

# A Proposal to Permanently Ban Flame Retardant Chemicals to Meet California's Flammability Standard for Upholstered Furniture

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In March 1972, Assembly Bill 2165 (AB 2165), a product safety-specific bill “relating to furniture and bedding”, was one of 2395 bills introduced in the California State Assembly and one of 896 bills enacted on January 1, 1973. AB 2165 was co-authored by Assemblymembers John Burton and Willie Brown who, from 1965 to 1974, represented the 20th and 18th districts, respectively, within San Francisco County. Based on the public record, it is unclear what compelled Burton and Brown to co-author AB 2165 during the 1972–1973 session. AB 2165 included a 141-word amendment to Section 19161 of the Business and Professions Code (BPC) requiring that “all mattresses manufactured for sale in this state ... shall be fire retardant” and “all upholstered furniture sold or offered for sale by a manufacturer or wholesaler for use in this state ... shall be fire retardant and shall be labeled in a manner specified by the bureau.” The Bureau of Electronic and Appliance Repair, Home Furnishings, and Thermal Insulation (now Bureau of Household Goods and Services) held jurisdictional authority over the furniture and bedding industries and were responsible for ensuring compliance with this new law. However, this

amendment did not specify how mattresses and upholstered furniture “shall be fire retardant”.

In 1973, the Federal Mattress Flammability Standard was simultaneously introduced by the U.S. Consumer Product Safety Commission (CPSC), allowing mattress manufacturers to immediately comply with California’s amendment to Section 19161 of the BPC. However, California was the only state that legally required that (1) upholstered furniture be fire retardant and (2) manufacturers affix permanent labels indicating compliance with state-specific flammability standards. As a result, this led to the implementation of an upholstered furniture flammability performance standard (Technical Bulletin 117, or

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TB117) in 1975, a deadline mandated by AB 2165. TB117 required that interior filling materials (e.g., polyurethane foam) of upholstered furniture be individually evaluated using open flame and cigarette smolder tests. In 2013, TB117 was revised (now TB117-2013) to address the potential ignition of upholstered cover fabric and interactions among different upholstered furniture components following exposure to smoldering ignition sources (i.e., cigarettes). Importantly, as a smolder-specific standard, TB117-2013 provides manufacturers the flexibility to use either flame retardant (FR) chemicals or barrier (interliner) materials to maintain compliance.

Since 1975, TB117-compliant furniture has been sold across the entire United States to simplify production and distribution. As a result, TB117 has been the *de facto* flammability standard across the country since California was the only state that required upholstered furniture to be fire retardant. Moreover, the adoption of TB117 in the United States preceded fire safety regulations for upholstered furniture in the United Kingdom and Ireland in 1988,<sup>1</sup> suggesting that California-specific regulations initially exerted an influence on fire safety regulations and flammability standards within certain parts of Europe. However, the potential impact of California's strict fire safety regulations on the rest of Europe and the world appears to have waned since the late 1980s, as there is currently a patchwork of fire safety regulations that vary in scope and stringency.<sup>1</sup> From 1975 to 2013, the addition of FR chemicals to interior filling materials of upholstered furniture was the primary approach to comply with TB117. Pentabrominated diphenyl ethers (PentaBDEs) were added to upholstered furniture from 1975 to the mid-2000s prior to being phased out in 2004 due to concerns about persistence, bioaccumulation, and toxicity within humans and the environment. As a result, formulations containing organophosphate esters (OPEs) were introduced as major alternatives to PentaBDEs in the mid-2000s and continue to be used today to maintain compliance with TB117-2013 and similar flammability standards around the world. As additive FR chemicals are not chemically bound to fabric or interior filling materials, these chemicals have the potential to migrate from upholstered furniture to indoor environmental media. Indeed, human exposure to additive flame retardants has, as a result of AB 2165, been chronic and ubiquitous across the United States for >50 years, where indoor exposure was initially dominated by PentaBDEs from the mid-1970s to mid-2000s and then by OPEs from the mid-2000s to the present.<sup>2</sup> Moreover, relative to the general population, emergency personnel responding to structure fires continue to be at increased risk following ignition of FR chemical-containing furniture,<sup>3</sup> especially during large-scale wildfires at the wildland–urban interface such as the January 2025 fires within the Pacific Palisades and Altadena communities in southern California.

The chemical industry has argued that the introduction of FR chemicals within upholstered furniture is necessary for delaying combustion and increasing escape time in the event of structure fires.<sup>4</sup> However, flammability studies conducted by the CPSC nearly 15 years ago demonstrate that (1) TB117-compliant foam treated with FR chemicals did not significantly decrease the rate of flame propagation of upholstered chairs compared to chairs that were not treated with FR chemicals and (2) incorporation of fiberglass- and modacrylic-containing fire barriers between the cover fabric and interior filling materials significantly decreased the rate of flame propagation of upholstered chairs regardless of fabric type and the presence or absence of FR chemicals in foam.<sup>5</sup> Motivated by CPSC's

findings, AB 2998 was introduced in the California State Assembly in 2018 to amend Section 19101 of the BPC and limit the concentration of FR chemicals added to consumer products. Effective January 1, 2020, AB 2998 prohibits the sale and distribution of juvenile products, mattresses, or upholstered furniture containing >1000 ppm FR chemicals within California.

Although the use of FR chemicals within upholstered furniture has declined over the past 10 years as a result of California's regulations,<sup>6</sup> AB 2998 did not prohibit the use of FR chemicals despite CPSC's data demonstrating that addition of FR chemicals to upholstered furniture did not provide an added benefit relative to fire barriers. Importantly, enacted in October 2023, AB 1059 amended Section 19101 of the BPC to ban fiberglass-containing fire barriers in California effective January 1, 2027, due to concerns about the potential for human inhalation of fiberglass fragments, raising the possibility that manufacturers may pivot back to FR chemicals (albeit at levels of  $\leq 1000$  ppm) to comply with TB117-2013. Therefore, the California State Assembly should, within their 2025–2026 or 2026–2027 session, introduce an Assembly Bill to further amend Section 19161 and/or Section 19101 of the BPC by including language that prohibits the use of FR chemicals at *any* concentration as a “fire retardant” to meet California's flammability standard for upholstered furniture, as this will (1) prevent an increase in human and environmental exposure to FR chemicals resulting from enforcement of AB 1059-specific regulations in January 1, 2027, and (2) encourage the incorporation of commercially available, fiberglass-free fire barriers in upholstered furniture. For example, knitted or nonwoven barrier materials constructed from synthetic aramid or silica-infused rayon fibers are widely used to comply with existing mattress-specific flammability standards at the federal level,<sup>7</sup> suggesting that these materials may, in the future, have the potential to be utilized as fiberglass-free barriers within upholstered furniture to comply with TB117-2013.

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### Notes

The author declares no competing financial interest.

## Biography



Dr. David C. Volz is a Professor within the Department of Environmental Sciences at the University of California, Riverside. Since transitioning from industry to academia in August 2009, Dr. Volz's research program has focused on identifying the potential human health risks of chemical exposure and, as a result, promoting population-wide intervention and/or prevention strategies for mitigating human exposure to certain high-risk chemicals within California and across the United States. Dr. Volz has authored or co-authored more than 80 peer-reviewed papers and more than 200 presentations and invited seminars at numerous institutions and scientific meetings on topics ranging from toxicology to exposure science to risk assessment. Dr. Volz also received an Outstanding New Environmental Scientist (ONES) Award from the NIH's National Institute of Environmental Health Sciences (NIEHS) in 2017, has served as an *ad hoc* reviewer on more than 20 special emphasis panels and study sections for NIH, and currently serves on a handful of editorial boards for journals focused on environmental science and toxicology.

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