

# ISOPROPYL ETHER

IPE

CAUTIONARY RESPONSE INFORMATION				4. FIRE HAZARDS	7. SHIPPING INFORMATION								
Common Synonyms Disopropyl ether Disopropyl oxide 2-Isoproxy propane	Liquid	Colorless	Sweet odor	<p>4.1 Flash Point: -15°F O.C., • -18°F C.C.</p> <p>4.2 Flammable Limits in Air: 1.4%-7.9%</p> <p>4.3 Fire Extinguishing Agents: Dry chemical, alcohol foam, carbon dioxide</p> <p>4.4 Fire Extinguishing Agents Not to Be Used: Water may be ineffective.</p> <p>4.5 Special Hazards of Combustion Products: Not pertinent</p> <p>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 when heated.</p> <p>4.7 Auto Ignition Temperature: 830°F</p> <p>4.8 Electrical Hazards: Currently not available</p> <p>4.9 Burning Rate: 5.0 mm/min.</p> <p>4.10 Adiabatic Flame Temperature: Currently not available</p> <p>4.11 Stoichiometric Air to Fuel Ratio: 42.8 (calc.)</p> <p>4.12 Flame Temperature: Currently not available</p> <p>4.13 Combustion Molar Ratio (Reactant to Product): 13.0 (calc.)</p> <p>4.14 Minimum Oxygen Concentration for Combustion (MOCC): N<sub>2</sub> diluent: 10.0%</p>	<p>7.1 Grades of Purity: 94+% May contain 0.01% hydroquinone or other inhibitor to prevent peroxide formation.</p> <p>7.2 Storage Temperature: Ambient</p> <p>7.3 Inert Atmosphere: No requirement</p> <p>7.4 Venting: Pressure-vacuum</p> <p>7.5 IMO Pollution Category: D</p> <p>7.6 Ship Type: 3</p> <p>7.7 Barge Hull Type: 3</p>								
Evacuate. Keep people away. Shut off ignition sources. Call fire department. Stay upwind. Use water spray to "knock down" vapor. Notify local health and pollution control agencies.				8. HAZARD CLASSIFICATIONS									
<b>Fire</b> 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>8.1 49 CFR Category: Flammable liquid</p> <p>8.2 49 CFR Class: 3</p> <p>8.3 49 CFR Package Group: II</p> <p>8.4 Marine Pollutant: No</p> <p>8.5 NFPA Hazard Classification:</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>		Category	Classification	Health Hazard (Blue)	2	Flammability (Red)	3	Instability (Yellow)	1
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<b>Exposure</b> Call for medical aid.  <b>VAPOR</b> Irritating to eyes, nose and throat. If inhaled will cause headache, dizziness, or nausea. Move victim to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.  <b>LIQUID</b> Irritating to skin and eyes. 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.				<p>8.6 EPA Reportable Quantity: Not listed.</p> <p>8.7 EPA Pollution Category: Not listed.</p> <p>8.8 RCRA Waste Number: Not listed</p> <p>8.9 EPA FWP/CA List: Not listed</p>									
<b>Water Pollution</b> 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.				9. PHYSICAL & CHEMICAL PROPERTIES									
<b>1. CORRECTIVE RESPONSE ACTIONS</b> Dilute and disperse Stop discharge Contain Collection Systems: Skim Chemical and Physical Treatment: Burn; Absorb		<b>2. CHEMICAL DESIGNATIONS</b> 2.1 CG Compatibility Group: 41; Ethers 2.2 Formula: (CH <sub>3</sub> ) <sub>2</sub> CHOCH(CH <sub>3</sub> ) <sub>2</sub> 2.3 IMO/UN Designation: 3.1/1159 2.4 DOT ID No.: 1159 2.5 CAS Registry No.: 108-20-3 2.6 NAERG Guide No.: 127 2.7 Standard Industrial Trade Classification: 51616											
<b>3. HEALTH HAZARDS</b> <p>3.1 Personal Protective Equipment: Air pack or organic canister mask; rubber gloves; goggles.</p> <p>3.2 Symptoms Following Exposure: Inhalation causes anesthesia, nausea, headache, dizziness, and irritation of the eyes and nose. Contact of liquid with eyes causes only minor injury; repeated contact with skin will remove natural oils and may cause dermatitis.</p> <p>3.3 Treatment of Exposure: INHALATION: remove victim to fresh air and obtain medical attention immediately; keep him warm and at rest, and give artificial respiration if breathing stops; maintain an open airway. EYES: flush with water for 15 min. SKIN: flush with water. INGESTION: do NOT induce vomiting; get medical attention.</p> <p>3.4 TLV-TWA: Not listed.</p> <p>3.5 TLV-STEL: Not listed.</p> <p>3.6 TLV-Ceiling: Not listed.</p> <p>3.7 Toxicity by Ingestion: Grade 1; oral LD<sub>50</sub> = 8,470 mg/kg (rat)</p> <p>3.8 Toxicity by Inhalation: Currently not available.</p> <p>3.9 Chronic Toxicity: Currently not available</p> <p>3.10 Vapor (Gas) Irritancy Characteristics: Vapors cause a slight smarting of the eyes or respiratory system if present in high concentrations. The effect is temporary.</p> <p>3.11 Liquid or Solid Characteristics: Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.</p> <p>3.12 Odor Threshold: Currently not available</p> <p>3.13 IDLH Value: Not listed.</p> <p>3.14 OSHA PEL-TWA: Not listed.</p> <p>3.15 OSHA PEL-STEL: Not listed.</p> <p>3.16 OSHA PEL-Ceiling: Not listed.</p> <p>3.17 EPA AEGL: Not listed</p>													
<b>6. WATER POLLUTION</b> <p>6.1 Aquatic Toxicity: Currently not available</p> <p>6.2 Waterfowl Toxicity: Currently not available</p> <p>6.3 Biological Oxygen Demand (BOD): Currently not available</p> <p>6.4 Food Chain Concentration Potential: None</p> <p>6.5 GESAMP Hazard Profile:            Bioaccumulation: 0            Damage to living resources: 2            Human Oral hazard: 0            Human Contact hazard: 0            Reduction of amenities: 0         </p>													
<b>7. SHIPPING INFORMATION</b> <p>7.1 Grades of Purity: 94+% May contain 0.01% hydroquinone or other inhibitor to prevent peroxide formation.</p> <p>7.2 Storage Temperature: Ambient</p> <p>7.3 Inert Atmosphere: No requirement</p> <p>7.4 Venting: Pressure-vacuum</p> <p>7.5 IMO Pollution Category: D</p> <p>7.6 Ship Type: 3</p> <p>7.7 Barge Hull Type: 3</p>													
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<b>9. PHYSICAL &amp; CHEMICAL PROPERTIES</b> <p>9.1 Physical State at 15° C and 1 atm: Liquid</p> <p>9.2 Molecular Weight: 102.2</p> <p>9.3 Boiling Point at 1 atm: 156°F = 69°C = 342°K</p> <p>9.4 Freezing Point: -123°F = -86°C = 187°K</p> <p>9.5 Critical Temperature: 440.4°F = 226.9°C = 500.1°K</p> <p>9.6 Critical Pressure: 418 psia = 28.4 atm = 2.88 MN/m<sup>2</sup></p> <p>9.7 Specific Gravity: 0.724 at 20°C (liquid)</p> <p>9.8 Liquid Surface Tension: 17.1 dynes/cm = 0.0171 N/m at 25°C</p> <p>9.9 Liquid Water Interfacial Tension: 17.1 dynes/cm = 0.0171 N/m at 25°C</p> <p>9.10 Vapor (Gas) Specific Gravity: 3.5</p> <p>9.11 Ratio of Specific Heats of Vapor (Gas): 1.0590</p> <p>9.12 Latent Heat of Vaporization: 131 Btu/lb = 73 cal/g = 3.1 X 10<sup>3</sup> J/kg</p> <p>9.13 Heat of Combustion: -16,900 Btu/lb = -9,390 cal/g = -393 X 10<sup>3</sup> J/kg</p> <p>9.14 Heat of Decomposition: Not pertinent</p> <p>9.15 Heat of Solution: Not pertinent</p> <p>9.16 Heat of Polymerization: Not pertinent</p> <p>9.17 Heat of Fusion: 25.79 cal/g</p> <p>9.18 Limiting Value: Currently not available</p> <p>9.19 Reid Vapor Pressure: High</p>													
<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
35	46.450	0	0.476	42	1.048	28	0.589
40	46.260	5	0.478	44	1.048	30	0.577
45	46.070	10	0.480	46	1.048	32	0.566
50	45.880	15	0.482	48	1.048	34	0.555
55	45.690	20	0.485	50	1.048	36	0.545
60	45.500	25	0.487	52	1.048	38	0.534
65	45.310	30	0.489	54	1.048	40	0.524
70	45.120	35	0.491	56	1.048	42	0.515
75	44.930	40	0.494	58	1.048	44	0.505
80	44.740	45	0.496	60	1.048	46	0.496
85	44.540	50	0.498	62	1.048	48	0.487
90	44.350	55	0.500	64	1.048	50	0.478
95	44.160	60	0.502	66	1.048	52	0.470
100	43.970	65	0.505	68	1.048	54	0.461
105	43.780	70	0.507	70	1.048	56	0.453
110	43.590	75	0.509	72	1.048	58	0.445
115	43.400	80	0.511	74	1.048	60	0.437
120	43.210	85	0.514	76	1.048	62	0.430
125	43.020					64	0.423
130	42.830					66	0.415
135	42.640					68	0.408
140	42.450					70	0.402
						72	0.395
						74	0.388
						76	0.382
						78	0.376

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	1.200	35	0.975	35	0.01876	0	0.310
		40	1.119	40	0.02132	20	0.321
		45	1.281	45	0.02416	40	0.333
		50	1.462	50	0.02732	60	0.344
		55	1.665	55	0.03081	80	0.355
		60	1.892	60	0.03466	100	0.366
		65	2.144	65	0.03891	120	0.377
		70	2.424	70	0.04357	140	0.388
		75	2.734	75	0.04869	160	0.398
		80	3.077	80	0.05429	180	0.409
		85	3.456	85	0.06041	200	0.419
		90	3.873	90	0.06708	220	0.428
		95	4.331	95	0.07434	240	0.438
		100	4.834	100	0.08223	260	0.448
		105	5.385	105	0.09079	280	0.457
		110	5.987	110	0.10010	300	0.466
		115	6.644	115	0.11010	320	0.475
		120	7.361	120	0.12090	340	0.484
		125	8.140	125	0.13250	360	0.492
		130	8.986	130	0.14510	380	0.501
		135	9.904	135	0.15860	400	0.509
		140	10.900	140	0.17300	420	0.517
		145	11.970	145	0.18850	440	0.525
		150	13.130	150	0.20510		
		155	14.380	155	0.22280		