**POLYETHYLENE POLYAMINES**

### CAUTIONARY RESPONSE INFORMATION

<table>
<thead>
<tr>
<th>Common Synonyms</th>
<th>Liquid</th>
<th>Amine odor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poly(ethyleneimine)</td>
<td>Yellowish</td>
<td>Amine odor</td>
</tr>
<tr>
<td>Polyethyleneimine</td>
<td>Miscible in water.</td>
<td></td>
</tr>
</tbody>
</table>

**KEEP PEOPLE AWAY. AVOID CONTACT WITH LIQUID AND VAPOR.**

- Wear self-contained positive pressure breathing apparatus
- and full protective clothing.
- Shut off ignition sources. Call fire department.
- Notify local health and pollution control agencies.
- Protect water intakes.

### 4. FIRE HAZARDS

4.1 Flash Point:
- 206.6°F

4.2 Flammable Limits in Air:
- Currently not available

4.3 Fire Extinguishing Agents:
- Small fires: dry chemicals, CO₂, water spray or alcohol foam. Large fires: water spray, fog or alcohol foam.

4.4 Fire Extinguishing Agents Not To Be Used:
- Not pertinent

5.  CHEMICAL REACTIVITY

5.1 Reactivity with Water:
- No reaction

5.2 Reactivity with Common Materials:
- Incompatible with aluminum, zinc and other nonferrous metals.

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:
- 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
- Damage to living resources: (2) Human Oral hazard: 1
- Human Contact hazard: 0
- Reduction of amenities: 0

### 7. SHIPPING INFORMATION

7.1 Grades of Purity:
- Currently not available

7.2 Storage Temperature:
- Ambient

7.3 Inert Atmosphere:
- No requirement

7.4 Ventings:
- Open

7.5 IMO Pollution Category:
- (C)

7.6 Ship Type:
- 3

7.7 Barge Hull Type:
- 3

### 9. PHYSICAL & CHEMICAL PROPERTIES

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

9.2 Molecular Weight:
- Currently not available

9.3 Boiling Point at 1 atm:
- 401.9°F = 205°C = 478°K

9.4 Freezing Point:
- Not pertinent

9.5 Critical Temperature:
- Not pertinent

9.6 Critical Pressure:
- Not pertinent

9.7 Specific Gravity:
- 0.99 (temperature unknown)

9.8 Liquid Surface Tension:
- Currently not available

9.9 Liquid Water Interfacial Tension:
- Currently not available

9.10 Vapor (Gas) Specific Gravity:
- Currently not available

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:
- Not pertinent

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
## Polyethylene Polyamines

### 9.20 Saturated Liquid Density

<table>
<thead>
<tr>
<th>Temperature (degrees F)</th>
<th>Pounds per cubic foot</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURRENTLY</td>
<td>NOT CURRENTLY</td>
</tr>
<tr>
<td>AVAILABLE</td>
<td>AVAILABLE</td>
</tr>
</tbody>
</table>

### 9.21 Liquid Heat Capacity

<table>
<thead>
<tr>
<th>Temperature (degrees F)</th>
<th>British thermal unit per pound-F</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURR</td>
<td>NOT CURR</td>
</tr>
<tr>
<td>AVAILABLE</td>
<td>AVAILABLE</td>
</tr>
</tbody>
</table>

### 9.22 Liquid Thermal Conductivity

<table>
<thead>
<tr>
<th>Temperature (degrees F)</th>
<th>British thermal unit inch per hour-square foot-F</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURR</td>
<td>NOT CURR</td>
</tr>
<tr>
<td>AVAILABLE</td>
<td>AVAILABLE</td>
</tr>
</tbody>
</table>

### 9.23 Liquid Viscosity

<table>
<thead>
<tr>
<th>Temperature (degrees F)</th>
<th>Centipoise</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURR</td>
<td>NOT CURR</td>
</tr>
<tr>
<td>AVAILABLE</td>
<td>AVAILABLE</td>
</tr>
</tbody>
</table>

### 9.24 Solubility in Water

<table>
<thead>
<tr>
<th>Temperature (degrees F)</th>
<th>Pounds per 100 pounds of water</th>
</tr>
</thead>
<tbody>
<tr>
<td>MISCELLANEOUS</td>
<td>CURRENTLY</td>
</tr>
<tr>
<td>NOT</td>
<td>AVAILABLE</td>
</tr>
</tbody>
</table>

### 9.25 Saturated Vapor Pressure

<table>
<thead>
<tr>
<th>Temperature (degrees F)</th>
<th>Pounds per square inch</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURR</td>
<td>NOT CURR</td>
</tr>
<tr>
<td>AVAILABLE</td>
<td>AVAILABLE</td>
</tr>
</tbody>
</table>

### 9.26 Saturated Vapor Density

<table>
<thead>
<tr>
<th>Temperature (degrees F)</th>
<th>Pounds per cubic foot</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURR</td>
<td>NOT CURR</td>
</tr>
<tr>
<td>AVAILABLE</td>
<td>AVAILABLE</td>
</tr>
</tbody>
</table>

### 9.27 Ideal Gas Heat Capacity

<table>
<thead>
<tr>
<th>Temperature (degrees F)</th>
<th>British thermal unit per pound-F</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOT</td>
<td>PERTINENT</td>
</tr>
<tr>
<td>AVAILABLE</td>
<td>AVAILABLE</td>
</tr>
</tbody>
</table>

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**JUNE 1999**