

# Medicine Meets Engineering: Should We Prescribe Tinted Windows? If So, When?

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## Abstract

The vast majority of photodermatoses are exacerbated by light in the ultraviolet (UV) range. Tinted windows may be appropriate for dermatoses induced by visible light (PMLE, solar urticaria), but are not photoprotective in dermatoses triggered by UVR including lupus. Dermatologists can recommend commercially available film (laminating) products that block up to 99% of UVR for side and rear auto windows and do not require medical prescription.

## DEAR EDITOR

A recent request from a patient with cutaneous lupus for a prescription for tinted windows prompted a literature search. Although the answer was not easily found, including on the Lupus Foundation website, we identified the following resources and make the following recommendations.

Automobile windows are of 2 glass types: laminated and tempered. Windshields have been made of laminated glass since 1937. Laminated (tri-layer) windows block >95% of UVA and UVB rays, and do not shatter in case of collision.<sup>1,2</sup> Side and rear windows are commonly made of tempered glass, so that they shatter and provide egress in case of collision. They are relatively efficient in blocking UVB, but are not efficient in blocking UVA, filtering only 71% of UVA rays.<sup>1</sup> Each auto window has a stamp in a lower corner, which identifies the type of glass and other specifications such as trademark and glass code.

Tinting of front and side windows is subject to regulations by United States and European Motor Vehicle Safety Standards because tints can create reduced visibility. Furthermore, medical exemptions for window tints require renewable prescriptions that vary by state.

The action spectrum for most photo-exacerbated dermatoses is in the ultraviolet light range (UVR) (100-400nm).<sup>3</sup> This includes diseases such as juvenile spring eruption, actinic prurigo, hydroa vacciniforme, photoallergy, phototoxicity, pseudoporphyria, and cutaneous lupus.<sup>3,4</sup> The action

spectrum for porphyria cutanea tarda and pseudoporphyria is in the Soret band (400-410nm) and polymorphous light eruption and solar urticaria are in the visible light range (400-700nm).<sup>3</sup>

Tinted films block predominantly visible light and hence do not accomplish the goal of UVR blockage for most patients with photosensitive eruptions.<sup>3</sup> They also carry potential for safety and legal issues. The benefit of window tinting exists in the small percent of patients sensitive to visible light. Such sensitivity can be confirmed by light testing in dermatology clinics. With the benefit of window tint for a small percent of patients with photodermatoses, physicians should consider alternative solutions to protect patients with UVR-induced photo eruptions while driving.

Commercially available film (laminating) products that block up to 99% of UVR are available in nearly clear shades and can be applied after purchase of a vehicle.<sup>2</sup> Products recommended by the Skin Cancer Foundation include 3M™ Automotive Window Film Crystalline™ Series, Eastman Saflex Solar Clear, and Johnson Window Film - Automotive Window Films. Additionally, 3M Crystalline also filters visible light. Such laminates ensure UVR filtration, and are nearly transparent, and as such, do not require renewable prescriptions.<sup>5,6</sup> Many of these clear tints are also available for installation in homes and offices. These measures should not be a substitute for physical sun protection or sun-protective clothing while outdoors.

In sum, windshields are made of laminated glass that already blocks >95% of UVA and UVB light transmission.

Laminating window film products in nearly clear shades for side and rear windows provide optimal augmentation for UV protection in patients with UVR-induced photodermatoses while driving, and do not require prescriptions.

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