

Firebrake® ZB to replace antimony oxide

An attractive application of *Firebrake* ZB is for partial or complete replacement of antimony oxide in flame retardant formulations. The concept applies to many polymer systems and is based on the following convincing evidence.



Flame retardant synergis

For most flame retardant formulations where antimony oxide is conventionally used, it is shown that a partial replacement with *Firebrake* ZB results in improved fire test performance. This has especially been investigated extensively in flexible PVC and the halogen-containing formulations for other polymer systems including polyolefins, polyamides, epoxies and many elastomers. If no performance improvement is required, the synergy of *Firebrake* ZB and antimony oxide can be used to reduce the total loading of these two additives with no negative impact on flame performance. Reduced total loading logically translates to reduced formulation cost assuming similar pricing for these two additives.

Lower cost *Firebrake* ZB

While partial replacement of antimony oxide is justified by synergy with *Firebrake* ZB even at similar pricing for the two additives, *Firebrake* ZB has been a lower cost additive than antimony oxide in recent years, which strengthens the cost saving for partial replacement of antimony oxide with *Firebrake* ZB and encourages enhanced or complete replacement of antimony oxide with *Firebrake* ZB.

Other performance improvements

In addition to improved flame test performance and reduce formulation costs, *Firebrake* ZB offers a range of performance enhancements depending on the end-use application and the polymer system that it is used in:

- Smoke suppression for both halogen containing and halogen-free systems
- Improve char formation for both halogen containing and halogen-free systems
- Improved ceramic formation for halogen-free systems
- Afterglow suppression for both halogen containing and halogen-free systems
- Anti-tracking for wire and cable applications and electrical parts

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 500 customers with more than 1,700 delivery locations globally. We supply 30% of the world's need for refined borates from our world-class mine in Boron, California, about 100 miles east of Los Angeles. We pioneer the elements of modern living, including:

- **Minerals that make a difference:** Consistent product quality secured by ISO 9000:2001 registration of its integrated quality management systems
- **People who make a difference:** Experts in borate chemistry, technical support, and customer service
- **Solutions that make a difference:** Strategic inventory placement and long-term contracts with shippers to ensure supply reliability