



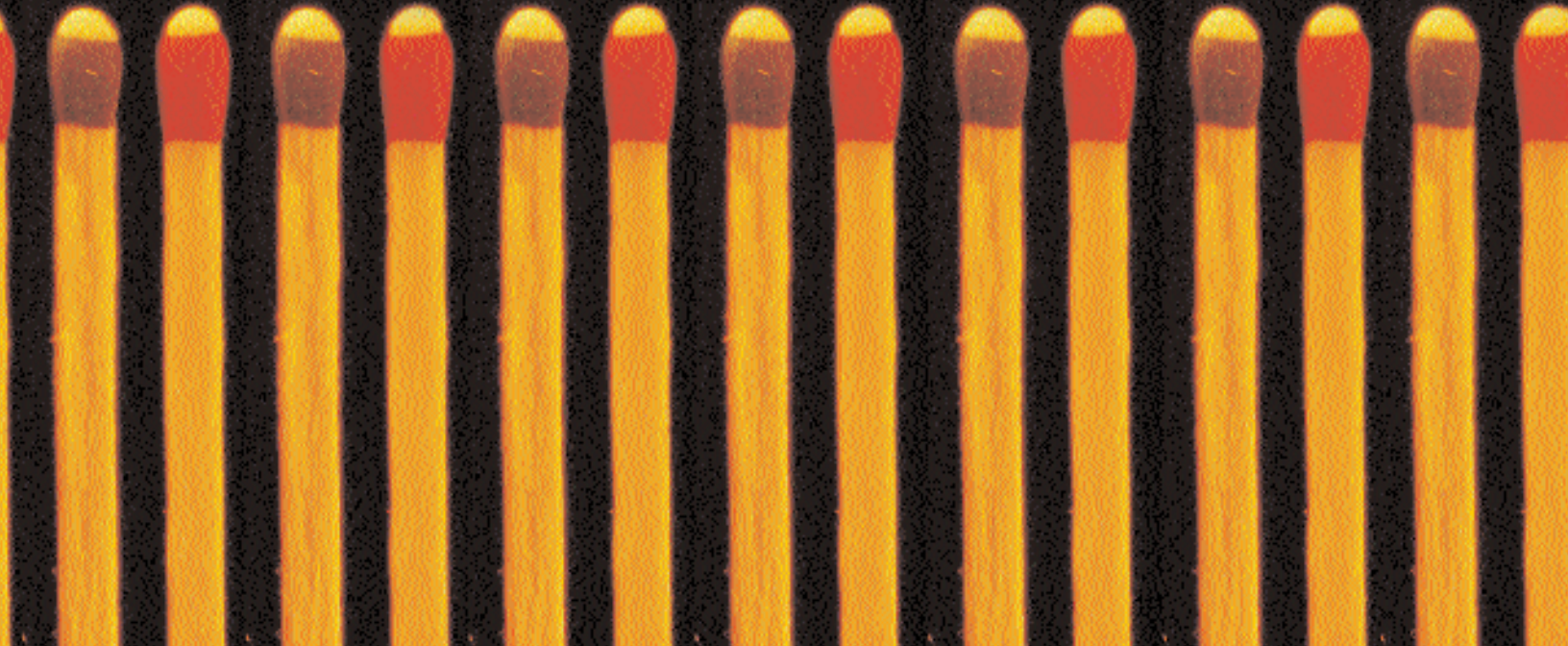
# FLAMMABILITY: Achieving compliance

*Part 3 in a series. For the full text of Part 1 (printed in the September 2000 issue of BEDtimes) and Part 2 (printed in the December 2001 issue of BEDtimes), please go to [www.sleepproducts.org](http://www.sleepproducts.org) and click on "Flammability."*

By Gordon Damant

**W**ith the success of cigarette ignition resistance safely in the past, the bedding industry faces another, perhaps more challenging, flammability issue today – resistance to ignition by open flame.

The industry is rapidly approaching the point where government regulators and mattress makers will soon be looking at a proposed test method for open-flame ignition of residential bed sets. With regard to future timelines (see timeline, page 34), it is important to recognize that California law currently requires every mattress sold in California after Jan. 1, 2004, to be in compliance with an open-flame test adopted by



## Index

Industry conference	page 38
History of flammability	page 42
Changes in materials	page 46
Suppliers of fire blockers	page 48

the California Bureau of Home Furnishings.

At the national level, however, the regulatory schedule is much more uncertain. Although the Consumer Product Safety Commission issued an advance notice of proposed rule-making in October 2001 concerning open-flame ignitions of mattresses, there is no indication at present when the agency will formally propose a federal open-flame standard that would apply to bed sets sold in the United States.

Some key activities have been successfully accomplished, or are close to culmination, in the path to compliance. For instance, Phase II of the bedding flammability research at the National Institute of Standards & Technology is almost complete. All flammability tests of mattresses, in various sizes, were finished by the end of July 2002. And a preliminary draft report of the NIST hazard analysis, "Estimating Reduced Fire Risk Resulting From An Improved Mattress Flammability Standard," has been prepared by NIST researchers, and will be released soon.

Separate open-flame ignition studies are underway at the California Bureau of Home Furnishings – pursuant to the provisions of California Assembly Bill 603. They include a comparison of the California Technical Bulletin 129 burner with the burner developed by NIST in Phase I of the current research.

A proposed test method for the open-flame ignition of bed sets, based upon the NIST ignition burner developed during Phase I of the industry sponsored research, is in preparation. The mattress ignition burner developed by NIST is expected to be commercially available later this year. And a research program will soon be underway to test whether reducing the flammability of bedclothes — such as pillows, comforters and mattress pads — will improve bedroom fire safety.

Frequent meetings have been held with bedding regulators, including the CPSC and the California Bureau of Home Furnishings. A flammability briefing for bedclothes manufacturers and their suppliers was held in May 2002.

### The challenges

Many of the questions faced by the mattress industry in the early 1970s (see sidebar, page 42) are likely to reappear in the coming months. Foremost in the concerns of mattress manufacturers is what exactly the new flammability standard will

posed a challenge to the bedding industry, addressing the more complex issues of open-flame combustibility of bed sets, and perhaps bedclothes, will present an even greater challenge to bedding producers. Full-scale fire tests, of the type under consideration by the various government authorities, are often complex, are difficult to perform without special equipment and facilities, and can be expensive.

Compliance with full-scale fire tests will require mattress makers to give careful attention to many of the mattress construction techniques that have been more or less taken for granted by bedding producers in recent years. For example, the type of binding tape and binding tape thread used, the design of the border panel, construction of quilt panels incorporating fire blockers or barriers, and methods of protecting and fire-hardening foundations may all be important factors in successfully negotiating the intricacies of a full-scale open flame fire test for bed sets.

Full-scale fire testing of bed sets

**Every bedding manufacturer, supplier and retailer must keep up to date with the latest developments on this critically important fire safety issue.**

be and how that standard is going to change the way bedding producers make bed sets.

Also of concern is what bedding producers will need to do to comply with any standards and how they will be able to comply with the new requirements with minimal impact on existing manufacturing practices. Manufacturers also want to know if they will need to test bed sets, and if so, how often, and with what type of record-keeping requirements.

If compliance with the cigarette ignition standard of the early 1970s

to date clearly indicates that bedding producers must address the fire performance of both the mattress and the foundation if they are to successfully achieve compliance with full-scale fire tests for bed sets.

### The good news

If the above has painted a bleak picture, there is good news. During the past 30 years, there have been significant advancements in our understanding of fire and fire science; in the development of fire performance test methods; and most impor-

tantly, in the current availability of materials and components with significantly improved fire performance that can assist manufacturers in constructing products of increased fire safety (see sidebars, pages 46 and 48). It is in the latter area that mattress producers will benefit most as they face the challenges of building products to meet the stringent requirements of the open flame fire tests that appear to be on the horizon.

### Compliance with full-scale fire tests

In the past 20 years or so, a number of full-scale fire tests for a variety of furnishings have been developed. These tests generally require either finished articles of furnishings, such as mat-

tresses or upholstered furniture, or large size mock-ups to be tested under specified ignition conditions. Typical full-scale fire tests for furnishings are shown in Table 1, below.

Compliance with large open-flame tests for furnishings is achieved by one of two approaches: either by using a state-of-the-art combination of fire-resistant fabrics and cushioning components, or by designing products that include fire-blocking fabrics or fire barrier layers. Fire-blocking materials are also often referred to as fire barriers or interliners.

Because component materials sometimes exhibit antagonistic behavior in fire tests, the use of a combination of state-of-the-art components, while having a benefi-

cial effect on ignition and fire propagation, does not always insure full compliance with the criteria of many of the current full-scale fire tests.

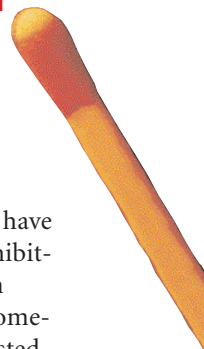
### “Business as usual” can no longer be the mantra of bedding makers.

For example, fire researchers have demonstrated that materials exhibiting good fire performance when tested as isolated components sometimes perform less well when tested in a composite structure with other components. On occasion it has been found that the fire performance of a composite assembly of certain components is worse than the fire performance of any of the individual components. This is sometimes the case in furnishings, for example when cellulosic and thermoplastic components are intermixed.

The design of bed sets is often complex. It is not unusual for a manufacturer to use eight to 12 fabric and cushioning components in the design of a product. For example, a typical innerspring mattress construction might include ticking, or outer fabric; binding tape fabric; quilt cushioning with one or more separate layers; quilt backing fabric; thread; cushioning with one or more separate layers; flanging; spring insulator pad; spring unit; and side panels.

Because of the complexities of bed set designs, complying with modern full-scale fire tests, such as those listed above, or the impending method(s) anticipated from state and federal regulators, presents a challenge for the bedding manufacturer.

Historically, some manufacturers have relied on compliance with fire tests upon certifications provided by suppliers of component materials. Typically, such certifications have



## Full-scale fire tests for furnishings

TEST	PRODUCT	IGNITION
ASTM E 1537 <sup>1</sup>	Upholstered Furniture	Gas Burner
ASTM E 1590 <sup>2</sup>	Mattress	Gas Burner
Boston BFD IX-10	Upholstered Furniture	Gas Burner
Boston BFD IX-11	Mattress with bedding	Match
BS 5852: Part 2	Upholstered Furniture	Wooden Cribs
BS 6807	Mattress	Wooden Cribs
California TB 106 <sup>3</sup>	Mattress	Cigarette
California TB 121	Mattress	Newspaper
California TB 129	Mattress	Gas Burner
California TB 133	Upholstered Furniture	Gas Burner
16 CFR 1632 (DOC FF 4-72)	Mattress	Cigarette
FAR 25-59	Aircraft Seating	Oil Burner
Michigan Roll-up Test	Mattress	Newspaper
NFPA 266	Upholstered Furniture	Gas Burner
NFPA 267	Mattress	Gas Burner
Nordtest NT 032	Upholstered Furniture	Wooden Cribs
UL 1056	Upholstered Furniture	Gas Burner
UL 1895	Mattress	Gas Burner
UL 2060	Mattress with bedding	Gas Burner

1. ASTM E 1537 is similar to NFPA 266. Both of these tests are based on California TB 133. Boston BFD IX-10 and UL 1056 are also similar.

2. ASTM E 1590 is similar to NFPA 267 and UL 1895. All of these tests are based on California TB 129.

3. California TB 106 and 16 CFR 1632 (DOC FF 4-72) are similar.

represented that specific components are in compliance with one or more small-scale or bench-scale fire tests. But these certifications may not accurately reflect fire performance of the complete bed set assembly under full-scale fire test conditions.

Many of the present genre of full-

scale fire tests require manufacturers of furnishings to be solely responsible for compliance, since these tests require finished articles or a composite mock-up assembly to be tested, and generally do not permit the evaluation of component materials as a means of compliance.

In addition, many of the government or private agencies who require the newer full-scale fire tests do not recognize the fire performance of components when tested by the multitude of the small or bench-scale test methods commonly referenced.

## Timeline of Flammability activities

This timeline records all on-going activities related to combustibility research, development of standards, legislation, etc. The Sleep Products Safety Council is responsible for monitoring and overseeing this work. Also, the SPSC has scheduled a meeting for all task force members (NIST, SPSC, SPSC and California) to develop a proposed standard and will host a briefing for bedclothes producers in the spring.

	Summer-Fall 2001	Spring 2002	Summer 2002	Fall 2002	Winter 2002-2003
<b>NIST</b>	SPSC Phase II – 2nd Mini-matt correlation study completed.	Hazard analysis report drafted for SPSC Board review (late June).	Hazard Analysis finalized. Begins SPSC FR-modified bedclothes study (late August). Screening test funded by CPSC begins.	Complete SPSC Phase II research projects: bedclothes study and mini-matt correlation test. Does not include screening test for CPSC.	CPSC screening tests concluded; data analysis begins.
<b>CPSC</b>	Advance notice of Proposed Rulemaking issued in October.	Reviewing comments received in response to ANPR.			Sets pass/fail criteria for compliance with new standard, with input from industry and other experts.
<b>California</b>	Passed AB603 in August. Deadline January 2004 Must be ASTM E1590 or equivalent and consider bedclothes flammability	Begins 3rd SPSC mini-matt correlation study in June in cooperation with NIST.	Finishes mini-matt correlation study; shares results with NIST/SPSC. Comparing results of NIST burners to TB 129 burner.	Will initiate bedclothes flammability research project late in the year.	Prepares standard for open-flame mattress and bedclothes fires. Initiates rulemaking (January).
<b>NASFM</b>	Initiates flammability legislation concept, covering: mattresses, bedclothes, upholstered furniture, candles and cigarettes.	Legislative proposal finalized and bill drafted with input from industry and consumer groups. Bill held up for introduction in next Congress.		Petition to CPSC regarding bedclothes flammability expected.	Flammability legislation resubmitted to Congress Jan. or Feb.

*continued  
on page 36*

## Achieving compliance

Faced with the difficulty of predicting how various combinations of fabric and cushioning components might perform in full-scale fire tests, many manufacturers have sought alternative methods to comply with today's stringent fire standards, and have virtually abandoned the state-of-the-art component approach to fire safety.

It is common today for producers of furnishings to rely on some type of fire-blocking approach to achieve increased levels of fire safety in their products. In response to the need for new fire-safe materials and for new methods of complying with full-scale fire tests, many suppliers to the bedding and furniture industry have developed a category of materials known as fire blockers, interliners or fire barriers.

## Fire blockers

Fire blockers are usually fire-resistant materials that are used in two principal ways in the design of the bed set. The fire blocker is placed either

directly between the exterior cover fabric of the product and the first layer of cushioning materials, or beneath one or more "sacrificial layers" of cushioning. Sacrificial layers are cushioning layers or components included in furnishings, close to the product's exterior surface, that give a certain aesthetic feel to the product, but may be consumed in a fire test. However, burning of these sacrificial layers, when used in an appropriate thickness, along with a fire blocking system encasing the major fuel load components, may not affect the product's ability to comply with the criteria of the test.

Essentially, the fire blocker is designed to protect and prevent ignition of the major cushioning component materials and to avert a self-propagating fire in the product. Many fire researchers have shown that the major fuel in many furnishings — and the greatest potential for rapid heat release — is provided by the easy ignition and rapid burning of bulky cushioning materials. Consequently, limiting the fire

involvement of the major cushioning components in furnishings by using a protective fire-blocking material will usually make it much more difficult to ignite the furnishings, and will significantly restrict fire growth and development.

Fire blockers are available to bedding producers today in several physical forms. The following are the more common versions:

- **Fabric-like materials.** These include woven, non-woven and needle-punched fabrics that include inherently highly fire-resistant textile fibers such as glass, Nomex, Kevlar, PBI, etc. Some of the fabric-like fire blockers available are multi-component engineered textile products that use a combination of several different fibers and fabric treatments.

In a recent development, one supplier of a fire blocking, or fire-barrier system, using a newly patented technology involving a double-core spun yarn system, has successfully incorporated excellent fire blocking properties into the construction of the exterior cover fabric or ticking.

## Timeline of Flammability activities

from page 34

	Spring 2003	Summer 2003	Fall 2003	Winter-Spring 2004
NIST	Results available for CPSC screening tests.	Further research (as needed) underway, if defined by SPSC Board at Oct. 2002 meeting.		
CPSC	Begins preparation of briefing package for commissioners regarding a proposed standard.	Public comment period begins for proposed standard, if commissioners agree to move forward.		Final test method/standard developed. Compliance date set.
California	Public comment period begins for proposed standard.		Adoption of proposed standard.	Open-flame standard becomes mandatory.

(As of 7/30/02) Notes: Dates listed may change. NIST=National Institute of Science & Technology; CPSC=Consumer Products Safety Commission; NASFM=National Association of State Fire Marshals

In this instance, a separate interior fire-barrier layer is not required to achieve excellent results in full-scale fire tests.

■ **Highly fire-resistant cushioning materials.** Sometimes relatively thin layers of state-of-the-art cushioning materials may be used for fire blocking purposes. Typical of this type of product are neoprene foam, boric acid treated cotton batting, hi-loft battings made from melamine fiber blends or carbon fiber blends, and certain types of highly fire-resistant polyurethane foams. Some of these materials may be costly if used in full cushioning thickness, but when used in thinner layers they often provide an adequate fire barrier at reasonable cost. In some cases, excellent fire-blocking systems have been developed using a combination of a fire-resistant fabric and a thin layer of an inherently fire-resistant cushioning material.

■ **Coatings.** Although less popular than other types of fire blockers, some fire-blocking coatings are available. These products, which often have intumescent properties, are typically applied either as a back-coating to the cover fabric or to the surface of the first layer of cushioning material. Although this approach to fire blocking can provide acceptable fire performance in some very limited instances, coatings do not appear to be as generally acceptable and applicable as other types of blockers.

Most of the fire-blocking systems currently used in furnishings consist of inherently fire-resistant fibers and other components, rather than systems to which flame-retardant chemicals have been added. Although flame retardants used in some systems, such as boric acid, have been around for many years in products such as cotton batting.

#### **The future**

It appears that at least a draft open-flame test method for bed sets will be available to the mattress industry before the end of 2002, although we are still uncertain exactly what the

## Industry Conference offers combustibility focus

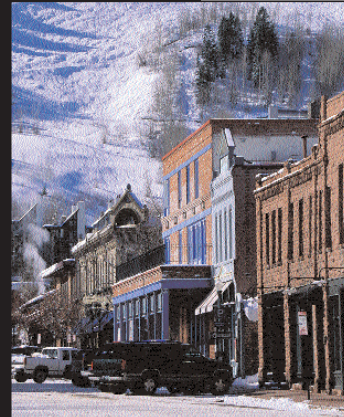
THE INTERNATIONAL SLEEP PRODUCTS ASSOCIATION will devote one day of its upcoming Industry Conference to the issue of combustibility. The conference will be held Oct. 3-4 at the St. Regis in Aspen, Colo.

On Friday, Oct. 4, the Sleep Products Safety Council will examine how upcoming requirements and regulations will impact mattress manufacturing and how companies can prepare. Up-to-date scientific research, regulatory developments and possible compliance alternatives will be presented.

The program also will report on the position of the California Bureau of Home Furnishings and the U.S. Consumer Product Safety Commission, and will discuss research being done by the National Institute of Standards & Technology.

Guest speakers are expected to include nationally recognized flammability experts, representatives from the fire safety community and state and federal safety officials. Invited speakers include: Richard Gann, senior scientist of the National Institute of Standards & Technology; Gordon Damant, SPSC's scientific spokesperson; Don Bliss, president of the National Association of State Fire Marshals; Pamela Rivette, chief of the California Bureau of Home Furnishings; and Hal Stratton or Margaret Neily, Consumer Products Safety Commission. The program will be followed by a Q&A session.

If you are a bedding supplier with new technologies available to address the open-flame mattress issue, reserve your tabletop display for ISPA's Industry Conference. Visit [www.sleepproducts.org](http://www.sleepproducts.org), and click on the Calendar of Events for more information, or call Pat Martin at 703-683-8371.



draft test method will look like. Materials and techniques are now available to assist bedding producers in complying with the new requirements.

Every bedding manufacturer, supplier and retailer must keep up to date with the latest developments on this critically important fire safety issue. "Business as usual" can no longer be the mantra of bedding makers.

Significant new challenges, and changes, will face the bedding industry over the coming months.

It is vitally important that all mattress producers immediately start a dialogue with industry sup-

pliers who are knowledgeable about compliance with full-scale fire tests and investigate product changes that may be necessary, and the impact of such changes on the manufacturing process.

Manufacturers also should refer to updates on the SPSC Web site ([www.SafeSleep.org](http://www.SafeSleep.org)) and should support the SPSC-sponsored fire research through the purchase of SPSC safety hangtags. ■

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## A look back at 30 years of flammability standards ISPA leads the way with proactive stance

**T**hirty years ago, the major issue facing the U.S. bedding industry was compliance with a new flammability standard requiring all

mattresses and mattress pads sold in the U.S. to be resistant to cigarette ignition. Before the early 1970s, mattresses sold in the U.S. were often con-

structed of components that smoldered – the very problem addressed by the proposed Federal cigarette test method, DOC FF 4-72.

In response to proposed Federal and California cigarette ignition resistant requirements, mattress manufacturers had to change the way mattresses had been made in the U.S. for many years. Major manufacturing changes are never easy for any industry, and in the early '70s there was concern within the industry about the ability of the manufacturers to comply with the new flammability requirements.

The major aim of mattress makers was to make products that provided comfort, were affordable, and that continued to offer U.S. consumers with reasonable choices. There was concern that the new flammability laws would somehow change those objectives.

Prior to the early '70s, most mattress manufacturers had little or no prior combustibility experience, yet the industry suddenly faced the challenge of redesigning products to comply with the new requirements. Components and manufacturing techniques that manufacturers had used for many years were now questioned, and some were no longer acceptable. Adding to the confusion was the virtual absence of scientific information available to provide a solution to the manufacturing problems created by the new flammability laws.

As they faced a deadline of early 1974 for compliance with the new cigarette resistant fire safety requirements, concerned mattress producers wondered how to design cigarette-resistant mattresses. They didn't know where to find the combustibility experts that could provide technical assistance and potential solutions. And they wondered what changes in manufacturing methods would be required for future mattress production. Finally, manufacturers were concerned about what impact the new requirements would have on

# FLAMMAbility

customer relations and liability issues.

Under the leadership of the bedding trade association, the National Association of Bedding Manufacturers (the former name of the International Sleep Products Association), the industry responded to the challenge in such a way that by the late '70s compliance with the new requirements was almost transparent and had minimal overall effect on the manufacturing practices of most producers.

Some of the proactive steps that NABM initiated in its leadership position on behalf of the bedding industry included:

- Establishing an NABM Flammability Standards Committee.
- Working with the American Society for Testing and Materials to develop a model test method and organize an inter-laboratory round-robin testing program.

- Supporting mattress cigarette ignitability research at the National Bureau of Standards.

- Cooperating with the Federal Trade Commission and the U.S. Department of Commerce to develop a cigarette flammability test method, as well as record-keeping and enforcement policies.

- Participating in a testing program involving the substitution of mattress ticking, leading to a mattress ticking classification procedure.

- Assisting in the preparation of an operations manual for use by manufacturers in testing and sampling their products.

- Preparing research data to guide manufacturers in the construction of mattresses to meet the cigarette test

- Launching a flammability newsletter for members of the association.

- Scheduling numerous regional workshops to brief mattress makers on the latest developments in flammability.

- And preparing a "cookbook" of mattress designs, in cooperation with industry consultant Steve Tyhanic, that provided mattress makers with guidance in construction methods of building products that had been shown, by prior testing, to comply with the federal flammability requirements.

The late '60s and the early '70s were a busy time for mattress makers and their trade association. But the threats to the mattress industry were successfully addressed, the cries of doom and gloom were thwarted and the mattress industry successfully negotiated perhaps the most challenging time, to date, in its history.

— Gordon Damant

## Evolution of filling materials

In the 1950s and 1960s, when problems of cigarette ignitability of furniture and mattresses first became prominent, the dominant filling materials used in home furnishings were cellulosic in nature. Blended cotton batting and loose vegetable fibers, such as kapok and sisal (which predated the availability of some of the current man-made materials) were common filling materials.

Also at that time, many upholstery fabrics and mattress tickings were made from cotton, rayon and linen fibers. The pervasive use of cellulosic fabrics and filling materials that have a known propensity to be ignited by cigarettes and then to smolder, and the use of other smolder-prone materials such as latex foam rubber, resulted in

tens of thousands of furniture and mattress fires and thousands of deaths annually from carelessly discarded cigarettes.

In retrospect, it is apparent that concern by regulators over the smoldering propensity of mattresses and furniture coincided with the emergence of man-made fibers and filling materials. Figure 1, for example, demonstrates the transition in furniture and mattress filling material usage from 1947 to 1993.

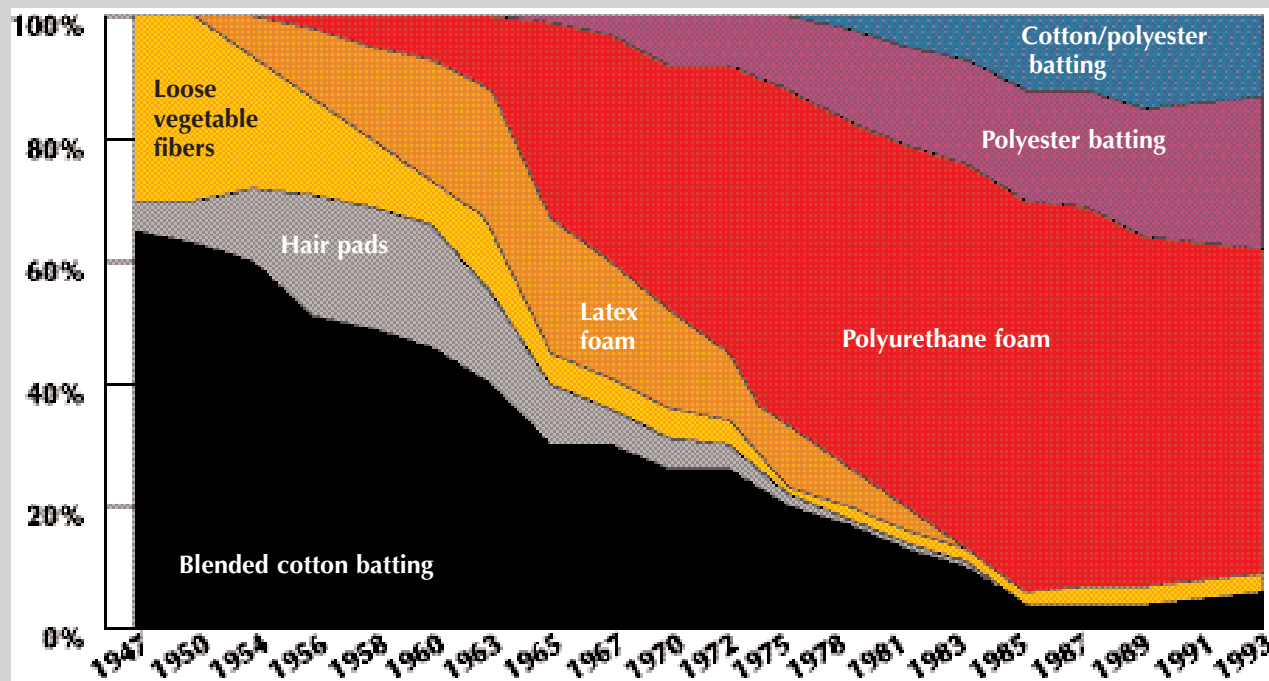
It is significant that the replacement in recent years of cellulosic fibers and filling materials with man-made materials, most of which are thermoplastics products that are more cigarette resistant than cellulosic materials, has resulted in furnishings

that are more likely to resist ignition from discarded cigarettes.

It is reasonable to conclude that the change to furnishings that are made from predominantly man-made thermoplastic materials, even in the absence of regulation, would have resulted in safer furnishings with regard to cigarette ignition. However, it is also apparent that the increased use of made-made materials has resulted in the manufacture and sale of furnishings that are more prone to ignition by open flame. Also, once these newer thermoplastic and foam-filled products are ignited by an open flame, they burn more rapidly and with greater intensity than did many of the furnishings formerly made from natural cellulosic components. ■

### Filling material use in furnishings

1947-1993



## Suppliers of fire-blocking materials

**A**lthough the intent of this industry update is not to promote any specific technology or manufacturer, the following list of suppliers, and some of their newer commercially available fire blocking products and technologies, may be helpful to bedding producers as they prepare to negotiate through the intricacies of the full-scale fire tests.

It is important to recognize that these suppliers to the bedding industry have performed, or participated in, numerous full-scale fire tests using their fire blocking systems. Many suppliers of fire blocking systems are therefore in a position to provide not only the physical components of their fire blocking system, but also share valuable technology and information about the practical application of their system in the design of bed sets. In other words – how to use the barrier, or fire blocking system in designing the bed set.

This list includes only suppliers of fire blocking systems that will assist in achieving compliance with full-scale fire tests, but not all flame-retardant component materials such as thread, tapes, polyurethane foams etc. Vendors are listed alphabetically. — *Gordon Damant*

### **E. R. Carpenter**

Carpenter Co. offers FireStop, a Basofil, fiber-based thermally-bonded high-loft flame barrier blend of fibers that will not melt or drip, but chars in place. FireStop can be used as a fire-barrier cushioning component in applications where polyester or other fiber is currently used and does not contain any flame-retardant chemical additives. For additional information, call 800-288-3834.

### **Chestnut Ridge Foam**

Chestnut Ridge offers a series of fire-barrier products based upon Neoprene (polychloroprene) and polyurethane tech-

nologies. Products include Vonar barriers, Airflex, CR Safeguard, CR Safeguard XL, and CR LS-200. Airflex is Chestnut Ridge's latest advancement consisting of a hybrid cushioning using both polyurethane and polychloroprene technology. For additional information, call 800-234-2734.

### **Chiquola Industrial Products**

Originally developed by the Protective Fabrics Division of Springs Industries, Chiquola offers FireGard, a widely-used fire-blocking system. FireGard, is an engineered textile system that combines open-flame barrier performance with comfort and durability. Chiquola offers tapes and threads designed to be used along with FireGard, in structural seams on fire resistant bed sets. Chiquola also offers CentraGard, a lightweight woven, breathable and dimensionally stable fire barrier product. CentraGard is made from a combination of cotton, fiberglass and FFR, fibers. SentrySac a machine-washable, open-flame mattress cover for use on existing mattresses, and EndoGard, a knit barrier product, are also available from Chiquola. For additional information, call 864-369-3000.

FireGard products are also available from ChemTick Coated Fabrics Inc., including products with an added polyvinyl chloride finish. For additional information, call 516-997-0900.

### **Elk Corp.**

Elk offers VersaShield, a coated woven fiberglass product. VersaShield was developed from experience of the fire-barrier concept used by Elk in the roofing industry. Elk Corp. reports impressive results in full-scale fire tests using this technology. For additional information, call 972-872-2297.

# FLAMMAbility

## Jones Fiber Products

New from Jones Fiber Products are two thermally bonded, FR-modified cotton barrier products for the mattress industry. Jones offers a special FR-barrier product specifically designed to address mattress border panel flammability problems. For top-of-the-bed applications, a soft but resilient fire-barrier product is offered for use directly under the mattress tick. A proprietary FR treatment is used that the company says will eliminate dusting problems and works well for open flame and smoldering ignition sources. Additional FR products are also available for foundation and insulator applications. For additional information, call 901-948-4469, or 423-586-4200.

## Leggett & Platt

Leggett & Platt offers a patented selection of barrier-type products based upon their Pyro-Gon, or Pyron technology. Products include quilt battings, bi-loft products, densified toppers, Poly Board, and needle-punched non-wovens. Insulator pads with a chemical treatment for added flame resistance are also available. For additional information, call 800-888-4136.

Hanes Division of Leggett also offers fire-barrier mattress ticking, as well as woven fire-barrier systems based on the Alessandra yarns developed by McKinnon-Land. For additional information, contact 828-464-4673.

## McKinnon-Land

McKinnon-Land LLC has recently introduced an innovative new yarn technology, Alessandra. This technology is based on a double-core spun-yarn system utilizing Basofil Fibers. Products using this new technology are available from Hanes Industries, a Leggett & Platt Co. Products include inherently fire-resistant mattress tickings and woven fire barrier systems. This technology can be used in many applications where excellent fire performance is required. In addition to bed set applications, this technology may also be used to make fire resistant bedclothes. For additional information, contact 704-423-2244.

## Tex Tech Industries

Tex Tech Industries offers a variety of Basofil, containing thermally bonded high-loft flame barrier blends of fibers, that do not melt or drip, but char in place. The products vary in weight, thickness and Basofil content and can be tailored to meet a variety of applications. The products can be used as fire-barrier cushioning components in applications where polyester or other fiber is currently used, and do not contain any flame-retardant chemical additives. For additional information, contact 888-414-4884 or 757-728-9414.

## Trace Industries

Trace Industries is a supplier of a densified Flame Barrier Batting. This 100% cotton batting product is produced by a process that mechanically interlocks the fibers to produce a dense, firm and stronger batting. The densified batting made by this process demonstrates good fire barrier properties. For additional information, contact 662-456-4261.

## Ventex Inc.

Ventex offers a number of fire blocking fabrics, using several technologies, under a variety of trade names, including: SpunGold, Integrity 30, AKTIV, Enhancer-F, Barrier-F, Kentland and Seneca. Some of these products are intended primarily for contract applications, while others have utility in both residential and contract bed sets. Several of the products include Visil fiber, a highly fire-resistant fiber developed in Finland. Kentland incorporates pre-oxidized carbon fiber as an alternative approach to achieving fire barrier performance. Ventex also offers Proaktiv FR Fabric, a technology intended for flame resistant bedclothes and ticking applications. For additional information, contact 800-800-3994.

## Wolf Corp.

Wolf Corp. has recently introduced Adventech Bonded Fibers. Adventech is a thermally bonded cotton fiber-based product with a low percentage of low-melt fibers. It has superior flammability properties and is resistant to both smoldering and open-flame ignition. In addition, Adventech has outstanding physical properties, including resiliency, and has been developed to be a significant improvement over standard cotton batting products. For additional information, call 800-642-9653.

Please note that any omission from this list is totally inadvertent, and is not by intent. The above information is provided solely to give guidance and assistance to mattress makers as they seek solutions to the challenge of developing bed sets that comply with the new open-flame test requirements that are expected in the next few months. There is no intent in providing the above information of promoting any one technology over another. Suppliers of these fire barrier technologies should be contacted directly for more detailed information. In addition to the above list of suppliers, we are also aware of several other suppliers who are in the process of developing technologies to address this pressing combustibility issue. We anticipate that as these additional technologies emerge, information will be available in *BEDtimes* and directly from the suppliers. ■