HOW TO SPECIFY BIOS

Healthy spaces and personal wellness are more important than ever. Projects increasingly require lighting strategies that not only meet visual requirements, but biological needs as well. Specifying circadian lighting can seem daunting, leaving many designers unclear about how best to hold their specification.

The best way to maintain the integrity of a specification is to capture color quality metrics as well as circadian impact. This means including melanopic ratio values—and for healthcare applications, the Cyanosis Observation Index (COI) should be included as well.

Unique Circadian Features

BIOS offers LED circadian lighting solutions that are unparalleled in the lighting industry—featuring the highest melanopic ratios for a given color temperature while maintaining color quality.

When specifying BIOS circadian lighting solutions, be sure to include key performance data—CCT, R9 value, melanopic ratio, source lumens/watt—and specify blue spectrum peak emission to be at 490 nm. The COI value should also be included (if applicable). Provide the "**Key Circadian Performance Data**" provided on the next page in a lighting fixture schedule, and/or use the "**Key Language**" on the right in Lighting Specification Section 265100.

Use the performance data and specification language outlined in this document to create a strong circadian lighting specification that achieves the most effective and comfortable circadian lighting available.

Key Language for Specifying BIOS

- Melanopic ratio (m/p)* of at least 0.70 @ 3000K, with an initial source efficacy of 145 lm/W (linear arrays) and 115 lm/W (COB)
- Melanopic ratio (m/p)* of at least 0.80 @ 3500K, with an initial source efficacy of 150 lm/W (linear arrays) and 120 lm/W (COB)
- Melanopic ratio (m/p)* of at least 0.90 @ 4000K, with an initial source efficacy of 160 lm/W (linear arrays) and 125 lm/W (COB)
- Blue Spectrum Peak Emission at 490 nm
- CRI 80+ and R9 > 90
- For Healthcare Applications — Cyanosis Observation Index (COI)** of 3.3 or lower
- BIOS Dynamic SkyBlue with Bio-Dimming™ — Spectral control and intensity via a single dimming interface (see SPD chart on next page)

***** The melanopic ratios (m/p) provided have been calculated using the WELL v2 methodology. Corresponding CIE melanopic Daylight Equivalent Ratios (m-DER) can be extrapolated by applying a 10% reduction to the m/p ratios as shown.

****** **COI_{10}**: Cyanosis Observation Index using the CIE 2006 Color Matching Functions.

Note: COI is color fidelity of oxygenated blood and cyanosed blood relative to a 4000K reference.

BIOS Dynamic SkyBlue™

Key Circadian Performance Data — Daytime Spectra

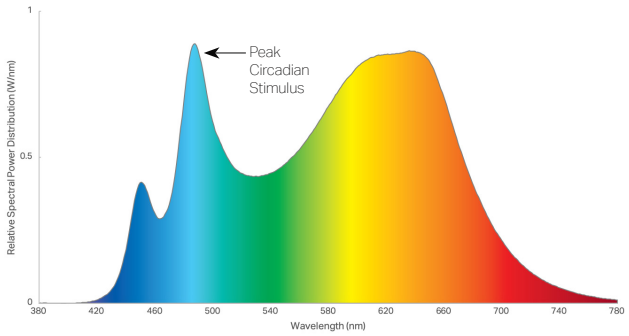
CCT		3000K	3500K	4000K
CRI		81	83	83
R9		90	95	95
COI_{10}*		5.4	3.3	1.5
Initial Source Efficacy (lm/W)	Linear Arrays / Tape Light	145	150	160
	Chip-on-Board (COB)	115	120	125
Melanopic Ratio**		0.74	0.83	0.92

*** COI_{10}**: Cyanosis Observation Index using the CIE 2006 Color Matching Functions.

****** The melanopic ratios (m/p) provided have been calculated using the WELL v2 methodology. Corresponding CIE melanopic Daylight Equivalent Ratios (m-DER) can be extrapolated by applying a 10% reduction to the m/p ratios as shown.

Note: COI is color fidelity of oxygenated blood and cyanosed blood relative to a 4000K reference.

BIOS Dynamic SkyBlue - High M/P Ratio SPD (3500K Day)



BIOS Dynamic SkyBlue - Low M/P Ratio SPD (2700K Night)