

# ETHYL ALCOHOL

EAL

## CAUTIONARY RESPONSE INFORMATION

<b>Common Synonyms</b> Alcohol Cologne spirit Denatured alcohol Ethanol Fermentation alcohol Grain alcohol	Watery liquid      Colorless      Alcohol odor
Floats and mixes with water. Flammable, irritating vapor is produced.	
<p><b>Keep people away.</b>  <b>Shut off ignition sources and call fire department.</b>  <b>Stay upwind and use water spray to "knock down" vapor.</b>  <b>Notify local health and pollution control agencies.</b>  <b>Protect water intakes.</b></p>	
<b>Fire</b>	<p><b>FLAMMABLE.</b>  Flashback along vapor trail may occur.  Vapor may explode if ignited in an enclosed area.  Extinguish with dry chemical, alcohol foam, or carbon dioxide.  Water may be ineffective on fire.  Cool exposed containers with water.</p>
<b>Exposure</b>	<p>CALL FOR MEDICAL AID.</p> <p>VAPOR  Irritating to eyes, nose and throat.  Move to fresh air.</p> <p>LIQUID  Not harmful.</p>
<b>Water Pollution</b>	<p>Dangerous to aquatic life in high concentrations.  May be dangerous if it enters water intakes.  Notify local health and wildlife officials.  Notify operators of nearby water intakes.</p>

### 1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse  
Stop discharge

### 2. CHEMICAL DESIGNATIONS

- 2.1 **CG Compatibility Group:** 20; Alcohol, glycol  
2.2 **Formula:** C<sub>2</sub>H<sub>5</sub>OH  
2.3 **IMO/UN Designation:** 3.2/1170  
2.4 **DOT ID No.:** 1170  
2.5 **CAS Registry No.:** 64-17-5  
2.6 **NAERG Guide No.:** 127  
2.7 **Standard Industrial Trade Classification:** 51215

### 3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** All-purpose canister; safety goggles. Avoid contact with liquid and inhalation of vapors.  
3.2 **Symptoms Following Exposure:** Irritation of eyes, nose and throat. Headache and drowsiness may occur. Liquid causes intoxication.  
3.3 **Treatment of Exposure:** INHALATION: if breathing is affected, remove victim to fresh air; call physician; administer oxygen. Speed is of primary importance. EYES OR SKIN: flush with water.  
3.4 **TLV-TWA:** 1,000 ppm  
3.5 **TLV-STEL:** Not listed.  
3.6 **TLV-Ceiling:** Not listed.  
3.7 **Toxicity by Ingestion:** Grade 1; LD<sub>50</sub> = 5 to 15 g/kg  
3.8 **Toxicity by Inhalation:** Currently not available.  
3.9 **Chronic Toxicity:** None  
3.10 **Vapor (Gas) Irritant Characteristics:** Vapors cause a slight smarting of the eyes or respiratory system if present in high concentrations. The effect is temporary.  
3.11 **Liquid or Solid Characteristics:** No appreciable hazard. Practically harmless to the skin.  
3.12 **Odor Threshold:** 10 ppm  
3.13 **IDLH Value:** 3,300 ppm  
3.14 **OSHA PEL-TWA:** 1,000 ppm  
3.15 **OSHA PEL-STEL:** Not listed.  
3.16 **OSHA PEL-Ceiling:** Not listed.  
3.17 **EPA AEGL:** Not listed

### 4. FIRE HAZARDS

- 4.1 **Flash Point:** 64°F O.C. 55°F C.C.  
4.2 **Flammable Limits in Air:** 3.3%-19%  
4.3 **Fire Extinguishing Agents:** Carbon dioxide, dry chemical, water spray, alcohol foam  
4.4 **Fire Extinguishing Agents Not to Be Used:** None  
4.5 **Special Hazards of Combustion Products:** None  
4.6 **Behavior in Fire:** Not pertinent  
4.7 **Auto Ignition Temperature:** 689°F  
4.8 **Electrical Hazards:** Class I, Group D  
4.9 **Burning Rate:** 3.9 mm/min.  
4.10 **Adiabatic Flame Temperature:** Currently not available  
4.11 **Stoichiometric Air to Fuel Ratio:** 14.3 (calc.)  
4.12 **Flame Temperature:** Currently not available  
4.13 **Combustion Molar Ratio (Reactant to Product):** 5.0 (calc.)  
4.14 **Minimum Oxygen Concentration for Combustion (MOCC):** N<sub>2</sub> diluent: 10.5-10.6%; CO<sub>2</sub> diluent: 13.0%

### 5. CHEMICAL REACTIVITY

- 5.1 **Reactivity with Water:** No reaction  
5.2 **Reactivity with Common Materials:** No reaction  
5.3 **Stability During Transport:** Stable  
5.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent  
5.5 **Polymerization:** Not pertinent  
5.6 **Inhibitor of Polymerization:** Not pertinent

### 6. WATER POLLUTION

- 6.1 **Aquatic Toxicity:** 250 ppm/6 hr/goldfish/lethal/fresh water  
6.2 **Waterfowl Toxicity:** Currently not available  
6.3 **Biological Oxygen Demand (BOD):** 125%, 5 days; 44.2% (theor.), 5 days; 71.2% (theor.), 20 days  
6.4 **Food Chain Concentration Potential:** None  
6.5 **GESAMP Hazard Profile:**  
Bioaccumulation: 0  
Damage to living resources: 0  
Human Oral hazard: 0  
Reduction of amenities: 0

### 7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** Anhydrous (200 proof); 190 proof; specially denatured; completely denatured  
7.2 **Storage Temperature:** Ambient  
7.3 **Inert Atmosphere:** No requirement  
7.4 **Venting:** Open (flame arrester) or pressure-vacuum  
7.5 **IMO Pollution Category:** Currently not available  
7.6 **Ship Type:** Currently not available  
7.7 **Barge Hull Type:** Currently not available

### 8. HAZARD CLASSIFICATIONS

- 8.1 **49 CFR Category:** Flammable liquid  
8.2 **49 CFR Class:** 3  
8.3 **49 CFR Package Group:** II  
8.4 **Marine Pollutant:** No  
8.5 **NFPA Hazard Classification:**
- | Category                  | Classification |
|---------------------------|----------------|
| Health Hazard (Blue)..... | 0              |
| Flammability (Red).....   | 3              |
| Instability (Yellow)..... | 0              |
- 8.6 **EPA Reportable Quantity:** Not listed.  
8.7 **EPA Pollution Category:** Not listed.  
8.8 **RCRA Waste Number:** Not listed  
8.9 **EPA FWPCA List:** Not listed

### 9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 **Physical State at 15° C and 1 atm:** Liquid  
9.2 **Molecular Weight:** 46.07  
9.3 **Boiling Point at 1 atm:** 172.9°F = 78.3°C = 351.5°K  
9.4 **Freezing Point:** -173°F = -114°C = 159°K  
9.5 **Critical Temperature:** 469.6°F = 243.1°C = 516.3°K  
9.6 **Critical Pressure:** 926 psia = 63.0 atm = 6.38 MN/m<sup>2</sup>  
9.7 **Specific Gravity:** 0.790 at 20°C (liquid)  
9.8 **Liquid Surface Tension:** Not pertinent  
9.9 **Liquid Water Interfacial Tension:** Not pertinent  
9.10 **Vapor (Gas) Specific Gravity:** 1.6  
9.11 **Ratio of Specific Heats of Vapor (Gas):** 1.128  
9.12 **Latent Heat of Vaporization:** 360 Btu/lb = 200 cal/g =  
9.13 **Heat of Combustion:** 8.37 X 10<sup>5</sup> J/kg  
-11,570 Btu/lb = 6425 cal/g = -268.8 X 10<sup>5</sup> J/kg  
9.14 **Heat of Decomposition:** Not pertinent  
9.15 **Heat of Solution:** -99 Btu/lb = -55 cal/g = -2.3 X 10<sup>5</sup> J/kg  
9.16 **Heat of Polymerization:** Not pertinent  
9.17 **Heat of Fusion:** Currently not available  
9.18 **Limiting Value:** Currently not available  
9.19 **Reid Vapor Pressure:** 2.3 psia

### NOTES

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9.20 SATURATED LIQUID DENSITY		9.21 LIQUID HEAT CAPACITY		9.22 LIQUID THERMAL CONDUCTIVITY		9.23 LIQUID VISCOSITY	
Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F	Temperature (degrees F)	British thermal unit inch per hour-square foot-F	Temperature (degrees F)	Centipoise
35	50.220	35	0.539	-40	1.289		N O T  P E R T I N E N T
40	50.080	40	0.545	-30	1.277		
45	49.930	45	0.552	-20	1.265		
50	49.780	50	0.558	-10	1.253		
55	49.630	55	0.564	0	1.242		
60	49.490	60	0.571	10	1.230		
65	49.340	65	0.577	20	1.218		
70	49.190	70	0.583	30	1.206		
75	49.040	75	0.590	40	1.194		
80	48.900	80	0.596	50	1.182		
85	48.750	85	0.603	60	1.171		
90	48.600	90	0.609	70	1.159		
95	48.460	95	0.615	80	1.147		
100	48.310	100	0.622	90	1.135		
105	48.160	105	0.628	100	1.123		
110	48.010	110	0.635	110	1.112		
115	47.870	115	0.641	120	1.100		
120	47.720	120	0.647	130	1.088		
125	47.570						
130	47.420						
135	47.280						
140	47.130						
145	46.980						
150	46.830						
155	46.690						
160	46.540						

9.24 SOLUBILITY IN WATER		9.25 SATURATED VAPOR PRESSURE		9.26 SATURATED VAPOR DENSITY		9.27 IDEAL GAS HEAT CAPACITY	
Temperature (degrees F)	Pounds per 100 pounds of water	Temperature (degrees F)	Pounds per square inch	Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F
	M I S C I B L E	40	0.304	40	0.00261	0	0.351
		50	0.441	50	0.00371	25	0.362
		60	0.629	60	0.00520	50	0.373
		70	0.884	70	0.00716	75	0.384
		80	1.224	80	0.00973	100	0.395
		90	1.671	90	0.01305	125	0.406
		100	2.253	100	0.01728	150	0.417
		110	3.001	110	0.02261	175	0.427
		120	3.952	120	0.02926	200	0.437
		130	5.148	130	0.03747	225	0.447
		140	6.640	140	0.04752	250	0.457
		150	8.482	150	0.05971	275	0.467
		160	10.740	160	0.07438	300	0.477
		170	13.480	170	0.09188	325	0.487
		180	16.790	180	0.11260	350	0.496
		190	20.740	190	0.13700	375	0.505
		200	25.450	200	0.16560	400	0.514
		210	31.010	210	0.19870	425	0.523
						450	0.532
						475	0.541
						500	0.549
					525	0.558	
					550	0.566	
					575	0.574	
					600	0.582	