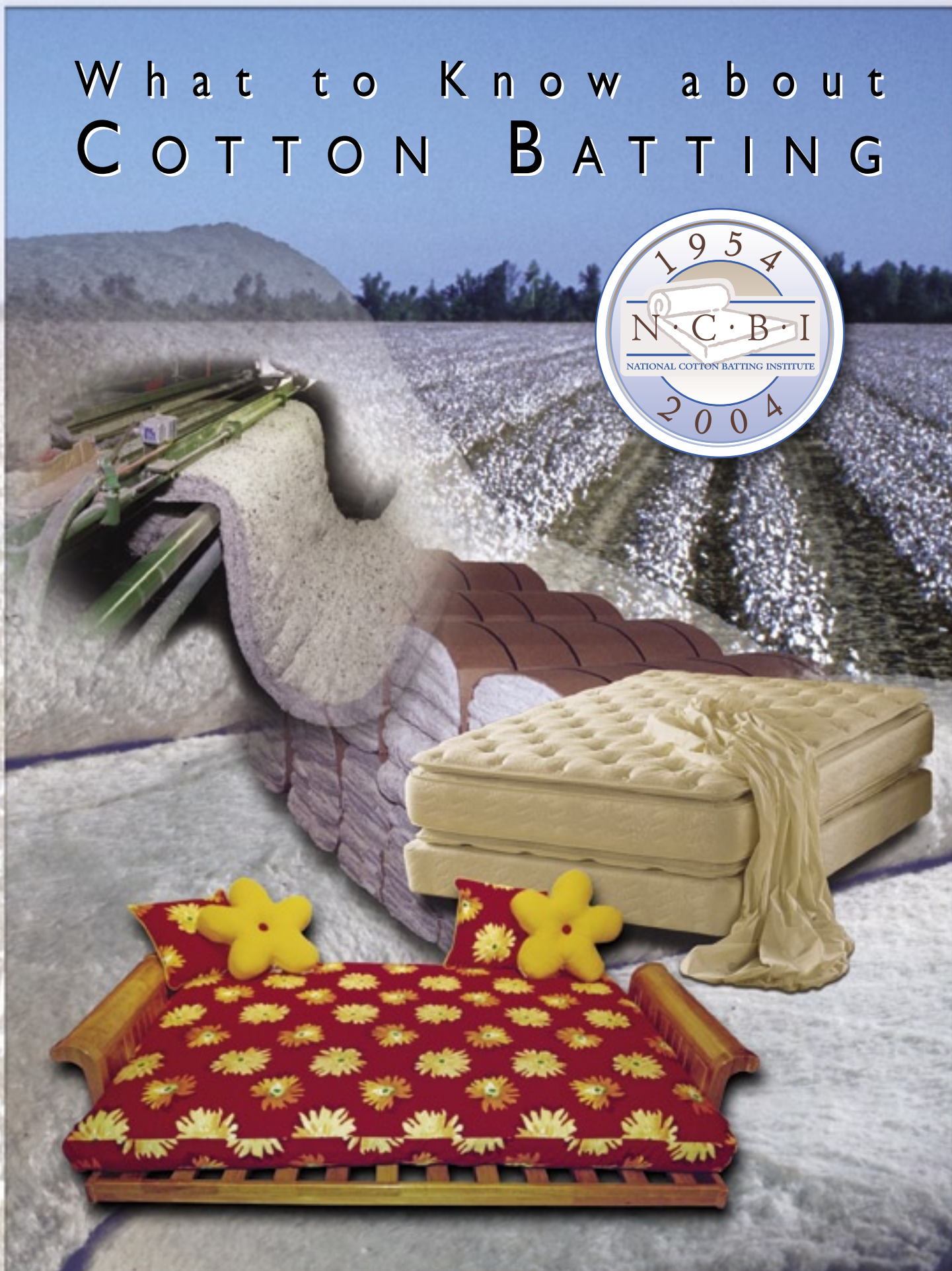


What to Know about COTTON BATTING



How is cotton batting used in the manufacture of products for the bedding and upholstered furniture industries?

Cotton batting may take many forms – as batts, in rolls, stitched or sewn to other materials. It can be a thermal bonded high loft and/or needle punched product. It can be used as a drop-in component fire barrier as a surface or interior product.

In the mattress industry, cotton batting is used directly under cover fabrics as well as in inner padding materials, insulators, cushioning padding and for filling. Some mattresses are produced with cotton batting as the only filling material with the spring unit.



In futons, batts are used as layering components to fill out the futon.

In the upholstered furniture industry, it is used as padding in seat backs, arms, cushions and as deck padding.

Cotton batting can serve as the filling alone or in combination with other materials in mattress pads, comforters, quilts and other products. In all of these products, cotton batting helps meet the various flammability requirements.

Is cotton batting truly eco-friendly for manufacturers and for dealers' ultimate market - the retail consumer?

Unlike many of the alternatives, cotton is a renewable resource that is biodegradable. Boric acid-treated cotton batting provides not only the benefits of durability, comfort and safety but also may offer some protection for those who suffer allergies from irritants such as mold, mildew and dust mites. The use of treated cotton batting not only helps to provide protection for our families today but also may help to keep our planet cleaner for future generations.

As a manufacturer, should I be concerned about comfort cotton batting affords my customers, particularly now that I plan to use it to cover my urethane foam underlayment.

Cotton batting's comfort is legendary. As an insulator, it provides a dense, even layer of padding and allows the spring unit to conform to the body, thus assuring that consumers don't feel the coils. In addition, the thermo-physical properties of cotton prevent the unpleasant build-up of body heat, helping to further assure the consumer of a comfortable sleeping environment.

As a manufacturer of mattresses and futons, I need further assurances that using cotton batting will provide enhanced durability to my product line. What can you tell me about this benefit?

Cotton batting is extremely durable when used as a dense padding layer. The dense web of fibers also prevents premature wear of other comfort layers resulting in a product that brings value to the consumer because of its resiliency and reliability.



What value does cotton batting bring to my business, whether in the bedding or upholstered furniture industry?

Cotton batting is the all-natural choice in home furnishings and many other industrial applications important in today's lifestyles. Cotton batting is produced from a natural fiber that provides comfort, is a renewable resource and is produced under environmentally friendly management practices.

How is cotton batting treated for fire retardancy?

The standard for making cotton smolder and flame-resistant is the application of boric acid to the fiber, a process developed by the U.S. Department of Agriculture. Because untreated cotton, a natural cellulose product, smolders when it burns, the rate of combustion is slow compared to other padding products, e.g., untreated polyurethane foam. 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 FR-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.



Do cotton batting manufacturers have testing procedures for fire retardancy?

Cotton batting produced by NCBI member companies is tested and certified by Underwriters Laboratories as a fire retardant filling that meets or exceeds all safety standards set within the industry. Boric acid and cotton are combined to offer a unique smolder-resistant and open flame retardant product.

What is the origin of boric acid and is it a safe product?

Like cotton, boric acid is a safe product that also is used in a host of products we use every day – in pharmaceuticals, topical medicines for skin and even contact lens solution. It also is used as a micronutrient to produce fruit and vegetable crops we eat every day.



Boric acid is produced from Borates, which have been a part of nature since the earth's formation and have been put to many productive

uses since the beginning of civilization. Borates are safe for people and the environment. They are naturally occurring minerals, essential to plants, and part of a healthy diet for people. Our greatest exposure to borates is the one to three milligrams we eat every day, but we also encounter borates in countless household items - from wallboard and insulation to cookware and eye drops.

Boric acid is an inorganic compound that also provides value as an anticorrosive compound when used in cotton batting by offering a protective oxide film on steel used in making bedding and upholstered furniture. This is just one of several benefits that boron-treated cotton batting provides these industries.

How is boric acid applied to the cotton fiber?

Generally applied in the mixing machine prior to the manufacturing process, boric acid is introduced to the cotton fibers along with a small amount of oil and chemical surfactant. The oil helps control dust and also acts as a



carrying agent that allows the boric acid to adhere to the cotton fibers. The surfactant allows the oil and cotton to bond to the boric acid. To further achieve even distribution and adherence to the fibers, the boric acid is ground to a very fine consistency prior to application.

Is boric acid an “add-on” chemical? Will it wash out of the product?

The great benefit of boron-treated cotton batting is boric acid's ability to be absorbed into the cotton fiber. However, as with any water-soluble compound, it is possible that some of the boric acid could be removed from the inner core if water penetrated that deep. For that to happen, however, would require significant water damage to the exterior covering that would most likely result in the total loss of the bedding or upholstered furniture.

Does boric acid shake out or dust out of the batting?

Since cotton batting manufacturers began using boric acid as a fire retardant in the early 1970s, the goal of the NCBI has been to develop a more effective boron-treated product. When properly applied, boric acid becomes a property of the fiber and does not shake out of the product.

How long is treated cotton batting effective as a fire retardant? I know fire retardant foam loses its effectiveness after time.

Unlike manmade-based compounds, boron-treated cotton batting is effective well beyond the useful life of bedding and furniture. Tests performed on cellulosic-based materials have shown that the efficacy of these boron-treated materials has lasted well beyond 30 years. Borates act primarily in the solid phase, where they promote the formation of char and inhibit the release of combustible gases from the burning materials. The release



of chemically bonded water in boric acid also reduces flame combustion. This formation of a protective coating on the char is the reason why boric acid is effective in preventing smoldering combustion. It is that issue of suppressing smoldering that makes boric acid the proper choice for treated cotton batting.

Today, with the new California testing protocols for bedding and upholstered furniture, boron-treated cotton batting can meet these more stringent regulations. This provides further assurance that manufacturers are using the safest cotton batting on the market.

Is boric acid considered a pesticide?

Borates have been used safely as an insecticide for more than 100 years. Boron-based compounds such as boric acid can offer pesticidal qualities and have been used in many pest control products. This value could be a benefit to bedding and upholstered furniture manufacturers as well as the retail trade. An issue that the NCBI is investigating within the bedding and upholstered furniture industry is the value of performing Dust Mite mitigation research at the university level with a well-known entomologist. Recent documentation shows that boric acid can control dust mites in carpets.

Is boric acid carcinogenic?

Boric acid is NOT carcinogenic; in fact, boron that is derived from boric acid is all around us in all aspects of our lives. Boron is an essential micronutrient, integral to a plant's life cycle. As plants draw boron from the soil, either naturally or through fertilization, this is transferred to fruits, vegetables, nuts and legumes. Studies indicate that people in a wide variety of cultures consume about one to three milligrams of boron per day through a combination of foods and drinking water. There is almost universal agreement in the scientific community, including the World Health Organization, that boron is nutritionally important to maintain optimal human health.

Does boric acid or cotton batting contain polybrominated diphenyl ethers, or PBDEs?

Neither boric acid nor cotton batting contain PBDEs, which have been shown to accumulate in humans. PBDEs are used as fire retardants in products from foam cushioning to plastic casings of computers and TV sets. California has banned two of the three main PBDE compounds, those used in furniture and some plastics. Europe also has banned two of the compounds, with the ban going into effect in 2004.

What are the dangers, if any, of having boric acid in the batt?

Boric acid in the batt poses no dangers.

Is cotton batting packaged compressed or uncompressed for shipment?

The product is shipped compressed. Compressed baling helps remove any false loft within the product, thereby reducing the body impressions over the life of the product.



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