

# LED Lighting Update



A consumer guide to energy efficient LED lighting

# Benefits of Solid State Lighting

**Light Emitting Diodes, or LEDs** are solid state semi-conductors, similar to computer chips that emit light when electricity is applied to them. While LED technology has been used in the electronics industry for a number of decades, only recently have advancements in technology allowed for its application in general lighting. Early attempts at using LEDs for everyday lighting were unsuccessful because of insufficient light output and lack of white light. However, the recent surging development of LED technology has seen high output white light growing at an exponential rate without sacrificing color rendering or efficiency.

Incandescent fixtures operate at about 20% efficiency while some LED fixtures approach 80% efficiency, thereby converting 80% of the energy consumed into light output. Other advantages of LEDs over traditional light sources include extended lamp life, less maintenance, smaller size, less environmental impact, and greater durability. This brochure will help you identify what to look for in LED fixtures in order to maximize these performance advantages.

## ENVIRONMENTAL STEWARDSHIP

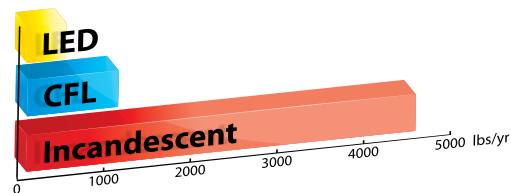
- WAC Lighting manufactures LED fixtures in our zero-landfill manufacturing campus.
- Most of our LED fixtures are designed with replaceable LED modules.
- By carefully engineering our products to last and be easily maintained, we can reduce the amount of landfill waste.

### Carbon Dioxide Emissions

(30 bulbs/year)

source: <http://www.designrecycleinc.com>

Many of our fixtures are designed for the LEDs to last for over **50,000 hours**.



## SAVE ENERGY

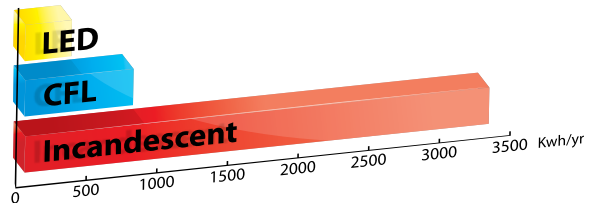
- Solid State Lighting (SSL) is more efficient than conventional lighting technology.
- WAC Lighting LED fixtures use half the energy of compact fluorescent fixtures.
- Consuming less energy results in fewer power plant and green house gas emissions.

### Kilowatts of electricity used

(30 incandescent bulbs/year equivalent)

source: <http://www.designrecycleinc.com>

WAC Lighting LED fixtures use up to **85% less energy** than standard incandescent bulbs.



## SAVE MONEY

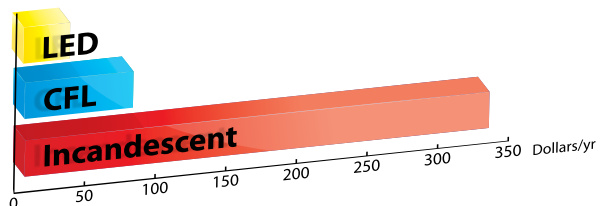
- On average in the United States, running a 50W PAR20 incandescent lamp for 50,000 hours would cost \$250 in electricity alone. The lamp will also need to be replaced 50 times or more, costing an additional \$100. A 9W LED fixture of similar light output run for 50,000 hours will cost only about \$45 in comparison and will not have to be replaced.
- Ask your WAC Lighting distributor about additional money saving rebates and tax credits you may qualify for.

### Annual Operating Cost

(30 incandescent bulbs/year equivalent)

source: <http://www.designrecycleinc.com>

Over the potential lifetime of the LED fixture you save **\$305**.



# Essential Components of an LED Fixture and What They Do

## DRIVER

Maintains proper current and voltage levels to the diodes within the specific range at which the diodes are designed to perform.

- The technological differences between traditional lighting and LED lighting are such that LED fixtures require specific drivers in order to protect and achieve optimal performance.
- High powered LEDs include anything powered at 1-watt or greater and require constant current drivers in order to protect the diodes from over-current.
- LEDs also require a minimum current in order to light. Optimally designed fixtures include drivers that account for compatibility with dimmers.

## HEAT SINK

Thermally efficient heat sink provides heat transference to eliminate excess heat generated by diodes.

- Heat sinks are engineered to meet the thermal demands of the array of diodes within the fixture. Optimal thermal management allows LEDs to shine brighter, last longer, and maintain color consistency over time.
- The more conductive the heat sink, the smaller it needs to be. Die-cast solid aluminum is among the best materials available.
- Heat sinks are designed to maximize the surface area for heat to be released into the air. Fewer wide fins with more space in between achieve better air flow than a higher number of long fins packed into the same area.

## FIXTURE HOUSING

Holds all the components together in a functional and aesthetically pleasing structure.

- Solid State Lighting technology makes possible the design of truly original form and function.
- WAC Lighting LEDme™ fixtures are designed to look unique and exhibit the salient qualities of Solid State Lighting, different from traditional lighting.
- Certain LEDme™ fixtures are designed to be smaller in size while others outperform conventional lighting in light distribution.

## DIODES

Semi-conductor chips mounted to a heat conducting PC board and electrified with bond wires that generate light when direct current is passed through.

- Highly efficient; 80% of the energy used is converted to light output. The remaining 20% emitted as heat is dissipated by the proportionally sized heat sink.
- Each Light Emitting Diode is designed to operate at a specific level of direct current, provided by the driver it is paired with.
- Primary silicon optics are applied directly to the diodes to control the light and protect the chips.

## SECONDARY OPTICS

Individual secondary optics control the beam spread distribution of light from the point source LEDs.

- Quality LED optics deliver over 90% of the light emitted more evenly over the area to be lit, dissipating hot spots, rings and shadows.
- All secondary optics in WAC Lighting's LEDme™ fixtures may be replaced for various beam spreads for different functions, including 8°, 25° and 40° light distributions.

## 1. How can I compare the quality of light?

Quality of a light source is generally described as providing full spectrum light. Full spectrum light is color-corrected light that simulates the clear brilliance of white light and the optical beauty of outdoor light at noon. There are several specifications commonly published to provide information on the quality of the light emitted, **CRI**, **GAI**, and **CCT**.

**Color Accuracy – CRI (Color Rendering Index)** is the ability of a light source to reproduce the colors of objects accurately compared to an incandescent lamp, on a scale of 0-100, where 100 is the most similar.

**A CRI of 85 to 100 indicates quality color rendering**



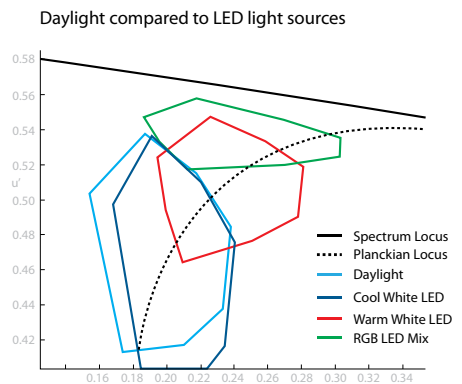
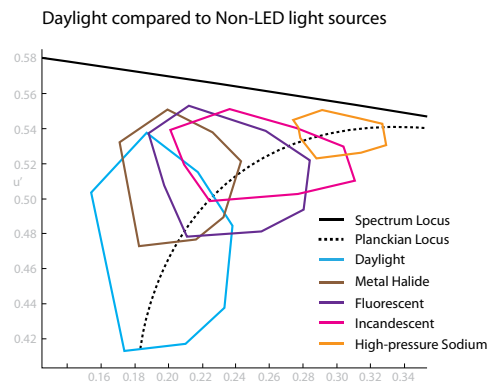
*Test: 25 colored panels are viewed under both the incandescent lamp and the light source being tested, the more similarly the colors look under each light the higher the CRI score.*



*It is now generally accepted that a CRI score of 99 may not be preferable over a CRI score of 90. New light sources like LEDs are better at rendering blues and greens than the incandescent light to which they are compared.*

**Gamut Vividness – GAI (Gamut Area Index)** measures how vivid objects appear under the light. Low numbers denote a small range of color that can be differentiated under the light, high numbers denote a large range of color that can be differentiated.

**A GAI score between 70 and 100 is generally perceived as the most realistic.**



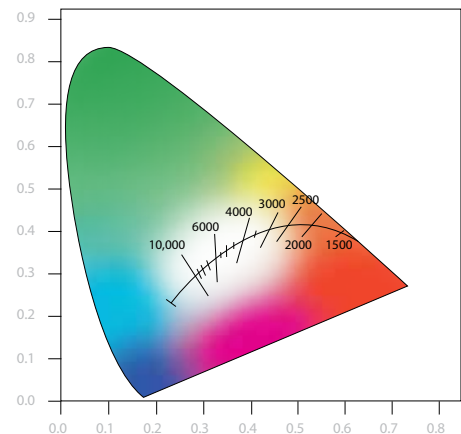
*source: ASSIST recommends: Light Source Color for Retail Merchandising; Mark Rea PhD, Jean Paul Freyssinier MSc LC*



*Test: Various colors are viewed under the tested light source and a measurement is taken on how well one color can be distinguished from neighboring colors on the color chart.*

**Color Temperature – CCT (Correlated Color Temperature)** measures, in degrees Kelvin(K), the range of colors within white light. A CCT of 3500K is neutral, meaning the reds and blues are balanced in the white light produced.

**3200K and below are considered warm white; 4000K and above are considered cool white.**



*Test: The color spectrum of a light source is measured against the established scale for white light derived from heating a tungsten filament. At 2700K the filament glowed a reddish white light and at 4000K it glowed a bluish white light.*



*Each color temperature represents a line on the color scale rather than a point. As such, two LEDs of the same color temperature may not appear the same if they are at two different points on the same color temperature line.*

## 2. How efficient is it?

Efficacy is the specification that measures the efficiency of a light source by comparing lumen output to wattage consumed. Efficacy is derived by dividing wattage consumed into lumens emitted.

The **higher** the efficacy number, the more efficient the fixture.

Example	LED	CFL	Incandescent
Wattage (Input Power)	8	15	60
Lumens (Light Output)	450	450	450
Efficacy (Lumens per Watt)	<b>56</b>	<b>30</b>	<b>7.5</b>



*It's always good to verify that the published data from the manufacturer is tested for input wattage and total lumens as a complete fixture. If the specifications are only for the LEDs as tested in laboratory conditions, the true performance of the fixture may be less.*

**All published specifications for WAC Lighting LED fixtures are based on testing complete fixtures.**

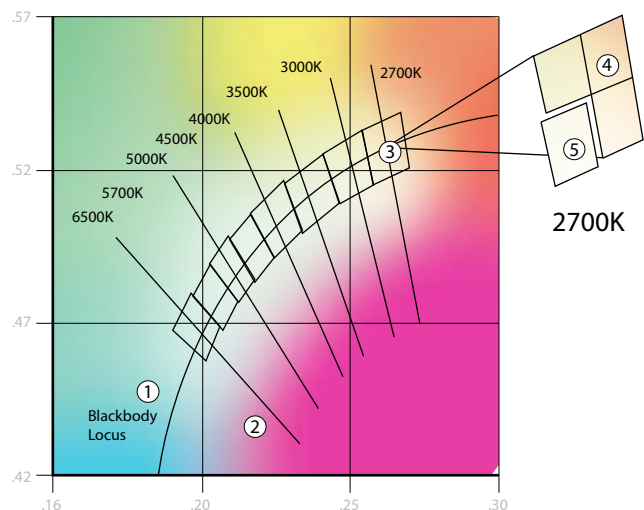
## 3. How consistent are the LEDs?

When LEDs are manufactured the most challenging part is producing consistent and precise white color. Binning is the process of sorting the white LEDs into groups of similar white colors. The regulation of this process is outlined by the ANSI standards for tolerances of white color variations to fit within a color temperature group, or bin. Some LED manufacturers have adapted a more stringent process of sorting called micro-bins which allows for much smaller white color variations.

**WAC Lighting uses LEDs that exceed the ANSI binning standards, giving our fixtures optimal color matching.**

**Binning Explained**– When white LEDs are created, whether they be on the warm or cool end of the spectrum, there are always slight inconsistencies with regards to specific color temperatures.

1. The arced black line in the graph at right represents the white color spectrum.
2. These long intersecting lines represent the range, from one end of the line to the other, of variation in color for each corresponding color temperature.
3. In order to keep the range of each temperature as close to the same color as possible, ANSI created tolerance zones. Only the LEDs that fall into this range are used for that particular color temperature, these are referred to as "bins".
4. As you can see this bin still has plainly visible variations throughout. ANSI tolerance zones are adjacent to account for the challenges around manufacturing LED chips consistently.
5. Once divided into smaller bins, the differences in color are much less, allowing for minimal variation when two or more LEDs are used together.



*Although there is a cost associated with consistency, various LED chip manufacturers now make smaller bins available. Micro-bin sizes vary between chip manufacturers and while micro-bins allow for better consistency by batch, there is commonly a color variation between batches.*

## 4. How dimmable are LEDs?

LED technology responds to voltage and subsequent changes in current differently than traditional incandescent lighting, presenting a unique engineering challenge for maintaining consistent dimming.

- Low power LEDs, powered by constant voltage drivers are more easily dimmed with conventional dimming technology than high powered LEDs that require the use of constant current drivers.
- Full scale dimming claims with corresponding dimmer usage recommendations should be confirmed by lighting control suppliers in order to have assurances of actual performance.
- LEDs also require a minimum current level in order to function and turn on at a brightness between 15-25% of their full intensity, thereby preventing full scale dimming down to 1% without additional technology.

**WAC Lighting has worked with leading suppliers of lighting controls to engineer full scale dimming on many of our led products.**

WAC Lighting products are dimmable using Electronic Low Voltage (ELV) dimmers. All LED fixtures have been tested and approved by the dimmer suppliers, as well as by our own UL approved laboratories.



Many LED fixtures consume less power than the minimum recognizable load requirements of most dimmers on the market.

## 5. What is the significance of heat sink?

Semi-conductors and other electronics have a limited tolerance to the effects of heat on lifetime and performance. Higher power LEDs (with higher current) are generally less efficient and result in heat buildup. A proportionally sized heat sink and heat transference system must be engineered to optimize the LEDs within a fixture. The larger the surface area of a heat sink made of a solid conductive material such as aluminum, the more ideal it is for creating airflow, dissipating heat, and extending the usable light of the LEDs.

**WAC Lighting designs and engineers die-cast aluminum heat sinks proportional to the excess heat generated by the LEDs, resulting in optimal heat transference.**

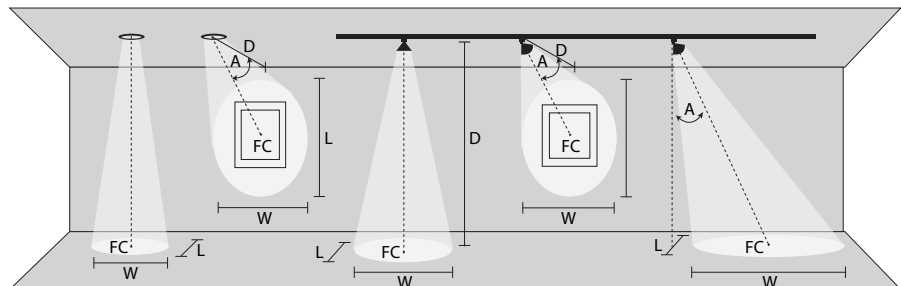
## 6. Will I get enough light with LEDs? For how long?

LED fixture manufacturers should be able to demonstrate the real life performance of any given product through extended whole fixture testing. WAC Lighting's LEDme™ fixtures have published photometric data available on our web site with downloadable specification sheets that provide actual photometric data covering efficiency, light output and distribution, quality of light, and life of the light source.

### Photometrics example

**H-9S-WW** 9W, Beam spread: 10°

0° Aiming Angle				45° Aiming Angle			
D	FC	L	W	D	FC	L	W
3	528	0.5	0.5	3	187	0.7	1.1
6	132	1.0	1.0	6	47	1.5	2.1
9	59	1.6	1.6	9	21	2.2	3.2
12	33	2.1	2.1	12	12	3.0	4.2



A-Aiming angle, D-Distance from fixture to floor\*, FC-Initial foot candle level at the center of the beam, L-Listing at the point that the candle power drops off to 50% of maximum\*, W-Listing at the point that the candle power drops off to 50% of maximum\* \*Measurements in feet

## 7. Should I be concerned with safety and wiring requirements around LEDs?

National Electric Code (NEC) regulations do not permit exceptions to Class I and Class II wiring requirements for LED fixtures even where they use low voltage power supplies. In order to avoid potential risks of shock or fire hazards, it is important to follow local codes as though working with traditional lighting technologies and utilize products that have been listed with UL and CUL or CSA.

All WAC Lighting products have been **thoroughly tested** to UL and CUL safety standards and offer wiring methods in accordance with the NEC.



## 8. Are the LED fixtures covered under warranty for performance?

WAC Lighting offers a 5 year warranty on all of its products, including LED fixtures and drivers.

### 5 year warranty



*Rated lifetime is not a warranty. Many LED fixtures available today have a rated potential life of 50,000 hours, however most product warranties only extend to 1 year.*

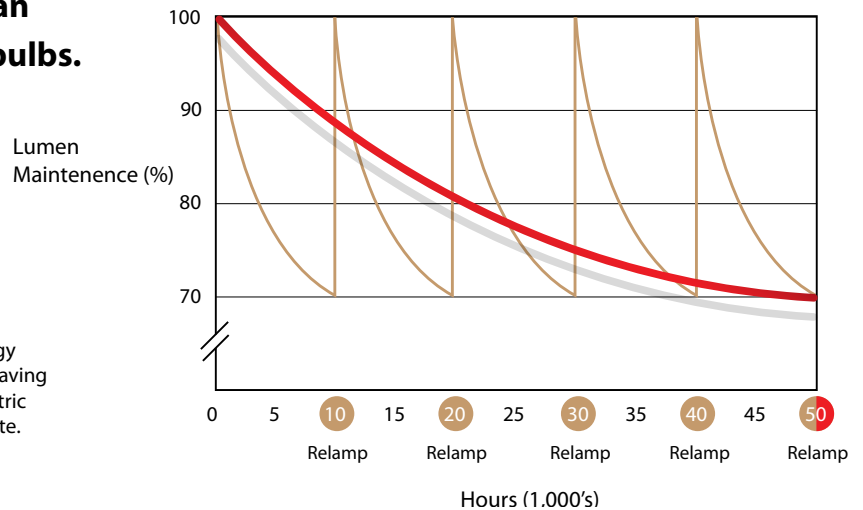
## 9. Are the LED fixtures engineered to be sustainable?

WAC Lighting's LED luminaires are generally engineered for an average life of 50,000 hours or better based on an end of life standard at a loss of 30% of original luminance, significantly longer than CFLs and incandescents. All of our LED products also offer a responsible solution for replacing the LEDs without wasting the fixture once the LEDs have exceeded their usable lifetime.

LEDs deliver **better lumen efficiency** over time than Compact Fluorescent bulbs.

29%

Estimated reduction in national energy consumption with a switch to LEDs, saving households \$125 billion on their electric bills and greatly reducing landfill waste. source: <http://www.ledsource.com>

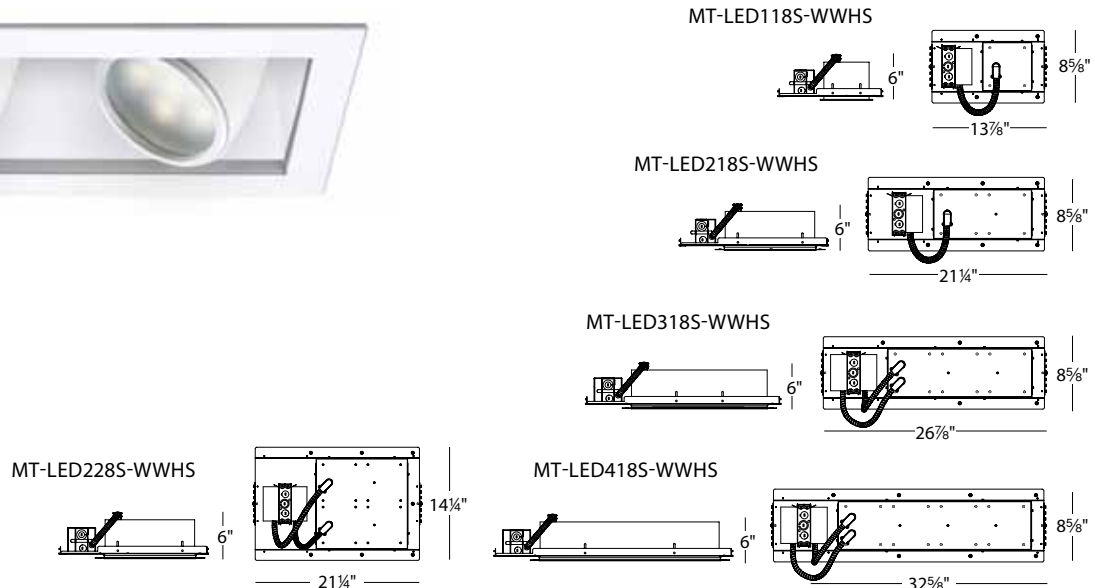


## 10. What is the shelf life of an LED fixture?

As technology continues to advance, inexpensive products that don't meet the needs of the application quickly become obsolete. The risk of adopting new technology has costs, but as seen in the electronics industry, the rewards and quality of life improvements are great as well. WAC Lighting believes that in engaging advances in technology, it is responsible to design products that meet or beat the performance requirements of their respective applications.

- Die-cast aluminum heads, steel trims and housings
  - Powder coat finish
- Full scale dimming to 1%
  - Optimal dimming with Electronic Low Voltage (ELV) dimmer
  - Dimming luminaire patent: pending
- 50,000 hour potential life
- IC Rated

- Available in two different beam angles
- Spot (10°) and Flood (25°)
- For optimal performance and color consistency we only use ANSI Compliant Warm/Neutral LED Bins from top manufacturers including Cree®, Philips Lumileds and Nichia
  - 90° vertical tilt, 350° horizontal rotation



	Trim	Finish	Trimless	Housings	Finish	Watt	Light Output	Color Temp	Beam
1 Light	<b>MT-LED118</b>	•	<b>MT-LED118TL</b>	<b>MT-LED118S-WWHS</b>	•	1 × 11	450 lumens	3000K	Spot (10°)
				<b>MT-LED118F-WWHS</b>					Flood (25°)
				<b>MT-LED118S-CWHS</b>					•
<b>MT-LED118F-CWHS</b>	Flood (25°)								
Dimensions: 6 3/4" × 6 3/4"		Dimensions: 5 7/8" × 5 7/8"		•Trim Cutout: 6" × 6"		•Trimless Cutout: 6 1/2" × 6 1/2"			
2 Lights	<b>MT-LED218</b>	•	<b>MT-LED218TL</b>	<b>MT-LED218S-WWHS</b>	•	2 × 11	860 lumens	3000K	Spot (10°)
				<b>MT-LED218F-WWHS</b>					Flood (25°)
				<b>MT-LED218S-CWHS</b>					•
<b>MT-LED218F-CWHS</b>	Flood (25°)								
Dimensions: 12 5/8" × 6 3/4"		Dimensions: 11 5/8" × 5 7/8"		•Trim Cutout: 11 3/8" × 6"		•Trimless Cutout: 12 1/4" × 6 1/2"			
3 Lights	<b>MT-LED318</b>	•	<b>MT-LED318TL</b>	<b>MT-LED318S-WWHS</b>	•	3 × 11	1290 lumens	3000K	Spot (10°)
				<b>MT-LED318F-WWHS</b>					Flood (25°)
				<b>MT-LED318S-CWHS</b>					•
<b>MT-LED318F-CWHS</b>	Flood (25°)								
Dimensions: 18 1/8" × 6 3/4"		Dimensions: 17 1/4" × 5 7/8"		•Trim Cutout: 17 3/8" × 6"		•Trimless Cutout: 17 7/8" × 6 1/2"			
4 Lights	<b>MT-LED418</b>	•	<b>MT-LED418TL</b>	<b>MT-LED418S-WWHS</b>	•	4 × 11	1720 lumens	3000K	Spot (10°)
				<b>MT-LED418F-WWHS</b>					Flood (25°)
				<b>MT-LED418S-CWHS</b>					•
<b>MT-LED418F-CWHS</b>	Flood (25°)								
Dimensions: 23 7/8" × 6 3/4"		Dimensions: 23" × 5 7/8"		•Trim Cutout: 23 3/8" × 6"		•Trimless Cutout: 23 5/8" × 6 1/2"			
4 Lights (2 × 2)	<b>MT-LED228</b>	•	<b>MT-LED228TL</b>	<b>MT-LED228S-WWHS</b>	•	4 × 11	1720 lumens	3000K	Spot (10°)
				<b>MT-LED228F-WWHS</b>					Flood (25°)
				<b>MT-LED228S-CWHS</b>					•
<b>MT-LED228F-CWHS</b>	Flood (25°)								
Dimensions: 12 5/8" × 12 5/8"		Dimensions: 11 5/8" × 11 5/8"		•Trim Cutout: 11 3/4" × 11 3/4"		•Trimless Cutout: 12 1/4" × 12 1/4"			

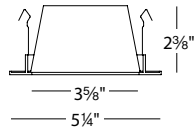
LEDs included. Order housings with corresponding trims.

Example Order: **MT-LED118-WT** trim with **MT-LED118S-WWHS-WT** housing

Finish Key: WT-White

- Less than 1/8" thick, super low profile die-cast aluminum trim
  - Powder coated or Plated Brushed Nickel finishes
- Full scale dimming to 1%
  - Optimal dimming with Electronic Low Voltage (ELV) dimmer
  - Dimming luminaire patent: pending
- Light level for 3000K, 74 foot candles at 5 feet, 29 foot candles at 8 feet
  - Comparable to 45W BR30 for IC and 50W PAR20 for Non-IC

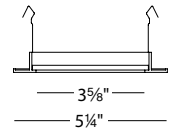
- 50,000 hour potential life
- Narrow flood beam spread and 35° visual cutoff
  - For comfortable general and task lighting
- Distance from LEDs to trim edge is 2 3/8"
- Replaceable LED Module and lens
  - For optimal performance and color consistency we only use ANSI Compliant Warm/Neutral LED Bins from top manufacturers including Cree®, Philips Lumileds and Nichia



### OPEN REFLECTOR – ROUND

Model	Finish	Interior	Trim
<b>HR-LED411</b>	<b>BK/BN</b>	Black	Brushed Nickel
	<b>BK/WT</b>	Black	White
	<b>WT/WT</b>	White	White

Model Shown: **HR-LED411-BK/BN**



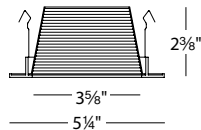
### SHOWER LIGHT – ROUND

UL listed for wet locations

Model	Finish	Trim
<b>HR-LED431</b>	<b>CH</b>	Chrome
	<b>WT</b>	White

Tempered borosilicate glass lens.

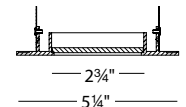
Model Shown: **HR-LED431-CH**



### STEP BAFFLE – ROUND

Model	Finish	Interior	Trim
<b>HR-LED421</b>	<b>BK/BN</b>	Black	Brushed Nickel
	<b>BK/WT</b>	Black	White
	<b>WT/WT</b>	White	White

Model Shown: **HR-LED421-WT/WT**



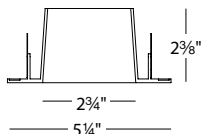
### SHOWER LIGHT – SQUARE

UL listed for wet locations

Model	Finish	Trim
<b>HR-LED471</b>	<b>CH</b>	Chrome
	<b>WT</b>	White

Tempered borosilicate glass lens.

Model Shown: **HR-LED471-WT**



### OPEN REFLECTOR – SQUARE

Model	Finish	Interior	Trim
<b>HR-LED451</b>	<b>BK/BN</b>	Black	Brushed Nickel
	<b>BK/WT</b>	Black	White
	<b>WT/WT</b>	White	White

Model Shown: **HR-LED451-WT/WT**

### NEW CONSTRUCTION HOUSING

Model	Type	Wattage	Light Output	Color
<b>HR-LED418-NIC-W</b>	IC*	11 watts	380 lumens	3000K
<b>HR-LED418-N-W</b>	Non-IC†	18 watts	480 lumens	3000K
<b>HR-LED418-NIC-C</b>	IC*	11 watts	457 lumens	4500K
<b>HR-LED418-N-C</b>	Non-IC†	18 watts	600 lumens	4500K

LEDs included. \*Suitable for direct contact with insulation. †3" clearance on all sides when insulation is present.

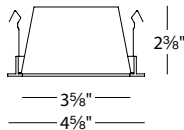
### REMODEL HOUSING

Model	Type	Wattage	Light Output	Color
<b>HR-LED418-RIC-W</b>	IC*	11 watts	380 lumens	3000K
<b>HR-LED418-R-W</b>	Non-IC†	18 watts	480 lumens	3000K
<b>HR-LED418-RIC-C</b>	IC*	11 watts	457 lumens	4500K
<b>HR-LED418-R-C</b>	Non-IC†	18 watts	600 lumens	4500K

LEDs included. \*Suitable for direct contact with insulation. †3" clearance on all sides when insulation is present.

- Less than 1/8" thick, super low profile die-cast aluminum trim
  - Powder coated or Plated Brushed Nickel finishes
- Full scale dimming to 1%
  - Optimal dimming with Electronic Low Voltage (ELV) dimmer
  - Dimming luminaire patent: pending
- Light level for 3000K, 74 foot candles at 5 feet, 29 foot candles at 8 feet
  - Comparable to 45W BR30 for IC and 50W PAR20 for Non-IC

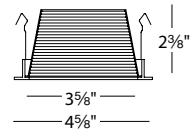
- Narrow flood beam spread and 35° visual cutoff
  - For comfortable general and task lighting
- Distance from LEDs to trim edge is 2 3/8"
- Replaceable LED Module and lens
  - For optimal performance and color consistency we only use ANSI Compliant Warm/Neutral LED Bins from top manufacturers including Cree®, Philips Lumileds and Nichia
- 50,000 hour potential life



### OPEN REFLECTOR – ROUND

Model	Finish	Interior	Trim
<b>HR-LED411TL</b>	<b>BK/BN</b>	Black	Brushed Nickel
	<b>BK/WT</b>	Black	White
	<b>WT/WT</b>	White	White

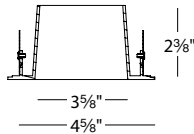
Model Shown: **HR-LED411TL-BK/BN**



### STEP BAFFLE – ROUND

Model	Finish	Interior	Trim
<b>HR-LED421TL</b>	<b>BK/BN</b>	Black	Brushed Nickel
	<b>BK/WT</b>	Black	White
	<b>WT/WT</b>	White	White

Model Shown: **HR-LED421TL-WT/WT**



### OPEN REFLECTOR – SQUARE

Model	Finish	Interior	Trim
<b>HR-LED451TL</b>	<b>BK/BN</b>	Black	Brushed Nickel
	<b>BK/WT</b>	Black	White
	<b>WT/WT</b>	White	White

Model Shown: **HR-LED451TL-BK/WT**

### ROUND SPACKLE TRIM – NEW CONSTRUCTION HOUSING

Model	Type	Wattage	Light Output	Color
<b>HR-LED418-NIC-ROW</b>	IC*	11 watts	380 lumens	3000K
<b>HR-LED418-N-ROW</b>	Non-IC†	18 watts	480 lumens	3000K
<b>HR-LED418-NIC-ROC</b>	IC*	11 watts	457 lumens	4500K
<b>HR-LED418-N-ROC</b>	Non-IC†	18 watts	600 lumens	4500K

LEDs included. \*Suitable for direct contact with insulation. †3" clearance on all sides when insulation is present.

### ROUND SPACKLE TRIM – REMODEL HOUSING

Model	Type	Wattage	Light Output	Color
<b>HR-LED418-RIC-ROW</b>	IC*	11 watts	380 lumens	3000K
<b>HR-LED418-R-ROW</b>	Non-IC†	18 watts	480 lumens	3000K
<b>HR-LED418-RIC-ROC</b>	IC*	11 watts	457 lumens	4500K
<b>HR-LED418-R-ROC</b>	Non-IC†	18 watts	600 lumens	4500K

LEDs included. \*Suitable for direct contact with insulation. †3" clearance on all sides when insulation is present.

### SQUARE SPACKLE TRIM – NEW CONSTRUCTION HOUSING

Model	Type	Wattage	Light Output	Color
<b>HR-LED418-NIC-SQW</b>	IC*	11 watts	380 lumens	3000K
<b>HR-LED418-N-SQW</b>	Non-IC†	18 watts	480 lumens	3000K
<b>HR-LED418-NIC-SQC</b>	IC*	11 watts	457 lumens	4500K
<b>HR-LED418-N-SQC</b>	Non-IC†	18 watts	600 lumens	4500K

LEDs included. \*Suitable for direct contact with insulation. †3" clearance on all sides when insulation is present.

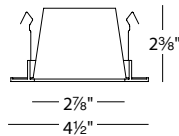
### SQUARE SPACKLE TRIM – REMODEL HOUSING

Model	Type	Wattage	Light Output	Color
<b>HR-LED418-RIC-SQW</b>	IC*	11 watts	380 lumens	3000K
<b>HR-LED418-R-SQW</b>	Non-IC†	18 watts	480 lumens	3000K
<b>HR-LED418-RIC-SQC</b>	IC*	11 watts	457 lumens	4500K
<b>HR-LED418-R-SQC</b>	Non-IC†	18 watts	600 lumens	4500K

LEDs included. \*Suitable for direct contact with insulation. †3" clearance on all sides when insulation is present.

- Less than 1/8" thick, super low profile die-cast aluminum trim
  - Powder coated or Plated Brushed Nickel finishes
- Full scale dimming to 1%
  - Optimal dimming with Electronic Low Voltage (ELV) dimmer
  - Dimming luminaire patent: pending
- Light level for 3000K, 41 foot candles at 5 feet, 16 foot candles at 8 feet
  - Comparable to 50W R20 for IC and 45W BR30 for Non-IC

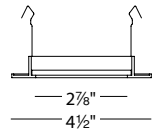
- Narrow flood beam spread and 40° visual cutoff
  - For comfortable general and task lighting
- Distance from LEDs to trim edge is 2 3/8"
- Replaceable LED Module and lens
  - For optimal performance and color consistency we only use ANSI Compliant Warm/Neutral LED Bins from top manufacturers including Cree®, Philips Lumileds and Nichia
- 50,000 hour potential life



### OPEN REFLECTOR – ROUND

Model	Finish	Interior	Trim
<b>HR-LED311</b>	<b>BK/BN</b>	Black	Brushed Nickel
	<b>BK/WT</b>	Black	White
	<b>WT/WT</b>	White	White

Model Shown: **HR-LED311-BK/BN**



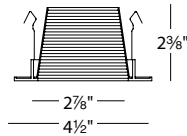
### SHOWER LIGHT – ROUND

UL listed for wet locations

Model	Finish	Trim
<b>HR-LED331</b>	<b>CH</b>	Chrome
	<b>WT</b>	White

Tempered borosilicate glass lens.

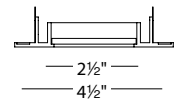
Model Shown: **HR-LED331-CH**



### STEP BAFFLE – ROUND

Model	Finish	Interior	Trim
<b>HR-LED321</b>	<b>BK/BN</b>	Black	Brushed Nickel
	<b>BK/WT</b>	Black	White
	<b>WT/WT</b>	White	White

Model Shown: **HR-LED321-WT/WT**



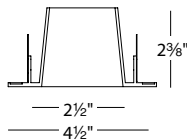
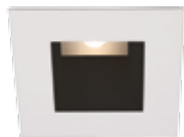
### SHOWER LIGHT – SQUARE

UL listed for wet locations

Model	Finish	Trim
<b>HR-LED371</b>	<b>CH</b>	Chrome
	<b>WT</b>	White

Tempered borosilicate glass lens.

Model Shown: **HR-LED371-WT**



### OPEN REFLECTOR – SQUARE

Model	Finish	Interior	Trim
<b>HR-LED351</b>	<b>BK/BN</b>	Black	Brushed Nickel
	<b>BK/WT</b>	Black	White
	<b>WT/WT</b>	White	White

Model Shown: **HR-LED351-BK/WT**

### NEW CONSTRUCTION HOUSING

Model	Type	Wattage	Light Output	Color
<b>HR-LED309-NIC-W</b>	IC*	6 watts	250 lumens	3000K
<b>HR-LED309-N-W</b>	Non-IC†	10 watts	350 lumens	3000K
<b>HR-LED309-NIC-C</b>	IC*	6 watts	277 lumens	4500K
<b>HR-LED309-N-C</b>	Non-IC†	10 watts	400 lumens	4500K

LEDs included. \*Suitable for direct contact with insulation. †3" clearance on all sides when insulation is present.

### REMODEL HOUSING

Model	Type	Wattage	Light Output	Color
<b>HR-LED309-RIC-W</b>	IC*	6 watts	250 lumens	3000K
<b>HR-LED309-R-W</b>	Non-IC†	10 watts	350 lumens	3000K
<b>HR-LED309-RIC-C</b>	IC*	6 watts	277 lumens	4500K
<b>HR-LED309-R-C</b>	Non-IC†	10 watts	400 lumens	4500K

LEDs included. \*Suitable for direct contact with insulation. †3" clearance on all sides when insulation is present.

- Less than 1/16" thick, super low profile die-cast aluminum trim
  - Powder coated finish
- Dimming from 100% to 15% with existing wiring, improves with number of connected fixtures
  - Optimal dimming with Electronic Low Voltage (ELV) dimmer
- Light level for 3000K, 14 foot candles at 5 feet, 5 foot candles at 8 feet
- Narrow flood beam spread and 25° cutoff angle (for open reflector models)
  - For comfortable general and task lighting

- Sold as new construction
  - May be re-configured in field for remodel
  - IC Rated
- Replaceable LED Module and lens
  - For optimal performance and color consistency we only use ANSI Compliant Warm/Neutral LED Bins from top manufacturers including Cree®, Philips Lumileds and Nichia
- 50,000 hour potential life

- Home docking position to ensure light is projected straight down when needed.



**OPEN REFLECTOR – ROUND**

Model	Wattage	Light Output	Color Temp	Finish
<b>WT</b>				
<b>HR-LED211-W</b>	3 watts	100 lumens	3000K	•
<b>HR-LED211-C</b>	3 watts	123 lumens	4500K	•

LEDs included. Integral housings and trims.

Model Shown: **HR-LED211-W-WT**



**20° ADJUSTMENT FROM VERTICAL – ROUND**

Model	Wattage	Light Output	Color Temp	Finish
<b>WT</b>				
<b>HR-LED212-W</b>	3 watts	100 lumens	3000K	•
<b>HR-LED212-C</b>	3 watts	123 lumens	4500K	•

LEDs included. Integral housings and trims.

Model Shown: **HR-LED212-W-WT**

- Home docking position to ensure light is projected straight down when needed.



**OPEN REFLECTOR – SQUARE**

Model	Wattage	Light Output	Color Temp	Finish
<b>WT</b>				
<b>HR-LED251-W</b>	3 watts	100 lumens	3000K	•
<b>HR-LED251-C</b>	3 watts	123 lumens	4500K	•

LEDs included. Integral housings and trims.

Model Shown: **HR-LED251-W-WT**

Finish Key: WT-White



**20° ADJUSTMENT FROM VERTICAL – SQUARE**

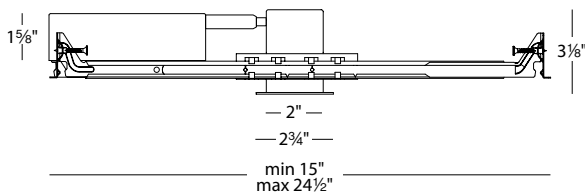
Model	Wattage	Light Output	Color Temp	Finish
<b>WT</b>				
<b>HR-LED252-W</b>	3 watts	100 lumens	3000K	•
<b>HR-LED252-C</b>	3 watts	123 lumens	4500K	•

LEDs included. Integral housings and trims.

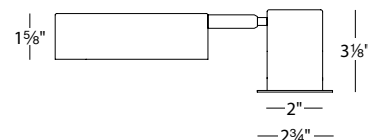
Model Shown: **HR-LED252-W-WT**

**HOUSING CONFIGURATIONS – Can be used as *New Construction* or *Remodel***

**New Construction**



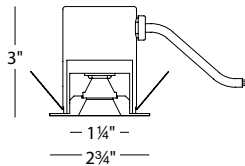
**Remodel**



- Less than 1/16" thick, super low profile die-cast aluminum trim
  - Powder coated finish
- Dimming from 100% to 15%
  - Optimal dimming with Electronic Low Voltage (ELV) dimmer
- Light level for 3000K, 14 foot candles at 5 feet, 5 foot candles at 8 feet

- Narrow flood beam spread and 25° cutoff angle
  - (for open reflector models)
  - For comfortable general and task lighting
- Replaceable LED Module and lens
  - For optimal performance and color consistency we only use ANSI Compliant Warm/Neutral LED Bins from top manufacturers including Cree®, Philips Lumileds and Nichia
- 50,000 hour potential life

- Home docking position to ensure light is projected straight down when needed.

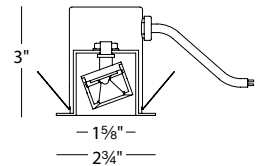


### OPEN REFLECTOR – ROUND

Model	Wattage	Light Output	Color Temp	Finish		
				BN	GM	WT
<b>HR-LED231R-W</b>	3 watts	100 lumens	3000K	•	•	•
<b>HR-LED231R-C</b>	3 watts	123 lumens	4500K	•	•	•

LEDs included. Integral housings and trims.

Model Shown: **HR-LED231R-W-WT**

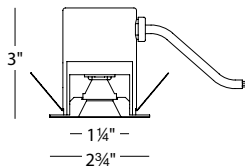
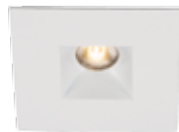


### 20° ADJUSTMENT FROM VERTICAL – ROUND

Model	Wattage	Light Output	Color Temp	Finish		
				BN	GM	WT
<b>HR-LED232R-W</b>	3 watts	100 lumens	3000K	•	•	•
<b>HR-LED232R-C</b>	3 watts	123 lumens	4500K	•	•	•

LEDs included. Integral housings and trims.

Model Shown: **HR-LED232R-W-WT**



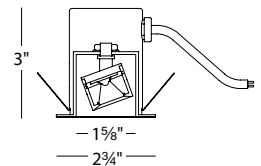
### OPEN REFLECTOR – SQUARE

Model	Wattage	Light Output	Color Temp	Finish		
				BN	GM	WT
<b>HR-LED271R-W</b>	3 watts	100 lumens	3000K	•	•	•
<b>HR-LED271R-C</b>	3 watts	123 lumens	4500K	•	•	•

LEDs included. Integral housings and trims.

Model Shown: **HR-LED271R-W-WT**

Finish Key: BN–Brushed Nickel, GM–Gun Metal, WT–White



### 20° ADJUSTMENT FROM VERTICAL – SQUARE

Model	Wattage	Light Output	Color Temp	Finish		
				BN	GM	WT
<b>HR-LED272R-W</b>	3 watts	100 lumens	3000K	•	•	•
<b>HR-LED272R-C</b>	3 watts	123 lumens	4500K	•	•	•

LEDs included. Integral housings and trims.

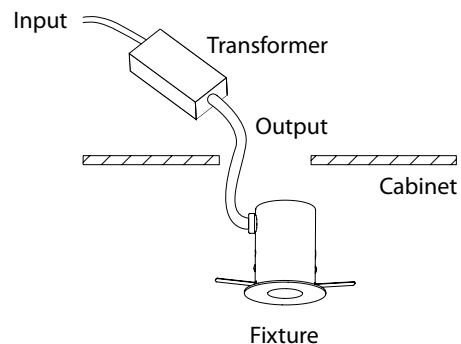
Model Shown: **HR-LED272R-W-WT**

- Home docking position to ensure light is projected straight down when needed.

## REMOTE TRANSFORMERS

### LED DIMMABLE ELECTRONIC TRANSFORMER

Model	Input	Output	Wattage	Dimensions		
				L	W	H
<b>LD-700MA03-EDIM-IS</b>	120V	3.5V	3W max	8 1/4"	1 3/4"	1 3/4"
<b>LD-700MA09-EDIM-IS</b>	120V	10.5V	9W max	7 1/4"	3 1/8"	1 3/4"



ORB



FORZA



- Die-cast aluminum construction
- Dimming from 100% to 15% or better
  - Optimal dimming with Electronic Low Voltage (ELV) dimmer
  - Dimming for SOLORAIL™/DUORAIL™ is recommended with electronic transformer
- 360° horizontal rotation and 90° vertical adjustment
- Replaceable LED Module
  - For optimal performance and color consistency we only use ANSI Compliant Warm/Neutral LED Bins from top manufacturers including Cree®, Philips Lumileds and Nichia
- 30,000 hour potential life
- Compatible with AC 12V SOLORAIL™ and DUORAIL™ systems and with Monopoint Canopy - (canopy sold separately, see table below)

LEDme™ QUICK CONNECT™ FIXTURES

Model	Extension (H)	Finish			Wattage	Light Output	Color Temp
		BN	CH	DB			
<b>QF-LED-171</b> Orb	<b>X3</b> (3")	•	•	•	7.5 watts	280 lumens	3000K
<b>QF-LED-173</b> Forza	<b>X6</b> (6")	•	•	•			
	<b>X12</b> (12")	•	•	•			

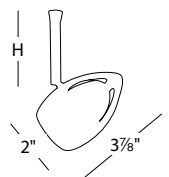
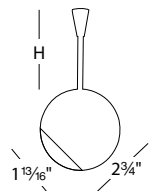
LEDs included.

Example Order: **QF-LED-171X6-DB**

LEDme™ MONOPOINT CANOPY

Model	Finish			Maximum Output
	BN	CH	DB	
<b>QMP-LED10M</b>	•	•	•	12V / 10W

Mounts to a standard 4" junction box, integral magnetic transformer. Also accepts LEDme™ QUICK CONNECT™ Pendants.



Finish Key: BN-Brushed Nickel, CH-Chrome, DB-Dark Bronze



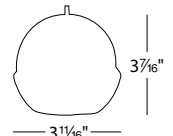
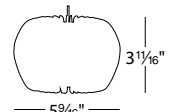
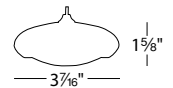
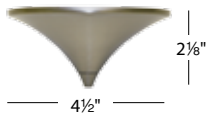
QUEST

GENESIS

ÜBER



- Die-cast aluminum construction
- Dimming from 100% to 15% or better
  - Optimal dimming with Electronic Low Voltage (ELV) dimmer
  - Dimming for SOLORAIL™/DUORAIL™ is recommended with electronic transformer
- Replaceable LED Module
  - For optimal performance and color consistency we only use ANSI Compliant Warm/Neutral LED Bins from top manufacturers including Cree®, Philips Lumileds and Nichia
- 50,000 hour potential life
- Compatible with AC 12V SOLORAIL™ and DUORAIL™ systems or as an individual pendant
  - Easy adjustment monopoint canopy and LEDme™ socket set with 4 inch adjustability included with MP models



LEDme™ QUICK CONNECT™ PENDANTS

Mounting Options	Model	Adapter Finish	Adapter Finish			Wattage	Light Output	Color Temp
			BN	CH	DB			
MP* Canopy	LED311-BN	Genesis	•	•	•	5.5 watts	183 lumens	3000K
QP SOLORAIL™/DUORAIL™	LED314-BN	Quest	•	•	•	5.5 watts	183 lumens	3000K
	LED315-BK	Über	•	•	•	4.5 watts	66 lumens	3000K

LEDs included. MP models include canopy and 72" braided wire. \*Only available in BN adapter finish. QP models include QUICK CONNECT™ socket set and 72" braided wire.

Example Order: **MP-LED315-BK/BN** or **QPLED315-BK/CH**

Finish Key: BK-Black, BN-Brushed Nickel, CH-Chrome, DB-Dark Bronze



- Aluminum construction with acrylic diffuser
- For use with WAC Lighting's 500 series glass shades
  - (see chart below)
- Dimming from 100% to 15% or better
  - Optimal dimming with Electronic Low Voltage (ELV) dimmer
  - Dimming for SOLORAIL™/DUORAIL™ is recommended with electronic transformer
- Energy efficient LEDs
  - For optimal performance and color consistency we only use ANSI Compliant Warm/Neutral LED Bins from top manufacturers including Cree®, Philips Lumileds and Nichia
- 30,000 hour potential life
- Strong light output with no projected heat
  - Input – 5 watts
  - Light Output – 230 lumens
  - Color Temp – 3500K



### SOCKET SET ONLY

Mounting Options	Model	Finish		
		BN	CH	DB
MP Canopy	LED503			
QP SOLORAIL™		•	•	•
DUORAIL™				

LEDs included. MP models include canopy and 72" braided wire. QP models include QUICK CONNECT™ adapter and 72" braided wire.

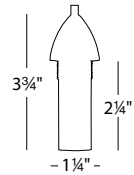
Example Order: **MP-LED503-BN**

### SOCKET SET with GLASS

Mounting Options	Glass-Finish	Socket Set Finish		
		BN	CH	DB
MP-LED Canopy	515-BW			
QP-LED SOLORAIL™		•	•	•
DUORAIL™				

LEDs included. MP models include canopy and 72" braided wire. QP models include QUICK CONNECT™ adapter and 72" braided wire.

Example Order: **MP-LED515-BW/BN**



Finish Key: BN-Brushed Nickel, CH-Chrome, DB-Dark Bronze

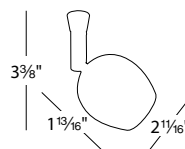
## 500 Series QUICK CONNECT™ Pendants

(refer to our 25th Anniversary Catalog for complete information on 500 series glass)



- Die-cast aluminum construction
- For optimal performance and color consistency we only use ANSI Compliant Warm/Neutral LED Bins from top manufacturers including Cree®, Philips Lumileds and Nichia

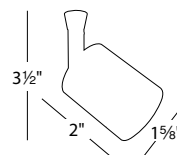
- 30,000 hour potential life
- Strong projected light output with no projected heat



Model	Beam							Wattage	Lumens	Color Temp
	S (8°)	F (25°)	W (40°)	BN	CH	DB	WT			
<b>QF-LED-101-WW</b>	•	•	•	•	•	•	•	3.5 watts	110	3000K

LEDs included. Clear lens included.

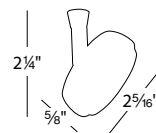
Example Order: **QF-LED-101-WW-S-BN**



Model	Beam							Wattage	Lumens	Color Temp
	S (8°)	F (25°)	W (40°)	BN	CH	DB	WT			
<b>QF-LED-102-WW</b>	•	•	•	•	•	•	•	3.5 watts	110	3000K

LEDs included. Clear lens included.

Example Order: **QF-LED-102-WW-S-CH**



Model	Finish				Wattage	Lumens	Color Temp
	BN	CH	DB	WT			
<b>QF-LED-103-WW</b>	•	•	•	•	4 watts	114	3000K

LEDs included. Clear lens included.

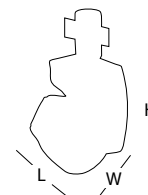
Example Order: **QF-LED-103-WW-DB**

- Die-cast aluminum construction
- For optimal performance and color consistency we only use ANSI Compliant Warm/Neutral LED Bins from top manufacturers including Cree®, Philips Lumileds and Nichia

- 50,000 hour potential life
- Strong projected light output with no projected heat



System	Model	Finish		Wattage	Light Output	Color Temp	Beam	Dimensions		
		DB	PT					L	W	H
HM1	• 9S-WW	•	•	3 × 3W	325 lumens	3000K	10°	2¾"	3"	6⅞"
	• 9F-WW	•	•	3 × 3W	325 lumens	3000K	25°	2¾"	3"	6⅞"
	• 18S-WW	•	•	6 × 3W	620 lumens	3000K	10°	3½"	3¾"	7¼"
	• 18F-WW	•	•	6 × 3W	620 lumens	3000K	25°	3½"	3¾"	7¼"
HM1	• 9S-CW	•	•	3 × 3W	374 lumens	4500K	10°	2¾"	3"	6⅞"
	• 9F-CW	•	•	3 × 3W	374 lumens	4500K	25°	2¾"	3"	6⅞"
	• 18S-CW	•	•	6 × 3W	706 lumens	4500K	10°	3½"	3¾"	7¼"
	• 18F-CW	•	•	6 × 3W	706 lumens	4500K	25°	3½"	3¾"	7¼"



LEDs included. See p.193-194 of 25th Anniversary catalog for lens options.

Example Order: **HM1-9S-WW-DB**

Finish Key: DB-Dark Bronze, PT-Platinum

- Die-cast aluminum construction
- For optimal performance and color consistency we only use ANSI Compliant Warm/Neutral LED Bins from top manufacturers including Cree®, Philips Lumileds and Nichia

- 50,000 hour potential life
- Strong projected light output with no projected heat

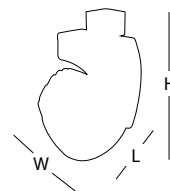


System			Model	Finish			Wattage	Light Output	Color Temp	Beam	Dimensions		
L	H	J		BK	BN	WT					L	W	H
•	•	•	<b>9S-WW</b>	•	•	•	3 × 3W	325 lumens	3000K	10°	2¾"	3"	6⅞"
•	•	•	<b>9F-WW</b>	•	•	•	3 × 3W	325 lumens	3000K	25°	2¾"	3"	6⅞"
•	•	•	<b>18S-WW</b>	•	•	•	6 × 3W	620 lumens	3000K	10°	3½"	3¾"	7¼"
•	•	•	<b>18F-WW</b>	•	•	•	6 × 3W	620 lumens	3000K	25°	3½"	3¾"	7¼"
•	•	•	<b>9S-CW</b>	•	•	•	3 × 3W	374 lumens	4500K	10°	2¾"	3"	6⅞"
•	•	•	<b>9F-CW</b>	•	•	•	3 × 3W	374 lumens	4500K	25°	2¾"	3"	6⅞"
•	•	•	<b>18S-CW</b>	•	•	•	6 × 3W	706 lumens	4500K	10°	3½"	3¾"	7¼"
•	•	•	<b>18F-CW</b>	•	•	•	6 × 3W	706 lumens	4500K	25°	3½"	3¾"	7¼"

LEDs included. See p.193-194 of 25th Anniversary catalog for lens options.

Example Order: **L-9S-WW-WT**

Finish Key: BK-Black, BN-Brushed Nickel, WT-White



- Aluminum construction
- True 1 inch profile
- 50% light output increase
- Interconnection accessories available
- Replaceable LED Modules
  - For optimal performance and color consistency we only use ANSI Compliant Warm/Neutral LED Bins from top manufacturers including Cree®, Philips Lumileds and Nichia
- 6W LEDme™ Light Bar performs as well as a 60W Low Voltage Light Bar
- 50,000 hour potential life



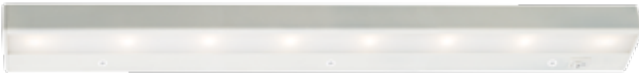
BA-LED2-WT



BA-LED4-SN



BA-LED6-BB



BA-LED8-WT



BA-LED10-SN

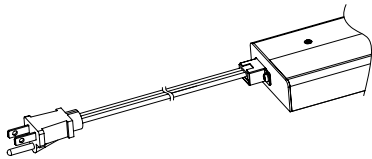


Model	Finish			# of LEDs	Wattage	Light Output	Color Temp	Dimensions			Replaceable Modules			
	BB	SN	WT					L	W	H	RM2X1-30-BA	RM4X1-30-BA		
<b>BA-LED2</b>	•	•	•	2	3.6W	128 lumens	3000K	8"	2¾"	1"	order	1		
<b>BA-LED4</b>	•	•	•	4	6.2W	221 lumens	3000K	12"	2¾"	1"	order		1	
<b>BA-LED6</b>	•	•	•	6	9.8W	331 lumens	3000K	18"	2¾"	1"	order	1	+	1
<b>BA-LED8</b>	•	•	•	8	13W	480 lumens	3000K	24"	2¾"	1"	order			2
<b>BA-LED10</b>	•	•	•	10	16.4W	593 lumens	3000K	30"	2¾"	1"	order	1	+	2

LEDs included. Integral driver.

Example Order: **BA-LED4-SN**

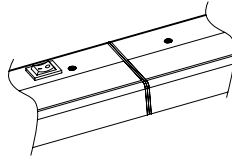
## ACCESSORIES



### POWER CORD

Model	Length
<b>BA-PC6-WT</b>	6'

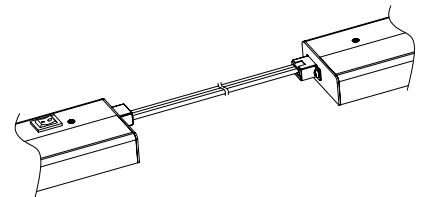
Allows light bars to be powered in any application.



### "1" CONNECTOR

Model
<b>BA-I-WT</b>

Interconnection for seamless end to end transitions. Included with each light bar.



### INTERCONNECT CABLE

Model	Length
<b>BA-IC12-WT</b>	12"
<b>BA-IC24-WT</b>	24"
<b>BA-IC36-WT</b>	36"

Allows the linking of two light bars using a single power connection.

Finish Key: BB–Bronze, SN–Satin Nickel, WT–White

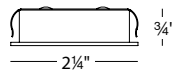
- Die-cast aluminum construction
- Available retrofit housing
  - Use to replace recessed HR-88 halogen fixture using existing cut out and wiring
  - Retains low profile look after installation
- Simple, quick and easy installation
- 50,000 hour potential life
- Compact and reliable constant current LED power supply
  - "Plug and Play" terminal blocks for wiring up to four HR-LED85 LED button lights
  - Surge protection
  - Short circuit protection



Surface Mounted



Recessed Mounted



Model	Wattage	Light Output	Color Temp	Finish					
				BK	BN	CB	CH	DB	WT
<b>HR-LED85</b>	3 watts	180 lumens	3000K	.	.	.	.	.	.

LEDs included.

Example Order: **HR-LED85-CB**

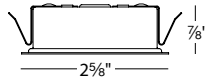


### LEDME™ BUTTON LIGHT RETROFIT HOUSING

Model	Finish					
	BK	BN	CB	CH	DB	WT
<b>HR-LED-COV</b>	.	.	.	.	.	.

LEDme™ Button Light not included.

Example Order: **HR-LED-COV-BK**



Finish Key: BK-Black, BN-Brushed Nickel, CB-Copper Bronze, CH-Chrome, DB-Dark Bronze, WT-White

### DRIVERS

#### LEDme™ BUTTON LIGHT DRIVER

Model	Wattage	Power up to	Dimensions		
			L	W	H
<b>LED-350MA03-RB</b>	3 watts	1 LED85	5 5/8"	1 5/8"	1 1/8"
<b>LED-350MA09-RB</b>	9 watts	3 LED85	7 1/8"	3 1/8"	1 5/8"
<b>LED-350MA12-RB</b>	12 watts	4 LED85	7 7/8"	3 1/8"	1 5/8"

Works in BOTH series wiring and home-run wiring set ups.

#### LEDme™ DIMMABLE BUTTON LIGHT DRIVER

Model	Wattage	Power up to	Dimensions		
			L	W	H
<b>LED-350MA09-DIM-RB</b>	9 watts	3 LED85	6 3/4"	3 1/2"	1 7/8"
<b>LED-350MA12-DIM-RB</b>	12 watts	4 LED85	6 3/4"	3 1/2"	1 7/8"

ONLY works in home-run wiring set up.



# INVISILED® CLASSIC 12V and 24V

- 2W per foot
- 50,000 hours of potential life
- Temperature tolerance: -4° to 122° F
- Relative humidity: up to 95%
- Dimmable with Electronic Low Voltage (ELV) dimmer
- Combine 5', 1' and 2" sections to customize lengths
- Field cuttable every 1" for 12V and every 2" for 24V, or at the end of every run
- 12V – minimum run length of 1' and maximum of 25'
- 24V – minimum run length of 1' and maximum of 40'



## INVISILED® CLASSIC SECTIONS

	12V	Qty	24V	Qty	Length	Color	Color Temp	Watt	Lm/ft
Unit	<b>LED-T-2IN</b>	1	<b>LED-T24-2IN</b>	1	2 inch	<b>AM</b> Amber	590-595nm	.33W	22
	<b>LED-T-1</b>	1	<b>LED-T24-1</b>	1	1 foot	<b>BL</b> Blue	465-470nm	2W	20
	<b>LED-T-5</b>	1	<b>LED-T24-5</b>	1	5 feet	<b>GR</b> Green	515-520nm	10W	60
Bulk	<b>LED-T-2IN-10</b>	10	<b>LED-T24-2IN-10</b>	10	2 inch	<b>RD</b> Red	625-630nm	.33W	35
	<b>LED-T-1-25</b>	25	<b>LED-T24-1-40</b>	40	1 foot	<b>WT</b> White	3500K	2W	90

Example Order: **LED-T24-1-BL**

## ACCESSORIES

### CLASS 2 POWER SUPPLY

12V	24V		Watt
<b>EN-1260-RB2-T</b>	<b>EN-2460-RB2-T</b>	Remote	60W
	<b>EN-24100-RB2-T</b>		96W
<b>EN-1260-P-AR-T</b>	<b>EN-2460-P-AR-T</b>	Plug-in	60W
	<b>EN-24100-P-AR-T</b>		96W

Input 120V

A 6' lead wire is included. Minimum load requirement of 1W for consistent operation.

### JOINER CABLE

12V	24V	Length
<b>LED-T-IC2</b>	<b>LED-TC-IC2</b>	2"
<b>LED-T-IC6</b>	<b>LED-TC-IC6</b>	6"
<b>LED-T-IC12</b>	<b>LED-TC-IC12</b>	12"
<b>LED-T-IC72</b>	<b>LED-TC-IC72</b>	72"

Connects two sections of INVISILED®.

### ADDITIONAL LEAD WIRES

12V	24V	Length
<b>LED-T-P-2</b>	N/A	2 ft.
<b>LED-T-P-12</b>	N/A	12 ft.

Alternative length of lead wires for plug-in or remote power supply. May be field cut for use with a remote power supply.

### 4-WAY "X" CONNECTOR

12V	24V
<b>LED-T-X</b>	<b>LED-TC-X</b>

X connector has one male and three female connectors and can be used to easily customize your design layout.

### 3-WAY "Y" CONNECTOR

12V	24V
<b>LED-T-Y</b>	<b>LED-TC-Y</b>

Y connector has one male and two female connectors and can be used to easily customize your design layout.

### L CONNECTOR

12V	24V
<b>LED-T-L</b>	<b>LED-TC-L</b>

L connector has male and female connectors and is used to create 90° right angles.

### END CAP

12V	24V
<b>LED-T-EC</b>	<b>LED-TC-EC</b>

Cut end cap  $\frac{1}{2}$ "L x  $\frac{1}{4}$ "W x  $\frac{3}{16}$ "H

Male end cap  $\frac{1}{2}$ "L x  $\frac{1}{2}$ "W x  $\frac{1}{16}$ "H

Includes 1 cut end cap and 1 male end cap. Use to terminate every run to protect against contaminants.

### MOUNTING CLIPS

<b>LED-T-CL</b>	$\frac{1}{2}$ "
Qty	10

For installation on surfaces that are difficult to adhere to. Two mounting clips per foot are recommended for straight runs.

### RETROFIT CHANNEL

<b>LED-T-RC</b>	36"L x $\frac{1}{2}$ "W x $\frac{1}{2}$ "H
-----------------	--

Use to construct a miniature cove or light baffle in which tape may be concealed. May also be mounted to the channel as a way to change the direction of the projected light.

# INVISILED® PALETTE and DAYLIGHT to SUNSET Tape Light

- 1.5W per foot
- 50,000 hours of potential life
- Temperature tolerance: -4° to 122° F
- Relative humidity: up to 95%
- All products tested in our inhouse UL laboratories
- Minimum run length of 1' and maximum of 40'
- PALETTE – Select from any color in the spectrum to visibly change an interior design
- DAYLIGHT to SUNSET – Choose a color from daylight to sunset to set the desired ambiance of any room
- Run a program to change the speed and brightness of the effect
- Combine 5' and 1' sections to customize lengths
- Field cuttable every 6" or at the end of every run



Palette

## INVISILED® SECTIONS

	Model	Length	Qty	Watt	Lm/ft
PALETTE	<b>LED-TC-1-RGB</b>	1 foot	1	1.5W	40
	<b>LED-TC-5-RGB</b>	5 feet	1	7.5W	40
	<b>LED-TC-1-40-RGB</b>	1 foot	40	1.5W	40
DAYLIGHT to SUNSET	<b>LED-TC-1-WA</b>	1 foot	1	1.5W	55
	<b>LED-TC-5-WA</b>	5 feet	1	7.5W	55
	<b>LED-TC-1-40-WA</b>	1 foot	40	1.5W	55

Example Order: **LED-TC-1-WA**

Minimum run length of 1' with a maximum of 40' per 60W Class 2 power supply. Field cuttable every 6".



Aura

## ACCESSORIES

### CLASS 2 60W POWER SUPPLY

<b>EN-2460D-C</b>	Remote
<b>EN-2460D-C-P</b>	Plug-in
Input	120V-240V
Output	24V

A 6' lead wire is included. Minimum load requirement of 1W for consistent operation.

### L CONNECTOR

<b>LED-TC-L</b>	1 3/8" L x 1 5/16" W x 1/4" H
-----------------	-------------------------------

L connector has male and female connectors and is used to create 90° right angles.

### MOUNTING CLIPS

<b>LED-T-CL</b>	1/2"
Qty	10

For installation on surfaces that are difficult to adhere to. Two mounting clips per foot are recommended for straight runs.

### INVISILED® PALETTE AND DAYLIGHT TO SUNSET CONTROLLER

<b>LED-TC-CTR</b>	Output	24V	Length	6 ft
-------------------	--------	-----	--------	------

Use + or - buttons to independently adjust the speed and/or intensity of the color changing effect. Center button stops color changing effect at any point during its progression.

### 4-WAY "X" CONNECTOR

<b>LED-TC-X</b>	3 3/4" L x 3 3/4" W x 5/16" H
-----------------	-------------------------------

X connector has one male and three female connectors and can be used to easily customize your design layout.

### RETROFIT CHANNEL

<b>LED-T-RC</b>	36" L x 1/2" W x 1/2" H
-----------------	-------------------------

Use to construct a miniature cove or light baffle in which tape may be concealed. May also be mounted to the channel as a way to change the direction of the projected light. The channel has a 3/32" slot every 1" and can be curved at a radius of 52" or greater. 2" screws are provided

### JOINER CABLE

<b>LED-TC-IC2</b>	2"
<b>LED-TC-IC6</b>	6"
<b>LED-TC-IC12</b>	12"
<b>LED-TC-IC72</b>	72"

Connects two 5-pin sections of INVISILED®.

### 3-WAY "Y" CONNECTOR

<b>LED-TC-Y</b>	3 1/16" L x 3 1/16" W x 5/16" H
-----------------	---------------------------------

Y connector has one male and two female connectors and can be used to easily customize your design layout.

### END CAP

<b>LED-TC-EC</b>	Cut end cap	1/2" L x 1/4" W x 3/16" H
	Male end cap	1/2" L x 1/2" W x 1/8" H

Includes 1 cut end cap and 1 male end cap. Use to terminate every run to protect against contaminants.



# INVISILED® CLASSIC 24V and PALETTE Outdoor Tape Light

## FEATURES

- 2W per foot
- 50,000 hour potential life
- Tape sections are IP-68 rated; allows for submersion up to five feet
- Power supply is UL listed for wet locations
- Low profile ½" W x ⅛" H
- Four mounting options for various applications
- Comes in 1', 5' and 10' sections
- Cut to length every 2" for CLASSIC, every 6" for PALETTE, or at the end of every run
- Minimum run length of 1', maximum of 40'
- Unique watertight connections allow for end-to-end joining of sections while maintaining even spacing between diodes

## INVISILED® CLASSIC 24V OUTDOOR SECTIONS

Model	Length	Watt	Color	Color Temp	Lm/ft
<b>LED-TO24-1</b>	1 foot	2W	<b>AM</b> Amber	590-595nm	22
<b>LED-TO24-5</b>	5 feet	10W	<b>BL</b> Blue	465-470nm	20
<b>LED-TO24-10</b>	10 feet	20W	<b>GR</b> Green	515-520nm	60
			<b>RD</b> Red	625-630nm	35
			<b>WT</b> White	3700K	90

Minimum run of 1' and a maximum run of 40'. Cut to length every 2 inches.

Example Order: **LED-TO24-1-RD**

## INVISILED® PALETTE OUTDOOR SECTIONS

Model	Length	Watt	Color	Color Temp	Lm/ft
<b>LED-TCO-1-RGB</b>	1 foot	1.5W	RGB	N/A	40
<b>LED-TCO-5-RGB</b>	5 feet	7.5W	RGB	N/A	40
<b>LED-TCO-10-RGB</b>	10 feet	15W	RGB	N/A	40

Minimum run of 1' and a maximum run of 40'. Cut to length every 6 inches.

## ADDITIONAL PALETTE COMPONENTS

### PALETTE MASTER CONTROLLER

**LED-TO24-CM** 4"L x 2"W x 12"H

Connects to 120V power supply, powers first 40' of run. For more than 40' runs a Slave Controller is needed.

### PALETTE SLAVE CONTROLLER

**LED-TO24-CS** 4"L x 2"W x 1½"H

Connects to Master Controller for runs over 40'. Uses a separate 120V power supply. Powers up to another 40', a new Slave Controller is needed for every 40' extension.

### PALETTE SIGNAL WIRE

**LED-TO24-SW60** 60"

**LED-TO24-SW120** 120"

Extends distance between Master Controller and Slave Controller.

### PALETTE WIRELESS CONTROLLER

**LED-TO24-WS** 4"L x 22"W x 5"H

Wireless connection to Master Controller. (see diagram at right for full description of functions).

### RGB JOINER CABLE

**LED-TO24-IC6-RGB** 6"

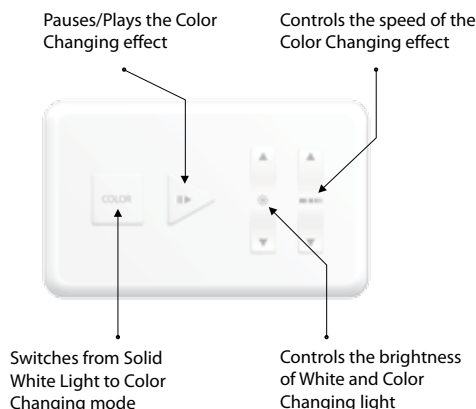
**LED-TO24-IC12-RGB** 12"

**LED-TO24-IC72-RGB** 72"

**LED-TO24-IC120-RGB** 120"

Extends distance between Master and/or Slave Controller and start of INVISILED® run.

### WIRELESS CONTROLLER FUNCTIONS



## INVISILED® CLASSIC and PALETTE ACCESSORIES

### OUTDOOR REMOTE POWER SUPPLY

**EN-O24100-RB2-T** Input 120V

100W Output 24V

Lead Wire 6 ft

Supplies power with hard wiring. A 6' long lead wire is included. Minimum load requirement of 1W for consistent operation.

### 3-WAY "Y" CONNECTOR

Classic 24V

**LED-TO24-Y** 7½"L x 7½"W x ¾"H

Palette

**LED-TO24-Y-RGB** 4¾"L x 4¾"W x ¾"H

One male and two female connectors, can be used to easily customize your design layout.

### 4-WAY "X" CONNECTOR

Classic 24V

**LED-TO24-X** 11½"L x 11½"W x ¾"H

Palette

**LED-TO24-X-RGB** 6½"L x 6½"W x ¾"H

One male and three female connectors, can be used to easily customize your design layout.

### JOINER CABLE

**LED-TO24-IC6** 6"

**LED-TO24-IC12** 12"

**LED-TO24-IC72** 72"

**LED-TO24-IC120** 120"

CLASSIC – Connects 2 sections of tape ONLY.  
PALETTE – Extends distance between Power Supply and Master and/or Slave Controller ONLY.

### END CAP

**LED-TO24-EC** 5"L x 5/8"W x 3/8"H

Use to terminate every run to protect against contaminants. Seal cut end with silicon after adding end cap.

### RETROFIT CHANNEL

**LED-TO24-CH1** 12"L x 5/8"W x ¼"H

**LED-TO24-CH5** 60"L x 5/8"W x ¼"H

Rigid, non-flexible channel for mounting to a straight, solid surface.

### MOUNTING CLIP 1

**LED-TO24-C1** 1½"L x 3/8"W x ¼"H

Qty 10

For installation on non-flat surfaces where there is no edge contact. Two mounting clips per foot are recommended for straight runs.

### MOUNTING CLIP 2

**LED-TO24-C2** 7/8"L x 3/8"W x ¼"H

Qty 10

For installation on non-flat surfaces, allows for contact on one edge. Two mounting clips per foot are recommended for straight runs.

### MOUNTING CLIP 3

**LED-TO24-C3** 5/8"L x 5/8"W x ¼"H

Qty 10

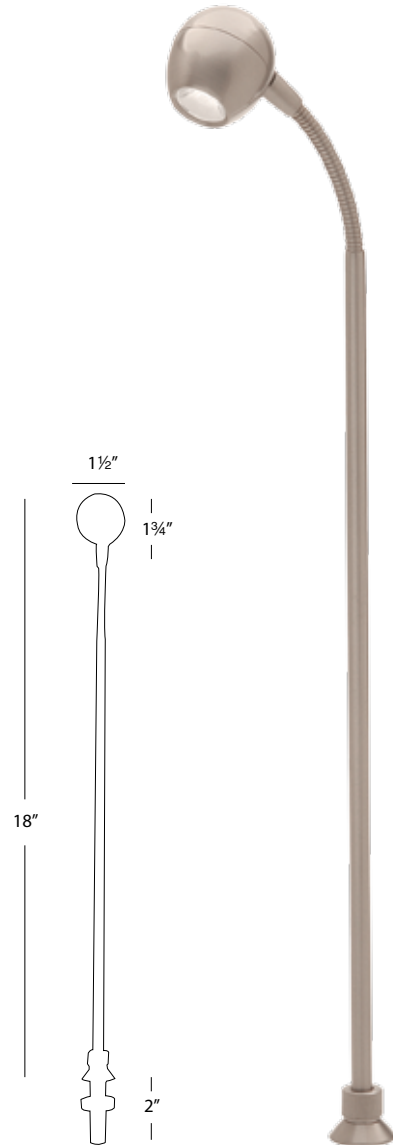
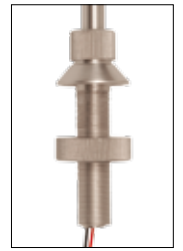
For installation on non-flat surfaces, allows for contact on both edges. Two mounting clips per foot are recommended for straight runs.

- Available in three different color temperatures
- Choose from three different beam spreads
- Simple, quick and easy installation
- 50,000 hour potential life
- Compact and reliable constant current LED power supply
  - Surge protection
  - Short circuit protection

- Flexible neck for challenging lighting situations
- Vents provide thermal management to extended LED life



- Threaded rod allows for mounting in varying applications
- Adjustable from 4 to 18 in, may be cut in field for custom lengths



### LEDME™ SHOWCASE FIXTURE

Model	Color Temp	Beam	Finish			Wattage	Light Output
			BK	BN	CH		
LED-SL-101	WW 3000K	S Spot (8°)	•	•	•	3 watts	100 lumens
	NW 4500K	F Flood (25°)	•	•	•	3 watts	110 lumens
	CW 6000K	W Wide (40°)	•	•	•	3 watts	120 lumens

Includes LED, lens and 6' cord.

Example Order: **LED-SL-101-CW-F-BK**

Finish Key: BK-Black, BN-Brushed Nickel, CH-Chrome

### ACCESSORIES

#### LEDme™ DRIVER

Model	Wattage	Power up to	Dimensions		
			L	W	H
LED-700MA12-P	12 watts	4 LED-SL-101	5"	3"	1 5/8"

#### LENS ACCESSORIES

Model	Beam
SL-LEN-S	8°
SL-LEN-F	25°
SL-LEN-W	40°

Order separately.

# Alternative energy efficient products from WAC Lighting

## COMPACT FLUORESCENT (CFL)

*Much more efficient than traditional incandescent bulbs, CFLs offer much longer life and reduced energy costs.*

*WAC Lighting offers a wide range of CFL fixtures including Downlights, Track Heads, Decorative Glass Pendants, Wall Sconces and Light Bars.*



## METAL HALIDE (HID)

*High Intensity Discharge lamps.*

*Ideal for large stores, warehouses, auditoriums, outdoor parking areas, and applications where efficiency is a priority. HIDs have a warm-up period, which results in slower start-up. HIDs deliver a large amount of light over a wide area and have a long life of between 5,000 and 24,000 hrs.*

*WAC Lighting offers HID lamping in Downlights, Multi-spots and Track Heads.*



## LOW VOLTAGE HALOGEN

*Halogen lamps are a more efficient version of incandescent bulbs. They produce more light, last over 3 times as long and the light output will not diminish over time. WAC Lighting offers halogen lamping in a number of Decorative Glass Pendants and Wall Sconces.*

## LOW VOLTAGE XENON

*Xenon bulbs give off more light than their halogen counterparts and have a longer life, up to 20,000 hours. Xenon bulbs have no filament so they are much more durable than halogen or incandescent bulbs.*

*We offer xenon lamping in a number of Decorative Glass Pendants and Light Bars.*



# Glossary

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**ANSI** – American National Standards Institute

**BINNING** – A process by which LEDs are sorted in order to maintain proper color consistency between individual LEDs.

**CCT (CORRELATED COLOR TEMPERATURE)** – A number assigned to a given light source that represents the color temperature of a black body radiator which to human color perception most closely matches the light from the lamp.

**CFL** – Stands for Compact Fluorescent; An energy efficient lamping source.

**CRI (COLOR RENDERING INDEX)** – A measurement, from 0 to 100, of a light sources ability to reproduce the colors of objects accurately.

**DIE-CAST** – A term that refers to the process of forcing molten metal, under great pressure, into a die or form to give it a specific shape. A very efficient process, excess material can be reused for future casting.

**DIODES** – Semi-conductors similar to a computer chip that emit light when electricity is applied to them.

**EFFICACY** – Measures the efficiency of a light source by comparing lumens to wattage.

**ENERGY STAR** – A United States government program created in 1992 by the US Environmental Protection Agency in an attempt to reduce energy consumption and green house gases. What began as a voluntary labelling program has grown into one of the largest efforts worldwide to promote energy efficient consumer products.

**FOOT CANDLE** – Measurement of light at an illuminated object; equal to the amount of light one candle generates one foot away.

**HEAT SINK** – A device or substance used for absorbing and dissipating excessive or unwanted heat.

**HID** – Stands for High Intensity Discharge, also referred to as Metal Halide lamping.

**INCANDESCENT** – Traditional lamping widely used in residential and commercial applications. Incandescent bulbs have a low manufacturing cost but a short lifespan and poor energy efficiency.

**KELVIN** – A unit increment of temperature.

**LED** – Light Emitting Diode.

**LUMENS** – A metric equivalent of foot candles. Measures how much light gets to the object you want to light. Equal to one foot candle falling on one square foot of area.

**LUMEN MAINTENANCE** – Compares the amount of light produced from a light source to the amount of light output at a given time in the future. Example: If a luminaire produced 1000 lumens of light when it was brand new and now produces 700 lumens of light after 30,000 hours, then it would have a lumen maintenance of 70%.

**NATIONAL ELECTRIC CODE (NEC)** – A part of the National Fire Codes NFPA (National Fire Protection Association) outlining the United States standard for the safe installation of electrical equipment and wiring.

**PHOTOMETRICS** – Measurement of light intensity.

**SEMI-CONDUCTOR** – A material that has an electrical conductivity between that of a conductor and an insulator. Devices made from semiconductor materials are the foundation of modern electronics.

**SOLID STATE LIGHTING** – A type of lighting that uses semi-conductor light emitting diodes (LEDs) or organic light emitting diodes (OLED) as sources of illumination rather than incandescent, plasma or gas lamp sources.

**UL LISTING** – UL stands for Underwriters Laboratory, it is a trusted resource across the globe for product safety certification and compliance solutions.

All WAC Lighting products come with a 5 year warranty

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