

TB 1.1 Interesting facts about UV protection

Solar protection film

Solar protection films can significantly reduce the three factors of heat, visible light and especially UV light being considered the most effective products on the market to reduce fading of materials. They are available in different types such as transparent, tinted, reflective and semi-reflective and are available in different colors and shades. However, no sunscreen product can completely stop fading! Nevertheless, a sun protection film offers maximum protection from UV radiation, heat and sunlight.

UV radiation and UV filter

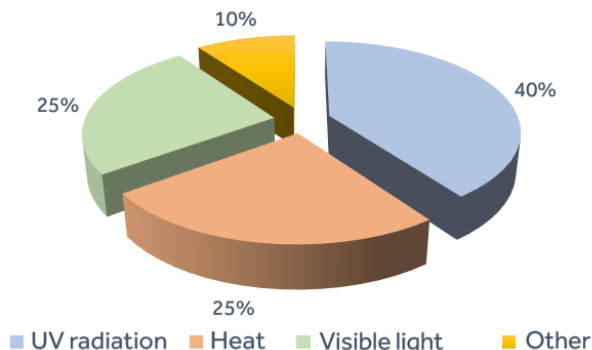
Solar protection films contain UV filters that almost completely absorb the ultraviolet radiation penetrating through windows and glass doors and counteract the fading of objects due to solar radiation. These UV absorbers are integrated in the adhesive system and/or in the polyester film, in the case of exterior films, in the scratch-resistant coating, and not only protect objects inside the room from UV radiation, but also protect and stabilize the film itself from UV radiation. To further combat discoloration, fading or solar heat, the artificial light sources must be checked after installation of the solar protection film and adjusted if necessary.

Factors for fading

In addition to UV radiation, visible light (especially in the violet and blue range) has a strong influence on the fading of floors, carpets and other furnishings in living and working areas. A sunscreen film can extend the color fastness of items exposed to sunlight many times over, but it is not only sunlight that causes fading.

The following factors are jointly responsible for fading:

- UV Radiation
- Visible light
- Heat
- Humidity
- Chemical vapors
- Age of the material
- Quality of the material
- Light fastness of the material
- Infrared
- Environmental influences



Heat impact

Various types of transparent glass block 13 to 29% of total solar radiation, solar control film can reduce total solar radiation up to 85%.

Reflections and shadow

It is not only direct sunlight that causes fading!

UV rays can be reflected from solid material such as buildings, roads and trees, as well as from other surfaces such as water, snow, etc., thus even doubling the UV radiation. For this reason, even shaded business premises can have problems with fading. Therefore, human skin in the shade must also be protected from sunburn.

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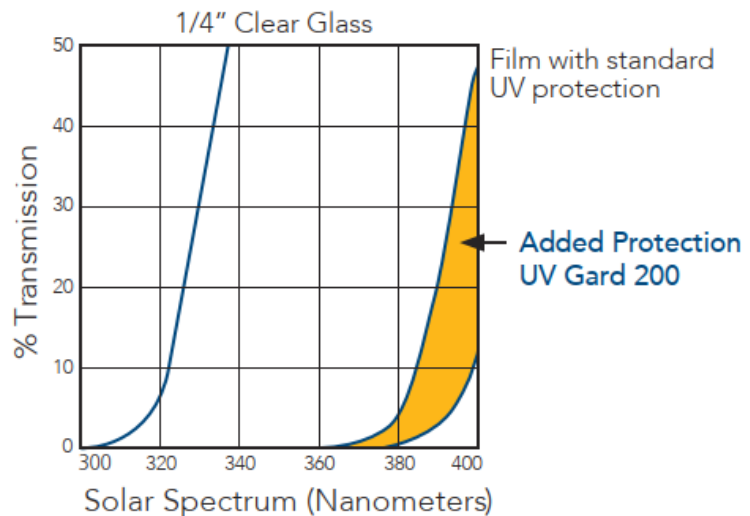
Wavelength

Clear, simple flat glass (3 to 6 mm) filters only 23 to 28% of UV radiation, insulating glass is somewhat more effective and reduces 36 to 42%. Solar control films block 98 to 99% of UV solar radiation, but only in the wavelength between **280 and 380 nanometers**. Depending on the molecular structure, there are also materials with photochemically critical properties that nevertheless react very sensitively to radiation in the **380 to 405 nanometer** range (even behind a sunscreen film).

Here is an exemplary compilation:

- 385 nm Modern paints with organic pigments
- 385 nm Modern binders (in interior applications)
- 385 nm Untreated wood components
- 385 nm Plastics with UV stabilizers (in interior application)
- 385 nm Paper (based on rags)
- 395 nm Historic binders and textiles
- 400 nm Pigments in untreated wood
- 400 nm Historic inks
- 400 nm Historic paints with organic pigments
- 405 nm Protein structures and protein pigments (e.g. leather, skin, hair, feathers)
- 405 nm plastics without UV stabilizers
- 405 nm pigments in historical textiles

For the best possible UV protection even in the higher nanometer range, special products are required that are effective in the extended wavelength range. A recommended product for this is for example MADICO UV Gard.



Guarantee and warranty

Information on physical and chemical properties is based on reproducible investigations, knowledge and experience in practice, which we consider to be reliable and, however, does not constitute a guarantee for the future. All data and information are to the best of our knowledge and are based on measurements and experience and are to be regarded as guide values. They do not release the processor from the obligation to carry out his own checks and tests to determine whether the material is suitable for the intended use. Due to the abundance of possible influences during processing and application, own tests are essential. Our products are subject to continuous quality control and further development. We therefore reserve the right to adapt the chemical composition or physical properties to new findings without prior notice and without providing additional information. All questions of warranty and liability are governed by our valid General Terms and Conditions. Errors and omissions excepted.