

U.S. Consumer Product Safety Commission



Status Update: CPSC Activities on Upholstered Furniture Flammability*

AHFA Flammability Workshop

April 25, 2007

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CPSC Fire Hazard Program Strategic Goal:

Reduce the rate of death from residential fire-related causes by 20 percent from 1998 to 2013



Upholstered Furniture Flammability Standards Development Project

- **CPSC Staff Revised Draft Standard - December 2005**
- **FY 2007 Performance Goals:**
 - Continue research and publish reports
 - Maintain coordination with stakeholders in government, industry and the fire safety community



Background

- **Current CPSC staff standards development activities pursuant to October 2003 ANPR**
- **2003 ANPR expanded CPSC proceeding to cover ignition from both smoldering and open flame sources**
- **Latest version of CPSC staff's revised draft standard presented in January 2006 briefing package***

*see <http://www.cpsc.gov/library/foia/foia06/brief/briefing.html>

January 2006 Briefing Package

- Updated fire hazard data
- CPSC staff lab testing data and other technical research
- Review of 2005 stakeholder input
- CPSC staff's 2005 revised draft standard
- Preliminary regulatory analysis of revised draft standard & significant alternatives
- Preliminary health risk & environmental assessments of FR chemicals in foam

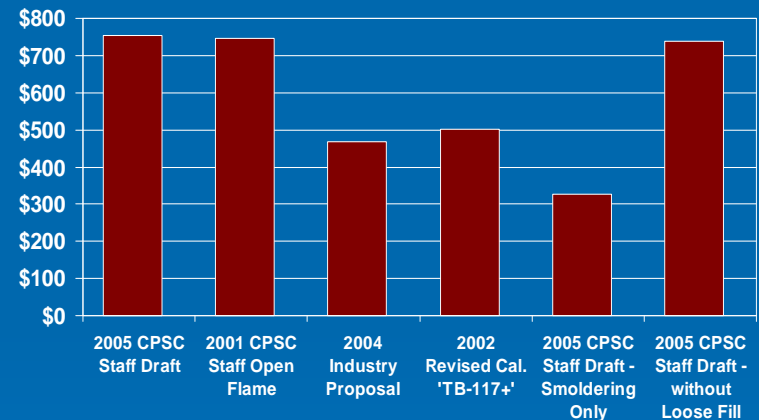
Addressable Upholstered Furniture Fire Losses

- **Average annual national estimates, 2001-2003 residential fires in which upholstered furniture was 1st item ignited:**
 - 4,000 non-intentional fires
 - 330 civilian deaths
 - 580 civilian injuries
 - \$115 million property damage
- **Annual average societal costs of addressable fire losses = \$1.9 billion**
- **88% of deaths and 65% of injuries resulted from smoking material-ignited fires**



Regulatory Options in January 2006 Briefing Package

- CPSC staff's 2005 revised draft std
- Previous (2001) staff draft small open flame std
- 2004 AHFA / industry-recommended standard
- 2002 draft revised California standard Technical Bulletin 117 ("TB-117+")
- Variations on the CPSC staff's 2005 draft:
 - Smoldering provisions only
 - Without loose fill open flame provisions
 - With cover fabric open flame provisions
- No action



Net Benefits of Various Alternatives
(\$million per year's complying production)

Summary of CPSC Staff's 2005 Draft Standard

- Residential (including home office, dormitory use) upholstered furniture with contiguous upholstered seats & backs
- Tests for smoldering and open flame resistance of seating area materials
 - Maximum allowable mass loss over time
 - Cover fabrics
 - Resilient, fibrous and loose filling materials
 - Fire barriers (optional)
- Bench scale performance composite tests using standard test materials
- Test methods & apparatus similar to Calif., U.K., ASTM/UFAC
- Four compliance options to reduce costs and preserve material choices

2005 CPSC Staff Draft Standard: Smoldering Resistance Tests

- For cover fabrics, filling materials & fire barriers
- Modified (3" thick) ASTM / UFAC mock-up with standard materials, standard cigarette ignition source
- Max 10% filling material mass loss in 30 minutes



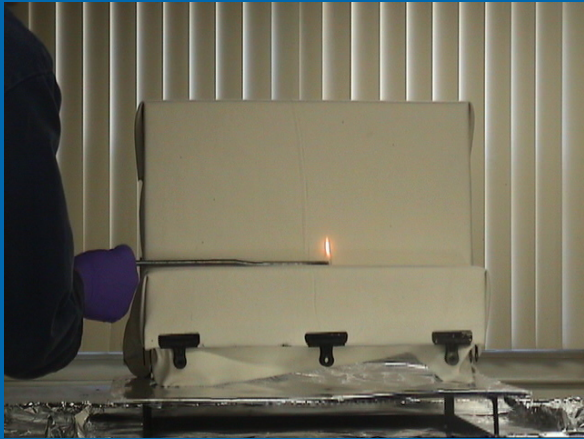
2005 CPSC Staff Draft Standard: Open Flame Resistance Tests

- **BS-5852 seating mockup, standard materials & ignition sources**
- **For filling materials & cover fire barriers:
35 mm flame, 20 sec.**
- **For interior barriers:
240 mm flame, 70 sec.**
- **Max 20% filling material mass loss in 45 minutes**



Fire Barriers

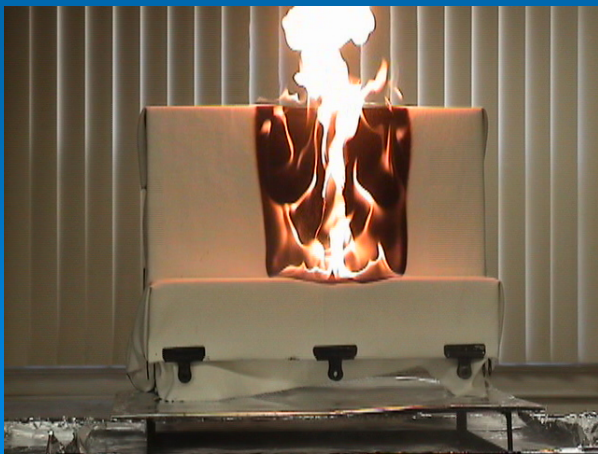
- **Type I: Interior barriers - qualify for use with both non-complying cover fabrics and non-complying fillings**
 - High-loft batting, interior fabrics, etc.
- **Type II: Cover barriers – qualify for use with non-complying fillings**
 - Some leather, wool, vinyl, FR cover fabrics



6 min

Conventional materials can ignite quickly & burn intensely

(example: mid-weight cotton twill over untreated polyurethane foam)



3 min



10 min

12



6 min

Interior fire barriers protect fillings

(example: rayon/poly/cotton fabric over PAN fiber interior barrier over untreated polyurethane foam)



3 min

- Good performing alternatives to FR fillings
- High-loft drop-in replacement for batting / cushion wrap



10 min

Open Flame Ignition-Prone Fabric with Conventional Fillings vs. Interior Barrier



Time = 2:20 after ignition

2006 – 2007 Activity Overview

- **Continued testing & standards development**
- **Peer review of technical reports**
- **Review / evaluation of stakeholder comments & recommendations**

November 2006 Status Report*

Update on CPSC staff technical research

- **Standard test materials and qualifying methods**
- **Public comments on statistical and economic issues related to estimated benefits & costs of a standard and alternatives**

*see <http://www.cpsc.gov/library/foia/foia07/brief/briefing.html>

Standard Test Materials

- **Non-FR foam; FR foam; cover fabric**
- **2005 CPSC staff tests indicated consistent smoldering & open flame performance; inconsistencies observed in subsequent CPSC staff & industry open flame tests**
 - Variability in cotton velvet fabric
 - Fabric / foam interdependency
- **Potential qualification test revisions**
 - Non-FR foam: bare foam tests (no change)
 - Cover fabric: over standard non-FR foam only
 - FR foam: bare foam open flame test; with standard fabric for smoldering only

Smoldering Test Draft-Limiting Enclosure

- CPSC staff draft uses ASTM / UFAC seating area mockup and enclosure
- Public comments:
 - Smoldering artificially limited
 - Difficult to load / unload 3 mockups
 - Potential for heavy smoke / flare-up at end of test
- Testing showed increased average mass loss without enclosure, but no reversals
- No flare-ups observed

Statistical & Economic Issues

- **2006 industry-sponsored report by CRA International**
 - Criticized CPSC staff's National Fire Loss Estimates methodology; recommended two alternative methods to reduce estimated losses
 - Criticized CPSC staff's Preliminary Regulatory Analysis; recommended changes to reduce estimated benefits, increase estimated costs
- **CPSC staff met with CRA & AHFA to discuss comments & recommendations**

Fire Loss Estimates Methodology Issues

- Data 'raking' procedure to allocate deaths & injuries from fires with unknown causes
- CPSC / NFIRS / NFPA method to estimate deaths per furniture fire

Benefit / Cost Analysis Methodology Issues

- **Effectiveness rates**
- **Projected declines in smoking fire deaths**
- **Risk to households containing furniture with smolder-prone fabrics**
- **Discount rates / statistical value of life**
- **Cost estimates**
- **Sensitivity analysis**

December 2006 Status Report*

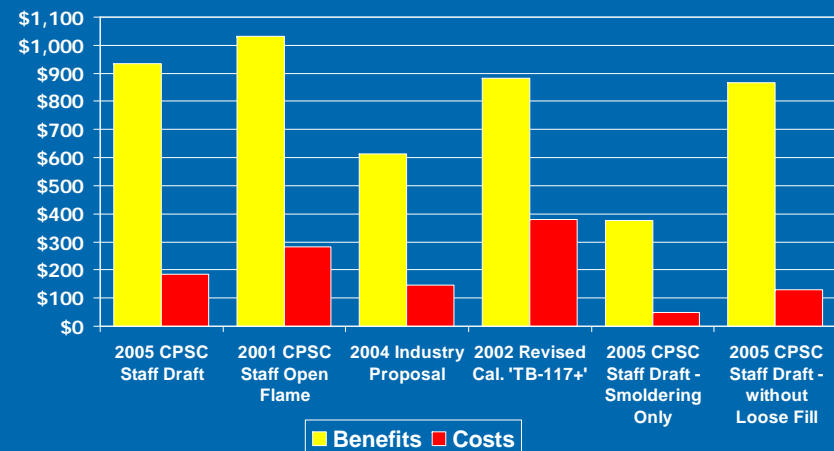
**Peer-reviewed CPSC staff technical reports
(per OMB Bulletin M-05-03)**

- **Preliminary Regulatory Analysis:
benefits & costs of regulatory options**
- **Preliminary Health Risk Assessment:
FR chemicals in urethane foam fillings**

*see <http://www.cpsc.gov/library/foia/foia07/brief/briefing.html>

Preliminary Regulatory Analysis

- Analysis describes potential benefits & costs of various alternatives, several with significant net benefits to the public
- Interagency Economic Peer Review Group (IEPR) – 2 reviewers
- Revised report reflects reviewers' (and public) comments & recommendations



Benefits & Costs of Various Alternatives
(\$million per year's complying production)

Preliminary Health Risk Assessment

- Described potential health effects associated with 3 foam FRs:
 - Melamine: not considered toxic
 - Firemaster 550™: principal components unlikely to pose significant risk but additional toxicity and inhalation exposure data needed
 - TDCP: may be hazardous, additional inhalation exposure data needed
- Independent experts in toxicology and risk assessment – 2 reviewers
- Revised report reflects reviewers' (and public) comments & recommendations

Fire Barrier FRs

- **2006 CPSC staff risk assessment of selected mattress barrier FRs:**
 - Antimony trioxide
 - Boric acid
 - Decabromodiphenyl oxide
 - Vinylidene chloride
 - Ammonium polyphosphate
 - Melamine
- **Conclusion: FR mattress barriers are available that would not pose appreciable health risks**
- **Conclusions likely to apply to furniture barriers**

Industry Stakeholders' Recent Technical Comments

➤ Smoldering Ignition

- Uncertain effect of filling material FR loading on smolder resistance
- Mass loss vs. char length acceptance criteria

➤ Open Flame Ignition

- Effect of variability in cotton velvet fabric (2006 PFA interlab study)
- Impact of Calif. AB-706 proposing state ban on bromine & chlorine FRs
- High-loft barriers & interliners as more effective substitutes for FR foam & loose fillings

Stakeholder Recommendations

- AHFA / PFA / NCC / NTA / DFA: Federal standard for smoldering ignition, based on ASTM / UFAC voluntary method, continue open flame research
- AHFA / PFA: Suspend Cal. TB-117 open flame requirements pending development of new combustion modification technologies (in view of Cal. AB-706)
- AFSC: Federal standard for both smoldering & open flame ignition, based on TB-117+, but consider impact on low-density foam
 - One member recommended existing TB-117 rather than TB-117+
- NASFM: Federal standard based on TB-117+

Next Steps

- **Continue research on standard materials & test methods**
- **Initiate Low-IP cigarette evaluation to compare ignition hazard to traditional cigarettes**
- **Continue working with government, industry & fire community stakeholders on technical issues**
- **Continue cooperation with EPA & monitor regulatory developments on FR chemical issues**

CPSC Quorum Status

- **Chairman Hal Stratton left CPSC July 2006**
- **Temporary quorum of 2 Commissioners expired January 2007**
- **Vice Chairman Nancy Nord is Acting Chairman until a new Chairman is nominated & confirmed**
- **President nominated Michael E. Baroody March 2007**

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