LUMINUS

Salud™ Human Centric Midpower LEDs

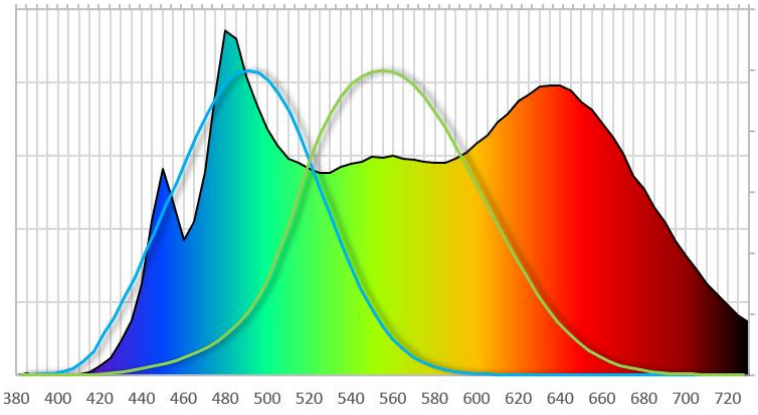
SPECIFIED MELANOPIC / PHOTOPIC RATIOS FOR HEALTHFUL DAYTIME ILLUMINATION

Quality of light takes on a new dimension with the release of Luminus' Salud™ 3030 mid-power LEDs. Salud LEDs are engineered and specified to achieve specific Melanopic/Photopic Ratios in addition to providing light that is comfortable and renders true colors.

Scientists studying human circadian rhythm and the physiological reaction to light have determined that low Melanopic Ratios (MRs) are a signal to the body to prepare for sleep, and higher MRs tell the body to be more alert. Sunlight is a perfect example of illumination with a high MRs. Typical daylight is approximately 6500K with an MR of ~1.1.

In fact, most lights with cooler temperatures haves a high MR; however, it's generally not desirable to illuminate spaces with high CCT LED light as it tends to be bluish and feel uncomfortable. Luminus Salud LEDs deliver high MR in warmer CCTs to enable lighting that is comfortable, invigorating, and renders vibrant colors.

Luminus Technology Fills the Cyan Gap and Enhances 660nm Red



- Engineered spectrum with enhanced cyan for melatonin suppression
- The world's first LED with typical Melanopic/Photopic ratios (melanopic ratios) specified
- Enhanced MR provides healthy daytime lighting with warmer CCTs
- Full spectrum emission – no cyan gap
- Excellent color rendering: Ra>90
- Enriched 660nm emission for natural skin tones and excellent red rendering
- No near UV radiation – safer and better than sunlight

Salud mid-power LEDs

Nominal CCT	Part Number	Typical MR	Minimum CRI	Typical R9	Typical Flux (lumens)
3000K	MP-3030-21C2-30-90	0.68	90	95	33
3500K	MP-3030-21C2-35-90	0.72	90	75	36
4000K	MP-3030-21C2-40-90	0.80	90	65	38
5000K	MP-3030-21C2-50-90	0.96	90	85	38

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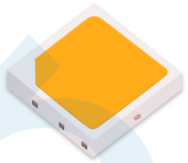
The Melanopic/Photopic ratio (a.k.a. melanopic ratio or MR) is a metric designed to quantify lighting's circadian effect. The higher the MR, the stronger the circadian effect of the light source. Increasing blue and cyan content suppresses the production of melatonin in the body and raises the MR. As the demand for human-centric lighting grows, lighting designers will need to plan for adequate levels of Melanopic lux (lux multiplied by MR of the light source).

Cool CCTs tend to have higher levels of blue and cyan content and higher MRs. Under this type of light, people tend to be more alert and productive making it perfect for schools, factories, offices, etc.... Warm CCTs, often have higher red content and tend to have less blue and cyan, so their MRs are lower and are ideal for night time relaxation and preparation for sleep. It's not typical to illuminate architectural spaces with very cool CCTs (>4000K), so the challenge is to create warmer LEDs, 4000K and below, with higher MRs. With Salud LEDs, high MRs and high melanopic lux can be achieved without having to use high CCTs and without having to "over light" the space. The result is lighting that is more comfortable, saves energy, reduces glare, and keeps occupants healthy, alert, and productive.

CCT	Standard LED M/P Ratio	Salud M/P Ratio
2400K	0.40	n/a
2700K	0.44	n/a
3000K	0.53	0.68
3500K	0.63	0.72
4000K	0.67	0.80
5000K	0.84	0.96
6500K	0.98	n/a



About Luminus

Luminus, Inc. develops and markets solid-state lighting solutions (SSL) to help its customers migrate from conventional lamp technologies to long-life and energy-efficient LED illumination. Combining technology originated from the Massachusetts Institute of Technology (MIT) with innovation from Silicon Valley, Luminus offers a comprehensive range of LED solutions for global lighting markets as well as high-output specialty lighting solutions for performance-driven markets including consumer displays, entertainment lighting and medical applications. Luminus is headquartered in Sunnyvale, California. For additional information please visit www.luminus.com.