

ETHYL BUTYRATE

EBR

CAUTIONARY RESPONSE INFORMATION

Common Synonyms Butyric acid, ethyl ester Butyric ether Ethyl butanoate		Liquid	Colorless	Fruity odor
		Floats on water.		
<p>Keep people away. Avoid contact with liquid and vapor. Avoid inhalation. Shut off ignition sources. Call fire department. Stay upwind. Use water spray to "knock down" vapor. Notify local health and pollution control agencies. Protect water intakes.</p>				
Fire	<p>FLAMMABLE. Containers may explode in fire. Flashback along vapor trail may occur. Vapor may explode if ignited in an enclosed area. Extinguish with dry chemicals, alcohol foam, or carbon dioxide. Water may be ineffective on fire. Cool exposed containers with water.</p>			
Exposure	<p>CALL FOR MEDICAL AID.</p> <p>VAPOR Irritating to eyes, nose and throat. If inhaled will cause headache or dizziness. If in eyes, hold eyelids open and flush with plenty of water. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.</p> <p>LIQUID Irritating to skin and eyes. If swallowed will cause nausea, vomiting, dizziness or headache. Remove contaminated clothing and shoes. Flush affected areas with plenty of water. IF IN EYES, hold eyelids open and flush with plenty of water. IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk and have victim induce vomiting. IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.</p>			
Water Pollution	<p>Effect of low concentrations on aquatic life is unknown. Fouling to shoreline. 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
- Contain
- Collection Systems: Skim

2. CHEMICAL DESIGNATIONS

- 2.1 **CG Compatibility Group:** Not listed.
- 2.2 **Formula:** CH₃CH₂CH₂COOC₂H₅
- 2.3 **IMO/UN Designation:** 3.3/1180
- 2.4 **DOT ID No.:** 1180
- 2.5 **CAS Registry No.:** 105-54-4
- 2.6 **NAERG Guide No.:** 129
- 2.7 **Standard Industrial Trade Classification:** 51375

3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** All-purpose canister mask or chemical cartridge respirator; glass or face shield; rubber gloves
- 3.2 **Symptoms Following Exposure:** Inhalation or ingestion causes headache, dizziness, nausea, vomiting, and narcosis. Contact with liquid irritates eyes.
- 3.3 **Treatment of Exposure:** INHALATION: move victim to fresh air and call a physician; give artificial respiration if necessary. INGESTION: induce vomiting and call a physician. EYES: flush with water for at least 15 min. SKIN: flush with water; wash with soap and water.
- 3.4 **TLV-TWA:** Not listed.
- 3.5 **TLV-STEL:** Not listed.
- 3.6 **TLV-Ceiling:** Not listed.
- 3.7 **Toxicity by Ingestion:** Grade 1; oral LD₅₀ = 13 g/kg (rat)
- 3.8 **Toxicity by Inhalation:** Currently not available.
- 3.9 **Chronic Toxicity:** Currently not available
- 3.10 **Vapor (Gas) Irritant Characteristics:** Currently not available
- 3.11 **Liquid or Solid Characteristics:** Currently not available
- 3.12 **Odor Threshold:** 0.015 ppm
- 3.13 **IDLH Value:** Not listed.
- 3.14 **OSHA PEL-TWA:** Not listed.
- 3.15 **OSHA PEL-STEL:** Not listed.
- 3.16 **OSHA PEL-Ceiling:** Not listed.
- 3.17 **EPA AEG1:** Not listed

4. FIRE HAZARDS

- 4.1 **Flash Point:** 85°F O.C. 75°F C.C.
- 4.2 **Flammable Limits in Air:** Currently not available
- 4.3 **Fire Extinguishing Agents:** Dry chemical, alcohol foam, carbon dioxide
- 4.4 **Fire Extinguishing Agents Not to Be Used:** Water may be ineffective
- 4.5 **Special Hazards of Combustion Products:** Currently not available
- 4.6 **Behavior in Fire:** Vapor is heavier than air and may travel to a source of ignition and flash back. Containers may explode in fire.
- 4.7 **Auto Ignition Temperature:** 865°F
- 4.8 **Electrical Hazards:** Currently not available
- 4.9 **Burning Rate:** 4.72 mm/min.
- 4.10 **Adiabatic Flame Temperature:** Currently not available
- 4.11 **Stoichiometric Air to Fuel Ratio:** 38.1 (calc.)
- 4.12 **Flame Temperature:** Currently not available
- 4.13 **Combustion Molar Ratio (Reactant to Product):** 12.0 (calc.)
- 4.14 **Minimum Oxygen Concentration for Combustion (MOCC):** Not listed

5. CHEMICAL REACTIVITY

- 5.1 **Reactivity with Water:** No reaction
- 5.2 **Reactivity with Common Materials:** May attack some forms of plastics
- 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:** Currently not available
- 6.2 **Waterfowl Toxicity:** Currently not available
- 6.3 **Biological Oxygen Demand (BOD):** Currently not available
- 6.4 **Food Chain Concentration Potential:** None
- 6.5 **GESAMP Hazard Profile:**
Bioaccumulation: 0
Damage to living resources: 2
Human Oral hazard: 0
Human Contact hazard: 1
Reduction of amenities: X

7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** Commercial, 98+%
- 7.2 **Storage Temperature:** Ambient
- 7.3 **Inert Atmosphere:** No requirement
- 7.4 **Venting:** Open (flame arrester)
- 7.5 **IMO Pollution Category:** C
- 7.6 **Ship Type:** 3
- 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:** III
- 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:** 116.16
- 9.3 **Boiling Point at 1 atm:** 250°F = 121°C = 394°K
- 9.4 **Freezing Point:** -135°F = -93°C = 180°K
- 9.5 **Critical Temperature:** 559.4°F = 293°C = 566.2°K
- 9.6 **Critical Pressure:** 460 psia = 31 atm = 3.2 MN/m²
- 9.7 **Specific Gravity:** 0.879 at 20°C (liquid)
- 9.8 **Liquid Surface Tension:** 24.5 dynes/cm = 0.0245 N/m at 20°C
- 9.9 **Liquid Water Interfacial Tension:** Currently not available
- 9.10 **Vapor (Gas) Specific Gravity:** 4.0
- 9.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent
- 9.12 **Latent Heat of Vaporization:** 128 Btu/lb = 71 cal/g = 3.0 X 10⁵ J/kg
- 9.13 **Heat of Combustion:** -13,200 Btu/lb = -7330 cal/g = -306 X 10⁵ J/kg
- 9.14 **Heat of Decomposition:** Not pertinent
- 9.15 **Heat of Solution:** Not pertinent
- 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:** Currently not available

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
34	56.050	51	0.460	30	0.987	55	0.733
36	55.980	52	0.460	35	0.983	60	0.706
38	55.910	53	0.460	40	0.979	65	0.680
40	55.840	54	0.460	45	0.974	70	0.656
42	55.770	55	0.460	50	0.970	75	0.633
44	55.700	56	0.460	55	0.965	80	0.611
46	55.630	57	0.460	60	0.961	85	0.590
48	55.560	58	0.460	65	0.957	90	0.570
50	55.490	59	0.460	70	0.952	95	0.552
52	55.420	60	0.460	75	0.948	100	0.534
54	55.350	61	0.460	80	0.943	105	0.517
56	55.290	62	0.460	85	0.939	110	0.501
58	55.220	63	0.460	90	0.935	115	0.485
60	55.150	64	0.460	95	0.930	120	0.471
62	55.080	65	0.460	100	0.926		
64	55.010	66	0.460	105	0.922		
66	54.940	67	0.460	110	0.917		
68	54.870	68	0.460	115	0.913		
70	54.800	69	0.460	120	0.908		
72	54.730	70	0.460	125	0.904		
74	54.660	71	0.460	130	0.900		
76	54.590	72	0.460	135	0.895		
		73	0.460	140	0.891		
		74	0.460	145	0.886		
		75	0.460	150	0.882		
		76	0.460	155	0.878		

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
77	0.680	60	0.196	60	0.00407		N
		70	0.271	70	0.00553		O
		80	0.369	80	0.00739		T
		90	0.496	90	0.00976		
		100	0.657	100	0.01271		P
		110	0.862	110	0.01637		E
		120	1.116	120	0.02084		R
		130	1.430	130	0.02625		T
		140	1.815	140	0.03275		I
		150	2.281	150	0.04048		N
		160	2.840	160	0.04960		E
		170	3.508	170	0.06029		N
		180	4.299	180	0.07272		T
		190	5.228	190	0.08707		
		200	6.313	200	0.10360		
		210	7.572	210	0.12230		
		220	9.024	220	0.14370		
		230	10.690	230	0.16770		
		240	12.590	240	0.19480		
		250	14.750	250	0.22490		
		260	17.190	260	0.25850		
		270	19.940	270	0.29570		
		280	23.020	280	0.33670		
		290	26.450	290	0.38180		
		300	30.260	300	0.43110		
		310	34.490	310	0.48490		