

Illumination

The measure of the brightness of light is typically either in units of lux or footcandles. One footcandle equals approximately 10.76 lux. For this paper we will use lux as our unit of measure.

A discussion of illumination must begin with a discussion of human perception of brightness of light. The human eye does not perceive brightness linearly. At extremely low light levels a doubling in the level of illumination is perceived as dramatic, while at higher light levels it may not be noticeable at all.

To illustrate this, consider the following illumination levels:

Full moon at night: 1 lux
Very dark day: 10 lux
Living room: 50 lux
Office: 500 lux
Supermarket: 750 lux
Overcast day: 1000 lux
Full daylight: 25000 lux
Direct Sunlight : 130000 lux

The SkyShield has been tested and found to cause approximately 20-30% reduction in light permitted through depending upon a wide variety of factors. By comparison, under the same conditions, a typical window screen causes 35-40% reduction in sunlight.

It can be seen from the examples above that the difference between supermarket light levels and full daylight is such that the reduction in light is inconsequential. This is why no one complains that window screens cut the light too much – the light permitted is still more than adequate for illumination purposes.

Additionally it should be noted that supermarkets do not rely on skylights primarily for illumination, needing to ensure adequate lighting at night and cloudy days. Perhaps the primary benefit of natural light is the effect that natural light has on color perception. Artificial lighting is typically dominant towards one color which causes colors of items on display to look “off”. The full color spectrum of natural light overcomes the deficiencies in the color spectrum in artificial lights. Skyshield certainly allows adequate light through to take advantage of this effect.

The perhaps unconsidered benefit of SkyShield is that while the partial blocking of the sun does not dim the available light that anyone would notice, it will however have a full effect on blocking heat transfer through the skylight due to solar transmittance to the same degree it blocks the sunlight. This will result in lower cooling bills during the summer months in hot climates.

In summary, in addition to the prevention of losses due to damage, the SkyShield will not cause unacceptable dimming of natural light but will have the benefit of lower cooling bills