

*Use of Energy-Control Window Films in
LEED Certification and Energy Star
Building Ratings*



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Why consider window films ?

On average: 1/3 of a building's cooling load is due to solar heat gain through the building's windows



Why consider window films ?



Over 75% of windows are “energy-inefficient” – doing little to reduce solar-heat gain:

Single-pane clear
Dual-pane clear
Single-pane tinted

Source: DOE BED 2006



Window Film Used by ESCOs and NAESCO Member Companies

- Johnson Controls
- Siemens
- Honeywell
- NORESKO
- Chevron Energy Solutions
- Trane
- TAC
- Sempra

What is Window Film?

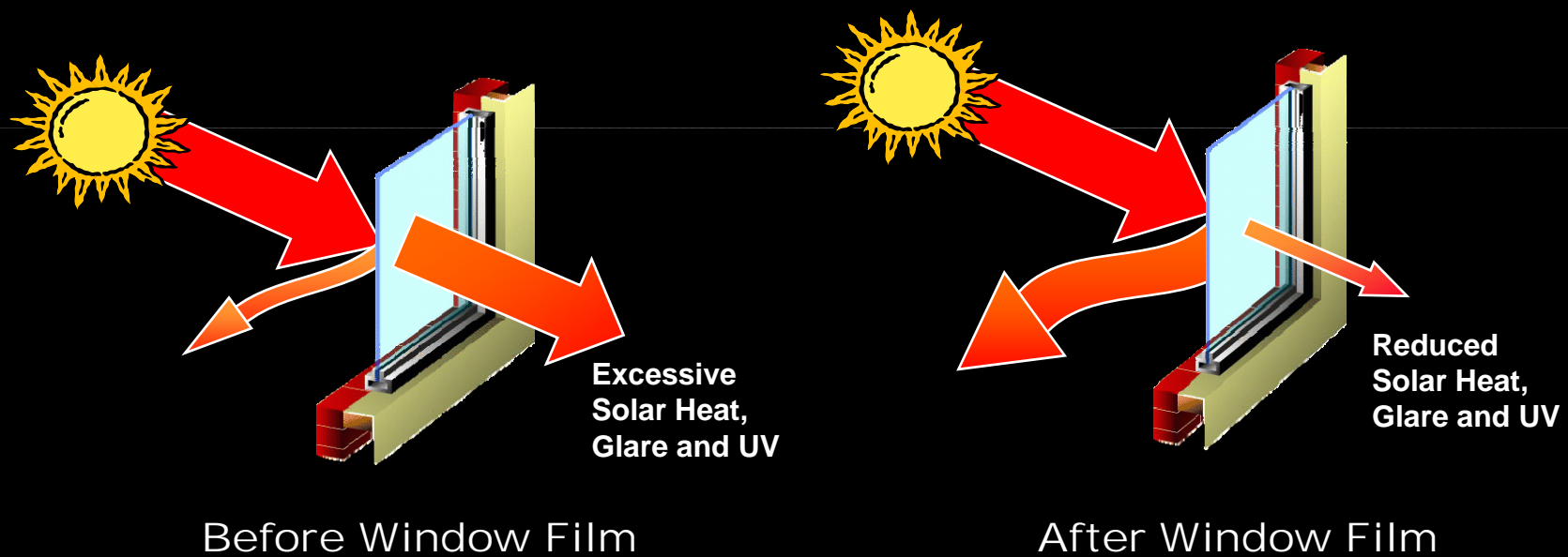


- Clear Polyester Film Base
- Sputtered or Metalized Coating applied to film instead of to glass (as done with energy efficient windows)
- Scratch resistant coating on room side
- Adhesive backing on glass side

Film Today vs. 1980's Technology

- More product choices available – not just silver reflective
 - Metallic alloys – various color options, reduced reflectance, pleasant neutral-gray appearance
 - Low-e films with as much as 30% improvement in insulating performance for improved cooling savings and often heating season savings
 - Ceramic coatings - reduced reflectance
 - Spectrally-selective products - high visible light transmission, low visible reflectance, good heat rejection
- Advances in adhesives technologies – no loss of film adhesion to glass
- 99%+ UV Blockage – improved product longevity and occupant protection

How Energy-Control Window Film Saves Energy



Saving Energy Using Window Films

- **Reduced Solar Heat Gain:**
 - Reduced Cooling Load
 - Lower Peak KW Demand
 - Reduced kwhr energy usage for a/c
- **Low-E Insulating window films:**
 - Reduce Solar Heat Gain
 - Improve insulation value of window glass
(as much as 30%)
 - Added cooling season savings and often heating season savings

Typical Savings and Payback

- Energy Savings of 5% to 10%+
 - Annual electricity costs
 - peak kW
 - kwhr usage
- Simple Payback in less than 4 years in many cases, for well-identified opportunities

"Well Identified Opportunities"



PROJECT OPPORTUNITY CHECKLIST for Energy-Control Window Films

INSTRUCTIONS:

- 1- In Section A choose the one best answer for each of the 6 questions. In Section B choose as many items that apply.
- 2- Add the values obtained for the Sub-Total of Section A and the Sub-Total of Section B and enter the value in the Total Score area.
- 3- Compare the Total Score obtained to the guidelines at the bottom of the page to determine if adding window film to the building is likely to result in substantial energy savings with a reasonable payback period.

For questions concerning this Checklist, contact Steve DeBusk at CPFilms, (276) 627-3234, or steve.debusk@cpfirms.com

If ANY of the following conditions exist, do not proceed further, building will not show good energysavings potential:

- a. Building not air-conditioned, or not in operation during cooling season
- b. Existing windows are highly reflective
- c. Almost all windows have large overhangs (more than 2 ft) at the top of the window that substantially shades window and/or there are trees that shade almost all windows during the cooling season
- d. Majority of windows are triple-pane, even if clear

Section A

	Value	Points for Section A
1- Which is the most common type of window for this building:		
<input type="checkbox"/> Single-pane Clear	30	
<input type="checkbox"/> Single-pane Tinted (Gray, Bronze, Blue, Green, etc..)	15	_____
<input type="checkbox"/> Dual-pane Clear	15	
<input type="checkbox"/> Dual-pane Tinted (Gray, Bronze, Blue, Green, etc..)	0	
2- Type of climate:		
<input type="checkbox"/> Warm Climate - cooling dominated for most of year	15	
<input type="checkbox"/> Moderate Climate - heating and cooling for several months each	10	_____
<input type="checkbox"/> Cool Climate - heating dominated for most of year	5	
3- What is the approximate average cost of electricity?		
<input type="checkbox"/> less than \$0.05 per kilowatt-hour	10	
<input type="checkbox"/> \$0.051 to \$0.10 per kilowatt-hour	15	_____
<input type="checkbox"/> greater than \$0.10 per kilowatt-hour	25	
4- In general, what is the extent of exterior shading, by trees or overhangs on the windows on the South and West exposures?		
<input type="checkbox"/> Minimal or none	10	
<input type="checkbox"/> Moderate - overhangs (2 ft or less) on most of windows and/or less than a majority of windows are completely shaded by trees in cooling season	0	_____
5- Do the windows on the South and West exposures (including SE and SW facing windows) comprise about half, or more, of the building's windows?		
<input type="checkbox"/> Yes	10	_____
<input type="checkbox"/> No	0	
6- Does the building exterior have a "substantial" amount of glass meaning a "window area to wall area ratio" of 20% or more? (Most important for South, Southwest and West facing windows)		
<input type="checkbox"/> Yes	10	_____
<input type="checkbox"/> No	0	
Sub-Total Section A:		_____

Section B

Add 5 points for EACH of the items below that apply:

- Larger project (> 20,000 sqft windows)

Subtract the points indicated for items below that apply:

- Prevailing labor wages apply (- 5 points)

Window Film Warranties and Maintenance

- Most film manufacturers warrant products for 10-18 years commercial (materials and labor)
- Typical product life 20+ years
- Maintained with normal window cleaning methods and solutions

LEED Certification

Window Film helps buildings qualify for up to 7 LEED Points:

- Optimizing Energy Performance (1-3 pts)
 - Improved Energy Star Portfolio Manager Ratings
- Light Pollution Reduction (1 pt)
- Improving Thermal Comfort (1 pt)
- Providing Daylighting and Views (1-2 pts)

LEED Optimize Energy Performance & Building Energy Star Labeling



LEED for Existing Buildings: Operations & Maintenance Registered Project Checklist

Yes	?	No			30 Points
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Energy & Atmosphere		
<input checked="" type="checkbox"/>			Prereq 1	Energy Efficiency Best Management Practices	Required
<input checked="" type="checkbox"/>			Prereq 1	Minimum Energy Efficiency Performance	Required
<input checked="" type="checkbox"/>			Prereq 1	Refrigerant Management, Ozone Protection	Required
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Credit 1	Optimize Energy Efficiency Performance	1 to 15
				ENERGY STAR Rating: 65 / Alternative Score: 15% Above Nat'l Average:	Required
			Credit 1.1	ENERGY STAR 67 / Alternative Score: 17% Above Average	1
			Credit 1.2	ENERGY STAR 69 / Alternative Score: 19% Above Average	2
			Credit 1.3	ENERGY STAR 71 / Alternative Score: 21% Above Average	3
			Credit 1.4	ENERGY STAR 73 / Alternative Score: 23% Above Average	4
			Credit 1.5	ENERGY STAR 75 / Alternative Score: 25% Above Average	5
			Credit 1.6	ENERGY STAR 77 / Alternative Score: 27% Above Average	6
			Credit 1.7	ENERGY STAR 79 / Alternative Score: 29% Above Average	7
			Credit 1.8	ENERGY STAR 81 / Alternative Score: 31% Above Average	8
			Credit 1.9	ENERGY STAR 83 / Alternative Score: 33% Above Average	9
			Credit 1.10	ENERGY STAR 85 / Alternative Score: 35% Above Average	10
			Credit 1.11	ENERGY STAR 87 / Alternative Score: 37% Above Average	11
			Credit 1.12	ENERGY STAR 89 / Alternative Score: 39% Above Average	12
			Credit 1.13	ENERGY STAR 91 / Alternative Score: 41% Above Average	13
			Credit 1.14	ENERGY STAR 93 / Alternative Score: 43% Above Average	14
			Credit 1.15	ENERGY STAR 95+ / Alternative Score: 45%+ Above Average	15

5 – 10%
Energy
Savings
Worth
1-3 points



Light Pollution Reduction

- Films reduce light transmission through windows by 20-90%, so films will also reduce transmission of artificial light to outdoors at night.
- Most popular films reduce light 40-50%
- Most likely will need additional measure(s) to reach required 90% reduction for LEED point.

Improved Thermal Comfort

- Typical comments following film installation:
 - “Its so much more comfortable in here”
 - “How did you make the air conditioning work better by adding window film?”
 - “Now we don’t have to freeze the people on the North/East side of the building to make us comfortable on the South/West side”
 - “My complaints about people being too hot or cold have been reduced 95% - Thank you!”

Provide Daylighting and Views

Before Film

- Blinds used 100% of time when sun shines on exposure
- No view to outdoors
- Reduction in sunlight for daylighting

After Film

- Blinds used rarely
- Views to outdoors almost all the time
- Increase in sunlight for daylighting

Energy Star

- **Lack of awareness regarding films through Energy Star** - as currently window films are not Energy Star Qualified Products
- Window Film Industry working towards Qualified Status
- Required National Fenestration Rating Council (NFRC) Certification, and currently CPFilms is the only Certified window film manufacturer
- Energy Star requires more than one manufacturer to be eligible for qualified status on a product



Summary – Energy Control Window Films

- Excellent potential to enhance LEED Certification efforts using energy-control window films (**assistance with up to 7 points**).
- Product significantly improves Energy Star Building Rating (**with 5-10% annual energy savings**).

Questions / Comments

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