Culminal™ methylcellulose derivatives

Description

Culminal methylcellulose derivatives are cellulose ethers that, when dissolved in water, offer a variety of functional properties. Culminal products are powders used as thickeners, protective colloids, stabilizers, suspending aids and water-retention agents in many industrial applications.

Key Attributes

Culminal cellulose ethers have many functional properties such as:

- Water retention
- Thickening and stabilizing action
- Binding ability
- Adhesion
- Protective colloid
- Suspension effect
- Emulsion stabilization
- Film formation
- Thermogelling properties

Applications and Usage Notes

Culminal methylcellulose derivatives are easily soluble in cold water. The product is not soluble in hot water. Culminal methylcellulose derivatives are non-ionic cellulose ethers and are compatible with many surfactants and polymers such as starch, guar and alginates. Solutions of Culminal methylcellulose derivatives are pseudoplastic; some solutions show thixotropy. The solution viscosity is a function of the temperature, as the latter increases, viscosity decreases. When reaching the gel temperature gelting and flocculation of the polymer will occur. This process is reversible upon cooling. Viscosity is nearly independent of the pH over a wide range.

Typical applications are:

- Adhesives – Adhesive, Binder, Film Former
- Emulsions – Rheology Modifier, Stabilization Agent
- Ceramics – Extrusion Aid, Binder, Rheology Modifier, Stabilization Agent
- Metal Processing – Rheology Modifier, Stabilization Agent
- Mineral Slurries – Rheology Modifier, Stabilization Agent
- Mining – Rheology Modifier, Stabilization Agent
- Paint Removers – Rheology Controller, Thickener, Film Former
- Paper Coatings – Rheology Modifier, Stabilization Agent, Film Former
- Pulp & Paper – Rheology Modifier, Stabilization Agent
- Suspension Polymerization – Protective Colloid, Rheology Modifier, Stabilization Agent
- Tobacco – Adhesive, Binder, Rheology Modifier, Stabilization Agent (subject to applicable regulations with respect to each application and usage)
Usage Notes

Either of the two procedures outlined below may be used for dispersing methylhydroxypropylcellulose (MHPC).

- **Cold Procedure (for concentrations less than 5%)**: Carefully sift the Culminal™ methylhydroxypropylcellulose (MHPC) into the vortex of well-agitated water. Discontinue agitation once the polymer particles begin to swell. Allow the particles to swell for 30 to 60 minutes. Agitate the solution until it is homogeneous, at which time it is ready to use.

- **Hot/Cold Procedure**: Add the Culminal MHPC by stirring into water that has been heated to boiling. Use between one-third and one-half of the total water required for the batch for this dispersion process. After the powder is dispersed, add cool water to reach the final amount of solution needed. Agitate continuously until the powder has completely dissolved.

**Typical Product Specifications**

Chemically, Culminal products are ethers of cellulose and methylchloride, ethylene oxide or propylene oxide. These cellulose derivatives have been designated as follows:

- **Culminal MC**: methylcellulose
- **Culminal MHEC**: methylhydroxyethylcellulose
- **Culminal MHPC**: methylhydroxypropylcellulose

These designations are followed by a viscosity number, as listed below. "R"-types have retarded solubility.

**Viscosity specification of Culminal, Brookfield RVT at 20°C, mPa·s**

Aqueous viscosity specification at 20 rpm, on bone-dry basis.

<table>
<thead>
<tr>
<th>Product type</th>
<th>Viscosity at 2%</th>
<th>Product type</th>
<th>Viscosity at 2%</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC 2000 S</td>
<td>2.100 - 2.900</td>
<td>MHPC 50</td>
<td>40 - 55</td>
</tr>
<tr>
<td>MC 3000 P</td>
<td>3.500 - 4.700</td>
<td>** MHPC 100</td>
<td>90 - 125</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MHPC 400 R</td>
<td>400 - 550</td>
</tr>
<tr>
<td>MHEC 3000 PFSM</td>
<td>3.500 - 4.700</td>
<td>MHPC 500 PF</td>
<td>400 - 600</td>
</tr>
<tr>
<td>MHEC 6000 PFS</td>
<td>6.500 - 8.000</td>
<td>MHPC 724</td>
<td>15.000 - 22.000</td>
</tr>
<tr>
<td>MHEC 6000 PR</td>
<td>6.000 - 8.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHEC 8000</td>
<td>8.500 - 11.500</td>
<td>MHPC 3000 P1R</td>
<td>3.500 - 4.700</td>
</tr>
<tr>
<td>MHEC 15000 PFF</td>
<td>18.000 - 24.000</td>
<td>MHPC 6000 PF</td>
<td>6.000 - 8.000</td>
</tr>
<tr>
<td>MHEC 15000 PFR</td>
<td>15.000 - 20.500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHEC 15000 PFS</td>
<td>12.750 - 17.250</td>
<td>MHPC 20000 P</td>
<td>20.000 - 27.500</td>
</tr>
<tr>
<td>MHEC 25000 PFF</td>
<td>26.000 - 34.000</td>
<td>MHPC 20000 PFR</td>
<td>20.000 - 27.500</td>
</tr>
<tr>
<td>MHEC 35000 P1R</td>
<td>35.000 - 48.000</td>
<td>MHPC 20000 PR</td>
<td>20.000 - 27.500</td>
</tr>
<tr>
<td>MHEC 40000 P1</td>
<td>38.000 - 51.500</td>
<td>MHPC 20000 R</td>
<td>20.000 - 27.500</td>
</tr>
<tr>
<td>MHEC 40000 PF</td>
<td>38.000 - 51.500</td>
<td>MHPC 20000 S</td>
<td>10.000 - 20.000</td>
</tr>
</tbody>
</table>

(1) Organic viscosity measured in a 1.5% IPA / Methylenechloride (1/7) solution

**Other Specifications of Culminal methylcellulose derivatives**

Particle size in micrometers

- Regular, S and R-types with the exception of Type MHPC 724: Laser Dv50: 250 min. – 450 max.
- Type MHPC 724: Laser Dv50: 80 max.
- PF, PFR, PFF and PFS-types: Laser Dv90: 170 min. – 295 max.
- P1R-types: Laser Dv90: 275 min. – 340 max.
Other specifications of Culminal™ methylcellulose derivatives (Ctd)

Appearance
White to brownish for MHPC 50 and MHPC 100, white to creamy for all other types.

Bulk density
- 350 - 650 g/l for MHPC 50
- 400 - 700 g/l for MHPC 100
- 200 - 500 g/l for all other types

Moisture content
- 8.5% max. for MHPC 50 and MHPC 100,
- 8.0% max. for all other types.

Packaging Information

<table>
<thead>
<tr>
<th>Product</th>
<th>Physical Form</th>
<th>Pkg Type</th>
<th>Net Wgt (lbs)</th>
<th>Net Wgt (kgs)</th>
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</thead>
<tbody>
<tr>
<td>Culminal MHPC 50</td>
<td>Powder</td>
<td>Bag</td>
<td>50 lb</td>
<td>25 kg</td>
</tr>
<tr>
<td>Culminal MHPC 100</td>
<td>Powder</td>
<td>Bag</td>
<td>50 lb</td>
<td>25 kg</td>
</tr>
<tr>
<td>Culminal (All other grades)</td>
<td>Powder</td>
<td>Bag</td>
<td>55 lb</td>
<td>25 kg</td>
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<tr>
<td>Culminal (All other grades)</td>
<td>Powder</td>
<td>Pallet</td>
<td>1,653 lbs</td>
<td>750 kg</td>
</tr>
</tbody>
</table>

Culminal methylcellulose derivatives are non-perishable products. It is recommended that the product be used in rotation on a first-in first-out basis. The product should be stored under dry and clean conditions in its original packing and away from heat. The product is hygroscopic. The packaging is selected to avoid ingress of moisture, but the water content of the packed product will/may increase if not stored dry.

Product Safety Information

Please read and understand the Safety Data Sheet (SDS) before using this product.

Toxic substances information

<table>
<thead>
<tr>
<th>Product</th>
<th>CAS Name</th>
<th>CAS Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culminal MC</td>
<td>MC</td>
<td>9004-67-5</td>
</tr>
<tr>
<td>Culminal MHEC</td>
<td>HEMC</td>
<td>9032-42-2</td>
</tr>
<tr>
<td>Culminal MHPC</td>
<td>HPMC</td>
<td>9004-65-3</td>
</tr>
</tbody>
</table>

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