

## LIGHTING CONVERSIONS NEW PLUG AND PLAY OPTION FOR FLUORESCENT TO LED

### FLORESCENTS

Fluorescent lamps currently dominate in the commercial sector where they represent about 80% of installed lamps. (This sector includes school administrative offices, classrooms, school libraries and school conference rooms.) However, light-emitting diode lighting (LED) is receiving a lot of attention lately due to the many significant advantages of this technology.

Compared to fluorescent lighting, LEDs require less maintenance and have much longer lamp life expectancy. Unlike fluorescent lights, they can be cycled on and off without degrading lamp life. There are significant end-of-life advantages because old LED lamps are non-hazardous waste (free of toxic mercury pollution found in all fluorescent lamps) and the plastic tubing is stronger and safer to handle and dispose compared to fragile fluorescent glass tubing. LEDs generally have good color rendition compared to fluorescent lamps. Most users report a more pleasant brightness and better lit surfaces after an LED retrofit. Measured against the fluorescent baseline of 32W T8 systems, LED lights use 50% less energy. This estimated savings is based on lighting efficiency alone. Where additional upgrades to lighting control systems are feasible, an LED retrofit could yield a much higher energy savings potential.

### LEDS

Linear LED Replacement lamps (plug and play) are a recent and revolutionary development in lighting technology. The plug and play LED permits a simple and inexpensive lighting upgrade in the majority of buildings by merely swapping fluorescent for LED tubes. Until now, fluorescent to LED retrofits would require either a complete removal of old fluorescent fixtures and replacement with dedicated LED fixture types or would require a fairly labor-intensive modification of the wiring and components of existing fluorescent fixtures (retrofit kits) to accept the LED lamps.

It should be noted that each lighting retrofit approach has advantages and disadvantages depending on the requirements of the user. For example, plug and play retrofits are subject to ballast failure (at which point rewiring kits are installed), they sometimes experience ballast compatibility issues (such as light output problems), and they are not dimmable. Fixture replacement retrofits, on the other

hand, have much higher up-front costs, but the approach allows for maximum integration of control systems, optimal floorplan design and fixture layout.

The use of linear LED replacement lamps are currently limited to fluorescent lighting fixtures that feature instant-start electronic ballasts with 32W T8 systems. However these systems represent about 80% of fluorescent lamps in use today. Furthermore, the list of fluorescent fixture types that can accept LED plug and play lamps (e.g., based on ballast compatibility) is increasing each year. LED linear replacement lamps are available in 2 ft., 3 ft., 4ft., U-Bent, and 4-pin compact fluorescent lamps (G24q/ GX24 bases) and 4-pin long compact fluorescent lamps (2G11 base).

### SUMMARY

Plug and play LEDs offer an attractive retrofit approach that results in short payback for fluorescent to LED conversions. This is because the option allows existing fixtures to be reused, lamp installation costs are minimal and the life cycle economics reflects lower operation and maintenance benefits of LED lights. This option applies to most, but not all typical retrofit applications. It allows the building owner to reap the benefits of LED lighting with relatively low up-front costs and no design costs. Of course, the decision-maker that is interested in maximizing the long-term life cycle costs of their LED lighting retrofit may wish to consider the other retrofit options described above.



### REFERENCES & RESOURCES

"5 Smart Trends to Watch in Commercial Lighting" [www.greenbiz.com](http://www.greenbiz.com)

GSA Public Building Service [www.gsa.gov/gpg.gov](http://www.gsa.gov/gpg.gov)

RAISE Energy [www.engineering.com](http://www.engineering.com)