



Replacement or New Construction; A Solution for Every Need

LED provides a superior alternative to traditional sources for replacement of existing fixtures or for new construction.

- Over 5x longer life; virtually maintenance free.
- 70-90% reduction in energy consumption.
- Superior lumen maintenance over life.
- Clean white light for improved aesthetic and visibility.
- Superior luminous uniformity and glare control.
- Qualifies for many available utility rebate programs.
- Contains no mercury.

For a list of DesignLights Consortium™ QPL listed products, please visit www.designlights.org/QPL/en/saved/UBU24XJ.

This Application Guide includes a reference to determine the appropriate Everline WPL13 model to replace an existing metal halide, high pressure sodium, or compact fluorescent wall pack or to determine the mounting height and spacing range for new construction applications.

The following pages also illustrate the annual savings that can result from replacement of existing, non-LED wall packs with the WPL13. Additional savings opportunities exist in regions with higher electric rates and rebate programs.

Explaining Equivalence

“How can an LED wall pack delivering 904 lumens be considered equivalent to an HID wall pack using a 5,000 lumen 70-watt metal halide lamp?”

This guide illustrates LED / HID equivalence *in application* using lighting calculations to compare the WPL13 to representative non-LED wall packs. This “real world” approach considers all factors including light losses, optical efficiency, and optical directionality.

Let’s use the 70W metal halide wall pack as an example.

Light Loss Factor: A 70W coated metal halide lamp produces 5,000 lm initially and mean lumens over life of around 2,800 lm. Although that’s a 0.53 Light Loss Factor (LLF), most engineers use around a 0.72 LLF for HID. We now have only 3,600 lm from the metal halide lamp (5,000 x .72). A LLF of 0.9 is commonly used for LED due to its superior lumen maintenance and longer life.

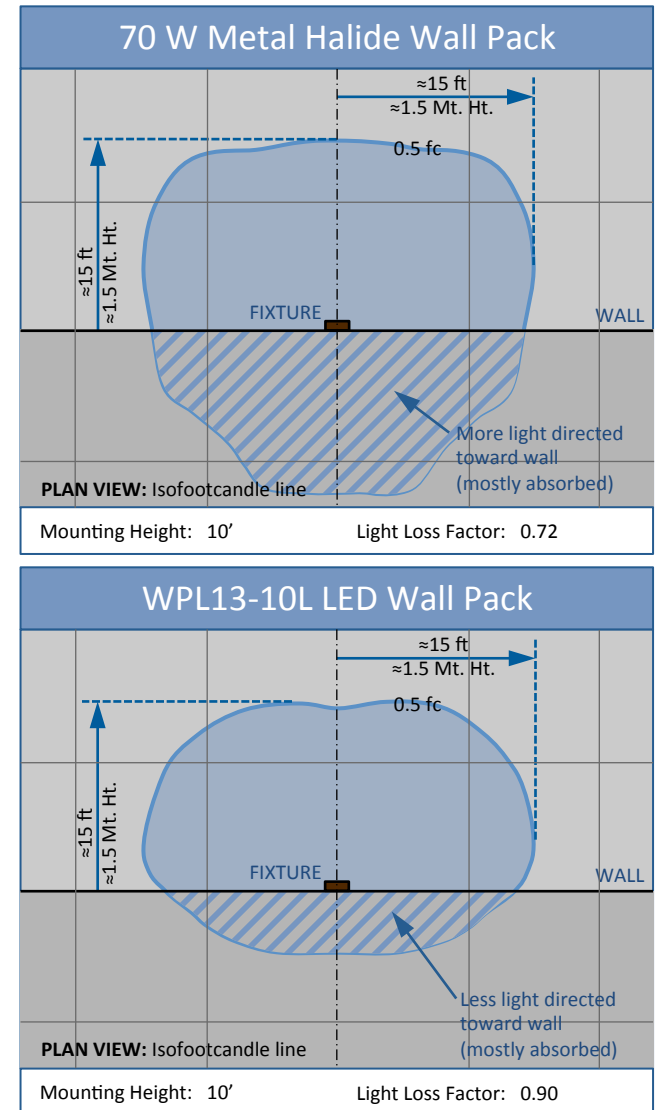
Optical Efficiency: The 3,600 metal halide lamp lumens also suffer fixture optical losses. The 70W metal halide fixture depicted in the guide is pretty typical at a 68% optical efficiency. So, we now have only about 2,450 lm exiting the 70W metal halide fixture vs. 904 lm existing the WPL13-10L.

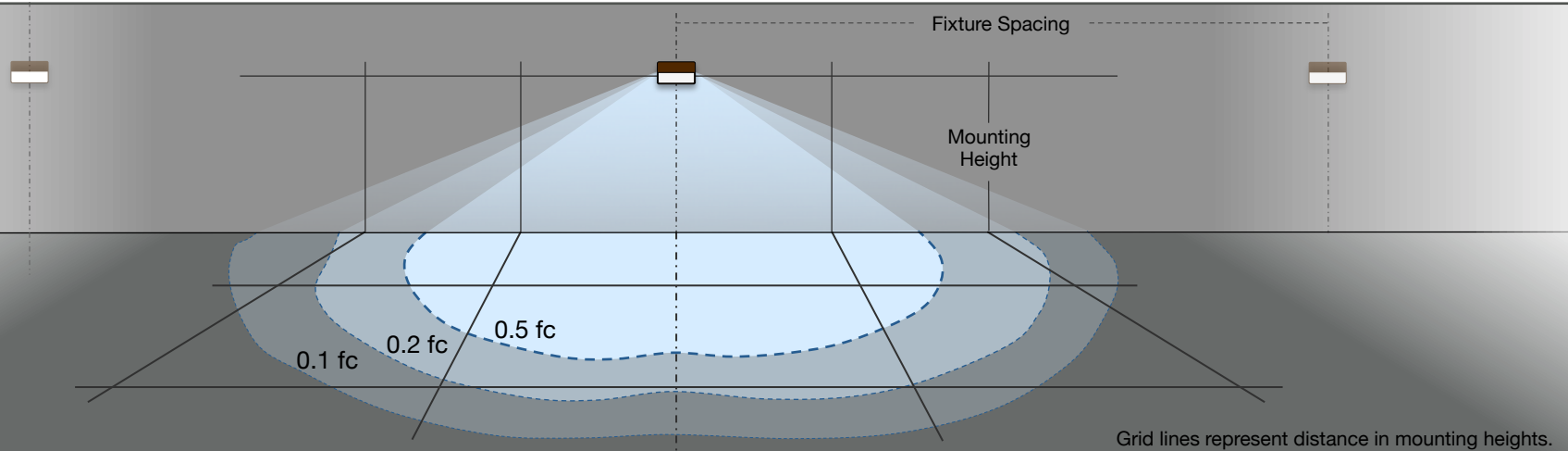
Optical Directionality: Not every lumen exiting the fixture **beneficially** contributes footcandles to the task (the ground in this case). HID and CFL lamps are difficult to control with precision. Lumens directed to the wall are mostly absorbed. Lumens directed at high angles are wasted as stray light or uplight. Excessive lumens directly below wastefully produce a non-uniform hot spot. Fortunately, LED sources are much easier to control, allowing more effective use of fewer lumens.

That’s why this Application Guide is based on actual lighting calculations.

Outdoor lighting requirements commonly call for a minimum illuminance of 0.5 fc. The diagrams to the right illustrate the calculated ground illuminance pattern of the a typical 70W metal halide cutoff wall pack and the WPL13-10L, both at a 10’ mounting height. In both cases, the 0.5 fc line is about 1.5 mounting heights in front and to each side of the fixture, resulting in the same fixture count and spacing.

Hence, both fixtures are equivalent from the most “real world” way of looking at things... application.





Catalog Number ¹	REPLACEMENT			NEW CONSTRUCTION	
	Approximate Equivalence ²			Mounting Height ³	Fixture Spacing ⁴
	MH	HPS	CFL		
WPL13-10L8XX-U-BZ with WCS13-BZ	50-70W	35-70W	1x42W	Up to 10 ft	Up to 32 ft
WPL13-14L8XX-U-BZ with WCS13-BZ	100-150W	70W	2x42W	Up to 12 ft	Up to 39 ft
WPL13-23L8XX-U-BZ with WCS13-BZ	175W	70-100W	2x42W	Up to 14 ft	Up to 44 ft
WPL13-27L8XX-U-BZ with WCS13-BZ	175W	100W	-	Up to 15 ft	Up to 48 ft
WPL13-33L8XX-U-BZ with WCS13-BZ	200W	150W	-	Up to 16 ft	Up to 50 ft

- NOTES:
- Calculations based on 4000K unit with acrylic lens and WCS13-BZ cutoff shield. Units without cutoff shield exhibit increased forward throw of approximately 0.25-0.5 mounting heights.
 - Approximate equivalence based on illuminance calculations assuming a typical conventional cutoff luminaire at the same corresponding WPL13 mounting height, an HID or CFL light loss factor of 0.72, and negligible surface reflectance.
 - Upper limit of mounting height range produces 0.5 fc on grade, approx. 1.5-2.0 mounting heights in front of and to either side of the luminaire. Assumes a 0.9 LED light loss factor and negligible surface reflectance. Mounting height may be further increased if a lower illuminance target is acceptable.
 - Fixture spacing indicated is for upper limit of mounting height range based on photometric Spacing Criterion to maintain uniformity.



		METAL HALIDE								
Traditional Wall Pack ¹		50W MH	70W MH	100W PMH	125W PMH	150W MH	150W PMH	175W MH	200W PMH	
Lamp Lumens ²		3,100 lm	5,000 lm	8,100 lm	10,800 lm	11,500 lm	12,600 lm	13,500 lm	18,900 lm	
Fixture Delivered Lumens ³		2,116 lm	3,412 lm	5,528 lm	7,695 lm	8,193 lm	8,977 lm	9,618 lm	8,767 lm	
Input Power		68.0 W	90.0 W	129.0 W	150.0 W	185.0 W	190.0 W	213.0 W	232.0 W	
Luminaire Efficacy		31.1 lm/W	37.9 lm/W	42.9 lm/W	51.3 lm/W	44.3 lm/W	47.2 lm/W	45.2 lm/W	37.8 lm/W	
Lamp Life		10,000 Hr.	15,000 Hr.	15,000 Hr.	15,000 Hr.	15,000 Hr.	15,000 Hr.	12,000 Hr.	15,000 Hr.	
ANNUAL COST OF OWNERSHIP	Electricity ⁴	\$29.78	\$39.42	\$56.50	\$65.70	\$81.03	\$83.22	\$93.29	\$101.62	
	Peak Demand Charge ⁵	\$12.24	\$16.20	\$23.22	\$27.00	\$33.30	\$34.20	\$38.34	\$41.76	
	Relamp Material ⁶	\$5.42	\$3.67	\$7.04	\$13.32	\$9.06	\$6.96	\$4.25	\$11.61	
	Relamp Labor ⁷	\$8.67	\$5.78	\$5.78	\$5.78	\$5.78	\$5.78	\$7.22	\$5.78	
	Total	\$56.11	\$65.07	\$92.54	\$111.80	\$129.17	\$130.16	\$143.11	\$160.77	
Everline WPL13-XXL840-U⁸		WPL13-10L840-U		WPL13-14L840-U			WPL13-23L840-U	WPL13-27L840-U	WPL13-33L840-U	
Fixture Delivered Lumens ³		904 lm		1,712 lm			2,084 lm	2,402 lm	2,817 lm	
Input Power		9.4 W		19.8 W			24.3 W	30.8 W	35.4 W	
Luminaire Efficacy		96.2 lm/W		86.5 lm/W			85.8 lm/W	78.0 lm/W	79.6 lm/W	
Op. Hrs. to 70% Lumens		>140,000 Hr.		>140,000 Hr.			>140,000 Hr.	>140,000 Hr.	>140,000 Hr.	
ANNUAL COST OF OWNERSHIP	Electricity ⁴	\$4.12		\$8.67			\$10.64	\$13.49	\$15.51	
	Peak Demand Charge ⁵	\$1.69		\$3.56			\$4.37	\$5.54	\$6.37	
	Relamp Mat'l. & Labor ^{6,7}	\$0.00		\$0.00			\$0.00	\$0.00	\$0.00	
	Total	\$5.81		\$12.24			\$15.02	\$19.03	\$21.88	
Everline WPL13 Annual Savings		\$50.30	\$59.26	\$80.31	\$99.56	\$116.94	\$117.92	\$128.09	\$124.07	\$138.89

NOTES:

- Based on typical non-LED cutoff wall pack.
- Design lumens after ballast factor.
- Neglecting light loss factor, typically 0.72 for HID and 0.9 for LED.
- Based on 10 Hr/day, 365 day/year operation at \$0.12/KWH
- Based on \$15/KW monthly peak demand charge.
- Based on typical retail lamp replacement cost.
- Assumes 15 minute/fixture re-lamp labor at \$95/hour.
- Assumes wall pack fixtures used with WCS13-BZ full cutoff shield installed.



		HIGH PRESSURE SODIUM					COMPACT FLUORESCENT				
Traditional Wall Pack ¹		35W HPS	50W HPS	70W HPS	100W HPS	150W HPS	1x42W	2x42W			
Lamp Lumens ²		2,250 lm	4,000 lm	6,400 lm	9,500 lm	16,000 lm	3,520 lm	7,040 lm			
Fixture Delivered Lumens ³		1,336 lm	2,375 lm	3,799 lm	5,640 lm	9,498 lm	2,059 lm	4,118 lm			
Input Power		46.0 W	62.0 W	86.0 W	115.0 W	170.0 W	51.0 W	102.0 W			
Luminaire Efficacy		29.0 lm/W	38.3 lm/W	44.2 lm/W	49.0 lm/W	55.9 lm/W	40.4 lm/W	40.4 lm/W			
Lamp Life		16,000 Hr.	24,000 Hr.	24,000 Hr.	24,000 Hr.	24,000 Hr.	12,000 Hr.	12,000 Hr.			
ANNUAL COST OF OWNERSHIP	Electricity ⁴	\$20.15	\$27.16	\$37.67	\$50.37	\$74.46	\$22.34	\$44.68			
	Peak Demand Charge ⁵	\$8.28	\$11.16	\$15.48	\$20.70	\$30.60	\$9.18	\$18.36			
	Relamp Material ⁶	\$2.35	\$1.81	\$1.51	\$1.89	\$1.52	\$4.37	\$13.11			
	Relamp Labor ⁷	\$5.42	\$3.61	\$3.61	\$3.61	\$3.61	\$7.22	\$7.22			
	Total	\$36.20	\$43.74	\$58.27	\$76.58	\$110.19	\$43.11	\$83.37			
Everline WPL13-XXL840-U⁸		WPL13-10L840-U	WPL13-10L840-U	WPL13-14L840-U	WPL13-23L840-U	WPL13-23L840-U	WPL13-27L840-U	WPL13-33L840-U	WPL13-10L840-U	WPL13-14L840-U	WPL13-23L840-U
Fixture Delivered Lumens ³		904 lm	904 lm	1,712 lm	2,084 lm	2,084 lm	2,402 lm	2,817 lm	904 lm	1,712 lm	2,084 lm
Input Power		9.4 W	9.4 W	19.8 W	24.3 W	24.3 W	30.8 W	35.4 W	9.4 W	19.8 W	24.3 W
Luminaire Efficacy		96.2 lm/W	96.2 lm/W	86.5 lm/W	85.8 lm/W	85.8 lm/W	78.0 lm/W	79.6 lm/W	96.2 lm/W	86.5 lm/W	85.8 lm/W
Op. Hrs. to 70% Lumens		>140,000 Hr.	>140,000 Hr.	>140,000 Hr.	>140,000 Hr.	>140,000 Hr.	>140,000 Hr.	>140,000 Hr.	>140,000 Hr.	>140,000 Hr.	>140,000 Hr.
ANNUAL COST OF OWNERSHIP	Electricity ⁴	\$4.12	\$4.12	\$8.67	\$10.64	\$10.64	\$13.49	\$15.51	\$4.12	\$8.67	\$10.64
	Peak Demand Charge ⁵	\$1.69	\$1.69	\$3.56	\$4.37	\$4.37	\$5.54	\$6.37	\$1.69	\$3.56	\$4.37
	Relamp Mat'l. & Labor ^{6,7}	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
	Total	\$5.81	\$5.81	\$12.24	\$15.02	\$15.02	\$19.03	\$21.88	\$5.81	\$12.24	\$15.02
Everline WPL13 Annual Savings		\$30.39	\$37.93	\$52.46	\$46.03	\$43.25	\$61.56	\$57.54	\$88.31	\$37.30	\$71.13

- NOTES:
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