TRIAL

November 2005 / Volume 41, Issue 12

Is there a time bomb in the sofa?

Upholstered furniture can turn a small fire into a life-threatening blaze in minutes. Although the problem of furniture flammability is well known to manufacturers, most consumers remain unaware of its magnitude.

Robert P. Foster and **Joseph B. Zicherman**

The scenario is all too frequent and invariably tragic. Small children are naturally attracted to fire. An unsupervised child, playing with a lighter or matches, ignites the couch in the family den, then runs and hides.[1] In just two or three minutes, the room becomes untenable; fire then fills the room in a condition called flashover,[2] which no one can survive. Almost immediately, the fire spreads rapidly to other parts of the home, where occupants often are seriously injured or killed.

This is a worst-case scenario, but sadly, it is not unusual. Dwellings are especially vulnerable to fire hazards because of furniture that can ignite easily, regardless of how a fire starts. Statistical and fire incidence data indicates that the home is where people are most likely to experience a serious fire.[3]

In the presence of an ignition source, a fire is more likely to start or spread in a home that has furniture cushioned with polyurethane foam. And yet this material is used in nearly all upholstered furniture sold in the United States. It is a petroleum-based product that has some of the same combustion characteristics as gasoline and kerosene. Unmodified, it ignites readily and burns vigorously when exposed to a small ignition source, giving off huge volumes of dense black smoke that contains toxic gases. It also consumes available oxygen as it burns, which further threatens people in the home.

Foam manufacturers have long issued explicit written warnings of these properties to furniture makers,[4] but the makers do not convey these warnings meaningfully to consumers, probably because such warnings would cause furniture sales to decline.

Other furniture components contribute to the problem as well. Some fabrics perform better than others in the presence of small, open-flame ignition sources such as matches and lighters. Some ignite easily and spread flame rapidly or accelerate smoldering in the presence of burning cigarettes. Polyester fiber used in seat backs may initially melt away from flame but then burn rapidly and create a liquid “pool fire,” which then flows into and ignites surrounding materials.

Why is upholstered furniture so dangerous? If a sofa in an average-sized family den (8 feet by 12 feet, for example) ignites, the fire in that room will reach a heat-release level of several million watts of energy in less than four minutes. The room typically reaches the point of flashover when the fire approaches 800,000 to 1 million watts of energy. So in this example, where does the rest of the energy—2 million to 3 million watts—go? It goes elsewhere in the home and creates untenable conditions far from the room the sofa is in.

The heat and smoke produced are lethal, and the speed with which they spread makes the situation even more deadly. Extensive literature confirms this effect of burning furniture.[5] Furniture need not perform so poorly, but most cushioned furniture available for purchase today will perform this way in a fire.

Furniture can be made reasonably safe with feasible, commercially available materials and designs at reasonable cost. Some furniture-covering materials such as wool, leather, modacrylics, and PVC vinyl typically perform adequately without retardants. Fire barrier materials, designed to go between the fabric and highly flammable foam to delay ignition, have been produced for decades and can be incorporated into furniture for a modest increase in cost.[6]

Methods to treat filling materials such as polyurethane foam, polyester fiber, and cotton with fire retardants have long been available.[7] Certain design options in upholstered furniture construction also can help minimize flammability.[8] For example, manufacturers can use less of the most flammable foam materials by making cushions with a layer of fire-retardant foam or padding (also known as an interliner) that wraps around the highly flammable foam core.

Standards

It has been well known for years that cushioned furniture manufactured with conventional polyurethane foam routinely causes fires to grow so rapidly that the resulting heat and smoke pose a grave hazard to life. As early as 1972, the Department of Commerce issued a notice in the *Federal Register* that a regulation may be needed to eliminate or reduce the risk of injury and death from upholstered furniture fires.[9]

Furniture manufacturers, retailers, and component and material suppliers addressed smoldering ignition sources such as cigarettes in the late 1970s by adopting a voluntary standard through an industry organization formed for that purpose, the United Furniture Action Counsel (UFAC). The standard addressed only cigarettes as an ignition source—not open-flame sources. The industry adopted the standard largely to thwart mandatory federal regulation, which presumably would have been more stringent and thus more costly than the voluntary standard. The industry has continued to resist regulation for decades, primarily through the UFAC and the American Furniture Manufacturers Association (AFMA).

While the voluntary standard has reduced the incidence of upholstered furniture fires, both smoldering and open-flame ignition sources continue to cause catastrophic losses. The Consumer Product Safety Commission (CPSC) reported in 1997 and again in 2001 that upholstered furniture is associated with more residential fire deaths than any other product under its jurisdiction[10] and that the rate of injury and death from open-flame ignition of upholstered furniture had remained constant for more than 20 years.[11]

Until recently, neither the industry nor the CPSC had addressed the rate of fire growth after upholstered furniture ignites. A May 2005 CPSC draft performance-based flammability standard limits the mass or weight loss of burning furniture in a given period of time under a specific test protocol.[12]

Government agencies such as the National Institute of Standards and Technology, the U.S. Fire Administration, and the CPSC—as well as fire-related organizations such as the National Fire Protection Association (NFPA) and National Association of State Fire Marshals (NASFM)—have conducted testing and analyzed fire-loss trends and statistics and have published articles, studies, and reports chronicling the problem over the last 30 years.[13] Numerous television documentaries have broadcast the tragic consequences of fires associated with these products and the unsuccessful efforts of these organizations to bring about positive change.[14]

In 1993, the NASFM petitioned the CPSC to pass regulations requiring that upholstered furniture be constructed with fire-retardant materials and that manufacturers convey appropriate warnings of fire hazards to consumers.[15] The CPSC has had the petition under consideration ever since. Regulatory bills were introduced in the House and Senate in the 108th Congress, but they did not pass.[16]

The outcome of a 2003 CPSC meeting on furniture flammability[17] suggested that the furniture industry and its trade associations may be less resistant to improving their products' fire performance—possibly because it would help them control the growth of imported upholstered furniture. If standards were stricter, American manufacturers would have an edge over their foreign counterparts.

In 2004, leaders of the furniture, textile, and polyurethene foam industries, as well as the CPSC, NASFM, and public interest groups, participated in a hearing that then-Sen. Ernest Hollings (D-S.C.) convened on the proposed American Home Fire Safety Act. The industries acknowledged that a mandatory flammability standard was forthcoming and offered perspectives on available options to make their products safer.

California is the only state that regulates upholstered furniture for residential use,[18] and a bill is pending in its legislature to toughen its flammability standard.[19] However, any new federal legislation that results from the CPSC's efforts may preempt that standard. In 1991, the state enacted stringent performance-based flammability regulations that incorporate heat-release sensing technology to ensure the safety of upholstered seating furniture used in public buildings.[20]

California has a stringent flammability regulation for mattresses as well. It includes scientific performance-based criteria to significantly reduce the deaths and injuries that polyurethene-filled mattresses have caused in the state for decades.[21]

The United Kingdom has adopted a stringent fire standard requiring the use of fire-retardant technology in residential furniture sold there since 1988.[22] A recent U.K. government study attests to the regulation's role in significantly reducing death, injury, and property damage caused by furniture fires.[23]

Due to scientific advances, heat- release sensing technology could be used more widely than in California to regulate the fire performance of commercial[24] and residential [25] upholstered furniture. However, even if manufacturers do make their furniture safer, the nation has a backlog of cushioned furniture and mattresses produced over the last 30 to 40 years that will continue to pose a grave hazard.

Types of claims

Furniture fire hazards are not a new phenomenon, although most Americans remain unaware of them. People injured by these fires are increasingly bringing recovery actions against manufacturers, material suppliers, and retailers of upholstered furniture products. To the authors' knowledge, no such claims have gone to trial, but many have been settled. In one Alabama case against a furniture maker, for example, a candle fell from a wall sconce to the floor and ignited a sectional sofa, killing two children and seriously injuring their mother. In another case, all four occupants of a Kentucky home died when a child set fire to a sectional sofa with a cigarette lighter.[26]

In addition to claims made for deaths and injuries from furniture fires, there is subrogation potential for insured property losses that furniture flammability defects exacerbated. As in automobile crashworthiness cases, you can argue that while the product itself did not cause the accident or the fire, its defective construction caused additional injury and damages.[27] In a furniture fire case, plaintiff counsel should try to prove that without the defect, no one would have been hurt or killed because the furniture may not have ignited—or, if it did, slower fire growth would have left ample time for a potential victim to understand the developing hazard and escape injury-free.

This theory also effectively rebuts the defense that the occupants' negligence somehow caused the fire. Furniture being exposed to a small ignition source is undeniably foreseeable, based on reliable government statistics.[28] In most states, manufacturers have a duty to design products without defects against foreseeable uses and misuses.[29]

A manufacturer has a duty first to eliminate defects and then, if the danger cannot be removed, to adequately warn users about the product's inherent dangers.[30] A retailer or distributor may not have "safe design" obligations but in most jurisdictions does have a duty to refrain from contributing to the defect (by removing warnings, for example) and to communicate any dangers of which it is, or should be, aware.[31] This duty can be used to address liability in states that have a "sealed container" defense, which insulates the distributors and retailers that pass the product along from the manufacturer.

In many instances, furniture manufacturers discard explicit flammability warnings from foam suppliers, and consumers never see them. The average consumer is unaware of the flammability characteristics of household furniture, and those in the chain of distribution do little to advise them of these dangers.

Pursuing a case

When initially evaluating a potential case, you need to undertake a thorough investigation of the cause and origin of the fire and preserve the scene and remains of furniture that may have accelerated the blaze. You will need to show that the item in question was one of the initial materials ignited, so it does not appear that it was engulfed by a large conflagration that no product design could avoid. One could not reasonably expect a sofa to be fireproof.

It is important to determine what role the product played. You need to determine the area where the fire started, how the piece of furniture affected fire spread and fire suppression, and the product's background

(when and where it was purchased and its manufacturer). Even if most materials have been burned away, the furniture springs almost always survive the fire and indicate the furniture's location.

The dense black smoke, toxic gases, and rapid heat release that accompany furniture and mattress fires rarely can be attributed to other household sources. Investigators should be aware that if these factors are present, defectively designed and manufactured cushioned furniture may well have been present. In the absence of known accelerants, investigators should focus on spread factors that led a small fire to grow quickly into a large one (consistent with NFPA 921, the NFPA's Guide for Fire and Explosion Investigations, which provides proper investigation techniques).

Documentation of the scene should include pre- and postfire conditions, dimensions of rooms and openings, remains of the furniture, and the condition of other furnishings.

It is important to preserve the scene of the fire and any furniture remains so that potential defendants can inspect them. This will help you avoid evidence-spoliation claims that could, under some state laws, lead to limitations on evidence presented at trial—or outright dismissal of the claim.[32]

As in any products case, you need to identify the manufacturer or other liable defendant. But in some cases, the piece of upholstered furniture at issue may have been so flammable that it virtually destroyed itself and rendered identification nearly impossible. The "law tag" that federal law requires be affixed to the product, identifying the maker and type and percentages of filling materials, seldom survives a substantial residential fire that originated with upholstered furniture.

Consumers often purchase furniture in suites, which may include a companion piece of furniture that was far enough away from the fire to have retained its identification tags. Another possible way to identify furniture is through retailers and rental companies, which may be able to provide a paper trail from the client back to the manufacturer.

Upholstered furniture has been estimated to last an average of 15 to 17 years[33] and is often passed down through family members and sold at yard sales and flea markets. This can make tracing the product through the chain of ownership back to a particular retailer or manufacturer difficult. Also, popular styles are copied by other makers, compounding the problem. Since styles of upholstered furniture change every six to nine months on average, the item in question is unlikely to be in production very long, which sometimes makes obtaining an exemplar for testing more difficult.

If an exemplar can be obtained, having an expert conduct full-scale testing of the product can help demonstrate its combustion characteristics. Burning characteristics such as rate of heat release; temperatures at various locations in the area of the furniture; smoke, carbon monoxide, oxides of cyanide and nitrogen generated; and consumption of oxygen can be measured and documented. Such testing often adds compelling evidence to the plaintiff's case. However, you should exercise caution in attempting to reconstruct the fire in question because many variables make precise reconstruction difficult, and such attempts might not be admissible in court.

All states have statutes of limitations from the accrual of the claim, most often the date of the fire, unless minors or incompetents are living victims. Some states have statutes of repose from the date the product was manufactured or placed in the stream of commerce. Repose limitations can bar claims even before the fire occurred if the period of time between manufacture and the fire is longer than the period of repose. These statutes usually have been upheld against constitutional challenges based on equal protection, open courts, and due process.[34] You may want to consider whether the forum is subject to stringent statutes of limitations or repose when deciding where to file suit.

If the investigation and research look promising, you must weigh the merits of the claim and likelihood of success against the high costs of litigating a complex products case of this type. You may need to employ experts on several subjects, including ignitability, flammability, and design of upholstered furniture; warnings; cause and origin; toxicity of combustion by-products; human factors and behavior in fire emergencies; computer fire modeling; fire dynamics; and burn physicians, psychiatrists, and other medical experts. These cases always are litigated vigorously through extended periods of discovery.

A combination of full-scale tests, corporate depositions, and discovery can yield successful results against furniture makers. Full-scale tests of a defendant manufacturer's exemplar product that demonstrate a raging fire, as well as information in the public domain about the furniture flammability problem, provide fertile ground for discovery, depositions, mediation, and trial. You can use them to prove not only how dangerous

upholstered furniture is but also that the defendants knew or should have known of these dangers and the means to mitigate them.

Until mandatory regulations or stricter standards make upholstered furniture safer, people remain vulnerable to the danger that their own furniture will fuel a fire. Technical knowledge of upholstered furniture flammability, along with creative advocacy, will increase the likelihood of a favorable result for clients whose lives have been forever changed by this serious product defect.

Notes

1. JOHN RAYMOND HALL, CHILDREN PLAYING WITH FIRE: U.S. EXPERIENCE, 1980-1992 (1994); JOHN RAYMOND HALL, CHILDREN PLAYING WITH FIRE (2003).

2. Flashover is the point in the growth of a fire in a room or compartment where the hot gas layer developing at the ceiling level radiates sufficient heat energy to essentially ignite all combustibles in the room simultaneously. The "whoosh" that witnesses of serious fires describe refers to flashover.

3. Alison Miller, *What's Burning in Home Fires?,* NFPA J., Sept./Oct. 1991, at 73.

4. Typical warnings and material safety data sheets from polyurethane foam suppliers notify of rapid flame spread, intense heat, dense black smoke, and toxic gases (carbon monoxide and hydrogen cyanide); warn that the material can cause serious injury or death, consumes oxygen at high rate (can suffocate), and melts into a burning liquid; and advises furniture makers to avoid open flames and ignition sources near the material and to pass notification on to the consumer.

5. CONSUMER PROD. SAFETY COMM'N, BRIEFING PACKAGE ON UPHOLSTERED FURNITURE FLAMMABILITY: REGULATORY OPTIONS 6, 10 (2001), *available at* www.cpsc.gov/library/foia/foia02/brief/furnitrep1.pdf (last visited Oct. 5, 2005) [hereinafter CPSC BRIEFING PACKAGE 2001].

6. GEORGE BOOTH, SPRINGS INDUS. PRODS. DIV., USING OPEN FLAME BARRIERS TO ACHIEVE STATE OF THE ART PERFORMANCE (1996) (on file with author).

7. For example, Hickory Spring Code Red Fire Retardant Foam has been available since the early 1980s.

8. Joseph B. Zicherman & Douglas Allard, *Compartment Tests of Polyurethane Foam Seating Assemblies*, 24 FIRE TECH. 128 (1988).

9. 37 Fed. Reg. 230 (1972).

10. CONSUMER PROD. SAFETY COMM'N, BRIEFING PACKAGE ON UPHOLSTERED FURNITURE FLAMMABILITY: REGULATORY OPTIONS FOR SMALL OPEN FLAME AND SMOKING MATERIAL IGNITED FIRES 5 (1997), *available at* www.cpsc.gov/library/foia/foia98/brief/3458ca2d.pdf (last visited Oct. 5, 2005)[hereinafter CPSC BRIEFING PACKAGE 1997]; CPSC BRIEFING PACKAGE 2001, *supra* note 5.

11. CPSC BRIEFING PACKAGE 2001, *supra* note 5, at 12.

12. CPSC STAFF DRAFT STANDARD FOR UPHOLSTERED FURNITURE FLAMMABILITY (May 12, 2005), *available at* www.cpsc.gov/library/foia/foia05/brief/uphols1.pdf (last visited Oct. 5, 2005).

13. Miller, *supra* note 3; CPSC BRIEFING PACKAGE 2001, *supra* note 5, at 5-6; CONSUMER PROD. SAFETY COMM'N, CIGARETTE IGNITION OF UPHOLSTERED FURNITURE: COMMISSION OPTIONS (2003), *available at* www.cpsc.gov/library/foia/foia04/pubcom/cigarettept1.pdf (last visited Oct. 5, 2005).

14. *See, e.g.*, *Dateline NBC* (NBC television broadcast, Oct. 4, 1998); *Early Show* (CBS television broadcast, Feb. 16, 2004).

15. 16 C.F.R. §1640 (1994).

16. Foam Fire Safety Act, H.R. 3437, 108th Cong., 1st Sess. (2003); American Home Fire Safety Act, H.R. 4233, 108th Cong., 2d Sess. (2004); American Home Fire Safety Act, S. 1798, 108th Cong., 1st Sess. (2003). The Fire Foam Safety Act, H.R. 943, 109th Cong., 1st Sess. (2005), was introduced this year to direct the CPSC to issue standards addressing open-flame ignition of consumer products containing polyurethane foam.

17. At a public meeting on Upholstered Furniture Flammability Rulemaking held on September 24, 2003, the AFMA and other upholstered furniture and related industry groups recommended that the commission promulgate mandatory rules addressing both cigarette and open-flame ignition of upholstered furniture. Press Release, Consumer Prod. Safety Comm'n, CPSC Votes to Expand Rulemaking for Upholstered Furniture Flammability (Oct. 21, 2003), *available at* www.cpsc.gov/cpscpub/prerel/prhtml04/04012.html (last visited Oct. 5, 2005).

18. Bureau of Home Furnishings & Thermal Insulation (BHFTI), Cal. TB-117 (2000), *available at* www.bhfti.ca.gov/techbulletin/117.pdf (last visited Oct. 5, 2005).

19. Cal. TB-117, Draft Amendment, Flammability of Upholstered and Reupholstered Furniture (2002) (on file with author).

20. Cal. TB-133 (effective Mar. 1992), *available at* www.bhfti.ca.gov/techbulletin/tb133.pdf (last visited Oct. 5, 2005).

21. Dep't of Consumer Affairs, BHFTI, Flammability Regs., Art. 13 (rev. 2005) (implementing CAL. BUS. & PROF. CODE §§19000-19221). Section 1371 requires that mattresses meet the requirements of TB- 603 (2004).

22. The Furniture and Furnishings (Fire) (Safety) Regs. 1988 (commonly referred to as BS 5852), *available at* www.dti.gov.uk/ccp/topics1/guide/furnitureguide.pdf (last visited Oct. 5, 2005). A description of these regulations is available at www.pfa.org/intouch/new_pdf/hr_IntouchV.7.pdf (last visited Oct. 5, 2005).

23. CPSC BRIEFING PACKAGE 1997, *supra* note 10, at 35, *citing* Univ. of Surrey, Effectiveness of the Furniture & Furnishings (Fire) (Safety) Regs. 1988 (2000).

24. WILLIAM J. PARKER ET AL., NAT'L INST. OF STANDARDS & TECH., FURNITURE FLAMMABILITY: AN INVESTIGATION OF THE CALIFORNIA TECHNICAL BULLETIN 133 TEST. PART III: FULL SCALE CHAIR BURNS, NISTIR 4375 (1990).

25. Vytenis Babrauskas, *The Results of a Major Upholstered Furniture Fire Study*, NFPA J., July/Aug. 1996, at 84; Vytenis Babrauskas, *Upholstered Furniture Heat Release Rates: Measurements and Estimation*, 1 J. FIRE SCIENCES 9 (1983).

26. For more information on settled or pending cases, visit www.fosterfoster.com/CM/RecentCasesandDecisions/UpholsteredFurnitureFlammabilityCases.asp (last visited Oct. 5, 2005).

27. *See, e.g.*, Connelly v. Hyundai Motor Co., 351 F.3d 535 (1st Cir. 2003); Jimenez v. DaimlerChrysler Corp., 269 F.3d 439 (4th Cir. 2001).

28. Miller, *supra* note 3; CPSC BRIEFING PACKAGE 2001, *supra* note 5, at 5-6; CONSUMER PROD. SAFETY COMM'N, *supra* note 13.

29. *See, e.g.*, Halter v. Waco Scaffolding & Equip. Co., 797 P.2d 790 (Colo. Ct. App. 1990); Tide Craft, Inc. v. Red Ball Oxygen Co., 514 So.2d 664 (La. Ct. App. 1987); Towner v. Grand Trunk W. R.R. Co., 57 Fed. Appx. 232 (6th Cir. 2003).

30. *Halter*, 797 P.2d 790;*Towner*, 57 Fed. Appx. 232.

31. *See, e.g.*, KY. REV. STAT. ANN. §411.340 (Baldwin 2005); N.C. GEN. STAT. §99B-2(a) (2005).

32. *See, e.g.*, McLain v. Taco Bell Corp., 527 S.E.2d 712 (N.C. Ct. App. 2000); Beers v. Bayliner Marine Corp., 675 A.2d 829 (Conn. 1996); Kambylis v. Ford Motor Co., 788 N.E.2d 1 (Ill. Ct. App.

2003). (*McLain* and *Beers* apply adverse inference for spoliation of evidence; *Kambylis* speaks of disbarment of evidence as appropriate sanction.)

33. CPSC BRIEFING PACKAGE 2001, *supra* note 5, at 50.

34. *See, e.g.*, Davidson v. Volkswagenwerk A.G., 336 S.E.2d 714 (N.C. Ct. App. 1985); Love v. Whirlpool Corp., 449 S.E.2d 602 (Ga. 1994) (statute that bars strict liability actions after 10 years from date of first sale does not violate equal protection).

Robert P. Foster is a partner in the Foster Law Firm in Greenville, South Carolina. **Joseph B. Zicherman** is a fire scientist and a principal of Fire Cause Analysis, a consulting firm located in Berkeley, California.