



United States  
**CONSUMER PRODUCT SAFETY COMMISSION**  
Washington, D.C. 20207

MEMORANDUM

DATE: December 29, 2003  
Revised October 19, 2004

TO : EC

Through: Todd A. Stevenson, Secretary, OS *TAS*

FROM : Martha A. Kosh, OS *MAK*

SUBJECT: Ignition of Upholstered Furniture by Small Open Flames  
and/or Smoldering Cigarettes

ATTACHED ARE COMMENTS ON THE CF 04-2

<u>COMMENT</u>	<u>DATE</u>	<u>SIGNED BY</u>	<u>AFFILIATION</u>
CF04-1-1	12/09/03	Magnus Bjork Laws & Standards Compliance Mgr.	IKEA North America Services
CF04-1-2	12/18/03	Nicholas Geale Attorney On behalf of the Decorative Fabric Association, the Coalition of Converters Of Decorative Fabrics, And Calico Corners, Inc.	Thelen Reid & Priest llp 701 Pennsylvania Ave, NW Suite 800 Washington, DC 20004
CF04-1-3	12/19/03	Anne Meininger On behalf of China Furniture Industry	National Institute of Standards & Technology 100 Bureau Dr, MS-2160 Gaithersburg, MD 208994
CF04-1-4	12/19/03	Richard Driscoll Technical Services Manager	BIFMA International
CF04-1-5	12/22/03	Joseph Ziolkowski Exec. Director	Upholstered Furniture Action Council P.O. Box 2436 High Point, NC 27261

Ignition of Upholstered Furniture by Small Open Flames and/or Smoldering Cigarettes

CF04-1-6	12/22/03	Russell Batson Vice President Governmental Affairs	American Furniture Manufacturers Assoc 1120 Connecticut Ave, NW Suite 1080 Washington, DC 20036
CF04-1-7	12/22/03	Louis Peters Exec. Director	Polyurethane Foam Assoc. P.O. Box 1459 Wayne, NJ 07474
CF04-1-8	12/22/03	John Biechman Vice President	National Fire Protection Association 499 South Capitol St, SW Suite 518 Washington, DC 20003
CF04-1-9	12/22/03	Robert DuPree Vice President	American Textile Manufacturers Institute 1130 Connecticut Ave, NW Suite 1200 Washington, DC 20036
CF04-1-10	12/22/03	Phillip Wakelyn Sr Scientist Environmental Health & Safety	National Cotton Council of America 1521 New Hampshire Ave NW Washington, DC 20036
CF04-1-11	12/22/03	Jack Connors	American Hotel & Lodging Association 1201 New York Ave, NW Suite 600 Washington, DC 20005
CF04-1-12	12/19/03	Andy Counts CEO	American Furniture Manufacturers Assoc.
		James Burns President	National Association of State Fire Marshals
		J.Thomas Chapin	Underwriters Laboratories, Inc. and
		Larry Liebenow President & CEO	Quaker Fabric Corporation of Fall River, on behalf of The Fabric Coalition
CF04-1-13	12/06/03	Lynn Morris Chief	Bureau of Home Furnishings & Thermal Insulation 3485 Orange Grove Ave North Highlands, CA 95660



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**Ignition of Upholstered Furniture by Small Open Flames and/or Smoldering Cigarettes**

CF04-1-14	01/26/04	Richard Mericle Exec Director	Alliance for the Polyurethanes Industry 1300 Wilson Blvd. Arlington, VA 22209
CF04-1-15	03/08/04 (Late)	Richard Mericle	Address same as above
CF04-1-16	03/01/04 (Late)	David Pettey Quaker Fabric Corp.	The Fabric Coalition
CF04-1-17	03/01/04 (Late)	David Bell	Culp, Inc.
CF04-1-18	03/10/04 (Late)	Scott Haigh President	California Furniture Manufacturers Assoc. 1240 Jefferson St. Suite G Anaheim, CA 92807
CF04-1-19	03/14/04 (Late)	Andy Counts CEO	American Furniture Manufacturers Assoc.
CF04-1-20	05/27/04 (Late)	Roger Berkley Chairman	National Textile Assoc. 6 Beacon St, Suite 1125 Boston, MA 02108
CF04-1-21	06/04/04 (Late)	Louis Peters Exec. Director	Polyurethane Foam Assoc. P.O. Box 1459 Wayne, NJ 07474
CF04-1-22	06/15/04 (Late)	James Narva Chairman Consumer Product Safety Task Force	National Association of State Fire Marshals
CF04-1-23	07/12/04 (Late)	Lou Peters Ryan Trainer Andy Counts Mark Buczek Gerald Wilder  Joe Ziolkowski  Carl Spilhaus	Polyurethane Foam Assoc. Int'l Sleep Products Assoc. American Furniture Mfrs. Assoc American Fire Safety Council Decorative Fabrics Assoc./ Coalition of Coverters of Decorative Fabrics Upholstered Furniture Action Council National Textile Assoc.
CF04-1-24	10/08/04 (Late)	Joe Ziolkowski Exec. Director	Upholstered Furniture Action Council P.O. Box 2436 High Point, NC 27261

Stevenson, Todd A.

*Upholstered  
Furniture  
Comments*

**From:** Ray, Dale R.  
**Sent:** Tuesday, December 09, 2003 10:42 AM  
**To:** Stevenson, Todd A.  
**Subject:** FW: Small open flame, Upholstered

Should we consider this a comment on the furniture ANPR? I am circulating to technical staff; these are among the issues we are considering. --Dale

-----Original Message-----

**From:** MAGNUS BJÖRK [mailto:MAGNUS.BJORK1@MEMO.IKEA.COM]  
**Sent:** Tuesday, December 09, 2003 9:42 AM  
**To:** Ray, Dale R.  
**Subject:** Small open flame, Upholstered

--- Inkommet från IKEA1.WASP 6108340180X5406

03-12-09 15.42

Dear Mr Ray

I found you name on the projects regarding cigarette resistance. Are you project leader also for the small flame test?

If so I have a few question regarding the Fabric Coalitions suggested 5 second test for fabric and the test that the commission suggested:

- a) Have you made any verification for this test to compare it with the match test suggested by CPSC?

We have looked at the 5 second flame as per the fabric coalitions suggestion and have the feeling that the safety it adds is fairly good for any non-melting fabrics such as cotton, but a fabric like polyester or nylon will comply very easily. This indicates that the end product may have very different protection level between a compliant cotton fabric and a compliant polyester fabric even if both fabrics complies with the same 5 second test.

- b) I know that you have looked at the UK-fire regulation, using the 20 second flame application, have you considered EN 1021-2?

It's basicly the same test but with the flame application reduced to 15 second due to the fact that no match burns for 15 second and all lighters on the market has a much lower flame intensity than when the BS 5852-1 was written 1979.

Best regards

Magnus Bjork  
Laws & Standards Compliance Manager  
IKEA North America Services

----- 03-12-09 15.42 ----- Sämt till

-----  
-> dray(a)cpsc.gov

*Upholstered Furniture Comments*

**Thelen Reid & Priest LLP**  
Attorneys At Law

Nicholas Geale  
202.508.4051 Direct Dial  
202.508.4321 Direct Fax  
ngeale@thelenreid.com

701 Pennsylvania Avenue, N.W., Suite 800  
Washington, DC 20004-2608  
Tel. 202.508.4000  
Fax 202.508.4321  
www.thelenreid.com

December 18, 2003

**By Hand-Delivery**

Office of the Secretary  
Consumer Product Safety Commission  
4330 East-West Highway, Room 502  
Bethesda, MD 20814

2003 DEC 18 PM 12: 29  
RECEIVED  
CPSC  
MAILROOM

Re: **Upholstered Furniture Flammability Proceeding ANPR Comments By The  
Decorative Fabric Association, et al.**

Dear Mr. Secretary:

On behalf of the Decorative Fabric Association, the Coalition of Converters of  
Decorative Fabrics, and Calico Corners, Inc., please accept the enclosed comments for filing. I  
have enclosed an original and one copy. So that I may complete my records, please date stamp  
the copy and return it to my courier for return delivery to me.

Please do not hesitate to contact my colleague Richard Taffet at 212-603-8925 or me at  
202-508-4051 should you have any questions or need anything further. Thank you.

Sincerely,



Nicholas C. Geale

Enclosures

**BEFORE THE CONSUMER PRODUCTS SAFETY COMMISSION**

**WASHINGTON, D.C.**

----- X  
In the matter of: :  
 : 68 FR 60629  
Upholstered Furniture Flammability : ANPR  
Proceeding : October 23, 2003  
 :  
----- X

**COMMENTS OF THE DECORATIVE FABRIC ASSOCIATION,  
THE COALITION OF CONVERTERS OF DECORATIVE FABRICS  
AND CALICO CORNERS, INC.**

The Decorative Fabric Association (“DFA”), the Coalition of Converters of Decorative Fabrics (“CCDF”) and Calico Corners, Inc. (“Calico Corners”) submit these comments in response to the Advanced Notice of Proposed Rulemaking issued by the Consumer Product Safety Commission (“CPSC” or “Commission”) on October 23, 2003 in connection with the ignition of upholstered furniture by small open flames and/or smoldering cigarettes (the “ANPR”). Each of the DFA, CCDF and Calico Corners have appeared before the Commission previously, and have provided testimony supporting a mandatory national standard such as is contemplated by the ANPR. These comments reaffirm those earlier positions.

Specifically, by these comments the DFA, CCDF and Calico Corners seek to speak in favor of a uniform national upholstered furniture flammability standard that is both technically effective and cost justified. We believe the direction now being taken by the Commission staff, including through its collaborative efforts with industry and other interested stakeholders, should succeed in achieving these dual objectives.

Accordingly, the DFA, CCDF and Calico Corners submit that:

(i) The Commission should move with all due speed to promulgate a uniform federal upholstered furniture flammability regulation. Such a regulation would provide certainty, and allow interested and affected parties to be best able to benefit from increased fire safety while retaining the ability of industry to offer the wide range of products that consumers demand.

(ii) An upholstered furniture flammability regulation must, as the current CPSC draft proposal does, provide for a “barrier alternative.” Such an alternative should allow the use of fabrics that are untreated with flame retardant chemicals to meet the requirements of the regulation if a qualified barrier or fire blocking material is used beneath them. This will preserve the ability of DFA and CCDF members, as well as Calico Corners, to remain viable competitors, allow consumers the widest choices of products, and reduce unnecessary health risks for consumers and workers that may arise from an increased use of flame retardant chemicals on fabrics sold by DFA and CCDF members, as well as by Calico Corners.

(iii) Any regulation should include testing methodologies that reflect what we understand to be a growing consensus among industry participants, the fire community and the CPSC staff.

## **DISCUSSION**

### **A. A Uniform Federal Upholstered Furniture Flammability Regulation Should Be Adopted**

As former DFA President, Rosecrans Baldwin of Bergamo Fabrics testified before the Commission this past summer, “[i]ndustry needs certainty.”<sup>1</sup> A uniform federal upholstered furniture flammability regulation will achieve this.

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<sup>1</sup> Statement before the Consumer Products Safety Commission of Rosecrans Baldwin on Behalf of the Decorative Fabrics Association and The Coalition of Converters of Decorative Fabrics, dated September 15, 2003.

Any upholstered furniture regulation will require industry participants to take some steps and incur some costs to ensure compliance. A properly formulated regulation, however, should impose only those costs that are necessary to address the risks at issue. If industry, including the DFA and CCDF membership, and Calico Corners, were required to meet a multitude of potentially inconsistent standards, the overall cost of compliance would be prohibitive, assuming compliance would even be possible from a production and manufacturing perspective.

Nor is the risk of multiple inconsistent regulations merely theoretical. As is well known, the State of California is considering an upholstered furniture regulation that would not allow for an effective barrier alternative, and that draft proposed regulation has been included in proposed legislation in the United States Senate. Other states may pursue their own approaches as well.

In these circumstances, as we have previously urged, a single, uniform, national upholstered furniture regulation is a necessity. Such a regulation should pre-empt inconsistent state regulations and thereby allow industry to effectively protect the consumer without incurring the added costs and inefficiencies created by different requirements from state to state.

## **B. The Regulatory Framework**

The DFA, CCDF and Calico Corners are on record supporting the CPSC staff regulatory approach as set forth in the most recent draft upholstered furniture regulation for small open flames. That approach remains on point even with the expansion of the ANPR to include smoldering cigarette ignition.

In particular, the need for a “barrier alternative” - for cost, aesthetic and health reasons - has been well documented. In short, an alternative that would test qualified barrier materials, rather than outer fabrics, is imperative if companies such as those comprising the DFA and

CCDF memberships, as well as Calico Corners, have any chance to remain in business. Simply, without such an alternative the products of these companies would not remain merchantable if treated with flame retardant chemicals, and even if they did, the costs attendant to treating and testing them would make it wholly unprofitable for these firms to continue in business.

To take a different approach would be unreasonable, especially one that would require treatment of outer fabrics with flame retardant chemicals, when inclusion of a “barrier alternative” would allow for an effective and less costly regulatory scheme. Moreover, we understand that since the CPSC staff announced a draft regulation including a “barrier alternative,” aggressive steps have been taken in industry to develop barrier and fire blocking materials that will be effective from both a technical and economic perspective. It can only be expected that these developments will continue if the Commission promulgates a national standard that includes a “barrier alternative.”

### **C. Technical Parameters Should Reflect The Consensus Of All Stakeholders**

We understand that there is now a growing consensus among industry, the fire community, and we hope the CPSC staff, concerning the proper test methodologies that should be included in a national upholstered furniture regulation. This consensus is emerging around proposals first developed by the group of fabric companies that has designated itself as the “Fabric Coalition”, and that ongoing work is being pursued by fabric, furniture and other industry interests, as well as the National Association of State Fire Marshals and other fire interests, to further develop the original proposal.

These efforts must be applauded, and to the extent the CPSC staff is not now fully invested in this ongoing work, we urge that it become so involved. A consensus built on the

work of all interested parties – industry, the Fire Marshals, the CPSC staff – is the best assurance that the best regulation will emerge. Indeed, to be successful it is vital that any regulation effectively address the serious risks of upholstered furniture fires, and do so in a cost effective way that does not expose significant segments of the industry to economic ruin.

Adopting a regulation that reflects a broad consensus of all stakeholders should also allow for the most expeditious promulgation of an upholstered furniture flammability regulation in that the views of interested parties will have been considered and reconciled. As the DFA, CCDF and Calico Corners have made known, the prompt adoption of a uniform federal regulation should be the goal of the Commission for this rulemaking. This will minimize the likelihood of conflicting standards being adopted by other jurisdictions, or as the result of legislative mandate. It would also ensure that the regulation that is adopted is based upon the best available scientific and economic information and analysis. Equally important, the speedy development of a national standard will most quickly address the risks of upholstered furniture fires to consumers.

## CONCLUSION

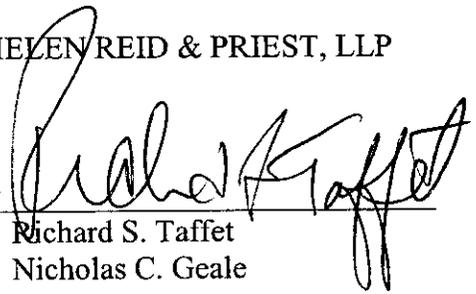
In summary, the DFA, CCDF and Calico Corners continue in their support of a uniform national upholstered furniture flammability regulation. Such a regulation should be adopted with all due speed, must include the type of "barrier alternative" reflected in the CPSC staff's most recent draft standard for small open flames, and should reflect the consensus positions developed by all stakeholders – industry, the fire community and the CPSC staff.

December 18, 2003

Respectfully submitted,

THELEN REID & PRIEST, LLP

By

  
Richard S. Taffet  
Nicholas C. Geale

875 Third Avenue  
New York, NY 10022-6225  
(212) 603-2000

-and-

701 Pennsylvania Avenue, N.W.  
Washington, D.C. 20004-2608  
(202) 508-4000

Attorneys for the Decorative Fabric  
Association, the Coalition of Converters  
of Decorative Fabrics and Calico Corners, Inc.

3  
Upholstered  
Furniture  
Committee

**Comments made by China furniture industry  
on the USA Notification G/TBT/N/USA/54 circulated on October 27, 2003**

1. It is necessary to make flammability standards or regulations for upholstered furniture products and related fabrics or materials for the safety of human and properties. It is in conformity with the basic principles of the TBT Agreement.
2. The risk of fire from ignition of upholstered furniture by smoldering cigarettes identified by the Consumer Product Safety Commission is in existence. Practical situation in China also shows that fire from ignition of upholstered furniture by smoldering cigarettes is one of the major causes leading to injury of human and damage of property.
3. It is expected to have a clear definition of the term of “upholstered furniture”. In China the term refers to spring mattress and sofa.
4. There is already an International Standard namely ISO 8191—1:1987 《Furniture; Assessment of the ignitability of upholstered furniture; Part 1: Ignition source: smoldering cigarette》 developed by Technical Committee ISO/TC136 which can be taken as a reference when drafting the new rule by CPSC.
5. In China there is already a mandatory National Standard GB 17927—1999 《Upholstered furniture—Assessment of the resistance to ignition of the spring mattress and the sofa》 published in December 17,1999 based on ISO 8191—1:1987 《Furniture; Assessment of the ignitability of upholstered furniture; Part 1 : Ignition source : smoldering cigarette》 , which also can be considered as a reference in the rulemaking by CPSC.

## 对美国通报 G/TBT/N/USA/54 的评议意见

1. 为了保护人类健康和财产安全，有必要对软体家具产品及有关织品或材料制定易燃性标准或法规，这符合 TBT 协定的基本原则。
2. 美国消费品安全委员会确定的香烟阴燃引起软体家具燃烧的风险是存在的。中国的实际情况也表明，软体家具由香烟阴燃引起火灾同样是导致人体伤害和财产损失的主要原因之一。
3. 应对术语“软体家具”有明确的定义，中国对于软体家具的界定范围是弹簧软床垫和沙发。
4. ISO/TC136 已经发布了 ISO8191—1:1987《家具 软体家具易燃性的评定 第 1 部分：点火源；阴燃的香烟》国际标准。希望美国消费品安全委员会制定其法规时参考采用该标准。
5. 中国已于 1999 年 12 月 17 日制定发布了 GB 17927—1999《软体家具 弹簧软床垫和沙发抗引燃特性的评定》国家标准，该标准是在国际标准 ISO 8191—1:1987《家具 软体家具易燃性的评定 第 1 部分：点火源；阴燃的香烟》的基础上制定的。美国消费品安全委员会在制定法规时可予参考。

## Stevenson, Todd A.

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**From:** Anne Meininger [anne.meininger@nist.gov]  
**Sent:** Friday, December 19, 2003 11:09 AM  
**To:** Stevenson, Todd A.  
**Cc:** Ray, Dale R.  
**Subject:** "Upholstered Furniture Flammability Proceeding" -- comments



Comments on SA54(Chineses)1.d\SA54(English)1.do.

Hello CPSC,

Attached are comments from the People's Republic of China.

Comments were received by the WTO TBT U.S. Inquiry Point at NIST, Department of Commerce.

Please let me know if you need additional information.

Please acknowledge receipt of this email.

Thank you very much!  
Anne Meininger

```
>>X-Sieve: CMU Sieve 2.2
>>To: ncsci@nist.gov
>>From: tbt@aqsiq.gov.cn
>>Subject: Comments on G/TBT/N/USA/54
>>Date: Fri, 19 Dec 2003 14:29:24 +0800
>>X-MIMETrack: Serialize by Router on mailsvr1/Aqsiq(Release 5.0.11
>>|July
>>24, 2002) at
>> 2003-12-19 02:29:41 PM
>>X-MailScanner:
>>
>>Dear Anne Meininger,
>>
>>Enclosed please find the comments made by furniture industry of China
>>on the USA Notification G/TBT/N/USA/54 on upholstered furniture.
>>Please acknowledge receipt of these comments by sending a message to
>>our office (tbt@aqsiq.gov.cn).
>>
>>Your consideration and reply to the comments will be very much
>>appreciated.
>>
>>
>>Best regards
>>
>>
>>Guo Lisheng
>>Deputy Director General
>
>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](mailto:ncsci@nist.gov) or [anne.meininger@nist.gov](mailto:anne.meininger@nist.gov)  
>Internet: <http://ts.nist.gov/ncsci/>



The Industry Voice for Workplace Solutions

*Upholstered  
Furniture  
Comments 4*

19 December 2003

Mr. Todd A. Stevenson  
Office of the Secretary  
US Consumer Product Safety Commission  
4330 East West Highway, Room 502  
Bethesda, Maryland 20814

Dear Mr. Stevenson,

Attached you will find the response to your solicitation for comments in the Federal Register Vol. 68 No. 205 page 60629 from BIFMA International on "Ignition of Upholstered Furniture by Small Open Flames and/or Smoldering Cigarettes."

Our submission should not be construed as an endorsement of the proposed rule. Further, we reserve the right to submit additional comments as more data becomes available.

Sincerely,

A handwritten signature in cursive script that reads "Richard P. Driscoll".

Richard P. Driscoll P. E.  
Technical Services Manager

## **Upholstered Furniture Flammability Proceeding**

BIFMA suggests that the following revisions to the proposed rule listed in 16 CFR Chapter II, Subchapter D, "Ignition of Upholstered Furniture by Small Open Flames and/or Smoldering Cigarettes" would substantially reduce the cost of compliance with the rule without diminishing the benefits.

1. BIFMA requests that the words "offices, and other places of assembly and public accommodation" be deleted from the "SUPPLEMENTARY INFORMATION, A. The Product" section. Fire history data indicates that there have been no fire incidents originating from office furniture. The intent of the rulemaking, voted on by the CPSC is clearly stated to address the risk of residential fires. The market data, existing standards and additional background information supplied in the ANPR reference residential only, not offices or places of public assembly. The product covered therefore, should remain consistent with residential only.
2. BIFMA further requests that office furniture be exempted from the rule, cited above. BIFMA recommends that office furniture be defined, as a means for exemption, with a combination of the following characteristics:
  - Seat and back upholstery separated with a 0.5 inch open space or more
  - No dust cover
  - No skirt
  - Open space beneath the seat underside of at least 10 inches
  - Chair rolls on casters
  - Chair pivots on its axis
  - Total weight of the combustible materials in the chair is less than (x) pounds or (y) %

BIFMA concurs with the goal of reduced fatalities and injuries due to residential fire that is put forth in the ANPR and the May 2 and June 27, 2003 position papers of AFMA and the Fabric Coalition, respectively. Their position on the appropriateness of a Federal standard for open flame and cigarette ignition are also appropriate.

Since a small portion of the products that the contract furniture industry produces would be subject to the rule, even with the above requested exemption, BIFMA notes with interest the June 27, 2003 Fabric Coalition standard proposal, now backed, with slight modifications, by AFMA. While the proposal has merit, no tests of this type have been conducted on office seating components. Typical office seating construction varies from residential in the use of denser foam and bonding the fabric to a molded foam pad, rather than stretching the upholstery over the foam. BIFMA believes it is necessary to perform this newly proposed test on this type of construction to judge its appropriateness. It is possible that these tests would suggest proposals for still further revision to the proposed test procedure. Until these types of tests have been conducted, BIFMA is reluctant to endorse an open flame ignition test of any type.

# UFAC<sup>SM</sup>

*upholst from WYNN*

**Upholstered Furniture  
Action Council**

P.O. Box 2436  
High Point, NC 27261

PHONE (336) 885-5065  
FAX (336) 885-5072

INTERNET [www.ufac.org](http://www.ufac.org)  
EMAIL [info@ufac.org](mailto:info@ufac.org)

December 22, 2003

Mr. Todd Stevenson  
Office of the Secretary  
U. S. Consumer Product Safety Commission  
Washington, DC 20207

RE: Upholstered Furniture Flammability Proceeding

Dear Mr. Stevenson:

On behalf of the Upholstered Furniture Action Council (UFAC), we congratulate the Commission for its decision to include cigarette ignition within the scope of the ongoing upholstered furniture flammability rule making. Cigarette ignition of upholstered furniture remains the leading cause of upholstery fires in this country and is a much more common scenario than small open flame ignition. For this reason, any regulatory solution should emphasize the prevention of cigarette ignition of upholstered furniture as a top priority and secondarily attempt to address small open flame ignition of upholstered furniture.

UFAC is pleased with the 70% decline in the number of deaths from cigarette-ignited fires involving upholstered furniture. It believes that its voluntary construction criteria incorporated into ASTM E 1353 contributed significantly towards this decline. By any measurement, UFAC has been a success. Despite indications that the downward trend will continue, the number of deaths and injuries from cigarette ignited fires remains significant.

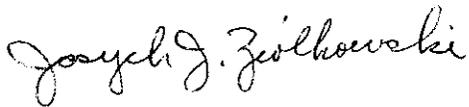
The UFAC program is a voluntary one. CPSC data shows that 90% of current production complies with UFAC<sup>1</sup>. However, with more and more upholstery products being imported from China and other foreign countries, it is clear that the compliance rate with the UFAC program could begin to fall. Therefore, UFAC recognizes that the time has come for a mandatory safety standard for upholstered furniture flammability that is safe, effective, and saleable.

From a technical standpoint, the cigarette ignition resistance and small open-flame ignition resistance should be addressed in the same regulatory document. In the past year, significant progress has been made towards a sensible regulatory approach for a comprehensive flammability standard on upholstered furniture.

<sup>1</sup> U. S. CPSC, *Regulatory Options Briefing Package on Upholstered Furniture Flammability*, October 28, 1997, p. 7.

UFAC encourages the stakeholders to continue this progress. In October 2003, the UFAC Board voted to support a mandatory flammability standard for upholstered furniture that would address both small open flame ignition as well as smoldering ignition. In the opinion of the Board, the CPSC should adopt the relevant portions of ASTM E 1353 for cigarette ignition. In addition, the Board voiced support for the proposal of the Fabric Coalition for a five second ignition test for upholstery fabrics. It believes that this five second small open flame fabric test used with TB 117 plus foam and the cover fabric test from ASTM E 1353 provide a sensible regulatory framework for a mandatory flammability standard that addresses both cigarette ignition and small open flame ignition of upholstered furniture.

Sincerely yours,

A handwritten signature in cursive script that reads "Joseph J. Ziolkowski". The signature is written in dark ink and is positioned above the printed name and title.

Joseph J. Ziolkowski  
Executive Director

*Update  
furniture  
comments*



**Comments of  
The American Furniture Manufacturers Association  
(AFMA)**

**To the U.S. Consumer Product Safety Commission**

December 22, 2003

## **Introduction**

The American Furniture Manufacturers Association (AFMA) is pleased to submit the following comments in response to the October 23, 2003 Federal Register notice.

First, we would like to commend the Commission for voting to address both cigarette ignition and small open flame ignition risks within the present rulemaking. Hopefully, this action will allow the agency to deal expeditiously with both of these ignition scenarios.

In addition, we would like to comment on several other issues that were the subject of testimony and discussion at the September 24 public hearing.

## **Support for a Uniform National Flammability Standard**

The hearing revealed a widespread consensus among stakeholders in support of a national flammability standard for upholstered furniture. Witnesses appearing on behalf of AFMA, the National Association of State Fire Marshals, the Polyurethane Foam Association, the Alliance for the Polyurethanes Industry, the American Textile Manufacturers Institute, the National Textile Association, the Fabric Coalition, the Decorative Fabrics Association, the Coalition of Converters of Decorative Fabrics, Calico Corners, the Association of the Nonwoven Fabrics Industry, the Fire Retardant Chemicals Association, and Underwriters Laboratories all expressed support for a such a regulation.<sup>1</sup>

## **Elements of Such a Standard**

There was also considerable agreement about the shape that such a regulation should take. ATMI, NTA and the companies comprising the Fabric Coalition supported a 5-second open flame test for fabric in combination with the flame test for polyurethane foam embodied in the pending TB-117 revision ("117 plus" foam). Other organizations, including AFMA, NASFM and FRCA, expressed support for combining performance requirements for fabrics with requirements for foam as the basis of a more reliable and equitable upholstered furniture standard.

We are pleased to report that on November 13, the AFMA Board of Directors endorsed the Fabric Coalition proposal. This decision was based on the research results presented at the hearing by Mr. David Pettay of Quaker Fabric, as well as on independent analysis by our own member companies and suppliers. AFMA believes that the Fabric Coalition framework promises significant advantages compared to the other approaches considered by the Commission.

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<sup>1</sup> U.S. CPSC, *Upholstered Furniture Briefing*, September 24, 2003.

## Relationship to Actual Childplay Scenarios

First, the five-second flame test more realistically models curiosity-driven fireplay by young children, as distinguished from more purposeful behavior. CPSC staff has noted that:

Available information on child fireplay suggest that young children, who are most often cited as fire starters, are fascinated with fire but not generally motivated to ignite objects such as chairs or sofas. Further, many *young children would not be expected to hold a flame source in one place for more than several seconds*; a child who engages in the relatively focused behavior of holding a flame in one place for an extended period of time is persistent beyond mere fireplay.<sup>2</sup>

Data indicates that child fireplay accounts for the great majority of both match and lighter incidents,<sup>3</sup> but is not a significant factor in candle ignitions (candles are most often lit by adults and subsequently tipped over).<sup>4</sup>

Behavior that involves more focused attempts to initiate a fire is unlikely to be addressed by changes in furniture construction. CPSC staff has recognized that "intentional ignitions are difficult to address by means of a product flammability standard,"<sup>5</sup> as has the U.S. General Accounting Office (GAO).<sup>6</sup> The U.S. Small Business Administration (SBA) has raised similar concerns, grouping sustained exposures to fallen candles along with intentional ignitions as a class of incident a flammability standard for furniture is unlikely to address.<sup>7</sup>

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<sup>2</sup> U.S. Consumer Product Safety Commission, *Regulatory Options Briefing Package on Upholstered Furniture Flammability* October 28, 1997, p. 38 (emphasis added).

<sup>3</sup> Mark Berkman, *Assessing the Need for a Federal Upholstered Furniture Flammability Standard*, National Economic Research Associates (NERA), February 16, 2001 found that 80 percent of lighter fire fatalities and 70 percent of match fire fatalities involved child's play during the period 1980-1998.

<sup>4</sup> U.S. CPSC, *Regulatory Options Briefing Package on Upholstered Furniture Flammability*, 1997, p. 50. See also IDI's 960423CCC6174; 960530CNE5146; 950201HWE5004; 960404CCC8127; 950724HWE5008; 950213HNE5166; 950310HCC2052. Cf. IDI 960729HCC5388.

<sup>5</sup> U.S. CPSC, *Regulatory Options Briefing Package on Upholstered Furniture Flammability*, 1997, p. 38.

<sup>6</sup> U.S. GAO, *Consumer Product Safety Commission: Better Data Needed to Help Identify and Analyze Potential Hazards*, September 1997.

<sup>7</sup> U.S. Small Business Administration, Office of Advocacy, *Comments in Response to the March 17, 1998 Federal Register Notice*.

We agree with the Fabric Coalition that a five-second test represents a sensible demarcation between accidental fires of limited duration, and other fires that by their nature will prove unresponsive to changes in furniture construction.

### **Sets Realistic Performance Requirements for Fabrics**

The Fabric Coalition reports that approximately 80 percent of fabrics currently in the U.S. market would fail its proposed test without modification. They further indicate that most fabrics can be reformulated (through yarn substitution and FR backcoating) to reliably pass this test.

This contrasts with the experience of the United Kingdom, where a 20-second test has in practice encountered widespread non-compliance.<sup>8</sup> During the course of this rulemaking, Dr. Kurt Reimann and his colleagues tested a representative sample of 31 fabrics backcoated and BS5852 certified by an accredited laboratory in the U.K. Seventeen of these failed subsequent small open flame testing in the U.S. Some of these required multiple treatments in order to pass, and many exhibited a mixture of passing and failing results.<sup>9</sup>

We believe a sensible test method met with high levels of compliance is more appropriate for the United States than one that is largely symbolic and aspirational. Consumers could trust that they are getting the safety benefits they pay for, fabric and furniture manufacturers would be on firmer legal footing, and the Commission would be less burdened by compliance and recall actions.

### **Preserves Fabric Function and Aesthetics**

AFMA was also pleased to hear Mr. Pettey report that FR treatment sufficient to pass the Fabric Coalition fabric test can be achieved using existing backcoating techniques. The net result is that the functional and aesthetic qualities of the present fabric market can be preserved.

Once again, this contrasts with the experience in the United Kingdom under BS-5852, where it is widely acknowledged that important fabric qualities have been sacrificed. The editor of the U.K. publication *Cabinet Maker* said of the fabrics at a 1996 Italian trade show:

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<sup>8</sup> Andrew Kidd, "More than 50% of Sofa beds Failed to Pass Fire Safety Regulations," *Cabinet Maker*, January 31, 1997.

Derbyshire County Council, *Company Fined Over Fire Retardant Claims*, August 13, 2001.

<sup>9</sup> Janet L. Brady, *A Study of the Effects of FR Backcoating on Selected Upholstery Fabrics*, Philadelphia College of Textiles, June 16, 1999.

*It makes me sad to think that so few of these exquisite weaves and prints will ever reach the U.K. market, mainly because of our stringent fire retardancy regulations. A number of mills commented that although they would like to export more to the U.K., the application of FR backings would ruin the special feel and texture of the fabric....*<sup>10</sup>

## **Cost-Effectiveness**

The Fabric Coalition estimates that compliance with its proposed framework would be significantly less costly than alternative proposals. The ability to adequately reduce the identified risks in the most cost-effective and least disruptive manner is of course consistent with CPSC's statutory mandate.<sup>11</sup>

It is also critical to the successful implementation of this program. There are approximately 400 million units of upholstered furniture currently in use in this country, and the average product life is between 15-17 years.<sup>12</sup> New upholstered furniture represents a discretionary purchase for most U.S. consumers. In median income households, the replacement rate for sofas and loveseats is 3.6 percent annually. This figure drops to 2.5 percent among households with annual incomes under \$20,000.<sup>13</sup> The replacement of the nation's furniture stock with more fire-resistant constructions will take place over several generations. AFMA members are committed to the manufacturing and marketing of these products. The Commission can advance this process by choosing the most practical and cost-effective regulatory framework.

## **Conclusion**

For all of the reasons discussed, AFMA believes the Fabric Coalition proposal represents the most promising basis for an upholstered furniture regulation. Further research and analysis is appropriate, in order to establish the reproducibility and repeatability of the test method. We plan to participate, along with representatives of the fabric industry, testing labs and fire community in a project with these ends in mind. This initiative is described in greater detail in a December 19 letter to the Commissioners from some of the participating organizations.

We respectfully urge CPSC staff to conduct their own testing and analysis of the Fabric Coalition protocol, and provided that such work supports its efficacy and

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<sup>10</sup> Felicity Murray, *Cabinet Maker*, Miller Freeman Publishers, May 1996.

<sup>11</sup> 15 U.S.C. 1193 (j) (2) (C).

<sup>12</sup> U.S. CPSC, *Briefing Package on Upholstered Furniture Flammability*, October 2001, p. 50.

<sup>13</sup> Berkman (2001), p. 32.

practicality, to include this approach among any options presented to the Commissioners for inclusion in a Notice of Proposed Rulemaking (NPR).



**Executive Offices**  
PO Box 1459 Wayne, NJ 07474-1459  
Telephone 973-633-9044  
Fax 973-628-8986  
E-mail [loupeters@pfa.org](mailto:loupeters@pfa.org)

December 22, 2003

Via e-mail ([cpsc-os@cpsc.gov](mailto:cpsc-os@cpsc.gov))

Office of the Secretary  
Consumer Product Safety Commission  
4330 East-West Highway  
Bethesda, MD 20814  
Attention: Todd Stevenson

Re: Upholstered Furniture Flammability Proceeding (ANPR)

Dear Sir:

The Polyurethane Foam Association (PFA) provides the following comments concerning the referenced advance notice of proposed rulemaking.<sup>1</sup> PFA supports performance-based national standards to address both small open-flame ignition and cigarette ignition of an article of upholstered furniture, as long as the Commission (1) takes certain precautions to ensure that the standards do not conflict with each other; (2) establishes performance standards that permit a variety of compliance options for each standard; and (3) does not discriminate against any component if a component testing protocol is considered for either ignition source.

By way of background, PFA has been involved in the Commission's deliberations on upholstered furniture flammability since the early 1980s, and we have participated in and commented upon various proposals, including participation in the September 24, 2003 public meeting. One of the documents filed in these proceedings by the PFA, an "Overview of the Combustibility and Testing of Filling Materials and Fabrics for Upholstered Furniture," was prepared at the request of the CPSC in 1998 by Dr. Herman Stone, a consultant to the PFA. It comprehensively deals with more than 25 years of history on the subject of flammability testing of flexible polyurethane foam and other materials similarly used in the production of upholstered furniture. As demonstrated by this report, flammability testing is an extremely complex matter because the reaction of materials can differ with regard to the type of ignition source, variety of fabrics or covering materials, cushioning materials, and human behavioral patterns. The interactions between the covering materials, possible inter-layers, the filling materials, and the cushioning system are frequently unpredictable.

PFA concurs with other organizations, such as AFMA, UFAC, and ATMI, on the desirability of developing a uniform national standard for the flammability of upholstered

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<sup>1</sup> 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.

furniture. There appears to be a growing consensus that any flammability standard should address the hazard posed by a finished article as opposed to focusing solely on individual components. This is important because historical flammability testing done by many laboratories has demonstrated that the interaction of various components differs significantly in a finished article from how they perform when tested individually. This has been demonstrated by testing with respect to polyurethane foam wrapped with polyester fiber as well as in combination with various fabrics. In those tests, the synergistic effects of the tested products were quite different than the performance of the products when tested individually.

According to the most recent fire data, cigarette ignition, by far, continues to be the most frequent source of upholstered furniture fire losses. Concerning the expansion of the scope of the rulemaking to develop a cigarette ignition standard, the ASTM standard E1353 should form its basis. Domestic furniture manufacturers are familiar with this ASTM standard, and there is already a very high level of compliance with the standard in the U.S. domestic furniture industry. As reflected in a CPSC report, the ASTM standard also has proved to be effective in reducing fires resulting from smoldering cigarettes. It is important to point out that in promulgating a regulation that addresses cigarette ignition, the Commission must ensure that achievement of that goal does not come at the expense of denigrating the performance of a product in a small open-flame standard test.

As to the development of a small open-flame standard or a cigarette ignition standard, for them to be meaningful, they must (1) address the performance of a finished article of upholstered furniture in a real fire situation and (2) recognize that fires are reflective of the synergy between the covering material, the cushioning material, other components in the furniture, and their unique method of assembly or geometry. As we have also stated in the past, PFA supports the use of bench-scale tests, which address the performance of components for manufacturing quality-control purposes so long as the results of such tests have a reasonable relationship to the performance of the finished upholstered furniture article in a real fire situation.

The PFA supports the staff approach to provide a variety of compliance options to recognize the vast number of different fabrics, filling materials, constructions, and designs offered by the furniture industry to U.S. consumers. Different compliance options also give flexibility to the furniture industry to manufacture a large variety of upholstered furniture for U.S. consumers. Also, establishing performance-based standards will encourage product innovation and encourage the development of new design materials and technology for manufacturing upholstered furniture.

If the CPSC decides to employ component tests as part of the small open-flame standard, PFA urges the Commission to ensure that all components used in a similar manner be required to meet equally rigorous test standards. Discrimination against any one component would disadvantage that component with respect to its competitors. Any such component test should be reasonable, reproducible, predictable, and technically feasible. Any test should also be cost-effective and consistent with ASTM requirements for repeatability and reproducibility.

The CPSC staff found that the current combustibility modification requirements for polyurethane foam such as California TB 117 have little impact on the flammability behavior of the finished article in a real fire situation. That has also been demonstrated in other testing as well, because the synergistic effect of component materials caused them to react differently when put together than when testing them individually.

With respect to flame-retardant treatment of foam, some states are restricting the use of certain chemicals currently used for combustion modification of foam. For example, the state of California recently passed, and the governor signed into law, legislation prohibiting the use of pentabrominated diphenyl ether (PBDE) and octabrominated diphenyl ether (OBDE) in products manufactured or sold in California after January 1, 2008. This date may be accelerated in light of Great Lakes Chemicals' announcement that it will no longer manufacture and sell PBDEs in the United States after 2004. Massachusetts and New York also are considering legislation that would restrict the use of PBDE in products made or sold in those states. The final rule should, accordingly, provide options for complying with the standards without having to resort solely to the use of chemical flame retardants. In that regard, the use of barrier materials, or fire-blocking materials, should be one alternative available for compliance with any standard. The use of barrier materials would minimize the burden of sampling, testing, and recordkeeping by furniture manufacturers. It also would preserve the choice of covering materials for consumers.

In the past, the AFMA has suggested that a labeling program based upon the current UFAC label could help educate consumers on potential flammability hazards and might be considered by the Commission. PFA supports the UFAC labeling program and believes it is an important part of educating consumers about potential flammability hazards of upholstered furniture and would support such a labeling initiative as part of a national standard.

Finally, there is a need for educating consumers about fire prevention. Consumers should not be given a false sense of security that an article of upholstered furniture that meets national flammability standards will not burn. Consumers must be educated to the fact that furniture will burn – notwithstanding the existence of a national standard. The consumer education should teach responsible action and encourage the use of detection, alarm, and suppression systems. Only with a comprehensive approach to fire prevention, including public education, will there be a significant reduction in fire deaths and injuries in the United States.

In conclusion, the proposed rule should be drafted to make residential upholstered furniture more fire safe, but it also should recognize the potential for conflict between a standard for small open-flame ignition and one for cigarette ignition. It is also important that if a component test is included in either standard, it should not discriminate against one component over another.

Sincerely,

A handwritten signature in black ink, appearing to read "Louis H. Peters". The signature is stylized with a large initial "L" and a long horizontal stroke extending to the right.

Louis H. Peters  
Executive Director

Upholstered Furniture Comment 12/01/2003 8



499 South Capitol Street, SW, Suite 518, Washington, DC 20003 USA  
Phone: +1 (202) 488-4428 • Fax: +1 (202) 488-4452 • www.nfpa.org

December 18, 2003

Office of the Secretary  
Consumer Product Safety Commission  
Washington, DC 20207

Re: Upholstered Furniture Flammability Proceeding

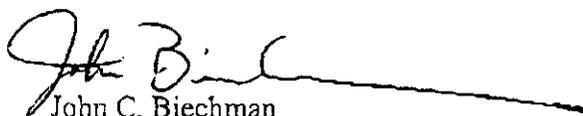
Dear Mr. Secretary:

I am writing on behalf of the National Fire Protection Association (NFPA) in support of the Consumer Product Safety Commission's October 23, 2003 advance notice of proposed rulemaking on upholstered furniture. In 1994, when the CPSC began regulatory proceeding on upholstered furniture, NFPA supported this process. Since then we have worked with the CPSC as it has worked through the regulatory process.

We are very pleased that the Commission is expanding the proceeding to address cigarette ignitions. Upholstered chairs and sofas were the items first ignited in 12,700 home fires per year, resulting in 636 civilian fire deaths, 1,572 civilian fire injuries, and \$231.9 million in direct property damage per year, between 1994 and 1998. Abandoned or discarded smoking materials caused the largest percentage of these fires (42%). With regard to civilian fire deaths, the percentage is even higher, with cigarette-ignited fires causing 60% of the upholstered furniture related civilian fire deaths. NFPA has long supported a reduced ignition propensity cigarette standard, such as the State of New York will have soon, but we must address this problem from aspect of upholstered furniture. I have included NFPA's relevant data on upholstered furniture for your review.

We appreciate an opportunity to comment on this important matter. We also commend you for your work on this and all consumer safety issues. NFPA is prepared to assist the CPSC in carrying out its responsibilities with respect to upholstered furniture. Please contact us should you need any further information.

Sincerely,

  
John C. Biechman  
Vice President  
Government Affairs  
Enclosure

*Washington Office*

NFPA's mission is to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating scientifically-based consensus codes and standards, research, training, and education.

**Selections From  
The U.S. Home Product Report  
(Forms and Types of Materials First Ignited in Fires)  
Furniture**

**Kimberly D. Rohr  
Fire Analysis and Research Division  
NFPA  
1 Batterymarch Park  
Quincy, MA 02269-9101**

**December 2001**

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## FURNITURE

### Upholstered Furniture

Upholstered chairs and sofas were the items first ignited in 12,700 home fires per year, resulting in 636 civilian fire deaths, 1,572 civilian fire injuries, and \$231.9 million in direct property damage per year, between 1994 and 1998.

Abandoned or discarded smoking materials caused the largest percentage of these fires and associated fire losses. Incendiary and suspicious causes were responsible for the next largest percentage of upholstered furniture fires. People falling asleep (with cigarettes, etc.) were responsible for 11 percent of civilian deaths in upholstered furniture fires, making it the second leading cause of deaths in these fires.

In 79 percent of upholstered furniture fires there was no involvement of any type of equipment. Cigarettes were the leading heat source involved in upholstered furniture fires, civilian deaths, civilian injuries and direct property damage. The high percentage of cigarette-related fires - 42 percent of all upholstered furniture fires - is compatible with the high percentage of abandoned or discarded smoking material fires.

#### Safety Tips

- Be careful when smoking around upholstered furniture. Use large, sturdy ashtrays and do not rest them on a sofa or chair. When lighting cigars, pipes, or cigarettes, make sure sparks from matches do not land on the couch or chair. In addition, whenever there has been smoking in a room, check under cushions and in cracks for discarded butts before going to bed or leaving the home.
- Do not smoke when drowsy, intoxicated or medicated.
- Cigarette ignition-resistant upholstered furniture is more common now, but be aware of potential higher fire risk when purchasing antique or used furniture from the mid-1960s or before.
- Keep portable heaters at least three feet (1 meter) away from upholstered furniture. See the manufacturer's instructions for how to operate and install the appliance safely.
- Do not place furniture near a fireplace or wood stove. Leave adequate space for ventilation. The furniture should be at least three feet (1 meter) away from a heat source.
- Eleven percent of upholstered furniture fires were begun by a child playing with fire. Children should not be left unsupervised - particularly young children, sometimes as young as two, who play with fire but do not understand the consequences of it. Keep matches and lighters up high, out of the reach of children, preferably in a locked cabinet. Encourage children to tell an adult when they find matches and lighters.
- Keep any open flame, such as candles, away from upholstered furniture.

**Upholstered Furniture Fires in U.S. Homes\*, by Year  
Unknowns Allocated**

Reporting Year	Fires	Civilian Deaths	Civilian Injuries	Direct Property Damage (in Millions)
1980	36,800	1,356	2,972	\$219.5
1981	33,800	1,360	2,626	\$218.2
1982	27,500	1,185	2,532	\$271.9
1983	24,600	1,099	2,698	\$200.2
1984	24,100	1,093	2,313	\$217.1
1985	23,100	931	2,331	\$225.0
1986	22,100	1,068	2,197	\$234.1
1987	20,800	1,030	2,145	\$196.0
1988	20,200	1,098	2,291	\$223.2
1989	18,100	883	2,116	\$229.2
1990	16,400	867	2,052	\$256.7
1991	16,200	676	2,053	\$290.1
1992	15,200	631	1,657	\$188.4
1993	14,300	653	1,955	\$231.1
1994	14,000	669	1,708	\$233.8
1995	13,300	659	1,676	\$239.3
1996	12,800	652	1,608	\$249.2
1997	11,800	655	1,444	\$212.7
1998	11,600	543	1,425	\$224.5
<b>Annual Average</b>				
1980-1998	19,800	900	2,095	\$229.5
1994-1998	12,700	636	1,572	\$231.9

\* "Homes" include one- & two-family dwellings, duplexes, manufactured homes, apartments, townhomes, flats, townhouses, and condominiums. The home category does not include rooming, boarding, or lodging houses; hotels or motels; dormitories or fraternity or sorority houses; barracks or bunk houses; or any institutional property providing lodging.

Estimates are based on data from the NFPA's annual stratified random sample survey and the U.S. Fire Administration's (USFA's) National Fire Incident Reporting System (NFIRS), and are combined using statistical methods developed by analysts at NFPA, USFA and the U.S. Consumer Product Safety Commission. National estimates do not reflect unreported fires. Fires are rounded to the nearest hundred, civilian deaths and injuries are rounded to the nearest one, and direct property damage is rounded to the nearest hundred thousand dollars.

Source: National estimates based on NFIRS and NFPA survey.

**Upholstered Furniture Fires in U.S. Non-Homes\*, by Year  
Unknowns Allocated**

Reporting Year	Fires	Civilian Deaths	Civilian Injuries	Direct Property Damage (in Millions)
1980	7,200	30	211	\$42.3
1981	6,800	91	255	\$57.4
1982	6,000	24	194	\$37.3
1983	4,600	20	115	\$26.0
1984	4,800	42	139	\$40.9
1985	4,300	36	101	\$34.8
1986	4,400	16	111	\$31.1
1987	3,700	21	96	\$39.2
1988	3,100	32	136	\$40.2
1989	2,900	24	79	\$26.9
1990	2,700	24	151	\$25.6
1991	2,800	31	73	\$40.3
1992	2,900	19	132	\$34.6
1993	2,500	15	71	\$33.8
1994	2,400	10	94	\$21.8
1995	2,200	32	101	\$37.8
1996	2,200	2	88	\$29.6
1997	2,100	12	105	\$38.9
1998	1,800	7	72	\$28.2
<b>Annual Average</b>				
1980-1998	3,700	26	122	\$35.1
1994-1998	2,100	13	92	\$31.3

\* "Non-Homes" include all structures except homes. The home category includes one- & two-family dwellings, duplexes, manufactured homes, apartments, tenements, flats, townhouses, and condominiums.

Estimates are based on data from the NFPA's annual stratified random sample survey and the U.S. Fire Administration's (USFA's) National Fire Incident Reporting System (NFIRS), and are combined using statistical methods developed by analysts at NFPA, USFA and the U.S. Consumer Product Safety Commission. National estimates do not reflect unreported fires. Fires are rounded to the nearest hundred, civilian deaths and injuries are rounded to the nearest one, and direct property damage is rounded to the nearest hundred thousand dollars.

Source: National estimates based on NFIRS and NFPA survey.

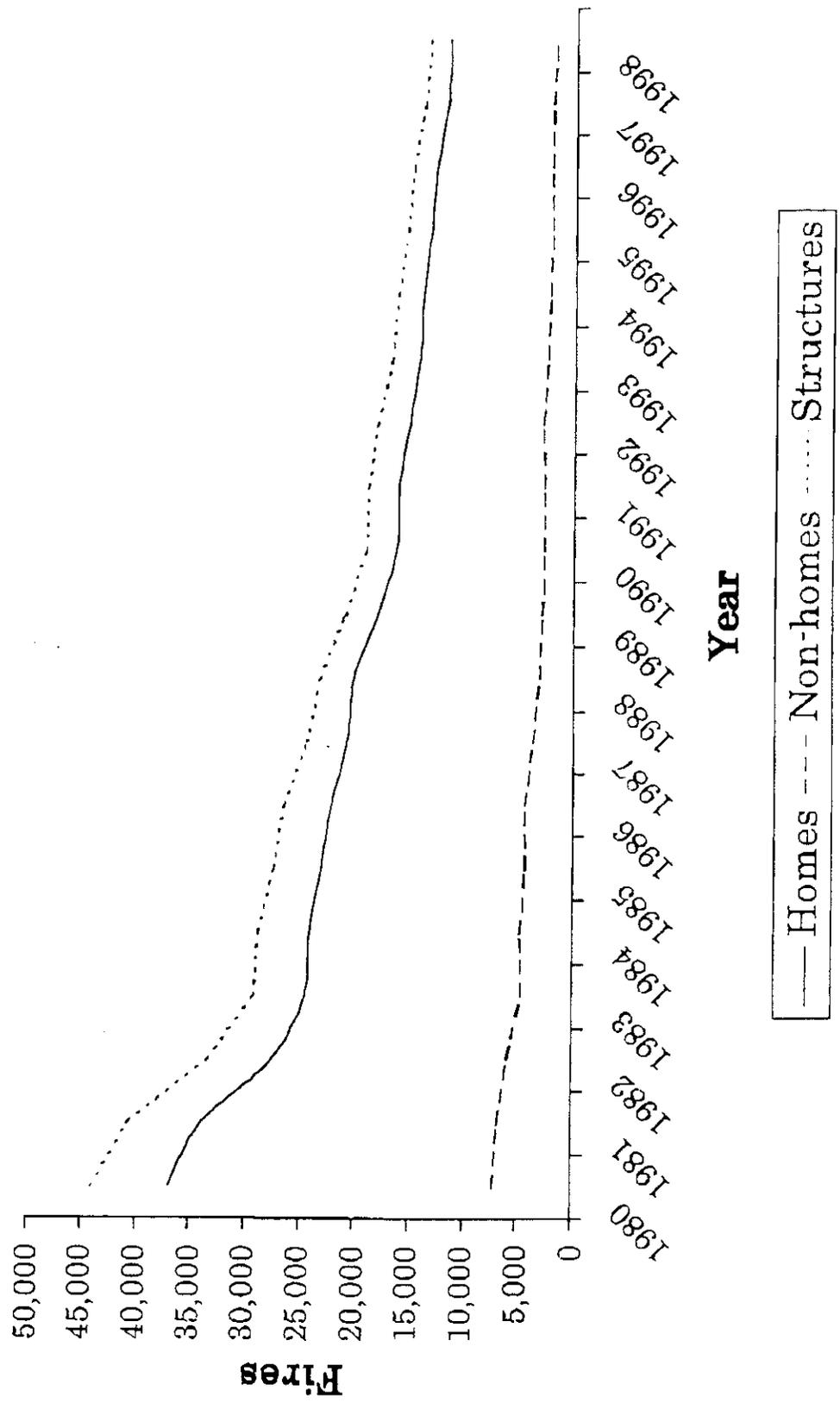
**Upholstered Furniture Fires in U.S. Structures, by Year  
Unknowns Allocated**

Reporting Year	Fires	Civilian Deaths	Civilian Injuries	Direct Property Damage (in Millions)
1980	44,000	1,386	3,183	\$261.8
1981	40,600	1,451	2,881	\$275.6
1982	33,400	1,209	2,726	\$309.2
1983	29,200	1,119	2,813	\$226.1
1984	28,900	1,134	2,452	\$258.1
1985	27,400	967	2,432	\$259.8
1986	26,500	1,084	2,307	\$265.3
1987	24,400	1,051	2,241	\$235.3
1988	23,300	1,130	2,427	\$263.3
1989	21,000	908	2,195	\$256.1
1990	19,100	890	2,203	\$282.3
1991	18,900	707	2,127	\$330.5
1992	18,100	650	1,789	\$222.9
1993	16,800	668	2,026	\$264.8
1994	16,300	679	1,802	\$255.6
1995	15,500	690	1,777	\$277.1
1996	15,000	654	1,696	\$278.8
1997	13,900	667	1,549	\$251.6
1998	13,400	550	1,497	\$252.7
<b>Annual Average</b>				
1980-1998	23,500	926	2,217	\$264.6
1994-1998	14,800	648	1,664	\$263.2

Estimates are based on data from the NFPA's annual stratified random sample survey and the U.S. Fire Administration's (USFA's) National Fire Incident Reporting System (NFIRS), and are combined using statistical methods developed by analysts at NFPA, USFA and the U.S. Consumer Product Safety Commission. National estimates do not reflect unreported fires. Fires are rounded to the nearest hundred, civilian deaths and injuries are rounded to the nearest one, and direct property damage is rounded to the nearest hundred thousand dollars.

Source: National estimates based on NFIRS and NFPA survey.

# Upholstered Furniture Fires, 1980-1998



Source: National estimates based on NFIRS and NFPA survey.

**Upholstered Furniture Fires in U.S. Homes  
1994-1998 Annual Average, Unknowns Allocated**

Ignition Factor	Fires		Civilian Deaths		Civilian Injuries		Property Damage (in Millions)	
Abandoned or discarded material	4,300	(33.8%)	288	(45.3%)	602	(38.3%)	\$73.4	(31.6%)
Incendiary or suspicious	2,300	(18.4%)	42	(6.6%)	151	(9.6%)	\$38.8	(16.7%)
Children playing	1,400	(11.0%)	62	(9.8%)	270	(17.2%)	\$29.2	(12.6%)
Falling asleep	700	(5.7%)	69	(10.9%)	134	(8.6%)	\$10.3	(4.5%)
Combustible too close	700	(5.5%)	35	(5.5%)	58	(3.7%)	\$12.1	(5.2%)
Short circuit or ground fault	700	(5.4%)	14	(2.2%)	66	(4.2%)	\$13.6	(5.9%)
Unclassified or unknown-type misuse of heat	500	(3.7%)	35	(5.5%)	69	(4.4%)	\$11.2	(4.8%)
Electrical failure other than short circuit or ground fault	300	(2.3%)	10	(1.5%)	30	(1.9%)	\$7.3	(3.2%)
Unattended	300	(2.2%)	16	(2.5%)	26	(1.7%)	\$5.4	(2.3%)
Unclassified ignition factor	200	(1.4%)	9	(1.3%)	18	(1.1%)	\$4.2	(1.8%)
Unclassified or unknown-type misuse of material	200	(1.2%)	9	(1.5%)	27	(1.7%)	\$2.7	(1.2%)
Inadequate control of an open fire	200	(1.2%)	6	(1.0%)	22	(1.4%)	\$3.0	(1.3%)
Rekindled from a previous fire	100	(1.0%)	0	(0.0%)	1	(0.1%)	\$2.3	(1.0%)
Other known ignition factor	900	(7.0%)	41	(6.5%)	96	(6.1%)	\$18.5	(8.0%)
<b>Total</b>	<b>12,700</b>	<b>(100.0%)</b>	<b>636</b>	<b>(100.0%)</b>	<b>1,572</b>	<b>(100.0%)</b>	<b>\$231.9</b>	<b>(100.0%)</b>

Equipment Involved in Ignition	Fires		Civilian Deaths		Civilian Injuries		Property Damage (in Millions)	
No equipment involved	10,000	(78.9%)	558	(87.9%)	1,336	(85.0%)	\$176.2	(76.0%)
Card or plug	400	(3.0%)	8	(1.3%)	35	(2.2%)	\$8.9	(3.8%)
Portable heater	300	(2.7%)	12	(1.9%)	38	(2.4%)	\$8.1	(3.5%)
Unclassified object or exposure to fire	300	(2.4%)	14	(2.2%)	28	(1.8%)	\$6.7	(2.9%)
Fixed space heater	200	(1.8%)	13	(2.0%)	12	(0.8%)	\$4.5	(1.9%)
Lamp or light bulb	200	(1.4%)	1	(0.1%)	17	(1.1%)	\$3.1	(1.3%)
Portable appliance designed to produce controlled heat	100	(1.0%)	2	(0.3%)	10	(0.7%)	\$2.2	(1.0%)
Other known equipment	1,100	(8.8%)	27	(4.3%)	96	(6.1%)	\$22.3	(9.6%)
<b>Total</b>	<b>12,700</b>	<b>(100.0%)</b>	<b>636</b>	<b>(100.0%)</b>	<b>1,572</b>	<b>(100.0%)</b>	<b>\$231.9</b>	<b>(100.0%)</b>

Note: The statistics in this analysis are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported only to Federal or state agencies or industrial fire brigades. Fires are given as annual averages based on five years of data (1994-1998). Estimates are based on data from the NFPA's annual stratified random sample survey and the U.S. Fire Administration's (USFA's) National Fire Incident Reporting System (NFIRS), and are combined using statistical methods developed by analysts at NFPA, USFA and the U.S. Consumer Product Safety Commission. National estimates do not reflect unreported fires. Fires are rounded to the nearest hundred, civilian deaths and injuries are rounded to the nearest one, and direct property damage is rounded in the nearest hundred thousand dollars. Percentages are calculated on the actual estimates, so two figures with the same rounded-off estimates may have different percentages. Sums may not equal due to rounding errors.

Source: National estimates based on NFIRS and NFPA survey.

**Upholstered Furniture Fires in U.S. Homes  
1994-1998 Annual Average, Unknowns Allocated**

Form of Heat of Ignition	Fires		Civilian Deaths		Civilian Injuries		Property Damage (in Millions)	
	Fires	(%)	Deaths	(%)	Injuries	(%)	Property Damage	(%)
Cigarette	5,300	(41.9%)	379	(59.6%)	772	(49.1%)	\$86.4	(37.3%)
Match	1,200	(9.6%)	33	(5.2%)	141	(9.0%)	\$19.5	(8.4%)
Lighter	900	(7.0%)	37	(5.8%)	176	(11.2%)	\$19.0	(8.2%)
Candle	600	(4.5%)	23	(3.6%)	99	(6.3%)	\$13.3	(5.7%)
Unspecified short circuit	500	(4.2%)	12	(1.9%)	44	(2.8%)	\$13.6	(5.9%)
Unclassified or unknown -type heat from spark or open flame	500	(3.9%)	11	(1.7%)	36	(2.3%)	\$8.9	(3.8%)
Heat from properly operating electrical equipment	400	(3.0%)	17	(2.7%)	31	(2.0%)	\$7.2	(3.1%)
Unclassified or unknown -type heat from smoking material	400	(2.9%)	42	(6.7%)	56	(3.5%)	\$9.2	(3.9%)
Short circuit or arc due to defective or worn insulation	300	(2.1%)	6	(0.9%)	19	(1.2%)	\$4.7	(2.0%)
Electric lamp	200	(1.8%)	1	(0.2%)	12	(0.8%)	\$3.9	(1.7%)
Heat from gas-fueled equipment	200	(1.7%)	18	(2.8%)	10	(0.6%)	\$3.1	(1.3%)
Hot ember or ash	200	(1.5%)	7	(1.1%)	18	(1.1%)	\$2.9	(1.3%)
Unclassified or unknown -type heat from electrical equipment	200	(1.3%)	3	(0.5%)	18	(1.1%)	\$4.1	(1.8%)
Heat from overloaded equipment	100	(1.1%)	4	(0.6%)	16	(1.0%)	\$2.7	(1.1%)
Unclassified form of heat	100	(1.1%)	2	(0.3%)	11	(0.7%)	\$4.6	(2.0%)
Heat from solid-fueled equipment	100	(1.0%)	2	(0.3%)	6	(0.4%)	\$3.7	(1.6%)
Other known form of heat	1,400	(11.4%)	40	(6.3%)	108	(6.9%)	\$25.2	(10.9%)
<b>Total</b>	<b>12,700</b>	<b>(100.0%)</b>	<b>636</b>	<b>(100.0%)</b>	<b>1,572</b>	<b>(100.0%)</b>	<b>\$231.9</b>	<b>(100.0%)</b>

Note: The statistics in this analysis are national estimates of fires reported to U.S. municipal fire departments and do not include fires reported only to Federal or state agencies or industrial fire brigades. Fires are given as annual averages based on five years of data (1994-1998). Estimates are based on data from the NFPA's annual stratified random sample survey and the U.S. Fire Administration's (USFA's) National Fire Incident Reporting System (NFIRS), and are combined using statistical methods developed by analysts at NFPA, USFA and the U.S. Consumer Product Safety Commission. National estimates do not reflect unreported fires. Fires are rounded to the nearest hundred, civilian deaths and injuries are rounded to the nearest one, and direct property damage is rounded to the nearest hundred thousand dollars. Percentages are calculated on the actual estimates, so two figures with the same rounded-off estimates may have different percentages. Sums may not equal due to rounding errors.

Source: National estimates based on NFIRS and NFPA survey.

Upholstered Furniture 7



**AMERICAN TEXTILE  
MANUFACTURERS INSTITUTE**

December 22, 2003

Mr. Todd Stevenson  
Office of the Secretary  
Consumer Product Safety Commission  
4330 East-West Highway, Room 502  
Bethesda, MD 20814

Re: "Upholstered furniture flammability  
proceeding"

Dear Mr. Stevenson:

ATMI is pleased to submit the following comments on the *Ignition of Upholstered Furniture by Small Open Flames and/or Smoldering Cigarettes; Advanced Notice of Proposed Rulemaking; Request for comments and information* (Federal Register 60629; October 23, 2003).

ATMI is very supportive of the decision by the U.S. Consumer Product Safety Commission (CPSC) to expand the present rulemaking project on upholstered furniture flammability to include both cigarette ignition and small open flame ignition risks. By including cigarette ignition as well as small open flame, the Commission can directly address the largest proportion of overall residential upholstered furniture fire losses.

ATMI supports the proposal developed by the Fabric Coalition and presented by Mr. David Pettey at the CPSC's September 24, 2003 hearing on this issue. ATMI believes that the Fabric Coalition approach \* is the most appropriate one compared with other approaches considered by the CPSC.

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\* *All furniture would be required to be assembled using foam compliant to CA BHFTI "TB-117 Plus" as specified in the 2/02 draft revision of TB-117 (10). Cover fabrics are tested using 45 degree (TB-117) testing apparatus. Cover fabrics are required to meet either of the following two criteria after exposure to a 5.0 second small open flame: (1) for "Class 1" the fabric fails to ignite or self-extinguishes, and the average flame spread time is slower than 30.0 seconds; (2) for "Class 2" fabrics an appropriate fire blocking system would be required. Foam requirements remain "TB-117 Plus." Cigarette ignition resistance: ASTM E-1353. Furniture to be assembled with Class A barriers, when constructed with Class 2 cover fabrics.*



1130 Connecticut Ave., NW • Suite 1200 • Washington, DC 20038-3912  
202-862-0500 • fax: 202-862-0570 • <http://www.atmi.org>  
fax on demand: 202-862-0572



ATMI Comments  
December 22, 2003  
Page 2 of 2

ATMI members continue to be concerned about the toxicity of flame retardant chemicals that may be used to meet a future federal furniture flammability standard. We would like for the Commission to consider including a "hold harmless" provision for the U.S. textile industry's use of flame retardant chemicals with respect to a potential federal flammability standard. In addition, we also want to impress upon the commission the absolute need for a "level playing field" in terms of compliance testing for both domestic and imported products.

Please contact me at 202-862-0526 or [rdupree@atmi.org](mailto:rdupree@atmi.org) if you have any questions regarding our comments.

Sincerely,

A handwritten signature in cursive script that reads "Robert DuPree". The signature is written in dark ink and is positioned above the printed name.

Robert DuPree  
Vice President of Government Relations



1521 New Hampshire Avenue, NW • Washington, DC 20036  
(202) 745-7805 • FAX (202) 483-4040

PRODUCERS • GINNERS • WAREHOUSEMEN • MERCHANTS • CRUSHERS • COOPERATIVES • MANUFACTURERS

Upholstered Furniture 10

December 22, 2003

Mr. Todd Stevenson  
Office of the Secretary  
Consumer Product Safety Commission  
4330 East-West Highway, Room 502  
Bethesda, MD 20814

Re: Upholstered furniture flammability proceeding

Dear Mr. Stevenson:

The National Cotton Council (NCC) submits these comments in response to the U.S. Consumer Product Safety Commission Advanced Notice of Proposed Rulemaking, Request for comments and information (68 FR 60629; October 23, 2003) on the *Ignition of Upholstered Furniture by Small Open Flames and/or Smoldering Cigarettes*. The NCC is the central organization of the U.S. cotton industry, representing producers, ginner, oilseed crushers, merchants, cooperatives, warehousemen and textile manufacturers in 18 states. NCC represents approximately 25,000 cotton producers that annually produce about 18 million bales of cotton (about 500 lbs/bale) and the domestic textile mills that produce apparel and home furnishings from the about 6.5 million bales of cotton that are spun into textiles in the U.S. NCC members produce fibers, fabrics, and internal furnishings used in the upholstered furniture market and are directly affected by any mandatory standards that affect upholstered furniture.

NCC is supportive of CPSC's decision to expand their rulemaking on upholstered furniture flammability to address the risks of cigarette ignitions explicitly as well as small open flame ignitions. This will allow the Commission to address the largest proportion of overall residential upholstered furniture fire losses directly. Any regulation proposed and promulgated by CPSC to address the risk of death or injury due to ignition of upholstered furniture by small open flames and/or smoldering cigarettes should be based on sound science, be shown to address unreasonable risk, be technologically and economically feasible, and preserve fabric and furniture function and aesthetics.

NCC supports the Fabric Coalition proposal that was presented by Mr. David Pettey, Quaker Fabric Corporation of Fall River, at the CPSC's September 24, 2003 hearing on this issue (also see Pettey, D. Fabric Coalition Proposal for a National Furniture Flammability Standard. Presentation to the National Association of State Fire Marshals Science Advisory Committee,

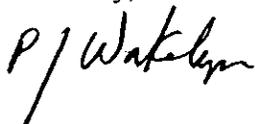
Ammendale, MD. November 14, 2003). NCC believes the Fabric Coalition approach represents the most promising and most appropriate approach of the approaches considered by the CPSC, since it address the small open-flame and cigarette ignition of fabrics and filling materials:

- all furniture would be required to be assembled using foam compliant to CA BHFTI "TB-117 Plus" as specified in the 2/02 draft revision of TB-117 (*Proposed Update of Upholstered Furniture Flammability Standard*. Technical Bulletin 117 Requirements, Test Procedures and Apparatus for Testing the Flame and Smolder Resistance of Upholstered Furniture. California Bureau of Home Furnishings and Thermal Insulation [Draft 2/2002] ([http://www.bhfti.ca.gov/techbulletin/tb117\\_draft\\_2002.pdf](http://www.bhfti.ca.gov/techbulletin/tb117_draft_2002.pdf))).
- Cover fabrics are tested for small open flame by using a 45 degree angle testing apparatus (TB117. *Requirements, Test Procedures and Apparatus for Testing the Flame Retardance of Resilient Filling Materials Used in Upholstered Furniture*. [[techbulletin/117.pdf](#)[techbulletin/117.pdf](#)Technical Bulletin 117] ); cover fabrics are required to meet either of the following two criteria, after exposure to a 5.0 second small open flame – for "Class 1" the fabric fails to ignite, or self-extinguishes and the average flame spread time is slower than 30.0 seconds; for "Class 2" fabrics an appropriate fire blocking system would be required.
- Cigarette ignition resistance: ASTM E-1353. Furniture to be assembled with Class A barriers, when constructed with Class 2 cover fabrics.

NCC continue to be concerned about the toxicity of flame retardant chemicals that may be used to meet a future federal furniture flammability standard. The EU (6/04) and the state of CA (1/06) have banned some of these chemicals and the EU continues to review the toxicity, persistence, and bioaccumulation of some of these chemicals (see Brominated Flame Retardants, Environmental Transport and Fate, Atmospheric Transport and Fate. *Proceedings Dioxin 2003*, Boston, MA, Aug. 24-29, 2003; and Studies Show Flame Retardants Breaks Down, Data Said to Refute Previous Industry Studies. *BNA Daily Report for Executives*, 11-24-03, p. 24). The Commission should thoroughly review any chemicals that they anticipate will likely be used to meet their performance standards. In addition, CPSC should include a "hold harmless" provision in any standard they promulgate for flammability of upholstered furniture to protect the U.S. textile companies who are forced to use flame retardant chemicals to meet potential mandatory federal flammability standard. There is also a need for a "level playing field" in terms of compliance testing for both domestic and imported products.

NCC is pleased to submit these comments for CPSC's consideration. If there are questions regarding our comments please contact me (202-745-7805 or [pwakelyn@cotton.org](mailto:pwakelyn@cotton.org)).

Sincerely,



Phillip J. Wakelyn, Ph.D.  
Senior Scientist, Environmental health and Safety

## Stevenson, Todd A.

---

**From:** Phil Wakelyn [PWAKELYN@cotton.org]  
**Sent:** Monday, December 22, 2003 3:58 PM  
**To:** Stevenson, Todd A.  
**Cc:** Ray, Dale R.  
**Subject:** "Upholstered Furniture Flammability Proceedings"



33UFurn comments  
to CPSC on Oc...

Attached are the comments the National Cotton Council (NCC) in response to the U.S. Consumer Product Safety Commission Advanced Notice of Proposed Rulemaking, Request for comments and information (68 FR 60629; October 23, 2003) on the Ignition of Upholstered Furniture by Small Open Flames and/or Smoldering Cigarettes.



**John P. Connors**  
Executive Vice President for Public Policy

December 22, 2003

Office of the Secretary  
Consumer Product Safety Commission  
Room 502  
4330 East-West Highway  
Bethesda, MD 20207

Re: Upholstered Furniture Flammability Proceeding

Dear Sir/Madam:

On behalf of the American Hotel & Lodging Association (AH&LA), I appreciate the opportunity to submit these comments on the Advance Notice of Proposed Rulemaking on the Upholstered Furniture Flammability Proceeding currently under consideration by the Consumer Product Safety Commission.

AH&LA was founded in 1910 and is a federation of state and local lodging associations, representing the nation's lodging industry. There are over 53,000 lodging properties with more than 4.2 million rooms and nearly two million employees in the United States. Our industry's annual sales exceed \$103 billion. AH&LA's membership ranges from the smallest mom-and-pop independent properties to the largest convention hotels. Every hotel or motel in our country is unique due to factors that include size, type, location, services offered, clientele, ownership, and status as an independent or chain affiliate. In fact, there is a high degree of franchising and independent ownership in our industry.

We commend the efforts of the CPSC in addressing fire safety. Working to protect the safety and security of the public is a noble effort for any Federal agency. Our industry understands the tremendous costs associated with fire loss, to both life and property. The death of 85 people in the 1980 fire at the Las Vegas MGM Grand Hotel was a tragic loss of life and a black eye for the industry. It was also a wake-up call for our industry to redouble our efforts in addressing fire safety.

AH&LA does not believe a new upholstered furniture standard is necessary for hotel, motel, resort or casino properties.

In the 23 years since 1980, the lodging industry has made tremendous strides in fire safety and our members are proud of our record. The lodging industry has been, and continues to be, vigilant in preventing, stopping, and limiting fire and smoke incidents.

Lodging operations must meet increasingly rigorous building codes designed to eliminate and mitigate risks from fire and smoke. Through requirements such as hard-wired smoke detectors, sprinklers, flammability testing of walls and doors, our industry continues to lead the way in fire prevention.

As an additional push for increased fire prevention in the lodging industry, Congress passed the Hotel & Motel Fire Safety Act of 1990. This law now requires that 95 percent of all Federal employee room nights, while traveling, be at properties that meet certain fire safety standards. Additionally, 100 percent of all federally sponsored meetings, in part or in whole, must be at these fire safe properties.

Our efforts have not gone unnoticed. In November 1996, the NFPA presented to AH&LA a plaque recognizing the extraordinary commitment, efforts and record of achievement by our industry for excellence in providing and promoting safety from fire to our guests.

In fact, the NFPA announced in 1996 that its annual study of U.S. fire losses showed such a dramatic drop in lodging industry fire losses that it would no longer include a separate entry for lodging. Rather, the NFPA began to include lodging industry in the "other" category. This, according to the NFPA, was "a milestone in the dramatic and remarkable progress of fire safety in the lodging industry." (*NFPA Journal*, July/August 1996, page 56)

NFPA recently reported statistics that show lodging industry fires have decreased 63 percent since 1980. This success compares favorably to a decrease of 51 percent for all types of structures over that same time period.

In fact, a June 2003 NFPA report entitled "The U.S. Fire Problem Overview Report, Leading Causes and Other Patterns and Trends, Hotels and Motels" show the success of the lodging industry:

*Hotel and motel structure fires fell 63% from 12,500 in 1980 to a 20-year record low of 4,600 in 1999. From 1998 to 1999, these fires fell 2% from 4,700 in 1998. In comparison, structure fires for all types declined 51% from 1980 to 1999. From 1998 to 1999, total structure fires increased by 1%.*

The report goes on to show that the rate of deaths per 1,000 fires in the lodging industry with automatic suppression systems is 0.0% annually.

In its notice, the CPSC directs many of its comments to fire problems in residential use of unsafe upholstered furniture. Given the past success, and ongoing activity, with reducing fire incidents in the lodging industry, we strongly recommend the

CPSC clarify the use of this term to narrowly define this as a private non-commercial location that is not likely to have sprinklers, smoke detectors and meet current fire safety standards.

Given the success in fire safety of the lodging industry, we believe it unnecessary for any Federal regulations to direct our members to replace existing upholstered furniture either retroactively or before the items have been fully utilized. The effect on the lodging industry of such a regulatory initiative could be enormous. Every lodging establishment, no matter how small, provides beds to its guests. A CPSC rulemaking could impact every lodging property in the United States by having significant impact on the cost of mattresses, bedding and other furniture.

Regulations of this nature would fall disproportional upon small businesses. The lodging industry is largely one of small businesses.

- \* 52 percent of properties have less than 75 rooms.
- \* 45 percent of properties charge less than \$60 a night.

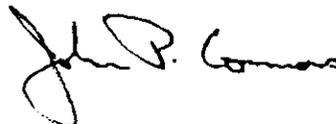
AH&LA does not believe new regulations by the CPSC are necessary for the lodging industry. We take this position because of the success of our past performance and ongoing activity in addressing fire safety and the high degree of likelihood that guest rooms are equipped with smoke detectors and/or sprinklers.

The lodging industry is one of service and accommodation. We pride ourselves in this. We must seize opportunities to ensure our guests, our customers, are safe and comfortable. The guest has a right to expect this and requests as much. A tragedy in one property affects us all.

Mr. Chairman and Commissioners, we applaud your leadership in working towards greater fire safety. We look forward to working with you and your staff in the future. The lodging industry stands ready to offer our expertise, experience and success in this endeavor.

Thank you for your consideration of our views.

Sincerely,



John P. Connors



Underwriters  
Laboratories Inc.®

*The Fabric Coalition*

*Up next  
from  
UL*

December 19, 2003

The Honorable Hal Stratton  
The Honorable Mary Sheila Gall  
The Honorable Thomas Moore  
US Consumer Product Safety Commission  
4330 East-West Highway  
Bethesda, Maryland 20814-4408

Dear Chairman Stratton and Commissioners Gall and Moore:

The purpose of this letter is to request a meeting at your earliest convenience to discuss new developments in upholstered furniture flammability. The following is intended to provide background for that meeting.

At the Commission's September 24, 2003, public meeting on upholstered furniture fire safety, Commission staff said that it welcomed any and all new information pertinent to a national upholstered furniture fire safety standard. The meeting resulted in some new information being shared and was an opportunity for all stakeholders to listen to one another's views on this important matter. Immediately after the meeting, representatives of the upholstered furniture industry, its suppliers, the National Association of State Fire Marshals (NASFM), and Underwriters Laboratories (UL) agreed to an in-depth review of all existing and new data, and to try to seek consensus on a package of upholstered furniture fire safety standards that achieves a significant reduction in fire losses in practical ways.

On November 14, 2003, technical experts from the upholstered furniture, textiles, polyurethane and flame retardant chemical industries met with NASFM's Science Advisory Committee. A significant portion of this meeting was spent reviewing and assessing the proposal of the Fabric Coalition, the details of which are on the public record. A summary of the November 14 meeting is attached for your information.

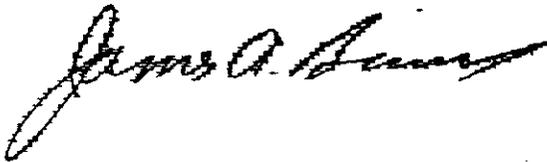
To achieve further progress, our four organizations have agreed to establish a committee of technical experts from the affected industries under the auspices of UL to relate what has been proposed to what we know about the real world, and then to recommend an effective, workable set of standards. A plan for moving forward is attached for your information. At the September 24 hearing, the Commission was urged to act promptly with its rulemaking and we have no interest in further delays. Therefore, the UL-convened panel of experts will be instructed to complete its work no later than April 15, 2004. If a consensus cannot be reached by that date on all elements of a standard, this cooperative effort will end.

The meeting we request will be to provide further details of the technical group we have assembled, the consensus we have achieved and the issues that remain unresolved. In order to facilitate this dialogue, our four organizations began with a strong, shared commitment to safety. Our hope is that this commitment – combined with our best experts – will provide the answers we all seek. We look forward to meeting with you soon and sharing more details of our work.

Sincerely,



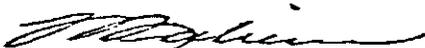
Andy S. Counts, Chief Executive Officer  
American Furniture Manufacturers Association



James A. Burns, President  
National Association of State Fire Marshals



J. Thomas Chapin, PhD., General Manager, Fire & Construction Strategic Business Unit  
Underwriters Laboratories, Inc.



Larry Liebenow, President & CEO, Quaker Fabric Corporation of Fall River, on behalf of  
The Fabric Coalition

Attachments

cc: Dale Ray

## **Upholstered Furniture Test Method Advisory Committee (UFTAC)**

In anticipation of launching the Upholstered Furniture Test method Advisory Committee (UFTAC), the following information has been developed as a framework for the program. The main objective is to establish a committee composed of key members of the upholstered furniture and testing community to rapidly assess the current state test methods on upholstered furniture components, composites and manufactured products. The Committee's task is to assess the current state of test methods, evaluate their efficacy and to recommend a final methodology that best meets the objective of improving upholstered furniture flammability in products sold in the US.

### **1. Committee Membership Selection Criteria**

- a. Affiliation
- b. Technical competence and experience
- c. Leadership, teamwork and problem-solving skills
- d. Authority
- e. Standards knowledge
- f. Commitment and availability
- g. Balance within the team membership

### **2. Committee Representation from the Industry**

- a. Testing, Certification Labs
- b. Furniture Manufacturers
- c. Upholstered Fabrics
- d. Barrier Products
- e. Foams/Filling Products
- f. Flame Retardant Chemicals and Toxicology
- g. Fire Services

### **3. Objectives**

- a. Compile, categorize and assess existing and proposed upholstered furniture test methods
- b. Test methods fall into the following categories:
  - i. Component
  - ii. Composite
  - iii. Product
- c. Review criteria for test methods:
  - i. Design
  - ii. Relevance
  - iii. Sample range
  - iv. Scope of data collected
  - v. Repeatability and Reproducibility
- d. Determine if there is any correlation between the three categories listed above.

- e. Establish metrics for the successful implementation of a regulatory/certification scheme based upon the recommended test methodology.

4. Timeline:

- a. December conference calls - planning discussions, finalize sector representation and candidate list
- b. December 17-31 – contact candidates and finalize Team membership
- c. January 1-30 – hold first kick-off meeting, establish meeting objectives, action items and deliverables.
- d. February 2-27 – conduct two conference calls and one face-to-face meeting
- e. March 1-31 – conduct two conference calls and one face-to-face meeting
- f. April 15<sup>th</sup> – Deadline for final Committee report

J. Thomas Chapin, Ph.D.  
General Manager,  
Fire and Construction Strategic Business Unit  
Underwriters Laboratories Inc.



**Meeting Notes**  
**National Association of State Fire Marshals**  
**Science Advisory Committee**  
**Special Session on Upholstered Furniture Flammability Standard**  
**14 November 2003**

**Attendees**

*NASFM Science Advisory Committee*

Margaret Simonson, Chair  
Van Bowen  
Gordon Damant  
John Dean  
Jim Hoebel  
Steve Spivak  
Bill Grosshandler  
Hank Roux  
Jack Watts

*Invited Guests*

Patty Adair, American Textile Manufacturers Institute  
Bob Barker, American Fiber Manufacturers Association  
Russ Batson, American Furniture Manufacturers Association  
John Blair, ASTM Committee on Consumer Products  
Donald Bliss, Center for Infrastructure Expertise (former President, NASFM)  
Tom Chapin, Underwriters Laboratories  
Richard Mericle, Alliance for the Polyurethanes Industry (API)  
David Pettey, Fabric Coalition  
Carol Pollack Nelson, consultant, Human Factors Psychologist  
Kurt Reimann, API Combustibility Committee  
Rich Rose, Flame Retardant Chemicals Association  
Joe Ziolkowski, Upholstered Furniture Action Council

*NASFM Staff*

Connie Lamberson  
Melissa Klein  
Frank McGarry  
Karen Suhr

In her introductory remarks, Dr. Simonson explained that this meeting was the first of what would likely be a series of meetings to discuss and ultimately gain agreement on the content of a national upholstered furniture flammability standard that could be proposed to the US Consumer Product Safety Commission (CPSC).

- **Fabric Coalition Presentation:** David Pettey, representing the Fabric Coalition, gave a presentation on the Fabric Coalition's proposal to the CPSC. A copy of his presentation will be distributed to all meeting attendees. Mr. Batson noted that the AFMA board had voted to endorse each element of the Fabric Coalition's proposal. (Discussion points related to the Coalition's proposed textile cover fabric test appear in that section of these notes – see p. 3.)
- **Foam filling requirement:** All present agreed that the foam standard referred to as "TB 117 plus" (proposed by the California Bureau of Home Furnishings as part of its Technical Bulletin 117 revised standard of February 2002) was an acceptable element of an upholstered furniture flammability standard. Mr. Mericle suggested that the foam manufacturers, who were not present at this meeting, needed to positively state that they could produce foam to meet the standard.

Mr. Rose mentioned that Great Lakes Chemical has announced a phase-out of the flame retardant pentabrom (which is used to flame retard foam) and is working with EPA to identify a sustainable alternative. Penta production will cease at the end of 2004.

In reaction to a comment about the need to spread the costs of compliance across different segments of the industry, Mr. Hoebel noted that balancing costs does not necessarily serve fire safety. The fabric has a much greater impact on the small open-flame ignition performance of the final furniture product than the foam cushioning. This was demonstrated by CPSC's full-scale furniture testing, which found hardly any difference in fire performance between chairs meeting California regulations (with FR foam) and chairs that did not comply (non-FR foam). Mr. Hoebel also noted that during the CBUF project in Europe, mockups with various combinations of fabric and cushioning were tested that showed that the fabric controlled the small open-flame ignition process. It mattered little what was beneath the fabric. Mr. Damant pointed out that many of the CPSC full-scale chairs that were intended to comply to the California regulations (built with FR foam) did not, in fact, comply with such regulations.

- **Fiber filling:** The group agreed that a test is needed for fiber filling, but did not agree about the adequacy of the existing proposed test. Mr. Ziolkowski noted that no tests for polyester fiber filling exist outside of what California has proposed in its revised TB 117 standard, and he believes that test does not adequately address the fire safety issue. He said that there are ways to "beat" the Cal 117 proposed test.

Mr. Damant stressed that, based on a good deal of composite testing, if one lays fiber batting (e.g., bonded polyester) over FR foam, the fire performance of the system can be seriously compromised.

Mr. Barker added that there is a synergy among the fabric, polyester batting and foam, which makes the performance of these materials more of a composite issue than a component issue. The test for the new TB 117 does not seem to reflect the

hazard, in his view. He suggested that the TB 117 test was developed to screen out thermoplastic materials.

- **Textile cover fabric:** Three approaches are currently on the table: the Fabric Coalition's proposed test, the test proposed in the revised California TB 117 of February 2002, and the proposed cover fabric test in the CPSC draft standard of October 2001. Mr. Hoebel pointed out that there is more of a difference between the two tests than just the exposure times – the tests are altogether different. It must be determined first, which is the most appropriate test, and second, what is the most appropriate exposure time.

Regarding the Fabric Coalition's proposed test, several participants questioned whether the 5-second exposure time had been sufficiently validated. Mr. Roux suggested that there was a need to test a 5-second fabric that fails at 6 seconds, or it would never be known if 5 seconds was the correct exposure time or not. Mr. Barker said that it was not time to ignition but rather rate of flame spread that is most important.

Mr. Pettey pointed out that the objective of the Fabric Coalition's proposed standard is to protect against accidental ignition of upholstered furniture. It was noted that the objective of the CPSC's proposed standard encompassed not only accidental ignition, such as by a candle, but also a potential deliberate ignition of furniture by a child with a match or lighter.

Mr. Pettey said that between exposure times of 5 seconds and 10 seconds there was not appreciably more screening of fabrics, but the test would cost more to run at 10 seconds. Dr. Grosshandler pointed out that the difference in exposure time for a screening test was not that great, and did not merit much discussion. Dr. Spivak mentioned that, in vertical strip tests for supposedly self-extinguishing fabrics used for children's sleepwear, a 3-second exposure was more severe than the previous 12-second exposure.<sup>1</sup>

Dr. Chapin said that the confidence and reliability of any testing scheme has to be based on real world performance first, and subsequently it must be determined whether various components pass what are believed to be the right component tests. Human behavior issues in the real world need to be considered as well. Dr. Pollack-Nelson agreed with the need to see data related to use scenarios in real-world hazard analysis.

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<sup>1</sup> Research showed that this was being caused by oxygen depletion in the plume of gases surrounding the test specimens during the 12-second test. During the 12-second test, the time of the ignition (12 seconds) was using up much of the oxygen in the gas plume surrounding the test specimen. Therefore, the gases surrounding the test specimen became oxygen depleted, which in turn reduced the burning of the test specimens. This unusual oxygen depletion phenomenon was found not to occur, or to occur at a much lower level, during the 3-second ignition test. Hence, more severe burning of test specimens in the 3-second test.

Mr. Ziolkowski noted that fabric resistant to small open flame is not necessarily cigarette resistant and vice versa.

- **Fire-resistant barrier materials option:** Industry representatives suggested that the Crib 5 test proposed by the CPSC is too expensive for barriers and produces excessively variable results. A T-burner test is being developed at DuPont. While there is some uncertainty as to which test to use, there are no real roadblocks to including a barriers test, as it would allow for the use of Class II fabrics. Some sort of fire barrier system classification test is needed, in which appropriate barriers would correspond with certain types of fabric. The CPSC has said it is open to proposals for a new test.
- **Dust cover:** It was noted that most materials currently being used pass the CPSC's proposed dust cover test, and the majority of the materials used are nonwoven fabrics, often polypropylene, which melt rather than burn. There was discussion about whether it mattered if a dust cover burned or not, because there is so little mass involved, but a standard might need to be considered if a fire originating in the dust cover spreads to other furniture components. Given the air space between the dust cover and the rest of the furniture, ignition of the dust cover may not be an issue. Mr. Hoebel reminded the group that the CPSC, in its initial work, conducted several in-depth investigations and found that sometimes the dust cover was the first component ignited.
- **Structural components:** Mr. Rose said that testing done by FRCA indicated that structural components were difficult to ignite. Dr. Simonson and Mr. Damant have seen the use of furniture incorporating huge blocks of polystyrene as structural components that can ignite with a match. However, the general sense of the group was that a standard for structural components was not a priority. When ignition reaches the structural components the fire is considerably larger than a small open flame.
- **Composite vs. component test:** The group agreed that a meaningful discussion on component vs. composite testing would have to take place at a future meeting due to time constraints. Mr. Damant reminded participants that a full-scale fire test requirement as part of a standard is not feasible because it would be too costly for industry, but meaningful component tests that can be validated are doable.
- **Full-scale validation of small-scale, mockup and component tests:** Dr. Spivak conveyed the strong conviction of the Science Advisory Committee that full-scale basic configuration tests are needed to validate the small-scale, mockup and component tests that are chosen as part of an overall upholstered furniture flammability standard. All components go together in a configuration, and suitable component compliance criteria must be validated to full-scale performance.
- **Additional industry representation:** Participants suggested adding representatives from the following industry groups to future discussions on this subject: the

Polyurethane Foam Association and INDA, the Association of the Nonwoven Fabrics Industry.

**Future meetings:** Dr. Simonson concluded the meeting by stating that notes from the meeting would be distributed to participants, and that NASFM would be in touch about arranging future meetings to continue the discussion. A table summarizing the results of the various parts of the discussion is given below.

Elements	Test Method Options			Pass-Fail Criteria	In Combination With...	Comments
	Cigarette	Small Open Flame	Flame Spread			
Foam Filling	ASTM 1353 (UFAC standard)	TB 117 Plus, California's proposed TB 117 revised draft standard (Feb 2002)			Fabric Coalition (FC) 5-sec fabric test	TB 117 plus endorsed by AFMA, ATMI and Fabric Coalition. NASFM and API favor TB 117 plus for foam but needs more science on the 5 sec Fabric Test. Foam manufacturers need to state that they can comply.
Fiber Filling		California's proposed TB 117 revised draft standard (Feb 2002)			Barrier option	There is general agreement a standard is needed, but that the TB 117 revised standard does not adequately reflect the hazard. No other tests have been proposed. Need to account for synergy among fabric, polyester batting and foam because fiber filling can compromise the fire performance of the system.
Textile Cover Fabric	ASTM 1353 (UFAC standard)	CPSC 20-sec test (Oct 2001)		Failure to ignite or self-extinguishment Avg. flame spread slower than 30 sec.	Untreated foam TB 117-plus foam Standard FR foam	Two issues to be resolved: 1) Which test is most appropriate 2) What ignition exposure time (5, 10, 20 secs) is most appropriate  AFMA, ATMI, AFiMA, FC support 5 sec test and TB 117-plus foam. NASFM supports TB 117-plus, but believes both of the above issues remain to be resolved.
		California's proposed TB 117 revised draft standard 20-sec test (Feb 2002)		Failure to ignite or self-extinguishment or weight loss of <=4% total initial weight of specimen in first 10 min.		

	Test Method Options					
Fire-Resistant Barrier Materials Option		CPSC-proposed Crib 5 test (Oct 2001)				Industry feels that Crib 5 test is inadequate because it is too variable and too expensive. But all agree there should be a standard, to allow for use of Class II fabrics. Industry is moving on its own to develop a test method. Classification test is needed.
Dust Cover		CPSC proposed test (Oct. 2001)				Most stakeholders agree that dust cover fires are likely a non-issue, but all agree that the CPSC standard can be met with existing materials.
Structural Components	N/A	N/A	N/A	N/A	N/A	Once the fire has reached the structural components it is too far gone for this to be an issue. Some discussion of need for standard in case of polystyrene used for indoor residential furniture.

Note: All component tests must be validated by full-scale testing as a system.



Bureau of Home Furnishings & Thermal Insulation  
3485 Orange Grove Avenue  
North Highlands, California 95660  
(916) 574-2041 • Fax (916) 574-2043 • Web: www.bhfti.ca.gov



13  
*Upholstery Committee*

December 22, 2003

Office of the Secretary  
CONSUMER PRODUCT SAFETY COMMISSION  
Washington, DC 20207

Subject: "UPHOLSTERED FURNITURE FLAMMABILITY PROCEEDING"

Since October, 1975, the California Bureau of Home Furnishings and Thermal Insulation (the Bureau) has enforced a furniture flammability standard in the state of California that addresses small open flame ignition and smoldering sources. This minimum California upholstered furniture flammability standard, known as California Technical Bulletin 117 (TB 117), is currently enforced as the March, 2000 revision (see attached) and has provided improvements in fire resistance for upholstered furniture components compliant with the standard.

Since 1975, research at the Bureau and at other testing and research bodies, has shown that improvements in the original Technical Bulletin 117 are needed in order to more adequately address fire risks in furniture. The proposed draft Technical Bulletin 117, dated February 2002 (see attached), offers improvements in the performance of fabrics, fiber battings, polyurethane foam and loose fillings and includes a composite test to allow use of a wider choice of fabrics. The Bureau believes this revision offers significant improvement over the current 117 standard and, with some modifications and enhancements, could serve as the basis for a national standard.

Any national standard should address the typical scenario of open flame ignition in a piece of upholstered furniture and prevention of the hazard to life, health and property that this product represents when ignited. While the scale of the proposed February 2002 draft standard, that uses a seat-back mockup placed in a laboratory hood, is larger than that of the small-scale flame test cabinets used in the current TB 117 standard, it is cheaper and less complex to perform than full-scale (burn room) testing. The scale of the proposed 117 standard, as well as the proposed CPSC standard, mimics fire behavior over a larger surface area, than a traditional small-scale test. It effectively represents the flammability of actual furniture and offers more predictability than a small-scale standard. Thus, it is more "real world" than small-scale test methods. Provisions of each element of the proposed TB 117 draft standard are discussed below.

#### UPHOLSTERY FABRICS

In home fires, that are generally accidental, the ignition source typically contacts the surface upholstery fabric. It then melts, burns or smolders, exposing the underlying fillings to flame and possible involvement in the fire. The rate of fire growth is determined by a number of complex factors. Limiting fire growth is a key element of

mitigation of the fire hazard. Given that, some level of fire is inevitable when upholstered furniture is ignited. Construction of furniture to prevent rapid fire growth can reduce the risk of fire death and injury, by minimizing fabric involvement and slowing the synergistic fire growth of the fabric and underlying fillings, primarily polyurethane foam and polyester batting.

If the filling of a typical article of upholstered furniture becomes involved in the fire, the probability of flashover is increased. Most upholstery fabrics do not contain enough fuel to cause a flashover fire without involvement of the filling materials. However, they are a major factor in development of a serious furniture fire initiated by small open flame. Burning and melting of the fabric may form a pool fire. This generally increases the probability that the filling will become involved. It may also increase the likelihood of other room combustibles becoming involved in the fire. Because fillings in most articles of furniture, especially fully upholstered furniture, contain ample fuel load to cause flashover of a typical room, avoidance of fill involvement is critical to minimization of fire growth and avoidance of a worst-case fire. Thus, the impact of propagation of a fire due to filling involvement should not be discounted. Improvements in the fire performance of filling materials is essential to a safer standard.

Upholstery fabrics generally exhibit a range of resistance to open-flame ignition sources:

#### Worst-case flammable fabrics –

In some furniture constructions, especially larger products such as love seats and sofas, the fuel provided by the fabric alone may lead to a large fire producing a serious hazard. This can occur even if there is no involvement from the fill. Heavyweight polyolefin fabrics may present this hazard in large furniture products, even those containing barriers and/or highly fire-resistant filling materials. And some of these fabrics are flammable enough to compromise a British Standard 5852 Crib 5 compliant barrier. While this is a worst case scenario, consideration should be given to development of a standard that eliminates these worst case fabrics from the market or minimizes their use.

#### Average-performing fabrics –

Most fabrics will ignite and burn, to some degree, on contact with a small open flame. However, they do not represent a worst-case scenario. These fabrics may not create large fires that threaten fillings, but may break open and expose underlying fillings to direct flame or thermal contact that can lead to fill involvement. The majority of these fabrics can be used safely in upholstered furniture, when constructed with an appropriate barrier material, flame-resistant filling materials or application of a flame-retardant treatment or backcoating. Thus, the fire safety of upholstered furniture can easily be improved while allowing for a wide choice of fabrics.

#### Best-performing fabrics-

Wool, wool-blends, leather, other animal fiber-based fabrics and thermally-engineered fabrics generally self-extinguish on contact with small open flame. They typically do not

require use of a barrier to provide protection from flame for concealed fillings and may actually act as a barrier to protect filling materials from flame penetration.

A national upholstery fabric standard should be able to distinguish between those fabrics representing a worst case hazard and safer fabrics. Those in group 1) represent a worst-case fire hazard, in and of themselves, and may need to be avoided in most furniture designs, especially large products. Many group 2) fabrics may be acceptable with use of a fire-blocking barrier with an established level of performance. Those in group 3) are typically acceptable with no modification.

The 45-degree small-scale cabinet test (current Technical Bulletin 117, Section E, based on the federal clothing textile standard 16 CFR 1610) is a traditional, well-established test. However, it may have limited value in predicting the performance of upholstery fabric in actual upholstered furniture, when contacted by small open flame in composite constructions. This test measures whether a small fabric swatch oriented at a 45-degree angle, ignites with a 1-second flame impingement and, if ignition occurs, the rate of flame spread. However, fabrics such as thermoplastics and some thermoplastic-cellulosic blends, generally pass this test by melting away from the flame and self-extinguishing. If they ignite, they do not exhibit rapid flame spread.

Open flame test methods, that are either too small to measure the early stages of fire growth or that do not employ standard substrate materials in contact with the tested item, lack real-world predictability. The Bureau has observed that many upholstery fabrics passing TB 117, Section E, a small-scale test on a fabric with no substrate material in contact, may burn vigorously when placed in actual furniture. Burning of these fabrics in actual furniture is due to the inherent flammability of the fabrics and/or the presence of underlying substrate materials (fiber or foam) that interact with the fabric after ignition and cause the fabric to contribute to fire growth.

The traditional 45-degree flame test, using a 5-second flame impingement time, has been proposed recently by the Textile Coalition as a possible upholstery fabric screening test. Under this test proposal, fabrics that will not ignite are considered class 1. Fabrics that ignite but exhibit slow flame spread (above 30 seconds) to the top of the specimen are class 2. If the fabric does not fall into either class 1 or 2, a flame-blocking barrier is required between the upholstery fabric and the first fill layer. To examine this proposed test method, the Bureau compared the performance for a small group of fabrics at 1-second and 5 second impingements (see Table). For most fabrics tested, results were similar. Although our test sample group was limited, it appears that little fabric differentiation may be likely by increasing flame impingement times.

Correlation between the 45-degree test of the fabric and larger scale tests of the actual furniture composite, is also critical, if the Textile Coalition test or any similar protocol, were to be used in an enforceable standard. Thus, the Bureau conducted tests on a group of five fabrics (labeled A-E), testing each to the Textile Coalition's proposed, 5-second, 45 degree flame test and the proposed 117 mockup test (see Table). The 117 test (Section 5) used a seat-back mockup configuration with the subject fabric over a variety of fill components. None of the five fabrics failed the Textile Coalition test criteria and most did not ignite or burn with a 5-second flame. However, results in the proposed 117 fabric mockup test showed a greater range of performance. Some fabrics passing

the Textile Coalition test performed poorly in the proposed 117 mockup test and led to rapid burning and fully-involved fires.

Fabric A (64% rayon/36% polyester) was tested (Fabric A, API-Alliance for the Polyurethane Industry Test #3) in the 117 mockup test over a synthetic batting meeting the proposed 117 test (Section 2) and a polyurethane foam pad meeting the proposed 117 test, Section 3, Option A. The synthetic batting tended to act as a barrier material to protect the foam but did little to minimize the fabric fire. This combination exhibited fairly rapid, fire growth, losing 4 % of its weight at 165 seconds and 60 grams of weight by 275 seconds. Due to rapid burning, the fire had to be extinguished.

Fabric A was also tested (Fabric A, API Test #4) with an FR barrier and conventional (current 117) synthetic batting replacing the batting compliant with the proposed 117 test. The same foam meeting the proposed 117 was used. Improvement in fire resistance was gained, using the barrier with the time to 4% weight loss extended to 245 seconds, and the time to 60 gram weight loss extended to 512 seconds.

Fabric B (72% polypropylene/28% polyester) was tested as a 117 mockup over a barrier, covering a conventional (current 117) synthetic batting and a foam meeting the proposed 117 standard. This sample burned more vigorously than Fabric A, Test #4 above, with a time to 4% weight loss of 200 seconds and a time to 60 gram weight loss of 253 seconds.

Fabric C (100% nylon) was tested, with no barrier, over a foam meeting the British Standard 5852 Crib 5 test. The sample reached a 4% weight loss in 140 seconds and had to be extinguished due to rapid burning prior to a weight loss of 60 grams.

Fabric D (100% polyester) was also tested with no barrier, over a foam meeting BS 5852 as above. This sample also exhibited rapid fire growth, reaching a 4% weight loss in 125 seconds and had to be extinguished.

Fabric E (100% wool) was tested directly over a foam meeting the proposed 117 standard. Despite the use of a foam pad with lower fire resistance than the Crib 5 foam, the wool acted as a flame barrier and the sample self-extinguished.

Thus, Bureau test results tend to indicate that the choice of a test for flame resistance of upholstery fabric is critical to the process of improving the fire safety of upholstered furniture. Correlation between the 45-degree test, with an increase in the flame impingement time to 5 seconds, and the proposed TB 117 mockup test was poor. The 45-degree test does not adequately predict how all fabrics will burn in the proposed TB 117 test. Possibly this is because of the tendency of thermoplastic fabrics to melt away from flame or to spread flame slowly in the 45 degree test, absent a filling (substrate) material below the fabric, and thus pass the proposed criteria. Other unidentified factors may also be involved.

Results for the 45-degree tests and the proposed 117 mockup tests were then compared to Bureau test results for fabrics A and B from the Alliance for the Polyurethane Industry (API) – Inter-laboratory 117 Study (see Table, page 10 and photographs, page 9). These fabrics had been tested in full-scale mockups in this study

to assess their burn performance. Also, they passed the proposed Textile Coalition test, but had marginal to poor results in the proposed TB 117 mockup test, even with the use of flame-blocking barriers. API study fabrics were chosen to allow possible correlation of small scale and proposed 117 test data to other research data generated earlier by API and the Bureau. The fabrics were placed over filling substrates in a TB 133-sized mockup configuration, constructed to resemble an actual furniture article with a seat and back cushion.

Two full-scale mockup tests were performed on Fabric A and one test was performed on Fabric B to compare to the 45 degree tests and proposed 117 mockup tests done earlier. The mockups were constructed using the same layering construction as the proposed TB 117 mockup tests. Each mockup consisted of a seat piece and back piece (each 18 inches by 18 inches by 4 inches) and contained approximately the amount of polyurethane foam typically found in a small, finished furniture article. Sizes of the mockups for Fabric A and Fabric B were standardized, to allow direct comparison of performance. A small open flame source was applied for 20 seconds to the seat cushion to initiate the test.

The full-scale mockup constructed from Fabric A, API Test #3, generated an average peak heat release rate of 199 kW at 6 minutes, 55 seconds. The mockup constructed with Fabric A, API Test #4, produced negligible heat release due to the protection provided by the added barrier, which was not used in the first Fabric A full-scale test.

The full-scale test of Fabric B, API Test #7, produced an average peak heat release of 180 kW in 13 minutes, 27 seconds. Use of the barrier slowed the development of heat, but did not prevent a fairly substantial heat release from this sample. A heat release versus time curve is shown in the graph (Full Scale Test Results, page 11) for one test of each fabric fill mockup, Tests # 3, 4 and 7. Also, color photographs of the three "Full Scale Mockup Tests" are shown.

The full-scale test results for these three fabric-fill combinations tended to correlate with their performance in the proposed TB 117 mockup test but did not correlate with the 45 degree results obtained when these fabrics were tested by themselves with a 5 second flame impingement and were rated as passed. This tends to further invalidate the 45-degree protocol as a predictive test for upholstery fabric performance.

Based on these results, the Bureau concludes that an upholstery fabric test method, of the scale described in the Feb. 2002 draft of Technical Bulletin 117, is needed to provide correlation to actual furniture fire performance. Use of this composite fabric test method, employing the actual mockup construction of furniture, is superior to a small-scale test such as the current TB 117, Section E in predicting actual performance. The Bureau has spent considerable time attempting to identify a simple, small-scale test method to predict the fire performance of fabrics in upholstered furniture or to screen out worst performing fabrics. The proposed TB 117 test method (Feb. 2002 draft) for fabric uses a standard, flame-resistant polyurethane foam (SFRPUF) as underlying substrate. Use of this flame-resistant foam underneath the fabric allows for good to moderate performing fabrics to be qualified for furniture, but still screens out worst-performing fabrics, since these will still tend to burn vigorously, even when in contact with a flame-resistant foam. Testing over a non-FR foam increases the tendency of a

fabric to burn. However, it is not as realistic in terms of current actual furniture constructions in the United States, where many manufacturers voluntarily employ the use of current TB 117 foam. Also, testing over non-FR foam will require more fabrics to be FR-backcoated or treated to comply.

Also, we recommend that the test protocol use a weight loss versus time curve as a means of determining open flame performance, as opposed to a test using only subjective pass/ fail criteria such as "did not ignite" or "time to burn to top edge", as employed in the current TB 117, Section E. Use of weight loss versus time allows a straightforward measurement, offers more flexibility in the setting of failure criteria and makes establishment of precision and bias values easier to develop in an inter-laboratory study. Weight loss is a substitute for heat release measurement, a critical hazard-related parameter in a burn room test, but is substantially cheaper.

## FILLING MATERIALS

There is no set construction geometry included in the proposed 117 standard that would mandate that barriers be used above or around more flammable fillings, except for the composite test requirement for worst case fabrics. Thus, many articles of furniture could be constructed without barriers and without testing of a composite sub-assembly, and still comply with the California proposal. Nor does it mandate testing of finished products. Therefore, it would be possible to comply simply by using components that comply with their applicable standard. Thus, it is important that the filling materials meet specific flame resistance standards to provide some redundancy in fire safety for furniture products. Without this requirement, the flame resistance of upholstered furniture may degrade over time, as fabric becomes frayed, worn, split or torn.

## FIBERS

Fiber pads and battings are typically found in the first fill layer of upholstered furniture to provide resiliency, and are sometimes used to act as a smolder-barrier to meet Upholstered Furniture Action Council (UFAC) and/or California Technical Bulletin 116 smoldering standard guidelines. Most fibrous pads and battings meet the fiber tests for the current TB 117, but once exposed to small open flame, may represent a severe melting and pooling hazard in a real furniture product. The proposed TB 117 draft standard, Part 1, Section 2, minimizes melting and pooling in fiber battings, Fiber pads and battings meeting this standard may also act as flame-blocking barriers in addition to providing resiliency and resisting smoldering sources. The standard thus promotes the use of battings that provide some barrier protection from transfer of heat and flame into underlying fills such as polyurethane foam. This process interrupts or slows the process of synergistic action leading to rapid fire propagation of core fills, such as polyurethane foam.

## CELLULAR FOAM PADS

Bureau data validates the significant role that polyurethane foam pads play in preventing or contributing to worst-case furniture fires. Polyurethane foam is typically the major filling component in furniture and one of the most flammable components, if not properly formulated to resist flame. Given the fact that fire-retardant polyurethane

foam meeting the current TB 117 may still burn when contacted by burning fabric or fiber paddings, some improvement in the performance of foam is needed. Section 3 of the draft TB 117 test provides for a test that raises the level of performance over that of the current 117 foam and decreases the rate of fire growth in cases where the fabric or filling has been compromised due to fraying, wear, accidental tearing, arson or other scenarios.

## LOOSE FILLINGS

Loose filling materials such as shredded polyurethane foam, polystyrene foam beads, etc. are typically used in children's products and tend to be more flammable than their solid counterparts, due to the intimate mixture of air and fuel inherent in the product. Thus, they represent a unique fire hazard. This hazard can be mitigated by use of flame-resistant barrier fabrics or tickings around the loose fillings as described in the proposed 117 standard, Section 4, or as proposed in the CPSC Composite Test.

## COMPOSITE TEST

Upholstered furniture products are composites of individual component materials. A test consisting of the actual product or a composite sub-assembly representing the full product is thus more predictive than a test based on the individual performance of single components. This was demonstrated by the comparative tests described above. The Bureau proposes that if an upholstery fabric does not pass the individual fabric test of the draft TB 117, Section 1, or the proposed CPSC fabric test, it can still be used but its performance must be confirmed by testing in a composite form, per Section 5 of the TB 117 draft standard or per the CPSC's proposed Composite Test. This test will confirm that the combination of the fabric, barrier (if used) and the underlying fillings, meets the minimum expected performance criteria.

## DUST COVER TEST

The Bureau recommends that a dust cover test such as proposed by CPSC be included in the national standard.

## BARRIER QUALIFICATION TEST

While there is no barrier qualification test in the Feb. 2002 draft of TB 117, the Bureau's experience is that use of effective barriers can provide significant improvements in fire safety for upholstered furniture. Thus, we support the concept of use of barriers along with maintaining minimal standards for filling materials as a redundant feature of furniture safety. The Bureau would also urge that research continue on an alternative to the BS 5852 Crib 5, barrier test. While this test offers value in selecting effective barriers, an alternative test method is needed that is more indicative of the actual flammability performance of real fabrics as they burn on the surface of articles of upholstered furniture.

## SMOLDERING TESTS

While smoldering hazards have not been the recent, primary focus of a national furniture standard, a critical need still exists for a smoldering standard that minimizes fires initiated by cigarettes, cigars and other smoldering sources. Thus, the February 2002 draft of TB 117 includes the original smoldering standards in place in the current TB 117 document. Alternatives to the current TB 117 component smoldering standards include the Upholstered Furniture Action Council (UFAC) standards, which the CPSC acknowledges have demonstrated value through the years in reducing smoldering-caused fire losses nationwide or Technical Bulletin 116 (TB 116), which is now voluntary in California but widely referenced.

## HARMONIZATION BETWEEN THE PROPOSED CPSC AND CALIFORNIA 117 FURNITURE TESTS

While the February, 2002 draft TB 117 test and the latest proposed CPSC Upholstered Furniture Flammability Protocol are not equivalent, they both employ a bench-scale furniture mockup system, using similar test equipment, equivalent sample sizes and geometry and similar ignition procedures for upholstery fabrics and furniture composites. These tests can also be conducted in a laboratory hood, which is less expensive than a full-scale fire test facility. Thus, the two standards each can employ the benefits of more realistic and predictable test conditions than small scale tests employed in the current TB 117 standard and have the ability to use weight loss numbers versus time as a surrogate for full-scale heat release values. Given this, opportunities exist for harmonization of the best elements of these draft standards into a national standard that is practical, effective, cost efficient and provides significant improvements in upholstered furniture fire safety.

Respectfully Submitted,



Lynn Morris  
Bureau Chief

## Large Scale Mockup Tests

<b>Fabric A</b> <b>Test #3</b>  <u>Composite:</u> Fabric A New Cal 117 Batting New Cal 117 Foam	 Pre	 1 min	 2 min	 3 min	 4 min
	 5 min	 6 min	 7 min	 8 min	 9 min
	 Post				
<b>Fabric A</b> <b>Test #4</b>  <u>Composite:</u> Fabric A FR Barrier Conventional Batting New Cal 117 Foam	 Pre	 Post			
<b>Fabric B</b> <b>Test #7</b>  <u>Composite:</u> Fabric B FR Barrier Conventional Batting New Cal 117 Foam	 Pre	 1 min	 2 min	 3 min	 4 min
	 5 min	 6 min	 7 min	 8 min	 10 min
	 Post				

## RESULTS - COMPARISON OF FOUR FURNITURE FABRIC OPEN-FLAME TESTS (Dec. 2003)

Fabric	Fiber ID	45 degree 1 sec ignition, average flame spread, s	45 degree 5 sec ignition, average flame spread, s	Proposed 117 Mockup Result			Large Scale Mockup Result	
				117 composite	4% Weight Loss Time, s	60g Weight Loss Time, s	Peak Heat Release Rate (Average of 3 runs), kW	Approx. Time to Peak Heat Release Rate (Average of 3 runs)
Fabric A API Test # 3	64% rayon/36% polyester	DNI	DNI (Class I)	Fabric A New Cal 117 Bating New Cal 117 Foam	165	275	199	6:55
Fabric A API Test # 4	64% rayon/36% polyester	DNI	DNI (Class I)	Fabric A FR Barrier Conv. Bating New Cal 117 Foam	245	512	Negligible	N/A
Fabric B API Test # 7	72% polyolefin/ 28% polyester	DNI	DNI, 1 case 73.5 (Class I)	Fabric B FR Barrier Conv. Bating New Cal 117 Foam	200	253	180	13:27
Fabric C	100% Nylon	DNI	30.9 (Class I)	Fabric C BS crib 5 Foam	140	EB**	N/A	N/A
Fabric D	100% polyester	DNI	51.0 (Class I)	Fabric D BS crib 5 Foam	125	EB**	N/A	N/A
Fabric E	100% wool	DNI	DNI (Class I)	Fabric E New Cal 117 foam	SE*	SE*	N/A	N/A

API = Alliance for the Polyurethane Industry - Interlaboratory Study on Proposed 117 test

DNI = Did not ignite

BS = British Standard 5852

SE\* - Self-extinguished.

EB\*\* - Fire was extinguished before 60 gram weight loss reached due to intensive flame.

**Graph - Full Scale Test Results on Different Constructions  
(Test #3, #4 and #7) - 12/03**

