

## LIGHTING LAYOUT GUIDE SERIES

LINEAR LIGHTING GUIDE 1

### KEY TIPS

When comparing lumen outputs, remember that the delivered lumens are important. Some kits only list LED or "lamp" lumens but don't account for optical losses.

NOTE: Some utilities provide incentives for kits, but not lamps. Currently, UL and DesignLights Consortium™ (DLC) have different definitions of what a "lamp" and a "kit" are. Check with the utility prior to beginning your project.

# LINEAR LIGHTING

## LED RETROFIT KIT



### THE OPPORTUNITY

Lighting in the commercial sector is dominated by fluorescent lamps, particularly 4' T8s, which are very efficient, higher quality and inexpensive. By at least one estimate, there are almost 3 billion 4' T8 linear fluorescent lamps in service. This represents a large energy savings opportunity. With the advent of high-efficiency sources, such as LED retrofit kits, there are cost-effective ways to update the look and performance of older fluorescent fixtures. Many kits are available, similar in appearance, to popular LED fixture styles.

### THE SOLUTION

Retrofit options range from changing to an LED T8 lamp, installing some type of retrofit kit, or replacing the entire fixture altogether. Each option has merits and pitfalls. The apparent ease of using a tubular LED (T-LED) is attractive, but system compatibility can be challenging and the overall robustness remains in question. Replacing the fixture ensures a higher level of performance, but this can be cost prohibitive for many project budgets. A retrofit kit is a good middle ground. Typically retrofit kits fall into two major categories: 1) only electrical components are replaced, and 2) kits include new optics and/or lenses.

### DESIGN CONSIDERATIONS

Evaluate the existing lighting system to determine the most appropriate strategy. If the current fixtures are in good condition, offer appropriate light distribution, and are acceptable in appearance then a simple electrical LED kit may be adequate. Some kits use the socket to energize the LED. If the sockets are the wrong type or worn-out they will need to be replaced. Be aware that the light distribution from LED retrofits is frequently different than the existing fixtures.



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# LINEAR LIGHTING LED RETROFIT KIT

## CONTROLS STRATEGY

LED technology offers opportunities for the control of power consumption, light levels, light distribution, color temperature, and much more. When retrofitting an existing fixture not all retrofit LED products are equally controllable. Seek out manufacturers that factory-build controls directly into the retrofit products.

T-LEDs are compact and inexpensive. However, if dimming is required this is a risky option, particularly if the control system is already in place. Some manufacturers offer dimmable T-LEDs, but thorough testing on-site is recommended to ensure compatibility prior to initiating the conversion project.

LED retrofit kits have drivers that are separate from the LED array, therefore they do not have the space limitations that T-LEDs have. Accordingly, LED retrofit kits allow for larger components and better thermal management. It also means that the driver can have more robust controllability but, control protocols and system requirements are not consistent throughout the lighting industry, so thorough testing is recommended to ensure compatibility.

## RETROFIT OPTIONS

TYPE	DESCRIPTION	BENEFITS	LIMITATIONS	TECH NOTES
Rewire T-LED Tube	An LED tube that looks like a fluorescent T8 lamp.	Can often be installed with simple re-wiring.	Not always compatible with existing sockets.	T-LEDs have a different light distribution than the fluorescent T8s that they replace.
Retrofit Kit Electrical Only	Replaces all of the electrical components in an existing luminaire.	More robust performance than T-LEDs. Lower cost than a new fixture.	Luminaire optics are not considered.	Some kits require more field assembly than others.
Retrofit Kit Electrical and Optical	All luminaire components are replaced except the housing.	Almost like having a new fixture. Optics along with appearance can be improved.	Can cost as much as a new fixture when labor is factored in.	Installation costs can be less than a new fixture because the housings are left undisturbed.

**Note:** Some utilities and UL, have deemed T-LEDs to be a “lamp” and not a “kit”.

Cover image courtesy of Cree, Inc.