PILKINGTON
NSG Group Flat Glass Business

Technical Information

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GLAZING CHOICE CAN AFFECT FADING OF HOME FURNISHINGS

The glazing industry placed much emphasis on the Ultraviolet (UV) transmission of glass relative to a glazing's ability to reduce fading damage in home furnishings. Although UV radiation is the major contributor to the fading of most interior fabrics, other factors such as temperature, humidity, and even visible light can play significant roles. Two major concerns arise when a simplistic approach of equating fading to UV transmittance is used.

First, there is not a single industry standard for calculating UV transmittance (T-uv). One of the most common methods of reporting T-uv defines UV energies as ranging from 300 to 380 nanometer wavelengths. This method is included in the Lawrence Berkeley Laboratory's Window 5.2 performance calculation software. Other methods of reporting T-uv (300 to 400 nm) are sometimes used which result in very different values for the same glazing, making comparisons impossible.

A second concern is that T-uv, no matter how it is defined, is responsible for only a portion of the total fading damage witnessed in home furnishings. Lawrence Berkeley Laboratory's Window software addresses this fact by defining a damage weighted transmittance (Tdw-ISO). Tdw-ISO considers that wavelengths from 300 to 600 nanometers, well into the visible light range, contribute to material fading.

Pilkington North America, Inc. research provided an excellent opportunity to check how accurately Tdw-ISO predicts fading. Hundreds of fabrics were evaluated after extended exposure behind Pilkington North America, Inc. Blue-Green and Pilkington **EverGreen™** glasses. The testing determined that on average, Pilkington **EverGreen™** glass reduced fading damage by approximately 40% compared to Blue-Green. The testing showed that Tdw-ISO is a better predictor of fading than T-uv.

Actual Fabric Tests show that Pilkington **EverGreen** glass reduces fading by 40% compared to Blue-Green glass. By comparison, the computer calculated T-dw values predict a 36% reduction in fading.

Monolithic Glass (6mm)	T-uv (300-380)	Tdw-ISO (300-600)
Blue-Green	32%	64%
Pilkington **EverGreen™**	14%	48%
Percent Change	56% Reduction	25% Reduction

The T-uv and Tdw-ISO were calculated using the LBL Window software for all 6mm thick Pilkington North America, Inc. monolithic products. Note that a clear laminate consisting of two pieces of 3mm clear glass and 0.030" clear Solutia pvb was included for comparison.

Calculated T-uv and Tdw-ISO values.		
Monolithic Glass (6mm)	T-uv (300-380)	Tdw-ISO (300-600)
Clear	63%	81%
Pilkington **Energy Advantage™** Low-E	49%	71%
Blue-Green	32%	64%
Clear Laminate	0%	62%
Grey	21%	40%
Bronze	24%	44%
Pilkington **EverGreen™**	14%	48%
Pilkington **Eclipse Advantage™** Clear	30%	53%
Pilkington **Eclipse Advantage™** Blue-Green	16%	43%
Pilkington **Eclipse Advantage™** Grey	10%	25%
Pilkington **Eclipse Advantage™** Bronze	11%	27%

The final table contains T-uv and Tdw-ISO data calculated using LBL Window software for some typical insulating glass units used in residential windows.

Calculated T-uv and Tdw-ISO values for several window glazing configurations		
Insulating Unit (3mm glasses)	T-uv (300-380)	Tdw-ISO (300-600)
Clear / Clear	60%	74%
Clear / Pilkington **Energy Advantage™** Low-E (E=0.15)	50%	65%
Clear / Soft-coat Low E (E=0.08)	23%	62%
Clear / Soft-coat Low E (E=.04)	14%	52%
EverGreen / Pilkington **Energy Advantage™** Low-E (E=0.15)	18%	48%
Clear / HM88 / Clear	1%	53%

Note that although the Southwall Heat Mirror product has near zero T-uv (300-380), it's T-dw of 53% indicates it allows more of the damaging wavelengths of energy to pass than through a window constructed with Pilkington **EverGreen™** glass plus Pilkington **Energy Advantage**™ Low-E glass.

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