

Preferable Approaches for Meeting Furniture Fire Safety Standards



**Design for the Environment
Kathleen Vokes**

Economics, Exposure & Technology
Division
Office of Pollution Prevention & Toxics
U.S. Environmental Protection Agency
www.epa.gov/dfc

November 10, 2004



Design for the Environment Program

- Collaborative partnerships with industry sectors
 - Industry leaders
 - Trade associations
 - Public interest groups
- Non-Regulatory
- Risk reduction through access to EPA's chemical information and models
- Convener, facilitator, information broker





Flame Retardancy Partnership Overview

- Origins
 - Events influencing FRs in furniture
 - Partnership development
- Project Plan
 - Goals
 - Action Items
 - Product Stewardship





Events Influencing FRs in Furniture Fire Safety

- American Home Fire Safety Act (S 1798 IS)
- US Consumer Product Safety Commission ANPR
- California TB117 - Proposed update of upholstered furniture flammability standard





Events Influencing FRs in Furniture Environmental

- Environmental Monitoring Programs – several PBDEs detected in human breast milk, environment
- Voluntary phase-out and SNUR for penta- and octa-BDE
- Significant New Use Rule – Residential Upholstered Furniture
- State legislation banning PBDEs





Partnership Development Meetings

- San Francisco roundtables
- Furniture manufacturer interest
 - AFMA and BIFMA
- Broad stakeholder interest and support
 - CPSC
 - AFSC
 - GreenBlue





Partnership Scope

- Green Chemistry Solutions
 - **Drop-in chemical substitutions**
 - Green chemistry challenge to encourage environmentally preferable flame retardants
- Green Engineering and Design Solutions
 - Barrier technologies
 - Alternative formulation of foams
 - Design challenge to address environmental impact of entire supply chain



Partnership Goals

- Short Term – December 2004
 - Compile hazard and exposure information on viable flame retardant chemicals used in furniture foam
 - Make information available to facilitate industry decision making
- Longer Term
 - Compile hazard and exposure information on viable flame retardant chemicals used in other furniture components (fabric, barriers, filling materials, etc...)
 - Establish a fair and consistent level of expectation for toxicological information on new and established FR products
 - Develop a targeted challenge to encourage and recognize environmentally safer FR technologies





Action Plan

- Evaluate flame retardants for use in low-density foam
 - Focused on California TB117 Standard
- Develop a targeted green chemistry challenge
- Develop a process for developing and collecting additional toxicological information on flame retardant chemicals
- Evaluate flame retardants and other methods that will meet the performance requirements of the planned CPSC standard





Flame Retardant Options Report Purpose

- Provide information to make environmentally sound decisions when flame retarding furniture
- Discuss considerations for selecting a replacement for pentaBDE
- Provide information on :
 - General characteristics of flame retardant chemicals
 - Exposure to flame retardant chemicals in foam
 - Toxicology and exposure for PentaBDE Alternatives
 - Alternatives technologies



Flame Retardant Options Report Hazard Assessments

- Detailed hazard reviews
 - Based on publicly available literature
 - Determine whether endpoints can adequately be characterized based on OECD guidelines
- Summary of chemicals in flame retardant formulations
 - Detailed hazard reviews
 - Measured confidential data from EPA
 - Estimations from EPA New Chemicals Program
 - Professional judgment of EPA staff
- Summary of EPA assessment for environmental and human health endpoints
 - High, Medium, Low



Flame Retardant Options Report Exposure Routes

- Description of Key elements for Exposure Assessment
- Industrial Releases and Exposures
 - Chemical Manufacturing
 - Foam Manufacturing
 - Furniture Manufacturing
- Consumer and General Population Exposures
- Potential routes of exposure based on physical/chemical properties



Flame Retardant Options Report

Toxicity Summary Table

Chemical	Human Health Effects							Ecotoxicity	
	Cancer Hazard Potential	Skin Sensitizer	Reproductive Effects	Developmental Effects	Genotoxicity	Systemic Effects	Mutagenicity	Acute	Chronic
Chemical A	L	M	L	L		M	L	M	H
Chemical B	M	L	M	M	L	M	M	M	M
Proprietary A	L		M	L	M	L	M	L	M



Flame Retardant Options Report

Fate/Exposure Summary Table

Chemical	Potential Routes of Exposure						Environmental Fate			
	Worker			General Population			Persistence	Persistence	Bioaccumulation	Reactive?
	Inhalation	Dermal	Ingestion	Inhalation	Dermal	Ingestion				
Chemical A	Yes	Yes	No	No	No	No	Yes	L	L	Additive
Chemical B	Yes	Yes	No	Yes	No	No	Yes	L	L	Reactive
Proprietary A	Yes	Yes	Yes	No	No	No	Yes	L	M	Reactive



Chemical Information

Establishing criteria

- Baseline set of information on commercial FRs
- Additional information based on production volume
- Method for communicating information





Targeted Green Chemistry Challenge

- Build on the Presidential Green Chemistry Awards
- Provide high-level recognition
- Recognize and encourage development of environmentally safer alternatives
 - FRs for flexible foam
 - Backlights for TV and computer flat screen displays
 - Floor refinish technologies





FR Options Analysis

Planned Fire Safety Regulation

- Identify FRs in fabric, barriers, fillers, etc...
 - Viable FR chemicals
- Data compilation and presentation





Product Stewardship



AFMA understands and supports the long term nature of this project and encourages EPA to remain engaged with stakeholders to develop environmentally sound solutions to fire safety



BIFMA is committed to providing sustainable work environments and business practices based on sound economics, environmental protection and social responsibility



AFSC is committed to improving fire safety and saving lives...We expect this partnership to lead to the implementation of safe and environmentally sound approaches to fire safety



GreenBlue helps diverse audiences to understand, adopt, and implement innovative design approaches that optimize benefits for people and the environment. We are attracted to this partnership for the unique opportunity to reconceive design criteria for flame retardant products.



Next Steps

- DfE Partnership Website
- Two-Day Workshop – January 2005





Environmentally Preferable Approaches for Meeting Furniture Fire Safety Standards

Contact Information

Kathleen Vokes, EPA DfE, 202-564-9910

Bill Perdue, AFMA, 336-884-5000 x117

Dick Driscoll, BIFMA, 616-285-3963

Mark Buczek, AFSC, 202-530-4590

Lauren Heine, GreenBlue, 434-817-1424 x305