



May 19, 2017

Doug Anderson
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1200 Pennsylvania Avenue NW
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Dear Doug:

I am writing in response to letters from the American Architectural Manufacturers Association (AAMA) recently posted on the Energy Star Exterior and Interior Storm Panels web page. Larson Manufacturing Company has been an AAMA member for 45 years; however, these letters contain several inaccuracies and statements with which Larson does not agree. In fact, despite being the largest storm products manufacturer in the United States and having the only storm windows currently in the AAMA certification program, Larson was neither consulted in the development of nor given the opportunity to review these letters before they were sent.

AAMA's December 2016 letter references EPA's statement in the August 2016 Response to Comments document that EPA does not wish to include product design requirements that do not directly affect the energy performance of the product, and states that this is inconsistent with EPA's requirement for insulating glass (IG) certification in the Energy Star program for windows, doors, and skylights. Larson agrees with EPA's position on not over-burdening an Energy Star storm panel program with unnecessary requirements, including NAFS certification, which is not an Energy Star requirement for primary windows, doors, and skylights, either. It must also be noted that the EPA requirement for IG certification is actually quite consistent with the position of limiting requirements to those that affect energy performance, as an IG assembly that fails to maintain its integrity and performance attributes over time will have a direct impact on the energy performance the product containing the IG assembly.

The December 2016 AAMA letter urges EPA to include safety glazing requirements in an Energy Star storm panel program. Larson fully acknowledges the importance of product safety, and just as the glass in Larson storm doors carries a permanent mark designating its compliance with the applicable 16 CFR 1201 and ANSI Z97.1 safety glazing standard(s), Larson storm windows utilizing tempered glass carry this same mark. However, it is not appropriate to mandate this in an Energy Star program for storm windows, just as it is not included as a requirement in the Energy Star program for primary windows, doors, and skylights. The need for safety glazing is heavily dependent on the installed location of the product. Given that many storm windows are sold through big box retailers and installed by the homeowner on a DIY basis with no involvement of the manufacturer, it is impossible for the manufacturer to know which windows should include safety glazing or not and, therefore, which windows could be identified as Energy Star-qualified. This responsibility to ensure storm windows include safety glazing when appropriate can only rest with the homeowner or person purchasing or ordering the products who knows where the products will be installed, exactly as is the case with prime windows.

Another point attempted to be made in the December 2016 AAMA letter is that adding another glazing product such as a storm window, especially with a low-E coating, may lower the visible transmittance (VT) and SHGC properties of the window opening resulting in overall performance reductions. While the AAMA letter cited a reduction in VT from adding a low-E storm window over a dual clear prime window, it failed to mention that replacing the existing window with a new window containing one of today’s common double-silver or triple-silver low-E coatings will also reduce the VT by a similar amount. As Table 1 below shows, adding a low-E exterior storm window to a window with double clear IG reduces the VT by approximately 17%, while a replacement window with a double- or triple-silver low-E IG package will reduce the VT by 12% to as much as 21%. In the case of a window with single clear glass, Table 2 shows that adding a low-E storm reduces the VT by 18%, but a replacement window will reduce VT by as much as 28%. See Attachment A for construction and performance property details.

Table 1: Center of Glass Properties for Existing Window with Double Clear Glass, Existing Window with Double Clear and Exterior Low-E Storm Window, & Low-E Replacement Windows

Property	Exist. w/ Double Clear	Exist. w/ Double Clear and Ext Low- E Storm	Change from Exist. w/ Double Clear	Repl. Window w/ Double Silver Low-E IG	Change from Exist. w/ Double Clear	Repl. Window w/ Triple Silver Low-E IG	Change from Exist. w/ Double Clear
VT	0.814	0.676	17%	0.716	12%	0.644	21%
SHGC	0.763	0.591	23%	0.413	46%	0.272	64%
U-factor	0.481	0.250	48%	0.250	48%	0.242	50%

Table 2: Center of Glass Properties for Existing Window with Single Clear Glass, Existing Window with Single Clear and Exterior Low-E Storm Window, & Low-E Replacement Windows

Property	Exist. w/ Single Clear	Exist. w/ Single Clear and Ext Low- E Storm	Change from Exist. w/ Single Clear	Repl. Window w/ Double Silver Low-E IG	Change from Exist. w/ Single Clear	Repl. Window w/ Triple Silver Low-E IG	Change from Exist. w/ Single Clear
VT	0.899	0.741	18%	0.716	20%	0.644	28%
SHGC	0.861	0.646	25%	0.413	52%	0.272	68%
U-factor	1.041	0.355	66%	0.250	76%	0.242	77%

With respect to SHGC, the AAMA letter expressed concerns that adding a low-E storm window to a dual clear prime window would also reduce SHGC, yet didn’t acknowledge that replacing the window will reduce SHGC, as well. In fact, as shown in both Tables 1 and 2, replacing a double-clear or single-clear prime window with one containing a double- or triple-silver low-E IG package will reduce SHGC 46-64% and 52-68%, respectively, while adding a low-E exterior storm window will reduce SHGC by just 23-25%.

Beyond this, the AAMA letter completely omitted any mention of U-factor which must be considered along with SHGC when evaluating the overall performance of a window system. While double- and triple-silver IG packages in replacement windows can offer U-factors of 0.24-0.25, the addition of a low-E storm window to an existing dual clear window that creates, in effect, a triple-glazed low-E unit that yields a nearly identical 0.25 U-factor. In sum, AAMA’s concerns about reductions to VT and SHGC resulting from the addition of low-E storm windows are not justified when considered in the context of other alternatives such as replacement windows, and when the comparison of glass properties is expanded beyond VT and SHGC to include U-factor, storm windows are very comparable to other alternatives.

The December 16 letter from AAMA also contained factual errors regarding the Efficiency Vermont white paper on low-E storm windows. First, the AAMA letter claimed that a 46% discount was necessary to sell more storm products. Despite the fact that the markdown rate of 20-35% for stock products and 20% for custom products was clearly stated in Table 1 on page 9 of the white paper (see Figure 1 below), the only way a discount rate of 46% can be obtained is by comparing the largest discount from one of the most expensive SKUs (\$26) to the regular retail price of the least expensive SKUs (\$56). These two SKUs weren’t even available in the same retail location, making a 46% discount impossible. Second, the AAMA letter claimed that exclusive in-store sales personnel were also needed to sell more storm products. The reality is that the Efficiency Vermont pilot program was supported by no additional, dedicated, or exclusive personnel, but instead by retailer sales associates, manufacturer sales representatives, and energy efficiency personnel all carrying out their normal day-to-day responsibilities.

Low-E Storm Window Product Type	Pricing Type	Value
Stock windows	Markdown rate	20% - 35%
	Regular price range, per window	\$56 - \$79
	Promotional price range, per window	\$39 - \$63
	Incentive markdown range	\$11 - \$26
Custom windows	Markdown rate	20%
	Regular price range, per window	\$80 - \$231
	Promotional price range, per window	\$64 - \$185
	Incentive markdown range	\$16-\$46

Figure 1. Table 1 from Efficiency Vermont – Low-E Storm Window Report

The December 16 and January 30 AAMA letters both reference concerns related to heat buildup. The December 16 letter claims that storm products “will cause frequent premature failure” of various prime window components, yet fails to define “frequent” or provide any data to substantiate how often this might be expected to occur. More importantly, the thermal analysis cited in the December letter claimed that high glass temperatures can develop behind a storm window, yet obtaining these temperatures required

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the outside air temperature be manually manipulated in the WINDOWS simulation software to 180°F. On top of this, the high-performance primary glazing selected for the analysis is hardly typical of the glazing that can be expected to be found in the windows of the older homes of those desiring to improve energy performance by adding storm windows. This is both the incorrect application of the WINDOWS simulation software and an unrealistic combination of storm and prime window glazing, and these results should be dismissed from consideration.

Finally, the January 30 AAMA letter attempted to use Consumer Product Safety Commission (CPSC) National Electronic Injury Surveillance System (NEISS) data to justify assertions made in the December letter and to imply that installing a storm window exposes occupants, bystanders, or the building itself to increased risks. Any injuries at all are too many, including the 56 injuries associated with storm window breakage reported to the NEISS sample of 100 hospitals over the ten-year period, although this essentially means that one out of two hospitals will see one injury resulting from storm window breakage every ten years. In the same ten-year period, however, the NEISS data for product code 1894 (Windows or window glass, other than storm windows) shows that a total of 31,886 injuries were reported for windows, *nearly 100 times* the 330 total injuries reported for product code 1826 (Storm windows). See Attachment B for the raw injury data from NEISS. Furthermore, all but one of the 56 injuries related to storm windows carried a disposition of “1” indicating the lowest level of severity according to the NEISS Coding Manual: treated and released, or examined released without treatment.

Larson Manufacturing Company continues to support the EPA’s ongoing efforts to develop an Energy Star program for storm windows and panels. As noted in the initial Specification and Framework Document, these products have been repeatedly demonstrated by the U.S. Department of Energy, as well as other groups and organizations, to be a cost-effective means of saving energy. In addition, for those that do not have the financial resources for more expensive alternatives, storm windows and panels provide an additional affordable method of saving money on utility bills as well as increasing the comfort of their homes. We welcome any additional questions or comments, and look forward to reviewing the Draft 1 Specification proposal once it is released.

Regards,



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