December 27th, 2024

Safer Products for Washington
Hazardous Waste and Toxics Reduction Program
Washington State Department of Ecology
Olympia, WA 98504-7600

Submitted Electronically to: SaferProductsWA@ecy.wa.gov

RE: Draft Identification of Priority Products Report to the Legislature: Safer Products for Washington Cycle 2, Phase 2, Organohalogen Flame Retardants in Insulation

Dear Washington State Department of Ecology Staff,

The North American Modern Building Alliance (NAMBA)[1] of the American Chemistry Council (ACC) appreciates the opportunity to provide comments on the *Draft Identification of Priority Products Report to the Legislature: Safer Products for Washington Cycle 2* (Draft Report)[2]. NAMBA represents manufacturers and stakeholders involved in the production and safe use of plastic building materials in building envelopes.

In this context, NAMBA has significant concerns with the inclusion of insulation with organohalogen flame retardants (OFRs) as a priority product category. For the reasons outlined below, we urge the Department to withdraw insulation as a potential priority product category.

Foam plastic insulation materials, including those containing organohalogen flame retardants (OFRs), are essential to meeting Washington State's goals for improved building energy efficiency and sustainability. OFRs are crucial for helping to ensure that insulation products meet protective building and fire safety standards, thereby safeguarding human health. These materials also contribute to energy efficiency, reduction of greenhouse gas emissions, durability, moisture management, and indoor air quality. Additionally, NAMBA highlights the need for specificity in evaluating OFRs, as not all OFRs are the same and should not be treated as a single group for regulatory purposes.

Importance of OFRs in Insulation Materials

OFRs used in insulation products serve to protect building occupants and help ensure the safety, effectiveness, and durability of the insulation throughout its lifecycle. Foam plastic insulation, including polyisocyanurate (rigid boards or panels), polystyrene (extruded or expanded rigid boards), and polyurethane (typically spray applied), is formulated through complex processes to engineer chemical specifications that can meet these requirements. Some of the key fire safety benefits that OFRs in insulation provide include:

[1] The North American Modern Building Alliance (NAMBA) of the American Chemistry Council is a leading voice on the safe and effective use of plastic building materials in building envelopes. For more information on NAMBA and our members, please visit: https://www.modernbuildingalliance.us/about-us/

[2] Washington State Department of Ecology. "Draft Identification of Priority Products Report to the Legislature: Safer Products for Washington Cycle 2 Implementation Phase 2."

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- **Flame Retardancy**: OFRs provide flame retardancy to insulation materials, making them a necessary choice for manufacturers who need reliable solutions for fire safety. These chemicals offer broad-spectrum flame retardancy, addressing a wide range of fire hazards that could otherwise compromise building safety [3].
- **Regulatory Compliance**: U.S. and state building codes regulate the use of plastics, foam plastic insulation, and other combustible materials used in the building envelope through a robust combination of reference standards, material fire tests, and complete assembly fire performance requirements [4]. Manufacturers use flame retardants in finished products to help meet the stringent fire performance criteria for flame and smoke spread required by government regulations [5]. These provisions, combined with other building and fire code requirements produce multiple cooperative layers of fire safety.
- **Modern Code Compliant Buildings**: The International Code Council notes that building envelope requirements within codes and standards maintain internal temperatures, permitting building occupants to shelter in place for periods without power during extreme weather [6]. Meeting multi-variable code requirements for fire and structural safety, moisture control, long-term durability, energy efficiency, and cost-effective construction/installation usually requires using highly engineered plastic products, such as foam insulation and building wraps.

OFRs in insulation materials help to ensure the safety and effectiveness of modern building practices. Not only do they provide essential flame retardancy, making insulation materials safer and more reliable, but they also help manufacturers comply with stringent regulatory standards. By meeting these fire performance criteria, OFRs contribute to multiple layers of fire safety within building codes, and are a key factor in achieving durable, energy-efficient, and safe building environments.

Benefits of Foam Plastic Insulation

Flame retardants and innovations in chemistry help play a critical role in enabling energy-efficient products to meet necessary safety criteria today and for the future. Foam plastic insulation products, which often contain OFRs, are modern materials used in residential and commercial buildings to meet stringent energy code standards for both new construction and renovation projects.

- **Energy Efficiency**: Foam plastic insulation products, such as rigid boards and spray foam, provide important benefits beyond thermal protection including air sealing, vapor management, moisture performance, structural performance, and durability, which are beneficial to a building's overall performance. Properly insulated and air-sealed buildings can save homeowners up to 20% on heating and cooling costs, according to the U.S. Department of Energy [7]. In commercial construction, new buildings can achieve up to 50% energy savings when continuous foam plastic insulation is incorporated into the project [8].

[3] American Chemistry Council. "Flame Retardants."
[4] International Code Council. "Chapter 26 Plastic - 2021 Washington State Building Code."
[5] North American Modern Building Alliance. "Flame Retardants in Building & Construction."
[6] North American Modern Building Alliance. "Fire Safety in Buildings: A Multi-Layered Approach."
[7] U.S. Department of Energy. "Guide to Home Insulation."
[8] National Renewable Energy Laboratory. "Saving Energy in Commercial Buildings."

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- **Reduction of Greenhouse Gas Emissions**: By improving energy efficiency, foam plastic insulation products contribute to the reduction of greenhouse gas emissions. According to a report by the American Chemistry Council, these materials offer significant carbon savings during their use in buildings, with the carbon investment being offset in under one year in most scenarios[9]. ENERGY STAR® estimates that air sealing and adding insulation to a typical existing U.S. home can save an average of 15% on heating and cooling costs[10]. In Washington, 36.6% of energy consumption is attributed to residential and commercial buildings, making the impact of reducing consumption through foam plastic insulation significant[11]. This aligns with broader Washington State policy goals for decarbonization and combating climate change.
- **Durability and Longevity**: Foam plastic insulation products are durable and can perform throughout the life of the building when properly installed. This long-term performance reduces the need for frequent replacements, contributing to resource conservation and waste reduction. Additionally, it adds rigidity and strength to buildings, enhancing structural integrity and building lifespan[12].
- **Moisture Management**: Foam plastic insulation helps manage vapor transmission and bulk water intrusion, which is essential for the long-term durability of buildings. Proper moisture management prevents mold growth and structural damage, further enhancing the sustainability of buildings[12].
- **Indoor Air Quality:** Foam plastic insulation can create an effective air barrier that seals gaps and cracks in walls, floors, and ceilings. This helps to prevent outdoor pollutants, allergens, and dust from entering homes, minimizes drafts and air leakage, and improves overall indoor air quality, benefiting occupant health[13].

In our ongoing commitment to energy efficiency and sustainability, foam plastic insulation products will be crucial for enhancing building performance and greatly reducing their environmental impact.

Specificity in Evaluating Organohalogen Flame Retardants for Insulation

The Draft Report refers to the category of "organohalogen flame retardants" (OFRs) in insulation materials. However, it is important to recognize that not all OFRs are the same, and grouping all chemicals classified as OFRs together is not suitable for determining regulatory actions. For instance, a polymeric FR (Poly FR) was identified as a safer alternative to Hexabromocyclododecane (HBCD) use in polystyrene foam insulation[14] and its lower risk compared to HBCD confirmed in a 2021 Commentary[15]. Environment and Climate Change Canada and Health Canada's screening assessment of Tris(chloropropyl) phosphate (TCPP) highlights how it differs significantly from other OFRs[16]. Similarly, the National Academies of Sciences,

[9] American Chemistry Council. "Unlocking Carbon Savings with Plastic Insulation Materials."
[10] US Environmental Protection Agency & US Department of Energy. "Methodology for Estimated Energy Savings."
[11] US Energy Information Administration. "Washington State Profile and Energy Estimates."
[12] Plastics Engineering. "Five Benefits of Foam Plastic Insulation."
[13] US Department of Energy. "Guide to Air Sealing."
[14] US Environmental Protection Agency. "EPA Report – Flame Retardant Alternatives for HexaBromoCyclodecane (HBCD)."
[15] Environmental Science & Technology. "Response to Comment on 'High Production, Low Information: We Need to Know More about Polymeric Flame Retardants.'"
[16] Environment and Climate Change Canada. "Updated Risk Management Scope for TCPP and TDCPP."

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Engineering, and Medicine published a report noting that OFRs cannot be treated as a single group due to their varying chemical structures and biologic activity [17]. They concluded that OFRs need to be divided into smaller subclasses to support a regulatory hazard assessment. Table 1 provides a general overview of the OFRs used in different plastic insulation products:

Table 1: Foam Plastic Insulation Product Table

Product Category	Product Type	Flame Retardant
Polyisocyanurate[18]	• Rigid Foam Board Insulation • Insulated Metal Panels	TCPP
Polystyrene (XPS – Extruded Polystyrene)[19]	• Rigid Foam Board Insulation	Polymeric FR
Polystyrene (EPS – Expanded Polystyrene) [19]	• Rigid Foam Board Insulation	Polymeric FR
Polyurethane[20]	• Rigid Foam Board Insulation • Spray Foam Insulation • Insulated Metal Panels	TCPP, Polymeric FR

This variability in products and OFRs underscores the need for specificity in naming which chemicals are included in the priority category. From a practical perspective, selecting all OFRs as a priority chemical complicates the evaluation process for manufacturers, making it challenging to identify and implement safer alternatives. Therefore, it is crucial to consider the specific characteristics and safety profiles of different OFRs when evaluating their use in insulation materials. Ecology should provide a clear and specific list of chemicals under consideration to facilitate a more accurate and practical regulatory approach.

Health and Environmental Safety in Foam Plastic Insulation

Minimizing exposure and helping to achieve high standards for health and environmental safety is a key priority with foam plastic insulation applications. Through rigorous VOC emissions testing, compliance with third-party certifications, and robust worker protection measures, manufacturers and suppliers can significantly minimize exposure risks.

- **VOC Emissions Testing:** Manufacturers and suppliers of foam plastic insulation are often required to conduct rigorous volatile organic compound (VOC) emissions testing to ensure

[17] National Academies of Sciences, Engineering, and Medicine. *A Class Approach to Hazard Assessment of Organohalogen Flame Retardants*
[18] Polyisocyanurate Insulation Manufacturers Association (PIMA). "Flame Retardants."
[19] The International Bromine Council (BSEF). "A new generation of brominated flame retardants: Butadiene Styrene Co-polymer."
[20] North American Modern Building Alliance (NAMBA). "Facts About Flame Retardants & Foam Plastic Insulation."

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these materials have low VOC emissions, contributing to safer indoor air quality and consumer health[21].

- **Third-Party Certifications:** Third-party certifications for foam plastic insulation are often necessary to help demonstrate compliance with local, state, and federal building codes, and to meet specific safety, performance, human health, and environmental standards[22]. For example, the California Code of Regulations, Title 24, Part 12, Chapters 12 – 13 Standards for Insulating Materials, outlines strict safety and performance standards and requires insulation manufacturers certify their products to demonstrate compliance with these provisions. Notable certifications from ENERGY STAR[23], ICC Evaluation Service (ICC-ES)[22], ASTM International[22], and UL GREENGUARD[24] all help to demonstrate foam plastic insulation products are safe, effective, and environmentally friendly; these certifications help indicate that manufactures meet stringent requirements for containment.
- **Worker Protection:** Occupational exposure to OFRs in insulation primarily occurs during manufacturing, installation, and disposal processes. For workers, exposure can be minimized by following robust worker protection guidelines and requirements. This includes wearing appropriate personal protective equipment (PPE) like respirators and gloves, ensuring proper ventilation in the work area to reduce the concentration of airborne particles and fumes, and in-depth worker training on the safe handling and installation of foam plastic installation[25,26].

By implementing these measures, manufacturers and suppliers can ensure the sustainable and responsible use of foam plastic insulation in building projects.

Evaluating Safer Alternatives to Organohalogen Flame Retardants

OFRs are an important class of flame retardants used in plastic insulation materials. Should a use restriction be imposed by regulatory bodies like Ecology, it could adversely impact the availability of products that help to ensure fire safety. Further, the benefits, viability, and availability of alternative chemistries and products must be strongly considered before regulatory action is taken.

- **Product Availability:** Modern construction requires diverse products to ensure constructability and performance. Overly broad regulations can hinder builders' and designers' abilities to meet affordability and sustainable construction goals and restrict their ability to provide the best quality homes for consumers.
- **Alternative Materials**: When performing alternative assessments, Ecology must assess the actual risk of current chemistries by considering both the hazard and the level of exposure in various use scenarios, and to identify any new risks that a substitute formulation might pose. Alternative insulation materials such as fiberglass, mineral wool, cellulose, and natural fibers have several drawbacks that could make them inappropriate

[21] Intertek. "VOC Emission Testing of Spray Polyurethane Foam Insulation (SPF)."
[22] International Code Council Evaluation Service. "Foam Insulation."
[23] US Environmental Protection Agency & US Department of Energy. "Choosing the Appropriate Insulation Type."
[24] UL Solutions. "UL GREENGUARD Certification."
[25] US Consumer Product Safety Commission. "Spray Polyurethane Foam Insulation: Health and Safety Recommendations for Consumers."
[26] Spraypolyurethane.org. "Spray Polyurethane Foam Health + Safety."

substitutes for foam plastic insulation. Fiberglass and mineral wool can release irritating fibers during installation, affecting the skin, eyes, and respiratory system, whereas cellulose and natural fibers are susceptible to moisture, affecting their insulating properties and enabling mold growth[27]. From a cost and availability standpoint, materials such as mineral wool and natural fibers are less widely available and often more expensive than foam plastic insulation.

Taken together, these factors highlight the importance of product choice and the need to carefully consider the implications of restricting OFRs in insulation materials. Ensuring a balanced approach that maintains fire safety, affordability, and sustainability is crucial for the construction industry.

Conclusion

OFRs are crucial for the safety, efficacy, and stability of foam plastic insulation, helping to prevent fire hazards and improve building safety. They also offer significant environmental benefits, such as improved energy efficiency, reduced greenhouse gas emissions, and enhanced durability.

It is important to recognize that OFRs are not a uniform group and treating them as such for regulatory purposes is inappropriate. Different OFRs have varying characteristics and safety profiles, necessitating precise identification of which specific OFRs should be regulated. Broadly categorizing all OFRs complicates the assessment process for manufacturers and makes it difficult to adopt safer alternatives. Regulatory bodies should provide a detailed and specific list of chemicals under scrutiny to ensure a more accurate and practical regulatory framework.

We strongly urge Ecology to consider the established safety and benefits of OFRs in foam plastic insulation and to avoid unnecessary restrictions that could undermine the quality, safety, and availability of insulation materials. Any regulation or policy should be based on sound scientific evidence and consider the overall benefits these chemicals provide in maintaining building safety and occupant protection. Finally, we would like to express our support for the comments submitted by the American Chemistry Council, The Center for the Polyurethanes Industry, and the Extruded Polystyrene Foam Association (XPSA) and EPS-Industry Alliance (EPS-IA). Their insights and concerns regarding the selection of organohalogen flame retardant chemistries and identified products align closely with our own. We believe that a comprehensive evaluation of these points is crucial for informed decision-making.

We appreciate your consideration of these comments and look forward to continued dialogue on this important issue. If you have any questions or need further clarification, please feel free to contact me at (202) 249-7039 or colton_naval@americanchemistry.com

Sincerely,

Colton Naval
Manager, Durable Markets
American Chemistry Council
On behalf of the North American Modern Building Alliance

[27] HomePerch. "Comparing Insulation Types: Pros, Cons, And Best Uses"