**N-AMINOETHYL PIPERAZINE**

### CAUTIONARY RESPONSE INFORMATION

<table>
<thead>
<tr>
<th>Common Synonyms</th>
<th>Liquid</th>
<th>Color/condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, (2-Aminoethyl) piperazine</td>
<td>Liquid</td>
<td>Colorless to light colored</td>
</tr>
<tr>
<td>N-(2-Aminoethyl) piperazine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-Piperazine ethanamine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USAF DD-46</td>
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</tbody>
</table>

**Fire**

- Combustible: Fire may produce irritating or poisonous gases. Flammable, poisonous gases may accumulate in tanks and hopper cars. May ignite combustibles (wood, paper, oil, etc.).
- Extinguish with dry chemical, CO\(_2\), water spray or alcohol foam.
- Container: If container is exposed to flames, cool containers with water from the side until well after fire is out.

**Exposure**

- CALL FOR MEDICAL AID.
- VAPOR: Irritating to eyes, nose, and throat. Move victim to fresh air. If breathing is stopped, give artificial respiration. Give oxygen.
- LIQUID: Contact causes burns to skin and eyes. Remove and isolate contaminated clothing and shoes at the site. In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes. If swallowed, do not induce vomiting. Keep victim quiet and maintain normal body temperature.

**Water Pollution**

- Effects of low concentrations on aquatic life are not known. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of local water intakes.

### 1. CORRECTIVE RESPONSE ACTIONS

**Shop discharge**

**Contain**

**Collection Systems:** Skim

### 2. CHEMICAL DESIGNATIONS

<table>
<thead>
<tr>
<th>Category</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>CG Compatibility Group: 7; Aliphatic amines</td>
</tr>
<tr>
<td>2.2</td>
<td>Formula: C(<em>4)H(</em>{12})N</td>
</tr>
<tr>
<td>2.3</td>
<td>IMO UN Designation: 82185</td>
</tr>
<tr>
<td>2.4</td>
<td>DOT II No.: 2015</td>
</tr>
<tr>
<td>2.5</td>
<td>CAS Registry No.: 140-31-8</td>
</tr>
<tr>
<td>2.6</td>
<td>NAEEM Guide No.: 153</td>
</tr>
<tr>
<td>2.7</td>
<td>Standard Industrial Trade Classification: 51453</td>
</tr>
</tbody>
</table>

### 3. HEALTH HAZARDS

**3.1 Personal Protective Equipment:** Wear approved respirator, chemical resistant gloves, safety goggles, rubber boots, and protective clothing.

**3.2 Symptoms Following Exposure:** INHALATION: Burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. EYES AND SKIN: Extremely destructive to mucous membranes, upper respiratory tract, eyes and skin. Causes burns on short contact.

**3.3 Treatment of Exposure:** INHALATION: Remove to fresh air; if not breathing, give artificial respiration; if breathing is difficult, give oxygen. SKIN: Remove contaminated clothing and shoes, flush affected areas with plenty of water. EYES: Hold eyelids open and flush with water for at least 15 minutes.

**3.4 TLV-TWA:** Not listed.

**3.5 TLV-STEL:** Not listed.

**3.6 TLV-Ceiling:** Not listed.

**3.7 Toxicity by Ingestion:** Grade 2; LD\(_50\) = 2.14 g/kg (rat)

**3.8 Toxicity by Inhalation:** Currently not available

**3.9 Chronic Toxicity:** Currently not available

3.10 Vapor (Gas) Irritant Characteristics: Vapors cause severe irritation of eyes and throat and can cause lung injury. They cannot be tolerated even at low concentrations.

**3.11 Liquid or Solid Characteristics:** Causes second and third degree burns on short contact, and is very poisonous to the eyes.

**3.12 Odor Threshold:** Currently not available

**3.13 DLH 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:** 200°F C.C.
- **4.2 Flammable Limits in Air:** Currently not available
- **4.3 Fire Extinguishing Agents:** Dry chemical, alcohol foam, water spray
- **4.4 Fire Extinguishing Agents Not to Be Used:** Not pertinent
- **4.5 Special Hazards of Combustion Products:** Toxic fumes of NO.
- **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:** Currently not available
- **4.12 Flame Temperature:** Currently not available
- **4.13 Combustion Molar Ratio (Reactant to Product):** Currently not available
- **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:** No reaction

**5.3 Stability During Transport:** Stable

**5.4 Neutralizing Agents for Acids and CAustic:** Dry lime, soda ash

**5.5 Polymerization:** Not pertinent

**5.6 Inhibitor of Polymerization:** Not pertinent

### 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:** Currently not available
- **6.5 GESAMP Hazard Profile:** Bioaccumulation: 0

### 7. SHIPPING INFORMATION

- **7.1 Grades of Purity:** 97%
- **7.2 Storage Temperature:** Currently not available
- **7.3 Inert Atmosphere:** Currently not available
- **7.4 Venting:** Currently not available
- **7.5 IMO Pollution Category:** D
- **7.6 Ship Type:** 3
- **7.7 Barge Hull Type:** Currently not available

### 8. HAZARD CLASSIFICATIONS

- **8.1 49 CFR Category:** Corrosive material
- **8.2 49 CFR Class:** 8
- **8.3 49 CFR Package Group:** III
- **8.4 Marine Pollutant:** No
- **8.5 NFPA Hazard Classification:** Not listed

### 9. PHYSICAL & CHEMICAL PROPERTIES

- **9.1 Physical State at 15°C and 1 atm:** Liquid
- **9.2 Molecular Weight:** 129.24
- **9.3 Boiling Point at 1 atm:** 429°F = 220°C = 493 K
- **9.4 Freezing Point:** -2°F = -19°C = 254 K
- **9.5 Critical Temperature:** Currently not available
- **9.6 Critical Pressure:** Currently not available
- **9.7 Specific Gravity:** 0.8862 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:** 4.4
- **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:** Currently not available
- **9.17 Heat of Fusion:** Currently not available
- **9.18 Limiting Values:** Currently not available
- **9.19 Reid Vapor Pressure:** Currently not available

### NOTES

- **JUNE 1999**
<table>
<thead>
<tr>
<th>Temperature (degrees F)</th>
<th>Pounds per cubic foot</th>
<th>Temperature (degrees F)</th>
<th>British thermal unit per pound-F</th>
<th>Temperature (degrees F)</th>
<th>British thermal unit inch per hour-square foot-F</th>
<th>Temperature (degrees F)</th>
<th>Centipoise</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Saturated Liquid Density</strong></td>
<td></td>
<td><strong>Liquid Heat Capacity</strong></td>
<td><strong>Liquid Thermal Conductivity</strong></td>
<td><strong>Liquid Viscosity</strong></td>
<td><strong>Solubility in Water</strong></td>
<td><strong>Saturated Vapor Pressure</strong></td>
<td><strong>Saturated Vapor Density</strong></td>
</tr>
</tbody>
</table>
| **Temperature** | **C** | **R** | **E** | **N** | **T** | **L** | **Y** | **N** | **O** | **T** | **A** | **V** | **A** | **I** | **L** | **A** | **B** | **E** | **C** | **U** | **R** | **E** | **N** | **T** | **L** | **Y** | **N** | **O** | **T** | **A** | **V** | **A** | **I** | **L** | **A** | **B** | **E** | **C** | **U** | **R** | **E** | **N** | **T** | **L** | **Y** | **N** | **O** | **T** | **A** | **V** | **A** | **I** | **L** | **A** | **B** | **E** | **C** | **U** | **R** | **E** | **N** | **T** | **L** | **Y** | **N** | **O** | **T** | **A** | **V** | **A** | **I** | **L** | **A** | **B** | **E** | **C** | **U** | **R** | **E** | **N** | **T** | **L** | **Y** | **N** | **O** | **T** | **A** | **V** | **A** | **I** | **L** | **A** | **B** | **E** | **C** | **U** | **R** | **E** | **N** | **T** | **L** | **Y** | **N** | **O** | **T** | **A** | **V** | **A** | **I** | **L** | **A** | **B** | **E** | **C** | **U** | **R** | **E** | **N** | **T** | **L** | **Y** | **N** | **O** | **T** | **A** | **V** | **A** | **I** | **L** | **A** | **B** | **E** | **C** | **U** | **R** | **E** | **N** | **T** | **L** | **Y** | **N** | **O** | **T** | **A** | **V** | **A** | **I** | **L** | **A** | **B** | **E** | **C** | **U** | **R** | **E** | **N** | **T** | **L** | **Y** | **N** | **O** | **T** | **A** | **V** | **A** | **I** | **L** | **A** | **B** | **E** | **C** | **U** | **R** | **E** | **N** | **T** | **L** | **Y** | **N** | **O** | **T** | **A** | **V** | **A** | **I** | **L** | **A** | **B** | **E** | **C** | **U** | **R** | **E** | **N** | **T** | **L** | **Y** | **N** | **O** | **T** | **A** | **V** | **A** | **I** | **L** | **A** | **B** | **E** | **C** | **U** | **R** | **E** | **N** | **T** | **L** | **Y** | **N** | **O** | **T** | **A** | **V** | **A** | **I** | **L** | **A** | **B** | **E** | **C** | **U** | **R** | **E** | **N** | **T** | **L** | **Y** | **N** | **O** | **T** | **A** | **V** | **A** | **I** | **L** | **A** | **B** | **E** | **C** | **U** | **R** | **E** | **N** | **T** | **L** | **Y** | **N** | **O** | **T** | **A** | **V** | **A** | **I** | **L** | **A** | **B** | **E** | **C** | **U** | **R** | **E** | **N** | **T** | **L** | **Y** | **N** | **O** | **T** | **A** | **V** | **A** | **I** | **L** | **A** | **B** | **E** | **C** | **U** | **R** | **E** | **N** | **T** |**