

Triple-Pane Windows with a U-Factor of 0.22 A Better Builder Value?

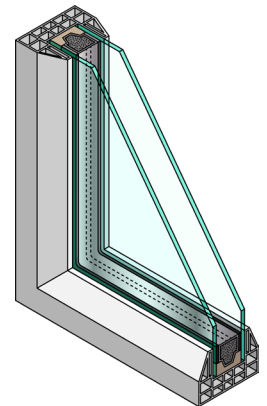
Recent advancements in triple-pane window technology have resulted in the broad availability of American-made windows with a U-Factor of ≤ 0.22 from most major manufacturers¹. These triple-pane windows deliver greatly improved energy performance without the added weight and thickness of early designs at prices close to double-pane windows.

Triple-pane windows use the same glazing unit dimensions as double-pane windows. Triple-pane windows are a 40% more energy efficient² drop-in substitute to double-pane, Low-E windows with a U-Factor of 0.30. This is without any changes to how the window is framed, installed, or trimmed.

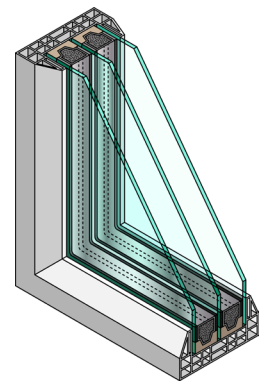
These triple-pane windows meet the new ENERGY STAR[®] version 7 requirements³ for the Northern Climate Zone that go into effect in October 2023. Most models will also meet the ENERGY STAR Most Efficient specification of U-Factor ≤ 0.20 . Triple-pane windows make for an economical code trade-off or upgrade option for addressing envelope heat loss targets.

ACHIEVING ENERGY CODE COMPLIANCE WITH BETTER WINDOWS

Triple-pane windows offer a lower or equivalent cost option for meeting energy code or above-code certification program requirements without the labor and installation complexity associated with reducing air infiltration or adding envelope insulation. The following table shows a comparative added cost⁴ of two different ways to build a more energy-efficient home, based on a 2,300 square foot home with 24 windows.



Double-pane window



Triple-pane window

	Option 1			Option 2
	Double-Pane Window	Rigid Foam	Furring Strips for Rain Screen	New Triple-Pane Window
Material Cost	\$9,209/building	\$1,971/building	\$333/building	\$11,554/building
Installation Costs	\$6,000/building	\$8,000/building		\$6,000/building
Total Costs	\$15,209/building	\$10,304/building		\$17,554/building
Grand Total	\$25,513/building			\$17,554/building

*Estimated \$250/window installation cost

¹ <https://www.energy.gov/>

² Manufacturers include: Milgard, PlyGem, Prime, Pella, and Marvin


³ https://www.energystar.gov/sites/default/files/asset/document/ES_Residential_WDS_V7_Final%20Specification%202022.pdf


⁴ Cost estimates based on a case study from the Habitat for Humanity Bend/Redmond at their 27th St. Townhomes project

While each home must uniquely qualify for the 45L tax credit for energy-efficient homes, tax credit modeling reveals that a substantial amount of the needed efficiency improvement above the 2021 Washington State Energy Code is achieved by using triple-pane windows.

Benefits and attributes include:

 **Weight**
Installer interviews indicate no change or added difficulty in installation practices.

 **Experience**
In the Northwest, large national builders, regional green builders, and non-profit low income builders use triple-pane windows in single-family and multifamily construction.

 **Durability**
Triple-pane windows must meet the same ASTM E2190 durability requirements as double-pane windows.

 **Comfort**
Triple-pane windows are substantially quieter, warmer in the winter, and cooler in the summer than double-pane windows.

 **Availability**
Most major U.S. manufacturers offer triple-pane options on most of their product lines and lead times are on par with double-pane windows.

 **Condensation**
Triple-pane windows are less likely to show condensation and are excellent choices for high humidity spaces such as bathrooms and kitchens.

TAX CREDITS AND INCENTIVES

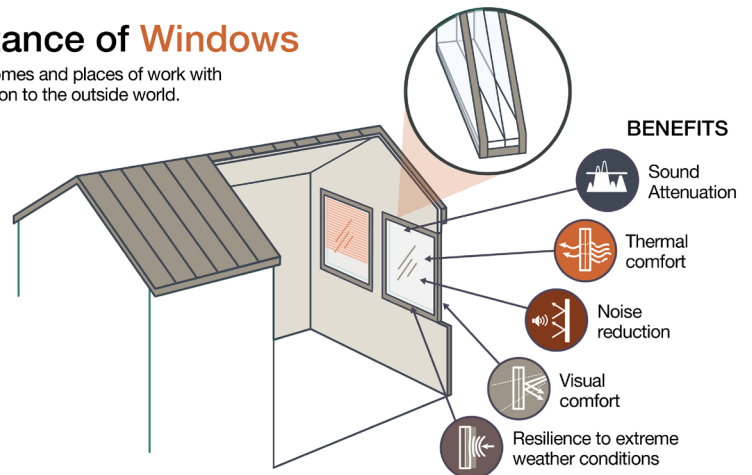
Triple-pane windows are approximately the same added cost as insulation and ventilation options and provide additional comfort benefits. Each of these approaches can be used to either meet minimum code requirements or potentially qualify for a federal tax credit of \$2,500 for energy-efficient homes built to ENERGY STAR standards⁵. A \$5,000 incentive is available if the home is built to the U.S. Department of Energy's Zero Energy Ready Home Program standards⁶. In addition to 45L tax credits, many utilities offer incentives for homes that participate in an above-code certification program such as ENERGY STAR Certified Homes, EarthAdvantage™, Home Energy Rating System, BuiltGreen™, PassiveHouse™, or LEED for Homes that use a third-party verifier.

The Importance of Windows

Windows provide our homes and places of work with light, view, and connection to the outside world.

ENERGY USE

- 25%** of heating and cooling energy use
- 10%** of total building energy use
- 8%** of envelope area, but
- 45%** of envelope heat transfer



Please contact Greg Lasher to learn more about incentives, the model home grant, and how your company can help NEEA recruit local manufacturing of triple-pane windows.

CONTACT

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BetterBuilt^{NW}

⁵ https://www.energystar.gov/partner_resources/residential_new/homes_prog_reqs/national_page

⁶ <https://www.energy.gov/eere/buildings/zero-energy-ready-home-program>