



Technical Bulletin

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GLAZING CHOICE CAN AFFECT FADING OF HOME FURNISHINGS

Summary

The glazing industry placed much emphasis on the Ultraviolet (UV) transmission of glass relative 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 6 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 (T_{dw-ISO}). T_{dw-ISO} considers that wavelengths from 300 to 600 nanometers, well into the visible light range, contribute to material fading.

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Coating Impact on Tuv and Tdw-ISO values

The following Tuv and Tdw-ISO values were calculated using the LBL Window software for 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 Tuv and Tdw-ISO values. Monolithic Glass (6mm)	Tuv (300-380)	Tdw-ISO (300-600)
Pilkington Optifloat™ Clear	63%	81%
Pilkington Energy Advantage™ Low-E Glass	49%	71%
Pilkington Optifloat™ Blue-Green	32%	64%
Clear Laminate	0%	62%
Pilkington Eclipse Advantage™ Clear	30%	53%
Pilkington EverGreen™	14%	48%
Pilkington Optifloat™ Bronze	24%	44%
Pilkington Eclipse Advantage™ Blue-Green	16%	43%
Pilkington Optifloat™ Grey	21%	40%
Pilkington Eclipse Advantage™ Grey	11%	27%
Pilkington Eclipse Advantage™ Bronze	10%	25%

Glazing Selection

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

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Insulating Unit (3 mm glass / 13 mm air space / 3 mm glass)	Tuv (300-380)	Tdw-ISO (300-600)	Visible Transmission
Clear / air / Clear	67%	78%	83%
Clear / air / Generic Soft-coat Low E (E=0.08)	37%	66%	79%
Clear / air / Pilkington Energy Advantage™ Low-E Glass (E=0.15)	55%	70%	77%
Clear / air / HM88 / air / Clear	1%	52%	73%
Clear / air / Generic Soft-coat Low E (E=.04)	17%	55%	72%
EverGreen / air / Pilkington Energy Advantage™ Low-E Glass (E=0.15)	20%	49%	65%
Pilkington SuperGrey™ / air / Clear	5%	18%	22%

Note that although the single glazed clear laminate, and the Southwall Heat Mirror HM88 product have near zero T-uv (300-380), their Tdw values of 62% and 52% respectively show they allow more of the fading causing wavelengths of energy to pass than through a window constructed with Pilkington **EverGreen™** plus Pilkington **Energy Advantage™** Low-E Glass.

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