

October 30, 2023

## XPSA Comments in Response to Request for Information (RFI): Senate Bill (SB) 1206 Assessment Report

XPSA is the trade association representing manufacturers of extruded polystyrene (XPS) foam insulation products. XPSA members collectively manufacture more than 95 percent of all XPS destined for use in the United States market. XPSA promotes the safe use of XPS in commercial and residential construction.

XPS foam insulation provides a number of unique performance characteristics which make it a valuable insulation product. XPS foam insulation has excellent compressive strength and moisture resistance characteristics, as well as a high r-value, which makes it ideally suited for certain kinds of insulation applications where there really is no alternative capable of providing the same performance. Some of these applications for which XPS foam is uniquely suited include insulating below grade foundations, or protected membrane insulation installations which facilitate “blue” or “green” roof construction. XPS foam insulation is generally the best choice for any building project which requires insulation with high compressive strength in a relatively compact area of a building which may be subject to moisture intrusion. Competing low-GWP air-permeable insulations, such as mineral wool, cellulose, and hempcrete, simply cannot replace XPS foam insulation in these applications, because XPS has a higher R-value per inch than any of these products, in addition to its significant moisture resistance. Hempcrete has an R-value per inch of around 2.08 to 2.4.<sup>1</sup>, compared to the R-value of 5/inch for XPS foam insulation. Mineral wool has an R-value of 3.1 - 3.4 per inch. Cellulose fiber insulation generally has an R-value per inch of 3.2 to 3.8.<sup>2</sup>

Lower R-values necessitate thicker insulation to maintain the same insulation properties, leading to an increased carbon footprint for a building. Many complications can arise in building practice/cost by needing potentially thicker amounts of insulation to meet energy efficiency codes. Removing XPS foam insulation from the market and replacing it with materials that have a 25% reduction in R-value per inch would result in thicker substitute insulation products. More material means higher embodied carbon for the equivalent thermal efficiency of the building. Without XPS foam insulation, California’s specifiers and builders will be missing a very valuable tool in their toolbox for creating roof assemblies that maximize efficient use of urban space and reduce the problem of heat islands.

The path to reduced carbon emissions is directly linked to building lifetime energy savings, balanced by the embodied carbon of the product itself. In that light, the embodied carbon of XPS foam insulation is far outweighed by the carbon saving benefits of the insulation product. One study on the life cycle of XPS foam insulation products found that XPS foam insulation prevents at least 28 times more greenhouse gas emissions than are generated in producing it.<sup>3</sup> Recent changes to the formulation of the product in efforts to comply with the AIM Act have only enhanced the degree to which XPS products help to reduce more GHG emissions than they “cost”.

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<sup>1</sup> <https://hempcretedirect.com/hempcrete-insulation/>

<sup>2</sup> [http://www.energy.wsu.edu/documents/AHT\\_Inspection%20Attic%20Insulation.pdf](http://www.energy.wsu.edu/documents/AHT_Inspection%20Attic%20Insulation.pdf)

<sup>3</sup> Life Cycle Greenhouse Gas Emissions Reduction From Rigid Thermal Insulation Use in Buildings M.H. Mazor, J.D. Mutton, D.A.M. Russell, G.A. Keoleian, J. Ind. Ecology, 15, 2, pp 284–299, April 2011.

In recent years, XPSA members have moved away from high-GWP blowing agent formulations to low-GWP blowing agents. This transition took many years and presented a challenging engineering problem. All XPSA members now use blowing agent blends with a GWP below 150. This transition to low-GWP blowing agents puts XPSA members in compliance with the recent EPA AIM Act Technology Transition rule, which has established a GWP limit of 150 for 'Polystyrene – extruded boardstock and billet' products.<sup>4</sup>

It is important to note that XPSA members are not manufacturers of blowing agents. XPSA supports an approach to greenhouse gas reduction which focuses on presenting realistic low-GWP targets and allowing industry to find ways to reach these targets. XPSA also supports sell through allowance provisions for foams manufactured with blowing agents that are being phased down.

In response to Question 35 in the RFI Section 8, which deals with foams and other aerosolized products, XPSA is not aware of any emerging technologies which might reduce the GWP value of polystyrene blowing agents below 10 without compromising the thermal & physical performance of the product. The US XPS industry took approximately 7 years to transition out of HFC-134a and there is a current lack of alternatives to achieve a <150 GWP. Each transition of blowing agents takes more time. Time will be required to find a new solution of GWP <10 which will mean transition is not likely by 2030. It is important that CARB ensure sufficient transition time for the XPS industry until 2035.

In response to Question 38 in the RFI Section 10, which deals with PFAS considerations, XPSA members have just converted away from HFC-134a. This transition has proved that ultra-low-GWP, hydrofluoroolefins and hydrochlorofluoroolefins (HFOs/HCFOs), foam blowing agents are the only replacement technology to work in manufacturing XPS foam and ensure XPS foam insulation product performance. The use of HFO/HCFOs will be an ongoing need for the XPSA members. California must be careful to ensure any definition of "PFAS" does not incorrectly include HFO/HCFOs which are non-persistent, non-toxic, and non-bioaccumulative. An example of a responsible definition of "PFAS" is found in the US EPA reporting rule published October 11, 2023<sup>5</sup>

XPS foam insulation is a unique building product with valuable properties, which has contributed significantly to the push for energy efficiency and sustainable construction across the United States. XPS foam insulation should be evaluated in light of the overall effect it has on energy use and the environment, which is a net positive. For the reasons contained in this letter, we respectfully urge the California Air Resources Board to avoid adoption of any standard which will remove XPS foam insulation from the marketplace in California.

Best,



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<sup>4</sup> <https://www.federalregister.gov/d/2023-22529/p-973>

<sup>5</sup> [Federal Register :: Toxic Substances Control Act Reporting and Recordkeeping Requirements for Perfluoroalkyl and Polyfluoroalkyl Substances](#)