

# The Safe Kids Buyer's Guide



How can you protect your family from toxic  
flame retardants?

# Flame Retardants: Cause for Concern?

Compared to previous generations, today's children have higher rates of serious health problems including allergies, attention deficit/hyperactivity disorder, autism, birth defects, certain types of cancer, cryptorchidism, hypospadias, diabetes, and obesity. In hundreds of animal studies, such conditions have been connected to environmental factors such as flame retardant chemicals. Our current regulatory system does not protect our children from such toxic chemicals.

**Flame retardants, found at high levels in baby products and furniture, may be contributing to these serious health problems.** These chemicals leak into dust where they make their way into our bodies where they can pose a health hazard.

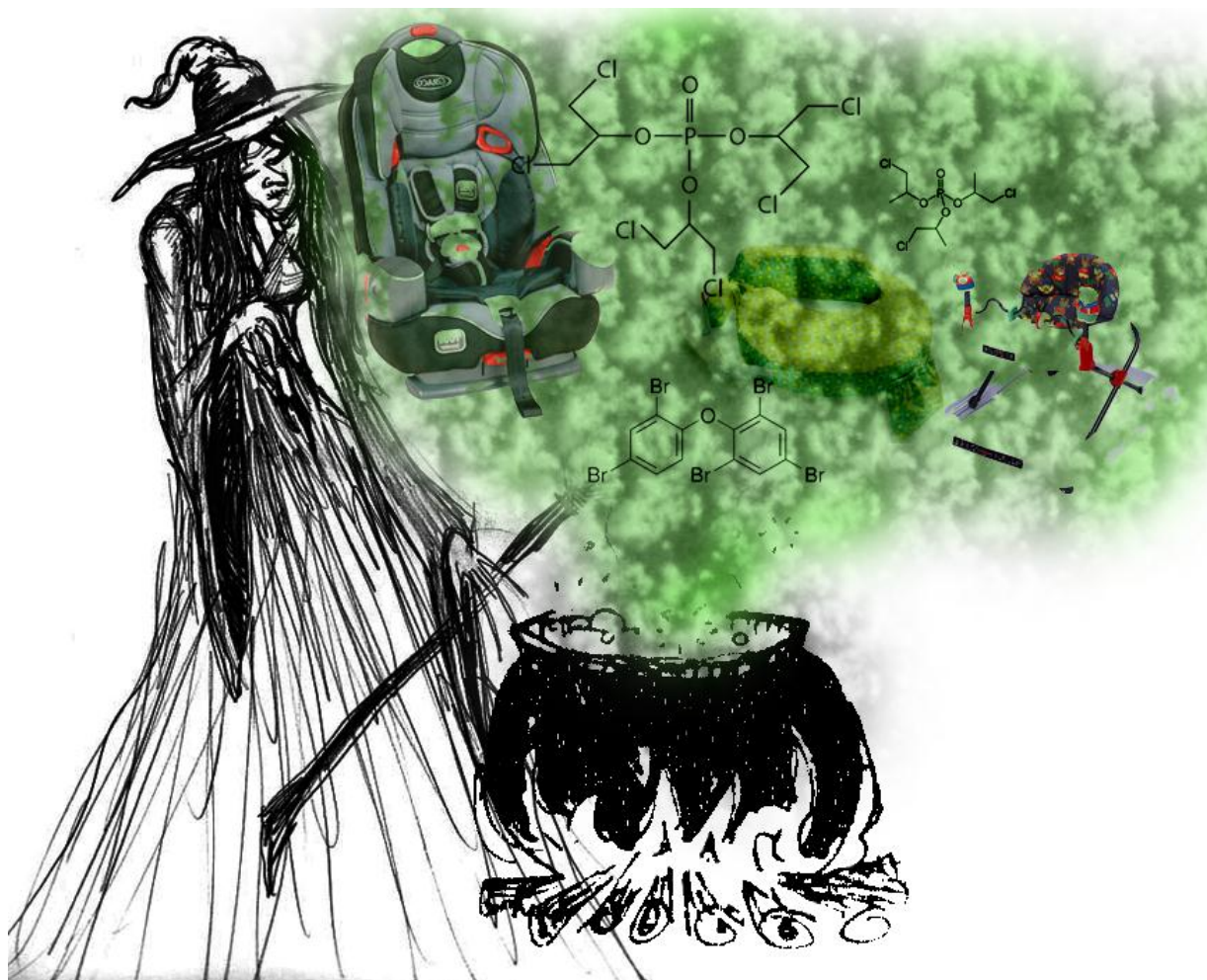
In our recent study, we found that 80% of baby products tested, including nursing pillows, changing table pads, baby carriers, and car seats, contained chemical flame retardants associated with adverse health effects or lacking adequate health information. These chemicals continue to be used in baby products despite the fact that they provide **no fire safety benefit**.



Informed parents can minimize their family's exposure to flame retardants by avoiding products that are likely to contain such chemicals. In this guide, we provide information on:

- ✚ The flame retardant chemicals that are being used in baby products
- ✚ How to minimize exposure and find products that do not contain flame retardant chemicals

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# Introduction

Lurking in the couches, nursing pillows and televisions in a typical home are pounds of toxic **flame retardant chemicals**. These substances are from the same family and similar in structure to organohalogens such as PCBs and DDT. While those chemicals were banned in the 1980's, the use of halogenated flame retardants (their chemical cousins) is rapidly increasing. Parallel to this increase are the rising levels of chemical flame retardants detected in our and in our children's bodies. However, **this is a relatively easy problem to solve** with enormous potential to benefit the health of every creature on the planet.

## Why is my family exposed to flame retardant chemicals?

A California furniture flammability standard called **Technical Bulletin 117 (TB117)** requires polyurethane foam in furniture and baby products to withstand a 12-second exposure to an open flame. This is the only such standard in the world. Since 1975 TB117 been met with the addition of high levels of halogenated flame retardants to foam. However, this standard has *not* led to a measurable improvement in fire safety in California according to National Fire Protection Association data.

## What are the health effects of exposure to flame retardants?

Accumulation of these chemicals in humans and animals as well as adverse health effects have been documented in many hundreds of peer reviewed research papers. **For one commonly used flame retardant called pentaBDE**, increased flame retardant body levels are associated with reduced IQ in children, changes in male hormone levels and reduced sperm count, increased time to become pregnant in women, adverse birth outcomes, and impaired development. This chemical has since been banned but its replacement chemicals are from the same family and may pose similar problems. **Pages 7 through 11** highlight the health effects of the five commonly used flame retardants detected in the baby products in our study, selected references are listed in **Appendix I**.

## Who is most vulnerable to the health risk presented by flame retardants?

Toddlers have three to four times the levels of toxic flame retardants in their bodies compared to their parents. These chemicals pose a serious hazard to pregnant women and young children who are the most vulnerable to endocrine disruptors, carcinogens, mutagens, and neurological and reproductive toxins.

## How do I know which products to avoid? Are there flame retardant-free products out there?

**Page 13** of this guide will give you tips to reduce exposure. There are some flame retardant-free products on the market. We provide examples of these products in **Appendix II**.

## How can this problem be solved?

The California furniture flammability standard TB117 should be replaced with a standard that does not lead to the use of toxics in baby products. **Page 14** provides tips for becoming a consumer advocate. Attempts to change to a more effective and less toxic fire standard have been defeated by flame retardant industry lobbying.



# How are we exposed to flame retardants?

Step 1: Flame retardant chemicals escape from furniture and baby product(s) and settle into house dust



Step 2: Contaminated dust gets onto hands, food, and toys



Step 3: Contaminated dust is ingested by eating with hands, or putting toys or hands in mouth



# The Flame Retardant Chemicals in Baby Products



# PentaBDE

Pentabrominated diphenylether

We detected pentaBDE in the following types of baby products:

- car seats
- rockers
- portable cribs



From the 1980s pentaBDE was used in furniture and juvenile product foam to meet TB117 until 2004 when it was banned due to its toxic properties. Though it is not used in new products, furniture and baby products containing pentaBDE are still in use.

## Health Associations

### Animal Studies:

- Cancer
- Neurotoxicity
- Reproductive and developmental toxicity
- Hormone disruption

### Human Studies:

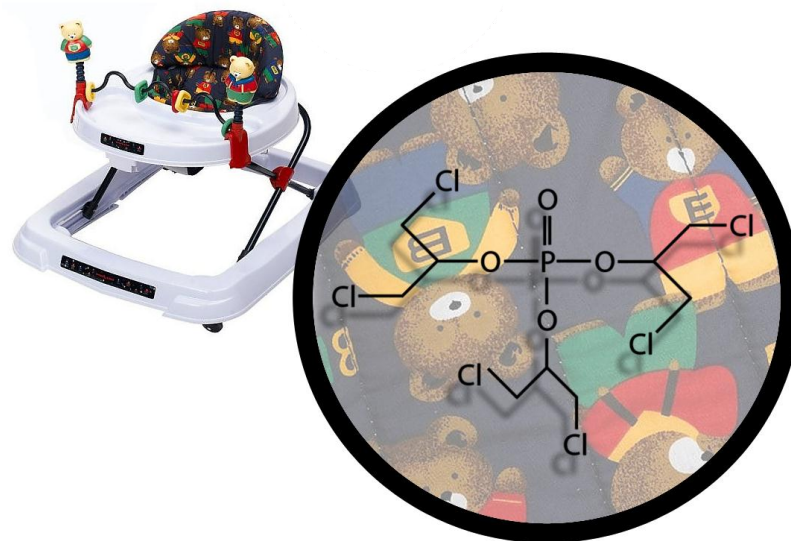
- Lowered IQ in children
- Reduced male and female fertility
- Hormone disruption
- Low birth weight
- Cryptorchidism or undescended testicles (which is associated with cancer later in life)

# TDCPP (chlorinated tris)

Tris(1,3-dichlorisopropyl)phosphate

We detected TDCPP in the following types of baby products:

- car seats
- changing table pads
- sleep positioners
- baby carriers
- nursing pillows
- portable cribs
- high chair pads
- bassinet mattresses



More than a third of the baby products we tested contained a flame retardant known as TDCPP, or chlorinated tris, which was removed from children's pajamas in the 1970s because it caused genetic mutations. Levels of up to 12.5% were found.

## Health Effects

### Animal Studies

- ✚ DNA mutations
- ✚ Considered moderate hazard for cancer and reproductive/developmental effects by US EPA
- ✚ Consumer Product Safety Commission estimates lifetime cancer risk from TDCPP-treated furniture foam is up to 300 cancer cases/million

### Human Studies

- ✚ Men living in homes with high amounts of TDCPP in household dust have reduced sperm counts and altered levels of hormones related to fertility and thyroid function

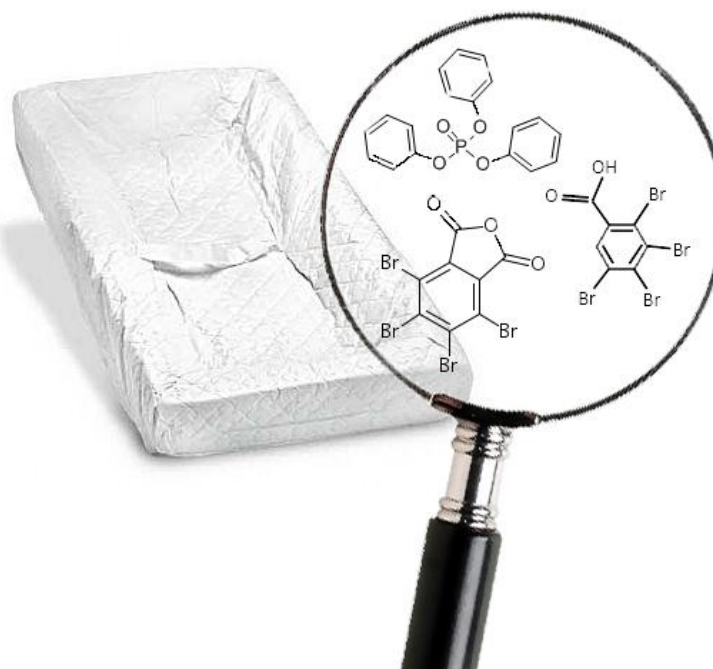


# Firemaster 550

Triphenyl phosphate, 2-ethylhexyl-2,3,4,5-tetrabromobenzoate, bis (2-ethylhexyl) tetrabromophthalate, triaryl phosphate isopropylate

We detected Firemaster 500 in the following types of baby products:

- car seats
- changing table pads
- portable cribs



The second most frequently detected flame retardant additive was Chemtura's Firemaster 550.

## Health Effects

### Animal Studies:

- EPA predicts reproductive, neurological, and developmental toxicity
- Bioaccumulative in marine mammals

# TCEP

Tris (2-chlorethyl)phosphate

We detected TCEP in the following types of baby products:

- nursing pillows
- baby carriers
- portable cribs



Fourteen products in our study were found to contain the flame retardant TCEP, which has been identified as a Proposition 65 carcinogen by the State of California.

## Health Effects

### Animal Studies:

- ✚ Carcinogenic (especially in kidney and liver)
- ✚ Reproductive toxicant with a significant adverse potential to fertility
- ✚ Neurotoxicity

# TCPP

Tris (2-chloro-2-propyl) phosphate

We found TCPP in the following types of baby products:

- changing table pads
- car seats
- nursing pillows
- sleeping wedges
- portable cribs
- rockers



Fifteen products in our study were found to contain TCPP which is similar in chemical structure to the two previous chemicals and has limited health information.

## Health Effects

### Animal Studies:

- ✚ Possible carcinogen
- ✚ Haemolytic effects
- ✚ Skin irritation

# Is There a Fire Safety Benefit?

**There is not data to show that using these flame retardant chemicals in baby products is effective in saving life or property**

California's flammability standard TB117 has led to the use of flame retardants in furniture for more than thirty years. Despite this, an analysis of fire data from 1980 to 2005 by the National Fire Protection Association (NFPA) does not show a greater reduction in the rate of fire deaths in California compared to that of other states without such a standard .

**More effective fire strategies exist**

- ✚ Decreased smoking
- ✚ Fire-safe cigarettes
- ✚ Fire-safe candles
- ✚ Sprinklers
- ✚ Smoke detectors

These can prevent fires without adding potentially hazardous chemicals to consumer products. Early data suggests that fire-safe cigarettes, now mandatory across the U.S., may have a much greater life-saving effect than the hundreds of millions of pounds of flame retardant chemicals added to consumer products.

**The fire *hazards* of fire retardants**

While flame retardants may reduce the time for a material to ignite by a few seconds, they increase the **carbon monoxide, toxic gases, and soot** produced once the fire begins. Most fire deaths and most fire injuries result from inhalation of these gases and soot. When the flame retardants themselves eventually burn, they can produce highly toxic, bioaccumulative and persistent dioxins and furans. Firefighters have high levels of certain types of cancers associated with dioxin exposure which may be connected to the use of flame retardants.

**The TB 117 flammability standard does not provide any protection from real-life product ignition scenarios**

The flame retardants are used to meet TB117 which is a small open flame standard—is not intended to provide protection from ignition by large flame sources. Once the fabric of a baby product or piece of furniture is ignited (from cigarette, candle, etc.), the fabric burns and the underlying foam is presented with flame challenge which is many times larger than the flame which originally ignited the fabric. Therefore, ignition is not slowed and there is no extra escape time is provided.



# If there's no benefit, why are the chemicals still used?

The three producers of the flame retardant chemicals (Albemarle, Chemtura, and Israel Chemicals Limited) spend millions of dollars lobbying at the state and federal levels to create and maintain regulations favorable to their industry. Their political group "Citizens For Fire Safety" fronts as an organization pushing for fire safety and publishes inaccurate, hysterical fliers and news ads around proposed regulations that may lessen the sales of their chemicals to manufacturers.



## Don't Let Sacramento Weaken Fire Safety.

California has some of the toughest, most progressive fire safety standards in the country — including the only regulation in the country that requires flame retardants for residential furniture.

Since these safeguards were introduced, deaths from fires have been reduced by 64%.

But now, some politicians in Sacramento have proposed a sweeping ban on flame retardants that help prevent fires — and keep our homes and families safe.

Based on extensive scientific review, the Consumer Product Safety Commission has concluded that today's most commonly used flame retardants are safe and effective — while many of the chemical alternatives being proposed are unproven and their environmental impact unknown.

Fire safety must come first. Misguided efforts to ban proven flame retardants are going too far — putting lives and property at risk. Why take the chance?

**Tell Your State Legislator  
We Can't Take a Chance on Fire Safety.  
Call 800-330-3036 Today!**



## Every Second Counts When Escaping A Fire

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## A DEADLY MISTAKE

Help stop the bill that will ban material used to make flame resistant products.

CALL YOUR STATE SENATOR TODAY AND TELL THEM TO **VOTE NO ON AB 706**

Call State Senator **Tom Torlakson** at 916-651-4007 and tell him to **VOTE NO** on AB 706.

**DON'T LET THE SACRAMENTO POLITICIANS BAN THE USE OF PROVEN FLAME RETARDANTS-IT COULD BE A DEADLY MISTAKE**

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# How to Reduce Your Family's Exposure to Flame Retardants

## 1) Purchase safe baby products and furniture

- ✚ Consider buying baby products and furniture that contain **polyester, down, wool or cotton** (not polyurethane foam) which are less likely to contain harmful flame retardant chemicals.
- ✚ Products that have an attached TB 117 label could be a cause for concern (see picture below)
- ✚ See Appendix II



## 2) Reduce exposure to house dust

- ✚ Vacuum often (with an HEPA filter) and wet-mop to reduce build-up of dust in your home.
- ✚ Wash hands frequently, as hand-to-mouth contact with dust is a major pathway for exposure.



### 3) Advocate for safer products

Your participation in the advocacy for safer, more effective flammability regulations and chemical policies is powerful. With enough consumer support, **this problem can be solved**. We have reached a critical moment for toxic chemical policy.

- ✚ Your voice does matter. Voice your support for the modification or replacement of the obsolete California flammability standard Technical Bulletin 117 to the Chief of the California Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation. If you are out of California, you should copy your state representatives and/or governor.

Visits, calls, or emails to the bureau are the most effective ways of showing your concern. Materials to prepare you are available at [www.greensciencepolicy.org](http://www.greensciencepolicy.org).

**An example letter is printed below, though we encourage you to modify with your own words.** Congressional staff consider individual messages from constituents more than obvious mass messages.

Bureau of Electronic and Appliance Repair,  
Home Furnishings and Thermal Insulation  
3485 Orange Grove Avenue  
North Highlands, California 95660  
Telephone: (916) 574-2041  
Fax: (916) 574-2043  
Email: [homeproducts@dca.ca.gov](mailto:homeproducts@dca.ca.gov)

To whom it may concern,

We applaud your exempting three baby products from the California flammability standard Technical Bulletin 117 that leads to the use of toxic or untested flame retardant chemicals in baby products and furniture. However, as a consumer and parent I am writing to voice my concern with this standard being applied to furniture and other baby products. We as consumers cannot choose products without such toxic chemicals. As a consequence of this standard, Californians have the highest levels in the world of the toxic flame retardant, pentaBDE, in their bodies. Recent human epidemiology studies have found associations with decreased IQ, reduced fertility, birth defects, and hormonal changes.

Although pentaBDE has been banned, its replacements could also be toxic. We as consumers have no choice to buy products without flame retardants to protect our family's health. Furthermore, there is no data to show that these flame retardants are effective in increasing overall fire safety. In fact, when these chemicals do ignite they combust to form the toxic gases that cause most fire deaths and injuries. Fire-safe cigarettes, fire-safe candles, child-proof lighters, sprinklers, and smoke detectors prevent fires without added chemicals.

In light of the above, I urge you to consider modifying this standard so that consumers can choose to buy products without added toxic chemicals.

Thank you,  
[Name and Contact Information]

- ✚ Support reforms to the Toxic Substances Control Act (TSCA). The **Safe Chemicals Act of 2011**, currently in the U.S. Senate, would amend TSCA to better protect public health and the environment, while restoring trust in the safety of U.S. goods in the world market. If passed, this will give EPA authority to regulate the use of chemicals suspected to be hazardous, ensure safer replacement chemicals, and require manufacturers to submit information proving the safety of chemical both in production and in advance of their entering the market.

Write your Senator or Representative to support this legislation. A sample letter is printed below. You can find out who your Representative is and their contact information at the following link:

<http://www.house.gov/htbin/zipfind>

Dear [Senator Name],

As a consumer and parent I am writing to urge your support for the proposed reform of the Toxic Substances Control Act. This is an antiquated standard that does not adequately protect public health. Compared to previous generations, today's children have higher rates of serious health problems including allergies, attention deficit/hyperactivity disorder, autism, birth defects, cancer, cryptorchidism, hypospadias, diabetes, and obesity. In hundreds of studies, such conditions have been connected to persistent, bioaccumulative, and/or toxic chemicals used in consumer products.

This law places the burden of proving a chemical is causing harm on EPA, rather than requiring chemical producers to prove their chemicals are safe. In addition, the law requires that EPA prove a chemical presents an "unreasonable risk." In practice, this standard has been impossible for EPA to meet—even asbestos cannot meet the required standard of proof to be banned.

Please co-sponsor the Safe Chemicals Act of 2011. This legislation will help reduce the public's exposure to toxic chemicals in everyday products by updating the Toxic Substances Control Act. This will require chemical manufacturers to develop submit toxicity and exposure information for all chemicals. This will improve the EPA's ability to protect human health from toxic chemicals and provide the necessary incentive for the chemical industry toward the development of safer chemicals.

Please show your leadership in protecting my family's health by co-sponsoring this critical legislation?

Thank you,  
[Name and Contact Information]



- ✚ Write letters to manufacturers of baby products stating your preference for flame retardant-free products.

Dear [CEO],

As a consumer and parent I am writing to urge you to consider the potential adverse health consequences of the halogenated flame retardants added to the polyurethane foam of your products to comply with California Technical Bulletin 117 (TB117). As a manufacturer, your support for a replacement standard for TB117 is influential.

As a consequence of this standard, Californians have the highest levels in the world of the toxic flame retardant, pentaBDE, in their bodies. Recent human epidemiology studies have found associations with decreased IQ, reduced fertility, birth defects, and hormonal changes. Although pentaBDE has been banned, its replacements may be similarly toxic. There is no data to show that these flame retardants are effective in increasing overall fire safety. In fact, when these chemicals do ignite, they combust to form the toxic gases that cause most fire deaths and injuries. Fire-safe cigarettes, fire-safe candles, child-proof lighters, sprinklers, and smoke detectors prevent fires without added chemicals.

I urge your company to appeal to the California Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation, the regulatory authority behind TB117 to replace the standard so that your company does not need to use toxic flame retardant chemicals in order to meet flammability requirements. An alternative standard, based on the use of cover materials with inherent flame resistance, would protect consumers from both fire hazard and toxic chemicals.

Thank you,  
[Name and Contact Information]

# Appendix I

## Selected References Showing Toxic Effects of Flame Retardants

### TDCPP

Babich, MA. (2006) CPSC Staff Preliminary Risk Assessment of Flame Retardant (FR) Chemicals in Upholstered Furniture Foam.

Gold MD, Blum A, Ames BN (1978) *Another flame retardant, tris-(1,3-Dichloro-2-Propyl)-phosphate, and its expected metabolites are mutagens.* Science 200:785-787

Meeker JD, Stapleton HM (2010) *House dust concentrations of organophosphate flame retardants in relation to hormone levels and semen quality parameters.* Environmental Health Perspectives 118:318-323

### Firemaster 550

Bearr JS, Stapleton HM, Mitchelmore CL. Accumulation and DNA damage in fathead minnows (*Pimephales promelas*) exposed to 2 brominated flame-retardant mixtures, Firemaster 550 and Firemaster BZ-54. Environ Toxicol Chem 2010;29:722-9.

EPA, *Furniture Flame Retardancy Partnership: Environmental Profiles of Chemical Flame-Retardant Alternatives for Low-Density Polyurethane Foam* (EPA 742-R-05-002A, September, 2005), pp. 4-2 to 4-5.

### PentaBDE

Chevrier J, Harley KG, Bradman A, Gharbi M, Sjödin A, Eskenazi B (2010) Polybrominated diphenylether (PBDE) flame retardants and thyroid hormone during pregnancy. *Environmental Health Perspectives*. doi: 10.1289/ehp.1001905

Harley KG, Marks AR, Chevrier J, Bradman A, Sjödin A, Eskenazi B (2010) PBDE concentrations in women's serum and fecundability. *Environmental Health Perspectives* 118(5): 699-704

Herbstman JB, Sjödin A, Kurzon M, Lederman SA, Jones RS, Rauh V, Needham LL, Tang D, Niedzwiecki M, Wang RY, Perera F (2010) *Prenatal exposure to PBDEs and neurodevelopment.* Environmental Health Perspectives 118:712-719

Main KM, Kiviranta H, Virtanen HE, Sundqvist E, Tuomisto JT, Tuomisto J, Vartiainen T, Skakebaek NE, Toppari J (2007) Flame retardants in placenta and breast milk and Cryptorchidism in newborn boys. *Environ Health Perspectives* 115:1519-1526

Schreiber T, Gassmann K, Gotz C, Hubenthal U, Moors M, Krause G, Merk HF, Crofton KM, Nguyen NH, Scanlan TS, Abel J, Rose CR, Fritsche E (2010) Polybrominated diphenyl ethers induce developmental neurotoxicity in a human in vitro model: Evidence for endocrine disruption. *Environmental Health Perspectives*. 118:572-578

### TCEP

Marklund A, Andersson B, Haglund P (2005) Organophosphorous flame retardants and plasticizers in air from various indoor environments. *Journal of Environmental Monitoring* 7(8): 814-819

WHO (1998) World Health Organization. *Flame Retardants: Tris (chloropropyl) phosphate and tris (2 chloroethyl) phosphate*. Environmental Health Criteria 209. Geneva

### TCPP

Follman W, Wober J (2006) Investigation of cytotoxic, genotoxic, mutagenic, and estrogenic effects of the flame retardants *tris*-(2-chloroethyl)-phosphate (TCEP) and *tris*-(2-chloropropyl)-phosphate (TCPP) in vitro. *Toxicology Letters* 16(2):124-134

Ingerowski G, Friedle A, Thumulla J (2001) Chlorinated Ethyl and Isopropyl Phosphoric Acid Triesters in the Indoor Environment – An Inter-Laboratory Exposure Study. *International Journal of Indoor Environment and Health* 11(3):145-149

# Appendix III

## Baby Product Manufacturers Stating Products Meet TB117 without Added Halogenated Flame Retardants



Polyester-filled and cotton-covered **pads** and **mattresses**



Polyester-filled and cotton-covered **baby carriers**



**Strollers** and **car seats** with Expanded Polypropylene foam that meets TB 117 without halogenated chemicals



**Nursing pillows** filled with polyester and no added flame retardant chemicals