



Press Release

ZEISS BlueGuard: The Latest Generation of Blue Light Protection for more Visual Comfort and Aesthetics

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The use of electronic devices, whether in small or large format, changes viewing habits. With ZEISS BlueGuard, a new generation of blue light blocking lenses is introduced to the market addressing today's technology and media use in the context of the "new normal". The blue light blocking properties are now incorporated into the lens material itself. As a result, ZEISS BlueGuard Lenses provide excellent lens clarity as well as the blocking of up to 40 percent of the potentially harmful and irritating blue light in the wavelength between 400 and 455 nanometer (nm),¹ which is known to be linked to digital eye strain.

The right time to introduce a new solution for blue light protection

Especially in home office or mobile working scenarios, which has become a daily routine for millions of people worldwide, video conferencing with colleagues, online lectures or home schooling with the children, challenge the eyes. The increasing use of digital devices is skyrocketing, in addition with more time spent indoors often exposed to modern LED lights. A global survey conducted in March 2020 indicated that the pandemic has a direct impact on in-home media consumption. According to the survey, 44 percent of global respondents reported that they spend more time on social media channels, as well as 36 percent more time on the computer.²

In general, high-energy visible light (i.e. part of the blue light spectrum), is presumed to have an influence on sleep and alertness, on mood and concentration. The question whether high-energy visible light can damage the eyes is another recurring point of discussion. Specifically, the violet-blue wavelength band from 400 nm to 455 nm is considered potentially harmful. The relatively high levels of energy inherent in the comparatively short wavelengths of blue light have been shown to impact metabolic processes in retinal cells. It is quite possible that excessive exposure to blue light can lead to retinal damage, in particular long-term and degenerative processes. However, it is still part of medical research to better determine what dose and what specific light sources have a significant damage-causing potential. While caution is advised when exposing the eye to high intensity daylight from the sun, there is a relief for eyes exposed to digital devices, displays, monitors or normal illumination. In fact, there is currently no evidence from patient

¹ Inhouse measurements and calculations based on the BVB (Blue-Violet-Blocking) metric. Analyses by Technology and Innovation, Carl Zeiss Vision International GmbH, DE, 2020.

² Watson A. (2020). In-home media consumption due to the coronavirus outbreak among internet users worldwide as of March 2020, by country. [www.statista.com](https://www.statista.com/statistics/1106498/home-media-consumption-coronavirus-worldwide-by-country/), URL <https://www.statista.com/statistics/1106498/home-media-consumption-coronavirus-worldwide-by-country/>.



studies that these devices pose a health risk to the retina. Nevertheless, patient complaints of decreased visual comfort, asthenopic symptoms such as blurred vision, burning, painful or tired eyes, and eyestrain are common and familiar topics to eye care professionals.

More protection

While the scientific discussion about blue light hazards continues, ZEISS BlueGuard incorporates the latest organic-chemical technology to make the blue light blocking an integral part of the chemical structure of the lens material. As a result, ZEISS BlueGuard Lenses block up to 40 percent³ of potentially harmful blue light in the wavelength between 400 and 455 nm. Based on proven UVProtect technology, ZEISS BlueGuard Lenses additionally ensure full UV protection up to 400 nm.

Preventing digital eye strain when using digital devices

"Digital screens and indoor LED lighting emit a higher proportion of blue light than traditional incandescent or halogen-type light bulbs. In addition, we are often exposed to this blue light for long periods of time, often until late at night at short visual distances. This combination of excessive near work and chromatic intraocular challenges linked to blue light strains the eye muscles and can contribute to visual discomfort and asthenopic symptoms associated with digital eye strain," explains Dr. Christian Lappe, Director Technical Communication at ZEISS. BlueGuard Lenses from ZEISS block a part of the blue light spectrum that could exacerbate symptoms of digital eye strain, including tired eyes, blurred vision, sleep disturbances and dry or irritated eyes. The positive properties of blue light, ranging from about 455 to 500 nm, remain unaffected. "By reducing glare, our new material-based approach contributes to preventing strain on the eyes and provides comfortable, relaxed vision and increased contrast," he adds. All in all, ZEISS BlueGuard Lenses are designed for all-day use and offer an additional comfort aspect that reduces eye strain and allows relaxed working conditions.

A material solution that combines protection, visual comfort and aesthetics

A common disadvantage of many blue light blocking solutions are irritating and disturbing reflections in the lens surface. Such reflections can cause cosmetic irritation to the observer and distract the wearer. Especially in indoor environments, where displays or LEDs are the main sources of illumination, these reflections tend to be more visible. As blue light blocking properties now are incorporated into the lens material, ZEISS BlueGuard Lenses come standard with ZEISS DuraVision Platinum UV. This premium anti-reflection coating with its subtle blue residual reflection ensures the wearer does not get annoyed by irritating reflections and the eyes are clearly visible behind the lenses. Compared to the current blue light coating ZEISS DuraVision BlueProtect, the reflections of digital blue light are reduced

³ Inhouse measurements and calculations based on the BVB (Blue-Violet-Blocking) metric. Analyses by Technology and Innovation, Carl Zeiss Vision International GmbH, DE, 2020.



by up to 50 percent⁴. The result is high lens clarity with significantly lower visible reflections of digital blue light.

ZEISS BlueGuard is suitable for all ages and available for the entire ZEISS portfolio of clear lenses.⁵

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About ZEISS

ZEISS is an internationally leading technology enterprise operating in the fields of optics and optoelectronics. In the previous fiscal year, the ZEISS Group generated annual revenue totaling 6.3 billion euros in its four segments Semiconductor Manufacturing Technology, Industrial Quality & Research, Medical Technology and Consumer Markets (status: 30 September 2020).

For its customers, ZEISS develops, produces and distributes highly innovative solutions for industrial metrology and quality assurance, microscopy solutions for the life sciences and materials research, and medical technology solutions for diagnostics and treatment in ophthalmology and microsurgery. The name ZEISS is also synonymous with the world's leading lithography optics, which are used by the chip industry to manufacture semiconductor components. There is global demand for trendsetting ZEISS brand products such as eyeglass lenses, camera lenses and binoculars.

With a portfolio aligned with future growth areas like digitalization, healthcare and Smart Production and a strong brand, ZEISS is shaping the future of technology and constantly advancing the world of optics and related fields with its solutions. The company's significant, sustainable investments in research and development lay the foundation for the success and continued expansion of ZEISS' technology and market leadership. ZEISS invests 13 percent of its revenue in research and development – this high level of expenditure has a long tradition at ZEISS and is also an investment in the future.

With over 32,000 employees, ZEISS is active globally in almost 50 countries with around 30 production sites, 60 sales and service companies and 27 research and development facilities. Founded in 1846 in Jena, the company is headquartered in Oberkochen, Germany. The Carl Zeiss Foundation, one of the largest foundations in Germany committed to the promotion of science, is the sole owner of the holding company, Carl Zeiss AG.

Further information at www.zeiss.com

ZEISS Vision Care

ZEISS Vision Care is one of the world's leading manufacturers of eyeglass lenses and ophthalmic instruments. The unit is allocated to the Consumer Markets segment and develops and produces offerings for the entire eyeglass value chain that are distributed globally under the ZEISS brand.

⁴ Inhouse measurements and calculations based on the DBR_{LED} (Digital Blue Light Reflection) metric. Analyses by Technology and Innovation, Carl Zeiss Vision International GmbH, DE, 2020.

⁵ Except and not available for Bifocal and Trifocal Lenses, DriveSafe Lenses, Sports Lenses and ZEISS Myopia Management Lens Solutions.