THE LIGHTING SOLUTION for CONTROL ROOMS and 24/7 MISSION CRITICAL ENVIRONMENTS
Optimizes Performance, Productivity and Health

DynamicBlu™ Spectrum Control
With Day and NightSafe™ Technology
THE LIGHTING SOLUTION
for CONTROL ROOMS and 24/7 MISSION CRITICAL ENVIRONMENTS

THE CHALLENGE: 24/7 PERFORMANCE & CIRCADIAN DISRUPTION

Your company’s most valuable asset are the highly trained operators running your control rooms and 24/7 mission critical operation centers. To support these key employees, your lighting systems must address the challenges of:

1) 24/7 Performance - Shiftwork is challenging. Night and rotating shifts exert a toll on the bodies and brains of operators by disrupting sleep and circadian rhythms. In turn, fatigue-related errors, absenteeism, presenteeism and turnover rates are all higher in 24/7 operations.

2) Circadian Disruption - Substantial scientific evidence has shown that blue-rich light sources in the evening and at night (e.g. LEDs, fluorescents) disrupt circadian rhythms, trigger carcinogenic and metabolic processes and suppress health-protecting hormones like melatonin. Circadian disruption impacts the well-being and performance of your shiftworkers.

THE RESEARCH: WHAT’S THE BEST LIGHT FOR 24/7 OPERATIONS

Over twenty years of research by major universities, medical centers and government agencies has identified circadian disruption due to the wrong spectrum of light at the wrong time as one of the major contributors to the challenges of shiftwork.

To design the best light system for the 24/7 workforce, CIRCADIAN® - the world leader in shiftwork risk management - developed and tested in our Medical Research Center the optimal lighting solution for people working day and night shifts. To maintain workforce performance:

• Operators Need Blue-Rich Light During the Day - Blue-rich light during the day stimulates alertness, boosts energy and increases productivity. It also serves to synchronize our biological clock and helps us get better sleep at night.

• Operators Need Blue-Depleted Light After Sunset - Blue-depleted light after sunset prevents circadian disruption – a significant health concern. Conventional LED lights, and even tunable solutions that provide 2700K at night, have too much blue light and create circadian disruption.

• Blue-Depleted Light at Night Can Maintain and Improve Performance - PVT tests reveal that alertness and vigilance levels are maintained on the night shift under blue-depleted light at the same or better levels as conventional blue-rich LEDs.

• Automatic controls adjust the blue content by time of day and season to the latitude & longitude of your facility - Ideally, the light would automatically adjust by time of day, season and the geographic location (latitude/longitude).
DynamicBlu™ Lighting featuring Day and NightSafe™ LED Technology

CIRCADIAN® Zirc™ Lights for 24/7 Work
Medical science breakthroughs have created an intelligent light technology that removes the harmful effects of bio-active blue light at night that cause circadian disruption.

Aviation

Refinery, Gas, Oil

Power & Utilities

Emergency Services

Chemical Plants
THE SOLUTION: CIRCADIAN® ZircLight™ for 24/7 Operations

The result of our research led to engineering and patenting the optimal CIRCADIAN® ZircLight™, a revolutionary lighting technology for 24/7 operations that provides:

- **High Quality Light 24/7** - Color temperature remains in the preferred 3200-4200K range during each 24-hour period while maintaining accurate color rendering (CRI >80).

- **Automatically Controls the Amount of Blue Light 24/7** - Blue light is adjusted daily by time, location, and season to boost energy and protect health throughout every shift.

- **Powered by Day and Night LEDs to Ensure the Right Light is Provided 24/7**
  - DAY-LED is rich in blue during daylight hours – to boost energy and productivity
  - NIGHT-LED removes over 90% of the blue spectral content at night responsible for the circadian disruption and detrimental health effects without compromising alertness

- **Easy Installation** - CIRCADIAN® Lights can be installed by any qualified electrician

- **Lighting Design and Fatigue Training** - CIRCADIAN® ZircLight™ can provide a lighting design for your facility and fatigue training to your staff – making it a comprehensive and ideal solution for your 24/7 operation.

THE ROI: Why You Need CIRCADIAN® Zirc™ Lights

CIRCADIAN® ZircLight™ directly addresses the number one cost and risk factor in your operation: the health and performance of your people.

- **Reduce the Cost of Circadian Disruption** - Jet-lag malaise from disrupted circadian rhythms leads to increased absenteeism and turnover, which has a significant impact on morale, stress, productivity, and indirect payroll costs.

- **Address the Health Risks of Light at Night** - The World Health Organization, American Medical Association and other independent agencies have recognized the risk of light at night. And substantial scientific evidence has shown that circadian disruption caused from blue-rich light at night can increase the risk of obesity, diabetes, cardiovascular disease, mood disorders, breast and prostate cancer.

- **Make a Lighting Decision Based on People** - All too often lighting decisions are made based on lighting energy consumption, which accounts for less than 1% of operating costs according to the US Department of Labor. The costs related to reduced productivity, human error, absenteeism, and turnover are far greater. Operations and H&S staff should be part of lighting decisions to ensure you’re getting the light lights for your people.

- **Maximize Alertness and Vigilance** - Human lives and millions of dollars are at stake, when your mission critical operators make fatigue-related errors. Providing them with the best lights maximizes alertness and vigilance 24/7.

- **New Industry Standards for 24/7 Operations** - New industry standards like the American Petroleum Institute’s RP-755 recognize the importance of well lit work places with lights that prevent circadian disruption at night.
Since CIRCADIAN® ZircLight™ is designed to optimize the health, safety and performance of your workforce, an important part of the installation process is to provide 24/7 employees with optional education on how to take advantage of CIRCADIAN® Light both at work and in their daily lives.

The CIRCADIAN® ZircLight™ training includes:

- The impact of blue light on sleep and health
- Managing light at home and work to get better sleep
- Tips to reduce fatigue and increase alertness
- Improving health, wellness and nutrition
SPECIFICATION FEATURES

LED TROFFER CSPT/CSM Series

SPECIFICATIONS

1'x4', 2'x2' and 2'x4'

Mounting Options: Recessed Troffer, Surface Mount, and Pendant.

Human Performance Optimized: Proven results using human subject testing in 24/7 simulation of 12-hour day and night shifts in our medical research facility.

DynamicBlu™ Spectrum Control: DAY-LED provides blue-rich light during the daytime, while NIGHT-LED provides blue-depleted light (removes over 90% of blue light emitted by conventional LEDs) after sunset and during the night.

Color Characteristics: High quality white light, CRI >80; CCT 3200 – 4200K; Spectrum modulates based on astronomical time.

Dimmable: 0-10V dimming controls are standard.

Electrical: 48 - 108 watts dimmable to 10% (50% recommended) using standard 0-10V DC protocol. Universal input voltage range (120-277VAC) or 347VAC. Driver transient protection to NEMA SSL-2010. Non-roadway 2.5KV.

Construction: Heavy-duty C.R.S. construction. Matte white paint and frosted lens provide pleasing architectural aesthetics with non-glare reflective surfaces. Shallow housing depth (2 3/8") minimizes required plenum space.

Installation: For non-insulated standard 15/16" T-grid ceiling applications.

Operating Temperature: 0°C - 40°C

Listings: Rated for dry indoor locations. UL1598 listed, FCC and RoHS compliant.

Warranty: Limited 5-year warranty


FIXTURE PERFORMANCE

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<th>Nominal Lumen Output</th>
<th>Nominal Wattage</th>
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<td>3200-4200</td>
<td>&gt;80</td>
<td>up to 108</td>
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* based upon 24 hour duty cycle - 12 hour night, 12 hour day
LED TROFFER 2x4 / 1x4 CSPT/CSM Series

A DYNAMIC SOLUTION: A Day and Night LED to Provide the Right Light, at the Right Time

Bio-Active blue light (440-490nm) modulates the activity of the circadian clock. During the day, blue-rich light is good. However, blue-rich light at night disrupts circadian rhythms and is a health concern. To ensure the right spectrum of light is provided 24/7, the CIRCADIAN® ZircLight™ fixture is powered by both Day and Night LEDs:

Figure 1. A blue-rich LED is utilized during the day to simulate alertness and productivity. Blue light levels are adjusted to peak in morning and again during the post-lunch dip.

Figure 2. The patented CIRCADIAN® ZircLight™ Day and NightSafe™ LED, which emits very little bio-active blue-light, is used at night. It’s a high quality, white light (CCT 3200K, CRI >80) that removes blue light without compromising alertness.
DynamicBlu™ Spectrum Control
With Day and NightSafe™ Technology

CIRCADIAN® ZircLight™ is the Perfect Lighting Solution for 24/7 Operations

Intelligent light technology that removes the harmful effects of bio-active blue light at night.

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