



Blue Light
Defense Tech

Smart Protection for
the Digital World.

optik **k&r**

What is Blue Light?

Blue light refers to a band of high-energy visible (HEV) wavelengths between roughly 400 and 455 nanometres. These wavelengths are emitted by digital screens, LED lighting, and sunlight, and they are associated with visual fatigue, glare sensitivity, and reduced comfort during extended device use.

Blue Light Protection

Blue Light Protection lenses are designed to meet the visual demands of today's digital environment. While standard UV400 lenses block ultraviolet radiation up to 400 nm, they leave the 400–420 nm violet gap exposed — an area of high-energy light that can contribute to visual discomfort and cumulative retinal stress. This range forms part of the broader HEV Blue Light spectrum (400–455 nm), emitted by digital screens, LED lighting, and sunlight. By selectively reducing these wavelengths, Blue Light Protection lenses help maintain natural colour perception while improving comfort and clarity for screen-heavy wearers. For practices, this creates a clear value proposition: a modern, differentiated solution that aligns with the realities of contemporary visual habits.

Applications



Screen-intensive work

Ideal for individuals who spend long hours on computers, tablets, or smartphones.



Vision-related strain

Supports wearers who experience fatigue, glare sensitivity, or discomfort during extended near-work.



Retinal protection

Provides an added layer of defence against high-energy wavelengths linked to cumulative retinal stress.

Differentiating Factors

- **Percentage of blue light protection** — Measurable reduction of HEV wavelengths, often expressed as total HEV filtration or specific band performance.
- **Effectiveness range** — Targeted protection across key HEV segments, such as 400–420 nm (violet gap) and 425–450 nm (digital-device dominant wavelengths).
- **Method of protection** — Coatings may reduce HEV through reflective technology (surface reflection) or material-based absorption (integrated into the lens substrate).
- **Colour profile** — Subtle variations in residual hue or reflection colour that influence aesthetics, wearer acceptance, and product positioning.



Blue Light Product Comparison Chart

Brand/Model	Material	Coating	Colour	Protection ³ Range 400-420nm	Protection at 420nm	Protection ³ Range 421-450nm	Price
LuxAR ZeroBlue ¹	Yes	Yes	Neutral	96%	80%	32%	\$\$\$\$\$
Blue Barrier ²	Yes	—	Neutral	90%	50%	12%	\$\$
LuxAR Clear Blue ¹	—	Yes	Neutral	94%	70%	32%	\$\$\$\$
LuxAR Blue ¹	—	Yes	Blue reflection	30%	20%	15%	\$\$\$
BluTech® ED	Yes	—	Neutral	94%	70%	40%	\$\$\$\$\$
UV 420 Tint	—	Yes	Yellow	20%	20%	20%	\$

Blue Light Products



LuxAR ZeroBlue combines the Blue Barrier material with the LuxAR Clear Blue front-surface coating to create Optik K&R's most effective blue-light protection system. Blue Barrier absorbs harmful wavelengths while LuxAR Clear Blue reflects them — delivering dual-action filtering with no tint.



Blue Barrier is a built-in HEV-absorbing lens material that filters harmful blue light at the molecular level. The protection is built directly into the lens substrate rather than applied as a surface coating, so it never wears off and remains fully effective for the entire life of the lens. It absorbs UV and high-energy visible light without adding tint, making it ideal for children, heavy device users, and patients who want durable, maintenance-free protection.



LuxAR Clear Blue is a thin-film, vacuum-deposited anti-reflective coating engineered to reflect high-energy blue light while maintaining a completely clear, tint-free appearance. Unlike traditional blue-light coatings, it avoids the yellow cast and is designed for patients who want protection without cosmetic compromise.



LuxAR Blue is an anti-reflective coating that transmits less harmful blue light to help reduce digital eye strain. It features a subtle purple/blue AR hue with a warm yellow undertone, offering visible confirmation of blue-light filtering.



BluTech® ED is a pigment-infused lens material that uses natural ocular pigment and melanin to filter UV and high-energy blue light directly within the substrate, giving wearers durable protection with enhanced contrast, reduced glare, and a warm, natural visual tone. It's designed for patients who want premium visual comfort, improved depth perception, and all-day protection without relying on surface coatings.



UV420 Tint is a short-wavelength-cut tint that absorbs UV and high-energy visible light up to 420 nm, reducing digital eye strain and photochemical stress while maintaining good colour perception. Its subtle visible tint provides reassurance of active filtering and makes it a strong, budget-friendly option for patients who prefer a noticeable blue-light solution.

1. Tested on standard 1.5 index material.

2. Tested on 1.56 index material.

3. Measurements taken from Filmetrics F10 spectrometer using an SS Trans attachment. Inverse of transmittance averaged over range of wavelengths. Data displayed for relative comparison only. Protection may vary by ±4%. Protection equals the inverse of the average transmittance in range.

Benefits of Blue Light Protection



Reduces digital eye strain and visual fatigue during screen use



Supports clearer, more comfortable vision throughout the day



Provides an easy upgrade that helps maintain healthier visual habits

How Materials, Coatings, and Tints Protect Differently

Materials absorb blue light within the lens for built-in, long-lasting protection. Coatings reflect targeted wavelengths from the surface to keep optics clear and colour-neutral. Tints absorb short-wavelength light through visible colour filtering, offering a more noticeable option that reassures patients the lens is actively protecting.

FAQ

Q. Does Blue light protection include UV protection?

A. Yes.

Q. Is HEV light and Blue Light the same?

A. Yes.

Q. What is meant by Wavelength or nm (nanometres)?

A. Light can be described by the colours we see. It can also be described by how it moves through space like a wiggling rope or a water wave. The distance between the peaks (or valleys) is the wavelength of that colour of light. No two colours have the same wavelength.

Q. Why is Blue light considered “High Energy”?

A. Light can be described by the colours we see. It can also be described by how much energy it transmits. Shorter wavelengths have higher energy and can cause more damage. In the case of UV light (400nm) your skin can burn. In the case of green light, there is less harmful energy.

Q. Why is white light not considered a colour?

A. White light is the optical illusion humans perceive when all of the colours enter the eye at the same proportion. Specifically, Red, Green and Blue combine (when equal) to form white.

Q. Why is 420nm so special?

A. Wavelengths (colours) smaller than 420 are not visible to the eye. As such, when they are block or reflected, the lens colour remains neutral. In addition, the High Energy Visible (HEV) light in the range 400 to 420 is the most damaging and the most important wavelengths that should be blocked.

Q. Is it necessary to preserve eye and general health?

A. It's like taking vitamins. If you can afford it, it usually does no harm.

Q. Isn't 400 to 420nm wavelength purple and not blue?

A. Yes. However, the public has been conditioned to refer to HEV light as “blue” rather than purple.

Make smart protection for the digital world the natural choice and deliver comfort that enhances daily life.



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