)
Water Solubility	complete
- in other solvents	most organic solvents
Log P _{O/W} (Octanol/H ₂ O partition)	0.05 (<i>measured</i>)
Viscosity	2.4centipoise (20°C / 68°F)
pH	none – <i>does not yield hydrogen ions in solution</i>
Molecular Weight	60 grams/mole
Conversion Factor	1ppm = 4.9mg/m ³

10. REACTIVITY

Dangerously Reactive With	strong oxidising agents; strong acids; acid anhydrides; alkali metals or alkaline earth metals
Also Reactive With	ethylene oxide, phosgene, crotonaldehyde or isocyanates
Chemical Stability	stable; will not polymerize
Decomposes in Presence of	together oxygen (air) & light slowly convert isopropanol into potentially explosive peroxides
Decomposition Products	none apart from Hazardous Combustion Products
Mechanical Impact	not sensitive

11. TOXICITY**Effects, Acute Exposure**

Skin Contact	slightly irritating
Skin Absorption	slight; toxic effects unlikely by this route
Eye Contact	liquid irritating; vapour irritating above 400ppm; 800ppm considered highly unpleasant
Inhalation	400ppm mildly irritating; 800ppm very unpleasant; headache, dizziness, drowsiness, intoxication and lack of co-ordination
Ingestion	headache, dizziness, drowsiness, intoxication and lack of co-ordination

Effects, Chronic Exposure

General	prolonged or repeated exposure may cause dermatitis through removal of protective skin oils
Sensitising	not a sensitiser
Carcinogen/Tumorigen	not known to be a tumorigen or a carcinogen in humans or animals
Reproductive Effect	no known effect on humans; fetotoxic in animals <i>at doses also causing maternal toxicity and not relevant to industrial exposure</i>
Mutagen	not known to be a mutagen or teratogen in humans or animals
Synergistic With	not known
LD ₅₀ (oral)	4400-5500mg/kg (rat), 4475mg/kg (mouse), 4710mg/kg (cat), 5030 & 7990mg/kg (rabbit), 4830mg/kg (dog)
LD ₅₀ (skin)	12,900mg/kg (rabbit)
LC ₅₀ (inhalation)	10,800ppm (mouse), 5920, 10,420, 14,800, 16,000 & 17,000ppm (rat)

12. ECOLOGICAL INFORMATION

Bioaccumulation	low potential for bioaccumulation
Biodegradation	biodegrades readily & rapidly: aerobic – >75% in 28days; anaerobic – >65% in 20days
Abiotic Degradation	reacts with atmospheric hydroxyl (OH) radicals; estimated ½-life in air 3.2 days
Mobility in soil, water	water soluble; moves readily through soil and the water column
Marine Toxicity	
LC ₅₀ (Fish, 96)	9640, 10,400 & 11,130mg/litre (Pimephelas promelas), 4200mg/litre (Rasbora heteromorpha)
LC ₅₀ (Crustacea, 48)	1100 & 1400mg/l (Crangon crangon), 13,300mg/litre (Daphnia magna)
EC ₅₀ (Algae, 96hr)	1000mg/l (Scenedesmus subspicatus)
LC ₅₀ (Microorganisms)	1050 & 5175mg/l (Pseudomonas putida), 41,676mg/litre (“activated sludge, domestic sewage”) 39,540 & 112,000mg/litre (“activated sludge, industrial sewage”), 35,000 & 42,000mg/litre (Photobacterium phosphoreum) & others

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13. DISPOSAL

Waste Disposal Containers **do not flush to sewer**, recycle solvent if possible, may be incinerated in approved facility
Drums should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use.
Pails must be vented and thoroughly dried prior to crushing and recycling.
IBCs (intermediate bulk containers): polyethylene bottle must be pressure tested & recertified at 30 months. Replace at 60 months (5yrs). Steel containers must be inspected, pressure tested & recertified every 5 years.
Never cut, drill, weld or grind on or near this container, even if empty

14. TRANSPORT CLASSIFICATION

Canada TDG	PIN	UN - 1219
AND	Shipping Name	isopropyl alcohol <i>OR</i> isopropanol
U.S.A. 49 CFR	Class & Packing Group	3 II
Marine Pollutant		not a marine pollutant
ERAP Required		NO

15. REGULATIONS

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 Canada DSL **on inventory**
 U.S.A. TSCA **on inventory**
 Europe EINECS **on inventory**

U.S.A. Regulations:

Immediately Dangerous to Life or Health: 2000 ppm (Based on 10% of the lower explosive limit for safety considerations even though the relevant toxicological data indicated that irreversible health effects or impairment of escape existed only at higher concentrations.)

Allowable Tolerances: Unless specifically excluded, residues resulting from the use of the following substances as either an inert or an active ingredient in a pesticide chemical formulation, including antimicrobial pesticide chemicals, are exempted from the requirement of a tolerance under FFDCFA section 408, if such use is in accordance with good agricultural or manufacturing practices. 2-Propanol is included on this list.

OSHA Standards: Permissible Exposure Limit: Table Z-1 8-hr Time Weighted Avg: 400ppm (980mg/m³). Vacated 1989 OSHA PEL TWA 400ppm (980mg/m³); STEL 500ppm (1225mg/m³) is still enforced in some states.

NIOSH Recommendations: Recommended Exposure Limit: 10 Hour Time-Weighted Average: 400ppm (980mg/m³). Recommended Exposure Limit: 15 Minute Short-Term Exposure Limit: 500ppm (1225mg/m³).

Threshold Limit Values: 8 hr Time Weighted Avg (TWA): 200 ppm; 15 min Short Term Exposure Limit (STEL): 400 ppm A4; Not classifiable as a human carcinogen. Biological Exposure Index (BEI): Determinant: acetone in urine; Sampling Time: end of shift at end of workweek; BEI: 40 mg/L. The determinant may be present in biological specimens collected from subjects who have not been occupationally exposed, at a concentration which could affect interpretation of the result. Such background concentrations are incorporated in the BEI value. The determinant is nonspecific, since it is also observed after exposure to other chemicals.

Atmospheric Standards: This action promulgates standards of performance for equipment leaks of Volatile Organic Compounds (VOC) in the Synthetic Organic Chemical Manufacturing Industry (SOCMI). The intended effect of these standards is to require all newly constructed, modified, and reconstructed SOCMCI process units to use the best demonstrated system of continuous emission reduction for equipment leaks of VOC, considering costs, non air quality health and environmental impact and energy requirements. Isopropanol is produced, as an intermediate or a final product, by process units covered under this subpart.

State Drinking Water Guidelines: Connecticut 2300 ug/l

TSCA Requirements: Pursuant to section 8(d) of TSCA, EPA promulgated a model Health and Safety Data Reporting Rule. The section 8(d) model rule requires manufacturers, importers, and processors of listed chemical substances and mixtures to submit to EPA copies and lists of unpublished health and safety studies. 2-Propanol is included on this list. Effective date: 12/15/86; Sunset date: 12/15/96.

FIFRA Requirements: Unless specifically excluded, residues resulting from the use of the following substances as either an inert or an active ingredient in a pesticide chemical formulation, including antimicrobial pesticide chemicals, are exempted from the requirement of a tolerance under FFDCFA section 408, if such use is in accordance with good agricultural or manufacturing practices. 2-Propanol is included on this list. Based on the reviews of the generic data for the active ingredients ethanol and isopropanol, the Agency has sufficient information on the health effects and on their potential for causing adverse effects in fish and wildlife and the environment. The Agency has determined that ethanol and isopropanol products, labeled and used as specified in this Reregistration Eligibility Decision, will not pose unreasonable risks or adverse effects to humans or the environment. Therefore, the Agency concludes that products containing ethanol and isopropanol for all uses are eligible for reregistration. As the federal pesticide law FIFRA directs, EPA is conducting a comprehensive review of older pesticides to consider their health and environmental effects and make decisions about their continued use. Under this pesticide reregistration program, EPA examines newer health and safety data for pesticide active ingredients initially registered before November 1, 1984, and determines whether the use of the pesticide does not pose unreasonable risk in accordance to newer safety standards, such as those described in the Food Quality Protection Act of 1996. Pesticides for which EPA had not issued Registration Standards prior to the effective date of FIFRA '88 were divided into three lists based upon their potential for human exposure and other factors, with List B containing pesticides of greater concern than those on List C, and with List C containing pesticides of greater concern than those on List D. Isopropanol is found on List D. Case No: 4003; Pesticide type: insecticide, fungicide, herbicide, antimicrobial; Case Status: RED Approved 3/95; OPP has made a decision that some uses of the pesticide are eligible for reregistration, as reflected in a Reregistration Eligibility Decision (RED) document.; Active ingredient (AI): isopropanol; AI Status: OPP has completed a Reregistration Eligibility Decision (RED) for the case/AI.

FDA Requirements: Isopropyl alcohol (without residue) may be used in inks for marking food supplements in tablet form, gum, and confectionery. Diluents in color additive mixtures for drug use exempt from certification. Ingested drugs (general use) - Substance: isopropyl alcohol; Restrictions: In color coatings for pharmaceutical forms, no residue. Isopropanol is a food additive permitted for direct addition to food for human consumption as a synthetic flavoring substance and adjuvant in accordance with the following conditions: a) they are used in the minimum quantity required to produce their intended effect, and otherwise in accordance with all the principles of good manufacturing practice, and b) they consist of one or more of the following, used alone or in combination with flavoring substances and adjuvants generally recognized as safe in food, prior-sanctioned for such use, or regulated by an appropriate section in this part. Isopropyl alcohol may be present in the following foods under the conditions specified: (a) In spice oleoresins as a residue from the extraction of spice, at a level not to exceed 50 parts per million. (b) In lemon oil as a residue in production of the oil, at a level not to exceed 6 parts per million. (c) In hops extract as a residue from the extraction of hops at a level not to exceed 2.0 percent by weight; Provided, that, (1) The hops extract is added to the wort before or during cooking in the manufacture of beer. (2) The label of the hops extract specifies the presence of the isopropyl alcohol & provides for the use of the hops extract only as prescribed by paragraph (c)(1) of this section. Isopropanol is an indirect food additive for use only as a component of adhesives.

16. OTHER INFORMATION

Prepared for Megaloid Laboratories by Peter Bursztyn, (705) 734-1577

Data from RTECS, HSDB (Haz. Substance Data Base), Cheminfo (CCOHS), IUCLID Datasheets (ESIS – European Chem. Substance Info. System), & others.

Preparation Date: July 2006 Revision Date: July 2009, June 2012, November 2013

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