



## Ballot Vote Sheet

**TO:** The Commission  
Alberta E. Mills, Secretary

**THROUGH:** Austin C. Schlick, General Counsel  
Jason K. Levine, Executive Director

**FROM:** Daniel R. Vice, Assistant General Counsel, Regulatory  
Affairs  
Meridith L. Kelsch, Attorney, Regulatory Affairs

**SUBJECT:** Final Rule to Amend the Standard for the Flammability  
of Clothing Textiles (16 CFR part 1610)

**DATE:** October 11, 2023

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**BALLOT VOTE DUE:** Tuesday, October 17, 2023

Staff has prepared a briefing package recommending that the Commission issue a final rule, pursuant to the Flammable Fabrics Act (15 U.S.C. §§ 1191-1204), to amend the Standard for the Flammability of Clothing Textiles in 16 C.F.R. part 1610 to update and clarify equipment and procedures in the standard. The Office of the General Counsel is providing for the Commission's consideration a draft final rule for that purpose.

Please indicate your vote on the following options:

- I. Approve publication of the attached notice in the *Federal Register*, as drafted.

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Date)

- II. Approve publication of the attached notice in the *Federal Register*, with the following changes.

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\_\_\_\_\_  
\_\_\_\_\_  
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\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Date)



## Ballot Vote Sheet

III. Do not approve publication of the attached notice in the *Federal Register*.

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Date)

IV. Take other action specified below.

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\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Date)

Attachment: Draft *Federal Register* notice: Standard for the Flammability of Clothing Textiles

**Billing Code 6355-01-P**

**CONSUMER PRODUCT SAFETY COMMISSION**

**16 CFR Part 1610**

**[Docket No. CPSC-2019-0008]**

**Standard for the Flammability of Clothing Textiles**

**AGENCY:** Consumer Product Safety Commission.

**ACTION:** Final rule.

**SUMMARY:** The U.S. Consumer Product Safety Commission (Commission or CPSC) is amending the Standard for the Flammability of Clothing Textiles. The revisions clarify existing provisions, expand permissible equipment and materials for testing, and update equipment requirements that are outdated. The Commission issues this amendment under the authority of the Flammable Fabrics Act.

**DATES:** This rule is effective on **[INSERT DATE 180 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. The incorporation by reference of the publication listed in this rule is approved by the Director of the Federal Register as of **[INSERT DATE 180 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

**FOR FURTHER INFORMATION CONTACT:** Will Cusey, Small Business Ombudsman, U.S. Consumer Product Safety Commission, 4330 East West Highway, Bethesda, MD 20814; telephone (301) 504-7945 or (888) 531-9070; e-mail: [sbo@cpsc.gov](mailto:sbo@cpsc.gov).

**SUPPLEMENTARY INFORMATION:**

**I. Background**

On September 14, 2022, the Commission published a notice of proposed rulemaking (NPR), proposing to amend the Standard for the Flammability of Clothing Textiles at 16 CFR part 1610 (Standard). 87 FR 56289. The Standard was codified under the Flammable Fabrics Act

(FFA; 15 U.S.C. 1191-1204). The purpose of the FFA is to prohibit the importation, manufacture for sale, or sale in commerce of any fabric or article of wearing apparel that is “so highly flammable as to be dangerous when worn by individuals.” Pub. L. No. 83–88, 67 Stat. 111 (June 30, 1953). The Standard accomplishes this by providing a national standard for testing and rating the flammability of textiles and textile products used for clothing. The Standard specifies test equipment, materials, and procedures for testing the flammability of clothing textiles and prohibits the use of highly flammable textiles in clothing.

The amendments proposed in the NPR and adopted in this final rule aim to clarify existing provisions in the Standard and update the specifications for materials and equipment that have become outdated. The amendments do not alter the testing or criteria in the Standard for determining the flammability of a fabric or whether it is permissible for use in clothing; rather, they facilitate accurate testing and classifications by clarifying existing requirements and updating material and equipment specifications to reflect currently available materials, equipment, and technologies.

The amendments proposed in the NPR and adopted in this final rule address three areas of the Standard. First, they aim to clarify and streamline the provisions regarding test result codes (*i.e.*, burn codes), which help determine the classification of a textile and whether it may be used for clothing. The amendments remove an unnecessary code and revise wording in the provisions to clarify the existing requirements. Second, the amendments revise the stop thread specification, which indicates the thread that must be used in flammability testing. The description has become unclear, as threads matching the description in the Standard are no longer readily available. Third, amendments revise the refurbishing requirements in the Standard, which address dry cleaning and laundering specimens during the testing process. In recent years, there have been increasing restrictions on the use of the dry cleaning solvent specified in the

Standard, and washing machines that meet the specifications required in the Standard are no longer made.

The NPR and CPSC staff's briefing package supporting it included detailed information about the need for the amendments, the rationale for the revisions, and test results illustrating the comparability of the flammability classifications under the existing Standard and amendments. The NPR also included detailed information about 16 CFR section 1610.40 of the Standard, which permits the use of alternative apparatus, procedures, or criteria for tests for guaranty purposes. This allowance permits the continued use of the dry cleaning solvent and laundering methods in the current Standard by relying on CPSC's test results demonstrating the comparability of test results under the current Standard and the amendments.

This final rule adopts the amendments proposed in the NPR, with only minor modifications. Therefore, this notice focuses on comments received in response to the NPR and the minor modifications in the final rule. For detailed information about the amendments, the rationale for them, the comparability of flammability test results under the amendments, and the allowance in 16 CFR section 1610.40, see the NPR and the briefing package supporting it.<sup>1</sup>

## **II. Statutory Requirements for Revising the Standard**

The FFA specifies the requirements for the Commission to issue or amend a flammability standard. To issue a final rule, the Commission must make certain findings and publish a final regulatory analysis. 15 U.S.C. 1193(b), (j)(1), (j)(2). The Commission must find that each regulation or amendment:

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<sup>1</sup> The NPR is available at 87 FR 56289 (Sep. 14, 2022). The briefing package supporting the NPR is available at: <https://www.federalregister.gov/documents/2022/09/14/2022-19505/standard-for-the-flammability-of-clothing-textiles-notice-of-proposed-rulemaking#:~:text=The%20purpose%20of%20the%20Standard%20is%20to%20reduce,procedures%20for%20testing%20the%20flammability%20of%20clothing%20textiles.>

- is needed to adequately protect the public from unreasonable risk of the occurrence of fire leading to death, injury, or significant property damage;
- is reasonable, technologically practicable, and appropriate;
- is limited to fabrics, related materials, or products that present such unreasonable risks; and
- is stated in objective terms.

*Id.* 1193(b). In addition, to promulgate a regulation, the Commission must make the following findings and include them in the rule:

- if a voluntary standard addressing the risk of injury has been adopted and implemented, that either compliance with the voluntary standard is not likely to result in the elimination or adequate reduction of the risk or injury, or it is unlikely that there will be substantial compliance with the voluntary standard;
- that the benefits expected from the rule bear a reasonable relationship to its costs; and
- that the rule imposes the least burdensome requirement that prevents or adequately reduces the risk of injury.

*Id.* 1193(j)(2).

When issuing a final rule, the Commission must publish a final regulatory analysis with the regulation, which includes:

- a description of the potential benefits and costs of the rule, including benefits and costs that cannot be quantified, and who is likely to receive the benefits and bear the costs;
- a description of reasonable alternatives the Commission considered, their potential costs and benefits, and the reasons the Commission did not choose the alternatives; and
- a summary of significant issues raised by commenters in response to the preliminary regulatory analysis and the Commission's assessment of them.

*Id.* 1193(j)(1).

### III. The Product and Risk of Injury<sup>2</sup>

The Standard applies to all items of clothing and fabrics intended to be used for clothing (*i.e.*, articles of wearing apparel), whether for adults or children, for daywear or nightwear,<sup>3</sup> with certain listed exclusions.<sup>4</sup>

Between January 1, 2017, and December 31, 2021 (the most recent years for which data are available), there were an average of 85.8 deaths annually in the United States that involved ignition of clothing. An average of 2.6 of these fatalities involved ignition or melting of nightwear, and an average of 83.2 of these fatalities involved ignition or melting of other clothing. Between 2000 and 2021, the number of clothing fire deaths declined, overall. In addition, using CPSC's National Electronic Injury Surveillance System (NEISS),<sup>5</sup> staff estimates that between January 1, 2018, and December 31, 2022 (the most recent year for which data are complete), an average of 5,500 nonfatal injuries per year were associated with clothing ignition and treated in U.S. hospital emergency departments.

### IV. Comments on the NPR

In response to the NPR, CPSC received comments from four commenters: American Apparel and Footwear Association (AAFA), China WTO/TBT National Notification and Inquiry Center (China), a George Washington University student (student), and Consumer Safety Consultancy (CSC). Commenters generally supported updating the Standard and the

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<sup>2</sup> For detailed information about the risk of injury, see Tab A of staff's briefing package supporting this document, available at: [TBD](#).

<sup>3</sup> Other regulations governing the flammability of children's sleepwear, in 16 CFR parts 1615 and 1616, are more stringent than the general wearing apparel flammability standard in 16 CFR part 1610. The amendments in this document would not affect the children's sleepwear standards.

<sup>4</sup> Excluded products include certain hats, gloves, footwear, interlining fabrics, plain surface fabrics meeting specified criteria, and fabrics made from certain fibers that, from years of testing, have been shown to consistently yield acceptable results when tested in accordance with the Standard. 16 CFR 1610.1(c), (d).

<sup>5</sup> NEISS uses a probability sample of hospitals in the United States that represent all U.S. hospitals with emergency departments to identify and generate national estimates of nonfatal injuries treated in emergency departments.

amendments proposed in the NPR. This section summarizes the comments and responds to them; for a more detailed review of the comments, see Tab B in CPSC staff's briefing package supporting this rule.

#### *A. Test Results Codes*

*Background:* Table 1 to section 1610.4 of the Standard states, among other things, that a raised surface textile fabric is Class 1 if “burn time is 0-7 seconds with no base burns (SFBB).” In the NPR, the Commission proposed to replace the wording “with no base burns (SFBB)” in this description with “with no SFBB burn code.” The purpose of the proposed revision was to clarify the existing criteria for classifications of raised surface textile fabrics by referencing burn code SFBB more clearly, because two similar codes (SFBB poi and SFBB poi\*) do not meet the criteria stated in the table.

*Comment:* CSC expressed confusion with the proposed revision, asserting that the description for Class 1 raised surface textile fabrics should state, “Average Burn time is 0-7 seconds with surface flash only;” that Table 1 is the general criteria for classification; and that the full discussion of how to classify is in section 1610.7.

*Response:* As explained in the NPR, the Class 1 description for raised surface textile fabrics in Table 1 indicates that if a fabric has a burn time between 0 and 7 seconds, it can only be Class 1 if it exhibits rapid surface flash only, and no base burns. Although there are three burn codes that indicate that a base burn occurred—SFBB, SFBB poi, and SFBB poi\*—only SFBB is relevant to this determination because it applies when the base burn occurs as a result of the surface flash. In contrast, SFBB poi and SFBB poi\* only have a base burn due to the flame that impinges on the fabric, not from the intensity of the surface of the fabric itself burning. As such, only fabrics with burn code SFBB, and not SFBB poi and SFBB poi\*, are excluded from being Class 1. As the definition of “base burn” in section 1610.2(a) indicates, SFBB poi and SFBB

poi\* are not considered in determining a Class 3 fabric. However, staff is aware that some testers are confused by these provisions and incorrectly use SFBB poi and SFBB poi\* as “base burn” codes for determining Class 3 fabrics. As such, the amendment clarifies the specific burn code—SFBB—being referenced. In addition, although CSC is correct that the regulatory text in the Standard provides a full discussion of classification, Table 1 to section 1610.4 provides a useful summary.

*Background:* In the NPR, the Commission proposed to add a note to Table 1 to section 1610.4, stating that burn codes SFBB poi and SFBB poi\* are not considered a base burn for purposes of determining Class 2 and 3 fabrics. Class 2 and 3 descriptions for raised surface textile fabrics in the table specify that fabrics in these classes exhibit base burns (SFBB). Only fabrics with a burn code of SFBB, and not SFBB poi and SFBB poi\*, have a base burn that occurs as a result of the surface flash rather than from the point of impingement of the burner. Although Table 1 already references burn code SFBB for the Class 2 and 3 descriptions, the purpose of the added note is to make clear that SFBB refers only to that specific code, and not the other two base burn codes.

*Comment:* In reference to this proposed revision, CSC stated that Table 1 is only a summary of the requirements for classification and it is confusing to put partial information in the table. CSC asserted that the information for evaluating SFBB poi and SFBB poi\* for determining classifications should be in section 1610.7.

*Response:* As noted above, staff is aware that some testers incorrectly use SFBB poi and SFBB poi\* as “base burn” codes, resulting in classifying fabrics as Class 3 when they should be designated as Class 1. The added note in Table 1 will make clear that SFBB poi and SFBB poi\* are not used to determine Class 3 fabrics. Again, although CSC is correct that the regulatory text in the Standard provides a full discussion of classification, Table 1 provides a useful summary.

*Background:* In the NPR, the Commission proposed to streamline section 1610.8, which lists the burn codes and requirements relevant to them, by consolidating similar codes. The Commission proposed to combine burn codes SF uc, SF pw, and SF poi into a single new burn code, SF ntr (no time recorded, does not break stop thread). The three existing codes all describe burning behavior that does not have enough intensity to break the stop thread and, accordingly, have no burn time and all result in a fabric being Class 1. As the NPR explained, the rationale for the proposed change was that the purpose of burn codes is to determine the classification of fabrics, making it unnecessary to have all three of these codes, which do not result in different classifications.

*Comment:* CSC objected to this proposed change, noting that the codes reflect observations about the intensity of burning, which can indicate to testers or manufacturers characteristics of the fabric or that additional testing may be useful.

*Response:* CPSC agrees that the different burn codes can be helpful to indicate the flammability of a fabric, whether additional testing may be useful, and whether a fabric should be used. Accordingly, the Commission is not adopting the amendment proposed in the NPR to consolidate the three burn codes into a single code, SF ntr. Instead, the Commission is retaining burn codes SF poi, SF pw and SF uc as separate codes. However, to streamline the burn codes for raised surface textile fabrics, the Commission is revising the order of the burn codes for raised surface textile fabrics in section 1610.8(b)(2). See the discussion of the final rule amendments, below, for further explanation.

#### *B. Stop Thread Specification*

*Comment:* All four commenters agreed that the stop thread description needs to be updated. In support of the proposed amendment, AAFA noted that laboratories had reported

difficulty in sourcing threads and agreed that a range of Tex<sup>6</sup> sizes was a good option. Two commenters (China and CSC) questioned whether additional testing should be done to identify an appropriate stop thread, specifically suggesting testing with raised surface textile fabrics and Class 3 fabrics (*i.e.*, dangerously flammable fabrics), respectively.

*Response:* As explained in the NPR, staff conducted testing to identify a thread specification that would yield comparable flammability results to the thread currently specified in the Standard, while providing greater clarity about the thread required and using a description that is readily available on the market. Staff did not use raised surface textile fabrics or Class 3 fabrics in the thread comparison study. The objective of the study was to examine the effect of different stop threads on the burn times under the Standard, so staff aimed to keep as many parameters constant as possible to observe burn time changes that resulted from changing only the stop thread. Staff used plain surface textile fabric, rather than raised surface textile fabric, because it typically has less variation in burn behavior between specimens. Staff did not use Class 3 fabric because it would be more difficult to observe the effect of the thread type on burn times if the burn times were all clustered close to 0 seconds.

### *C. Refurbishing Specifications*

AAFA, China, and the student commenter all expressed support for updating the refurbishing procedures; CSC did not offer comments on this topic.

## **V. Final Rule Amendments**

As noted above, the final rule adopts the amendments proposed in the NPR with only minor modifications. For a detailed explanation of the amendments, the rationale for them, and the testing and information supporting them, see the NPR and briefing package supporting it.

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<sup>6</sup> The Tex system is commonly used to define thread size. “Tex” is defined as the weight, in grams, of 1,000 meters of yarn and is determined by measuring and weighing cotton threads and calculating linear density.

This section describes the modifications to the amendments proposed in the NPR that the Commission is adopting in this final rule.

*A. Test Results Codes*

Currently, section 1610.8(b)(2) of the Standard provides eight possible burn codes for raised surface textile fabrics, which help determine the classification of a fabric. In the NPR, the Commission proposed to update the list of burn codes for raised surface textile fabrics to consolidate redundant codes, eliminate unnecessary and unclear codes, and improve clarity. One such revision proposed to combine three burn codes—SF uc, SF pw, and SF poi—into a single new burn code, SF ntr (no time recorded, does not break stop thread). The rationale was that these three codes all describe burning behavior that does not have enough intensity to break the stop thread and, accordingly, have no burn time and all result in a fabric being Class 1. Consolidating the three codes would result in the same classifications, but would streamline the regulation.

However, as noted above, CSC pointed out that these three codes can be useful because they indicate different burn behaviors, which can provide information about the characteristics or flammability of the fabric or result in testers or manufacturers opting to conduct further testing. As such, it is helpful to retain the three separate codes, as currently written in the regulations. Accordingly, the Commission is retaining the three separate codes. However, to accomplish the objective of streamlining the burn code list to make them easier to follow, the Commission is revising the order of the burn codes in section 1610.8(b)(2), as follows:<sup>7</sup> SFBB; SFBB poi; SFBB poi\*; SF only; SF poi; SF uc; SF pw.

This order puts the codes used for identifying more flammable and dangerous fabrics (*i.e.*, Class 2 and 3) at the top of the list. Burn code SFBB is first in the list because this code,

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<sup>7</sup> Note that, as proposed in the NPR, the burn code “\_ \_ sec.” is being removed from the list of burn codes for raised surface textile fabrics.

along with burn time, identifies the most flammable and hazardous fabrics—Class 2 and 3. The next codes—SFBB poi and SFBB poi\*—also involve the flame burning through the base of the specimen, but are not considered base burns. The next code, SF only, is the next most hazardous because it involves the flame traveling the length of the specimen, although the flame does not burn through the base. The remaining codes—SF poi, SF uc, and SF pw—describe burning behavior that poses the least risk, as these all indicate Class 1 fabrics that do not have a burn time and merely describe burn behavior. This revision accomplishes the streamlining of burn codes proposed in the NPR, by allowing testers to identify the most hazardous fabrics first and, thereby, potentially eliminates the need for further testing. However, this revision does not substantively alter the burn codes or their criteria and the resulting classifications.

#### *B. Stop Thread Specification*

In the NPR, the Commission proposed to amend the description of stop thread in section 1610.2(p) and section 1610.5(a)(2)(ii) of the Standard to state that it consists of a spool of “3-ply, white, mercerized, 100% cotton sewing thread, with a Tex size of 35 to 45 Tex.” In this final rule, the Commission adopts that proposed amendment, but revises “Tex size of 35 to 45 Tex” to state, “a Tex size of  $40 \pm 5$ .” This is substantively the same as the NPR and provides the same Tex range as proposed in the NPR, but stating the range with an absolute value is more consistent with other ranges stated in the Standard and, therefore, provides greater clarity and consistency.

#### *C. Refurbishing Specifications*

The amendments to the refurbishing specifications proposed in the NPR are adopted in this final rule, without revisions.

## **VI. Section 1610.40 – Use of Alternate Apparatus, Procedures, or Criteria for Tests for Guaranty Purposes**

As explained in the NPR, section 1610.40 of the Standard permits the use of alternative apparatus, procedures, or criteria for tests for guaranty purposes. The FFA states that no person will be subject to prosecution for failing to comply with flammability requirements if that person has a guaranty, meeting specific requirements, that indicates that reasonable and representative tests confirmed compliance with flammability requirements issued under the statute. 15 U.S.C. 1197. For purposes of supporting guaranties, section 1610.40(c) of the Standard states that “reasonable and representative tests” could be either the flammability tests required in the Standard or “alternate tests which utilize apparatus or procedures other than those” in the Standard. The Standard specifies that for persons or firms issuing guaranties to use an alternative apparatus or procedure, the alternative must be “as stringent as, or more stringent than” the test in the Standard, which the Commission will consider met “if, when testing identical specimens, the alternative test yields failing results as often as, or more often than,” the test in the Standard.

Section 1610.40 sets out conditions for using this allowance. A person or firm using the allowance “must have data or information to demonstrate that the alternative test is as stringent as, or more stringent than,” the test in the Standard, and retain that information while using the alternative and for one year after. 16 CFR 1610.40(d)(1), (2), (3), and (f). Section 1610.40 specifies that the Commission will test fabrics in accordance with the Standard and will consider any failing results evidence of non-compliance and a false guaranty. *Id.* 1610.40(e), (g).

As proposed in the NPR, this final rule updates the washing machine specifications in the Standard. However, as explained in the NPR, for purposes of 16 CFR 1610.40, the Commission also concludes that the testing CPSC staff conducted that is discussed in the NPR and in full

detail in Tabs D and E of the briefing package supporting the NPR<sup>8</sup> constitutes information demonstrating that the washing procedure specified in the current Standard, as stated below, is as stringent as the washing procedure in AATCC LP1-2021, Laboratory Procedure for Home Laundering: Machine Washing, 2021 (AATCC LP1-2021) that is required in this amendment. The washing procedure in the current Standard is:

- in compliance with sections 8.2.2, 8.2.3 and 8.3.1(A) of AATCC Test Method 124-2006, *Appearance of Fabrics after Repeated Home Laundering* (AATCC TM124-2006),
- using AATCC 1993 Standard Reference Detergent, powder,
- with wash water temperature (IV) ( $120^{\circ} \pm 5^{\circ}\text{F}$ ;  $49^{\circ} \pm 3^{\circ}\text{C}$ ) specified in Table II of AATCC TM124-2006,
- using water level, agitation speed, washing time, spin speed and final spin cycle for “Normal/Cotton Sturdy” in Table III of AATCC TM124-2006, and
- with a maximum wash load of 8 pounds (3.63 kg) and consisting of any combination of test samples and dummy pieces.

If firms rely on this information and conform to the other requirements in section 1610.40, this will provide an option for them to continue to use washing machines that comply with the provisions in AATCC TM124-2006 in the current Standard.

Likewise, this final rule updates the drying machine specifications in the Standard. However, as with the washing machine specification, for purposes of 16 CFR 1610.40 the Commission concludes that the testing CPSC staff conducted that is provided in the NPR and in

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<sup>8</sup> The NPR is available at 87 FR 56289 (Sep. 14, 2022). The briefing package supporting the NPR is available at: <https://www.federalregister.gov/documents/2022/09/14/2022-19505/standard-for-the-flammability-of-clothing-textiles-notice-of-proposed-rulemaking#:~:text=The%20purpose%20of%20the%20Standard%20is%20to%20reduce,procedures%20for%20testing%20the%20flammability%20of%20clothing%20textiles.>

full detail in Tabs D and E of the briefing package supporting the NPR<sup>9</sup> constitutes information demonstrating that the drying procedure specified in the current Standard, as stated below, is as stringent as the drying procedure in AATCC LP1-2021 that is required in this amendment. The drying procedure in the current Standard is:

- in compliance with section 8.3.1(A), Tumble Dry, of AATCC TM124-2006,
- using the exhaust temperature ( $150^{\circ} \pm 10^{\circ}\text{F}$ ;  $66^{\circ} \pm 5^{\circ}\text{C}$ ) specified in Table IV, “Durable Press,” of AATCC TM124-2006, and
- with a cool down time of 10 minutes specified Table IV, “Durable Press,” of AATCC TM124-2006.

If firms rely on this information and conform to the other requirements in section 1610.40, this will provide an option for them to continue to use dryers that comply with the provisions in AATCC TM124-2006 in the current Standard.

## VII. Relevant Existing Standards

CPSC staff reviewed and assessed several voluntary and international standards that are relevant to clothing flammability:

- AATCC TM124;
- AATCC LP1-2021;
- ASTM D1230-22, *Standard Test Method for Flammability of Apparel Textiles*; and
- Canadian General Standards Board Standard CAN/CGSB-4.2 No. 27.5, *Textile Test Method Flame Resistance - 45° Angle Test – One-Second Flame Impingement*.

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<sup>9</sup> The NPR is available at 87 FR 56289 (Sep. 14, 2022). The briefing package supporting the NPR is available at: <https://www.federalregister.gov/documents/2022/09/14/2022-19505/standard-for-the-flammability-of-clothing-textiles-notice-of-proposed-rulemaking#:~:text=The%20purpose%20of%20the%20Standard%20is%20to%20reduce,procedures%20for%20testing%20the%20flammability%20of%20clothing%20textiles.>

As explained in the NPR, AATCC TM124-2006 is currently incorporated by reference into the Standard as part of the laundering requirements, but washing machines that meet this specification are no longer available on the market. The current version, AATCC TM124-2018, includes washing and drying specifications that are the same as AATCC LP1-2021. However, AATCC TM124 is not a flammability standard; rather, it is intended to evaluate the smoothness appearance of fabrics after repeated home laundering. As such, it contains provisions that are not relevant to flammability testing and lacks provisions that are necessary for flammability testing.

Similarly, the Commission is incorporating by reference portions of AATCC LP1-2021, but this standard also does not include full flammability testing and classification requirements because it is intended as a stand-alone laundering protocol, for use with other test methods. As such, it also contains provisions that are not relevant to flammability testing and lacks provisions that are necessary for flammability testing.

ASTM D1230 is similar to the Standard but contains similar issues to those this rule aims to address (*e.g.*, same unclear stop thread description as the Standard), and it contains different laundering specifications, terminology, and burn codes. As such, the Commission is not adopting provisions from ASTM D1230 because it would not provide the needed clarity that the amendments in this notice provide and would unnecessarily alter provisions in the Standard.

The Canadian standard also is similar to the Standard, but includes several differences from longstanding provisions in the Standard, such as stop thread specifications. Accordingly, adopting provisions from the Canadian standard would unnecessarily alter the Standard when the purpose of the amendments in this rule is to minimize changes to flammability test results while improving the clarity and usability of the Standard.

## VIII. Final Regulatory Analysis

The Commission is issuing this amendment under the FFA, which requires that a final rule include a final regulatory analysis. 15 U.S.C. 1193(j). The following discussion is based on staff's final regulatory analysis, available in Tab C of the final rule briefing package.<sup>10</sup>

### *A. Description of Potential Costs and Benefits of the Amended Rule*

The final regulatory analysis must include a description of the potential benefits and costs of the rule, including unquantifiable benefits and costs.

#### *1. Potential Benefits*

The primary benefit of the amendments is a reduction of burdens for testing laboratories by clarifying existing requirements and updating the specifications for stop thread, dry cleaning, and laundering to include options that are identifiable, permissible for use, and currently available. In addition, the amendments should improve consumer safety because the amendments provide comparable flammability results to the current Standard but would improve testing laboratories' abilities to conduct testing and obtain consistent and reliable results. This should improve consumer safety by ensuring that textiles intended for use in clothing are properly tested and classified so that dangerously flammable textiles are not used in clothing. Staff is unable to quantify these potential benefits but estimates that these benefits are likely to be small.

*Burn Codes.* The amendments to burn codes clarify and streamline these provisions of the Standard, which staff expects will improve the consistency and reliability of flammability testing results and classifications. More consistent and reliable test results, in turn, may provide some safety benefit to consumers, while reducing testing burdens for testing laboratories. Because these amendments are intended to clarify existing provisions and do not change current

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<sup>10</sup> Staff's briefing package supporting this document is available at: **TBD**.

requirements for testing or classification, staff expects that they will provide a small amount of unquantifiable benefits.

*Stop Thread.* The amendments to the stop thread specification in the Standard clarify the type of thread required by using the Tex system, which is commonly used and understood by the industry, to define the thread size. The amendments also expand the range of threads permissible for use under the Standard by providing a range of permissible Tex sizes, rather than specifying a single thread specification, as the current Standard does. As such, the amendments clarify the requirements, which may have consumer safety benefits by yielding more consistent and reliable test results so that the flammability of fabrics are accurately identified. However, these benefits are expected to be small since the amendments provide comparable test results and classifications to the current Standard. The amendments also may ease burdens on testing laboratories, by making it easier to identify compliant thread and by making more threads permissible for use. Therefore, staff expects that these amendments will provide a small amount of unquantifiable benefits.

*Dry Cleaning Specification.* The amendments to the dry cleaning specification continue to allow use of perchloroethylene solvent, but add an additional specification, as an alternative, to accommodate testing laboratories that are unable to use the solvent currently specified in the Standard. The alternative specification, using hydrocarbon solvent, provides comparable flammability results to the perchloroethylene solvent specified in the Standard. CPSC staff assesses that the hydrocarbon solvent is comparable (or lower) in cost than other alternatives. Therefore, staff expects the amendments to reduce burdens on testing laboratories by providing an additional alternative for laboratories that are subject to restrictions on the use of perchloroethylene.

*Laundering Specification.* The amendments to the washing specifications provide a specification that can be met by machines that are currently on the market. Staff expects that this will reduce burdens on testing laboratories because it will eliminate the need to maintain and repair older machines and allow those testing laboratories that can no longer maintain or obtain washing machines that comply with the current Standard to continue to test to the Standard. Staff expects the amendments to the drying specifications will provide benefits as well. By requiring the use of the same standard for both washing and drying, these amendments streamline the requirements for testing laboratories, making it less cumbersome and less costly than obtaining and following two standards. Moreover, AATCC LP1-2021 is already familiar to many testing laboratories since it is used for other standards as well; as such, using this standard should be clear and low cost. In addition, requiring the use of a single standard (rather than referencing two standards) that is widely familiar to industry members should reduce the risk of confusion or testing errors, which may have some safety benefits for consumers by yielding consistent and reliable test results and classifications.

## *2. Potential Costs*

*Burn Codes.* The amendments regarding burn codes clarify and streamline existing requirements, and do not change any testing, flammability results, or classification criteria. As such, staff does not expect these amendments to have any notable costs.

*Stop Thread.* The amendments regarding the stop thread specification clarify and expand the range of permissible threads. They do not change any testing, flammability results, or classification criteria. As staff's testing indicates, thread that meets the current specification in the Standard would comply with the amendments, and the amendments would allow for the use of a wider range of threads than the current Standard. This will allow testing laboratories to

continue to use their existing thread or more easily obtain compliant thread by providing a wider range of options. Therefore, staff does not expect these amendments to have any notable costs.

*Dry Cleaning Specification.* The amendments to the dry cleaning specification allow for the continued use of perchloroethylene solvent, but also provide an additional alternative specification using hydrocarbon solvent. The amendments do not change any testing requirements or criteria and, as staff's testing demonstrates, the hydrocarbon alternative provides comparable flammability results and classifications to the perchloroethylene specification. As such, testing laboratories could continue to use the existing specification, but will also have an additional option for complying with the Standard. Therefore, staff does not expect these amendments to have any notable costs.

*Laundry Specification.* The amendments regarding the washing specification will require different washing machines than those that currently comply with the Standard, because those machines are no longer available on the market. However, firms have the option to continue using machines that comply with the current Standard under 16 CFR 1610.40, thereby avoiding the need to obtain new washing machines. As explained in the NPR and in this notice, the Commission concludes that, for purposes of 16 CFR 1610.40, the testing CPSC staff conducted that was provided in the NPR and in full detail in Tabs D and E of the briefing package supporting the NPR constitutes information demonstrating that the washing procedure specified in the current Standard is as stringent as the washing procedure in AATCC LP1-2021 that is adopted in this notice. Therefore, if firms rely on this information and conform to the other requirements in section 1610.40, this will provide an option for them to continue to use washing machines that comply with the provisions in AATCC TM124-2006 in the current Standard. This alternative would impose no costs, as testing laboratories could continue to use their existing compliant machines.

Although staff does not expect the amendments to the washing specifications to impose any costs, staff examined potential costs associated with obtaining machines that comply with the amendments to assess the costs to firms that choose to do so, rather than continuing to use existing machines in accordance with the allowance in 16 CFR 1610.40. The primary cost to firms that choose to obtain new machines would be the cost of new washing machines that comply with AATCC LP1-2021. Staff estimates that these machines cost an average of \$4,300. However, this cost would be offset by the reduced costs of no longer needing to repair or maintain existing, outdated machines. Staff estimates that the cost of maintaining and repairing the outdated machines is \$300 annually and assumes that if a laboratory chooses to upgrade machines, it expects to receive benefits from the upgrade that outweigh the acquisition costs. Firms that choose to obtain new machines might also incur the cost of buying a copy of AATCC LP1-2021, which is approximately \$50 for AATCC members and \$70 for non-members. Staff does not consider this a significant cost and firms will not incur this cost if they already have AATCC LP1-2021 to comply with other standards. Moreover, a read-only copy of AATCC LP1-2021 will be available for viewing on the AATCC website when this rule takes effect.

Staff was unable to determine the number of testing laboratories that test to the Standard and that would, therefore, be subject to the amendments. At a minimum, currently there are more than 300 testing laboratories that are CPSC-accepted third party laboratories that test to the Standard for purposes of children's product certifications. However, that is an underestimate of the number of firms impacted by the rule because testing laboratories need not be CPSC-accepted third party laboratories to test to the Standard for non-children's products. At a maximum, there are a total of 7,389 testing laboratories in the United States, according to the Census Bureau. However, this is an overestimate of the number of firms in the United States impacted by the rule because this number includes testing laboratories that do not test to the

Standard. Staff estimates that each testing laboratory that tests to the Standard has three washing machines that do not meet AATCC LP1-2021.

The amendments regarding the drying specification are unlikely to require different dryers than those that currently comply with the Standard because most dryers can comply with both specifications. However, to the extent that dryers that meet the current Standard do not meet the amendments, firms would again have the option to continue to use their existing compliant dryers in accordance with 16 CFR 1610.40. Therefore, this alternative would eliminate any potential costs associated with the amendments. Moreover, because most dryers comply with both the current Standard and AATCC LP1-2021, staff does not expect that most firms will need to replace their dryers even if they chose to comply with AATCC LP1-2021, instead of using 16 CFR 1610.40 to continue to comply with AATCC TM124-2006.

*B. Alternatives to the Rule*

A final regulatory analysis must describe reasonable alternatives to the rule, their potential costs and benefits, and a brief explanation of the reasons the alternatives were not chosen. 15 U.S.C. 1193(j). CPSC considered several alternatives to the rule.

*Burn Codes.* CPSC considered retaining the current burn code provisions in the Standard, rather than updating them. This alternative would not create any costs, but also would not provide any benefits. In comparison, the amendments do not create any costs, but have benefits by providing needed clarifications.

*Stop Thread Specification.* CPSC considered updating the stop thread specification to require the use of a stop thread with the specific Tex size of the thread currently required in the Standard. This would not create any costs since thread that meets the current Standard would meet this alternative. However, this alternative would be more restrictive than the final rule by providing fewer options of stop threads. Because staff determined that the range of Tex sizes in

the rule would provide comparable flammability results to the Standard, while providing a broader range of options, CPSC did not select this alternative.

Another alternative CPSC considered is to allow a wider range of Tex sizes, such as the full range staff assessed during flammability testing and found to yield comparable flammability results to the Standard. This would further reduce burdens on testing laboratories by providing even more options. However, staff concluded that it is more appropriate to limit the range of Tex sizes to those of cotton threads that yielded comparable flammability results to the Standard because some polyester threads are designed to be flame resistant.

*Dry Cleaning Specification.* In addition to the hydrocarbon alternative adopted in this amendment, CPSC considered two additional dry cleaning specifications—silicone and butylal. As staff's testing indicates, both of these alternatives also yield comparable flammability results to the current Standard and, therefore, are likely to offer similar benefits to the hydrocarbon specification. Staff identified estimated costs of the four dry cleaning solvent specifications using comparisons provided by the Toxic Use Reduction Institute (TURI). These comparisons estimate that dry cleaning with perchloroethylene involves equipment costs between \$40,000 and \$65,000 and solvent costs of \$17 per gallon; dry cleaning with hydrocarbon involves equipment costs between \$38,000 and \$75,000 and solvent costs of \$14 to \$17 per gallon; dry cleaning with silicone involves equipment costs between \$30,500 and \$55,000 and solvent costs of \$22 to \$28 per gallon; and dry cleaning with butylal involves equipment costs between \$50,000 and \$100,000 and solvent costs of \$28 to \$34 per gallon. CPSC selected hydrocarbon rather than the silicone or butylal alternatives because butylal yielded classifications consistent with the current Standard slightly less often during comparison testing; hydrocarbon is the most commonly used alternative to perchloroethylene; hydrocarbon has a long history of use; and several companies

manufacture hydrocarbon solvents for dry cleaning, whereas silicone and butylal are newer technologies and patented, making their availability more limited.

CPSC also considered requiring the use of only the hydrocarbon specification, rather than continuing to allow the use of the perchloroethylene specification in the current Standard. However, this alternative could increase costs by requiring all testing laboratories to change their dry cleaning specifications. CPSC did not select this option because, although perchloroethylene is being restricted in some locations, it is still available and widely used in the dry cleaning industry.

*Laundering Specification.* In addition to the AATCC LP1-2021 alternative adopted in this amendment, CPSC considered an alternative of continuing to require compliance with the laundering specification in AATCC TM124-2006, but with a reduced agitation speed. As staff's testing indicates, this alternative yields flammability results comparable to the current Standard and, therefore, would likely offer similar benefits to the AATCC LP1-2021 specification adopted. However, this alternative may have higher costs than the amendment because laboratory-grade washing machines are not sold pre-programmed to the reduced agitation speed settings, but they are sold pre-programmed with the AATCC LP1-2021 settings. Consequently, additional time and skilled labor resources would be necessary to program machines to meet the reduced agitation speed alternative, and there would be the potential for testing errors. CPSC did not select this option because testing laboratories are likely to already have and be familiar with AATCC LP1-2021 and have machines that comply with it since it is required for other standards and there are more washing machines on the market that meet the specifications in LP1-2021 than the reduced agitation speed parameters.

CPSC also considered amending the Standard to allow the use of either the AATCC LP1-2021 specifications or the AATCC TM124-2006 specifications. Similarly, CPSC considered

amending the Standard to include the specifications in AATCC LP1-2021, while allowing for the continued use of AATCC TM124-2006 for a limited phase-out period. These alternatives would have minimal, if any, costs because they would allow testing laboratories to continue to use existing machines, while providing an option to obtain machines that are available on the market. CPSC did not select these options because they both would leave CPSC unable to test for compliance in accordance with one of the procedures in the Standard when CPSC's machines that comply with AATCC TM124-2006 reach the end of their useful lives; this would retain in the Standard an outdated and obsolete specification that is no longer possible to meet with products available on the market; and staff does not have information about an appropriate phase-out period for machines that comply with AATCC TM124-2006. Although CPSC did not select either of these alternatives, firms would still be able to continue to use machines that comply with AATCC TM124-2006, instead of machines that comply with AATCC LP1-2021, under the provisions in 16 CFR 1610.40.

For dryers, CPSC considered retaining the current provisions in the Standard, which reference AATCC TM124-2006, because dryers that meet this standard are still available on the market. This alternative would eliminate any costs associated with the amendment to dryer specifications. CPSC did not select this option because requiring the use of a single standard ensures compatible washing and drying requirements and reduces confusion and costs associated with obtaining and following two separate standards. In addition, because the dryer specifications in AATCC TM124-2006 and AATCC LP1-2021 are nearly identical, testing laboratories are unlikely to need to replace their dryers to meet the amendments and, for those that do, the allowance in 16 CFR 1610.40 would mitigate or eliminate that need.

*C. Significant Issues Raised by Commenters*

A final regulatory analysis must include a summary of significant issues raised by commenters in response to the preliminary regulatory analysis and CPSC's assessment of those comments. 15 U.S.C. 1193(j). CPSC did not receive any comments regarding the preliminary regulatory analysis in the NPR or any comments regarding costs, benefits, or alternatives, generally.

**IX. Paperwork Reduction Act**

This rule does not involve any new information collection requirements subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501-3521). The Standard does contain recordkeeping provisions, but this rule would not alter the estimated burden hours to establish or maintain associated records from the information collection approved previously.<sup>11</sup>

**X. Regulatory Flexibility Act Analysis**

When an agency is required to publish a proposed rule, the Regulatory Flexibility Act (5 U.S.C. 601-612) requires that the agency prepare an initial regulatory flexibility analysis (IRFA) at the NPR stage and a final regulatory flexibility analysis (FRFA) at the final rule stage. An IRFA and FRFA must contain specific content that describes the impact that the rule would have on small businesses and other entities. 5 U.S.C. 603, 604. However, an IRFA and FRFA are not required if the head of the agency certifies that the rule "will not, if promulgated, have a significant economic impact on a substantial number of small entities." *Id.* 605(b). The agency must publish the certification in the *Federal Register* along with the NPR or final rule, include

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<sup>11</sup> See Office of Management and Budget (OMB) Control No. 3041-0024.

the factual basis for the certification, and provide the certification and statement to the Chief Counsel for Advocacy of the Small Business Administration. *Id.*<sup>12</sup>

In the NPR, the Commission certified that the proposed amendments, if adopted, would not have a significant economic impact on a substantial number of small entities. As support for the certification, the Commission noted that there are little to no estimated costs associated with the rule because the amendments reduce burdens on industry, maintain or expand existing requirements, or firms may rely on the allowance in 16 CFR 1610.40 to continue to use equipment that is being updated in the amendments. The factual basis for the certification is in Tab F of the NPR briefing package and Tab C of the final rule briefing package, but the NPR provided an overview, including information about the small entities to which the rule would apply; the potential economic impact of the rule on small entities; the criteria CPSC used for a “significant economic impact” and a “substantial number”; assumptions and uncertainties; and a request for comments.

CPSC did not receive any comments regarding the certification or the economic analysis in the NPR, or any new cost, market, or other information or data that would change the economic impact assessments in the NPR. Therefore, because the amendments in this rule are consistent with those proposed in the NPR, the Commission certifies that the amendments will not have a significant economic impact on a substantial number of small entities, for the reasons stated in the NPR.

## **XI. Incorporation by Reference**

This rule incorporates by reference AATCC LP1-2021. The Office of the Federal Register (OFR) has regulations regarding incorporation by reference. 1 CFR part 51. Under these

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<sup>12</sup> For additional details regarding certifications, see *A Guide for Government Agencies: How to Comply with the Regulatory Flexibility Act*, SBA Office of Advocacy (Aug. 2017), available at: <https://advocacy.sba.gov/2017/08/31/a-guide-for-government-agencies-how-to-comply-with-the-regulatory-flexibility-act/>.

regulations, in the preamble, an agency must summarize the incorporated material, and discuss the ways in which the material is reasonably available to interested parties or how the agency worked to make the materials reasonably available. 1 CFR 51.5(a). In accordance with the OFR requirements, this preamble summarizes the provisions of AATCC LP1-2021 that the Commission incorporates by reference.

The standard is reasonably available to interested parties and interested parties can purchase a copy of AATCC LP1-2021 from the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, North Carolina 27709; telephone (919) 549-8141; [www.aatcc.org](http://www.aatcc.org). Once this rule takes effect, a read-only copy of the standard will be available for viewing on the AATCC website. Interested parties can also schedule an appointment to inspect a copy of the standard at CPSC's Office of the Secretary, U.S. Consumer Product Safety Commission, 4330 East West Highway, Bethesda, MD 20814, telephone: 301-504-7479; e-mail: [cpsc-os@cpsc.gov](mailto:cpsc-os@cpsc.gov).

## **XII. Testing, Certification, and Notice of Requirements**

Because the Standard applies to clothing and textiles intended to be used for clothing, it applies to both non-children's products and children's products. Section 14(a) of the Consumer Product Safety Act (CPSA; 15 U.S.C. 2051-2089) includes requirements for testing and certifying that non-children's products and children's products comply with applicable mandatory standards issued under any statute the Commission administers, including the FFA. 15 U.S.C. 2063(a). The Commission's regulations on certificates of compliance are codified at 16 CFR part 1110.

Section 14(a)(1) addresses required testing and certifications for non-children's products and requires every manufacturer of a non-children's product, which includes the importer,<sup>13</sup> that

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<sup>13</sup> The CPSA defines a "manufacturer" as "any person who manufactures or imports a consumer product." 15 U.S.C. 2052(a)(11).

is subject to a rule enforced by the Commission and imported for consumption or warehousing or distributed in commerce, to issue a certificate. The manufacturer must certify, based on a test of each product or upon a reasonable testing program, that the product complies with all rules, bans, standards, or regulations applicable to the product under statutes enforced by the Commission. The certificate must specify each such rule, ban, standard, or regulation that applies to the product. 15 U.S.C. 2063(a)(1).

Sections 14(a)(2) and (a)(3) address testing and certification requirements specific to children's products. A "children's product" is a consumer product that is "designed or intended primarily for children 12 years of age or younger." 15 U.S.C. 2052(a)(2). The CPSA and CPSC's regulations provide factors to consider when determining whether a product is a children's product. 15 U.S.C. 2052(a)(2); 16 CFR 1200.2. An accredited third party conformity assessment body (third-party lab) must test any product that is subject to a children's product safety rule for compliance with the applicable rule. 15 U.S.C. 2063(a)(2)(A); *see* 77 FR 31086, 31105 (May 24, 2012). After this testing, the manufacturer or private labeler of the product must certify that, based on the third-party lab's testing, the product complies with the children's product safety rule. 15 U.S.C. 2063(a)(2)(B).

The Commission must publish a notice of requirements (NOR) for third-party labs to obtain accreditation to assess conformity with a children's product safety rule. 15 U.S.C. 2063(a)(3)(A). The Commission must publish an NOR for new or revised children's products standards not later than 90 days before such rules or revisions take effect. *Id.* 2063(a)(3)(B)(vi). The Commission previously published an NOR for the Standard.<sup>14</sup> The NOR provided the criteria and process for CPSC to accept accreditation of third-party labs for testing products to 16 CFR part 1610. Part 1112 provides requirements for third-party labs to obtain accreditation to

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<sup>14</sup> *See* 75 FR 51016 (Aug. 18, 2010), amended at 76 FR 22608 (Apr. 22, 2011); 78 FR 15836 (Mar. 12, 2013).

test for conformance with a children's product safety rule, including the Standard. 16 CFR 1112.15(b)(20).

The rule does not require third-party labs to change the way they test products for compliance with the Standard. The amendments to burn codes do not alter test protocols; they merely clarify existing requirements. The amendments regarding stop thread and dry cleaning specifications continue to allow the use of specifications consistent with the current Standard. Although the amendments regarding laundering specifications differ from the current Standard, 16 CFR 1610.40 provides an allowance for the continued use of laundering specifications under the current Standard. Accordingly, the existing accreditations that the Commission has accepted for testing to the Standard will cover testing to the revised Standard, and CPSC-accepted third party conformity assessment bodies are expected to update the scope of their accreditations to reflect the revised Standard in the normal course of renewing their accreditations.

### **XIII. Environmental Considerations**

The Commission's regulations address whether CPSC is required to prepare an environmental assessment (EA) or an environmental impact statement (EIS). 16 CFR 1021.5. Those regulations list CPSC actions that "normally have little or no potential for affecting the human environment," and, therefore, fall within a "categorical exclusion" under the National Environmental Policy Act (42 U.S.C. 4321-4370h) and the regulations implementing it (40 CFR parts 1500 through 1508) and do not require an EA or EIS. 16 CFR 1021.5(c). Among those actions are rules that provide design or performance requirements for products, or revisions to such rules. *Id.* 1021.5(c)(1). Because this rule makes minimal revisions to the equipment and materials used for flammability testing in the Standard, and makes minor revisions for clarity, the rule falls within the categorical exclusion, and thus, no EA or EIS is required.

#### **XIV. Preemption**

In accordance with Executive Order (EO) 12988, *Civil Justice Reform*, CPSC states the preemptive effect of the rule, as follows. 61 FR 4729 (Feb. 7, 1996). Section 16 of the FFA provides that when a flammability standard or other regulation for a fabric, related material, or product is in effect under the FFA, no state or political subdivision may establish or continue in effect a flammability standard for such fabric, related material or product if it is designed to protect against the same risk as the standard under the FFA unless the state or political subdivision standard is identical to the Federal standard. 15 U.S.C. 1203(a). The federal government, or a state or local government, may establish or continue in effect a non-identical requirement for its own use that is designed to protect against the same risk as the CPSC standard if the federal, state, or local requirement provides a higher degree of protection than the CPSC requirement. *Id.* 1203(b). In addition, states or political subdivisions of a state may apply for an exemption from preemption regarding a flammability standard or other regulation applicable to a fabric, related material, or product subject to a standard or other regulation in effect under the FFA. Upon such application, the Commission may issue a rule granting the exemption if it finds that: (1) compliance with the state or local standard would not cause the fabric, related material, or product to violate the federal standard; (2) the state or local standard provides a significantly higher degree of protection from the risk of occurrence of fire than the CPSC standard; and (3) the state or local standard does not unduly burden interstate commerce. *Id.* 1203(c).

#### **XV. Effective Date**

Section 4(b) of the FFA specifies that an amendment to a flammability standard shall take effect 12 months after the date the amendment is promulgated unless the Commission finds, for

good cause shown, that an earlier or later effective date is in the public interest and publishes the reasons for that finding. 15 U.S.C. 1193(b).

The amendments to the Standard adopted in this notice take effect six months after publication of the final rule in the *Federal Register*. The Commission finds that this earlier effective date is in the public interest because the Standard provides an important safety benefit and the amendments provide some improvement to those benefits, with little to no costs. Moreover, a shorter effective date is justified given that the amendments should have minimal impacts, improve clarity, and relieve burdens; the prohibition on the use of perchloroethylene in dry cleaning in California took effect in January 2023; and washing machines that meet the Standard are no longer available.

Section 4(b) of the FFA also requires that an amendment of a flammability standard exempt fabrics, related materials, and products “in inventory or with the trade” on the date the amendment becomes effective, unless the Commission prescribes, limits, or withdraws that exemption because it finds that the product is “so highly flammable as to be dangerous when used by consumers for the purpose for which it is intended.” Because the amendments adopted in this notice are intended to have minimal impacts, the Commission concludes that products in inventory or with the trade on the date the amendment becomes effective are exempt from the amended Standard.

## **XVI. Findings**

As discussed in section **II. Statutory Requirements for Revising the Standard**, above, the FFA requires the Commission to make certain findings when it issues or amends a

flammability standard. 15 U.S.C. 1193(b), (j)(2). This section discusses the support for those findings.

*The amendments are needed to adequately protect the public against unreasonable risk of fire leading to death, injury, or significant property damage.* Since the requirements in the Standard were promulgated in 1953, industry practices, equipment, materials, and procedures have evolved, making some parts of the Standard outdated or unclear. Because the Standard determines whether a fabric is safe for use in clothing, it is necessary to replace requirements for outdated and unavailable equipment, materials, and procedures and clarify unclear provisions, to ensure that flammability testing can be performed and that the results of the testing yield consistent, reliable, and accurate flammability classifications so that dangerously flammable fabrics are not used in clothing.

*The amendments are reasonable, technologically practicable, and appropriate, and are stated in objective terms.* The amendments streamline existing requirements and update specifications for outdated equipment, materials, and procedures. The amendments reflect changes recommended by industry members, and allow for the use of equipment, materials, and procedures that are commonly used by industry members, recognized in standards developed by industry, are readily available, and stated in objective terms.

*The amendments are limited to fabrics, related materials, and products that present an unreasonable risk.* The amendments do not alter the textiles or products that are subject to the Standard, which addresses products that present an unreasonable risk.

*Voluntary standards.* CPSC identified four relevant voluntary standards. AATCC Test Method 124-2018, *Appearance of Fabrics after Repeated Home Laundering*, includes provisions that are relevant to flammability testing and is similar to portions of the Standard, but is not a flammability standard. Rather, it is intended to evaluate the smoothness appearance of fabrics

after repeated home laundering. As such, it contains provisions that are not relevant to flammability testing and lacks provisions that are necessary for flammability testing. AATCC's Laboratory Procedure 1-2021, *Home Laundering: Machine Washing*, also includes provisions that are relevant to flammability testing and is similar to portions of the Standard but is not a flammability standard. Rather, it is intended as a stand-alone laundering protocol, for use with other test methods, such as a flammability standard. Therefore, it contains provisions that are not relevant to flammability testing and lacks provisions that are necessary for flammability testing. ASTM D1230-22, *Standard Test Method for Flammability of Apparel Textiles*, is similar to the Standard, but contains different laundering specifications, terminology, and burn codes, and it does not address issues identified in this rule, such as clarification of the stop thread specification. Canadian General Standards Board Standard CAN/CGSB-4.2 No. 27.5, *Textile Test Method Flame Resistance - 45° Angle Test – One-Second Flame Impingement*, also is similar to the Standard, but includes several differences from longstanding provisions in the Standard, such as stop thread specifications. As such, adopting provisions in the Canadian standard would unnecessarily alter the Standard when the purpose of the amendments in this rule is to minimize changes to flammability test results while improving the clarity and usability of the Standard. Compliance with these voluntary standards is not likely to result in the elimination or adequate reduction of the risk of injury identified by the Commission. The amendments will better address the risk of injury than these voluntary standards by retaining the longstanding provisions in the Standard that have been demonstrated to effectively address the flammability hazard, while making minimal revisions to ensure the accuracy of flammability classifications by improving the clarity of the requirements and updating outdated equipment and materials.

*Relationship of benefits to costs.* Because the amendments reflect current industry practices and provide needed clarifications, the anticipated benefits and costs are expected to be small and bear a reasonable relationship to each other.

*Least burdensome requirement.* The amendments do not substantively change the Standard but provide changes that are necessary for clarity and so that testing laboratories may obtain necessary materials and equipment to conduct testing. Several amendments expand the permissible range of materials or equipment to reduce burdens. For revisions that include new equipment or materials, the amendments either allow use of the new materials and equipment as additional alternatives, or the Commission provides information to support the continued use of equipment or materials in the current Standard under 16 CFR section 1610.40.

## **XVII. Congressional Review**

The FFA requires CPSC to transmit a copy of a flammability regulation to the Secretary of the Senate and the Clerk of the House of Representatives. 15 U.S.C. 1204. The Congressional Review Act (CRA; 5 U.S.C. 801-808) similarly states that before a rule may take effect, the agency issuing the rule must submit the rule, and certain related information, to each House of Congress and the Comptroller General. 5 U.S.C. 801(a)(1). The CRA submission must indicate whether the rule is a “major rule.” The CRA states that the Office of Information and Regulatory Affairs (OIRA) determines whether a rule qualifies as a “major rule.” A “major rule” is one that OIRA finds has resulted in or is likely to result in:

- an annual effect on the economy of \$100,000,000 or more;
- a major increase in costs or prices for consumers, individual industries, government agencies, or geographic regions; or

- significant adverse effects on competition, employment, investment, productivity, innovation, or the ability of U.S. enterprises to compete with foreign enterprises in domestic and export markets.

5 U.S.C. 804(2).

Because the costs and benefits associated with this rule are expected to be minimal, OIRA determined that this is not a major rule. To comply with the CRA and FFA, CPSC will submit the required information to the appropriate Congressional offices and the Comptroller General.

## **XVIII. Conclusion**

For the reasons stated in this preamble, the Commission concludes that the amendments to the Standard adopted in this notice are needed to protect the public against unreasonable risk of the occurrence of fire leading to death or personal injury, or significant damage.

## **List of Subjects**

### **16 CFR Part 1610**

Clothing, Consumer protection, Flammable materials, Incorporation by reference, Reporting and recordkeeping requirements, Textiles, Warranties.

For the reasons discussed in the preamble, the Commission amends title 16 of the Code of Federal Regulations by revising part 1610 to read as follows:

### **PART 1610—STANDARD FOR THE FLAMMABILITY OF CLOTHING TEXTILES**

1. The authority citation for part 1610 continues to read as follows:

**Authority:** 15 U.S.C. 1191-1204.

2. Amend § 1610.2 by revising paragraphs (a) and (p) to read as follows:

### **§ 1610.2 Definitions.**

\* \* \* \* \*

(a) *Base burn* (also known as base fabric ignition or fusing) means the point at which the flame burns the ground (base) fabric of a raised surface textile fabric and provides a self-sustaining flame. Base burns, used to establish a Class 2 or 3 fabric, are those burns resulting from surface flash that occur on specimens in places other than the point of impingement (test result code SFBB) when the warp and fill yarns of a raised surface textile fabric undergo combustion. Base burns can be identified by an opacity change, scorching on the reverse side of the fabric, or when a physical hole is evident.

\* \* \* \* \*

(p) *Stop thread supply* means 3-ply, white, mercerized, 100% cotton sewing thread, with a Tex size of  $40 \pm 5$ .

\* \* \* \* \*

3. Amend § 1610.4 by revising paragraphs (a)(2), (b)(2), (c)(2), and Table 1 to read as follows:

**§ 1610.4 Requirements for classifying textiles.**

(a) \* \* \*

(2) *Raised surface textile fabric.* Such textiles in their original state and/or after being refurbished as described in § 1610.6(a) and (b), when tested as described in § 1610.6, shall be classified as Class 1, Normal Flammability, when the burn time is more than 7.0 seconds, or when they burn with a rapid surface flash (0.0 to 7.0 seconds), provided the intensity of the flame is so low as not to ignite or fuse the base fabric.

(b) \* \* \*

(2) *Raised surface textile fabric.* Such textiles in their original state and/or after being refurbished as described in § 1610.6(a) and (b), when tested as described in § 1610.6, shall be classified as Class 2, Intermediate Flammability, when the burn time is from 4.0 through 7.0

seconds, both inclusive, and the base fabric starts burning at places other than the point of impingement as a result of the surface flash (test result code SFBB).

(c) \* \* \*

(2) *Raised surface textile fabric.* Such textiles in their original state and/or after refurbishing as described in § 1610.6(a) and § 1610.6(b), when tested as described in § 1610.6, shall be classified as Class 3, Rapid and Intense Burning, when the time of flame spread is less than 4.0 seconds, and the base fabric starts burning at places other than the point of impingement as a result of the surface flash (test result code SFBB).

Table 1 to § 1610.4 – Summary of Test Criteria for Specimen Classification

[See § 1610.7]

Class	Plain surface textile fabric	Raised surface textile fabric
1	Burn time is 3.5 seconds or more. ACCEPTABLE (3.5 seconds is a pass)	(1) Burn time is greater than 7.0 seconds; or (2) Burn time is less than or equal to 7.0 seconds with no SFBB test result code. Exhibits rapid surface flash only. ACCEPTABLE – Normal Flammability
2	Class 2 is not applicable to plain surface textile fabrics.	Burn time is 4.0 to 7.0 seconds (inclusive) with base burn (SFBB). ACCEPTABLE – Intermediate Flammability
3	Burn time is less than 3.5 seconds. NOT ACCEPTABLE	Burn time is less than 4.0 seconds with base burn (SFBB). NOT ACCEPTABLE – Rapid and Intense Burning

Note: SFBB poi and SFBB poi\* are not considered a base burn for determining Class 2 and 3 fabrics.

4. Amend § 1610.5 by revising paragraphs (a)(2)(ii), (b)(6), and (b)(7) to read as follows:

#### § 1610.5 Test apparatus and materials.

(a) \* \* \*

(2) \* \* \*

(ii) *Stop thread supply.* This supply, consisting of a spool of 3-ply, white, mercerized, 100% cotton sewing thread, with a Tex size of  $40 \pm 5$  Tex, shall be fastened to the side of the chamber and can be withdrawn by releasing the thumbscrew holding it in position.

\* \* \* \* \*

(b) \* \* \*

(6) *Commercial dry cleaning machine.* The commercial dry cleaning machine shall be capable of providing a complete automatic dry-to-dry cycle using perchloroethylene solvent or hydrocarbon solvent and a cationic dry cleaning detergent as specified in § 1610.6(b)(1)(i).

(7) *Dry cleaning solvent.* The solvent shall be perchloroethylene, commercial grade, or hydrocarbon solvent, commercial grade.

\* \* \* \* \*

5. Amend § 1610.6 by revising paragraphs (b)(1)(i)(A), (b)(1)(ii), and (b)(1)(iii) to read as follows:

**§ 1610.6 Test procedure.**

\* \* \* \* \*

(b) \* \* \*

(1) \* \* \*

(i) \* \* \*

(A) All samples shall be dry cleaned before they undergo the laundering procedure.

Samples shall be dry cleaned in a commercial dry cleaning machine, using one of the following prescribed conditions:

(I) For perchloroethylene:

(i) Solvent: Perchloroethylene, commercial grade.

(ii) Detergent class: Cationic.

(iii) Cleaning time: 10-15 minutes.

(iv) Extraction time: 3 minutes.

(v) Drying Temperature: 60-66°C (140-150°F).

(vi) Drying Time: 18-20 minutes.

(vii) Cool Down/Deodorization time: 5 minutes.

(2) For hydrocarbon:

(i) Solvent: Hydrocarbon.

(ii) Detergent Class: Cationic.

(iii) Cleaning Time: 20-25 minutes.

(iv) Extraction Time: 4 minutes.

(v) Drying Temperature: 60-66°C (140-150°F).

(vi) Drying Time: 20-25 minutes.

(vii) Cool Down/Deodorization Time: 5 minutes.

Samples shall be dry cleaned in a load that is 80% of the machine's capacity.

(B) \* \* \*

(ii) *Laundering procedure.* The sample, after being subjected to the dry cleaning procedure, shall be washed and dried one time in accordance with section 9.2, section 9.4, section 12.2(A), Table I “(1) Normal,” “(IV) Hot,” and Table VI “(Aiii) Permanent Press” of AATCC LP1-2021 (incorporated by reference, see § 1610.6(b)(1)(iii)). Washing shall be performed in accordance with the detergent (powder) specified in section 9.4 of AATCC LP1-2021; parameters for water level, agitator speed, stroke length, washing time, spin speed, spin time, and wash temperature specified in Table I, “Standard Washing Machine Parameters,” “(1) Normal” and “(IV) Hot” of AATCC LP1-2021; and a maximum wash load as specified in section 9.2 of AATCC LP1-2021, which may consist of any combination of test samples and dummy pieces. Drying shall be performed in accordance with section 12.2(A) of AATCC LP1-2021, Tumble Dry, using the exhaust temperature and cool down time specified in Table VI, “Standard Tumble Dryer Parameters,” “(Aiii) Permanent Press” of AATCC LP1-2021.

(iii) AATCC LP1-2021, Laboratory Procedure for Home Laundering: Machine Washing, 2021, is incorporated by reference. The Director of the Federal Register approves this incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. A read-only copy of the standard is available for viewing on the AATCC website. You may obtain a copy from the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, North Carolina 27709; telephone (919) 549-8141; [www.aatcc.org](http://www.aatcc.org). You may inspect a copy at the Office of the Secretary, U.S. Consumer Product Safety Commission, Room 710, 4330 East West Highway, Bethesda, MD 20814, telephone (301) 504-7479, e-mail [cpssc-os@cpssc.gov](mailto:cpssc-os@cpssc.gov), or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, e-mail [fr.inspection@nara.gov](mailto:fr.inspection@nara.gov), or go to: [www.archives.gov/federal-register/cfr/ibr-locations.html](http://www.archives.gov/federal-register/cfr/ibr-locations.html).

\* \* \* \* \*

6. Amend § 1610.7 by revising paragraph (b) to read as follows:

**§ 1610.7 Test sequence and classification criteria.**

\* \* \* \* \*

(b) *Test sequence and classification criteria.* (1) Step 1, Plain Surface Textile Fabrics in the original state.

(i) Conduct preliminary tests in accordance with § 1610.6(a)(2)(i) to determine the fastest burning direction of the fabric.

(ii) Prepare and test five specimens from the fastest burning direction. The burn times determine whether to assign the preliminary classification and proceed to § 1610.6(b) or to test five additional specimens.

(iii) Assign the preliminary classification of Class 1, Normal Flammability, and proceed to § 1610.6(b) when:

(A) There are no burn times; or

(B) There is only one burn time, and it is equal to or greater than 3.5 seconds; or

(C) The average burn time of two or more specimens is equal to or greater than 3.5 seconds.

(iv) Test five additional specimens when there is either only one burn time, and it is less than 3.5 seconds; or there is an average burn time of less than 3.5 seconds. Test these five additional specimens from the fastest burning direction as previously determined by the preliminary specimens. The burn times for the 10 specimens determine whether to:

(A) Stop testing and assign the final classification as Class 3, Rapid and Intense Burning, only when there are two or more burn times with an average burn time of less than 3.5 seconds; or

(B) Assign the preliminary classification of Class 1, Normal Flammability, and proceed to § 1610.6(b) when there are two or more burn times with an average burn time of 3.5 seconds or greater.

(v) If there is only one burn time out of the 10 test specimens, the test is inconclusive. The fabric cannot be classified.

(2) Step 2, Plain Surface Textile Fabrics after refurbishing in accordance with § 1610.6(b)(1).

(i) Conduct preliminary tests in accordance with § 1610.6(a)(2)(i) to determine the fastest burning direction of the fabric.

(ii) Prepare and test five specimens from the fastest burning direction. The burn times determine whether to stop testing and assign the preliminary classification or to test five additional specimens.

(iii) Stop testing and assign the preliminary classification of Class 1, Normal

Flammability, when:

(A) There are no burn times; or

(B) There is only one burn time, and it is equal to or greater than 3.5 seconds; or

(C) The average burn time of two or more specimens is equal to or greater than 3.5 seconds.

(iv) Test five additional specimens when there is only one burn time, and it is less than 3.5 seconds; or there is an average burn time less than 3.5 seconds. Test five additional specimens from the fastest burning direction as previously determined by the preliminary specimens. The burn times for the 10 specimens determine the preliminary classification when:

(A) There are two or more burn times with an average burn time of 3.5 seconds or greater. The preliminary classification is Class 1, Normal Flammability; or

(B) There are two or more burn times with an average burn time of less than 3.5 seconds.

The preliminary and final classification is Class 3, Rapid and Intense Burning; or

(v) If there is only one burn time out of the 10 specimens, the test results are inconclusive. The fabric cannot be classified.

(3) Step 1, Raised Surface Textile Fabric in the original state.

(i) Determine the area to be most flammable per § 1610.6(a)(3)(i).

(ii) Prepare and test five specimens from the most flammable area. The burn times and visual observations determine whether to assign a preliminary classification and proceed to § 1610.6(b) or to test five additional specimens.

(iii) Assign the preliminary classification and proceed to § 1610.6(b) when:

(A) There are no burn times. The preliminary classification is Class 1, Normal Flammability; or

(B) There is only one burn time and it is less than 4.0 seconds without an SFBB test result code, or it is 4.0 seconds or greater with or without an SFBB test result code. The preliminary classification is Class 1, Normal Flammability; or

(C) There are no base burns (SFBB) regardless of the burn time(s). The preliminary classification is Class 1, Normal Flammability; or

(D) There are two or more burn times with an average burn time of 0.0 to 7.0 seconds with a surface flash only. The preliminary classification is Class 1, Normal Flammability; or

(E) There are two or more burn times with an average burn time greater than 7.0 seconds with any number of base burns (SFBB). The preliminary classification is Class 1, Normal Flammability; or

(F) There are two or more burn times with an average burn time of 4.0 through 7.0 seconds (both inclusive) with no more than one base burn (SFBB). The preliminary classification is Class 1, Normal Flammability; or

(G) There are two or more burn times with an average burn time less than 4.0 seconds with no more than one base burn (SFBB). The preliminary classification is Class 1, Normal Flammability; or

(H) There are two or more burn times with an average burn time of 4.0 through 7.0 seconds (both inclusive) with two or more base burns (SFBB). The preliminary classification is Class 2, Intermediate Flammability.

(iv) Test five additional specimens when the tests of the initial five specimens result in either of the following: There is only one burn time and it is less than 4.0 seconds with a base burn (SFBB); or the average of two or more burn times is less than 4.0 seconds with two or more base burns (SFBB). Test these five additional specimens from the most flammable area. The burn times and visual observations for the 10 specimens will determine whether to:

(A) Stop testing and assign the final classification only if the average burn time for the 10 specimens is less than 4.0 seconds with three or more base burns (SFBB). The final classification is Class 3, Rapid and Intense Burning; or

(B) Assign the preliminary classification and continue on to § 1610.6(b) when:

(1) The average burn time is less than 4.0 seconds with no more than two base burns (SFBB). The preliminary classification is Class 1, Normal Flammability; or

(2) The average burn time is 4.0 to 7.0 seconds (both inclusive) with no more than 2 base burns (SFBB). The preliminary classification is Class 1, Normal Flammability; or

(3) The average burn time is greater than 7.0 seconds. The preliminary classification is Class 1, Normal Flammability; or

(4) The average burn time is 4.0 to 7.0 seconds (both inclusive) with three or more base burns (SFBB). The preliminary classification is Class 2, Intermediate Flammability; or

(v) If there is only one burn time out of the 10 specimens, the test is inconclusive. The fabric cannot be classified.

(4) Step 2, Raised Surface Textile Fabric After Refurbishing in accordance with § 1610.6(b).

(i) Determine the area to be most flammable in accordance with § 1610.6(a)(3)(i).

(ii) Prepare and test five specimens from the most flammable area. Burn times and visual observations determine whether to stop testing and determine the preliminary classification or to test five additional specimens.

(iii) Stop testing and assign the preliminary classification when:

(A) There are no burn times. The preliminary classification is Class 1, Normal Flammability; or

(B) There is only one burn time, and it is less than 4.0 seconds without an SFBB test result code; or it is 4.0 seconds or greater with or without an SFBB test result code. The preliminary classification is Class 1, Normal Flammability; or

(C) There are no base burns (SFBB) regardless of the burn time(s). The preliminary classification is Class 1, Normal Flammability; or

(D) There are two or more burn times with an average burn time of 0.0 to 7.0 seconds with a surface flash only. The preliminary classification is Class 1, Normal Flammability; or

(E) There are two or more burn times with an average burn time greater than 7.0 seconds with any number of base burns (SFBB). The preliminary classification is Class 1, Normal Flammability; or

(F) There are two or more burn times with an average burn time of 4.0 to 7.0 seconds (both inclusive) with no more than one base burn (SFBB). The preliminary classification is Class 1, Normal Flammability; or

(G) There are two or more burn times with an average burn time less than 4.0 seconds with no more than one base burn (SFBB). The preliminary classification is Class 1, Normal Flammability; or

(H) There are two or more burn times with an average burn time of 4.0 to 7.0 seconds (both inclusive) with two or more base burns (SFBB). The preliminary classification is Class 2, Intermediate Flammability.

(iv) Test five additional specimens when the tests of the initial five specimens result in either of the following: There is only one burn time, and it is less than 4.0 seconds with a base burn (SFBB); or the average of two or more burn times is less than 4.0 seconds with two or more base burns (SFBB).

(v) If required, test five additional specimens from the most flammable area. The burn times and visual observations for the 10 specimens determine the preliminary classification when:

(A) The average burn time is less than 4.0 seconds with no more than two base burns (SFBB). The preliminary classification is Class 1, Normal Flammability; or

(B) The average burn time is less than 4.0 seconds with three or more base burns (SFBB). The preliminary and final classification is Class 3, Rapid and Intense Burning; or

(C) The average burn time is greater than 7.0 seconds. The preliminary classification is Class 1, Normal Flammability; or

(D) The average burn time is 4.0 to 7.0 seconds (both inclusive), with no more than two base burns (SFBB). The preliminary classification is Class 1, Normal Flammability; or

(E) The average burn time is 4.0 to 7.0 seconds (both inclusive), with three or more base burns (SFBB). The preliminary classification is Class 2, Intermediate Flammability; or

(vi) If there is only one burn time out of the 10 specimens, the test is inconclusive. The fabric cannot be classified.

7. Amend § 1610.8 by revising paragraph (b) to read as follows:

**§ 1610.8 Reporting results.**

\* \* \* \* \*

(b) *Test result codes.* The following are definitions for the test result codes, which shall be used for recording flammability results for each specimen that is burned.

(1) For Plain Surface Textile Fabrics:

(i) DNI Did not ignite.

(ii) IBE Ignited, but extinguished.

(iii) \_.\_ sec. Actual burn time measured and recorded by the timing device.

(2) For Raised Surface Textile Fabrics:

(i) \_\_. \_\_ SFBB Time in seconds, surface flash base burn starting at places other than the point of impingement as a result of surface flash.

(ii) \_\_. \_\_ SFBB poi Time in seconds, surface flash base burn starting at the point of impingement.

(iii) \_\_. \_\_ SFBB poi\* Time in seconds, surface flash base burn possibly starting at the point of impingement. The asterisk is accompanied by the following statement: “Unable to make absolute determination as to source of base burns.” This statement is added to the result of any specimen if there is a question as to origin of the base burn.

(iv) \_\_. \_\_ SF only Time in seconds, surface flash only. No damage to the base fabric.

(v) SF poi Surface flash, at the point of impingement only (equivalent to “did not ignite” for plain surfaces).

(vi) SF uc Surface flash, under the stop thread, but does not break the stop thread.

(vii) SF pw Surface flash, part way. No time shown because the surface flash did not reach the stop thread.

**Alberta E. Mills,**

*Secretary,*

*Consumer Product Safety Commission.*



United States  
**Consumer Product Safety Commission**

## Staff Briefing Package

### Final Rule to Amend the Standard for the Flammability of Clothing Textiles

October 11, 2023

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*This report was prepared by the CPSC staff.  
It has not been reviewed or approved by,  
and may not necessarily reflect the views of,  
the Commission.*

## Executive Summary

Congress enacted the Flammable Fabrics Act (FFA; 15 U.S.C. §§ 1191-1204) in 1953. As part of its authority under the FFA, in 1975 the Commission codified the Standard for the Flammability of Clothing Textiles at 16 C.F.R. part 1610 (Standard). The purpose of the Standard is to keep dangerously flammable textiles and clothing made of such textiles out of commerce. Clothing and textile fabrics intended to be used for clothing are required to meet the Standard. The Standard provides a method of testing the flammability of clothing textiles, establishes three classes of flammability based on the time of flame spread, and specifies whether each class can be used for clothing, prohibiting the most dangerously flammable fabrics from being used for clothing.

Since 1975, the Commission has updated the Standard several times to clarify requirements and update outdated materials, equipment, and technologies. In 2022, the Commission issued a Notice of Proposed Rulemaking (NPR) proposing several updates to the Standard.<sup>1</sup> Specifically, the NPR proposed to amend the provisions regarding test result codes, the specification for stop thread used for testing, and the equipment used for refurbishing (*i.e.*, dry cleaning and laundering) samples during testing. The NPR provided information and test results in support of the proposed changes. The purpose of the proposed revisions is to clarify and streamline provisions and to update references to outdated or unavailable equipment and test materials, while maintaining test results and flammability classifications comparable to the current Standard. Comments on the NPR generally supported the proposed changes. The draft final rule is consistent with the amendments proposed in the NPR, with minor, non-substantive revisions based on the comments received.

The draft final rule is intended to make the Standard easier to understand and more consistent with currently available materials and equipment. Its rule amendments would improve consumer safety by facilitating testing laboratories obtaining consistent and reliable test results, which are necessary to accurately determine the classification of a fabric and whether it may be used for clothing. The draft amendments updating 16 C.F.R. part 1610 are not expected to have any significant economic effects on manufacturers, testing laboratories, consumers or other parties.

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<sup>1</sup> 87 Fed. Reg. 56,289 (Sep. 14, 2022).

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# Briefing Memorandum

Staff Briefing Package: Final Rule to Amend the Standard for the Flammability of Clothing Textiles

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**TO:** The Commission  
 Alberta E. Mills, Secretary

**THROUGH:** Austin C. Schlick, General Counsel  
 Jason K. Levine, Executive Director  
 DeWane Ray, Deputy Executive Director for Operations

**FROM:** Duane Boniface, Assistant Executive Director,  
 Office of Hazard Identification and Reduction

Paige Witzen, Project Manager,  
 Division of Engineering  
 Directorate for Laboratory Sciences

**SUBJECT:** Staff Recommendation for a Final Rule to Amend the  
 Standard for the Flammability of Clothing Textiles

**DATE:** October 11, 2023

## Introduction and Background

In 1953, Congress enacted the Flammable Fabrics Act (FFA; 15 U.S.C. 1191-1204), which required that Commercial Standard 191-53, Flammability of Clothing Textiles (CS 191-53), be used to determine if fabric or clothing is “so highly flammable as to be dangerous when worn by individuals.” In 1975, the Commission codified CS 191-53 as the Standard for the Flammability of Clothing Textiles at 16 C.F.R. part 1610 (Standard).<sup>1</sup> The purpose of the Standard is to reduce the risk of injury and death by providing a standard for testing and rating the flammability of textile products used for clothing and prohibiting the use of dangerously flammable clothing textiles. 16 C.F.R. 1610.1(a). The Standard includes test equipment, materials, and procedures for testing the flammability of clothing textiles. As a general overview, the Standard includes specifications for a flammability test apparatus; refurbishing requirements (dry cleaning and laundering); a test procedure that involves recording burn behavior observations and the time it takes to sever a stop thread after impingement of a flame; and test result codes (*i.e.*, burn codes) that help determine the classification of the specimen. The classifications determine whether the textile may be used in clothing.

The Commission has amended 16 C.F.R. part 1610 several times to clarify requirements and update outdated materials, equipment, and technologies. Most recently, the Commission initiated an update in 2019, issuing a Request for Information (RFI) that sought input on ways to update the Standard to reduce testing burdens, improve clarity, and reflect current industry practices and technologies.<sup>2</sup> Following the RFI, staff submitted a status update briefing

<sup>1</sup> 40 Fed. Reg. 59,884 (Dec. 30, 1975).

<sup>2</sup> 84 Fed. Reg. 16,797 (Apr. 23, 2019).

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package to the Commission in 2020, recommending that the Commission initiate rulemaking to amend the Standard.<sup>3</sup>

In September 2022, the Commission issued a notice of proposed rulemaking (NPR)<sup>4</sup> proposing the following amendments to the Standard:

- clarifying the test result code (*i.e.*, burn code) descriptions that are used for reporting test results;
- updating the description of the specified stop thread<sup>5</sup> to provide clarity and reflect available products; and
- updating the refurbishing procedures, including laundering specifications and dry cleaning procedures, to reflect restrictions on the use of certain dry cleaning solvents and the availability of washing machines meeting the current Standard.

The purpose of the proposed amendments was not to alter the test method or criteria in the Standard for determining the flammability of a fabric or whether it is permissible for use in clothing, but rather, to facilitate accurate testing and classifications by clarifying existing requirements and updating material and equipment specifications to reflect currently available stop thread and refurbishing equipment technology. The NPR and the briefing package supporting it include detailed information and test results regarding the reasons for the draft amendments and the comparability of the recommended changes to the existing Standard. They also discuss an allowance in the existing regulations for the continued use of equipment and materials that are currently required, if the draft amendments are finalized. This allowance would permit testing laboratories to continue to use the current Standard. See the NPR and the briefing package supporting the NPR for further details.<sup>6</sup>

Four commenters provided input on the NPR. The comments were generally supportive of the proposed amendments and are discussed in this briefing package. In general, staff recommends that the Commission issue a final rule (FR) that amends the Standard as proposed in the NPR, with minor technical changes resulting from comments on the NPR. This briefing package discusses these minor revisions as well as the safety hazard being addressed, recalls relevant to the Standard, and economic considerations related to the rulemaking.

## Risk of Injury

From 2000 through 2021 (the most recent year for which data are available), there were an average of 85.8 deaths per year in the United States caused by the ignition or melting of

<sup>3</sup> The status update briefing package is available at: <https://www.cpsc.gov/s3fs-public/StatusUpdate-16CFRPart1610RuleUpdateandConsiderationforAddingSpandexFiberstotheListofCurrentlyExemptedFibers-from-Testing.pdf>.

<sup>4</sup> 87 Fed. Reg. 56289 (Sep. 14, 2022).

<sup>5</sup> The stop thread is used to determine burn time, which is needed to help determine the classification of specimens and whether they are acceptable for use in clothing.

<sup>6</sup> The NPR briefing package is available at: <https://www.federalregister.gov/documents/2022/09/14/2022-19505/standard-for-the-flammability-of-clothing-textiles-notice-of-proposed-rulemaking#:~:text=The%20purpose%20of%20the%20Standard%20is%20to%20reduce,procedures%20or%20testing%20the%20flammability%20of%20clothing%20textiles.>

clothing. In addition, using CPSC's National Electronic Injury Surveillance System (NEISS),<sup>7</sup> in the most recent 5 years of NEISS data available (2018–2022), there was an estimated annual average of 5,500 nonfatal injuries associated with clothing ignition treated in U.S. hospital emergency departments. The Standard is intended to reduce the risk of injury and death by requiring testing and classification criteria to prohibit the use of dangerously flammable clothing textiles. Detailed incident information is available in Tab A of this briefing package.

## Recalls

There were two recalls of apparel violating the Standard between August 2022 and August 2023. Both garments had plain surface fabric on the outside and raised surface fabric that was exposed from the inside. The raised surface fabric did not meet the requirements of the Standard.

## Comments Received on the Proposed Rule

There were four comments submitted during the NPR comment period. Commenters were: American Apparel and Footwear Association (AAFA), China WTO/TBT (China), a George Washington University student (student), and Consumer Safety Consultancy (CSC). Although the Commission offered the opportunity for interested parties to provide oral comments at a public hearing, CPSC did not receive a request for an oral hearing. In general, the commenters expressed support for updating the Standard, but some commenters offered suggested changes to the proposed amendments or disagreed with portions of the NPR. This section provides an overview of the substantive comments on the NPR; further detail about the comments and staff's response are in Tab B of this briefing package. For background about the proposed changes and the justifications and test data supporting them, see the NPR and NPR briefing package.

## Clarification of the Test Result Codes

The Standard establishes three classes of flammability of clothing textiles and prohibits the use of textiles unsuitable for clothing. Class 1 and 2 fabrics are permissible for use in clothing, while class 3 fabrics are not. The flammability classes are determined by the measure of burn time (i.e., time from impingement of the flame to severing of the stop thread) and flame intensity (discussed below). The Standard lists a number of specific test result codes (i.e., burn codes) that describe the burning behavior of fabrics, which must be used to record the flammability results for each specimen and help determine the proper classification for the sample (16 C.F.R. § 1610.8). Table 1 in the Standard is intended to provide a summary of the test results and what classification is associated with them. AAFA, China, and the student stated their support for the proposed changes to the Test Result Codes. CSC disagreed with the proposed changes to Table 1. They indicated that Table 1 only provides general criteria for classification, with further details elsewhere in the Standard. For reasons described in Tab B, staff still recommends the changes to Table 1 that the Commission proposed in the NPR. CSC also disagreed with the

<sup>7</sup> NEISS uses a probability sample of about 100 hospitals in the United States that represent all U.S. hospitals with emergency departments to identify and generate national estimates of nonfatal injuries treated in emergency departments.

proposal to combine the surface flash burn codes with no burn time (SFpoi, SFpw, and SFuc) into a single code, SFntr, because observations about burn behavior are useful for determining safety, even if it does not alter classifications. Staff agrees that there is some utility to having the separate burn codes, and therefore, recommends retaining these three existing burn codes, but reordering them to have the burn codes in order of describing burning behavior from the most to least risk of hazard to consumers. This order also lists the burn code SFBB first as it is the code, along with burn time, to determine Class 2 and 3 fabrics, which are more flammable than Class 1 fabrics. Reordering the existing burn codes would not alter how they are determined or how fabrics are classified; it would simply make it easier for testers to determine which code (SFBB) is used to determine which code classifies Class 2 and 3 fabrics as it is listed first. Being able to classify fabrics more easily will reduce testers' misclassification of fabrics and allow greater efficiency in testing.

### **Stop Thread Description**

The Standard specifies test methods, test apparatus and materials required for testing. The test generally involves placing a textile specimen in the test apparatus, stringing stop thread across the specimen, activating a trigger device that impinges a flame, and recording the time it takes to sever the stop thread, and observations of the burn behavior of the specimen. All commenters support updating the stop thread description, with AAFA noting that labs reported difficulty sourcing the required thread and that a range of Tex sizes was an appropriate option. However, China and CSC questioned whether additional fabric types (raised surface fabrics and Class 3 fabrics, respectively) should have been tested as well. Staff did not test Class 3 fabrics or raised surface fabrics with the different threads because the purpose of the thread comparison study was to determine whether differences in thread effected burn times and flammability classifications and to determine what range of Tex sizes yielded comparable flammability results to the current Standard. To accomplish this, staff aimed to keep all other parameters as consistent as possible to isolate the effect of the stop thread on the burn times. Additional testing on additional raised surface or Class 3 fabrics would not be necessary as the burning behavior of the thread is the only property we were concerned with. As such, staff recommends retaining the requirements proposed in the NPR.

### **Refurbishing Procedures**

The Standard requires fabrics to be tested in their original state and after being refurbished (dry cleaned and then laundered) one time. The purpose of the refurbishing requirement is to remove any non-durable or water-soluble treatments present on the fabric that can affect its flammability performance. It is not meant to replicate how the garment is to be used or cared for by the consumer over its useful life. The commenters who addressed the proposed amendments to the refurbishing requirements expressed support for the proposed changes.

### **Discussion**

Staff recommends amending the Standard consistent with the NPR, with minor modifications resulting from comments on the NPR. The recommended amendments are discussed in detail in the NPR and NPR briefing package. This section only addresses changes that staff recommends to the amendments proposed in the NPR, which apply to the clarification of the

test result codes and the stop thread description. Staff does not recommend any changes to the proposed amendments in the NPR regarding the refurbishing provisions.

### Clarification of the Test Result Codes

In the NPR, the Commission proposed to revise 16 C.F.R. § 1610.8, which lists the burn codes and requirements relevant to them, to streamline the codes by consolidating similar codes and removing unnecessary and confusing codes. Specifically, the Commission proposed to combine the burn codes SF uc, SF pw, and SF poi into a single new burn code, SF ntr (no time recorded, does not break stop thread), because the three existing codes all describe burning behavior that does not have enough intensity to break the stop thread and, accordingly, have no burn time and all result in a fabric being Class 1. Because the purpose of burn codes is to determine the classification of fabrics, staff considered it unnecessary to have all three of these codes; instead, a single code, indicating that there was no burn time recorded, would be sufficient.

However, as noted above, CPSC received a comment regarding this proposed change, indicating that observations about the intensity of a burn or burn behavior are also important because they may indicate that additional testing is appropriate. Staff agrees that there is some utility to having the separate burn codes that allows for documentation of different burning behavior, and therefore, recommends not adopting the change proposed in the NPR. Instead, staff recommends retaining the three separate burn codes, but reordering them, listed below<sup>8</sup>.

Recommended Language for section 1610.8(b)(2):

(2) For Raised Surface Textile Fabrics:

\_\_ SFBB Time in seconds, surface flash base burn starting at places other than the point of impingement as a result of surface flash.

\_\_ SFBB poi Time in seconds, surface flash base burn starting at the point of impingement.

\_\_ SFBB poi\* Time in seconds, surface flash base burn possibly starting at the point of impingement. The asterisk is accompanied by the following statement: "Unable to make absolute determination as to source of base burns." This statement is added to the result of any specimen if there is a question as to origin of the base burn.

\_\_ SF only Time in seconds, surface flash only. No damage to the base fabric.

SF poi Surface flash, at the point of impingement only (equivalent to "did not ignite" for plain surfaces).

SF uc Surface flash, under the stop thread, but does not break the stop thread.

SF pw Surface flash, part way. No time shown because the surface flash did not reach the stop thread.

This change does not change the Standard substantively or alter the descriptions of any of the codes. The reordering of the burn codes allows for the burn code SFBB to be listed first as it is the code, along with burn time, that determines if a fabric is Class 2 or 3. All other codes indicate a Class 1 fabric but describe different burning behavior. SFpoi, SFuc and SFpw describe burning behavior that poses the least risk to consumers and, therefore, staff recommends these be listed at the end.

<sup>8</sup> See Tab B in the NPR for more in-depth discussion of the burn codes and how they are used.

## Stop Thread Description

Staff recommends changing the Tex<sup>9</sup> description of the thread from 35-45 Tex to 40 +/- 5 Tex. This change is not substantive as the same threads would meet both descriptions. This change still allows the same range of Tex sizes to be used while providing an absolute value with a tolerance rather than a range. The purpose of this change is to provide clarity and is consistent with how other values are conveyed in the Standard.

## Regulatory Flexibility Act Analysis

Tab C of this briefing includes a final regulatory analysis, required by the FFA, 15 U.S.C. § 1193(j), which primarily focuses on the potential benefits and costs associated with the rule, and alternatives staff considered.

Staff states that there would be some unquantifiable benefits associated with the recommended amendments. Although staff's testing indicates that the amendments would provide flammability test results consistent with the current Standard, the amendments would facilitate compliance by providing clearer and more up-to-date provisions, which is likely to result in more reliable and consistent flammability classifications and reduce burdens associated with sourcing unclear or unavailable materials and equipment for testing laboratories.

Staff expects the recommended amendments would be largely cost-neutral. The revisions to test result codes would not impose costs, because they merely clarify, and do not alter, the Standard. Similarly, the recommended revisions to the stop thread description would not impose costs, because they would allow the continued use of the thread currently specified in the Standard, as well as allow a broader range of thread options, making it easier and less costly for firms to source compliant thread. The update to the dry cleaning provisions would not impose costs because it would retain the current provisions and add an alternative that is low in cost, readily available, and widely used. Finally, although staff notes that the revisions to the laundering requirements could potentially create costs for firms that replace machines that comply with the current Standard with machines that meet the specifications listed in LP1, this cost would likely be low, mitigated by the reduction in burdens for firms unable to source currently required machines, and could be avoided by using the provisions in section 1610.40 to continue to use older machines.

Staff's analysis also discusses potential alternatives to the amendments, notes potential benefits and costs associated with these options, and explains why staff does not recommend these alternatives. Overall, the costs associated with staff's recommended amendments are expected to be very low or non-existent, and other alternatives generally do not offer improved benefits.

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<sup>9</sup> "Tex" is defined as the weight in grams of 1000 meters of yarn.

## Staff's Conclusion and Recommendation

Comments received on the proposed update to 16 C.F.R. part 1610 were generally supportive. The purpose of the recommended amendments is to modify the current procedures only as necessary to reflect the existence of modern equipment and to provide clarification on several aspects of the Standard. Staff's testing, as discussed in the NPR, aimed to ensure that the recommended amendments would not change the classification criteria of the Standard and minimize the likelihood that any textiles would yield different classifications. As noted above, the draft updating 16 C.F.R. part 1610 is not expected to have any significant economic effects on manufacturers, testing laboratories, consumers, or other parties.

The staff recommends that the Commission issue the draft final rule to amend 16 C.F.R. part 1610 Standard for the Flammability of Clothing Textiles, as proposed in the NPR, with minor changes as discussed in this briefing package.

## Certification and Notice of Requirements

Because the Standard applies to clothing and textiles intended to be used for clothing, it applies to both non-children's products and children's products. Accordingly, the testing and certification requirements in section 14(a) of the Consumer Product Safety Act (CPSA; 15 U.S.C. 2051-2089) apply to products tested under the Standard. Consistent with the CPSA requirements for testing and certifying children's products, the Commission previously published a notice of requirements (NOR) for third party conformity assessment bodies to obtain accreditation to assess conformity with the Standard. 16 C.F.R. § 1112.15(b)(20).

In the NPR, the Commission proposed no changes to the NOR. No comments were submitted on that issue. Therefore, staff recommends finalizing the rule without any changes to the NOR.

## Effective Date

The FFA states that an amendment to a flammability standard must take effect 12 months after the amendment is issued unless the Commission finds a good cause reason that is in the public interest to implement an earlier or later effective date and publishes the reasons for that finding. 15 U.S.C. § 1193(b). The FFA also requires that an amendment of a flammability standard exempt fabrics, related materials, and products "in inventory or with the trade" on the date the amendment becomes effective, unless the Commission prescribes, limits, or withdraws that exemption because it finds that the product is "so highly flammable as to be dangerous when used by consumers for the purpose for which it is intended." *Id.*

In the NPR, the Commission proposed a 6-month effective date, noting that an effective date earlier than 12 months is justified by the following factors: the anticipated prohibition on the use of perchloroethylene in dry cleaning in California, which took effect on January 1, 2023; that washing machines that meet the Standard are no longer made and the update would make it easier for labs to get compliant washing machines; and all of the recommended changes should have minimal impacts and are intended for clarity and to relieve burdens associated outdated equipment. No comments were received in opposition to the proposed 180 day effective date; therefore, for the reasons stated in the NPR, staff recommends that the draft final rule have a 180 day effective date.

In addition, staff recommends that the Commission exempt from the amendments those fabrics, related materials, and products “in inventory or with the trade” on the date the amendment becomes effective. Because the draft rule is intended to have minimal impacts, staff did not identify a reason that the rule would justify limiting that exemption, as required in the statute. The proposed amendment relates to an existing regulation. There is no alternative voluntary standard that contains provisions sufficient to address all of the updates that staff recommends<sup>10</sup>.

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<sup>10</sup> In the NPR Briefing Memorandum, staff reviewed voluntary and international standards that are relevant to 16 CFR part 1610 and the recommended changes.

## Tab A: Memorandum by the Directorate for Epidemiology, Incident Data



# Memorandum

**TO:** Paige Witzen, Project Manager  
Division of Engineering,  
Directorate for Laboratory Sciences

**DATE:** May 18, 2023

**THROUGH:** Steve Hanway, AED  
Directorate for Epidemiology (EPI)

Ryan Seebruck, Director, Division of Hazard Analysis,  
Directorate for Epidemiology (EPHA)

**FROM:** David Miller, Statistician  
Division of Hazard Analysis (EPHA)  
Directorate for Epidemiology

**SUBJECT:** Clothing Ignition Fatalities and Emergency Department-Treated Injuries

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## Background

In this memorandum, Consumer Product Safety Commission (CPSC) staff is providing information related to the Commission's pending decisions related to updating some of the provisions of its clothing flammability standard (16 C.F.R. part 1610). As part of this briefing package, CPSC staff is providing information about deaths and injuries associated with clothing fires<sup>1</sup>.

## Methodology

### Clothing Fire Deaths:

The National Center for Health Statistics (NCHS) maintains a database of all recorded deaths in the fifty states and the District of Columbia. It is called the CDC Wonder Online Database. This database has a variable called *Underlying Cause of Death*. This variable has two different codes (these codes are called ICD 10 codes) for the ignition of clothing. They are:

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<sup>1</sup> The information in this memo is the same as the information presented in the NPR with the addition of 2021 CDC death counts and 2022 NEISS estimates.

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- X05 – Exposure to ignition or melting of nightwear
- X06 – Exposure to ignition or melting of other clothing and apparel

These two codes were used to count the clothing fire deaths for the years 2000 – 2021.

The National Fire Incident Reporting System (NFIRS) residential structure fire estimates that CPSC staff produce for clothing fires (and other products), rely on NFIRS, which come from fire department reports. However, not all fire departments report to NFIRS and so the estimates are produced by weighting to national estimates that are obtained from the National Fire Protection Association's (NFPA) Survey of Fire Departments. Unlike the NFIRS estimates, these counts of death certificates from CDC Wonder are a census of death certificates.

As a count of all the death certificates where clothing fire was cited as the underlying cause of death, this data includes some deaths left out of the NFIRS estimates. The NFIRS estimates exclude deaths from fires that were intentionally set and also deaths from fires that occurred outside of residential structures. These counts from the CDC Wonder database include deaths from fires that occur outside of residences and also from fires that were intentionally set.

### **Clothing Fire Injuries:**

Estimates of non-fatal burn injuries associated with clothing ignition were based on data reported through CPSC's National Electronic Injury Surveillance System (NEISS), a probability sample of hospital emergency departments that represent all hospitals with emergency departments in the United States. Participating hospitals capture all injuries associated with consumer products and recreational activities that are treated in their emergency departments, allowing calculation of national estimates of injuries by product, along with confidence intervals associated with those estimates.

To identify NEISS injuries caused by the ignition of clothing worn by consumers, CPSC staff used the following NEISS product codes:

- 1644 – Nightwear
- 1645 – Daywear
- 1646 – Outerwear
- 1658 – Clothing Not Specified
- 1677 – Other Clothing

The NEISS code for Diagnosis and the narrative were also used to identify which incidents were in-scope as clothing ignition injuries. The incidents considered in-scope were limited to those with a Diagnosis code of either '51 – Thermal Burns' or '47 – Burns Not Specified.' Also, to be considered in-scope, an incident had to have comments in the narrative indicating clothing ignition.

## Results

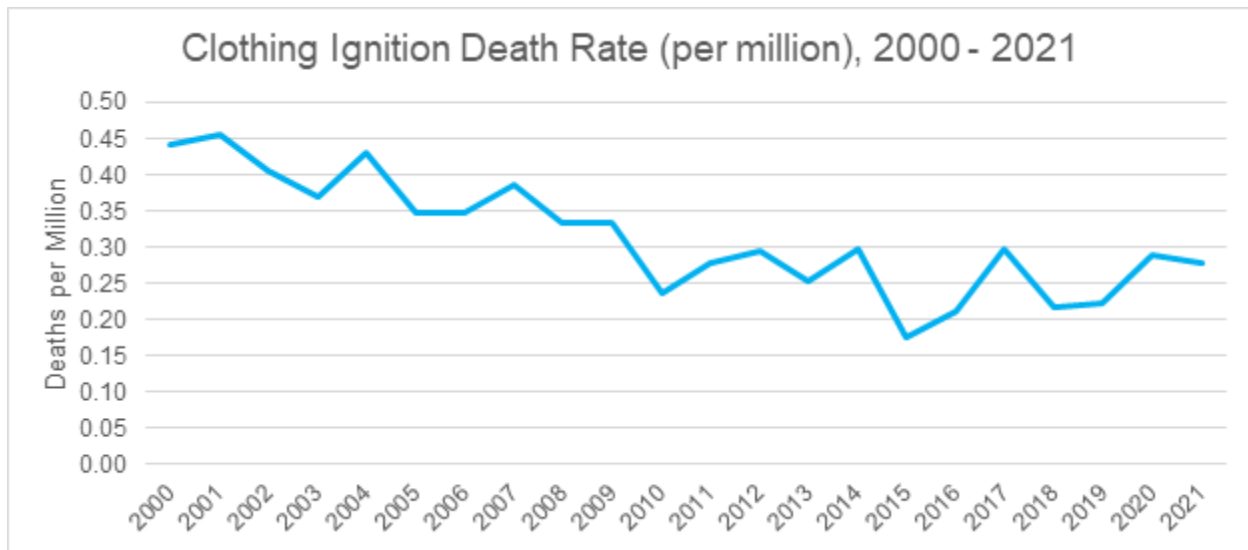
### Clothing Fire Deaths:

The counts of clothing ignition fire deaths (from NCHS) for the years 2000 – 2021 are presented in Table 1 below. The death counts are broken down into deaths resulting from the ignition or melting of nightwear and those caused by the ignition or melting of other clothing or apparel. The table also includes the clothing ignition fire death rate (per million population). The table shows that the number of yearly clothing fire deaths and the corresponding death rates have declined during this period. The decline appears to have occurred largely between 2000 and 2009. Figure 1 displays the clothing fire death rate (per million population) that is seen in the last column of Table 1.

**Table 1. Clothing Ignition Fatalities, 2000–2021**

Year	Deaths	Nightwear	Other Clothing	Deaths per Million Population
2000	125	9	116	0.44
2001	130	5	125	0.46
2002	117	13	104	0.41
2003	107	3	104	0.37
2004	126	7	119	0.43
2005	103	6	97	0.35
2006	104	5	99	0.35
2007	116	3	113	0.39
2008	101	4	97	0.33
2009	102	5	97	0.33
2010	73	4	69	0.24
2011	87	4	83	0.28
2012	92	3	89	0.29
2013	80	0	80	0.25
2014	95	2	93	0.30
2015	56	3	53	0.17
2016	68	0	68	0.21
2017	97	6	91	0.30
2018	71	3	68	0.22
2019	73	1	72	0.22
2020	96	1	95	0.29
2021	92	2	90	0.28
<b>2017 – 2021 Avg.</b>	<b>85.8</b>	<b>2.6</b>	<b>83.2</b>	<b>0.26</b>

Source: Death counts obtained from CDC Wonder data. Population estimates obtained from U.S. Census resident population estimates (<https://www.census.gov/data/datasets/time-series/demo/popest/2010s-national-detail.html>).

**Figure 1. Clothing Ignition Fire Death Rate (per Million Population), 2000–2021**

Source: CDC Wonder (NCHS) death counts and U.S. Census bureau resident population estimates.

The annual average number of deaths over the last five available years of data (2017 – 2021), where the Underlying Cause of Death was the ignition or melting of clothing, is 85.8. These 85.8 deaths consist of an annual average of 2.6 deaths from the ignition or melting of nightwear and 83.2 deaths from the ignition or melting of other clothing. The annual average fire death rate from clothing ignition for this period (2017 – 2021) is 0.26 per million people.

### Clothing Fire Injuries:

Staff produced NEISS injury estimates for nonfatal emergency room-treated injuries caused by clothing ignition for the years 2013 – 2022. Table 2 displays these estimates as well as the number of NEISS cases that each estimate is based on (N), the standard deviation (SD), the coefficient of variation (CV)<sup>1</sup>, and the 95% confidence intervals<sup>2</sup> for these estimates.

**Table 2. NEISS Clothing Ignition Injury Estimates, 2013–2022**

Year	N	Estimate	Injuries per Million	SD	CV	
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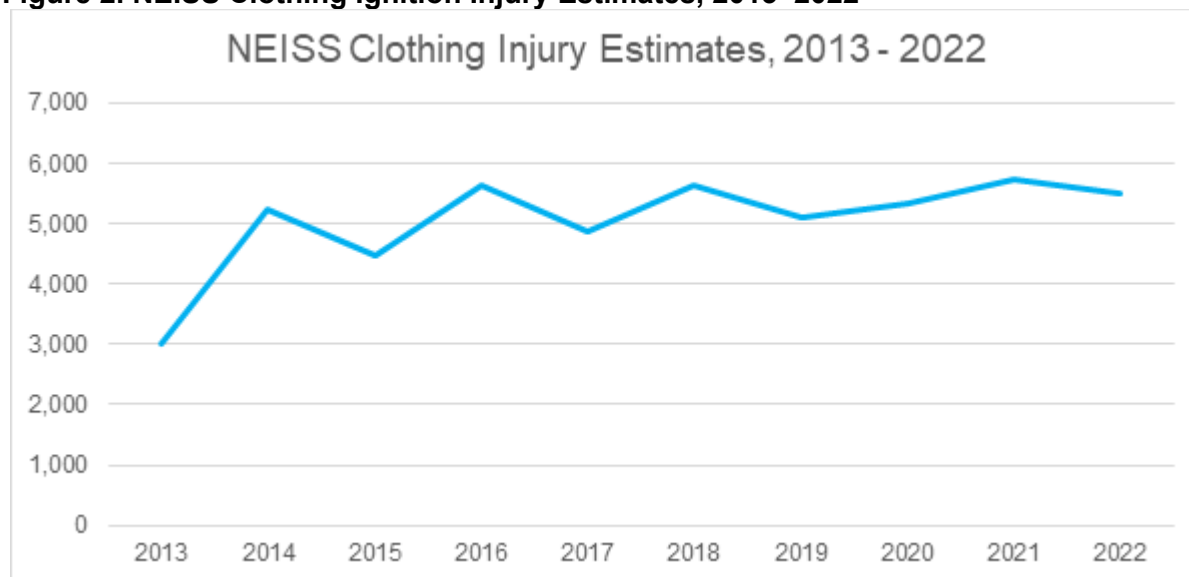
<sup>2</sup> A 95% confidence interval is computed based on the estimate and the variance of the estimate and is expected to contain the true parameter 95 percent of the time.

						95% Confidence Interval <sup>3</sup>
2013	109	3,000	9.55	705.6	0.23	(1,600, 4,400)
2014	146	5,200	16.45	811.2	0.15	(3,600, 6,800)
2015	162	4,500	13.91	919.7	0.21	(2,700, 6,300)
2016	148	5,600	17.43	831.4	0.15	(4,000, 7,300)
2017	131	4,900	15.01	939.3	0.19	(3,000, 6,700)
2018	135	5,600	17.26	757.3	0.13	(4,200, 7,100)
2019	144	5,100	15.52	1,116.3	0.22	(2,900, 7,300)
2020	170	5,300	16.18	1,353.5	0.25	(2,700, 8,000)
2021	184	5,700	17.37	1,099.4	0.19	(3,600, 7,900)
2022	135	5,500	16.53	1416.2	0.26	(2,700, 8,300)
<b>2018 – 2022 Avg.</b>	<b>153.6</b>	<b>5,500</b>	<b>16.54</b>	<b>1022.8</b>	<b>0.19</b>	<b>(3,500, 7,500)</b>

Source: National Electronic Surveillance System (NEISS) estimates and U.S. Census Bureau resident population estimates.

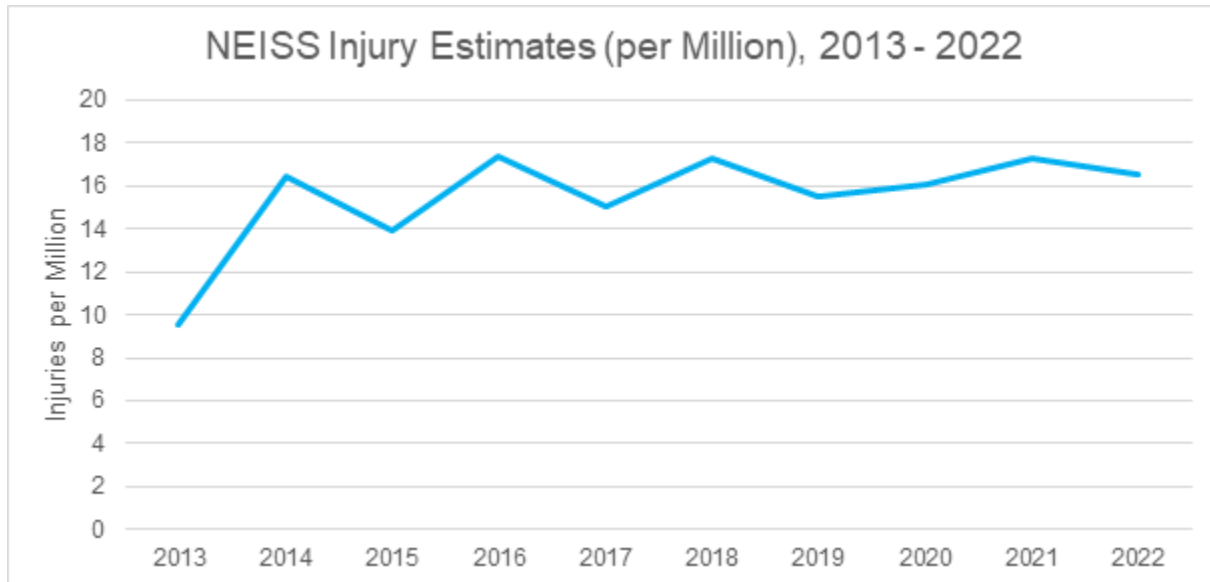
Figure 2 displays the NEISS clothing ignition injury estimates for the years 2013 – 2022. Figure 3 shows the estimated NEISS clothing ignition injury rate (per million population) for these same years.

**Figure 2. NEISS Clothing Ignition Injury Estimates, 2013–2022**



Source: National Electronic Injury Surveillance System (NEISS) estimates.

**Figure 3. Estimated NEISS Clothing Ignition Injury Rate (per Million Population), 2013–2022**



Source: National Electronic Surveillance System (NEISS) estimates and U.S. Census Bureau resident population estimates.

The annual average estimate, for the most recent five years (2018 – 2022), is 5,500 NEISS clothing ignition injuries with a 95 percent confidence interval of (3,500, 7,500).

### Summary

In support of CPSC staff's final rule briefing package to update some of the provisions of the clothing flammability standard (16 CFR part 1610), staff has assessed data on the clothing flammability hazard. According to NCHS CDC Wonder data, there have been 85.8 deaths per year in the United States (in the most recent five years available) caused by the ignition or melting of clothing. There were more deaths per year at the beginning of the century. There appears to have been a decline in these deaths between 2000 and 2021. In addition to the counts of clothing fire fatalities, CPSC staff used NEISS to estimate the number of emergency department-treated injuries caused by clothing ignition. Based on the most recent five years of NEISS data available (2018 – 2022), there was an estimated annual average of 5,500 such injuries with a 95 percent confidence interval of (3,500, 7,500).

## Tab B: Memorandum of the Directorate of Laboratory Sciences, Division of Engineering, Response to Comments

Staff Briefing Package: Final Rule to Amend the Standard for the Flammability of Clothing Textiles

October 11, 2023 | [cpsc.gov](https://www.cpsc.gov)

**TO:** Paige Witzen, Project Manager  
Division of Engineering

**DATE:** July 6, 2022

**THROUGH:** Andrew G. Stadnik, Associate Executive Director  
Directorate for Laboratory Sciences

Allyson Tenney, Division Director  
Division of Engineering  
Directorate for Laboratory Sciences

**FROM:** Paige Witzen, Textile Technologist  
Division of Engineering

**SUBJECT:** Response to Comments Received on the Notice of Proposed  
Rulemaking (NPR) for Updating the Standard for the  
Flammability of Clothing Textiles

## Introduction

In September 2022, the Commission published a notice of proposed rulemaking (NPR) proposing several updates to the Standard for the Flammability of Clothing Textiles (16 C.F.R. Part 1610). 87 Fed. Reg. 56,289 (Sep. 14, 2022). The proposed amendments and justifications for them are discussed in detail in the NPR and the briefing package supporting the NPR.<sup>1</sup> During the comment period, CPSC received comments from four commenters: American Apparel and Footwear Association (AAFA), China WTO/TBT (China), a George Washington University student (student), and Consumer Safety Consultancy (CSC). Comments received on the proposed update to 16 C.F.R. Part 1610 were generally supportive. This memorandum summarizes the comments and provides the staff's responses to them.

## Comments about Test Result Codes

The Standard establishes three classes of flammability of clothing textiles and prohibits the use of textiles unsuitable for clothing. Class 1 and 2 fabrics are permissible for use in clothing, while class 3 fabrics are not. The flammability classes are determined by the measure of burn time (i.e., time from impingement of the flame to severing of the stop thread) and flame intensity (discussed below). The Standard lists a number of specific test result codes (i.e., burn codes) that describe the burning behavior of fabrics, which must be used to record the flammability

<sup>1</sup>The briefing package supporting the NPR is available at:  
<https://www.federalregister.gov/documents/2022/09/14/2022-19505/standard-for-the-flammability-of-clothing-textiles-notice-of-proposed-rulemaking#:~:text=The%20purpose%20of%20the%20Standard%20is%20to%20reduce,procedures%20for%20testing%20the%20flammability%20of%20clothing%20textiles.>

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results for each specimen and help determine the proper classification for the sample (§ 1610.8). Table 1 in the Standard is intended to provide a summary of the test results and what classification is associated with them. AAFA, China, and the student expressed support for the proposed changes to the test result codes. CSC raised some concerns with the proposed changes, which are discussed in this section.

### **Comment about SFBB code:**

**Background:** Table 1 to § 1610.4 of the Standard states, among other things, that a raised surface textile fabric is Class 1 if “burn time is 0-7 seconds with no base burns (SFBB).” In the NPR, the Commission proposed to replace the wording “with no base burns (SFBB)” in this description with “with no SFBB burn code.” The purpose of the proposed revision was to clarify the existing criteria for classifications of raised surface textile fabrics by referencing burn code SFBB more clearly, since two similar codes (SFBB poi and SFBB poi\*) do not meet the criteria stated in the table.

**Comment:** CSC stated that the proposed revision “with no SFBB code” is confusing to them. They stated that the classification for Class 1 of raised surface fabrics should read “Average Burn time is 0-7 seconds with surface flash only;” Table 1 is the general criteria for classification; and the full discussion of how to classify is in § 1610.7.

**Response:** As explained in the NPR, the Class 1 description for raised surface fabrics in Table 1 indicates that if a fabric has a burn time between 0-7 seconds, it can only be Class 1 if it exhibits rapid surface flash only, and no base burns. Although there are three burn codes that indicate that a base burn occurred—SFBB, SFBB poi, and SFBB poi\*, only SFBB is relevant to this determination because it applies when the base burn occurs as a result of the surface flash. In contrast, SFBB poi and SFBB poi\* only have a base burn due to the flame that impinges on the fabric, not from the intensity of the surface of the fabric itself burning. As such, only fabrics with burn code SFBB, and not SFBB poi and SFBB poi\*, are excluded from being Class 1. However, staff have learned that some testers are confused by these provisions and use SFBB poi and SFBB poi\* as “base burn” codes for determining Class 3 fabrics when those codes do not classify a fabric as a Class 3 fabric. According to the definition of “base burn” in § 1610.2(a), SFBB poi and SFBB poi\* are not considered in determining a Class 3 fabric. In addition, the test method and classifications are prescribed in the Standard in sections §1610.6 and §1610.7. Table 1 provides a summary. The proposed revision would clarify the specific burn code—SFBB—being referenced.

### **Comment about SFBB burn code note in Table 1 to § 1610.4:**

**Background:** In the NPR, the Commission proposed to add a note to Table 1 to § 1610.4, stating that burn codes SFBB poi and SFBB poi\* are not considered a base burn for purposes of



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determining Class 2 and 3 fabrics. Class 2 and 3 descriptions for raised surface textile fabrics in the table specify that fabrics in these classes exhibit base burns (SFBB). Only fabrics with a burn code of SFBB, and not SFBB poi and SFBB poi\*, have a base burn that occurs as a result of the surface flash rather than from the point of impingement of the burner. Although the table already references burn code SFBB for the Class 2 and 3 descriptions, the purpose of the added note would be to make clear that SFBB refers only to that specific code, and not the other two base burn codes.

**Comment:** CSC stated:

Table 1 is a summary of the requirements for classification. Placing only partial information into the Table will confuse the information that is there. The information on how to evaluate SFBB-poi and SFBB-poi\* in determining the fabric class should be in section 1610.7. In addition, it should also be explained that the timed burning result for the specimen that exhibits SFBB-poi and poi\* should be included in the average time for that fabric. As stated in the Standard, SFBB-poi cannot be used to determine the intensity of the flame for classifying as a Class 3 fabric, however, the time is used in the average for flame spread.

**Response:** Staff disagrees with the commenters recommendation to remove the statement "Note: SFBBpoi and SFBBpoi\* are not considered a base burn for determining Class 2 and 3 fabrics." Staff have seen how testers misuse burn codes SFBBpoi and SFBBpoi\* to classify fabrics as Class 3 when they are, in fact, Class 1. Having this statement will make it clear that SFBBpoi and SFBBpoi\* are not used to determine Class 3 fabrics.

**Comment about streamlining burn codes:**

**Background:** In the NPR, the Commission proposed to revise § 1610.8, which lists the burn codes and requirements relevant to them, to streamline the codes by consolidating similar codes. The Commission proposed to combine burn codes SF uc, SF pw, and SF poi into a single new burn code, SF ntr (no time recorded, does not break stop thread). The three existing codes all describe burning behavior that does not have enough intensity to break the stop thread and, accordingly, have no burn time and all result in a fabric being Class 1. As the NPR explained, the rationale for the proposed change was that the purpose of burn codes is to determine the classification of fabrics, making it unnecessary to have all three of these codes, which do not result in different classifications.

**Comment:** CSC disagreed with the proposed change. The commenter stated that the purpose of the codes is to provide observation about the intensity of the burn. Keeping the individual coding for the observation of low intensity surface flash events in the Standard is important



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because when surface flash is observed and recorded during testing, the different codes inform the manufacturer of the surface characteristics of the fabric, e.g., yarn construction, and possibly the ground fabric. The commenter agreed that “a partial surface flash up the specimen is of low concern” but notes that “a surface flash all the way up the specimen and under the [thread] may indicate to a manufacturer to do additional testing.” The commenter further noted that “observations regarding how a fabric specimen burns are very important in the testing under part 1610.”

**Response:** Staff agrees with the comment. The different burn codes can indicate to firms that they may wish to conduct further testing or choose not to use the fabric, depending on the test results. As a result, staff recommends maintaining the burn codes SFpoi, SFpw, and SFuc as separate codes instead of combining the codes as proposed in the NPR. However, consistent with the goal of improving the clarity of the burn codes listed in this section and streamlining the provisions, staff recommends updating the ordering of the burn codes in section 1610.8(b)(2). Specifically, staff recommends revising the order as follows:

Recommended Language for section 1610.8(b)(2):

(2) For Raised Surface Textile Fabrics:

\_\_ SFBB Time in seconds, surface flash base burn starting at places other than the point of impingement as a result of surface flash.

\_\_ SFBB poi Time in seconds, surface flash base burn starting at the point of impingement.

\_\_ SFBB poi\* Time in seconds, surface flash base burn possibly starting at the point of impingement. The asterisk is accompanied by the following statement: “Unable to make absolute determination as to source of base burns.” This statement is added to the result of any specimen if there is a question as to origin of the base burn.

\_\_ SF only Time in seconds, surface flash only. No damage to the base fabric.

SF poi Surface flash, at the point of impingement only (equivalent to “did not ignite” for plain surfaces).

SF uc Surface flash, under the stop thread, but does not break the stop thread.

SF pw Surface flash, part way. No time shown because the surface flash did not reach the stop thread.

This would order the codes so that the most significant codes for identifying more flammable fabrics (i.e., Class 2 and 3) are presented and explained first in the section. SFBB would be the first code listed for raised surface fabrics since SFBB is the code, along with burn time, that determines a Class 2 and 3 fabric. It would be followed by SFBBpoi and SFBB poi\*. These codes are not considered base burns in regard to determining Class 2 and 3 fabrics, but the flames do burn through the base. This burning behavior is why they should be listed next. Burn code \_\_ SF would be listed next because, while the flame does not burn through the base of

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the fabric, it does travel the length of the specimen and describes a different burning behavior than the remaining burn codes. All other codes indicate a Class 1 fabric that does not have a burn time, but describe different burning behaviors. SFpoi, SFuc and SFpw describe burning behavior that poses the least risk to consumers and, therefore, staff recommends that these be listed at the end. By being able to classify fabrics more easily, it will allow for less misclassification of fabrics and more efficiency in the amount of testing needed. For example, less testing is needed if testers are able to determine a Class 3 fabric more easily and no longer need to test.

Note that the commenter did not address the proposal to remove from the list of raised surface textile fabric burn codes in § 1610.8, the code that lists only a burn time (\_\_\_ sec.). Staff continues to recommend this revision for the reasons stated in the NPR.

### Comments on Stop Thread Description

The Standard specifies test methods, test apparatus and materials required for testing. The test generally involves placing a textile specimen in the test apparatus, stringing stop thread across the specimen, activating a trigger device that impinges a flame, and recording the time it takes to sever the stop thread, and observations of the burn behavior of the specimen.

**Comment:** All four commenters agree that the stop thread description needs to be updated. In support of the proposed amendment, AAFA noted that laboratories had reported difficulty in sourcing threads and agreed that a range of Tex sizes was a good option. Two commenters (China and CSC) questioned whether additional testing should be done to identify an appropriate stop thread, specifically suggesting testing with raised surface fabrics and class 3 fabrics (*i.e.*, dangerously flammable fabrics), respectively.

**Response:** In developing its draft NPR, staff conducted testing and proposed a new way to describe the stop thread as the current description does not describe thread currently available for testing. For the testing of the stop thread, staff wanted to keep all parameters as consistent as possible to be able to observe any changes in the burn time that could be attributed to the stop thread. Staff did not test any class 3 fabrics or raised surface fabrics with the different threads. As the objective of this thread comparison study was to isolate the effect of different stop threads on the resulting times for 1610 tests, staff chose to use only plain surface fabrics as plain surface fabrics typically have less variation in burn behavior between specimens than for raised surface fabrics. A class 3 fabric was not chosen as it would be harder to see the effect of the thread on the distribution of times if they are clustered too close to zero. The only parameter staff evaluated in the test matrix was the effect of different stop threads, which is

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minimal when considering the variability in the fabric. All other parameters needed to be as consistent as possible so we could see the effect of the stop thread on the burn times.

### Comments on Refurbishing Procedures

The Standard requires fabrics to be tested in their original state and after being refurbished (dry cleaned and then laundered) one time. The purpose of the refurbishing requirement is to remove any non-durable or water-soluble treatments present on the fabric that can affect its flammability performance. It is not meant to replicate how the garment is to be used or cared for by the consumer over its useful life. China, AAFA and the student commenters all state their support for updating the refurbishing procedures. CSC did not offer comments on this topic.

### Additional Comments

**Comment:** AAFA recommended that spandex fibers be added to the list of exempted fibers in section 1610.1(d), which provides that exempted fibers, based on years of testing, consistently yield acceptable results when tested in accordance with the Standard.

**Response:** Although this topic was considered in the RFI that preceded the NPR, the Commission did not propose this in the NPR. The RFI sought input on the possibility of adding spandex to the list of fabrics that are exempt from testing requirements in 16 C.F.R. part 1610. However, comments on the RFI and additional staff research did not provide sufficient information to justify such an exemption at this time and AAFA did not provide data to support its comment. Therefore, there is no justification for a specific exemption for spandex fibers at this time.



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### Tab C: Memorandum of the Directorate of Economic Analysis

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**TO:** Paige Witzen, Textile Technologist  
1610 Burden Reduction Project Manager  
Division of Engineering  
Directorate for Laboratory Sciences

**THROUGH:** Alex Moscoso, Associate Executive Director,  
Directorate for Economic Analysis

Jose Tejeda, Division Director,  
Directorate for Economic Analysis

**FROM:** David Olson, Economist,  
Directorate for Economic Analysis

**SUBJECT:** Final Regulatory Analysis for the Amendment to the Standard  
for the Flammability of Clothing Textiles

**DATE:** May 1, 2023

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### Introduction

This memorandum provides information required under the Flammable Fabrics Act (FFA; 15 U.S.C. §§ 1193). The FFA requires the Commission to prepare a final regulatory analysis that describes the potential benefits and costs of the rule, any alternatives considered by the Commission, and a summary of any significant issues raised by comments submitted during the public comment period following the publication of the preliminary regulatory analysis (15 U.S.C. § 1193(j)).

In addition, the Regulatory Flexibility Act, 5 U.S.C. § 604, requires the Commission to prepare a final regulatory flexibility analysis when promulgating a final rule unless the agency certifies that, if the rule is promulgated, it would not have a “significant economic impact” on a “substantial number of small entities.” 5 U.S.C. § 605(b). The Commission made such a certification in the NPR. 87 Fed. Reg. 56,289 (Sept. 14, 2022). No comments were received regarding this certification and staff received no new information that would change staff’s assessment of the economic impact of the rule on small businesses. This draft final rule is generally the same as the rule proposed in the NPR, except for two non-substantive changes (discussed elsewhere in this briefing package) that do not alter the costs or benefits of the rule. Therefore, the Commission’s certification in the NPR fulfilled its obligation under the RFA.

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The recommended amendments to the Standard for the Flammability of Clothing Textiles, hereafter referred to as “the Standard,” 16 C.F.R. part 1610, would revise the burn code descriptions, stop thread description, and refurbishing procedures for dry cleaning and laundering, as identified in the Standard’s test methods. Reordering of the burn codes prioritizes based on burning behavior that poses the most risk to consumers and simplifies the process for referencing the procedures for testing labs. Changes to the test description were made to improve clarity and to communicate procedures more succinctly. The proposed amendments in the NPR were based on staff assessments and testing. Comments received during the NPR comment period were generally supportive of the amendments with two minor non-substantive modifications to the draft final rule. Staff assesses these minor modifications have no cost or benefit impacts. Additionally, staff did not find any additional cost, market, or other data since the NPR’s publication that would have changed any of the NPR’s findings.

### Draft Final Rule

The Standard includes requirements to test and assess the flammability of fabrics, and to determine whether they are suitable to be used in clothing, as determined by the classifications defined in the Standard.<sup>1</sup> The Standard was issued under the FFA, which authorizes the Commission to amend the Standard when needed to protect the public against unreasonable risk of the occurrence of fire leading to death, injury, or significant property damage. 15 U.S.C. § 1193(b). In this draft final rule, staff recommends several amendments to the Standard that would lead to increased public safety by improving clarity, streamlining provisions, and reflecting current industry practices, available equipment, and materials for testing laboratories. These revisions would not alter the flammability requirements or testing methods used, but are intended to reduce burdens to testing laboratories and facilitate compliance by ensuring the provisions in the Standard are understandable and can be met with currently available equipment and materials. Brief summaries of the recommended amendments are presented below.

### Burn Code Clarification

The Standard includes test result codes (i.e., burn codes) that help determine the classification of a tested fabric and whether it is permissible for use in clothing. CPSC staff recommends updating and reordering the description of the burn codes in the Standard to improve clarity of meaning and streamline the provisions. Staff recommends revisions to clarify the burn code provisions. Also for clarification, staff recommends adding the name of each classification (normal flammability, intermediate flammability, and rapid and intense burning) to this table, and other clarifying text to the Standard. None of these changes are expected to cause costs to be incurred.

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<sup>1</sup> Testing laboratories use the Standard to classify textiles into Class 1 (Normal flammability), Class 2 (Intermediate flammability), and Class 3 (Rapid and intense burning). The first two of these classes of textiles are suitable to be used in clothing, while the third one is not.

## Stop Thread Specification

The test apparatus required for flammability testing in the Standard includes as part of the necessary components stop thread, which is used to determine burn time. In the Standard, the stop thread is described as “a spool of No. 50, white, mercerized, 100% cotton sewing thread” (sections 1610.2(p), 1610.5(a)(2)(ii)). However, thread meeting this description has limited availability, the numbering is outdated, and the industry now largely uses the Tex system<sup>2</sup> to define thread size. Accordingly, staff recommends revising the Standard to specify that the stop thread consist of “3-ply, white, mercerized, 100% cotton sewing thread, with a Tex size of  $40 \pm 5$  Tex.”<sup>3</sup> This is a non-substantive change from the NPR and not expected to change the burden associated with this rulemaking.

## Refurbishing Procedure

The Standard requires that flammability testing be performed before and after refurbishing specimens, which includes dry cleaning and then laundering (i.e., drying and washing) the specimens according to specific requirements. Staff recommends updating the dry cleaning solvent because the current dry cleaning solvent named in the Standard, perchloroethylene, is being increasingly restricted from use in some states. Staff also recommends updating the laundering procedure outlined in the Standard because washing machines that meet the specifications of the procedure are no longer commercially available.

*Dry cleaning.* The Standard requires the use of “perchloroethylene, commercial grade,” as the dry cleaning solvent, and specifies parameters for this method (e.g., drying time). To accommodate the ongoing use of perchloroethylene within the industry with the increasing restrictions on its use, staff recommends adding hydrocarbon solvent as an alternative, along with its accompanying parameters, to the Standard. This provides an additional choice of solvent that the industry can use for dry cleaning.

*Laundering.* The Standard requires that samples be laundered in washing and drying machines that meet certain conditions in accordance with American Association of Textile Chemists and Colorists (AATCC) Test Method (TM) 124-2006, Appearance of Fabrics After Repeated Home Laundering. However, washing machines that meet these conditions are no longer produced, and when operable washing machines reach the end of their useful lives, laboratories will be unable to test in accordance with the Standard. Therefore, staff recommends amending the Standard to replace the reference to TM 124-2006 with a reference to AATCC Laboratory

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<sup>2</sup> Tex is a fixed-length system to measure thread size. The size is measured in grams of weight per 1,000 meters of thread.

<sup>3</sup> Staff changed the thread description from 35-45 Tex to  $40 \pm 5$  Tex. This changes nothing, since the two thread descriptions are exactly the same; however, it is important to note the new description included in the final rule versus the NPR for clarity.

Procedure 1, Home Laundering: Machine Washing (LP1 2021), Table I (1) Normal (IV) Hot for washing machines. Staff identified four laboratory-grade washing machines that have the functionality to perform test method LP1. Each of these machines is recommended by AATCC and can be used to test to a variety of AATCC-approved test methods.<sup>4</sup> Although this recommended change would remove the currently permissible washing machines from the Standard, testing laboratories that still have operable machines that comply with the current Standard could continue to use such machines under provisions already in section 1610.40. This section allows for the use of alternate apparatus or procedures other than those in the Standard, if the alternate is as stringent as, or more stringent than, the Standard. As the draft final rule explains, the test results provided in the NPR briefing package could serve as the evidence supporting the equivalency of the current washing machines.

Staff also recommends replacing the reference to TM 124-2006 in the Standard as it applies to drying specifications, with reference to LP 1, Table VI, (Aiii) Permanent Press. The parameters for drying in LP1 almost entirely overlap with those in the current Standard, meaning that it would be unlikely for test laboratories to have to replace current drying machines. Moreover, referencing only a single standard (LP1) would make compliance easier for regulated entities. Furthermore, testing laboratories that have operable dryers that comply with the current Standard could continue to use such machines under provisions already in section 1610.40.<sup>5</sup>

### Laboratories Testing to the Standard

Testing laboratories that would be impacted by the recommended amendments to the rule are included within the classification NAICS sector 541380. According to the Census Bureau, there are 7,389 testing laboratories in the United States; however, only some of these testing laboratories perform flammability testing.<sup>6</sup> A subset of 300 CPSC-accepted third-party testing laboratories test to the Standard for children's product certification.<sup>7</sup> The majority of these third-party testing labs are in Asia, mainly China, with approximately one in 20 of these labs in the United States. In addition to the CPSC-accepted laboratories, there are other laboratories that conduct third-party garment testing, both inside and outside the United States. In the absence of more precise data on the number of laboratories impacted, staff uses a range of 300 to 7,389 laboratories, as the lower and upper bounds. The number of laboratories affected by the rule should fall between these bounds.

<sup>4</sup> Manufacturers report that the washing machines meet the parameters listed in the current versions of AATCC. TM88B, TM88C, TM124, TM130, TM135, TM143, TM150, TM179, and TM207. These parameters are also listed in AATCC LP1, Home Laundering: Machine Washing, Table I. AATCC does not verify the parameters of washing machines or dryers. (<https://aatcc.org/testing/>).

<sup>5</sup> This section allows for the use of alternate apparatus or procedures other than those in the Standard, if the alternate is as stringent as, or more stringent than, the Standard.

<sup>6</sup> U.S. Census Bureau, 2020, County Business Patterns, Table ID: CB2000CBP.

<sup>7</sup> <https://www.cpsc.gov/cgi-bin/labsearch/>.

## Potential Benefits of the Proposed Amendments

Staff assesses that the recommended amendments are as effective as the provisions in the current Standard; however, these amendments should facilitate compliance by making it more efficient for laboratories to comply and by providing clear and up-to-date testing procedures. The primary benefit of the recommended amendments would be burden reduction for testing laboratories. In addition, by improving the consistency of testing and by producing more reliable and consistent flammability classifications, consumer safety can be improved marginally.<sup>8</sup>

Staff identified the following specific unquantified benefits from the recommended updates to the Standard:

***Burn Codes.*** Updating the description of the burn codes would address uncertainty and enhance consistency in reporting results for 16 C.F.R. part 1610, while maintaining unaltered the testing procedures, the way classifications are determined, and the flammability results.

***Stop Thread.*** Changing the definition of stop thread would clear up confusion among testing laboratories and make it easier to source a thread that meets the specifications for 16 C.F.R. part 1610.

***Dry Cleaning Solvent.*** Staff found that the hydrocarbon dry cleaning procedure is a suitable alternative to perchloroethylene, as well as comparable in cost to other dry cleaning alternatives; therefore, its adoption should enable compliance with the dry cleaning procedure in states where the use of perchloroethylene is restricted.<sup>9 10</sup>

***Laundrying.*** Staff assesses that LP1 (Table 1, Option 3) is already a standard used by testing laboratories; therefore, its adoption would enable testing laboratories to comply with the laundrying procedure, and reduce the burden associated with sourcing compliant washing machines that are no longer commercially available. Staff also expects that the recommended changes to the drying procedure would reduce the burden to testing laboratories by providing a set of streamlined and single-source laundrying specifications (LP1), over the old standard's varied procedures based on availability of testing materials and textile specifics.

***Clarity of the Rule.*** Several commenters supported updating and clarifying the language included in the Standard, with comments such as: "I believe the proposed amendment is comprehensive in achieving its intention to both broaden and clarify current standards for

<sup>8</sup> Improvements in safety would likely be small and difficult to measure, so staff does not provide quantified benefit estimates.

<sup>9</sup> In December 2020, EPA issued a final risk evaluation for perchloroethylene, determining that there are unreasonable risks to workers, occupational non-users, consumers, and bystanders from 59 out of 61 conditions of use ([www.epa.gov/chemicals-under-tsca/epa-releases-final-chemical-risk-evaluation-perchloroethylene](https://www.epa.gov/chemicals-under-tsca/epa-releases-final-chemical-risk-evaluation-perchloroethylene)).

<sup>10</sup> CPSC did not evaluate the additional hydrocarbon solvent option for health-related risks to laboratory workers. It is possible that its introduction would produce health-related costs savings with respect to the use of perchloroethylene (or even increased costs, if the health hazards of the hydrocarbon solvent exceed those of perchloroethylene). These cost savings (or increased costs) are not quantified in this analysis.

assessing clothing flammability” and “Product safety regulations should be practical and designed to foster compliance. For these reasons, we are glad to see that CPSC is undertaking efforts to revise flammability testing standards.”

### Potential Costs of the Recommended Amendments

*Burn Codes.* The recommended amendments would not alter testing, change the way classifications are determined, or affect flammability results. Therefore, the technical amendments to the burn code classification would have no significant impact on the costs of the flammability standards for clothing textiles.

*Stop Thread.* Similarly, the recommended amendments regarding stop thread would clarify the existing description, allow the continued use of the thread currently specified in the Standard, and provide a wider range of available thread options to testing laboratories; without affecting test results or flammability classifications. Therefore, this recommended amendment would have no significant impact on the costs of the flammability standard.

*Dry Cleaning Solvent.* The amendments to the Standard that add the option for dry cleaning with hydrocarbon solvent are not expected to increase costs to testing laboratories because they effectively increase the number of approved options available for testing to the Standard.

*Laundering.* Staff assessed the amended laundering procedure would be as effective as the current laundering procedure; and under section 1610.40, laboratories may continue using washing machines and dryers that meet the current laundering procedure. Therefore, this requirement is not expected to have a cost impact on testing laboratories.

Although the amended laundering procedure would have no cost impacts on testing laboratories, the following section presents information regarding the potential costs associated with upgrading existing machines to comply with the recommended laundering procedures. In addition to the machine-related costs discussed in the following section, there may be a non-significant cost to obtain a copy of the LP1 standard estimated at \$70 or less per copy.<sup>11</sup> However, many testing laboratories may already have a copy of LP1 (to comply with requirements outside the Standard); so this one-time cost would apply only to testing laboratories that do not already have LP1 and do not opt to use section 1610.40.

### Discussion of the Potential Costs of Washers and Dryers

According to data collected by staff through direct industry engagement, the price of a laboratory-grade washing machine able to perform the laundering specifications in the recommended amendment to the Standard is, on average, \$4,300 (not including tax)<sup>12</sup>. Staff identified four washing machines that are able to perform the LP1 laundering specifications, as recommended in the amended Standard (See Table 1). Typically, the total price of purchasing a

<sup>11</sup> The list price for an electronic version of LP1 is \$70, while the cost the member price is \$50. Purchased standards are delivered as a link in the customer's emailed receipt (<https://members.aatcc.org/store/lp001/2212/>).

<sup>12</sup> Staff called suppliers in March 2022.

machine includes the price of the unit, the cost of certified calibration, and packaging and shipping. Note that the price for shipping the washing machine varies, with representative examples listed below.

**Table 1. Prices of Laboratory Grade Washing Machines**

<b>Washing Machine</b>	<b>Unit price</b>	<b>Calibration Certificate Cost</b>	<b>Packaging and Shipping</b>
Machine 1	\$3,862	\$190	\$147 (packaging only)
Machine 2	\$3,060	\$150	\$570
Machine 3	\$3,600	\$320	\$780
Machine 4	\$3,700	\$350	\$430

Source: Quotes collected from suppliers in March 2022.

Although each of the four laboratory-grade washers can perform to the specifications of laundering procedure LP1, these machines cannot perform laundering according to the specifications of AATCC TM124-2006 (TM124-2006). Staff is currently unaware of any washing machine that can perform both the specified current (TM124-2006) and proposed (LP1) laundering procedure. Because of provisions in section 1610.40, labs would not be required to purchase washing machines that can perform laundering procedure LP1 if they still have machines that meet the current Standard. Because of this optionality, the proposed final rule would not require firms to incur a net cost. If a laboratory chooses to upgrade and purchase a washing machine listed in Table 1, this analysis assumes the laboratory is doing so voluntarily because it expects to receive benefits from the upgrade that outweigh its acquisition costs. For example, laboratories may save money by purchasing a laboratory-grade washing machine that can perform LP1 (\$4,300, not including tax)<sup>13</sup> and avoiding the repair costs they would incur to maintain existing washing machine equipment.

<sup>13</sup> The average total price of Machine 1 ( $3,862 + 190 + 147 = \$4,199$ ), Machine 2 ( $3,060 + 150 + 570 = \$3,780$ ), Machine 3 ( $3,600 + 320 + 780 = \$4,700$ ), and Machine 4 ( $3,700 + 350 + 430 = \$4,480$ ) machines is \$4,289.75, not including tax. Note that this estimate may underestimate the price for shipping for Machine 1.

Staff estimates the costs of maintaining and repairing old machines that are used for laundering to comply with procedure TM124-2006, at \$300 annually based on research<sup>14</sup>. On average, staff estimates that each lab has 3 laboratory-grade washing machines that do not meet the recommended laundering procedure based on informal communications with testing labs.

Staff also expects no costs associated with the recommended update to the dryer specification. Like washing machines, firms could continue to use dryers that comply with the current Standard under section 1610.40. Moreover, dryers that comply with LP1 largely also comply with the current Standard, which means that it is unlikely that testing laboratories would need to replace existing dryers under staff's recommended update.

### Regulatory Alternatives

Staff considered several alternatives to the recommended revisions to the Standard. This section discusses potential costs and benefits associated with these alternatives and the reasons staff does not recommend them.

*Burn Codes.* Because the recommended amendments to the burn code provisions merely clarify existing requirements, the only other test result description alternative staff considered was to keep the current language in the Standard regarding the description of the burn codes. However, staff concludes that revising these provisions is the preferred option because it would clarify and streamline the codes, making it easier for testers to complete their testing.

*Stop Thread.* Staff considered variations of the recommended revision regarding stop thread. One potential regulatory alternative is to specify a single Tex size representing the thread staff currently uses under the Standard. However, this alternative could confine testing laboratories, by limiting the range of threads they may use for testing. Another potential regulatory alternative considered was to allow a wider range of Tex sizes. This alternative would provide testing laboratories greater flexibility to select from a range of test threads. However, staff assessed that the recommended update imposes minimal costs, offers enough flexibility to testing laboratories, and best aligns with the current Standard.

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<sup>14</sup> Research conducted via internet searches and machine producers public information regarding maintenance costs.

*Dry cleaning Solvent.* Staff considered three alternative dry cleaning solvents that yield flammability results comparable to the current Standard.<sup>15</sup> These are hydrocarbon, silicone, and butylal.

The Toxic Use Reduction Institute (TURI) provides a financial comparison of alternatives in comparison to perchloroethylene. (See table 3.)

**Table 3. Dry cleaning Methods – Financial Data**

Methods	Equipment Costs	Solvent Costs
Perchloroethylene	\$40,000 to \$65,000	\$17
Hydrocarbon	\$38,000 to \$75,000	\$14 - \$17
Silicone	\$30,500 to \$55,000	\$22 - \$28
Butylal	\$50,000 to \$100,000	\$28 - \$34

Source: TURI Assessment of Alternatives to Perchloroethylene

As shown in Table 3, hydrocarbon is expected to be the least costly alternative in the long-run, as the cost of this solvent is the most affordable and is the second least-costly in terms of equipment costs. Therefore, we recommend hydrocarbon as the financially wise choice in the long run.

*Laundering Procedure.* Staff also considered several alternatives for updating the laundering procedures. With respect to washing machines, staff assessed two revised laundering procedures when preparing the recommended proposed amendments to the Standard: (1) AATCC Laboratory Procedure 1 Table I, (1) Normal, (IV) Hot (LP1), and (2) AATCC 124-2006, with modifications to the laundering agitation speed (AGIT).

As a regulatory alternative to staff's recommendation to amend the Standard to reference LP1, staff considered the AGIT laundering procedure because it closely aligns with the current laundering procedure referenced in the Standard.<sup>16</sup> However, the AGIT laundering procedure is not based on laundering methods developed by AATCC and is not used for other AATCC standards. In addition, staff notes that some testing laboratories already use LP1 for other

<sup>15</sup> Staff did not consider removal of the dry cleaning step of the refurbishment procedure. The impact of a no dry- cleaning step alternative on comparable flammability remains unknown.

<sup>16</sup> The AGIT procedure reduces the required agitation speed from 179 rpm to 120 rpm, keeping other parameters the same.

testing. The laundering procedure LP1 is based on laundering methods and parameters originally developed as part of various AATCC standards.<sup>17</sup>

The cost of testing to the AGIT procedure might be comparatively more expensive because laboratory-grade washing machines are not sold pre-programmed to the AGIT specification settings, while they are sold pre-programmed with the LP1 setting.<sup>18</sup> Using pre-programmed settings saves time and skilled labor resources during testing. It also reduces the chances of testing error in the lab. Therefore, the use of a not pre-programmed setting, AGIT, should be considered costlier in skilled-labor time and resources, as well as more cumbersome and a possible source of laboratory error, during testing. For these reasons, staff does not recommend the AGIT alternative.

Additionally, staff considered two approaches to achieve cost neutrality for the recommended amendments to the laundering procedure. Staff considered various proposals that would allow testing laboratories impacted by the rule to continue using their currently owned washing machines to meet the provisions of the Standard:

Require the use of LP1-compliant washing machines, but provide in the regulation, a phase-out period, during which washing machines that comply with AATCC TM124-2006 would also remain permissible.

Add laundering method LP1 to the Standard, while keeping TM124-2006 as an additional laundering method option.

Either of these approaches would be cost neutral, or potentially cost-beneficial, because (like the proposed rule) they would allow the continued use of the washing machines that are currently owned by testing laboratories and provide an alternative for when those machines are no longer usable. However, staff does not recommend these alternatives for the following reasons. First, the purpose of this rule is to remove aspects of the Standard that are outdated, like washing machines that comply with TM124-2006.<sup>19</sup> Second, staff does not have accurate information about the phase out period of TM124-2006, so there is uncertainty about the timespan that would properly allow for the replacement of existing laboratory-grade washing machines by testing laboratories. Additionally, staff could not determine the timespan when a

<sup>17</sup> AATCC LP1 is a complete laundering protocol that may be used in coordination with appearance evaluation, flammability preparation, or other laundering procedures. AATCC LP1 replaces AATCC M6.

<sup>18</sup> The Machine 1 and Machine 2 laboratory-grade washing machines are sold pre-programmed for the LP1 setting.

<sup>19</sup> Moreover, TM124-2006 should be removed from the Standard because it is more precisely a test method used to grade and evaluate the appearance of textile fabric after repeated home laundering, rather than a standard washing procedure. Meanwhile, LP1 is a standard washing procedure.

laboratory will need or wish to discontinue maintenance of their existing laboratory-grade washing machine and replace it with an updated machine. For these reasons, staff recommends requiring the use of LP1-compliant washing machines in the Standard and relying on section 1610.40 to mitigate any costs associated with phasing out the use of functional washing machines that comply with the current Standard.

For dryers, staff considered retaining the current provisions in the Standard, which reference TM 124-2006, since dryers that meet this standard are still available on the market. This alternative would eliminate any costs associated with this recommended revision. However, the costs of the recommended change are already expected to be minimal since most dryers that meet the current Standard also meet LP1, and section 1610.40 would be an option for those that do not. As such, staff did not select this alternative.

## Conclusion

This memorandum provides the final regulatory analysis, including a discussion of the potential benefits and costs of the recommended amendments. Although the benefits of the recommended amendments are not quantified, staff was able to identify unquantified benefits likely to accrue to testing laboratories that test to the Standard. Staff also considered several regulatory alternatives to the recommended revisions.

Finally, in the absence of new cost, market, or other data that would change the predicted costs or benefits of the rule, and the lack of public comments regarding the Commission's certification that the rule, if promulgated, would not have a significant impact on a substantial number of small entities, the Commission's certification in the NPR fulfilled its obligations under the RFA.