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**Contact:** Gwen Dwyer, Silent Spring Institute  
[dwyer@silentspring.org](mailto:dwyer@silentspring.org) or 617-332-4288 ext. 226

## **CALIFORNIANS HAVE TOXIC FLAME RETARDANTS IN THEIR BLOOD AT LEVELS TWICE THE NATIONAL AVERAGE, ACCORDING TO NEW PEER-REVIEWED STUDY**

State and Federal Governments Consider Imposing New Fire Standards  
that Would Expand Use of Flame Retardants

People and homes in California have been found to have significantly higher levels of toxic flame retardants called polybrominated diphenyl ethers (PBDEs), compared to other locations in the country and the world. A new peer-reviewed study published online in *Environmental Science & Technology* provides evidence that California's unique furniture flammability standard, requiring furniture to be fire resistant to an open flame for 12 seconds, has led to increased exposure to penta-BDE, a commercial flame retardant mixture added to polyurethane furniture foam to meet the standard.

Penta-BDE production in the U.S. ended in 2004 following bans in several states including California. However, furniture treated with the chemical is still present in homes. Most states have not banned the use of flame retardant penta-BDE in imported furniture.

Chemical ingredients of the flame retardant penta-BDE were found in the dust of California homes at 4 to 10 times the levels found elsewhere in the U.S. and 200 times higher than in Europe. This finding is important as California debates a new standard that would likely increase the amount of flame retardant used in some household products.

The most contaminated California homes had levels higher than have ever been detected in household dust previously. The researchers also found double the amount of penta-BDEs in the blood of California residents compared to the nationwide average. Animal studies show PBDEs cause thyroid hormone disruption and affect the developing reproductive and nervous system.

The study was conducted by Silent Spring Institute in collaboration with the University of California Berkeley, Brown University, and Communities for a Better Environment, a California environmental justice organization.

"This study finds that if you live in California you are at far greater risk of exposure to penta-BDE flame retardants than if you live anywhere else in the country or the world. These chemicals enter the body when people breathe or ingest contaminated house dust, which is why California residents have double the amount of the chemical in their bloodstreams compared to the national average," said lead author Dr. Ami Zota, a scientist at Silent Spring Institute. "The health effects are of particular concern for babies, children, and pregnant women."

The California Bureau of Home Furnishings and Thermal Insulation is now considering extending flammability standards to bed coverings and pillows, a change that could increase the use of potentially toxic flame retardant chemicals and materials. The U.S. Consumer Product Safety Commission (CPSC) is also considering adopting fire standards for furniture and bed coverings.

In order to comply with California's strict standards, furniture foam is now treated with alternative flame retardants such as tris(1,3-dichloro-2-propyl)phosphate (TDCP), which is a probable human carcinogen, and Firemaster 550, which is suspected of being toxic but has not been tested adequately.

"Concerns about safety gave PBDEs a black eye so the U.S. manufacturer stopped making it. The problem now is that one hazardous chemical is being traded for another," said director of the study, Ruthann Rudel, senior scientist with Silent Spring Institute.

PBDEs' chemical structure is similar to that of PCBs, for which adverse health effects, including effects on brain development and breast cancer, have been demonstrated in humans. Penta-BDE flame retardants migrate out of furniture and end up in house dust, resulting in human exposure. Young children are especially vulnerable due to their close contact with the floor and frequent hand-to-mouth behavior.

Levels of penta-BDEs in the blood were lower among US residents who were born outside the country, confirming the less frequent use of these chemicals outside the U.S. Within the U.S., blood levels of penta-BDEs were higher among individuals with lower incomes and younger age groups.

"California's fire standard was passed thirty years ago with the best intentions, but an unintended consequence is that many families have been exposed to toxic chemicals at levels that were never anticipated," continued Zota. "Even more surprising, virtually all the penta-BDE produced globally was used to meet this fire standard, and now these chemicals have been detected in nearly every species across the globe."

### **Methodology**

The study compared dust samples collected from 49 homes in two California communities with 120 Cape Cod, Massachusetts, homes, along with results from published home tests in Texas, Boston, Washington, D.C., Canada, U.K. and Germany. When researchers found high levels of penta-BDEs in California dust, they wondered if the same pattern would be found in national human biomonitoring data. To answer this question, the researchers analyzed regional differences in human blood levels of PBDEs from more than 2,000 people in the US Centers for Disease Control and Prevention (CDC) National Health and Nutrition Examination Survey (NHANES), a nationally-representative dataset.

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*Founded in 1994, Silent Spring Institute is a non-profit research organization dedicated to studying the environment's effect on women's health. The PBDE study was funded by the National Institute of Environmental Health Sciences and the New York Community Trust.*