**Technical Bulletin**

**JEFFAMINE® D-4000 Polyetheramine**

**JEFFAMINE® D-4000** polyetheramine is characterized by repeating oxypropylene units in the backbone. As shown by the representative structure, JEFFAMINE D-4000 polyetheramine is a difunctional, primary amine with average molecular weight of about 4000. The primary amine groups are located on secondary carbon atoms at the end of the aliphatic polyether chains.

![Representative Structure](structure.png)

**APPLICATIONS**
- Key ingredient in the formulation of polyurea RIM
- Co-curing agent in epoxy systems which require increased flexibility and toughness
- General polymer flexibilizer

**BENEFITS**
- Relatively low viscosity, color and vapor pressure
- Improved flexibility from high molecular weight polyether backbone
- Increase peel strength

**SALES SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Property</th>
<th>Specifications</th>
<th>Test Method*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Colorless to pale yellow liquid with slight haze permitted</td>
<td>ST-30.1</td>
</tr>
<tr>
<td>Color, Pt-Co</td>
<td>75 max.</td>
<td>ST-30.12</td>
</tr>
<tr>
<td>Conversion, total amine as</td>
<td>95 – 98 %</td>
<td>ST-5.22</td>
</tr>
<tr>
<td>% of total acetylatables</td>
<td></td>
<td></td>
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<tr>
<td>Primary amine, % of total amine</td>
<td>95 min.</td>
<td>ST-5.34</td>
</tr>
<tr>
<td>Total amine, meq/g</td>
<td>0.44 – 0.52</td>
<td>ST-5.22</td>
</tr>
<tr>
<td>Water, wt%</td>
<td>0.25 max.</td>
<td>ST-31.53, 6</td>
</tr>
</tbody>
</table>

*Methods of Test are available from Huntsman Corporation upon request.

**ADDITIONAL INFORMATION**

**Regulatory Information**
- DOT/TDG Classification: Amines, liquid, corrosive, n.o.s. (polyoxypropylenediamine)
- HMIS Code: 3-1-0
- CAS Number: 9046-10-0
- US, TSCA: Listed
- Canadian WHMIS Classification: D1B, E
- Canada, DSL: Listed
- European Union, EINECS/ELINCS: Polymer Exempt
- Australia, AICS: Listed
- Japan, ENCS: Contact Huntsman Regulatory
- Korea, ECL: Listed
- China, IECSC: Listed

**Typical Properties**
- AHEW (amine hydrogen equivalent wt.), g/eq: 1000
- Equivalent wt. with isocyanates, g/eq: 2000
- Viscosity, cSt, 25°C (77°F): 877
- Density, g/ml, 25°C (77°F): 0.994
- Density, lb/gal, 25°C (77°F): 8.29
- Flash point, PMCC, °C (°F): 227 (440)
TOXICITY AND SAFETY
For additional information on the toxicity and safe handling of this product, consult the Material Safety Data Sheet (Safety Data Sheet in Europe) prior to use of this product.

HANDLING AND STORAGE
Materials of Construction

At temperatures of 75-100°F (24-38°C)
- Tanks: Carbon steel
- Lines, valves: Carbon steel
- Pumps: Carbon steel
- Heat exchange Surfaces: Stainless steel
- Hoses: Stainless steel, polyethylene, polypropylene, and TEFLO® (elastomers such as neoprene, Buna N, and VITON® should be avoided)
- Gaskets, packing: Polypropylene or TEFLO®
- Atmosphere: Nitrogen or dry air

At temperatures above 100°F (38°C)
- Tanks: Stainless steel or aluminum
- Lines, Valves: Stainless steel
- Pumps: Stainless steel or Carpenter 20 equivalent
- Atmosphere: Nitrogen

JEFFAMINE® D-4000 polyetheramine may be stored under air at ambient temperatures for extended periods. A nitrogen blanket is suggested for all storage, however, to reduce the effect of accidental exposure to high temperatures and to reduce the absorption of atmospheric moisture and carbon dioxide. It should be noted that pronounced discoloration is likely to occur at temperatures above 140°F (60°C), whatever the gaseous pad.

Cleanout of lines and equipment containing JEFFAMINE D-4000 polyetheramine can be accomplished using warm water and steam. In the event of spillage of this product, the area may be flushed with water. The proper method for disposal of waste material is by incineration with strict observance of all federal, state, and local regulations.

AVAILABILITY
JEFFAMINE D-4000 polyetheramine is available in tank cars, tank wagons, and 55-gallon (208L) drums. Samples are available in North America and Asia by contacting our sample department at 1-800-662-0924. Samples in other locations, including Europe, are available by contacting any Huntsman Corporation sales office.

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