FUTURE HARVEST NUTRIENTS

Future Harvest Development Ltd.
725 Evans Court, Kelowna, B.C. V1X 6G4, Canada
1.866.491.0255 | www.futureharvest.com

Safety Data Sheet
Isopropanol 99%

1. Identification

1.1. Product identifier
Product Identity Isopropanol 99%
Alternate Names 2-Propanol, Isopropyl Alcohol

1.2. Relevant identified uses of the substance or mixture and uses advised against
Intended use Solvent
Application Method See Technical Data Sheet.

1.3. Details of the supplier of the safety data sheet
Company Name Future Harvest
725 Evans Crt
Kelowna BC Canada
V1X 6G4

Emergency
Customer Service: 250-491-0255

2. Hazard(s) identification

2.1. Classification of the substance or mixture
Flammable Liquids: Category 2
Acute Toxicity – Oral: Category 4
Serious eye damage / eye irritation: Category 2A
Specific target organ toxicity (single exposure): Category 3

2.2. Label elements

Danger

Hazard Statements:
Highly flammable liquid and vapor
Harmful if swallowed
Causes serious eye irritation
May cause drowsiness or dizziness

Precautionary Statements

Prevention:
Keep away from heat, hot surfaces, sparks, open flames or other ignition source. No smoking
Keep container tightly closed
Ground and bond container and receiving equipment
Use explosion-proof electrical, ventilating, lighting, equipment
Use only non-sparking tools
Wash thoroughly after handling.
Do not eat drink or smoke when using this product
Use only outdoors or in well-ventilated area.
Avoid release to the environment.
Wear protective gloves/eye protection/face protection.

Response
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing.
Specific treatment (see information on this label).
IF SWALLOWED: Rinse mouth. Do not induce vomiting. Call a POISON CENTER or doctor/physician if you feel unwell.
Take off contaminated clothing and wash before reuse.
In case of fire: Use dry sand, dry chemical, or alcohol-resistant foam.

Storage
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.

Disposal
Dispose of contents/container to an approved waste disposal plant.

3. Composition/information on ingredients

Isopropanol
CAS number: 67-63-0
Weight Percent: 95-99%
Synonyms: 2-Propanol, Isopropyl Alcohol

4. First aid measures

4.1. Description of first aid measures

General In all cases of doubt, or when symptoms persist, seek medical attention.
Never give anything by mouth to an unconscious person.
Inhalation If inhaled, remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention
Eyes In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.

Skin In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shows. Wash clothing before reuse. Thoroughly clean shoes before reuse.
Ingestion If swallowed, DO NOT induce vomiting unless directed to do so by medical personnel. Get medical attention immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person. Rinse mouth

Self-Protection for the first aider
Remove all sources of ignition. Ensure that medical personnel are aware of the materials involved, take precautions to protect themselves and prevent the spread of contamination. Use personal protective equipment as required. See section 8 for more information. Avoid contact with skin, eyes, or clothing.

Most important symptoms and effects, both acute and delayed:
Causes serious eye irritation Low toxicity. May cause corneal injury. May cause lachrymation (excessive tears). May cause pain disproportionate to the level of irritation to eye tissue. Aspiration into the lungs during ingestion or vomiting may lead to chemical pneumonitis. May cause central nervous system effects, such as headache, nausea, vomiting, abdominal pain, dizziness, confusion and breathing difficulties. Small amounts swallowed incidental to normal handling operations are not likely to cause injury. Prolonged skin contact is unlikely to result in absorption of harmful amounts. Swallowing larger amounts may cause injury. Vapor may cause eye irritation experienced as mild discomfort and redness. May cause drying and flaking of the skin. Prolonged exposure not likely to cause significant skin irritation. Signs and symptoms of excessive exposure may include: Facial flushing. Low blood pressure. Irregular heartbeats. With good ventilation, single exposure is not likely to be hazardous. In poorly ventilated areas, vapors or mists may accumulate and cause respiratory irritation. Prolonged excessive exposure may cause adverse effects. Excessive exposure (400 ppm) to isopropanol may cause eye, nose and throat irritation. Incoordination, confusion, hypotension, hypothermia, circulatory collapse, respiratory arrest and death may follow a longer duration or higher levels. Observations in animals include middle ear lining damage upon exposure to vapors of isopropanol. However the relevance of this to humans is unknown.

Indication of any immediate medical attention and special treatment needed:
Note to physicians
Treatment based on sound judgment of physician and individual reactions of patient. Hemodialysis may be of benefit if substantial amounts have been ingested and the patient is showing signs of intoxication. Consider hemodialysis for patients with persistent hypotension or coma unresponsive to standard therapy (isopropanol levels >400 - 500 mg/dl). (Goldfrank 1998, King et al, 1970). Because rapid absorption may occur through lungs if aspirated and cause systemic effects, the decision of whether to induce vomiting or not should be made by a physician. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach.

5. Fire-fighting measures

5.1. Extinguishing media
Water fog or fine spray, carbon dioxide, dry chemical, foam. Alcohol resistant foams (ATC type) are preferred if available. General purpose synthetic foams (including AFFF) or protein foams may function, but much less effectively. Do not use direct water stream, which will spread fire.
CAUTION: Use of water spray when fighting fire may be inefficient.

5.2. Special hazards arising from the substance or mixture
Use water spray to cool fire-exposed containers and structures. Vapors are heavier than air and may accumulate in low areas. Vapors may travel along the ground to be ignited at distant locations. Isolate and restrict area access. Move containers from fire area if you can do it without risk. Stop leak only if safe

to do so. Container may rupture from gas generation in a fire situation. Fight fire from a safe distance and from a protected location. Flammable concentrations of vapor can accumulate at temperatures above flash point. Use proper bonding and grounding during product transfer. NEVER use a water jet directly on the fire because it may spread the fire to a larger area. Flammable mixtures may exist within the vapor space of containers at room temperature. Keep out of low areas where gases (fumes) can accumulate. Flammable mixtures of this product are readily ignited even by static discharge. Use water spray to disperse vapors; re-ignition is possible. When product is stored in closed containers, a flammable atmosphere can develop. Use caution and test if material is burning before entering area. Material burns with invisible flame

5.3. Advice for fire-fighters

Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Evacuate personnel to safe areas. Use personal protective equipment as required. See section 8 for more information. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Pay attention to flashback. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material.

6.2. Environmental precautions

Do not allow spills to enter drains or waterways.
Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet. Promptly remove soiled clothing and wash thoroughly before reuse.

6.3. Methods and material for containment and cleaning up

Stop leak if you can do it without risk. Do not touch or walk through spilled material. A vapor suppressing foam may be used to reduce vapors. Dike far ahead of spill to collect runoff water. Keep out of drains, sewers, ditches and waterways. Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Take precautionary measures against static discharges. Dam up. Soak up with inert absorbent material. Pick up and transfer to properly labeled containers.

7. Handling and storage

7.1. Precautions for safe handling

Do not taste or swallow.
Don not get in eyes, on skin or on clothing.
Avoid breathing vapor or mist.
Keep from contact with clothing and other combustible materials.
Keep away from heat sparks and flames.
Use only with adequate ventilation.
Wash thoroughly after handling.
Wear fire/flame resistant/retardant clothing.
Prevent product contamination.
Keep only in the original container. Store in tightly closed container
DO NOT CUT, DRILL, GRIND, OR WELD ON OR NEAR THIS CONTAINER.
Emptied container retains vapor and product residue.
Observe all labeled safeguards until container is cleaned, reconditioned or destroyed.

Avoid contamination.
See section 2 for further details. - [Prevention]:

7.2. Conditions for safe storage, including any incompatibilities
Store in a cool, dry, well ventilated area, away from heat and ignition sources. Place away from incompatible materials. Keep away from direct sunlight. Peroxides can form if this product is stored in contact with air. Peroxides can be explosive. Shelf life: 20 months in original, sealed container. Incompatible materials: acids, alkalis, oxidizing agents

7.3. Specific end use(s)
No data available.

8. Exposure controls and personal protection

8.1. Control parameters

Exposure Limits .

Chemical Name	Alberta OEL	British Columbia OEL	Ontario	Quebec OEL	Exposure Limit - ACGIH	Immediately Dangerous to Life or Health - IDLH
Isopropyl Alcohol 67-63-0	TWA: 200 ppm TWA: 492 mg/m³ STEL: 400 ppm STEL: 984 mg/m³	TWA: 200 ppm STEL: 400 ppm	TWA: 200 ppm STEL: 400 ppm	TWA: 400 ppm TWA: 985 mg/m³ STEL: 500 ppm STEL: 1230 mg/m³	400 ppm STEL 200 ppm TLV-TWA	2000 ppm

Consult local authorities for recommended exposure limits

8.2. Exposure controls

Appropriate engineering controls
Engineering controls
Electrical and mechanical equipment should be explosion proof. Local ventilation recommended where mechanical ventilation is ineffective in controlling airborne concentrations below the recommended occupational exposure limit. Make up air should always be supplied to balance air exhausted (either generally or locally). For personnel entry into confined spaces (i.e. bulk storage tanks) a proper confined space entry procedure must be followed including ventilation and testing of tank atmosphere. Concentrations in air should be maintained below lower explosive limit at all times or below the recommended threshold limit value if unprotected personnel are involved. Mechanical ventilation is recommended for all indoor situations to control fugitive emissions.

Individual protection measures, such as personal protective equipment
Eye/face protection
Tight sealing safety goggles.
Hand protection
Nitrile gloves. Neoprene gloves. Polyvinyl alcohol gloves. Ethyl Vinyl Alcohol Laminate (EVAL). Natural rubber gloves.

Polyvinylchloride (PVC) gloves. Polyethylene gloves. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove

materials as well as the instructions/specifications provided by the glove supplier. Use gloves chemically resistant to this material, examples of preferred glove barrier materials include:. Examples of acceptable glove barrier materials include:.

Skin and body protection

Antistatic boots. Chemical resistant apron. Long sleeved clothing. Wear suitable protective clothing.

Respiratory protection

Use a NIOSH-approved chemical cartridge respirator with organic vapor cartridges or use a NIOSH-approved supplied-air respirator. For high airborne concentrations, use a NIOSH -approved supplied-air respirator, either self-contained or airline breathing apparatus, operated in positive pressure mode. NIOSH approved supplied air respirator when airborne concentrations exceed exposure limits.

General hygiene considerations

Do not eat, drink or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product. Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection.

9. Physical and chemical properties

Appearance Colorless liquid
Odor Alcohol
Odor threshold Not Measured
pH Not available
Melting point / freezing point -89 C
Initial boiling point and boiling range 82 C
Flash Point 12 C
Evaporation rate (Ether = 1) 1.5
Flammability (solid, gas) No data
Upper/lower flammability or explosive limits
Lower Explosive Limit: 12
Upper Explosive Limit: 2
Vapor pressure (Pa) 33 mmHg
Vapor Density 2.1
Specific Gravity 0.78
Solubility in Water Miscible
Partition coefficient n-octanol/water (Log Kow) No data
Auto-ignition temperature 425 C
Decomposition temperature No data
Viscosity (cSt) 2.4 mPa

9.2. Other information

No other relevant information.

10. Stability and reactivity

10.1. Reactivity and Chemical stability

Stable

10.2. Possibility of hazardous reactions

No additional.

10.4. Conditions to avoid

Product can decompose at elevated temperatures. Avoid contact with heat, sparks, open flame, and static discharge.

10.5. Incompatible materials
Strong oxidizers. Strong acids. Aldehydes. Halogens. Halogenated organics.

10.6. Hazardous decomposition products
Hazardous decomposition products depend upon temperature, air supply, and the presence of other materials.

11. Toxicological information
Information on likely routes of exposure

Inhalation
With good ventilation, single exposure is not likely to be hazardous. In poorly ventilated areas, vapors or mists may accumulate and cause respiratory irritation. Prolonged excessive exposure may cause adverse effects. Excessive exposure (400 ppm) to isopropanol may cause eye, nose and throat irritation. Incoordination, confusion, hypotension, hypothermia, circulatory collapse, respiratory arrest and death may follow a longer duration or higher levels. Observations in animals include middle ear lining damage upon exposure to vapors of isopropanol. However, the relevance of this to humans is unknown.

Eye contact
Causes serious eye irritation. May cause corneal injury. May cause lachrymation (excessive tears). May cause pain disproportionate to the level of irritation to eye tissue. Vapor may cause eye irritation experienced as mild discomfort and redness.

Skin contact
Prolonged skin contact is unlikely to result in absorption of harmful amounts. May cause drying and flaking of the skin. Prolonged exposure not likely to cause significant skin irritation.

Ingestion
Harmful if swallowed. Low toxicity. May cause central nervous system effects, such as headache, nausea, vomiting, abdominal pain, dizziness, confusion and breathing difficulties. Small amounts swallowed incidental to normal handling operations are not likely to cause injury. Swallowing larger amounts may cause injury. Signs and symptoms of excessive exposure may include: Facial flushing. Low blood pressure. Irregular heartbeats.

Information on toxicological effects
Symptoms
Isopropanol is a moderate to severe eye irritant and a mild skin irritant. Repeated or prolonged skin contact can cause drying and cracking of the skin (dermatitis). There are no reports of harmful effects developing following short-term exposure to Isopropanol. Exposure produced mild - moderate irritation of the nose and throat. It can probably cause central nervous system (CNS) depression, based on animal information and comparison to related alcohols.
Symptoms may include headache, nausea, dizziness, vomiting and incoordination. High exposures may result in unconsciousness and death. Ingestion of large amounts can result in symptoms of CNS depression. Isopropanol can probably be inhaled into the lungs (aspirated) during ingestion or vomiting. Aspiration can result in severe, life-threatening lung damage. In rats and mice long-term exposure by inhalation or ingestion has produced decreased body weight, a reversible increase in motor activity, increased liver weight, and signs of central nervous system (CNS) depression. Decreased testes weight has been observed in mice, while increased testes weight has been observed in rats exposed to high concentrations. Kidney injury has been observed in rats (especially males) and mice exposed to high concentrations. These effects are believed to be species specific and unlikely to occur in humans.

Observations in animals include: Lethargy. Isopropanol toxicity is synergistic with chloroform and carbon tetrachloride resulting in hepatotoxicity.

Numerical measures of toxicity

Acute toxicity

The following values are calculated based on chapter 3.1 of the GHS document .

ATEmix (oral) 1,870.00 mg/kg
ATEmix (dermal) 4,059.00 mg/kg

Unknown acute toxicity No information available

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Isopropyl Alcohol 67-63-0	= 1870 mg/kg (Rat)	= 4059 mg/kg (Rabbit)	= 72600 mg/m³ (Rat) 4 h

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation

Prolonged skin contact is unlikely to result in absorption of harmful amounts. May cause drying and flaking of the skin.

Prolonged exposure not likely to cause significant skin irritation.

Serious eye damage/eye irritation

Causes serious eye irritation. May cause corneal injury. May cause lachrymation (excessive tears). May cause pain disproportionate to the level of irritation to eye tissue. Vapor may cause eye irritation experienced as mild discomfort and redness.

Respiratory or skin sensitization

No information available.

Germ cell mutagenicity

No information available.

Carcinogenicity

Classification based on data available for ingredients.

The table below indicates whether each agency has listed any ingredient as a carcinogen.

Chemical Name	ACGIH	IARC	NTP	OSHA
Isopropyl Alcohol 67-63-0	Not available	Group 1 Group 3	Not available	X

Legend

IARC (International Agency for Research on Cancer)
Group 1 - Carcinogenic to Humans
Group 3 - Not Classifiable as to Carcinogenicity in Humans
OSHA (Occupational Safety and Health Administration of the US Department of Labor)
X - Present

Reproductive toxicity

There is no human information available for Isopropanol. However, Isopropanol is considered teratogenic/embryotoxic based on animal information. One inhalation rat study has shown that 2-propanol is fetotoxic (caused reduced fetal weight gain) in the absence of maternal toxicity. Other studies have shown no effects or effects in the presence of maternal toxicity. Positive and negative mutagenic results have been obtained in mammalian cells in vitro and negative results in bacteria.

Specific target organ systemic toxicity - single exposure

May cause drowsiness or dizziness.

Specific target organ systemic toxicity - repeated exposure

No information available.

Aspiration hazard

No information available.

12. Ecological information

Ecotoxicity

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Chemical Name	Ecotoxicity - Freshwater Algae Data	Ecotoxicity - Fish Species Data	Toxicity to microorganisms	Crustacea
Isopropyl Alcohol 67-63-0	1000 mg/L EC50 Desmodesmus subspicatus 72 h 1000 mg/L EC50 Desmodesmus subspicatus 96 h	11130 mg/L LC50 (Pimephales promelas) 96 h static 9640 mg/L LC50 (Pimephales promelas) 96 h flow-through 1400000 µg/L LC50 (Lepomis macrochirus) 96 h	Not available	EC50: =13299mg/L (48h, Daphnia magna)

Persistence and degradability No information available.

Bioaccumulation No information available.

Component Information

Chemical Name	Partition coefficient
Isopropyl Alcohol 67-63-0	0.05

Other adverse effects No information available.

13. Disposal considerations

Waste treatment methods

Disposal of all wastes must be done in accordance with municipal, provincial and federal regulations. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Recover or recycle if possible. Empty containers should be recycled or disposed of through an approved waste management facility. Drain container thoroughly. After draining, vent in a safe place away from sparks and fire. Residues may cause an explosion hazard. Do not puncture, cut or weld uncleaned drums.

14. Transport information

TDG (Canada):

UN Number	UN1219
Shipping name	ISOPROPANOL
Class	3
Packing Group	II
Marine pollutant	No.

DOT (U.S.)

UN Number	UN1219
Shipping name	ISOPROPANOL
Class	3
Packing Group	II
Marine pollutant	Not available

15. Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture

U.S. Regulatory Rules

Chemical Name	CERCLA/SARA - Section 302:	SARA (311, 312) Hazard Class:	CERCLA/SARA - Section 313:
Isopropyl Alcohol - 67-63-0	Not Listed	Not Listed	Listed

International Inventories

TSCA	Complies
DSL/NDSL	Complies

Legend:
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

NFPA:	**Health hazards** 2	**Flammability** 3	**Instability** 0	**Physical and chemical properties** -
HMIS Health Rating:	**Health hazards** 2 *	**Flammability** 3	**Physical hazards** 0	**Personal protection** X

16. Other information

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects which may be caused by exposure to our products. Customers/users of this product must comply with all applicable health and safety laws, regulations, and orders.

This is the first version in the GHS SDS format. Listings of changes from previous versions in other formats are not applicable.

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