Get Attached: Efficient Window Solutions for Better Buildings

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Agenda

- Window attachment overview + benefits
- Secondary glazing systems
- Low-e storm window attachments
- Product & installation information
- Opportunities + resources

WINDOW ATTACHMENTS OVERVIEW



What are window attachments?



Secondary glazing systems

Shading devices

Blinds

Storm windows

Lower costs and energy use



- Lower upfront costs
- Lower monthly operating costs
 - (energy savings)
- Reduce heating and cooling loads
- Lower peak heating and cooling demand

Facility Energy Planning / Existing Building Renewal

- Building Optimization
- Energy Conservation Measures (Tier 1 ECMs: ROI<10 yrs)
- Energy Conservation Measures (Tier 2 ECMs: ROI>10 yrs)



Improve comfort, health and wellness



- Minimize drafts and increase comfort
- Reduce glare and noise
- Improve health and wellness
- Reduce UV deterioration of furnishings
- Improved thermal and visual comfort

Improve comfort, health and wellness

Existing High Rise Perimeter SpaceTemperatures (Seattle)



Attachments Energy Rating Council

Rates, labels and certifies the energy performance of window attachments

- Independent, public
 - interest organization
- DOE-funded
- 38 members
- Enrollment now open for product ratings





SECONDARY GLAZING SYSTEMS



Secondary Glazing Systems (SGS)

50%

the cost of existing window replacement

- Medium-to-large commercial buildings with fixed windows (20,000 sq. ft. or more)
- Buildings constructed before 1995 without low-e coating on windows
- Office, lodging, hospital, and historic buildings

How it works

- Attaches to inside of existing window
- Creates insulating air pocket
- Reflects unwanted solar heat gain, interior heat loss
- Installed by contractor in fraction of time as window replacement



Sill Section View

Lower energy use

SIMPLIFIED ENERGY SAVINGS CALCULATOR SECONDARY GLAZING SYSTEMS (SGS)				
Ver. 3_beta			5/7/2018	
Annual Electric Energ	536,721			
Annual Natural Gas Ei	nergy Savings, therms/	/yr 🗕 🛶	57,180	
Information About Your Building Location		Information Abou	Information About Your Building	
Project Location (State)	Washington	Building Area, Sq.Ft.	278102	
Project Location (City)	Seattle	No. of Floors	12	
			Built-up VAV with	
Electric Utility	SCL	HVAC System Type	hydronic reheat	
Natural Gas Utility	PSE	Dominant Heating Fuel	Natural Gas	
Location HDD (Base 65)	4,800	Annual Operating Hours	5500	
Location CDD (Base 65)	116			
Information About Your Proposed SGS Project				
Information About Your Building		Type of SGS Analyzed	Double	
Electric Rate, \$/kWh	\$ 0.08	Sq.ft. of SGS Installed	45504	
Natural Gas Rate, \$/therm	\$ 0.75	SGS Sq.Ft Limit (Max.)	109,608	
Savings Output				
Heating, kWh/SF	-	Electric Savings, kWh/yr	536,721	
Cooling & Fans, kWh/SF	11.80			
Heating, therms/SF	1.26	Gas Savings, therms/yr	57,180	
Electric Cost Savings, \$/yr	\$ 42,938	Total Savings, kBtu/SF-yr	27.15	
Gas Cost Savings, \$/yr	\$ 42,885	Total Savings, \$/yr	\$ 85,822	



Lower peak heating and cooling demand



17%

average first-cost savings on HVAC downsizing resulting from windows upgrade

Comfort improvements



Thermal Comfort

Reduces solar gain Improves building insulation Reduces perimeter zone infiltration Moderates interior glass temperature



Visual Comfort

Preserves outside views Reduces need for blinds/shades Effectively increases daylight



Acoustic Comfort

Reduces exterior noise transmission

Building improvements



Reduce furnishing deterioration



Modernize building



Reduce maintenance

CASE STUDY: 195 CHURCH STREET



Office Building

Location: New Haven, CT Built: 1974 Size: 18 stories / 224,000 SF Upgrade: secondary glazing systems, LED lighting

- Installed VAV with electric reheat
- 29% energy savings, 19% from SGS
- \$203,000 saved per year
- 21% increase in hours windows are predominantly open

Manufacturers

THERMOLITE WINDOW SYSTEMS



WINDOW AND WALL SYSTEMS



WINDOW RETROFIT SYSTEM





LOW-E STORM WINDOW ATTACHMENTS



Low-E Storm Window Attachments



- Small commercial buildings with fixed or operable windows (20,000 SF or less)
- Retail, office, lodging, residential care, and historic buildings
- Attach to interior or exterior

How it works

- Attaches to inside or outside of existing window
- Low-e coating
- Creates insulating air pocket
- Reflects unwanted solar heat gain and interior heat loss
- Self-installation with a few basic tools



PROJECT EXAMPLES: LARSON









3 Military base Hattiesburg, MS

1

4

Historic courthouse Brigham City, UT



Manufacturers











PRODUCT INSTALLATION / APPLICATION



Secondary glazing vs. low-e storm windows

	Secondary Glazing Systems	Low-E Storm Windows
Medium-large buildings (>20k SF)	•	
Small buildings (<20k SF)		•
Operable		•
Interior attachment	•	
Exterior attachment	•	•
Low-e coating	•	•
Flexibility with self-installation		•

Installation

1

2

Building, structural assessment

Measurement and site prep

3 Installation

OPPORTUNITIES & RESOURCES



Bundle, rebate and save



Bundle with lighting and/or HVAC upgrade to maximize comfort and savings



Check with your utility about pay-forperformance incentives

Strategic Facility Planning



Secondary glazing system upgrades

can be a Solid Tier 1 Energy Conservation Measure

Regional Technical Forum

Commercial secondary glazing systems – status

- Category: Planning
- Status: Active
- Sunset date: Nov 30, 2021
- Research strategy developed



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- HVAC
- SEM
- Lighting

- Benchmarking
- Integrated design
- Building operations

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BetterBricks BetterBricks.com/solutions/windows

Attachments Energy Rating Council (AERC) aercnet.org/resources/window-attachments

