Testing Children's Foam-Padded Sleeping Products in California: A Summary of Findings

January 2019

Prepared by Department of Toxic Substances Control

Safer Products and Workplaces Program

SAFER CONSUMER PRODUCTS

CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL

Testing Children's Foam-Padded Sleeping Products in California:

A Summary of Findings

CONTENTS

SAFER CONSUMER PRODUCTS PROGRAM

EXECUTIVE SUMMARY

The Department of Toxic Substances Control (DTSC) Safer Consumer Products (SCP) regulations are designed to protect people and the environment from harm due to exposure to hazardous chemicals in consumer products. In spring 2018, the SCP Program tested children's foam-padded sleeping products sold in California to determine if they comply with regulations identifying these products as Priority Products. DTSC identified children's foam-padded sleeping products with two commonly used flame retardants, tris(1,3-dichloro-2-propyl) phosphate (TDCPP) and tris(2-chloroethyl) phosphate (TCEP), as Priority Products because these chemicals can cause cancer or developmental harm to children. Companies that manufactured these products were required to notify DTSC if they produced products with these chemicals for sale in California. Since no manufacturers notified DTSC by the regulatory deadline, a variety of children's foam-padded sleeping products marketed in California were tested to verify manufacturer compliance with the SCP regulations.

DTSC purchased and analyzed 21 products from major online retailers. The results showed that none contained either of the two flame retardants covered by the regulations above levels indicating the flame retardants were intentionally added to the tested products. While the breadth of this investigation was limited, DTSC found that TDCPP and TCEP are being phased out of children's foam-padded sleeping products being offered for sale in California and that manufacturers appear to be in compliance with DTSC's SCP regulations.

INTRODUCTION

DTSC is currently implementing its SCP regulations, which took effect October 1, 2013. The primary goal of DTSC's Safer Consumer Products Program is to reduce human and environmental exposures to toxic chemicals in consumer products. We use a science-based process to evaluate the use of hazardous chemicals in consumer products and consider routes of exposure to these chemicals throughout the full life cycle of the product.

The SCP regulations can be applied to products sold to consumers in California if there is a possibility of hazardous chemical exposures to the public or the environment that may pose a significant or widespread adverse impact. If DTSC decides to regulate a product-chemical combination, DTSC must add the product-chemical combination to its Priority Products list through a formal rulemaking process, which includes public input. Following the listing of a Priority Product, manufacturers must notify DTSC

within 60 days of the effective date of the regulation. After notification, manufacturers of Priority Products must complete an Alternatives Analysis.

Figure 1: Common sleeping products

DTSC defines children's foam-padded sleeping products containing TDCPP or TCEP as products designed for children 12 years of age or younger to nap or sleep on that incorporate polyurethane foam mats, pads, or pillows and contain the chemical flame retardants TDCPP or TCEP. This definition includes the following sub-products: nap mats, soft-sided portable cribs, play pens, play yards, infant travel beds, portable infant sleepers, bassinets, nap cots, infant sleep positioners, bedside sleepers, co-sleepers, and baby or toddler foam pillows.

The regulation listing children's foam-padded sleeping products containing TDCPP or TCEP as a Priority Product went into effect on July 1, 2017; manufacturers were required to notify DTSC by September 1, 2017, if they manufactured these products for sale in California.

As of December 1, 2018, no manufacturers had notified DTSC. This may be because manufacturers stopped adding TDCPP or TCEP to children's foam-padded sleeping products for sale in California, or it may indicate that manufacturers have failed to notify DTSC even though they continue to manufacture products with flame retardants. Thus, DTSC tested a variety of children's foam-padded sleeping products that were for sale in California to determine if manufacturers are in compliance with the SCP regulations or still using TDCPP or TCEP.

PRODUCT SELECTION AND TESTING

Product Selection

DTSC first investigated the marketplace by visiting several major retailers, children's product stores, discount stores, including dollar stores, and boutiques. Our investigation revealed that children's sleeping products were predominantly carried by major retailers. These products were either very

Figure 4: DTSC collected samples from products using a standardized procedure

Figure 2: DTSC followed established chain-of-custody procedures during sample handling and submission

Figure 3: Sample extraction techniques were applied uniformly to each individual product

limited or unavailable in the other types of stores visited. In addition, only the most common name-brand products were available from brick-and-mortar stores with a physical presence in the state.

We found that a large number of different "off-brand" products were widely available online, many at price points lower than the products we found in physical stores. These tend to be less expensive than name-brand products, which may suggest they were manufactured with lower quality materials or recycled materials that may be more likely to contain unknown or harmful chemicals. To evaluate the California marketplace, DTSC acquired products solely from major online sellers that offer delivery of products throughout the state. Name-brand products and off-brand products were purchased from both domestic and international manufacturers.

DTSC used additional selection criteria, such as the manufacturers' license or registration status in California, to ensure a broad range of products were evaluated.[1] Products recently tested by other organizations and found to contain flame retardants were also identified and given high priority.

For a list of products tested, please see Table 1.

Table 1. Tested Products

Name	Brand	Product Type
Costway Coffee Baby Crib	Costway	soft-sided portable crib
By Your Side Sleeper	Summer Infant	sleeper
SleepFresh Celebrity Portable Play Yard	Foundations Worldwide	play yard
Funsport Play Yard	Cosco	play yard
FastAsleep Go Playard	Chicco	play yard
Graco Pack 'n Play Playard	Graco	play yard
Bassinet	Badger Basket	bassinet
Rest Mat	ECR4Kids	nap mat
KinderMat	Peerless Plastics	nap mat
Pillow Rest Toddler Mat	Children's Factory	nap mat
Rest Mat	School Outfitters (Sprogs)	nap mat
Benee's Resting Mat	Benee's	nap mat
Toddler Pillow	Baby Works	foam pillow
Safe Lift Universal Crib Wedge	DexBaby	crib wedge
My First Pillow	Kittrich	foam pillow
Foam Baby Pillow	Kosbon	foam pillow
Head Shaping Memory Foam Pillow	Baby Love	foam pillow
Lulyboo Baby Lounge Set	Lulyboo	bassinet
Newborn Infant	Generic	sleep positioner
Baby Pillow	EasyLife185	foam pillow
Dream Little Cot	Baby Home	cot

[1] California's Bureau of Electronics and Appliance Repair, Home Furnishings, and Thermal Insulation (BEARHFTI) requires licensing and registration.

Sample Collection and Analysis

DTSC collected samples from products using a standardized procedure to help ensure consistency and minimize sampling error. Samples were selected to be representative of the products being tested, and sample extraction techniques were applied uniformly to each individual product. DTSC followed established chain-of-custody procedures during sample handling and submission to ensure integrity of the samples and legally defensible results. DTSC's Environmental Chemistry Laboratory (ECL) in Berkeley conducted the testing. All samples were screened by X-Ray Fluorescence Spectrometry (XRF) and quantitatively analyzed utilizing Gas Chromatography Tandem Mass Spectrometry (GC-MS/MS). The GC-MS/MS analysis targeted 17 commonly found flame retardants listed in Table 2 below.

Table 2. Compound Name, Abbreviation and CAS Number

Compound Name	Abbreviation	CAS Number
Tri-propyl phosphate	TPP	513-08-6
Tri-n-butyl phosphate	TNBP	126-73-8
Tris(2-chloroethyl) phosphate	TCEP	115-96-8
Tris(1-chloro-2-propyl) phosphate	TCPP	13674-84-5
Tris(1,3-dichloroisopropyl) phosphate	TDCPP	13674-87-8
Triphenyl phosphate	TPHP	115-86-6
2,2',4-Tribromodiphenyl ether	BDE-17	147217-75-2
2,4,4'-Tribromodiphenyl ether	BDE-28	41318-75-6
2,2',4,4'-Tetrabromodiphenyl ether	BDE-47	5436-43-1
2,2',3,4,4'-Pentabromodiphenyl ether	BDE-85	182346-21-0
2,2',4,4',5-Pentabromodiphenyl ether	BDE-99	60348-60-9
2,2',4,4',6-Pentabromodiphenyl ether	BDE-100	189084-64-8
2,2',4,4',5,5'-Hexabromodiphenyl ether	BDE-153	68631-49-2
2,2',4,4',5,6'-Hexabromodiphenyl ether	BDE-154	207122-15-4
2,2',3,4,4',5',6-Heptabromodiphenyl ether	BDE-183	207122-16-5
2-Ethylhexyl-2,3,4,5-tetrabromobenzoate	EH-TBB	183658-27-7
Bis(2-ethylhexyl)-2,3,4,5-tetrabromophthalate	BEH-TEBP	26040-51-7

LAB RESULTS

Of the 21 products tested, none contained either tris(1,3-dichloro-2-propyl) phosphate (TDCPP) or tris(2-chloroethyl) phosphate (TCEP) at levels indicating they were intentionally added. TDCPP and TCEP were detected, but at relatively low levels: 56 parts per million and 348 parts per million respectively. However, a few products contained relatively high concentrations of other flame retardants not currently regulated as part of this Priority Product listing. The California Bureau of Electronics and Appliance Repair, Home Furnishings and Thermal Insulation (BEARHFTI), which regulates flame retardants in furniture sold in California, uses 1,000 ppm as a regulatory action level for identifying the presence of flame retardants in furniture. Using the BEARHFTI level of 1,000 parts per million (ppm) as

an indicator of intentionally added flame retardants, DTSC identified four samples that contained flame retardants near or exceeding this indicator level.[2]

Table 3 contains a list of products with positive results. The table also includes the date and location of manufacture, type of flame retardant detected and concentration in parts per million.

The "Firemaster" compound found in Benee's Resting Mat consists of three different flame retardants: Triphenyl phosphate (TPHP); 2-Ethylhexyl-2,3,4,5-tetrabromobenzoate (EH TBB); and Bis(2-ethylhexyl)-2,3,4,5-tetrabromophthalate (BEH TEBP).

TCIPP detected in the Badger Basket Bassinet and Baby Home Cot is also known as TCPP, as identified in Table 2.

The flame retardant mixture detected in Kittrich's Foam Pillow is comprised of three chemicals: tris(2-chloroethyl) phosphate (TCEP); tris(1-chloro-2-propyl) phosphate (TDCIPP or TCPP); and tris(1,3-dichloroisopropyl) phosphate (TDCPP).

These other common flame retardants have very similar chemical compositions, and these products and their associated flame retardants could pose a risk similar to the two flame retardants currently being regulated by DTSC. Studies conducted on different organohalogenated flame retardants have shown they pose comparable health risks.[3]

Table 3. Products With High Levels of Flame Retardants

Product Name	Date of Manufacture	Location of Manufacture	Flame Retardants Detected
Badger Basket Bassinet	12/2015	China	TCIPP@1160 ppm
Benee's Resting Mat	Unknown	Unknown	Firemaster@57,852 ppm
Kittrich Foam Pillow	10/2017	China	Flame Retardant Mixture@ 914 ppm
Baby Home Cot	11/2013	Unknown	TCIPP@41,910 ppm

[2] When manufacturers added flame retardants to products containing foam to ensure they met the flammability standard, they typically did so in the 40,000 to 50,000 ppm range, which is equivalent to 4 to 5 percent of the product by weight. Manufacturers found that these levels were necessary to pass the open-flame test required by California's original Technical Bulletin 117 (TB 117) established in 1975. However, revisions to TB 117 in 2013 eliminated the open-flame test and revised the smolder test provisions for upholstered furniture sold in California. This meant manufacturers no longer needed to add flame retardants in order to comply with the revised flammability standards.

[3] Eastmond, D.A.; Bhat, V.S.; & Capsel K. (2012). A Screening Level Assessment of the Health and Environmental Hazards of Organohalogen Flame Retardants. Collegium Ramazzini, Capri, Italy.

ADDITIONAL FINDINGS AND CONSIDERATIONS

Products Manufactured With Recycled Foam

Our testing revealed that some manufacturers are incorporating used foam into children's foam-padded sleeping products. We reached this conclusion when we found interior foam pieces that appeared to be quite old and discolored by ultraviolet radiation or that had markings suggesting they were previously incorporated in another product. One product contained shredded foam of varying colors and sizes, clearly indicating the foam had been recycled. Incorporating used or older foam stock to manufacture new products may increase the probability that products may contain unknown flame retardants at high concentrations.

Certification Standard Not Met

Flexible polyurethane foam manufacturers and their suppliers are represented by the Polyurethane Foam Association (PFA). The PFA mainly educates foam users and allied industries by sharing information and resolving technology issues. In addition, the PFA has partnered with the Alliance for Flexible Polyurethane Foam (AFPF) to create an industry certification standard for products made with polyurethane foam.

CertiPUR-US is the official certification applied to products that the AFPF claims to have been tested and shown to be free of a variety of chemicals. CertiPUR's website states that products are tested and certified to be made without the following chemicals:

- Ozone depleters
- PBDEs, TDCPP or TCEP (tris) flame retardants
- Mercury, lead and heavy metals
- Formaldehyde
- Phthalates regulated by the Consumer Product Safety Commission

DTSC only tested one product bearing the CertiPUR certification: Kittrich's Foam Pillow. Results showed that it contained a mixture of flame retardants at levels totaling just under 1,000 ppm, which may indicate the flame retardants were intentionally added. The flame retardants detected were TCEP, TCIPP, and TDCPP. All three of these flame retardants are covered by CertiPUR's certification and should not be present in their certified products.

Detection of Other Flame Retardants Not Covered by SCP's Regulations

As reported in Table 3, we detected high levels of two other flame retardants not covered by DTSC's regulations. However, finding these other flame retardants does not suggest there is a widespread problem that needs to be addressed through additional regulations. Of the three products with high concentrations of flame retardants, one was manufactured in 2013 and another in 2015, while the third product failed to include a manufacture date. Since none of the tested products manufactured within the last two years contain flame retardants, we believe this may indicate manufacturers have started phasing out or have ceased adding flame retardants to these types of children's products.

In addition to the limited number and age of products containing flame retardants, a recently passed California law prohibits manufacturers from using flame retardants in children's sleeping products. Assembly Bill 2998 was signed in October 2018 and bans the use of all flame retardants in upholstered furniture, including children's products and mattresses. It takes effect on January 1, 2020, and requires BEARHFTI to conduct testing to ensure products on the market in California are free of flame retardants.

Product Labels Missing Information

Some of the products failed to include basic label information required by federal law. The date of manufacture and location of manufacture were the two pieces of information omitted most often. This suggests manufacturers may need to improve their manufacturing processes to ensure their product labels comply with federal labeling requirements and to provide additional transparency to consumers.

CONCLUSIONS

Our evaluation of children's foam-padded sleeping products currently on the market in California revealed that none of the products we tested contained either of the two flame retardants covered by DTSC's regulations at concentrations that would indicate they were intentionally added. Based on these findings, we believe no further compliance activities are warranted at this time.

Before DTSC listed children's foam-padded sleeping products as a Priority Product, we suspected manufacturers were gradually phasing out the use of flame retardants in children's products. It appears our regulations helped accelerate that trend.

If you have questions about this report or would like to learn more about the Safer Consumer Products Program, please email us at: SaferConsumerProducts@dtsc.ca.gov.