

### Today's Patients are Exposed to a Broader Range of Light



Although blue and violet light wavelengths are often grouped together, there are **important differences** 

#### Why Filter Violet Light (380 – 460 nm)

#### More Light Scatter

Higher energy wavelengths create more light scatter. Blocking this wavelength has positive benefits on dysphotopsias<sup>1,2</sup>

#### Associated with Retinal Damage



Violet Light exposure is linked to cell death & retinal damage, including AMD (age-related macular degeneration)\*<sup>3</sup>

 $^{*}8.7x$  more  $H_{2}O_{2}$  (a reactive oxygen species) than blue light

#### Why Transmit Blue Light (460 – 500 nm)

#### Aids Image Quality in Low Light



Blue light transmission to the eye decreases with age and may reduce the ability to walk on uneven surfaces at night or read in dim light<sup>4,5</sup>

#### **Regulates Circadian Rhythm**



Daytime exposure (especially
morning), is beneficial for sleep, mood, and cognitive function<sup>6,7</sup>

## TECNIS<sup>™</sup> violet light-filtering technology allows the transmission of blue light,\*\* while filtering the violet light<sup>8</sup>

\*Wavelength (nm=nanometers). \*\*Other available IOLs often focus on blocking the majority of blue light.

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**TECNIS**<sup>™</sup> Violet Light-Filtering Technology

### The Value of TECNIS<sup>™</sup> Violet Light-Filtering IOLs

Clinical evidence for TECNIS<sup>™</sup> violet light-filtering IOLs resulted in benefits compared with colorless IOLs<sup>8,9</sup>

Significantly more patients experienced **no difficulties driving** in daytime (P = 0.033) or **at night** (P = 0.017)<sup>8</sup>



# Reduction of halo intensity

by 29% for Xenon LED headlights and by 13% for smartphone LED blue light<sup>9</sup>

TECNIS<sup>™</sup> violet light- iltering technology builds upon the features of proprietary material and design provided by TECNIS<sup>™</sup> presbyopia-correcting IOLs

Correction of spherical aberration to virtually zero, resulting in sharp quality of vision<sup>2</sup>

Low level of chromatic aberration and high image contrast<sup>2</sup> Material that is not associated with glistenings, minimizing light scatter<sup>2</sup>

Today's patients will particularly benefit from the high quality vision in all lighting conditions (including driving at night) provided by TECNIS<sup>™</sup> presbyopia-correcting IOLs enhanced with TECNIS<sup>™</sup> violet light-filtering technology

**REFERENCES: 1.** Puell MC, Palomo-Alvarez C (2017) Effects of Light Scatter and Blur on Low-Contrast Vision and Disk Halo Size. *Optom Vis Sci* 94 (4): 505-510. REF2019CT4288. **2.** Johnson & Johnson Vision (2019) Why violet-light filtration? Data on file. REF2019CT4260. **3.** Marie M, et al. (2018) Light action spectrum on oxidative stress and mitochondrial damage in A2E-loaded retinal pigment epithelium cells. *Cell Death Dis* 9 (3): 287. REF2019CT4273. **4.** Cuthbertson FM, et al. (2009) Blue light-filtering intraocular lenses: review of potential benefits and side effects. *J Cataract Refract Surg* 35 (7): 1281-1297. REF2022CT4068. **5.** Mainster MA (2006) Violet and blue light blocking intraocular lenses: photoprotection versus photoreception. *Br J Ophthalmol* 90 (6): 784-792. REF2019CT4272. **6.** Tosini G, Ferguson I, Tsubota K (2016) Effects of blue light on the circadian system and eye physiology. *Mol Vis* 22 61-72. REF2019CT4233. **7.** Bauer M, et al. (2018) The potential influence of LED lighting on mental illness. *World J Biol Psychiatry* 19 (1): 59-73. REF2019CT4234. **8.** Canovas C, et al. (2019) Optical and visual performance of violet blocking intraocular lenses. Poster presented at the Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting. Vancouver, BC, Canada. SC2018CT4033. **9.** DOF2019CT4010 – Scotopic halo and MTF violet blocking. 26 June 2019.

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