
EYESAFE TECHNOLOGY


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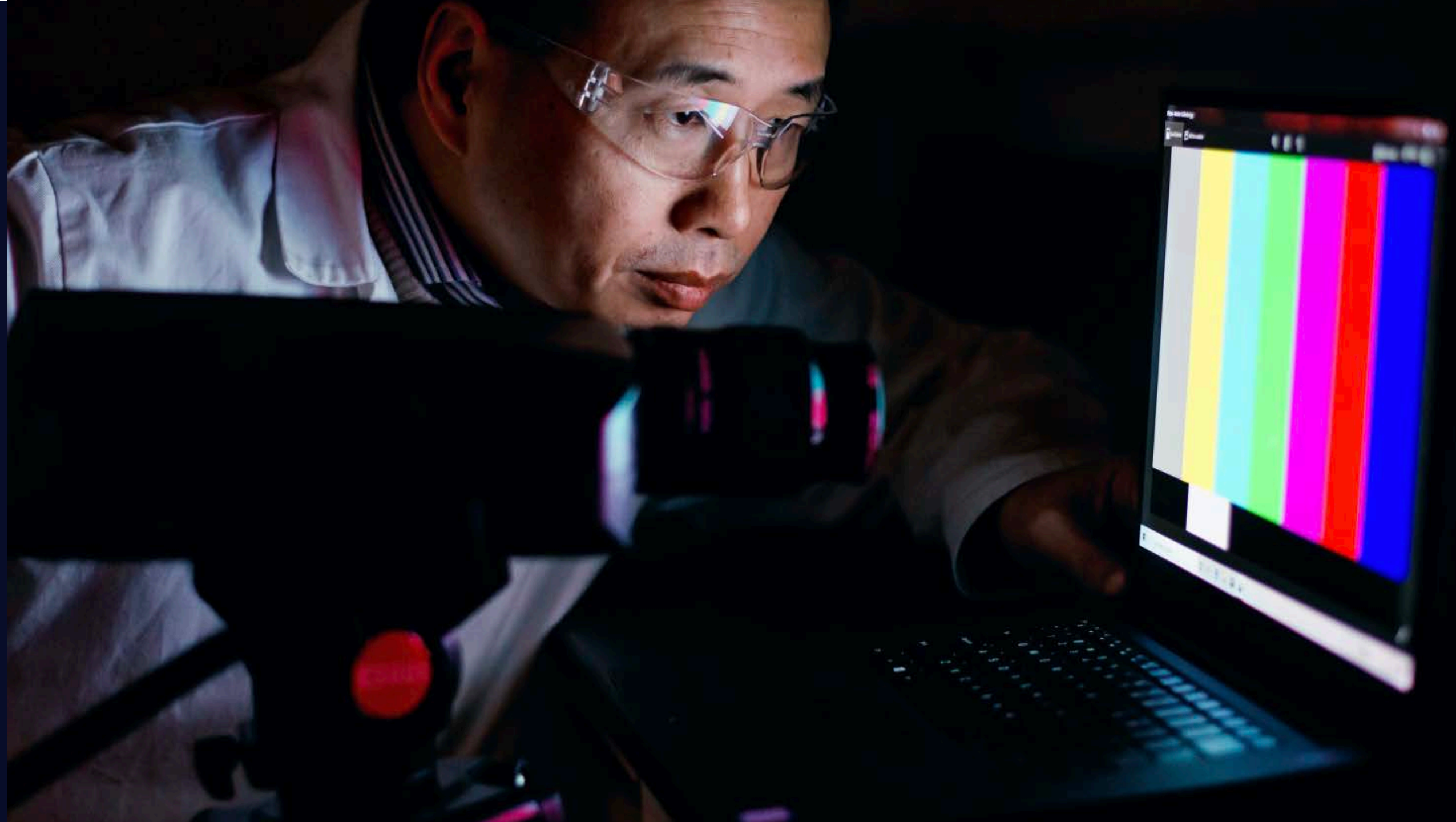
BLUE LIGHT
SUMMIT 2020



# Designed for Human Health

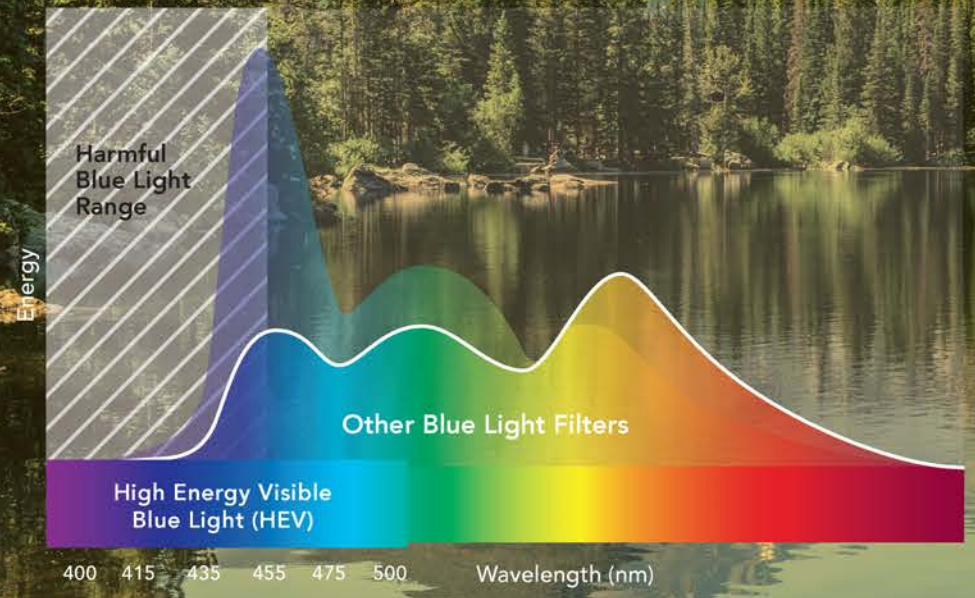
High-Energy Blue Light

Maximum Energy

Color Performance

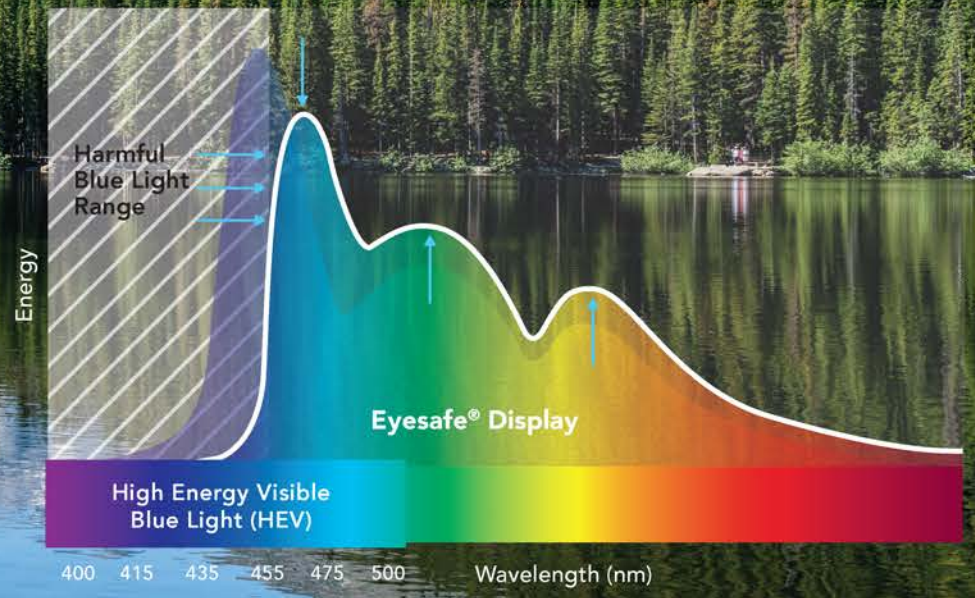
# Other Blue Light Filters vs. Eyesafe® Display

## OTHER BLUE LIGHT FILTERS




Others adjust the blue light by shifting color to warmer hues which impacts color

## EYESAFE® DISPLAY




Eyesafe® Display redesigns light emission and the color filter for beautiful color with less blue light

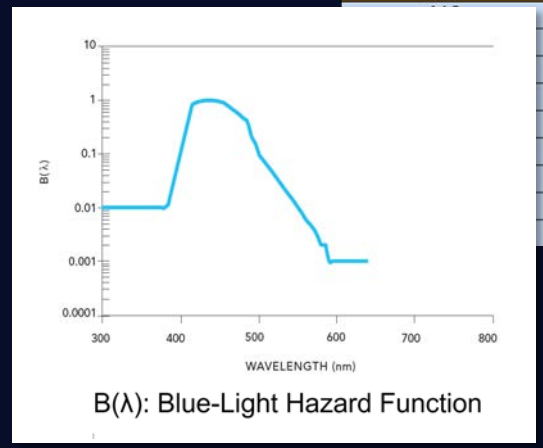
# Eyesafe Technology – Focusing the Impact

- Clinical research shows that retinal damage from light peaks between 430 and 445 nm.
- Eyesafe dyes and technology focus filtering at the peak of the Blue-Light Hazard Function
- Provides the biggest impact on reduction of the potential damage from Blue Light vs. impacts on color or luminance.

| TOXICITY ZONES | |
|---|---|
| Level 5 | 1 |
| Level 4 | 0.9 - .99 |
| Level 3 | .5 - .89 |
| Level 2 | .2 - .49 |
| Level 1 | 0 - .19 |

(*BLH = Blue light Hazard ANSI = American National Standards)

| nm | *BLH - ANSI Z80.3 Table | Toxicity Zone Level | Primary area of concern |
|---|---|---|---|
| Far UV 200 - 315 | 0 | 1 | UV Region: Cataracts & Other |
| Near UV 315 - 380 | 0 | 1 | |
| 380 | 0.006 | 1 | Surface Symptoms Blue Region: Computer Vision Syndrome & Digital Eye Strain |
| 385 | 0.012 | 1 | |
| 390 | 0.03 | 1 | |
| 395 | 0.05 | 1 | |
| 400 | 0.1 | 2 | |
| 405 | 0.2 | 2 | |
| 410 | 0.4 | 2 | |
| 415 | 0.8 | 3 | Toxic Blue Region: Retinal Cell Damage & AMD |
| 420 | 0.9 | 4 | |
| 425 | 0.95 | 4 | |
| 430 | 0.98 | 4 | |
| **Peak 435 | 1 | 5 | |
| **Peak 440 | 1 | 5 | |
| 445 | 0.97 | 4 | |
| 450 | 0.94 | 4 | |
| 455 | 0.9 | 4 | |
| | 0.8 | 3 | Healthy & Unhealthy Blue Region: Circadian Rhythms, Melatonin Suppression |
| | 0.7 | 3 | |
| | 0.62 | 3 | |
| | 0.55 | 3 | |
| | 0.45 | 2 | |
| | 0.4 | 2 | |
| | 0.22 | 2 | |
| | 0.16 | 1 | |
| | 0.1 | 1 | |



B(λ): Blue-Light Hazard Function

International Commission on Non-Ionizing Radiation Protection (ICNIRP) - Guidelines, most toxic portions of the blue spectrum

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# Linking Blue Light Hazard to Clinical Research

- Research shown that high-energy blue light (415 to 455 nm) produces oxidative and phototoxic damage to cells in the cornea and retina of the eye.
- Clinical research studies have demonstrated photochemical damage to retinal cell physiology and potential harmful effects of cumulative exposure to HEV light leading to premature aging of the retina.

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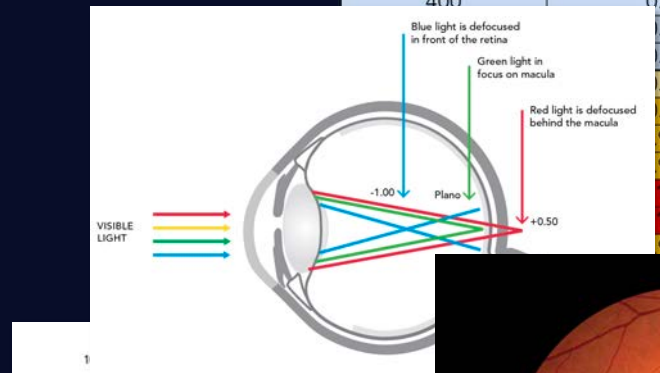
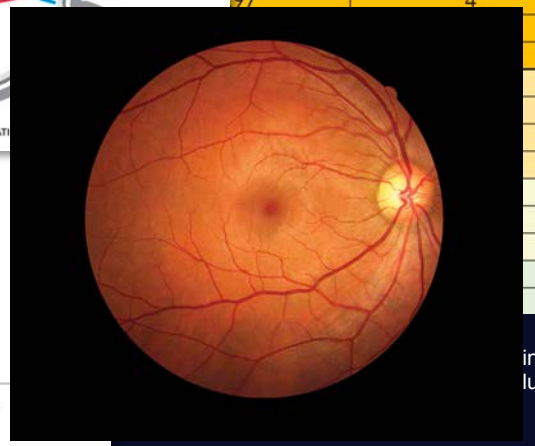
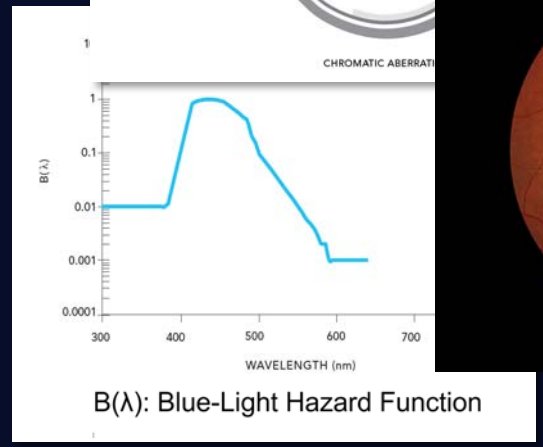
| | .8 | 3 | Toxic Blue Region: Retinal Cell Damage & AMD |
| | .9 | 4 | |
| | 95 | 4 | |
| | 98 | 4 | |
| | 1 | 5 | |
| | 1 | 5 | |
| | 97 | 4 | |
| | | | Healthy & Unhealthy Blue Region: Circadian Rhythms, Melatonin Suppression |



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# Managing Blue Light and Color Performance

Eyesafe dyes provide best-in-class blue light management while maintaining color performance

- Very narrow bandwidth filtration at the 435 – 440nm peak blue light hazard region
- Corresponding filtration across the spectrum to balance color

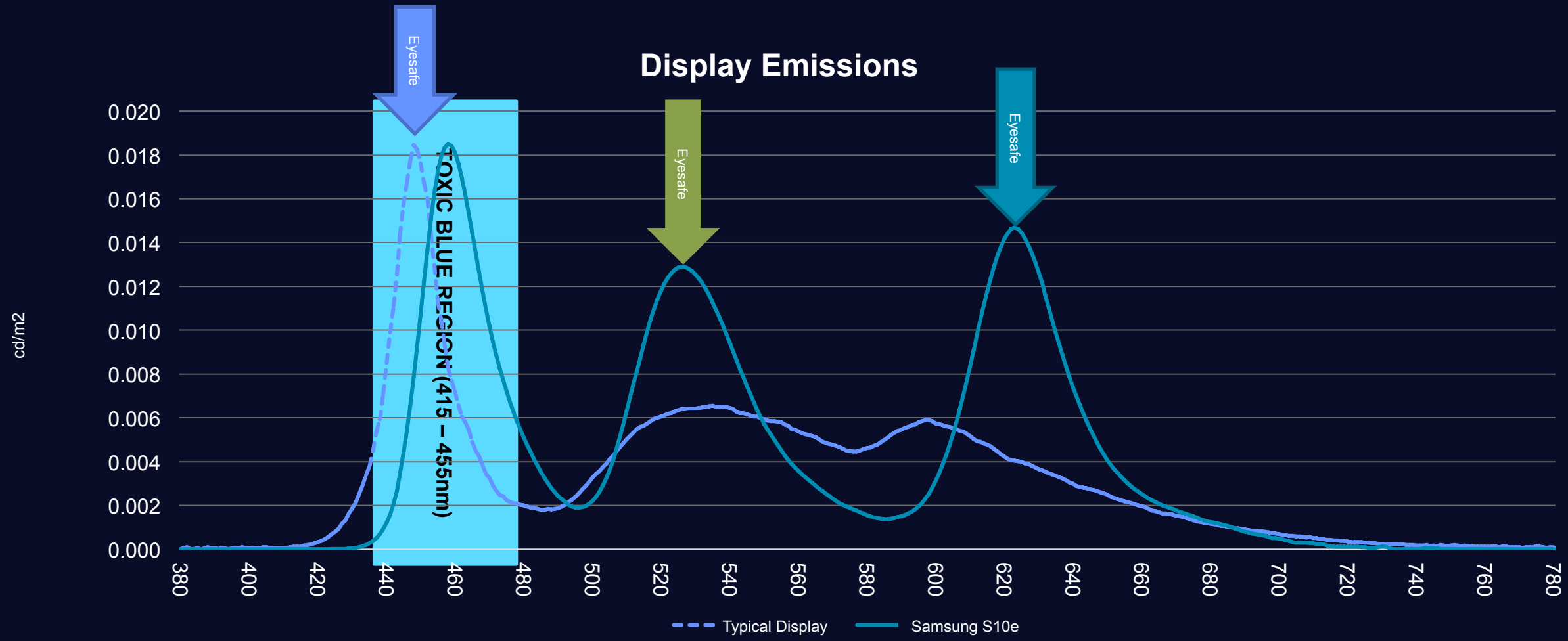
Result

- Maintains white point
- Maintains or improves color gamut
- Minimal impact to luminance

Eyesafe materials

- Exclusive supply for consumer electronics markets

# Managing Blue Light and Color Performance

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**Eyesafe materials**

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# Implementation and Supply Chain

Eyesafe materials provide *flexibility* in design applications:

- Coated films for screen protection
- Optically clear adhesives for screen protection
- Coated films and OCA for display
- LED packaging materials

**LCD / OLED**

**SCREEN PROTECTION**

eyesafe.com/solutions

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