

of bed size, particularly in relation to the ability of small-scale mattresses to predict burning behavior of twin size and larger bedding systems. The other is to provide an analytical basis for estimating the necessary performance characteristics of the mattress needed to address and reduce the hazard.

Bed size

The first area of study will focus on mattress size and room effects. Most available fire data relates to twin size mattresses, but to get a more accurate representation of a residential situation it will be necessary to obtain data on larger size mattresses. The research will evaluate the effects of scale up to king size and down to a 2 foot by 2 foot mini-mattress, a size commonly used by manufacturers as a selling tool, in order to determine if the fire behavior correlates with mattress size. The resulting data, peak rate of heat release, time to peak and maximum rate of weight loss will be compared to the data obtained in Phase 1 on twin size mattresses. If it can be shown that the heat release rate or another measure (e.g. weight loss) of smaller mattresses yield correlating results with larger size mattresses, the ability to conduct safe, convenient mattress tests and the ability to produce more fire safe products becomes substantially more feasible.

The second issue regarding bed size that will be evaluated during Phase 2 addresses the room effects. There is no available data confirming the correlation between lateral dimensions of mattresses and their affect on fire intensity. Additional tests will be conducted to evaluate how the lateral dimensions of mattresses affect their fire intensity and how fires from different mattress sizes impact a specified room environment. An evaluation of the largest bed size (king size) will provide an indication of the effect of scaling up a specific mattress design and will show how the heat release rate impacts a given room context.

Hazard analysis

The second area of the study will focus on the hazard level in reference to bed fire size in an attempt to estimate the peak rate of heat release from a mattress that would substantially reduce the fire hazard by preventing flashover. In order to conduct a hazard analysis of mattress fires, several factors will be considered. The factors to be considered include the effect of bed size and room size on fire size, the proximity of other objects around the bed fire and the ignition threat of surrounding objects, and the location of persons with respect to the location of fire origin. Three tiers of hazard of mattress/bedding fires have been identified using the U.S. Fire Administration's National Fire Incident Reporting System (NFIRS) data, (1) outside the room of origin, (2) within the room of origin but not in contact with mattress fire, and (3) direct contact with mattress fire. It is the intent to connect reduction in fire size with a reduction in bed fire fatalities through data analysis of the various tests and to assess what reduction in bed fire intensity will significantly eliminate fatalities based on the three tiers of hazard.

The objectives of Phase 2 have been expanded to include tests of bed clothing (comforters, quilts and pillows) constructed with a variety of flame resistant filling and cover materials to assess the effect of material changes on the flammability behavior.

CPSC Screening Test

To be conducted concurrently with Phase 2, CPSC has contracted with NIST to develop a screening test method or bench scale test to be used as a surrogate for full-scale tests of mattresses exposed to burning bedding or equivalent gas burners. Although the most reliable

measures of mattress performance are full-scale tests, they are expensive and require specialized facilities. The development of a bench scale test could be used by the CPSC as a compliance screening program and by manufacturers for designing purposes. The source of the test specimens should be actual production mattresses and the test should be more stringent than the full-scale test to avoid recalls.

The current proposal outlines the development of a bench scale test by incorporating three tests of the integrity of fire barrier technologies and one test of mattress constructions using modified interior components in a series of four steps. Step One would evaluate flame penetration to the interior of the mattress through the components on top of the mattress. Step Two would evaluate penetration through materials used in conjunction with tape edges and side panel seams. Step Three would evaluate the integrity of the seams following exposure to the ignition source, especially those seams under tension. Step Four would be put into practice if the mattress design performed inadequately in Steps One through Three and would measure the weight loss rate of the complete bed system (mattress and foundation) under severe test conditions intentionally compromising the cover.

During each of the test steps, NIST will record time as a critical factor since it may tie into the hazard analysis planned for Phase 2 and become part of the acceptance criteria. A direct correlation between heat release rate behavior between the samples used in the bench scale test with full-scale test will be closely evaluated. Pass/fail criteria will also need to be determined based on findings. The testing is estimated to be completed in 15 months and should be underway by the Spring, 2001.

Conclusions

Phase 1 of the Flammability Assessment Methodology for Mattresses conducted at NIST, has provided useful data regarding the behavior of real life mattress fires and burning bedding. The research characterized bed clothing combinations and the heat impact imposed on a mattress surface by bedding combinations. It also succeeded in designing gas burners that could consistently simulate the characteristics of burning bedding. The research showed that various combinations of materials and mattress constructions that would be desired by the residential market are viable to potentially reduce the risk of mattress fires.

Phase 1 of the research project also highlighted significant shortcomings of existing standards and raised additional scientific questions regarding the behavior of mattresses in real life fire scenarios. Phase 2 of the research project will attempt to address those concerns. The data collected from Phase 2 will be used with what was learned in Phase 1 to develop a reasonable, scientifically based standard and test method that would effectively address the hazard of real life open flame residential mattress fires.

In general, to best address the fire hazard, it appears that a full-scale mattress test method may be required for a definitive measure of the fire behavior of a mattress, foundation, bedding ensemble. For practical purposes, when many expensive full-scale tests are needed, a bench scale test is an essential component of a performance standard. Objectives of the current research project include the development of viable test methods to be used for compliance and design testing purposes.

References

Hiser, S. (2000). Residential fires in mattresses and bedding 1980-1998. Washington, DC: U.S. Consumer Product Safety Commission, Directorate of Epidemiology.

Ohlemiller, T.J. (2000). Assessing potential hazard reduction for bed fires: A proposal to the Sleep Products Safety Council. Gaithersburg, MD: National Institute of Standards and Technology.

Ohlemiller, T.J. Gaithersburg, MD:
National Institute of Standards and Technology.

Ohlemiller, T.J., Shields, R.J., McLane, R.A. & Gann, R.J. (2000). assessment methodology for mattresses (NISTIR 6497). Gaithersburg, MD: National Institute of Standards and Technology.

Tab G

LOG OF MEETING

DIRECTORATE FOR ENGINEERING SCIENCES

3/23/01
244

SUBJECT: Mattress Flammability and California Legislation Update 244

DATE OF MEETING: March 7, 2001

DATE OF LOG ENTRY: March 20, 2001

SOURCE OF LOG ENTRY: Allyson Tenney, ESME (AT)

LOCATION: National Institute of Standards and Technology (NIST),
Polymers Building, Room B-245, Gaithersburg, Maryland

CPSC ATTENDEES: See attached list of attendees

NON-CPSC ATTENDEES: See attached list of attendees

SUMMARY OF MEETING:

Tom Ohlemiller of NIST presented an overview of the current research project evaluating mattress flammability, sponsored by the Sleep Products Safety Council. The first phase of the research project focused on characterizing the heat impact of burning bedding and developing surrogate gas burners that could simulate the heat impact imposed on a mattress by burning bedding. The second phase, already in its early stages, will evaluate the effects of mattress size, interaction of secondary ignited items and criteria needed to eliminate room flashover. The second phase has recently been expanded to include a supplemental study of filled bedding items (quilts, comforters or pillows) when filled with modified materials.

The group was also updated on the status of the NIST proposal to the U.S. Consumer Product safety Commission (CPSC) to develop a mattress flammability screening test. The current proposal outlines a four-step bench scale test approach that is intended to assess the expected fire behavior of a full-scale mattress.

Karen Hatchel, Chief of California's Bureau of Home Furnishings, updated the group on proposed California legislation to regulate mattresses. The proposed legislation, which would mandate a standard to address open flame ignition of mattresses, is on hold until January 2003. In the meantime, The Bureau intends to closely monitor the progress and conclusions of the NIST mattress flammability research project. A test method coming from this effort could be incorporated in the California legislation, otherwise California Technical Bulletin 129 (TB129) may be used for mattress regulations. A standard could be issued in January 2003 and become effective in July 2003.



Karen Hatchel updated the group on the revision process of California Technical Bulletin 117 (TB 117), a mandatory standard for upholstered furniture sold in California. The formal revisions of TB 117 are expected to be complete by the end of 2001, after which round robin testing of the revisions will begin.

Tab H



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

MEMORANDUM

DATE: 8/11/00

TO : ES

Through: Sadye E. Dunn, Secretary, OS *S. Dunn*

FROM : Martha A. Kosh, OS

SUBJECT: Petitions- FP 00-1 through FP 00-4, Requesting
Standards, Labeling, and Identification Tags for
Mattresses

ATTACHED ARE COMMENTS ON THE CF 00-1

<u>COMMENT</u>	<u>DATE</u>	<u>SIGNED BY</u>	<u>AFFILIATION</u>
CF 00-1-1	7/24/00	Anthony O'Neill Vice President Government Affairs	National Fire Protection Assoc. 1 Batterymarch Park P.O. Box 9101 Quincy, MA 02269
CF 00-1-2	8/03/00	George Miller President	National Association of State Fire Marshalls P.O. Box 8778 Albany, NY 12208
CF 00-1-3	8/08/00	Patty Adair Asst. Director Textile Products & Standards	American Textile Manufacturers Inst. 1130 Connecticut Ave NW, Suite 1200 Washington, DC 20036
CF 00-1-4	8/09/00	Patricia Martin Exec. Director	Sleep Products Safety Council 501 Wythe Street Alexandria, VA 22314
CF 00-1-5	8/10/00	Phillip Wakelyn Sr. Scientist Environmental Health and Safety	National Cotton Council of America 1521 New Hampshire Ave., NW Washington, DC 20036

Petitions FP 00-1 through FP 00-4, Requesting Standards,
Labeling, and Identification Tags for Mattresses

CF 00-1-6	8/11/00	Louis Peters Exec. Director	Polyurethane Foam Association P.O. Box 1459 Wayne, NJ 07474
CF 00-1-7	8/11/00	Peter Mayberry Director of Government Affairs	Association of the Nonwoven Fabrics Industry 7799 Leesburg Pike Suite 900 N Falls Church, VA 22034
CF 00-1-8	8/07/00	Fran Lichtenberg Exec. Director Alliance for the Polyurethanes Industry	Alliance For The Polyurethanes Industry 1300 Wilson Blvd., Suite 800 Arlington, VA 22209
CF 00-1-9	8/04/00 rec'd 9/4/00	Marcelo Hirschler Dr.	GBH Intrnational 2 Friar's Lane Mill Valley, CA 94941



*Mattress
Commission
CF00-1*

National Fire Protection Association

International

OFFICE OF THE SECRETARY
NATIONAL FIRE PROTECTION ASSOCIATION

Executive Offices
1 Batterymarch Park
P.O. Box 9101

2000 AUG -1 P 2:51

Quincy, Massachusetts 02269-9101 USA
Telephone (617) 770-3000 Fax (617) 770-0700

Washington Office
Suite 560, 1110 N. Glebe Road
Arlington, VA 22201
Telephone: (703) 516-4346
Fax: (703) 516-4350

July 24, 2000

Ms. Sadye E. Dunn
Secretary
U.S. Consumer Product Safety Commission
Washington, D.C. 20207

Re: "Petitions FP 00-1 through 00-4 on Mattress Flammability"

Dear Ms. Dunn:

The National Fire Protection Association (NFPA) supports the concept and need for increased federal flammability standards for mattresses as recommended in the Petition of the Children's Coalition for Fire Safe Mattresses.

Fire deaths and injuries associated with mattresses, directly or through first ignition of bedding, remain at an unacceptably high level in our country. Mattresses and bedding remain by far the second leading burnable item associated with civilian deaths and the second leading burnable item associated with civilian injuries in U.S. home structure fires. In 1992-96, home fires starting with ignition of mattress or bedding accounted for an estimated 578 civilian deaths a year (trailing only upholstered furniture) and 2,997 civilian injuries a year (trailing only cooking materials). Nearly a third of the deaths (180 deaths a year) and nearly half of the injuries (1,430 injuries a year) occurred in fires started by lighters, matches, candles, or unclassified or unknown-type small open flame sources. On both a share basis and an absolute basis, then, the problem targeted by these proposals is large enough to justify additional attention.

Publishers of the National Fire Codes* and National Electrical Code*

A non-profit membership organization dedicated to promoting safety from fire, electricity, and related hazards through research, codes and standards, technical advisory services, and public education since 1896.

Ms. Sadye E. Dunn
Secretary
U.S. Consumer Product Safety Commission
July 24, 2000
Page 2

The CPSC has a unique opportunity under the *Flammable Fabrics Act* or other CPSC statutes to adopt and enforce state-of-the-art testing methods and associated evaluation protocols to further reduce the loss of life, injuries and property loss associated with mattress fires.

The Children's Coalition Petition Numbers FP00-1 and FP00-2 requests that the CPSC initiate rulemaking proceedings and adopt federal regulations that approximate those set forth in California Technical Bulletin 129 and/or those set forth in BS 5852 (emphasis added). This provides a unique opportunity for CPSC to utilize the latest state-of-the-art testing protocols and standards that have been or are being developed by NFPA, ASTM and the National Institute of Standards and Technology (NIST), designed to address small-flame-source ignition and the heat release rates of mattresses and to provide a basis for threshold limits for these household furnishings. Also, CPSC can examine the latest state-of-the-art fire retardant techniques and the fire characteristics of component materials used in today's mattresses that comply with the California and British regulations and voluntary industry standards. Together, these approaches will enable CPSC to develop reasonable, cost-effective federal standards based on the past decade's experience and private/public sector expertise.

With regard to Petitions FP00-3 and FP00-4, NFPA believes that the objectives for improving mattress flammability safety can best be achieved by CPSC pursuing concepts contained in the Children's Coalition Petition Numbers FP00-1 and FP00-2. Therefore, we recommend a vigorous pursuit of those objectives by CPSC in preference to warning labels and/or mattress identification tags. The latter may be determined useful to reinforce a test-based approach but should not be pursued in place of the flammability standards.

Ms. Sadye E. Dunn
Secretary
U.S. Consumer Product Safety Commission
July 24, 2000
Page 3

NFPA is prepared to work with the Commission to make use of the expertise of NFPA Technical Committees – the Fire Test Committee, the Technical Committee on Contents and Furnishings and the Subcommittee on Furnishings and Contents of the Safety to Life Committee.

Along with this proposed initiative, NFPA encourages CPSC to continue its proactive support of a number of ongoing initiatives that also offer the promise of reducing the loss of life and property from mattress fires (e.g., the National Smoke Detector project, continued support for the Commission's successful standard on child-resistant lighters, renewed attention to the potential for cigarettes with reduced ignition propensity, etc.).

Thank you for the opportunity to comment on the Children's Coalition petition and we at NFPA stand ready to assist the Commission in carrying out its responsibilities in addressing the mattress flammability fire problem.

Sincerely,



Anthony R. O'Neill
Vice President
Government Affairs

ARON:ews

CF00-2



CPSC/OFC OF THE SECRETARY
FEDERAL INFORMATION

NATIONAL ASSOCIATION OF STATE FIRE MARSHALS A 9:00

Executive Committee

August 3, 2000

Sadye E. Dunn, Secretary
United States Consumer Product Safety Commission
Washington, DC 20207

RE: Petitions FP 00-1 through FP 00-4

Dear Ms. Dunn:

The National Association of State Fire Marshals (NASFM) represents the most senior fire official in each of the 50 states and the District of Columbia. NASFM appreciates the opportunity to comment on Petitions FP 00-1 through FP 00-4.

The petitions address a significant hazard – one that the Commission, this organization, mattress producers, the scientific community and others fully acknowledge. NASFM believes that the Commission should formally initiate work on mattress flammability standards in the form of an Advance Notice of Proposed Rulemaking.

In expressing our agreement with the fire risks identified in the petitions, we are not prepared to settle for any of the remedies proposed by the petitioner. We believe that a much more feasible, timely effort is already under way that will result in a meaningful, effective flammability standard for mattresses. Having taken the time to understand and carefully track the industry-sponsored work now in its second year at the Building and Fire Research Laboratory at the National Institute of Standards and Technology (NIST), we regard this program as a model capable of making a significant contribution to the understanding of precisely why and how mattresses burn, and how best to minimize this serious hazard.

We believe, moreover, that the petitioner has failed to fully describe the hazard as it exists in the real world. Standards must be the result of a credible, transparent, scientific process examining real-world scenarios and end-product combustion performance. With automobile fire safety, we look at the interaction of gasoline and the system of tanks, hoses and valves that the fuel system comprises. By the same token, we must look at a bed as a system of materials. Mattresses are covered by sheets, blankets, comforters and pillows that ignite first and serve as the ignition source for the mattress. Therefore,

Ms. Dunn
August 3, 2000
Page 2

NASFM plans to petition the Commission in the near future to consider ways in which the producers of some of these products can help prevent fires.

We join the petitioner in demanding progress as soon as possible. However, the work under way at NIST will be concluded before Congress would conceivably appropriate funds for the Commission to initiate similar work. This cooperative partnership between government agencies and the industry is the most likely means of avoiding the years of litigation that commonly follow the contentious adoption of standards. The goal is to prevent fires, save lives and protect property. Let's get on with it by working together.

Sincerely,



George A. Miller
President

cc: NASFM Membership



AMERICAN TEXTILE
MANUFACTURERS INSTITUTE

OFFICE OF THE SECRETARY
2000 AUG 10 A 11:41

August 8, 2000

Sadye E. Dunn
Office of the Secretary
U.S. Consumer Product Safety Commission
Washington, DC 20207

Re: Petitions FP 00-1
through FP 00-4 on
Mattress Flammability

Dear Ms. Dunn:

The American Textile Manufacturers Institute (ATMI) appreciates the opportunity to comment on petitions FP 00-1 through FP 00-4 on mattress flammability (65 *Federal Register* 36890; June 12, 2000). ATMI is the national trade association for the domestic textile industry. Our members operate in more than 30 states and process approximately 80 percent of all textile fibers consumed by plants in the United States.

ATMI does not believe petitions FP 00-1 through FP 00-4 should be the basis for the Consumer Product Safety Commission's future rulemaking on small open flame ignition of mattresses. Instead, the Commission should rely on the ongoing research at the National Institute of Standards and Technology (NIST) on mattress flammability for the development of a small open-flame ignition standard.

ATMI partnered with the Sleep Products Safety Council for Phase I of the NIST study and we will also support Phase II. We believe the resulting standard, based on sound scientific research conducted at a world renowned fire science laboratory, will be more effective in reducing mattress fire injuries and deaths than the existing standards proposed in the petitions. We encourage CPSC to join in support of the NIST research.

Please contact me at 202-862-0518 or padair@atmi.org if you have any questions or need additional information.

Sincerely,

Patty K. Adair
Assistant Director
Textile Products & Standards



SPSC
Sleep Products
Safety Council

CF-004

SECRETARY'S OFFICE
U.S. CONSUMER PRODUCT SAFETY COMMISSION

AUG 10 A 11:26

August 9, 2000

Ms. Sadye E. Dunn
Secretary
U.S. Consumer Product Safety Commission
Washington, D.C. 20207

Re: Comments on Petitions FP 00-1 to 00-4 Requesting Standards, Labeling, and Identification Tags for Mattresses

Dear Ms. Dunn:

The Sleep Products Safety Council ("SPSC") takes this opportunity to comment on the four petitions filed on behalf of the Childrens' Coalition for Fire-Safe Mattresses (the "Coalition") that are identified by the Consumer Product Safety Commission (the "Commission") in its Federal Register notice published on Monday, June 12, 2000, 65 Fed. Reg. 36,890. Those petitions request the following additional flammability requirements for mattresses used in residential settings:

- (1) An open-flame standard similar to the full-scale test set forth in California Technical Bulletin 129 ("TB-129");
- (2) An open-flame standard similar to the component test set forth in British Standard 5852;
- (3) A warning label for flammable mattresses; and
- (4) A permanent mattress identification tag attached to the innerspring of mattresses.

By way of background, SPSC was established in 1986 as a non-profit organization to disseminate consumer safety information, support research, and promote public educational and other activities aimed at enhancing the safety of sleep products. SPSC is affiliated with the International Sleep Products Association, an industry trade association established in 1915 to represent the interests of mattress manufacturers and their suppliers in the United States, Canada, and abroad.

SPSC and the Coalition share a goal of further reducing bedroom fire risks. Nevertheless, we believe that the Coalition's petitions do not describe appropriate remedies to address the flammability risks that exist in real world residential settings. Moreover, as described in more detail below, important precedent-setting scientific research of residential bedroom fires is well under way. The results of this research would assist the Commission in deciding whether to modify the existing federal flammability standard to address mattress fires caused by open-flame ignitions. Thus, SPSC urges the Commission to dismiss each of the Coalition's petitions as premature. The following is submitted in support of this position.

As you are well aware, the mattress industry has taken seriously its responsibilities regarding product flammability for over 30 years. Among other things, the industry worked closely with federal safety regulators in the early 1970s to develop the existing federal cigarette-ignition mattress flammability standard, which became effective in 1973 and is codified at 16 C.F.R. Part 1632.

Consistent with the industry's continuing responsibility to provide consumers with a product that is safe, comfortable, and affordable, SPSC later sponsored further analysis of the mattress flammability risk. This involved funding an important study conducted by the National Association of State Fire Marshals to assist the industry and others in better understanding home mattress fires and their causes.

Based on that research and other available data, the industry in 1997 resolved to explore the possibility of revising the existing federal flammability standard to improve mattress resistance to open-flame ignition. As a first step in this process, SPSC began work with the National Institute of Standards and Technology ("NIST") in 1998 to conduct precedent-setting scientific research on this subject. The first phase of this research, which concluded in June 2000, focused on (1) the fire behavior of mattresses when used with typical bedroom accessories (*e.g.*, sheets, blankets, mattress pads, comforters, pillows, etc.), and (2) the development of testing equipment that simulates the type of open-flame ignition that accessories create on a mattress. SPSC provided a copy of NIST's report on this initial research to the Commission on June 23, 2000.

As the next step in this process, we will be meeting jointly with the NIST researchers and the Commission's technical staff at the end of this month to discuss the Commission's views on NIST's initial findings and our plans for the next phase of research, which is scheduled to begin this fall. During the next phase, NIST will examine the extent to which mattress size (*e.g.*, twin, double, queen, king) affects the characteristics and intensity of a bedroom fire, the types of fire-related injuries that can be addressed at different levels of fire reduction, and the feasibility of a mattress manufacturer using a "bench-scale" test to verify performance under appropriate finished product criteria. The completion of the NIST research should place the Commission and the industry in a position to make a sound evaluation of how best to address the issue of open-flame ignition.

As it did 30 years ago when the industry worked with the federal government in establishing the current mattress standard, the industry continues to believe that a sound understanding of the problem, the performance objectives to be achieved, and the technical means for meeting those objectives are critical in developing improved solutions to mattress fires. This effort requires a thorough scientific evaluation of the fire characteristics of the typical residential bedding scenario — including not only the mattress, but also the foundation, mattress accessories (*e.g.*, sheets, blankets, mattress pads, pillows, comforters, etc.), and other items that can have a significant impact on the size and intensity of a mattress fire.

Rather than initiate a rulemaking proceeding on the basis of the Coalition's petitions, which we believe propose remedies that do not appropriately address the flammability risks at

issue, SPSC urges the Commission to dismiss the petitions, and instead to join in our flammability research work, the results of which will be important in addressing mattress combustion issues further on the basis of good science. The Commission's insights on these subjects, from both a consumer safety and scientific perspective, will be highly valuable to this process.

The industry is committed to cooperating with the Commission in developing an appropriate approach that will improve consumer safety, provide consumer choice and value, and be workable for the industry.

Sincerely,

A handwritten signature in cursive script that reads "Patricia Martin".

Patricia A. Martin
Executive Director



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

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

August 10, 2000

Sadye E. Dunn
Office of the Secretary
U.S. Consumer Product Safety Commission
Washington, DC 20207

Attn: petitions FP 00-1 through FP 00-4, Petitions on Mattress Flammability

Re: Comments of the National Cotton Council on Petitions FP 00-1 through FP 00-4,
Petitions on Mattress Flammability (65 FR 36890; June 12, 2000)

CPSC/OFC. OF THE SECRETARY
FEDERAL REGULATION
2000 AUG 11 2:07

Dear Ms. Dunn:

The National Cotton Council (NCC) submits these comment in response to the Consumer Product Safety Commission's (CPSC) request for comments on petitions FP 00-1 through FP 00-4, petitions on mattress flammability (65 FR 36890; June 12, 2000). NCC is the central trade association of the U.S. cotton industry, representing producers, ginners, oilseed crushers, merchants, cooperatives, warehouses, and textile manufacturers in 18 states. On average, NCC members produce and gin over 17 million bales of cotton for the manufacture of textile and apparel products. NCC has always supported actions that enhance consumer safety.

These petitions, FP 00-1 through FP 00-4, request that CPSC issue open flame standards (similar to CA Technical Bulletin 129 and British Standard 5852) and warning labeling (for flammable mattresses) and permanent identification tag (attached to the innerspring of the mattress) requirements to address the flammability of mattresses. The petitions offer no data that would assist CPSC in the development of meaningful open flame flammability regulations for residential mattresses or to support the need for a flammability standard for residential mattresses that is the same as is presently required for high risk occupancies. In fact petitions such as these take valuable resources away from CPSC's present efforts to meaningfully address flammability hazards.

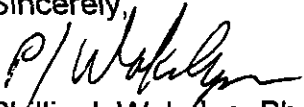
Petitions FP 00-1 through FP 00-4 should not be the basis for CPSC's future rulemaking on open flame ignition of residential mattresses. Instead, the Commission should rely on the excellent research conducted at the National Institute of Standards and Technology (NIST) on mattress flammability for the development of an open-flame ignition standard for residential mattresses. The first phase of this research, which developed testing equipment that consistently simulates the type of fire that typical bedroom accessories create on a mattress and demonstrated mattress assemblies that would pass such a test, concluded in June 2000. The second phase will start soon. Before any meaningful

standard that addresses the potential unreasonable risk associated with open flame ignition of residential mattresses can be issued, there has to be a valid benchscale test developed that predicts the open flame flammability behavior of a residential mattress. The NIST research will provide CPSC a solid basis to determine the most effective way to address open flame ignition of residential mattresses.

NCC worked with the Sleep Products Safety Council (SPSC) and the American Textile Manufacturers Institute (ATMI) in Phase I of the NIST study and are helping support Phase II research efforts. A standard, to address in a meaningful way the real fire scenario of residential mattresses, should be based on sound science and research such as that conducted at the world renowned NIST fire science laboratory. A sound science based regulation will be more effective in reducing residential mattress fire injuries and deaths than the standards and other requirements the petitions proposed that CPSC adopt.

NCC strongly urges CPSC to reject these petitions and instead put their efforts and resources on mattress flammability into supporting the valuable research already being conducted by NIST. NCC appreciates the opportunity to provide comments on these petitions and thanks CPSC for considering these comments. If there are questions or need additional information please contact me at 202-745-7805 or pwakelyn@cotton.org.

Sincerely,



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



CFOO-1-6
Polyurethane Foam Association
PO Box 1459 Wayne, NJ 07474-1459
Telephone 973-633-9044
Fax # 973-628-8986

OFFICES OF THE SECRETARY
FEDERAL GOVERNMENT

2000 AUG 11 P 2:32

August 10, 2000

Ms. Sadye E. Dunn
Secretary
U.S. Consumer Product Safety Commission
Washington, D.C. 20207

Re: Comments on Petitions FP 00-1-4 Requesting Flammability Standards, Labeling and Identification Tags for Residential Mattresses

Dear Ms. Dunn:

The Polyurethane Foam Association (PFA) appreciates this opportunity to comment upon the four petitions filed on behalf of The Children's Coalition for Fire-Safe Mattresses (the Coalition) published in the Federal Register on Monday, June 12, 2000 (65 Fed. Reg. 36890). The petitions request the following actions regarding flammability requirements for residential mattresses: (1) FP 00-1 asks the Commission to adopt an open-flame standard similar to the full scale test set forth in California Technical Bulletin 129 (TB-129); (2) FP 00-2 asks the Commission to adopt an open-flame standard similar to that in BS 5852, Part 2, Ignition Crib 5; (3) FP 00-3 asks the Commission to adopt a flammability warning label for mattresses; and (4) FP 00-4 asks the Commission to require that a permanent, fireproof identification tag be attached to all mattresses.

The PFA believes that these petitions are premature and do not describe or present appropriate remedies that address potential fire hazards for mattresses in a real residential fire scenario. For example, there is no role in the petitioner's proposed remedies to deal with the effect of "bedclothes" such as sheets, blankets, pillows, etc., in residential mattress fires.

The Sleep Product Safety Counsel (SPSC) initiated an effort in 1998 to better understand the dynamics of open flame hazards of the complete bedding ensemble. The SPSC contracted with the National Institute of Standards and Technology (NIST) to study the problem of mattress flammability and make suggestions regarding how to test and initiate testing. One of the goals was to develop a flammability test, which would include the effect of "bedclothes" along with a mattress in the fire scenario.

Phase I of this effort has been completed in which NIST has developed a test apparatus that appears to reasonably emulate the heat source equivalent of "bedclothes" which would become the primary source of ignition for the mattress. The results of these efforts are very promising, and Phase II, which will look at, among other things, the feasibility



of a bench scale test and develop a basis for estimating the reduction in bed fires as a function of the reduction for peak heat release rate from a burning mattress, will begin this fall.

The Polyurethane Foam Association has participated with SPSC in evaluating the NIST approach and supports the SPSC research project. We believe that within a reasonable period of time, the basis for presenting an acceptable standard which will address mattress flammability in a scientifically valid and technically sound manner will be available for presentation to the CPSC. We urge the CPSC to participate with SPSC in this next phase of the study with NIST. We believe the results of this effort can lead to a technically sound flammability standard for residential mattresses.

The following are some observations about the individual petitions:

With respect to the remedies suggested by petitioner, it should be observed that Cal. T.B. 129 was designed for contract mattresses for high risk occupancies. A full-scale open flame test such as T.B. 129 would not be feasible for residential mattresses because it was developed to deal with circumstances that are significantly different from those found in a residential setting. Two of the principal differences are the type of ignition source and point of ignition of mattresses used in high risk occupancies and those used in residences. Mattress manufacturers currently do not have the capability of running the T.B. 129 test, and there are not enough individual laboratories to test either the volume or all of the different styles and models of residential mattresses. Furthermore, full scale tests such as T.B. 129 are very expensive to run.

With respect to the proposed use of British Standard 5852, it should be pointed out that this standard employs a component test and thus does not measure the effect of the finished product in a real fire situation. The test applies to residential furniture, not residential mattresses, and it does not account for the role that bedclothes play in igniting mattresses. A material that passes a component flammability test has often performed differently in a composite test due to synergistic effects with other seemingly safe components.

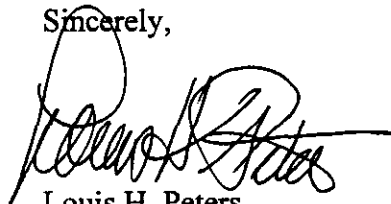
With respect to the proposed labeling remedy, SPSC has made finished product flammability warning labels available to mattress manufacturers for use on their products since 1989. This labeling program, which is widely used, involves a hangtag or a sewn-in tag. While it might be appropriate to review the current labels to determine whether they can be improved, the proposed label is extreme and does not represent the performance of the finished product in a real fire situation.

The request to affix a permanent fireproof identification tag to the innersprings in mattresses raises many questions including how would the tag enhance consumer safety. The presence or absence of an innerspring tag would have no impact on the propensity of a mattress to ignite or the intensity of a resulting fire. In addition to the difficulty of coming up with an identification tag that will not burn, there is also the problem of affixing it in mattresses that do not include innersprings or metal components.

For the above reasons, the PFA believes these petitions should be denied. The CPSC should use its limited resources to participate in the NIST study with SPSC. The results of the NIST research should provide a scientific approach that CPSC can use to adopt an open flame standard for residential mattresses. The Polyurethane Foam Association would support a rule making and a standard for residential mattresses based on sound science that addresses actual flammability hazards. Any standard should include a test which is a performance based, composite test representative of the mattress in residential use. It should be a small scale test that can be conducted at a reasonable cost. All residential mattresses should be subjected to the same test requirements regardless of the materials used in construction. The standard should have a valid scientific and technical basis. PFA would also support an appropriate labeling requirement which addresses an actual hazard. We continue to believe that to promote improved fire safety there needs to be an educational component and emphasis on greater use of fire and smoke detectors and fire suppressant systems such as residential sprinklers.

The PFA looks forward to working with the mattress industry and the CPSC in developing a sound standard that addresses the real-life flammability hazard of residential mattresses based upon the NIST research.

Sincerely,

A handwritten signature in black ink, appearing to read "Louis H. Peters", written in a cursive style.

Louis H. Peters
Executive Director

 Association of the
Nonwoven Fabrics Industry

7799 Leesburg Pike • Suite 900 N • Falls Church, VA 22043 • (703) 847-6747 • Fax (703) 538-6305 • E-mail: pmayberry@inda.org

*Mattress
Comment*
CF00-1-7

August 11, 2000

VIA FACSIMILE: 301/504-0127

Sadye E. Dunn
Office of the Secretary
U.S. Consumer Product Safety Commission
Washington, DC 20207

Re: Petitions FP 00-1 through FP 00-4, Petitions on Mattress Flammability

Dear Ms. Dunn:

I am writing on behalf of INDA, Association of the Nonwoven Fabrics Industry, in response to the Notice published in the June 12, 2000 edition of the *Federal Register* regarding "Petitions Requesting Standings, Labeling, and Identification Tags for Mattresses (Petitions FP 00-1 through FP 00-4)." INDA is the internationally-recognized trade association of the nonwoven fabrics industry, and INDA's interest in this issue stems from the fact that nonwovens are a commonly-used component in mattress construction.

INDA does not believe petitions FP 00-1 through FP 00-4 should be the basis for a future Notice of Proposed Rulemaking. Instead, INDA agrees with other parties (such as the American Textile Manufacturers Institute, ATMI) that CPSC should rely on research on mattress flammability which is ongoing at the National Institute of Standards and Technology (NIST) to address issues raised in petitions from the Children's Coalition for Fire-Safe Mattresses.

INDA is aware of efforts between ATMI, the Sleep Products Safety Council, and others regarding the NIST study, and believes that the standard expected to emerge from these efforts will be more effective in reducing mattress fire injuries and deaths than any of the steps proposed in petitions FP 00-1 through FP 00-4. This is primarily due to the fact that the NIST study is based on sound scientific research that is being conducted at a world-renowned fire science laboratory. INDA also encourages CPSC to join in support of the NIST research.

Please feel free to call me at 703/847-6747 should you have any questions or need additional information.

Sincerely,



Peter G. Mayberry
Director of Government Affairs



ALLIANCE FOR THE
POLYURETHANES
INDUSTRY
A BUSINESS UNIT OF THE AMERICAN PLASTICS COUNCIL

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CFOO-1-8

August 7, 2000

Sadye E. Dunn, Secretary
United States Consumer Product Safety Commission
Washington, DC 20207

RE: Comments on Petitions FP 00-1 through FP 00-4 Addressing Mattresses

Dear Ms. Dunn:

The Alliance for the Polyurethanes Industry (API) appreciates the opportunity to comment on Petitions FP 00-1 through FP 00-4 on mattress flammability (65 *Federal Register* 36890; June 2000).

API is a business unit of the American Plastics Council. API represents companies who produce chemicals, systems and equipment used to make polyurethane foams, which are used in the manufacture of many mattresses. API supports standards development and rulemaking that will enhance consumer safety. A copy of API's position statement on residential upholstered furniture and mattresses is attached.

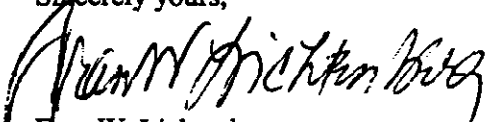
API is aware of the extensive research program on mattress flammability now underway at the National Institute of Standards and Technology (NIST). API encourages the Consumer Product Safety Commission (CPSC) to work with the Sleep Products Safety Council on the NIST research that can serve as a basis for a national standard for mattress fire performance. Because of this research, any consideration of the above-referenced petitions by CPSC would be misplaced. Therefore, the petitions should be rejected and CPSC's limited resources should be committed to supporting the effort already underway.

The first phase of research under the NIST/SPSC effort concluded in June 2000. The next step of this research is scheduled to begin Fall 2000. Completion of this work will help CPSC and industry develop a good scientific evaluation about how to address open-flame ignition of mattresses. The remedies proposed in the above-referenced petitions were not based on the NIST research, and are not adequate to address the potential hazard; more appropriate proposals based on the research will be forthcoming. Working with NIST and the SPSC, CPSC can help develop an effective national standard for mattress fire performance.

When the NIST research is completed, API believes that CPSC should issue an Advance Notice of Proposed Rulemaking.

If you have questions or need additional information, please do not hesitate to contact me at 703-253-0652 or via e-mail to Fran.Lichtenberg@plastics.org

Sincerely yours,


Fran W. Lichtenberg,
Executive Director
Alliance for the Polyurethanes Industry

CPSC OFFICE OF THE SECRETARY
FEDERAL REGISTER
2000 AUG 15 11:14 AM

Mattress
CF 00-1-9

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September 4, 2000

Office of the Secretary
Consumer Product Safety Commission
Room 501
4330 East-West Highway
Bethesda, MD, 20814

Comments Regarding Petitions on Mattress Flammability
(Petitions FP 00-1, FP 00-2, FP 00-3 and FP 00-4)

Summary

- * *Open flame ignition of residential mattresses is a serious problem that must be addressed.*
- * *Fires from residential mattresses fires alone can result in flashover fires.*
- * *The technology for making fire safe mattresses has existed for many years.*
- * *Modern mattresses cause more severe open flame ignition fires than those from the 1930s.*
- * *British residential mattresses have good fire performance and can be made cheaply.*
- * *British regulations led to large savings in fire deaths, fire injuries and financial fire losses.*
- * *The tests proposed in the petitions, BS 5852 and CA TB 129, would help solve the problem.*
- * *The most cost-effective way to address the problem is by requiring BS 5852 Part 2 Crib 5.*

Details

The flammability of residential mattresses has been acknowledged as a potentially severe problem in the United States since the issuance of the Flammable Fabrics Act, which resulted in regulation requiring mattresses and mattress pads to be resistant to smoldering ignition by cigarettes (namely CFR 1632, originally FF 4-72). Undoubtedly, this legislation has been very effective in preventing cigarette ignition of mattresses and mattress tickings or fabrics. However, the ignition of mattresses by the effect of open flames has not been addressed, then or since. Recent fire statistics as well as tests on fire performance of the mattresses being sold for the residential market indicate that open flame ignition of mattresses is a severe fire safety problem that needs to be addressed.

At the California Bureau of Home Furnishings and Thermal Insulation, Gordon Damant conducted a number of tests of mattresses and bedding systems in 1991 [Heat Release Tests of Mattresses and Bedding Systems, by G.H. Damant and S. Nurbakhsh, October 1991] and found that rates of heat release of almost 2 MW in a small room could be achieved from a single mattress (in

actual fact, the tests were terminated early by water extinguishment, to prevent destruction of the facility resulting from the fire). In those cases, the temperatures in the test room went up to almost 2,000°F (before extinguishment). Mattresses of the type that caused these severe fires can today be purchased commercially throughout the country: solid core non fire retarded conventional polyurethane foam, 6 inches thick, at 1.5 pounds per cubic foot density, with quilting and ticking. The same study also showed that mattresses could be made that released no more than 20-30 kW and increased room temperatures to values of less than 200°F, and yet be a viable product. It is interesting that, at the same organization, the same researcher conducted studies 11 years earlier (on detention facility mattresses) indicating that mattresses could be produced that caused very little temperature increases in the same room (maximum temperatures of less than 200°F), one of them being a cotton mattress [Penal Institution Mattresses - A Fire Safety Study, La. Report SP-80-1, G.H. Damant, J.A. McCormack and S.S. Williams, March 1980]. In spite of this information, now 20 years old, mattresses are being sold today for the residential market that have exceedingly poor fire performance, and endanger the lives of the people using them.

I have recently been able to conduct fire tests on a queen-size mattress purchased commercially in California in the 1990s and intended for residential use. That mattress caused flashover on its own and released almost 2 MW of heat in a standard room (with temperatures up to 1,700°F), when ignited by a simulated match, by which time we had to extinguish the fire to prevent damage to the facility. Interestingly, at the same time I tested a residential mattress built in 1937, constructed mostly with cotton materials, and it released only 114 kW, with maximum temperatures of ca. 360°F (and that fire took well over an hour to get going while the modern mattress reached flashover in 11 min). The old mattress failed the smoldering ignition test, so that a cigarette would have eventually caused it to catch on fire. During a later investigation, I tested a baby mattress, purchased commercially in Texas in the 1990s, constructed of solid core non fire retarded polyurethane foam (its size was, of course, only a fraction of the size of the modern residential queen-size mattress, and weighed some 20 times less). This mattress, intended for use in baby cribs, ignited easily again and released over 250 kW and gave a peak temperature of 485°F in the same standard room. Clearly, these modern mattresses exhibit very poor fire safety.

For comparison purposes, mattresses were purchased commercially in the United Kingdom. A full sized adult (double) residential mattress was purchased in 1999 and a baby crib residential mattress was purchased this year. They were tested under the same conditions as the US mattresses, and gave heat releases that were barely measurable. The baby mattress was also tested using as the ignition source a half sheet and a half comforter placed on the mattress as they would be in actual use, and the maximum heat released was 10 kW, and the maximum temperature measured was 110°F. The mattresses purchased in the United Kingdom, at a low cost retailer, used foams that complied with the UK British Standard BS 5852 Part 2, crib 5. From the point of view of cost, the mattresses purchased in the UK (converted to US dollars) cost approximately \$250 for the full scale double and \$30 for the baby crib one¹, which shows that they were fairly inexpensive.

The United Kingdom instituted regulations in 1988 for fire safety of upholstered furniture and furnishings, and that was extended to mattresses in 1993. However, foam filling materials used in all upholstery was required to pass the same test irrespective of its end use, from the beginning. The requirement was, and still is, that the foam must meet BS 5852 Part 2 Crib 5, when tested under a standard fabric, which is a specific type of fire retarded polyester fabric. Earlier this year the UK Department of Trade and Industry issued a report from its "Government Consumer Safety Research"

¹ The full scale double size mattress cost £180, the single size one cost £100, and the baby crib one cost £20. This can be converted using the exchange rate between US\$ and UK£ (ca. 1.60) and noting that sales tax is included, at the Value Added Tax of 18.5%, in UK purchases.

section, entitled "Effectiveness of the Furniture and Furnishings (Fire) (Safety) Regulations 1988". Table 1 in that report describes the annual benefit for 1992 and for 1997 and the cumulative benefit to society of the regulations between 1988 and 1997. The information in that Table follows:

Benefit Measure	1992 Annual Benefit	1997 Annual Benefit	1988-97 Cumulative Benefit
Number of Dwelling Fires	3,715	8,769	42,754
Total Lives Saved	169	362	1,856
Lives Saved for Upholstery as Item First Ignited	65	138	7,100
Total Non-Fatal Injuries Saved	1,548	3,315	17,000
Injuries Saved for Upholstery as Item First Ignited	526	1,126	5,774
Loss Adjusted Cost Saving £m pa	23	53	249
Final Cost Saving £m pa	507	10,835	5,567
Total Cost Saving £m pa	530	1,138	5,615

The information shows that the United Kingdom fire safety regulation has been calculated to have saved 1,856 lives over 10 years, and almost \$9 million (calculated from the British estimate of over £5 million). The number of fire deaths in the UK in 1988 was 915, while in the USA it was over 5,000; thus the savings that would result in the USA from introducing fire safety regulation would be much higher than in the UK. At the same time, there has been no significant increase in the cost of upholstery items in the UK, beyond the normal inflation adjustments. It is of further interest that the United Kingdom analysis cited refers to the USA as an example of failed opportunities, and uses it to estimate the UK savings.

Testing by British Standard BS 5852 Part 2 is both easy and inexpensive. The test frame is a small set (one part is 450 mm x 450 mm [ca. 18 inches by 18 inches] and the other one is 300 mm x 450 mm [ca. 12 inches by 18 inches], and they are hinged together) made of steel and can be built by any metal working shop. The ignition source, Crib 5, is composed of 20 pine wood sticks with a total mass of 17 g [ca. 0.6 ounces] glued together. The test can be conducted by any organization without requiring expensive instrumentation. The five test pass-fail criteria are simple:

- (a) the fire should not escalate out of control;
- (b) the flame should not consume the sample;
- (c) the flame should not spread to the lateral edge of the frame;
- (d) the flame should not penetrate through the full thickness of the sample;
- (e) the flame should not burn for over 10 min.

I must point out a technical deficiency of BS 5852: it does not require testing the composite that is actually used in the upholstered furniture or mattress: the foam is tested under a standard fabric. In this way, interactions between foams and fabrics are ignored. This has only been shown to be a problem in few cases. However, there is an advantage to the approach: foams (which are the critical component, as they have a much higher mass and tend release much more heat than the fabrics) can be tested and approved without undergoing the high expense of composite testing. Another deficiency of BS 5852 is that it does not assess heat release. However, I have undertaken

work that demonstrated that the rankings obtained with the test are very similar to those that are obtained using a heat release test ["Flammability of sets of fabric/foam combinations for use in upholstered furniture", M.M. Hirschler and G.F. Smith, Fire Safety Journal, 16, 13-31 (1990)].

California Technical Bulletin 129 (which is a consensus standard as ASTM E 1590) is a more sophisticated test than British Standard BS 5852 Part 2. It also offers a better degree of fire protection, and presents information useful for fire hazard analyses of the effects of mattresses. The test measures heat release and smoke release from actual mattresses exposed to a gas burner flame, and the results give a direct measure of the danger posed by the mattress tested. The main pass-fail criterion is a peak heat release rate of 100 kW, which is very reasonable. Unfortunately, the test can only be conducted in a fire test laboratory, equipped with large-scale heat release measurement capabilities, of which there are approximately a dozen in the USA. The test has been developed by Gordon Damant at the California Bureau of Home Furnishings and Thermal Insulation, and I have been personally instrumental in helping it become an ASTM consensus standard: it is excellent.

It has been argued that there is little advantage in improving the fire performance of the mattress without ensuring that it resists an ignition source composed of a full bedding combination. There is evidence that this is incorrect: (a) the British experience of improved fire safety since the regulations have come into effect and (b) the fact that foams that pass the BS 5852 Part 2 Crib 5 test have been shown not to cause very big fires even when larger ignition sources are used.

As an American, I have the utmost confidence in the ingenuity and inventiveness of American industry. Moreover, many manufacturers already offer for sale paddings (including foams), fabrics and interliner barriers that have significantly better fire performance than conventional non fire retarded polyurethane foam. Other manufacturers offer fire retardant additives that can be incorporated into paddings or fabrics to improve their fire performance. Therefore, I see no reason why manufacturers of mattresses in the United States cannot match the accomplishments of their British counterparts and improve the safety of the mattresses being offered to the American public, especially those for use by children, who are often the victims of fire incidents.

As a technical person, and an expert in fire safety (particularly fire testing) for over 20 years, I do not wish to comment on decisions regarding warning labels or identification tags.

Although my desire, as a technical person, is always for use of the most advanced technology when assessing materials or products, I tend to believe that requirements based on a simple test that can be used very widely are the most appropriate for country wide regulation. Thus, my recommendation is to adopt an open flame standard similar to the component test set forth in British Standard BS 5852 Part 2 Crib 5. This must be done without jeopardizing the advantages offered by ensuring that mattresses are not ignited by the effect of smoldering cigarettes.

In conclusion, it is my view that there is strong justification, both from the technical and the societal safety point of view for requiring improved fire performance of residential mattresses. Whether the safety level to be required is that offered by the California or British Standards should be a decision by the Consumer Product Safety Commission, after taking into account factors of economic impact as well as fire safety.

I would be very happy to discuss my opinions further with the Commission.

Yours sincerely



Dr. Marcelo M. Hirschler



FAX Cover Sheet

**Sender: Dr. Marcelo M. Hirschler
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Addressee: OFFICE OF THE SECRETARY

Organization: CPSC

Fax #: (301) 504-0127

Date: SEPTEMBER 4, 2000 3:45PM

No Pages (Including this cover sheet): 5

**Comments: RESPONSE TO REQUEST FOR COMMENTS ON
PETITIONS FP 00-1 THROUGH FP 00-4, PETITIONS ON
MATTRESS FLAMMABILITY**



U.S. CONSUMER PRODUCT SAFETY COMMISSION
WASHINGTON, D.C. 20207

April 25, 2001

TO: Margaret Neily, Project Manager
Directorate for Engineering Sciences

THROUGH: Hugh McLaurin, Associate Executive Director *hmm*
Directorate for Engineering Sciences

FROM: Allyson Tenney, M.S., Textile Technologist *AT*
Directorate for Engineering Sciences

SUBJECT: Response to Comments Received on Petitions FP 00-1 through FP 00-4,
Requesting Standards, Labeling and Identification Tags for Mattresses

This memorandum responds to public comments received on petitions from Whitney Davis, director of the Children's Coalition for Fire-Safe Mattresses (CCFSM), requesting mandatory standards, labeling and identification tags to address the flammability of residential mattresses. FP 00-1 requests that residential mattresses be required to pass an open flame standard approximating the full-scale test set forth in California Technical Bulletin 129. FP 00-2 requests that residential mattresses be required to pass an open flame standard approximating the component test set forth in British Standard 5852, Part 2, Ignition Crib 5. FP 00-3 requests mandatory labeling of mattresses with written and icon-based warnings about the fire hazard of polyurethane foam. FP 00-4 requests that mattresses be identified by a permanent, fire-proof tag affixed to the innerspring unit. The comments were received as written testimony in response to the Federal Register notice (65 *Federal Register* 36890; June 12, 2000).

The U.S. Consumer Product Safety Commission (CPSC) received nine written comments. All written comments were received from associations representing various segments of the industry and fire protection organizations. All commenters support the overall concept needed to address the fire risk of mattresses ignited by burning bedding. Seven of the commenters are not in favor of adopting any of the four petitions, but instead favor a standard based on in-progress research findings. One commenter supports adoption of either petition FP

00-1 or FP 00-2. Another commenter supports petition FP 00-2. Those comments raising technical engineering issues are addressed here.

I. General Comments on Petitions FP 00-1 through FP 00-4

I-1. Comment:

The petitioner fails to recognize the hazard as it exists in the real world, a hazard involving a system of materials (G. Miller, NASFM, CF00-1-2; L. Peters, PFA, CF00-1-6). The petitions do not appropriately address the flammability risks of a typical residential mattress fire scenario and do not describe appropriate remedies to address the risks in residential settings (P. Martin, SPSC, CF00-1-4; L. Peters, PFA, CF00-1-6).

Response:

Real-life residential bedding fires involve a complex system of materials, typically a mattress and foundation with a collection of bedclothes that may include any number of sheets, blankets, comforters, pillows, quilts and decorative items. The bedclothes add to the complexity of the hazard in that they are a significant contributor to the fire and are a potential secondary source of ignition. The bedding is most often the first item ignited by the ignition source, which in turn ignites the mattress. According to CPSC data, burning bedding is the first item to ignite in about one-half to two-thirds of mattress fire cases (Hiser, 2000; Boudreault & Smith, 1997). In this scenario, the mattress is essentially exposed to burning bedding, which is a much larger ignition source than the flame from a match, candle or lighter that may have been the original source of ignition. Burning combinations of typical bedclothes have been found to contribute up to approximately 200kW to the fire (NIST, 2000), adding to the complexity and severity of the fire hazard.

Possible test methods to address the hazard of residential mattress fires are requested in petitions FP00-1 and FP00-2. The applicability of the requests to address real-life residential mattress fires is unclear. An appropriate test method needs to effectively address the hazard as it exists in real-life fire scenarios, accounting for typical residential mattress constructions, mattress foundations, and bedclothes. The ignition source must be representative of typical ignition sources seen in residential fires. The point of ignition must also be a true and direct measure of the danger posed in a typical mattress fire scenario. The mattress needs to be considered as a finished item, consisting of a variety of components. Any suitable test method must also be feasible, practicable and cost efficient. The staff is not convinced that the test methods set forth in the petitions meet the requirements of an appropriate standard for effectively addressing residential mattress fires.

I-2. Comment:

The work at NIST is preferred for its capability of explaining precisely why and how mattresses and bedclothes burn and how best to minimize this serious hazard (G. Miller, NASFM, CF00-1-2). The work, based on sound scientific research will be more effective in reducing mattress fire losses than those proposed by the petitions (P. Adair, ATMI, CF00-1-3). A sound, science based regulation will be more effective in reducing fire losses (P. Wakelyn, NCC, CF00-1-5; P. Mayberry, INDA, CF00-1-7). Commenters support current research and describe background of NIST work that includes role of bedclothes, Phase 1

and plans for Phase 2 (P. Martin, SPSC, CF00-1-4; P. Wakelyn, NCC, CF00-1-5; L. Peters, PFA, CF00-1-6; P. Mayberry, INDA, CF00-1-7).

Response:

The current study being conducted by NIST is a scientifically based research program designed to address the open-flame ignition of mattresses and bedclothes under conditions that closely resemble real-life residential fire scenarios. The project was initiated because little factual data is available regarding the complex interaction of residential mattress and bedding when exposed to open-flame ignition. The study is focused on understanding the dynamics of fires involving mattresses and bedclothing assemblies and on developing an appropriate and technologically practicable methodology that can effectively address the hazard. The staff agrees that new regulations should take a scientific approach, relate closely to the real-life hazard, and significantly and effectively reduce the risk (NIST, 2000).

I-3. Comment:

A valid bench-scale test that predicts the open flame flammability behavior is needed for a reasonable standard (P. Martin, SPSC, CF00-1-4). A simple test that can be used widely is most appropriate for a national standard (M. Hirschler, GBH International, CF00-1-9).

Response:

Full-scale open-flame mattress tests are dangerous, costly and require specialized facilities. Presently, there are no U.S. mattress manufacturers and only a small number of laboratories capable of conducting any type of full-scale mattress fire test. While full-scale mattress tests may provide the most definitive measures of mattress fire behavior, a bench scale test is a necessary component of a performance standard. A valid bench scale test provides a method of testing that is practical and cost effective, particularly when many tests are needed. A simple bench or small scale test would enable mattress manufacturers to conduct some of their own testing, allowing them to proceed more easily with product and design innovation, and address safety concerns regarding their facilities and employees. A bench scale test that uses products obtained at retail would also be useful for regulatory and compliance purposes.

I-4. Comment:

Mattress manufacturers have at their disposal many fabrics, barriers, interliners, and other materials with improved fire performance than those used in conventional mattresses. Improvements in mattress fire performance are certainly possible (M. Hirschler, GBH International, CF00-1-9).

Response:

Mattress construction components with improved fire performance capabilities are currently available. However, the level of performance, appropriateness for end-use, and cost effectiveness are issues to be considered. According to various manufacturers of fibers, fabrics, fillings and backcoatings, the industry is actively attempting to improve the fire performance of existing materials and is also working to develop new flame resistant products. Technological advances and innovative manufacturing techniques are expected to increase the number of available products with enhanced flammability characteristics. The availability of new products

is expected to make it technically and economically feasible for manufacturers to significantly improve mattress fire performance without having to sacrifice comfort and thick cushioning expected by consumers.

I-5. Comment:

Any standard addressing open-flame ignition of mattresses should not jeopardize advantages gained by resistance to cigarette ignition (M. Hirschler, GBH International, CF00-1-9).

Response:

The Standard for the Flammability of Mattresses and Mattress Pads, codified as 16 CFR 1632, was developed in 1972 to reduce mattress fires caused by smoldering cigarettes. Since promulgation of the standard, mattress fires caused by cigarettes and smoking materials have significantly decreased. The staff agrees that any new regulation regarding mattress flammability should be closely assessed for possible impacts on the benefits of the existing regulations.

I-6. Comment:

Any new regulation should have the attributes of a good standard (L. Peters, PFA, CF00-1-6).

Response:

The staff agrees that any new regulation should have the attributes of a good standard and needs to be representative of the real-life fire hazard. The methodology should be reasonable, technologically practicable and based on sound, comprehensive research.

II. Comments on petition FP 00-1 suggesting adoption of California Technical Bulletin 129

II-1. Comment:

TB 129 provides a direct measure of the danger posed by the mattress tested. It is excellent for assessing product performance (M. Hirschler, GBH International, CF00-1-9). The type of ignition source and point of ignition used in the test are not appropriate for residences (L. Peters, PFA, CF00-1-6).

Response:

TB 129 was developed to address hazards associated with ignition of mattresses in public institutions. The test requires that the side of a bare mattress be exposed to a propane gas T-burner ignition source (heat output 17.8 kW) intended to simulate a wastebasket filled with burning newspaper. The test measures rate of heat release, mass loss and smoke production. The staff is not convinced that TB 129 provides a test method that is a true and direct measure of the danger posed by a typical residential mattress fire. First, the test does not require the use of bedclothes or mattress foundation while most residential fires involving mattresses involve both bed clothing and mattress foundations. Second, the specified ignition source (gas T-burner) is significantly less severe than the intense flames caused by burning bedding, a typical ignition source of residential mattress fires which can have heat release rates up to 200 kW. Finally, the

test requires a side ignition point while many residential fires involve the mattress's top surface. It is unclear as to the level of product performance the test assesses.

II-2. Comment:

TB 129 can only be conducted by a fire test laboratory with large-scale heat release measurement capabilities. The test is expensive (L. Peters, PFA, CF00-1-6; M. Hirschler, GBH International, CF00-1-9).

Response:

Full-scale open-flame mattress tests, like TB 129, require specialized fire test facilities and are dangerous and costly to conduct. There are currently no mattress manufacturers and only a small number of laboratories in the United States that have the proper facilities and equipment to conduct full-scale mattress fire tests. Nevertheless, according to NIST research, a full-scale test is the best measure of fire performance of the complex system of mattress, foundation and bedding. This creates practical problems for mattress manufacturers and enforcement issues that will need to be addressed.

III. Comments on petition FP 00-2 suggesting adoption of British Standard BS 5852

III-1. Comment:

British Standard 5852 has been effective in significantly reducing deaths and injuries from upholstery fires (M. Hirschler, GBH International, CF00-1-9).

Response:

Limited data are available for assessing the effectiveness of BS 5852 in reducing deaths and injuries, particularly for assessing losses from mattress fires. The UK Department of Trade and Technology report, *Effectiveness of the Furniture and Furnishings Regulations*, summarizes the findings of a study commissioned to evaluate the overall benefits of the Furniture and Furnishings Regulations introduced in 1988. In the case of mattresses, the report states that the data on mattresses is less clear than the data for upholstered furniture in part due to slightly different controls. Mattress regulations require the filling materials to meet the regulations for polyurethane foams but do not specify fire resistant requirements for mattress fabric coverings or tickings (DTI, 2000). The study is also limited in that it does not consider variables such as a decrease in smoking, increase in consumer awareness, increase in smoke detector use and increase in use of FR products. The staff is not convinced that any current data sufficiently shows that a reduction in mattress fires and resulting injuries is a direct result of implementing the BS 5852 standard.

III-2. Comment:

Full-scale tests of UK mattresses, mostly ignited by a match, show reduced fire intensity. It is not necessary to ensure resistance to burning bedding because the British experience

using complying foams has been good and complying foams do not cause big fires with larger ignition sources (M. Hirschler, GBH International, CF00-1-9).

Response:

Full-scale tests of British mattresses composed of treated foam components may exhibit a resistance to small open flames, such as matches, lighters and candles when compared to mattresses composed of untreated foam. Recent tests, however, show that British mattresses are clearly inadequate when presented with the intense flames and higher heat fluxes typically caused by burning bedding. Several full-scale tests of British mattresses were included in the mattress flammability study conducted at the National Institute of Standards and Technology (NIST). While the British mattresses may take several minutes to reach their peak rate of heat release, the peak rate of heat release observed for the mattresses alone (without bedclothing) was significantly above the level necessary to cause flashover (NIST, 2000).

Testing of mattresses complying with British regulations with bedclothing resulted in an even higher peak rate of heat release, clearly showing that bedding continues to be a major contributor to the fire hazard causing serious flaming of the foam. The suggestion that it is not necessary to consider the behavior of burning bedding, since the British experience using complying foams has been good and complying foams do not cause big fires with larger ignition sources, is not justified by recent data and test results. Current studies reveal the importance of considering the threat caused by burning bedding, despite the type of foam used in the mattress construction.

III-3. Comment:

Pros of BS 5852 are that it is easy to run and relatively inexpensive. The cons are that it is a composite test, does not assess heat release and does not account for bed clothing (L. Peters, PFA, CF00-1-6; M. Hirschler, GBH International, CF00-1-9).

Response:

The staff agrees that BS 5852 is a relatively inexpensive and easy to run test method but at the same time is concerned that the test does not measure heat release rates or account for the more severe ignition source from burning bedding. BS 5852 is a composite test that only requires testing of foams and filling when the mattress is composed of a single filling. Addressing only the foam is too restrictive. It does not allow the use of barrier technology and inhibits the use of alternate products and technologies that could be equally or more effective. It also does not allow for options and design features. The staff is not convinced that BS 5852 is an appropriate standard for residential mattresses that heavily rely on design features.

III-4. Comment:

A simple test, like this, that can be used very widely is the most appropriate for a national regulation (M. Hirschler, GBH International, CF00-1-9).

Response:

The staff agrees that an easy-to-run test is appropriate. It is unclear, however, if the most appropriate test is BS 5852.

IV. Comments on petition FP 00-3 suggesting warning label about foam hazards

IV-1. Comment:

SPSC finished product labels have been used since 1989. The petition suggests a label that is extreme and does not represent the performance of the finished product in a real life fire situation (L. Peters, PFA, CF00-1-6).

Response:

The petition calls for a warning label for foam hazards to be permanently affixed to the mattress surface of all mattresses offered for sale. It is requested that the label warn against the fire properties of foam in the manner used by foam manufacturers on shipping cartons of foam products. Polyurethane foam is just one of many components used to construct a mattress. Since there is no assurance that the fire behavior of individual components have any relation to the likely fire performance of a completed product, the staff agrees that providing a warning for polyurethane foam does not represent typical fire behavior of finished mattresses when exposed to a small open-flame ignition source.

V. Comments on petition FP 00-4 suggesting permanent identification tag in mattresses

V-1. Comment:

An identification tag would have no impact on propensity of a mattress to ignite or the intensity of the resulting fire (L. Peters, PFA, CF00-1-6).

Response:

The petition requests that all mattresses be required to have an identification tag permanently attached to the innerspring unit. The tag must be designed to survive a mattress fire. The staff agrees that such a tag would have no impact on reducing mattress fires or the propensity of a mattress to ignite when exposed to an open flame. Such a tag is not visible to consumers to influence their behavior, and the tag has no influence on the mattress's ability to resist ignition or its performance once ignited. An identification tag could be desirable for identifying mattresses involved in fires to improve utility of collected fire data and support further regulatory actions. However, the tag cannot be justified in terms of directly reducing death or injury from fires.

References

Boudreault, M.A. & Smith, L.E. (1997). Residential fires in mattresses and bedding. Washington, DC: U.S. Consumer Product Safety Commission, Directorate of Epidemiology.

Hiser, S. (2000). Residential fires in mattresses and bedding 1980-1998. Washington, DC: U.S. Consumer Product Safety Commission, Directorate of Epidemiology.

Ohlemiller, T.J., Shields, R.J., McLane, R.A. & Gann, R.J. (2000). Flammability assessment methodology for mattresses (NISTIR 6497). Gaithersburg, MD: National Institute of Standards and Technology.



UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
WASHINGTON, DC 20207

Memorandum

Date: March 16, 2001

TO : Margaret Neily, Project Manager, Mattress Petition

THROUGH : Hugh McLaurin, AED *hmm*
Directorate for Engineering Sciences

Robert B. Ochsman, Ph.D, CPE, Director *RO*
Division of Human Factors

FROM : Carolyn Meiers, Engineering Psychologist *cm*
Division of Human Factors

SUBJECT : Petition to Provide Rulemaking Regarding Mattress Combustibility
Warning Labels

I. INTRODUCTION

The Children's Coalition for Fire-Safe Mattresses (CCFSM) submitted four petitions to the U.S. Consumer Product Safety Commission (CPSC) in March 2000 regarding residential mattress fires. The petitions proposed the following: incorporation of parts of California Technical Bulletin 129 and British Standard BS5852 into existing CPSC regulations, a warning label for polyurethane foam on mattresses, and fire-resistant identification tags for innerspring units. Human Factors staff was requested to respond to the petition requiring a warning label for non-fire retardant (non-FR) polyurethane foam mattresses. This memorandum discusses the Human Factors issues relevant to that petition.

II. BACKGROUND

The proposed labels and a hang tag and permanent label provided by the Sleep Products Safety Council (SPSC) are described below.

A. Proposed Labels : The petitioner believes that "the most dangerous and destructive fuel element involved in a mattress fire is the non-FR polyurethane foam."¹ Therefore, the petitioner requests that consumers be made aware of this hazard through the use of warning labels that are similar to the warnings issued by the manufacturers of polyurethane foam. These warning would appear on all mattresses subject to the Commission's jurisdiction as stated in the mattress standard (16 CFR, Ch.II, part 1632). The proposed labels are described below.

¹ Petition CCFSM-001 concerning a proposed open flame standard based on California Technical Bulletin 129.

1) Written Warning. The petitioner proposed a warning label approximating the one below that is provided to mattress manufacturers by the polyurethane foam manufacturers. The petitioner states that such a warning is to be conspicuously placed on top of the mattress so it may be viewed each time the bedding is changed.

WARNING
FLAMMABLE POLYURETHANE FOAM
FOAM BURNS RAPIDLY

When ignited, this foam burns rapidly, resulting in great heat, generating dangerous and potentially toxic gas and thick smoke, consuming oxygen. Burning foam can be harmful or fatal.

Keep away from open flame, sparks, or other heat sources. Do not smoke near this foam."

IF FOAM STARTS BURNING
GET OUT!

These warnings should be passed on to the ultimate users.

2) Warning Icons. The petitioners also proposed multi-colored icons, no less than 6 inches square, that depict a column of flame, a burning cigarette with a red line through it, and a burning match with a red line through it. (The petitioner verbally described the icon but did not provide pictorial examples.)

B. Sleep Products Safety Council: Voluntary Hang Tag and Label

The SPSC currently provides hang tags and permanent labels that address fire, suffocation, and entrapment hazards with mattresses. Mattress manufacturers can request these labels from the SPSC to attach to their products. This is a voluntary program in which, according to an industry representative, approximately 70% of furniture manufacturers participate.

The safety messages on the hang tag and permanent label are identical. They address childplay with matches and lighters and the burning characteristics of non-FR polyurethane foam, the same issues which concern the petitioner. The messages which appear on the hang tag and permanent label are given below.

1. To Protect Your Family From Fire:

- Keep matches and lighters in a secured drawer or cabinet, out of reach of children.
- Check under beds and in closets for burnt matches, evidence your child may be playing with fire.
- Keep lit candles away from bedding, curtains, sleepwear and anything else that can ignite easily.
- Don't smoke in bed.
- Keep bedding, clothes, curtains and other flammable items at least 3 feet away from portable heaters.
- Do not store old mattresses in the home or garage; they are a fire hazard.

2. Fires can occur if the mattress, foundation or bedding comes in contact with an open flame, such as match, lighter or candle. When ignited, some mattress filling materials can burn rapidly and emit hazardous gases.
3. **WARNING:** Children playing with matches, lighters and candles is a leading cause of home fires. (This warning is highlighted on the hang tag and permanent label.)

III. DISCUSSION

The intent of the warning labels proposed by the petitioner is to make consumers aware that: 1) non-FR polyurethane foam in mattresses is highly flammable and emits toxic gases when burned and, 2) cigarettes, matches, and other open flame sources should be kept away from mattresses and non-FR polyurethane foam.

Warning label effectiveness is affected by the interaction of complex psychological, behavioral, and situational issues. Human Factors staff identified and analyzed such issues that are relevant to the effectiveness of the proposed label to reduce injuries and deaths from mattress and bedding fires. These are discussed in the following section.

WARNING LABEL EFFECTIVENESS

In a 1997 report on residential fires in mattresses and bedding, the CPSC staff determined that the majority of mattress fires are caused by children playing with fire and adults abandoning or discarding smoking materials. Childplay was the single most common cause of the fires. In this study, 70 percent of the small open flame fires were started by children playing with lighters, matches, or other open flame sources.² A warning label is not likely to be effective in changing the behavior of children or smokers for the following reasons.

Because children under five cannot read or comprehend the criticality of warning labels, the burden for complying with the safety precautions rests with parents and caregivers. A warning label regarding the hazard of polyurethane foam ignition would likely advise adults to keep matches and lighters out of the reach of children. However, even when adults attempt to respond responsibly to this message, children are able to circumvent the safety restrictions. The motor abilities of the children in the age range in which childplay fires occur make it nearly impossible to find a storage place for lighters and matches that prevents children from accessing them while allowing the products to be convenient for use.³

Lighted tobacco products are an open and obvious hazard when used in close proximity to mattresses and bedding. Smokers will likely be aware of this hazard before being exposed to the proposed warnings. They will, also, likely have acquired, and put into practice, their own

² Boudreault, M. and Smith, L. (1997). Residential Fires in Mattresses and Bedding. U.S. Consumer Product Safety Commission: Washington, DC.

³ Meiers, C. (1998). Response to Public Comments on Advance Notice of Proposed Rulemaking (ANPR) Requiring Multi-Purpose Lighters to be Child-Resistant. (Petition CP 96-1). U.S. Consumer Product Safety Commission: Washington, DC.

knowledge, personal attitudes and behaviors concerning smoking materials and fire safety. Ingrained, careless behavior and indifferent attitudes toward fire safety are not likely to be changed by a warning label. If a consumer's current fire-safety attitudes and behavior are consistent with the warning, the warning can serve as a reminder or reinforcer of the behavior. However, if a consumer's fire-safety attitudes and behavior are inconsistent with the warning, the warning is unlikely to elicit the desired behavior.⁴

The petitioner states that the written warning is to be conspicuously placed on top of the mattress so it may be viewed each time the bedding is changed. The label's impact as a reminder or reinforcer of behavior under these circumstances is limited. A consumer will only be able to see the labels when all bed linen are removed from the mattress. Therefore, the only individual to see, and be influenced by the labels, is the one who is changing the bed linen. In addition, after the initial impact of the labels, consumers are likely to become accustomed to them because they are part of the routine environment. Repeated exposure to the same label will engender stimulus habituation. That is, a consumer's perceptual threshold to the label will increase to the point where it is no longer noticed.⁵

The labels proposed by the petitioner do not offer any significant advantage over the current labels available from the SPSC. The SPSC labels address the same hazards as those that concern the petitioner. They do not present new or novel information on how to avoid the hazards. Using both the proposed labels and the current labels would be redundant. Duplication of information may be detrimental to the communication of safety messages. Research indicates that adding redundant information to warning labels may be viewed negatively by the consumer.⁶ Duplication may affect the credibility of the warnings and cause all the labels to be ignored.

The SPSC, in consultation with CPSC staff, is sponsoring research at the National Institute of Standards and Technology (NIST) to improve the fire resistance of mattresses. Focusing on technological rather than behavioral solutions to prevent mattress and bedding fires is a more effective safety strategy than labeling. However, until research finds ways to make mattresses more resistance to fires, manufacturers have the option of using the SPSC hang tag and permanent label to make consumers aware of hazards.

IV. CONCLUSION

Human Factors staff believes that the proposed labeling of non-FR polyurethane foam is not likely to be effective in reducing injuries and deaths from mattress and bedding fires. The majority of mattress fires are started by children and smokers. Warning labels are not likely to change the behavior of these two groups. Matches and lighters are difficult to keep out of the reach of children even when adults make responsible efforts to comply with these safety measures. Smokers with ingrained, careless smoking habits and indifferent attitudes toward fire safety are also unlikely to change their behavior based on a warning label. Research is currently

⁴ Lehto, M.R. and Miller, J.M. (1987). Warnings, Volume I, Fundamentals, Design, and Evaluation Methodologies, p.141. Fuller Technical Publications: Ann Arbor, MI.

⁵ Hale, A.R. (1987). Individual Behaviour in Control of Danger, p. 225. Elsevier: Amsterdam, NY.

⁶ Lehto. p.141.

underway to improve the fire resistance of mattresses. Focusing on technological rather than behavioral solutions to prevent mattress and bedding fires is a more effective safety strategy than labeling. Until technological measures are proposed, manufacturers have the option to use the SPSC labels to make consumers aware of hazards. The SPSC labels include warnings against the same hazards as those that concern the petitioner.

REFERENCES

- Hale, A.R. (1987). *Individual Behaviour in Control of Danger*. Elsevier: Amsterdam, NY.
- Lehto, M.R. and Miller, J.M. (1987). *Warnings, Volume I, Fundamentals, Design, and Evaluation Methodologies*. Fuller Technical Publications: Ann Arbor, MI.
- Laughery K.R. and Wolgalter, M.S. in *Handbook of Human Factors and Ergonomics*, 2nd. Edition, pp. 1174-1197. (1997). Salvendy, G. (ed.) John Wiley & Sons: New York.

Tab I

CONSUMER PRODUCT SAFETY COMMISSION

16 CFR Part 1633

Standard to Address Open Flame Ignition of Mattresses/Bedding;
Advance Notice of Proposed Rulemaking

AGENCY: Consumer Product Safety Commission.

ACTION: Advance Notice of Proposed Rulemaking.

SUMMARY: The Commission is considering issuing a flammability standard that would address open flame ignition of mattresses/bedding. The Commission currently has a flammability standard that addresses ignition of mattresses by cigarettes. However, mattress/bedding fires ignited by small open flames are a significant problem not addressed by the existing standard. This ANPR also is in response to two petitions from the Children's Coalition for Fire-Safe Mattresses ("CCFSM") requesting that the Commission issue (1) an open flame standard similar to the full-scale test set forth in California Technical Bulletin 129 or (2) an open flame standard similar to the component test set forth in British Standard 5852. The Commission invites comments concerning the risk of injury identified in this notice, the regulatory alternatives being considered, and other possible alternatives. The Commission also invites submission of any existing standard or statement of intention to modify or develop

a voluntary standard to address the flammability risk of mattress/bedding fires ignited by small open flames.

DATE: Comments and submissions must be received by _____
[insert date 60 days after publication].

ADDRESS: Comments should be mailed, preferably in five copies, to the Office of the Secretary, Consumer Product Safety Commission, Washington, D.C. 20207-0001, or delivered to the Office of the Secretary, Consumer Product Safety Commission, Room 502, 4330 East-West Highway, Bethesda, Maryland; telephone (301) 504-0800. Comments also may be filed by telefacsimile to (301)504-0127 or by email to cpsc-os@cpsc.gov. Comments should be captioned "Mattress ANPR."

FOR FURTHER INFORMATION CONTACT: Margaret Neily, Directorate for Engineering Sciences, Consumer Product Safety Commission, Washington, D.C. 20207; telephone (301) 504-0508, extension 1293.

SUPPLEMENTARY INFORMATION:

A. Background

The Commission currently has a flammability standard for mattresses that addresses ignition by cigarettes. 16 CFR Part 1632. Smoldering ignition of mattresses/bedding (usually caused by cigarettes) has declined since the standard took effect in 1973. However, the open flame ignition of mattresses/bedding continues to cause a significant number of deaths and injuries, especially to children. The most common open flame sources are

lighters, candles and matches. The Commission staff has been evaluating data concerning such fires for several years to determine how best to address open flame ignition of mattresses/bedding.

In 1995, CPSC conducted a field investigation study to learn more about cigarette-ignited fires and open flame fires. The report, issued in 1997, showed that about 70% of the open flame fires involved child play and that 68% of the open flame deaths were to children playing with lighters, matches, or other open flame sources. The mattress was ignited directly by open flame in about 24% of the cases. However, bedding was the first item to ignite in about 60% of the cases. In the latter scenario, the fire had already developed to a considerable size before the mattress became involved. A similar study conducted by the National Association of State Fire Marshals ("NASFM") in 1997 confirmed these findings.

A CPSC Chairman's Roundtable, conducted in February 1998, was intended to develop approaches to address these fires and fire deaths. The Roundtable concluded that technical studies were needed and that a public education effort should be considered. The industry's Sleep Products Safety Council ("SPSC"), an affiliate of the International Sleep Products Association ("ISPA"), sponsored a research program at the National Institute of Standards and Technology ("NIST") to

provide the technological basis for future performance requirements that could be included in a standard for mattresses and/or bedclothes. The mattress industry also began developing an expanded public education program in cooperation with other interested organizations.

On March 28, 2000, Whitney Davis, director of the Children's Coalition for Fire-Safe Mattresses ("CCFSM") submitted four petitions to the Commission concerning mattress flammability. The petitions proposed four options: (1) an open flame standard similar to the full-scale test set forth in California Technical Bulletin 129; (2) an open flame standard similar to the component test set forth in British Standard 5852; (3) a warning label for mattresses warning of polyurethane foam fire hazards, and (4) a permanent, fire-proof mattress identification tag. The petitions are discussed in greater detail in section G.

The Commission is considering a flammability standard that would address mattress fires ignited by small open flames. To be effective the standard must reflect the actual use of mattresses. Mattresses generally are not used alone, but are covered by bedding or bedclothes, such as sheets, blankets and comforters. The presence of these materials significantly affects the character of the fire. In some incidents the small open flame may ignite the mattress directly. But it is more common that the

smaller flame source initially ignites the bedding, and these materials serve as a larger ignition source for the mattress. Thus, an effective standard must consider the interplay between the mattress and the bedding.

B. The Product

According to the International Sleep Products Association ("ISPA"), 1999 sales of mattresses were an estimated \$2.8 billion. ISPA represents about 725 wholesalers, retailers, and manufacturers of conventional mattresses and foundations, accounting for over 80% of total U.S. sales of these products.

The expected useful life of mattresses is about 14 years. Based on estimates from ISPA and previous staff studies, the Commission's Product Population Model estimates about 240 million mattresses may have been in use in residential, commercial, and institutional applications at the end of 1999.

The top four producers operate about one-half of the 800 production facilities in the U.S. and account for over 50% of the total U.S. production of mattresses. The remainder of the production facilities are operated by smaller manufacturers that tend to be family-owned firms supplying mattresses and foundations to a regional market. While renovated mattresses account for as much as 25% of those in use in some parts of the country, the total extent of such renovated mattress use is unknown. Mattresses produced for institutional and commercial use

are available to consumers by special order.

C. Risk of Injury

In 1998, mattress or bedding items were first to ignite in about 18,100 residential fires that resulted in 390 deaths, 2,160 injuries, and \$208.3 million in property damage. Over the five-year period from 1994 through 1998, children under age 15 represented over 75% of the deaths in fires ignited by candles, matches, and lighters, and incurred over one third of the injuries from these fires. The most common ignition sources for the incidents involving deaths of these children were candles, matches and lighters. Among victims 15 years of age and older, smoking materials were the most common ignition sources causing death. In 1998, smoking materials accounted for 5,300 fires, 230 deaths, 660 injuries, and \$61.3 million in property damage. .

Since mattress fires often involve the ignition source of burning bedding, initially ignited by a smaller source, a standard incorporating an ignition source representing burning bedding could address deaths and injuries from fires caused by smoking materials, traditional small open flame sources, as well as other heat sources. Because few materials can resist such a large ignition source, the typical approach of preventing ignition of a mattress through a product performance standard is not reasonable. However, limiting the fire intensity and preventing flashover in mattress/bedding fires could result in a

reduction in the number of casualties due to such fires.

Flashover occurs when a fire becomes so intense that all exposed surfaces ignite nearly simultaneously, and quickly spreads through the structure. While victims intimate with the ignition may still be at risk due to their direct contact with the burning mattresses and bedclothes, preventing flashover may reduce the number of casualties to a portion of the other victims inside as well as those located outside the room of fire origin.

D. Statutory Provisions

Section 4 of the Flammable Fabrics Act ("FFA") authorizes the Commission to initiate proceedings for a flammability standard when it finds that such a standard is "needed to protect the public against unreasonable risk of the occurrence of fire leading to death or personal injury, or significant property damage." 15 U.S.C. 1193(a). That section also sets forth the process by which the Commission can issue a flammability standard. The Commission first must issue an advance notice of proposed rulemaking ("ANPR") which: (1) identifies the fabric or product and the nature of the risk associated with the fabric or product; (2) summarizes the regulatory alternatives under consideration; (3) provides information about existing relevant standards and reasons why the Commission does not preliminarily believe that these standards are adequate; (4) invites interested persons to submit comments concerning the identified risk of

injury, regulatory alternatives being considered, and other possible alternatives; (5) invites submission of an existing standard or portion of a standard as a proposed regulation; and (6) invites submission of a statement of intention to modify or develop a voluntary standard to address the risk of injury. 15 U.S.C. 1193(g).

If, after reviewing comments and submissions responding to the ANPR, the Commission determines to continue the rulemaking proceeding, it will issue a notice of proposed rulemaking. This notice must contain the text of the proposed rule along with alternatives the Commission has considered and a preliminary regulatory analysis. 15 U.S.C. 1193(i). Before issuing a final rule, the Commission must prepare a final regulatory analysis, and it must make certain findings concerning any relevant voluntary standard, the relationship of costs and benefits of the rule, and the burden imposed by the regulation. *Id.* 1193(j). The Commission also must provide an opportunity for interested persons to make an oral presentation before the Commission issues a final rule. *Id.* 1193(d).

E. Existing Open Flame Standards

The staff has reviewed 13 existing tests or standards relevant to open flame hazards associated with mattresses/bedding. State and local government tests and standards include Technical Bulletin ("TB") 129, TB 121, and TB

117 from California, the Michigan Roll-up Test, and Boston Fire Department ("BFD") 1X-11 from Boston. The staff reviewed other standards from the American Society for Testing and Materials standards (ASTM E-1474 and ASTM E-1590), Underwriters Laboratories (UL 1895 and UL 2060), the National Fire Protection Association (NFPA 264A and NFPA 267) and the United Kingdom (British Standard ("BS") 6807 and BS 5852).

Several of these standards specify tests which are duplicates or modifications of each other. To simplify the discussion of these existing standards, tests are grouped in two broad categories: full-scale fire tests of mattresses (sometimes including bedding items) and small-scale component tests of mattress materials. Important aspects of the standards are briefly summarized below.

Full-scale Tests: A full-scale test is generally considered the most reliable in measuring product performance, especially when the product contains multiple materials in a complex construction such as a mattress or mattress/bedding combination. Nine of the tests reviewed are full-scale burn tests of mattresses that can produce large fires. There are only about twelve laboratories in the United States that have test facilities capable of safely conducting these tests and properly controlling emissions produced. These tests are costly, ranging from \$2,000-5,000 per test; and CPSC does not have this type of

facility.

TB 129, TB 121, BFD IX-11, ASTM E-1590, NFPA 267, UL 1895, and UL 2060 use gas burners simulating a newspaper fire in a wastebasket, newsprint in a metal container, or burning bedding as the ignition source. The mattress is sometimes tested in combination with a foundation and bedding. Bedclothes are generally optional and unspecified (chosen by the tester). The ignition sources are applied to the side or underneath the mattress. The acceptance criteria, when specified, are intended to minimize the size/intensity of the fire and related hazards rather than prevent ignition. The standards limit the peak rate of heat release and/or total heat release, maximum temperature above the mattress, carbon monoxide concentration, and mass loss.

BS 6807, a voluntary British standard, provides multiple ignition source options for a full-scale test of a mattress or mattress/foundation combination. The top or underside of the mattress is exposed, depending on the specific ignition source. Ignition/non ignition is determined from the exposure to a cigarette, butane flame, wood crib, or bedclothes chosen by the tester.

The Michigan Roll-up Test was designed to test jail pads that had been rolled up and intentionally ignited by inmates. The pad or mattress is rolled and tied, stuffed with newsprint, leaned against a bed frame, and ignited. No test criteria are

specified.

Small-scale tests: The staff reviewed four smaller scale standards, all of which are used for evaluating mattress components rather than the full mattress. One serious drawback of component tests is their inability to accurately predict the real life performance of the full product, a complex combination of mattress, foundation and bedclothes.

TB 117 is mandatory in California for polyurethane foam used in mattresses. The test requires the average flame spread time of 5 inch specimens to be 10 seconds or more.

ASTM E-1474 and NFPA 264A measure the heat release rate of a small specimen of a mattress component material exposed to 35 kilowatts per square meter (kW/m²) from the burner of a Cone Calorimeter.

BS 5852 is a British standard, mandatory for mattress filling materials (typically foam) used in single-filling mattresses. A horizontal/vertical crevice of foam covered with a standard flame-resistant (FR) polyester fabric is exposed to an ignition source. Options include a cigarette, butane flames, and wood cribs of varying sizes with increasing thermal outputs. Maximum smoldering/flaming time and mass loss are specified.

Several of these standards, small and large scale, may ultimately offer the best choices for a test method, test conditions, magnitude and nature of the ignition source,

technical rationale, acceptance criteria, and so forth. However, more data are necessary to determine the most appropriate test. As a group, these standards lack clear links to the specific hazard of ignition from burning bedding materials typical of residential fire incidents, which is especially important for establishing effective acceptance criteria. A better understanding of the fire scenario, the magnitude of the hazard to be addressed, the contribution of burning bedding, and the effectiveness of product changes is needed. With this information, preparation of a reasonable, effective performance standard to reduce deaths and injuries is possible; and mattress materials and constructions suitable for the residential mattress market can be developed.

F. Technical Research and Test Development

From the CPSC and ISPA/NASFM studies of mattress fire incidents and the roundtable discussions, it became clear that a better understanding of the problem, desired performance objectives, and technical means to meet the objectives were needed. As discussed above, existing standards and tests were inadequate and new technical research was needed to support and develop an effective test method and standard. In 1998, in consultation with CPSC staff, SPSC began sponsoring the necessary research at NIST to define and measure the hazard from open flame ignition of mattresses from burning bedding. The first phase of

the research was completed in June 2000, and work on Phase 2 has begun and is scheduled for completion later in 2001. CPSC is sponsoring NIST to develop a complementary, smaller scale test method to address practical issues of enforcement and product development. The small-scale test method development will continue into 2002. These programs are summarized below.

1. Phase One

The Flammability Assessment Methodology for Mattresses-Phase 1, involved four main objectives: (1) initial evaluation of bedding products, (2) characterization of heat impact on a mattress, (3) design of gas burners, and (4) tests of mattresses/bedclothes with burners.

Because the bedclothes are most likely to be the item first ignited and serve as a magnifier for the original, small open flame source, NIST characterized the fire behavior of bedclothes typically used in residential settings. Tests of twelve combinations of bedclothes (sheets, pillows, comforters, and blankets) produced peak heat release rates that ranged from 50 kW to about 200 kW; all substantially higher than a match or lighter. Peak heat release rate is basically a measure of the intensity of the fire produced by these items.

NIST measured the heat impact imposed on the surface of a mattress by six bedding combinations covering a range of performance, from moderate to most intense ignition threat.

Measurements of heat flux, duration and affected location were taken. Distinctly different burning conditions existed on the top and side of the mattress, the top being more severe.

NIST then designed two gas burners to consistently simulate the typical heat impact imposed on a mattress top and side by burning bedding products. This is necessary for providing controlled and reproducible test results. The heat flux of the top surface burner is 65 kW/m^2 with a duration time of either 45 seconds or 70 seconds. The heat flux of the side surface burner is 50 kW/m^2 with a duration time of either 25 seconds or 50 seconds. These measurements were used to establish appropriate burner intensities and exposure times when applied to the mattress.

The burners were tested on five different types of mattresses to ensure their ability to produce results that correlated with actual tests of burning bedding. One mattress represented current residential technology. The other four mattresses were constructed with different types of potentially fire resisting components, including barrier fabrics, modified fibers, and treated foams. Correlation was good except for one mattress construction that exhibited internal over-pressurization with the ignited bedding. Internal over-pressurization occurs when a flammable gas mixture builds up within the mattress causing rupturing of the mattress seams and allowing fire to

penetrate the interior. Mattresses with this behavior should be avoided or designed to resist rupturing during a fire.

The research conducted during Phase 1 provided extremely useful information regarding fires involving mattresses and the interaction with bedclothes. Burning bedclothes by themselves were shown to produce large fires, reaching heat release rates up to 200 kW. A 200 kW fire is a much larger fire than a match, candle or lighter ignition source but not large enough to create flashover conditions. Mattresses without bedclothes, however, were shown to produce fires large enough to cause room flashover, adding to the complexity of the hazard. The gas burners appear to successfully simulate most burning bedding conditions and show how mattress materials and construction techniques can improve mattress fire behavior.

2. Phase Two

Phase 2 of the NIST/SPSC research will determine the ability of small-scale mattresses to predict burning behavior of twin size and larger bedding systems. Phase 2 will also provide an analytical basis for estimating the performance characteristics of the mattress needed to address and reduce the hazard.

Most available fire test data relate to twin size mattresses. To understand the effects of mattress size, it will be necessary to obtain data on larger size mattresses. The research will evaluate the effects of scale from king size to a

2'x 2' mini-mattress, a size commonly used by manufacturers as a selling tool. If the heat release rate behavior or other measure (e.g. weight or mass loss) seen in smaller mattresses correlates with that of larger size mattresses, the feasibility of conducting safe, convenient mattress tests and producing fire safe products increases. Additional tests will evaluate how the lateral dimensions of mattresses affect fire intensity and how different size mattresses affect a specified room environment.

Several factors will be considered in order to estimate the peak rate of heat release from a mattress that would substantially reduce the fire hazard. These include: (1) the effect of bed size and room size on fire size, (2) the proximity of other furnishings around the bed fire and the ignition threat of surrounding objects, and (3) the location of persons with respect to the location of fire origin. Three tiers of hazard for victims of mattress/bedding fires have been identified using National Fire Incident Reporting System (NFIRS) data: (1) outside the room of origin, (2) within the room of origin but not in contact with mattress fire and, (3) direct contact with mattress fire. Through analysis of the various tests, NIST will explore the relationship between fire size and the number of fatalities and determine what reduction in bed fire intensity will significantly reduce fatalities based on the three hazard tiers.

Phase 2 has been expanded to include tests of bedclothes (quilts, comforters, pillows) constructed with a variety of flame-resistant filling and cover materials to assess the effect of material changes on the flammability behavior.

3. Small-scale screening test

To be conducted concurrently with Phase 2, CPSC (with funding support from the U.S. Fire Administration) has contracted with NIST to develop a bench scale screening test to be used as a surrogate for full-scale tests of mattresses exposed to burning bedding or equivalent gas burners. Although the most reliable measures of mattress performance are full-scale tests, they are expensive and require specialized facilities. A bench scale test could be used by CPSC for compliance screening and by manufacturers for screening designs/materials. A similar concept is used in the mattress standard (16 CFR 1632) for substitution of tickings and materials used at the tape edge. Test specimens will be from actual production mattresses. Based on the performance of a variety of materials, designs, and constructions, the test will be designed to be more stringent than the full-scale test to avoid problems (such as approving a mattress construction that fails the full-scale test and must be recalled later).

G. The Petitions

CCFSM's petitions (Petitions FP 00-1, FP 00-2, FP 00-3, and

FP 00-4) proposed four options to address open flame ignition of mattresses: (1) an open flame standard similar to the full-scale test set forth in California Technical Bulletin 129; (2) an open flame standard similar to the component test set forth in British Standard 5852; (3) a label warning of polyurethane foam hazards and (4) a permanent, fire-proof mattress identification tag. The petitioner also requested that the Commission impose fines and take other actions to enforce the existing mattress flammability standard against renovated mattresses. This request was not docketed as a petition because it concerned action that cannot be taken through rulemaking.

The petitioner noted that the existing mattress flammability standard addresses deaths and injuries associated with cigarette ignition of mattresses, not small open flame ignition. The petitioner observed that the greater amount of polyurethane foam used in today's mattresses provides increased fuel for mattress fires. He argued there is a significant need for a standard that would address open flame ignition of mattresses.

In one petition (FP 00-1) the petitioner requested that the Commission issue a standard based on a full-scale test like that in California TB 129, discussed above. In another petition (FP 00-2) the petitioner requested that the Commission issue a standard based on a component test like that in BS 5852, discussed above. The Commission has determined to grant both of

these petitions requesting standards. The Commission also voted to deny the remaining two petitions. A label warning of the flammability of polyurethane foam may not accurately reflect the flammability of a finished mattress, particularly as it may actually be used with bedding. As for the requested fire-proof identification tag, although it might help identify a mattress after a fire, it would not affect a mattress's flammability performance.

The Commission will consider both full-scale and component tests in the course of rulemaking to determine the most effective standard to address mattress fires ignited by small open flames. As explained above, the Commission staff is involved in extensive research that is examining the characteristics of mattress/bedding fires and evaluating all relevant tests that could form the basis for a standard.

G. Response to Comments On the Petitions

On June 12, 2000, the Commission published a request in the Federal Register for public comments on these petitions. 65 FR 36890. Nine comments were submitted by a fire safety expert and various industry associations. Most of these comments were on the general issue of open flame ignition of mattresses rather than the specific petition recommendations. The major issues raised by the comments and responses to them are discussed below.

1. General Comments

Comment: Some commenters were concerned that standard tests recommended by the petitions do not reflect real hazards typical of residential mattress fire scenarios. Some stated that NIST's work examining mattresses and bedclothes is a preferable basis for a standard.

CPSC Response: Real-life residential bedding fires involve a complex system of materials, typically a mattress and foundation with a collection of bedclothes which may include any number of sheets, blankets, comforters, pillows, quilts and decorative items. The bedclothes add to the complexity of the hazard. Often, the mattress is essentially exposed to burning bedding, a much larger ignition source than the flame from a match, candle or lighter that may have been the original source of ignition. Two of the petitions request test methods to address the hazard of residential mattress fires (FP00-1 and FP00-2). The ability of the requested test methods to address real-life residential mattress fires is unclear at this time. An appropriate test method should effectively address the hazard as it exists in real-life fire scenarios, representing all materials present, the typical ignition source, and the point of ignition.

The current study being conducted by NIST is a scientifically based research program designed to address the open flame ignition of mattresses and bedclothes under conditions that closely resemble real-life residential fire scenarios. The

study is focused on understanding the dynamics of fires involving mattresses and bedclothes assemblies and on developing appropriate and technologically practicable methodology that can effectively address the hazard.

Comment: Some commenters stated that any new regulation should not compromise cigarette resistance. Commenters stated that any new regulation should provide a standard with a simple test that can be widely used. It should have the attributes of a good standard.

CPSC Response: The Commission agrees that any new regulation regarding mattress flammability should be closely assessed for possible impacts on the benefits of the existing regulation. While full-scale mattress tests may provide the most definitive measures of mattress fire behavior, they are costly, dangerous, and cannot be widely conducted. A valid bench or small-scale test that is practical and cost effective is a necessary component of a performance standard when many tests are needed. A simple bench scale test would enable manufacturers to conduct some of their own testing, allowing them to proceed more easily with product and design innovation and address safety concerns regarding their facilities and employees. A bench scale test that uses products obtained at retail would also be useful for regulatory and compliance purposes. The Commission agrees that any new standard would need to be representative of the real-life

fire hazard, and the methodology should be reasonable, technologically practicable and based on sound comprehensive research.

2. Petition FP 00-1 Suggesting California TB 129

Comment: One commenter noted that TB 129 provides a direct measure of the danger posed by the mattress tested and is excellent for assessing product performance. Another commenter, however, observed that the type of ignition source and point of ignition used in the test are not appropriate for residences. Two commenters noted that TB 129 tests are expensive and can only be conducted by a fire test laboratory with large-scale heat release measurement capabilities.

CPSC Response: TB 129 was developed to address hazards associated with ignition of mattresses in public institutions. It is not clear that TB 129 provides a test method that is a true and direct measure of the danger posed by a typical residential mattress fire. The CPSC staff has concerns about the lack of bedclothes and mattress foundations in the test, the intensity of the specified ignition source, and the required side ignition point. It is also true that full-scale open flame mattress tests, like TB 129, require specialized fire test facilities and are dangerous and costly to conduct.

3. Petition FP 00-2 Suggesting BS 5852

Comment: One commenter stated that British Standard 5852 has

been effective in significantly reducing deaths and injuries from upholstery fires.

CPSC Response: Limited data are available for assessing the effectiveness of BS 5852 in reducing deaths and injuries, particularly for assessing losses from mattress fires. The UK Department of Trade and Technology's report evaluating benefits of the 1988 regulations states that the data on mattresses is less clear than the data for upholstered furniture. Mattress regulations require the filling materials to meet the regulations for polyurethane foams, but do not specify fire resistant requirements for mattress fabric coverings or tickings. Moreover, the report did not consider variables such as a decrease in smoking, increase in consumer awareness, increased use of smoke alarms, and increase in use of FR products.

Comment: One commenter reported on full-scale tests of UK mattresses which, mostly ignited by a match, show reduced fire intensity. It is not necessary to ensure resistance to burning bedding because the British experience using complying foams has been good and complying foams do not cause big fires with larger ignition sources.

CPSC response: Full-scale tests of British mattresses composed of treated foam components may exhibit a resistance to small open flames, such as matches, lighters and candles when compared to mattresses composed of untreated foam. Recent tests,

however, show that British mattresses are clearly inadequate when presented with the intense flames and higher heat fluxes typically caused by burning bedding. Several full-scale tests of British mattresses were included in the mattress flammability study conducted at the NIST. While the British mattresses may take several minutes to reach their peak rate of heat release, the peak rate of heat release observed for the mattresses alone (without bed clothing) was significantly above the level necessary to cause flashover. Testing of mattresses complying with British regulations with bed clothing resulted in an even higher peak rate of heat release, clearly showing that bedding continues to be a major contributor to the fire hazard causing serious flaming of the foam.

Comment: Commenters indicated that BS 5852 is easy to run and relatively inexpensive. However, it is a composite test, does not assess heat release and does not account for bed clothing in the residential fire scenario.

CPSC response: The Commission agrees that BS 5852 is a relatively inexpensive and easy to run test method, but at the same time, is concerned that the test does not measure heat release rates or account for the more severe ignition source from burning bedding.

Comment: One commenter suggested that a simple test, like BS 5852, that can be used very widely is the most appropriate for

a national regulation.

CPSC Response: The Commission agrees that an easy-to-run test is appropriate. It is unclear, however, if the most appropriate test is BS 5852.

3. Petition FP 00-3, Mattress Combustability Warning Labels

Comment: One commenter noted that Sleep Product Safety Council product labels have been used on finished mattresses since 1989. The commenter stated that the petition suggests a label that is extreme and does not represent the performance of the finished product in a real life fire situation.

CPSC Response: The Commission agrees that the label recommended by the petition does not represent the hazard presented by the finished product in a real life fire situation. Polyurethane foam is just one of many components used to construct a mattress. Since it is unclear what relation the fire behavior of an individual component has to the likely fire performance of a completed product, the Commission agrees that the suggested warning is not appropriate for the final mattress product.

5. Petition FP 00-4, Fire-proof Mattress Identification Tags

Comment: One commenter argues that an ID tag would have no impact on the propensity of a mattress to ignite or the intensity of the resulting fire.

CPSC response: Petition FP 00-4 requests that all mattresses

have an identification tag designed to survive a fire permanently attached to the innerspring unit. The Commission agrees that such a tag is unlikely to have any impact on reducing mattress fires or the propensity of a mattress to ignite when exposed to an open flame. Such a tag is not visible to consumers to influence their behavior, and the tag has no influence on the mattress's ability to resist ignition or its performance once ignited. An ID tag could be desirable for identifying mattresses involved in fires to improve the utility of collected fire data and support further regulatory actions. However, the tag cannot be justified in terms of directly reducing death or injury from fires.

I. Invitations to Comment

In accordance with section 4(g) of the FFA, the Commission invites comments on this notice. Specifically, the Commission invites the following types of comments.

1. Comments concerning the risk of injury identified in this notice, the regulatory alternatives discussed above, and other alternatives to address the risk of injury;

2. An existing standard or portion of a standard as a proposed rule;

3. A statement of intention to modify or develop a voluntary standard to address the risk of injury identified in the notice along with a description of a plan to modify or

develop the standard.

In addition, the Commission is interested in obtaining further information about the following issues.

1. Materials that could improve mattress performance in open flame tests.

2. Any adverse consequences that an open flame standard might have on cigarette ignition of mattresses/bedding.

3. The appropriate scope of the standard, that is, particular items that should be included or excluded.

Dated: _____

Todd Stevenson, Acting Secretary
Consumer Product Safety Commission

List of Relevant Documents

1. Briefing memorandum from Margaret Neily, Project Manager, Directorate for Engineering Sciences, to the Commission, "Options to Address Open Flame Ignition of Mattress/Bedding and Petitions from the Children's Coalition for Fire Safe Mattresses," _____, 2001.

2. Memorandum from Signe Hiser, EPHA, to Margaret Neily, Engineering Sciences, Residential Fires in Mattresses and Bedding 1980 "1998," June 11, 2001.

3. Memorandum from Terrance R. Karels, EC, to Margaret L. Neily, ES, "Mattress Petitions," June 15, 2001.

4. Memorandum from Allyson Tenney, ES, to Margaret Neily, Project Manager, "Current Research Program to Evaluate Open flame Mattress Flammability," April 25, 2001.

5. Memorandum from Allyson Tenney, ES, to Margaret Neily, Project Manager, "Response to Comments Received on Petitions FP 00-1 through FP 00-4, Requesting Standards, Labeling and Identification Tags for Mattresses," April 25, 2001.

6. Memorandum from Carolyn Meiers, ESHF, to Margaret Neily, Project Manager, "Petition to Provide Rulemaking Regarding Mattress Combustibility Warning Labels," March 16, 2001.