

Choosing the Right Lens Tint for the Job

Lens Colors Enhance Workplace Performance and Protect Against Harmful Ultraviolet and Infrared Radiation

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For many people, wearing sunglasses serves a basic purpose — shielding our eyes from the bright light of the sun and the uncomfortable glare that causes us to squint and strain. What we likely fail to consider, however, is that which we cannot see: the harmful infrared and ultraviolet radiation which stands to cause permanent damage to our eyes. Individuals who endure prolonged exposure to this radiation — usually in the workplace — are particularly at risk. Tinted lenses are a critical component of protective eyewear and were developed to guard against these hazards, from the standard gray, brown or mirrored tints that the general public wears to tints like orange for some medical procedures and green for welding jobs. Though it might appear that a pink lens, for instance, should only be worn to make a fashion statement, the reason for using it is deliberate and functional and plays a critical role in eye protection and workplace performance.

Varying work environments warrant different lens tints which are designed to enhance visual perception and relieve eye strain in different job applications, increasing workers' productivity and longevity of vision. The use of appropriate tints can greatly reduce eye injuries on the job and the resulting financial impact on employers and employees.

A particular tint may be perfect for some tasks, but very dangerous for others. Employers are responsible for determining the need for protective eyewear and the appropriate lens tint. Ensuring that a proper workplace hazard assessment is conducted is one way for companies to be sure they are protecting their workers appropriately. Occupational Health & Safety Association (OSHA) and American National Standards Institute (ANSI) guidelines outline what employers are required to adhere to in order to remain compliant. Protective eyewear manufacturers serve as an excellent resource as well. The manufacturers of Uvex[®] lenses, for example, have intimate knowledge of various levels of protection and lens types and are available to help employers determine which lenses their employees should be wearing. Today's protective eyewear features the fit, style and protection that encourage workers to wear the lens. Wearing the appropriate tint is equally important.

Types of Radiation and the Impact on Eye Health

Emissions from the sun include visible light, ultraviolet (UV) and heat (infrared) radiation. UV radiation is part of the electromagnetic spectrum emitted by the sun. The UV region is divided into three bands: UVA, UVB and UVC. The UV radiation that reaches earth is largely comprised of UVA, with little UVB and no UVC. Small amounts of UV are important for human health and are required for the production of vitamin D. However, overexposure can penetrate the eyes and skin. Invisible to humans, UV radiation increases the likelihood of certain cataracts according to the Environmental Protection Agency. In fact, the World Health Organization (WHO) estimates that approximately 16 million people worldwide are currently blind as a result of cataracts,

and as many as 20 percent of those cases may be due to UV exposure. Prolonged exposure to UV radiation can also cause skin cancer around the eye, macular degeneration and pterygium, a thickening of the outer corner of the eye which grows onto the cornea impairing, and in some cases blocking, vision.

Infrared radiation (IR) is invisible electromagnetic radiation with a longer wavelength than visible light. This type of radiation can only be detected by its heating effect. The heat we feel from the sun, ovens, welding, fire or on pavement is all infrared. As with UV radiation, prolonged exposure to heat is dangerous, as it is absorbed into the eyes and can burn the retina, cause cataracts or cause blindness.

Technology Incorporates Unique Tints for Varied Applications

All of us are exposed to UV and infrared radiation at one point or another. However, in some industries workers are constantly affected by heat or exposure to UV radiation. Not only do these individuals require a specialty lens tint for their particular environment, but they can most likely benefit from enhanced visual perception. Specific types of work environments require varying degrees of visible light transmission and protection. Work in operating rooms, indoor/outdoor utility work, welding and high heating applications all require different tints.

Using cutting-edge technologies that incorporate unique dyes, manufacturers have developed lens tints that are designed to absorb select wavelengths of radiant energy (light) into the lens. Dyes enable the lens to manipulate light in order to reduce the hazard or provide distinctive filtration for specific viewing tasks. For example, brown or amber lens tints are ideal for outdoor work environments because they protect against sunlight and glare, which causes eye strain and fatigue. Individuals who require these lenses typically work in the construction, landscaping or transportation fields. For those who transition from indoor to outdoor work, such as the driver of a fork lift at a receiving dock, reflective lens tints are ideal because they suppress glare in bright indoor applications and allow easy transition from inside to outside. In addition to enabling true color recognition, reflective tints meet the traffic signal color requirements of ANSI Z80.3-1996 which requires that wearers be able to distinctly see each color of a traffic light/signal. Orange lens tints are ideal for protecting against UV radiation and glare caused by the presence of blue light, such as in dental and related medical applications.

The range of lens tints is broad to accommodate the varying degrees of exposure to infrared and UV radiation. Worn outside of their proper applications, specialized lens tints can actually impair vision, and cause eye strain and fatigue.

Visual function provided by lens tints is as important as impact protection, style, fit and comfort. The proper tint can increase worker productivity, reduce eye strain and fatigue, and prevent blindness by protecting against the dangers of UV and infrared radiation. Used appropriately, tints can greatly diminish workplace eye injuries and the resulting financial impact on the employer and employee alike.

Employers must ensure the safety of their employees by educating themselves and training their employees about the dangers and lasting effects of light and heat on the eyes. Though the eye occupies less than two percent of the whole body surface area, it is the only organ system that allows the penetration of visible light into the human body. Therefore, protecting the eye is vital. With research and commitment to determining the proper eyewear and lens tint for a specific working environment, employers can ensure the eye health of their workers today and for years to come.

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