



Making Batting More Resistant to Flame

The standard for making cotton flame and smolder-resistant is the application of boric acid to the fiber.

Generally applied in the mixing machine prior to garnetting, boric acid is introduced to the cotton fibers along with a small amount of oil and chemical surfactant. To further achieve even distribution and adherence to the fibers, the boric acid is ground to a very fine consistency prior to application.

Even untreated cotton batting, a natural cellulose product, tends to burn slow. It does not melt, become molten or drip like man-made materials and is more likely to smolder rather than flame after the initial source of flame is removed. This allows more time for reaction to a fire, a critical factor in safety during fires.

Properly treated cotton is self-extinguishing. Use of treated cotton batting in mattresses, futons and upholstered furniture significantly reduces the risk of injury because of its negligible burn factor and reduced emission of toxic fumes.

Applied as a white powder, boric acid is inorganic and is odorless. The Environmental Protection Agency has established that boric acid is benign.

The Safe Use of Boric Acid and Boron No. 10

By J.R. Blasius

Borates, including boric acid, have been used since the days of the ancient Greeks for cleaning, preserving food and other everyday activities.

Today, boric acid is found in more every day uses and products than ever before. Among them are eye wash solutions, flame retardants, insecticides, glass products and fertilizers. And yet with all these uses over all these years, the question, "Is boric acid toxic?" seems to be raised with regularity every year.

Asking "How toxic is boric acid?" is sort of like asking "How hot is hot?" The answer clearly needs to be qualified...and, yes, scientists have figured out a means to compare one chemical to the next. In fact, on this scale, scientists and/or regulators can compare most anything that can be swallowed, inhaled or put in one's eyes.

The scale I am referring to gives a figure known as the LD50 rating - a dose that would cause the deaths of 50 percent of a specific animal population. One method used to determine the LD50 rating for most substances is via laboratory-controlled oral doses to rats. The following table lists the LD50 (oral-rat) for several common substances as published by the Registry of Toxic Effects of Chemical Substances.

Substance	LD50 (milligrams of dose /kg of body weight)
Aspirin	1,000
Boric Acid	2,660
Table Salt	3,000
Boron #10	3,500
Baking Soda	4,200
Grain Alcohol	14,000

Based on this data, boric acid and Boron No. 10 are not significantly different in toxicity than common table salt. In addition, both boric acid and Boron No. 10 are less toxic than aspirin. The greater the LD50 rating the safer the substance is. When compared to these common household items, boric acid and Boron No. 10 are not particularly dangerous, and, if used properly, will not cause poisoning. It is important to remember that there have been no known deaths resulting from the use of boric acid or Boron No. 10 in mattresses or upholstered furniture or even in their use as an insecticide.

So are borates toxic? Certainly, and so is virtually every and anything else you come in contact with. It is simply a matter of quantity, and the simple fact is that exposure to cotton batting treated with borates is a safe exposure that should not cause alarm in anyone. In fact, the levels at which these borate products are present in cotton batting make them very effective control agents against dust mites, mold and mildew, all of which can develop in any mattress of any construction. Controlling the spread of dust mites, molds and/or mildews makes for a healthier home and less of a chance for the homeowners to develop allergies.

If you believe aspirin or table salt is dangerous, poisonous or in some other way life threatening, then you probably should not use borates. If, on the other hand, you can rationally look at the comparative data, you will probably come to the conclusion that boric acid and Boron No. 10 are among the safest of choices for making cotton-batting flame retardant.