

Figure 1. High Efficiency T8 LED Tube



Figure 2. Lighting the High Efficiency T8 LED Tube with Enclosure



Figure 3. Full View of Light High Efficiency T8 LED Tube

High Efficiency T8 LED Tube
FEATURES

- Cut electricity bill by 60%
- Mounted on regular T8 tube fixture: easy installation
- Work with or without the ballast removed
- Wide operating voltage range: 90VAC to 250VAC
- Power consumption: 18W
- High luminous efficiency: ≥ 90 lumen/W
- Total luminous flux: ≥ 1200 lumen
- Sun light color temperature: 4500K ~ 5000K
- High power factor: >0.85
- Low LED temperature: $\leq 65^{\circ}\text{C}$
- Wide operating temperature: $-30^{\circ}\text{C} \sim 55^{\circ}\text{C}$
- Long life time: $\geq 50,000$ hours

DESCRIPTIONS

Comparing with the conventional T8 tubes, our LED T8 tubes cut the electricity bill by 60%.

The high efficiency LED T8 Tube is a drop-in-replacement of the conventional T8 fluorescent tubes. They can be installed as regular T8 tubes into the existing conventional T8 tube lighting fixtures, with or without the ballast removed. Removing the ballast would result in 2W to 3W power saving.

Our product utilizes an extruded aluminum strip base, which has precise straightness, good looking, and high thermal conductivity, so that LEDs will have a low working temperature, thus maximizing the LED's life time.

This T8 Tube comes with an operation temp of $\cong 65^{\circ}\text{C}$, the temp of $> 65^{\circ}\text{C}$ will lead harms to the tube, for example, shorten the life span. To test the quality and stability of the tube, we put our tube under 50°C for 3000 hours, and found that no luminous decay occurs within 1000 hours, and only 3% luminous decay occurs during the test. In addition, even

ADVANTAGES OVER T8 FLUORESCENT TUBE

To learn the advantages of our High Efficiency T8 LED Tube over the conventional fluorescent T8 Tube, we made a test, see Figure 4, fix the tube to 2270mm(89.37inch) above the 0mm test point, so that the light sourcing from the tube can spread to large areas around. Always keep the tube balanced during the test, because little shake of the tube may lead big test errors; the best method is to keep the tube in a solt which is steady mounted on the ceiling board, and this method can also benefit your job when fixing the test points.
***. Cut off the current before removing the tube.**

The test result is shown in Table 1 on next page, from which we can educe that as the test point distance increases, the luminance output decreases, and the LED T8 Tube will always keep the advantages over the conventional fluorescent tube till the test point distance exceeds a certain level.

- Constant current, Reduce light decay, quick start, No flicking, Eyes protection.
- Lead free
- Mercury free
- No buzzing
- High shock & vibration resistance
- Dustproof and waterproof level: IP67
- CE, ROHS and FCC Certified

APPLICATIONS

Widely used in almost everywhere energy saving and high color rendering index lighting are needed, including hotels, conference rooms, shopping malls, factories, supermarkets, offices, commercial lighting, residential lighting, subway station, underground parking area, showcases, hospitals, etc.

when our product completes its task, and gets to the end of its life (80,000 hours), its luminous decay is just 30%.

Our High Efficiency T8 LED Tube comes in the up to date constant driving circuit, as well as the EMI shield measures, resulting in the zero EMI to the environment.

Our product comes with no hazardous substances to the environment, for example, mercury, and UV. The PC cover is made by the environmental friendly polymeric material, which is UL certified, it also comes with a high light transmittance of $> 93\%$, which can make our tube as bright as the conventional fluorescent tube. In addition, the LED based light source is environmental friendly, no doubtable the real green light source.

The T8 LED tube comes with a 120mm long enclosure, and 13 PCs of 0.5W LED internally. The words "T8" indicates its 1/8 inch end side diameter, which equals to 30mm. It has the same dimensions as traditional fluorescent tube, resulting an easy replacement.

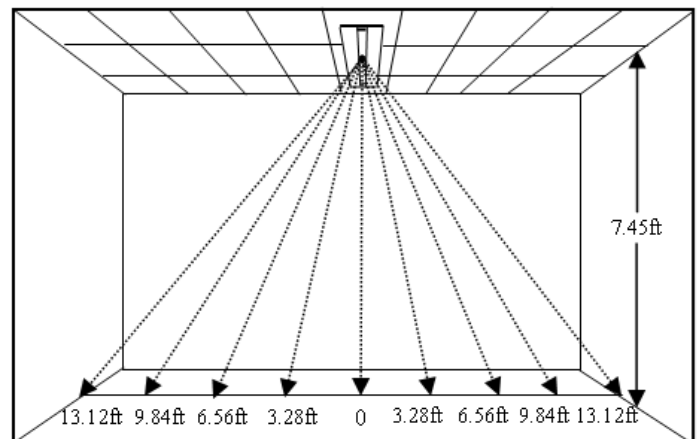


Figure 4. Measurement Description

Table 1. Test Results

Distance		60° LED T8 Tube (lux)	80° LED T8 Tube (lux)	Fluorescent T8 Tube (lux)	Distance		60° LED T8 Tube (lux)	80° LED T8 Tube (lux)	Fluorescent T8 Tube (lux)
mm	ft				mm	ft			
0	0	161	87	44	2050	6.726	18	27	24
50	0.164	161	86	43	2100	6.890	17	26	23
100	0.328	160	86	43	2150	7.054	17	25	22
150	0.492	157	85	43	2200	7.218	16	24	22
200	0.656	156	85	42	2250	7.382	16	23	22
250	0.820	154	83	42	2300	7.546	16	22	22
300	0.984	152	83	42	2350	7.710	15	21	21
350	1.148	150	82	42	2400	7.878	15	20	21
400	1.312	146	80	42	2450	8.038	14	20	21
450	1.476	141	79	42	2500	8.202	14	19	20
500	1.640	134	77	42	2550	8.366	14	18	20
550	1.804	129	76	42	2600	8.530	14	17	19
600	1.969	124	74	42	2650	8.694	13	16	19
650	2.133	117	72	41	2700	8.858	12	15	18
700	2.297	110	70	41	2750	9.022	12	14	18
750	2.461	105	69	40	2800	9.186	12	14	17
800	2.625	98	67	40	2850	9.350	12	13	17
850	2.789	94	66	39	2900	9.514	12	13	16
900	2.953	87	64	38	2950	9.678	12	12	16
950	3.117	81	62	38	3000	9.843	11	11	16
1000	3.281	75	61	36	3050	10.00	11	11	16
1050	3.445	72	60	36	3100	10.17	11	10	15
1100	3.609	67	58	35	3150	10.33	11	10	15
1150	3.773	63	56	34	3200	10.50	11	10	15
1200	3.937	58	55	34	3250	10.66	11	9	14
1250	4.101	52	53	34	3300	10.83	11	9	13
1300	4.265	49	51	34	3350	10.99	10	8	13
1350	4.429	45	50	33	3400	11.15	10	8	13
1400	4.593	40	48	32	3450	11.32	10	8	13
1450	4.757	37	47	31	3500	11.48	10	7	13
1500	4.921	35	45	30	3550	11.65	10	7	12
1550	5.085	33	44	29	3600	11.81	9	7	12
1600	5.249	31	43	29	3650	11.98	9	7	12
1650	5.413	28	40	29	3700	12.14	9	7	11
1700	5.577	26	38	29	3750	12.30	9	6	11
1750	5.741	25	37	28	3800	12.47	9	6	11
1800	5.906	24	35	27	3850	12.63	9	6	10
1850	6.070	23	34	27	3900	12.80	9	6	10
1900	6.234	22	32	26	3950	12.96	9	6	10
1950	6.398	20	30	25	4000	13.12	9	6	9
2000	6.562	19	29	25					

From Table 1, we can deduce the curve above.

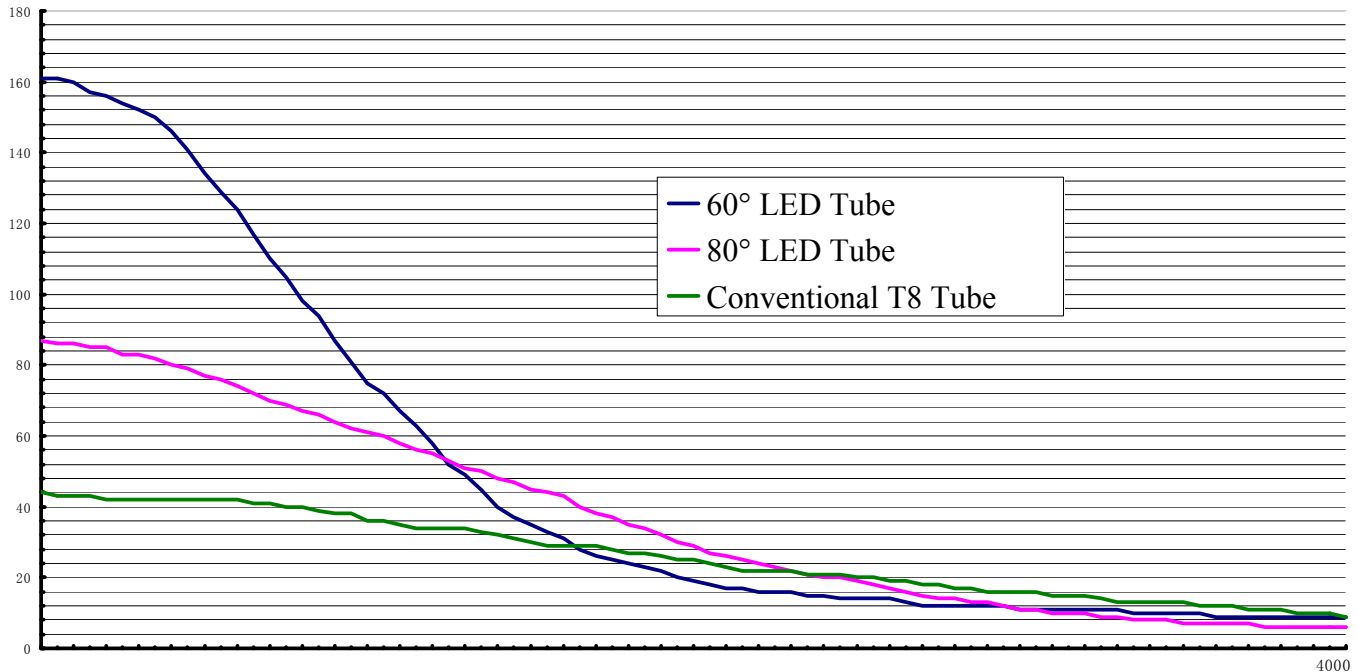


Figure 5. Luminance Output Curve for Different Tubes

In addition, High Efficiency T8 LED Tubes are ideal for conventional T8 fluorescent tubes replacement and have many advantages over the conventional T8 fluorescent tubes, the most absorbing one is its long life span, which is 6 to 8 years longer life than conventional fluorescent tubes, this is based on an 4000 hours average usage per year or about 11 hours a day @ $\leq 77^{\circ}\text{F}$.

The High Efficiency T8 LED Tube produces wonderful pure white light, printed materials appear sharpened and colors brighter, the viewing is easier on the eyes than with conventional fluorescent tubes. The T8 Fluorescent lamp is the most widely used light source in North America, for commercial use. Nearly every large building that you enter has arrays of T8 fixtures, their ceiling spaces are largely occupied with them.

The average standard conventional T8 fluorescent tube lasts about 20,000 hours if the temperature is less than 77°F . When the temp goes higher the life span of the fluorescent tube goes down.

The conventional T8 fluorescent tube is not only short on periods (less than three hours), but also shortens on the life

span, and being mounted so high in the air makes it a large expense to replace them when they fail.

When the groups of fluorescents need to be mended, location work and workers will be disrupted during the replacement of the fluorescent tubes and ballasts, lost production is the highest cost for replacing fluorescent tubes and ballasts. This equates to the highest cost saving for using LED T8 Tubes. LED T8 Tubes pay for themselves several times in actual bulb replacement (no more ballast replacement) and are labor savings during their lifetimes. The energy saving is substantial, and the improved light quality and workplace are bonuses.

An LED will operate 80,000 hours before dropping below 75% of their initial lumens output, but fluorescent tubes will lose 10% to 20% of their initial lumens output after the initial burn-in period of about 7000 hours. LED now can provide a 120 degree angle of light dispersion, a recent breakthrough to the LED area, it means they are less focused and can spread the light similarly to an incandescent bulb. But unlike conventional 360 degree fluorescent tube lighting, well dispersed light is directional which can add 46% more useable Lumens.

Table 2. High Efficiency T8 LED Tube vs. Conventional T8 Fluorescent Tube on Features

Features	T8 LED Tube	T8 Fluorescent Tube
Power consumption	18W	40W
Life span	80,000 hours	9,000 ~ 15,000 hours
Radiation	RoHS compliant	UV, IR
Toxicant	RoHS compliant	Toxic phosphor powders Mercury (Hg), Lead (Pb)
CO2 emission	Low	High
Heat damage	No	High
Fragile	Durable Aluminum Housing and PC Cover	Fragile Glass
Burn out failure	No	Yes
Flicking	Never	Frequently
Light wasted on reflector	No	High
Buzzing	No	Yes
EMI emissions	No, friendly to electronic equipment	Yes, harmful to electronic equipment
Recyclable	Yes	No
Low temp working environment	Compatible	Incompatible
Ballast needed	No	Yes
Starter needed	No	Yes
Maintenance fee	Low	High

Table 3. High Efficiency T8 LED Tube vs. Conventional T8 Fluorescent Tube on Expenses

Cost Savings Expanded	T8 LED Tube	T8 Fluorescent Tube
Life span @ 12 hours per day.	> 9 years	> 2 years
Cost of tube.	\$40.00	\$6.00
Cost to replace tubes in 10 years.	0	\$30.00
Energy cost for ten years .10 per Kw @ 11hours per day.	\$92.00	\$182.00
Energy cost for ballast .10 per Kw @ 11hours per day.	0	\$178.00
Maintenance cost to replace in 10 years. 15.00 per hour.	\$7.50	\$37.50
Ballast replacement cost. @ 28.00 ea.	0	\$224.00
Maintenance cost ballast replacement. 15.00 per hour.	0	\$75.00
Worker stoppage cost for T-8 replacement @ 35.00 per hour.	\$17.50	\$87.50
Worker stoppage cost for balast replacement @ 35.00 per hour.	0	\$175.00
Production slowdown for T-8 replacement @ depends on factory.	0	\$1000.00
Production slowdown for ballast replacement @ depends on factory.	0	\$5000.00
Average total cost for 8 years for 1 fixture.	\$157.00	\$6995.00

MECHANICAL DIMENSIONS

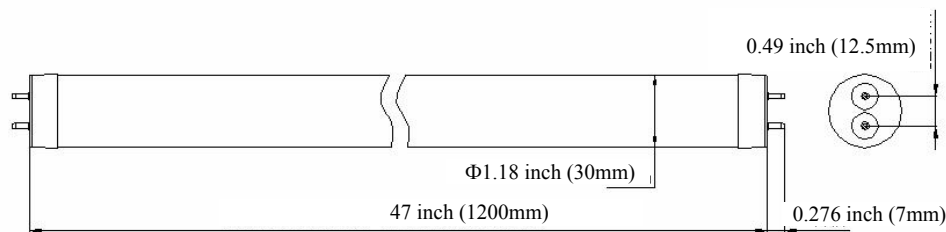


Figure 6. Mechanical Dimensions

We also have High Efficiency T10 LED Tube, whose end side diameter is 1/10 inch. When ordering, we will provide a corresponding power supply for you. If you have any doubt or suggestion, consult with us, we are all ears for you.



Figure 7. Supermarket Lighting



Figure 8. Subway Station Lighting



Figure 9. Office Lighting



Figure 10. Hall Lighting



CAUTIONS

1. Can be placed in conventional T8 fluorescent brackets (remove starter before replacement!).
2. Cut off the current before removing the tube.
3. The tube must work under the right voltage according to the specifications.
4. Do not touch the metal parts on both ends while the tubes are working.
5. Don't take the tube apart.
6. For indoor use only.

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