



UNITED STATES
 CONSUMER PRODUCT SAFETY COMMISSION
 4330 EAST WEST HIGHWAY
 BETHESDA, MD 20814

BALLOT VOTE SHEET

Date: JAN 22 2008

TO : The Commission
 Todd Stevenson, Secretary

THROUGH: Patricia Semple, Executive Director *PS*
 Lowell F. Martin, Acting General Counsel *L.F. Martin*
 Jeffrey R. Williams, Assistant General Counsel

FROM : Patricia M. Pollitzer, Attorney *MP*

SUBJECT : Draft *Federal Register* Notice of Proposed Rulemaking to Address the
 Flammability of Upholstered Furniture

Ballot vote due: JAN 29 2008

Attached is a memorandum from the staff briefly describing a draft notice of proposed rulemaking ("NPR") to address the flammability of upholstered furniture. The Office of General Counsel is providing a draft *Federal Register* notice for the NPR under separate cover (restricted).

Please indicate your vote on the following options.

- I. Approve the draft *Federal Register* notice for the upholstered furniture rulemaking as drafted.

 Signature Date

- II. Approve the draft *Federal Register* notice for the upholstered furniture rulemaking with the following changes (please specify changes):

NOTE: This document has not been reviewed or accepted by the Commission.
 Initial *AK* Date 1/22/08

RECEIVED
 1/22/08
 X
 REPRODUCED BY PERMITTED
 REPRODUCED BY PERMITTED
 REPRODUCED BY PERMITTED

Signature

Date

III. Do not approve the draft *Federal Register* notice.

Signature

Date

IV. Take other action (please specify):

Signature

Date

Attachment: Memorandum from Dale R. Ray, Project Manager, and Robert J. Howell, Acting Assistant Executive Director, EXHR, to the Commission, "Draft Notice of Proposed Rulemaking on Upholstered Furniture Flammability," January 2008



UNITED STATES
 CONSUMER PRODUCT SAFETY COMMISSION
 WASHINGTON, DC 20207

Memorandum

Date: JAN 22 2008

TO : The Commission
 Todd Stevenson, Secretary

THROUGH: Lowell F. Martin, Acting General Counsel *[Signature]*
 Patricia M. Semple, Executive Director *PS*

FROM : Robert J. Howell, Acting Assistant Executive Director for
 Hazard Identification & Reduction *[Signature]*
 Dale R. Ray, Project Manager, *[Signature]*
 Directorate for Economic Analysis
 301-504-7704

SUBJECT : Draft Notice of Proposed Rulemaking on
 Upholstered Furniture Flammability

On December 27, 2007, the U.S. Consumer Product Safety Commission (CPSC) voted to direct the staff to prepare a draft notice of proposed rulemaking (NPR) on upholstered furniture flammability for Commission consideration. The draft NPR is based on the staff's 2007 draft standard presented as a regulatory option in a November 2007 briefing package.¹ The regulatory options were developed pursuant to the Commission's advance notice of proposed rulemaking (ANPR) in the October 23, 2003 *Federal Register*. This ANPR expanded an ongoing proceeding to develop a possible flammability standard under the Flammable Fabrics Act (FFA).

The CPSC staff has prepared the text of a draft proposed standard and supporting documents, including a revised preliminary regulatory analysis and regulatory flexibility analysis. The text of the draft proposed standard and the substance of the revised preliminary regulatory and regulatory flexibility analyses are contained in the draft NPR; the Office of the General Counsel is forwarding this draft notice to the Commission under separate cover. The staff's technical rationale appeared in the November 2007 briefing package; a Directorate for Epidemiology memorandum on one new feature of the draft standard, a requirement for testing to support certifications or guaranties of compliance, is attached to this summary memorandum.

¹U.S. Consumer Product Safety Commission Briefing Package: "Regulatory Alternatives for Upholstered Furniture Flammability," November 2007.

CPSC OFFICE OF PUBLIC AFFAIRS
 RECEIVED BY: *[Signature]*
 ACCEPTED BY: PRYTON
 RULEMAKING ADMIN. PROCDC
 WITH PORTIONS REMOVED

NOTE: This document has not been reviewed or accepted by the Commission
 Initial *[Signature]* Date 1/22/08

The Draft Proposed Standard

The draft proposed standard contains flammability performance requirements for upholstered furniture, with a smoldering resistance test for fabrics and other upholstery cover materials, and smoldering and open flame tests for interior fire barriers that may be used with non-complying cover fabrics. There are also labeling, certification and recordkeeping requirements. Furniture with complying fabrics would be labeled as "Type I" and furniture with complying barriers would be labeled as "Type II." The draft NPR notes a proposed effective date of one year after the date of publication of a final rule.

Furniture manufacturers and importers would generally base their certifications of compliance on guaranties provided by suppliers of fabrics or barriers. These suppliers would be required to maintain test records to support their guaranties. To supplement the general FFA requirement that firms subject to a standard conduct "reasonable and representative tests" to demonstrate compliance, the staff devised a two-tiered testing plan for materials designed to: a) maintain a high probability that adequately-performing materials pass the tests, and b) maintain a low probability that inadequately-performing materials will pass the tests. There is no requirement for periodic production testing. This plan protects consumers from more ignition-prone upholstered furniture and affords a reasonable level of fairness and cost burden to manufacturers and importers. The attached Directorate for Epidemiology memorandum discusses the rationale for the test plan.

The draft proposed standard places primary emphasis on the smoldering performance of cover fabrics. Most existing fabrics, including predominantly thermoplastic fabrics and materials such as leather, wool and vinyl, would likely pass the fabric smoldering test without modification. Some predominantly cellulosic fabrics, like certain high-cotton content fabrics, may need to be modified to comply or be used with complying barriers. Barriers would provide a measure of protection from both smoldering and open flame-ignited fires, including smoldering ignitions that transition to flaming combustion.

As noted in the November 2007 briefing package, a principal objective of the draft proposed standard is that it greatly reduces the reliance on flame retardant (FR) chemical additives, compared to other options the staff has presented to the Commission. The draft contains no requirements for filling materials, which generally use FRs to meet other existing standards, such as those in California and the United Kingdom. While fabric manufacturers would not be prohibited from using FR treatments to comply, the staff considers this the least likely means of compliance in view of other options, such as re-engineering fabrics' fiber content. Thus, the draft proposed standard would not encourage the use of FR additives.

The draft proposal also takes into consideration a wide range of comments and recommendations provided by stakeholders. The draft provides substantial potential safety benefits (over \$400 million over the life of a year's production of complying

furniture) at relatively low cost (about \$35 million – \$60 million per year, depending on compliance methods chosen), without significant potential adverse impacts on small businesses or on environmental safety and health. The draft also has substantially greater estimated benefits than adopting or relying on the furniture industry's existing voluntary guidelines.

Commission Action

If the Commission votes to approve the draft NPR, the staff will submit the notice for publication in the *Federal Register* for public comment. The draft NPR also invites interested parties to submit comments to the Office of Management and Budget (with copies to CSPC requested) on issues related to information collection under the Paperwork Reduction Act.

As noted in the November 2007 briefing package, the staff is undertaking additional research in the areas of large scale verification testing of upholstered furniture materials and reduced ignition propensity cigarettes. The staff will report on these activities to the Commission in accordance with the agency's Operating Plan, and will use the results of this research in the further development of a possible upholstered furniture flammability standard.

Attachment:

CPSC Directorate for Epidemiology memorandum, D. Miller, Plan for Proposed Compliance Testing of Upholstered Furniture, January 18, 2008

(Note: draft NPR provided under separate cover)



UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
WASHINGTON, DC 20207

Memorandum

Date: January 18, 2008

TO: Dale Ray
Directorate for Economic Analysis

THROUGH : Russell Roegner, Ph.D. *RR*
Associate Executive Director
Directorate for Epidemiology

Kathleen Stralka *KS*
Division Director
Division of Hazard Analysis

FROM: David Miller *D.M.*
Division of Hazard Analysis

SUBJECT: Plan for Proposed Compliance Testing of Upholstered Furniture

On December 27, 2007, the Commission directed the staff to prepare a notice of proposed rulemaking (NPR) to address the flammability of upholstered furniture. The NPR under construction is based on the staff's 2007 draft flammability standard. This draft flammability standard defines two types of upholstered furniture: Type 1 upholstered furniture made with cover fabrics or other covering materials that are smolder-resistant in accordance with the proposed smoldering cover fabric performance test; and Type 2 upholstered furniture made with barriers that are smolder- and open flame-resistant in accordance with the two proposed barrier performance tests.

Proposed Fabric and Barrier Performance Tests:

The proposed performance test for Type 1 furniture is a smoldering test intended to measure the cigarette ignition resistance of the furniture's cover materials. The proposed test involves a seating mockup with the furniture's cover fabric over standard polyurethane foam (SPUF) substrate. A lit cigarette is placed on the mockup and the mockup is observed for 45 minutes. Complying cover materials are defined as fabrics that allow no more than 10% mass loss of the SPUF foam after 45 minutes, never transition from smoldering to flaming, and stop smoldering within the 45 minutes.

Barriers used in Type 2 furniture must pass two proposed performance tests. One is a smoldering test. In this proposed smoldering test a lit cigarette is placed on a mockup consisting of a standard cover fabric, the barrier being tested, and SPUF substrate. The mockup is observed for 45 minutes. Complying barriers do not allow more than one percent mass loss of the SPUF substrate after 45 minutes. The other proposed test is a small open flame test. An open flame is applied to a mockup consisting of a standard cover fabric, the barrier being tested, and SPUF substrate. The open flame is applied for 70 seconds. Complying barriers do not allow more than 20% mass loss of the total mockup assembly in 45 minutes.

The table below displays these proposed tests for Type 1 and Type 2 furniture:

Material	Test Description	Test Requirement
Type 1: Manufacturer selects smolder-resistant cover material		
Cover fabric / material (smoldering resistance)	Modified (3") ASTM/UFAC seating mockup with standard polyurethane foam substrate and standard cigarette ignition source	After 45 minutes: <ul style="list-style-type: none"> • No continued smoldering • No obvious flaming ignition • Maximum 10% mass loss of substrate
OR		
Type 2: Manufacturer selects qualified interior barrier		
Interior Fire Barrier (smoldering resistance)	Modified (3") ASTM/UFAC seating mockup with standard polyurethane foam substrate and standard cigarette ignition source	After 45 minutes: <ul style="list-style-type: none"> • Maximum 1% mass loss of substrate
Interior Fire Barrier (open flame resistance)	BS 5852 seating mockup with standard non-FR polyurethane foam substrate, standard rayon cover fabric, and 240 mm / 70 sec. flame ignition source	After 45 minutes: <ul style="list-style-type: none"> • Maximum 20% mass loss of mockup assembly

Test vs. Test Series:

An important distinction to note is the difference between one test and a series of tests to determine whether a particular product is compliant. The word ‘test’ is used to describe the burning of one mockup to evaluate as a pass or a fail with respect to the test requirement. A ‘test series’ is a series of tests after which, based on a defined criterion of how many passing tests there must be, a product is determined to be compliant or not.

Plans for Proposed Performance Test Series:

In order to demonstrate compliance with the draft standard, a manufacturer must test samples of each product (cover materials if it is Type 1 or barriers if it is Type 2) and demonstrate passing flammability performance. In its effort to select an appropriate test series plan, CPSC staff evaluated potential test series plans based on their probabilities of passing fabrics (or barriers) with different levels of overall compliance.

Assumption:

The probability that a particular cover fabric (or barrier) meets the proposed test requirement is designated as “p”. It is assumed that the probability that each sample (i.e. specimen) of that material will meet the proposed test requirement is p. In other words p is fixed and is not expected to vary from test to test of a given cover fabric or barrier.

Higher-performing Materials vs. Lower-performing Materials:

CPSC staff sought a test series plan with a high probability of passing higher-performing materials and a low probability of passing lower-performing materials. The more lenient the test series plan is, the more likely it is to pass both higher-performing and lower-performing materials. The more strict the test series plan, the less likely it is to pass both higher-performing and lower-performing materials. When reviewing test series plans, CPSC staff (assuming a fixed p) looked at the probabilities that a plan would pass a material for different levels of p. Without strictly defining what a higher-performing material is and what a lower-performing material is, CPSC staff looked particularly at the probability of passing when p=0.7 and when p=0.9. The desired test series plan would be very unlikely to pass a lower-performing material but very likely to pass a higher-performing material.

CPSC staff first considered plans for Type 1 furniture. Type 1 furniture must demonstrate that its cover materials are smolder-resistant. Here are some examples of plans considered by CPSC staff:

Candidate Test Series Plan for Type 1 Furniture:

Test 10 samples. If eight or more samples meet the proposed requirement, then that product passes the proposed test series. If less than eight samples pass the proposed test requirement, then it fails.

The probability that a cover fabric with a fixed probability p passes the proposed test series (i.e. at least 8 of the 10 samples meet the proposed test requirement) for various levels of p is listed below:

p ¹	0.6	0.7	0.8	0.9	0.95	0.99
Probability of Passing ²	17%	38%	68%	93%	99%	100%

Note: Probability rounded to the nearest percentage point.

These probabilities of passing of 17% for a fabric that complies 60% of the time and 38% for a 70% performing fabric are higher than what CPSC staff would want for these lower-performing fabrics.

Another candidate test series plan considered for the proposed Type 1 Furniture Test was the following:

Test 10 samples. If all 10 samples meet the proposed test requirement, then that product passes. If less than nine samples meet the proposed test requirement, then that product fails. If exactly nine samples meet the proposed test requirement, then collect and test 10 more samples. If any among the second sample of 10 do not meet the proposed test requirement, then that product fails the proposed test series plan. If all of the second sample of 10 meet the proposed test requirement, then the product passes the

¹ p is the likelihood that any one test of a material will meet the proposed test requirement (e.g., if it is a cover material, it is the likelihood that a mockup using a sample of that cover material would stop smoldering within 45 minutes, not exceed 10% mass loss, and not progress to flaming ignition).

² Probabilities of passing for a candidate test series plan are calculated using a binomial distribution with the probability of each test meeting the proposed test requirement = p.

proposed test series plan. Below are some probabilities that fabrics with various levels of p would pass under this test series plan:

p	0.6	0.7	0.8	0.9	0.95	0.99
Probability of Passing	1%	3%	14%	48%	79%	99%

The low probabilities of passing the 60% and 70% fabrics are an improvement over the previous test series plan but the 48% probability of passing a 90% performing fabric is lower than what is desired as is the 79% chance of passing for a 95% performing product.

Another candidate test series plan considered for the Proposed Type 1 Furniture Test was the following:

Test 10 samples. If all 10 tested samples meet the proposed test requirement, then that product passes the proposed test series plan. If less than 10 samples meet the proposed test requirement, then collect and test another 20 samples. At least 25 of the 30 tested samples must meet the proposed test requirement for the product to pass the proposed test series plan. If there are six or more samples that do not meet the proposed test requirement, the product fails the proposed test series plan. Below are some probabilities that fabrics with various levels of p would pass this proposed test series plan:

p	0.6	0.7	0.8	0.9	0.95	0.99
Probability of Passing ³	1%	9%	45%	93%	100%	100%

CPSC staff evaluated 34 different test series plans with varying degrees of strictness and sample sizes. After reviewing the probabilities of passing for different levels of p for each candidate plan, CPSC staff selected the test series plan above. It has a low probability of passing a lower-performing material – 60% performing product has a 1% chance of passing and 70% product has a 9% chance of passing. It has a high probability of passing higher-performing materials – 90% performing fabric has a 93% chance of passing.

Another positive feature of this sequential test series plan is that a product can pass based on just 10 tests. It is extremely unlikely that a lower-performing material would have 10 samples that meet the proposed test requirements, but materials that are higher performers should be able to meet requirements with 10 samples regularly. A product does not fail without 30 samples being tested. Thus, products can pass early but not fail early.

Type 2 Furniture:

Type 2 Furniture is furniture using a barrier that must demonstrate smolder-resistance and open flame-resistance. This calls for two test series plans – one for the proposed smoldering testing and one for the proposed small open flame testing. CPSC staff selected the same plans for the Type 2 Furniture testing as the Type 1 – collect and test 10 samples, collect and test 20 more if any fail.

A barrier must pass the proposed smoldering barrier test series plan and the proposed open flame barrier test series plan to pass.

³ Probabilities of passing are computed using the binomial distribution (with a given p). The probability of passing is the probability of passing the first 10 tests plus the probability that you fail at least one of the first 10 tests but pass at least 25 of the 30 tests.