POLYBROMINATED DIETHYL ETHERS (PBDEs)

Introduction: There are over 200 different types of polybrominated diethyl ethers (PBDEs), or flame retardants. Almost all of these are synthetic chemicals produced by humans and the vast majority of emissions come from human activities. PBDEs are capable of traveling long distances and impacting areas that are far from the original source of pollution. They also have the tendency to bioconcentrate in fish. This means that levels of PBDEs will be much higher in fish and other predatory animals than in the environment surrounding them. For example, studies have shown high concentrations of Persistent Organic Pollutants in human milk, particularly PCBs, but also PBDEs. Concentrations of PBDEs have been steadily increasing over time.

What it's used for: PBDEs are a group of chemicals that are used as flame retardants. They reduce the chance of something catching fire and slows down the burning if it does catch fire.

Where they're found: PBDE flame retardants are added to some plastics, electrical and electronic equipment, upholstered furniture, non-clothing textiles and foam products such as those used in mattresses and carpets. Over time, televisions and other products slowly release PBDEs, which accumulate in dust. In biomonitoring studies, PBDEs have been found in nearly all people who participated. More than 124 million pounds of PBDEs are produced annually worldwide and they do not break down easily. They can enter the environment through several routes: from products containing PBDEs degrading over time, to release of PBDEs from finished products in the form of vapour, to leaching from landfills and wherever PBDE containing products end up.

Heath Effects Summary: The Government of Canada has concluded that PBDEs pose a risk to the environment and has put in place regulations to control their release into the environment. There is some very limited evidence that PBDEs may cause cancer in laboratory animals. One study found one type of PBDE at very high levels caused liver tumours in rats and mice. PBDEs also have endocrine-disrupting properties. This means they may mimic or behave like hormones and can interfere with normal hormonal activity. This may lead to reproductive disorders and other development problems. In rats and mice, certain PBDEs have affected the thyroid, reproductive development and behaviour. These animals were exposed to levels higher than those to which the human population in Canada would be exposed to. In the few studies of humans exposed to PBDEs there is no clear evidence of any adverse health effects. However, this is not conclusive and does not mean that evidence of adverse health effects will not surface in future.

Household dust is the greatest source of PBDE contamination in homes

How we are exposed: The main sources of exposure to PBDEs are from indoor air, indoor dust and fatty foods of animal origin. Ingesting PBDE-contaminated dust and contact with this dust are the primary routes into our bodies where PBDEs collect in our fatty tissue. Breast-feeding infants are exposed to PBDEs through their mother's milk and levels in children have been found to be higher than in adults. Levels in humans have been rising rapidly since PBDEs were originally introduced in the 1960s and '70s.

What you can do to reduce exposure: Try to find products without PBDE flame retardants. Ask about PBDEs before you buy. Since PBDEs accumulate in house dust, be sure to sweep up, mop, dust and vacuum often, especially if you have young children. Using a vacuum with a HEPA filter helps to remove PBDE containing particles from your home.