

CCFL (Cold Cathode Fluorescent Lamp)

CCFL is known as "Cold Cathode Fluorescent Lamp", Unlike traditional incandescent lights that require thermionic emission, CCFL's benefit from operating at significantly lower temperatures. CCFL's are characterized by low power consumption, longevity, close to zero UV emission, excellent Color Rendering, and the elimination of flicker. Having widely long been used to TV backlight for liquid crystal displays, the technology is well proven and an excellent baseline for green lighting solutions. By applying CCFL technology, T1 has developed lighting products that save energy and reduce costs. Nevertheless, the properties holds is more economical and suitable for indoor lighting comparing to LED lights.



**ZhaoXu CCFL
Achievement**

**ZhaoXu CCFL
Advantage**

**ZhaoXu CCFL
Patent**

**ZhaoXu CCFL
Product**

CCFL Features



Long Lasting/High Cycle Life

50,000 hrs of illumination and over 100,000 ON/OFF cycles



High Brightness

Brightness increases more 20% than standard lights



Lasting Brightness

CCFL lamps will only show a small 2-3% fade in brightness offer one year working



Flicker Free

45-50 kHz operating frequency does not strain the eyes



Low Power Consumption

Consumes 30% to 50% less energy compared to traditional T8 fluorescent lamps



High CRI

Rating at 85Ra on the Color Rendering index, this light source reproduces the colors of various objects faithfully in comparison with a natural light source



Low Operating Temperature

Can help to save up to 10% on air-conditioning expenses



Low UV

99.9% of UV light is blocked from escaping light enclosure



Environmental Friendly

No hazardous gases-No gaseous Mercury used and the quantity contained is solid state and recyclable

What is the CCFL ?

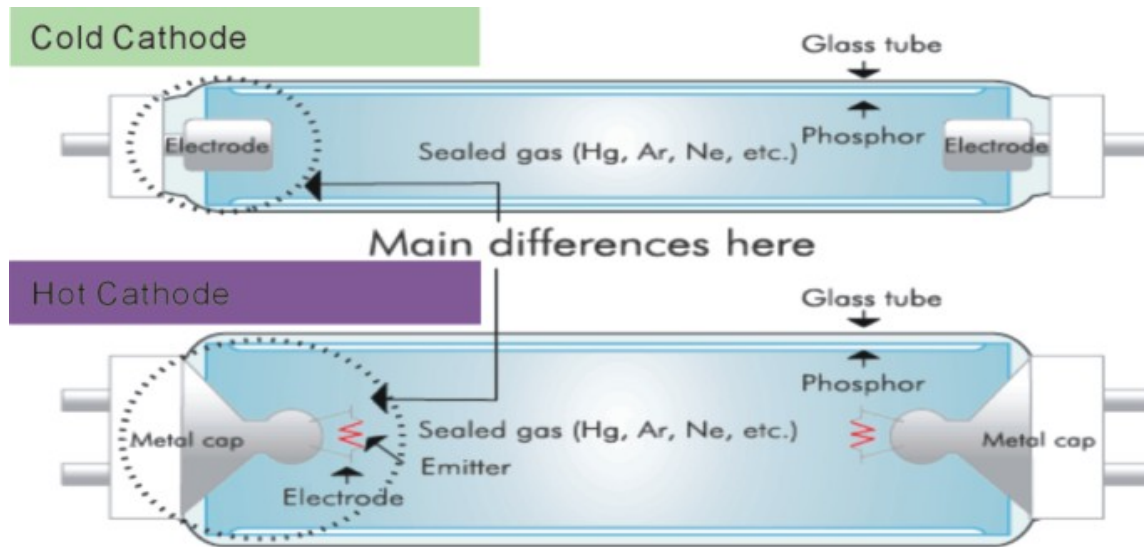
CCFL is known as “Cold Cathode Fluorescent Lamp”, Unlike traditional incandescent lights that require thermionic emission, CCFL’s benefit from operating at significantly lower temperatures. CCFL’s are characterized by low power consumption, longevity, close to zero UV emission, excellent Color Rendering, and the elimination of flicker. Having widely long been used to TV backlight for liquid crystal displays, the technology is well proven and an excellent baseline for green lighting solutions. By applying CCFL technology, ZhaoXu has developed lighting products that save energy and reduce costs. Nevertheless, the properties holds is more economical and suitable for indoor lighting comparing to LED lights.



Principles Of Fluorescent Tube Light

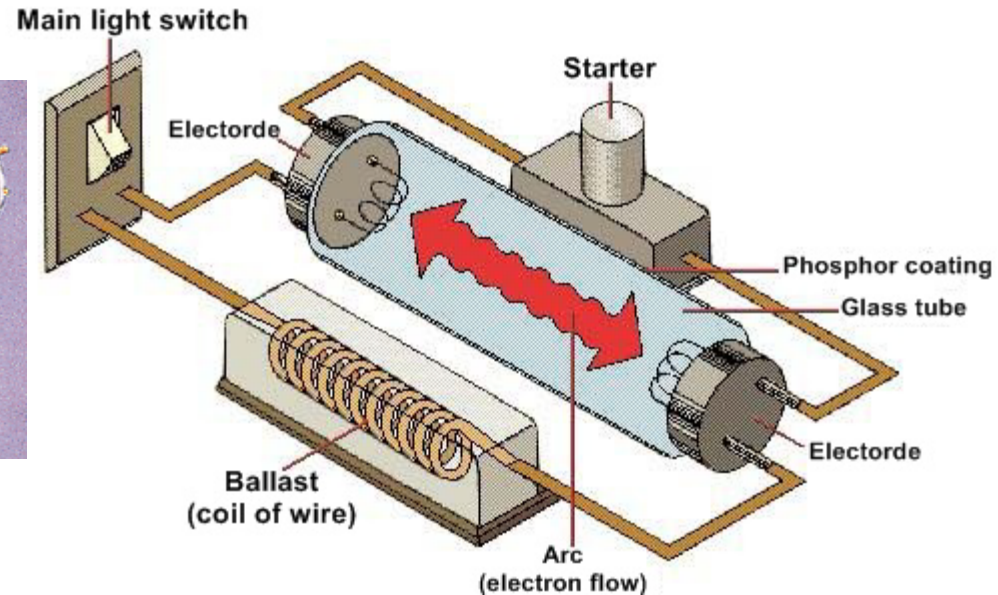
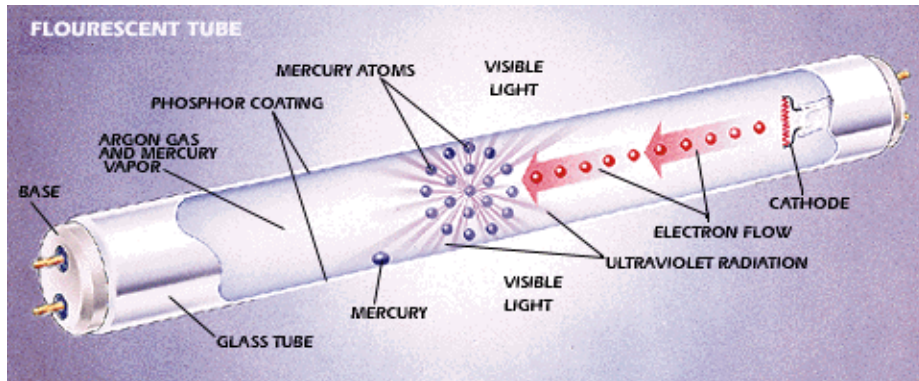
Cold cathode fluorescent lamp, energy saving bulbs, fluorescent tubes are fluorescent lamps, are inert gas through the tube ionization, mercury, and electronic dance. When the lamp electrodes applied high voltage electric field, mercury molecules produced by electron impact UV, coating agents, including the wall on the absorption of the ultraviolet fluorescence, you can send visible light. Principle of operation of the light they generally are similar.

We call CCFL is a cold cathode fluorescent lamp, fluorescent tubes as hot cathode fluorescent lamp HCFL, the electrode structure looks very similar.



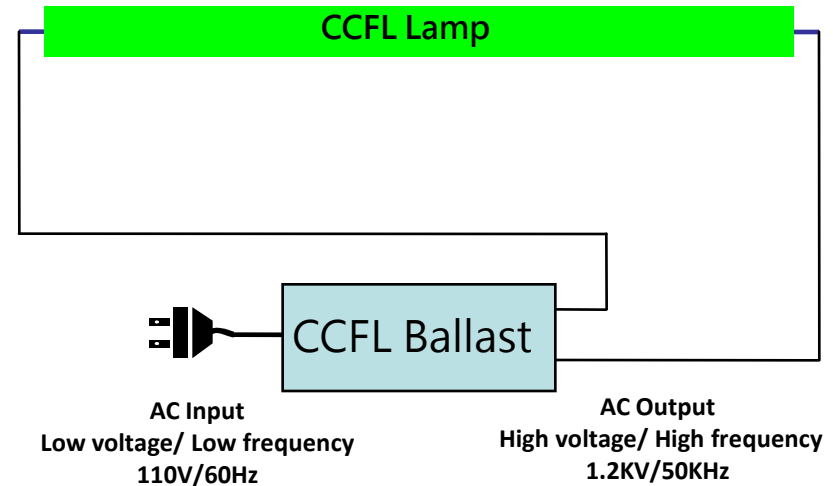
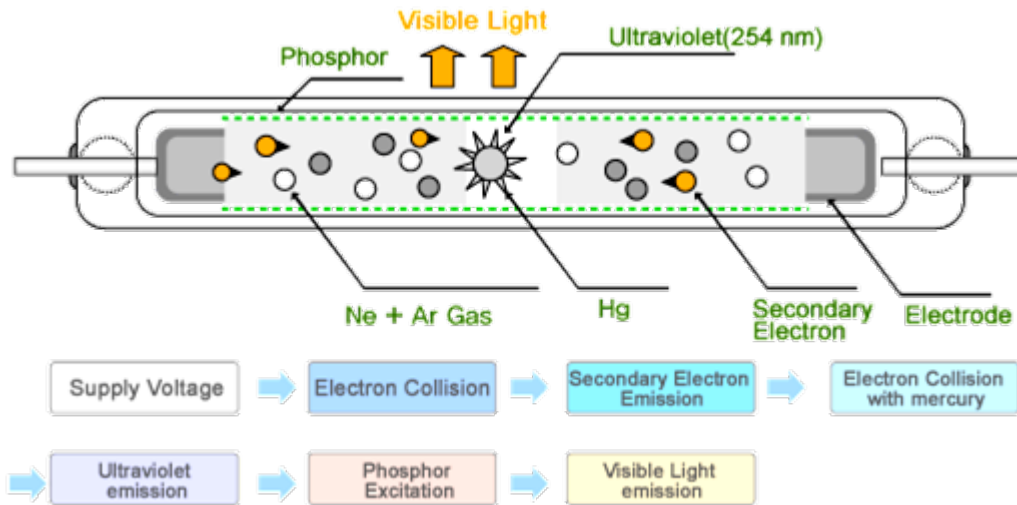
Principles Of Fluorescent Lamp

- HCFL (Hot Cathode Fluorescent Lamp)
 - A fluorescent lamp is a gas-discharge lamp that uses electricity to excite mercury vapor in argon or neon gas, resulting in a plasma that produces short-wave ultraviolet light. This light then causes a phosphor to fluoresce, producing visible light.
 - The life of fluorescent lamp usually depends on the consumption of the electrode, usually thousands of times through the electrode will start after the failure. So often on/off fluorescent lamps should be avoided

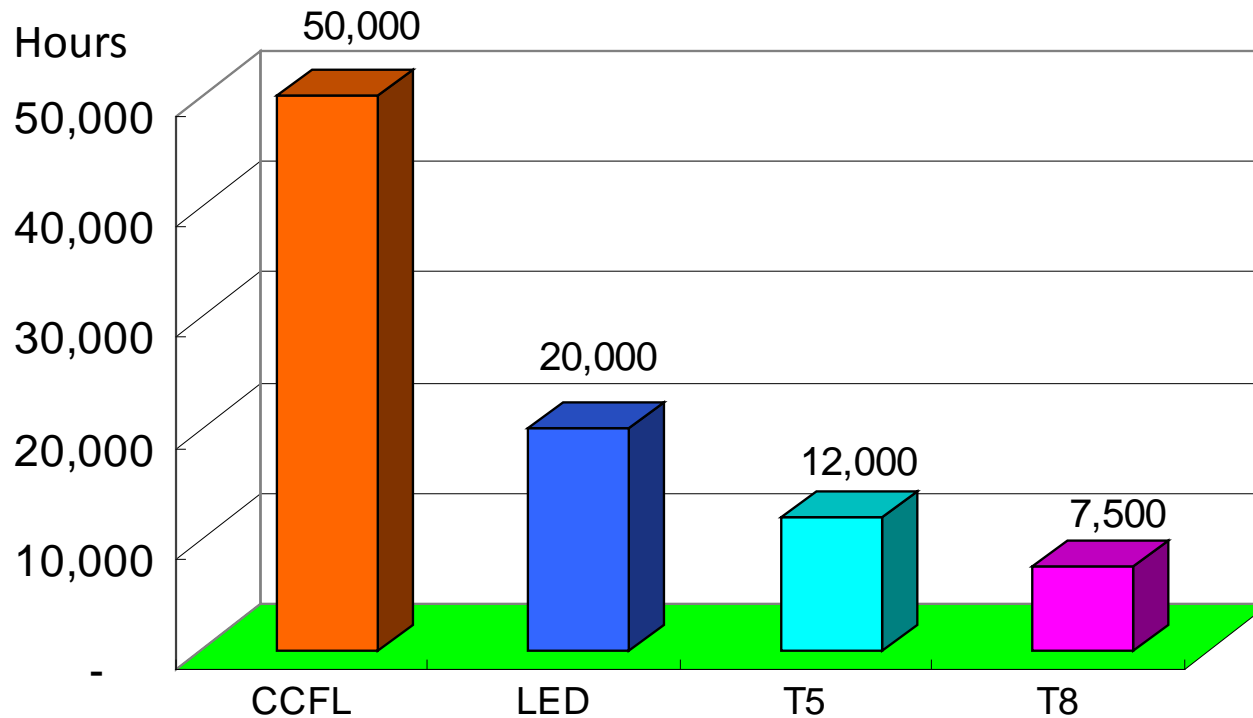


Principles Of CCFL

- **CCFL (Cold Cathode Fluorescent Lamp)**
 - CCFL without heating the cathode, but the direct use of high frequency resonant switching high voltage electric field after the sine function, so that the lamp electrodes within a small number of electronic high-speed impact secondary electron emission resulting from the discharge began.
 - The biggest characteristic of the two cathode, the CCFL near KV often required to generate a high voltage electron emission; generally hot cathode fluorescent lamp + ballast excited by the initiators, the use of the town after the AC power flow can continue to electron emission .

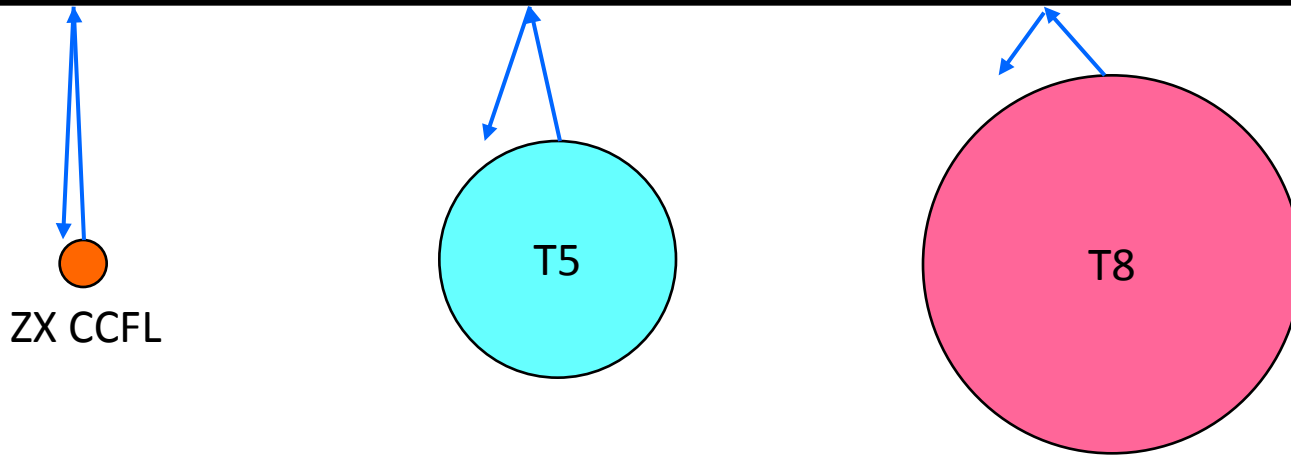


Comparison Of The Average Lamp Life

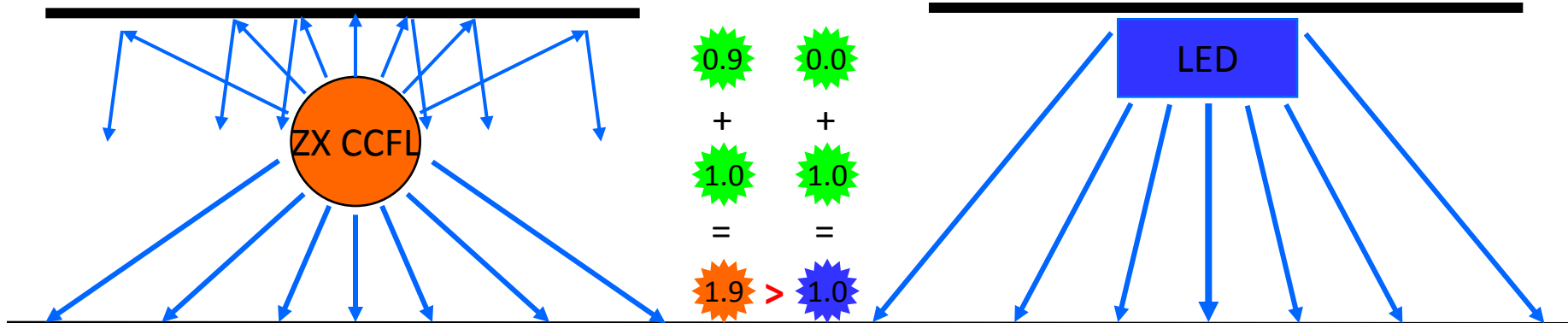


- The original design for the LCD CCFL backlight, to be more than 50,000 hours of life
- CCFL lighting is different from traditional HCFL to Tungsten wire

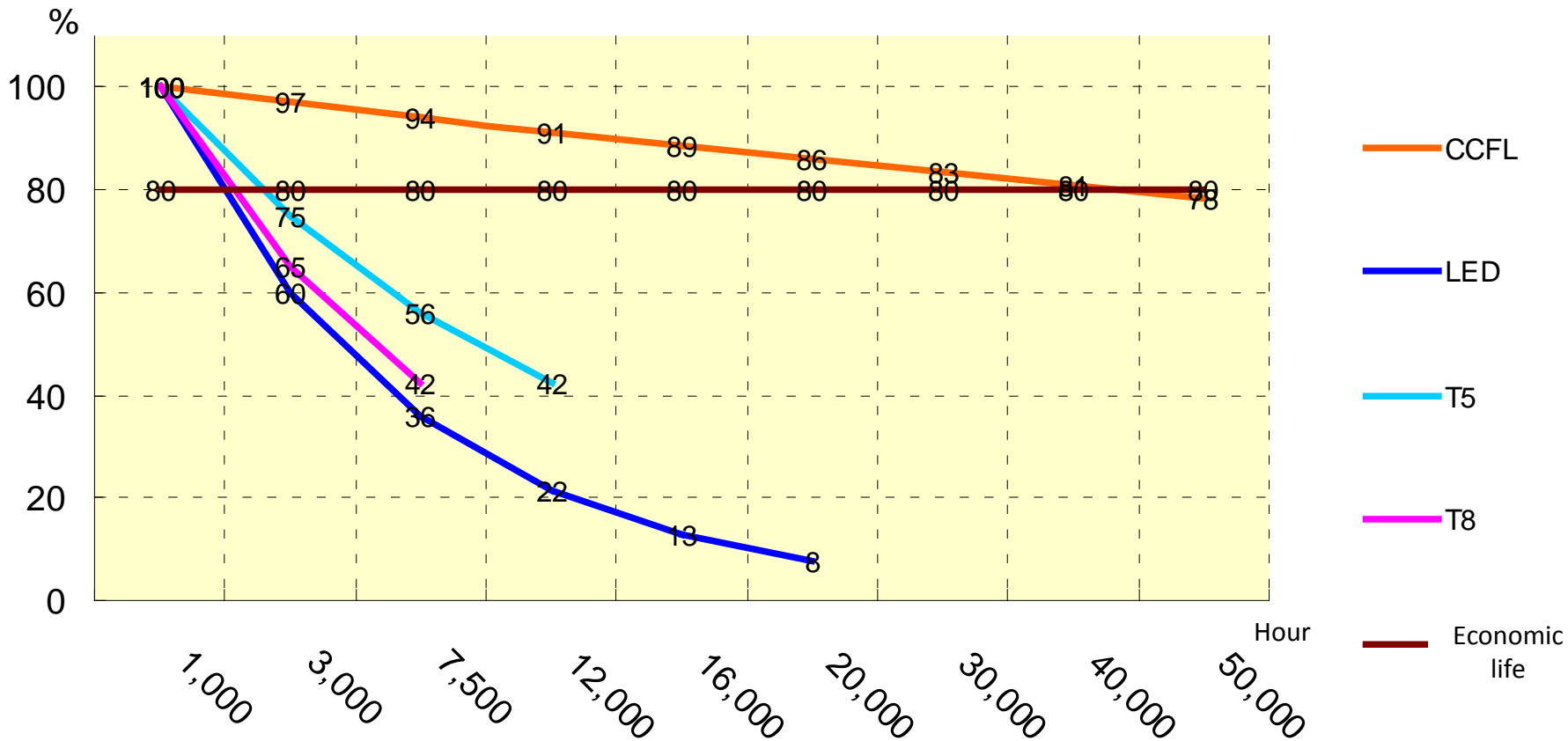
➤ Diameter of different effects have different degrees of shading



➤ LED emitting angle of 120° only, requires more energy to achieve the amount of circular LED lamps

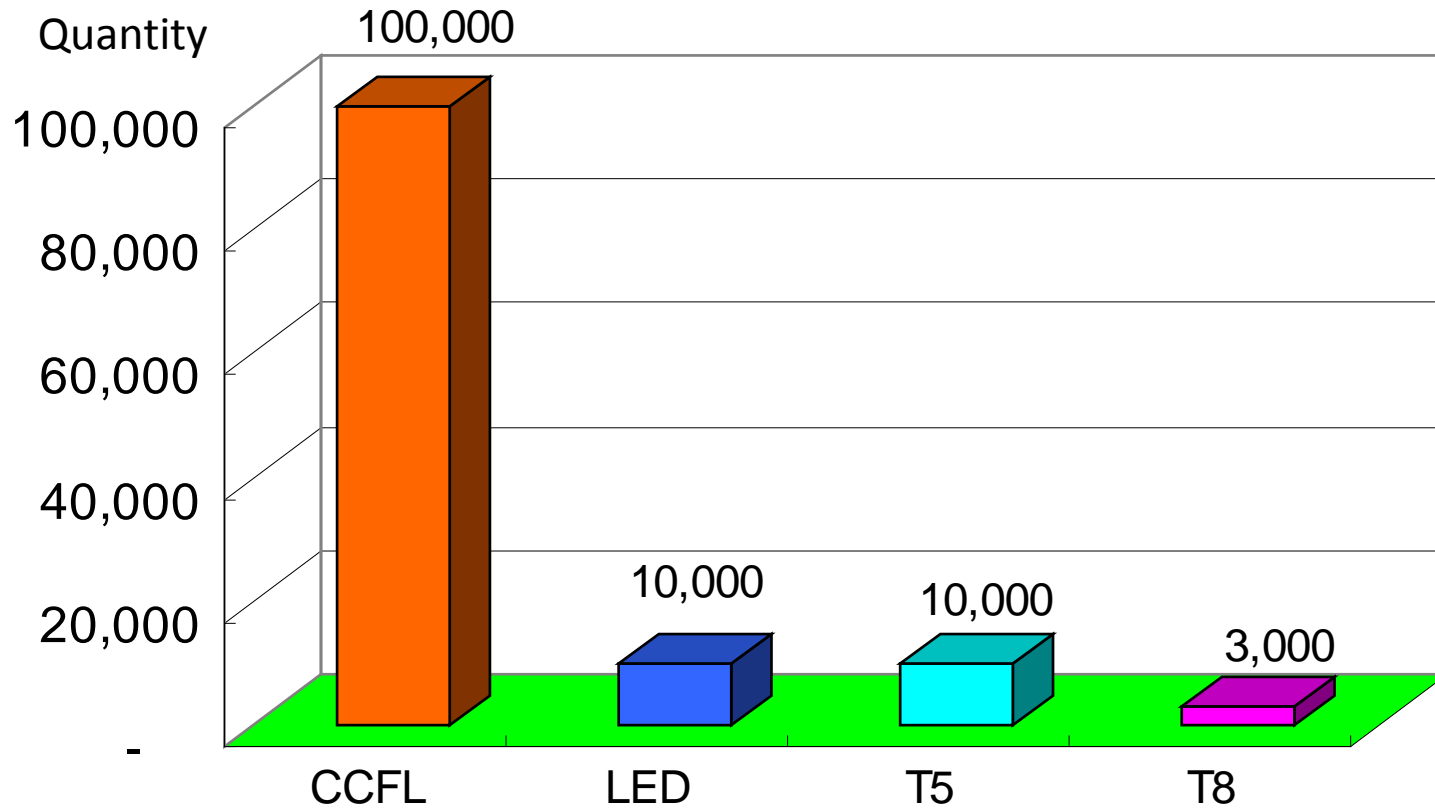


Comparison Of Light Failure



Light source	CCFL	LED	T5	T8
Light Failure Ratio	2~3%	30~50%	20~25%	30~35%

Comparison Of On/Off



- Different habits will increase the switching frequency and affect lamp life
- CCFL is not used tungsten filaments heating to reduce the electrode loss

Lighting Terminology

➤ Color Rendering Index CRI

- Measure of the light quality of a light source as compared with sunlight (which is given the maximum CRI value of 100). The closer a light-source's CRI is to 100, the better its ability to show true colors.
- Why the level of color rendering of the situation? The key lies in the spectral characteristics of the light · the wavelength of visible light of 380nm to 760nm range, this is what we see in the spectrum of red, orange, yellow, green, blue, indigo, violet range. If the light emitted by a light, being contained in the proportion of colored light and natural light close to the color of our eyes can see visible light will be more realistic.



60Ra



80Ra



85Ra

Comparison Of CCFL

Features	T8	T5	LED	ZX CCFL
Life Expectancy Hours Years	7,500 0.9	12,000 1.4	20,000 2.3	50,000 5.7
Average ON/OFF Cycle Capability	3,000	10,000	10,000	100,000
Percent Brightness Fade (after 3000 hours)	30%~35%	20~25%	30~50%	2%~3%
Power Consumption(W)	80W	56W	40W	48W
Operating temperature (°C) (middle) ----- (sides)	65 ----- 88	62 ----- 83	80 (散熱片)	46 ----- 67
Color Rendering Index(Ra)	80	80	<70	85
Maintenance Cost	High	High	High	Low
Environmental Impact	Liquid Mercury used is not recyclable. Contains 2.5 times the Mercury, Phosphor, and Glass of CCFL's.	Solid state Mercury can be recycled. Contains 1.5 times the Mercury, Phosphor, and Glass of CCFL's.	Semiconductor manufacturing processes require the use of hazardous materials. Proper disposal carries high maintenance cost.	Solid state Mercury can be recycled. T1 has significantly reduced the quantities of Mercury, Phosphor and Glass required.

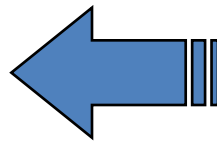
Data provided by the Taiwan Small and Medium Enterprise Administration, Ministry of Economic Affairs

Product Design & Advantage Of ZX CCFL

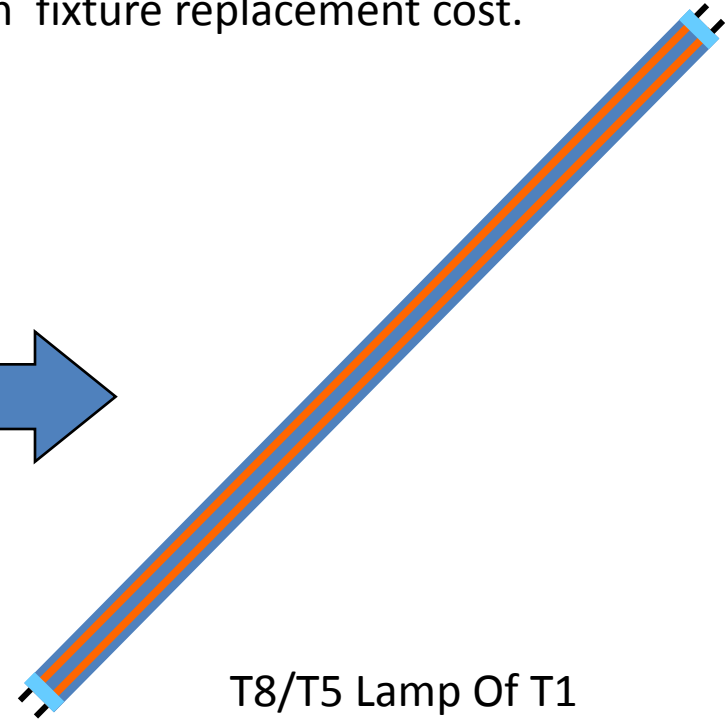
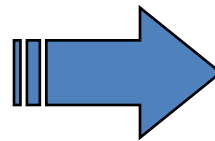
- **Lamp Modulization** Consistant with consumer, safe and easy.
- Light bulbs and lamps match tradition fixtures. Easy to replace.
 - Sturdy construction ensures greater handling safety and easy delivering.
 - Can be fitted with existing light fixtures to save on fixture replacement cost.
 - Minimal labor cost to replace.



E27 Light Bulb Of ZX
Product



Traditional CCFL Lamps



T8/T5 Lamp Of T1
Product

Comparison Of CCFL Lamps



Conventional CCFL



ZX CCFL Product

Comparison Of CCFL Lamps In The Form



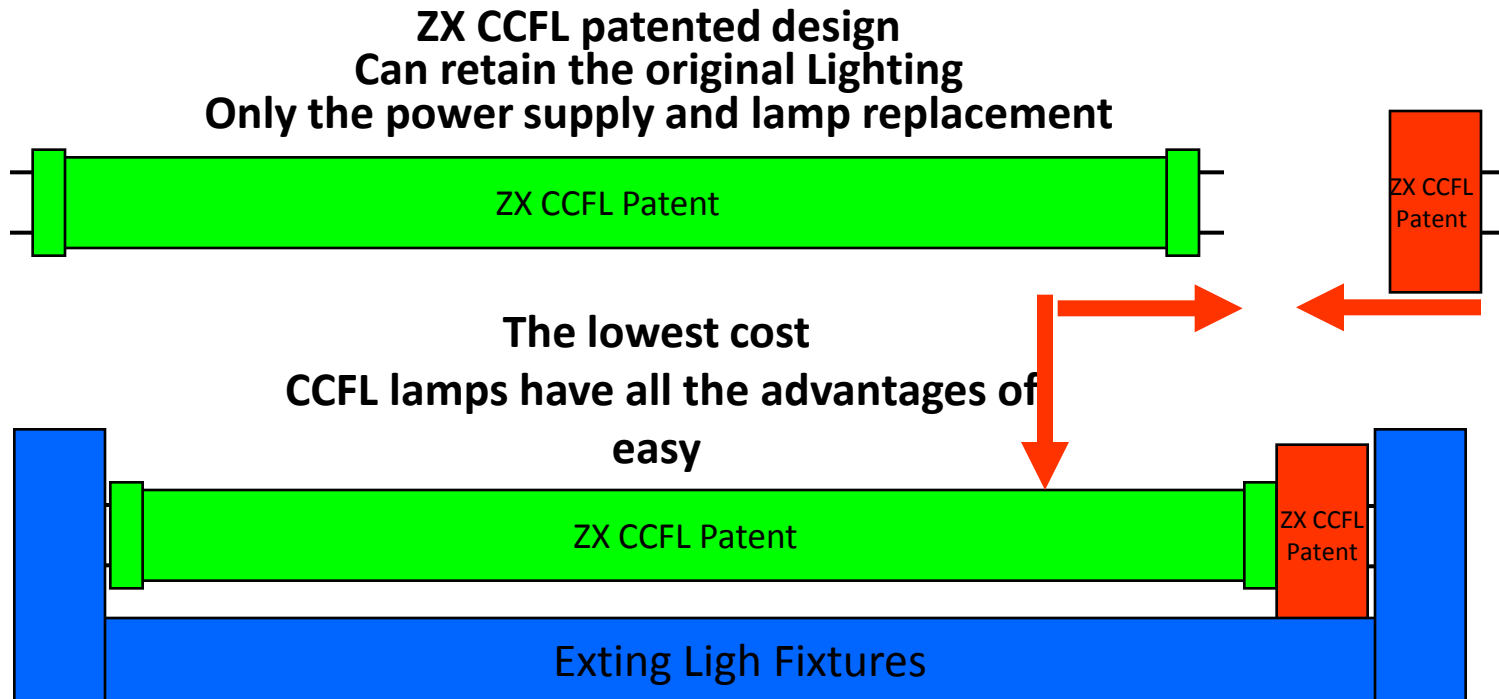
ZX CCFL Lamp



Traditional Of CCFL Lamp

Product Design & Advantage Of ZX CCFL

- **ZX CCFL Cartridge type adapter** Lower replacement cost, higher light effect.
 - Replaceable bulb or adapter independently.
 - 360 degree illumination. Light is not abstracted by adapters.



Changeable Power Adapter Modules



+



ZX CCFL Patent

ZX CCFL Patent



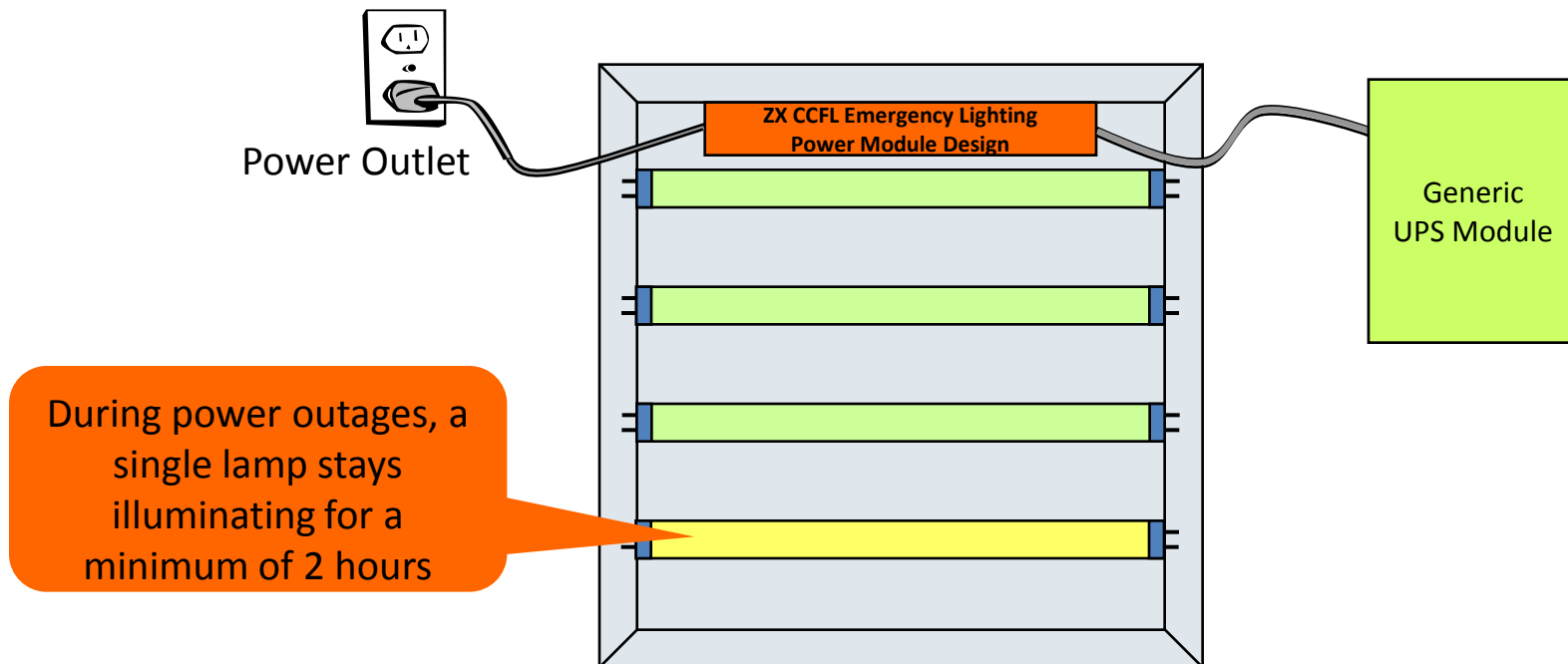
OR



Product Design & Advantage Of ZX CCFL

➤ Emergency Lighting Backup Function

- UPS can be combined with any ZX CCFL lamp fixture to ensure at least 2 hours of backup light.
- Single power module design improves both safety and efficiency.

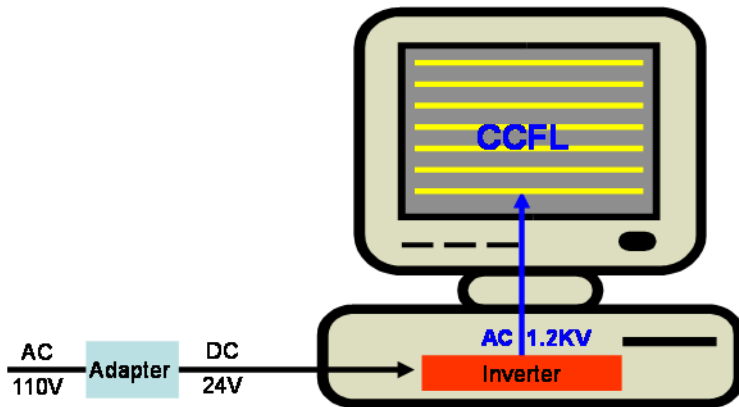


Product Design & Advantage Of ZX CCFL

➤ High Efficiency Power Design

- ZX CCFL lamps benefit from vast improvements to the CCFL circuitry design used on LCD inverters.
- Safety Circuit; when one lamp fails, the remaining three automatically shut off protecting the circuitry.
- Consolidating CCFL power circuitry into 1 module reduces cost and improves safety.

Traditional CCFL Power Conversion



Comparison Of CCFL Lamps

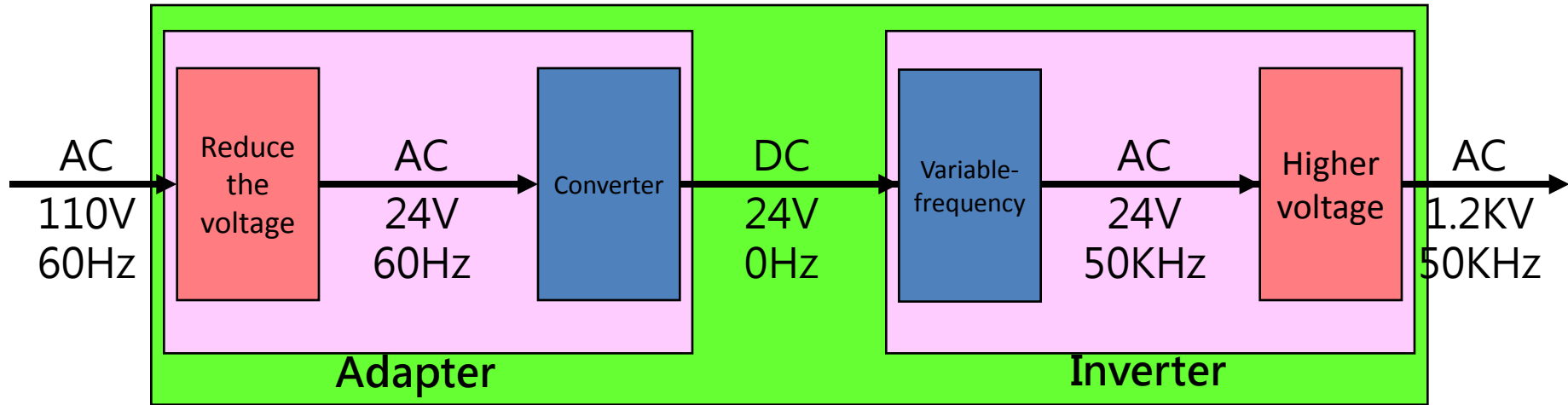


Conventional CCFL



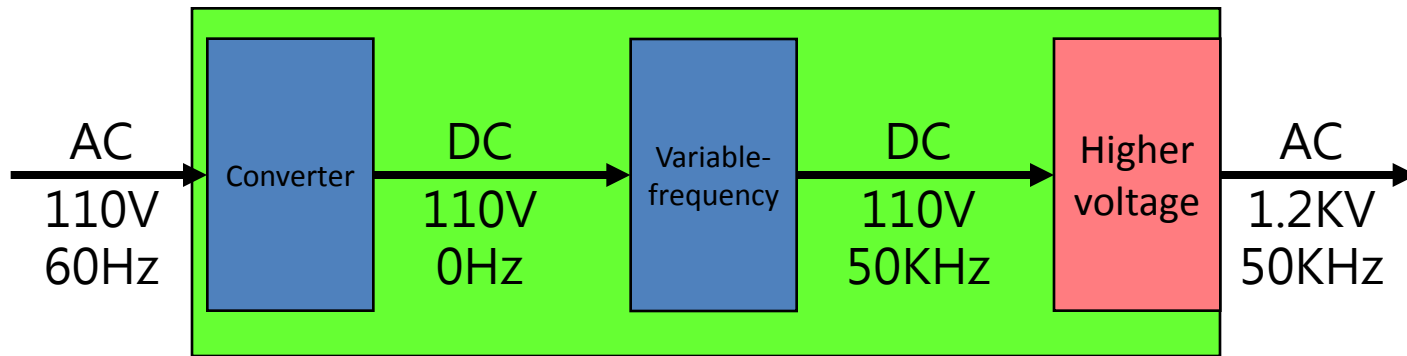
ZX CCFL Product

Comparison of CCFL lighting power conversion

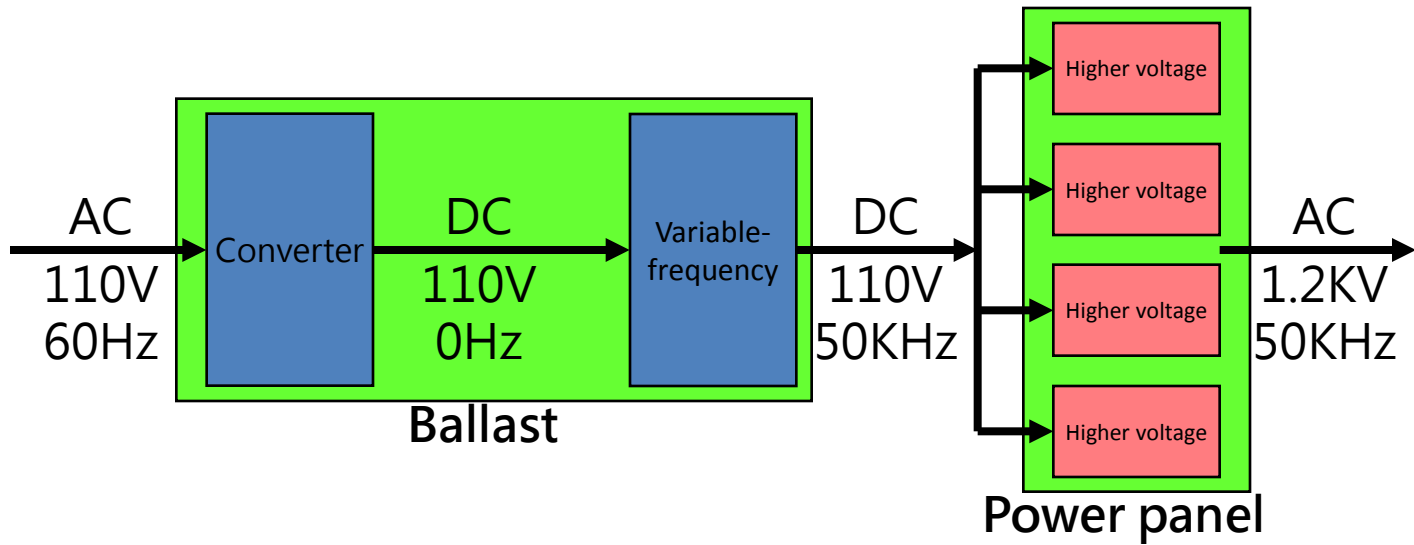


Ballast

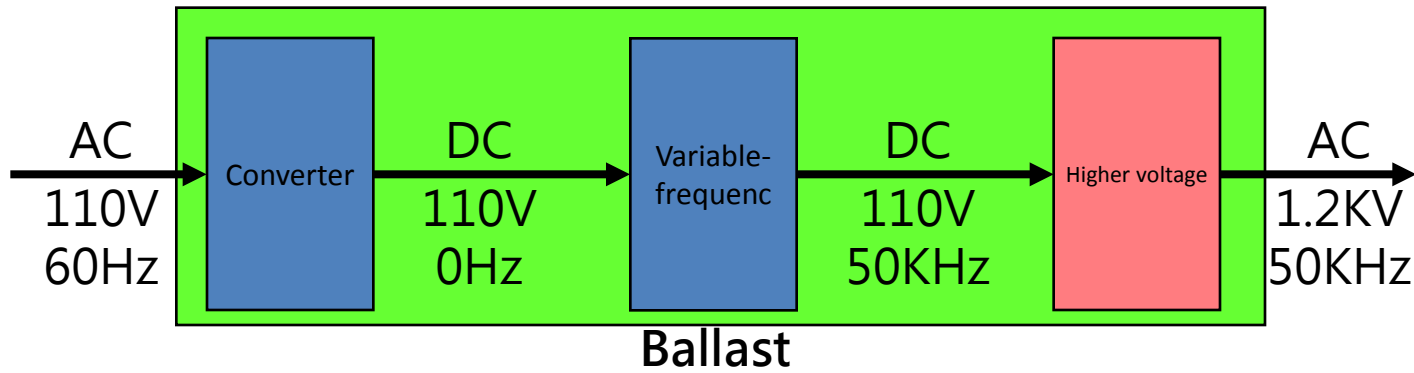
Less a voltage conversion, to reduce energy consumption



Ballast

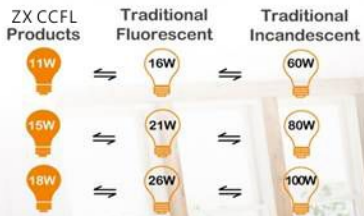


**No Lateral Power Circuitry,
low cost and safe**



Extreme Energy Saving

Energy Consumption Comparison at Equal Brightness



Life Expectancy Comparison



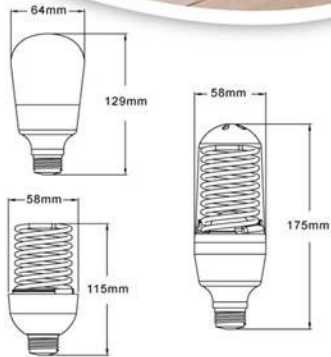
Dimmable

11W

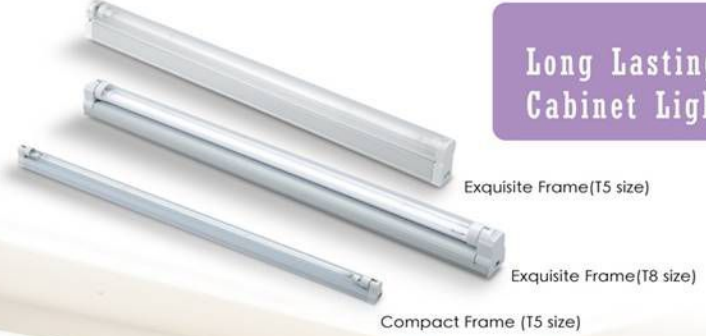
15W

18W

P/N	Power consumption	Voltage	Color temperature	Dimension (mm)	
				Diameter	Height
CBW11	11W	110V	6000K	64	129
CBW15	15W	110V	6000K	58	115
CBW18	18W	110V	6000K	58	175
CBW21	11W	220V	6000K	64	129
CBW25	15W	220V	6000K	58	115
CBW28	18W	220V	6000K	58	175
CBY11	11W	110V	3000K	64	129
CBY15	15W	110V	3000K	58	115
CBY18	18W	110V	3000K	58	175
CBY21	11W	220V	3000K	64	129
CBY25	15W	220V	3000K	58	115
CBY28	18W	220V	3000K	58	175



Long Lasting Cabinet Lights



Exquisite Frame(T5 size)

Exquisite Frame(T8 size)

Compact Frame (T5 size)



Exquisite Frame Fixture

P/N	Power consumption	Voltage	Dimension (mm)		
			Length	Width	Height
UCC1-52	12W*1	110V	576	27,5	57
UCC2-52	12W*1	220V	576	27,5	57
UCC1-54	24W*1	110V	1176	27,5	57
UCC2-54	24W*1	220V	1176	27,5	57
UCC1-82	12W*1	110V	617	38	54
UCC2-82	12W*1	220V	617	38	54
UCC1-84	24W*1	110V	1236	38	54
UCC2-84	24W*1	220V	1236	38	54

Taiwan Patents

M383677
M384277
M395900

China Patents

1563900
1571962
201020234416.7

Compact Frame Fixture

P/N	Power consumption	Voltage	Dimension (mm)		
			Length	Width	Height
UCN1-52	12W*1	110V	572	24	35,5
UCN2-52	12W*1	220V	572	24	35,5
UCN1-54	24W*1	110V	1172	24	35,5
UCN2-54	24W*1	220V	1172	24	35,5



Troffer Fixtures (T-Bar)



Taiwan Patents

M383677
M384277
M393129
M395900

China Patents

1563900
1571962
201020234416.7

P/N	Power consumption	Voltage	Dimension (mm)		
			Length	Width	Height
TBR-824	12W*4	110V-220V	601	601	65
TBR-823	12W*3	110V-220V	601	601	65
TBR-843	24W*3	110V-220V	1220	601	65

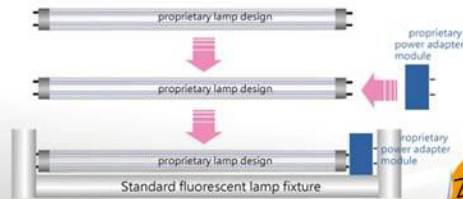
Taiwan Patents

M388803
M395900

China Patents

201020203825.0
201020234416.7

Changeable Power Adapter Modules



ZhaoXu Patented Design.

With replaceable adapters and lamps, fixture replacement is not necessary. The benefits of CCFL at the lowest overhead cost.



Cartridge Type Adapter Specs

P/N	Power consumption	Voltage	Dimension (mm)	
			Diameter	Height
IVL1C	12W	110V	39	25
IVL2C	12W	220V	39	25

Lamp Specs

P/N	Power consumption	Color temperature	Dimension (mm)	
			Diameter	Height
CLWC2	12W	6000K	T8	554
CLYC2	12W	3000K	T8	554
CLWC4	24W	6000K	T8	1146
CLYC4	24W	3000K	T8	1146

• Additional Color Temperature options available



Compatibility
with conventional
fixtures

Triangular Fixtures



Channel Fixtures



Triangular Fixtures

P/N	Consumption	Voltage	Dimension (mm)		
			Length	Width	Height
MTH1-821	12W*1	110V	643	130	95
MTH1-822	12W*2	110V	642	201	80
MTH2-821	12W*1	220V	643	130	95
MTH2-822	12W*2	220V	642	201	80
MTH1-841	24W*1	110V	1262	130	95
MTH2-841	24W*1	220V	1262	130	95
MTH3-842	24W*2	110V/220V	1262	201	80

Channel Fixtures

P/N	Consumption	Voltage	Dimension (mm)		
			Length	Width	Height
MWH1-821	12W*1	110V	637	126	83
MWH1-822	12W*2	110V	639	186	90
MWH2-821	12W*1	220V	637	126	83
MWH2-822	12W*2	220V	639	186	90
MWH1-841	24W*1	110V	1257	126	83
MWH2-841	24W*1	220V	1257	126	83
MWH3-842	24W*2	110V/220V	1257	186	90

Commercial Fixtures



Lamps for Commercial Sign Illumination



Commercial Fixtures

P/N	Consumption	Voltage	Dimension (mm)		
			Length	Width	Height
MEH1-821	12W*1	110V	610	55	80
MEH2-821	12W*1	220V	610	55	80
MEH1-841	24W*1	110V	1226	55	80
MEH2-841	24W*1	220V	1226	55	80

Lamps for Commercial Sign Illumination

P/N	Consumption	Voltage	Dimension (mm)	
			Diameter	Height
IVL1C	12W	110V	39	25
IVL2C	12W	220V	39	25
CLWC2	12W	6000K	T8	554
CLYC2	12W	3000K	T8	554
CLWC4	24W	6000K	T8	1146
CLYC4	24W	3000K	T8	1146

Power Specs

Lamp Specs

• Additional color temperatures available





Service and value
You can expect from **ZhaoXu CCFL**



Advanced Lighting Solutions

- 99.9% UV free
- Flicker Free
- High Brightness
- Vivid, natural color reproduction



Cost Efficient Products

- Long Life Expectancy
- Energy Efficient
- Lowers Electrical Costs
- Affordable Implementation
- Low Maintenance



Professional Service

- Advanced technical design
- Focused research and development
- Custom planning service
- Personal and continued support



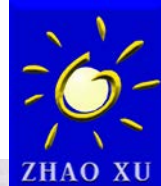
Green Solutions

- Minimal waste
- Made from recycled material
- Efficient Energy Consumption
- Reduced environmental impact

美國FCC認證

安規認證證書

美國FCC認證



CERTIFICATE OF CONFORMITY



Equipment : CCFL LAMP
 Brand Name : T1
 Test Model No. : ACLWC4-1
 Applicant : T1 LIGHTING TECHNOLOGY CO., LTD.
 Test Report No. : FD110808C05

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, declare that the equipment above has been tested in our facility and found compliance with the requirement limits of applicable standards. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate under the standards herein specified.

FCC Part 18, Subpart C

Kenny Meng
 Kenny Meng / Assistant Manager
 Aug. 9, 2011



CERTIFICATE OF CONFORMITY



Equipment : CCFL LAMP
 Brand Name : T1
 Test Model No. : ACLWC2-1
 Multiple Listing : ACLUD2-1, ACLUD4-1,
 ACLX;X₂ X₂-1
 X₁: Designates lamp color temperature. Can be A, B, C to Z. Ex: U (7500K), W (6000K), V (5000K), X (4000K), Y (3000K).
 X₂: Designates lamp Lens, can be C (Half diffused) or D (Entire diffused).
 X₃: Designates lamp length, can be 4 (1194.8~1198mm) or 2 (585~590mm).
 Applicant : T1 LIGHTING TECHNOLOGY CO., LTD.
 Test Report No. : FD110808C05A

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, declare that the equipment above has been tested in our facility and found compliance with the requirement limits of applicable standards. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate under the standards herein specified.

FCC Part 18, Subpart C

Kenny Meng
 Kenny Meng / Assistant Manager
 Sep. 15, 2011

