Material Safety Data Sheet
Ethanol, CDA 19

ACC# 88068

Section 1 - Chemical Product and Company Identification

**MSDS Name:** Ethanol, CDA 19  
**Catalog Numbers:** A406-20, A406F-1GAL, A406P-4  
**Synonyms:** Ethyl alcohol; Ethyl alcohol anhydrous; Ethyl hydrate; Ethyl hydroxide; Fermentation alcohol; Grain alcohol; Methylcarbinol; Molasses alcohol; Spirits of wine  
**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

<table>
<thead>
<tr>
<th>CAS#</th>
<th>Chemical Name</th>
<th>Percent</th>
<th>EINECS/ELINCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>64-17-5</td>
<td>Ethyl alcohol</td>
<td>92-93</td>
<td>200-578-6</td>
</tr>
<tr>
<td>108-10-1</td>
<td>Methylisobutyl ketone</td>
<td>3-4</td>
<td>203-550-1</td>
</tr>
<tr>
<td>7732-18-5</td>
<td>Water</td>
<td>&lt;1.0</td>
<td>231-791-2</td>
</tr>
<tr>
<td>110-54-3</td>
<td>Hexane</td>
<td>0.8</td>
<td>203-777-6</td>
</tr>
<tr>
<td>108-88-3</td>
<td>Toluene</td>
<td>0.08</td>
<td>203-625-9</td>
</tr>
</tbody>
</table>

Section 3 - Hazards Identification

**EMERGENCY OVERVIEW**

Appearance: clear colorless to pale yellow liquid. Flash Point: 61.9 deg F.  
**Warning!** Causes severe eye irritation. **Flammable liquid and vapor.** Causes respiratory tract irritation. This substance has caused adverse reproductive and fetal effects in humans. Prolonged or repeated contact causes defatting of the skin with irritation, dryness, and cracking. May cause central nervous system depression. May cause liver, kidney and heart damage.  
**Target Organs:** Kidneys, heart, central nervous system, liver.

**Potential Health Effects**  
**Eye:** Causes severe eye irritation. May cause painful sensitization to light. May cause chemical conjunctivitis and corneal damage.  
**Skin:** Causes moderate skin irritation. May cause cyanosis of the extremities. There is negligible absorption of ethanol through intact skin in humans. Ethanol has been shown to
have a weak skin sensitizing potential in a very small percentage of the population.

**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. Ethanol exposure in the workplace is primarily by inhalation. Ethanol vapors can occur at concentrations up to 6.58% in air (65,800 ppm).

**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.

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**Section 4 - First Aid Measures**

**Eyes:** Get medical aid. Gently lift eyelids and flush continuously with water.

**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. Do NOT use mouth-to-mouth resuscitation.

**Notes to Physician:** Treat symptomatically and supportively. Persons with skin or eye disorders or liver, kidney, chronic respiratory diseases, or central and peripheral nervous system diseases may be at increased risk from exposure to this substance.

**Antidote:** Replace fluid and electrolytes.

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**Section 5 - Fire Fighting Measures**

**General Information:** Replace fluid and electrolytes. 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:** 61.9 e deg F (16.61 deg C)

**Autoignition Temperature:** 363 deg C (685.40 deg F)

**Explosion Limits, Lower:** 3.3 vol %

**Upper:** 19 vol %

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

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**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

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH</th>
<th>NIOSH</th>
<th>OSHA - Final PELs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl alcohol</td>
<td>1000 ppm TWA</td>
<td>1000 ppm TWA; 1900 mg/m3 TWA 3300 ppm IDLH</td>
<td>1000 ppm TWA; 1900 mg/m3 TWA</td>
</tr>
<tr>
<td>Methylisobutyl ketone</td>
<td>50 ppm TWA; 75 ppm STEL</td>
<td>50 ppm TWA; 205 mg/m3 TWA 500 ppm IDLH</td>
<td>100 ppm TWA; 410 mg/m3 TWA</td>
</tr>
<tr>
<td>Water</td>
<td>none listed</td>
<td>none listed</td>
<td>none listed</td>
</tr>
<tr>
<td>Hexane</td>
<td>50 ppm TWA; Skin - potential significant contribution to overall exposure by the cutaneous route</td>
<td>50 ppm TWA; 180 mg/m3 TWA 1100 ppm IDLH</td>
<td>500 ppm TWA; 1800 mg/m3 TWA</td>
</tr>
<tr>
<td>Toluene</td>
<td>50 ppm TWA; Skin - potential significant contribution to overall exposure by the cutaneous route</td>
<td>100 ppm TWA; 375 mg/m3 TWA 500 ppm IDLH</td>
<td>200 ppm TWA; 300 ppm Ceiling</td>
</tr>
</tbody>
</table>

OSHA Vacated PELs: Ethyl alcohol: 1000 ppm TWA; 1900 mg/m3 TWA Methylisobutyl ketone: 50 ppm TWA; 205 mg/m3 TWA Water: No OSHA Vacated PELs are listed for this chemical. Hexane: 50 ppm TWA; 180 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 to pale yellow
Odor: alcohol-like
pH: Not available.
Vapor Pressure: 50 mm Hg @ 20 deg C
Vapor Density: 1.6 (air=1)
Evaporation Rate: 3.8 (n-Butyl acetate=1)
Viscosity: Not available.
Boiling Point: 79 deg C @ 760 mmHg
Freezing/Melting Point: < -85 deg C
Decomposition Temperature: Not available.
Solubility: Soluble.
Specific Gravity/Density: 0.8129 @ 20/20°C
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: Will not occur.

Section 11 - Toxicological Information

RTECS#: 
CAS# 64-17-5: KQ6300000
CAS# 108-10-1: SA9275000
CAS# 7732-18-5: ZC01100000
CAS# 110-54-3: MN92750000
CAS# 108-88-3: XS52500000

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# 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# 7732-18-5:
  Oral, rat: LD50 = >90 mL/kg;

CAS# 110-54-3:
  Draize test, rabbit, eye: 10 mg Mild;
  Inhalation, mouse: LC50 = 150000 mg/m3/2H;
  Inhalation, rat: LC50 = 48000 ppm/4H;
  Inhalation, rat: LC50 = 627000 mg/m3/3M;
  Oral, rat: LD50 = 25 gm/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# 108-10-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 110-54-3: 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".

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).


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°C Fish: Rainbow trout: LC50 = 11200 mg/L; 24 Hr; Fingertip (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 biocentrata 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# 108-10-1: waste number U161 (Ignitible waste).
CAS# 108-88-3: waste number U220.
Section 14 - Transport Information

<table>
<thead>
<tr>
<th>Shipping Name:</th>
<th>US DOT</th>
<th>Canada TDG</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETHANOL</td>
<td></td>
<td>ETHANOL</td>
</tr>
<tr>
<td>Hazard Class:</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>UN Number:</td>
<td>UN1170</td>
<td>UN1170</td>
</tr>
<tr>
<td>Packing Group:</td>
<td>II</td>
<td>II</td>
</tr>
</tbody>
</table>

Section 15 - Regulatory Information

US FEDERAL

TSCA
- CAS# 64-17-5 is listed on the TSCA inventory.
- CAS# 108-10-1 is listed on the TSCA inventory.
- CAS# 7732-18-5 is listed on the TSCA inventory.
- CAS# 110-54-3 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

Chemical Test Rules
- CAS# 108-10-1: 40 CFR 799.5000

Section 12b
- CAS# 108-10-1: Section 4 (applies only to those companies that signed an Enforceable Consent Ag)

TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs
- CAS# 108-10-1: 5000 lb final RQ; 2270 kg final RQ
- CAS# 110-54-3: 5000 lb 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 # 108-10-1: immediate, delayed, fire, reactive.
- CAS # 110-54-3: immediate, delayed, fire.
- CAS # 108-88-3: immediate, fire.

Section 313
This material contains Methylisobutyl ketone (CAS# 108-10-1, 3-4%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR.

Clean Air Act:
- CAS# 108-10-1 is listed as a hazardous air pollutant (HAP).
- CAS# 110-54-3 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# 108-10-1 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.
CAS# 110-54-3 can be found on the following state right to know lists: 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:**
F

**Risk Phrases:**
R 11 Highly flammable.
R 36/37 Irritating to eyes and respiratory system.
R 66 Repeated exposure may cause skin dryness or cracking.

**Safety Phrases:**
S 16 Keep away from sources of ignition - No smoking.
S 7 Keep container tightly closed.

**WGK (Water Danger/Protection)**
CAS# 64-17-5: 0
CAS# 108-10-1: 1
CAS# 7732-18-5: No information available.
CAS# 110-54-3: 1
CAS# 108-88-3: 2

**Canada - DSL/NDSL**
CAS# 64-17-5 is listed on Canada's DSL List.
CAS# 108-10-1 is listed on Canada's DSL List.
CAS# 7732-18-5 is listed on Canada's DSL List.
CAS# 110-54-3 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, 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# 108-10-1 is listed on the Canadian Ingredient Disclosure List.
CAS# 110-54-3 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: 7/28/1999
Revision #11 Date: 12/14/2006

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.