PRODUCT DATA SHEET

Firebrake® ZB

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

Zinc borate

Grades: ZB, ZB Fine, and ZB-XF

CAS Number 138265-88-00

20 MULE TEAM BORAX™

Rio Tinto

Zinc borate for fire retardancy

Firebrake® ZB is a white, crystal-like, powdered zinc borate with multifunctional fire-retardant applications in plastic and rubber compounds.

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.

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.

Depending on the base polymer and needed fire standards, *Firebrake* ZB can be used to partially (or even completely) replace 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 ranges between 3-25 parts per 100 parts of resin (phr). In halogen-free systems, the recommended level between 10-25 phr, normally used in conjunction with alumina trihydrate, magnesium hydroxide, or a silicone polymer.

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

Theoretical chemical composition	
Boric oxide, B_2O_3 (%)	48.05
Water H_2O (%)	14.51
Zinc oxide, ZnO (%)	37.44
Anhydrous equivalent $2ZnO\ B_2O_3$ (%)	85.49

PRODUCT DATA SHEET

Firebrake® ZB

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 temperature
Thermal stability	Stable up to 290°C Can be hydrolyzed by strong acids and bases
Specific gravity	2.8
Bulk denisty	42-60 lbs/ft^3

About U.S. Borax

U.S. Borax, part of Rio Tinto, is a global leader in the supply and science of borates—naturally-occurring minerals containing boron and other elements. We are 1,000 people serving 650 customers with more than 1,800 delivery locations globally. We supply around 30% of the world's need for refined borates from our world-class mine in Boron, California, about 100 miles northeast of Los Angeles.

About 20 Mule Team products

U.S. Borax produces the *20 Mule Team*® borates family of products from naturally occurring minerals and have an excellent reputation for purity and safety when used as directed. Borates are key ingredients in a number of industrial applications including fiberglass, glass, ceramics, batteries and capacitors, wood preservatives, and flame retardants.

High quality, high reliability, high performance borate products. It's what we're known for.