

## T5 Lamp Holder

A solution to replace the T8 fluorescent lamp with a T5 without having to spend on a T5 fixture. A quick and effectively retrofit, this will enable a instantaneously substitute to complete the energy conservation transformation without the need to modify the fixture.

This transformation will provide :

- Solution to Low Labor Cost for a T5 Lamp on T8 fixture
- Use existing T8 Fixture ; no new fixture needed
- Lower Utilities Bills
- Improve Power Factor
- Longer lifespan
- Go 'Green'

# What is T8 or T5 ?



## **T8 Fluorescent Lamps**

T8 lamp has a larger diameter of 25mm and comes in standard wattage of 18W, 23W, 36W, 54W. Operated with electro-magnetic ballasts, these lamps types are usually coated with Halo-phosphate. T8 lamps have the luminous efficacy of about 75 lm/W (Based on Electronics Ballast)

## **T5 Fluorescent Lamps**

T5 lamp is a fluorescent lamp with a diameter of 16 mm. The standard wattage of the T5 lamps range from 14W, 21W, 28W to 35W.

Operated with high frequency electronic ballasts, these new lamp types fulfill the principle of cost-effectiveness. These lamps are coated with Tri-phosphor.

T5 lamps have the highest luminous efficacy of about 95 lm/W (Based on Electronics Ballast)

### **Efficacy vs. Efficiency**

Efficacy is the lamp output per unit of energy input to the lamp. Therefore, it is the ratio of lamp output to wattage consumption, expressed in lumens per watt (LPW). Efficiency is the absolute percentage of light produced within a fixture that is not absorbed within the fixture, but actually leaves the fixture.

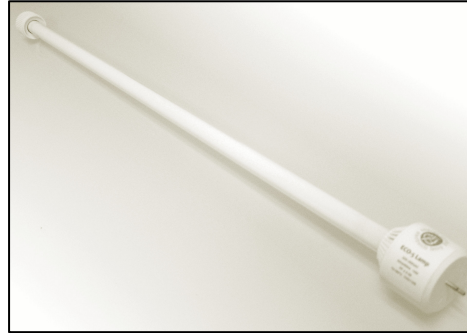
# T8 vs T5



## Advantages of T5 vs T8

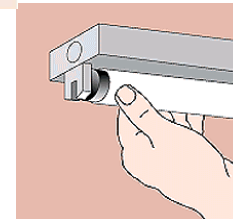
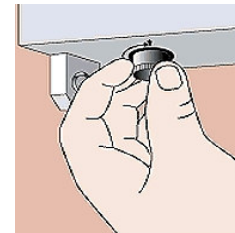
- Better Efficiency
  - T8 uses halo-phosphate and T5 uses tri-phosphor.
- Lower Mercury Used
  - T8 uses 9-12 mg while T5 uses less than 2 mg
- Higher CRI (Colour Rendering Index) ; improved illumination
- Longer Lifespan ; less maintenance cost
- T5 peak efficiency at 35 °C while T8 at 25 °C
- Electro-Magnetic vs Electronics Ballast
  - Electro-Magnetic can loss power of about 10W while Electronics Ballast is near zero.
  - Power Loss in form of heat affecting the connector to be brittle.
  - Electro-Magnetic will require a starter which may sometimes cause flickering while Electronics Ballast does not need one and will not flicker.
  - Electro-Magnetic have lower **pf** (power factor  $\phi$ ) while Electronic Ballast has **pf** near 1.
  - No starter need in Electronics Ballast ; one less component for replacement.
  - Increase the lifespan of the Fluorescent Tube ; less 'false' start of lighting.
  - High Frequency switching at Electronics Ballast will reduce power loss and at the same time, increase the efficacy of the lamp ; lumen per watt vs 50 Hz Magnetic Ballast

# ECO5 Series



Installation is quick and easy. Ready within 3 minutes.

- Simply remove the T8 Tube and Starter from its holders.
- Replace them with ECO-5 lamp and Starter, one for one.
- That's it. No rewiring, no need to remove existing magnetic ballast. No hassle!
- Switch ON the light and start enjoying the benefits of ECO-5 lamp.
- You will see instant light, brighter light and no more flickers.



# Potential Issues with Electronics Ballast



## 'End-of-Life' phenomenon

- Emitter/filament becomes depleted during the lifetime of the lamp due to sputtering at ignition and gradual emitter loss during burning. A lamp reaches its end-of-life when all the emitter is consumed.
- A symptom of emitter loss can be visual as it causes end-blackening by attaching itself to the phosphor in the electrode area.
- When all the emitter is gone, even the bare tungsten material starts to sputter off electrons, possibly causing severe end-blackening and the failure of the electrode. The lamp has now reached the end of its lifetime and should be replaced as soon as possible.
- Without effective protection or preventive circuitry, the ballast will continue to drive the lamp. The temperature in the region of the electrode increases rapidly and causes overheating easily reaching 800°C for a very short time the wire can drop on the glass and even melt a hole in the tube. As soon as a leak occurs in the glass, the process of ignition will stop. Statistically, less than 1% of the lamps fail this way.
- If the wire breaks but does not fall on the glass, however, a discharge can result between the wire of the electrode and the glass for a period of 60-180 seconds. The resulting temperature can be as high as 300°C. Subsequently the glass can weaken and the ring of the electrode sags towards the glass. This could result in a discharge and create high temperatures at the lamp-ends. If the ring comes in contact with the broken wire of the electrode, the arc discharge created could be maintained for hours and even days with an ever increasing temperature rise. The process will stop eventually when a leak in the lamp has developed.



# Comparison Chart

Lamp Type	T8 Lamp with magnetic ballast	ECO-5 Lamp	Power Saved	Percentage Saved
2 feet lamp	27W	14W	13W	48%
4 feet lamp	48W	28W	20W	41.60%

These results are achieved in addition to increased lamp life, reduced circuit power losses and less demand on air conditioning due to lower heat output.

# ECO-5 Lamp



Saves up to **48%**

- ✓ Flicker Free Instant Light
- ✓ Quite Operation, No Humming Noise
- ✓ Easy & Simple Installation
- ✓ Use Existing Standard T8 Fixture
- ✓ Extend Tube Life
- ✓ No Wiring Cost
- ✓ Developed in Singapore and produced within SEA



# T5 Lamp Holder



## Key Feature of ECO5 Lamp Holder

- Soft-start by pre-heating to prevent shortening the lifespan of fluorescent lamp (Rapid Start).
- Safety Measure with fuse for over-current protection.
- Built in feature to prevent damaging of adaptor when starter is not removed.
- Built in End-of-Life Protection Circuitry to protect the lamps from overheating at the end their life, preventing damaging of the Lamp Holder. IEC standard for fluorescent lamps (IEC 61347-2-3) has introduced requirements so as to avoid the overheating of the lamp-ends by incorporating 'suitable measures in the electrical circuit'. (This is very key Feature for protection Reason)
- Enhanced circuitry to extend the lifespan of the lamp itself. This will mean a bulb with lifespan of 10,000 hours will need to be replace only after 15,000 hours with such a feature.
- Tested and verified by TUV/PSB for its safety features.



PSB Singapore

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- Car Parks of 60 4 Feet Lamps (24 hours)
  - Annually Utilities of S\$5600
  - Re-lamping cost S\$200
  - Maintenance cost for Re-lamping S\$500

## Car Park Conversion of Lights



- **Summary of Main Cost Components based on 650 lamps (4 Feet) 24 hours operational**
  - Average Utility Cost (Saving of about S\$2,300)
  - Lamp/Bulb Replacement (Saving of S\$90)
  - Maintenance/Labor to replace Any Component of the Lamp (Saving of S\$300)
- **Nett Saving Achieved (Payback Period ard 6 months)**
  - First Year                      S\$1,400
  - Second Year                    S\$2,500
  - Third Year                      S\$2,500
  - Fourth Year                     S\$2,900

Investment of around S\$1,600.00.

After 6 months, saving will have recovered the costing of S\$1,600 based on current utility costing

End of 4<sup>th</sup> Year, would have saved S\$9,500.

# Existing vs Proposed Operating Cost (Car Park)

