



North American Flame
Retardant Alliance

August 23, 2021

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

Re: Safer Products for Washington and Flame Retardants in Electric and Electronic Equipment

The North American Flame Retardant Alliance (“NAFRA”)¹ of the American Chemistry Council (“ACC”) appreciates the opportunity to provide additional information to the Department of Ecology (“Department” or “Ecology”) regarding the use of flame retardants in electric and electronic equipment. NAFRA hopes this additional information will be considered as the Department determines whether a regulatory response, if any, is necessary due to its evaluation of the use of flame retardants in plastic device casings.

The following information provides additional background to the Department regarding the use of flame retardants in electronics, and is intended to help the State of Washington focus on meaningful policies and actions that promote chemical safety, while also helping ensure broader product and public safety.

NAFRA thanks you for considering the information below. We look forward to continuing our discussion with Ecology during this critical phase of 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,

A handwritten signature in black ink that reads "Ben Gann".

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.



1. United States Consumer Product Safety Commission (CPSC) Organohalogen Flame Retardants (OFRs) in Electronic Device Casings Tech-to-Tech Meeting.

On September 27, 2018, the CPSC hosted a technical meeting on the use of OFRs in consumer electronics. The purpose of the event was to bring stakeholders together for a technically focused meeting to exchange information on the use of additive, non-polymeric OFRs and alternative flame retardant technologies in plastic enclosures (casings) for electronics; existing requirements and standards for flammability performance of electronic enclosures; manufacturing practices for electronic enclosures; and other topics of interest.²

As part of our submission to Ecology, NAFRA includes a selection of presentations from that meeting. NAFRA did attend the meeting; in addition, one of its member companies (ICL) presented at the meeting.

2. Additional Background and Limitations of the TCO Certified Accepted Substance List.

The TCO Certified Accepted Substance List relies on GreenScreen for Safer Chemicals to identify chemicals for inclusion. Only plasticizers, flame retardants, and process chemicals that achieve a GreenScreen benchmark score of 2, 3, or 4 by a Licensed GreenScreen Profiler are added to TCO Certified Accepted Substance List and may be used in the production and manufacture of certified products.³

NAFRA asserts that GreenScreen disadvantages OFRs relative to alternatives. Therefore, based on TCO's reliance on GreenScreen for Safer Chemicals, the TCO process disadvantages certain products – such as electronics – that contain OFRs. Further, TCO certification has not been widely recognized and adopted by electronic manufacturers, which limits its relevance.

NAFRA is working with a contractor to perform a GreenScreen assessment for an organohalogen flame retardant used in electronic casings, and plans to share the results of that assessment this fall with Ecology.

3. Recent Study on the Role of Hands in Chemical Transport

In March 2021, research was published in *Environmental Science & Technology Letters* titled “Hands as Agents of Chemical Transport in the Indoor Environment.” The research provides

² U.S. Consumer Product Safety Commission Organohalogen Flame Retardants in Electronic Device Casings Tech-to-Tech Meeting, September 27, 2018; <https://cpsc-prod.ctacdev.com/s3fs-public/2018-09-27%20OFRs%20in%20Electronic%20Device%20Casings%20Tech-to%20Tech%20Public%20Meeting.pdf?68NMytIKs813sccjfbXycXzqbkOrcAF8>

³ TCO Certified, <https://tcocertified.com/industry/accepted-substance-list/>

additional context for how consumers come into contact with electronics, and how that may inform scientific understanding regarding chemical exposure. NAFRA has included the study, along with supplemental information from the study, for review by the Department.

NAFRA is working with its Science Advisory Council to generate analysis of the study by a board certified toxicologist to possibly contextualize related studies and potential future studies to supplement and build on the work.

4. Brominated Flame Retardants and Circularity

BSEF, the International Bromine Council, last year released a report regarding waste electrical and electronic equipment (WEEE) plastics flows and recycling efforts. The report, undertaken by a leading consultancy, SOFIES, addresses misperceptions regarding the impact of brominated flame retardants (BFRs) on WEEE plastics recycling and presents the successes and overarching challenges in making WEEE plastic streams more circular.

The overarching conclusion from the study is that the presence of BFRs in WEEE plastics do not reduce recycling yields more than other flame retardants, as plastics containing flame retardants, as well as plastics containing other additives in significant loads (e.g. fillers), are sorted out during the recycling process. Moreover, a switch from BFRs to other flame retardants would not improve WEEE plastics recycling and would most probably have detrimental impacts on yields and quality.⁴

NAFRA is currently performing a feasibility study to validate hydrolysis as an additional process for recycling WEEE plastics as well as other materials. In addition, NAFRA recently completed a successful pilot project with BSEF demonstrating how marker technology tracking specific flame retardants in plastics can be used to increase the percentage of end of life products being recycled.⁵

5. European Commission Ecodesign Directive and its Limitations

The European Commission's (EC) Ecodesign Directive that took effect on March 1, 2021 restricts the use of OFRs in electronic displays, including televisions, computer monitors, and digital signage displays. The EC exceeded its regulatory authority under the European Union

⁴ Sofies, "Study on the Impacts of Brominated Flame Retardants on the Recycling of WEEE plastics in Europe," <https://www.bsef.com/wp-content/uploads/2020/11/Study-on-the-impact-of-Brominated-Flame-Retardants-BFRs-on-WEEE-plastics-recycling-by-Sofies-Nov-2020.pdf>.

⁵ BSEF, "SMX Successfully Completed a Pilot Project Demonstrating a Unique Marker Technology for Brominated Flame Retardants in Plastic," January 26, 2021, <https://www.bsef.com/news/smx-successfully-completed-a-pilot-project-demonstrating-a-unique-marker-technology-for-brominated-flame-retardants-in-plastic/>.

(EU) Ecodesign Directive 2009/12, by imposing restrictions on an entire class of substances that are within the scope of, and controlled by other specific EU legislations, such as the EU Restrictions on Hazardous Substances (RoHS) Directive 2011/65, which controls the use of hazardous substances in electronic and electrical equipment, including electronic displays. BSEF has lodged a court case seeking annulment of the Ecodesign Directive. The case is now before the Court of Justice for the EU.

Relevant information was not taken into account by the EC, as an appropriate impact assessment was not conducted, and it breached the general EU law principles of legal certainty, proportionality, and equal treatment. The lack of a proper Impact Assessment means that OFRs have not undergone the scrutiny required under the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) Regulation and the RoHS Directive. The EC has therefore not examined the risks or the benefits to human health and the environment, and has instead relied on the incorrect analysis that plastics containing OFRs hinder recycling.

Beyond the flawed justification for restrictions, the regulation has the effect of deselecting resins available for product manufacturers, thereby reducing options for product design.

6. Flame Retardant Casings for Televisions and Their Role in Preventing Flashover

Southwest Research Institute (SwRI) recently conducted a study to determine through computer fire modeling how much more likely flashover is to occur when a flat screen television (TV) is the first item ignited in a room and the casing is not treated with flame retardants, compared to a flat screen TV that is the first item ignited in a room where the casing is treated with flame retardants. SwRI quantified the risk of flashover in a living room and bedroom by calculating the ratio of the risk measures for TVs with untreated casings versus those treated with a flame retardant casing. The ratio is an indication of the increased likelihood of flashover should flame retardant treated TV casings be replaced with untreated casings.

The results of the risk quantification indicate that a living room fire initiated with a flat screen TV where the casing is not treated with flame retardants, is between 4.2 and 15.2 times more likely to result in flashover compared to a flat screen TV where the casing is treated with flame retardants. For a fire in a bedroom, the relative likelihood is between 4.1 and 15.5 times more likely to result in flashover. The relative likelihood of flashover is slightly lower for apartments than for single-family homes.

NAFRA has included a draft of the study for review by the Department of Ecology, along with the supplemental data tables and appendices from the study.

7. Flame Retardants Used in High Impact Polystyrene (HIPS)

More information from each of the NAFRA member companies regarding the use of flame retardants in HIPS can be found at the links below.

- Albemarle - <https://www.albemarle.com/fire-safety-solutions>
- ICL - <https://www.icl-ip.com/flame-retardants/product-search-flame-retardants/>
- Lanxess - [U.S. Flame Retardant Product Guide](#)

8. Expert for on Fire Safety Standards for Electronics

Mr. Tim Cassidy, who is now retired, most recently served for 12 years in product compliance and safety for Best Buy. He is an excellent resource for discussing the range of considerations made by electronic manufacturers in ensuring that products meet flammability standards while also ensuring they comply with applicable regulations.

NAFRA has contacted Mr. Cassidy and he is interested in speaking with the Department of Ecology and serving as a technical resource. His contact information is 763-228-9196 or cassidy.tim@outlook.com.

9. Additional Information Being Developed by NAFRA to Share with the Department of Ecology

In addition to the information that NAFRA is providing now to Ecology, we are also developing new information to share with the Department ahead of a draft regulatory actions report. The new information that NAFRA plans to share includes the following:

- *OFR GreenScreen Assessment* – NAFRA is working with a contractor to perform a GreenScreen assessment for an organohalogen flame retardant used in electronic casings. The Department of Ecology has identified seven OFRs that score as Benchmark 1 under GreenScreen. NAFRA asserts that the GreenScreen methodology disadvantages OFRs, and more analysis may show that OFRs should remain an option for consumer electronic manufacturers in meeting flammability standards.
- *Context for Research on Hands as Agents of Chemical Transport* – NAFRA is having a board certified toxicologist review the research, and provide analysis with respect to how it may inform our understanding of chemical exposure – or the lack thereof – from electronics.

- *Comments Regarding Alternatives Assessment Criteria* – ACC plans to submit comments regarding the Department’s “safer, feasible, and available” criteria and offer suggestions how the approach may be improved.
- *Final Version of the Study on the Role of Flat Screen TVs in Flashover* – NAFRA plans to submit a final version of the study to Ecology once it is available.
- *Design Considerations for Fire-Resistant Battery-Powered Electronic Devices* – NAFRA’s Science Workgroup has engaged the University of Texas Austin to better understand and characterize the effects of flame retardant addition and geometry of plastic enclosures commonly used in portable devices on ignition and flammability. The testing seeks to quantify how and if the inclusion of flame retardants in plastic materials can reduce ignitability and flame spread rates in polymeric systems subjected to thermal assault by failing batteries. With the growth of battery powered devices and appliances, it is critical to document the impact of flame retardants in these new ignition scenarios.