


# Light Efficiency Analysis

## THT-EX LED VS Traditional lighting



# Lighting lamp : COB LED and HPS 、 Metal Halide Lamp



AC in LED 	HPS 、Metal Halide Lamp
Instant start!	Needs to warm up
Long lifetime, no need to change COB	Short lifetime, needs to change bulb often.
Compact size and lightweight	Bulky
No gas	Possibility of gas leakage.

# Product comparison A

40W LED replacing 100W HPS/MHL

60W LED replacing 175W HPS/MHL

**THT-EX**  
**60W LED**



**69.1** lm/W



**100W HPS**



44.8 lm/W

**175W Metal**  
**Halide Lamp**



42.9 lm/W



久鑫科技股份有限公司  
TOP HI-TECH CO.LTD.

# Product comparison -- Efficiency

Item	175W Metal Halide Light (a)	150W HPS (a)	100W HPS (a)	60W LED Street Light (L1105) (THT-EX) (b)
Model Number	N/A	N/A	N/A	THT-2LA60Wd52C1105
Picture				
Lamp Wattage(W) Voltage	220W N/A	198W N/A	100W 2.1A/ NA	62W 0.3126A @220Vac
Polar Luminous Intensity Distribution				
Light Installation Hightness(M)	Below 6M(inclusive)	Below 6M(inclusive)	Below 6M(inclusive)	Below 6M(inclusive)
Temperature Classes	T3 or T4	T3 or T4	T3 or T4	T5
Life time(hrs)	10,000hrs	20,000hrs	10,000hrs	30,000hrs
CCT(K)	4500K	2300K	1953K	4190K
CRI	CRI~70	CRI~20	CRI~8.4	CRI > 63
Replacement of				100W~175W HPS
Yearly maintenance fee(NTD)k	4,613NTD	4,481NTD	\$4,613	635NTD
Yearly purchase amount for light source(NTD)③	1,051NTD/ST	1,051NTD/ST	\$1,051/ST	0NTD/ST
Luminous Flux (lm)	5,559lm	5,559lm	5,559lm	2,037lm
Efficacy (lm/W)	42.9lm/W	44.8lm/W	47.2lm/W	68lm/W
Yearly power consupmtion (kW·h)	964kWh/year.ST	867kWh/year.ST	477KWH/year.ST	272kWh/year.ST
Average electricity cost per year (NTD · NTD3/kW·h) (Turn on 12 hrs daily- 365days/year)④	NTD 2,891kWh/year.ST	NTD2,602kWh/year.ST	NTD1,419kWh/year.ST	NTD815kWh/year.ST
Operation fee for 5 years (Base on trun on 12hrs daily · cost of electricity is NTD3 per kW·h)	NT\$40,734	NT\$35,259	NT\$24,616	NT\$16,483
Average cost per year(NTD) ⑤ = ② + ③ + ④	NTD 8,555/year.ST	NTD8,134/year.ST	NTD7,083/year.ST	NTD1,450/year.ST



**Cost  
saving!**

In a world full of risk, the value of safety isn't measured by what it costs, but by what it prevents.

# Comparison of LED & classic lamps



THT-EX 60W LED Light v.s  
100W HPS lighting

- light and handy volumetric
- lower wind resistance and vibration



THT-EX 80W LED 'column lamp  
type' v.s 250W HPS lighting.

- Wide beam angle (170 degree)
- similar illumination as HPS lighting
- Wide application

# Comparison of LED & classic lamps




THT-EX 120W LED lighting v.s 400W Metal Halide Lamp

- easily installation
- almost 4 times energy saving
- great carbon reduction

*Example :*

*400W MH Lamp consumption per year:  
400 x 10 hours x 21 days x 12 months  
/1,000 Watt per hour = 1,008 KW*

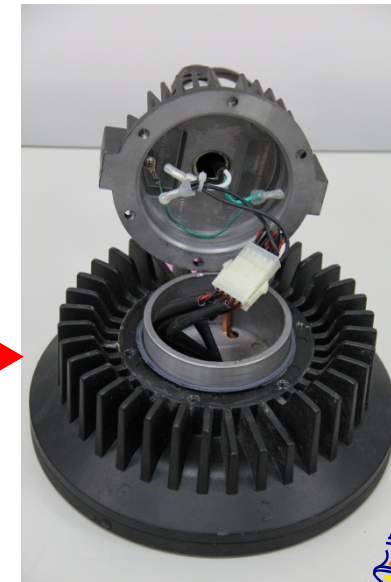
*120W **THT-EX** LED consumption per year:*

*120 x 10 hours x 21 days x 12 months/  
1,000 Watt per hour  
= 302.4 KW → Consumption is only 1/3  
of MH Lamp!!* 

ex: installed into gas stations in Korea



## Comparison with Sodium Lamp

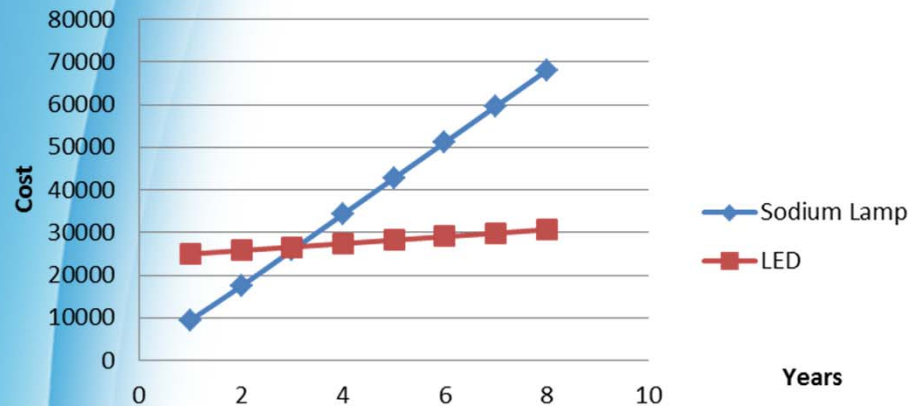


250W Sodium Lamp	100W THT-EX LED light
Driver with PSU and Transformer High failure rate on electrical components	No any electrics components Limited malfunction
complex connected with each part High risk of short circle	Simple wires connected low failure rate
Short life due to electrics components, huge and heavy	Long life (30,000 ~ 50,000 hours) Light weight
Low IP level	IP67~68 72-240 hours Salt spray completed

# Product comparison– Cost analysis

## Metal Halide Light & LED

Cost in 8 years



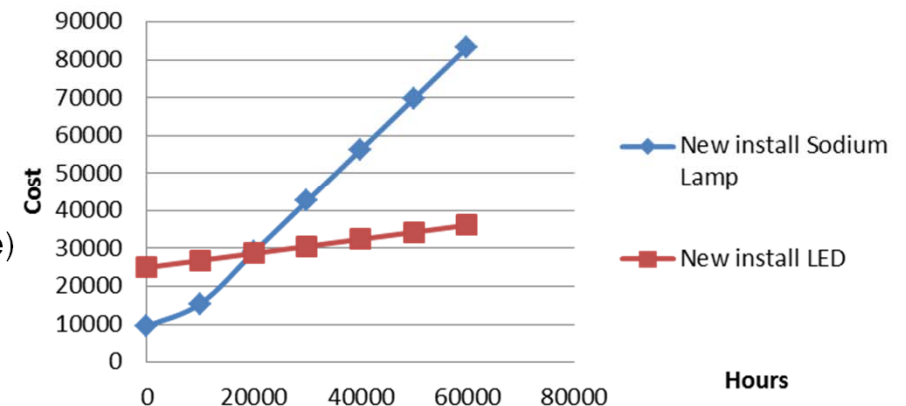
Note 1)

1. Tender project base
2. Street light height is under 6M, the wage to renew lamp: NT\$ 2,038/ per set (including 16% Industrial Safety management fee)
3. Aerial work truck rent fee: NT\$ 5,000/ per time

Note 2)

1. Based on the same Tender project of purchasing amount
2. Lamp of Metal Halide Light: 175W/ NT\$ 1,000/ PC
3. Calculation by using 60,000 hrs 5 times Lamp change request with :
  - (1) Requires to change MH Light 5 times( excluding new setting).
  - (2) Cost to purchase new lamp= NT\$ 1,000 x 5= NT\$ 5,000
4. Average cost per year = Wage to Maintain lamp + cost of lamp + electricity charge
- 5  $(U/P \text{ of LED light per set} - U/P \text{ of MH light per set}) \div (\text{maintains fee of LED light per year} - \text{maintains fee of MH light per year})$

Cost in 60,000 hours



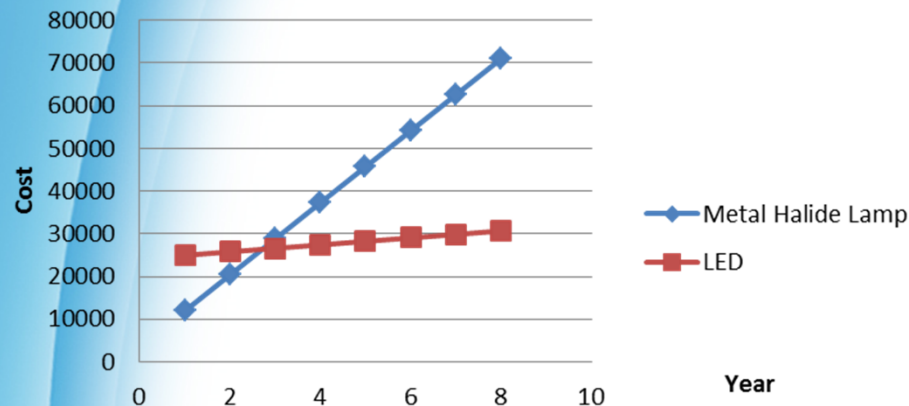
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# Product comparison– Cost analysis

## High Pressure Sodium Light & LED

Cost in 8 years



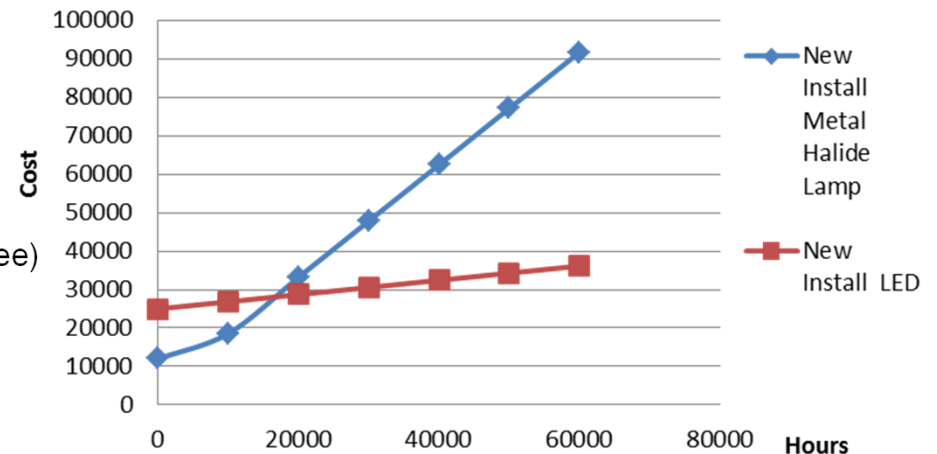
Note 1)

1. Tender project base
2. The installation charge is based on the Height 6M:  
NT\$ 2,038/ per set (including 16% Industrial Safety management fee)
3. Aerial work truck rent fee: NT\$ 5,000/ per time

Note 2)

1. Based on the same Tender project of purchasing amount
2. Lamp of HPS 150W/ NT\$ 600/pcs
3. Calculation by using 60,000 hrs 5 times Lamp change request with:
  - (1) Requires to change HPS 5 times( excluding new setting).
  - (2) Cost to purchase new lamp= NT\$ 600 x 5= NT\$ 3,000
4. Average cost per year = Wage to Maintain lamp + cost of lamp + electricity charge
5. (U/P of LED light per set – UP of HPS light per set) ÷ ( maintains fee of LED light per year – maintains fee of HPS per year)

Cost in 60,000 hours



In a world full of risk, the value of safety isn't measured by what it costs, but by what it prevents.

## Product comparison B

THT-EX LED : Compact/lighter & easy to install

Other brands : Large and heavy (x 1.5 – 2.3 times)

**THT-EX 100W LED**



**5.6 KG**



Around **43%~70%** of other brands!

**Brand C: 100W LED**



**8.2 KG**

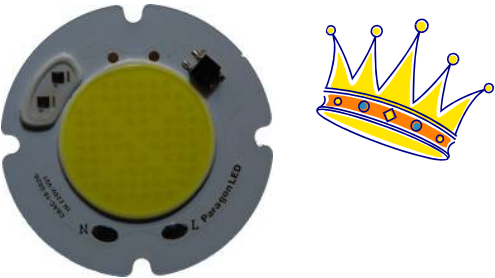

**Brand L: 112W LED**



**11.5KG**

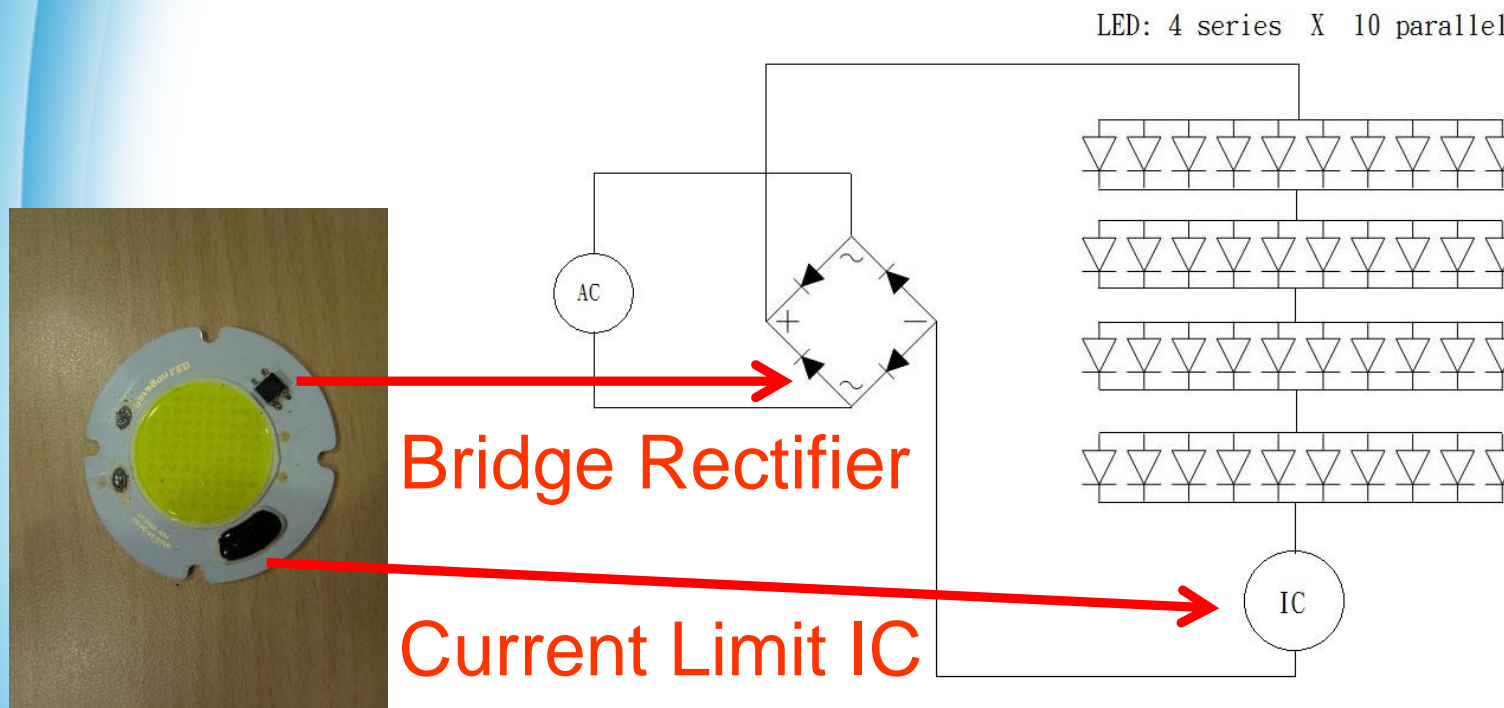
# Comparison– DC V.S. AC

## Difference between AC & DC driver

	THT-EX use AC light source		DC driver	
				
	AC input directly, no driver required		Use DC driver to transfer into AC; large volumn	
Driver	Unnecessary. Put Bridge Rectifier & Current Limit IC on the board.		Require driver and easy failure	
Heat release	Smaller volume & aluminum base to help heat dissipation.		Large for easy heat-dissipation	
LED light resource	Plate light source		Spot light source	
	Shadow	None	Shadow	Yes
	Application	Equally apply	Application	Focus
	Heat relese	Equally apply	Heat release	Focus
Unit price	Low		High	
Usage life	50,000 hour		5,000~10,000 hours	
Output to LED chip	Constant current; 120Hz flicking after transference		Constant current; No flicking	
PF	PF>0.9		PF>0.6(no PFC) PF>0.9(PFC)	
Power efficiency	80% ↑		65%~80%	

# Comparison– AC circuit diagram

- Input is AC electricity which through Bridge Rectifier & Current Limit IC on the chip to transfer into suitable voltage and current for LED lighting.





# THT-EX LED lighting vs. Other brands



## Disadvantage of driver :

- Complex wiring
- Lots of components
- Shorter lifetime
- Less efficiency



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# Comparison – summary

## Energy conservation & carbon reduce:

- Save NT \$ 17.8M when installing 10 thousand sets of explosion proof lighting each year.

Ps. Electricity charge is 596 KW; means 15% of electricity consumption per year

- **Reduce CO<sup>2</sup> emission** in 4.07M Kg and save \$ 17.8 million NTD.

## Cost saving:

- LED lighting needs minor electricity and could save lots materials such as transformer and wire, which means **less cost**.

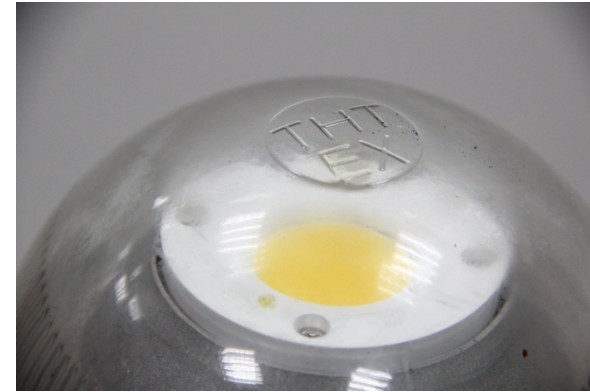
## Less maintenance:

- LED lifetime is 60,000 hours with smaller size & lightweight and so less requirement to change frequently which directly **reduces maintenance times**.
- Save **expense of lift renting**.
- Light weight and easy to install so fewer **workers is required**.

## Others:

- Less malfunction means less maintenance and also equals to increase of Industrial Safety
- Waterproof rating **IP 67** reduces the possibility of water ingress in the lighting fixture and save it from the dangerous of power off or leakage of electricity.
- Outstanding color rendition provides a safer night illumination.

# In house lighting demonstration



# Wide Product Portfolio and Modular design

## L1203





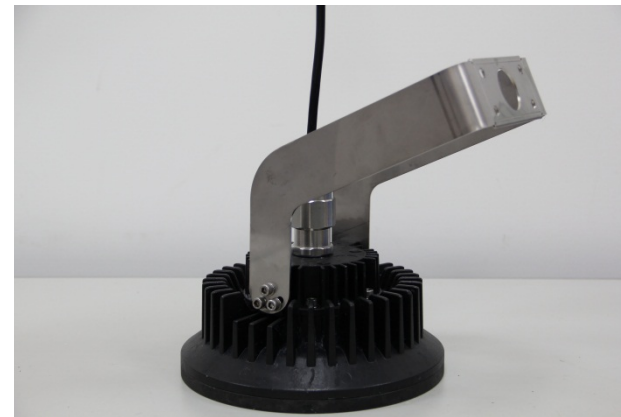
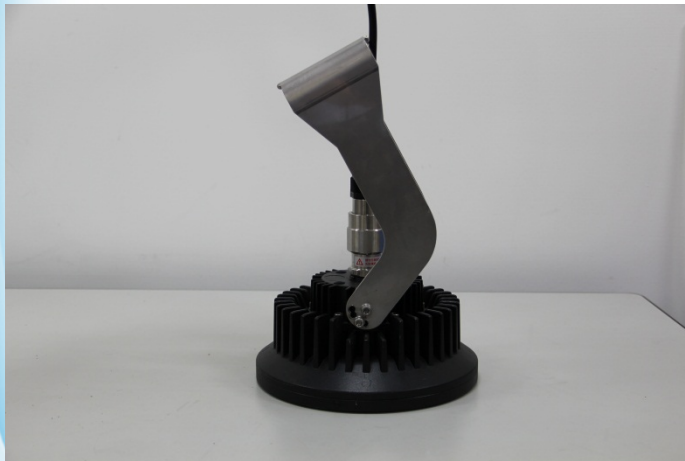
# Wide Product Portfolio and Modular design

## P1202



# Wide Product Portfolio and Modular design

**L1102**





# Wide Product Portfolio and Modular design

**L1105**



## Wide Product Portfolio and Modular design

### L1217、L1210、Exit sign



L1217



L1210



Exit sign

## Wide Product Portfolio and Modular design

### L1219 LED light in column type

**Wide angle**



**Reflect makes spot light**



**With guard**



**With cover**



# Wide Product Portfolio and Modular design

## Explosion proof Emergency LED light

for Eye wash & shower

for Warning

Without cover



With cover

