

# ISOPROPYL ALCOHOL

IPA

CAUTIONARY RESPONSE INFORMATION				4. FIRE HAZARDS		7. SHIPPING INFORMATION									
<b>Common Synonyms</b> Dimethylcarbinol Isopropanol Petrohol 2-Propanol sec-Propyl alcohol Rubbing alcohol		Watery liquid	Colorless	<b>4.1 Flash Point:</b> 65°F O.C. 53°F C.C. <b>4.2 Flammable Limits in Air:</b> 2.3%-12.7% <b>4.3 Fire Extinguishing Agents:</b> Alcohol foam, dry chemical, or carbon dioxide <b>4.4 Fire Extinguishing Agents Not to Be Used:</b> Water may be ineffective <b>4.5 Special Hazards of Combustion Products:</b> Not pertinent <b>4.6 Behavior in Fire:</b> Not pertinent <b>4.7 Auto Ignition Temperature:</b> 750°F <b>4.8 Electrical Hazards:</b> Class I, Group D <b>4.9 Burning Rate:</b> 2.3 mm/min. <b>4.10 Adiabatic Flame Temperature:</b> Currently not available <b>4.11 Stoichiometric Air to Fuel Ratio:</b> 21.4 (calc.) <b>4.12 Flame Temperature:</b> Currently not available <b>4.13 Combustion Molar Ratio (Reactant to Product):</b> 7.0 (calc.) <b>4.14 Minimum Oxygen Concentration for Combustion (MOCC):</b> N <sub>2</sub> diluent: 12.0%		<b>7.1 Grades of Purity:</b> 91%, 95% Anhydrous <b>7.2 Storage Temperature:</b> Ambient <b>7.3 Inert Atmosphere:</b> No requirement <b>7.4 Venting:</b> Open (flame arrester) or pressure-vacuum <b>7.5 IMO Pollution Category:</b> Currently not available <b>7.6 Ship Type:</b> Currently not available <b>7.7 Barge Hull Type:</b> Currently not available									
<b>Keep people away.</b> Shut off ignition sources and call fire department. Stay upwind and use water spray to "knock down" vapor. Avoid contact with liquid and vapor. Notify local health and pollution control agencies.															
<b>Fire</b> 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.						<b>8. HAZARD CLASSIFICATIONS</b> <b>8.1 49 CFR Category:</b> Flammable liquid <b>8.2 49 CFR Class:</b> 3 <b>8.3 49 CFR Package Group:</b> II <b>8.4 Marine Pollutant:</b> No <b>8.5 NFPA Hazard Classification:</b> <table> <tr> <th>Category</th> <th>Classification</th> </tr> <tr> <td>Health Hazard (Blue)</td> <td>1</td> </tr> <tr> <td>Flammability (Red)</td> <td>3</td> </tr> <tr> <td>Instability (Yellow)</td> <td>0</td> </tr> </table>		Category	Classification	Health Hazard (Blue)	1	Flammability (Red)	3	Instability (Yellow)	0
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<b>Exposure</b> CALL FOR MEDICAL AID.  <b>VAPOR</b> Irritating to eyes, nose and throat. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.  <b>LIQUID</b> Irritating to eyes. Harmful if swallowed. 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>5. CHEMICAL REACTIVITY</b> <b>5.1 Reactivity with Water:</b> No reaction <b>5.2 Reactivity with Common Materials:</b> No reaction <b>5.3 Stability During Transport:</b> Stable <b>5.4 Neutralizing Agents for Acids and Caustics:</b> Not pertinent <b>5.5 Polymerization:</b> Not pertinent <b>5.6 Inhibitor of Polymerization:</b> Not pertinent		<b>8.6 EPA Reportable Quantity:</b> Not listed. <b>8.7 EPA Pollution Category:</b> Not listed. <b>8.8 RCRA Waste Number:</b> Not listed <b>8.9 EPA FWPCA List:</b> Not listed									
<b>Water Pollution</b> 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.				<b>9. PHYSICAL &amp; CHEMICAL PROPERTIES</b> <b>9.1 Physical State at 15° C and 1 atm:</b> Liquid <b>9.2 Molecular Weight:</b> 60.10 <b>9.3 Boiling Point at 1 atm:</b> 180.1°F = 82.3°C = 355.5°K <b>9.4 Freezing Point:</b> -127.3°F = -88.5°C = 184.7°K <b>9.5 Critical Temperature:</b> 455.4°F = 235.2°C = 508.4°K <b>9.6 Critical Pressure:</b> 691 psia = 47.0 atm = 4.76 MN/m <sup>2</sup> <b>9.7 Specific Gravity:</b> 0.785 at 20°C (liquid) <b>9.8 Liquid Surface Tension:</b> Not pertinent <b>9.9 Liquid Water Interfacial Tension:</b> Not pertinent <b>9.10 Vapor (Gas) Specific Gravity:</b> 2.1 <b>9.11 Ratio of Specific Heats of Vapor (Gas):</b> 1.105 <b>9.12 Latent Heat of Vaporization:</b> 286 Btu/lb = 159 cal/g = 6.66 X 10 <sup>3</sup> J/kg <b>9.13 Heat of Combustion:</b> -12,960 Btu/lb = -7,201 cal/g = -301.5 X 10 <sup>3</sup> J/kg <b>9.14 Heat of Decomposition:</b> Not pertinent <b>9.15 Heat of Solution:</b> (est.) -9 Btu/lb = -5 cal/g = -0.2 X 10 <sup>5</sup> J/kg <b>9.16 Heat of Polymerization:</b> Not pertinent <b>9.17 Heat of Fusion:</b> 21.37 cal/g <b>9.18 Limiting Value:</b> Currently not available <b>9.19 Reid Vapor Pressure:</b> 1.4 psia		<b>6. WATER POLLUTION</b> <b>6.1 Aquatic Toxicity:</b> 900-1100 ppm/24 hr/chub/critical range/fresh water <b>6.2 Waterfowl Toxicity:</b> Currently not available <b>6.3 Biological Oxygen Demand (BOD):</b> 133%, 5 days <b>6.4 Food Chain Concentration Potential:</b> None <b>6.5 GESAMP Hazard Profile:</b> Bioaccumulation: 0 Damage to living resources: 0 Human Oral hazard: 1 Human Contact hazard: 0 Reduction of amenities: 0									
<b>1. CORRECTIVE RESPONSE ACTIONS</b> Dilute and disperse Stop discharge															
<b>2. CHEMICAL DESIGNATIONS</b> <b>2.1 CG Compatibility Group:</b> 20; Alcohol, glycol <b>2.2 Formula:</b> CH <sub>3</sub> CH(OH)CH <sub>3</sub> <b>2.3 IMO/UN Designation:</b> 3.2/1219 <b>2.4 DOT ID No.:</b> 1219 <b>2.5 CAS Registry No.:</b> 67-63-0 <b>2.6 NAERG Guide No.:</b> 129 <b>2.7 Standard Industrial Trade Classification:</b> 51212															
<b>3. HEALTH HAZARDS</b> <b>3.1 Personal Protective Equipment:</b> Organic vapor canister or air-supplied mask; chemical goggles or face splash shield. <b>3.2 Symptoms Following Exposure:</b> Vapors cause mild irritation of eyes and upper respiratory tract; high concentrations may be anesthetic. Liquid irritates eyes and may cause injury; harmless to skin; if ingested causes drunkenness and vomiting. <b>3.3 Treatment of Exposure:</b> INHALATION: if victim is overcome by vapors, remove from exposure immediately; call a physician; if breathing is irregular or has stopped, start resuscitation and administer oxygen. EYES: flush with water for at least 15 min. <b>3.4 TLV-TWA:</b> 400 ppm <b>3.5 TLV-STEL:</b> Not listed. <b>3.6 TLV-Ceiling:</b> 500 ppm. <b>3.7 Toxicity by Ingestion:</b> Grade 1; LD <sub>50</sub> = 5 to 15 g/kg (rat: LD <sub>50</sub> : 5.84 g/kg) <b>3.8 Toxicity by Inhalation:</b> Currently not available. <b>3.9 Chronic Toxicity:</b> Currently not available. <b>3.10 Vapor (Gas) Irritant Characteristics:</b> Vapors cause a slight smarting of the eyes or respiratory system if present in high concentrations. The effect is temporary. <b>3.11 Liquid or Solid Characteristics:</b> No appreciable hazard. Practically harmless to the skin. <b>3.12 Odor Threshold:</b> 90 mg/m <sup>3</sup> <b>3.13IDLH Value:</b> 2,000 ppm <b>3.14 OSHA PEL-TWA:</b> 400 ppm. <b>3.15 OSHA PEL-STEL:</b> Not listed. <b>3.16 OSHA PEL-Ceiling:</b> Not listed. <b>3.17 EPA AEGL:</b> Not listed															
<b>NOTES</b>															

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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	49.940	15	0.525	45	0.956		N
36	49.890	20	0.533	50	0.952		O
38	49.830	25	0.540	55	0.949		T
40	49.780	30	0.547	60	0.945		
42	49.720	35	0.554	65	0.941		
44	49.660	40	0.561	70	0.937		P
46	49.610	45	0.569	75	0.933		E
48	49.550	50	0.576	80	0.929		R
50	49.500	55	0.583	85	0.925		T
52	49.440	60	0.590	90	0.921		I
54	49.380	65	0.598	95	0.917		N
56	49.330	70	0.605	100	0.914		E
58	49.270	75	0.612	105	0.910		N
60	49.210	80	0.619	110	0.906		E
62	49.160	85	0.626	115	0.902		N
64	49.100						
66	49.050						
68	48.990						
70	48.930						
72	48.880						
74	48.820						
76	48.760						
78	48.710						
80	48.650						
82	48.600						
84	48.540						

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
M	40	0.223	40	0.00250		0	0.312
I	50	0.328	50	0.00361		25	0.325
S	60	0.476	60	0.00513		50	0.339
C	70	0.678	70	0.00717		75	0.352
I	80	0.953	80	0.00988		100	0.365
B	90	1.319	90	0.01343		125	0.378
L	100	1.801	100	0.01802		150	0.390
E	110	2.429	110	0.02387		175	0.403
	120	3.237	120	0.03126		200	0.416
	130	4.266	130	0.04050		225	0.428
	140	5.563	140	0.05194		250	0.440
	150	7.183	150	0.06596		275	0.453
	160	9.188	160	0.08302		300	0.465
	170	11.650	170	0.10360		325	0.477
	180	14.650	180	0.12820		350	0.489
	190	18.270	190	0.15740		375	0.500
	200	22.610	200	0.19190		400	0.512
	210	27.790	210	0.23240		425	0.524
						450	0.535
						475	0.546
						500	0.557
						525	0.568
						550	0.579
						575	0.590
						600	0.601