American Chemistry Council | North American Flame Retardant Alliance

Sent via Electronic Mail

March 2, 2020

Hazardous Waste and Toxics Reduction Program
Washington State Department of Ecology
P.O. Box 47600
Olympia, Washington 98504-7600

Re: Comments on Priority Consumer Products Draft Report to the Legislature: Safer Products for Washington Implementation Phase 2

The North American Flame Retardant Alliance (NAFRA)[1] of the American Chemistry Council (ACC) appreciates the opportunity to comment on the Washington Department of Ecology's (Ecology) Priority Consumer Products Draft Report to the Legislature regarding Safer Products for Washington Implementation Phase 2.

We offer the following comments to inform and enhance Ecology's draft report. These comments are intended to help the State focus on meaningful policies and actions to promote chemical safety while also helping ensure broader product and public safety.

Thank you for your consideration, and we look forward to working with Ecology as it implements the Safer Products for Washington program. If you have any questions or need clarification, please contact me at ben_gann@americanchemistry.com or 202-249-7000.

Sincerely,

Ben Gann
Director
Chemical Products & Technology Division

[1] *NAFRA members include Albemarle Corporation, LANXESS Corporation, and ICL Industrial Products who are the leading producers of flame retardants that are used in a wide variety of industrial and consumer applications. These companies represent the cutting edge of fire-safety chemistry and technology, and are dedicated to improving fire safety performance in a broad range of end uses.*

I. Identification of electric and electronic device casings utilizing flame retardants as priority consumer products is not warranted based on the Safer Products for Washington criteria.

The new Safer Products for Washington law requires the Department of Ecology (Ecology) to identify priority consumer products that are significant sources of identified priority chemicals. As part of this effort, the Department is required to consider specific criteria. Electric and electronic device casings utilizing flame retardants fail to meet the key criteria for identifying priority products, particularly as it relates to exposure, levels found in the environment, the status of various regulatory assessments, and the availability and feasibility of safer alternatives.

A. Electric and electronic equipment with plastic device casings utilizing flame retardants are not a significant source of exposure.

While it is true that electric and electronic equipment with plastic device casings utilize flame retardants, the relative contribution of electronics to potential flame retardant exposure is small.

Ecology appears to be using volume of electronics as a proxy for potential exposure. This is not accurate and should not be the basis for determining priority products.

Factors related to the availability and potential for migration of additives from plastics depend on the formulation process for specific products. Generally speaking migration is influenced by:

- Compatibility of the polymer and the additive;
- molecular geometry; and,
- Partial vapor pressure

Manufacturers give clear recommendations on what flame retardants are compatible with specific polymers, as a mismatch typically also leads to the deterioration of physical properties. Likewise, formulators seek flame retardants with structures similar to the base resin where they will be used. Doing so aids in maintaining the physical characteristics of the base resin and minimizes the potential for migration. There is no advantage to seeking poor performing products, so it is in the best interest of both the manufacturer and the formulator to use highly compatible materials.

All else being equal, more complex molecular geometries are likely to resist migration. The effect is similar to an anchor. An anchor that is just a heavy bowling ball shape would much more easily be pulled along the ocean floor than a more complex anchor with hooked ends or more sophisticated geometry. The geometry of most brominated flame retardants is quite complex and therefore more likely to anchor into the plastic than a smaller or simpler molecule would be.

The partial vapor pressure of non-polymeric organohalogen flame retardants is negligible. All of this indicates that the potential for migration of organohalogen flame retardants from electronic casings is quite low. Hence potential exposure is quite low.

Attachment 1 is an example of research that illustrates that the amount of additive TBBPA in acrylonitrile-butadiene-styrene (ABS) has limited potential to migrate. Specifically, the study that evaluated the migration potential of TBBPA from the surface of acrylonitrile butadiene styrene (ABS) plastic. The study found that TBBPA migration levels from the surface of ABS were below the study limit of quantification.

B. Specific flame retardants used in electronic casings are either not found in the Washington environment or any actual measured levels are extremely low and therefore unlikely to present a risk to human health or the environment.

While there is data demonstrating some level of some specific flame retardants in various media and in the environment, this is not the case for all of the referenced flame retardants, and, as noted above, electronic casings are not likely to be a significant source of any potential releases.

In many cases, the draft report tends to utilize measurement of a sub-class of older flame retardants, polybrominated diphenyl ethers (PBDEs), as a proxy for other flame retardants. This data is not indicative or relevant for other flame retardants, and it is inappropriate to use this as a basis for making conclusions about other flame retardants, much less an entire class or classes of flame retardants. Even more so, it is not appropriate as the basis for identifying electronic casings as a priority product category.

As noted in the draft report, beyond PBDEs, actual monitoring data indicates that some of the other referenced flame retardants (DBDPE, TBBPA, BTBPA, or TTBP-TAZ) are actually not found in the Washington state environment or they are found at extremely low levels not likely to present a risk.

Attachment 2 is an example of research that illustrates that specific flame retardants used in electronic casings do not present a risk to human health or the environment.

This comprehensive evaluation of TBBPA exposure and toxicity[2] found that margin of safety (MOS) estimates were sufficiently large. Using the most conservative estimates of exposure and toxicity, the total lifetime average daily exposure would have to be increased approximately 80 times or greater for adverse health effects to occur. Specifically, the study evaluated the available toxicity data and human exposure information using the maximum exposure concentrations of TBBPA in the diet, breast milk, soil/dust, and water and reported that the resulting exposures were many orders of magnitude below any reported adverse effects seen in research animal studies. This information directly reinforces why specific flame retardants used in electronic casings do not meet the criteria for a priority product listing.

C. Several government regulatory bodies have assessed specific flame retardants used in this product category and determined they do not present a risk and do not warrant additional regulation.

As noted in the draft report, no U.S. federal restrictions currently exist around flame retardants in electric and electronic enclosures. It is also important to note that most state regulation relative to flame retardants has explicitly exempted electronics for the reasons articulated through ACC and NAFRA's comments.

Attachment 3 provides some specific examples of where government regulators have determined that specific flame retardant uses in this product category do not present a risk to human health or the environment. This includes assessments and regulatory determination made by U.S. government authorities, as well as Canada, and the European Union.

D. In many cases alternatives are not readily available or feasible.

There are no 'universal' flame retardants. Different end products require different solutions and specific flame retardants are not interchangeable. A variety of flame retardants are necessary because materials that need to be made fire-resistant are very different, as are the end-use performance requirements of the final product. Specific flame retardants are paired with specific plastic materials to address the unique safety and performance requirements of the product that contains the plastic.

A combination of several products is often needed to achieve fire safety while maintaining material performance. For example, one consumer product might contain

[2] Wikoff et al. 2015. Development of toxicity values and exposure estimates for tetrabromobisphenol A (TBBPA): Application in a margin of exposure assessment. Journal of Applied Toxicology.

several types of plastics, and one type of plastic might have to meet different Electronics manufacturers need a broad array of material choices, including various plastics and flame retardants, to help meet product safety requirements. Material selection has a direct impact on utility, functionality, safety, cost, and weight of the product.

Flame retardants also enhance product performance and address key technical challenges like assembly temperatures, electrical properties, moisture uptake, mechanical performance, resistance to aging, mouldability, flexibility, and rigidity. In many cases flame retardants help enhance product performance and address key technical design challenges.

Manufacturers include specific flame retardants in their products based on the product's attributes, properties, usage, and potential ignition threats. The combination of the plastic matrices and the types of flame retardants is always based on the technical compatibility of the two materials. For example, a phosphorus-based flame retardant will only work on specific polymers because they need to react with it by forming a protective layer, whereas inorganic flame retardants are generally only efficient in high concentrations, which is only possible for elastomers. In comparison, organohalogen flame retardants have a good technical compatibility with a wide range of materials. They are stable during the plastic processing and are efficient at low concentrations. That is why in many instances they are the preferred choice for electronic casings.

The overly broad scope of both the priority chemicals and priority product category may also have unintended consequences of driving regrettable substitution. In some cases this may force the use of substances that may create more exposure and may also be less effective, thereby undermining overall product safety and performance.

The draft report references possibly using metal casings or removing the electronic source from the casing. However, it is not clear that these are realistic or even safe alternatives. Replacing plastics with materials like metals would not only increase weight, it would increase the risk of shock and heat transfer. And while reconfiguring the electronic source may be an option in some instances, complete product redesign and recertification may not be feasible or cost-effective for the hundreds if not thousands of products included in the scope of this product category. The fact is that plastics, and specifically flame retarded plastics, are often the best choice for manufacturers seeking overall product safety and performance.

Finally there are a host of sustainability issues to consider in the context of overall electronic product design and performance, including energy efficiency, durability, light weighting, material selection, etc.

Effective chemical regulation needs to take into account these factors and overall product safety. While we appreciate that Ecology is focused more narrowly on chemical safety, and is not necessarily positioned to assess overall product design and performance factors including fire safety, we would encourage the Department to engage more directly with relevant downstream sectors as it relates to flame retardants, alternatives, and overall product safety, design and performance. The assumption stated in the draft Ecology report would benefit from a more rigorous analysis of alternatives and does not address broader product safety and performance considerations, including broader sustainability and life-cycle factors. These broader product safety and design considerations are important to factor into Department's analysis and any policy recommendations.

Careful consideration of these issues is also particularly relevant for future phases of the Safer Products program and any proposed regulations as these will require further analysis and justification. So it is important to consider these issues now to guide effective public policy.

II. The proposed priority product category is overly broad both in terms of priority chemicals and priority products.

The draft report takes an overly broad approach in its characterization of, and recommendations for flame retardants. In many cases, the report makes some extremely broad assumptions and mischaracterizations that are not supported by the science, and in some cases are directly contradicted by the state of the science.

As we have emphasized throughout our engagement with Ecology, Department of Health, and the legislature over the last five years, it is not scientifically accurate or appropriate to make broad conclusions or impose a one-size-fits-all approach for all flame retardants or even sub-classes of flame retardants. Not all flame retardants are the same. They are a diverse set of chemicals that vary in property and molecular structure. Chemical and toxicological properties vary widely between various flame retardants and even substances of the same family. Specifications, standards, and regulations therefore need to address specific flame retardants and specific applications, and cannot take a "one-size-fits-all" approach.

A report by the National Academy of Sciences (NAS) released in May 2019 concluded that it was not possible to even assess one sub-class of flame retardants (organohalogen flame retardants) as a group. Key differences between flame retardants are also highlighted within assessments conducted by regulatory agencies such as the U.S. Environmental Protection Agency (EPA), Environment and Climate Change Canada and Health Canada, the European Chemicals Agency, and the European Food Safety Authority, which have taken approaches consistent with the NAS findings to initially screen and evaluate sub-categories or "clusters" of specific flame retardants that may have similar properties but not broad classes or even sub-classes.

In many cases, the basis for Ecology's recommendations seems to be on an older category of flame retardants, PBDEs. NAFRA members support efforts to discontinue their use and have proactively worked to develop new alternatives, but the fact remains that PBDEs are still used globally and may still be in imported products. This may be an area for further attention in the Safer Products program.

In addition to the overly broad focus for priority chemicals, the proposed product category is extremely broad and covers hundreds, if not thousands, of products. As discussed in the comments above relative to alternatives and Section III of our comments below, different products within this broad product category have different functional and safety needs, so taking a one-size-fits-all approach to this broad range of products does not make sense and likely undermines overall product safety—particularly for this product category.

Overall the factors outlined throughout NAFRA and ACC's comments argue for a more rigorous assessment and a more targeted approach. While the underlying law for the Safer Products program clearly identifies organohalogen flame retardants and non-halogenated flame retardants as priority chemicals under Chapter 70.240, there is nothing that would prevent Ecology from taking a more targeted approach in its policy recommendations. In enhancing its evaluation, we urge the Department to clearly evaluate the criteria and factors outlined in Chapter 70.76.010 (the underlying statute implementing HB 2545) and Chapter 70.365 RCW (the underlying statute for the Safer Products for Washington program) to help further inform and focus any recommendations made for priority products.

III. Electronic casings present unique fire risks and the proposed product category will undermine overall product safety and performance.

For this product category it is important to emphasize that electronics present unique fire safety risks. Electronic products are unique because they have a potential ignition source generated by the components of the product – circuit boards, transformers, batteries, connectors, and more. Despite fire safety standards, since 2017, nearly 3 million units for a variety of electronic products have been recalled due to fire hazards.[3]

Flame retardants are an essential tool for overall electronics safety and performance. One of the most important benefits of flame retardants in product design is they can stop small ignition events from turning into larger fires. Batteries can overheat, and circuit boards and other device components carry electric currents; therefore, electronic products present a higher risk of flammability than non-electronic products. Flame retardants help to reduce the risk of fire and are essential for overall product safety.

Electronic device manufacturers must balance the need to meet consumer demand for smaller, lighter, and more powerful electronics with the need to ensure that those devices meet performance and safety standards. Plastics have revolutionized electronic product designs. Manufacturers use plastics to ensure device performance goals, and plastic casings serve as an enclosure that protects from fire and shock risk. If left untreated, these plastics are flammable, so flame retardants serve as a critical line of defense against fire.

Organohalogen flame retardants provide essential fire safety benefits for electronics and help products meet established fire safety standards for the safety of consumers. These materials are used to reduce the fire risks posed by internal electrical short circuits, heat release during use, and the potential for ignition from external sources. These substances also help provide other important performance factors for end-use performance like durability, weight, fire resistance, sustainability, etc. Banning the use of organohalogen flame retardants will undermine the fire safety and overall product safety and performance of electronics.

Product design of electronics is complicated and design decisions can have implications for a variety of characteristics, included but not limited to product performance, product safety (including fire safety) and consumer utility. Fire safety is also important in product design and avoiding certain materials (e.g., plastics) or separating power supplies are not simple solutions. Likewise, when designing products OEMs need to consider specific plastic resin types and the flame retardant systems that are appropriate for those resins. Simple substitution is just not possible. Therefore, the electronics sector needs a broad array of material choices, including halogenated flame retardants.

As noted above, while we appreciate that Ecology is focused more narrowly on chemical safety and is not necessarily positioned to assess overall product design and performance factors, including fire safety, we would encourage the Department to engage more directly with

[3] Based on U.S. Consumer Product Safety Commission (CPSC) recall data.

relevant downstream sectors as it relates to flame retardants, alternatives, and overall product safety, design and performance. These broader product safety and design considerations are important to inform Ecology's analysis and any policy recommendations.