



DTSC's Environmental Chemistry Lab is a leader in flame-retardant research

Many people know that starting Jan. 1, 2015, [new flammability standards](#) for upholstered furniture make the use of flame-retardant chemicals unnecessary. What they may not know is that scientists in DTSC's Environmental Chemistry Laboratory in Berkeley produced much of the evidence that supported the new standards.

DTSC scientists have been at the [forefront](#) of studying the presence of certain flame retardants in humans. The chemicals were initially added to a host of consumer products to meet flammability standards, primarily California's Technical Bulletin 117.

But in the 1990s, DTSC scientists, studying chemical contaminants possibly linked to breast cancer, were the first to report unusually high levels of some flame retardants in the blood and fatty tissues of California women. While no clear link to breast cancer was found, the study revealed that levels of polybrominated diphenyl ethers, or PBDEs, to be about 30 times higher than what had been recently reported in Europeans.

It was a stunning discovery. "We accidentally found them when we were looking for other chemicals," said Myrto Petreas, a Branch Chief in the Berkeley lab. "Our numbers were so much higher. At first, we thought it was a mistake."

Further research corroborated the DTSC data. "It was very eye-opening," she said.

Since then, additional studies, some of them by scientists in the DTSC laboratory, have found strong links between fire retardants and potential health risk. The additive chemicals escape from consumer products and settle into house dust, which people and animals absorb through contact. Americans carry higher levels of flame retardants in their bodies than anyone else in the world, and California children have some of the highest levels reported.

DTSC scientists found an exponential increase in levels of PBDEs in harbor seals in San Francisco Bay from the 1980s to the 1990s. In a joint 2013 study with University of California, San Francisco, measured decreasing amounts of PBDEs in pregnant women recruited three years apart. Findings from the joint study were consistent with the phase-out of certain PBDEs in 2003.



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Flame-retardant research

Tests by other agencies as far back as the 1980s concluded flame retardants had little effect on fire safety. In 2012, the chairperson of the Federal Consumer Product Safety Commission testified to Congress that flame-retardant foams did not offer significantly greater open-flame safety, and officials in California reached a similar conclusion, according to testimony at a California Senate Environmental Quality Committee hearing in April 2014.

With multiple studies showing certain flame retardants offering no significant gains in fire safety, but evidence of toxic consequences on public health, California updated Technical Bulletin 117. The update, Technical Bulletin 117-2013, does not prohibit the use of flame retardants, but eliminates the need for them.

The standard is specific to California, but this is a bellwether state. California is so large that many manufacturers who ship here meet California's flammability standards for products they sell nationwide, according to information presented at the [Senate Environmental Quality Committee](#) hearing in April 2014.

The new standards won't stop there. Senate Bill 1019, signed in September, requires manufacturers of upholstered furniture to label whether the product contains flame retardants.

Meanwhile, DTSC research into flame retardants continues. Environmental chemistry lab studies contributed to the selection of TDCPP in children's foam padded sleeping products as one of three product-chemical combinations, or "Priority Products," through California's ground-breaking Safer

Consumer Products program.

Also, lab scientists have found high levels of PBDEs in the blood of California firefighters, and the highest levels ever reported in fire station dust. Newer flame retardants, introduced as BPDE replacements after the phase-out in 2003, also have been prominent in fire station dust.



Petreas attributes many of the recent advances to biomonitoring studies (testing urine and blood for levels of environmental chemicals) which can show time trends and, as in the case of PBDEs, demonstrate the efficacy of regulatory interventions. Such a program is [Biomonitoring California](#), a collaborative effort of DTSC, the Office of Environmental Health Hazard Assessment (OEHHA) and the California Department of Public Health (CDPH).