

SECONDARY WINDOWS: HIGH-PERFORMANCE WINDOWS AT A FRACTION OF THE COST

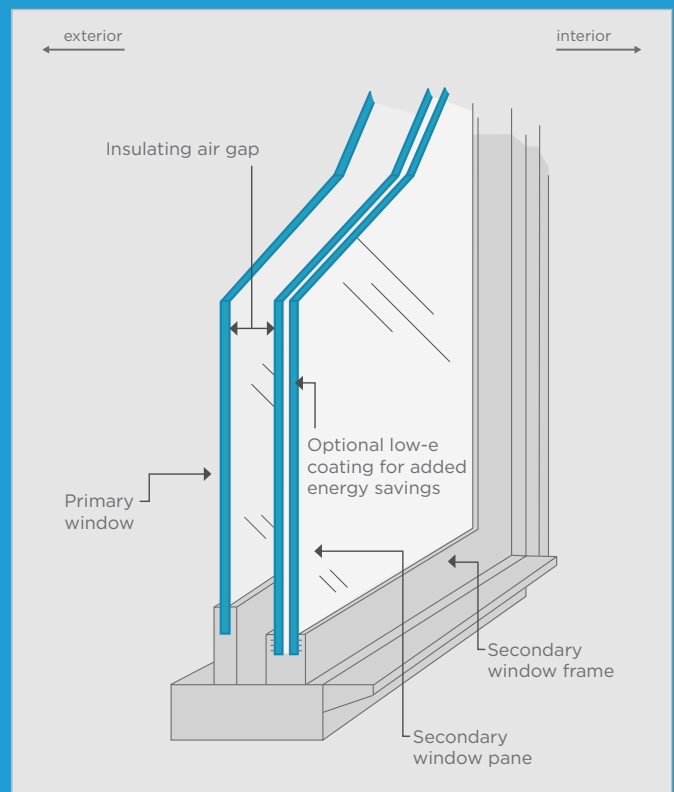
Secondary windows—also known as low-e storm windows, insulating panels, or secondary glazing systems—are a cost-effective, high-performance alternative to full window replacement for commercial buildings with old, inefficient windows. Secondary windows attach to the interior or exterior of an existing (i.e., primary) window to improve occupant comfort, health and wellness, and reduce heating and cooling energy use by up to 20 percent. For as little as half the cost (approximately \$32/sq. ft. installed), secondary windows achieve about the same performance as replacing windows with new high-performance models.

Secondary window products work by creating an insulating pocket of air between the existing and new secondary window that significantly reduces air leakage, outdoor air infiltration and heat transfer. This results in fewer drafts, reduced outside noise, and significant energy savings. The addition of a low-e coating provides increased benefits by allowing daylight through, while reducing unwanted exterior heat gain and interior heat loss. The low-e coating also reduces the glare and fabric deterioration that comes from UV light.



New Haven, Conn. office building with secondary window upgrade

EXAMPLE INTERIOR SECONDARY WINDOW



Note: Secondary window features and pricing vary by product and building application. Check with your manufacturer to determine the best solution based on your existing windows and project goals.

20%

reduction in heating/
cooling energy use

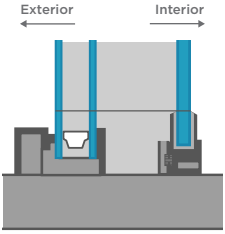
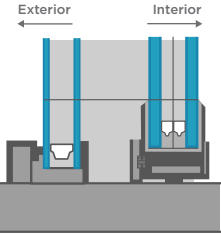
\$32 /sq. ft.

(installed cost;
up to half the cost of
window replacement)

SECONDARY WINDOW PERFORMANCE POTENTIAL

The following performance values are based on simulations using actual products conducted by the Attachments Energy Rating Council's (AERC) simulators. These performance values reflect both a single-pane secondary window and a double-pane secondary window. In both cases, the secondary windows have an aluminum frame and are attached to an existing, double-pane window.

Baseline Performance		
<i>U-Value</i>	0.68	0.68
<i>SHGC*</i>	0.67	0.67
<i>VLT**</i>	0.71	0.71

Secondary Window Performance				
	Single-Pane Secondary Window	Double-Pane Secondary Window		
<i>U-Value</i>	0.53	0.24		
<i>SHGC</i>	0.38	0.34		
<i>VLT</i>	0.51	0.47		

*Solar Heat Gain Coefficient

**Visible Light Transmission

APPLICATION AND OPTIONAL UPGRADES

Secondary window products work best in existing buildings with single- or double-pane windows without low-e coating or tint. Providing a range of benefits that can enhance a variety of commercial building types and functions, secondary windows are particularly suited for building types for which tenant comfort and noise reduction are essential (e.g., offices, hotels and hospitals).

Secondary window solutions can incorporate a wide range of optional upgrades, including:

► **Low-E (Low Emittance)**

A thin, colorless coating that is applied to existing window glass to improve energy efficiency.

► **Vacuum Insulated Glazing**

A thermal-efficient and sound-insulated solution that seals the space between the existing window and the secondary window.

► **Electrochromic Glazing**

An electronically tintable window glaze that can be controlled by occupants or building managers. Also known as "smart glass" or "dynamic glass."



Additional resources, including case studies, research and a forthcoming cost calculator tool, can be found at: betterbricks.com/solutions/windows/secondary-windows.