

# Protect Eyes from Ultraviolet Radiation All Day, Every Day

**Recent research has found new and unexpected risks to the eyes from the ultraviolet radiation (UVR). Innovative technology from Essilor can help reduce those at risk and protect eyes from UVR 365 days a year.**

**E**yecare professionals know that the cornea, crystalline lens, and even the retina can be damaged by long-term UVR exposure, which has been implicated in a variety of severe ocular conditions, including pterygium, climatic droplet keratopathy, cortical cataract, and possibly age-related macular degeneration. And scientific studies have found UVR dangers that were previously unknown.

Fortunately, Essilor scientists have found an effective way to counter these hazards, and patients can now buy lenses that give them the most complete protection from UVR 365 days a year. What we need going forward is greater public awareness of the dangers of UVR and more widespread adoption of UVR-protective lenses.

## Indirect Risks

One thing we have learned is that UVR risk to the eyes isn't greatest when the sun's energy is strongest. Because they are set into the orbit and protected by the upper lid, the eyes are shielded from direct sunlight when the sun is high in the sky, which is when it causes most damage to the skin. For the eyes, the risk is greatest when the sun is a bit lower in the sky—in mid-morning and mid-afternoon—times when people are less likely to wear sunglasses.<sup>1</sup> Thus, the need for UVR protection is not limited to sunglasses: people need UVR protection in every pair of lenses they wear outside.

Direct UVR exposure is not the only danger. Indirect UVR (that is scattered by clouds and reflected from the ground and other surfaces) actually accounts for nearly half of an individual's annual UVR dose.<sup>2</sup> This UVR is a particular threat to spectacle wearers because UVR coming from the side and behind the wearer can be reflected into the eye by the back surface of the spectacle lens. Although most higher-quality lens materials do a good job of blocking UVR *transmission* (ie, stopping UVR from passing through the lens), they can still reflect a significant amount of UVR from the back surface of the lens directly into the eye.

The public is fully aware of the risks associated with skin exposure to UVR, but the ocular

hazards—and how to protect against them—are much less known. The dangers of back surface UVR reflection, for example, are not well known. Eyecare professionals have a key role to play in creating awareness of the importance of maximum eye protection from UVR.

## Technology

Work by Karl Citek, OD, PhD, Professor of Optometry, has established that traditional anti-reflective or No-Glare lenses, although they transmit almost 100% of visible light, actually reflect considerable UVR.<sup>3</sup> Some No-Glare lenses reflect between 10% and 50% (with a mean 20%) of incident UVR.<sup>3</sup>

This important discovery was the stimulus for development of Essilor's Broad Spectrum Technology™ (patent pending),

rate skin care and sunscreen products' efficiency, E-SPF provides consumers and eyecare professionals with a simple way to select the highest level of UVR protection. E-SPF is defined as the ratio of UVR reaching the cornea with and without a lens in place. E-SPF accounts for both transmission and backside reflection of UVR, and higher values of E-SPF indicate greater levels of protection.

Integrating all these factors into a single measure helps eyecare practitioners communicate the importance of ocular UVR protection, and lets them (and their patients) compare the protection offered by different lenses.

Talking to patients about the E-SPF will reinforce the message that UVR protection is every bit as important for eyes as it is for skin. Discussing UVR hazards with every patient as a normal part of the comprehensive eye exam—and recommending glasses

## Superior Visual Clarity and UVR Protection

Essilor's Broad Spectrum Technology (patent pending) minimizes reflected UVR exposure and maximizes visible light transmission for safe, clear vision all day long. Introduced in all Crizal® lenses, Broad Spectrum Technology adds exceptional UVR protection to the features and benefits of all Crizal lenses.



**Crizal**  
**SAPPHIRE** UV™

The most advanced No-Glare lens available, minimizing both front and backside UVR reflections with an E-SPF of 25\* for excellent UVR protection and best-in-class visual clarity with 50% less visible reflections.

**Crizal**  
**AVANCE** UV™

The most durable, scratch-resistant, and dust-repellant No-Glare lens on the market today—now with excellent UVR protection (E-SPF 25).\*

**Crizal ALIZE** UV™

Sets the standard for smudge-resistance and easy cleanability that lasts, plus significantly reduced UVR reflection (E-SPF 25).\*

**Crizal easy** UV™

Provides glare and scratch protection, along with smudge resistance superior to every other standard No-Glare lens, plus significantly reduced UVR reflection (E-SPF 25).\*

**Crizal kids** UV™

Specially designed for kids, this lens comes systematically with Airwear® polycarbonate lens material for eye safety and clarity of vision, plus E-SPF 25.

EVERYDAY

\*with clear 1.5 index plastic, E-SPF of 10.

which reduces UVR reflection. This technology has been incorporated across the entire portfolio of Crizal® lenses, allowing them to offer the most complete UVR protection on No-Glare lenses.

## Clear Patient Benefits

To help patients understand the value of this protection, Essilor developed the Eye-Sun Protection Factor (E-SPF®).

Like the well-established index used to

that provide the most complete UVR protection—are simple and meaningful steps to better ocular health for everyone.

## REFERENCES

1. Sasaki H, Sakamoto Y, Schnider C, et al. UV-B exposure to the eye depending on solar altitude. *Eye Contact Lens*. 2011;37(4):191-5.
2. Baldy C, Greenstein V, Holopigian K, et al. *Light, Sight, and Photochromics*. Pinellas Park, Florida: Transitions Optical Inc. 2002.
3. Citek K. Anti-reflective coatings reflect ultraviolet radiation. *Optometry*. 2008;79(3):143-8.