EFFICIENT POWER CORP

Lighting Upgrade
Energy Reduction Opportunities

www.efficientpowercorp.com

As the Costliest Form of Energy, Electricity is by far the most attractive kind to save

- In a typical office bldg., about **30% of the electricity goes directly to lighting.**
- For each unit of lighting energy saved, about **1/3 of a unit of electric air conditioning is saved**
- **The heat** produced by lighting represents the **largest cooling load that many buildings have**
- Directly and indirectly, **lighting uses well over 40% of the buildings electricity** and a larger share of its peak electricity demand

T12 Phased Out Alert

- **T12 PHASED OUT ! ! !**

  Since July 2010, T12 ballasts are no longer commercially available.

  July 2012, T12 Bulbs will no longer be commercially available.

  Upgrade your Phased Out 1930's Technology T12 Lighting System Today to EPC High Efficiency T5™

  Federal, Local and Utility Efficiency Incentives are available to make the transition attractive and Affordable. Payment Plans are Available.

SIZES OF FLUORESCENT BULBS

Phased Out 1930's T12 – 1 ½" diameter
Typically 40 watts per tube

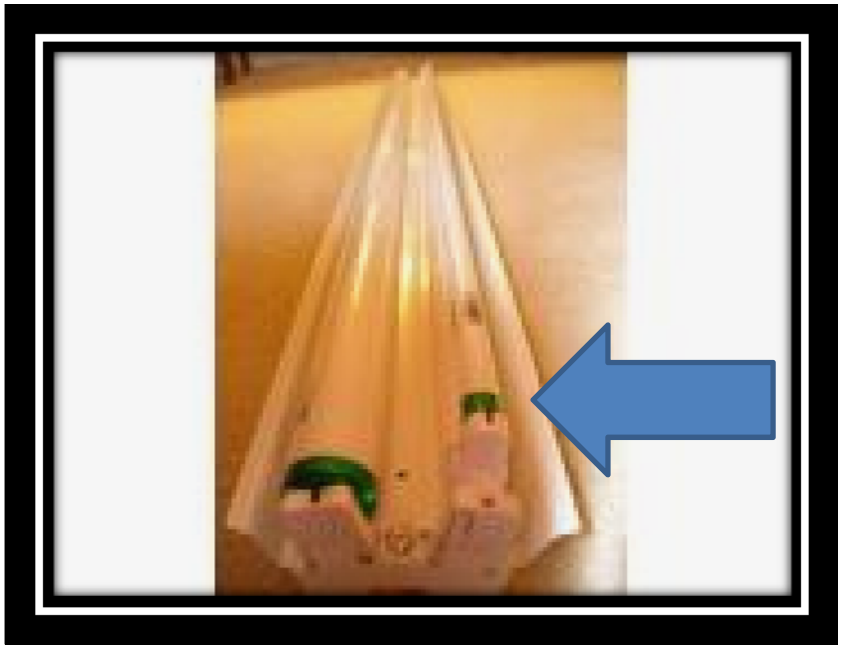
1960's T8 – 1" diameter
Typically 32 watts per tube

High Efficiency T5 – 5/8" diameter
18 watts per tube

Why upgrade with EPC T5™?

- **A T5 bulb is too short to fit into an <u>existing</u> fluorescent fixture.** The upgrade takes up that space by clipping into where the bulb clips into the fixture and then the new T5 bulb clips into the upgrade.
- The upgrade with it's **<u>built-in ballast</u>** burns at only **18w**

(vs. a 40w T12 bulb Save 55%
or 32w T8 bulb and save 44%)



REDUCE LIGHTING COSTS 44% TO 55%

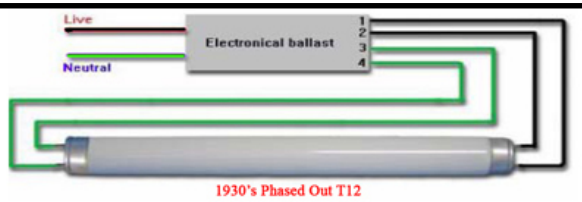
EPC High Efficiency T5™

WHY SWITCH TO EPC H.E T5™?

- **Less Watts Used-18w vs. 40w or 32w**
  T12 = reduced energy costs over 55%
  T8 = reduced energy costs over 44%
- **Approx. 1/2 the cost of <u>new</u> T5 fixtures**
- **Does NOT Disturb Existing Conditions**
  (No Asbestos, Lead, PCB worries)
- **Easy to Install: Minimal Impact on business**
- **Installation can be done overnight/weekend**

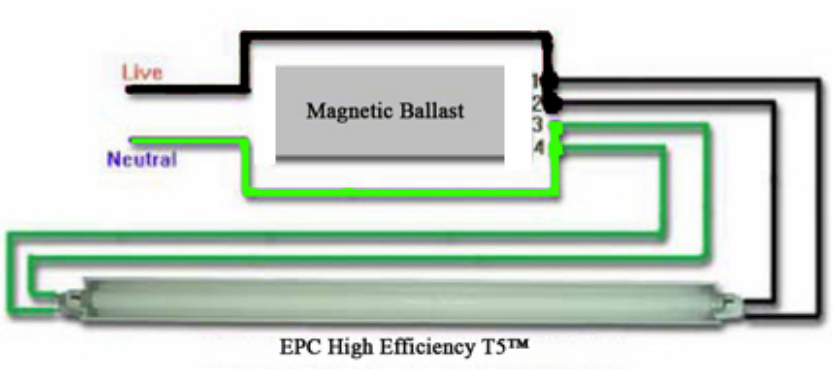
5 Minute Installation!

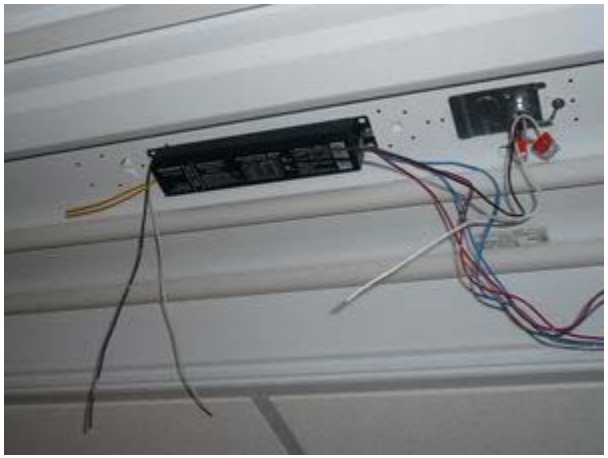
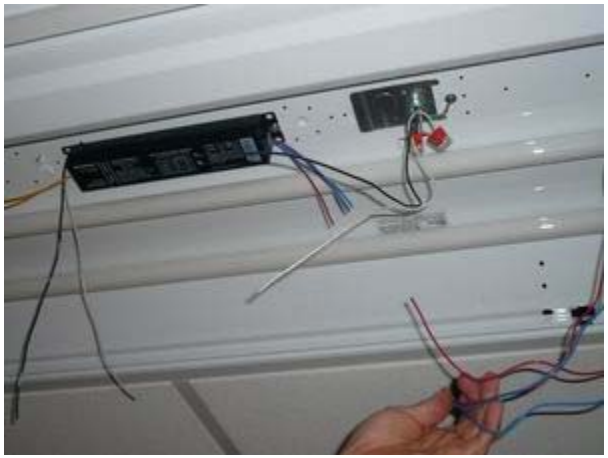
BEFORE

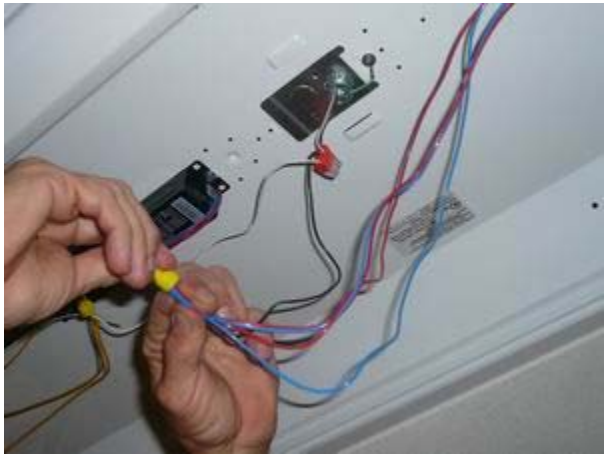


- **1. Turn off power**
- **2. Remove the T12 tube**
- **3. Connect Live to Wire 1 and 2**
- **4. Connect Neutral to Wire 3 and 4**
- **5. Clip in the T5 upgrade - Clip in the T5 bulb**
- **6. Turn on the power and installation is completed**

AFTER




Sustainable

- **Reduce your Carbon Footprint**
- **LEED Certification** – Lighting points
  Make your building “green”. Will “brown” buildings be as attractive to buyers/tenants?
- **Brighter**– Only 5/8” vs 1” = 1.6 x’s brighter
- **Sustainable: Uses your existing fixtures**

  Fixtures stay in use, not in Landfill
- **75% Less Toxic Mercury than T12**

EPC H.E. T5™ Features

- **FCC Approved for use in Hospitals and Clinics**
- **ETL Certified, ANSI/UL 1993 Approved**
- **Occupant Comfort: No Flicker, No Hum**
- Advanced Technology=Reliable Performance
- **Warm Start:** Electronic control gear units with warm start procedures **can increase lamp service life up to 50%**. (Our tests show that more than 1,000,000 switching cycles in 15 second intervals could not destroy the electrodes.

More T5 Features

- **Safety switch-off** in case of abnormal lamp operation, defective lamp electrodes, over-current, over-voltage, & the critical operation at the end of service life of the lamp.
- **Cut off technology:** This prevents permanent heating current during the operation of electrodes, which will result in less load to the electrodes and avoid additional power loss.

4 Bulb T12 vs 2 Bulb EPC T5

Lumens and Foot Candles

- **18w using a 4100K lamp = 2750 Lumens**
- **18w using a 4100K lamp with/reflector = 2900 Lumens**

FOOTCANDLES (fc):

A foot candle is a measure of illumination on a one square foot area one foot away from one lit candle at desktop.

In a recent test, a local High School measured the foot candles with a light meter:
Existing 4 bulb T8 32W fixture showed a foot candle of 46
4 bulb T5 18w showed a foot candle increase to 56

So reducing 44% energy = better lighting! Sounds like a Win Win.

The smaller bulb diameters and higher light outputs of T5 lamps increase the light emitted per unit area – or the luminance – of the lamp bulb walls. A T5 or T5 high output (T5 HO) lamp has 60% of the surface area of a T8 lamp. Because, however, a standard T5 lamp has nearly identical light output to a T8 lamp (2,900 lumens versus 2,950 lumens), **the surface luminance of a standard T5 lamp is 1.64 times as bright as a T8 lamp.**

LUMEN EXAMPLE

T8 2750 - Initial Lumens
2550 - Mean Lumens x .87 ballast factor =
2250 - Operating Lumens - heat builds up in a closed fixture reduces by 5-10%
2000 - Effective Lumens

T5 2900 - Initial Lumens
2750 - Mean Lumens x .99 ballast factor
2750 - Operating Lumens - no heat factor in the fixture
2750 - Effective Lumens

ROI – Return on Investment

- **Pay For Themselves Within 12-24 months**
- **Govt. and Utility Incentives make transition affordable while funds are still available.**
- **Low Cost Payment Programs Available.**
- By switching just 1,000 T12 40W (4 bulb) Fixtures to EPC High Efficiency T5™ 18W, you could be **saving over $750,000** on energy costs over a 5 year period!!

Cost of Doing Nothing

T12 Phase Out Means MANDATORY Upgrade

Why not upgrade now and start saving today!

- **Govt. Incentives Funding is still available**
- **EPAct 2005 Tax Deductions**
- **50% May be paid by Incentives!**

Wait til July, 2012 and waste 55% Electricity

Risk paying 100% of system if funding is gone

Pollute our world UNNECESSARILY

2’ U-bend Lights converted to 2’ linear adapters

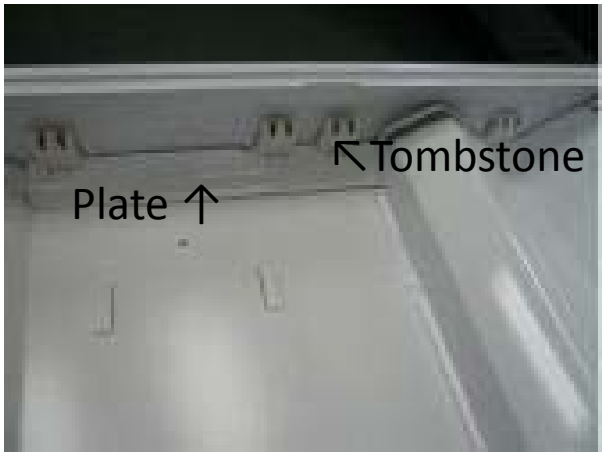
2’ U-bend light fixture (burning at 32w each)

2’ linear adapters replacing U-bend lamps (Plate & tombstones installed on opposite side of fixture to accept the adapter)

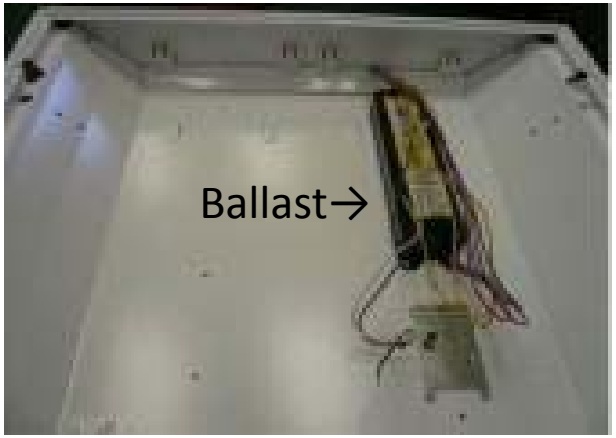
(Burning at only 12w each) ↓

2’ x 2’ Fixtures w/U-bend Lamps

- Fixture with Ballast cover on

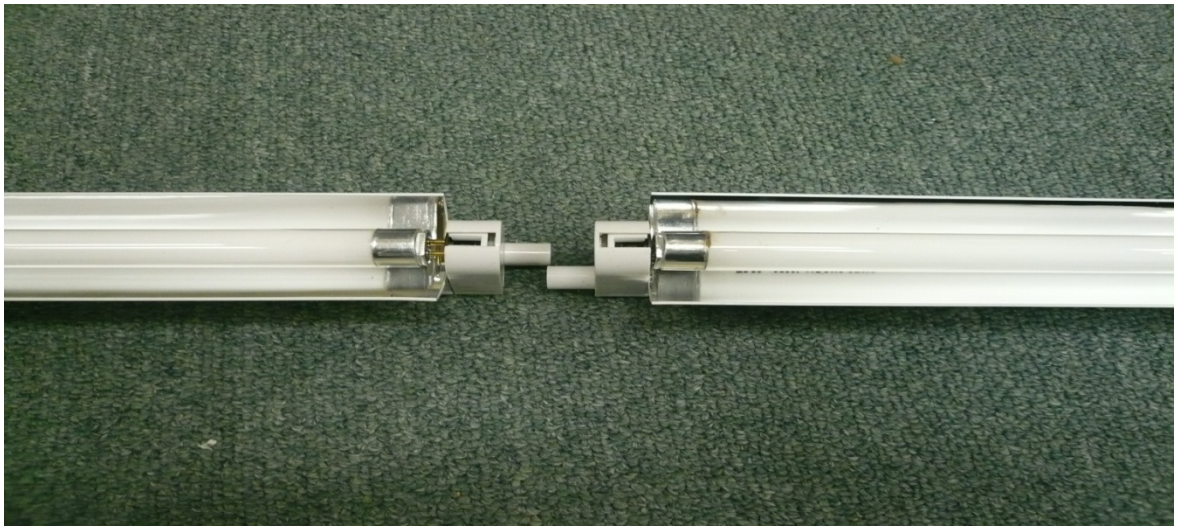


- Ballast cover off ~
  2’ adapter has a <u>built-in</u> ballast that burns at only 12w. Existing ballast will be bypassed.



8’ Bulb Conversion into (2) 4’ EPC H.E. T5™ upgrades and 4’ T5 bulbs

8’ EPC H.E. T5™ System



T8 fixture with Parabolic Lens

- De-lamping a (3) lamp T8 fixture to (2) T5
  18w upgrades leaves a black area in the fixture

T8 (3) de-lamped to T5 (2) bulbs with shield/reflector

(2) 18w upgrades saves 62.5% in energy

Deep Cell Parabolic

T5 (3) bulbs 18w
Saves 44% over T8 (3) 32w

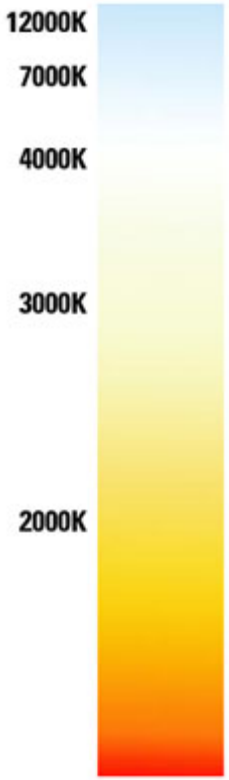
Available Upgrades

- 12 watt 2 Foot - with or w/o reflector
- 18 watt 4 Foot - with or w/o reflector
- 36 watt 8 Foot - with or w/o reflector
- 2’ U-shaped bulbs converted to 2’ T5
  or 2’ U-shaped EPC H.E. LED™

  (3’,5’,and 6’ available for special order)

Bulb Colors Available (Color Temperature)

- 6500K Daylight
- 5000K Pure White
  (EPC recommended)
- 4100K Cool White
- 3500K Warm/Cool Blend



Department of Energy LED Report

ABSTRACT:

The U.S. Department of Energy (DOE) Commercially Available LED Product Evaluation and Reporting (CALiPER) Program was established in 2006 to investigate the performance of luminaires and replacement lamps that use light-emitting diodes (LEDs). To help users better compare LED products with conventional lighting technologies, CALiPER also has performed benchmark research and testing of traditional (i.e., T12 and T8) and …. CALiPER benchmark testing.

In addition, the report describes LED replacements for linear fluorescent lamps and compares their bare lamp…. , including power usage, light output and distribution, efficacy, correlated color temperature, and the color rendering index. Potential performance and application…. retrofits . Although there may be some niche applications in which the lower light output, superior cold-temperature operation, and potentially longer life of LED linear replacements are indicated, CALiPER testing at this time shows that **LED technology is not yet ready to displace linear fluorescent lamps as replacement light sources in recessed troffers for general interior lighting.**

- http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/troffer_benchmark_01-09.pdf