



U.S. Consumer Product Safety Commission Log of Meeting

SUBJECT: CPSC Joint Technical Meeting on Upholstered Furniture Topics

DATE OF MEETING: May 16, 2018

LOG ENTRY SOURCE: Andrew Lock

DATE OF LOG ENTRY: July 12, 2018

LOCATION: CPSC National Product Testing and Evaluation Center (NPTEC), 5 Research Place, Rockville, Maryland

CPSC ATTENDEE(S): See attached list

NON-CPSC ATTENDEE(S): See attached list

SUMMARY OF MEETING:

CPSC staff hosted a day long technical meeting to bring together stakeholders with an interest in upholstered furniture involved fires to discuss collaborative efforts aimed at reduce fire risks to consumers without introducing other risks or hazards. Topics included upholstered furniture flammability risk data, state of the art technology to address flammability hazards, existing standards, and other considerations related to the hazard.

The first half of the day included presentations from CPSC staff, researchers, industry and the fire service to provide the current status of efforts to reduce furniture flammability and set the stage for the afternoon sessions. The second half of the day included panels and interactive discussions exploring opportunities for the stakeholder community to work together.

Presentation topics and session discussions included:

Data Trends: The group discussed how the hazard data related to upholstered furniture flammability have changed over time and what different factors might be contributing to the long term decline in upholstered furniture fire deaths and losses. These factors include, but are not limited to, changes in standards for furniture and components, building codes and standards, upholstered furniture materials and construction, cultural trends such as smoking behavior and residential co-habitants. One attendee asked if the current hazard data still warranted regulating upholstered furniture flammability.

Test Methods: Current and proposed test methods for evaluating the flammability of upholstered furniture were discussed. The group discussed the importance of validating test methods and ensuring the method predicts the behavior of real furniture exposed to an ignition source. This discussion

included what potential technologies might be employed to reduce the flammability of upholstered furniture while not introducing other hazards such as potentially hazardous chemicals. California Technical Bulletin 117-2013 (TB 117-2013) was discussed during several sessions. Many in attendance were in favor of making TB 117-2013 a national standard. Stakeholders asserted that implementing TB 117-2013 as a national standard will improve the performance of upholstered furniture in fires, reduce the use of potentially hazardous flame retardant chemicals, and provide a national standard for labeling requirements. CPSC staff reviewed the recommendation from the 2016 Briefing Package, *The Feasibility, Benefits and Costs of Adopting TB 117-2013 as a Mandatory National Standard*, one of the recommendations was *not* to adopt TB 117-2013 as a national standard because of staff concerns over repeatability of the test method and addressability of the associated hazards.

Other Approaches: The group discussed an array of other approaches that might help to reduce the risk of upholstered furniture fires other than implementing a standard on the furniture itself. The effectiveness of detection, suppression, and consumer education were key points. Many stakeholders commented on the value of residential smoke alarms and the benefit they provide. One challenge that was discussed is how to get smoke alarms into more homes and to educate people on the proper use, maintenance, and value of early fire detection. Stakeholders discussed how a properly installed and working sprinkler system can virtually eliminate the risk from residential upholstered furniture fires. This discussion included the success achieved in states such as Maryland, California, and the District of Columbia. The challenge of implementing this type of suppression system is primarily concerns about cost, however several stakeholders argued that education about the value and success of such systems could change that evaluation.

Education and outreach were a common theme for all approaches to reducing the risks of upholstered furniture fires. Different approaches for effectively improving the awareness and education of consumers were discussed. Consumers need detailed information in order to evaluate their risks effectively and make appropriate decisions about their personal behavior, use of smoke alarms, installation of sprinklers, and other available technologies. The group discussed the importance of communicating these messages and the fundamental need for funding campaigns with the national media and local fire departments, and in between. Stakeholders discussed the need for collaboration and coordination so that a consistent message is conveyed to the widest possible consumer population.

Next Steps:

Many of the stakeholders expressed interest in having a series of future meetings with focused discussions on specific topics raised at the meeting. CPSC staff is reviewing comments and suggestions from the meeting and considering a schedule for future discussions.

**CPSC Joint Technical Meeting on Upholstered Furniture Topics
National Product Testing and Evaluation Center**

**May 16, 2018
9:00am - 4:00pm**

AGENDA

- 8:00am Registration
- 9:00am **Welcome Remarks - ~~Chairman Buerkle~~ Gib Mullan**
- 9:20am Introduction – **Allyson Tenney**
- 9:30am **CPSC staff Presentations**
David Miller – *CPSC Upholstered Furniture Fire Hazard Data*
Andrew Lock – *Upholstered Furniture Flammability at CPSC*
- 10:00am **Industry/Technical Presentations**
Session moderator – Andrew Lock
Dick Gann – Independent Expert
~~Bob Luedeka~~ Russ Baston – Polyurethane Foam Association (PFA)
- 10:45am Break
- 11:00am **Industry Presentations, continued**
Session moderator – Andrew Lock
Don Coleman – Upholstered Furniture Action Council (UFAC)
Matt Vinci – International Association of Fire Fighters (IAFF)
Dave Panning – Business and Institutional Furniture Manufacturers Association (BIFMA)
- 11:30am **Moderated Panel Discussion**
Session moderators – Lisa Scott and Shelby Mathis
Andrew Lock – Consumer Product Safety Commission (CPSC)
David Miller – Consumer Product Safety Commission (CPSC)
Ellen Roaldi – Bureau Veritas (BV)
Don Coleman – Upholstered Furniture Action Council (UFAC)
Matt Vinci – International Association of Fire Fighters (IAFF)
- Noon Lunch Break
- 1:15pm **Moderated Discussion: Other technologies - new approaches - outreach**
Session moderator – Joe Galbo
Rik Khanna – Consumer Product Safety Commission (CPSC)
Matt Vinci – International Association of Fire Fighters (IAFF)
~~Derek Greenauer~~ – ~~Underwriters Laboratory (UL)~~
Kenneth Bush – Maryland State Fire Marshal’s Office
Dave Butry – National Institute of Standards and Technology (NIST)
Meghan Housewright – National Fire Protection Association (NFPA)
- 2:15pm Break
- 2:25pm **Interactive Session: How can we work together to keep consumers safe and reduce the fire hazards associated with upholstered furniture without introducing unintended hazards?**
Session moderator – Shelby Mathis
- 3:30pm Wrap-Up – Closing Remarks

Name of Attendee	Affiliation	Column11
Don Coleman	President of Upholstered Furniture Action Council	
Robert Luedeka	Executive Director Polyurethane Foam Association	
Bill Perdue	Vice President Regulatory Affairs American Home Furnishings Alliance	
Hardy Poole	National Council of Textile Organizations	
Michele Wallace	Director Product Integrity Cotton Incorporated	
Phillip Wakelyn	Wakelyn Associates LLC	
Bobby Bush	Corporate Director- Foam Specification/compliance Hickory Springs Mfg.Co	
Laxmi Ravikumar	Technical Manager products-toys & hardlines Intertek	
Dr. Joseph Zincherman	Berkeley Engineering and Research	
Benji Bagwell	Glen Raven Custom Fabrics	
Ryan Trainer	International Sleep Products Association (President)	
Marie Clarke	International Sleep Products Association	
Richard Gann	Unknown	
Dr. David Sheppard	ATF Fire Research Laboratory	
Stephen Paul Fuss	ATF Fire Research Laboratory	
Brian Kneibel	General Manager Furnishings & VOC Intertek	
Tim Earl	Director of Fire Test engineering GBH International	
Nicholas Oliver	Bureau Chief Bureau of Electronics & Appliance Repair Home Furnishings & Thermal Insulation	
Said Nurbakhsh	Flammability Research Test Engineer Bureau of Electronics & Appliance Repair Home Furnishings & Thermal Insulation	
Amy Lazas	Sr. Product Requirements & Compliance Specialist IKEA	
David Panning	Business and Institutional Furniture Manufacturers Association (BIFMA)	
Tomy Dykstra	Haworth Incorporated (Member of BIFMA)	
Lane Hochschwender	American Chemistry Council -Manager, Chemical Products & Technology	
Jay West	American Chemistry Council -Senior Director, Chemical Products & Technology	
Bruce Bouch	Fire Program Specialist - Prevention and Information Branch of USFA	
William Walker Jr.	Lawyer for Walker Morgan Attorneys At Law	
Meghan Housewright	Director- NFPA Fire & Life Safety Policy Institute	
Tracy Vecchiarelli (P.E.)	National Fire Protection Association	
Joseph Fleming	Deputy Chief- Boston Fire Dept.	
Matt Vinci	Assistant to the General President for Occupational Health, Safety and Medicine (IAFF staff member)	
Russ Baston	Associate Director-Polyurethane Foam Association	
Jim McIntyre	McIntyre and Lemon, PLLC	
Kenneth E Bush	Chief Fire Protection Engineer (Maryland Sate Fire Marshal's Office)	
Amaryllis Linero	Fire Protection Engineer (Maryland State fire Marshal's Office)	
Stephen Wieroniey	American Chemistry Council- Director Center for the Polyurethanes Industry	
Michael Babich	CPSC	
Tyler Mosman	Fire Marshal's office Montgomery County	
Ellen Roaldi	Bureau Veritas Consumer Products Services	
Derek Greenauer	Director: Global Government Affairs	
Neal Cohen	Neal Cohen Law LLC- Consumer Product Safety Law	
William Pitts	NIST	

Shonali Nazare	NIST
Mauro Zammarano	NIST
Rick Davis	NIST
David Butry	NIST
Mary Martha McNamara	McNamara & L'Heureux, P.C
Kuma Sumathipala	American Wood Council
Racquel Segall	International Association of Fire Fighters
Andrew Lock	CPSC
Lisa Scott	CPSC
Linda Fansler	CPSC
Kris Hatlelid	CPSC
Justin Jirgl	CPSC
Jonathan Kent	CPSC
Rik Khanna	CPSC
Yeon Seok Kim	CPSC
David Miller	CPSC
Chuck Smith	CPSC
Allyson Tenney	CPSC
Treye Thomas	CPSC
Jacqueline Campbell	CPSC
Arthur Lee	CPSC
Paige Witzen	CPSC
Andrew Stadnik	CPSC
Shelby Mathis	CPSC
Joe Galbo	CPSC
Chris Halstead	CPSC



Upholstered Furniture Flammability at CPSC

Andrew Lock, Ph.D.

Rockville, MD
May 2018

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

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Overview

- **Introduction**
- **Upholstered Furniture Flammability**
 - History
 - Recent Research
 - Current Status
- **Resources for Additional Information**



Upholstered Furniture Fire Hazard Data

- 2012-2014 Fire Loss Estimates
 - 4,500 Average annual fires
 - 440 Average annual deaths
 - 660 Average annual injuries
 - \$230.2 Million average annual losses



Source: CPSC 2012-2014 Residential Fire Loss Estimates

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Fire Losses Estimates

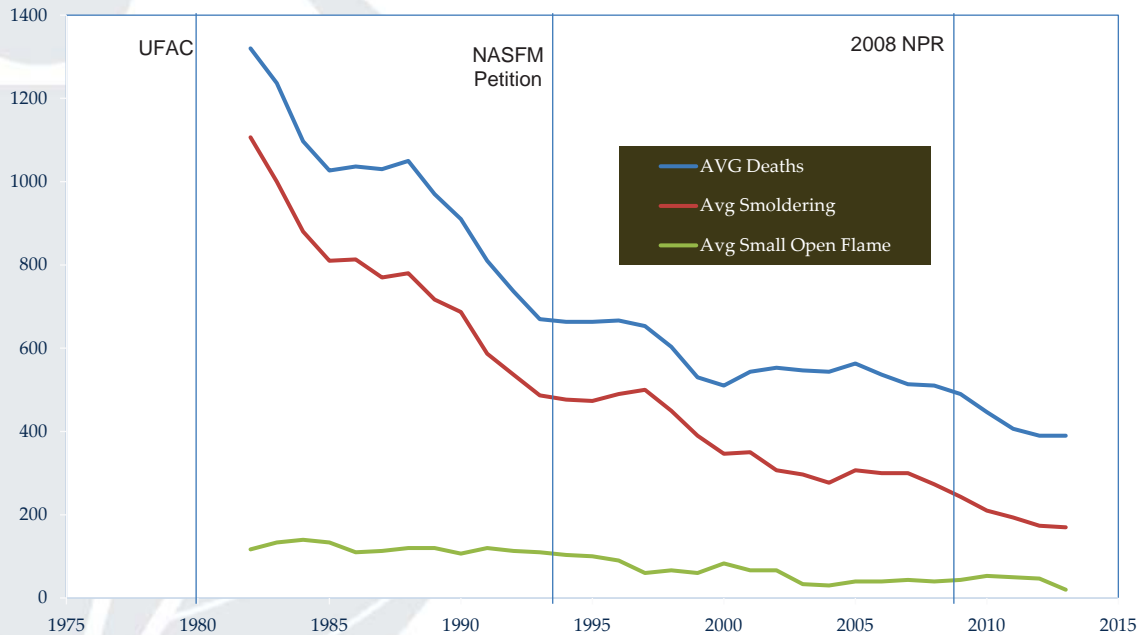
- UF Fire Deaths
 - 180/440 (41%) Smoking Materials
 - 20/440 (5%) Small Open Flame
 - 240/440 (55%) Other
- UF Fire Injuries
 - 200/660 (30%) Smoking Materials
 - 80/660 (12%) Small Open Flame
 - 380/660 (58%) Other
- UF Fire Losses
 - \$58.4/230.2 Million (25%) Smoking Materials
 - \$29.0/230.2 Million (13%) Small Open Flame
 - \$142.8/230.2 Million (62%) Other



Source: CPSC 2012-2014 Residential Fire Loss Estimates



Deaths from Upholstered Furniture Fires



3-Year moving averages compiled from CPSC Residential Fire Loss Estimates

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UF Open-Flame Ignitions

- Deaths from open-flame ignitions have stayed steady while smoldering ignitions have seen a large decrease
- Research* and studies suggest that furniture may be the item contributing most to flame spread
- Open flame ignitions may be attributed to more than just candles and lighters

*John R. Hall Jr., National Fire Protection Association, Estimating Fires When a Product is the Primary Fuel But Not the First Fuel, With an Application to Upholstered Furniture

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CPSC's Flammability Standards

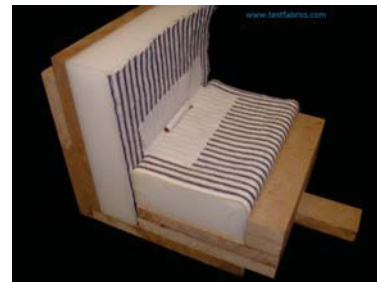
- Performance standards
 - Manufacturers are free to choose the means of meeting the standard
 - Must meet performance requirements
- FFA Requirements
 - Appropriately address the hazard
 - Technologically practicable
 - Benefits bear a reasonable relationship to costs

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UF Project History

- UFAC – 1980
- NASFM petition – 1993
- Series of ANPRs/NPRs 1995-2005
- 1995 – 2006 Series of FR Risk Assessments
- 2008 NPR
- 2012/2013
 - 2012 Validation Memos
 - TB 117 – 2013
 - Barrier Work
- 2016 – TB117 BP Directive
 - BP Assessed TB 117-2013
 - Staff recommended to prepare a separate package to terminate rulemaking





CPSC Rulemaking - 2008 NPR

- Attempted to address smoldering and small, open-flame ignitions
- Incorporated modified UFAC and BS 5852 test methods
- Not validated when published



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Validation Tests

- Bench-scale performance behavior was not qualitatively similar to full scale
 - Smoldering ignition bench-scale performance did not demonstrate an adequate prediction of real furniture flammability performance for Type I and Type II chairs, in this test series.
 - Open-flame ignition, bench-scale qualification tests for fire barriers (Type II) results in improvement in full-scale fire performance.



Validation Tests (continued)

- Issues were identified with standard materials
 - Standard polyurethane foam
 - Standard cotton velvet
- The test method did not address the hazard
 - Identical materials used and still inadequate prediction from bench to full scale

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Key Events 2012-2013

- Chicago Tribune Article
- John Hall Paper
- TB 117-2013
- Unable to validate 2008 NPR
- Obtaining standard materials for 2008 NPR more difficult than previously thought
- Staff held industry meeting on fire barrier technology





2014 Fire Barrier Work



STANDARD REFERENCE MATERIAL

1196

Standard Cigarette
for Ignition
Resistance Testing

www.nist.gov/srm

NIST

National Institute of Standards and Technology
U.S. Department of Commerce

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Ignition source: BS 5852 Source 3

- 240 mm Butane Flame
- Applied for 70 seconds
- Timer starts once ignition source is removed

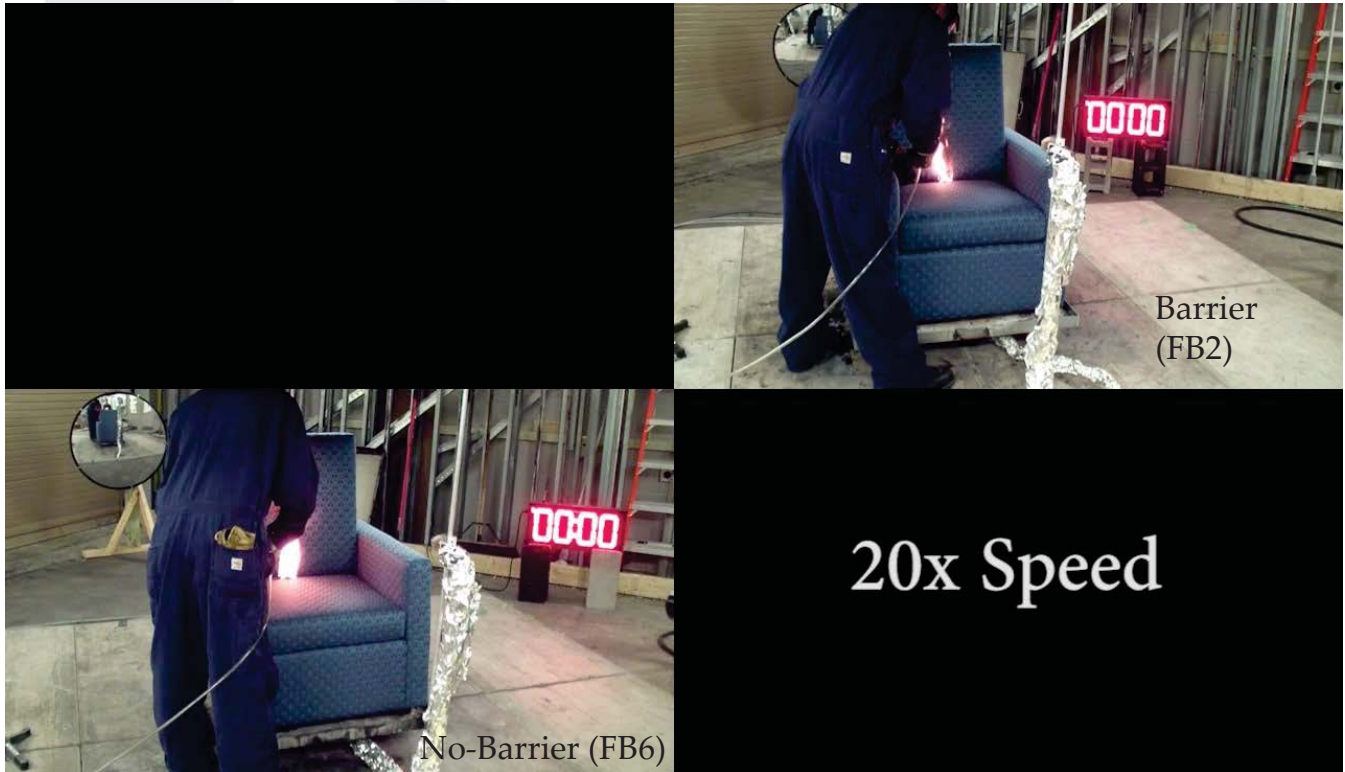


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Comparison: Ignition



Comparison: 1 Minute





Comparison: 3 Minutes



Results and Analysis

- Qualitative observations
 - Barriers tended to reduce PHRR compared to chairs without barriers
 - Barriers tended to delay TTPHRR compared to chairs without barriers
 - Mechanical Stress effect not statistically significant



Smoldering Observations

- Barriers that do well in smoldering ignition conditions do poorly in open-flame ignition and vice versa; polyester batting is an effective barrier for smoldering but not for open flame
- Fire barriers typically decreased the PHRR compared to polyester batting layer
- Fire barriers typically transitioned from smoldering to flaming earlier compared to polyester batting layer

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Summary of Barrier Tests (2014)

- 72 full-scale open-flame ignition chair tests conducted
- 24 full-scale smoldering-ignition chair tests conducted
- Mechanically stressed and unstressed
- Barriers generally decreased the peak heat, release rate, and delayed time to peak heat release rate for open-flame ignition
- Barriers were not as successful at reducing the rate of growth of smoldering ignitions
- The barriers are costly (materials and labor) to use in furniture



Chairs, Loose Fill Back



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Polyester Fill vs Polyurethane Foam Back



Polyester Fill
10 seconds after burner removed; 80 seconds since start of ignition

Polyurethane Foam



How Loose Fill Burns



F2/FF3



F3/FF4

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Summary of Loose Fill Tests (2016)

- Only open flame tests conducted
- Chairs with loose fill burned differently compared to chairs with foam backs
- Reduction in PHRR and TTPHRR compared to loose polyester fill
- Further research required



CPSC OFR Petition

- CPSC petitioned to ban non-polymeric additive Organohalogenated Flame Retardants (OFRs) in certain products
- Petition granted by Commission
- Commission published guidance document (82 FR 45268)
- Commission directed staff to convene a Chronic Hazard Advisory Panel (CHAP) to assess the toxicity of and exposure to OFRs as a class
- Commission directed staff to engage the National Academy of Sciences (NAS) to complete a scoping and feasibility study for assistance in convening and administering the CHAP
 - This work is underway to assess cost, timeframes, and approach, as well as alternative approaches

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Current Activities

- Staff proposed Terminating the Upholstered Furniture Flammability project in 2016
- Participating in Voluntary Standards
 - ASTM E05
 - NFPA Fire Test Committee
- Working with BEARHFTI
- SOFFA Bill in House



CPSC Packages and Reports

- 2016 TB 117-2016 Briefing Package
 - goo.gl/ZtHNYF
- Full Scale Upholstered Chair Report (Foam Backs)
 - goo.gl/HDvni8
- Full Scale Upholstered Chair Report (Loose Fill Backs)
 - goo.gl/u9WQWd

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Contact Information

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Reducing the Fire Hazard of Residential Upholstered Furniture (RUF)

Richard G. Gann

Presentation at the CPSC Meeting on Furniture Flammability

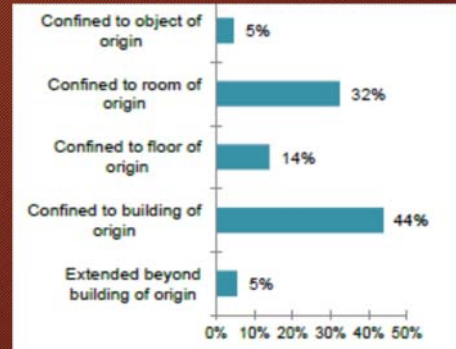
May 16, 2018

The RUF Fire Problem

- Upholstered furniture is the most common combustible in fatal home fires.
- These fires are approximately ten times more fatal than home fires in general.
- 90 % of the casualties and losses are from fires that spread beyond the initial burning object.
- Over the past 5 years, the deaths per 1000 RUF fires is up 50 %.
- The only currently addressed component of the RUF fire problem is resistance to smoldering ignition.

RUF Fire Deaths by Extent of Fire Spread

- Over 90 % of RUF fire deaths result from the fires spreading beyond the initial burning item, almost two-thirds from fires spreading outside the initial fire room.
- Fires beyond the object of origin are almost assuredly flaming.
- The effluent flow from the fire room increases sharply in magnitude and toxicity after room flashover.



Ahrens, Home Fires that Began with Upholstered Furniture, NFPA, 2017; 2010-2014 averages

Room Flashover



Estimated Annual RUF Fire Losses (2012-2016)

	Deaths	Injuries	Property	Fires
Direct small flame ignition ¹	50	150	\$60 M	1,100
Direct ignition to smoldering followed by transition to flaming ¹	360	500	\$200 M	3,400
Ignition by another burning item ²	130	300	\$150 M	3,500
All flaming RUF fires	540	950	\$410 M	8,000
All home fires ³	2600	11,700	\$6800 M	360,000
% from flaming RUF fires	21 %	8 %	6 %	2 %

1. Ahrens, Home Fires that Began with Upholstered Furniture, NFPA, 2017
2. Average of 2006-2010 data from Hall (NFPA, 2014) and Butry (NIST, 2014)
3. Haynes, Fire Loss in the United States during 2016, NFPA

Attributes of Hazard Reduction Approach

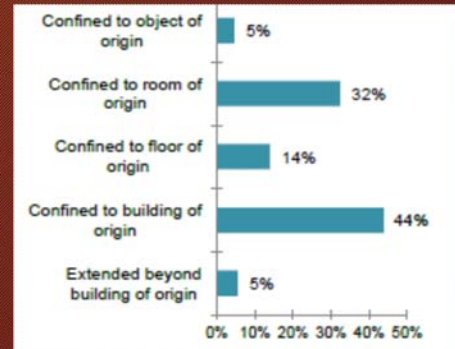
Ignition Reduction	Burning Rate (Heat Release Rate) Reduction
Hazard results from a later fire stage of low probability.	Hazard directly linked to intensity of burning, which includes results of a “productive” ignition.
A “non-fire” is a good fire.	Counting only RUF ignitions by small flames severely underestimates the RUF fire losses.
Consequences of ignition by a small ignition source are not necessarily severe.	Consequences of a high HRR include ignition of other combustibles and room flashover.
Different ignition sources attack different sites and potentially different RUF materials.	Peak HRR reached when flaming reaches an interior crevice or corner.

Therefore, focus on reducing the consequences of ignition, realizing that there is still some benefit to improving the predictivity of current ignition resistance tests.

Fire Safety Improvement

- These data indicate that reduction in RUF fire deaths should follow from reducing the likelihood of room flashover.
- Peak RUF heat release rate (HRR) values near and below 200 kW, plus a limit on heat release, would significantly reduce the likelihood of room flashover.
- HRR limitation also reduces the likelihood of igniting other combustibles and the hazard from initially smoldering fires.

RUF Fire Deaths by Extent of Fire Spread



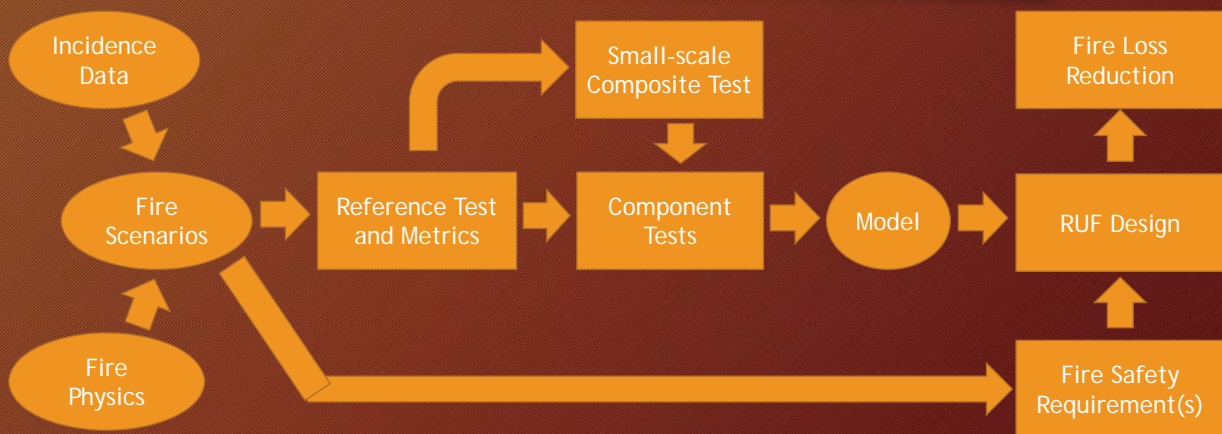
Vision

Success will be based on a simple-to-use tool with which a furniture manufacturer (or re-upholsterer) could pre-determine how to compose a piece of furniture that meets both customers' desires and the fire performance criteria

Concept

- Full-scale testing of all combinations of RUF materials and designs is impossible.
- A practical solution is a set of quantitative bench-scale fire property tests of RUF components, combined with a means to accurately integrate the test results.
- This allows the safety enhancement to be achieved by a single component or a combination of safer components.
- Assuring the accuracy of this process requires a reference test for RUF flammability resulting from flaming ignition.

Approach for Reducing RUF Fire Hazard



Three Myths

- All fire retardants are hazardous.
- Fire retardant additives are needed to reduce HRR.
- Further changes in RUF flammability means customers will be unhappy with less choice, less comfort, higher prices, etc.

Conclusion

- RUF fires are the most dangerous.
- The consequences of RUF fires are dominant when the RUF items are flaming.
- Reduction in burning (heat release) effects a reduction in fire hazard, regardless of the nature of the ignition.
- Safe technologies exist to achieve this reduction.
- It remains for our community to devise the metrics for less flammable RUF items that enhance safety while stimulating creative product development.

Thank you



**Round Robin Testing
To Investigate Alternative
Smolder Testing
Procedures & Materials**

Robert J. Luedeka
Executive Director, Polyurethane Foam Association

Agenda

- Background on the interlaboratory round robin
- Round robin objectives
- Test configuration
- Testing matrix
- Fabric composition
- Test procedures
- Preliminary results
- Observations
- Preliminary summary

Supporting ASTM International Work Item #56607

- ASTM Work Item #56607 is intended to create a standard smolder testing procedure for upholstered furniture based on California TB 117-2013 procedures
- Interlaboratory round robin testing was requested to investigate the effects of possible changes in:
 1. standard foam thickness
 2. methods for pass/fail evaluation (weight loss vs char length)
- Seven laboratories are participating

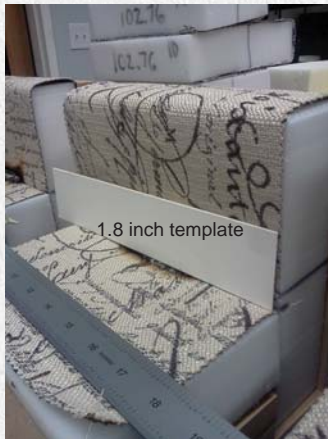
Evaluate Standard Foam Substrates



Investigate Pass/Fail Evaluation Methods



Measure char with ruler



Measure char with template



Mass loss measurement

Resolve Questions

- Is char length measurement (ruler or template) more reliable than mass loss?
- Is there a relationship between foam substrate thickness and possible increased mass loss?

Test Configuration



45 Minutes test duration

Round Robin Testing Matrix

	Fabric A	Fabric B	Fabric C	Fabric D	Fabric E
2" foam on vertical and horizontal	Char length	Char length	Char length	Char length	Char length
	Mass loss	Mass loss	Mass loss	Mass loss	Mass loss
3" foam on vertical, 2" foam on horizontal	Char length	Char length	Char length	Char length	Char length
	Mass loss	Mass loss	Mass loss	Mass loss	Mass loss
3" foam on vertical and horizontal	Char length	Char length	Char length	Char length	Char length
	Mass loss	Mass loss	Mass loss	Mass loss	Mass loss



Fabric Composition

Fabric	Composition / Weight*	Anticipated Fabric Class
Fabric A	100% cotton, 13.0 oz/yd ² (possible nylon-type back coating**)	Class 2
Fabric B	100% polyester, 8.7 oz/yd ²	Class 1
Fabric C	79.52% cotton/20.48% polyester, 13.1 oz/yd	Borderline
Fabric D	54% cotton/42.13% rayon/3.8% flax, 17.8 oz/yd ²	Borderline
Fabric E	53% polyester/47% cotton, 6.8 oz/yd ²	Borderline

*Fabrics and specifications from National Council of Textile Organizations (NCTO)

** Analysis by Calif. BEAR HFTI



Test Procedures

- Condition all materials
- Weigh vertical and horizontal foam pieces
- Assemble mock-up
- 45 Minutes of SRM 1196 cigarette smolder
- Test ends if there is ignition of fabric or foam
 - *If still smoldering at 45 minutes, smother with damp cloth
- Measure char length on fabric (2 methods – ruler & template)
- Disassemble
- Remove loose char and weigh remaining foam (vertical and horizontal)

Preliminary Results

- Based on results from four of seven labs
- Final tabulations, reproducibility & repeatability, precision & bias will be prepared by ASTM International

Round Robin Char Length Range (Preliminary)

	Fabric A Char Range	Fabric B Char Range	Fabric C Char Range	Fabric D Char Range	Fabric E Char Range
2" foam on vertical and horizontal	0.3" – 1.2"	0.5" – 1.4"	0.3" – 1.2"	0.7" – 4.1"*	0.4" – 1.6"
	Mean 0.6"	Mean 0.7"	Mean 0.7"	Mean 1.8"	Mean 0.8"
3" foam on vertical, 2" foam on horizontal	0.4" – 1.2"*	0.4" – 1.6"	0.4" – 1.2"	1.2" – 4.3"*	0.4" – 1.8"
	Mean 0.6"	Mean 0.8"	Mean 0.7"	Mean 2.3"	Mean 1.0"
3" foam on vertical and horizontal	0.4" – 1.8"*	0.5" – 1.6"	0.4" – 1.2"	1.3" – 4.1"*	0.5" – 1.6"
	Mean 0.8"	Mean 0.8"	Mean 0.7"	Mean 3.8"	Mean 0.9"

Comment: 3 labs were closely aligned. 1 lab was consistently high.

* Continued to smolder at 45 minutes



Preliminary Char Length Measurement Comments

- Three labs closely aligned; one lab was a consistent outlier
- Apparent difficulty differentiating char from smoke discoloration
- Example: One lab reported strong discoloration above template line; however, straight pin test determined this was not char. Pin passes through char easily, discolored fabric resists
- Final tabulations, reproducibility & repeatability, precision & bias will be provided by ASTM International



Round Robin Mass Loss Range and Mean (Preliminary)

	Average Start Weight	Fabric A Mass Loss	Fabric B Mass Loss	Fabric C Mass Loss	Fabric D Mass Loss	Fabric E Mass Loss
2" foam on vertical and horizontal	103.2g	0.1g – 1.0g	0.3g – 1.0g	0.2g – 2.9g	6.7g – 23.0g*	0.2g – 0.8g
		Mean 0.6g	Mean 0.6g	Mean 0.9g	Mean 11.9g	Mean 0.5g
3" foam on vertical, 2" foam on horizontal	134.1g	0.5g – 3.7g*	0.1g – 0.9g	0.3g – 0.9g	8.3g – 26.5g**	0.3g – 0.9g
		Mean 1.5g	Mean 0.5g	Mean 0.6g	Mean 12.0g	Mean 0.6g
3" foam on vertical and horizontal	154.3g	0.4g – 15.0g*	0.5g – 0.9g	0.3g – 1.2g	12.5g – 48.0g*	0.2g – 1.0g
		Mean 3.2g	Mean 0.6g	Mean 0.8g	Mean 21.1g	Mean 0.6g

Comment: 4 Labs were closely aligned. Intralab outliers were common with smolder-prone fabrics.

* Continued to smolder at 45 minutes **1 Lab could not smolder effectively (no data for 3 trials)



Preliminary Mass Loss Measurement Comments

- Four labs closely aligned (with non-smolder prone fabrics)
- Intralab outliers common with smolder-prone fabrics combined with 3" foam substrates
- Mass loss measurement may reduce possible operator error
- Possible slight correlation between mean mass loss and foam substrate thickness (with smolder-prone fabrics)
- Final tabulations, reproducibility & repeatability, precision & bias will be provided by ASTM International



Preliminary Summary

- Additional char length measurement training may be helpful
- Too early to conclude if mass loss provides significant advantages
- Not apparent difference between 2” and 3” thick foam substrate results except with catastrophic fabric failures.



MEMO

BIFMA

To: CPSC
From: Dave Panning (dpanning@bifma.org)
Date: May 7, 2018 draft

Subject: **Upholstered Furniture Flammability Survey**

The BIFMA Flammability Subcommittee has actively shared comments with code officials, and other interested stakeholders, regarding flammability requirements. From time to time the subcommittee has conducted surveys with membership. Below are a few of the results from the most recent survey conducted in April of 2017. You can also see a comparison with 2015.

- 1) What percentage of your TB-117-2013 foams contain fire retardant chemicals? **0.9%** (3.8% in 2015)
- 2) What percentage of your TB-117-2013 cover materials contain fire retardant chemicals? **3.1%** (7.9% in 2015)
- 3) What percentage of your TB-117-2013 products contain fire retardant chemicals? **3.6%** (11.0% in 2015)
(Note about #3: Above 1000ppm to be labeled YES per CAL SB1019 label law)
- 4) What percentage of your TB-133 foams contain fire retardant chemicals? **19.3%** (not asked in 2015)
- 5) What percentage of your TB-133 cover materials contain fire retardant chemicals? **21.1%** (not asked in 2015)
- 6) What percentage of your TB-133 barriers contain fire retardant chemicals? **98.4%** (not asked in 2015)
- 7) What percentage of your TB-133 products contain fire retardant chemicals? **99.5%** (98.3% in 2015)

May 4, 2018

State & Local Regulation of Flame Retardant Chemicals in Upholstered Furniture Components

The Business and Institutional Furniture Manufacturers Association (BIFMA) is the not-for-profit trade association for business and institutional furniture manufacturers. Since 1973, BIFMA has been the voice of the commercial furniture industry and currently has over 300 member companies.

BIFMA strongly supports eliminating flame retardant chemicals in upholstered furniture components. The State of California, and many other specifiers, have moved away from open-flame to smolder requirements such as TB 117-2013. We supported this change and urge adoption of a smolder standard based on TB 117-2013 as a national standard.

In 2015, the State of California enacted Business and Professions (B&P) Code section 19094 (introduced as Senate Bill SB 1019). Whereas,

A manufacturer of covered products shall indicate whether or not the product contains added flame retardant chemicals by including the following "flame retardant chemical statement" on the label:

"The upholstery materials in this product:

_____ contain added flame retardant chemicals
_____ contain NO added flame retardant chemicals

A manufacturer of covered products shall indicate the absence or presence of added flame retardant chemicals by placing an "X" in one of the appropriate blanks."

California's requirement for claiming "No Added Flame Retardant Chemicals" is based on levels of flame retardant chemicals measuring below 1000 ppm. This link provides more information regarding the California regulation: http://www.bearhfti.ca.gov/about_us/sb_1019_info.pdf

While the move to smolder regulations are very helpful to our industry in the removal of flame retardant chemicals, we are now seeing an increase in efforts to regulate the use of flame retardant chemicals in furniture. Current direction on these diverse flame retardant regulations are that they propose to regulate different chemicals, at different concentrations and with different requirements.

BIFMA believes that the inconsistent proposed State and Local flame retardant regulations place a huge burden on manufacturers. At the same time, nearly all manufacturers have removed these subject chemicals; others are in the final stages of doing so. To the extent bans are desired to regulate flame retardant chemicals, it is very important to BIFMA that such regulations be consistent in their scope and highly recommend such regulations be limited to the components in scope for California TB117-2013 (i.e., foam, fillings and textiles). It is also critical that any labeling requirements be consistent. If regulation is enacted, BIFMA strongly urges that state/local regulators collaborate to harmonize regulatory language and associated labeling requirements; ultimately, we would prefer national regulation be promulgated.

If a regulator chooses to enact a regulation, BIFMA recommends harmonization with the current California B&P Code 19094 regarding flame retardant chemicals (1000 ppm threshold) and labeling.

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May 7, 2018

Fire Safety of Upholstered Furniture

The Business and Institutional Furniture Manufacturers Association (BIFMA) is the not-for-profit trade association for business and institutional furniture manufacturers. Since 1973, BIFMA has been the voice of the commercial furniture industry and currently has over 300 member companies.

BIFMA strongly supports eliminating flame retardant chemicals in upholstered furniture. The State of California, and many other specifiers, have moved away from open-flame to smolder requirements such as TB 117-2013. We supported this change and urge adoption of a regulation based on TB 117-2013 as a national standard. We encourage all regulators, legislators, code officials and specifiers to replace existing open-flame requirements, including the open-flame TB-133 standard, with a smolder standard based on TB 117-2013.

Given the increasing body of evidence that indicates the persistence, bio-accumulation and known health concerns of many flame retardants, we believe the risks associated with the use of these chemicals is greater than the fire risk from furniture without flame retardants. Studies have shown that added flame retardants may have little impact on the flammability of furniture and are likely to increase smoke toxicity during a fire.

Additionally, the potential for fires has been reduced by the following:

- Increased use of smoke detectors
- Improved smoke detector technology that reduces nuisance alarms
- Sprinkler systems
- Smoking bans
- Societal changes that include fewer cigarette smokers
- USA and Canada require fire-safe cigarettes designed to extinguish when not in use

As a result, furniture purchasers are requesting safer, more environmentally friendly products that do not contain flame retardant chemicals.

In addition to environmental and health concerns of flame retardant chemicals, we are concerned with the performance and cost implications of open-flame regulations. These regulations often require the use of fire-barriers or other materials that limit furniture design, negatively affect comfort, and reduce longevity of the products, and significantly increase product costs.

Manufacturers have indicated that open-flame requirements, especially those that lead to the use of barrier technologies (such as TB-133), may increase product costs up to 100%. It is estimated that less than 1% of the current North American commercial upholstered furniture products are required to meet open-flame regulations. The adoption of an open-flame requirement as a national regulation could lead to cost increases exceeding \$600,000,000 for the commercial furniture industry. Residential furniture industry costs would also increase.

DO THE BENEFITS OF A NEW FLAMING IGNITION JUSTIFY THE RISKS?

PAST CPSC - INCIDENT ANALYSES

When looking at this issue in the past the CPSC did not just rely on NFIRS Data, which is incomplete at best. They undertook a more in-depth analysis of specific fire incidents using fire investigative reports. (See below.) These references were mentioned in a 1997 CPSC Document titled, "Upholstered Furniture Flammability.")

TAB B: Staff memorandum, National Fire Estimates for Smoking Material Ignited Upholstered Furniture Fires, K. Long, EHHA, to D. Ray, September 16, 1997.

Staff report, "Small Open Flame Ignitions of Upholstered Furniture: Final Report," K. Long, EHHA, to D. Ray, September 16, 1997.

PROPOSED CPSC INCIDENT ANALYSIS

In order to pursue an open flame, test the CPSC must conduct a cost/benefit analysis. In order to get a true estimate of any potential future benefit, that an updated "Fire Investigative Study," should be conducted, similar to the one the CPSC did in 1997.

I would also like to suggest that this time, the impact of smoke alarms be incorporated into the study.

PROPOSED CPSC INCIDENT ANALYSIS

I would also like to suggest that in order to estimate the impact of the new and improved smoke alarms (Contact Arthur Lee of the CPSC.) required by the recent changes to UL217 that this study be done in Massachusetts. Massachusetts has mandated photoelectric smoke alarms since 1997 and has also collected data on smoke alarm type, ion vs. photo. A preliminary analysis indicates far fewer fatalities with disabled alarms, which could impact benefit of any new ignition test.

PROPOSED CPSC INCIDENT ANALYSIS

For example: if the new UL217 standard reduces smoke alarm disablement then the fatal furniture fire problem may be reduced by 1/3 without changing the furniture. Of course the CPSC may still decide to pursue a flaming ignition test but at least the estimated future benefit would take into account future circumstances.

GAO COMMENTS ON CPSC METHODOLOGY

The CPSC blends information from two different sources. One source provides national estimates on the total number of fires in four general categories and the extent of losses, but it provides no information about specific types of fires, such as upholstered furniture fires. The second source provides detailed information for specific types of fires, but for only a portion of all fires in the United States. CPSC uses the details from the second source of data and the national estimates from the first source to calculate national estimates of fire losses from the kinds of upholstered furniture fires the standard would address.

GAO COMMENTS ON CPSC METHODOLOGY

For those fires for which the cause or origin is unknown, CPSC assumes that upholstered furniture fires will occur in the same proportion they occur in fires with a known cause. Our testing shows that these methods are likely to overstate fire losses that the standard would address, and as a result, they could have a material effect on the associated benefits expected from the potential standard. Various analyses can be used to assess the validity of underlying assumptions and ultimately strengthen CPSC estimates, but so far CPSC has not used them.

GAO COMMENTS ON CPSC METHODOLOGY

We are recommending that, as CPSC continues to consider the need for a mandatory flammability standard for upholstered furniture, it should conduct additional analyses to identify the level of imprecision in the methodology's fundamental assumptions and apply any necessary revisions to its cost-benefit analysis of the potential standard.

- GAO – “CPSC – Additional Steps needed to Assess Fire Hazards of Upholstered Furniture.” (1999)