

# PRODUCT LIABILITY

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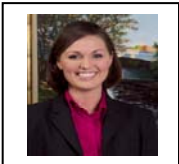
*David Rheney and Laura E. Figueroa provide an explanation of the history of mattress and upholstered furniture flammability standards and discuss the future of regulation in the industry.*

## Up in Smoke: The Changing Atmosphere of Mattress and Upholstered Furniture Flammability Standards

### ABOUT THE AUTHORS



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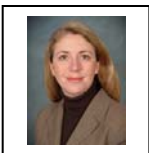


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**I. Introduction**

An increasing number of deaths in the late 1960's as a result of fires started by cigarettes prompted the federal government to consider implementation of national flammability standards for mattresses and upholstered furniture. However, the progression of regulation of these two industries has differed. Mattress flammability standards are promulgated by the government and include both a cigarette ignition standard and a standard for fires started by open-flames such as matches, candles and cigarette lighters. Conversely, upholstered furniture is regulated by a voluntary cigarette ignition standard created by the furniture industry, as well as by differing state statues regulating flammability. Despite 90% percent compliance with the voluntary standard and the state standards currently in place, the government is considering subjecting the upholstered furniture industry to a proposed unified federal flammability standard.

**II. Flammable Fabrics Act**

Much of the impetus for developing a flammability standard for mattresses and upholstered furniture originated from the Flammable Fabrics Act. The Flammable Fabrics Act (FFA) was passed in 1953 to guard individuals from personal injuries due to wearing highly flammable apparel.<sup>1</sup> In late 1967, while work was proceeding under the FFA on apparel flammability standards, investigation of the flammable nature of interior furnishings was also developing. Accident data indicated that the most frequent and severe injuries and losses were a result of ignition of sleepwear and certain interior furnishings of the home such as carpets, drapes, beds, and other furniture. Further, smoldering cigarette ignition was the most

frequent source of these dangerous fires in bedding and upholstered furniture.<sup>2</sup> Accident data also indicated that a high percentage of the victims of these fires were "partially incapacitated by alcohol, drugs, or infirmity associated with illness or old age<sup>3</sup>." Accordingly, the FFA determined that the promulgation of flammability standards was necessary to protect consumers against unreasonable risk of the occurrence of fire leading to death, personal injury, and serious property damage. The responsibility for development and promulgation of mattress flammability standards was delegated to the Department of Commerce ("Department").

**III. Mattress Flammability Standards****A. 16 CFR 1632: Cigarette Ignition**

The Department began addressing the issue of mattress flammability regulation in the early 1970s. The current standard, codified at 16 C.F.R. § 1632, emerged from a rulemaking process commenced June 10, 1970. At that time the Secretary of Commerce published notice that flammability standards for mattresses might be needed, and invited comments on the same.<sup>4</sup> In announcing the need for flammability standards for mattresses, the Department focused on a number of statistics that demonstrated the need to protect the public against unreasonable risk of the occurrence of fire leading to death, personal injury, or significant property damage. First, the

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<sup>2</sup> RICHARD N. WRIGHT, BUILDING AND FIRE RESEARCH AT NBS/NIST 1975-2000, 169-170, National Institute of Standards and Technology US Govt Printing Office 2003, available at <http://fire.nist.gov/bfrlpubs/build04/PDF/b04009.pdf>.

<sup>3</sup> *Id.*

<sup>4</sup> Allan L. Schwartz, Annotation, *Judicial Construction of Flammable Fabrics Act* (15 U.S.C.A. § 1191-1204), 19 A.L.R. FED. 837 (1974).

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<sup>1</sup> 15 U.S.C. §§ 1191-1204 (1953).

Department noted that in 1968, 26% of all fires in Arlington, Virginia and 24% of all fires in Washington, D.C. were started by the ignition of bedding.<sup>5</sup> Moreover, the Department presented statistics from the National Fire Protection Association in 1969 stating that bed fires were the cause of 307 or 21% of single-fatality non-clothing fire deaths.<sup>6</sup> As a result of that research, the Department invited written comments and suggestions regarding these regulations.<sup>7</sup>

A proposed standard was issued by the Department on September 9, 1971.<sup>8</sup> The proposed rule took its shape from the high incidence of fires resulting from mattress and bedding ignitions, and the Department noted that "burning cigarettes are the principal ignition source for mattress fires which result in the production of injurious smoke toxic atmospheres."<sup>9</sup> Consequently, the Department proposed a standard for mattress flammability based on cigarettes as the ignition source. Again seeking guidance and feedback from persons in the industry, the Department called for comments on the regulation, and received comments from approximately 75 different groups. At the same time, statistical data was gathered on bed fires across the nation, a consultant's study of such fires was obtained, and recommendations were received from members of the National Advisory Committee for the Flammable Fabrics Act.<sup>10</sup> A final rule was issued by the Department in

1972 which has been in effect since June 22, 1973.

In 1972 the Secretary of Commerce issued a flammability standard (FF4-72), codified at 16 C.F.R. § 1632, for mattresses to guard against fires associated with ignition of mattresses by smoldering cigarettes.<sup>11</sup> The standard provides a test for mattresses which requires placement of burning cigarettes at particular locations on the surface of the mattress in a draft-protected environment.<sup>12</sup> A mattress meets the standard if no cigarette test location produces char length more than 2 inches (5.1cm) in any direction from the nearest point of the cigarette, when the cigarette has been allowed to burn its entire length.<sup>13</sup> 16 C.F.R. § 1632 is still in effect today, though it has been amended, and any mattress that is manufactured or sold in the United States is still required to comply with its provisions. However, following the promulgation of 16 C.F.R. §1632, the regulation of mattresses underwent some changes.

First, in 1973, authority to issue flammability standards pursuant to the FFA was reassigned from the Department of Commerce to the new Consumer Protection Safety Commission (CPSC) by the Consumer Product Safety Act.<sup>14</sup> The bipartisan, independent regulatory commission established by Congress was therefore responsible for administering regulations regarding mattress flammability standards. Another change in direction for mattress regulation was a shift away from a cigarette ignition standard. The CPSC began to notice that although 16 C.F.R. §1632 provided consumer protection against ignition from

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<sup>5</sup> Notice of Finding that Flammability Standards or Other Regulations May Be Needed and Institution of Proceedings, 35 Fed. Reg. 8,944 (June 10, 1970) (to be codified at 15 C.F.R. pt. 7).

<sup>6</sup> *Id.*

<sup>7</sup> Schwartz, *supra* note 4.

<sup>8</sup> Proposed Flammability Standard, 36 Fed. Reg. 18,095 (September 9, 1971) (to be codified at 15 C.F.R. pt. 7).

<sup>9</sup> *Id.*

<sup>10</sup> Schwartz, *supra* note 4.

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<sup>11</sup> Wright, *supra* note 2.

<sup>12</sup> 16 C.F.R. § 1632 (1972).

<sup>13</sup> *Id.*

<sup>14</sup> 15 U.S.C. 2079(b)(1973).

low heat sources such as cigarettes, it could not predict the performance of a mattress once it became an actual fire. Moreover, § 1632 was not as effective in protecting consumers against fires started by larger heat sources. Therefore, the CPSC aimed to create new set of standards to mattress purchasers and consumers.

**B. 16 CFR 1633: Open-flame ignition**

In the 1990's, the CPSC began to focus its investigation on mattress fires that were started by "open flames," such as candles, matches, and cigarette lighters. Open flames expose mattresses to higher fire temperatures than smoldering cigarettes, and often lead to "flashover." Flashover is "the point where the entire contents of a room are ignited simultaneously by radiant heat, making conditions in the room untenable and safe exit from the room impossible."<sup>15</sup> Because a flashover fire spreads rapidly and exponentially, above two-thirds of all mattress fatalities are attributed to mattress fires that lead to flashover.<sup>16</sup>

Deciding that a standard specifically designed to reduce flashover would dramatically lessen the number of deaths and injuries resulting from fire, the CPSC published an Advanced Notice of Proposed Rulemaking in October 2001. The Advance Notice announced the CPSC's intent to update the mattress standards to reflect the threat of small open flames and was designed to produce mattresses that would generate a smaller size fire with a smaller growth rate,

thus reducing the possibility of flashover. Regulators also hoped that mattresses complying with the new standard would only make a limited contribution to the fire, especially in the early stages of the fire, thus allowing occupants more time to discover the fire and escape. The CPSC estimated that the open-flame standard would limit the size of mattress fires to the extent that 240 to 270 deaths and 1,150 to 1,330 injuries could potentially be eliminated annually.<sup>17</sup>

On July 1, 2007, after years of discussions within the industry, the CPSC's new standard, the Federal Open-Flame Mattress Standard took effect.<sup>18</sup> All mattresses manufactured, imported or renovated on or after that date are subject to the new open-flame standard. This standard set mandatory national fire performance criteria for all mattresses, and requires testing mattresses with substantial side and top gas ignition burners. The tests required by § 1633 include placing two T-shaped propane burners near the mattress which are then lit for 50-70 seconds allowing the flame to come in contact with the mattress for that length of time.<sup>19</sup> The total heat released may not exceed 15 mega joules in the first 10 minutes of the test and the maximum heat release rate may not exceed 200 kilowatts at any time within the 30 minute test<sup>20</sup>. The open-flame standard is a performance standard, and does not restrict the use of particular fabrics, materials or products. This allows manufacturers and suppliers to choose the materials and means of construction that they believe will be cost-effective and also meet the specified test criteria.

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<sup>15</sup> Final Rule: Standard for the Flammability (Open Flame) of Mattress Sets, 71 Fed. Reg. 13,472 (March 15, 2006) (to be codified at 16 C.F.R. pt. 1633).

<sup>16</sup> *Id.* ("This accounts for nearly all of the fatalities that occur outside the room where the fire originated and about half of the fatalities that occur within the room of origin.").

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<sup>17</sup> Final Rule: Standard for the Flammability (Open Flame) of Mattress Sets, 71 Fed. Reg. 13,472, 13,472 (March 15, 2006) (to be codified at 16 C.F.R. § 1633).

<sup>18</sup> 16 C.F.R. § 1633.1 (2006).

<sup>19</sup> 16 C.F.R. § 1633.3 (2006).

<sup>20</sup> *Id.*

The new open-flame standard codified at 16 C.F.R. § 1633 did not eclipse or invalidate the 16 C.F.R. § 1632 cigarette ignition standard. Rather, compliance with both standards remains mandatory. In addition, the CPSC determined that an extension of flammability standards to other rooms in American homes and houses was needed to further protect against loss of life and property due to fire.

#### IV. Upholstered Furniture

The development of flammability standards for upholstered furniture differs greatly from that of mattresses. There are currently no mandatory federal standards governing the combustibility of upholstered furniture. While federal standards have been discussed and a Notice of Proposed Rulemaking has been initiated, the only standard regarding the flammability of upholstered furniture currently in effect is a voluntary one.

Discussions regarding a flammability standard for upholstered furniture began around the same time as that of mattresses. In 1972, the Department of Commerce issued a notice in the Federal Register regarding the need to develop a standard for upholstered furniture which summarized the available accident data and solicited comments on the risks of fire and appropriate test methods.<sup>21</sup> However, unlike mattress regulations, no federal standard regarding upholstered furniture emerged from this notice. Rather, furniture manufacturers, retailers, and component and material suppliers adopted a voluntary standard through an industry organization formed for that purpose, the United Furniture Action Council (UFAC).<sup>22</sup> The industry has continued to support a

system of voluntary standards via the UFAC and other organizations such as the American Furniture Manufacturers Association (AFMA) since that time.

The UFAC voluntary standard addresses cigarettes as an ignition source and does not provide an open flame protocol or standard. The UFAC standard involves testing to ensure that a smoldering cigarette will not char or melt upholstered furniture for more than two inches and without ignition when the cigarettes are allowed to burn their entire lengths. The CPSC now estimates compliance with the UFAC voluntary standards at 90% of upholstered furniture production.<sup>23</sup>

UFAC also promoted cigarette resistant cover fabric and upholstered furniture design, testing protocols, and a labeling program in the industry.<sup>24</sup> It is believed that UFAC's impact on upholstered design, construction, and materials has "improved greatly" resistance to cigarette ignition in upholstered furniture. Undoubtedly the voluntary standard, in conjunction with a reduced number of smokers, increased use of smoke detectors, and consumer fire safety education programs have contributed to a decline in upholstered furniture fires and resultant deaths.<sup>25</sup>

However, some groups continue to argue that a voluntary standard is insufficient to protect against loss resulting from upholstered furniture fires. One group that

<sup>21</sup> 37 Fed. Reg. 230 (1972).

<sup>22</sup> Robert P. Foster & Joseph B. Zicherman, *Is There a Time Bomb in the Sofa?*, 41 Trial 58, 59 (Nov. 2005).

<sup>23</sup> Standard for the Flammability of Residential Upholstered Furniture; Proposed Rule, 73 Fed. Reg. 11,702, 11,704 (March 4, 2008) (to be codified at 16 C.F.R. pt. 1634).

<sup>24</sup> Wright, *supra* note 2 at 171.

<sup>25</sup> Kimberly D. Rohr, National Fire Protection Association, "Products First Ignited in U.S. Home Fires," April 2005, available at ([www.nfpa.org/assets/files/PDF/ProductsExecSum.pdf](http://www.nfpa.org/assets/files/PDF/ProductsExecSum.pdf))

continues to petition for a mandatory federal regulation is the National Association of State Fire Marshalls (NASFM). In 1994, in response to two petitions filed by the NASFM, the CPSC began formal consideration of a federal flammability standard for upholstered furniture. The petitions by the NASFM sought both a cigarette ignition standard and an open-flame standard for upholstered furniture. In response, the CPSC issued an Advance Notice of Proposed Rulemaking on June 15, 1994 on the specific risk of small open-flame ignited fires<sup>26</sup>. While the CPSC has reviewed fire resistant fabrics, fire blocking interliners and flame retardant treated cushioning materials, as well as cigarette smoldering and open flame testing standards, it has yet to adopt a mandatory federal rule regarding flammability standards for upholstered furniture.

Part of the difficulty in promulgating an ignition resistance standard for upholstered furniture is due to the more complex geometry of upholstered furniture, including both the geometry of construction of the furniture and geometry of exposure to a cigarette<sup>27</sup>. Likewise, the varied material of construction, fabric coatings, liners, and fill materials of upholstered furniture present additional problems in regulating flammability.

The realm of upholstered furniture is not completely devoid of mandatory regulations. For instance, though the CPSC has not enacted a flammability standard for upholstered furniture, both Ohio and California have enacted mandatory state standards for upholstered furniture. Since October 1975, the California Bureau of Home Furnishings and Thermal Insulation has

enforced a furniture flammability standard known as California Technical Bulletin 117 (TB 117) that addresses smoldering cigarette and small open flame ignition for upholstered furniture sold in California.<sup>28</sup> Draft Revisions were proposed to Cal. T.B. 117 in 2002, including upgrading the small open flame test to apply to both the cover material and fill material, as opposed to the current 117 that only applies to cover material. However, these draft revisions were not adopted in California. The CPSC considered the same draft revisions in developing a proposed federal standard for upholstered furniture, but no such standards have been adopted.

The lack of a mandatory federal standard and the initial promulgation of upholstered furniture flammability standards by states has provided the impetus for a national federal flammability standard for upholstered furniture. Rather than relying on voluntary compliance with an industry-set standard and piecemeal litigation initiated by states, the CPSC has recently begun developing a federal flammability standard. When this rule will be imposed, however, is not at all clear.

## **V. Future of Upholstered Furniture Flammability Standards**

In March 2008, the CPSC released a proposed standard for flammability of residential upholstered furniture that, if passed, will be codified at 16 C.F.R. § 1634.<sup>29</sup> The proposal would establish performance and labeling requirements for upholstered

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<sup>26</sup> 59 Fed. Reg. 30,735 (1994).

<sup>27</sup> Wright, *supra* note 2.

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<sup>28</sup> Bureau of Home Furnishings & Thermal Insulation (BHFTI), Cal. TB-117 (2002), available at [www.bhfti.ca.gov/industry/117pdf](http://www.bhfti.ca.gov/industry/117pdf) (last visited February 24, 2009).

<sup>29</sup> Standard for the Flammability of Residential Upholstered Furniture; Proposed Rule, 73 Fed. Reg. 11,702, 11,7040 (March 4, 2008) (to be codified at 16 C.F.R. pt. 1634).

furniture, including chairs, sofas, and home office furniture.<sup>30</sup> Upholstered furniture can meet the proposed standards by having either: (1) upholstery cover material that complies with a smoldering ignition resistance test or (2) an interior fire barrier that complies with specified smoldering cigarette *and* small open flame ignition resistance tests. To comply with the first option, a lighted cigarette is placed on the upholstered furniture and the smoldering patterns are observed for 45 minutes. The furniture must not continue to smolder at the end of the 45 minutes or flame up at any time during the test, and cannot have more than a 10% mass loss at the end of the 45 minutes.<sup>31</sup> The second option has two prongs and requires the furniture to have interior fabrics or high loss battings to act as fire barriers. First, a cigarette is placed on the interior fire barrier material and is allowed to burn for 45 minutes.<sup>32</sup> The upholstered furniture passes this smoldering prong of the test if after 45 minutes the cigarette is no longer smoldering, has not flamed up, and the barrier has not lost more than 10% of its mass. The upholstered furniture must then also pass the open-flame prong of the test. This prong requires lighting a small gas burner near the material that is used as a fire barrier in the furniture and allowing the flame to touch the material for 70 seconds. The combustion behavior of the material is observed for 45 minutes thereafter and the sample meets the standard if the fire barrier material has 20% or less mass loss at the end of 45 minutes.<sup>33</sup>

The greatest criticism of the proposed rule is that it does not subject the cover of the upholstered furniture to a mandatory open-flame test; rather, only the interior of the furniture may be subject to an open-flame test.<sup>34</sup> Critics suggest that neglecting an open-flame test will not sufficiently prevent death, injury and property damage. However, the CPSC determined that relatively few addressable deaths are attributable to open-flame ignition of upholstered furniture and that such stringent regulations would not be any more effective in preventing death or injury.<sup>35</sup> In any case, progress on the proposed rule has grinded to a halt. If adopted, the new rule would become effective one year after the final rule is published in the Federal Register, and would apply to upholstered furniture manufactured on or after that date.<sup>36</sup>

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<sup>30</sup> 73 Fed. Reg. at 11,704 (to be codified at 16 C.F.R. pt 1634.2(a))

<sup>31</sup> 73 Fed. Reg. at 11,741 (to be codified at 16 C.F.R. pt 1634.4).

<sup>32</sup> 73 Fed. Reg. at 11,742 (to be codified at 16 C.F.R. pt 1634.5).

<sup>33</sup> 73 Fed. Reg. at 11,744 (to be codified at 16 C.F.R. pt 1634.6).

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<sup>34</sup> 73 Fed. Reg. at 11,706.

<sup>35</sup> *Id.* (“[R]elatively few losses-e.g., about 10% of the addressable deaths-are attributable to open-flame ignited fires. Thus, relatively few injuries could be averted, even under highly effective open-flame requirements...Since a substantial majority of these losses result from cigarette-ignited fires, the Commission agrees that a rule with primary emphasis on smoldering can have substantial safety benefits.”).

<sup>36</sup> 73 Fed. Reg. at 11,740 (to be codified at 16 C.F.R. pt 1634.1).



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