TO: State of California, Department of Toxic Substances Control
RE: Proposed Regulatory Responses for Manufacturers of Spray Polyurethane Foam Systems with Unreacted Methylene Diphenyl Diisocyanate
FROM: Healthy Building Network
DATE: 01/18/2024
Submitted online via CalSAFER

Healthy Building Network (HBN) is pleased to submit comments to the California Department of Toxic Substances Control on the Proposed Regulatory Responses for Manufacturers of Spray Polyurethane Foam Systems with Unreacted Methylene Diphenyl Diisocyanate.

HBN is a non-profit organization that researches the contents and health impacts of building materials and generates guidance for the selection of safer materials. Our comments in this letter are to encourage DTSC to consider broader regulations of spray polyurethane foam (SPF) systems as whole products, as these products rely on multiple hazardous chemicals and the proposed regulations to address MDI alone are insufficient to protect consumer safety.

The comments and evidence supporting our findings are drawn largely from our own research, outlined below.

Safe SPF formulations are not available.

The proposed regulations are not sufficient to reduce the hazards associated with spray polyurethane foam (SPF) products. Because methylene diphenyl diisocyanate (MDI) is currently integral to the chemistry of SPF, and because SPF contains other hazardous chemicals not addressed by this alternatives assessment, safety of consumers can only be achieved through a ban of SPF products.

The proposed green chemistry investments that focus on improving SPF with respect to MDI will not achieve complete hazard reduction since SPF also commonly contains other hazardous chemicals, including halogenated flame retardants and halogenated blowing agents. Many of the halogenated flame retardants used in SPF are not only toxic to humans but persistent in the environment[1]. While California has banned certain high global warming potential (GWP) hydrofluorocarbons (HFCs) as blowing agents in these products, many manufacturers are instead using hydrofluoroolefins (HFOs). HFOs do not themselves have high GWP, but they do use high GWP and/or ozone depleting substances in the manufacturing process which can be released into the environment. Some halogenated blowing agents are also members of the class of chemicals called PFAS or “forever chemicals” which can be persistent, bioaccumulative, and toxic. For instance, our research has identified two PFAS chemicals[2],

[1] GHS H361 - Suspected of damaging fertility or the unborn child [Toxic to reproduction - Category 2]. Healthy Building Network. Pharos. Tri-(2-chloroisopropyl)phosphate. https://pharosproject.net/chemicals/2004842.
[2] The OECD defines PFAS as “fluorinated substances that contain at least one fully fluorinated methyl or methylene carbon atom (without any H/Cl/Br/I atom attached to it), i.e. with a few noted exceptions, any

CASRNs 692-49-9 and 102687-65-0, that may be used as blowing agents in SPF[3]. The multiple chemical hazards of SPF products are not addressed by the proposed regulations.

Safer alternative product types are available.

As we've detailed in previous public comments, the use of SPF in buildings is unnecessary. While there are few direct chemical alternatives to the isocyanates in SPF, there are many alternative materials available that accomplish the function and performance provided by SPF.

SPF is a relatively new addition to the arsenal of tools used by contractors to air seal houses. A wide range of caulking materials have been used for decades, including silicones, latexes, acrylics, and clay rope. Air sealing tapes made of polyethylene, polypropylene, butyl acrylate, Tyvek, and other adhesives and polyurethane gaskets are more recent and equally effective technologies. Tapes and gaskets used in conjunction with house wrap can be particularly effective. Many of these alternatives do not react or dry on site and typically contain less hazardous content than SPF. These solutions have a range of human health and environmental impacts which also should be taken into account in any alternatives assessment. See the Healthy Building Network's Pharos database for evaluations of these substances' impacts.

On the insulation side there are many options. Open vertical cavities can be filled with blanket insulations made of fiberglass, mineral wool, recycled cotton, wool, hemp, and various polymer fibers or sprayed insulations made of cellulose or fiberglass. Rigid board insulation made from EPS, XPS, polyisocyanates, fiberglass, mineral wool, and from sand, limestone and soda ash (foamglas) can also be used in many applications. Closed cavities and horizontal open cavities and vertical open cavities with a restraining mesh can use loosefill or blown cellulose or fiberglass. Again, HBN's Pharos database provides product content and health impact information about many of these potential alternatives.

Some of these insulation alternatives now are beginning to be packaged with air sealing technologies as a system approach, such as a latex sealant and fiberglass batt marketed by Knauf under the EcoSeal label. More content disclosure is needed on these systems to ensure avoidance of related chemicals of concern. For example, an SDS reference to hydrogen bromide released from EcoSeal during combustion that may indicate the presence of brominated flame retardants.

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chemical with at least a perfluorinated methyl group (–CF3) or a perfluorinated methylene group (–CF2–) is a PFAS." The OECD. Series on Risk Management No. 61. Reconciling Terminology of the Universe of Per- and Polyfluoroalkyl Substances: Recommendations and Practical Guidance. July 9 2021. https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ENV/CBC/MONO(2021)25&docLanguage=En.

[3] Healthy Building Network. Pharos. Common Product Profile: Closed Cell Spray Foam Insulation. 2021. https://pharosproject.net/common-products/2079008.

Cementitious foam made from magnesium oxide is the closest technology on the market to match the approach of SPF. Unlike SPF it also does not require hazardous flame retardants. In fact many of these alternative insulations and air sealants are far less hazardous than SPF.

HBN Resources

We have generated guidance for selecting healthier insulation and sealant materials (see links below) which considers hazards of various materials across the product life cycle. Of the twenty-two insulation product types considered in our guidance, SPF ranks as the worst option.

While our guidance is concerned with material health and does not explicitly consider performance, we do have additional resources that may provide useful information on material health, carbon, cost, and performance of insulating materials:

- Our Insulation Product Guidance and Sealant Product Guidance compare the material health of insulation and sealant products across the life cycle. Our Product Guidance considers potential impacts on building occupants and workers involved in the manufacturing, installation, disposal, recycling, and reuse of building products. It also considers the burden on fenceline communities who may be exposed to hazardous chemicals released during the manufacturing or end of life processes. We consider these criteria for all insulation and sealant materials covered in each assessment and rank them against each other.
- Details on the content and hazard information for the different product types considered in the Product Guidance are available in the Pharos database.
- We co-authored two reports with NRDC and the first, Making Affordable Multifamily Housing More Energy Efficient, has a relative cost and performance comparison on page 42.
- Our case study with OECD on insulation was scoped to assess "sustainable" plastics so does not consider non-plastic insulation materials but does include life cycle chemical hazards of plastic alternatives to SPF.
- Our carbon and health of insulation report with Perkins&Will offers a comparison of insulation materials on carbon and health.
- Our case studies on the chemical and environmental justice impacts of the main components of SPF and fiberglass may have helpful information to compare and contrast these two materials. This analysis shows that the primary component of SPF has worse impacts than fiberglass across the life cycle. Thus far we have only compared SPF and fiberglass insulation in this way, but could assist in generating similar comparisons for other materials.

In conclusion, it is the opinion of HBN that:

- SPF based products with unreacted MDI present a significant and well known public health hazard that the proposed regulations do not adequately control.
- SPF products rely on multiple hazardous chemicals, not just MDI, that the proposed regulations do not address.

- Safer alternative non-SPF products already exist that achieve the same performance and function.
- Stopping the use of SPF products is the most effective way to protect consumer health.

We support the DTSC's actions to protect the public from the hazards of exposure to MDI from SPF products and encourage the industry to move to inherently safer products for meeting the desired functions.

Sincerely,

Healthy Building Network