



## Fluorescent Lamp Applications

# Definition



## What is a Fluorescent Lamp application?

Fluorescent Lamps are a lamp type that is commonly used to provide illumination for settings such as commercial lighting, industrial lighting, classroom lighting, and retail lighting. The sizes, light colors, and wattage of fluorescent tubes vary significantly. The most common attribute of fluorescent lighting is that the lamps themselves are mounted within a fixture, often containing between 1-8 lamps, with the fixtures themselves mounted in, or hanging from a building's ceiling.

Below are a few image examples of fluorescent light fixtures in indoor lighting applications.



Most existing fluorescent fixtures are installed in recessed troffer, surface mount, vapor tight, or high bay lighting applications. The lamp are classified as either T8 bulbs, T12 bulbs, or T5 bulbs.

Here are some caparison blogs you can read to lean about the differences in these fluorescent lamps and fixtures.

- [Lighting Comparison: LED versus HID](#)
- [LED versus Metal Halide Lights](#)
- [LED Versus High Pressure Sodium and Low Pressure Sodium](#)

# Common Issues



## **What are some common issues with conventional fluorescent light fixture applications?**

There are several issues that users of fluorescent lights endure. Although the cost of the lamps themselves is very low, maintenance and performance issues often arise over time. Fluorescent lighting is designed to operate for a certain amount of time, each time it is turned on, and thus fluorescent tubes tend to have shorter lifetimes. The more frequently they are activated, the shorter the lifetime of the lamp. Fluorescent lamps are also susceptible to temperature fluctuations and under-perform in colder temperatures.

### **Energy Costs**

For a 4ft fluorescent light, tube wattage typically ranges from 40 watts to 28 watts, and a 8ft lamp typically operates at 96 watts. It is common for fluorescent light fixture applications to utilize between 2 to 4 lamps per fixture, total approximately 160 watts to 112 watts for 4ft lamp fixtures and 192 watts for 8ft lamp fixtures. Operating these types of lamps can easily cost up to \$200 in electricity costs alone, per fixture per year.

### **Maintenance Costs**

For fluorescent fixtures, lighting maintenance is very dependent on the operational use of the lamps and fixtures. When operated in cold environments, or operating in a scenario where the lamps are turned on and off frequently, lamp life and performance can degrade drastically in a short period of time. Every time a fluorescent light is tuned on, it degrades the cathodes (the fluorescent lamp ignition system), resulting in a shorter operational life of the lamp. Lifetimes range from 10,000 to 30,000 hours for typical fluorescent tube, and it can easily cost up \$1,545 over the course of 3 years to maintain the lighting in a space utilizing fluorescent light fixtures.

### **Lighting Performance**

The performance of fluorescent lights can vary based on the TYPE of lamp (T12 Bulb, T8 Bulb, T5 Bulb, etc). CCT (Correlated Color Temperature) and CRI (Color Rendering Index) can also vary amount by different manufacturers of these lamps. Ultimately the performance of a fluorescent light fixture degrades significantly over time, and considering that most fluorescent lamps operate in multi-lamp fixtures, what you are left with is an interior lighting fixture whose performance in dependent on how it is operated by a individual user, and the ability of individual components (the lamps and ballasts within the actual fixture) to maintain their peak performance. If a single lamp ceases to function properly within a multi-lamp fixture, the performance of the whole fixture is negatively affected.

# Benefits of LED



## What are the benefits of LED Fluorescent Tube Replacements?

LED replacements for fluorescent tubes, also described as LED tubes, T8 LED, or LED Linear Lamps, provide a range of benefits over conventional fluorescent lighting. As we discussed previously, the way LEDs operate provides inherent advantages over fluorescent light fixtures. The quality of LED Fluorescent tube replacements has increased dramatically over the past few years and as a result, LED T8s are adaptable to a wide range of existing fluorescent lighting applications. This adaptability is a key benefit of LED tubes. Often the biggest question when it comes to LED fluorescent replacements is whether to utilize a LED tube within an existing fixture, or to install a new integrated LED fixture. Ultimately that decision is driven by the customer, and their expectations and constraints as they pertain to budget and desired performance.

## The three most common benefits of LED Tube Lighting

### Energy Savings

4ft LED tube wattage typically ranges from 12 watts to 20 watts, resulting in a 40%-60% percent reduction in energy consumption. The LED Lamp wattage range is so dramatic due to the need to adapt to the many different applications of fluorescent lighting. It is common for indoor LED fluorescent lamp applications utilize between 2 to 4 lamps per fixture. By using LED Fluorescent Tube replacements in these fixtures, it is possible to save up to \$2,692 per year for a room currently using fluorescent light fixtures.

### Maintenance Cost Reduction

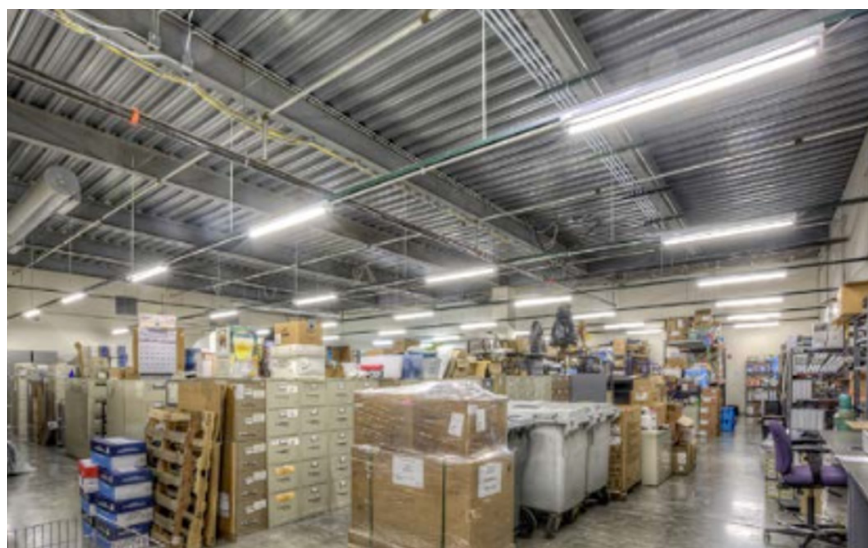
As mentioned previously, the way LEDs generate light and progress through their functional life results in a much longer operating life compared to conventional fluorescent light fixtures. Another advantage realized from LED replacements for fluorescent tubes is that they are not negatively affected by cycling (turning on and off), so they are more reliable in scenarios where lighting may be turned on and off frequently.

# Benefits of LED



## Lighting Performance

Moving on to the way LED Lamps "DISTRIBUTE" light. As a result of the Multi-Point design, LED fluorescent lamp replacements often provide a very EVENLY distributed light pattern. The result, in regards to LED vs Fluorescent, is a more even foot candle distribution from the LED conversion. In addition to the even distribution of light, LEDs are available in a range of color [temperatures](#), and as a result provide a range of options to increase the visual perception of "brightness".





# Next Steps



## **How do I determine what the next step is to convert to my Fluorescent Light Fixture?**

The first step is to speak with a LED lighting solutions provider or LED Lighting Company that is manufacturer neutral. Why this approach as opposed to the company you may have used for the past several years? Unless that company has a focus on providing LED Lamps and Light Fixtures, it is unlikely that will have the performance focused mentality that is required to obtain the desired results of a LED indoor lighting project for your fluorescent light fixture applications. A crucial Step in any LED project is understanding that LEDs are NOT a commodity. Prior decades consisted of building facility managers and owners evaluating options for Commercial LED Lighting, Industrial LED Lighting or LED recessed lighting purely on cost, assuming that all of the lighting options in consideration were equal in quality. This is not case with LED Fluorescent tube replacement options.

A solution focused supplier should ask you about your project objectives. Are there budget constraints, energy reduction targets, lighting performance requirements, etc? The appropriate partner will want to get an understanding of your desired OUTCOME, NOT just what specific products they can sell you. Not all LED Tube Retrofits and Conversions for replacing fluorescent lights are created equal. There are different levels of value from different manufacturers for different applications, and by working with a company that has the product expertise to recommend a solution that meets your project priorities, you will ultimately achieve the best results.

