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U.S. Consumer Product Safety Commission
4330 East-West Highway
Bethesda, MD 20814

Dear members of the Consumer Product Safety Commission,

We are submitting this testimony regarding the petition filed in June 2015 to ban organohalogen flame retardants (OFRs) from consumer products, including children's products, furniture, mattresses, and casings around electronics. We submitted an affidavit as part of the 2015 petition describing our research findings related to the exposures and harm of OFRs to the public (attached), and we are writing now to update our statement from 2015.

All OFRs that have been studied for toxicity, as well as other structurally-related organohalogen chemicals, such as DDT and dioxin, show adverse health effects in laboratory animals. When epidemiological studies have been conducted to look for health effects from these exposures, effects have been reported in humans as well. In many cases, scientists aren't able to detect these effects in humans for many years after exposure even though toxicity data from animal studies indicates likely harm to humans. For example, researchers recently found that women exposed to the organohalogen pesticide DDT in the 1940s have increased risk of breast cancer, and also their daughters' risk is elevated (Cohn, La Merrill et al. 2015). There are many other examples where regulatory protections have been inadequate to protect the general population against harm from chemical exposures from consumer products, including lead, asbestos, formaldehyde, and others, especially flame retardants.

Several of the organohalogen chemicals that have been most commonly incorporated into consumer products to reduce flammability are vivid examples of regrettable choices that have seriously harmed US consumers. It is also worth noting that these harms could have been anticipated based on laboratory evidence and based on analogy to other "bad actor" chemicals with similar chemical structures. Specifically:

- Polybrominated diphenyl ethers (PBDEs) were added in large quantities to foam furniture despite their structural similarity to the PCBs, which were banned in the 1970s from many uses. A recent Consensus Study Report from the National Academies of Sciences concluded that PBDEs are presumed to affect intelligence in humans based on animal and human evidence. What that "human evidence" actually means is that levels of PBDEs in children in the general US population were high enough that scientists could measure reductions in their IQ. It's a tragedy when we have that kind of evidence. The NAS report "found a decrease of 3.70 IQ points in children per 10-fold increase in serum PBDE concentration" (National Academy of Sciences 2017). Children in the US had some of the highest exposures in the world. A recent analysis of the economic costs of exposures to endocrine disrupting chemicals estimated that 11 million IQ points were lost due to PBDE exposures, with an associated $266 billion in medical costs, in 2010 (Attina, Hauser et al. 2016).

- In the case of organohalogen flame retardant TDCIPP (chlorinated Tris), manufacturers selected it as a substitute for the PBDEs around 2004 despite the following evidence: It was shown to be carcinogenic in animals and a mutagen several decades earlier by the US National Toxicology Program, and it was removed from children's pajamas in 1978 along with the structurally similar and also mutagenic and carcinogenic "brominated Tris." A recent publication found that higher levels of TDCIPP in women undergoing in vitro fertilization (IVF) were less likely to achieve successful implantation, pregnancy, and birth (Carignan, Mínguez-Alarcón et al. 2017). In our own research measuring levels of TDCIPP in dust in homes and college dorms, we have documented levels above EPA cancer risk screening levels, indicating an unacceptable cancer risk from these exposures (Dodson, Perovich et al. 2012; Dodson, Van den Eede et al. 2014; Dodson, Rodgers et al. 2017). In fact 41% of college dorm rooms in our study had TDCIPP dust levels above cancer risk screening levels.

As scientists, we are well aware that toxicity data available at the time these chemicals were introduced for use as flame retardants in consumer goods could have been used to anticipate these outcomes and we don't understand why regulatory approaches have not been effective at preventing these harms to US consumers. We are tired of discovering these preventable harms when it's too late.

The CPSC staff suggests that each chemical proposed for use as flame retardants in consumer goods should undergo a risk assessment to determine whether it is safe to use. This is the approach that has been used for several decades and—unfortunately—it hasn't been effective in preventing harms to consumers. Based on the entire body of evidence on the toxicity of organohalogens, it is difficult to imagine one that won't pose significant toxicity problems. There are near infinite number of chemical variants, and in theory a risk assessment could be done for each one, but that approach is impractical and in the past hasn't been effective at protecting consumers. There is enough evidence about the toxicity and harms to consumers of OFRs to regulate them collectively.

Manufacturers and regulators haven't effectively predicted exposures or risks from added OFRs to consumer products in the past, and so we encourage the CPSC to adopt a more effective approach to protecting consumers from chemical hazards.

Sincerely,

Kathryn Rodgers

Ruthann Rudel

References:

Attina, T. M., R. Hauser, et al. (2016). "Exposure to endocrine-disrupting chemicals in the USA: a population-based disease burden and cost analysis." Lancet Diabetes Endocrinol **4**(12): 996-1003.

Carignan, C.C., L. Mínguez-Alarcón, et al. (2017). "Urinary Concentrations of Organophosphate Flame Retardant Metabolites and Pregnancy Outcomes among Women Undergoing in Vitro Fertilization." Environ Health Perspect. **125**(8): 087018

Cohn, B. A., M. La Merrill, et al. (2015). "DDT Exposure in Utero and Breast Cancer." J Clin Endocrinol Metab **100**(8): 2865-2872.

Dodson, R. E., L. J. Perovich, et al. (2012). "After the PBDE phase-out: a broad suite of flame retardants in repeat house dust samples from California." Environ Sci Technol **46**(24): 13056-13066.

Dodson, R. E., K. M. Rodgers, et al. (2017). "Flame Retardant Chemicals in College Dormitories: Flammability Standards Influence Dust Concentrations." Environ Sci Technol **51**(9): 4860-4869.

Dodson, R. E., N. Van den Eede, et al. (2014). "Urinary biomonitoring of phosphate flame retardants: levels in California adults and recommendations for future studies." Environ Sci Technol **48**(23): 13625-13633.

National Academy of Sciences (2017). Application of Systematic Review Methods in an Overall Strategy for Evaluating Low-Dose Toxicity from Endocrine Active Chemicals.