

# ETHYLIDENE NORBORNENE

ENB

## CAUTIONARY RESPONSE INFORMATION

<b>Common Synonyms</b> 5-Ethylidenebicyclo (2, 2, 1)hept-2-ene Ethylidenenorbornylene Ethylidenenorcamphene		Liquid  White  Turpentine-like odor  Floats on water.
<p><b>KEEP PEOPLE AWAY. AVOID CONTACT WITH LIQUID AND VAPOR.</b>                  Avoid inhalation.                  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>		
<b>Fire</b>	Combustible. Extinguish with dry chemicals, alcohol 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 headache, 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 POISONOUS IF SWALLOWED. Irritating to skin and eyes. If swallowed will cause nausea and vomiting. 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 and have victim induce vomiting. IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.	
<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.	

### 1. CORRECTIVE RESPONSE ACTIONS

Stop discharge  
 Contain  
 Collection Systems: Skim  
 Chemical and Physical Treatment: Burn;  
 Absorb  
 Clean shore line  
 Salvage waterfowl

### 2. CHEMICAL DESIGNATIONS

2.1 **CG Compatibility Group:** Not listed.  
 2.2 **Formula:** C<sub>8</sub>H<sub>12</sub>  
 2.3 **IMO/UN Designation:** Not listed  
 2.4 **DOT ID No.:** Not listed  
 2.5 **CAS Registry No.:** 16219-75-3  
 2.6 **NAERG Guide No.:** Not listed  
 2.7 **Standard Industrial Trade Classification:** 51129

### 3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Organic canister or air-supplied mask; goggles or face shield; rubber gloves
- 3.2 **Symptoms Following Exposure:** Inhalation of vapors causes headache, confusion, and respiratory distress. Ingestion causes irritation of entire digestive system. Aspiration causes severe pneumonia. Contact with liquid causes irritation of eyes and skin.
- 3.3 **Treatment of Exposure:** INHALATION: remove victim to fresh air; administer artificial respiration and oxygen if required; call a doctor. INGESTION: give large amount of water and induce vomiting; get medical attention at once. EYES: flush with water for at least 15 min. SKIN: wipe off, wash with soap and water.
- 3.4 **TLV-TWA:** Not listed.  
 3.5 **TLV-STEL:** Not listed.  
 3.6 **TLV-Ceiling:** 5 ppm  
 3.7 **Toxicity by Ingestion:** Grade 2; oral LD<sub>50</sub> = 2.83 g/kg (rat)  
 3.8 **Toxicity by Inhalation:** Currently not available.  
 3.9 **Chronic Toxicity:** Causes kidney lesions and gain in kidney and liver weights in rats  
 3.10 **Vapor (Gas) Irritant Characteristics:** Vapors are moderately irritating such that personnel will not usually tolerate moderate or high concentrations.  
 3.11 **Liquid or Solid Characteristics:** Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of skin.  
 3.12 **Odor Threshold:** 0.007 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

### 4. FIRE HAZARDS

- 4.1 **Flash Point:** 98°F O.C.  
 4.2 **Flammable Limits in Air:** Currently not available  
 4.3 **Fire Extinguishing Agents:** Dry chemical, foam, carbon dioxide  
 4.4 **Fire Extinguishing Agents Not to Be Used:** Water may be ineffective  
 4.5 **Special Hazards of Combustion Products:** Currently not available  
 4.6 **Behavior in Fire:** Currently not available  
 4.7 **Auto Ignition Temperature:** Currently not available  
 4.8 **Electrical Hazards:** Currently not available  
 4.9 **Burning Rate:** Currently not available  
 4.10 **Adiabatic Flame Temperature:** Currently not available  
 4.11 **Stoichiometric Air to Fuel Ratio:** 57.1 (calc.)  
 4.12 **Flame Temperature:** Currently not available  
 4.13 **Combustion Molar Ratio (Reactant to Product):** 15.0 (calc.)  
 4.14 **Minimum Oxygen Concentration for Combustion (MOCC):** Not listed

### 5. CHEMICAL REACTIVITY

- 5.1 **Reactivity with Water:** No reaction  
 5.2 **Reactivity with Common Materials:** Currently not available  
 5.3 **Stability During Transport:** Stable  
 5.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent  
 5.5 **Polymerization:** Currently not available  
 5.6 **Inhibitor of Polymerization:** Currently not available

### 6. WATER POLLUTION

- 6.1 **Aquatic Toxicity:** Currently not available  
 6.2 **Waterfowl Toxicity:** Currently not available  
 6.3 **Biological Oxygen Demand (BOD):** Currently not available  
 6.4 **Food Chain Concentration Potential:** None  
 6.5 **GESAMP Hazard Profile:** Not listed

### 7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** Commercial, 99+%  
 7.2 **Storage Temperature:** Ambient  
 7.3 **Inert Atmosphere:** No requirement  
 7.4 **Venting:** Open (flame arrester)  
 7.5 **IMO Pollution Category:** B  
 7.6 **Ship Type:** 3  
 7.7 **Barge Hull Type:** 2

### 8. HAZARD CLASSIFICATIONS

- 8.1 **49 CFR Category:** Not listed  
 8.2 **49 CFR Class:** Not pertinent  
 8.3 **49 CFR Package Group:** Not listed.  
 8.4 **Marine Pollutant:** No  
 8.5 **NFPA Hazard Classification:** Not listed  
 8.6 **EPA Reportable Quantity:** Not listed.  
 8.7 **EPA Pollution Category:** Not listed.  
 8.8 **RCRA Waste Number:** Not listed  
 8.9 **EPA FWPCA List:** Not listed

### 9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 **Physical State at 15° C and 1 atm:** Liquid  
 9.2 **Molecular Weight:** 120.2  
 9.3 **Boiling Point at 1 atm:** 297.7°F = 147.6°C = 420.8°K  
 9.4 **Freezing Point:** -112°F = -80°C = 193°K  
 9.5 **Critical Temperature:** Not pertinent  
 9.6 **Critical Pressure:** Not pertinent  
 9.7 **Specific Gravity:** 0.896 at 20°C (liquid)  
 9.8 **Liquid Surface Tension:** Currently not available  
 9.9 **Liquid Water Interfacial Tension:** Currently not available  
 9.10 **Vapor (Gas) Specific Gravity:** 4.1  
 9.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent  
 9.12 **Latent Heat of Vaporization:** Currently not available  
 9.13 **Heat of Combustion:** (est.) -18,000 Btu/lb = -10,450 cal/g = -437 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:** Currently not available  
 9.17 **Heat of Fusion:** Currently not available  
 9.18 **Limiting Value:** Currently not available  
 9.19 **Reid Vapor Pressure:** 0.23 psia

### 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
52	56.490		N	52	1.048		N
54	56.420		O	54	1.048		O
56	56.350		T	56	1.048		T
58	56.280			58	1.048		
60	56.210		P	60	1.048		P
62	56.140		E	62	1.048		E
64	56.070		R	64	1.048		R
66	56.000		T	66	1.048		T
68	55.930		I	68	1.048		I
70	55.860		N	70	1.048		N
72	55.790		E	72	1.048		E
74	55.720		N	74	1.048		N
76	55.650		T	76	1.048		T
78	55.580			78	1.048		
80	55.510			80	1.048		
82	55.440			82	1.048		
84	55.380			84	1.048		
86	55.310			86	1.048		

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	0.010	60	0.062	60	0.00134		N
		70	0.087	70	0.00183		O
		80	0.119	80	0.00247		T
		90	0.161	90	0.00328		
		100	0.216	100	0.00433		P
		110	0.287	110	0.00564		E
		120	0.377	120	0.00728		R
		130	0.492	130	0.00934		T
		140	0.635	140	0.01185		I
		150	0.813	150	0.01493		N
		160	1.032	160	0.01866		E
		170	1.301	170	0.02314		N
		180	1.629	180	0.02851		N
		190	2.024	190	0.03489		T
		200	2.499	200	0.04242		
		210	3.067	210	0.05127		
		220	3.740	220	0.06161		
		230	4.535	230	0.07363		
		240	5.468	240	0.08752		
		250	6.560	250	0.10350		
		260	7.829	260	0.12180		
		270	9.298	270	0.14270		
		280	10.990	280	0.16640		
		290	12.940	290	0.19320		
		300	15.160	300	0.22350		