

# METHYL METHACRYLATE

MMM

## CAUTIONARY RESPONSE INFORMATION

<b>Common Synonyms</b> Methacrylate monomer Methacrylic acid, methyl ester Methyl a-methylacrylate Methyl 2-methyl-2-propenoate		Liquid	Colorless	Pleasant sharp odor
		Floats on water. Flammable, irritating vapor is produced.		
Keep people away. Avoid contact with liquid and vapor. Evacuate. Restrict human use; farm use. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). 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.				
<b>Fire</b>	FLAMMABLE. Flashback along vapor trail may occur. Container may explode when heated. Vapor may explode if ignited in an enclosed area. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). Combat fires from safe distance or protected location. Extinguish with dry chemical, foam, or carbon dioxide. Water may be ineffective on fire. Cool exposed containers with water.			
<b>Exposure</b>	CALL FOR MEDICAL AID. VAPOR Irritating to eyes, nose and throat. If inhaled, will cause dizziness, headache, difficult breathing or loss of consciousness. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. LIQUID Will burn skin and eyes. Harmful if swallowed. 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.			
<b>Water Pollution</b>	Dangerous to aquatic life in high concentrations. Fouling to shoreline. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.			

<b>1. CORRECTIVE RESPONSE ACTIONS</b> Dilute and disperse Stop discharge Contain Collection Systems: Skim Chemical and Physical Treatment: Absorb Clean shore line Salvage waterfowl	<b>2. CHEMICAL DESIGNATIONS</b> 2.1 CG Compatibility Group: 14; Acrylate 2.2 Formula: CH <sub>2</sub> =C(CH <sub>3</sub> )COOCH <sub>3</sub> 2.3 IMO/UN Designation: 3.2/1247 2.4 DOT ID No.: 1247 2.5 CAS Registry No.: 80-62-6 2.6 NAERG Guide No.: 129P 2.7 Standard Industrial Trade Classification: 51373
<b>3. HEALTH HAZARDS</b> 3.1 Personal Protective Equipment: Air mask; plastic gloves; goggles. 3.2 Symptoms Following Exposure: Irritation of eyes, nose, and throat. Nausea and vomiting. Liquid may cause skin irritation. 3.3 Treatment of Exposure: INHALATION: remove to fresh air; apply artificial respiration and oxygen if needed; refer to physician. SKIN OR EYES: flush with plenty of water for 15 min.; refer to physician for eye exposure. 3.4 TLV-TWA: 100 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 (rat) 3.8 Toxicity by Inhalation: Currently not available. 3.9 Chronic Toxicity: Currently not available 3.10 Vapor (Gas) Irritant Characteristics: Vapor is moderately irritating such that personnel will not usually tolerate moderate or high vapor concentrations. 3.11 Liquid or Solid Characteristics: Causes smarting of the skin and first-degree burns on short exposure; may cause secondary burns on long exposure. 3.12 Odor Threshold: 0.05 ppm 3.13 IDLH Value: 1,000 ppm 3.14 OSHA PEL-TWA: 100 ppm 3.15 OSHA PEL-STEL: Not listed. 3.16 OSHA PEL-Ceiling: Not listed. 3.17 EPA AEGL: Not listed	

<b>4. FIRE HAZARDS</b> 4.1 Flash Point: 50°F O.C. 4.2 Flammable Limits in Air: 2.1%-12.5% 4.3 Fire Extinguishing Agents: Foam, carbon dioxide, dry chemical 4.4 Fire Extinguishing Agents Not to Be Used: Water may be ineffective 4.5 Special Hazards of Combustion Products: Not pertinent 4.6 Behavior in Fire: Vapor is heavier than air and may travel a considerable distance to a source of ignition and flash back. Containers may explode in fire or when heated because of polymerization. 4.7 Auto Ignition Temperature: 790°F 4.8 Electrical Hazards: Not pertinent 4.9 Burning Rate: 2.5 mm/min. 4.10 Adiabatic Flame Temperature: Currently not available 4.11 Stoichiometric Air to Fuel Ratio: 28.6 (calc.) 4.12 Flame Temperature: Currently not available 4.13 Combustion Molar Ratio (Reactant to Product): 9.0 (calc.) 4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed	<b>7. SHIPPING INFORMATION</b> 7.1 Grades of Purity: 99.8% 7.2 Storage Temperature: Ambient 7.3 Inert Atmosphere: No requirement 7.4 Venting: Pressure-vacuum 7.5 IMO Pollution Category: D 7.6 Ship Type: 2 7.7 Barge Hull Type: 3								
<b>5. CHEMICAL REACTIVITY</b> 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: Heat, oxidizing agents, and ultraviolet light may cause polymerization. 5.6 Inhibitor of Polymerization: Hydroquinone, 22-65 ppm; hydroquinone methyl ether, 22-120 ppm; dimethyl tert-butylphenol, 45-65 ppm	<b>8. HAZARD CLASSIFICATIONS</b> 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: <table border="0"> <tr> <td>Category</td> <td>Classification</td> </tr> <tr> <td>Health Hazard (Blue).....</td> <td>2</td> </tr> <tr> <td>Flammability (Red).....</td> <td>3</td> </tr> <tr> <td>Instability (Yellow).....</td> <td>2</td> </tr> </table> 8.6 EPA Reportable Quantity: 1000 pounds 8.7 EPA Pollution Category: C 8.8 RCRA Waste Number: U162 8.9 EPA FWPCA List: Yes	Category	Classification	Health Hazard (Blue).....	2	Flammability (Red).....	3	Instability (Yellow).....	2
Category	Classification								
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Flammability (Red).....	3								
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<b>6. WATER POLLUTION</b> 6.1 Aquatic Toxicity: 250 ppm/96 hr/bluegill/TL <sub>m</sub> /fresh water 6.2 Waterfowl Toxicity: Currently not available 6.3 Biological Oxygen Demand (BOD): (theor.) 47%, 10 days 6.4 Food Chain Concentration Potential: None 6.5 GESAMP Hazard Profile: Not listed	<b>9. PHYSICAL &amp; CHEMICAL PROPERTIES</b> 9.1 Physical State at 15° C and 1 atm: Liquid 9.2 Molecular Weight: 100.12 9.3 Boiling Point at 1 atm: 214°F = 101°C = 374°K 9.4 Freezing Point: -54°F = -48°C = 225°K 9.5 Critical Temperature: 561.2°F = 294°C = 567.2°K 9.6 Critical Pressure: 485 psia = 33 atm = 3.3 MN/m <sup>2</sup> 9.7 Specific Gravity: 0.945 at 20°C (liquid) 9.8 Liquid Surface Tension: 28 dynes/cm = 0.028 N/m at 20°C 9.9 Liquid Water Interfacial Tension: 14.3 dynes/cm = 0.0143 N/m at 22.7°C 9.10 Vapor (Gas) Specific Gravity: Not pertinent 9.11 Ratio of Specific Heats of Vapor (Gas): 1.059 9.12 Latent Heat of Vaporization: 140 Btu/lb = 77 cal/g = 3.2 X 10 <sup>5</sup> J/kg 9.13 Heat of Combustion: (est.) -11,400 Btu/lb = -6,310 cal/g = -264 X 10 <sup>5</sup> J/kg 9.14 Heat of Decomposition: Not pertinent 9.15 Heat of Solution: Not pertinent 9.16 Heat of Polymerization: -248 Btu/lb = -138 cal/g = -5.78 X 10 <sup>5</sup> J/kg 9.17 Heat of Fusion: Currently not available 9.18 Limiting Value: Currently not available 9.19 Reid Vapor Pressure: 0.5 psia (Approx.)								

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	60.310	20	0.432	65	1.030	35	0.732
40	60.120	30	0.435	70	1.023	40	0.703
45	59.930	40	0.438	75	1.015	45	0.675
50	59.740	50	0.441	80	1.008	50	0.649
55	59.550	60	0.444	85	1.000	55	0.624
60	59.360	70	0.448	90	0.993	60	0.601
65	59.170	80	0.451	95	0.985	65	0.579
70	58.980	90	0.454	100	0.978	70	0.558
75	58.780	100	0.457	105	0.971	75	0.538
80	58.590	110	0.460	110	0.963	80	0.520
85	58.400	120	0.463	115	0.956	85	0.502
90	58.210	130	0.466	120	0.948	90	0.485
95	58.020	140	0.469	125	0.941	95	0.469
100	57.830	150	0.472	130	0.934	100	0.454
105	57.640	160	0.475	135	0.926	105	0.440
110	57.450	170	0.478	140	0.919	110	0.426
115	57.260	180	0.481	145	0.911	115	0.413
120	57.070	190	0.484	150	0.904	120	0.400
		200	0.487	155	0.897	125	0.389
		210	0.490	160	0.889	130	0.377
				165	0.882	135	0.367
				170	0.874	140	0.356
				175	0.867		
				180	0.859		
				185	0.852		

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
68	1.500	20	0.124	20	0.00241	0	0.321
		30	0.178	30	0.00339	25	0.334
		40	0.250	40	0.00468	50	0.348
		50	0.347	50	0.00635	75	0.361
		60	0.473	60	0.00849	100	0.373
		70	0.635	70	0.01119	125	0.386
		80	0.843	80	0.01456	150	0.398
		90	1.103	90	0.01872	175	0.410
		100	1.428	100	0.02379	200	0.422
		110	1.828	110	0.02992	225	0.434
		120	2.316	120	0.03726	250	0.445
		130	2.906	130	0.04596	275	0.457
		140	3.613	140	0.05619	300	0.468
		150	4.454	150	0.06814	325	0.478
		160	5.448	160	0.08200	350	0.489
		170	6.612	170	0.09794	375	0.499
		180	7.968	180	0.11620	400	0.509
		190	9.538	190	0.13690	425	0.519
		200	11.340	200	0.16040	450	0.529
		210	13.410	210	0.18670	475	0.539
		220	15.760	220	0.21630	500	0.548
		230	18.420	230	0.24910	525	0.557
		240	21.420	240	0.28550	550	0.566
		250	24.780	250	0.32570	575	0.574
		260	28.540	260	0.36990	600	0.583
		270	32.720	270	0.41830		