February 12, 2021

Jennifer Lane
Sean Harrington
Evergreen Sustainable Development Standard Team
Department of Commerce
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Dear Ms. Lane and Mr. Harrington:

We enthusiastically support the Department of Commerce's inclusion of criteria to reduce the use of harmful toxic chemicals in affordable housing in the penultimate draft of the Evergreen Sustainable Development Standard (ESDS). We request that the criteria related to several particularly toxic chemicals used in building materials be strengthened to mandatory requirements to avoid their use.

The areas where we are requesting mandatory restrictions align with the priority chemical classes identified by the Washington State Department of Ecology's 'Safer Products for Washington' program. That is the implementation program for a law designed to reduce the use of toxic chemicals in products by restricting or eliminating those toxics when healthier options are available.

In addition to these modifications to criteria included in the draft, we request that two criteria that are in the Enterprise Green Communities Criteria, the national standard upon which the ESDS is based, but are not included in the draft be added. The 2020 Enterprise Green Communities Criteria is the most recent version of a national standard for sustainable construction of affordable housing. Enterprise, the organization responsible for the criteria, has invested $1.2 billion in Washington and Oregon to preserve or build 25,000 affordable homes.[1]

We believe these modifications align with ESDS's goal of safeguarding the health and safety of residents and workers.

We would like to provide the following information to demonstrate that these changes to avoid toxic chemicals will protect residents:

Two-part Spray Foam Insulation

We are concerned about the toxic components of two-part spray foam insulation, and request a mandatory requirement to avoid its use. Our concerns derive from ingredients including organohalogen flame retardants and isocyanates.

Isocyanates can make up as much as 50% of the spray foam product, and are well-known to cause asthma. According to the Occupational Health and Safety Administration (OSHA), "isocyanates are one of the most common causes of work-related asthma."[2] The agency further states, "Work-related asthma may result in long-term lung damage, loss of work days, disability, or even death." The California Department of Toxic Substances Control has designated spray polyurethane foam containing isocyanates as a priority product, and has detailed concerns in a technical report.[3] Major health concerns noted by the Department include work-related asthma, or respiratory sensitization, along with immunotoxicity and dermatotoxicity, with workers and home users exposed through dermal contact and inhalation.

Organohalogen flame retardants are widely used in insulation for residential and commercial buildings. Of high concern is the use of chlorinated phosphates in polyisocyanurate insulation and spray foam insulation, with about 2 million pounds of tris(1-chloro-2propyl)phosphate (TCPP) used yearly in construction, including panels and laminates for insulation.[4]

TCPP is used not only in insulation but also in polyurethane foam used in furniture and children's products, as well as possibly other uses. Together, these uses have resulted in extensive contamination of U.S. homes with this

organohalogen flame retardant. In house dust sampled from 20 Washington State homes, TCPP was found at by far the highest median values.[5] Indoor air tests have also found TCPP to be one of or the most abundant flame retardant compounds.[6, 7]

TCPP is persistent and mobile, and because of these qualities along with its heavy use, it is commonly the flame retardant found in the highest concentrations in environmental samples. It has been detected in wastewater treatment plant effluent, surface water, and drinking water, and outdoor air in the U.S., Canada, and the Arctic.[8, 9] TCPP was the compound found at the highest concentrations in Washington State laundry water, and wastewater treatment plant influent and effluent.[5] TCPP was the flame retardant found in the highest concentrations in Arctic air.[10] In recent testing in New York State of surface, tap, and rain water, TCPP was the most abundant compound in each type of water.[11]

TCPP is a member of the organohalogen flame retardant class, and is a close relative of two other chlorinated organophosphate flame retardants that have been designated as carcinogens. Laboratory studies have indicated cause for concern related to thyroid effects and nervous system development.[12, 13] The hazards of organohalogen flame retardants generally are discussed extensively in the 2015 petition to the Consumer Protection Agency requesting a ban in several product categories, including the following statement from Dr. Ted Schettler:[14]

> "In general, halogenated organic molecules (i) are more resistant to metabolic break down, (ii) cross biologic membranes more readily, and (iii) gain access to cells and tissues more readily than non-halogenated compounds. Because of this, virtually all halogenated flame retardants have adverse impacts when they interact with cells and tissues of living organisms."

Occupational exposure to flame retardants is a particular concern for workers applying spray foam (SPF) insulation. Among SPF applicators, exposure to TCPP as measured by urinary biomarkers was 26 to 35 times that of the general population.[15] Levels were greater after the workers' shifts despite their use of personal protective equipment. The National Institute for Occupational Safety and Health has conducted research on exposures to components of spray foam during application due to concerns over toxicity of multiple components of spray foam. Besides concerns over worker exposures, occupant exposures to TCPP and other components are a concern: spray foam has been demonstrated to emit TCPP and other chemicals, with emissions of at least TCPP continuing for at least 18 months after application.[16] Renovations and demolition also present a significant exposure risk to the toxic chemicals of concern.[17]

Availability of alternatives

Healthier alternatives are widely available, including at Lowe's, The Home Depot, and other retail outlets. For example, The Home Depot and Lowe's both offer fiberglass batt insulation and blown-in fiberglass and cellulose insulations, which are healthier alternatives.[18, 19] Groups that facilitate the development of affordable housing have also made it easy to procure these materials. For example, Housing Partnership Network, which is a business collaborative of community development organizations and housing development nonprofits, provides access to many healthier insulation materials through the HPN Select Ecoguide. This includes fiberglass batt insulation, blown in fiberglass and cellulose insulations, and formaldehyde free mineral wool batts.[20] Additionally, these healthier alternatives can be used in conjunction with sealants that do not contain isocyanates or flame retardants to achieve air sealing where needed.

Cost-effectiveness of alternatives

Healthier alternatives to spray foam insulation frequently have a similar, or in some cases, lower cost. For example, research from Energy Efficiency for All found that these healthier alternatives have a similar or lower relative installed cost per R-value: loose fill fiberglass; dense pack fiberglass, spray applied fiberglass, fiberglass batts/blankets (kraft-faced and unfaced); loose-fill cellulose; dense-pack cellulose; and wet-blown cellulose.[21]

Restriction on PFAS in Carpet

The use of per- and polyfluorinated alkyl substances (PFAS) in carpet is one of the top uses of these persistent toxic chemicals in the home. It results in exposure to the building occupants as well as contamination of water, air, and soil during production and disposal. Exposure to PFAS is of high concern due to their association with toxic effects including harm to the immune system, increased cholesterol, cancer, and toxicity to the liver.[22] Because of these concerns, we request a mandatory restriction on the use of PFAS-treated carpet.

Carpets are believed to be one of the largest contributors to airborne PFAS indoors, which have been associated with serum PFAS concentrations.[23, 24] In a large study cohort, researchers found that sleeping in a room with carpet or rug was associated with higher serum PFAS levels.[25]

Treated textile products have been found to emit the volatile PFAS fluorotelomer alcohols into air, which have been measured in homes, and higher concentrations in retail shops that sell furniture, outdoor apparel, or carpets.[26-28] Based on testing of various indoor environments including offices, retailers that sell products with outdoor textiles (outdoor furniture, etc.), and carpet retailers, researchers have concluded that carpets and textiles are likely the dominant indoor source of these compounds.[26] The presence of airborne PFAS in indoor air contributes to exposure to persistent PFAS and may constitute the largest or one of the largest PFAS exposure routes, equivalent to or exceeding exposure from food.[26, 29] This conclusion is supported by evidence of the association between airborne PFAS concentrations in indoor air and serum PFAS levels.[24]

The use of PFAS in carpet also leads to outdoor emissions, with wastewater a major route of transfer to the outdoor environment, estimated at 85% of releases for PFAS.[30] Carpets and upholstery are a likely source of PFAS to wastewater treatment plants through the laundry water pathway, when PFAS in dust or air adsorb to clothing.[5] They may also enter wastewater when carpets or upholstery are cleaned. Landfilled carpets contribute to the high levels of contamination of landfill leachate, which in many cases is directed to wastewater treatment plants. The mass of measured PFAS from landfills in the U.S. to wastewater treatment plants via landfill effluent has been estimated at 563 to 638 kg for one year.[31] PFAS in effluent degrade during wastewater treatment, but are not destroyed, instead they form into different PFAS structures that accumulate in high concentrations, and some volatilize into the air and can be transported long distances.[32] Polymeric PFAS of the type currently used to treat carpets and upholstery (side-chain fluorinated polymers) have also been detected in high concentrations in biosolids-amended soil.[33]

Thus, the use of PFAS in carpets poses a threat to building occupants as well as people affected by contamination that occurs at other points in the life cycle.

Availability of alternatives

Healthier alternatives to carpeting that uses PFAS as a stain repellant are widely available. In fact, in recognition of the health risks posed by PFAS, The Home Depot and Lowe's have both phased out carpets that contain the toxic chemicals.[34, 35] Similarly, large carpet manufacturers, such as Interface, Engineered Floors, Shaw, and Tarkett, have stopped producing carpeting with PFAS.[36, 37]

Cost-effectiveness of alternatives

Large retailers, such as Lowe's and The Home Depot, which have phased out carpet with PFAS, offer carpeting at a range of prices.[38, 39] HPN Select Ecoguide, which facilitates procurement for building materials for affordable housing developers, lists many carpets from manufacturers that have PFAS-free policies (e.g. Interface, Shaw, Engineered Floors, and Tarkett).[20, 37] Many affordable housing developers seeking to reduce exposure to toxics through flooring while ensuring cost effectiveness also choose to not use carpet. For example, when Community Roots Housing (formerly Capitol Hill Housing) developed the Liberty Bank Building in Seattle, they decided not to use any carpet in the apartment bedrooms; they selected a new-formulation sheet vinyl and vinyl plank that were free of ortho-phthalates, free of undisclosed recycled content, and that did not make health claims about antimicrobials.[40]

Restriction on APEs in Paint

Alkylphenol ethoxylates (APEs) are known hormone disruptors, found at high concentrations in house dust and in wastewater treatment plant discharges.[41-43] APEs break down into persistent chemicals such as nonylphenol and octylphenol. Nonylphenol can also bioaccumulate in some aquatic animals, and nonylphenol ethoxylates have been found in salmon and sculpins in Puget Sound.[42] These chemicals have been widely detected in surface water and sediment, and build up in fish and other wildlife.

Much of the concern about release of APEs into the environment is due to their toxic effects on fish and wildlife. Nonylphenol, for example, feminizes male fish and otherwise affects reproduction in fish and invertebrates.[44] It also affects growth and harms the immune system.[44] Levels of nonylphenol in surface water in some Puget Sound locations are near or exceed those shown in laboratory studies to feminize fish and affect reproduction.[45]

There are also concerns about the effects of APEs on human health, including reproductive, nervous system, and immune effects.[46] Due to the impact that APEs have on the health of wildlife and residents, we request a mandatory requirement to avoid its use.

Availability of alternatives

National paint brands, such as Benjamin Moore, Sherwin-Williams, Dunne-Edwards, and Imperial Paints, now sell APE-free paints.[47-49] The Home Depot has phased out paints with APEs from its stores.[50]

Cost-effectiveness of alternatives

The introduction of APE-free paints by national paint brands has included lower cost options; for example, Benjamin Moore's ben® is estimated to be $15-$20 per 100 square feet.[47] HPN Select Ecoguide, which is used to help facilitate the procurement of materials for affordable housing developers, lists several APE-free paints that are in the lowest cost category.[20]

Restriction on Ortho-phthalates in Sealants

Ortho-phthalates are used as plasticizers and can be found in PVC products such as vinyl flooring, carpet backing, wall covering, children's toys, medical devices such as IV tubing, automobile interiors, and in many personal care products. Exposure to these compounds has been associated with ADD and learning disability [51], with deficits in childhood intellectual development [52], with social impairment in children exposed to ortho-phthalates prenatally [53], and with ADHD [54]. Ortho-phthalates have been linked to altered male reproductive development in human boys [55, 56]. The widely used ortho-phthalate DEHP is reasonably expected to be a human carcinogen and is linked to asthma [57]. People are widely exposed to ortho-phthalates, as evidenced by the common detection of their metabolites in urine [58] [59].

Ortho-phthalates are not chemically bound in products, and as semivolatile compounds they escape products into air. They are common indoor contaminants and are found in house dust and indoor air [60] [61] [62] [41, 63]. Specifically, their use in building materials such as vinyl flooring and wall covering has been associated with presence in dust.[64] They are also outdoor contaminants, found worldwide but concentrated in urban environments [65]. Ortho-phthalates enter the outdoor environment via landfill leachate, volatilization from products, and wastewater.[66]

Availability of alternatives

There are healthier alternatives that are free of ortho-phthalate plasticizers for sealants and virtually all building products. This includes sodium silicate caulk, expanding polyurethane tape, and acrylic latex sealants (without ortho-phthalate plasticizers).[67] Commercially available sealants, that do not contain ortho-ortho-phthalates, are already available for purchase through larger retailers.[68, 69] Many available sealants have declared they are free of ortho-phthalates through published Health Product Declarations or compliance with the European Union's Restriction of Hazardous Substances (RoHS) directive that requires reporting of any ortho-phthalates, or absence of, in their products.

Cost-effectiveness of alternatives

Ortho-phthalate-free sealants are already available for bulk order from common retailers including Lowe's, The Home Depot, and Grainger.[68-70]

Require Lead Service Line Identification and Replacement:

Lead exposure poses a risk to nearly every human body system, with impacts ranging from slowing children's growth and development to behavioral and learning problems.[71-73] Children are the most vulnerable to lead's harm, particularly its devastating effects on brain development, and no safe level of exposure has been identified.[71, 72] Despite advances in science about the harms of lead exposure and public health efforts to reduce it, today approximately 500,000 children in the U.S. ages 1-5 have blood lead levels above the Center for Disease Control's reference level of 5 micrograms per deciliter (µg/dL).[71] In research conducted in 2017 – 2018 on lead sources in Puget Sound area homes, 15% had first flush water samples that were above 1 ppb, the American Academy of Pediatrics recommended level for school drinking fountains.[74] Based on the harm to health caused by lead, we request that identification of lead service lines and replacement be a mandatory criteria. This would move the ESDS to be aligned to the Evergreen Green Communities criteria.[75]

Making the identification and replacement of lead service lines mandatory supports the Washington State Department of Health's recommendations developed following the Governor's Directive on Lead. The recommendations include working with "Group A public water systems (public water systems with 15 or more service connections) to identify and eliminate lead components."[76] Funding is available to support lead service line replacement through the Drinking Water State Revolving Fund Construction Loan Program.[76]

Add Ingredient Transparency as an Optional Criterion

In order to avoid exposure to toxic chemicals that damage our health, it is first necessary to identify that those chemicals are present. An important step to this identification is ingredient disclosure so that housing developers can make informed decisions to reduce the use of harmful chemicals. The importance of ingredient disclosure it outlined in the Enterprise Green Communities criteria:

"As occupants of buildings, we all are exposed to the chemicals that make up the built environment. People who build, and residents of communities where building products are manufactured, can be exposed at higher rates. We all are better served by knowing what chemicals we are exposed to and what health hazards may be associated with those chemicals. In particular, people responsible for the design, construction, and operation of buildings are in a position to act upon this information and avoid known and potential hazards. Public ingredient disclosure for building materials allows project teams to make more-informed choices."[75]

Understanding the important role that ingredient transparency plays, we request that it be added to the ESDS as an optional criterion. In line with the Enterprise Green Communities Criteria, we request that optional points are available for the use of products that have publicly disclosed inventories that are characterized and screened to 1,000 ppm or better.

Availability of products meeting optional ingredient transparency criteria

The number and variety of products with public ingredient disclosure is growing. There are now more than 7,500 published Health Product Declarations; that represents more than 20,000 building products.[77] Products with Health Product Declarations are available in many categories through HPN Select Ecoguide.[20]

Cost effectiveness of products meeting optional ingredient transparency criteria

Many products across categories that meet the ingredient transparency criteria are lower cost. For example, many products are in the HPN Select Ecoguide's lowest cost category.[20]

In summary, we very much appreciate the Department of Commerce's efforts to ensure that only healthy building materials are used in affordable housing, and request that you consider the changes we have detailed to

strengthen the protections. We are happy to meet with staff or advisory team members to discuss any of these proposed changes.

Sincerely,

Colin Hartke
Erika Schreder
Toxic-Free Future

Bill Walsh
Healthy Building Network

Veena Singla, PhD
Natural Resources Defense Council

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