

ETHYL METHACRYLATE

ETM

CAUTIONARY RESPONSE INFORMATION

Common Synonyms Ethyl 2-methacrylate Ethyl methacrylate-inhibited Ethyl alpha-methylmethacrylate Ethyl 2-methyl-2-propenoate Methacrylic acid, ethyl ester	Liquid	Colorless	Sharp unpleasant 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, 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 coughing or difficult breathing. 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 and vomiting. 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 concentration 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

- Stop discharge
- Contain
- Collection Systems: Skim
- Chemical and Physical Treatment: Burn;
- Absorb
- Clean shore line

2. CHEMICAL DESIGNATIONS

- 2.1 **CG Compatibility Group:** 14; Acrylate
- 2.2 **Formula:** CH₂=C(CH₃)COOC₂H₅
- 2.3 **IMO/UN Designation:** Not listed
- 2.4 **DOT ID No.:** 2277
- 2.5 **CAS Registry No.:** 97-63-2
- 2.6 **NAERG Guide No.:** 129P
- 2.7 **Standard Industrial Trade Classification:** 51373

3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Impervious gloves; splash goggles; self-contained breathing apparatus if exposed to vapors; coveralls
- 3.2 **Symptoms Following Exposure:** Inhalation may cause irritation of the mucous membrane. Ingestion causes irritation of mouth and stomach. Contact with liquid irritates eyes and skin.
- 3.3 **Treatment of Exposure:** INHALATION: remove victim to fresh air; apply artificial respiration and oxygen if indicated. INGESTION: induce vomiting; call a physician. EYES: wash with copious quantities of water for 15 min.; call a physician. 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 2; oral LD₅₀ = 4 g/kg (rabbit)
- 3.8 **Toxicity by Inhalation:** Currently not available.
- 3.9 **Chronic Toxicity:** Causes birth defects in experimental animals
- 3.10 **Vapor (Gas) Irritant Characteristics:** Currently not available
- 3.11 **Liquid or Solid Characteristics:** Currently not available
- 3.12 **Odor Threshold:** Currently not available
- 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 AEGL:** Not listed

4. FIRE HAZARDS

- 4.1 **Flash Point:** 85°F O.C. 80°F C.C.
- 4.2 **Flammable Limits in Air:** 1.8%(LFL)
- 4.3 **Fire Extinguishing Agents:** Foam, dry chemical, 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:** Sealed containers may rupture explosively if hot. Heat can cause a violent polymerization reaction with rapid release of energy. Vapors are heavier than air and can travel to a source of ignition and flash back.
- 4.7 **Auto Ignition Temperature:** 740°F
- 4.8 **Electrical Hazards:** Currently not available
- 4.9 **Burning Rate:** 4.56 mm/min.
- 4.10 **Adiabatic Flame Temperature:** Currently not available
- 4.11 **Stoichiometric Air to Fuel Ratio:** 35.7 (calc.)
- 4.12 **Flame Temperature:** Currently not available
- 4.13 **Combustion Molar Ratio (Reactant to Product):** 11.0 (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:** Currently not available
- 5.3 **Stability During Transport:** Stable
- 5.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
- 5.5 **Polymerization:** If proper concentration of inhibitor is not present or when material is hot, a violent polymerization reaction may occur.
- 5.6 **Inhibitor of Polymerization:** Oxygen in the air inhibits polymerization.

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: 1
 Human Oral hazard: 1
 Human Contact hazard: 1
 Reduction of amenities: XX

7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** Technical
- 7.2 **Storage Temperature:** Below 38°C (100°F)
- 7.3 **Inert Atmosphere:** Ventilated (natural)
- 7.4 **Venting:** Open (flame arrester)
- 7.5 **IMO Pollution Category:** (D)
- 7.6 **Ship Type:** 3
- 7.7 **Barge Hull Type:** 3

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).....	2
Flammability (Red).....	3
Instability (Yellow).....	0
- 8.6 **EPA Reportable Quantity:** 1000 pounds
- 8.7 **EPA Pollution Category:** C
- 8.8 **RCRA Waste Number:** U118
- 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:** 114
- 9.3 **Boiling Point at 1 atm:** 243°F = 117°C = 390°K
- 9.4 **Freezing Point:** <-58°F = <-50°C = <223°K
- 9.5 **Critical Temperature:** Not pertinent
- 9.6 **Critical Pressure:** Not pertinent
- 9.7 **Specific Gravity:** 0.9151 at 20°C (liquid)
- 9.8 **Liquid Surface Tension:** Currently not available
- 9.9 **Liquid Water Interfacial Tension:** Currently not available
- 9.10 **Vapor (Gas) Specific Gravity:** 3.9
- 9.11 **Ratio of Specific Heats of Vapor (Gas):** 1.064
- 9.12 **Latent Heat of Vaporization:** 170 Btu/lb = 96 cal/g = 4.0 X 10⁵ J/kg
- 9.13 **Heat of Combustion:** -12,670 Btu/lb = -7,040 cal/g = -294 X 10⁵ J/kg
- 9.14 **Heat of Decomposition:** Not pertinent
- 9.15 **Heat of Solution:** Not pertinent
- 9.16 **Heat of Polymerization:** -218 Btu/lb = -121 cal/g = -5.06 X 10⁵ J/kg
- 9.17 **Heat of Fusion:** Currently not available
- 9.18 **Limiting Value:** Currently not available
- 9.19 **Reid Vapor Pressure:** 0.77 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
42	57.960	60	0.450	52	1.048	60	1.001
44	57.890	61	0.450	54	1.048	61	0.992
46	57.820	62	0.450	56	1.048	62	0.984
48	57.750	63	0.450	58	1.048	63	0.975
50	57.680	64	0.450	60	1.048	64	0.967
52	57.610	65	0.450	62	1.048	65	0.959
54	57.540	66	0.450	64	1.048	66	0.951
56	57.470	67	0.450	66	1.048	67	0.943
58	57.400	68	0.450	68	1.048	68	0.935
60	57.330	69	0.450	70	1.048	69	0.927
62	57.260	70	0.450	72	1.048	70	0.919
64	57.190	71	0.450	74	1.048	71	0.912
66	57.120	72	0.450	76	1.048	72	0.904
68	57.050	73	0.450	78	1.048	73	0.897
70	56.980	74	0.450	80	1.048	74	0.889
72	56.920	75	0.450	82	1.048	75	0.882
74	56.850	76	0.450	84	1.048	76	0.875
76	56.780	77	0.450	86	1.048	77	0.868
		78	0.450			78	0.861
		79	0.450			79	0.854
		80	0.450			80	0.847
		81	0.450			81	0.840
		82	0.450			82	0.834
		83	0.450			83	0.827
		84	0.450			84	0.820
		85	0.450			85	0.814

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
	I	60	0.227	60	0.00464	0	0.261
	N	70	0.307	70	0.00617	20	0.270
	S	80	0.412	80	0.00810	40	0.278
	O	90	0.545	90	0.01053	60	0.287
	L	100	0.714	100	0.01356	80	0.295
	U	110	0.928	110	0.01730	100	0.303
	B	120	1.194	120	0.02188	120	0.311
	L	130	1.524	130	0.02744	140	0.319
	E	140	1.928	140	0.03415	160	0.327
		150	2.422	150	0.04219	180	0.335
		160	3.019	160	0.05174	200	0.343
		170	3.738	170	0.06304	220	0.350
		180	4.597	180	0.07631	240	0.358
		190	5.617	190	0.09181	260	0.365
		200	6.822	200	0.10980	280	0.372
		210	8.237	210	0.13060	300	0.379
		220	9.891	220	0.15460	320	0.387
		230	11.810	230	0.18190	340	0.393
		240	14.040	240	0.21310	360	0.400
						380	0.407
						400	0.414
						420	0.420
						440	0.427
						460	0.433
						480	0.440
						500	0.446