

d. A Commission Policy Favoring Common Law Preemption Will Assist Courts in Evaluating the Legal Significance of the Standard and Will Advance Public Policies Supporting Product Safety.

When it adopted 16 C.F.R. Part 1061, which sets forth regulations implementing the 1976 preemption clauses of the FFA, the CPSA, the FHSA and the PPPA, the Commission considered whether to apply its preemptive authority to common law rules. These regulations were adopted in 1991, before *Cipollone* and the subsequent Supreme Court and lower court decisions discussed above finding that federal safety requirements – including those issued by the Commission – can preempt state common law rules. In the preamble to Part 1061, the CPSC reasoned as follows:

The Commission does not believe that "standards" applied by courts should be included in the definition of "State or local requirement." Generally, courts do not establish prospective standards or regulations applicable to a category of persons, but instead deal with the specific parties before them. It is the Commission's view that the statutory preemption provisions were intended to address the legislative type of standard or regulation. Moreover, these procedures for application for exemption will be operative only once a State or local government recognizes that preemption may exist and, therefore, wishes to seek an exemption. It remains the role of the courts to determine whether a particular State or local standard or requirement is preempted.

56 Fed. Reg. 3414 (Jan. 30, 1991).

Obviously, subsequent judicial decisions have superseded the Commission's position on this point (at least with regard to Commission standards issued under statutes other than the CPSA). As a result, the only reported court decision that even considered the Commission's position against preemption of common law rules disregarded it. In *Miles v. S.C. Johnson & Son, Inc.*, 2002 WL 31655188 (N.D.II. 2002), Prod. Liab. Rep. (CCH) ¶ 16,455 (not reported in F.Supp.2d), the court found the Commission's position to be no impediment to finding state common law defective warning claims preempted by Commission standards issued under the FHSA and PPPA, stating that "Congress' intent to establish uniform, national labeling and packaging requirements for hazardous substances is clearly stated in the statutes' legislative histories. Accordingly, we must effectuate that intent, regardless of the CPSC's views."

In other words, the Commission's views regarding the preemption of state common law rules are outdated. To avoid confusion that the Commission's 1991 policy might otherwise create with the public and other courts, the mattress industry requests that the Commission reconsider its policy (at least with regard to the new mattress flammability standard) and state that this standard preempts common law rules that address the same risk of injury – that is, a burning mattress.

Furthermore, a policy change like this would achieve other important public benefits, including:

- Promoting public policies that improve product safety by encouraging other industries to work more closely with the Commission to set new safety standards that would have preemptive effect
- Providing added incentives for companies subject to such standards to comply with them fully in order to benefit from preemption, thereby using the threat of private civil liability in the event that a manufacturer fails to meet the Commission's standard to enhance the agency's limited enforcement resources
- Encouraging more consistent and predictable national rules for performance and liability (as opposed to a patchwork of ill-defined state common law rules in addition to federal standards)
- Lowering consumer prices and manufacturing costs because:
 - A manufacturer's safety obligations and liability rules would be more uniform and predictable
 - The Commission (with the technical and economic expertise that Congress has placed in the agency) would be better equipped than the courts to decide which state enhancements to the federal rules are legally and factually entitled to be exempted from preemption

For these reasons, the mattress industry requests that the Commission reconsider its position regarding the preemptive effect of its standards on state common law rules and state – either in the text of Part 1633 itself or the preamble to the final version of the standard – that a manufacturer's compliance with the new mattress flammability standard precludes parties from filing a lawsuit against that manufacturer based on common law rules that address the same risk of injury as Part 1633.

Conclusion

The mattress industry supports the mattress flammability standard that the Commission has proposed. We believe that it will be effective in improving product safety, practical for the industry to implement, and will allow manufacturers to produce mattresses that consumers will find comfortable and affordable.

We appreciate the opportunity to provide these comments on the proposed standard. Please contact us if you have any questions in this regard.

Table of Exhibits

<u>Exhibit</u>	<u>Description</u>
1	Redline Version of Proposed Standard Showing Mattress Industry's Suggested Changes and Chart Correlating Section-by-Section Changes to Specific Comments
2	"Final Report for Mites and Allergens in Mattresses," Larry G. Arlian, Ph.D., Dept. of Biological Sciences, Wright State University, Dayton, Ohio, March 24, 2000
3	"Tiny Mites in Mattresses Trigger Health Concerns," <i>BedTimes</i> , Dec. 1999 at 19-20
4	Letter from Patricia A. Martin, Director, Sleep Products Safety Council to Brian H. Stiger, Director, Bureau of Home Furnishings and Thermal Insulation, dated Mar. 24, 2005 (including statement from T.J. Ohlemiller, National Institute of Standards and Technology, dated Feb. 4, 2005)

Exhibit 1

**Redline Version of Proposed Standard Showing
Mattress Industry's Suggested Changes
and
Chart Correlating Section-by-Section Changes to Specific Comments**

Section of Proposed Part 1633	Mattress Industry Comment
1(b)	4(a)
1(c)	4(a)
2(b)	4(b)
2(i)	4(c)
2(j)	4(a), 4(d)
2(k)	4(e)
2(l)	1(f), 4(a), 4(g)
2(m)	4(d), 4(e)
2(n)	4(a)
2(r) new	1(a)
2(s) new	4(a)
2(t) new	4(e)
2(u) new	4(f)
2(v) new	2(a)
2(w) new	2(a)
3(a)	4(a)
3(b)	4(a)
3(c)	4(a)
3(d)	3(a), 3(b), 4(a)
4(a)	4(a)
4(b)	4(f)
4(c)	4(a)
4(c)(2)	5(c)
5(a)	4(e)
5(a)(2)	4(a), 4(e)
5(b)	1(b), 4(e)
5(c)(2)	4(e)
6(a)	4(e), 4(f)
6(a)(1)	4(a), 5(a)
6(a)(3)	4(e), 4(f)
6(b)	4(a)
6(c)	4(a)
7	6
7(k)	1(d)
11(a)	4(a)
11(a)(1)	5(d), 5(e)
11(a)(2)	4(a)
11(b)(1)	4(f), 5(g)
11(b)(2)	5(a), 5(g)
11(b)(3) proposed	5(g)

provision deleted	
11(b)(4) redesignated (3)	4(f)
11(b)(4) new	5(f)
11(c)(1)	4(e)
11(c)(2)	4(e)
11(c)(4)	4(f)
11(d)(1)	1(e)
11(d)(3)	4(a)
11(d)(5)	5(f)
11(e)	5(h)
12(a)	2(b)
12(a)(1)	1(c)
12(a)(2)	1(c)
12(a)(4)	Editorial
12(a)(5)	4(a)
12(b) proposed	Redesignated 12(c)
12(b) new	2(b)
12(b)(7) new	2(c)
12(c) proposed	Redesignated 12(d)
14(a)	2(a)

PART 1633--STANDARD FOR THE FLAMMABILITY (OPEN-FLAME) OF
MATTRESSES
and MATTRESS AND FOUNDATION SETS

Subpart A--The Standard

Sec.

1633.1 Purpose, scope and applicability.

1633.2 Definitions.

1633.3 General requirements.

1633.4 Prototype testing requirements.

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1633.6 Quality assurance requirements.

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1633.11 Records.

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1633.13 Tests for guaranty purposes, compliance with this section, and "one of a kind" exemption.

Subpart C--Interpretations and Policies

1633.14 Policy clarification on renovation of mattresses.

Authority: 15 U.S.C. 1193, 1194.

Subpart A--The Standard

Sec. 1633.1 Purpose, scope, and applicability.

(a) Purpose. This Part 1633 establishes flammability requirements that all mattress and mattress and foundation sets must meet before sale or introduction into commerce. The purpose of the standard is to reduce deaths and injuries associated with mattress fires by limiting the size of the fire generated by a mattress or mattress and foundation set during a thirty minute test.

(b) Scope. (1) All mattresses ~~and all mattress and foundation sets~~, as defined in Sec. 1633.2(ra) ~~and Sec. 1633.2(b)~~, of any size, manufactured or imported after [the effective date of this standard] are subject to the requirements of the standard.

(2) One-of-a-kind mattresses and foundations may be exempted from testing under this standard in accordance with Sec. 1633.13(c).

(c) Applicability. The requirements of this Part 1633 shall apply to each "manufacturer" (as that term is defined in Sec. 1633.2(i)) of mattresses ~~and/or mattress and foundation sets~~ which are manufactured for sale in commerce.

Sec. 1633.2 Definitions.

In addition to the definitions given in section 2 of the Flammable Fabrics Act as amended (15 U.S.C. 1191), the following definitions apply for purposes of this part 1633.

(a) Mattress means a resilient material or combination of materials enclosed by a ticking (used alone or in combination with other products) intended or promoted for sleeping upon.

(1) This term includes, but is not limited to, adult mattresses, youth mattresses, crib mattresses (including portable crib mattresses), bunk bed mattresses, futons, flip chairs without a permanent back or arms, sleeper chairs, and water beds or air mattresses if they contain upholstery material between the ticking and the mattress core. Mattresses used in or as part of upholstered furniture are also included; examples are convertible sofa bed mattresses, corner group mattresses, day bed mattresses, roll-away bed mattresses, high risers, and trundle bed mattresses. See Sec. 1633.9 Glossary of terms, for definitions of these items.

(2) This term excludes mattress pads, mattress toppers (items with resilient filling, with or without ticking, intended to be used with or on top of a mattress), sleeping bags, pillows, liquid and gaseous filled tickings, such as water beds and air mattresses that contain no upholstery material between the ticking and the mattress core, upholstered furniture which does not contain a mattress, and juvenile product pads such as car bed pads, carriage pads, basket pads, infant carrier and lounge pads, dressing table pads, stroller pads, crib bumpers, and playpen pads. See Sec. 1633.9 Glossary of terms, for definitions of these items.

(b) Foundation means a ~~ticking covered~~ structure used to support a mattress or sleep surface. The structure may include constructed frames, foam, box springs, or other materials, used alone or in combination.

(c) Ticking means the outermost layer of fabric or related material of a mattress or foundation. It does not include any other layers of fabric or related materials quilted together with, or otherwise attached to, the outermost layer of fabric or related material.

(d) Upholstery material means all material, either loose or attached, between the mattress ticking and the core of a mattress, if a core is present.

(e) Edge seam means the seam or border edge of a mattress or foundation that joins the top and/or bottom with the side panels.

(f) Tape edge means an edge seam made by using binding tape to encase and finish raw edges.

(g) Binding tape means a fabric strip used in the construction of some edge seams.

(h) Seam thread means the thread used to form stitches in construction features, seams, and tape edges.

(i) Manufacturer means an individual plant or factory that manufactures or assembles at which mattresses, foundations, and/or mattress and foundation sets are manufactured or assembled. ~~For purposes of this Part 1633, an importer is considered a manufacturer.~~

(j) Prototype means a specific design of mattress set that provides the basis for production of mattress models that are similar to the prototype, as described in ~~and corresponding foundation, if any, which, except as permitted by Sec. 1633.4(b), is the same in all material respects as, and serves as a model for, production units intended to be introduced into commerce.~~

(k) Prototype pooling means a cooperative arrangement whereby one or more manufacturers may rely on a prototype produced by a different ~~manufacturer~~party or a consortium of manufacturers and/or third parties.

(l) Production lot means any quantity of finished mattresses ~~or mattress and foundation sets~~ that are produced in a production interval defined by the manufacturer (either in terms of quantity or time), and are intended to replicate a specific prototype that complies with this part 1633, except that for imported products, a production lot should not be larger than the quantity of products intended to replicate a specific qualified prototype imported at the same time.

(m) Confirmation test means a pre-market test conducted by a manufacturer that is relying on a pooled prototype produced by another ~~party manufacturer~~. A confirmation test must be conducted in accordance with the procedures set forth in Sec. 1633.7 to confirm that the manufacturer can produce a mattress and/or corresponding foundation, if any, that is identical to the prototype in all ~~significant material~~ respects.

(n) Specimen means a mattress ~~set and corresponding foundation, if any,~~ tested under this ~~Part~~.

(o) Twin size means any mattress with the dimensions 38 inches (in) (96.5 centimeters (cm)) x 74.5 in. (189.2 cm), all dimensions may vary by $\frac{1}{2}$ in. (1.3 cm)

(p) Qualified prototype means a prototype that has been tested in accordance with Sec. 1633.4(a) and meets the criteria stated in Sec. 1633.3(b).

(q) Core means the main support system that may be present in a mattress, such as springs, foam, water bladder, air bladder, or resilient filling.

(r) Importer means the owner or consignee (as specified in 16 C.F.R. 1009.3(f)(5)) of an imported mattress set, unless that party is the ultimate consumer of the imported product, in which case it means the U.S.-domiciled party that introduced the product into commerce (including any party that is involved with selling or marketing the imported product to the consumer), a U.S.-domiciled party that is the agent of the manufacturer of the imported product, or any other party involved with manufacturing, selling, or marketing the imported product over which the Commission has jurisdiction. In addition to any other requirements specified for importers under this Part 1633, an importer shall be subject to the same requirements as a manufacturer under this Part.

(s) Mattress set means the mattress and foundation, if any, offered by the mattress manufacturer for sale as a set, or a mattress alone or a foundation alone if the manufacturer intends for the mattress or the foundation to be offered for sale without a corresponding mattress or foundation manufactured by the same company.

(t) Prototype developer means a mattress manufacturer or other party that develops a prototype.

(u) Model means a mattress set that is identical in all significant respects to a qualified prototype or, based on objectively reasonable criteria, is not sufficiently different from a qualified prototype such that the difference in any component, material, or method of construction between the prototype and the model will cause the model to exceed the test criteria specified in Sec. 1633.3(b).

(v) Mattress renovation means one or more of any of the following operations: replacing the ticking or batting on a mattress or foundation, stripping a mattress or foundation to its springs, rebuilding a mattress or foundation, or replacing components with new or recycled materials. Mattress renovation performed in connection with the

sale or offer for sale of a renovated mattress (which would not include a service provided for a party that intends to take back the mattress or foundation for its own use, or title to the mattress or foundation otherwise does not change to another party), shall be considered for purposes of this Part to be manufactured for sale, and therefore subject to the same testing, recordkeeping and other requirements of this Part, unless otherwise specified or the renovated product qualifies for a one-of-a-kind exemption.

(w) Renovated mattress means a mattress and/or foundation that has undergone mattress renovation.

Sec. 1633.3 General requirements.

(a) Summary of test method. The test method set forth in Sec. 1633.7 measures the flammability (fire test response characteristics) of a mattress set specimen by exposing the specimen to a specified flaming ignition source and allowing it to burn freely under well-ventilated, controlled environmental conditions. The flaming ignition source shall be a pair of propane burners. These burners impose differing fluxes for differing times on the top and sides of the specimen. During and after this exposure, measurements shall be made of the time-dependent heat release rate from the specimen, quantifying the energy generated by the fire. The rate of heat release must be measured by means of oxygen consumption calorimetry.

(b) Test criteria. When testing the mattress ~~or mattress and foundation set~~ in accordance with the test procedure set forth in Sec. 1633.7, the specimen shall comply with both of the following criteria:

(1) The peak rate of heat release shall not exceed 200 kilowatts ("kW") at any time within the 30 minute test; and

(2) The total heat release shall not exceed 15 megajoules ("MJ") for the first 10 minutes of the test. In the interest of safety, the test operator should discontinue the test and record a failure if a fire develops to such a size as to require suppression for the safety of the facility.

(c) Testing of mattress ~~set and corresponding foundation~~. Mattresses that the manufacturer to be offered for sale with a foundation as a mattress set shall be tested with that foundation. Mattresses or foundations offered by the manufacturer to be offered for sale alone without a foundation shall be tested alone.

(d) Compliance with this standard. Each mattress ~~or mattress and foundation set sold or introduced into commerce~~ manufactured or imported after [the effective date of this standard] shall meet the test criteria specified in paragraph (b) of this section and otherwise comply with all applicable requirements of this part 1633. Mattress sets manufactured or imported on or before [the effective date of this standard] may not be sold or introduced into commerce more than 12 months after that date.

Sec. 1633.4 Prototype testing requirements.

(a) Except as otherwise provided in paragraph (b) of this section, each manufacturer shall cause three specimens of each prototype to be tested according to Sec. 1633.7 and obtain passing test results according to Sec. 1633.3(b) before selling or introducing into commerce any ~~mattress or mattress and foundation set~~ based on that prototype, unless the manufacturer complies with the prototype pooling and confirmation testing requirements in Sec. 1633.5.

(b) Notwithstanding the requirements of paragraph (a) of this section, a manufacturer may sell or introduce into commerce a model of a qualified prototype without testing the model mattress or mattress and foundation set based on a prototype that has not been tested according to Sec. 1633.3(b) if the model that prototype differs from a qualified prototype only with respect to:

(1) Mattress/foundation size (e.g., twin, queen, king);

(2) Ticking, unless the ticking of the qualified prototype has characteristics (such as chemical treatment or special fiber composition) designed to improve performance on the test prescribed in this part; and/or

(3) The manufacturer can demonstrate, on an objectively reasonable basis, that a difference change in any component, material, or method of construction between the prototype and the model will not cause the model prototype to exceed the test criteria specified in Sec. 1633.3(b).

(c) All tests must be conducted on specimens that are no smaller than a twin size, unless the largest size ~~mattress or mattress and foundation set~~ produced is smaller than a twin size, in which case the largest size must be tested.

(d)(1) If each of the three specimens meets both the criteria specified in Sec. 1633.3(b), the prototype shall be qualified. If any one (1) specimen fails to meet the test criteria of Sec. 1633.3(b), the prototype is not qualified.

(2) Any manufacturer may produce mattresses and foundations, if any, for sale in reliance on prototype tests performed before [the effective date of this Standard], provided that such tests were conducted in accordance with all requirements of this section and Sec. 1633.7 and yielded passing results according to the test criteria of Sec. 1633.3(b), provided that the records from those tests substantially comply with the requirements of Section 1633.11.

Sec. 1633.5 Prototype pooling and confirmation testing requirements.

(a) Prototype pooling. One or more manufacturers may rely on a prototype produced by a prototype developer ~~another manufacturer~~ provided that:

(1) The prototype meets the requirements of Sec. 1633.4; and

(2) The ~~mattresses or mattress and foundation sets~~ being produced based on the prototype have components, materials, and methods of construction that are identical in all significant material respects to the prototype except as otherwise permitted by Sec. 1633.4(b).

(b) Confirmation testing. Any manufacturer ("Manufacturer B") producing mattresses ~~or mattress and foundation sets~~ in reliance on a prototype qualified by a prototype developer produced by another manufacturer ("Manufacturer A") shall cause to be tested in accordance with Sec. 1633.7 at least one (1) specimen produced by that manufacturer

~~Manufacturer B~~ of each qualified prototype of ~~Manufacturer A~~ upon which that said ~~Manufacturer B~~ is relying. The tested specimen must meet the criteria under Sec. 1633.3(b) before the ~~Manufacturer B~~ may sell or introduce any mattresses or mattress and foundation sets based on the pooled prototype. In the case of imported mattress sets, the importer shall be responsible for documenting that confirmation tests have been performed with respect to mattress sets produced by each foreign manufacturing facility whose mattress sets that importer is importing. Specifically, before the importer may sell or introduce into commerce any imported mattress sets based on a pooled prototype, the importer must obtain documentation from each foreign manufacturing facility from which it imports mattress sets stating that the foreign facility has caused to be tested in accordance with Sec. 1633.7 at least one (1) specimen produced by that facility of each qualified prototype upon which that facility is relying to make the imported mattress sets.

(c) Confirmation test failure. (1) If the confirmation test specimen fails to meet the criteria of Sec. 1633.3(b), the manufacturer thereof shall not sell any mattress or mattress and foundation set based on the same prototype until that manufacturer takes corrective measures, tests a new specimen, and the new specimen meets the criteria of Sec. 1633.3(b).

(2) If a confirmation test specimen fails to meet the criteria of Sec. 1633.3(b), the manufacturer thereof must notify the developer ~~manufacturer~~ of the corresponding prototype of the test failure.

Sec. 1633.6 Quality assurance requirements.

(a) Quality assurance. Each manufacturer shall implement a quality assurance program to ensure that mattress models ~~mattresses and mattress and foundation sets~~ manufactured for sale are sufficiently similar for purposes of Section 1633.4(b) ~~identical~~ in all significant material respects to the prototype on which they are based. At a minimum these procedures shall include:

(1) Controls, including incoming inspection procedures, of all mattress ~~and mattress and foundation set~~ components and materials that are critical to the performance of the models under Section 1633.3 to ensure that they are identical in all significant material respects to those used in the qualified prototype;

(2) Designation of a production lot that is represented by the prototype; and

(3) Inspection of mattresses models ~~and mattress and foundation sets~~ produced for sale sufficient to demonstrate that they are sufficiently similar ~~identical~~ to the prototype on which they are based in all material respects.

(b) Production testing. Manufacturers are encouraged to conduct, as part of the quality assurance program, random testing of mattresses ~~and mattress and foundation sets~~ being produced for sale according to the requirements of Sec. Sec. 1633.3 and 1633.7.

(c) Failure of mattresses produced for sale to meet flammability standard. (1) Sale of mattresses and foundations. If any test performed for quality assurance yields results which indicate that any mattress ~~or mattress and foundation set~~ of a production lot does not meet the criteria of Sec. 1633.3(b), or if a manufacturer obtains test results or other evidence that a component or material or construction/assembly process used could

negatively affect the test performance of the mattress set as set forth in Sec. 1633.3(b), the manufacturer shall cease production and distribution in commerce of such mattresses and/or mattress and foundation sets until corrective action is taken.

(2) Corrective actions. A manufacturer must take corrective action when any mattress or mattress and foundation set is manufactured or imported for sale fails to meet the flammability test criteria set forth in Sec. 1633.3(b).

Sec. 1633.7 Mattress test procedure.

(a) Apparatus and test materials (1) Calorimetry. The rate of heat release must be measured by means of oxygen consumption calorimetry. The calibration should follow generally accepted practices for calibration. The calorimetry system shall be calibrated at a minimum of two (2) calibration points, at 75 kW and 200 kW.

(2) Testroom. The testroom must have either Test Configuration A or B.

(i) Test Configuration A. (an open calorimeter (or furniture calorimeter)). In this configuration, the specimen to be tested is placed under the center of an open furniture calorimeter. Figure 1 of this part shows the test assembly atop a bedframe and catch surface. The specimen shall be placed under an open hood which captures the entire smoke plume and is instrumented for heat release rate measurements. The area surrounding the test specimen in an open calorimeter layout shall be sufficiently large that there are no heat re-radiation effects from any nearby materials or objects. The air flow to the test specimen should be symmetrical from all sides. The air flow to the calorimeter hood shall be sufficient to ensure that the entire fire plume is captured, even at peak burning. Skirts may be placed on the hood periphery to help assure this plume capture, if necessary, though they must not be of such an excessive length as to cause the incoming flow to disturb the burning process. Skirts must also not heat up to the point that they contribute significant re-radiation to the test specimen. The air supply to the hood shall be sufficient that the fire is not in any way limited or affected by the available air supply.

The fire plume should not enter the hood exhaust duct. Brief (seconds) flickers of flame that occupy only a minor fraction of the hood exhaust duct inlet cross-section are not a problem since they do not signify appreciable suppression of flames.

(ii) Test Configuration B. The test room shall have dimensions 3.05 meters (m) 25 millimeters (mm) by 3.66 m 25 mm by 2.44 m 25 mm (10 feet (ft) by 12 ft by 8 ft) high. The specimen is placed within the burn room. All smoke exiting from the room is caught by a hood system instrumented for heat release rate measurements. The room shall have no openings permitting air infiltration other than a doorway opening 0.97 m 6.4 mm by 2.03 m 6.4 mm (38 in by 80 in) located as indicated in Figure 2 of this part and other small openings as necessary to make measurements. Construct the test room of wood or metal studs and line it with fire-rated wallboard or calcium silicate board. Position an exhaust hood outside of the doorway so as to collect all of the combustion gases. There shall be no obstructions in the air supply to the set-up.

(2) Location of test specimen. The location of the test specimen is shown in Figure 2 of this part. The angled placement is intended to minimize the interaction of flames on the side surfaces of the test specimen with the room walls. One corner of the test specimen

shall be 13 centimeters (cm) to 17 cm from the wall and the other corner shall be 25 cm to 30 cm from the wall. The test room shall contain no other furnishings or combustible materials except for the test specimen.

(3) Bed frame. For twin size mattresses, the specimen shall be placed on top of a welded bed frame (1.90 m by 0.99 m by 115 mm high; 75 in by 39 in by 4.5 in high) made from 38 mm (1.5 in) steel angle. The frame shall be completely open under the foundation except for two crosspieces, 25 mm wide (1 in) at the $\frac{1}{3}$ length points. If testing a size other than twin, the relationship of the mattress to the frame shall be comparable to that specified in this paragraph.

(4) Catch pan. The bed frame feet shall rest on a surface of either calcium silicate board or fiber cement board, 13 mm (0.5 in) thick, 2.11 m by 1.19 m (83 in by 47 in). The board serves as a catch surface for any flaming melt/drip material falling from the bed assembly and may be the location of a pool fire that consumes such materials. This surface must be cleaned between tests to avoid build-up of combustible residues. Lining this surface with aluminum foil to facilitate cleaning is not recommended since this might increase fire intensity via reflected radiation.

(5) Ignition source. (i) General. The ignition source shall consist of two T-shaped burners as shown in Figures 3 and 4 of this part. One burner impinges flames on the top surface of the mattress. The second burner impinges flames on the side of the mattress and on the side of the foundation. Each of the burners shall be constructed from stainless steel tubing (12.7 mm diameter with 0.89 0.5 mm wall thickness; 0.50 in diameter with 0.035 0.002 in wall). Each burner shall incorporate a stand-off foot to set its distance from the test specimen surface (Figure 5 of this part). Both burners shall be mounted with a mechanical pivot point but the side burner is locked in place to prevent movement about this pivot in normal usage. The top burner, however, is free to rotate about its pivot during a burner exposure and is lightly weighted so as to exert a downward force on the mattress top through its stand-off foot so that the burner follows a receding top surface on the test specimen (Figure 6 of this part). The combination of burner stand-off distance and propane gas flow rate to the burners determines the heat flux they impose on the surface of the test specimen so that both of these parameters are tightly controlled.

(ii) Top surface burner. The T head of the top surface burner (horizontal burner, Figure 3 of this part) shall be 305 2 mm (12 0.08 in) long with gas tight plugs in each end. Each side of the T shall contain 17 holes equally spaced over a 135 mm length (8.5 mm 0.1 mm apart; 0.333 0.005 in). The holes on each side shall begin 8.5 mm (0.33 in) from the centerline of the burner head. The holes shall be drilled with a 56 drill and are to be 1.17 mm to 1.22 mm (0.046 in to 0.048 in) in diameter. The holes shall be pointed 5[deg] out of the plane of the Figure. This broadens the width of the heat flux profile imposed on the surface of the test specimen.

(iii) Side surface burner. The T head of the side surface burner (vertical burner) shall be constructed similarly to the top surface burner, as shown in Figure 4 of this part, except that its overall length shall be 254 2 mm (10 0.08 in). Each side of the burner head shall contain 14 holes spaced evenly over a 110 mm length (8.5 mm 0.1 mm apart; 0.333 0.005 in). The holes shall be drilled with a 56 drill and are to be 1.17 mm to 1.22 mm (0.046 in to 0.048 in) in diameter. The holes shall be pointed 5[deg] out of the plane of the Figure.

(iv) Burner stand-off. The burner stand-off on each burner shall consist of a collar fixed by a set screw onto the inlet tube of the burner head (Figure 5 of this part). The collar shall hold a 3 mm diameter stainless steel rod having a 12.7 mm by 51 mm by (2-2.5 mm) thick (0.5 in by 2 in by (0.08-0.10) in thick) stainless steel pad welded on its end with its face (and long axis) parallel to the T head of the burner. The foot pad shall be displaced about 10 mm to 12 mm from the longitudinal centerline of the burner head so that it does not rest on the test specimen in an area of peak heat flux. A short section (9.5 mm outer diameter ("OD"), about 80 mm long; 3/8 in OD, about 3.2 in long) of copper tubing shall be placed in the inlet gas line just before the burner to facilitate making the burner nominally parallel to the test specimen surface (by a procedure described in this paragraph). The copper tube on the top surface burner must be protected from excessive heat and surface oxidation by wrapping it with a suitable layer of high temperature insulation. Both copper tubes are to be bent by hand in the burner alignment process. They must be replaced if they become work-hardened or crimped in any way. The gas inlet lines (12.7 mm OD stainless steel tubing; 0.50 in) serve as arms leading back to the pivot points and beyond, as shown in Figure 6 of this part. The length to the pivot for the top burner shall be approximately 1000 mm (40 in).

(v) Frame. Figure 6 shows the frame that holds the burners and their pivots, which are adjustable vertically in height. All adjustments (burner height, burner arm length from the pivot point, counterweight positions along the burner arm) are facilitated by the use of knobs or thumbscrews as the set screws. The three point footprint of the burner frame, with the two forward points on wheels, facilitates burner movement and burner stability when stationary.

(vi) Arms. The metal arms attached to the burners shall be attached to a separate gas control console by flexible, reinforced plastic tubing. The gas control console is mounted separately so as to facilitate its safe placement outside of the test room throughout the test procedure. The propane gas lines running between the console and the burner assembly must be anchored on the assembly before running to the burner inlet arms. A 1.5 m 25 mm (58 in 1 in) length of flexible, reinforced tubing between the anchor point and the end of each burner inlet allows free movement of the top burner about its pivot point. The top burner arm shall have a pair of moveable cylindrical counterweights that are used, as described below, to adjust the downward force on the stand-off foot.

1 Fiber-reinforced plastic tubing (6 mm ID by 9.5 mm OD; 1/4 inch ID by 3/4 inch OD) made of PVC should be used.

(vii) Burner head. Each burner head shall have a separate pilot light consisting of a 3 mm OD (1/8 in OD) copper tube with an independently-controlled supply of propane gas. The tube terminates within 10 mm of the center of the burner head. Care must be taken to set the pilot flame size small enough so as not to heat the test specimen before the timed burner exposure is begun.

(viii) Flow control system. Each burner shall have a flow control system of the type shown in Figure 7 of this part. Propane gas from a source such as a bottle is reduced in

pressure to approximately 70 kilopascals ("kPa") (20 pounds per square inch gage ("psig")) and fed to the system shown in Figure 8 of this part. The gas flow to the burner is delivered in a square-wave manner (constant flow with rapid onset and termination) by means of the solenoid valve upstream of the flowmeter. An interval timer (accurate to 0.2 s) determines the burner flame duration. The pilot light assures that the burner will ignite when the solenoid valve opens \2\ . The gas flow shall be set using a rotameter type of flowmeter, with a 150 mm scale, calibrated for propane. When calibrating the flowmeter, take into account that the flow resistance of the burner holes causes a finite pressure increase in the flowmeter above ambient. (If a calibration at one atmosphere is provided by the manufacturer, the flowmeter reading, at the internal pressure existing in the meter, required to get the flow rates listed in this paragraph must be corrected, typically by the square root of the absolute pressure ratio. This calls for measuring the actual pressure in the flow meters when set near the correct flow values. A value roughly in the range of 1 kPa to 3 kPa--5 in to 15 in of water--can be expected.) Useful guidelines for calibration are provided in Appendix A of this part.

\2\ If the side burner, or more commonly one half of the side burner, fails to ignite quickly, adjust the position of the igniter, bearing in mind that propane is heavier than air. The best burner behavior test assessment is done against an inert surface (to spread the gas as it would during an actual test).

(ix) Gas flow rate. Use propane gas with a known net heat of combustion of 46.5 0.5 MJ/kg (nominally 99% to 100% propane). Each burner has a specific propane gas flow rate set with its respective, calibrated flowmeter. The gas flow rate to the top burner is 12.9 liters per minute ("L/min") 0.1 L/min at a pressure of 101 5 kPa (standard atmospheric pressure) and a temperature of 22 3 [deg]C. The gas flow rate to the side burner is 6.6 0.05 L/min at a pressure of 101 5 kPa (standard atmospheric pressure) and temperature of 22 3 [deg]C. For the flowmeters supplied with the burner assembly, the black float setting for the top burner is expected to be in the 85 mm to 95 mm range. For the side burner, the expected range for the black float is 115 m to 125 mm. The total heat release rate of the burners is 27 kW.

(b) Conditioning. Remove the specimens from any packaging prior to conditioning. Specimens shall be conditioned in air at a temperature greater than 18 [deg]C (65 [deg]F) and a relative humidity less than 55 percent for at least 48 continuous hours prior to test. Specimens shall be supported in a manner to permit free movement of air around them during conditioning.

(c) Test preparation. (1) General. Horizontal air flow at a distance of 0.5 m (20 in) on all sides of the test specimen at the mattress top height shall be ≤ 0.5 m/s. If there is any visual evidence that the burner flames are being shifted around during their exposure durations, the burner regions must be enclosed on two or more sides by at least a triple layer of screen wire. The screen(s) for the top burner shall sit on the mattress top but must be far enough away (typically 30 cm or more) so as not to interfere or interact with flame spread during the burner exposure. The screen for the side burner will require a separate

support from below. All screens shall be removed at the end of the 70 second exposure interval.

(2) Specimen. Remove the test specimen from the conditioning room immediately before it is to be tested. Be sure the bed frame is approximately centered on the catch surface. Place the specimen on the bed frame. Carefully center them on the bed frame and on each other. The mattress shall be centered on top of the foundation (see Figure 1 of this part). However, in order to keep the heat flux exposure the same for the sides of the two components, if the mattress is 1 cm to 2 cm narrower than the foundation, the mattress shall be shifted so that the side to be exposed is in the same plane as the foundations. Refer to Figure 8 of this part. A product having an intended sleep surface on only one side shall be tested with the sleeping side up so that the sleeping surface is exposed to the propane burner.

(d) Burner flow rate/flow timer confirmation. Just prior to moving the burner adjacent to the test specimen, briefly ignite each burner at the same time, and check that the propane flow to that burner is set at the appropriate level on its flowmeter to provide the flows listed in paragraph (a)(5)(ix) of this section. Check that the timers for the burner exposures are set to 70 seconds for the top burner and 50 seconds for the side burner. For a new burner assembly, check the accuracy of the gas flow timers against a stop watch at these standard time settings. Set pilot flows to a level that will not cause them to impinge on sample surfaces.

(e) Location of the gas burners. Place the burner heads so that they are within 300 mm (1 ft) of the mid-length of the mattress. The general layout for the room configuration is shown in Figure 2 of this part. For a quilted mattress top the stand-off foot pad must alight on a high, flat area between dimples or quilting thread runs. The same is to be true for the side burner if that surface is quilted. If a specimen design presents a conflict in placement such that both burners cannot be placed between local depressions in the surface, the top burner shall be placed at the highest flat surface.

(f) Burner set-up. The burners shall be placed in relation to the mattress and foundation surfaces in the manner shown in Figure 9 of this part, i.e., at the nominal spacings shown there and with the burner tubes nominally parallel $\backslash 3 \backslash$ to the mattress surfaces on which they impinge. Since the heat flux levels seen by the test specimen surfaces depend on burner spacing, as well as gas flow rate, care must be taken with the set-up process.

 $\backslash 3 \backslash$ The top burner will tend to be tangential to the mattress surface at the burner mid-length; this orientation will not necessarily be parallel to the overall average mattress surface orientation nor will it necessarily be horizontal. This is a result of the shape of the mattress top surface.

(g) Burner alignment procedure. (1) Preparation. Complete the following before starting the alignment procedure:

(i) Check that the pivot point for the mattress top burner feed tube and the two metal plates around it are clean and well-lubricated so as to allow smooth, free movement.

(ii) Set the two burners such that the 5[deg] out-of-plane angling of the flame jets makes the jets on the two burners point slightly toward each other.

(iii) Check the burner stand-off feet for straightness and perpendicularity between foot pad and support rod and to see that they are clean of residue from a previous test.

(iv) Have at hand the following items to assist in burner set-up: the jig, shown in Figure 10 of this part, for setting the stand-off feet at their proper distances from the front of the burner tube; a 3 mm thick piece of flat stock (any material) to assist in checking the parallelness of the burners to the mattress surfaces; and a 24 gage stainless steel sheet metal platen that is 30 mm (12 in) wide, 610 mm (24 in) long and has a sharp, precise 90[deg] bend 355 mm (14 in) from one 30 mm wide end.

(2) Alignment. (i) Place the burner assembly adjacent to the test specimen. Place the sheet metal platen on the mattress with the shorter side on top. The location shall be within 30 cm (1 ft) of the longitudinal center of the mattress. The intended location of the stand-off foot of the top burner shall not be in a dimple or crease caused by the quilting of the mattress top. Press the platen laterally inward from the edge of the mattress so that its side makes contact with either the top and bottom tape edge or the vertical side of the mattress. \4\ Use a 20 cm (8 in) strip of duct tape (platen to mattress top) to hold the platen firmly inward in this position.

\4\ Mattresses having a convex side are treated separately since the platen cannot be placed in the above manner. Use the platen only to set the top burner parallelness. Set the in/out distance of the top burner to the specification in the paragraph (g)(2)(iii). Set the side burner so that it is approximately (visually) parallel to the flat side surface of the foundation below the mattress/foundation crevice once its foot is in contact with the materials in the crevice area. The burner will not be vertical in this case. If the foundation side is also non-flat, set the side burner vertical (3 mm, as above) using a bubble level as a reference. The side surface convexities will then bring the bowed out sections of the specimen closer to the burner tube than the stand-off foot.

(ii) With both burner arms horizontal (pinned in this position), fully retract the stand-off feet of both burners and, if necessary, the pilot tubes as well \5\ (Neither is to protrude past the front face of the burner tubes at this point.) Move the burner assembly forward (perpendicular to the mattress) until the vertical burner lightly contacts the sheet metal platen. Adjust the height of the vertical burner on its vertical support column so as to center the tube on the crevice between the mattress and the foundation. (This holds also for pillow top mattress tops, i.e., ignore the crevice between the pillow top and the main body of the mattress.) \6\ Adjust the height of the horizontal burner until it sits lightly on top of the sheet metal platen. Its burner arm should then be horizontal.

\5\ The pilot tubes can normally be left with their ends just behind the plane of the front of the burner tube. This way they will not interfere with positioning of the tube but their flame will readily ignite the burner tubes.

\6\ For tests of the mattress alone, set the side burner mid-height equal to the lower tape edge of the mattress.

(iii) Move the horizontal burner in/out (loosen the thumb screw near the pivot point) until the outer end of the burner tube is 13 mm to 19 mm ($\frac{1}{2}$ in to $\frac{3}{4}$ in) from the corner bend in the platen (this is facilitated by putting a pair of lines on the top of the platen 13 mm and 19 mm from the bend and parallel to it). Tighten the thumb screw.

(iv) Make the horizontal burner parallel to the top of the platen (within 3 mm, $\frac{1}{8}$ in over the burner tube length) by bending the copper tube section appropriately. Note: After the platen is removed in paragraph (g)(2)(vii), the burner tube may not be horizontal; this is normal. For mattress/foundation combinations having nominally flat, vertical sides, the similar adjustment for the vertical burner is intended to make that burner parallel to the sides and vertical. Variations in the shape of mattresses and foundations can cause the platen section on the side to be non-flat and/or non-vertical. If the platen is flat and vertical, make the vertical burner parallel to the side of the platen (\pm 3 mm) by bending its copper tube section as needed. If not, make the side burner parallel to the mattress/foundation sides by the best visual estimate after the platen has been removed.

(v) Move the burner assembly perpendicularly back away from the mattress about 30 cm (1 ft). Set the two stand-off feet to their respective distances using the jig designed for this purpose. Install the jig fully onto the burner tube (on the same side of the tube as the stand-off foot), with its side edges parallel to the burner feed arm, at about the position where one end of the foot will be. Loosen the set screw and slide the foot out to the point where it is flush with the bottom end of the jig. Tighten the set screw. Make sure the long axis of the foot is parallel to the burner tube. It is essential to use the correct side of the spacer jig with each burner. Double check this. The jig must be clearly marked.

(vi) Set the downward force of the horizontal burner. Remove the retainer pin near the pivot. While holding the burner feed arm horizontal using a spring scale ∇ hooked onto the thumbscrew holding the stand-off foot, move the small and/or large weights on the feed tube appropriately so that the spring scale reads 170 g to 225 g (6 oz to 8 oz).

 ∇ An acceptable spring scale has a calibrated spring mounted within a holder and hooks on each end.

(vii) Remove the sheet metal platen (and tape holding it). (viii) Hold the horizontal burner up while sliding the burner assembly forward until its stand-off foot just touches the mattress and/or the foundation ∇ , then release the horizontal burner. The outer end of the burner tube should extend at least 6 mm to 12 mm ($\frac{1}{4}$ in to $\frac{1}{2}$ in) out beyond the uppermost corner/edge of the mattress so that the burner flames will hit the tape edge. (For a pillow top mattress, this means the outer edge of the pillow top portion and the distance may then be greater than 6 mm to 12 mm.) If this is not the case, move the burner assembly (perpendicular to the mattress side)--not the horizontal burner alone--until it is. Finally, move the vertical burner tube until its stand-off foot just touches the side of the mattress and/or the foundation. (Use the set screw near the vertical burner pivot.)

\8\ The foot should depress the surface it first contacts by no more than 1 mm to 2 mm. This is best seen up close, not from the rear of the burner assembly. However, if a protruding tape edge is the first item contacted, compress it until the foot is in the plane of the mattress/foundation vertical sides. The intent here is that the burner be spaced a fixed distance from the vertical mattress/foundation sides, not from an incidental protrusion. Similarly, if there is a wide crevice in this area which would allow the foot to move inward and thereby place the burners too close to the vertical mattress/foundation sides, it will be necessary to use the spacer jig (rather than the stand-off foot) above or below this crevice to set the proper burner spacing. Compress the mattress/foundation surface 1 mm to 2 mm when using the jig for this purpose.

(ix) Make sure all thumbscrews are adequately tightened. Care must be taken, once this set-up is achieved, to avoid bumping the burner assembly or disturbing the flexible lines that bring propane to it.

(x) If there is any indication of flow disturbances in the test facility which cause the burner flames or pilot flames to move around, place screens around the burners so as to minimize these disturbances \9\. These screens (and any holders) must be far enough away from the burners (about 30 cm or more for the top, less for the side) so that they do not interact with the flames growing on the specimen surfaces. For the top surface burner, at least a triple layer of window screen approximately 30 cm high sitting vertically on the mattress top (Figure 9 of this part) has proved satisfactory. For the side burner at least a triple layer of screen approximately 15 cm wide, formed into a square-bottom U-shape and held from below the burner has proved satisfactory. Individual laboratories will have to experiment with the best arrangement for suppressing flow disturbances in their facility.

\9\ The goal here is to keep the burner flames impinging on a fixed area of the specimen surface rather than wandering back and forth over a larger area.

(xi) Proceed with the test (see Test Procedure in paragraph (h) of this section and Appendix B of this part).

(h) Running the test. (1) Charge the hose line to be used for fire suppression with water.

(2) Ignite the pilot lights on both burners and make sure they are small enough as to not heat the test specimen surfaces significantly.

(3) With the calorimetry system fully operational, after instrument zeroes and spans, start the video lights and video camera and data logging systems two minutes before burner ignition (or, if not using video, take a picture of the setup).

(4) Start the burner exposure by activating power to the burner timers. Also start a 30 minute timer of the test duration. If not using video, one photo must be taken within the first 45 seconds of starting the burners.

(5) When the burners go out (after 70 seconds for the longer exposure), carefully lift the top burner tube away from the specimen surface, producing as little as possible

disturbance to the specimen. Remove the burner assembly from the specimen area to facilitate the video camera view of the full side of the specimen. In the case of the room-based configurations, remove the burner assembly from the room to protect it. Remove all screens.

(i) Video recording/photographs. Place a video or still frame camera so as to have (when the lens is zoomed out) just slightly more than a full-length view of the side of the test specimen being ignited, including a view of the flame impingement area while the burner assembly is present. The view must also include the catch pan so that it is clear whether any melt pool fire in this pan participates significantly in the growth of fire on the test specimen. The camera shall include a measure of elapsed time to the nearest 1 second for video and 1 minute for still frame within its recorded field of view (preferably built-in to the camera). For the room-based configuration, the required full-length view of the sample may require an appropriately placed window, sealed with heat resistant glass, in one of the room walls. Place the camera at a height just sufficient to give a view of the top of the specimen while remaining under any smoke layer that may develop in the room. The specimen shall be brightly lit so that the image does not lose detail to over-exposed flames. This will require a pair or more of 1 kW photo flood lights illuminating the viewed side of the specimen. The lights may need to shine into the room from the outside via sealed windows.

(j) Cessation of test. (1) The heat release rate shall be recorded and video/photographs taken until either 30 minutes has elapsed since the start of the burner exposure or a fire develops of such size as to require suppression for the safety of the facility.

(2) Note the time and nature of any unusual behavior that is not fully within the view of the video camera. This is most easily done by narration to a camcorder.

(3) Run the heat release rate system and datalogger until the fire has been fully out for several minutes to allow the system zero to be recorded.

(k) The above tests should be performed only by a laboratory (regardless of whether it is independent of or related to the manufacturer) that has demonstrated to an objective third party that it is qualified to perform the tests in a competent, thorough and consistent manner.

Sec. 1633.8 Findings.

(a) General. In order to issue a flammability standard under the FFA, the FFA requires the Commission to make certain findings and to include these in the regulation, 15 U.S.C. 1193(j)(2). These findings are discussed in this section.

(b) Voluntary standards. No findings concerning compliance with and adequacy of a voluntary standard are necessary because no relevant voluntary standard addressing the risk of injury that is addressed by this regulation has been adopted and implemented.

(c) Relationship of benefits to costs. The Commission estimates the potential total lifetime benefits of a mattress that complies with this standard to range from \$62 to \$74 per mattress (based on a 10 year mattress life and a 3% discount rate). The Commission estimates total resource costs of the standard to range from \$13 to \$44 per mattress. This yields net benefits of \$18 to \$62 per mattress. The Commission estimates that aggregate lifetime benefits associated with all mattresses produced the first year the standard

becomes effective range from \$1,560 to \$1,880 million, and that aggregate resource costs associated with these mattresses range from \$320 to \$1,110 million, yielding net benefits of about \$450 to \$1,560 million. Accordingly, the Commission finds that the benefits from the regulation bear a reasonable relationship to its costs.

(d) Least burdensome requirement. The Commission considered the following alternatives: Alternative maximum peak heat release rate and test duration, alternative total heat released in the first 10 minutes of the test, mandatory production testing, a longer effective date, taking no action, relying on a voluntary standard, and requiring labeling alone (without any performance requirements). The alternatives of taking no action, relying on a voluntary standard (if one existed) requiring labeling alone are unlikely to adequately reduce the risk. Requiring a criterion of 25 MJ total heat release during the first 10 minutes of the test instead of 15 MJ would likely reduce the estimated benefits (deaths and injuries reduced) without having much effect on costs. Both options of increasing the duration of the test from 30 minutes to 60 minutes and decreasing the peak rate of heat release from 200 kW to 150 kW would likely increase costs significantly without substantial increase in benefits. Requiring production testing would also likely increase costs. Therefore, the Commission finds that an open flame standard for mattresses with the testing requirements and criteria that are specified in the Commission rule is the least burdensome requirement that would prevent or adequately reduce the risk of injury for which the regulation is being promulgated.

Sec. 1633.9 Glossary of terms.

(a) Absorbent pad. Pad used on top of mattress. Designed to absorb moisture/body fluids thereby reducing skin irritation, can be one time use.

(b) Basket pad. Cushion for use in an infant basket.

(c) Bunk beds. A tier of beds, usually two or three, in a high frame complete with mattresses (see Figure 11 of this part).

(d) Car bed. Portable bed used to carry a baby in an automobile.

(e) Carriage pad. Cushion to go into a baby carriage.

(f) Chaise lounge. An upholstered couch chair or a couch with a chair back. It has a permanent back rest, no arms, and sleeps one (see Figure 11).

(g) Convertible sofa. An upholstered sofa that converts into an adult sized bed. Mattress unfolds out and up from under the seat cushioning (see Figure 11).

(h) Corner groups. Two twin size bedding sets on frames, usually slipcovered, and abutted to a corner table. They also usually have loose bolsters slipcovered (see Figure 11).

(i) Crib bumper. Padded cushion which goes around three or four sides inside a crib to protect the baby. Can also be used in a playpen.

(j) Daybed. Daybed has foundation, usually supported by coil or flat springs, mounted between arms on which mattress is placed. It has permanent arms, no backrest, and sleeps one (see Figure 11).

(k) Dressing table pad. Pad to cushion a baby on top of a dressing table.

(l) Drop-arm loveseat. When side arms are in vertical position, this piece is a loveseat. The adjustable arms can be lowered to one of four positions for a chaise lounge effect or

a single sleeper. The vertical back support always remains upright and stationary (see Figure 11).

(m) Futon. A flexible mattress generally used on the floor that can be folded or rolled up for storage. It usually consists of resilient material covered by ticking.

(n) High riser. This is a frame of sofa seating height with two equal size mattresses without a backrest. The frame slides out with the lower mattress and rises to form a double or two single beds (see Figure 11).

(o) Infant carrier and lounge pad. Pad to cushion a baby in an infant carrier.

(p) Mattress foundation. This is a ticking covered structure used to support a mattress or sleep surface. The structure may include constructed frames, foam, box springs or other materials used alone or in combination.

(q) Murphy Bed. A style of sleep system where the mattress and foundation are fastened to the wall and provide a means to retract or rotate the bed assembly into the wall to release more floor area for other uses.

(r) Pillow. Cloth bag filled with resilient material such as feathers, down, sponge rubber, urethane, or fiber used as the support for the head of a person.

(s) Playpen pad. Cushion used on the bottom of a playpen.

(t) Portable crib. Smaller size than a conventional crib. Can usually be converted into a playpen.

(u) Quilted means stitched with thread or by fusion through the ticking and one or more layers of material.

(v) Roll-away-bed. Portable bed which has frame that folds with the mattress for compact storage.

(w) Sleep lounge. Upholstered seating section is mounted on a frame. May have bolster pillows along the wall as backrests or may have attached headrests (see Figure 11).

(x) Stroller pad. Cushion used in a baby stroller.

(y) Sofa bed. These are pieces in which the back of the sofa swings down flat with the seat to form the sleeping surface. All upholstered. Some sofa beds have bedding boxes for storage of bedding. There are two types: The one-piece, where the back and seat are upholstered as a unit, supplying an unbroken sleeping surface; and the two-piece, where back and seat are upholstered separately (see Figure 11).

(z) Sofa lounge--(includes glideouts). Upholstered seating section is mounted on springs and in a frame that permit it to be pulled out for sleeping. Has upholstered backrest bedding box that is hinged. Glideouts are single sleepers with sloping seats and backrests. Seat pulls out from beneath back and evens up to supply level sleeping surface (see Figure 11).

(aa) Studio couch. Consists of upholstered seating section on upholstered foundation. Many types convert to twin beds (see Figure 11).

(bb) Studio divan. Twin size upholstered seating section with foundation is mounted on metal bed frame. Has no arms or backrest, and sleeps one (see Figure 11).

(cc) Trundle bed. A low bed which is rolled under a larger bed. In some lines, the lower bed springs up to form a double or two single beds as in a high riser (see Figure 11).

(dd) Tufted means buttoned or laced through the ticking and upholstery material and/or core, or having the ticking and loft material and/or core drawn together at intervals by any other method which produces a series of depressions on the surface.

(ee) Twin studio divan. Frames which glide out (but not up) and use seat cushions, in addition to upholstered foundation to sleep two. Has neither arms nor back rest (see Figure 11).

(ff) Flip or sleeper chair. Chair that unfolds to be used for sleeping, typically has several connecting fabric covered, solid foam core segments.

Subpart B--Rules and Requirements

Sec. 1633.10 Definitions.

(a) Standard means the Standard for the Flammability (Open-Flame) of Mattresses and Foundations (16 CFR part 1633, subpart A).

(b) The definition of terms set forth in Sec. 1633.2 of the standard shall also apply to this subpart.

Sec. 1633.11 Records.

(a) Test and manufacturing records--General. Every manufacturer (including importers) or other person initially introducing into commerce mattresses ~~or mattress and foundation~~-sets subject to the standard, irrespective of whether guarantees are issued relative thereto, shall maintain the following records:

(1) Test results and details of each test performed by or for that manufacturer (including failures), ~~whether~~ for prototype, confirmation, and ~~or~~ production, in accordance with Sec. 1633.7. Details shall include: Name and full address ~~Location of~~ test facility, type of test room, test room conditions, prototype, model, or production identification number, and test data including the peak rate of heat release, total heat release in first 10 minutes, a graphic depiction of the peak rate of heat release and total heat release over time. These records shall include the name and signature of person conducting the test, the date of the test, and a certification by the person overseeing the testing as to the test results and that the test was carried out in accordance with the Standard. For confirmation tests, the identification number must be that of the prototype tested.

(2) Video and/or a minimum of eight photographs of the testing of each mattress or mattress and foundation set, in accordance with Sec. 1633.4 (one taken before the test starts, one taken within 45 seconds of the start of the test, and the remaining six taken at five minute intervals, starting at 5 minutes and ending at 30 minutes), with the prototype identification number or production lot identification number of the mattress ~~or mattress foundation~~-set, date and time of test, and name and location of testing facility clearly displayed.

(b) Prototype records. In addition to the records specified in paragraph (a) of this section, the following records related to prototype testing shall be maintained:

(1) ~~A list of the unique prototype identification numbers for each the-qualified prototype and a list of the unique model identification numbers of each prototype based on each the-qualified prototype.~~

(2) ~~A detailed description of all materials, components, and methods of construction for each prototype-mattress or prototype-mattress and foundation set. Such description shall include at a minimum, the specifications of all materials and components, name and full address location of each material and component supplier, and a physical sample of each material and component of the prototype.~~

(3) ~~A list of which models and production lots of mattresses or mattress and foundation sets are represented by each prototype identification number.~~

(34) ~~For a given mattress model-Where a prototype is not required to be tested before sale, pursuant to Sec. 1633.4(b), the prototype identification number of the qualified prototype on which the model mattress-to be offered for sale is based, and, at a minimum, the manufacturing specifications and a description of the materials substituted and/or the size change, photographs or physical specimens of the substituted materials, and documentation based on objectively reasonable criteria that the difference change-in any component, material, or method of construction between the prototype and the model will not cause the model-prototype to exceed the test criteria specified in Sec. 1633.3(b).~~

(4) Acceptable forms of objectively reasonable criteria referred to in paragraph (b)(3) of this section may include test data, certificates of analysis, quality or the like, Material Safety Data Sheets or other information provided by a vendor of materials or another third party.

(5) Identification, composition, and details of the application of any flame retardant treatments and/or inherently flame resistant fibers or other materials employed in mattress components.

(c) Pooling confirmation test records. With respect to pooling confirmation testing, records shall be maintained to show:

(1) ~~The prototype identification number assigned by the original-prototype developer manufacturer.~~

(2) ~~Name and full address location of the prototype developer manufacturer.~~

(3) ~~Copy of prototype test records, and records required by paragraph (b)(2) of this section.~~

(4) ~~A list of mattress models based on -of mattresses, and/or mattress and foundation sets, represented by the prototype.~~

(d) Quality assurance records. In addition to the records required by paragraph (a) of this section, the following quality assurance records shall be maintained:

(1) A written copy of the manufacturer's quality assurance procedures; in the case of imported mattress sets, the importer shall maintain a written copy of the quality assurance procedures followed by each foreign manufacturer that produces the mattress sets it imports and a certificate signed by an official of the foreign manufacturer stating that it follows those procedures.-

(2) Records of any production tests performed. Production test records must be maintained and shall include in addition to the requirements of paragraph (a) of this section, an assigned production lot identification number and the identification number of the prototype associated with the specimen tested.

(3) For each prototype, the number of mattresses ~~or mattress and foundation~~ sets in each production lot based on that prototype.

(4) The duration of manufacture of the production lot, i.e., the start and end dates of production of that lot.

(5) Component, material and assembly records. Every manufacturer conducting tests and/or technical evaluations of components and materials that are critical to the performance of models under Section 1633.3 and/or methods of construction used in a qualified prototype must maintain detailed records of such tests and evaluations, which may be conducted by the manufacturer or importer, suppliers of the component or material, or a third party.

(e) Record retention requirements. The records required under this section shall be maintained by the manufacturer (including importers) at its place of business (if in the United States) or at a designated location in the United States for as long as mattress models/mattresses/foundations based on the prototype in question are in production and shall be retained for 3 years thereafter. Records shall be written in the English language and available upon the request of Commission staff.

Sec. 1633.12 Labeling.

(a) Each new mattress or mattress/foundation set subject to the standard shall bear a permanent, conspicuous, and legible white label containing:

(1) Name of the manufacturer, or for imported mattresses or foundations, the name of the foreign manufacturer and the importer;

(2) Location of the manufacturer, including street address, city, ~~and state~~ and country (if not the United States);

(3) Month and year of manufacture;

(4) Model identification number;

(5) Prototype identification number for the mattress set; and

(6) A certification that the mattress complies with this standard.

(b) Each renovated mattress set subject to the standard shall bear a permanent, conspicuous, and legible yellow label printed with lettering in black ink containing:

(1) Name of the renovator, or for imported mattresses or foundations, the name of the foreign renovator and the importer;

(2) Location of the renovator, including street address, city, state and country (if not the United States);

(3) Month and year of renovation;

(4) Model identification;

(5) Prototype identification number for the renovated mattress set; and

(6) A certification that the renovated mattress set complies with the fire performance requirements of this standard, but that since some or all of the internal materials used to make the renovated mattress have been used by other consumers, compliance with the flammability standard does not mean that the renovated mattress set is clean, hygienic, or sanitary in terms of being free of human or animal blood, urine, feces, insects, other organisms, mold or allergens.

(7) The statement required by the Section 4(h) of the Textile Fiber Products Identification Act, 15 U.S.C. § 70b(h), notifying consumers that the renovated mattress set contains "reused stuffing" may be placed on the label required by this provision.

(c) The information required on labels by this section shall be set forth separately from any other information appearing on such label. Other information, representations, or disclosures, appearing on labels required by this section or elsewhere on the item, shall not interfere with, minimize, detract from, or conflict with the required information.

(d) No person, other than the ultimate consumer, shall remove or mutilate, or cause or participate in the removal or mutilation of, any label required by this section to be affixed to any item.

Sec. 1633.13 Tests for guaranty purposes, compliance with this section, and one of a kind exemption.

(a) Tests for guaranty purposes. Reasonable and representative tests for the purpose of issuing a guaranty under section 8 of the Flammable Fabrics Act, 15 U.S.C. 1197, for ~~mattresses or mattress and foundation sets~~ subject to the standard shall be the tests performed to show compliance with the standard.

(b) Compliance with this section. No person subject to the Flammable Fabrics Act shall manufacture for sale, import, distribute, or otherwise market or handle any mattress or mattress and foundation set which is not in compliance with the provisions under subpart B of this part.

(c) "One of a kind" exemption for physician prescribed mattresses. (1)(i) A ~~mattress or mattress and foundation set~~ manufactured in accordance with a physician's written prescription or manufactured in accordance with other comparable written medical therapeutic specification, to be used in connection with the treatment or management of a named individual's physical illness or injury, shall be considered a "one of a kind mattress" and shall be exempt from testing under the standard pursuant to Sec. 1633.7 thereof: Provided, that the mattress or mattress and foundation set bears a permanent, conspicuous and legible label which states:

WARNING: This mattress or mattress and foundation set may be subject to a large fire if exposed to an open flame. It was manufactured in accordance with a physician's prescription and has not been tested under the Federal Standard for the Flammability (Open-Flame) of Mattresses and Foundation Sets (16 CFR part 1633).

(ii) Such labeling must be attached to the mattress or mattress and foundation set so as to remain on or affixed thereto for the useful life of the mattress or mattress and foundation set. The label must be at least 40 square inches (250 sq. cm) with no linear dimension less than 5 inches (12.5 cm). The letters in the word "WARNING" shall be no less than 0.5 inch (1.27 cm) in height and all letters on the label shall be in a color which contrasts with the background of the label. The warning statement which appears on the label must also be conspicuously displayed on the invoice or other sales papers that accompany the mattress in commerce from the manufacturer to the final point of sale to a consumer.

(2) The manufacturer of a mattress or mattress and foundation set exempted from testing under this paragraph shall, in lieu of the records required to be kept by Sec. 1633.10, retain a copy of the written prescription or other comparable written medical therapeutic specification for such mattress during a period of three years, measured from the date of manufacture.

(3) For purposes of this subpart the term physician shall mean a physician, chiropractor or osteopath licensed or otherwise permitted to practice by any State of the United States.

Subpart C--Interpretations and Policies

Sec. 1633.14 Policy clarification on renovation of mattresses.

(a) Section 3 of the Flammable Fabrics Act (15 U.S.C. 1192) prohibits, among other things, the "manufacture for sale" of any product which fails to conform to an applicable standard issued under the Act. The standard for the Flammability (Open-Flame) of Mattresses and Foundations in subpart A of this part, issued pursuant to the Act, provides that, with certain exceptions, mattresses must be tested according to a prescribed method. ~~The standard does not exempt renovation; nor does it specifically refer to renovation.~~

(b) The purpose of this subpart is to inform the public that mattresses renovated for sale are considered by the Commission to be mattresses manufactured for sale and, therefore, subject to the requirements of the open-flame Mattress Standard. The Commission believes that this policy clarification will better protect the public against the unreasonable risk of fires leading to death, personal injury or significant property damage, and assure that purchasers of renovated mattresses receive the same protection under the Flammable Fabrics Act as purchasers of new mattresses.

~~(c) For purposes of this subpart, mattress renovation includes a wide range of operations. Replacing the ticking or batting, stripping a mattress to its springs, rebuilding a mattress, or replacing components with new or recycled materials, are all part of the process of renovation. Any one, or any combination of one or more, of these steps in mattress renovation is considered to be mattress manufacture.~~

~~(d) If the person who renovates the mattress intends to retain the renovated mattress for his or her own use, or if a customer or a renovator merely hires the services of the renovator and intends to take back the renovated mattress for his or her own use, "manufacture for sale" has not occurred and such a renovated mattress is not subject to the mattress standard.~~

~~(e) However, if a renovated mattress is sold or intended for sale, either by the renovator or the owner of the mattress who hires the services of the renovator, such a transaction is considered to be "manufacture for sale".~~

~~(f) Accordingly, mattress renovation is considered by the Commission to be "manufacture for sale" and, therefore, subject to the open flame Mattress Standard, when renovated mattresses are sold or intended for sale by a renovator or the customer of the renovator. the standard defines the term mattress renovation and renovated mattress in paragraphs (--) and (--) of section 2.~~

~~(g) A renovator who believes that certain mattresses are entitled to one of a kind exemption, may present relevant facts to the Commission and petition for an exemption.~~

~~Renovators are expected to comply with all the testing requirements of the open flame Mattress Standard until an exemption is approved.~~

Exhibit 2

“Final Report for Mites and Allergens in Mattresses,”

Larry G. Arlian, Ph.D.,
Dept. of Biological Sciences,
Wright State University,
Dayton, Ohio,
March 24, 2000

Final Report for

Mites and Allergens in Mattresses

Submitted to:

Shawn Conrad, Vice President
Government Relations
International Sleep Products Association
501 Wythe Street
Alexandria, Virginia 22314-1917

Submitted by:

Larry G. Arlian, Ph.D.
Department of Biological Sciences
Wright State University
Dayton, Ohio 45435-0001
Telephone (937) 775-2568
FAX (937) 775-3320

PURPOSE

The objective of this study was to determine house dust mite and allergen concentrations in new mattresses, used mattresses prior to their renovation and renovated mattresses.

MITE COUNTS

Methods

New, used and renovated mattresses in three different locations (Los Angeles, California; Miami, Florida; and Washington, D.C.) were vacuumed by the International Sleep Products Association. The samples were frozen and sent to our laboratory at Wright State University.

The dust samples from used and renovated mattresses were prepared for counting using our usual methods (Arlian et al. 1982, 1992). Briefly, 50 mg of each sample was weighed, agitated with saturated NaCl and detergent, rinsed through a sieve (35 μ m pore size), stained with crystal violet and rinsed into a gridded Petri dish. The numbers of mites (per 50 mg) were counted using a stereomicroscope and then extrapolated to mites per gram.

There was so little dust on the filters following vacuuming all of the new mattresses that for these samples, the entire filter was systematically viewed with the stereomicroscope and those counts are reported as mites per entire vacuumed sample (not extrapolated).

Results

Almost no mites were recovered from the new mattresses in any of the locations (Los Angeles, Miami or Washington, D.C.) (Tables 1-4). Two mites (largest number on any new mattress) were recovered from a new mattress Washington, D.C. However, at least one mite was recovered from at least one new mattress in each location.

The vacuum samples from the used and renovated mattresses had differing numbers of mites and they varied between and within the geographical areas. Los Angeles had the fewest mites in samples from the used mattresses. Only four of the ten mattresses had any mites at all and those four had very few (20-80 mites/g). All of the used mattresses from Miami and Washington, D.C. had mites.

Most importantly there were differences in the numbers of mites found in the renovated mattress samples when compared with the used mattress samples from the same geographical area. Washington, D.C. was the only location from which the renovated mattresses had fewer recovered mites than the used mattress samples. All of the used mattress samples from Washington, D.C. contained mites (range 20-980 mites/g) whereas 8/10 of the renovated mattress samples had mites ranging from 0-120 mites/g.

Miami, on the other hand, generally had many more mites in the renovated mattress samples (range 80-7,660 mites/g) while the mite numbers for the used mattress samples ranged from 60-860 mites/g. Also, some of the renovated mattress samples were broken down into lower and upper ticking. Generally there were more mites recovered from the lower portion of the ticking than the upper portion.

The samples from Los Angeles were different than the other locations because there were two different companies (X and Y) renovating the mattresses. Mattresses renovated by Company X had very few mites remaining on the "top" (range 0-100 mites/g). The one sample that was collected from "under" after renovation by the same company had 240 mites/g). Mattresses renovated by Company Y had 0-880 mites/g. More mites were found on the mattresses renovated by Company Y.

Although mite counts varied greatly between groups, used and renovated mattresses contained similar numbers of mites suggesting that renovation does not decrease the numbers of mites found on mattresses.

ALLERGEN CONCENTRATION

Methods

Standard ELISA procedures (Chapman et al. 1987) were used to determine allergen concentrations of mite (Der f1 and Der p1), dog (Can f1) and cat (Fel d1) in the samples. Briefly, a 50 mg aliquot (used and renovated samples) was extracted overnight on an orbital shaker in 1 ml of extracting buffer (Dulbecco's phosphate-buffered saline, 0.05% Tween 20, 0.05% sodium azide and 0.5% bovine serum albumin). The entire filters from the new mattress samples were extracted overnight (on orbital shaker) in 40 ml of buffer. A 1 ml aliquot of each sample was centrifuged at 14,00 x g and the supernatant collected. The supernatants were then assayed to determine concentrations for Der f1, Der p1, Fel d1 and Can f1.

Polystyrene microtiter plate wells were coated with monoclonal antibody specific for the allergen of interest (Der f1, Der p1, the dog allergen Can f1 or the cat allergen Fel d1). Diluted allergen (standard) and the sample extracts were added to the wells and then the microtiter wells washed. Bound allergen was detected with a second, enzyme-conjugated antibody which recognizes a different epitope on the allergen molecule. An enzyme substrate/chromogen solution was added (peroxide/ABTS) and the optical absorbance (color change) read with a microtiter plate reader.

The quantitation of allergen levels was obtained by comparing the optical density of the test sample with a standard curve generated from the allergen standard with known Der f1, Der p1, Can f1 or Fel d1 concentrations.

Results

Allergen data are given in Tables 1-4. There was virtually no allergen (all four allergens tested) on new mattresses. Four samples out of 120 (thirty samples x 4 allergens), 1 Der f1 from Washington D.C. and 3 Der p1 from L.A., contained very low levels of allergen. The remaining samples had levels that were all below the limits of detection.

The used and renovated samples from all three locations had significant but varying amounts of allergen. In the case of mite allergen, the concentrations in most used and renovated mattresses were above the threshold (10µg/g dust) that would induce allergic reactions.

Conclusion

Renovated mattresses can contain significant concentrations of dust mite, dog and cat allergens.

Exhibit 3

**“Tiny Mites in Mattresses Trigger Health Concerns,”
Bed Times,
Dec. 1999 at 19-20**

Tiny Mites in Mattresses Trigger Health Concerns

Dust mites (a.k.a. genus *Dermatophagoides*) are hardly the most glamorous of marketing topics in the mattress industry, but because scientists and the medical community say household mites constitute a health risk, both the bedding industry and health conscious consumers are beginning to take action.

"Dust mites occurring in bedding, soft furniture and carpeting are a contributing factor to illnesses like asthma, allergies and eczema," says Dr. Emmett Glass, a research associate in the Department of Internal Medicine at Ohio State University.

Glass' area of expertise is dust mite behavior and control methods. He has published a number of papers on dust mites, with recent mentions in *Discover Magazine* and *Popular Science*, as well as the *New York Times*.

Just how many consumers are suffering from allergies to mites? The American Academy of Allergy, Asthma and Immunology (AAAAI) estimates as many as 20 percent of the U.S. population, some 50 million Americans, are prone to asthma, hay fever and atopic dermatitis.

Scientists at a recent meeting of the World Health Organization presented evidence to support the theory that there is a link between asthma and dust mites. According to these studies,



Dust mite

between 45 percent and 85 percent of asthmatics are allergic to mites, compared with between 5 percent and 30 percent of nonasthmatic people.

Allergy-related illnesses translate into sizable expenses, both from a medical and personal perspective. In a further AAAAI study from 1996, researchers calculated the potential cost of lost work days and impaired performances at approximately \$1,000 per worker for the year, totaling \$11 billion for the aggregate for the year. Medically, the United States spends billions of dollars in treating asthma, which is now the most common chronic disease affecting children.

According to Glass, "There is a sense of urgency in the health care community to affect a change in the

trend of increasing asthma morbidity and mortality."

The problem is that dust mites live all around us; in fact, they surround us. The mite is a tiny, microscopic creature. Ten of them could sit on the head of a pin. They are soft-bodied with eight legs. They live in extremely close proximity to people because they feed on human proteins, from the 50 million or so skin cells we shed every day to our hair follicles to body excretions and skin dander.

"Our main exposure to dust mite allergens is at night when we are sleeping," Glass noted. "This is why the mattress is the most important part of the home as far as controlling dust mites."

According to Glass, mites crawl up from mattresses and graze on the dander of the prone sleeper on the mattress. It is a guaranteed food source but a disaster waiting to happen for the potential allergy sufferer or asthmatic, because, after mites eat, they produce 20 to 30 pellets of feces containing an enzyme highly irritating to sensitized individuals. This feces is so minute that it quickly becomes airborne.

Mite population numbers are staggering. Even though they only live about 45 to 60 days, reproduction is highly efficient, leading to hundreds and thousands of generations of mites

DUST MITE / see page 20

BY KHADIJA CARA KHAN

DUST MITE / from page 19

existing in a small area. In his book, "The Secret House," David Bodanis calculates that about 42,000 mites may live in an ounce of mattress dust, which works out to an average of 2 million mites in a double bed.

Currently, mechanical and chemical methods of removal and eradication are the only options available to consumers concerned about dust mite exposure. Unfortunately, says Glass, "Cleanliness is no guarantee. You could have a very clean home and clean bedroom and yet your bedding could still be heavily infested by mites."

Mechanical methods consist primarily of altering the humidity in the home, encasing bedding in plastic and increased/constant sanitizing of all soft furniture and carpeting. Since the mite is dependent on a high level of moisture in the air, lowering relative humidity to below 50 percent is conducive to significantly reducing mite populations.

Mechanical methods have not yielded convincing results. "None of these methods are effective for the long-term improvement of allergy symptoms. Plus they are highly labor intensive and impractical for the average consumer," says Glass.

Chemical methods present a number of drawbacks as well. Treatments have focused on acaricides and/or protein-denaturing agents. Research by Glass has shown that Permethrin, a commonly used agricultural pesticide with the toxicity of table salt, has been effective in eradicating mite populations in treated bedding

for up to three years. He points to reticence on the part of most manufacturers of bedding and other household products to integrate powerful chemicals, albeit at low levels, into the manufacturing process. "There is a concern that consumers will shy away from further chemical exposure of any kind and will see it as negative rather than an enhancement of their sleeping surface," he added.

That is not to say that there are no other options available to consumers. Glass noted that a number of U.S. market leaders, both manufacturers of mattresses and textiles, are studying materials that defy dust mite penetration in bedding.

Glass questioned the lack of mite-control options available to consumers currently. "You would think that the Environmental Protection Agency or some governmental agency would come out and examine other treatment options or environmental issues and incorporate the various control strategies into an effective regimen."

Glass also is part of a research team that has initiated a study at the Cleveland Clinic in Florida. "Part of our research is to understand dust mite behavior aspects and how they interact in a micro-habitat of a mattress or a carpet," he said. The study will also look at an integrated approach to dust mite control and examine a number of systems used in a home environment to improve the health of allergy sufferers.

Khadija Cara Khan is a freelance writer based in Pennsylvania.

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Exhibit 4

Letter from Patricia A. Martin, Director, Sleep Products Safety Council to
Brian H. Stiger, Director, Bureau of Home Furnishings and Thermal
Insulation, dated Mar. 24, 2005 (including statement from T.J. Ohlemiller,
National Institute of Standards and Technology, dated Feb. 4, 2005)

SPSC

Sleep Products
Safety Council

March 24, 2005

Mr. Brian J. Stiger, Chief
Bureau of Home Furnishings and Thermal Insulation
3485 Orange Grove Avenue
North Highlands, CA 94660

Dear Brian:

I am writing to you on behalf of the Sleep Products Safety Council to bring your attention to the fact that the holes on burners currently being used by both your agency and all of the commercial testing laboratories now testing mattresses and foundations for compliance with California Technical Bulletin 603 (TB 603) are slightly larger than the hole size specified in TB 603.

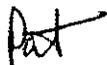
Enclosed is a February 5, 2005, statement by Dr. Thomas Ohlemiller, a senior fire scientist with the National Institute of Standards and Technology (NIST) who was directly involved with the design of the burners in question and in writing the test protocol for their use (both of which the Bureau has referenced in TB 603). In his statement, Dr. Ohlemiller describes the difference between the aperture size specified in TB 603 and the holes actually drilled in the existing test burners, and his thoughts on the impact of this difference on mattress fire tests performed using such equipment.

Apparently the company that prepared the original technical drawings inadvertently specified that the holes should be drilled using a #53 drill. However, NIST's design for the apparatus specified #55 or #56 drill holes. A second company that actually fabricated the burners followed the technical drawings and used the #53 drill specified there. We have confirmed that all of the burners now in use by the Bureau and all commercial test facilities were made using a #53 drill.

As for the impact of this hole size discrepancy on the results of mattress flammability tests conducted using burners with #53 drill holes, Dr. Ohlemiller states that "NIST has no evidence at this point that the burner hole discrepancy has any appreciable impact on test results."

Please contact me if you have any questions.

Cordially,



Patricia A. Martin
Executive Director

Enclosure

Mullin
524



9724 Kingston Pike, Suite 503
Knoxville, TN 37922
Telephone 865-690-4648
Fax 865-690-4649
E-mail rluedeka@pfa.org
www.pfa.org

March 29, 2005

cpsc-os@cpsc.gov

Office of the Secretary
Consumer Product Safety Commission
Washington, D.C. 20207-0001

*Re: Comments on Proposed Standard for the Flammability (Open Flame) of
Mattresses and Mattress/Foundation Sets*

Dear Sir or Madam:

After carefully reviewing the proposed rule and attending the public meeting on March 3, 2005, the Polyurethane Foam Association (PFA) is pleased to submit comments on the above stated proposed standard.¹

PFA supports the approach of the Consumer Product Safety Commission in the proposed open flame flammability standards for mattresses. Specifically, PFA supports the fact that the rule establishes a performance based standard for open flame mattress flammability. Establishing a performance based standard will allow the industry greater flexibility to use improved technology to meet the standard.

PFA also supports the test method proposed – a full scale composite test rather than relying upon the testing of individual components. A flammability standard should address the hazard posed by a finished article as opposed to focusing solely on individual components, because historical flammability testing done by many laboratories has demonstrated that the interaction of various components differs significantly in a fire involving a finished article from how components perform when tested individually. For an open-flame flammability standard to be meaningful, it must address the performance of a finished mattress/set in a real fire situation.

PFA believes the Commission should include a clear statement in the text of the standard that it preempts state efforts to regulate mattresses/sets. Although a state is preempted from imposing its own flammability rules on products that are regulated by the Commission, such language in the regulation would avoid any confusion as there are

¹ The Polyurethane Foam Association is a not-for-profit trade association representing manufacturers of flexible polyurethane foam, both slabstock and molded, and their chemical and equipment suppliers.

bills or regulations pending in several states that would set different flammability requirements for mattresses/sets. We suggest that the CPSC assert field preemption in the regulation to establish a uniform national standard and to make clear that no state is permitted to enforce different flammability rules with respect to mattresses/sets. An example of such preemption language can be found in the preamble to the Office of the Comptroller Currency's regulation governing debt cancellation contracts offered by a national bank where the OCC eliminates any uncertainty regarding the ability of the states to regulate these contracts. The preamble to the regulation explains the preemptive power of the regulation as follows:

This final rule, together with any other applicable requirements of Federal law and regulations, are intended to constitute the entire framework for uniform national standards for DCCs and DSAs offered by national banks. Accordingly, the final rule states that DCCs and DSAs are regulated pursuant to Federal standards, including part 37, and not State law.²

Sincerely,



Executive Director

² 67 Fed. Reg. 58,964 (2002).

Stevenson, Todd A.

From: Bob Luedeka [rluedeka@pfa.org]

Sent: Tuesday, March 29, 2005 11:43 AM

To: Stevenson, Todd A.

Subject: Potential Spam: Comments on Proposed Standard for the Flammability (Open Flame) of Mattresses and Mattress/Foundation Sets Flame) of Mattresses and Mattress/Foundation Sets

Dear Sir or Madam:

The Polyurethane Foam Association is pleased to submit the attached comments on the *Proposed Standard for the Flammability (Open Flame) of Mattresses and Mattress/Foundation Sets*.

Sincerely,

Robert Luedeka
Executive Director
Polyurethane Foam Association
9724 Kingston pike, Ste. 503
Knoxville, TN 37922

Tel 865-690-4648
Fax 865-690-4649

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China WTO/TBT National Notification & Enquiry Center

No.7, Ma Dian Dong Ave, Hai Dian District, Beijing, China, Tel: 86 10 8226 0618 Fax:86 10 8226 2448

FAX

TO: National Center for Standards and Certification Information National Institute of Standards and Technology Bldg. 820, Room 164 Gaithersburg, MD 20899	Fax: + (1 301) 926 15 59 Tel: + (1 301) 975 40 40 E-mail: ncsci@nist.gov
Date: March 29, 2005	Number of pages: 5+1
Copies:	
Department for WTO Affairs, Ministry of Commerce of P.R.China	Fax: +86 10 65197726;65128304 E-mail: wtonoti@mofcom.gov.cn
Permanent Mission of P.R. of China to WTO	Fax: +41-22-9097699/9097688 E-mail: zhoush@aqsiq.gov.cn
WTO Affairs Office, General Administration for Quality Supervision, Inspection and Quarantine, P.R.C.	Fax: +86 10 82260553
From:	
China WTO/TBT National Notification & Enquiry Center	Tel: 86-10-82260618 Fax: 86-10-82262448 E-mail: tbt@aqsiq.gov.cn
Subject: Comments of China on US Notification G/TBT/N/USA/95 Standard for the Flammability (Open Flame) of Mattresses and Mattress/Foundation Sets; Standard To Address Open Flame Ignition of Bedclothes	

Comments of China on US Notification G/TBT/N/USA/95

Dear Sir or Madam,

We respectfully submit the enclosed comments of China on your notification circulated by WTO as follows:

G/TBT/N/USA/95 Standard for the Flammability (Open Flame) of Mattresses and Mattress/Foundation Sets; Standard To Address Open Flame Ignition of Bedclothes

The comments are in English and Chinese.

Please acknowledge the receipt of the comments by e-mail to tbt@aqsiq.gov.cn.

Thank you very much for your consideration of our comments.

Best regards

Guo Lisheng
Deputy Director General
China WTO/TBT National Notification and Enquiry Center
No. 9 Ma Dian Dong Lu, Hai Dian District, Beijing
Post Code: 100088
Tel: 86-10-82260611/0618
Fax:86-10-82262448
E-mail: tbt@aqsiq.gov.cn

Comments of China on US Notification G/TBT/N/USA/95

The Chinese industries have conducted a detailed study on the US Notification G/TBT/N/USA/95, and come up with the following comments:

1. The proposed regulation described in your G/TBT/N/USA/95 as regards open flame flammability of mattress and mattress/foundation sets proposes to subject mattress and mattress/foundation sets to test before they are introduced into commerce by means of gas burner representing bedclothes burning and presents such a new requirement as to obtain the measured rate of heat release from energy released from the specimen and fire. We express our concerns about the making of this technical regulation.

2. The bedclothes are often first ignited by open flame in the case of a fire. Due to different living habits, ages and health conditions as well as climatic change, there will be considerable differences from people to people in selecting bedclothes both in kinds and in quantity. Therefore, it needs further research to determine if the gas burner represented burning environment with jet burner agrees with the actual situation when gas burner method is used to test the mattress and mattress/foundation sets.

3. The mattress and mattress/foundation sets can satisfy the requirements of the proposed regulation either by adding flame retardant chemicals to the materials or by using natural fire-resisting materials. But doing so may bring unacceptable health risk to consumers or will result in adverse influence on environment. Cost analysis should also be made regarding the cost rise because of using fire retardant or efforts to reduce the harmful effect of fire retardant.

4. It is known that the California State of your country published Technical Bulletin TB 603 for flame retardant requirements and test procedure concerning mattress/sets in January 2004, which entered into force on January 1, 2005. You did not notify WTO of this California regulation. According to Article 3 of the TBT Agreement, the local technical regulations should also be notified to WTO,

please explain why did not you notify the said technical regulation.

5. Please explain what are the differences and common points in requirements between this proposed regulation and California's TB 603?

6. The California TB 603 limits the fire size in the first 10 minutes of the test process to 25MJ, while this regulation limits the fire size in the first 10 minutes of the test process to 15MJ, what are the scientific bases?

7. Are there any other technical regulations developed by other States of your country concerning the fire-resistant requirements for mattress and mattress/foundation sets? If yes, are you going to notify WTO of them?

8. Comments on cost model for expected return included in the proposed regulation: In Part K6 of the proposed regulation, the expected return is affected by such three factors as obtaining returns from reduction in death and injury, discount and discount cycle (mattress useful life). In the proposed regulation, the useful life of mattress is expected to be 10 to 14 years. The return discount cycle is too long and the return is overestimated. It is more reasonable to expect mattress's useful life to 5 to 7 years. By the sensitivity analysis of Part K7 of the proposed regulation, there will be a wider range of negative net return.

The following is comments in Chinese:

中国产业界对美国通报G/TBT/N/USA/95进行了认真研究，提出评议意见如下：

1. 贵国G/TBT/N/USA/95通报所述关于床垫及成套床具明火易燃性的法规提案，提出对床垫及成套床具投入商用前以喷燃器模拟燃烧的床上用品对床垫及成套床具进行检测，以及从样品和火产生的能量来获得热释放率测量值的新要求。我们对该项技术法规的制定表示关注。

2. 床上用品往往是发生火灾时先被明火引燃的用品，人们因

为生活习惯、气候变化、年龄与身体健康状况的不同，采用床上用品的类别与数量也会有很大区别。因此以喷燃器模拟燃烧的床上用品对床垫及成套床具进行检测，其喷燃器模拟的燃烧环境是否符合现场发生的情况，需要进一步确定。

3. 床垫及成套床具可通过将阻燃化学品加入构成材料中或使用天然耐火材料的方法达到该法规提案的要求，但有可能对消费者造成不能接受的健康风险或对环境造成不利影响。对由阻燃剂的使用和改进阻燃剂的有害影响导致的成本增加，也应该做出成本分析。

4. 据了解，贵国加州于2004年1月公布了床垫、床具等产品阻燃要求及测试程序的TB603号技术公报，于2005年1月1日起生效，此项加州法规未向WTO通报。根据TBT协定第3条关于地方技术法规也应向WTO通报之规定，请说明没有进行通报的理由。

5. 请解释该法规提案与加州TB603的要求有何异同？

6. 加州TB603将测试过程前10分钟产生的火灾规模限制到25MJ，而该法规提案将测试过程前10分钟产生的火灾规模限制到15MJ，有何科学依据？

7. 贵国其它各州关于床垫、床具等产品耐燃要求的技术法规还有哪些？是否打算向WTO通报？

8. 对法规提案预期收益费用模型的意见：

在法规提案K6部分中，预期收益受减少死亡和伤害获得收益、

贴现率、贴现周期（床垫使用寿命）三个因素的影响。法规提案中，床垫的使用寿命被预定为10年到14年，收益贴现周期过长，高估了收益值。床垫的使用寿命预定为5年到7年更为合理。在法规提案K7部分的敏感性分析中将出现较大范围的负值净收益。

Stevenson, Todd A.

Mattress
Bedclothes

From: Anne Meininger [anne.meininger@nist.gov]
Sent: Tuesday, March 29, 2005 11:12 AM
To: Stevenson, Todd A.
Subject: Mattress NPR -- comments from the People's Republic of China (PRC)
Importance: High

Hello CPSC,

Attached please find comments on your notice of proposed rulemaking which were received today from the PRC on:

**Standard for the Flammability (Open Flame) of Mattresses and Mattress/ Foundation Sets;
Standard To Address Open Flame Ignition of Bedclothes;
Publication data: [Federal Register: January 13, 2005 (Volume 70, Number 9)] [Proposed Rules]
[Page 2469-2514].**

Comment deadline is today, March 29, 2005. Please acknowledge receipt of these comments by return email to: ncsci@nist.gov

Thank you very much --
Anne Meininger

WTO TBT U.S. Inquiry Point
National Center for Standards and Certification Information
National Institute of Standards and Technology
100 Bureau Drive, MS-2160
Gaithersburg, MD 20899-2160
Telephone: 301-975-4040 or 301-975-2921
Fax: 301-926-1559
Email: ncsci@nist.gov or anne.meininger@nist.gov
Internet: <http://ts.nist.gov/ncsci/>

1184 Channel Ave.
P. O. Box 13212
Memphis, TN 38113-0212
Phone 901-948-4469
Fax 901-948-4123



JONES FIBER PRODUCTS, INC.

134 Pope Rd.
P. O. Box 1195
Morristown, TN 37816-1195
Phone 423-586-4200
Fax 423-581-8139

At all times 526

**Comments for the consideration of
The Consumer Products Safety Commission
NPR: 70 FR 2470
March 29, 2005**

Honorable Commissioners and ladies and gentlemen of the CPSC,

We are a garnerter of cotton-based batting and fire barrier products. Our company is national in scope with manufacturing facilities in Memphis, TN, Humboldt, TN and Morristown, TN. We expect to have our new facility in North Las Vegas, NV in production by summer of 2005. We have been in the garnering industry under the current ownership since 1981. We supply products to the manufacturers of mattresses, futons and furniture.

Our company has been a champion for fire safe products in the home furnishings industry for many years. In the 1980's we worked with other industry members to develop the cigarette smoldering test for production lines, which is now known as ASTM D 5238-98. This test is the anchor of quick production testing for cotton-based products on many production floors today. In the early 1990's we chaired the committee in the National Cotton Batting Institute that developed the UL certification program, which made UL certification of a garnerter's fire resistant products compulsory for membership in the National Cotton Batting Institute. For many years prior to the UL certification program we voluntarily supplied our customers with objective evidence that our product conformed to the existing cigarette ignition and open flame laws. Suffice it to say fire safety has been high on our priority list for a number of years.

We have reviewed your proposed rulemaking for mattresses and foundations for open flame testing. We would like to go on record as being an endorser of the proposal. The spirit of the regulation truly embodies the cooperative manner in which industry and government can work together to accomplish a safer home and environment without throwing out concern for cost.

As a direct result of a similar regulation, California TB 603, the mattress industry has already seen the questions of exorbitant cost and lack of available fire barrier products prove to be unfounded. The supplies to help mattress manufacturers meet this proposed regulation do exist at pricing that is dollars per linear yard less than was first thought it would be.

Our industry's primary product, cotton based batting treated with Boric Acid, has been a leader in delivering good performance in fire barriers at very competitive prices. To that end we know that our product is a very "green" product and certainly a renewable resource. Boric Acid treated cotton has been the product of choice for many years in many states for fire safe institutional bedding. UNICOR, the Federal Prison Industries has used Boric Acid treated cotton for decades and continues to do so daily in the construction of institutional and military bedding.

Consumer Exposure

In your Briefing package the issue was brought forth about the safety of our product and exposure levels of Boric Acid to the consumer when sleeping on a mattress containing our product. Based on the Commission's draft there seems to exist some "data gaps" to give conclusive proof of the safety of our product.

We are currently testing mattresses to determine the level of exposure during use. We are confident when these exposure levels are correlated with safe permissible levels of exposure as set forth by The National Academy of Science, the Environmental Protection Agency, the Consumer Products Safety Commission, the USDA and the FDA there will be shown that Boric Acid treated cotton poses no human health hazard when properly used in mattress constructions.

Our testing procedures and test results will be reviewed and summarized by a toxicologist with an opinion. Test procedures being used are recognized by the industry as good indicators of a mattresses ability to withstand use and wear. We will be accumulating data that illustrates the amount of Boric Acid that could possibly be expelled from a mattress during use under the most severe circumstance. Measurements of Boric Acid accumulations will be taken from the surface of the mattress before and after testing and many times during testing. Boric Acid amounts found present on the surface of the mattress will then be correlated to known acceptable exposure levels and the opinion and conclusions will be presented.

We will then test the same specimens to California TB 603 to exhibit durability. Those results will also be forthcoming.

Durability

There has been some discussion about the possibility of cotton batting/pads or barriers treated with Boric Acid having a problem with leaching when subjected to water. While it is true that Boric Acid is an inorganic borate that is water-soluble I cannot imagine a "real" situation that would render the product in a mattress unsafe without ruining the entire unit. In order to "wash" the Boric Acid out of the fiber it would have to become totally saturated and flushed. I submit to you that any filling material that would have the opportunity to be subjected to such harsh circumstances would be ruined and lose its value as a filling material. Thus it is only logical that the entire mattress would no longer be usable.

Under normal and even excessive use there are numbers of documented cases where cotton batting treated with Boric Acid remained very effective when measured and tested after being taken out of service. I cite the following as a partial listing of these examples:

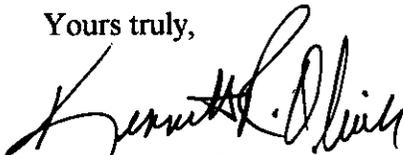
1. Louisiana State Penitentiary – Angola, LA 1982. A fire consumed everything inside the mattress manufacturing area of the prison with the exceptions of concrete, steel and cotton mattresses. In the housing area piles of mattresses were found to be extinguished and smoldering but the cotton inside had not burned away. These mattresses had been in use for approximately 2 years.
2. Shelby County Jail – Shelby County, TN 1981. Inmates stacked several mattresses and tried to ignite them. “The mattresses,” said arson officials, “did not burn well.” The mattresses were recovered and the cotton was extracted and tested for compliance to TB 117 and UFAC. They passed both with ease.
3. Pursuant to the Shelby County Jail fire the producer of the Boric Acid treated cotton Kroehler/Hogan/Jones asked to buy some of the mattresses back for documentation purposes. The mattresses were known to have been in use for approximately 3.5 years. The cotton inside the mattresses was then analyzed for Boric Acid content and tested for compliance to Cal TB 117 and Federal Standard FF 4-72. The Boric Acid level in the cotton batting ranged from 9.4% to 10.1 %. They passed all fire tests to which they were subjected.
4. State of Arkansas Corrections 1982. Several mattresses were taken out of service after 3.5 years of use in the Arkansas State Prison. The mattresses were sent to the USDA in New Orleans for testing and evaluation. The Boric Acid treated cotton batting inside these mattresses was tested for compliance to Cal TB 117 and UFAC. All specimens passed and self extinguished. The samples were then analyzed for Boric Acid content. The Boric Acid in the cotton batting ranged from 8.7% to 9.7%. This was done after these mattresses had been subjected to nearly four years of harsh use.

All pertinent copies of documentation of the above cases are enclosed for your review. Based on these real life studies I submit to you the durability of Boric Acid treated cotton is more than adequate and could reasonably be concluded to outlast the life of a mattress.

As mentioned previously all testing, analysis, and conclusions we develop pertinent to exposure levels to the consumer will be forthcoming as soon as our work is complete.

I respectfully submit this information for your consideration.

Yours truly,



Kenneth R. Oliver
President
Jones Fiber Products, Inc.
Memphis, TN 38113



The Angola mattress, broom and mop factories, sign shop and dental lab stand gutted

Angola industries gutted by flames

By GIBBS ADAMS
Advocate staff writer

ANGOLA — Fire of undetermined origin wiped out most of Angola's prison industries Tuesday night.

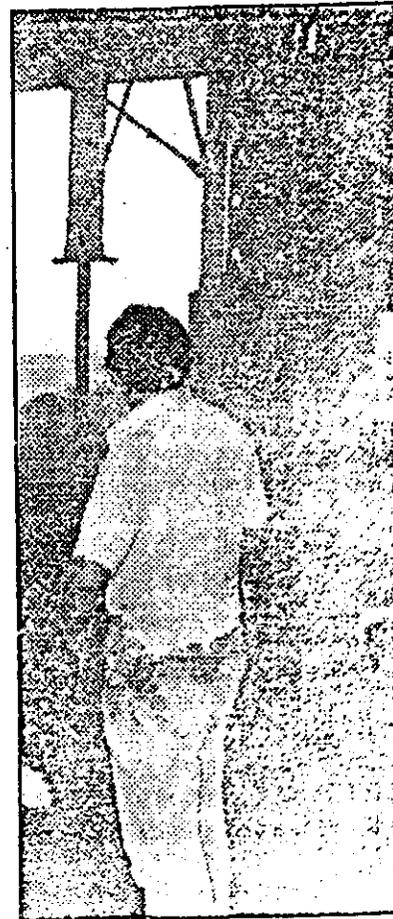
Put out of business temporarily are the Louisiana State Penitentiary's mattress factory, which makes bedding for state prisons, some Louisiana hospitals and parish prisons around the state; the sign shop, which turns out street and road signs for parish police juries and municipalities; the mop and broom factory, whose products are used in state institutions; and the dental laboratory.

Insurance and fire investigators were on the scene Wednesday, but the cause of the blaze remained undetermined late in the day, Warden Ross Maggio said.

Unofficially, some Angola authorities said they believe the damage could exceed \$200,000 or \$300,000. Some equipment might be salvageable at raw materials and manufactured items were lost in the blaze. A spokesman for the Department of Corrections in Baton Rouge said the loss will be at least partially covered by insurance.

The only prison industry at Angola operating Wednesday was the tag plant, where inmates make the metal license plates for Louisiana cars.

The fire was spotted about 11 p.m. Tuesday by a woman guard in a watch tower just outside the main prison compound. With both prison fire trucks and a truck from St. Francisville called to the scene, the blaze was brought under control within a couple of hours, Maggio said. But cotton mattresses were still smoldering at midday Wednesday, and other firefighters were still pouring water onto the debris. Later in the



Staff photo by Gibbs Adams

Firefighter cools mattresses

(See • FIRE, Page 4-B)

★ Fire

(Continued from Page 1-B)

day, Angola crews began moving the smoldering materials to another site.

Maggio said about \$300,000 worth of building maintenance materials — lumber, plumbing supplies, roofing, paint and other miscellaneous items — were stored in the other half the huge building made of concrete and steel and covered in tin.

Steel beams in the building, which was erected in the early 1950s to the south and west of the main prison, were twisted from the heat of the fire, but about 25 firefighters were able to control the blaze before it could spread into that half of the building used as a warehouse for prison maintenance crews.

"My men did a tremendous job of fighting the fire and keeping it under control, or it would have taken the whole thing," Maggio said. The crews worked through the night and were still working Wednesday to keep the fire from catching again.

The warden said no prisoners were ever in any danger and no prisoners were used in fighting the fire. Angola has two pumper trucks, which sometimes go to St. Francisville to help fight serious fires there.

Maggio said the building had been closed since 4 p.m. and no one was in the structure at the time the tower guard first saw the fire. He said the fire could have been caused by "many things — anything from electrical wiring to sabotage" by any of the 30 to 35 prisoners who work each day in the

building that housed the prison industries.

The heavy loss is to the prison industries operated by the Department of Corrections' Office of Agri-Business. Maggio said the prison itself sustained a \$10,000 to \$15,000 loss in water damage to some of its building materials in the warehouse, which was divided from the remainder of the building by a wall that reached less than halfway to the ceiling.

Not only did firemen keep the blaze from spreading to the prison warehouse, they kept the nearby Vocational-Technical School from catching fire.

Maggio said he did not know what plans would be made for putting the industries back into operation, but he said the old cannery — located across the sally port to the main prison and north of the building that burned — might be converted to temporarily house the mattress factory.

The Agri-Business office two years ago closed the cannery, which once preserved in gallon cans surplus produce from penitentiary crops for sale to other state institutions.

Dick Oliveaux, agri-business director for farms and industry at Angola, said he managed to enter the building during the early stages of the fire and retrieved the records and orders that had been placed for mattresses, brooms, mops and signs.

A spokesman in the Department of Corrections said that, in addition to the fire marshal's investigation, the department also will "conduct our own investigation" in an effort to determine the cause of the fire.

Enfor

FIRE AT LOUISIANA DEPARTMENT OF CORRECTIONS
NOTE FIRE RETARDANT COTTON TAKEN FROM BUILDING
SHOWN IN PHOTO DID NOT BURN.



FIRE AT LOUISIANA DEPARTMENT OF CORRECTIONS
NOTE FIRE RETARDANT COTTON TAKEN FROM BUILDING
SHOWN IN PHOTO DID NOT BURN.



Shakedown, Cellblock Fire Follow Rumors of Escape

By **RANDELL BECK**
Press-Scimitar Staff Writer

Suspicion of an escape attempt with a "high-ranking official" as hostage resulted in a shakedown of the Shelby County Jail by deputies and eventually led to prisoners retaliating by setting fire to several mattresses in the jail.

No one was injured in last night's disturbance on the jail's fourth floor, where more than 15 mattresses were ignited with papers and placed against the walls of the jail.

But investigators with the Shelby County Sheriff's Department and Metro Arson today were taking statements from inmates who either witnessed the disturbance or helped set fire to the mattresses.

A high-ranking deputy, who asked that his name not be used, said the incident apparently began when jail deputies ran a routine shakedown of the jail between 3:30 and 4 p.m. yesterday.

The shakedown, said the deputy, was in response to rumors that several inmates were planning an escape attempt. The deputy said there was the possibility that the attempt involved taking a "high-ranking official" hostage and "if they needed to show they meant business, killing an officer."

The shakedown produced several saw blades, a handcuff key and "shivs" — homemade knives created from metal. The deputy would not say which inmates were carrying the weapons.

Shortly after the shakedown, said the deputy, several inmates in cell block 4E, where inmates facing long prison sentences are kept, began complaining that the search was illegal and "violated their rights," the deputy said.

"These are inmates who consistently cause trouble," said the deputy. "They go from jail to jail and are a real problem wherever they are."

One inmate, characterized by the official as a "jailhouse lawyer," began calling the news media, complaining about the arrest. The deputy said the prisoner, who remains unidentified, apparently threatened to burn the jail down.

The deputy said the shakedown, which took about an hour, caused a delay in visitation for all inmates and in serving supper to inmates. That in turn "caused some of the inmates to get upset," he said.

At about 7 p.m., several inmates in cellblock 4E stacked mattresses against the walls of the jail, setting them afire with papers. The mattresses, said arson officials, did not burn well.

As deputies rushed in to put out the small blaze, officials said, inmates knocked out lights in the cell, making it difficult to see. Prisoners were evacuated from the west end of the building while deputies and firefighters fought the blaze.

Sheriff Gene Barksdale said there are 24 inmates in the tank where the fire

occurred, though he would not say how many inmates took part in setting fire to the mattresses.

He said investigators are considering charges against two inmates in connection with last night's disturbance.

One official, however, said it is likely sheriff's officers will wait until Friday for the regular meeting of the Shelby County Grand Jury. Then, the official said, sheriff's officers will ask for indictments on charges of aggravated arson.

Aggravated arson carries a maximum punishment of 15 years to life in prison.

The fire caused little smoke damage on the jail's fourth floor. Inmates this morning were carrying charred mattresses out of the jail as the cleanup continued.

THE FIRE RETARDANT COTTON BATTING IN THESE MATTRESSES WAS PRODUCED BY KROEHLER MFG. CO. (PREDECESSOR OF HOGAN & ASSOCIATES, INC.), MEMPHIS, TENNESSEE, IN NOVEMBER AND DECEMBER 1978 AND IN JUNE 1980.

TEST PROCEDURES: CALIFORNIA TECHNICAL BULLETIN 117 FOR MATTRESS FR FELT.

COPY ATTACHED.

UFAC TEST PROCEDURES USED FOR FIRE RETARDANT UPHOLSTERED FURNITURE COTTON BATTING.

COPY ATTACHED.

Strip-Search Is Followed By Jail Fires

A strip-search and shakedown inspection of a cellblock in the Shelby County Jail apparently precipitated an incident in which several mattresses were set afire last night.

However, no one was injured as deputies put out the fire on the jail's fourth floor and additional officers moved in to restore control.

Jail spokesmen said a prisoner also helped extinguish the blaze and aided a deputy who was overcome by smoke. The prisoner, Lester Brooks, 24, of 174 Modder, was later treated for smoke inhalation.

Brooks was on the fourth floor when the fire occurred. Sgt. Joe Tuggle said he and Brooks opened the fire box, pulled out the hose and began spraying the fire while several other deputies moved other prisoners away from the fire.

"He (Brooks) was instrumental in helping me contain the fire," Tuggle said. "He is one of our ideal prisoners and we owe him a lot."

Tuggle said he was overcome by smoke while he and Brooks were fighting the blaze and that Brooks led him out of the cellblock to safety.

"The smoke got pretty thick," Tuggle said. "Lester helped me out. Then he went back to fight the fire until the Fire Department arrived."

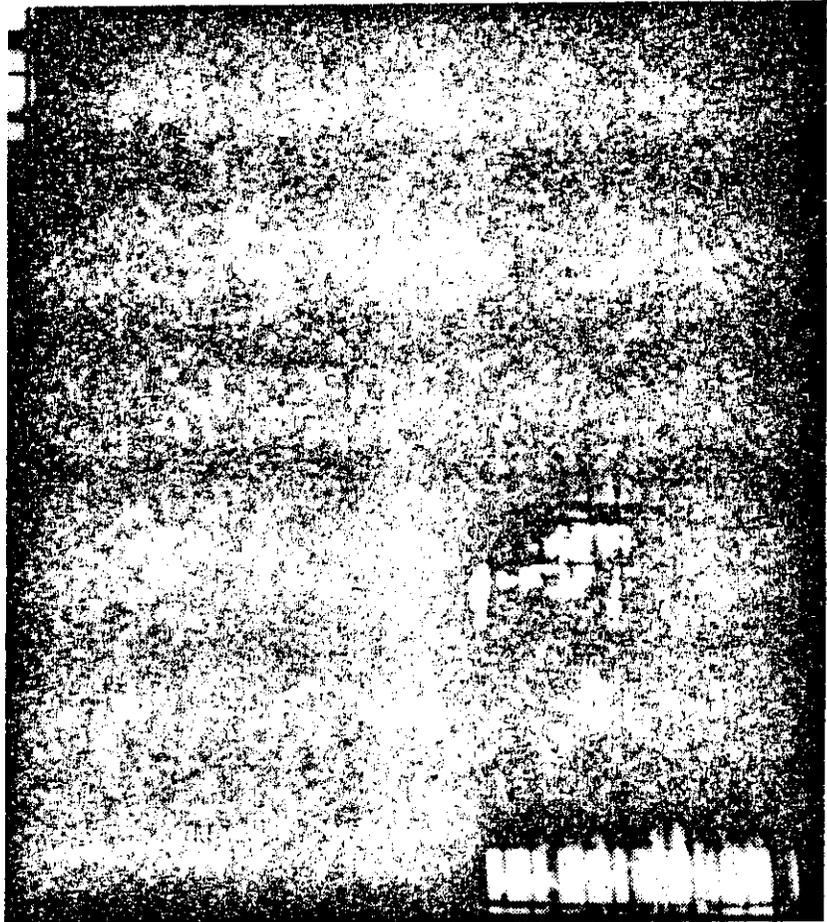
Tuggle said he recovered from the smoke after a few minutes and then went back inside the cellblock to help Brooks.

Brooks is serving time for larceny and receiving stolen property.

Shelby County Sheriff Eugene Barksdale said the afternoon search and inspection were brought on "because we had had rumors that there was to be a jailbreak. We had word that hacksaw blades had been smuggled into (cellblock) 4E.

"The search angered some of the men, but no contraband — no weapons, drugs or other materials — was found."

Barksdale said the fires were set principally by "two men who agitated and got about eight or ten others involved. But it was the principal two we're most concerned about." He said the two would be charged with arson and perhaps other charges "if the investigation bears out what we've learned in our preliminary investigation."



By Leonard Atkins

Flames Show Through 4th Floor Window At County Jail

He declined to name the men or say where they are from or why they are confined.

All the fires were confined to the fourth floor of the jail, which was about eight cellblocks. Each cellblock contains about seven two-man cells. Barksdale said he had no total of the number of prisoners in the jail, but that about 400 prisoners would be the average.

Dist. Chief E. R. Lemmon of the Fire Department said 14 or 15 mattresses had been piled in the catwalk and set afire. "I don't know how they set them on fire. There was a lot of smoke, but not too much fire."

Prisoners from the east end of the jail, near the corner of Third and Adams, were moved to the west end, near Second and Adams as the fire was put out.

Lemmons said the prisoners "did a lot of hollering and screaming, but I think they

were just hollering and screaming. I don't think it was directed toward anyone in particular."

He said a couple of small fires were set in the west end but no damage resulted.

Barksdale said there was "an extensive breakage of glass from the windows," but maintenance crews were working to shore up the broken panes so prisoners would not be exposed to the cold night air.

Barksdale said strip-searches and shakedown inspections are done "routinely" for contraband items "to help us insure safety in the jail for the inmates."

All mattresses in the jail are fire retardant-type mattresses, which burn slowly. Those were ordered by most jails nationwide after a jail fire in Columbia, Tenn., on June 26, 1977, resulted in the deaths of 42 prisoners.

OFFICIAL SHELBY COUNTY SHERIFF'S DEPARTMENT PHOTOGRAPH



HOGAN AND ASSOCIATES, INC.
P.O. Box 13212 Riverside Station
Memphis, Tennessee 38113
Telephone (901) 948-4469

THE FIRE RETARDANT COTTON BATTING IN THESE MATTRESSES WAS PRODUCED BY KROEHLER MFG. COMPANY, MEMPHIS, TENNESSEE IN NOVEMBER AND DECEMBER 1978 AND IN JUNE 1980.

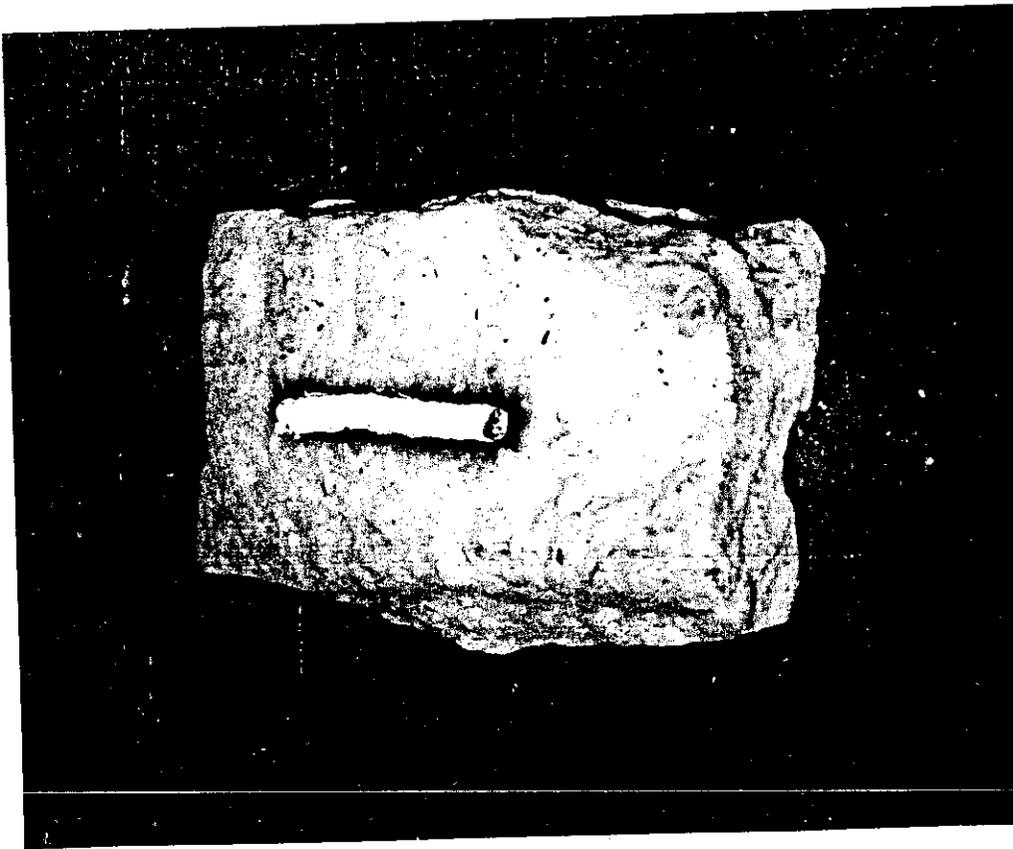
KROEHLER MFG. COMPANY WAS PURCHASED BY HOGAN AND ASSOICATES ON NOVEMBER 2, 1981. WE ARE UNDER THE SAME MANAGEMENT TEAM WITH EACH OF THE STAFF HAVING OVER 25 YEARS EXPERIENCE AT THE MEMPHIS FACILITY. WE HAVE PRODUCED FIRE RETARDANT COTTON FELT SINCE 1975.

TEST PROSEDURES: CALIFORNIA TECHNICAL BULLETIN 117 FOR MATTRESS FR-FELT
"COPY ATTACH"
UFAC TEST PROSEDURES USED FOR FIRE RETARDANT UPHOLSTERY FURNITURE COTTON BATTING.
"COPY ATTACHED"
TEST PROSEDURE USED BY UNICOR,
FEDERAL PRISON INDUSTRIES, INC.
LEAVENWORTH, KANSAS

OUR BORIC ACID TREATING SYSTEM IS UNIQUE TO THE TOTAL COTTON BATTING INDUSTERY. THERE IS NO DUSTING OUT OR LOSS OF BORIC ACID IN GARNETTING NOR AT THE MATTRESS OR UPHOLSTERY ASSEMBLY POINT.

SINCE 1975 WE HAVE SOLD & SHIPPED 31,559,700# OF FIRE RETARDANT COTTON BATTING TO FEDERAL AND STATE INDUSTRIES, FURNITURE MANUFACTURES AND BEDDING MANUFACTURES. DURING THIS SPAN OF TIME WE HAVE ENCOUNTERED TWO COMPLAINTS ON ONLY 1½ TRUCKLOADS.

WE ALSO PRODUCE A BORIC ACID PRETREATED COTTON BLEND, PACKAGED IN A STANDARD COTTON BALE SIZE, 650 POUNDS, FOR GARNETTING.



ORIGINAL TEST MADE 11/28/78 ON COTTON FOR JAIL MATTRESSES.



SAME MATERIAL RETESTED 3/25/81.

REQUIREMENTS, PROCEDURES AND TEST RESULTS FOR TESTING THE FLAME RETARDANCE OF NON MAN MADE FILLING MATERIALS USED IN UPHOLSTERED FURNITURE AND MATTRESSES AS REQUIRED BY U.F.A.C. AND STATE OF CALIFORNIA TECHNICAL BULLETIN 117.

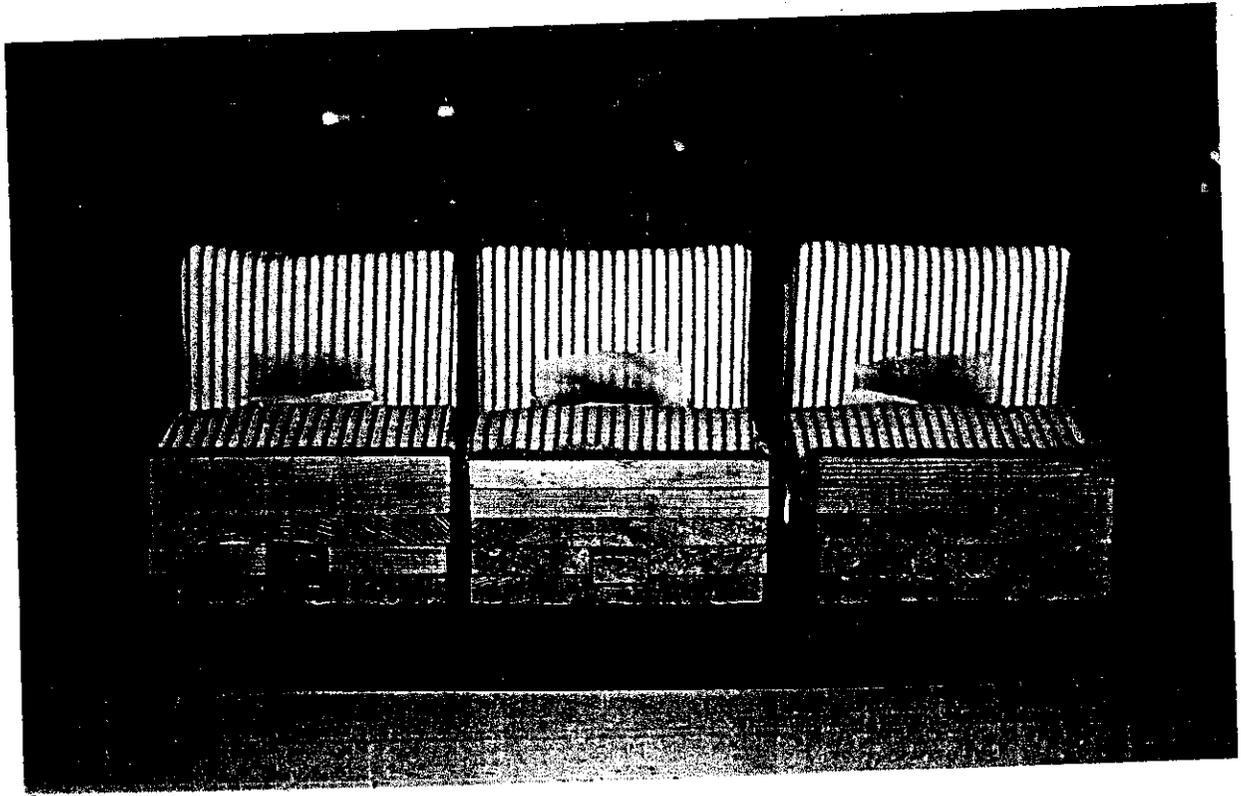
1. FLAME RETARDANT: (OPEN FLAME) CALIFORNIA BULLETIN 117
 - A. SPECIMENS TESTED: A MINIMUM OF 5 SPECIMENS, EACH SPECIMEN 12" x 3", MAXIMUM THICKNESS OF 1" SHALL BE TESTED.
 - B. CHAR LENGTH: MAXIMUM CHAR LENGTH OF EACH SPECIMEN TESTED SHALL NOT EXCEED 8 INCHES, AVERAGE NOT OVER 6 INCHES.
 - C. AFTER FLAME: MAXIMUM AFTER FLAME SHALL NOT EXCEED 10 SECONDS, AVERAGE NOT OVER 5 SECONDS.
 - D. AFTER GLOW: AVERAGE FOR THE 5 SPECIMENS SHALL NOT EXCEED 15 SECONDS.

2. CIGARETTE RESISTANT: CALIFORNIA BULLETIN 117
 - A. SPECIMENS TESTED: A MINIMUM OF 3 SPECIMENS SHALL BE TESTED, LAYING A LIGHTED CIGARETTE ON EACH SPECIMEN COVERING THE CIGARETTE WITH A LAYER OF COTTON SHEETING. THE SPECIMENS SHALL BE 12" x 12" IN THICKNESS OF USE.
 - B. CHAR LENGTH: MAXIMUM CHAR LENGTH SHALL NOT EXCEED 2 INCHES IN ANY DIRECTION OF CIGARETTE.

3. FILLING/PADDING COMPONENT TEST METHOD AS SET FORTH IN U.F.A.C. TEST PROCEDURES FOR NON MAN MADE FILLING MATERIALS USED IN UPHOLSTERED FURNITURE.
 - A. TEST PROCEDURE WILL CONSIST OF TESTING 3 PROTYYPES AS ILLUSTRATED IN FIGURES 1 AND 2 OF U.F.A.C. FILLING/PADDING TEST METHOD INSTNS.
 - B. IN ONE OR MORE IGNITIONS OF THE FILLING/PADDING MATERIAL AND COVER FABRIC OCCURS, THE MATERIAL FAILS THE TEST.
 - C. IF ANY VERTICAL CHAR OF 1.5 INCHES OR GREATER IS OBTAINED, THE FILLING/PADDING MATERIAL FAILS THE TEST.

TEST RESULTS

DATE <u>11/28/78</u>	CUSTOMER _____	BALE TAG# <u>625454</u>	SIZE <u>28x76-FRS</u>
CIGARETTE RESISTANT		FLAME RETARDANT	
CHAR LENGTH	CHAR LENGTH	AFTER FLAME	AFTER GLOW
<u>3/4"</u>	<u>1/8"</u>	<u>0</u> SEC.	<u>8</u> SEC.
<u>3/4"</u>	<u>1/8"</u>	<u>0</u>	<u>7</u>
<u>3/4"</u>	<u>1/8"</u>	<u>0</u>	<u>12</u>
U.F.A.C.	<u>1/8"</u>	<u>0</u>	<u>10</u>
IGNITION VERTICAL	<u>1/8"</u>	<u>0</u>	<u>10</u>
_____	_____	TOTAL	<u>47</u> SEC.
_____	_____		<u>04</u>



UFAC TEST



KROEHLER MFG. CO.

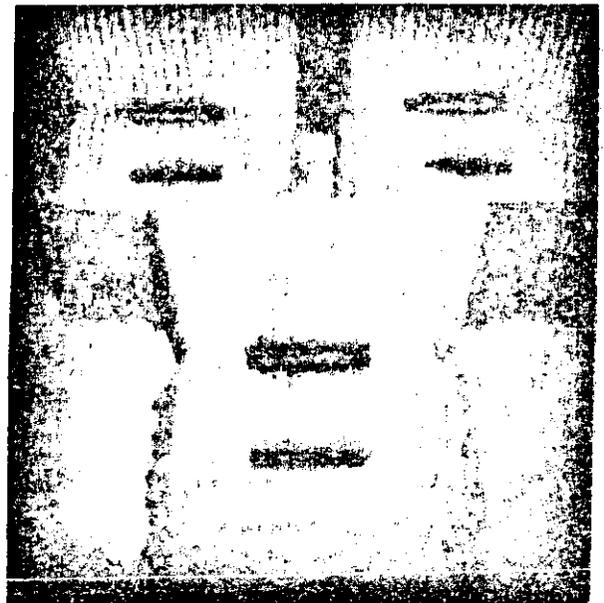
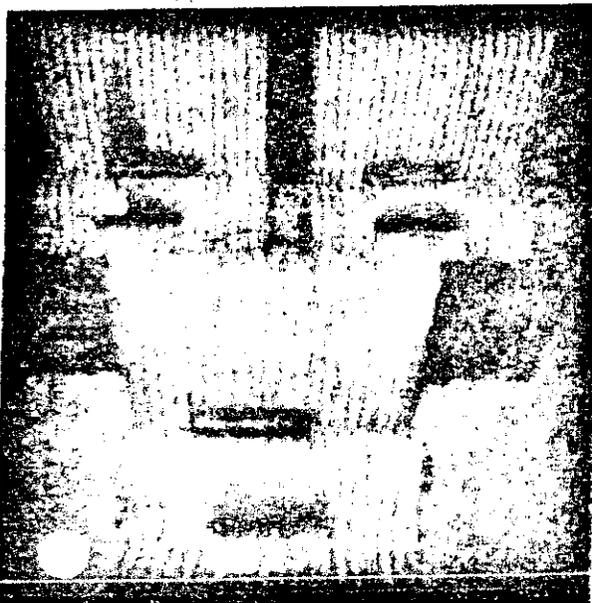
Memphis, Tenn.
March 20, 1981

Photographs of our Grade FR-500 Cotton batting felt in U.F.A.C. testing procedure. The photographs represent one U.F.A.C. test with the seat deck padding stapled down and densely compressed and the other with the seat deck portion loose and the cover material pinned to felt.

As indicated in the photographs the samples on the left represent the denser compression on the seat deck and also indicate this test is more stringent than the loosely constructed seat deck samples.

Tightly compressed padding

Loosely compressed padding



REQUIREMENTS, PROCEDURES AND TEST RESULTS FOR TESTING THE FLAME RETARDANCE OF NON MAN MADE FILLING MATERIALS USED IN UPHOLSTERED FURNITURE AND MATTRESSES AS REQUIRED BY U.F.A.C. AND STATE OF CALIFORNIA TECHNICAL BULLETIN 117.

1. FLAME RETARDANT: (OPEN FLAME) CALIFORNIA BULLETIN 117

- A. SPECIMENS TESTED: A MINIMUM OF 5 SPECIMENS, EACH SPECIMEN 12" x 3", MAXIMUM THICKNESS OF 1" SHALL BE TESTED.
- B. CHAR LENGTH: MAXIMUM CHAR LENGTH OF EACH SPECIMEN TESTED SHALL NOT EXCEED 8 INCHES, AVERAGE NOT OVER 6 INCHES.
- C. AFTER FLAME: MAXIMUM AFTER FLAME SHALL NOT EXCEED 10 SECONDS, AVERAGE NOT OVER 5 SECONDS.
- D. AFTER GLOW: AVERAGE FOR THE 5 SPECIMENS SHALL NOT EXCEED 15 SECONDS.

2. CIGARETTE RESISTANT: CALIFORNIA BULLETIN 117

- A. SPECIMENS TESTED: A MINIMUM OF 3 SPECIMENS SHALL BE TESTED, LAYING A LIGHTED CIGARETTE ON EACH SPECIMEN COVERING THE CIGARETTE WITH A LAYER OF COTTON SHEETING. THE SPECIMENS SHALL BE 12" x 12" IN THICKNESS OF USE.
- B. CHAR LENGTH: MAXIMUM CHAR LENGTH SHALL NOT EXCEED 2 INCHES IN ANY DIRECTION OF CIGARETTE.

3. FILLING/PADDING COMPONENT TEST METHOD AS SET FORTH IN U.F.A.C. TEST PROCEDURES FOR NON MAN MADE FILLING MATERIALS USED IN UPHOLSTERED FURNITURE.

- A. TEST PROCEDURE WILL CONSIST OF TESTING 3 PROTOTYPES AS ILLUSTRATED IN FIGURES 1 AND 2 OF U.F.A.C. FILLING/PADDING TEST METHOD INSTRUCTIONS.
- B. IF ONE OR MORE IGNITIONS OF THE FILLING/PADDING MATERIAL AND COVER FABRIC OCCURS, THE MATERIAL FAILS THE TEST.
- C. IF ANY VERTICAL CHAR OF 1.5 INCHES OR GREATER IS OBTAINED, THE FILLING/PADDING MATERIAL FAILS THE TEST.

TEST RESULTS

DATE 3/10/81 CUSTOMER FUTORIAN BALE TAG # 639207 SIZE 20x45.300 FR. 500

CIGARETTE RESISTANT

CHAR LENGTH

3/8"
3/8"
3/8"

CHAR LENGTH

1/8"
1/8"
1/8"
1/8"
1/8"

FLAME RETARDANT

AFTER FLAME AFTER GLOW

0 Sec. 14 Sec.
0 15
0 9
0 13
0 11

U.F.A.C TEST

IGNITION VERTICAL CHAR

0 1/2"
0 1/2"
0 1/2"

Total 62 Sec.
12.4 Average

HOGAN AND ASSOCIATES, INC.
P.O. Box 13212 Riverside Station
Memphis, Tennessee 38113
Telephone (901) 948-4469

SHELBY COUNTY FR-MATTRESS

Actual prison use - 3 years 2 months

Special mattress test by Ramcon Inc. with Perm-a-lator testing machine.

Test simulates an additional 10 years usage

MATTRESS AND FR-FELT PASSED:

1. Open flame test - California Bulletin 117
2. Cigarette test - California Bulletin 117
3. Cigarette test - FF 4-72 Federal Standard



SHELBY COUNTY SHERIFF'S DEPARTMENT

SUITE 777 • 160 NORTH MAIN • MEMPHIS, TENNESSEE 38103 • PHONE (901) 528-3600

B. J. Smith

GENE BARKSDALE
SHERIFF

~~XXXXXXXXXX~~
CHIEF DEPUTY

N. W. KIMBROUGH
CHIEF ADM. OFFICER

March 15, 1982

Mr. Jim Hogan
Hogan and Associates
Post Office Box 13212
Riverside Drive
Memphis, Tennessee 38101

Dear Mr. Hogan:

In November, 1978 we purchased five hundred and fifty (550) mattresses from Richwell Bedding, containing a fire retardant cotton. These mattresses were used in the old jail at 150 Washington and in the Jail East Annexes.

We still have over fifty percent of these mattresses being used in different areas of the Justice Complex.

A test was recently conducted on the cotton materials contained in these mattresses and it was found that they still meet the necessary specifications of a fire retardant cotton. We feel that these mattresses have far exceeded our original expectations, especially taking into consideration the conditions in which they are being used.

If any additional information is needed, please feel free to contact me at my office. My office number is 577-2420.

Respectfully submitted,

GENE BARKSDALE, SHERIFF

Kenneth E. Rook
Kenneth E. Rook *ajdst*
Jail Operations Manager

KER:dst

Note: The mattresses delivered to you on March 10, 1982 is one of the above mentioned mattresses that has been used since November, 1978.

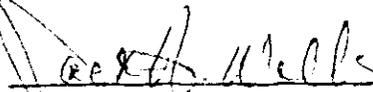
RICH-WELL BEDDING CO.
316 S. Front St.
Memphis, Tenn.

March 18, 1982

I hereby certify that the mattress picked up by Jim Hogan from the Shelby County Sheriffs Department on March 10, 1982 is one of the group of 550 mattresses that I produced and shipped to the Shelby County Sheriffs Department in 1978.

The fire retardant cotton batting in these mattresses was purchased from Hogan & Associates, Inc., formerly Kroehler Mfg. Co. in 1978.

Signed



Jack Wells

SWORN TO AND SUBSCRIBED BEFORE

ME

3/18/82



(Notary's Signature and Seal)

Comm expires 3/11/84

HOGAN AND ASSOCIATES, INC.
P.O. Box 13212 Riverside Station
Memphis, Tennessee 38113
Telephone (901) 948-4469

March 25, 1982

Titration test of cotton batting felt produced Nov. 28, 1978 to determine percentage of boric acid (H_3BO_3).

Test #1: Titration test on sample of felt that was produced 11-28-78 and tested for fire retardancy at time of production. Sample of felt attained from sample on file.

Test conducted on 3-25-82

Results 9.3% Boric Acid (H_3BO_3)

Test #2: Titration test on sample of felt produced 11-28-78, sold to a mattress manufacturer, used in a mattress produced by this manufacturer, mattress sold to Shelby County Jail and used for a period 3 years and 2 months. This sample was extracted from this mattress which had been in use in excess of 3 years.

Test conducted on 3-25-82

Results 9.2% Boric Acid (H_3BO_3)

Analysis: The above 2 tests revealed there was no appreciable leaching out of the boric acid and no loss of fire retardancy of this cotton batting felt after being in actual use in a prison facility for over 3 years.

HOGAN AND ASSOCIATES, INC.
P.O. Box 13212 Riverside Station
Memphis, Tennessee 38113
Telephone (901) 948-4469

March 26, 1982

Titration test of cotton batting felt produced November, 1978 to determine percentage of boric acid content (H3BO3).

The samples used in these tests were taken from a mattress that had been in use in the Shelby County Jail for over 3 years. A sample of the felt taken from this mattress was made into a prototype mattress 7" x 7" and subjected to a pounding test for a period of 51 hours at 90 cycles per hour for a total of 4590 cycles at a weight of 1# per square inch. Upon completion of the pounding test the prototype was opened up and a titration test was conducted on a sample of felt from the top portion a sample from the bottom portion of the prototype mattress. The results of the tests are as follows:

Test #1: Sample from top portion of prototype

Result 9.3% Boric Acid (H3BO3)

Test #2: Sample from bottom portion of prototype

Result 10% Boric Acid (H3BO3)

Analysis: Above tests indicated that after 3 years of actual useage in a mattress and after extensive pounding the cotton batting felt within this mattress still retained its original fire retardancy and there was little or no leaching of the boric acid.

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- C. AFTER FLAME: MAXIMUM AFTER FLAME SHALL NOT EXCEED 10 SECONDS, AVERAGE NOT OVER 5 SECONDS.
- D. AFTER GLOW: AVERAGE FOR THE 5 SPECIMENS SHALL NOT EXCEED 15 SECONDS.

2. CIGARETTE RESISTANT: CALIFORNIA BULLETIN 117

- A. SPECIMENS TESTED: A MINIMUM OF 3 SPECIMENS SHALL BE TESTED, LAYING A LIGHTED CIGARETTE ON EACH SPECIMEN COVERING THE CIGARETTE WITH A LAYER OF COTTON SHEETING. THE SPECIMENS SHALL BE 12" x 12" IN THICKNESS OF USE.
- B. CHAR LENGTH: MAXIMUM CHAR LENGTH SHALL NOT EXCEED 2 INCHES IN ANY DIRECTION OF CIGARETTE.

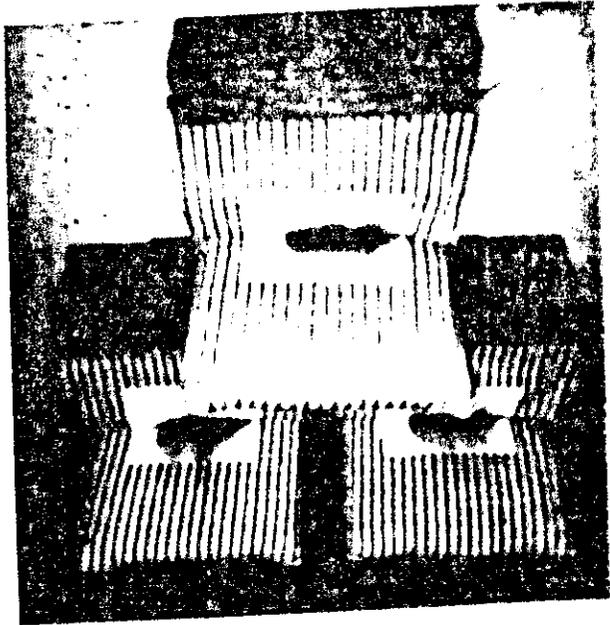
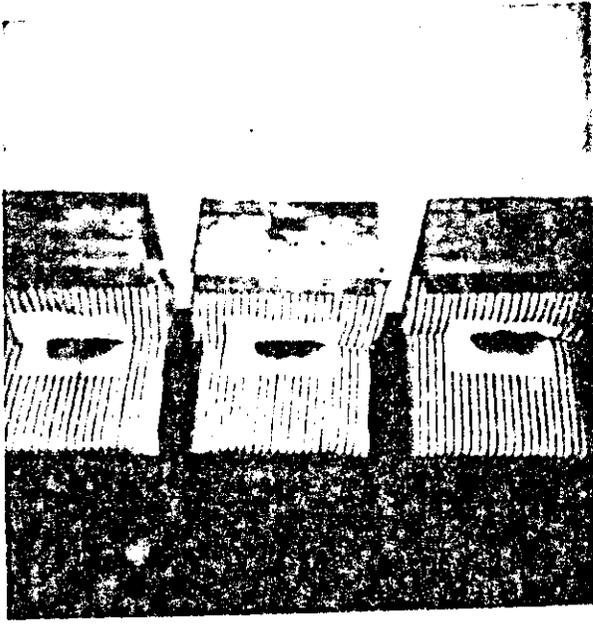
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- B. IF ONE OR MORE IGNITIONS OF THE FILLING/PADDING MATERIAL AND COVER FABRIC OCCURS, THE MATERIAL FAILS THE TEST.
- C. IF ANY VERTICAL CHAR OF 1.5 INCHES OR GREATER IS OBTAINED, THE FILLING/PADDING MATERIAL FAILS THE TEST.

TEST PROCEDURE 11/28/78 TEST RESULTS SHELBY COUNTY FR. 55
 Re Tested AFTER 4,590 CYCLES PRISON MATTRESS
 DATE 3/12/82 CUSTOMER RICHWELL BROWN - BALE TAG #625454 SIZE 28'x76"

CIGARETTE RESISTANT		FLAME RETARDANT	
CHAR LENGTH	IGNITION VERTICAL CHAR	CHAR LENGTH	AFTER FLAME AFTER GLOW
1/2"	0	1/2"	0 Sec. 3 Sec.
1/2"	0	1/2"	0 Sec. 7 Sec.
1/2"	0	1/2"	0 Sec. 2 Sec.
1/2"	0	1/2"	0 Sec. 2 Sec.
			Total 14 Sec.
			Average 3 1/2

NOTE: 1.5 SECONDS WAS OBTAINED AFTER GLOW



US BORAX RESEARCH

March 22, 1982

SUBJECT: FR Cotton Batting taken from Shelby County
Mattress picked up by Jim Hogan on 3-10-82.
Mattress had been in use since November 1978.

Mr. Jim Hogan
Hogan and Associates, Inc.
1184 Channell
Memphis, TN 38113

Dear Mr. Hogan:

Per our telephone conversation, this is to confirm that our analyses showed that your mattress cotton batting sample contains 10.2% boric acid (average of two runs - 10.3 and 10.1%).

The sample was sent to us via Mr. Jack Wasson.

Sincerely,

Kelvin K. Shen

Kelvin K. Shen
Senior Research Chemist

/mh

cc: D. E. Buck
V. Palmere
P. L. Strong
J. Wasson
J. Yannacakis

SPECIAL MATTRESS TESTING REPORT

On March 10, 1982 we received from Mr. James N. Hogan of Hogan & Associates, Inc. of Memphis, Tennessee a mattress on which we conducted a number of tests.

It is our understanding that the mattress supplied by Mr. Hogan had been in use in a penal institution for more than three years prior to our receiving it for test. It is also our understanding that the filling material in the mattress is smoulder-resistant cotton batting made from a boric acid-treated cotton manufactured by Hogan & Associates formerly Kroehler Manufacturing Company.

The mattress is a slab or solid core type (no innerspring) approximately three inches thick and containing approximately 25 pounds of the treated cotton batting. The covering is "Staff Check" coated fabric ticking.

The boric acid content of the cotton batting in the mattress was measured by Dr. Gareth Barnard of our laboratory. In the mattress as received by us, samples were drawn from three levels of the batting which were designated as "top", middle, and "bottom". The "as received" boric acid content at each level was 9.2% for the top, 9.5% for the middle, and 8.8% for the bottom.

After these measurements were made, the mattress was placed on a test stand and subjected to accelerated wear testing under a 250 pound hexagonal wooden roller. This roller was operated for 135,000 cycles, which is a wear test sufficiently long in most cases to destroy even the spring of an innerspring mattress. Although the number of cycles cannot be accurately related to years of actual use, our accelerated wear test is probably equivalent to the normal wear life of a mattress.

After subjecting the mattress to the 135,000 cycles of accelerated wear, the boric acid levels from the "top", "middle", and "bottom" thirds of the cotton filling material were again measured. The concentrations were 8.1% in the "top", 7.9% in the middle, and 7.6% in the "bottom" levels of the batt.

From this test we conclude that the mechanical working of a mattress containing boric acid-treated cotton applied by the method of Hogan & Associates will have a relatively minor effect on boric acid levels during the normal service life of such a mattress.

To determine the effect, if any, on the smoulder-resistant and fire-resistant properties of the batting and mattress, we conducted the following tests:

I. Open Flame Test - California Bulletin 117

Sample No.	After Flame (secs.)	After Glow (secs.)	Char Length
1	-0-	-0-	<1/4"
2	-0-	-0-	<1/4"
3	-0-	-0-	<1/4"
4	-0-	4	<1/4"
5	-0-	-0-	<1/4"

II. Cigarette Test: California Bulletin 117

#1 plain surface without sheets	1/4"	#1 surface with sheets	1/4"
#2 plain surface without sheets	1/4"	#2 surface with sheets	1/4"
#3 plain surface without sheets	1/4"	#3 surface with sheets	1/4"

All Passed

III. FF 4-72 Test Results:

SMOOTH	QUILTED	TAPED
Passed	Passed	Passed
Passed	Passed	Passed
Passed	Passed	Passed
Without Sheets		
SMOOTH	QUILTED	TAPED
Passed	Passed	Passed
Passed	Passed	Passed
Passed	Passed	Passed