Sunglasses have played a large role in fashion for generations. From Jackie O to Audrey Hepburn, many style icons have inspired eyewear trends over the years. Even the popular ZZ Top billboard hit in 1980 had everyone running out to get themselves a pair of “cheap sunglasses.” And although they continue to remain popular today, functionality and UV protection have now become the driving force behind the production of sunglasses.

The UV measurement of sunglasses is leading the way in eyewear technology and new developments in protection are setting the standards for this industry. As we learn more about the harmful effects of the sun’s rays, consumers are setting new expectations regarding the UV defense capabilities of their eyewear. Combining style and protection are now a top priority in protective eyewear technology and spectrophotometers offer a simple solution to developing quality products.

Sunglasses are more than just a fashion accessory in today’s retail market. Special attention must be given to the careful measurement and quantification of the UV blocking power of these lenses. Image Source: Flickr user Herry Lawford

Eye Protection and Regulatory Standards

The sun provides the precise amount of heat and light needed to sustain life on our planet, yet medical research has revealed that UV radiation can have harmful effects on both our skin and eyes. **Advancements in sunscreen**and skin protection have increased over the past decade, but the technology needed to protect our eyes has also become a major concern in the medical field. Vision specialists warn of the harmful effect of the sun’s rays, which include cataracts, macular degeneration, and more. To avoid these adverse effects, the NEI (National Eye Institute) recommends that individuals wear sunglasses to “block out 99 to 100% of both UVA and UVB radiation, so that you can keep your vision sharp and eyes healthy.”[1]

In order to ensure protection, the FDA (Food and Drug Administration) has developed regulatory standards to monitor the effectiveness of protective eyewear.[2] Precise data of the UV blocking capabilities of material and/or coatings must be carefully measured and quantified during processing

and product development. Spectrophotometers offer an easy-to-use method to accurately measure the amount of **UV absorption in protective lenses and coatings**, providing the quantifiable data needed to meet these standards and promote quality products.

Instrumental Analysis of UV Lenses and Coatings

Regulations on UV and Vis-NIR wavelength transmissions are used around the world to monitor sunglasses and other protective eyewear products. The main emphasis in protective eyewear production is the ability of the lenses to absorb harmful UV radiation. Earth's atmosphere blocks out most of the UVC radiation, which wavelengths are measured at 100-280 nm. However, UVA (315-400 nm) and UVB (280-315 nm) rays are the main culprits of skin and eye damage.[3] Measuring wavelengths with these specific calculations is necessary for providing an accurate representation of the protective value in lenses and coatings.

Color measurement is an important part of lens production and industry leaders rely on advanced spectral technology to maintain quality and consistency in their products.
Image Source: Flickr user Steve Jurvetson

Spectral analysis is used for both production monitoring and quality control. Many quality sunglasses use this technology to integrate UV protection directly into the lens itself. Instrumental analysis is extremely important for the process monitoring of lens development where consistency and effectiveness of UV blocking materials are essential to the final quality of the product. With protective coatings, these same applications and **absorption measurement quantifications** apply.

Increased Quality Equal Higher Profit

With the main emphasis on UV protection, this attribute is used as a selling point in both prescription and non-prescription lenses. Product development is crucial in setting the price for these products. Consumer selection of a lens that both protects and improves vision is causing an increase in the demand and price of sunglasses, ranging anywhere from $10 up to $1000. Polarized lenses are quickly becoming the most desired eyewear on the market today and pulling in a good

price for value as well. Polarized technology must provide 100% UV protection as well as reduce glare and improve visual clarity.

Polarized lenses increase the value and price of protective eyewear. The ability to measure both UV protection as well as the glare reduction quality of the lens are necessary to improve visual clarity. Image Source: Flickr user ilovebutter

Absorption measurements alone do not account for all of the intricate qualities of light and color. In order to account for attributes such as glare or reflectiveness, sphere technology must be implemented. This advanced level of spectrophotometric technology controls all factors of light including reflection, absorption, observation angle, and light source. This allows for accurate measurements during every stage of production, increasing both the quality and value of protective lenses.

HunterLab is a leading name in ophthalmic and protective lens measurement. From the assessment of raw materials to final product evaluation, our spectrophotometers offer the most advanced technology needed to help maintain color consistency and protection throughout production. Our goal is to help our customers develop a high-level reputation that will increase product value and sales. With over 60 years of experience in the plastic and coating industry, we understand the needs and challenges of the market. For more information on how spectral analysis can ensure quality and take your product to the next level, **contact us** today.

1. "Keeping Your Eyes Healthy: Wear

   Sunglasses," https://nei.nih.gov/hvm/healthy_eyes_glasses

2. "Guidance for Industry: Guidance Document For Nonprescription Sunglasses," Oct. 9, 1998,

   https://www.fda.gov/RegulatoryInformation/Guidances/ucm073951.htm

3. “Scientific Review of Ultraviolet (UV) Radiation, Broad Spectrum and UVA, UVB, and UVC,” Dec. 13-15, 2000,

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