Ascend Performance Materials offers a number of high performance additives for the paints and coatings industry. Ascend’s portfolio of specialty chemicals includes unique amines and solvents that can help reduce VOCs and improve performance and durability.

### Isocyanate Precursor

**HEXATRAN TTI**

As a precursor for triaminononanetriisocyanate (TTI), Hexatran™ promotes easy workability and low viscosity at high solids. Hexatran’s unique aliphatic structure provides alternate routes to carbamates and isocyanates. Urethanes produced with Hexatran TTI maintain yellowing and perform well in harsh conditions, even at reduced thickness.

#### KEY CHARACTERISTICS

- High boiling point
- Low vapor pressure
- Low to no smell
- Clear color
- High amine value

#### HEXATRAN TTI PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solids (wt. %)</td>
<td>100</td>
</tr>
<tr>
<td>Isocyanate equivalent weight (g)</td>
<td>84</td>
</tr>
<tr>
<td>Viscosity at 25°C (cst)</td>
<td>10</td>
</tr>
<tr>
<td>Composition (monomer, %)</td>
<td>&gt;99</td>
</tr>
<tr>
<td>Molecular weight (g/mol)</td>
<td>251</td>
</tr>
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</tr>
</tbody>
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**Hexatran TTI PROPERTIES**

- Solids (wt. %) 100
- Isocyanate equivalent weight (g) 84
- Viscosity at 25°C (cst) 10
- Composition (monomer, %) >99

### About Ascend

Ascend Performance Materials is a global leader in the production of high-quality plastics, chemicals, and fibers. As the world’s largest fully integrated manufacturer of nylon 6,6 resins, our manufacturing processes are vertically integrated, ensuring the highest level of quality and economies of scale. Ascend’s specialty chemicals and blends of acids, amines and esters are used in a variety of applications and industries. We offer customized solutions through formulated products and superior technical support.

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China
+86 21 6340 3300

ascendmaterials.com/specialtychemicals
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<tr>
<td>Isooctane equivalent weight (g)</td>
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<tr>
<td>Viscosity at 25°C (cst)</td>
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</tr>
<tr>
<td>Composition (monomer, %)</td>
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</tr>
<tr>
<td>Molecular weight (g/mol)</td>
<td>251</td>
</tr>
<tr>
<td>Boiling point at 1 torr</td>
<td>198</td>
</tr>
<tr>
<td>Viscosity at 20°C (torr)</td>
<td>0.00001</td>
</tr>
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</table>

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Korea
+82 (0)2 6940 3000

ascendmaterials.com/specialtychemicals
**Amines for Epoxy**

Hexatran™ and cycloaliphatic FlexaTram™-DAM provide exceptional performance, like enhanced curing time, improved flow, and chemical and heat resistance.

**Characteristics**
- High boiling point
- Low vapor pressure
- Low to no smell
- Low color mostly clear
- High amine value

**Properties**
- **Appearance**: Liquid
- **Color**: Clear
- **GC-VOC (%)***: <0.2
- **Molecular weight (g/mol)**: 386
- **Density at 25°C (lbs/gal)**: 8.24
- **Specific gravity at 25°C**: 0.987
- **Viscosity at 25°C (cps)**: 14.85
- **Flash point (°C)****: >155
- **Freeze point (°C)****: -60
- **Boiling point (°C)****: 383.6
- **Vapor pressure at 25°C (torr)****: 0.021

* Per ASTM D6886-12
** Per Cleveland open-cup testing

**Solvents**

**FlexaTrac-DME**
- **Dimethyl Succinate (wt. %)**
  - 15-25
- **Dimethyl Glutarate (wt. %)**
  - 59-73
- **Dimethyl Adipate (wt. %)**
  - 10-20
- **Molecular weight (g/mol)**
  - 159
- **Flash point (°C)**
  - >98
- **Freeze point (°C)**
  - -38
- **Boiling point (°C)**
  - 211-214

**FlexaTrac-DMS**
- **Dimethyl Succinate (wt. %)**
  - 15-25
- **Dimethyl Glutarate (wt. %)**
  - 59-73
- **Dimethyl Adipate (wt. %)**
  - 10-20
- **Molecular weight (g/mol)**
  - 159
- **Flash point (°C)**
  - >98
- **Freeze point (°C)**
  - -38
- **Boiling point (°C)**
  - 211-214

**FlexaTrac-DMG**
- **Dimethyl Succinate (wt. %)**
  - 15-25
- **Dimethyl Glutarate (wt. %)**
  - 59-73
- **Dimethyl Adipate (wt. %)**
  - 10-20
- **Molecular weight (g/mol)**
  - 159
- **Flash point (°C)**
  - >98
- **Freeze point (°C)**
  - -38
- **Boiling point (°C)**
  - 211-214

**FlexaTrac-DMA**
- **Dimethyl Succinate (wt. %)**
  - 15-25
- **Dimethyl Glutarate (wt. %)**
  - 59-73
- **Dimethyl Adipate (wt. %)**
  - 10-20
- **Molecular weight (g/mol)**
  - 159
- **Flash point (°C)**
  - >98
- **Freeze point (°C)**
  - -38
- **Boiling point (°C)**
  - 211-214

**ProPERTIES**
- **Appearance**: Liquid
- **Color**: Clear
- **VOC content**: Low
- **Readily biodegradable**: Yes
- **Clear, colorless liquid**: Yes
- **Mild to no odor**: Yes
- **Excellent polymer solvency**: Yes
- **Miscibility with most organic solvents**: Yes

**KEY CHARACTERISTICS**
- Low VOC content
- Readily biodegradable
- Low to no odor
- Superior flow & leveling
- Low freeze point
- Low water solubility
- Works in latex paints

**Ultra-Low VOC Coalescing Aid**

Hexatran™ E is an ultra-low VOC coalescing aid for use in architectural coatings. It produces superior film integrity at lower loading levels than other coalescing aids.
# Amines for Epoxy

**HEXTRAN™ | FLEXATRAM-DAM**

As epoxy curing agents, Ascend’s Hextran™ and cycloaliphatic FlexaTram™-DAM provide exceptional performance, like enhanced curing time, improved film, and chemical and heat resistance.

### Key Characteristics
- High boiling point
- Low vapor pressure
- Low to no smell
- Low color mostly clear
- High amine value

## PROPERTIES

<table>
<thead>
<tr>
<th>Physical Form</th>
<th>Color</th>
<th>Water Content (%)</th>
<th>Amines Value (mg KOH/g)</th>
<th>Viscosity at 25°C (cps)</th>
<th>Purity (as %)</th>
<th>Purity (as % amines)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hexatran-110</td>
<td>Clear</td>
<td>&lt;0.5</td>
<td>970</td>
<td>14</td>
<td>≥ 99</td>
<td>≥ 99</td>
</tr>
<tr>
<td>Hexatran-100</td>
<td>Clear</td>
<td>&lt;0.5</td>
<td>903</td>
<td>14</td>
<td>≥ 95</td>
<td>≥ 94</td>
</tr>
<tr>
<td>Hexatran-200</td>
<td>Straw</td>
<td>&lt;0.5</td>
<td>911</td>
<td>21</td>
<td>≥ 95</td>
<td>≥ 95</td>
</tr>
<tr>
<td>FlexaTran GMM 800</td>
<td>Clear</td>
<td>&lt;0.5</td>
<td>970</td>
<td>6</td>
<td>≥ 95</td>
<td>≥ 95</td>
</tr>
</tbody>
</table>

# Solvents

**FLEXATRAC-DME | FLEXATRAC-DMG | FLEXATRAC-DMS | FLEXATRAC-DMG | FLEXATRAC-DMA**

With low VOC and biodegradable solvents, Ascend’s portfolio offers unique solutions across applications, including paints and coatings, inks, resins and cleaners and strippers.

### Key Characteristics
- Low VOC content
- Readily biodegradable
- Clear, colorless liquid
- Mild to no odor
- Excellent polymer solvency
- Miscibility with most organic solvents

## PROPERTIES

<table>
<thead>
<tr>
<th>Dimethyl Succinate (wt. %)</th>
<th>Dimethyl Glutarate (wt. %)</th>
<th>Dimethyl Adipate (wt. %)</th>
<th>Molecular weight (g/mol)</th>
<th>Flash point (°C)</th>
<th>Freezing point (°C)</th>
<th>Vapour pressure at 25°C (torr)</th>
<th>Boiling point (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FlexaTrac-DME-100</td>
<td>FlexaTrac-DME-200</td>
<td>FlexaTrac-DME-500</td>
<td>FlexaTrac-DME-200</td>
<td>FlexaTrac-DME-500</td>
<td>FlexaTrac-DME-100</td>
<td>FlexaTrac-DME-200</td>
<td>FlexaTrac-DME-500</td>
</tr>
<tr>
<td>15-25</td>
<td>59-73</td>
<td>16-20</td>
<td>159</td>
<td>98</td>
<td>-26</td>
<td>0.06</td>
<td>212-214</td>
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<tr>
<td>1.0 max.</td>
<td>1.0 max.</td>
<td>1.0 max.</td>
<td>1.0 max.</td>
<td>1.0 max.</td>
<td>1.0 max.</td>
<td>1.0 max.</td>
<td>1.0 max.</td>
</tr>
<tr>
<td>98.5 min.</td>
<td>72.7-76</td>
<td>23.3-27</td>
<td>146</td>
<td>104</td>
<td>94</td>
<td>0.04</td>
<td>303-320</td>
</tr>
<tr>
<td>1.0 max.</td>
<td>1.0 max.</td>
<td>1.0 max.</td>
<td>160</td>
<td>107</td>
<td>124</td>
<td>0.12</td>
<td>192-201</td>
</tr>
<tr>
<td>1.0 max.</td>
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<td>124</td>
<td>0.12</td>
<td>303-321</td>
</tr>
<tr>
<td>0.06</td>
<td>0.04</td>
<td>0.05</td>
<td>0.12</td>
<td>0.04</td>
<td>0.05</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>1.0 max.</td>
<td>1.0 max.</td>
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<td>164</td>
<td>107</td>
<td>124</td>
<td>0.12</td>
<td>303-321</td>
</tr>
</tbody>
</table>

## Ultra-Low VOC Coalescing Aid

**HEXTRANOL E**

Ascend’s Hextran™ E is an ultra-low VOC coalescing aid for use in architectural coatings. It produces superior film integrity at lower loading levels than other coalescing aids.

### Key Characteristics
- Low VOC content
- Readily biodegradable
- Low to no odor
- Superior flow & leveling
- Low freeze point
- Low water solubility
- Works in latex paints

## PROPERTIES

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Color</th>
<th>Odor</th>
<th>QC-VOC (N7)</th>
<th>Molecular weight (g/mol)</th>
<th>Flash point (°C)</th>
<th>Freezing point (°C)</th>
<th>Vapour pressure at 25°C (torr)</th>
<th>Specific gravity at 25°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid</td>
<td>Clear</td>
<td>Mild to none</td>
<td>&lt;0.2</td>
<td>286</td>
<td>155</td>
<td>383.4</td>
<td>0.031</td>
<td>0.987</td>
</tr>
</tbody>
</table>

* Per ASTM D6886-12
** Per Cleveland open-cup testing
Amines for Epoxy

Ascend’s Hexatran™ and cycloaliphatic FlexaTram™-DAM provide exceptional performance, like enhanced curing time, improved film, and chemical and heat resistance.

CHARACTERISTICS
- High boiling point
- Low vapor pressure
- Low to no smell
- Low color mostly clear
- High amine value

PROPERTIES
- Dimethyl Succinate (wt. %) 59-73
- Dimethyl Glycerate (wt. %) 15-25
- Molecular weight (g/mol) 159
- Flash point (°C) 98
- Freezing point (°C) -38
- Boiling point (°C) 211-214

Solvents

With low VOC and biodegradable solvents, Ascend’s portfolio offers unique solutions across applications, including paints and coatings, inks, resins and cleaners and strippers.

CHARACTERISTICS
- Low VOC content
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- Excellent polymer solvency
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- Dimethyl Succinate (wt. %) 59-73
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Ultra-Low VOC Coalescing Aid

Ascend’s Hexanol™ E is an ultra-low VOC coalescing aid for use in architectural coatings. It produces superior film integrity at lower loading levels than other coalescing aids.

CHARACTERISTICS
- Ultra-low VOC
- Readily biodegradable
- Low to no odor
- Superior flow & leveling
- Low freeze point
- Low water solubility
- Works in latex paints

PROPERTIES
- Appearance: Liquid
- Viscosity at 25°C (cP) 14.85
- Solubility in water (wt. %) 0.24
- Freezing point (°C) -42
- Flash point (°C) 155
- Boiling point (°C) 383.4
- Vapor pressure at 25°C (torr) 0.001

Hansen Solubility Parameters (FlexaTrac vs. Common Solvents)

- Polar Solubility Parameter
- Hydrogen Bonding Solubility Parameter

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**HEXATRAN TTI PROPERTIES**

- Solids (wt. %): 100
- Isocyanate equivalent weight (g): 84
- Viscosity at 25°C (cst): 10
- Composition (monomer, %): >99
- Molecular weight (g/mol): 251
- Vapor pressure at 30°C (torr): 0.00001
- Boiling point at 1 torr: 198

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