Firebreak® ZB

Zinc Borate
2ZnO·3B₂O₃·3.5H₂O

Firebreak ZB
Firebreak ZB-Fine
CAS Number 138265-88-0

Firebreak ZB fire retardant is a unique form of zinc borate with multifunctional fire retardant applications in plastic and rubber compounds. Since Firebreak ZB releases its water of hydration at temperatures exceeding 290 °C (554 °F), it can be used in systems requiring high processing temperatures. Firebreak ZB has a refractive index similar to that of most polymer systems, which results in the retention of considerable translucency and allows the use of low pigment loading. It can be fed to extruders, calenders, or injection molding equipment in much the same way as other solid polymer additives.

Applications

Firebreak ZB is used as a flame retardant, smoke and afterglow suppressant, and anti-arching agent in polymer systems such as polyvinyl chloride, nylon, epoxy, polyethylene, polypropylene, polyesters, thermoplastic elastomers and rubbers. Depending on the base polymer used and fire standards to be met, Firebreak ZB can be used to replace partially (or even completely) other fire retardant additives such as antimony oxide. In some systems, Firebreak ZB displays synergism with antimony oxide. In halogen-containing systems, the usage level of Firebreak ZB is in the range of 3-25 parts per hundred parts of resin (phr). In halogen-free systems, the recommended level is in the range of 10-250 phr, normally used in conjunction with alumina trihydrate, magnesium hydroxide, or a silicone polymer. Examples of starting point formulations are available upon request.

Firebreak ZB-Fine is recommended for applications where maximum fire test performance is needed, and physical properties such as film forming and adhesion are critical.

Chemical and Physical Properties

Theoretical composition

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boric Oxide, B₃O₃</td>
<td>48.05%</td>
</tr>
<tr>
<td>Zinc Oxide, ZnO</td>
<td>37.45%</td>
</tr>
<tr>
<td>Water of Crystallization, H₂O</td>
<td>14.50%</td>
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<tr>
<td>Anhydrous Equivalent</td>
<td>85.50%</td>
</tr>
</tbody>
</table>

Characteristics (typical values)

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refractive Index</td>
<td>1.58</td>
</tr>
<tr>
<td>Median Particle Size: ZB</td>
<td>7 microns (Sedigraph)</td>
</tr>
<tr>
<td>ZB-Fine</td>
<td>3 microns (Sedigraph)</td>
</tr>
<tr>
<td>Solubility</td>
<td>Less than 0.28% in water at room temp.</td>
</tr>
<tr>
<td>Stability</td>
<td>Thermally stable up to 290 °C. Can be hydrolyzed by strong acids and bases.</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>2.77</td>
</tr>
</tbody>
</table>

Stability

When stored under normal conditions of temperature and humidity, Firebreak ZB is chemically stable and shows little tendency to cake.
Notice:
Before using this product, please read the Product Specification, the Material Safety Data Sheet and any other applicable product literature.

The descriptions of potential uses for this product are provided only by way of example. The product is not intended or recommended for any unlawful or prohibited use including, without limitation, any use that would constitute infringement of any applicable patents. Nor is it intended or recommended that the product be used for any described purposes without verification by the user of the product's safety and efficacy for such purposes, as well as ensuring compliance with all applicable laws, regulations and registration requirements.

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