



**Aluminum Extruders Council  
Position Paper on the Interests of the  
Aluminum Fenestration Industry in Energy Code and Rating Activities**

Recently, questions have been raised about developments in the energy codes and rating programs that affect the aluminum fenestration industry and how the industry should respond. The following information depicts the AEC's position on responses to these developments and, most importantly, the vast scope in which the organization must monitor, develop and respond to these issues.

**Aluminum Windows and Energy Performance Requirements**

Compared to nonmetal windows, it is well known that the primary performance advantages of aluminum fenestration are its structural strength and long term durability, whereas its primary weakness is its lower energy performance. Even with the best thermal barrier, low-e glazing, argon gas fill, and warm edge spacer, the whole window U-value of aluminum windows is commonly 30% higher than for similar nonmetal windows.

Unfortunately, recent changes to the energy codes and above-code programs like Energy Star have focused on simply reducing the U-value, supposedly with the goal of improving energy efficiency. However, this ignores the true total energy performance of the entire system, which involves the combination of U-value, SHGC (solar heat gain coefficient), air leakage (AL), and any permanent shading devices. Also, this has often been done without any regard or allowance for structural requirements in commercial buildings or impact resistant applications.

This focus on only U-value has a severe negative impact on aluminum windows as it exploits the primary weakness of aluminum (U-value) while ignoring its primary advantages (structural strength, durability) and not fully accounting for other factors that contribute to energy performance besides U-value. In part, this has led to the loss of residential market share and now threatens the commercial market.

To counter this, AEC and the aluminum window industry must change the focus from only reducing U-value to properly accounting for total energy performance and structural performance. By promoting total energy performance, the balance and trade-offs between *all* the factors including U,

SHGC, and AL becomes more important than just the U-value. Codes and rating programs, which are truly performance-based, provide the manufacturer flexibility to trade-off higher U-values with appropriate changes in SHGC and AL while guaranteeing the same overall energy performance. Adopting performance-based requirements is a long term goal, along with developing methods to quantify and give credit for long term durability. In the short term, we must at least get code and government bodies to recognize the importance of structural performance when setting prescriptive U-values.

AEC and the aluminum window industry have been focusing on two major activities: introducing performance-based trade-offs to the DOE Energy Star program, and correcting very harmful commercial code requirements in the IECC. First, the current prescriptive requirements for Energy Star only allow aluminum products to qualify in Florida and along the Gulf Coast even if we can prove equivalent energy performance. This puts aluminum products at a marketing disadvantage. Performance trade-offs in the southern states would allow the manufacturer more flexibility by allowing slightly higher U-values if the SHGC is lowered to maintain the same overall energy performance. Although the requirements will still be very difficult for most products, it is important to also set a precedent such that any future changes to Energy Star or similar programs that may develop for the commercial market will be performance-based. We have already seen a commercial program start in the Pacific Northwest (the Commercial Windows Initiative) which includes prescriptive criteria unfavorable to aluminum products and we need to stop this trend.

Second, the IECC recently adopted a code change which simplified the prescriptive requirements for commercial buildings, Table 802.2(2). Over the objections of AEC, AAMA, and aluminum window manufacturers, the new requirements greatly reduced the window U-values so much that they basically prohibit glazed aluminum doors, site-built operable aluminum windows, and *all* factory-built aluminum windows in the northern half of the country. It is imperative that we correct these U-values in the 2005 code cycle to make them realistic for aluminum window products, which are required in commercial buildings for structural and safety reasons.

## Other Groups and Interests

Strategically, it is always advantageous to align with similar interests to maximize success in passing code proposals or promoting our positions for rating programs such as Energy Star. The voices of trade organizations and/or groups of companies are almost always more powerful than the voice of an individual interest. Both code committees and the DOE (political appointees and program staff) look for broad representation to support their actions. Therefore, the question is, how do the interests of the aluminum fenestration industry align with other segments of the industry?

In a broad sense, the groups or segments active in these areas include:

- aluminum extruders and window manufacturers
- vinyl extruders and window manufacturers
- wood window manufacturers
- hard coat low-e glass suppliers
- soft coat low-e glass suppliers
- window film and attachment manufacturers
- non-profit energy efficiency groups

It is important to note that this is somewhat oversimplified as individual companies in each group may take different positions or have interests in more than one group.

### *Vinyl and wood:*

Clearly, aluminum interests are in direct competition with vinyl and wood. Vinyl and wood benefit from a focus on U-value, which highlights their particular advantage over aluminum without regard for structure or overall energy performance. The Vinyl Institute and AAMA Vinyl Materials Council have actively opposed our efforts to add performance-based criteria to Energy Star.

However, we should also acknowledge that there is a place for each material type in the market. Many aluminum window manufacturers also produce vinyl windows exactly for this reason. The support of these companies has increased our credibility with DOE, because it highlights that performance-based systems should not just be an aluminum vs. vinyl battle – they are simply the way to fairly compare total energy performance, regardless of material.

### *Hard coat and soft coat:*

Hard coat low-e products have also been adversely affected by prescriptive criteria, although primarily from differences in SHGC rather than U-value. On the other hand, soft coat low-e products benefit from prescriptive criteria which focus on low SHGC (or ignore SHGC in the north where high SHGC is actually better). Therefore, similar to aluminum, hard coat low-e suppliers have also supported performance-based requirements which allow trade-offs between U- and SHGC values. Certain soft coat low-e suppliers have actively opposed these efforts.

However, the aluminum group has no particular tie to hard coat or soft coat – we are not necessarily allies with hard coat nor enemies with soft coat. We do have overlapping interests with hard coat suppliers on certain issues, but using soft coat low-e products is important for aluminum to achieve their desired performance values, particularly in southern regions.

The industry group labels don't indicate where interests may be aligned with the aluminum window industry and it is better to look at the actions of individual companies:

**PPG** (hard coat and soft coat), **Guardian** (soft coat), and **Viracon** (soft coat) have either been neutral or not active on recent issues of importance to aluminum.

**Pilkington** (hard coat), **AFG** (hard coat and soft coat), and **Arkema** (hard coat supplier) have actively supported issues of interest to aluminum:

- Met with DOE and submitted comments in support of performance-based criteria for Energy Star, even if only implemented in southern areas which only benefit aluminum (they only benefit from performance-based systems in the north).
- Supported AEC and AAMA efforts to overturn the IECC commercial code changes (Table 802.2(2)) which greatly harm aluminum window products.
- Supported development of the AEC and AAMA code proposals to correct the commercial U-values for aluminum products in Table 802.2(2). Filed a parallel code proposal using AEC and AAMA's categories and U-values.
- Supported aluminum manufacturer's objections to prescriptive requirements in the Commercial Windows Initiative program in the Pacific Northwest, preferring performance trade-offs.

**Cardinal** (soft coat) has actively pushed issues which are against the interests of aluminum and have adverse impacts on aluminum window manufacturers. Cardinal has repeatedly taken positions at the IECC and the Commercial Windows Initiative that restrict the use of aluminum fenestration products in commercial applications. Likewise, with the DOE's Energy Star Program, Cardinal has been an opponent to the development of a performance-based rating system.

The key Cardinal representative has acknowledged the importance of aluminum to the commercial window market and says they are willing to work with us on these issues. It is important to maintain an open dialogue and negotiate with Cardinal. However, their past actions have repeatedly been harmful to aluminum in favor of overly simplified and strict requirements that favor a specific technology (vinyl or wood windows with soft coat low-e). Therefore, while it is good to maintain open communication with all parties, it should certainly not be assumed that Cardinal's interests are in alignment with the interests of the aluminum window industry.

While AEC should remain open to working with all parties, it is in the best interest to maintain a closer relationship with other groups who have similar goals and interests. For the energy code and rating activities, the interests of companies such as Pilkington, Arkema, and AFG (who do both hard coat and soft coat) align much more closely than those of Cardinal.