

2-NITROPROPANE

NPP

CAUTIONARY RESPONSE INFORMATION				4. FIRE HAZARDS	7. SHIPPING INFORMATION								
Common Synonyms Isobutane sec-Nitropropane 2-NP	Liquid	Colorless	Mild, fruity odor	<p>4.1 Flash Point: 100°F O.C. 82°F C.C.</p> <p>4.2 Flammable Limits in Air: 2.6% (LFL)</p> <p>4.3 Fire Extinguishing Agents: Foam, dry chemical, carbon dioxide</p> <p>4.4 Fire Extinguishing Agents Not to Be Used: "Alcohol" foam; water may be ineffective.</p>	<p>7.1 Grades of Purity: Technical, 94+%</p> <p>7.2 Storage Temperature: Ambient</p> <p>7.3 Inert Atmosphere: No requirement</p> <p>7.4 Venting: Open (flame arrester)</p> <p>7.5 IMO Pollution Category: D</p> <p>7.6 Ship Type: 3</p> <p>7.7 Barge Hull Type: 3</p>								
Keep people away. Avoid contact with liquid and vapor. 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>4.5 Special Hazards of Combustion Products: Toxic oxides of nitrogen may form in fire.</p> <p>4.6 Behavior in Fire: Currently not available</p> <p>4.7 Auto Ignition Temperature: 802°F</p> <p>4.8 Electrical Hazards: Currently not available</p> <p>4.9 Burning Rate: Currently not available</p> <p>4.10 Adiabatic Flame Temperature: Currently not available</p>	<p>8. HAZARD CLASSIFICATIONS</p> <p>8.1 49 CFR Category: Flammable liquid</p> <p>8.2 49 CFR Class: 3</p> <p>8.3 49 CFR Package Group: III</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>1</td> </tr> <tr> <td>Flammability (Red).....</td> <td>2</td> </tr> <tr> <td>Instability (Yellow).....</td> <td>2</td> </tr> </tbody> </table> <p>8.6 EPA Reportable Quantity: 10 pounds</p> <p>8.7 EPA Pollution Category: A</p> <p>8.8 RCRA Waste Number: U171</p> <p>8.9 EPA FWCNA List: Not listed</p>	Category	Classification	Health Hazard (Blue).....	1	Flammability (Red).....	2	Instability (Yellow).....	2
Category	Classification												
Health Hazard (Blue).....	1												
Flammability (Red).....	2												
Instability (Yellow).....	2												
Fire	Combustible. 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>5. CHEMICAL REACTIVITY</p> <p>5.1 Reactivity with Water: No reaction</p> <p>5.2 Reactivity with Common Materials: May attack some forms of plastics</p> <p>5.3 Stability During Transport: Stable</p> <p>5.4 Neutralizing Agents for Acids and Caustics: Not pertinent</p> <p>5.5 Polymerization: Not pertinent</p> <p>5.6 Inhibitor of Polymerization: Not pertinent</p>								
Exposure	CALL FOR MEDICAL AID. VAPOR Irritating to eyes, nose and throat. If inhaled will cause headache, dizziness, 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. LIQUID Irritating to skin and eyes. If swallowed will cause nausea, and vomiting. Remove contaminated clothing and shoes. Flush affected area 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>6. WATER POLLUTION</p> <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: O Damage to living resources: 1 Human Oral hazard: 2 Human Contact hazard: II Reduction of amenities: XX</p>								
Water Pollution	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.				<p>9. PHYSICAL & CHEMICAL PROPERTIES</p> <p>9.1 Physical State at 15°C and 1 atm: Liquid</p> <p>9.2 Molecular Weight: 89.09</p> <p>9.3 Boiling Point at 1 atm: 248.5°F = 120.3°C = 393.5°K</p> <p>9.4 Freezing Point: -132°F = -91°C = 182°K</p> <p>9.5 Critical Temperature: Currently not available</p> <p>9.6 Critical Pressure: Currently not available</p> <p>9.7 Specific Gravity: 0.99 at 20°C (liquid)</p> <p>9.8 Liquid Surface Tension: 30 dynes/cm = 0.030 N/m at 20°C</p> <p>9.9 Liquid Water Interfacial Tension: Currently not available</p> <p>9.10 Vapor (Gas) Specific Gravity: 3.06 at 16°C</p> <p>9.11 Ratio of Specific Heats of Vapor (Gas): 1.090 at 20°C</p> <p>9.12 Latent Heat of Vaporization: 178 Btu/lb = 99 cal/g = 4.1 X 10⁵ J/kg</p> <p>9.13 Heat of Combustion: -9,650 Btu/lb = -5,360 cal/g = -224 X 10⁵ 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: Currently not available</p> <p>9.18 Limiting Value: Currently not available</p> <p>9.19 Reid Vapor Pressure: Currently not available</p>								
<p>1. CORRECTIVE RESPONSE ACTIONS</p> <p>Dilute and disperse Stop discharge Contain Collection Systems: Skim; Pump Chemical and Physical Treatment: Absorb Do not burn Clean shore line Salvage waterfowl</p> <p>2. CHEMICAL DESIGNATIONS</p> <p>2.1 CG Compatibility Group: 42; Nitrocompound</p> <p>2.2 Formula: CH₃CH(NO₂)CH₃</p> <p>2.3 IMO/UN Designation: Not listed</p> <p>2.4 DOT ID No.: 2608</p> <p>2.5 CAS Registry No.: 79-46-9</p> <p>2.6 NAERG Guide No.: 129</p> <p>2.7 Standard Industrial Trade Classification: 51140</p> <p>3. HEALTH HAZARDS</p> <p>3.1 Personal Protective Equipment: Self-contained breathing apparatus; goggles or face shield; rubber gloves</p> <p>3.2 Symptoms Following Exposure: Inhalation causes respiratory tract irritation, headache, dizziness, nausea, and diarrhea. Ingestion causes irritation of mouth and stomach. Contact with liquid irritates eyes and causes mild irritation of skin.</p> <p>3.3 Treatment of Exposure: INHALATION: In case of pulmonary symptoms, enforce bed rest and give oxygen; get medical attention at once. INGESTION: give large amount of water and induce vomiting. EYES OR SKIN: flush with water.</p> <p>3.4 TLV-TWA: 10 ppm</p> <p>3.5 TLV-STEL: Not listed.</p> <p>3.6 TLV-Ceiling: Not listed.</p> <p>3.7 Toxicity by Ingestion: Grade 2; oral rat LD₅₀ = 720 mg/kg</p> <p>3.8 Toxicity by Inhalation: Currently not available.</p> <p>3.9 Chronic Toxicity: Causes liver cancer in rats</p> <p>3.10 Vapor (Gas) Irritant 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 skin.</p> <p>3.12 Odor Threshold: 300 ppm</p> <p>3.13 IDLH Value: 100 ppm</p> <p>3.14 OSHA PEL-TWA: 25 ppm.</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>				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
60	62.100		N	80	0.889	52	0.865
61	62.060		O	90	0.877	54	0.852
62	62.030		T	100	0.864	56	0.839
63	61.990			110	0.852	58	0.827
64	61.950		P	120	0.840	60	0.815
65	61.910		E	130	0.828	62	0.803
66	61.870		R	140	0.815	64	0.791
67	61.840		T	150	0.803	66	0.780
68	61.800		I	160	0.791	68	0.769
69	61.760		N	170	0.779	70	0.758
70	61.720		E	180	0.766	72	0.747
71	61.680		N	190	0.754	74	0.737
72	61.640		T	200	0.742	76	0.727
73	61.610			210	0.730	78	0.717
74	61.570			220	0.717	80	0.707
75	61.530			230	0.705	82	0.697
76	61.490					84	0.688
77	61.450					86	0.679
78	61.420					88	0.670
79	61.380					90	0.661
80	61.340					92	0.653
81	61.300					94	0.644
82	61.260						
83	61.230						
84	61.190						
85	61.150						

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
34	1.473	60	0.237	60	0.00378	0	0.239
36	1.487	70	0.317	70	0.00497	20	0.248
38	1.500	80	0.420	80	0.00646	40	0.257
40	1.513	90	0.551	90	0.00832	60	0.266
42	1.527	100	0.716	100	0.01062	80	0.274
44	1.540	110	0.921	110	0.01342	100	0.283
46	1.553	120	1.176	120	0.01683	120	0.291
48	1.567	130	1.488	130	0.02094	140	0.300
50	1.580	140	1.868	140	0.02586	160	0.308
52	1.593	150	2.328	150	0.03169	180	0.316
54	1.607	160	2.881	160	0.03859	200	0.324
56	1.620	170	3.541	170	0.04667	220	0.331
58	1.633	180	4.324	180	0.05610	240	0.339
60	1.647	190	5.248	190	0.06704	260	0.347
62	1.660	200	6.332	200	0.07966	280	0.354
64	1.673	210	7.597	210	0.09415	300	0.361
66	1.687	220	9.067	220	0.11070	320	0.368
68	1.700	230	10.760	230	0.12950	340	0.375
70	1.713	240	12.720	240	0.15090	360	0.382
72	1.727					380	0.389
74	1.740					400	0.395
76	1.753					420	0.402
78	1.767					440	0.408
80	1.780					460	0.415
82	1.793					480	0.421
84	1.807					500	0.427