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Office of Pollution Prevention and Toxics  
Environmental Protection Agency  
1200 Pennsylvania Avenue, NW  
Washington, DC 20460 - 0001

Attention: Docket ID Number EPA - HQ - OPPT - 2010 - 1039

**Re: Comments of the Carpet Cushion Council on EPA's Proposal on Certain Polybrominated Diphenyl Ethers; Significant New Use Rule and Test Rule, [77 FR 19862; 4/2/2012;][EPA - HQ - OPPT - 2010 - 1039; FRL - 8889 - 3]**

Dear Sir or Madam:

The comments below are submitted on behalf of the Carpet Cushion Council ("CCC"), the national trade association of and for manufacturers of separate carpet cushion and their suppliers. They are specific to separate carpet cushion and to the recycling of flexible polyurethane foam ("FPF") into bonded carpet cushion ("bonded").

The comments are intended to provide support for the position of the Carpet Cushion Council that, in finalization of its proposed rule on Significant New Use Reports (SNUR) and its Test Rule, EPA should make it unequivocally clear that neither the SNUR nor the Test Rule is intended to apply to the recycling of flexible polyurethane foam into new bonded carpet cushion.

The overall objective of the Council is to facilitate continuation of the historical and existing system of collection and recycling of flexible polyurethane foam into new bonded carpet cushion. Achievement of this objective requires explicit recognition, by EPA, of the fact that the manufacture of and continued manufacture and sale of end-products produced using recycled flexible polyurethane foam (including post-consumer (take-up) carpet cushion foam scrap) is and will be considered to be an ongoing use and that, insofar as concerns the carpet cushion manufacturer ("bonder"), the presence of PBDEs (such as PentaBDE) in the foam being recycled and the end-product ("bonded") has been, is, and will be solely as an impurity.

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## **Carpet Cushion and Recycling of PentaBDE-Containing Products**

The ability to recover, repeatedly re-manufacture and recycle foam scrap 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 dilutes the PentaBDE content and helps reduce the necessity of disposing of the bulky solid waste in landfills.

In the manufacture of flexible polyurethane foam a significant amount of foam scrap 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 foam scrap is generated during fabrication as large foam blocks are cut into the desired shapes for the bedding, upholstered furniture or automotive industries.

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 foam scrap) 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 this 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 post-consumer (take-up) foam scrap that is generated as old carpet cushion is replaced with new carpet cushion when the carpet is replaced. This practice dates back to about 1993, initially involving small amounts of take-up. By 2005, use of take-up carpet cushion foam scrap in bonded was estimated at between 300 and 400 million pounds per year. In the context of these proceedings, the processing of flexible polyurethane foam into bonded carpet cushion was, is, and is expected to be an ongoing use.

The ability to absorb post-consumer (take-up) materials into new bonded products, diverting them from disposal in landfills, is a further benefit of the available technology.

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

Flammability requirements promulgated by various Federal, state and local

government entities 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 (including PentaBDE) in flexible polyurethane foam (FPF) and use of such modifiers in larger amounts than had previously been the case.

Separate carpet cushion is not, with rare exceptions, subject to flammability regulation by federal, state or local laws or building codes. This is so because all carpet (used in homes, etc.) is required by law to comply with flammability regulations promulgated by the U. S. Consumer Product Safety Commission, 16 CFR Part 1630, and carpet (as distinguished from separate carpet cushion) in commercial and institutional installations is required to comply with specific flammability requirements (imposed or adopted by Federal, state and local authorities and/or building codes which employ ASTM E648 -10e1 (or variants thereof). These authorities almost uniformly recognize that the flammability requirements applicable to the carpet obviate the need for imposing flammability requirements upon separate carpet cushion, which is invariably installed under a regulated carpet.

Beginning in 1971 and continuing until 1995, some jurisdictions, most notably the U. S. Department of Housing and Urban Development (FHA/HUD), imposed flammability requirements (UM 47, UM 72) on separate carpet cushion in addition to requirements applicable to carpet (UM 44). As a consequence, some separate carpet cushions (depending upon the cushion type) were manufactured using chemical flame retardants of some type (but not PBDEs). The HUD flammability requirements were eliminated, by HUD, effective in 1995. It is the present understanding of the Carpet Cushion Council that producers of separate carpet cushion (all types) have generally not used chemical flame retardants (of any type) in their carpet cushion products since.

Historically, PentaBDE has not been and is not presently in separate carpet cushion as a flame retardant or flame retardant additive, i.e., to impart flammability properties to the carpet cushion. The presence of PentaBDE in carpet cushion is solely the fortuitous consequence of the fact that bonded cushion is manufactured from recycled foam. The presence of PBDEs in carpet cushion has been, is, and will continue to be an impurity. There is simply no commercial advantage to be gained by the use of PBDE - containing flame retardant additives in separate carpet cushion.

**Disclaimer as to Addition of PentaBDE (or any other PBDE) During Recycling of Flexible Polyurethane Foam (Take-Up Foam, Import, or Otherwise) During the Processing of FPF 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 FPF some of which was 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 or categories of carpet cushion, distinguished by the materials used in the cushion, such as fiber (hair, jute, synthetic, resonated recycled), flexible polyurethane foam (prime, grafted prime, densified prime, bonded, mechanically frothed), rubber (flat, rippled, textured flat, reinforced) and crosslinked olefin.

Over 80% of all domestically produced separate carpet cushion is bonded polyurethane foam cushion ("bonded" or "rebond"), made of various combinations of salvage, scrap or recycled flexible polyurethane foam. The remaining 20% of separate cushion produced in the U.S. is divided among the other types of carpet cushion, i.e., fiber, rubber and flexible polyurethane foam (other than bonded) and other types.

About 90% of the raw material used to make bonded carpet cushion is recycled flexible polyurethane foam scrap. The total weight of the annual production of bonded carpet cushion in the U. S. is currently being estimated (data circa 2011) by the Carpet Cushion Council to be 900 million pounds. 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 carpet cushion foam scrap, was used in making this bonded carpet 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 foam scrap mainly from Europe, and increasingly from Asia.

Imported flexible polyurethane foam scrap ("import") is used by some U. S. producers of bonded where availability of other recyclable FPF or economic circumstances in the U.S. or world-wide dictate. The amount of import recycled into bonded carpet cushion varies dramatically from year to year. For example, since 2006 usage has varied from a high of 250 - 275 million pounds to a low of 90 -125 million pounds.

**Adverse Industry Impacts Flow Directly from PBDE Initiatives Which Fail to Recognize that Bonded Carpet Cushion Consists Entirely of Recyclable/Recycled Flexible Polyurethane Foam Scrap Some of Which May Contain PentaBDE**

Finalization of the SNUR and Test Rule without explicit recognition, by EPA, (1) of the fact that the manufacture of and continued manufacture and sale of end - products produced using recycled flexible polyurethane foam (including post-consumer (take-up) carpet cushion foam scrap) is and will be considered an ongoing use and that, (2) insofar as concerns the carpet cushion manufacturer (bonder), the presence of PBDEs (such as PentaBDE) in the foam being recycled and the end-product ("bonded") has been, is, and will be solely as an impurity, will adversely affect recycling of flexible polyurethane foam, bonders who recycle carpet cushion foam scrap (take-up), collectors of such recyclable foam, the retailers and distributors of bonded carpet cushion, and the public.

Finalization of the SNUR and Test Rule without explicitly addressing their application to recycling flexible polyurethane foam into bonded carpet cushion, will render the post-consumer (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. Manufacturers of bonded would be forced to find and secure recyclable FPF from other sources.

Failure to explicitly address the application of the SNUR and Test Rule to recycling flexible polyurethane foam into bonded carpet cushion in finalization of the SNUR and Test Rule will force domestic producers of bonded cushion to increase their reliance on imported scrap to replace the estimated 300 - 400 million pounds of take-up carpet cushion foam scrap now being recycled into bonded 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 prime foam materials can resort to converting prime urethane foam into new bonded but would experience material costs easily triple or quadruple present foam scrap costs. Companies making bonded cushion but lacking foaming capability would not even have that option.

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

The adoption by the European Union of requirements limiting the use of PentaBDE and OctaBDE and the enactment of the earliest of state limitations 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 polyurethane 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 developments, the domestic post-industrial foam scrap now being used in the manufacture of bonded carpet cushion has been formulated without PentaBDE, and the PentaBDE content of new bonded carpet cushion is thought to be a function of the recycling of post-consumer carpet cushion foam scrap into new bonded carpet cushion.

It is thought to be unlikely that imported foam scrap will contain any PentaBDE since its use has already been discontinued in Europe and Asia as well as in the United States.

#### **The PentaBDE Content of the FPF Recycled into New Bonded and the PentaBDE Content of the New Bonded Carpet Cushion Produced Using Post - Consumer FPF Scrap are Inherently Variable**

The PentaBDE content of the post-consumer (take-up) carpet cushion foam scrap will vary depending upon the PentaBDE content when the foam was originally produced (for other uses), the number of times the foam scrap has been recycled, and the PentaBDE content of the other take-up scrap with which it is collected, sorted, and blended in the process of becoming new bonded cushion.

The PentaBDE content of new bonded carpet cushion made in part from post-consumer (take-up) carpet cushion foam scrap is necessarily going to vary because (1) the PentaBDE content of the take-up itself will vary due to its own history, and (2) the percentage of take-up scrap used in mixing formulas varies by the cushion density and by the producer of bonded carpet cushion.

In the course of manufacturing new bonded, all of the factors affecting variability are occurring more or less continuously, and the PentaBDE content of the eventual new bonded will be a function of all of them.

#### **PentaBDE Content of Bonded Carpet Cushion is a Function of PentaBDE Content of the FPF (take - up or import) Recycled Into It and is Necessarily Variable**

Bonded cushion is comprised of a mixture of post-industrial and post-consumer foam scrap, with the percentage of post-consumer foam scrap (thought to be the only source of PentaBDE in new bonded cushion) used tending to increase as the density of

the bonded cushion increases.

Depending upon the facility, a bonder might have an inventory of anywhere from 50,000 and 1,500,000 pounds of post-consumer foam scrap. Inventory levels tend to be dictated by business conditions. Post-consumer foam scrap is typically converted into new bonded and shipped within 5 -14 days of its receipt by the bonder.

### **Post - Consumer Carpet Cushion Foam Scrap**

There is no single description that would apply to all recycling operations, but the following is thought to be typical. Post-consumer (take-up) carpet cushion foam scrap is collected either by direct drop-off by carpet installers or pro-active pick-up from carpet distribution points (carpet retailers, work rooms, etc.) that collect the take-up from jobs via carpet installers. The take-up foam scrap is checked for such things as tack strip, blades, metal strips, carpet, or other unwanted materials, a process that requires unrolling each piece. Typically, the take-up scrap carpet cushion is then sorted by density/type, e.g., rebond cushion is separated from prime foam cushion scrap, etc., before it is baled.

Take-up carpet cushion foam scrap is received by the manufacturer of bonded cushion in the form of compressed bales weighing between 400 and 1500 pounds. The average bale of foam scrap weighs between 800 - 900 pounds and is made up of post-consumer foam scrap and post-industrial foam scrap (less than 5%), both types being collected from the new installation. The post-consumer scrap is comprised of pieces that range in size (from 5 -15 square yards or 45 -75 square feet) and in thickness. The average bale consists of from 70 -110 different units of post-consumer foam cushion, which could have come from as many as 110 different sources.

During the manufacture of bonded carpet cushion, the foam scrap (post-industrial and post-consumer) is ground into an irregularly shaped "crumb", which ranges in size from 1/4" to 3/4", with take-up grind tending to be smaller (1/4" to 3/8") than the average.

There are two types of bonded plants, known as either extruder plants or log and peel plants. In the United States, three (3) companies have extruders, one company employs a process similar to the extruded process except that it extrudes a single roll; the balance of the bonded companies operate log and peel plants. These plants produce, respectively, buns that range in weight from 3600-5700 pounds or logs that range in weight from 500 -1600 pounds. A substantial bonded operation can mold 250 - 275 logs per day or extrude 100 buns per day. The typical bonded plant is operating 16 -24 hours per day, the higher number in peak periods, 5 days a week.

### **Imported Flexible Polyurethane Foam Scrap, i.e., "Import"**

Dating back to the mid -1990s, when limitations were imposed on certain PBDEs in Europe, specifically PentaBDE and OctaBDE, users of imported (import) foam scrap from Europe in production of bonded carpet cushion have had the expectation that imported foam scrap from such sources will not contain PentaBDE. It is not expected that import foam scrap from other sources (such as Asian) will contain PentaBDE. Beyond that, importers of foam scrap or users of the import would typically not know about its PentaBDE content, if any.

A manufacturer of bonded carpet cushion in the United States would not purchase and use import foam scrap with the expectation that including such foam scrap in its mixing formula for bonded carpet cushion would impart flame retardant properties to the finished product.

As concerns import, there are some transactions involving direct relationships between a US-based bonder and a foreign-based foamer. Some import FPF is purchased through distributors from Europe or Asia, 20 - 30 of which are thought to be selling to bonders in the United States.

There is no single description that would apply to all collection and export of foam scrap in the European and Asian markets and acquisition of import by a bonder in the United States, but the following is thought to be typical. In any event, transactions in import typically involve 6-month contracts or longer and the relationships change on a regular basis.

Fabricators of foam will often buy foam from several manufacturers of foam. The fabrication process begins with large blocks of foam of different colors and densities which are then converted into sofa cushions and other cushions, etc.

All of the trimmings in-between are referred to as "fall off". The fall off is then mixed together, and bagged or baled and sold to a bonder or a broker where it is mixed with other scrap from other sources to become an unrecognizable conglomeration the source of which could not be reasonably ascertained. The fall off from one source would usually be indistinguishable from another source.

Foam scrap is typically collected in the form of small bales which are then re-baled for export. Foam scrap may also be exported loose in large (7 - 8 foot) plastic bags. During the process of collection, baling or bagging, foam scrap is sorted and graded. The baler is typically a collector and is usually a broker selling on the international market, although some Europeans bale their own scrap, which they then sell to the US. Export transactions would typically involve 20 metric tons, more or less.

Regardless of the circumstances of the collection of the import or the consummation of the transaction, usually the US-based bonder is several steps (3 - 4



or more) removed from the foreign-based foamer or foam fabricator.

Under the circumstances, a US-based bonder would not know or reasonably ascertain what PBDEs, if any, are in the imported foam scrap, i.e., the import it is purchasing for use with other flexible foam in its mixing formula for bonded.

Testing of foam scrap or bonded cushion for its PentaBDE content is a process that could take several days or weeks from the time test samples are collected, making it impractical to test the post-consumer scrap or the new bonded production for its PentaBDE content prior to shipment of the finished product. As a consequence, to gauge the PentaBDE content of the finished product, producers of bonded are obliged to blend post-industrial and post-consumer scrap in the context of what is known by them about the PentaBDE content of post-consumer scrap being collected at the time. This information would include the results of CCC-sponsored assessments, surveys and studies.

While the PentaBDE content of a given quantity of bonded cushion product manufactured can be expected to vary within a log or bun, from one log or bun to the next, from roll to roll, and within a roll, based upon tests conducted to date the finished bonded product (produced in accordance with general industry practice at the time) can be expected to contain a mean of 0.085% PentaBDE by weight at this time.

A bonder would not ordinarily know or reasonably ascertain what PBDEs, if any, are in the post-consumer (take-up) foam scrap it is purchasing for use with other flexible polyurethane foam in its mixing formula for bonded.

**CCC - Sponsored Assessments, Surveys and Studies, Initiated in 2004 and Continuing Since, Indicate that the PentaBDE Content of Post - Consumer (Take - Up) Carpet Cushion Foam Scrap and in New Bonded Carpet Cushion is Low and Declining**

Prior to 2005, published information on the PentaBDE-content of bonded carpet cushion manufactured with post-industrial and post-consumer (take-up) scrap 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.

In 2004, the Carpet Cushion Council commissioned a set of tests on new bonded carpet cushion by Air Quality Sciences of Marietta, GA and ALTA Analytical Laboratory of El Dorado Hills, CA the primary purpose of which study was to assess the extent to which, if any, PentaBDE in bonded carpet cushion could be volatilized during the course of its use, i.e., was a volatile organic compound ("VOC"). To make this assessment, the foam to be tested needed to contain the amount of PentaBDE that

would have enabled the foam to meet, for example, Cal. Tech. Bull. No. 117, before the production of PentaBDE was discontinued by its manufacturer.

The result of these tests showed that the amount of PentaBDE volatilized, if any, was "non-detectable". This assessment also showed the PentaBDE content of the tested samples (two samples of 8 pound bonded) to be 0.594% and 0.807% respectively, i.e. less than 1% by weight.

Beginning in 2005, the CCC initiated a series of surveys and studies intended to assess the PentaBDE content of (1) post-consumer carpet cushion foam scrap and (2) new bonded carpet cushion. These surveys and studies have been conducted at the rate of about one per year, roughly alternating between surveys of take-up carpet cushion foam scrap and studies of new bonded carpet cushion. As is reflected in the survey and study results, recycling of take-up into new bonded significantly dilutes the PentaBDE content of the take-up during the course of processing the foam scrap into new bonded carpet cushion.

In each of the surveys and studies sponsored by CCC since 2005, all samples have been analyzed for percent by weight of penta technical mixture (PentaBDE) 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.

For purposes of each of its studies and surveys on PentaBDE since 2005, reported results from the laboratory conducting evaluations on behalf of the Carpet Cushion Council as PentaBDE reflect all PBDE congeners generally associated with penta technical mixture (PentaBDE) and octa technical mixture (OctaBDE) combined. This approach takes into account the possibility that the limits adopted in some US jurisdictions might be interpreted to apply to combined PentaBDE and OctaBDE content of products and because some congeners associated with the industrial mixtures of PentaBDE and OctaBDE overlap.

Cushion samples submitted to any laboratory for an assessment of PentaBDE-content by a scrap collector, recycler, bonder, regulatory official, trade association, publication or any other interested party in the context of what the result(s) would be said to represent. Given the reasons for variability in the PentaBDE content of any particular roll of bonded carpet cushion, which range from zero PentaBDE upwards, a test sample intended to represent anything other than the tested sample itself, should be constructed as a composite. In tests sponsored by the Carpet Cushion Council (to determine the PentaBDE content of take-up foam scrap or new bonded) the materials submitted for evaluation are "sub-sampled" by the testing lab by taking cuttings from the various samples submitted which are then accumulated to comprise the sample analyzed.

In mid-2005, the Carpet Cushion Council underwrote a comprehensive survey of post-consumer (take-up) carpet cushion foam scrap supplies in the United States to determine the actual PentaBDE levels in material being supplied to manufacturers for incorporation into new bonded cushion at the time.

In the 2005 survey, take-up foam carpet 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 PentaBDE technical mixture (PentaBDE) 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.

The mean for all samples of total technical mixture (PentaBDE) was 0.313% by weight with SD=0.174.

Under the protocols employed in its testing programs on post-consumer (take-up) carpet cushion foam scrap, CCC considers the test results to be a fair representation of the take-up carpet cushion foam scrap being recycled into new bonded from all regions of the United States at the time the surveys are conducted.

There are variations from bonder to bonder in the mixing formulas used in the production of bonded carpet cushion made with take-up scrap carpet cushion foam. The following description of the product taken from published literature had general acceptance within the industry by mid - 2005:

Take-up polyurethane foam scrap 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.

With its 2005 - 06 New Bonded Test Program, the Council sought to establish the maximum PentaBDE content of then-current (late - 2005) bonded cushion production. The Council (1) solicited cushion samples containing the highest levels of post-consumer scrap in the applicable mixing formulas, based upon general industry practice at the time, and (2) tested the full range of bonded cushion densities (in which take-up scrap cushion foam is used) currently on the market, i.e., 5 lb, 6 lb, 8 lb and 10 lb density products. Specifically, two major producers of bonded thought to be responsible for approximately one half of total US production were asked to provide new bonded product reflecting the upper end of the range for use of take-up carpet cushion foam, i.e., samples of bonded that contained 20% take-up in the medium densities and 55% take-up in the high densities.

The results of its 2005-06 New Bonded Test Program indicated that the mean PentaBDE content of the tested samples (all made using post-consumer scrap cushion foam) was 0.106% by weight with SD=0.060.

Under the protocols employed in its testing programs on new bonded, CCC considers the test results to represent a conservative assessment of the PentaBDE content of current production new bonded at the time they are conducted.

In 2009, the Carpet Cushion Council sponsored a survey of take-up scrap carpet cushion foam. Samples were collected from sources in fourteen (14) geographically dispersed cities. The intention of this survey was to include the same array of collection points (cities or geographical area) as had been provided for assessment in the Council's initial (2005) survey of take-up carpet cushion foam scrap.

Samples of medium density and high density foam from each of the above collection points were analyzed for percent by weight of penta technical mixture (PentaBDE) 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.

The mean for all samples of total technical mixture (PentaBDE) in the 2009 Survey was 0.273% by weight with SD=0.259.

Although the mean for all samples of total technical mixture (PentaBDE) in the take-up (post-consumer) scrap carpet cushion foam scrap assessed in the surveys 2005 and 2009 has declined from 0.313% by weight to 0.273% by weight, the testing laboratory opined that difference in the results between the two surveys was not "statistically significant". Accordingly, the Council has regarded the results of the 2005 survey as the benchmark against which future results should be compared.

In 2011 the Carpet Cushion Council authorized a study, to be conducted in 2011 -12, of the PentaBDE content of new bonded carpet cushion as currently produced.

Participants in the 2011 -12 study on new bonded carpet cushion were asked to provide (1) samples representing the product densities that have mixing formulas involving take-up carpet cushion foam scrap, i.e., products with 5 - 10 pound densities, (2) which samples were to consist of the maximum percentage of take-up scrap likely to be used by the participating producer in normal production of (each) density. The five participants in this study are thought to be responsible for approximately 90% of U.S. production of bonded carpet cushion.

The results of the 2011-12 New Bonded Test Program indicated that the mean

PentaBDE content of the tested samples (all made using post-consumer scrap carpet cushion foam) was 0.085% by weight with SD=0.059. This compares favorably with the results of the 2005 - 06 study that indicated the mean PentaBDE content of products tested was then 0.106% by weight.

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 flexible 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.

### **Conclusion**

In the finalization of its PBDE SNUR and Test Rule, EPA should explicitly recognize that (1) the manufacture of and continued manufacture and sale of end - products produced using recycled flexible polyurethane foam (including post-consumer (take-up) carpet cushion foam scrap) is and will be considered to be an ongoing use and that (2) insofar as concerns the carpet cushion manufacturer (bonder), the presence of PBDEs (such as PentaBDE) in the foam being recycled and the end-product ("bonded") has been, is, and will be solely as an impurity.

Respectfully submitted.



G. William Haines  
Executive Director