

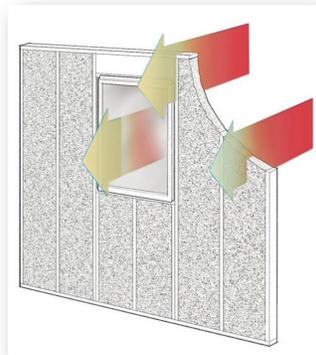
From: [Rolf Jacobson](mailto:Rolf.Jacobson@energystar.gov)
To: windows@energystar.gov
Subject: ENERGY STAR Residential Window, Door, and Skylight Version 7.0 Draft 1 Specification
Date: Monday, August 2, 2021 3:48:36 PM
Attachments: [image.png](#)

As a research member of the University of Minnesota's Cold Climate Housing Program, I fully support the new draft specification for residential Energy Star-certified windows, doors, and skylights.

The new requirements are urgently needed to help the building sector achieve necessary reductions in energy consumption and carbon emissions. The residential window industry is stagnating - rapid performance improvements came about with the adoption of low-e window technology, but have not continued. The market is now saturated with these low-e products while higher performance triple glazed window products and window companies struggle to achieve differentiation.

As residential building codes continue to improve and enclosure R-values continue to climb, it becomes increasingly imperative to address the weak points in the thermal barrier. Currently, windows are the weak points, with an overwhelming impact on the overall energy performance of the enclosure. As shown in the chart below, as wall R-value more than doubles from R-18 to R-39, its overall performance barely improves (increases by only R-4) when standard U-0.3 windows are used. To achieve the high performance enclosures needed in the near future, window performance must be improved in lockstep with wall performance, or substantial investments in R-value are largely wasted.

Window 15% of Wall Area	Wall R-Value with Windows w/Variied Wall Insulation Levels			
	U-Value	R-0	R-18	R-39
0.30	R-5	R-11	R-15	R-17
0.20	R-5	R-13	R-19	R-23
0.15	R-5	R-14.5	R-23	R-28
0.10	R-5.5	R-16	R-27	R-34



Sources:

"Holes in the Wall: To Improve the Energy Performance of Walls, Look at the Total R-Value,"
 Journal of Light Construction, February 2014;
 Multi-Assembly R-Value / U-Value Calculator – Cascadia Windows and Doors;
 Michael Blasnik Presentation, 2014 ACI Conference

Window manufacturers are quick to point out that triple glazed windows are not cost effective at the current time. This may be true in many markets, but cost-effectiveness will be slow to improve if triple glazed windows stay at their current low market share (2-3%). Jumpstarting the triple glazed window market with an Energy Star label that actually differentiates them from much lower performance double glazed windows will help increase their market share, bringing down costs. Importantly, there are current, readily-available technologies (such as

the "thin triple" IGU) that can help manufacturers achieve economical production of triple glazed windows for only a marginal increase in cost - if there was an adequate market stimulus, such as provided by Energy Star certification. An Energy Star label that differentiates triple glazed windows from the rest of the standard double-glazed, low-e window market is needed now to help break through this cost impasse.

Thank you for the opportunity to provide comments.

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