



## SOLUTIONS FOR BUSINESS

# Bright ideas to illuminate your workplace

What you need to know about lighting and your business

Quality lighting is critical for your business operations. What are the important lighting metrics and practices you need to know? Learn more about how to transform your work environment with lighting below.

### Lighting: Why It Matters

Lighting is certainly functional: We need to see well in order to complete tasks, and we want customers to see our products in the best light. But lighting also creates a space that makes us feel a certain way. In fact, lighting affects our mood, alertness, productivity and circadian rhythms. Dim-to-warm, white-tunable and full-color tuning products allow you to create a different look and feel for each space. With the recent emergence of smart connected lighting in office environments, users can personalize their workspace lighting and receive valuable usage data at their fingertips.

### Best Practices

Get the most from your workplace lighting system with these quick tips.

- Purchase indoor lighting with an 80+ CRI color quality rating
- Replace fluorescent lamps with LEDs and save 30% or more
- Look for Energy Star® certification for quality and maximum savings
- Select lower illumination levels and lower CCT (<3000K) to create an inviting atmosphere in waiting areas
- Install occupancy sensors in low foot-traffic areas
- Use task lighting or natural lighting (skylights and windows) to reduce overhead lighting

## Legacy Lighting Flaws

- Most legacy lighting has a nominal life of 800 to 30,000 hours. Switching lights off frequently decreases rated life.
- Fixture efficiency (called efficacy) is low, around 15 to 90 lumens per watt. Many tubes and lamps use filaments that are subject to failure from vibration.
- Existing linear fluorescent light fixtures are susceptible to striation, flickering and the generation of harmonics.
- In cold temperatures, fluorescents have slow warm-up times and reduced levels of light output.
- High-intensity discharge (HID) lighting takes several minutes to achieve rated light output. HID color ratings can be CRI 20 or below.

## The LED Lighting Solution

A Light-Emitting Diode (LED) is essentially a miniature solar panel that runs in reverse. As a solid-state device, they are very rugged, instant-on (do not require warm-up time), contain no mercury and are directional by nature. LED-rated life is between 50,000 to 100,000 hours. They perform superbly in cold temperatures, and efficacy is up to 200 lumens per watt.

When replacing linear fluorescent (T5, T8, T12) lighting, at least three LED options are available. First, you can replace fluorescent tubes with drop-in or direct-wired TLED tubes. These tubes sometimes have built-in occupancy or daylight sensors and back-up batteries. Second, you can replace them with LED strips and drivers using a retrofit kit. Third, manufacturers have created new purpose-built fixtures, such as edge-lit and light-guide LEDs, to replace fluorescent troffers. These LEDs are lower profile and produce less glare.

### Fun Fact

Nick Holonyak, Jr., a GE employee, created the first visible red LED in 1962. It was used to light the display of the first digital quartz watch, the Hamilton Pulsar.

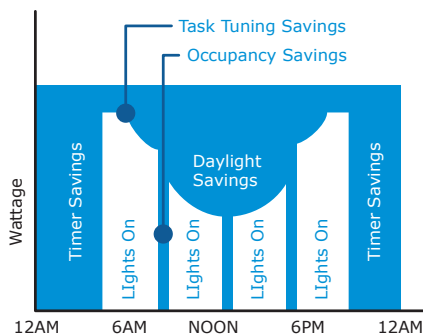
## Lighting Controls

Automatic controls, such as timers, occupancy sensors, photo sensors and dimmers, can reduce lighting costs by 50% or more. Start with the first type, then add the others in a layered approach:

1. Programmable timers
2. Occupancy and vacancy sensors
3. Task tuning
4. Daylighting sensors
5. Local dimming control

Lighting can also be incorporated into existing Energy Management System (EMS) operations.

Keep in mind, LED lighting may not work well with all legacy dimmers. Consider installing new LED dimming controls designed to work specifically with LEDs.



When it comes to designing a lighting system for your business, you're in luck. There are many contractors who specialize in lighting and can help you identify the best products and strategies for your business.

## Lighting Metrics

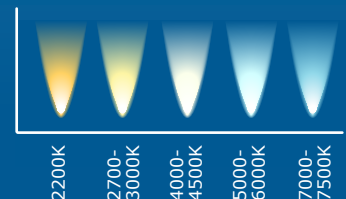
To help you choose the right lamp or fixture for your specific application, there are several important lighting metrics to keep in mind. Many of these metrics are listed on the packaging or specifications.

**Lumens** – A measure of the perceived power of a light source. Lumen ratings are constant regardless of distance from a light source. For instance, an 8-watt LED bulb emits about 800 lumens.

**Footcandle** – A unit of light intensity that measures the amount of light illuminating a surface. This changes depending on distance from a light source.

**Color Rendering Index (CRI)** – The measurement of a light source's ability to render colors compared to sunlight (CRI = 100). Lighting for indoor applications should have a minimum CRI rating of 80.

**Correlated Color Temperature (CCT)** – The measurement of how visually warm (orange or yellow tint) or cool (blue tint) a white light source appears. It uses units of degree Kelvin (K) where  $\leq 3000\text{K}$  is visually warm and  $\geq 4000\text{K}$  is visually cool.



## Start saving today.

For more energy-saving ideas to enhance your workplace, call the Solutions for Business team at (866) 333-4735, email us at [aps.solutionsforbusiness@dnvgl.com](mailto:aps.solutionsforbusiness@dnvgl.com), or visit [aps.com/business](http://aps.com/business).