



**Statement of the Carpet Cushion Council on Legislative Initiatives to Ban  
Products Containing  
Polybrominated Diphenyl Ethers (PBDEs)**

**Introduction:**

This statement was prepared by the Carpet Cushion Council ("CCC"), the national trade association for manufacturers of separate carpet cushion and their suppliers. It urges states enacting bans on PBDEs to include an exemption with respect to products for which the source of pentaBDE is from a material that is recycled, and provides support for such an exemption. Our goal is to maintain the collection and recycling of post-consumer take-up foam carpet cushion and the continued manufacture and sale of end-products produced using recycled take-up foam carpet cushion materials.

**Summary of Enacted State Bans on PBDEs:**

Six states (California<sup>1</sup>, Hawaii<sup>2</sup>, Illinois<sup>3</sup>, Maryland<sup>4</sup>, Michigan and New Yorks) have enacted legislation providing to the effect that no person "manufacture, process, or distribute in commerce a product, or a flame-retarded part of a product, containing more than one-tenth of 1 percent of pentaBDE, by mass". A seventh state (Maine<sup>1</sup>) has enacted a similar ban limiting pentaBDE content to no more than 1 per cent, by mass. These bans go into effect on 1/1/06 (New York, Hawaii, Illinois, Maine), on 6/1/06 (California, Michigan), and on 10/1/08 (Maryland).

Each of the seven state's bans (with the exception of Maine) exempts metallic recyclables containing pentaBDE (conducted) in compliance with all applicable federal, state, and local laws, either expressly by defining "processing" as not including metallic recyclables or by means of a general exemption for processing of recyclables or recycled material (containing pentaBDE).

Three state's bans (Illinois, Maryland and Michigan) exempt "processing of recycled material (or recyclables) containing pentaBDE in compliance with applicable (federal, state, and local laws)".

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In addition to the three states whose bans contain a general exemption for recyclables or recycled materials, the ban enacted by a fourth state (Maine) is being interpreted to exempt recycled products, and the ban enacted by a fifth state (New York) provides that the Commissioner of Environmental Conservation “may waive the provisions ... in whole or in part upon a finding ... in a particular instance ... that there is no significant threat to the public health”.

Legislation that is or has been under consideration in some other states would exempt in some manner use of used or recycled pentaBDE-containing materials, and would establish processes to develop proposals for dealing with reuse and recycling of products containing PBDEs and methods of management or disposal that will result in the lowest potential for PBDEs entering the environment, etc.

Except to the extent their bans exempt metallic recyclables, the bans enacted by two states (California and Hawaii), (1) make no provision for exempting other recyclables or products comprised of recycled materials, (2) fail to expressly provide (a) for an administrative mechanism by means of which exemptions or exceptions from or modifications of the bans can be sought or (b) standards applicable to such applications.

The earliest of the state bans on pentaBDE to be enacted (California, Hawaii and Maine) contain no express provisions generally exempting recyclables or products comprised of recycled materials. By contrast, the bans most recently enacted by five states (Maine, Michigan, New York, Illinois and Maryland) (1) contain an express exemption for recyclables or products comprised of recycled materials, (2) contain administrative procedures through which duly justified relief from the bans can be pursued and obtained, or (3) are being interpreted to exempt recycled products.

States enacting legislation making it a prohibited act to manufacture, process, sell or distribute in commerce a product, or a flame-retarded part of a product containing pentaBDE should provide that the prohibitions do not apply to a product for which the source of pentaBDE is from a material that is recycled.

### **Carpet Cushion and Recycling of pentaBDE-Containing Products:**

The ability to recover, repeatedly re-manufacture and recycle scrap foam generated from carpet cushion waste and other sources is one of the most significant recycling success stories in the United States. And, the ability to continue recycling such foams in the production of new bonded carpet cushion is in the public interest, as the process helps reduce the necessity of disposing of the bulky solid waste in landfills.

In the manufacture of flexible polyurethane foam a significant amount of scrap foam is generated. This consists of skins, side and bottom trim and the foam generated as different grades of foam are produced during a production run, without stopping during the change-over. Additional scrap foam is generated during fabrication as large foam blocks are cut into the desired shapes for the bedding, upholstered furniture or automotive industries.

Since early in the development of the industry a process for using all of this scrap was developed, thus avoiding the necessity of disposing of it in landfills. That process is the manufacture of bonded carpet cushion. The process consists of chopping flexible polyurethane foam (usually scrap foam) into small pieces, bonding these under pressure with a polyurethane binder into blocks and then cutting long thin slices of appropriate length, thickness and width and producing carpet cushion by adding a slip film to one side.

Historically the “bonded foam” process has been able to absorb all of the flexible polyurethane foam (FPF) scrap generated in the United States during end-product manufacturing. The processing of bonded cushion also consumes a growing amount of consumer take-up foam scrap that is generated as old carpet cushion is replaced with new cushion when carpet is replaced.

The ability to absorb “take up” materials into new bonded products, diverting them from disposal in landfills is a further benefit of the available technology. **Adapted from Carpet Pad and Recycling, PFA, February, 2004**

### **The Role of Federal, State and Local Regulations and Voluntary Industry Standards in the Use of Combustion Modifiers in Flexible Polyurethane Foam:**

Flammability standards promulgated by various Federal agencies in the late 1960s-early 1970s and certain voluntary industry standards (UFAC) led to the use of combustion modifiers in regulated products such as mattresses, automotive and upholstered furniture. The promulgation of Cal. Tech. Bull. No. 117, which required resistance to both smoldering and small open flame ignition sources, and certain other regulations promulgated by the State of California (Cal. Tech. Bull. No. 133), the City of Boston, the NY Port Authority, the Federal Aviation Administration, etc., led to the use of different combustion modifiers (such as pentaBDE) in flexible polyurethane foam (FPF) and use of such modifiers in larger amounts than had previously been the case.

**Adapted in part from 4/29/03 Presentation by H. Stone on behalf of PFA.**

### **Disclaimer as to Addition of PentaBDE During Recycling of Take-Up Foam Cushion Scrap into Bonded Carpet Cushion:**

PentaBDE was not and is not added as a combustion modifier (flame retardant) in the manufacture of separate carpet cushion of any type. The presence of pentaBDE in bonded cushion is a circumstantial consequence of the fact that bonded cushion is manufactured using, in part, recycled foam originally manufactured for other end uses into which pentaBDE was incorporated.

### **Profile of the U. S. Carpet Cushion Industry:**

The carpet cushion industry consists of the producers of separate carpet cushion (also referred to as separate underlayment or carpet pad). There are several “types” of cushion, distinguishing among the materials used in the cushion’s construction, i.e., fiber (hair, jute, synthetic, resonated recycled), polyurethane foam (prime, grafted prime, densified prime, bonded, mechanically frothed), and rubber (flat, rippled, textured flat, reinforced).

In 2004, approximately 86% of all domestically produced separate carpet cushion was bonded polyurethane foam cushion (“bonded” or “rebond”), made of various combinations of salvage, scrap or recycled polyurethane foam. The remaining 14% of separate cushion produced is divided among the other types of cushion, i.e., fiber, rubber and polyurethane foam (other than bonded). **Carpet Cushion Council (2004).**

The total weight of the annual production of bonded polyurethane foam carpet cushion in the U. S. is currently being estimated at between 1.1 - 1.2 billion pounds. This cushion is comprised of an estimated 1.0 - 1.1 billion pounds of recycled flexible polyurethane foam, which is a combination of post-industrial and post-consumer scrap foam.

The foam scrap used in bonded cushion is thought to range from between 60% and 70% post-industrial scrap and 30% to 40% post-consumer scrap. The latter includes annually an estimated 300-400 million pounds of take-up foam cushion collected primarily from carpet installers by carpet cushion recyclers, thus diverting it from landfills. **Carpet Cushion Council (2004).** Take-up foam cushion is then ground into coarse granules (foam chips) and the granules are blended with manufacturing scrap for the processing of new bonded cushion.

#### **Adverse Industry Impacts Attributable to PBDE Bans and Failure to Exempt Recyclables or Products Comprised of Recycled Materials Containing pentaBDE:**

Adoption of laws banning pentaBDE without providing that such prohibitions do not apply to a product for which the source of pentaBDE is from a material that is recycled, will have a profound adverse effect upon the recycling industry, the retailers and distributors of carpet cushion, the manufacturers of bonded carpet cushion, and the public.

PBDE bans without exemptions for recyclables, even bans permitting storage or transportation of penta-containing materials, will render the take-up foam carpet cushion valueless, with the result that collectors (recyclers) will decline to handle what have been recyclables, leaving to the retailer or distributor the task and expense of dealing with the removed materials in the form of increased trash disposal load, including pull charges.

At this time, very little post-consumer carpet is being recycled, but the carpet industry is committed to recycling a significant portion of post-consumer carpet by the year 2012. The existence of a national infrastructure to collect, process and ship post-consumer carpet cushion can be helpful to the carpet industry. By “piggybacking” on the existing carpet cushion collection system, it will be less expensive for the carpet industry to place its recycling program into effect as it attempts to redirect its large and important waste stream from landfills.

About 90% of the raw material used to make bonded carpet cushion is recycled polyurethane scrap. Our best estimate at this time considering the total amount of bonded carpet cushion made in 2004, is that about 1.0 - 1.1 billion pounds of polyurethane scrap was used in manufacturing about 850 million square yards of bonded carpet cushion in 2004. It is estimated that about 30 to 40 percent of that amount, or about 300 to 400 million pounds of "post-consumer" or "take-up" scrap, was used in making this bonded cushion. The balance of the scrap was "post-industrial" or "process" scrap which comes from (1) polyurethane shapes that are fabricated in the United States and (2) from imports of the same type of scrap mainly from Europe, and increasingly from Asia. It is estimated that about 12-15 percent of the scrap used annually in the manufacture of bonded (or about 120 to 150 million pounds) is imported, since the quantities of post-industrial scrap available from domestic sources cannot meet the demands of the bonded cushion industry.

It is unlikely that imported scrap will contain any pentaBDE since its use has already been discontinued in Europe and Asia as well as in the United States. Assurance that imported post-industrial scrap does not include pentaBDE would require testing of each lot of scrap, an extremely cumbersome and costly process.

Failure to exempt take-up carpet cushion scrap from PBDE bans will force domestic producers of bonded cushion to increase their reliance on imported scrap to replace an estimated 300-400 million pounds of take-up carpet cushion annually. In that event, market forces will drive up the price of imported scrap significantly, assuming its continued use in bonded cushion proves feasible under the circumstances. Increased costs for materials of 100% or more can be expected if the post-consumer scrap supply is replaced by imported post-industrial scrap.

If imported scrap is not available, companies capable of making polyurethane foam scrap directly from the chemicals used to produce the prime foam materials can experience material costs easily triple or quadruple present scrap costs; and companies making bonded cushion but lacking foaming capability, could be forced out of business.

### **Effect of Actions Already Taken Regarding Use of PentaBDE in Flexible Polyurethane Foam on the PentaBDE Content of Future Production of Bonded Cushion:**

The adoption by the European Union of a policy banning the use of pentaBDE and OctaBDE and the enactment of the earliest of the state bans on products containing pentaBDE and OctaBDE, was followed by the announced cessation of production of these brominated fire retardants as of late 2004 by Great Lakes Chemical, the only U. S. manufacturer of the items. Concurrent with these developments, U. S. producers of flexible polyurethane foam abandoned the use of pentaBDE as a combustion modifier in flexible urethane foam (FPF). As of 2005, pentaBDE has been replaced in the production of flexible polyurethane foam by use of other production modifiers.

As a consequence of these recent developments, the post-industrial scrap now being used in the manufacture of bonded carpet cushion has been formulated without pentaBDE, and new bonded carpet cushion will contain pentaBDE only to the extent that it is introduced in the form of recycled post-consumer flexible polyurethane foam (FPF).

Take-up polyurethane scrap foam tends to be used in the medium to higher density bonded carpet cushion grades (5-6 lbs/cu.ft. and 7-10 lbs/cu.ft.), and in amounts ranging from 5-20% and 40-55% of total weight, respectively. **Adapted from Carpet Pad and Recycling, PFA, February, 2004.**

Previously published information on the penta-content of bonded carpet cushion manufactured with post-industrial and post-consumer scrap has consisted primarily of (1) isolated test results on very small numbers of samples of largely unknown formulation or vintage or (2) calculated content as opposed to tests.<sup>9</sup>

In mid-2005, the Carpet Cushion Council underwrote a comprehensive survey of post-consumer scrap suppliers in the United States to determine the actual pentaBDE levels in material currently being supplied to manufacturers for incorporation into new bonded cushion.

In the 2005 Survey, take-up foam cushion scrap was collected from fourteen (14) warehouses located in twelve (12) states geographically dispersed throughout all regions of the United States. These samples were analyzed for percent by weight of penta technical mixture and penta congener only by means of gas chromatography/mass spectrometry under the supervision of Dr. Robert Hale of the Department of Environmental & Aquatic Animal Health, Virginia Institute of Marine Science, College of William and Mary.<sup>10</sup>

Based upon the results of these tests, the actual pentaBDE levels in take-up cushion scrap were demonstrated to be significantly lower than the "highest calculated" levels. The average for all samples of total technical pentaBDE was 0.313% by weight. Broken down into the low density and high density products, (1) the average for low density products for total technical pentaBDE was 0.292% by weight, and (2) the average for high density products for total technical pentaBDE was 0.333% by weight, with standard deviations of 0.193% and 0.166%, respectively. **U. S. Survey of PBDE Content in Post-Consumer Rebond (FPF) Carpet Cushion - June 2005.**

Carpet cushion currently in use is expected to be replaced when the carpet under which it is installed is replaced. This is thought to occur every ten years, on average (within a range of 5-15 years). To the extent the polyurethane foam cushion being replaced contains pentaBDE and is replaced by new bonded cushion manufactured employing a mix of post-industrial and post-consumer scrap, it will continue to contain some pentaBDE. But, new bonded cushion, if containing any pentaBDE, will necessarily contain significantly less pentaBDE than the bonded cushion it replaces.

Notwithstanding these significant reductions in pentaBDE content in new bonded cushion directly attributable to abandonment of the use of pentaBDE in the production of flexible polyurethane foam, i.e., the post-industrial scrap now being generated as of 2005, new bonded cushion cannot consistently attain a 0.1% pentaBDE limit, by mass, under any scenario while continuing to utilize post-consumer or take-up foam carpet cushion.

It would be possible to achieve lower pentaBDE content in the higher density bonded cushion (7-10 lbs/cu.ft.) by diluting the percentage of recycled material used. Questions exist as to whether all of the available take-up scrap could be consumed in this way or whether this approach would leave surplus take-up cushion that would need to be diverted to land-fills.

Alternatively, bonded cushion could be produced by controlling the level of pentaBDE in the mix of post-industrial and post-consumer scrap blend. This approach (1) would entail a significant amount of analytical work and associated costs by either the carpet cushion producers or their suppliers of take-up cushion to define the actual pentaBDE content of each lot of material received and (2) would oblige each cushion producer to have the blending capacity in order to mix the scrap to achieve the desired level in the fresh product. **Adapted from Carpet Pad and Recycling, PFA, February, 2004**

#### **Conclusion:**

In order for post-consumer scrap, i.e., take-up foam carpet cushion, to continue to be used in the production of bonded carpet cushion, PBDE bans, including those recently enacted in some states, will need to incorporate exemptions for the collection of recyclables, and for manufacturing and distribution of products for which the source of pentaBDE is from a material that is recycled. Otherwise, take-up foam cushion will be land-filled or will be disposed of improperly, to the detriment of the recycling industry, distributors and dealers, bonded cushion manufacturers, and the public.



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