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*Comment Received From: Stephen Wieroniey
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ACC - Spray Foam Coalition Comments

See attached comments from the ACC Spray Foam Coalition

Additional submitted attachment is included below.



Spray Foam
Coalition

June 21, 2021

David Hochschild
Chair
California Energy Commission
1516 Ninth Street,
Docket Office, MS-4
Sacramento, CA. 95814

Re: 2022 Energy Code Update Rulemaking; Express Terms 2022 Energy Code, Title 24 Parts 1 and 6; and Reference Appendices (Docket Number 21-BSTD-01; TN: 237717 and 237714)

The American Chemistry Council's Spray Foam Coalition¹ (SFC) is pleased to provide comment on the California Energy Commission's (CEC) Title 24 – Part 6 – 2022 Express Terms and Reference Appendices. SFC commends the CEC for its ongoing efforts to improve energy efficiency of the thermal envelope, which is one of the most effective means to reduce greenhouse gas emissions from buildings. Reducing energy demand from heating and cooling buildings will help fight climate change and ease the transition to renewable energy. California is a leader in the fight against climate change and it is important for the state to ensure that Title 24 – Part 6 helps drive towards net-zero energy buildings.

Improving energy efficiency by increasing insulation levels and the airtightness of buildings helps the state fulfill its broader environmental goals and provides energy savings to building owners. Considering energy efficiency during the design and construction of homes and commercial buildings will help keep residences and buildings affordable to own and operate. It is important for California to use Title 24 – Part 6 to help ensure builders are making appropriate decisions during the construction phase to help the state meet its climate goals.

The spray polyurethane foam (SPF) industry has been investigating how to maximize energy savings and greenhouse gas reductions by using SPF. The Spray Polyurethane Foam Alliance recently published [*Counting Carbon: Demand A Better Insulation for Your Next Home*](#). This report highlights the benefits of insulating and air sealing homes with spray foam and building an unvented attic with ductwork in conditioned space. This type of construction can significantly reduce greenhouse gas emissions associated with the heating and cooling of buildings. The SFC has published two infographics that summarize this report: one on [spray foam and greenhouse gas reductions](#) and one on [embodied carbon and environmental payback](#). We hope CEC finds these documents informative.

¹ The Spray Foam Coalition champions the use of spray polyurethane foam in North America by promoting its energy efficiency, performance, economic benefits, and contributions to sustainability. The SFC provides a forum to conduct research, to advocate for science-based public policy, excellence in safety, stewardship, training, and to advance technical knowledge. The Coalition represents 29 spray foam systems houses and suppliers to the industry.

The SFC respectfully submits the following comments:

1. Appendix JA4

Title 24 – Part 6 (2019) Appendix JA4 sets default R-values for open- and closed-cell SPF. The Appendix includes an option for SPF products to demonstrate higher R-values using an Evaluation Service Report (ESR) developed by International Code Council Evaluation Services (ICC-ES). Last year, the Coalition submitted a letter to CEC requesting that Appendix JA4 be amended to allow for the use of all Code Compliance Reports written by certified entities. Currently, spray foam systems houses are listing SPF products with several certified entities, including, but not limited to: IAPMO-ES, UL, Intertek, and Factory Mutual. SFC believes that all Code Compliance Reports should be able to use the current option to demonstrate higher R-values that is available to SPF products with ICC-ES reports.

CEC proposes the following changes to Appendix JA4 in the Express Terms:

Alternatively, the total R-value may be calculated based on the thickness of insulation multiplied by the "tested R-value per inch" as listed in the Table of R-values or R-value Chart from the manufacturer's current ICC Evaluation Service Report (ESR) that shows compliance with Acceptance Criteria for Spray Applied Foam Plastic Insulation – AC377 certified by the Department of Consumer Affairs, Bureau of Electronics and Appliance Repair, Home Furnishings and Thermal Insulation. Supporting documentation showing the certified R-value per inch shall be made available at the site for verification and noted on the Certificate of Installation.

The proposed changes to Appendix JA4 are problematic. The Bureau of Household Goods and Services² (BHGS) listings only identify the R-value of SPF products at 1-inch of thickness. Appendix JA4 suggests that for other thicknesses one would multiply the 1-inch R-value by the thickness to get the installed R-value. This assumes the performance varies linearly; in reality, it does not. All Code Compliance Reports include a table that provides a list of R-values tested at various thicknesses in compliance with the Federal Trade Commission's R-value Rule.³

In Section 460.6, the FTC states insulation manufacturers must conduct R-value testing at “representative thicknesses” to ensure R-values do not vary more than 2% as thickness of the insulation increases. Therefore, it is important that SPF manufacturers conduct R-value tests at typically installed thicknesses and report appropriate R-values for those thicknesses. Calculating installed SPF R-values using the installed thickness and the R-value at 1-inch of thickness would not comply with the FTC's R-value rule.

The SFC recommends the following changes to appendix JA4:

Alternatively, the total R-value may be ~~determined~~ ~~calculated~~ based on the ~~thickness of insulation multiplied by the "Tested R-value per inch" as listed listing~~ in the Table of R-values or R-value Chart from the manufacturer's current ~~code compliance report (CCR), developed by an Approved Agency (as defined in the California Residential Code, Title 24, Part 2.5) ICC Evaluation Service Report (ESR) that shows compliance with Acceptance Criteria for Spray Applied Foam Plastic~~

² The Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation is now the Bureau of Household Goods and Services (BHGS)

³ [16 Code of Federal Regulations Section 460](#)

~~Insulation—AC377 per ICC-1100, Standard for Spray-applied Foam Plastic Insulation, or other applicable standards.~~

SFC supports CEC’s additional changes to Appendix JA4 that delete references to ICC-EC ESRs and insert “supporting documentation.”

2. Air Barriers

The SFC believes that continuous air barriers and insulation are fundamental to improving the energy efficiency of the thermal envelope in new and existing buildings. Continuous air barriers provide direct energy savings by reducing or eliminating air leakage and can improve the performance of air permeable insulation products.

SFC supports CEC’s proposal in the Express Terms that include more detailed prescriptive language for installing and testing for air barriers. Table 140.3-A lists characteristics for materials that can form part of an air barrier and are deemed to comply with Section 140.3(a)9B. Table 140.3-A states that medium density (closed-cell) SPF forms an air barrier at a minimum of 2-inches thick; and that low density (open-cell) SPF forms an air barrier at a minimum of 5 ½-inches thick. SFC believes that these thicknesses are reasonable for a generic reference. However, many commercially available medium density SPF products form code compliant air barriers at a thickness of 1-inch and many low density SPF products form code compliant air barriers at a thickness of 3 ½-inches.

SFC recommends that Table 140.3A include a footnote instructing readers to reference Code Compliance Reports for product specific air permeance information. Code Compliance Reports include product specific air permeance testing (based upon ASTM E2178) and provide the product’s installation instructions to form an air barrier.

3. Air tightness Testing

SFC supports the requirements for air tightness testing of buildings. The current wording in the draft language appears to suggest all buildings should be tested at 75 pascals depressurization. While this is the common pressure used to test materials and some assemblies, it is not the common pressure used to test houses and small buildings. Houses and small buildings are usually tested for air tightness at 50 pascals depressurization. The International Energy Conservation Code (IECC) requires air tightness testing at 50 pascals depressurization. The IECC sets air tightness requirements at 3.0 ACH₅₀ for most climate zones. We suggest presenting the testing requirements using 50 pascals depressurization.

Our key concern relates to how testing is being implemented. Section 140.3 of the Express Terms offers air tightness targets and provides an exemption if a building meets the air tightness requirements. The exemption allows builders to fix easily accessible air leaks without retesting for compliance with the air tightness threshold. The IECC has included airtightness requirements since 2009. Builders should be comfortable with the requirements and building in a manner that facilitates compliance with the air tightness requirements.

4. High Performance Attic

The Express Terms include a prescriptive path for insulating at the floor or at the roofline of an attic to create a “high performance attic.” Unfortunately, these “high performance attics” do not fully address air leakage at the floor of the attic or leakage from mechanical equipment and ductwork located in the attic. This undermines the energy efficiency of the buildings. Also, air permeable insulation that is not enclosed on all 6 sides is vulnerable to wind washing and convective air currents that undermine performance.

We recommend that CEC create a third option for constructing “high performance attics.” This third option would require the use of air impermeable insulation at the roof line and indirectly (passively) conditioning the attic space to create an “unvented attic” or “conditioned attic.” This is consistent with the CEC definition of:

“CONDITIONED SPACE, INDIRECTLY is enclosed space that (1) is not directly conditioned space; and (2) either (a) has a thermal transmittance area product (UA) to directly conditioned space exceeding that to the outdoors or to unconditioned space and does not have fixed vents or openings to the outdoors or to unconditioned space, or (b) is a space through which air from directly conditioned spaces is transferred at a rate exceeding three air changes per hour.”

Creating an unvented attic by insulating and air sealing at the roofline also facilitates the ability to inspect and test air barrier continuity. It allows mechanical systems and ductwork to be brought within the boundary of conditioned space (or thermal envelope), which helps keep any leakage of conditioned air inside the thermal envelope. Finally, unvented attics create a more effective and continuous thermal envelope because the insulation and air barrier are not interrupted by duct penetrations, plumbing, wiring, and other services. Unvented attics are rapidly becoming one of the most popular insulation options for new home attics in many jurisdictions in the southern United States and it is one of the effective retrofit options for existing buildings.

5. Request for Continuing our Discussion on CBECC-Res

Previously, CEC indicated that innovations like unvented attics were always available to builders using the “performance path” in the Title 24 – Part 6. However, in reality, this option is not as practical as CEC believes. There are several calculations built into the Title 24 compliance software (CBECC-Res) that lock in assumptions based on characteristics of other more common attic designs. We believe CEC needs to commit resources to ensure CBECC-Res properly models unvented attics. We thank CEC for their attention to this issue and would like to schedule a meeting with staff to continue our discussions to help improve CBECC-Res.

Thank you for the opportunity to comment on the draft language before it is implemented into Title 24. We welcome the opportunity to continue to assist you in your important work. If you have any questions or need additional information, please contact me at Stephen.wieroniey@americanchemistry.com, or (202) 249-6617.

Sincerely,



Stephen Wieroniey