April 30, 2020

Air Quality and Climate Division
Vermont Department of Environmental Conservation
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Re: Pre-Draft: Rules Regarding Phase-Down of the Use of Hydrofluorocarbons
Polyisocyanurate Insulation Manufacturers Association Public Comments

Dear Air Quality and Climate Division Staff:

The Polyisocyanurate Insulation Manufacturers Association\(^1\) (“PIMA”) appreciates the opportunity to comment on the Vermont Department of Environmental Conservation’s (“Department”) pre-draft version of Rules Regarding Phase-Down of the Use of Hydrofluorocarbons (“HFC Phase-down Rule”). PIMA represents North American manufacturers of laminated polyisocyanurate insulation board products (“polyiso insulation”). Our members include Atlas Roofing Corporation, Carlisle Construction Materials, Firestone Building Products, GAF, Johns Manville, IKO Industries, Rmax, and Soprema. These manufacturers account for the majority of polyiso insulation produced and sold in North America, including Vermont.

PIMA supports the Department’s efforts to reduce harmful emissions of greenhouse gases through restrictions on the use of hydrofluorocarbons (HFCs) with high global warming potential (GWP) in the foam sector. This brief letter provides additional detail on polyiso insulation that may be helpful in your efforts to finalize the HFC Phase-down Rule.

1. Introduction to Polyiso Insulation

Polyiso insulation is a rigid foam board product used to insulate roofs, walls, and other components of commercial and residential buildings. With respect to the blowing agent

\(^1\) More information available at [www.polyiso.org](http://www.polyiso.org).
substances used to manufacture polyiso insulation, manufacturers in the North American market use pentane (or pentane blends) in their product formulations and have done so for more than twenty years.

Pentane is a non-ozone depleting, low GWP substance that offers an economical solution for polyiso insulation products and delivers exceptional thermal resistance that contributes to polyiso insulation’s high R-value – the primary physical property for thermal insulation products. Furthermore, polyiso insulation manufacturers have made significant capital investments in modifying existing facilities and constructing new plants that allow for the safe use of pentane technology in the manufacturing process. More information on the polyiso industry’s use of pentane blowing agents can be found in the attached performance bulletin.²

2. PIMA supports the purpose and applicability provisions of the HFC Phase-down Rule.

PIMA supports the purpose of the HFC Phase-down Rule as described in Section 37-102 as well as the applicability provisions of Section 37-103. Furthermore, we understand that the Department is not proposing to include any requirements for recordkeeping and disclosure. We support this decision. Other jurisdictions have proposed certain requirements for recordkeeping and disclosure that would apply to end-uses like polyiso insulation where the prohibited HFC substances were never used or where the industry has otherwise transitioned away from the legacy chemicals. In our opinion, these requirements unnecessarily burden manufacturers of polyiso insulation and similarly situated end-uses without providing any benefit to the public or regulatory enforcement efforts. Therefore, we reiterate our support and appreciation for the narrow scope of the Department’s HFC Phase-down Rule.

3. PIMA supports the prohibitions included in Section 37-301 of the HFC Phase-down Rule.

PIMA supports the use restrictions for high-GWP HFCs as currently proposed for the end-use category that applies to polyiso insulation products (“Foams; Rigid Polyurethane and Polyisocyanurate Laminated Boardstock”). Furthermore, PIMA supports the prohibition date of January 1, 2021 for the aforementioned end-use category.

² The attached performance bulletin is available online at the PIMA website here: https://www.polyiso.org/resource/resmgr/performance_bulletins/2020/PIMA_PerfBull_LowGWP_Final01.pdf.
4. Conclusion

PIMA appreciates the opportunity to comment on the pre-draft version of the HFC Phase-down Rule. Please contact me at jkoscher@pima.org should additional information be helpful to your deliberative regulatory process.

Respectfully submitted,

Justin Koscher
President
Insulation and Blowing Agents

Closed-cell foam insulation products like polyiso are manufactured with captive blowing agents. The blowing agents are primarily used to increase the final product’s thermal resistance or R-value. The substances are also an integral part of the manufacturing process helping to produce the ideal cell structure.

In closed-cell products, the blowing agents are retained within the cell structure to provide long-term thermal performance. And while closed-cell insulation products can exhibit an initial drop in R-value due in large part to the diffusion of air into the foam, all polyiso insulation products are tested to reflect an aged (i.e., long-term) R-value. For more information on polyiso’s R-value and the applicable testing requirements, visit the PIMA website.

Insulation products manufactured without captive blowing agents (e.g., expanded polystyrene, fiberglass, mineral wool) result in lower R-values per inch. Therefore, these products must be installed at greater thicknesses to equal the high R-value of polyiso insulation.

Polyiso + Pentane = Environmental Leadership

Polyiso products are manufactured using pentane or pentane blends. Pentane is a hydrocarbon with zero ozone depletion potential (ODP) and low global warming potential (GWP). GWP is a measure of a substances ability to trap heat in the atmosphere and is calculated over a specific period of time (commonly 100 years). Specifically, GWP measures how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of CO₂. A substance that traps more heat will contribute more to global warming (and will be assigned a higher GWP value). Therefore, products that incorporate low-GWP blowing agents provide insulation solutions that offer reduced environmental footprints.

Notes:
1 The U.S. Federal Trade Commission’s R-value Rule requires that tests performed on samples of polyiso insulation reflect the effect of aging on the product’s R-value (Labeling and Advertising of Home Insulation, 16 CFR Part 460).

2 Pentane is used as a general term to describe the different pentane isomers or mixtures of isomers used by polyiso manufacturers. Isomers are molecules with the same molecular formula, but different bonding patterns. In terms of environmental impacts, all pentane isomers have the same GWP.

3 Ozone depletion potential, or ODP, is a relative measure of substance’s contribution to the degradation of the ozone layer. For more information, visit: https://www.epa.gov/ozone-layer-protection/basic-ozone-layer-science.

4 Visit the U.S. EPA’s webpage, Understanding Global Warming Potentials, for more information: https://www.epa.gov/ghgemissions/understanding-global-warming-potentials.
For over 20 years, the polyiso industry has utilized pentane in product formulations. These products replaced formulations using CFCs and HCFCs, which are no longer permitted for use in insulation products in major markets, including the United States and Canada. The transition to pentane blowing agents was preceded by years of research and development. As a result of these efforts, the polyiso industry was recognized by the U.S. Environmental Protection Agency with the Stratospheric Ozone Protection Award for leadership in the phase-out of CFCs and exceptional contributions to global environmental protection. Please refer to PIMA’s Environmental Product Declarations for additional information regarding GWP and polyiso’s overall environmental performance.

Comparing Polyiso to Other Insulation Products

Not all closed-cell foam insulation products are created equal when it comes to the environmental impacts of their blowing agents. **Pentane has a GWP of less than 10.** Other insulation products still utilize hydrofluorocarbon (HFC) blowing agents, which can have a GWP of 1300 or higher. This is more than 100 times the global warming impact of pentane used in polyiso insulation.

As a category, other closed-cell insulation products are transitioning to blowing agents with lower GWP in part as a response to international and domestic regulations. However, not all blowing agent substitutes are equivalent. In Canada, regulations prohibit the manufacture, import or sale of foam plastic insulation products that contain a blowing agent with a GWP greater than 150. The U.S. Environmental Protection Agency does not enforce GWP limits for blowing agents used in foam insulation products. However, several states have, or are in the process of, enacting prohibitions on the use of certain HFC blowing agents in foam insulation products manufactured or sold within their jurisdictions.

Environmental Product Declarations

GWP is an important measure of a product’s impact on the environment, but there is a larger story to tell for insulation products like polyiso. The polyiso insulation industry provides stakeholders with information on the environmental impacts of its products through the publication of Environmental Product Declarations (EPDs). An EPD is an internationally recognized and standardized tool that

Notes:


6 For example, XPS insulation is typically manufactured with HFC-134a. This compound has a GWP of 1430. Source: The Intergovernmental Panel on Climate Change, Fourth Assessment Report, Chapter 2 - Changes in Atmospheric Constituents and in Radiative Force (available at: [https://www.ipcc.ch/site/assets/uploads/2018/02/ar4-wg1-chapter2-1.pdf](https://www.ipcc.ch/site/assets/uploads/2018/02/ar4-wg1-chapter2-1.pdf)).


8 U.S. EPA SNAP Rules 20 and 21 were partially vacated by a decision of the Court of Appeals for the District of Columbia Circuit (Mexichem Fluor, Inc. v. EPA). As a result, EPA has issued interim guidance to stakeholders that the Agency will not enforce certain prohibitions that limit the use of blowing agents based solely on GWP (available at: [https://www.govinfo.gov/content/pkg/FR-2018-04-27/pdf/2018-08310.pdf](https://www.govinfo.gov/content/pkg/FR-2018-04-27/pdf/2018-08310.pdf)).

9 Information on state-level activities is available via the United States Climate Alliance: [http://www.usclimatealliance.org/clpchallenge](http://www.usclimatealliance.org/clpchallenge). Under certain state laws or regulations, replacement substitutes may still have a GWP of nearly 750.
reports the environmental impacts of products. EPDs report data on environmental metrics across a product’s life cycle, including GWP, primary energy, resource depletion, and water use. Importantly, EPDs also provide an opportunity to disclose the environmental benefits of products. For example, the net return on environmental metrics like embodied energy, where polyiso’s long-term energy savings benefits far exceed the energy used to manufacture the product.

The polyiso industry’s third-party verified, ISO-compliant EPDs are available for download on the PIMA website.

PIMA

For more than 30 years, the Polyisocyanurate Insulation Manufacturers Association (PIMA) has served as the voice of the rigid polyiso industry, proactively advocating for safe, cost-effective, sustainable, and energy-efficient construction. Organized in 1987, PIMA is an association of polyiso manufacturers and industry suppliers. Polyiso is one of North America’s most widely-used and cost-effective insulation products.

PIMA produces performance bulletins to provide technical and industry information on key topics related to insulation performance. The resources provide the public with information that can be used to evaluate polyiso insulation products and compare their performance to other common insulation types. Industry professionals should review individual polyiso manufacturer resources for product-specific information.

For more information on polyisocyanurate insulation, visit www.polyiso.org