INTERNATIONAL SLEEP PRODUCTS ASSOCIATION
ISPA

Alberta E. Mills
Office of the Secretary
U.S. Consumer Product Safety Commission
4330 East-West Hwy
Bethesda, MD 20814

November 7, 2024

Dear Madam Secretary:

The International Sleep Products Association (ISPA), the trade association for mattress manufacturers and suppliers of components and services to the mattress industry, appreciates the opportunity to provide comments in response to a request for public comment dated October 7, 2024 issued by the U.S. Consumer Safety Commission (CPSC) regarding certain aspects of the existing mattress flammability standards codified at 16 CFR Part 1632 (which addresses smoldering ignition risks for both mattresses and mattress pads) and Part 1633 (which addresses open-flame ignition sources for mattresses and mattress sets). Our comments focus primarily on provisions in these standards that describe the circumstances in which mattress manufacturers may use ticking that is different from the ticking used on qualified prototypes.

As a preliminary matter, we note several important changes that have occurred since Part 1632 was promulgated 50 years ago:

1. During that time, the mattress industry has shifted to materials that are less likely to be ignited by a smoldering heat source. Prior to 1632, most mattresses contained large quantities of cotton or cotton mixed with other cellulosic material (including rayon) in both the ticking and the interior upholstery materials. Today, the industry has largely eliminated or substantially reduced the use of these materials. Contemporary ticking is often made from fiber blends that contain significant percentages of polyester, nylon or other non-cellulosic fiber, and the upholstery material often consists of resilient smolder-resistant polyurethane foam. Experience showed that these new materials would not ignite when exposed to a smoldering heat source, such as a smoldering cigarette.

2. The risk of smoldering cigarette ignitions overall has substantially declined over the past 50 years. The incidence of smoking among U.S. adults has fallen by nearly three-fourths, from 40% in 1974 to 11% in 2024,[1] during which time states now also require the tobacco industry to produce so-called "fire safe" cigarettes.[2] Furthermore, the use of residential smoke detectors has increased from 22% in 1979 to 96% in 2009.[3] These factors substantially reduce the risk of cigarette-ignited mattress fires.
3. The CPSC has implemented the Part 1633 open-flame standard, which requires that mattresses resist ignition from an open-flame heat source, which is an ignition risk far more challenging than that posed by the 1632 smoldering ignition heat source.

ISPA proposes that any amendments that the CPSC makes to Parts 1632 and 1633 meet the following overarching criteria:

1. The amendments should be neutral relative to current requirements, and should not have the effect of increasing existing overall performance requirements of either Part 1632 or 1633. Using the so-called ticking substitution test set forth in Section 1632.6 as an example, if a given ticking tests as a Class B ticking using the current test, it must also test as a Class B ticking using a modified test.
2. The amended standards should not be overly burdensome for the mattress industry to meet. Specifically:
   a. the tests required by the standards should be easy and inexpensive to use, and
   b. the equipment needed to conduct for such tests should not be expensive and must be easy to maintain and calibrate.
3. Where possible, the amendments should reduce the variability of the test results and reduce uncertainty in the application of the standards.

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[1] "Cigarette Smoking Rate in U.S. Ties 80-Year Low," Jeffrey M. Jones (downloaded from https://news.gallup.com/poll/648521/cigarette-smoking-rate-ties-year-;ow.aspx#:~:text=Cigarette%20Smoking%20Among%20U.S.%20Adults%20at%2080%2DYear%20Low&text=Lin e%20graph%20showing%20percentage%20of,peaking%20at%2045%25%20in%201954 on October 28, 2024).

[2] As of 2012, all 50 states and the District of Columbia have enacted laws that require all cigarettes to be designed to provide reduced ignition propensity (RIP). "Current State of Cigarette Fires in the US: Data Analysis and Workshop" (July 15, 2023) (downloaded at https://www.nfpa.org/education-and-research/research/fire-protection-research-foundation/projects-and-reports/current-state-of-cigarette-fires-in-the-us-data-analysis-and-workshop on October 28, 2024).

[3] Smoke Alarms in US Home Fires" (June 1, 2024) (downloaded at https://www.nfpa.org/education-and-research/research/nfpa-research/fire-statistical-reports/smoke-alarms-in-us-home-fires on October 28, 2024).

With these criteria in mind, ISPA proposes that the CPSC consider the following options:

1. Materials Used to Conduct Ticking Substitution Test: Currently, Section 1632.6 requires that the ticking substitution test be conducted by placing a lit standard reference material (SRM) cigarette on a ticking sample stretched across a square wooden box that has cotton batting immediately beneath the ticking. The ability to perform the current ticking substitution test has been compromised because it is difficult today to obtain commercially produced cotton batting that does not contain at least some boric acid, which makes the cotton less combustible. As a consequence, batting contaminated by even small amounts of boric acid can produce erroneous results under the ticking substitution test.

   In addition, the use of ticking stretched over a wooden box introduces a myriad of variables into the test. For example, the test results can vary depending on how tightly the ticking is stretched over the box, the dryness and grain density of the wood used to construct the box and whether the cotton batting is packed tightly under the ticking or loosely (which can create air channels that add variability to the test), etc.

Options for addressing these issues include:

a. Eliminate the use of cotton batting and the wooden box, and conduct the test by placing the fabric on top of a non-combustible surface, such as a metal grill, fiberglass sheeting or a ceramic coated material. We are aware that a maritime standard used to test the smolder resistance of fabric used on furnishings on ocean liners and cruise ships (IMO A688) follows this type of approach. Provided that the results from testing ticking in this manner can be correlated with how ticking would perform under today's ticking substitution test, this approach could be superior to the current approach in Section 1632.6. Eliminating the use of cotton batting would address the problem that FR-free batting is no longer commercially available, and eliminating both the batting and the wooden box would eliminate important factors that create test result variability.
b. Alternatively, some other form of non-FR batting or other material could be used in place of non-FR cotton batting. If the CPSC pursues this approach, it will be necessary to describe the material in sufficient detail that it can be obtained with consistency.
c. Use an electronic heater cartridge as the ignition source, in place of the SRM cigarette. ISO 16840-10 uses such devices to test the fire performance of wheelchair cushions and

other positional support devices. Using a heater cartridge should eliminate some of the variability inherent in using an ignited cigarette as the heat source, given that the fire performance of a cigarette can vary depending on how tightly the tobacco is packed in the cigarette, humidity and other factors. Furthermore, the equipment required to operate the heater cartridge is relatively inexpensive to acquire, is simple to use and can be positioned easily to conduct the test. Once again, it is important that if the CPSC should adopt this approach, the results of the test using heater cartridges should be correlated to the results of testing using lit cigarettes. Note that we propose that this change be limited to the ticking substitution test, and not affect the use of SRM cigarettes to conduct 1632 full product prototype tests.

2. Enhanced Training and Documentation Regarding Proper Conduct of Ticking Substitution Test and Use of Ticking Classifications: We understand that the CPSC has encountered situations in which the ticking substitution test is not being properly conducted or the manufacturer is not properly using the ticking classifications when substituting ticking. For example, some A and B ticking fabrics may be misclassified, and sometimes the test is not fully completed. These problems may be more prevalent among new entrants to the mattress industry that may not be experienced with the CPSC's mattress flammability standards.

   To address this problem, we propose that the CPSC regularly host industry events and other opportunities to publicize the importance of fully complying with all relevant requirements. ISPA is prepared to assist with organizing and promoting such events, and to work with the CPSC to develop resources that the industry can use to better understand the requirements of the federal flammability standards.

3. Make Interim Guidance Permanent: ISPA urges the CPSC to modify 1632 to make permanent the interim guidance it issued several years ago to allow mattress manufacturers to conduct 1632 prototype tests using only 2 sleep surfaces (instead of 6 as is currently required by 1632). Experience has shown that this change has reduced testing costs without affecting product safety. (Logically, the same change should be made for mattress pad testing.)

4. Consider Establishing "Safe Harbor" under Part 1632 for Certain Materials: Experience in complying with and enforcing Part 1632 shows that some materials consistently perform well when exposed to a lit cigarette. For example, ticking that contains

substantial amounts of polyester, nylon and other non-cellulosic synthetic fiber tends to resist ignition from a smoldering heat source. These materials consistently test as a B ticking or better under the current ticking substitution test.

ISPA urges the CPSC to study whether defining a "safe harbor" that takes this experience into account could substantially simplify the ticking substitution process by requiring no test burn for certain fabrics. These changes would lower test costs, simplify the process for designing and supplying different types of ticking and reduce the amount of material wasted through flammability testing. For those ticking fiber blends that are outside the safe harbor, the ticking substitution test would still apply.

If the CPSC should adopt this approach, it will be necessary to define the safe harbor with sufficient detail to provide clear guidance to the industry regarding exactly what criteria must be met to qualify for the safe harbor. This will avoid misunderstandings and non-compliance.

5. Require That Part 1633 Ticking Substitutions Meet Objective Reasonable Criteria Requirements and Provide Regulatory Guidance Regarding Possibly Relevant Data: Currently, Section 1633.4(b) specifies under what circumstances a manufacturer may deviate from the materials and designs used in a 1633 qualified prototype without conducting a new burn test. In general, a manufacturer may substitute materials only if it can demonstrate on an "objectively reasonable basis" that that change will not cause a 1633 failure. Section 1633.4(b)(2), however, currently exempts ticking from the objective reasonable criteria requirement.

   We understand that over the past several years, the CPSC has encountered situations in which a manufacturer has properly substituted a Class B ticking for a Class B ticking used on a 1632 qualified prototype, but the mattress with the substituted ticking nevertheless fails a 1633 test burn.

   To address these situations, we propose to eliminate the ticking exemption in Section 1633.4(b)(2). That would require a manufacturer to apply the objective reasonable criteria requirement that applies to all other materials substitutions under Part 1633 to ticking as well. That is, if the 1633.4(b)(2) ticking exemption were eliminated, a manufacturer could use ticking that is different from that used on a 1633 qualified

prototype without having to qualify a new prototype only if it can demonstrate on an "objectively reasonable basis" that the substituted ticking will not cause a 1633 failure.

We caution, however, that a change of this nature would be significant. Since the CPSC has to date not required manufacturers under Part 1633 to have objective reasonable criteria to support ticking changes to a qualified prototype, ISPA proposes that it would be important ***before implementing such a change*** for the CPSC to provide regulatory guidance regarding possible data that a manufacturer could consider under 1633 to provide an objective reasonable basis when deciding whether to substitute a new ticking for the one used on an existing qualified prototype without needing to qualify a new prototype.

For example, we urge the CPSC to consider whether something like the Thermal Gravimetric Analysis (TGA), which uses a time-based weight loss measurement to depict how a material decomposes once ignited, might provide information which could be useful in evaluating the relative fire characteristics of different ticking fabrics. Exhibit 1 attached to these comments provides an example of the output generated from conducting TGA tests of several different types of ticking. Hypothetically speaking, if a qualified 1633 prototype used a ticking coded A, this TGA report might provide an objective reasonable basis for a manufacturer to substitute ticking coded C in place of the A ticking since the C ticking's decay curve is to the right and above the curve for ticking A (which indicates that C decays more slowly than A when ignited).

Other information that the CPSC might consider as potentially relevant for use as objective reasonable criteria could include various types of existing fabric flammability tests, as well as the heat release rates for different types of ticking, when ignited.

To reduce the cost of analyses like the TGA approach, we also urge the CPSC to explore whether it would be useful for a nationally recognized lab like the National Institute of Standards & Technology (NIST) to test the most frequently used ticking types (classified in terms of fiber blend, fabric formation technique, coatings, treatments and other appropriate variables) and publish the TGA results for those fabrics. Ticking suppliers could submit their ticking samples to NIST for testing and publication (although ticking suppliers could also have the option to conduct their own tests for new fabrics and treatments, or for proprietary materials). Such a library of TGA test results could provide a basis for reasonable objective criteria for ticking substitutions under 1633. This

information could also provide a resource as companies develop new ticking types to understand how they perform compared to existing ticking types.

6. Reorganize Parts 1632 and 1633: ISPA requests that the CPSC move all mattress requirements from Part 1632 to 1633. The scope of 1632 would then be limited to addressing smoldering ignitions for mattress pads only. We think that this change would simplify industry compliance and CPSC enforcement in several respects.

   Under this approach, it would be necessary to define the same terms consistently for both the smoldering ignition and open-flame requirements, which is not always the case today. For example, Section 1632.1(c) defines "ticking" as:

   > the outermost layer of fabric or related material that encloses the core and upholstery materials of a mattress or mattress pad. A mattress ticking may consist of several layers of fabric or related materials quilted together.

   Section 1633.2(e) takes a different approach, defining "ticking" as:

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

   The differences between these definitions can lead to confusion and uncertainty when a manufacturer wishes to substitute ticking for that used on a qualified 1632 or 1633 prototype.

   Consistent with this approach, we also urge the CPSC to consider modifying the smoldering ignition requirements:
   - to allow manufacturers to use the reasonable objective criteria concept in analyzing whether a 1632 prototype test is necessary for mattress material substitutions, and
   - to allow for pooled prototyping.

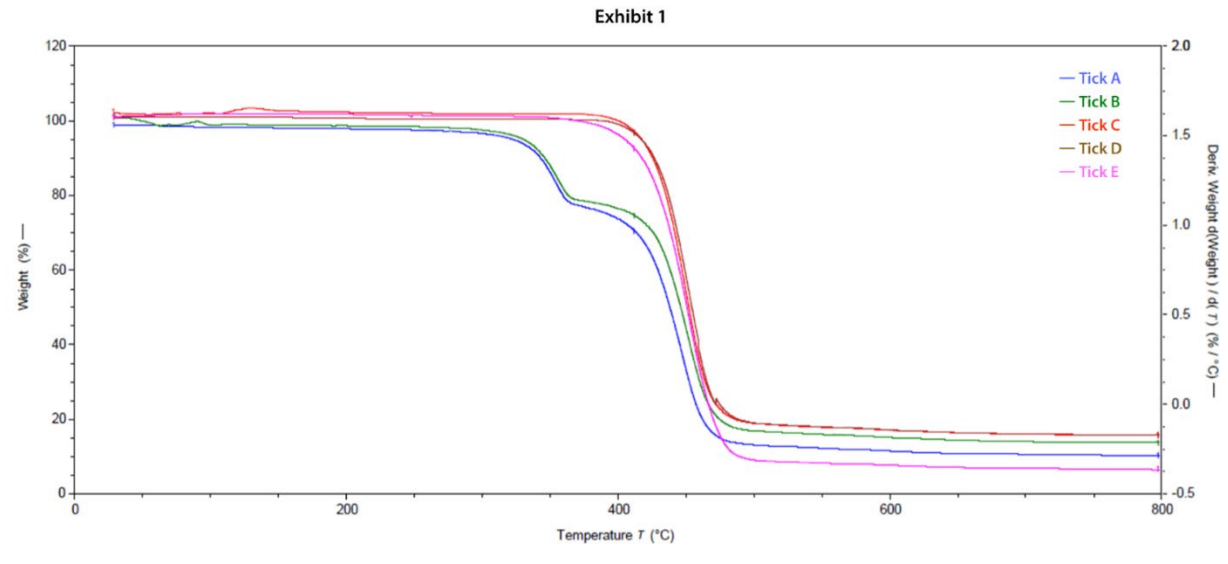
Moving all mattress provisions to Part 1633 should also reduce compliance ambiguities by consolidating all testing requirements under a single CPSC flammability standard and streamline recordkeeping requirements, which in turn should simplify the CPSC's enforcement efforts.

We appreciate the opportunity to provide these comments.

Sincerely,

Alison Keane
President, ISPA

Exhibit 1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Tick B
Tick C
Tick D
Tick E
Weight (%)
Deriv. Weight d(Weight) / d(T) (% / °C)
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