

# ISTC Fact Sheet: LED Lighting



## SAVE 50% ENERGY BY REPLACING LINEAR FLUORESCENT LAMPS WITH LED LAMPS

Lighting is a crucial component of the manufacturing process; it impacts worker productivity, product quality, and facility appearance. Lighting also comprises a significant portion of a facility's energy costs and is frequently overlooked by maintenance and purchasing personnel. Old lamps are often replaced with new identical lamps without consideration being given to energy efficiency or cost.

Today, LED (light emitting diode) technology is changing that practice. Burgeoning LED products offer a variety of energy-efficient alternatives for industrial applications. ISTC has identified a simple, quick-fix solution to a very common scenario of upgrading linear fluorescent lighting.

### ALL TOO COMMON SCENARIO: REINVEST VS. REUSE

This fact sheet addresses a typical industrial scenario. A company which has previously replaced older, less efficient fixtures with more efficient fluorescent T8 or T5 fixtures within the last 5-10 years. What are they to do? They could:

- Replace "perfectly good" fixtures with new LED fixtures and make the high capital investment again.
- Use existing fixtures and electronic ballasts, exchanging only the T8/T5 lamps with linear LED replacement lamps at a fraction of the investment while still saving energy.

This fact sheet addresses the latter: (1) Are LED replacements lamps a viable, affordable option?; (2) How do they perform?; (3) What might be the best applications?

### THE LIGHTING EVOLUTION

Over the course of the past two decades, lighting technology has been in a state of evolution, transitioning from high-intensity discharge, fluorescent, and induction technologies to that of LED.

In the mid-1990s and early 2000s, more efficient, affordable T5 and T8 fluorescent industrial high bay lighting offered substantial energy savings to that of traditional T12 fluorescent, metal halide or high pressure sodium, with clients achieving as much as 50-60% energy reductions.

When LED entered the arena this past decade, it was novel, targeting specialty applications. As LED technology matured, competition increased, quality improved and markets expanded; industrial applications have exploded and prices have steadily dropped. Today, LED offers industrial facilities a variety of alternatives.

LED direct-install (plug and play) replacements of T8/T5 fluorescent lamps have recently become economically-viable for most customers. In late 2015, Ameren Illinois's [ActOn Energy](#) energy efficiency program introduced an instant incentive to business customers. This incentive makes the changeover to more efficient LED lighting very financially attractive. However, many are not aware of LED replacement lamp availability, performance, energy savings, utility incentives, or ROI (return on investment).

[istc.illinois.edu/tech](http://istc.illinois.edu/tech)

	Easy to install in minutes and without tools
	No mercury, improved safety, shatterproof*
	Instant energy savings, up to 50%
	Long lamp life: 50,000 hours
	Simple Payback: 3 to 10 months

\*glass bulbs also available

Great application for food manufacturers, healthcare facilities, commercial space, and industrial plants.

### LED PILOT COMPANY STATS

**Ownership:** privately-owned

**Operation:** 1 shift, 5 days

**Footprint:** 52,000 ft<sup>2</sup>

**Employees:** 20

**NAICS Code:** 561910



### ISTC TAP Assistance

ISTC's Technical Assistance Program (TAP) makes businesses more competitive and resilient with sustainable business practices, technologies, and solutions. TAP offers: Comprehensive Assessments, Zero Waste and Watch2O services.



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## THE PILOT

In order to facilitate adoption of pollution prevention (P2) and energy efficiency (E2) technologies and practices, ISTC Technical Assistance Program (TAP) staff conduct on-site pilots of newly-available technologies at manufacturing facilities. ISTC has shown that pilots accelerate adoption of sustainability practices by overcoming typical barriers to implementation, namely by showing [relative advantage, compatibility, complexity, observability, and trialability](#). An LED lighting pilot would enable TAP engineers to acquire hands-on experience (pros and cons), performance data, and customer feedback rather than mimic product guides, technical sheets, and sales flyers.

ISTC conducted a 30-day field trial of linear LED T8 replacement lamps at a small, privately-owned industrial facility. This industrial facility had previously replaced its 400W metal halide fixtures with 6 and 8-lamp 32W T8 fluorescent fixtures in 2009 and was reluctant to again invest in new fixtures.

ISTC retrofitted a sampling of their fixtures with DLC listed, LED T8 15W replacement lamps. The retrofit took mere minutes to swap out the lamps and turn on the fixture. A light meter was used to capture before/after light levels. The lamps were left in place for 30 days, allowing the facility manager to observe performance, compatibility with existing fixture and controls, and garner feedback from employees and owner. At the pilot's end, ISTC staff documented performance, energy savings, lamp cost, and simple payback.

The pilot showed the LED replacement lamps to: (1) function within fixtures with/without motion control, (2) produce equivalent or increased light levels, (3) reduce energy consumption over 50%, and (4) provide a simple payback of 10 months, excluding labor (three months @ 24/7).

## THE BOTTOM LINE

If capital is restricted, time is limited, or mercury and glass is a safety concern, then ISTC recommends businesses investigate retrofitting existing T8 and T5 fluorescent fixtures with LED replacement lamps (glass or plastic). The retrofit is easy to do and will produce equivalent or better light. The LED lamps will also reduce a business's environmental footprint, improve product/employee safety, reduce energy consumption, and yield an attractive ROI.

## ACKNOWLEDGEMENT

This fact sheet was developed as part of ISTC's [Illinois Conservation of Resources – Economy, Energy and Environment \(ICORE3\)](#) assistance project, funded by a grant from the U.S. Environmental Protection Agency, Region 5.

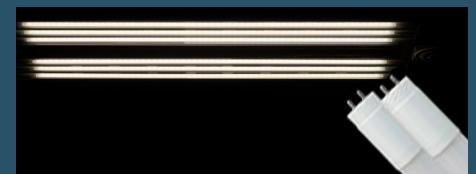
## T8 LAMPS - TECHNICAL SPECS

**Manufacturer:** Philips  
**Model:** Alto II, Long Life  
**Product Number:** F32T8/TL850 Plus  
**Lumens:** 3,100 with HBF 1.15  
**Lamp Life:** 36,000 hours  
**Bulb Material:** glass  
**Mercury:** 1.7 mg/lamp



## LED T8 LAMPS - TECHNICAL SPECS

**Manufacturer:** TCP  
**Model:** DirecT8 LED  
**Product Number:** LED15T841S50K  
**Lumens:** 2,280 with HBF 1.15  
**Lamp Life:** 50,000 hours  
**Bulb Material:** plastic  
**Mercury:** none



# Lamps	Fluorescent T8 Ft-c*	LED T8 Ft-c*	Diff Ft-c	Diff %
6	29.7	29.2	(0.5)	(1.6)
8	59.2	63.9	4.7	7.9

\*at work surface, approx. 44"

## ISTC FACT SHEETS

Find other fact sheets and more information about ISTC's Technical Assistance Program at:  
[istc.illinois.edu/info](http://istc.illinois.edu/info)  
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