

# PROPIONALDEHYDE

PAD

CAUTIONARY RESPONSE INFORMATION				4. FIRE HAZARDS	7. SHIPPING INFORMATION								
Common Synonyms Methyl acetaldehyde Propanal Propionic aldehyde Propyl aldehyde Propylc aldehyde	Liquid Floats and mixes slowly with water. Flammable, irritating vapor is produced.	Colorless Suffocating, unpleasant odor		<p><b>4.1 Flash Point:</b> -22°F O.C.</p> <p><b>4.2 Flammable Limits in Air:</b> 2.6%-16.1%</p> <p><b>4.3 Fire Extinguishing Agents:</b> Carbon dioxide or dry chemical for small fires, alcohol-type foam for large fires.</p> <p><b>4.4 Fire Extinguishing Agents Not to Be Used:</b> Water may be ineffective.</p> <p><b>4.5 Special Hazards of Combustion Products:</b> Not pertinent</p> <p><b>4.6 Behavior in Fire:</b> Vapor is heavier than air and may travel considerable distance to a source of ignition and flash back.</p> <p><b>4.7 Auto Ignition Temperature:</b> 405°F</p> <p><b>4.8 Electrical Hazards:</b> Not pertinent</p> <p><b>4.9 Burning Rate:</b> 4.4 mm/min.</p> <p><b>4.10 Adiabatic Flame Temperature:</b> Currently not available</p> <p><b>4.11 Stoichiometric Air to Fuel Ratio:</b> 19.0 (calc.)</p> <p><b>4.12 Flame Temperature:</b> Currently not available</p> <p><b>4.13 Combustion Molar Ratio (Reactant to Product):</b> 6.0 (calc.)</p> <p><b>4.14 Minimum Oxygen Concentration for Combustion (MOCC):</b> Not listed</p>	<p><b>7.1 Grades of Purity:</b> 97-99+%</p> <p><b>7.2 Storage Temperature:</b> Ambient</p> <p><b>7.3 Inert Atmosphere:</b> No requirement</p> <p><b>7.4 Venting:</b> Open (flame arrester) or pressure-vacuum</p> <p><b>7.5 IMO Pollution Category:</b> C</p> <p><b>7.6 Ship Type:</b> 3</p> <p><b>7.7 Barge Hull Type:</b> Currently not available</p>								
	Keep people away. Avoid contact with liquid and vapor. 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. Protect water intakes.				<p><b>8. HAZARD CLASSIFICATIONS</b></p> <p><b>8.1 49 CFR Category:</b> Flammable liquid</p> <p><b>8.2 49 CFR Class:</b> 3</p> <p><b>8.3 49 CFR Package Group:</b> II</p> <p><b>8.4 Marine Pollutant:</b> No</p> <p><b>8.5 NFPA Hazard Classification:</b></p> <table> <thead> <tr> <th>Category</th> <th>Classification</th> </tr> </thead> <tbody> <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>1</td> </tr> </tbody> </table> <p><b>8.6 EPA Reportable Quantity:</b> 1000 pounds</p> <p><b>8.7 EPA Pollution Category:</b> C</p> <p><b>8.8 RCRA Waste Number:</b> Not listed</p> <p><b>8.9 EPA FWPCA List:</b> Yes</p>	Category	Classification	Health Hazard (Blue)	2	Flammability (Red)	3	Instability (Yellow)	1
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Health Hazard (Blue)	2												
Flammability (Red)	3												
Instability (Yellow)	1												
Fire	FLAMMABLE. Flashback along vapor trail may occur. Vapor may explode if ignited in an enclosed area. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). Extinguish with dry chemical, alcohol foam, carbon dioxide. Water may be ineffective on fire. Cool exposed containers with water.			<p><b>5. CHEMICAL REACTIVITY</b></p> <p><b>5.1 Reactivity with Water:</b> No reaction</p> <p><b>5.2 Reactivity with Common Materials:</b> No reaction</p> <p><b>5.3 Stability During Transport:</b> Stable</p> <p><b>5.4 Neutralizing Agents for Acids and Caustics:</b> Not pertinent</p> <p><b>5.5 Polymerization:</b> May occur in presence of acids or caustics.</p> <p><b>5.6 Inhibitor of Polymerization:</b> Not pertinent</p>	<p><b>9. PHYSICAL &amp; CHEMICAL PROPERTIES</b></p> <p><b>9.1 Physical State at 15°C and 1 atm:</b> Liquid</p> <p><b>9.2 Molecular Weight:</b> 58.08</p> <p><b>9.3 Boiling Point at 1 atm:</b> 118.4°F = 48.0°C = 321.2°K</p> <p><b>9.4 Freezing Point:</b> -112°F = -80°C = 193°K</p> <p><b>9.5 Critical Temperature:</b> 433.4°F = 223°C = 496.2°K</p> <p><b>9.6 Critical Pressure:</b> 690 psia = 47 atm = 4.8 MN/m<sup>2</sup></p> <p><b>9.7 Specific Gravity:</b> 0.805 at 20°C (liquid)</p> <p><b>9.8 Liquid Surface Tension:</b> 23.4 dynes/cm = 0.0234 N/m at 20°C</p> <p><b>9.9 Liquid Water Interfacial Tension:</b> 29 dynes/cm = 0.029 N/m at 22.7°C</p> <p><b>9.10 Vapor (Gas) Specific Gravity:</b> 2.0</p> <p><b>9.11 Ratio of Specific Heats of Vapor (Gas):</b> 1.120</p> <p><b>9.12 Latent Heat of Vaporization:</b> 211 Btu/lb = 117 cal/g = 4.9 X 10<sup>5</sup> J/kg</p> <p><b>9.13 Heat of Combustion:</b> -12,470 Btu/lb = -6930 cal/g = -290.1 X 10<sup>5</sup> J/kg</p> <p><b>9.14 Heat of Decomposition:</b> Not pertinent</p> <p><b>9.15 Heat of Solution:</b> (est.) -9 Btu/lb = -5 cal/g = 0.2 X 10<sup>5</sup> J/kg</p> <p><b>9.16 Heat of Polymerization:</b> Not pertinent</p> <p><b>9.17 Heat of Fusion:</b> Currently not available</p> <p><b>9.18 Limiting Value:</b> Currently not available</p> <p><b>9.19 Reid Vapor Pressure:</b> 6.7 psia</p>								
Exposure	CALL FOR MEDICAL AID.  VAPOR Irritating to eyes, nose and throat. If inhaled, will cause nausea or vomiting. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.  LIQUID Irritating to 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.												
Water Pollution	Effect of low concentrations on aquatic life is unknown. 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 Collection Systems: Skim Salvage waterfowl	2. CHEMICAL DESIGNATIONS 2.1 CG Compatibility Group: 19, Aldehyde 2.2 Formula: CH <sub>3</sub> CH <sub>2</sub> CHO 2.3 IMO/UN Designation: 3.2/1275 2.4 DOT ID No.: 1275 2.5 CAS Registry No.: 123-38-6 2.6 NAERG Guide No.: 129 2.7 Standard Industrial Trade Classification: 51621	3. HEALTH HAZARDS  3.1 Personal Protective Equipment: Air-supplied mask for high vapor concentrations; plastic gloves; goggles. 3.2 Symptoms Following Exposure: Vapors will irritate nose and throat, and may cause nausea and vomiting. Liquid causes eye irritation. 3.3 Treatment of Exposure: INHALATION: remove victim to fresh air; give oxygen if breathing is difficult; call a physician. EYES: flush with plenty of water for at least 15 min., and call a physician. SKIN: flush with 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; LD <sub>50</sub> = 0.5 to 5 g/kg (rat) 3.8 Toxicity by Inhalation: Currently not available. 3.9 Chronic Toxicity: Currently not available. 3.10 Vapor (Gas) Irritant Characteristics: Vapors cause moderate irritation, such that personnel will find high concentrations unpleasant. The effect is temporary. 3.11 Liquid or Solid Characteristics: Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin. 3.12 Odor Threshold: 1 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 AEGL: Not listed	3. HEALTH HAZARDS  3.1 Personal Protective Equipment: Air-supplied mask for high vapor concentrations; plastic gloves; goggles. 3.2 Symptoms Following Exposure: Vapors will irritate nose and throat, and may cause nausea and vomiting. Liquid causes eye irritation. 3.3 Treatment of Exposure: INHALATION: remove victim to fresh air; give oxygen if breathing is difficult; call a physician. EYES: flush with plenty of water for at least 15 min., and call a physician. SKIN: flush with 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; LD <sub>50</sub> = 0.5 to 5 g/kg (rat) 3.8 Toxicity by Inhalation: Currently not available. 3.9 Chronic Toxicity: Currently not available. 3.10 Vapor (Gas) Irritant Characteristics: Vapors cause moderate irritation, such that personnel will find high concentrations unpleasant. The effect is temporary. 3.11 Liquid or Solid Characteristics: Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin. 3.12 Odor Threshold: 1 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 AEGL: Not listed	6. WATER POLLUTION  6.1 Aquatic Toxicity: Currently not available 6.2 Waterfowl Toxicity: Currently not available 6.3 Biological Oxygen Demand (BOD): 95% of theoretical in 5 days 6.4 Food Chain Concentration Potential: None 6.5 GESAMP Hazard Profile: Bioaccumulation: T Damage to living resources: 2 Human Oral hazard: 1 Human Contact hazard: I Reduction of amenities: X	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
-20	53.670	0	0.502	70	1.121	35	0.456
-15	53.480	5	0.504	75	1.114	40	0.440
-10	53.290	10	0.506	80	1.106	45	0.425
-5	53.100	15	0.508	85	1.099	50	0.410
0	52.910	20	0.510	90	1.091	55	0.396
5	52.720	25	0.512	95	1.084	60	0.383
10	52.530	30	0.514	100	1.077	65	0.371
15	52.330	35	0.516	105	1.069	70	0.359
20	52.141	40	0.518	110	1.062	75	0.348
25	51.950	45	0.520	115	1.054	80	0.337
30	51.760	50	0.522			85	0.327
35	51.570	55	0.525			90	0.318
40	51.380	60	0.527			95	0.308
45	51.190	65	0.529			100	0.300
50	51.000	70	0.531			105	0.291
55	50.810	75	0.533			110	0.283
60	50.620	80	0.535			115	0.276
65	50.430	85	0.537				
70	50.240	90	0.539				
75	50.050	95	0.541				
80	49.850	100	0.543				
85	49.660	105	0.545				
90	49.470	110	0.547				
95	49.280	115	0.550				
100	49.090						
105	48.900						

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	21.000	-30	0.250	-30	0.00315	0	0.290
		-20	0.366	-20	0.00450	25	0.301
		-10	0.524	-10	0.00630	50	0.312
		0	0.736	0	0.00866	75	0.323
		10	1.016	10	0.01171	100	0.333
		20	1.381	20	0.01558	125	0.344
		30	1.849	30	0.02043	150	0.354
		40	2.440	40	0.02643	175	0.364
		50	3.180	50	0.03376	200	0.374
		60	4.095	60	0.04264	225	0.384
		70	5.214	70	0.05326	250	0.394
		80	6.570	80	0.06587	275	0.403
		90	8.197	90	0.08068	300	0.413
		100	10.130	100	0.09796	325	0.422
		110	12.420	110	0.11790	350	0.431
		120	15.100	120	0.14090	375	0.440
		130	18.210	130	0.16710	400	0.449
		140	21.810	140	0.19680	425	0.458
		150	25.940	150	0.23020	450	0.466
		160	30.660	160	0.26770	475	0.475
		170	36.020	170	0.30950	500	0.483
						525	0.491
						550	0.499
						575	0.507
						600	0.515