

Risk Policy Report

An exclusive weekly report for scientists interested in environmental policymaking and policymakers interested in science

from Vol. 17, No. 43, October 26, 2010

Study Finds Flame Retardants' Health Risks May Outweigh Safety Benefits

Environmentalists and a top former EPA researcher are charging that the health risks posed by flame-retarding chemicals that persist in humans and the environment outweigh the safety benefits industry and some safety officials argue the chemicals provide in reducing the risk of home fires, according to recently presented study results.

"Flame-retardant chemicals can pose a potentially greater hazard to health and environment than the risk of the fires they are supposed to prevent," according to the study, "PBDES and Their Replacements: Does the Benefit Justify The Harm?" *An abstract is available on InsideEPA.com. See page 2 for details.*

The paper says that some newer flame-retardant chemicals may increase the risk of death in home fires because they increase exposure to carbon monoxide, smoke and other harmful substances.

Authored by long-time PBDE-opponent and University of California Berkeley researcher Arlene Blum, National Institutes of Environmental Health Director and former EPA researcher Linda Birnbaum, and Susan Shaw, president of the Marine Environmental Research Institute, the study suggests that federal product safety officials preempt California's strictest-in-the-nation safety standard that critics have long charged drives the use of the chemicals.

The study also recommends that the chemicals — especially the next generation of flame retardant chemicals — be tested for their health and environmental risks and that regulators use other methods of preventing furniture fires, such as internal barriers and fire-safe cigarettes. The study was presented at the Dioxin 2010 conference in San Antonio last month.

The issue of product safety standards driving the use of harmful chemicals poses a tricky risk-risk tradeoff for policymakers as they seek to balance competing concerns from some fire safety officials who favor strict product flammability standards while EPA, environmentalists and public health officials are eager to limit the use of the harmful chemicals (*Risk Policy Report*, Oct. 14, 2008).

Of particular concern to environmentalists is California's flammability standard, which requires furniture and children's products to withstand igniting when exposed to an open flame for as long as 12 seconds. Attempts to change this flammability standard, or exempt some products from meeting it, have been met with overwhelming chemical industry resistance in Sacramento.

As a result, critics of the standard are increasingly looking to a pending new flammability standard being crafted by the federal Consumer Product Safety Commission (CPSC), which they hope will pre-empt the California standard and limit the use of chemicals the critics say persist in the environment and are linked to liver and thyroid toxicity, neurological problems and reproductive issues.

The CPSC's proposed standard is not an open-flame test, and would not require the use of chemicals to meet. Instead, manufacturers could use internal barriers in furniture to meet the standard. The researchers indicate that if implemented, the new standard "which regulates fabric flammability rather than foam," could "greatly reduce the use of halogenated flame retardants in furniture and baby products across North America."

The most recent federal regulatory agenda shows that CPSC published a notice of proposed rule-making in 2008. CPSC staff sent the commission a status report on the proposed rule in June. A CPSC source says that staff "have been doing additional research to support the rule," and are "planning to get a package of regulatory options to our commissioners ASAP." However, the source adds that there is "no time line" for when the rule will be finalized, and that more research is planned in the 2011 fiscal year.

At the same time, EPA is seeking to limit the use of PBDE flame retardant chemicals. The agency issued a chemical action plan last December that proposes writing new significant new use rules which would require manufacturers to notify EPA before producing certain PBDEs. The plan also announces the agency's intent to add PBDEs to its list of chemicals of concern and its support for a voluntary industry phaseout of deca-BDE by 2013 (*Risk Policy Report*, Dec. 22).

In their study, the researchers note that beginning in the 1960s, "naturally flame-resistant materials such as wood, cotton, wool and leather" were replaced with synthetic materials that were more flammable, possibly leading to a rise in

deaths and injuries stemming from house fires. This led to the promulgation of flammability regulations in the 1970s.

“Brominated and chlorinated flame retardant chemicals were found to be the most cost effective ways to meet the new flammability requirements,” according to the scientists’ abstract. “The potential adverse health and environmental impacts of these halogenated chemicals were not considered when the regulations leading to their use were implemented. Furthermore, when selecting flame retardants, manufacturers’ primary criteria were cost and performance rather than human or environmental health considerations.”

The first generation of these flame-retarding chemicals, polybrominated diphenyl ethers, have largely been phased out. But according to the report, their replacements are “other organohalogens of similar structure and/or properties lacking adequate data on health effects.” The researchers point to data showing that some of the alternatives have been found in U.S. house dust, and in wildlife testing.

The researchers also argue that the use of organohalon flame-retarding chemicals could actually increase fire-related deaths. “Most fire deaths and most fire injuries result from inhalation of fire effluents such as carbon monoxide, irritant gases, and soot,” according to the abstract. “Although the incorporation of halogenated flame retardants can reduce the ignitability and heat release of a material, they also increase the yield of such toxic products when combustion occurs.”

The report explains that the chemical changes flame-retarding chemicals make in a fire produce “much higher yields of carbon monoxide” and “significantly increase” smoke. The researchers conclude that these changes “will make escape more difficult.”

The researchers argue that “The health and environmental impacts as well as fire safety benefits of flammability standards should be considered.” They note that EPA’s Design for the Environment Program, which evaluates whether there are less toxic alternatives to chemicals, predicted the “reproductive, neurological, and developmental toxicity” of one of the replacement chemicals, Firemaster 550, in 2004. The agency is evaluating research that the chemical’s manufacturer, Chemtura, provided almost two years ago.

The scientists question whether California’s existing flammability standard, which manufacturers apply to products shipped to much of the country, is representative of house fires. They note that a companion, voluntary cigarette smolder standard for upholstery is “rarely used.”

“Standards that are designed to prevent a small open flame from igniting uncovered foam may not reflect the flammability of a complete upholstered chair,” according to the abstract. “Since fabric will ignite first in a furniture fire, the lack of an enforced fabric standard is one weakness of” the California flammability standard.

The authors recommend the use of fire-safe cigarettes and candles, child-resistant lighters, sprinklers and smoke detectors to protect against fire risks. And they conclude that “Chemical producers should be required to disclose the identity of chemical additives in consumer products and provide health and toxicity data about flame retardants and replacement chemicals before they are marketed.” — *Maria Hegstad*