

N-ETHYL MORPHOLINE

EMN

CAUTIONARY RESPONSE INFORMATION

Common Synonyms 4-Ethylmorpholine	Liquid	Colorless to slight yellow	Ammonia-like
Wear impervious protective clothing and approved respirator. Shut off ignition sources and call fire department. Notify local health and pollution control agencies. Protect water intakes.			
Fire	Flammable. Toxic gases, such as ammonia and nitrogen oxides, may be produced. Wear full protective clothing with self-contained breathing apparatus. Extinguish fire with alcohol foam, carbon dioxide, or dry chemical.		
Exposure	CALL FOR MEDICAL AID. VAPOR Move victim to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. LIQUID Irritating to skin and eyes. Remove contaminated clothing and shoes. Wash affected areas with soap and water. IF IN EYES, hold eyelids open and flush with plenty of water. If swallowed, and victim is conscious, give large quantities of water and induce vomiting.		
Water Pollution	Effect of low concentrations on aquatic life is unknown. 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
Dilute and disperse

2. CHEMICAL DESIGNATIONS

- 2.1 CG Compatibility Group: Not listed.
- 2.2 Formula: C₆H₁₁ON(C₂H₅)
- 2.3 IMO/UN Designation: Currently not available
- 2.4 DOT ID No.: Not listed.
- 2.5 CAS Registry No.: 100-74-3
- 2.6 NAERG Guide No.: Not listed
- 2.7 Standard Industrial Trade Classification: 51579

3. HEALTH HAZARDS

- 3.1 Personal Protective Equipment: Impervious protective clothing and gloves, full face shield; approved respirator.
- 3.2 Symptoms Following Exposure: Exposure can cause irritation of eyes, nose and throat. Contact with eyes may result in foggy vision and seeing halos around lights.
- 3.3 Treatment of Exposure: Get medical attention. INHALATION: Remove to fresh air. If breathing has stopped, give artificial respiration. EYES: Flush with water for at least 15 min., lifting lids occasionally. Contact lenses should not be worn when working with this chemical. SKIN: Flush with water. INGESTION: If the victim is conscious, give large quantity of water immediately, then induce vomiting.
- 3.4 TLV-TWA: 5 ppm
- 3.5 TLV-STEL: Not listed.
- 3.6 TLV-Ceiling: Not listed.
- 3.7 Toxicity by Ingestion: Grade 2; oral rat LD₅₀ = 1.78 g/kg
- 3.8 Toxicity by Inhalation: Currently not available.
- 3.9 Chronic Toxicity: Vapor causes visual disturbances and irritates mucous membranes. There is a possibility that eye damage could be permanent.
- 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.
- 3.11 Liquid or Solid Characteristics: Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.
- 3.12 Odor Threshold: 25 ppm
- 3.13 IDLH Value: 100 ppm
- 3.14 OSHA PEL-TWA: 20 ppm
- 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: 90°F C.C.
- 4.2 Flammable Limits in Air: LEL: 1.0%; UEL: 9.8%
- 4.3 Fire Extinguishing Agents: Alcohol foam, carbon dioxide, dry chemical.
- 4.4 Fire Extinguishing Agents Not to Be Used: Water.

4.5 Special Hazards of Combustion

Products: Irritating vapors and toxic gases, such as ammonia, nitrogen oxides, and carbon monoxide, may be formed when involved in fire.

- 4.6 Behavior in Fire: Can react vigorously with heat or flame.

- 4.7 Auto Ignition Temperature: Currently not available

- 4.8 Electrical Hazards: Will attack some forms of plastics, rubber, and coatings (insulators).

- 4.9 Burning Rate: Currently not available

- 4.10 Adiabatic Flame Temperature: Currently not available

- 4.11 Stoichiometric Air to Fuel Ratio: 46.4 (calc.)

- 4.12 Flame Temperature: Currently not available

- 4.13 Combustion Molar Ratio (Reactant to Product): 13.5 (calc.)

- 4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed

7. SHIPPING INFORMATION

- 7.1 Grades of Purity: 99%; technical.
- 7.2 Storage Temperature: Ambient.
- 7.3 Inert Atmosphere: No requirement.
- 7.4 Venting: Not listed.
- 7.5 IMO Pollution Category: Currently not available
- 7.6 Ship Type: Currently not available
- 7.7 Barge Hull Type: Currently not available

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:
- | Category | Classification |
|----------------------|----------------|
| Health Hazard (Blue) | 2 |
| Flammability (Red) | 3 |
| Instability (Yellow) | 0 |

- 8.6 EPA Reportable Quantity: Not listed.

- 8.7 EPA Pollution Category: Not listed.

- 8.8 RCRA Waste Number: Not listed

- 8.9 EPA FWCNA List: Not listed

9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 Physical State at 15°C and 1 atm: Liquid

- 9.2 Molecular Weight: 115.2

- 9.3 Boiling Point at 1 atm: 281°F = 138.6°C = 411.6°K

- 9.4 Freezing Point: -81°F = -63°C = 210°K

- 9.5 Critical Temperature: Currently not available

- 9.6 Critical Pressure: Currently not available

- 9.7 Specific Gravity: 0.916 at 20°C

- 9.8 Liquid Surface Tension: Currently not available

- 9.9 Liquid Water Interfacial Tension: Currently not available

- 9.10 Vapor (Gas) Specific Gravity: 4.0

- 9.11 Ratio of Specific Heats of Vapor (Gas): Currently not available

- 9.12 Latent Heat of Vaporization: Currently not available

- 9.13 Heat of Combustion: Currently not available

- 9.14 Heat of Decomposition: Currently not available

- 9.15 Heat of Solution: Currently not available

- 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
68	7.640		C U R R E N T L Y N O T A V A I L A B L E		C U R R E N T L Y N O T A V A I L A B L E		C U R R E N T L Y N O T A V A I L A B L E

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 I S C I B L E	68	0.097	68	0.00197		C U R R E N T L Y N O T A V A I L A B L E