7 Common Flame Retardant Chemicals Found in Furniture

PentaBDE

PentaBDE is a commercial flame retardant mixture containing brominated chemicals called PBDEs (polybrominated diphenyl ethers). PentaBDE has been used for decades in residential furniture, but due to concerns over their persistence, ability to accumulate in humans, as well as their potential toxicity, the US began a phase-out of pentaBDE in 2005.

For more information on PBDEs, including pentaBDE, read the <u>ToxFAQs summary</u> created by the US Agency for Toxic Substances and Disease Registry.

TDCPP

TDCPP, or tris (1,3-dichloro-2-propyl) phosphate, is an organophosphate flame retardant that is being used to replace PentaBDE. TDCPP, which is used as an additive flame retardant in resins, polymers, latexes, and foams, is most widely used in the US (annual estimations are 4,500-22,700 metric tons). There is evidence that TDCPP is a probable carcinogen and a developmental neurotoxicant², as well as an endocrine disruptor in fish.

For more information on TDCPP, read

- This Environmental Health Perspectives article,
- This technical report published by California's EPA in 2011, and
- <u>This factsheet</u> from EPA's <u>Environmental Profiles of Chemical Flame Retardant Alternatives</u> report on their Design for the Environment page.

Firemaster® 550

Firemaster® 550 (FM 550) is a mixture of brominated and organo-phosphorous flame retardants. It was advertised as a replacement for pentaBDE following its phase-out. Other than some limited testing carried out by the manufacturer, little information on the health effects of Firemaster 550 is available. However, a recent study conducted by researchers at Duke University and NC State found that some of the components in FM 550 bioaccumulate and act as an endocrine disruptor. FM 550 may also cause obesity, metabolic disruption, and increase the onset of puberty.

For more information, read this press release from NC State University on a recent study of Firemaster 550.

² Dishaw LV, et al. Is the PentaBDE replacement, tris (1,3-dichloropropyl) phosphate (TDCPP), a developmental neurotoxicant? Studies in PC12 cells. Toxicol Appl Pharmacol 256(3):281–289. (2011); http://dx.doi.org/10.1016/j.taap.2011.01.005





¹ Meeker JD, et al. Urinary metabolites of organophosphate flame retardants: Temporal variability and correlations with house dust concentrations. Environ Health Perspect 121:580-585. (2013); http://dx.doi.org/10.1289/ehp.1205907

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V 6

V6 is a chlorinated organophosphate flame retardant that can contain TCEP as an impurity in the mixture. TCEP is considered a carcinogen.

TBPP

TBPP, or Tris-isobutylated triphenyl phosphate, is a mixture organophosphate flame retardants that do not contain halogens (e.g. bromine or chlorine). About 40% of the TBPP mixture is a chemical called triphenyl phosphate (TPP). Limited information exists on the health impacts of this mixture, but scientific studies have shown that TPP can have high acute aquatic toxicity.

EPA conducted a risk characterization for TBPP, click here to read their technical document from 2008.

MPP Mix

MPP, or methyl phenyl phosphate, is a mixture of organophosphate flame retardants that do not contain halogens (e.g. bromine or chlorine). Triphenyl phosphate (TPP) is also a primary component in MPP (see above for more information on TPP). Little information is available on the toxicity and levels of exposure to chemicals found in this mixture.

TCPP

TCPP is very similar in structure to TDCPP (see above) – it's used as an additive flame retardant in resins, polymers, latexes, and foams, and is most widely used in the US (annual estimations are 4,500-22,700 metric tons).³ As a relatively new flame retardant additive, little is known about possible health effects.

³ See first footnote



