

ETHYLENE

ETL

CAUTIONARY RESPONSE INFORMATION

Common Synonyms Ethene Olefiant gas		Liquefied compressed gas Colorless Sweet odor
Floats and boils on water. Flammable visible vapor cloud is produced.		
<p>Evacuate. Keep people away. Avoid inhalation. Wear self-contained breathing apparatus. Shut off ignition sources and call fire department. Avoid contact with liquid. Stay upwind and use water spray to "knock down" vapor. Notify local health and pollution control agencies.</p>		
Fire	<p>FLAMMABLE. Flashback along vapor trail may occur. May explode if ignited in an enclosed area. Wear self-contained breathing apparatus. Stop flow of gas if possible. Cool exposed containers and men effecting shutoff with water. Let fire burn.</p>	
Exposure	<p>CALL FOR MEDICAL AID. VAPOR Not irritating to eyes, nose or throat. If inhaled, will cause headache, dizziness, or loss of consciousness. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. LIQUID Will cause frostbite. Flush affected areas with plenty of water. DO NOT RUB AFFECTED AREAS.</p>	
Water Pollution	Not harmful to aquatic life.	

1. CORRECTIVE RESPONSE ACTIONS

Stop discharge
Chemical and Physical Treatment: Burn

2. CHEMICAL DESIGNATIONS

- 2.1 CG Compatibility Group: 30; Olefin
- 2.2 Formula: C₂H₄
- 2.3 IMO/UN Designation: 2.0/1962 (compressed); 2.0/1038 (liquefied)
- 2.4 DOT ID No.: 1962 (compressed); 1038 (liquefied)
- 2.5 CAS Registry No.: 74-85-1
- 2.6 NAERG Guide No.: 116P (compressed); 115 (liquid)
- 2.7 Standard Industrial Trade Classification: 51111

3. HEALTH HAZARDS

- 3.1 Personal Protective Equipment: Organic vapor canister or air-supplied mask.
- 3.2 Symptoms Following Exposure: Moderate concentration in air causes drowsiness, dizziness, and unconsciousness. Overexposure causes headache, drowsiness, muscular weakness.
- 3.3 Treatment of Exposure: Remove victim to fresh air, give artificial respiration and oxygen if breathing has stopped, and call a physician.
- 3.4 TLV-TWA: Simple asphyxiant.
- 3.5 TLV-STEL: Not listed.
- 3.6 TLV-Ceiling: Not listed.
- 3.7 Toxicity by Ingestion: Not pertinent
- 3.8 Toxicity by Inhalation: Currently not available.
- 3.9 Chronic Toxicity: None
- 3.10 Vapor (Gas) Irritant Characteristics: Vapors are nonirritating to the eyes and throat.
- 3.11 Liquid or Solid Characteristics: No appreciable hazard. Practically harmless to the skin, but may cause frostbite.
- 3.12 Odor Threshold: Currently not available
- 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: -213°F (approx.) C.C.
- 4.2 Flammable Limits in Air: 2.75%-28.6%
- 4.3 Fire Extinguishing Agents: Stop flow of gas if possible. Use carbon dioxide, dry chemical, water fog.
- 4.4 Fire Extinguishing Agents Not to Be Used: Not pertinent
- 4.5 Special Hazards of Combustion Products: Vapors are anesthetic.
- 4.6 Behavior in Fire: Container may explode.
- 4.7 Auto Ignition Temperature: 842°F
- 4.8 Electrical Hazards: Class I, group C
- 4.9 Burning Rate: 7.4 mm/min.
- 4.10 Adiabatic Flame Temperature: 2600. (Est.)
- 4.11 Stoichiometric Air to Fuel Ratio: 14.3 (calc.)
- 4.12 Flame Temperature: Currently not available
- 4.13 Combustion Molar Ratio (Reactant to Product): 4.0 (calc.)
- 4.14 Minimum Oxygen Concentration for Combustion (MOCC): N₂ diluent: 10.0%; CO₂ diluent: 11.5%

5. CHEMICAL REACTIVITY

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

6. WATER POLLUTION

- 6.1 Aquatic Toxicity: 22 ppm/1 hr/sunfish/killed/fresh water
- 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: 99-100%
- 7.2 Storage Temperature: Ambient (gas); -155°F (liquid)
- 7.3 Inert Atmosphere: No requirement
- 7.4 Venting: Safety relief
- 7.5 IMO Pollution Category: Currently not available
- 7.6 Ship Type: 2
- 7.7 Barge Hull Type: Currently not available

8. HAZARD CLASSIFICATIONS

- 8.1 49 CFR Category: Flammable gas
- 8.2 49 CFR Class: 2.1
- 8.3 49 CFR Package Group: Not pertinent.
- 8.4 Marine Pollutant: No
- 8.5 NFPA Hazard Classification:

Category	Classification
Health Hazard (Blue).....	1
Flammability (Red).....	4
Instability (Yellow).....	2
- 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: Gas
- 9.2 Molecular Weight: 28.05
- 9.3 Boiling Point at 1 atm: -154.7°F = -103.7°C = 169.5°K
- 9.4 Freezing Point: -272.4°F = -169.1°C = 104.1°K
- 9.5 Critical Temperature: 49.8°F = 9.9°C = 283.1°K
- 9.6 Critical Pressure: 742 psia = 50.5 atm = 5.11 MN/m²
- 9.7 Specific Gravity: 0.569 at -103.8°C (liquid)
- 9.8 Liquid Surface Tension: 16 dynes/cm = 0.016 N/m at -104°C
- 9.9 Liquid Water Interfacial Tension: (est.) 50 dynes/cm = 0.05 N/m at -104°C
- 9.10 Vapor (Gas) Specific Gravity: 1.0
- 9.11 Ratio of Specific Heats of Vapor (Gas): 1.240
- 9.12 Latent Heat of Vaporization: 207.7 Btu/lb = 115.4 cal/g = 4.832 X 10⁵ J/kg
- 9.13 Heat of Combustion: -20,290 Btu/lb = -11,272 cal/g = -471.94 X 10⁵ J/kg
- 9.14 Heat of Decomposition: Not pertinent
- 9.15 Heat of Solution: Not pertinent
- 9.16 Heat of Polymerization: Not pertinent
- 9.17 Heat of Fusion: Currently not available
- 9.18 Limiting Value: Currently not available
- 9.19 Reid Vapor Pressure: Currently not available

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
-165	36.090	-215	0.597		N	-165	0.199
-160	35.810	-210	0.601		O	-160	0.190
-155	35.530	-205	0.604		T	-155	0.181
		-200	0.607				
		-195	0.611		P		
		-190	0.614		E		
		-185	0.617		R		
		-180	0.621		T		
		-175	0.624		I		
		-170	0.627		N		
		-165	0.631		E		
		-160	0.634		N		
		-155	0.637		T		

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
	N	-250	0.121	-250	0.00151	0	0.332
	O	-240	0.252	-240	0.00300	25	0.344
	T	-230	0.488	-230	0.00555	50	0.357
	P	-220	0.884	-220	0.00964	75	0.369
	E	-210	1.517	-210	0.01588	100	0.381
	R	-200	2.482	-200	0.02497	125	0.394
	T	-190	3.895	-190	0.03774	150	0.406
	I	-180	5.894	-180	0.05507	175	0.417
	N	-170	8.637	-170	0.07791	200	0.429
	E	-160	12.300	-160	0.10720	225	0.441
	N	-150	17.070	-150	0.14400	250	0.452
	T	-140	23.160	-140	0.18930	275	0.464
		-130	30.780	-130	0.24400	300	0.475
		-120	40.160	-120	0.30890	325	0.486
		-110	51.520	-110	0.38500	350	0.497
		-100	65.099	-100	0.47300	375	0.508
						400	0.519
						425	0.529
						450	0.540
						475	0.550
						500	0.560
						525	0.571
						550	0.581
						575	0.591
						600	0.600