MSDS	MATERIAL SAFETY DATA SHEET
American Recorder Technologies, Inc. 1872 Angus Avenue Simi Valley, CA 93063 Voice: 805-527-9580 M-F, PST Fax: 805-527-1433 Email: info@americanrecorder.com MODEL NUMBER & CAPACITY: DSCK-TO-317 (0.5 ounces) DSCK-TO-320 (0.5 ounces) DSCK-TO-324 (0.5 ounces) OCF-TO-0.5 (0.5 ounces)	Emergency Contact Information: PERS-ER DOMESTIC SHIPMENTS: 800 633-8253 INTERNATIONAL: (1) 801 629-0667 Ethyl Alcohol (Liquid) UN# 1987 Ethyl Alcohol, Alcohol

Section 1. Product Information

Product Name: Ethyl Alcohol
Product Description: Alcohol, denatured with isopropanol and methanol

Section 2. Composition and Information on Ingredients

Name	CAS#	Concentration*
Ethyl alcohol 200 Proof	64-17-5	90%
Isopropyl alcohol	67-63-0	5%
Methyl alcohol	67-56-1	5%

*All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.

Toxicological Data on Ingredients	**Ethyl alcohol 200 Proof:** ORAL (LD50): Acute: 7060 mg/kg [Rat]. 3450 mg/kg [Mouse] VAPOR (LC50): Acute: 20000 ppm 8 hours [Rat]. 39000 mg/m^3 4 hours [Mouse]
	Isopropyl alcohol: ORAL (LD50): Acute: 5045 mg/kg [Rat]. 3600 mg/kg [Mouse]. 6410 mg/kg [Rabbit] DERMAL (LD50): Acute: 12800 mg/kg [Rabbit]
	Methyl alcohol: ORAL (LD50): Acute: 5628 mg/kg [Rat] DERMAL (LD50): Acute 15800 mg/kg [Rabbit]

Section 3. Hazards Identification

Potential Acute Health Effects	Hazardous in case of skin contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).
Potential Chronic Health Effects	Slightly hazardous in case of skin contact (sensitizer). **Carcinogenic Effects:** Classified A4 (not classifiable for human or animal) **Mutagenic Effects:** Mutagenic for bacteria and/or yeast **Teratogenic Effects:** Classified PROVEN for human [Ethyl

	alcohol 200 proof]. Classified POSSIBLE for human [Methyl alcohol] **Developmental Toxicity:** Classified development toxin [PROVEN]. Classified reproductive system/toxin/female, reproductive/toxin/male [POSSIBLE]. The substance is toxic to blood, liver, eyes, central nervous system (CNS). The substance may be toxic to kidneys, the reproductive system, heart, brain, peripheral nervous system, upper respiratory tract, skin , optic nerve. Repeated or prolonged exposure to the substance can produce target organs damage.		
NFPA Hazard ID	Heath 2	Flammability 3	Reactivity 0
HMIS Hazard ID	Heath 2	Flammability 3	Reactivity 0

Section 4. First Aid Measures

Inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear. Serious Inhalation: Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.
Skin Contact	In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention. Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.
Eye Contact	Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Get medical attention.
Ingestion	Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

FOR SERIOUS INGESTION NOTES TO PHYSICIAN:

1. Support vital functions, correct for dehydration and shock, and manage fluid balance.
2. This product contains Methanol. The currently recommended medical management of Methanol poisoning includes the following methods:

a. Emptying the stomach by gastric lavage. It is useful if initiated within < 1 hour of ingestion.

b. Correct metabolic acidosis with intravenous administration of sodium bicarbonate, adjusting the administration rate according to repeated and frequent measurement of acid/base status.

c. Administer Fomepizole (4-methylpyrazole or Antizol) therapy by IV as an antidote to inhibit the formation of toxic metabolites. Adjunct therapy with Leucorvin followed by Folate can also be initialized.
d. If patients are diagnosed and treated early in the course with the above methods, hemodialysis may be avoided if fomepizole or ethanol therapy is effective and has corrected the metabolic acidosis, and no renal failure is present. However, once severe acidosis and renal failure occurred, however, hemodialysis is necessary. Hemodialysis is effective in removing Methyl alcohol and toxic metabolites, and correcting metabolic acidosis.

Section 5. Fire Fighting Measures

Flammable

Flammability Properties	Flash Point [Method]: 16°C (60.8°F) Flammable Limits (Approx volume % in air): Lower: 3.3% Upper: 19% Autoignition Temperature: 399°C (750.2°F) Products of Combustion: Carbon oxides (CO, CO_2)
Appropriate Extinguishing Media	Flammable liquid, soluble or dispersed in water SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog
Fire Hazards in Presence of Various Substances	Highly flammable in presence of open flames and sparks, of heat. Slightly flammable to flammable in presence of oxidizing materials. Non-flammable in presence of shocks.
Explosion Hazards in Presence of Various Substances	Slightly explosive in presence of open flames and sparks, of heat, of oxidizing materials, of acids
Special Remarks on Fire Hazards	Containers should be grounded. CAUTION: MAY BURN WITH NEAR INVISIBLE FLAME. Vapor may travel considerable distance to source of ignition and flash back. May form explosive mixtures with air. Contact with Bromine pentafluoride is likely to cause fire or explosion. Ethanol ignites on contact with chromyl chloride and iodine heptafluoride gas. It ignites than explodes upon contact with nitrosyl perchlorate. Addition to platinum black catalyst caused ignition.
Special Remarks on Explosion Hazards	Ethanol has an explosive reaction with the oxidized coating around potassium metal. Ethanol ignites and then explodes on contact with acetic anhydride + sodium hydrosulfate (ignites and may explode), disulfuric acid + nitric acid, phosphorous (III) oxide platinum, potassium-tert-butoxide + acids. Ethanol forms explosive products in reaction with the following compound: ammonia + silver nitrate (forms silver nitride and silver fulminate), iodine + phosphorus (forms ethane iodide), magnesium perchlorate (forms ethyl

	perchlorate) mercuric nitrate, nitric acid + silver (forms silver fulminate) silver nitrate (forms ethyl nitrate) silver (I) oxide + ammonia or hydrazine (forms silver nitride and silver fulminate), sodium evolves hydrogen gas). Sodium Hydrazide + alcohol can produce an explosion. Alcohols should not be mixed with mercuric nitrate, as explosive mercuric fulminate may be formed. May form explosive mixture with manganese perchlorate + 2,2-dimethoxypropane. Addition of alcohols to highly concentrate hydrogen peroxide forms powerful explosives. Explodes on contact with calcium hypochlorite. Vapor may explode if ignited in an enclosed area. Containers may explode when heated or involved in a fire. Vapor may form explosive mixtures with air.

Section 6. Accidental Release Measures

Small Spill	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill	Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas, dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7. Handling and Storage

Precautions	Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids, alkalis, moisture.
Storage	Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8. Exposure Controls / Personal Protection

Exposure Limit Values

Ethyl Alcohol	TWA: 1000 (ppm) from ACGIH (TLV) [U.S.] [1999] TWA: 1000(ppm) from OSHA (PEL) [U.S.] TWA: 1900 (mg/m^3) from OSHA (PEL) [U.S.] TWA: 1000 (ppm) from NIOSH TWA: 1000 (ppm) [United Kingdom (UK)] TWA: 1920 (mg/m^3) [United Kingdom (UK)] TWA: 1000 STEL: 1250 (ppm) [Canada]
Isopropyl Alcohol	TWA: 983 STEL: 1230 (mg/m^3) [Australia] TWA: 200 STEL: 400 (ppm) from ACGIH (TLV) [U.S.] [1999] TWA: 980 STEL: 1225 (mg/m^3) from NIOSH TWA: 400 STEL: 500 ppm from NIOSH TWA: 400 STEL: 500(ppm) [United Kingdom (UK)] TWA: 999 STEL: 1259 (mg/m^3) [United Kingdom (UK)] TWA: 400 STEL: 500 (ppm) from OSHA (PEL) [U.S.] TWA: 980 STEL: 125 (mg/m^3) from OSHA (PEL) [U.S.]
Methyl Alcohol	TWA: 200 from OSHA (PEL) [U.S.] TWA: 200 STEL: 250 (ppm) from ACGIH (TLV) [U.S.] [1999] STEL:250 from NIOSH [U.S.] TWA: 200 STEL: 250 (ppm) from NIOSH SKIN TWA: 200 STEL: 250 (ppm) [Canada]

Consult local authorities from acceptable exposure limits.

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the workstation location.
Personal Protection	Safety glasses; gloves; lab coat; vapor respirator.
Personal Protection in Case of Large Spill	Splash goggles, full suit, vapor respirator, boots, gloves, a self contained breathing apparatus should be used to avoid inhalation o f the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Section 9. Physical and Chemical Properties

General Information	Physical State: Liquid Color: colorless, clear Odor: Alcohol like
Properties	Molecular Weight: N/A Boiling Point: 78.4^{o}C (173.1^{o}F) Melting Point: start to solidify at -88.5oC (-127.3^{o}F) based on data for: Isopropyl alcohol. Weighted avg: -112^{o}C (-169.6^{o}F) Critical Temperature: 235oC(455oF) (Isopropyl alcohol) Specific Gravity: 0.81 (Water=1)

	Vapor Density (Air=1): 1.59 at 101 kPa Vapor Pressure: 5.9 kPa at 20^{o}C pH: N/A Odor threshold: 100 ppm (Ethyl alcohol). Weighted avg: 97.15 ppm Water/Oil Dist. Coeff.: Equally soluble in oil and water Solubility in water: Easily soluble in cold water, hot water, n-octanol. Soluble in methanol, diethyl ether, acetone.

Section 10. Stability and Reactivity

Stability	Material is stable under normal conditions
Conditions of Instability	Excess heat, ignition sources, incompatible materials
Incompatibility with Various Substances	Reactive with oxidizing agents, acids, alkalis. Slightly reactive to reactive with metals.
Corrosivity	Non-corrosive in presence of glass
Special Remarks on Reactivity	Ethanol rapidly absorbs moisture from the air. Can react vigorously with oxides. The following oxidants have been demonstrated to undergo vigorous/explosive reaction with ethanol: barium perchlorate, bromine pentafluoride, calcium hypochlorite, chloryl perchlorate, chromium trioxide, chromyl chloride, dioxygen, difluoride, disulfuryl, difluoride, fluorine nitrate, hydrogen peroxide, iodine heptafluoride, nitric acid nitrosyl perchlorate, perchloric acid permanganic acid, peroxodisulfuric acid, potassium dioxide, potassium perchlorate, potassium permanganate, ruthenium(VII) oxide, silver perchlorate, silver peroxide, uranium hexafluoride, uranyl perchlorate. Ethanol reacts violently/explodes with the following compounds: acetyl bromide (evolves hydrogen bromide) acetyl chloride aluminum, sesquibromide ethylate, ammonium hydroxide & silver oxide, chlorate, chromic anhydride, cyanuric acid + water, dichloromethane + sulfuric acid + nitrate (or) nitrite, hydrogen peroxide + sulfuric acid, iodine + methanol + mercuric oxide, manganese perchlorate + 2,2-dimethoxy propane, perchlorates, permanganates + sulfuric acid, potassium superoxide, potassium tert-butoxide, silver & nitric acid, silver perchlorate, sodium hydrazide, sulfuric acid + sodium dichromate, tetrachlorisilane + water. Ethanol is also incompatible with platinium, sodium. No really safe conditions exist under which ethyl alcohol and chlorine oxides can be handled. Reacts vigorously with acetyl chloride.

Section 11. Toxicological Information

Routes of Entry	Absorbed through skin, eye contact, inhalation.
Toxicity to Animals	Acute oral toxicity (LD50): 3450 mg/kg [Mouse] (Ethyl Alcohol 200 Proof) Acute dermal toxicity (LD50): 12800 mg/kg [Rabbit] (Isopropyl alcohol)
Chronic Effects on Humans	**CARCINOGENIC EFFECTS:** Classified A4 (Not classifiable for human or animal) (Ethyl and isopropyl alcohol) **MUTAGENIC EFFECTS:** Mutagenic for bacteria and/or yeast (Ethyl and methyl alcohol) **TERATOGENIC EFFECTS:** Classified PROVEN for human (Ethyl alcohol). Classified POSSIBLE for human (Methyl alcohol) **DEVELOPMENTAL TOXICITY:** Classified development toxin [PROVEN] (Ethyl alcohol). Classified reproductive system/toxin/female, reproductive system/toxin/male [POSSIBLE] (Ethyl alcohol). Contains material which may cause damage to the following organs: kidneys, the reproductive system, heart, brain, peripheral nervous system, upper respiratory tract, skin, optic nerve.
Other Toxic Effects on Humans	Hazardous in case of skin contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).
Special Remarks on Chronic Effects on Humans	May affect genetic material (mutagenic). Causes adverse reproductive effects and birth defects (teratogenic), based on moderate to heavy consumption. May cause cancer based on animal data. Human: passes through the placenta, excreted in maternal milk (Ethyl alcohol 200 Proof).
Special Remarks on other Toxic Effects on Humans	Acute potential health effects: Skin: causes skin irritation Eyes: causes eye irritation Ingestion: may cause gastrointestinal tract irritation with nausea, vomiting, diarrhea, and alteration in gastric secretions. May affect the brain, behavior/central nervous system (central nervous system depression – amnesia, headache, muscular in coordination, excitation, mild euphoria, slurred speech, drowsiness, staggering gait, fatigue, changes in mood/personality, excessive talking, dizziness, ataxia, somnolence, coma/narcosis, hallucinations, distorted perceptions, general anesthetic), peripheral nervous system (spastic paralysis), vision (diplopia). Moderately toxic and narcotic in high concentrations. May also affect metabolism, blood, liver, respiration (dyspnea), and endocrine system. Contains Methanol, which may cause blindness if swallowed. May affect respiratory tract, cardiovascular (cardiac arrhythmias, hypotension), and urinary systems.

	Inhalation: May cause irritation of the respiratory tract and affect brain, behavior/central nervous system with symptoms similar to ingestion. Chronic Potential Health Effects: Skin: Prolonged or repeated skin contact may cause dermatitis, an allergic reaction. Ingestion: Prolonged or repeated ingestion will have similar effects as acute ingestion. It may also affect the brain.

Section 12. Ecological Information

Ecotoxicity	Not available.
Products of Biodegradation	Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.
Toxicity of the Products of Biodegradation	The product itself and its products of degradation are not toxic.

Section 13. Disposal Considerations

Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

Section 14. Transport Information

Proper Shipping Name	Alcohols (denatured ethanol)
Hazard Class & Division	Class 3: Flammable liquid
UN ID#	1987
Packing Group	II

Section 15. Regulatory Information

Other Regulations	OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
CERCLA	Hazardous Substances: Methyl alcohol: 5000 lbs (2268 kg)
SARA 313	Toxic chemical notification and release reporting: Isopropyl Alcohol 5%, Methyl alcohol 5%
DSCL (EEC)	R11- Highly flammable R36/38- Irritating to eyes and skin S7- Keep container tightly closed S16- Keep away from sources of ignition – No smoking S24/25- Avoid contact with skin and eyes S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S36/37- Wear suitable protective clothing and gloves

Section 16. Other Information

N/D=Not Determined, N/A= Not Applicable