

Material Safety Data Sheet

Ethyl alcohol, denatured (A407)

ACC# 08701

Section 1 - Chemical Product and Company Identification

MSDS Name: Ethyl alcohol, denatured (A407)**Catalog Numbers:** A407-1, A407-20, A407-200, A407-20LC, A407-4, A407-500, A407-500LC, A407FB-19, A407FB-200, A407P-4, A407POPB19, A407POPB200, A407RB-19, A407RB-200, A407S-4, A407SK-4, NC9005755**Synonyms:** Ethyl alcohol, denatured; Grain alcohol, denatured; Ethyl hydroxide, denatured.**Company Identification:**

Fisher Scientific
 1 Reagent Lane
 Fair Lawn, NJ 07410

For information, call: 201-796-7100**Emergency Number:** 201-796-7100**For CHEMTREC assistance, call:** 800-424-9300**For International CHEMTREC assistance, call:** 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
64-17-5	Ethyl alcohol	92-93	200-578-6
67-56-1	Methyl alcohol	3.7	200-659-6
108-10-1	Methyl iso-butyl ketone	1.0-2.0	203-550-1
141-78-6	Ethyl acetate	<1.0	205-500-4
108-88-3	Toluene	0.07	203-625-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. Flash Point: 13.9 deg C.

Warning! Causes severe eye irritation. **Flammable liquid and vapor.** Causes respiratory tract irritation. This substance has caused adverse reproductive and fetal effects in humans. May cause central nervous system depression. May cause liver, kidney and heart damage. Causes moderate skin irritation.

Target Organs: Kidneys, heart, central nervous system, liver, eyes, optic nerve.

Potential Health Effects

Eye: Causes severe eye irritation. May cause painful sensitization to light. May cause chemical conjunctivitis and corneal damage. Inhalation, ingestion or skin absorption of methanol can cause significant disturbances in vision, including blindness.

Skin: Causes moderate skin irritation. May cause cyanosis of the extremities. Methanol can be absorbed through the skin, producing systemic effects that include visual disturbances.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause

systemic toxicity with acidosis. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure.

Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. Causes respiratory tract irritation. May cause narcotic effects in high concentration. Vapors may cause dizziness or suffocation.

Chronic: May cause reproductive and fetal effects. Laboratory experiments have resulted in mutagenic effects. Animal studies have reported the development of tumors. Prolonged exposure may cause liver, kidney, and heart damage.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Wash clothing before reuse. Flush skin with plenty of soap and water.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: Treat symptomatically and supportively. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. Will burn if involved in a fire. Flammable Liquid. Can release vapors that form explosive mixtures at temperatures above the flashpoint. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire.

Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. For large fires, use water spray, fog, or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective. Do NOT use straight streams of water.

Flash Point: 13.9 deg C (57.02 deg F)

Autoignition Temperature: 362.8 deg C (685.04 deg F)

Explosion Limits, Lower: 3.3 (ethanol)

Upper: 19 (ethanol)

NFPA Rating: (estimated) Health: 2; Flammability: 3; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation. A vapor suppressing foam may be used to reduce vapors.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area. Do not store near perchlorates, peroxides, chromic acid or nitric acid.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ethyl alcohol	1000 ppm TWA	1000 ppm TWA; 1900 mg/m ³ TWA 3300 ppm IDLH	1000 ppm TWA; 1900 mg/m ³ TWA
Methyl alcohol	200 ppm TWA; 250 ppm STEL; Skin - potential significant contribution to overall exposure by the cutaneous route	200 ppm TWA; 260 mg/m ³ TWA 6000 ppm IDLH	200 ppm TWA; 260 mg/m ³ TWA
Methyl iso-butyl ketone	50 ppm TWA; 75 ppm STEL	50 ppm TWA; 205 mg/m ³ TWA 500 ppm IDLH	100 ppm TWA; 410 mg/m ³ TWA
Ethyl acetate	400 ppm TWA	400 ppm TWA; 1400 mg/m ³ TWA 2000 ppm IDLH	400 ppm TWA; 1400 mg/m ³ TWA
Toluene	20 ppm TWA	100 ppm TWA; 375 mg/m ³ TWA 500 ppm IDLH	200 ppm TWA; 300 ppm Ceiling

OSHA Vacated PELs: Ethyl alcohol: 1000 ppm TWA; 1900 mg/m³ TWA Methyl alcohol: 200 ppm TWA; 260 mg/m³ TWA Methyl iso-butyl ketone: 50 ppm TWA; 205 mg/m³ TWA Ethyl acetate: 400 ppm TWA; 1400 mg/m³ TWA Toluene: 100 ppm TWA; 375 mg/m³ TWA

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: clear, colorless
Odor: aromatic odor
pH: No data
Vapor Pressure: 40.9 mm Hg @ 20 deg C
Vapor Density: Not available.
Evaporation Rate: 2.0
Viscosity: Not available.
Boiling Point: 78.5 deg C
Freezing/Melting Point: -90 deg C
Decomposition Temperature: Not available.
Solubility: Soluble in water.
Specific Gravity/Density: 0.7905
Molecular Formula: Mixture.
Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, ignition sources, excess heat, oxidizers.

Incompatibilities with Other Materials: Strong oxidizing agents, acids, alkali metals, ammonia, hydrazine, peroxides, sodium, acid anhydrides, calcium hypochlorite, chromyl chloride, nitrosyl perchlorate, bromine pentafluoride, perchloric acid, silver nitrate, mercuric nitrate, potassium tert-butoxide, magnesium perchlorate, acid chlorides, platinum, uranium hexafluoride, silver oxide, iodine heptafluoride, acetyl bromide, disulfuryl difluoride, tetrachlorosilane + water, acetyl chloride, permanganic acid, ruthenium (VIII) oxide, uranyl perchlorate, potassium dioxide.

Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 64-17-5: KQ6300000

CAS# 67-56-1: PC1400000

CAS# 108-10-1: SA9275000

CAS# 141-78-6: AH5425000

CAS# 108-88-3: XS5250000

LD50/LC50:

CAS# 64-17-5:

Draize test, rabbit, eye: 500 mg Severe;

Draize test, rabbit, eye: 500 mg/24H Mild;

Draize test, rabbit, skin: 20 mg/24H Moderate;

Inhalation, mouse: LC50 = 39 gm/m³/4H;

Inhalation, rat: LC50 = 20000 ppm/10H;

Oral, mouse: LD50 = 3450 mg/kg;

Oral, rabbit: LD50 = 6300 mg/kg;

Oral, rat: LD50 = 7060 mg/kg;

Oral, rat: LD50 = 9000 mg/kg;

CAS# 67-56-1:

Draize test, rabbit, eye: 40 mg Moderate;
 Draize test, rabbit, eye: 100 mg/24H Moderate;
 Draize test, rabbit, skin: 20 mg/24H Moderate;
 Inhalation, rabbit: LC50 = 81000 mg/m³/14H;
 Inhalation, rat: LC50 = 64000 ppm/4H;
 Oral, mouse: LD50 = 7300 mg/kg;
 Oral, rabbit: LD50 = 14200 mg/kg;
 Oral, rat: LD50 = 5600 mg/kg;
 Skin, rabbit: LD50 = 15800 mg/kg;

CAS# 108-10-1:

Draize test, rabbit, eye: 40 mg Severe;
 Draize test, rabbit, eye: 100 uL/24H Moderate;
 Draize test, rabbit, skin: 500 mg/24H Mild;
 Inhalation, mouse: LC50 = 23300 mg/m³;
 Inhalation, mouse: LC50 = 23300 mg/m³;
 Inhalation, rat: LC50 = 100 gm/m³;
 Oral, mouse: LD50 = 1900 mg/kg;
 Oral, mouse: LD50 = 2850 mg/kg;
 Oral, rat: LD50 = 2080 mg/kg;
 Oral, rat: LD50 = 4600 mg/kg;

CAS# 141-78-6:

Inhalation, mouse: LC50 = 45 gm/m³/2H;
 Inhalation, rat: LC50 = 200 gm/m³;
 Oral, mouse: LD50 = 4100 mg/kg;
 Oral, rabbit: LD50 = 4935 mg/kg;
 Oral, rat: LD50 = 5620 mg/kg;
 Skin, rabbit: LD50 = >20 mL/kg;

CAS# 108-88-3:

Draize test, rabbit, eye: 870 ug Mild;
 Draize test, rabbit, eye: 2 mg/24H Severe;
 Draize test, rabbit, skin: 435 mg Mild;
 Draize test, rabbit, skin: 500 mg Moderate;
 Draize test, rabbit, skin: 20 mg/24H Moderate;
 Inhalation, mouse: LC50 = 400 ppm/24H;
 Inhalation, mouse: LC50 = 30000 mg/m³/2H;
 Inhalation, mouse: LC50 = 19900 mg/m³/7H;
 Inhalation, mouse: LC50 = 10000 mg/m³;
 Inhalation, rat: LC50 = 49 gm/m³/4H;
 Oral, rat: LD50 = 636 mg/kg;
 Skin, rabbit: LD50 = 14100

Carcinogenicity:

CAS# 64-17-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
 CAS# 67-56-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
 CAS# 108-10-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
 CAS# 141-78-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
 CAS# 108-88-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Ethanol has been shown to produce fetotoxicity in the embryo or fetus of

laboratory animals. Prenatal exposure to ethanol is associated with a distinct pattern of congenital malformations that have collectively been termed the "fetal alcohol syndrome". Methanol has been shown to produce fetotoxicity in the embryo or fetus of laboratory animals. Specific developmental abnormalities include cardiovascular, musculoskeletal, and urogenital systems.

Teratogenicity: Oral, Human - woman: TDLo = 41 gm/kg (female 41 week(s) after conception) Effects on Newborn - Apgar score (human only) and Effects on Newborn - other neonatal measures or effects and Effects on Newborn - drug dependence.

Reproductive Effects: Intrauterine, Human - woman: TDLo = 200 mg/kg (female 5 day(s) pre-mating) Fertility - female fertility index (e.g. # females pregnant per # sperm positive females; # females pregnant per # females mated).

Mutagenicity: DNA Inhibition: Human, Lymphocyte = 220 mmol/L.; Cytogenetic Analysis: Human, Lymphocyte = 1160 gm/L.; Cytogenetic Analysis: Human, Fibroblast = 12000 ppm.; Cytogenetic Analysis: Human, Leukocyte = 1 pph/72H (Continuous).; Sister Chromatid Exchange: Human, Lymphocyte = 500 ppm/72H (Continuous).

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Rainbow trout: LC50 = 12900-15300 mg/L; 96 Hr; Flow-through @ 24-24.3° CFish: Rainbow trout: LC50 = 11200 mg/L; 24 Hr; Fingerling (Unspecified) Bacteria: Phytobacterium phosphoreum: EC50 = 34900 mg/L; 5-30 min; Microtox test When spilled on land it is apt to volatilize, biodegrade, and leach into the ground water, but no data on the rates of these processes could be found. Its fate in ground water is unknown. When released into water it will volatilize and probably biodegrade. It would not be expected to adsorb to sediment or bioconcentrate in fish.

Environmental: When released to the atmosphere it will photodegrade in hours (polluted urban atmosphere) to an estimated range of 4 to 6 days in less polluted areas. Rainout should be significant.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series:

CAS# 67-56-1: waste number U154 (Ignitable waste).

CAS# 108-10-1: waste number U161 (Ignitable waste).

CAS# 141-78-6: waste number U112 (Ignitable waste).

CAS# 108-88-3: waste

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	ETHANOL SOLUTION	ETHANOL SOLUTION
Hazard Class:	3	3

UN Number:	UN1170	UN1170
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

- CAS# 64-17-5 is listed on the TSCA inventory.
- CAS# 67-56-1 is listed on the TSCA inventory.
- CAS# 108-10-1 is listed on the TSCA inventory.
- CAS# 141-78-6 is listed on the TSCA inventory.
- CAS# 108-88-3 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 108-10-1: Effective 10/4/82, Sunset 10/4/92 CAS# 108-88-3: Effective 10/4/82, Sunset 10/4/92

Chemical Test Rules

CAS# 108-10-1: 40 CFR 799.5000 CAS# 141-78-6: 40 CFR 799.5000

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 67-56-1: 5000 lb final RQ; 2270 kg final RQ CAS# 108-10-1: 5000 lb final RQ; 2270 kg final RQ CAS# 141-78-6: 5000 lb final RQ; 2270 kg final RQ CAS# 108-88-3: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

- CAS # 64-17-5: immediate, delayed, fire.
- CAS # 67-56-1: immediate, fire.
- CAS # 108-10-1: immediate, delayed, fire, reactive.
- CAS # 141-78-6: fire.
- CAS # 108-88-3: immediate, fire.

Section 313

This material contains Methyl alcohol (CAS# 67-56-1, 3.7%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains Methyl iso-butyl ketone (CAS# 108-10-1, 1.0-2.0%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

Toluene is not at a high enough concentration to be reportable under Section 313.

Clean Air Act:

- CAS# 67-56-1 is listed as a hazardous air pollutant (HAP).
- CAS# 108-10-1 is listed as a hazardous air pollutant (HAP).

CAS# 108-88-3 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 108-88-3 is listed as a Hazardous Substance under the CWA. CAS# 108-88-3 is listed as a Priority Pollutant under the Clean Water Act. CAS# 108-88-3 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 64-17-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 67-56-1 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 108-10-1 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 141-78-6 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 108-88-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

WARNING: This product contains Ethyl alcohol, a chemical known to the state of California to cause developmental reproductive toxicity.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN F

Risk Phrases:

R 11 Highly flammable.

R 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.

R 68/20/21/22 Harmful : possible risk of irreversible effects through inhalation, in contact with skin and if swallowed.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

S 36/37 Wear suitable protective clothing and gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 7 Keep container tightly closed.

WGK (Water Danger/Protection)

CAS# 64-17-5: 0

CAS# 67-56-1: 1

CAS# 108-10-1: 1

CAS# 141-78-6: 1

CAS# 108-88-3: 2

Canada - DSL/NDSL

CAS# 64-17-5 is listed on Canada's DSL List.

CAS# 67-56-1 is listed on Canada's DSL List.

CAS# 108-10-1 is listed on Canada's DSL List.

CAS# 141-78-6 is listed on Canada's DSL List.

CAS# 108-88-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, D1A, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 64-17-5 is listed on the Canadian Ingredient Disclosure List.

CAS# 67-56-1 is listed on the Canadian Ingredient Disclosure List.

CAS# 108-10-1 is listed on the Canadian Ingredient Disclosure List.

CAS# 141-78-6 is listed on the Canadian Ingredient Disclosure List.

CAS# 108-88-3 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 10/12/1998

Revision #10 Date: 12/04/2007

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.