2013

Safety Convergence

[FURNITURE FLAMMABILITY AND HUMAN HEALTH SUMMIT]

Held on April 16th and 17th in Atlanta, GA.

Furniture Flammability and Human Health Summit
A Summary - Read Out

Held on April 16th & 17th in Atlanta, GA, the goal of this initial Summit was to begin an open, honest, and respectful dialogue about the issues among key stakeholders including environmental and health advocates, scientific researchers, the chemical and furniture industries, fire officials, the standards development community and potential regulators.

Following a day and a half of stimulating plenary and panel presentations by various distinguished speakers, the collective group divided into 3 individual breakout sessions. The groups were given questions we received from attendees the day prior, and challenged to come up action items for each of the topic categories. Following an extended working session, the break out groups returned to the general session to share answers and recommended actions with the greater assembly.

The Key Topics, Charge Questions, and Group responses are detailed below.

The separate breakout group topics consisted of:

1. Opportunities for Technologies and Manufacturing Strategies
2. Role of Standards, Methods, and Alignment to Current and Emerging Needs
3. Data and Research

Breakout 1 -Opportunities for Technologies and Manufacturing Strategies

Specific questions posed by general session and addressed:

1) **What is the definition of safe FR? What is it worth to really make furniture fire safe?**
- Very difficult to define this – can be subjective but no cutoffs identified so you need to rank, rate, and characterize. May be better to define "safer" versus truly safe. Suggestion made to make the underlying assumptions behind the definitions transparent for what the tradeoffs are with each particular FR additive. Must be clear what the value judgments are with the products to assess the various tradeoffs objectively.
- Consumers need assurance of safety, but will have to be delivery of data that has trust behind it and is easily understandable. An easily understandable certification system associated with the product, and if someone wanted to dig more into it, the data are all there. Valid point is made that in the US, in most cases, products being sold in stores are automatically assumed to be safe. Models may exist though like Proposition 65 for labeling. Tags are needed by both manufacturers and consumers, but needs may differ among these groups. (See mattress standard for fire safety recently developed – do customers really notice?)
- Model for "fire safe product development" – mattress manufacturers got actively involved in development of new fire safety standards of their products and how to meet it and the new safety issues.
- "Safer" may best be defined by both fire safe and environmentally/health safe. Safety can also be based upon risk and/or hazard. May have to have more parties weigh in on. Risk is

a perception issue relevant to alternatives. Item A is perceived as more risky than Item B due to reasons which are and are not always fact based.

- Economics and price rules and typically trump perceptions of safety in many cases, even if benefits justify it. Sometimes consumer choice may have to be removed to force a particular safe change.
- Consumer focus groups may be needed to help define this issue. Some data is available.
- What is it worth to make furniture fire safe?   See economics / price commentary and consumer perceptions. Some data/math exists from NFPA in models they have done (see John Hall) where they quantified fire damage and death. Not easy to quantify hazards and injury, but $2B was number that NFPA came up with.
- Burden of disease from using a particular FR chemical vs. fire safety issues not easy to quantify costs. CDC has some data on this for specific chronic diseases to quantify financial burden. (lost work, health care costs, early death and burden on family from loss of family member)
- Are there models existing from studies on phasing out lead or mercury that can be used to help quantify this burden.
- Different values @ different price points. So some customers at a particular price point may not care about some of these issues at all, while those at another price point they may care more, or care about different issues. See Foam Manufacturer Association data. May be a study more for sociologists / psychologists to help sort this out.

2) **Are there FR chemicals in the barrier**?
- Depends upon the type of barrier one uses whether or not FR chemicals will be present.
- Knit, woven, batting, back-coating fabric, inherently FR fabrics and each of these may or may not have FR chemicals depending up on what test the barrier fabric must provide protection against.
- Depends upon test methodology that the barrier must provide protection against.

3) **How much do barriers cost relative to cost of making a chair? (notes that costs below are manufacturer costs, does not include profit margins)**
- Depends upon the barrier chosen and the shape of the chair and the manufacturing methodology.
- Also depends upon the fire test that the barrier must provide protection against.
- According to a barrier costing manufacturer, assuming existing fire tests, $5/square yard to $12/square yard. May add another $1.50 per yard to co-laminate barrier to outer furniture fabric.
- Chair – 5-7 yards barrier fabric needed. Sofa – 13-15 yards barrier fabric needed.
- If barrier fabrics are not co-laminated with outer fabrics, can double labor costs to manufacture a successful piece of furniture. Other complications of manufacturing show up as well (new materials may require new equipment and tooling to successfully make good furniture at cost).
- May also depend upon regulatory requirements – one that describes performance and leaves open some ways to meeting the fire safety needs.
- Costs of the fire tests – whole furniture vs. barrier fabric vs. individual components….Adds to the total cost of the system. So the fire tests will drive the costs, what is the fire test trying to measure?

- Also more muddled when/if the end-consumer makes their own chair or reupholsters the furniture. If those reupholster fabrics don't meet specifications, how does that change the fire loss statistics?

4) **Comment: We did not get upholstered furniture manufacturer's perspective**
- We have some of their inputs, but see list of those missing from discussions at the end of this document.

Bottom line: Summary Comments

What is the problem, what is the acceptable solution to that problem? Because this is not yet defined, it is impossible to move forward on manufacturing solutions. Manufacturers cannot proceed until they know what is/is not allowable based upon that problem being defined in light of a specific definition of "safe". And that definition of safe may not be clear until specific tests or a system of screening methodology is in place. Screening methodology for system will have to look at fire scenarios, EH&S safety, and cost/performance criteria. Begin with this matrix with what you know today and fill in the gaps and see if the problem can be answered. Simplifications cannot be used to solve the problem – have to do systems approach that looks at fire, EH&S, and economic criteria – systems engineering that feeds benefits of one system into another, or at least seeks to do so.

This will have to consider holistically: goals, evaluate existing & new strategies, test protocols, MFR needs and enforcement.

Those missing from discussions at UL event:
Supply chain MFRs (National / International):
- Retailers
- Fabric / Textile MFRs
- Batting / Filling MFRs
- Coating/Back coating
- Reupholster manufacturers
- Foam Fabricators

Regulatory Agencies (Chemical and Fire):
- EPA
- State Regulatory Agencies
- International organizations (in case of global commerce and imports/exports)

Others:
- Consumer reports?

Possible Frameworks to consider:
Design for the Environment type methodology: Starts creating a real matrix of what the research gaps are, but there is concern that filling in everything might take forever to really fill out and therefore nothing gets done (analysis by paralysis)
RTI (Research Triangle Institute) has another methodology used recently to look at different technologies to see what data is missing (Alex Morgan will look into this – cannot remember name of methodology)

Breakout 2 - Role of Standards, Methods, and Alignment to Current and Emerging Needs

Specific Questions Posed by General Session

- What are the attributes of a sustainable flame retardant?-
- Recycling of foam and other FR treated materials has been strongly encouraged by Green Rating Systems such as USGBC LEED, and others.
    - Is there now an unintended consequence of this action illustrated by persistence of FRs in the environment?
    - Topic – End of Life strategies persistence
- Furniture manufacturing companies need to know if barriers will be required if they are currently using FR foam and Type I fabrics.
- What are the details of the proposed California Smolder Standard and how does the data compare with the open flame standard?
- How can we assure barriers that might be used do not contain flame retardant chemicals?
- If couches are used indoors and if smoke constitutes cause of ¼ to 60% of fire deaths (comments from experts heard today), should there be a smoke generation component to the regulation of upholster? Perhaps 3 tier

The workgroup did not answer each question individually but provided over-arching concepts / principles that should be considered:

- Balanced approach to the issues
    - E&HS is increasingly important to manufacturers
        - Manufacturers want to eliminate chemicals where possible
- Continuous improvement process
    - Perfection is the enemy of the good
- Acceptable levels of risk
    - Being considered by standard developing organizations
    - What is acceptable level of risk for fire?
    - Available under Fed. Haz. Assessment Act (CPSC)
    - Current CPSC flammability standards are PB
- Need a level playing field (harmonization)
    - Domestic and imported products
- Is a particular standard really needed?
    - How big is the problem being addressed?
    - Cost-benefit analysis
    - Vulnerable populations
- Conceptual framework (applies to fire / E&HS)
    - Raw materials
    - Components
    - Products (demonstrate performance at this level)
    - Systems
    - Structure
        - occupants
        - First responders
        - Combustion products
    - End of life / disposal / environmental fate

General approach for a standard or program should include
- Performance-based approach
- Goals
- Objectives
- Standards / test methods
- Performance criteria

Answers that are needed to proceed-
- Fire testing at the product level
  - Demonstrate performance at product level
  - Guided by end-use application
  - Exposure conditions
- Has scale been validated?
  - Selection of ignition source
- Fault tree, HBSE analysis of upholstered furniture needed
  - Acute (test methods unknown)
  - Chronic
    - (routes of exposure known, define population)
- What ignition sources should be used for fire testing of upholstered furniture?
  - Magnitude of open flame
- How do you establish the performance requirements for toxin-free fire safety?
- What are the characteristics of a "sustainable" FR product?

Breakout 3 - Data and Research Needs

Questions posed by general session

- How do we get more funding for new flame retardants/flame retardant materials with superior environmental <u>and</u> fire safety performance?
- What one integrating vision/conceptual framework can we develop that will allow us to prioritize research and qualify strategies on all the parts of the upholstered furniture fire problem?
- Is any work being done to prioritize health effects or tox data? (Identifying gaps in exposure data for consumers)
- Are certain types of tox testing being done for Phosphorous FRs based, other halogenated FRs, alternative FRs?
- What evidence is there that TB 117 compliant foam has had a measurable effect on upholstered furniture ignition of fire intensity?
- What is the role of public health in addressing the issues discussed during the symposium? I would like to better understand exactly how the fire standard tests are done and evaluated, e.g., TB117, TB-117-revision, TB133

Overarching workgroup recommendations for steps forward included data sharing and key research needed to assist in moving ahead to solutions.

- Development of common data repository and make available
  - Data on fire statistics (International data would be helpful to have as well).
  - Matrix to help normalize data
- Consider NAS review of existing data on fire-related deaths in the US (including Firefighters)
  - Compare to other countries
  - Need for additional regulation
  - Normalized for population
- Provide alternative analysis definition for flame retardants and provide currently available data
- Define key elements of life cycle analysis with common metrics and provide what is currently available
- Research data needed for migration pathway for flame retardants out of foam
- Research on the effectiveness of barriers- define and test for chemical exposure and fire impact
- Research FR exposure pathways via air, dust and ingestions and analyze for vulnerable populations