FlexaTram™-HMT

HEXAMETHYLENETETRAMINE
FlexaTram-HMT-100 and FlexaTram-HMT-200, hexamethylenetetramine, are used to synthesize chemical compounds such as resins, plastics, personal care and rubber additives. Ascend has been producing FlexaTram-HMT for over 50 years at one of its world-class facilities in Chocolate Bayou, Texas.

**Also known as:**
- Hexamine
- Methenamine
- Aminoform
- Urotropine

FlexaTram-HMT products are used as a catalyst in the synthesis of phenol, melamine and urea-formaldehyde based resins and as a curing agent in the preparation of novolac phenolic resin systems. These resins are versatile synthetic materials with outstanding mechanical properties, bonding performance, chemical and water resistance and flame retardancy.

**FlexaTram-HMT is used in phenolic systems to make the following products:**
- Foundry resins
- Brake and clutch linings
- Abrasive products
- Non-woven textiles
- Proppant coatings

**Novolacs pre-polymer**

![Novolacs pre-polymer](image)

**Novolacs (cross-linked)**

![Novolacs (cross-linked)](image)
### Specifications and properties

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>FlexaTram-HMT-100 (Aqueous ~32% solution)</th>
<th>FlexaTram-HMT-200 (Aqueous ~41% solution)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molar mass</td>
<td>140.1 g/mol</td>
<td>140.1 g/mol</td>
</tr>
<tr>
<td>Appearance</td>
<td>Clear solution, no suspended particles</td>
<td>Colorless to slightly yellow solution</td>
</tr>
<tr>
<td>Relative density (g/cm³)</td>
<td>1.00-1.10</td>
<td>1.00-1.15</td>
</tr>
<tr>
<td>Hexamine content (wt.%)</td>
<td>31-33</td>
<td>40-42</td>
</tr>
<tr>
<td>pH</td>
<td>9.5-11.5</td>
<td>8.0-10.0</td>
</tr>
<tr>
<td>APHA color</td>
<td>20 max</td>
<td>20 max</td>
</tr>
<tr>
<td>Ash (wt. %)</td>
<td>0.02% max on solid HMTA</td>
<td>0.02% on solid HMTA</td>
</tr>
</tbody>
</table>

### Other uses of FlexaTram-HMT

- **Personal care:** A formaldehyde donor at use levels of 0.01-1.0 phr
  - Cosmetics, foot cream and deodorants as an antibacterial and fungicidal agent
  - Hair dye fixative as a preservative
- **Curing agent for rubber and epoxy:** Use levels of 0.5-2.5 phr
  - High-temperature accelerators with medium to long curing ranges and slow curing rates, preventing early stage rubber sagging
  - Secondary accelerators to control curing rates such as mercapto, sulphenamide, thiuram and dithiocarbamate
- **Combustion:** As a fuel additive in combustible solid fuel cubes and in RDX for the explosive industry
- **Adhesives:** In elastic glues as an adhesion promoter for direct bonding of
  - Rubber-to-fabric
  - Rubber-to-metal (steel cords)
- **Intermediate:** For the synthesis of chelating agents and other agro compounds
- **Food additives:** As a cheese preservative and fungicide for citrus fruits
- **Medical:** As a methenamine mandelate and hippurate treatment of urinary tract infections
- **Rubber:** The manufacturing of dinitrosopentamethylene-tetramine, a blowing agent for rubber
About Ascend

Headquartered in Houston, Texas, Ascend Performance Materials is one of the world’s largest fully integrated producers of nylon 6,6 resin. As the world’s only large-scale converter of acrylonitrile to adiponitrile, Ascend is uniquely positioned for the production of dozens of amines, acids, esters and intermediates used in a variety of end applications. Our integrated manufacturing processes allow us to produce a wide range of specialty chemicals. Ascend’s specialty chemicals are used in hundreds of brand-name adhesives, coatings, cleansers and detergents. Ascend manufactures chemicals at its facilities in Alabama, Florida and Texas.

For more information on our specialty chemicals visit us at ascendmaterials.com/specialtychemicals