ETHYL ALCOHOL

EAL

CAUTIONARY RESPONSE INFORMATION

Common Synonyms
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.

Keep people away.
Shut off ignition sources and call fire department.
Stay upwind and use water spray to ``knock down'' vapor.
Notify local health and pollution control agencies.
Protect water intakes.

Fire

FLAMMABLE.
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.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Irritating to eyes, nose and throat.
Move to fresh air.

LIQUID
Not harmful.

Water Pollution

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.

1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse
Stop discharge

2. CHEMICAL DESIGNATIONS

2.1 CG Compatibility Group: 20; Alcohol, glycol
2.2 Formula: C_2H_5OH
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_{50} = 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 Stoichometric 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_2 diluent: 10.5-10.6%; CO_2 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
Human Contact 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^2
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 10^5 J/kg –11,570 Btu/lb = 6425 cal/g = –268.8 X 10^5 J/kg
9.14 Heat of Decomposition: Not pertinent
9.15 Heat of Solution: –99 Btu/lb = –55 cal/g = –2.3 X 10^5 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	
Temperature (degrees F)	Pounds per cubic foot
35	50.220
40	50.080
45	49.930
50	49.780
55	49.630
60	49.490
65	49.340
70	49.190
75	49.040
80	48.900
85	48.750
90	48.600
95	48.460
100	48.310
105	48.160
110	48.010
115	47.870
120	47.720
125	47.570
130	47.420
135	47.280
140	47.130
145	46.980
150	46.830
155	46.690
160	46.540

9.21 LIQUID HEAT CAPACITY	
Temperature (degrees F)	British thermal unit per pound-F
35	0.539
40	0.545
45	0.552
50	0.558
55	0.564
60	0.571
65	0.577
70	0.583
75	0.590
80	0.596
85	0.603
90	0.609
95	0.615
100	0.622
105	0.628
110	0.635
115	0.641
120	0.647

9.22 LIQUID THERMAL CONDUCTIVITY	
Temperature (degrees F)	British thermal unit inch per hour-square foot-F
-40	1.289
-30	1.277
-20	1.265
-10	1.253
0	1.242
10	1.230
20	1.218
30	1.206
40	1.194
50	1.182
60	1.171
70	1.159
80	1.147
90	1.135
100	1.123
110	1.112
120	1.100
130	1.088

9.23 LIQUID VISCOSITY	
Temperature (degrees F)	Centipoise
	NOT PERTINENT

9.24 SOLUBILITY IN WATER	
Temperature (degrees F)	Pounds per 100 pounds of water
	MISCIBLE

9.25 SATURATED VAPOR PRESSURE	
Temperature (degrees F)	Pounds per square inch
40	0.304
50	0.441
60	0.629
70	0.884
80	1.224
90	1.671
100	2.253
110	3.001
120	3.952
130	5.148
140	6.640
150	8.482
160	10.740
170	13.480
180	16.790
190	20.740
200	25.450
210	31.010

9.26 SATURATED VAPOR DENSITY	
Temperature (degrees F)	Pounds per cubic foot
40	0.00261
50	0.00371
60	0.00520
70	0.00716
80	0.00973
90	0.01305
100	0.01728
110	0.02261
120	0.02926
130	0.03747
140	0.04752
150	0.05971
160	0.07438
170	0.09188
180	0.11260
190	0.13700
200	0.16560
210	0.19870

9.27 IDEAL GAS HEAT CAPACITY	
Temperature (degrees F)	British thermal unit per pound-F
0	0.351
25	0.362
50	0.373
75	0.384
100	0.395
125	0.406
150	0.417
175	0.427
200	0.437
225	0.447
250	0.457
275	0.467
300	0.477
325	0.487
350	0.496
375	0.505
400	0.514
425	0.523
450	0.532
475	0.541
500	0.549
525	0.558
550	0.566
575	0.574
600	0.582