



Material Safety Data Sheet
Ethanol SDA1, Anhydrous

MSDS# 88067

Section 1 - Chemical Product and Company Identification

MSDS Name: Ethanol SDA1, Anhydrous
Catalog Numbers: A405-20, A405P-4
Synonyms: Ethyl alcohol, denatured; Grain alcohol, denatured; Ethyl hydroxide, denatured.

Company Identification: Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410

For information in the US, call: 201-796-7100
Emergency Number US: 201-796-7100
CHEMTREC Phone Number, US: 800-424-9300

Section 2 - Composition, Information on Ingredients

Risk Phrases: 11

CAS#: 64-17-5
Chemical Name: Ethyl alcohol
%: 92-93
EINECS#: 200-578-6
Hazard Symbols: F

Risk Phrases: 11 23/24/25 39/23/24/25

CAS#: 67-56-1
Chemical Name: Methyl alcohol
%: 3.7
EINECS#: 200-659-6
Hazard Symbols: F T

Risk Phrases:

CAS#: 108-10-1
Chemical Name: Methyl iso-butyl ketone
%: 1.0-2.0
EINECS#: 203-550-1
Hazard Symbols:

Risk Phrases: 11 20

CAS#: 108-88-3
Chemical Name: Toluene
%: 0.07
EINECS#: 203-625-9
Hazard Symbols: F XN

Risk Phrases: 11 36 66 67

CAS#: 141-78-6
Chemical Name: Ethyl acetate
%: <1.0
EINECS#: 205-500-4
Hazard Symbols: F XI

Text for R-phrases: see Section 16

Hazard Symbols:

XN F



Risk Phrases:

11 20/21/22 68/20/21/22

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

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

Autoignition Temperature: 362.8 deg C (Ethano

Flash Point: 13.9 deg C (57.02 deg F)

Explosion Limits: Lower: 3.3 (Ethanol)

Explosion Limits: Upper: 18.0 (Ethanol)

NFPA Rating: 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

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ethyl alcohol	1000 ppm	1000 ppm TWA; 1900 mg/m3 TWA 3300 ppm IDLH	1000 ppm TWA; 1900 mg/m3 TWA
Methyl alcohol	200 ppm; 250 ppm STEL; Skin - potential significant contribution to overall exposure by the cutaneous route	200 ppm TWA; 260 mg/m3 TWA 6000 ppm IDLH	200 ppm TWA; 260 mg/m3 TWA
Methyl iso-butyl ke tone	50 ppm; 75 ppm STEL	50 ppm TWA; 205 mg/m3 TWA 500 ppm IDLH	100 ppm TWA; 410 mg/m3 TWA
Toluene	20 ppm	100 ppm TWA; 375 mg/m3 TWA 500 ppm IDLH	200 ppm TWA; 300 ppm Ceiling
Ethyl acetate	400 ppm	400 ppm TWA; 1400 mg/m3 TWA 2000 ppm IDLH	400 ppm TWA; 1400 mg/m3 TWA

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 Toluene: 100 ppm TWA; 375 mg/m3 TWA Ethyl acetate:

400 ppm TWA; 1400 mg/m³ TWA

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

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

Color: clear, colorless

Odor: alcohol-like

pH: Not available

Vapor Pressure: 48 mm Hg

Vapor Density: 1.5

Evaporation Rate: 3.6 (Butyl Acetate=1)

Viscosity: Not available

Boiling Point: 77.1 deg C (170.78°F)

Freezing/Melting Point: <-90 deg C

Decomposition Temperature: Not available

Solubility in water: 100% at 20°C

Specific Gravity/Density: .785-.792

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# 108-88-3: XS5250000

CAS# 141-78-6: AH5425000

RTECS:

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;

RTECS:

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;

RTECS:

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;

LD50/LC50:

RTECS:

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 uL/kg;

RTECS:

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;

Ethyl alcohol - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.
Methyl alcohol - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.
Carcinogenicity: Methyl iso-butyl ketone - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.
Toluene - IARC: Group 3 (not classifiable)
Ethyl acetate - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.

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.

Epidemiology:

Teratogenicity: Not available

Reproductive: Not available

Neurotoxicity: No information found

Mutagenicity: Not available

Other: Standard Draize Test(Skin, rabbit) = 20 mg/24H (Moderate) Standard Draize Test: Administration into the eye (rabbit) = 500 mg (Severe).

Section 12 - Ecological Information

Ecotoxicity: Fish: Rainbow trout: LC50 = 12900-15300 mg/L; 96 Hr; Flow-through @ 24-24.3°C
Fish: Rainbow trout: LC50 = 11200 mg/L; 24 Hr; Fingerling (Unspecified)
Bacteria: Phytobacterium phosphoreum: EC50 = 34900 mg/L; 5-30 min; Microtox test

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# 108-88-3: waste number U220. CAS# 141-78-6: waste number U112 (Ignitable waste).

Section 14 - Transport Information

US DOT

Shipping Name: ETHANOL SOLUTION

Hazard Class: 3

UN Number: UN1170

Packing Group: II

Canada TDG

Shipping Name: ETHANOL SOLUTION

Hazard Class: 3

UN Number: UN1170

Packing Group: II

USA RQ: CAS# 67-56-1: 5000 lb final RQ; 2270 kg final RQ

USA RQ: CAS# 108-10-1: 5000 lb final RQ; 2270 kg final RQ

USA RQ: CAS# 108-88-3: 1000 lb final RQ; 454 kg final RQ

USA RQ: CAS# 141-78-6: 5000 lb final RQ; 2270 kg final RQ

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# 108-88-3 is listed on the TSCA Inventory.

CAS# 141-78-6 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# 108-88-3: 1000 lb final RQ; 454 kg final RQ CAS# 141-78-6: 5000 lb final RQ; 2270 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: acute, chronic, flammable. CAS # 67-56-1: acute, flammable. CAS # 108-10-1: acute, chronic, flammable, reactive. CAS # 108-88-3: acute, flammable. CAS # 141-78-6: flammable.
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 372. This material contains Methyl iso-butyl ketone (CAS# 108-10-1, 1.02%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 372. This chemical 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:	
STATE	Ethyl alcohol can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts. Methyl alcohol can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts. Methyl iso-butyl ketone can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts. Toluene can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts. Ethyl acetate 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 birth defects or other reproductive harm.
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 7 Keep container tightly closed.
	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).

WGK (Water Danger/Protection)

CAS# 64-17-5: 0

CAS# 67-56-1: 1

CAS# 108-10-1: 1

CAS# 108-88-3: 2

CAS# 141-78-6: 1

Canada

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

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

Canadian WHMIS Classifications: B2, D2A, D1B, 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.

CAS# 64-17-5 is listed on Canada's Ingredient Disclosure List

CAS# 67-56-1 is listed on Canada's Ingredient Disclosure List

CAS# 108-10-1 is listed on Canada's Ingredient Disclosure List

CAS# 108-88-3 is listed on Canada's Ingredient Disclosure List

CAS# 141-78-6 is listed on Canada's Ingredient Disclosure List

Section 16 - Other Information

MSDS Creation Date: 12/12/1997

Revision #11 Date 10/30/2007

Revisions were made in Sections: 5, 9

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 the company 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 the company has been advised of the possibility of such damages.
