20 MULE TEAM BORAX

Product Data Sheet

Firebrake® ZB

$2ZnO \cdot 3B_2O_3 \cdot 3.5H_2O$
Zinc Borate

Firebrake ZB
Firebrake ZB-Fine
Firebrake ZB-XF
CAS Number 138265-88-0

Firebrake® ZB is a unique form of zinc borate with multifunctional fire retardant applications in plastic and rubber compounds. Since *Firebrake*® ZB releases its water of hydration at temperatures exceeding 290°C (554°F), it can be used in systems requiring high processing temperatures. *Firebrake*® 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

Firebrake® ZB is used as a flame retardant, smoke and afterglow suppressant, and anti-arcing 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, *Firebrake*® ZB can be used to replace partially (or even completely) other fire retardant additives such as antimony oxide. In some systems, *Firebrake*® ZB displays synergism with antimony oxide. In halogen-containing systems, the usage level of *Firebrake*® 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.

Firebrake® ZB-Fine and *Firebrake*® ZB-XF are recommended for applications where maximum fire test performance is needed, and physical properties such as film forming and adhesion are critical. The XF grade has no particles greater than 12 microns, as determined by Laser Diffraction technique, and therefore is suitable for more critical applications.

Storage

When stored under normal conditions of temperature and humidity, *Firebrake*® ZB products are chemically stable and show little tendency to cake.

Chemical and physical properties

Typical properties

Refractive index	1.58
Median particle size Firebrake ZB Firebrake ZB-Fine Firebrake ZB-XF	(Laser diffraction) 9 microns 2.1 microns 1.8 microns
Solubility	Less than 0.28% in water at room temp.
Thermal stability	Stable up to 290°C. Can be hydrolyzed by strong acids and bases.
Specific gravity	2.77

Chemical composition

Boric oxide (B_2O_3), %	47.5 - 48.9%
Zinc oxide (ZnO), %	37.7 - 38.7%