

# HALO



Sustainable Design™

## HALO LED

H4 | Collection  
H7

**COOPER** Lighting

# HALO LED

First with  
ENERGY STAR®  
Qualification



## ENERGY STAR® for Solid State Lighting (LED Luminaires)

Concerned about LED luminaires? Caution is prudent and to be expected. The United States Department of Energy (DOE) commissioned by the US legislature, coordinated a thorough review of the current LED and compact fluorescent luminaires supplied to consumers. It included lighting industry experts and research personnel with the purpose of driving product requirements to satisfy customer expectations and encourage the use of energy saving and sustainable solid state lighting products. This effort resulted in a set of eligibility requirements for Solid State Lighting (LED luminaires) for ENERGY STAR® qualification. The requirements are substantially different from the current ENERGY STAR® program used in compact fluorescent. The core differences include color quality, light delivered by the luminaire, power quality and reliability of the total luminaire. Five key qualification requirements form the foundation of the ENERGY STAR® Standards - qualifications that the Halo Recessed LED has met and exceeded.

- 1. TESTING:** Requires submission of qualified independent test lab data to obtain qualification. Halo LED complies with ENERGY STAR® SSL test standards including IES LM-79-2008 and LM-80-2008 as performed by an independent test lab.
- 2. EFFICACY:** The luminaire test data and submitted report must demonstrate a minimum of 35 lumens per watt and 575 lumens for the least efficient LED for apertures  $\geq 4.5"$  (and 345 lumens for apertures  $\leq 4.5"$ ), lowest efficient optic, and hottest luminaire configuration for the product group submitted for qualification.
- 3. COLOR:** LED luminaire must demonstrate color uniformity across the aperture. For example, color of 3000K recessed LED (Like the Halo LED) must fall between  $3045K \pm 175K$ , and the color maintenance must be within 0.007 (u',v') over the lifetime, and color range must fall within 7-Step Quadrangle.
- 4. POWER:** The driver/power supply must have a power factor of  $>0.70$  and  $>0.90$  for residential and non-residential respectively, meet FCC requirements, sound rating of A and provide transient protection.
- 5. RELIABILITY:** The LED luminaire must demonstrate 70% lumen maintenance at 25,000 hours and 35,000 hours for residential and non-residential respectively, as calculated using the DOE's linear extrapolation model. The LED luminaire must include a 3-year written warranty provided with the product.

There are many more details to the solid state lighting standards that can be found at the ENERGY STAR® website: [www.energystar.gov](http://www.energystar.gov).

Knowing that consumer confidence is very important to adopt LED energy saving luminaires, it is important early on to establish a set of requirements to meet customer expectations. ENERGY STAR® for solid state lighting is the standard for high quality and reliable LED recessed downlighting. Rest assured that Cooper Lighting along with the lighting industry and DOE are working hard to provide standards that encourage lighting products that reliably save energy and reduce our consumption of natural resources.

# HALO LED

First with California Energy  
Commission Title 24-2008  
Mandated LED Registration



## Title 24 Requirement for Solid State High Efficacy Lighting

California Title 24-2008 residential code specifically requires LED lighting products be qualified and registered with the State of California Energy Commission Title 20 database. The result of this code requirement is that the CEC Title 20 database is the single source for specification of Title 24 qualified LED 'high-efficacy' lighting products in the State of California.

A key feature in the 2008 version of California Title 24 is the addition of qualifications for LED lighting fixtures. Title 24-2008 defines standards for LED lighting products to qualify as 'high-efficacy', and also requires manufacturers certify LED products to the California Energy Commission. Title 24 continues to drive California's shift toward more energy efficient lighting with definition of high-efficacy (Lumens-per-Watt) standards for LED lighting sources. More significantly, the standards require measurement and testing of the complete LED luminaire, and not just the light source itself (as has been the practice with the established fluorescent lamp technologies). With the new standards for LED, only products certified by the State of California and registered in the California Title 20 state database may qualify as 'high-efficacy,' under Title24-2008. And Halo LED was the first to be registered and listed in the California Title 20 database of qualified LED lighting products.

California Title 24-2008 requires a complete LED luminaire be tested and certified for maximum input wattage, luminous flux (delivered lumens), and efficacy (lumens-per-watt). These criteria must be documented through specific test standards, either IESNA LM-79-08 or California's Joint Appendix JA-8. For certification, testing must meet minimum lumen-per-watt criteria based upon total wattage.

California Title-24 has many more requirements specific to residential and commercial applications that can be found at the CEC Website:

<http://www.energy.ca.gov/title24/2008standards/>

## 2009 International Energy Conservation Code®

The International Code Council (ICC) is a professional association devoted to building and fire safety codes. The ICC develops codes and standards used for construction of residential and commercial buildings. According to the ICC, fifty states and the District of Columbia have adopted their I-Codes at the state or local level. The relevant code applicable to lighting standards is the International Energy Conservation Code (IECC). The IECC sets standards for both Residential Code and Commercial Code. The 2009 Commercial Code sets requirements for lighting in watts per square foot, which is a familiar metric for commercial energy efficient lighting, similar to other standards such as ANSI/ASHRAE/IESNA Standard 90.1. Of significance are new requirements in the 2009 Residential Code, and the impact of these will be seen in the IECC's continued adoption by states nationwide. The 2009 Residential Code sets new requirements for application of high-efficacy lamp sources, as well as specifies minimum efficacy standards in lumens per watt (LpW) for these high-efficacy lamp sources. In this manner the 2009 IECC sets LpW standards much like those of the California Title 24 code. For more information on the IECC, refer to the ICC Website:



<http://www.iccsafe.org/Pages/default.aspx>

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# HALO LED MEANS SUPERIOR PERFORMANCE

## The benefits of HALO LED are significant ...

- Energy Savings – Halo LED offers significant savings over traditional sources; for example H7 600 Series consumes 78% less energy than comparable 65W BR30 incandescent lamps
- High Efficacy – Halo LED offers more Lumens per Watt; for example H7 1200 Series LED delivers over 62 lumens per watt
- Long Operational life – over 50,000 hours. Halo LED is designed to deliver 70% of initial lumens at 50,000 hours as per LM-80 test protocol
- Reduced maintenance cycle – Halo LED can perform for over 5 years operating 24 hours / 7 days a week
- Dimmable – full range dimming to 15% or lower, depending upon LED Module and type of dimmer
- Improved quality of light – Smooth, even illumination across the visual field
- H4 LED Collection – designed for high performance in a small 4" aperture with minimal ceiling presence
- H7 LED Collection – designed for 6" housings, both new construction or retrofit in existing installations
- H7 LED Collection – offers a powerful selection of three lumen packages: 600 Series, 900 Series, 1200 Series
- H4 and H7 LED Collections – offer flexibility in lighting design with selection of four Correlated Color Temperatures: 2750°K, 3000°K, 3500°K, 4000°K
- H4 and H7 LED Collections are ENERGY STAR® Qualified and can be used for California Title 24-2008 and IECC-2009 High Efficacy compliance – with designated LED Modules and LED trims
- SustainableLEDesign™ – Cooper Lighting's sustainable lighting solutions – like Halo LED that reduce energy demand and corresponding carbon emissions



## Revolutionary Lighting Technology

LED - Light Emitting Diodes - Once only known to the electronics industry are now becoming a common component used for general lighting. And the reason for such interest and integration of LED in general lighting is LED's superior energy efficiency and extremely long operational life compared to traditional incandescent technology. LED's have been used in automotive and traffic signal products for some time because of LEDs natural generation of red, blue, and green color. With recent breakthroughs in LED technology a LED is now capable of generating "white light". Combined with technological advances in LED power electronics LEDs are now capable of generating white light at a level of performance where LED may be applied successfully to general lighting products. LED is also referred to as Solid State Lighting (SSL) because it is composed of various semiconductor materials and when an electrical current passes through the diode, the recombination of positive and negative charges results in the emission of photons or light. As a result LED luminaires are high-efficiency alternatives to less efficient incandescent light sources. Halo LED offers the latest in LED technology in a collection of high-performing energy-efficient 4" and 6" aperture recessed downlights. The Halo ML706830 LED Module was the first solid state lighting device to qualify for the ENERGY STAR® rating, and Halo H4 and H7 collections were the first to receive California Title 24 certified LED product registration. These qualifications are your assurance that the Halo LED Modules deliver effective lighting while also meeting very demanding and stringent energy efficient operating guidelines.

A complete luminaire consists of LED compatible housing, LED Module and LED trim.



### H7 collection 6 inch recessed retrofit LED Modules



600 Series

900 Series

1200 Series

### H4 Collection 4 inch light engine and housing



# HALO LED PROVIDES VALUE AND CONTRIBUTES TO LOWER ENVIRONMENTAL IMPACT

## HALO LED Environmental Benefits

Halo LED luminaires not only reduce your energy cost but they also benefit the environment. By lowering the demand for electricity, power plants can generate less energy and lower the amount of carbon emissions discharged into the environment.

## HALO LED reduces the environmental impact

The supplies of fossil fuels are diminishing due to high demand for energy. Since lighting constitutes a large percentage of electric generation capacity, it has become a target for higher mandated efficiency standards. Changes in the lighting industry are driven by both energy legislation and by consumers who are concerned with excessive consumption. The future of lighting is with high efficiency products that meet lower energy consumption levels while not using hazardous materials like mercury and lead that can damage the environment.



### Sustainability

Halo LED is a part of Cooper Lighting's SustainabLEDesign™ initiative that offers environmental and sustainable solutions that reduce carbon emissions and hazardous materials in support of overall strategy to improve the environment. Halo LED is mercury-free, PCB-free and lead-free and thus does not need special handling to dispose of properly. The Halo LED downlight solution contributes to reduction of carbon emissions and conserves natural resources while diminishing the concerns of toxic substances in the water supply resulting from improper disposal. Halo provides solutions with LED's that make it easy to be environmentally responsible.



### Energy saving

Changing one incandescent lamp to a Halo LED recessed downlight will save you hundreds of dollars over the life of the fixture. Changing multiple fixtures will significantly lower your electric bill and change how you view lighting. The Halo LED luminaire is more efficient than traditional light sources; for example the H7 600 series consumes 78% less energy than a 65 watt incandescent BR30 lamp. Halo LED offers additional savings when dimming along with user control of the lighted environment.



### Long life

LED's are solid state devices that do not have filaments or glass components that could break. The light source is not susceptible to vibration thus reducing the risk of premature failure. The Halo LED design delivers over 70% of the initial light output long after 50,000 hours of operation. The sustainability of the Halo LED fixture dramatically reduces maintenance and service costs over traditional sources.

#### LIFE COMPARISONS\* - Incandescent, Fluorescent, Halo LED

INCANDESCENT = 0.46 YEARS LIFE (50% OF LAMPS FAIL AT 1,000 HOURS)

FLUORESCENT = 5.5 YEARS LIFE (50% OF LAMPS FAIL AT 12,000 HOURS)

LED = 22.8 YEARS AND STILL PRODUCING 70% OF INITIAL LUMEN OUTPUT

\* 2,190 hours/year (6 hours per day)



## Sustainable lighting for hospitality

Halo LED luminaires are ideal for creating virtually maintenance-free public spaces. Hotels, restaurants and night-time businesses will reduce expensive electric bills and maintenance costs by choosing the Halo LED. Halo LED will continue to deliver 70% of the original light after eleven years based on 12 hours usage per day.

## Lobbies and more...

The Halo LED downlight is a perfect choice for the hospitality industry due to the sustained light levels provided by the LED. The Halo LED provides lower operating costs per fixture and the difference can be significant with a large number of fixtures utilized in an installation. Since there is limited infrared and no ultraviolet emissions, artwork and wall hangings are protected from fading. The basic "downlight" look and operation of the Halo LED allows it to easily blend in with other fixtures so it does its job without calling undue attention to itself.



Halo LED can help improve customer satisfaction. Most recent reports indicate the number one complaint of customers staying in hotels is the lighting does not work. This is due to the high mortality rates of incandescent and compact fluorescent lamps. Even under harsh demands of 24/7 operation, the Halo LED Module will continue to deliver 70% of the original light after 5-1/2 years. That's over five years of no unsightly maintenance operations disturbing your customers.

Operational costs can be dramatically reduced with Halo LED lighting. When lighting is operated 24/7, the burn hours of traditional light sources increase the total energy load and frequency of lamp replacement.

Since the Halo LED does not emit heat like traditional incandescent or fluorescent sources, even a large installation will not put a significant strain on the air conditioning system. This is another benefit from Halo LED.



### Maintenance free for health care

The principal characteristics of LED lighting make it a natural for health care installations. Besides the low energy consumption and resulting cost savings, Halo LED's sustainable operation virtually eliminates maintenance issues.

### Benefits for the health care patient

LED downlights are ideal for creating low maintenance public spaces, patient rooms and recovery rooms. Halo LED is friendly to the room occupants with its warm white color, low brightness and low glare. In addition, the Solite® Lensed White Baffle and White Reflector trims feature an antimicrobial paint finish that actively kill bacteria which is a major health care concern. Antimicrobial trims: H7 collection 493WBBS06 and H4 collection TL403WBS and TL402WHS.



The advanced dimming range of Halo LED provides user control of the lighted space. Halo LED offers dimming as a standard feature. This allows ultimate flexibility in facility design – switching for simple on/off control, or dimming when needed to control the user's visual environment.

Waiting rooms provide another application for Halo LED. Operating 24 hours a day, the Halo LED can still be operating after 5-1/2 years of continuous lighting with over 70% of its original lumens. Maintenance personnel will appreciate the time savings offered by Halo LED compared to the spot re-lamping and disinfecting that is typical with traditional incandescent sources.

As an added benefit, especially in healthcare environments, the Halo LED Solite® Lensed White Baffle and White Reflector trims feature an antimicrobial paint finish that actively kills bacteria. The Solite® Lens offers wet location and shower rating, and the added benefit of a smooth lens surface for ease in general wipe-down cleaning.



# HALO LED MEANS VERSATILE, HIGH QUALITY LIGHTING FOR COMMERCIAL SPACES



## Quality lighting for commercial spaces

Focus on the importance of lighting. Halo LED luminaires provide light output that is comparable to traditional sources while saving energy and eliminating the inconvenience and distraction of frequent relamping and maintenance. Effective lighting is one of the keys to feeling good and productive about where you work and what you do. HALO LED's superior optical design delivers productive beam lumens with smooth, even

illumination across the visual field. It provides excellent color rendering over 80 CRI, and selection of four color temperatures ranging from warm white to cool white: 2700°K, 3000°K, 3500°K and 4000°K. Halo LED is also dimmable. These qualities make Halo LED perfect for meeting rooms, private offices, reception desks, service counters, rest rooms, break rooms, kitchens and more.



LED lighting in the office provides effective illumination while lowering energy costs. With its dimming capability HALO LED allow rooms to be set for presentations at the push of a button.



A commercial canopy or soffit lighting luminaire that delivers high lumens with significantly lower wattage, a long sustainable life, and lowered maintenance cycle has not been available until now. The Halo LED is rated for continuous operation in non-insulated spaces with temperatures from -22°F (-30°C) to +104°F (+40°C). The Halo LED system offers energy saving operation and extended life-time for maintenance savings in canopy applications.



Any workplace can benefit from the main advantages of Halo LED lighting: Low energy consumption, reduced energy cost, low maintenance, dimmability, and high quality illumination. The dependable and lower overall life-time cost of the Halo LED allows a business to focus on satisfying customers and raising the bottom line.



## Halo LED is a natural for retail

The Halo LED downlight is an ideal choice for retail applications. It provides high performance lighting in almost any department. Halo LED presents the merchandise in the best light. The fact that Halo LED generates no ultraviolet and limited infrared means that even the most sensitive colored merchandise can be illuminated without color deterioration. The other characteristics of Halo LED such as low wattage means that energy costs are reduced and that,

even with large installations, energy conservation codes can be met. Finally, with 70% lumens operating at 50,000 hours, Halo LED significantly reduces the maintenance cycle thereby lowering maintenance cost in the retail space. Also, LED's generate much less heat thereby significantly reducing the load on air conditioning systems.



With so much merchandise competing for attention and energy code requirements driving higher efficiency standards, Halo LED provides superior illumination along with high efficacy for energy savings that meet energy codes and makes people want to stop and take a closer look.



Colorful merchandise benefits with extra "eye-appeal" from the consistent lighting offered by Halo LED. Compared to traditional lamp sources, use of Halo LED means no more mismatched lamps, no flickering as lamps approach end of life and finally, no burned-out lamps for well beyond 50,000 hours of operation.



Traditional sources burn out frequently requiring maintenance personnel to replace lamps. Halo LED technology delivers over 70% of initial lumens over 50,000 hours. This long operational life means far less unsightly distractions of on-going maintenance with service personnel replacing lamps that burn out frequently.

## HALO LED IS IDEAL FOR RESIDENTIAL LIGHTING



### HALO LED is a natural for the home

Quality optical design provides light output and distribution comparable to an incandescent lamp source. Excellent cutoff, color quality and multiple color temperature options create an enjoyable illuminated environment. Full range dimming provides the ability to set different moods. The energy savings and cost reduction are welcome anytime. Unlike some compact fluorescent fixtures, the appearance of the LED Module with a lensed trim is reminiscent of a familiar downlight with a PAR lamp. The Halo LED can be dimmed so the brightness level can be adjusted as the day's activities change.



In the kitchen above, the downlighting energy load could be reduced over 78% with Halo LED fixtures (H7 600 series compared to 65W BR30 lamps). Now the homeowner can enjoy warm, high quality illumination with full range dimming without the high costs. Additionally, these luminaires dramatically lower the impact on the air conditioning system compared to incandescent and halogen lamps.



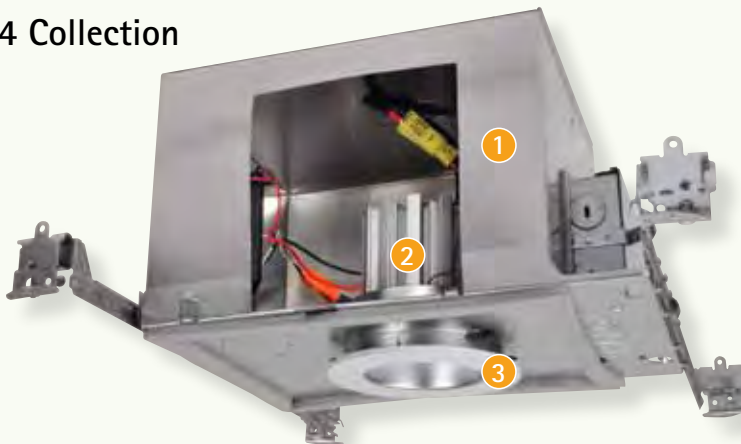
HALO LED recessed downlights offer architectural and landscape accent lighting as installed in protected soffits, porches, and canopies. Halo LED is an excellent solution for recessed lighting in these non-insulated spaces. Previously, soffit type lighting solutions have not been possible using energy-efficient lighting due to temperature limitations— particularly in cold climates. Until now, the best solution available for cold temperatures was incandescent lighting. Halo LED, when used in soffits, helps reduce the amount of in-ground landscape lighting and the associated yard damage that may occur. HALO LED provides an effective energy-efficient solution when installed in non insulated, protected soffits, porches and canopies.

## THE HALO H7 LED SYSTEM

- 1 H750 LED HOUSING OR EXISTING H7 COMPATIBLE HOUSING (RETROFIT)
- 2 H7 LED MODULE (WITH LED DRIVER)
- 3 H7 LED TRIM



## H4 Collection



## THE HALO H4 LED SYSTEM

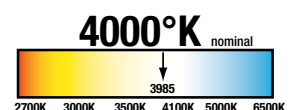
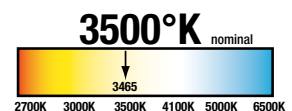
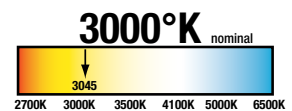
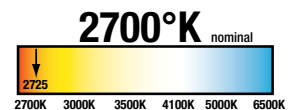
- 1 H4 LED HOUSING (WITH LED DRIVER)
- 2 H4 LED LIGHT ENGINE
- 3 H4 LED TRIM

## Halo LED Color Specification and Quality

- Halo employs a tight chromaticity specification and LED color binning process to ensure LED color uniformity, sustainable Color Rendering Index (CRI) and Correlated Color Temperature (CCT) consistency over the useful life of the LED
  - Halo LED chromaticity specification not only meets, but exceeds ENERGY STAR® SSL color standards (as per ANSIC 78.377-2008)
  - Halo LED offers the widest choice of four correlated color temperatures in recessed LED downlighting: 2700°K, 3000°K, 3500°K, 4000°K
  - Every Halo LED Module is quality tested and performance measured on the production line, and then serialized to register lumens, wattage, CRI and CCT
  - Halo LED's serialized testing and measurement process further ensures color and lumen consistency to meet stringent Cooper Lighting specifications and exceed ENERGY STAR® SSL standards
  - Halo LED Modules and light engines include color designation in the model number
  - Example:  
ML706827 or ML709830I/CAT120D or ML712835TUNVD010
- 827  
 |  
 | 2700°K nominal CCT  
 |  
 | > 80 CRI

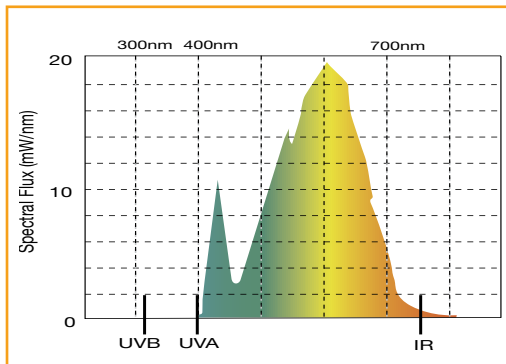
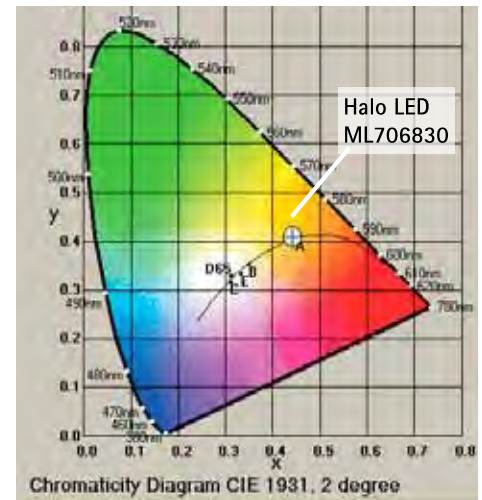
## Color Identification

ENERGY STAR® SSL  
Nominal CCT Designation



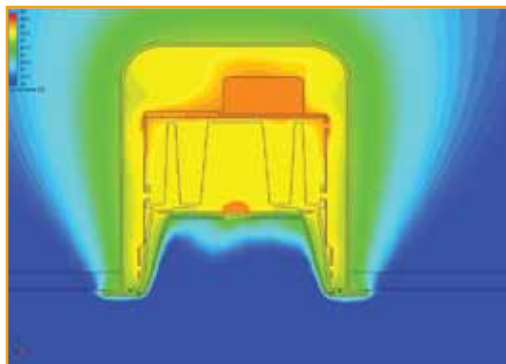
## C.I.E. Chromaticity Diagram

C.I.E. (Commission Internationale de l'Eclairage, The International Commission on Color). The C.I.E. diagram is based on the proposition that mixing varying proportions of three hypothetical primaries (not necessarily red, green, and blue) can create the sensation in the human observer of any color of light. The three "primary" colors are dubbed "X", "Y" and "Z". If we are merely concerned about color and not about brightness, we can specify just the relative strengths of these three colors, denoted by x, y and z. Since  $x+y+z$  must add up to 1 (i.e. 100%) just providing x and y is sufficient to specify lamp color with z implied. Lamp color can then be represented on a two dimensional plot of x and y. All possible colors then fall under a "guitar pick" shaped triangle in which the perimeter encompasses spectrally pure colors (seen in nature only in rainbows and prisms) ranging from red to blue. Moving toward the center "dilutes" the color until it ultimately becomes white. The color coordinates traversed by an incandescent object as its temperature is raised are plotted on the C.I.E. Chromaticity Diagram as the "Blackbody" curve and occupies the central white region. Two lamps whose x, y coordinates fall one above the blackbody and one below could have the same CCT. However the one above will appear slightly greener, and the one below slightly pinker. This is why two lamps having the same color temperature can still show differences in color as seen by the human eye. This is why the Halo LED has very stringent color specifications, testing, and production controls to ensure consistent color uniformity. Halo LED complies with ENERGY STAR® SSL test standards including IESNA LM-79-2008 and LM-80-2008 as performed by an independent test lab.



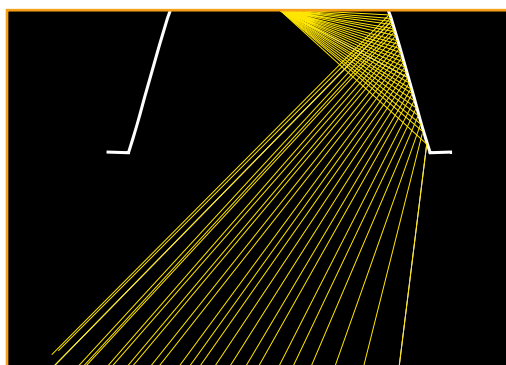
## LED - Spectral Distribution and Color

Halo LED deploys InGaN (Indium Gallium Nitride) semiconductor material which has absence of UV and has minimal IR wavelengths. The unique engineered conglomeration of diodes covered with a uniform phosphor coating provides for consistent color uniformity and tight color control even during dimming, exceeding the ANSI C78.377-2008 CCT ranges. The specified 80CRI of Halo LED exceeds ENERGY STAR® SSL requirements providing high quality color rendering.



## Thermal Management – The Key to LED Life

Proper thermal management of a LED system is critical for high efficiency and long life. Halo LED's heat sink construction is designed to yield 70% lumen maintenance after 50,000 hours of operation with many thousands of hours of operation thereafter. The Halo LED is tested to IESNA LM-79 and LM-80 test standards for performance and reliability, and qualification to ENERGY STAR® SSL standards.

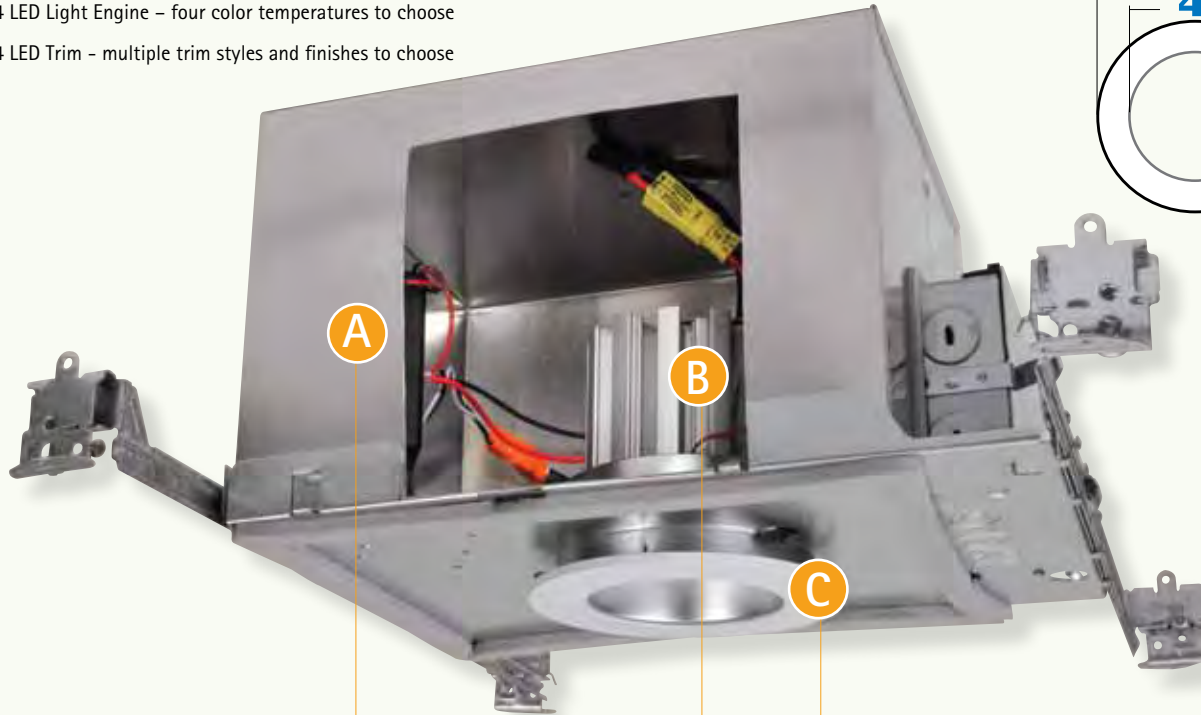
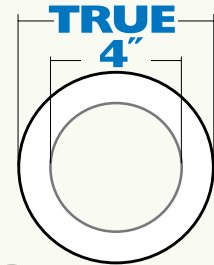


## Optics – Optimize Performance and Efficiency

Efficient optical control is achieved through computer optimized designs to achieve high luminaire efficiency. Halo LED's patent pending optics balance source brightness and performance to deliver a system that qualifies under ENERGY STAR® SSL requirements for luminaire efficacy and absolute lumen delivery from the luminaire.

The Halo LED H4 consists of three parts:

- A) H4 LED housing – LED driver is included
- B) H4 LED Light Engine – four color temperatures to choose
- C) H4 LED Trim – multiple trim styles and finishes to choose



## A LED Housing

- H4 - 4" nominal aperture housings designed for H4 LED light engines, incorporating the popular Halo customer-friendly installation features
- LED Driver (power supply) integrated in the housing for optimized lumen delivery and superior thermal management of the LED package

## B LED Light Engine

- H4 -Specially designed heat sink to ensure extended life of the LED package
- Heat sink features durable die-cast and extruded aluminum construction that conducts heat away from the LED package
- LED package consists of an engineered conglomeration of multiple LEDs
- Color temperature options: 2700°K, 3000°K, 3500°K, 4000°K

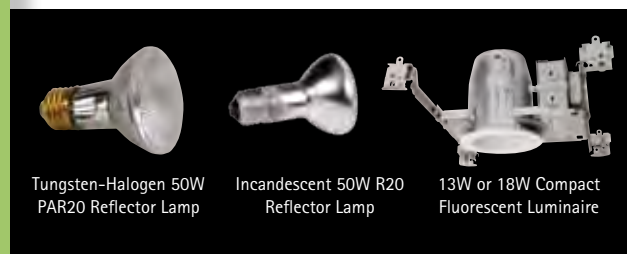
## C LED Trim

- H4 LED trims are available in open or regressed Solite® lens styles with multiple reflector and baffle finishes
- Precision trim designs and materials provide high-quality fit, form and finish
- Wide selection of 4" LED trim options allow Halo H4 LED to be used in a variety of interior spaces

The H4 Collection delivers high lumen values in the range of 534 – 700 lumens depending upon color temperature and trim selected. The Halo H4 provides light output and distribution comparable to and exceeding that of traditional sources used in small aperture downlights, such as 50W PAR20 halogen lamp, 50W R20 Incandescent lamp, or 13W and 18W Compact Fluorescent luminaires. H4 LED provides excellent color rendering and superior optical design with smooth beam distribution. The H4 LED offers dimming as a standard feature – standard (incandescent-type) dimming and 0-10VDC controlled dimming depending upon housing selected.



H4 LED can be a replacement for



Tungsten-Halogen 50W PAR20 Reflector Lamp

Incandescent 50W R20 Reflector Lamp

13W or 18W Compact Fluorescent Luminaire

## Halo LED H4 Housing Features

- H4 LED 4" nominal aperture housings are available for IC rated insulated ceilings (air-permeable insulation) and Non-IC rated non insulated ceilings
  - H4 LED housings are AIR-TITE™ in compliance with restricted airflow requirements per ASTM-E283 standard, and save energy restricting air flow from living spaces to unconditioned attic or plenum
  - H4 LED housings include standard Halo features:  
Got Nail!™ Bar hangers with pre-installed nail & integral T-grid clip  
Slide-N-Side™ wire traps and Quick-Connects for tool-less wiring outside the junction box  
Pass-N-Thru™ Bar Hanger feature for tool-less shortening of bars without removal from frame
  - LED Driver (power supply) integral in the housing for optimized lumen delivery & superior thermal management of the LED package
  - LED Driver designed for high efficiency and long life operating the LED package for over 50,000 hours
  - Dimmable to 15% and below depending upon H4 LED housing (refer to housing specifications)
  - If dimming is not required the fixture can be operated from a standard wall switch
  - Labels  
UL/cUL 1598 Listed Luminaire  
UL/cUL Listed for Damp Location  
UL/cUL Listed for Feed Through (new construction)  
UL/cUL Listed for Wet Location with select trims
  - Rated for 15W maximum
  - H4 LED housings meet ENERGY STAR® Qualification with designated Halo H4 LED Light Engines and H4 LED trims\*
  - H4 LED housings can be used to meet State of California Title 24 2008 and International Energy Conservation Code – IECC 2009 High Efficacy requirements when used with designated Halo H4 LED Light Engines and H4LED trims\*
- \*Refer to Compliance Matrix for qualified selection of H4 LED Light Engines and Trims
- See [www.cooperlighting.com](http://www.cooperlighting.com) – HALO web page for product specification sheets

## Energy Data/ IC Housings

Min. Operating Temp: -30°C / -22°F	Input Frequency: 50/60Hz	Maximum IC (Insulated Ceiling) Ambient Room Temperature: 25°C / 77°F (Continuous Operation)
EMI/RFI Emissions FCC 47CFR Part 18, Consumer Limits	THD: <20%	Maximum NON-IC (NON-Insulated Ceiling) Ambient Room Temperature: 40°C / 104° F (Continuous Operation)
Sound Rating: Class A standards	Rated Wattage: 15W max.	
Input Voltage: 120V	Input Power: 14.0W (13.6W Remodel)	
Power Factor: >0.90	Input Current: 121mA (120mA Remodel)	
	Dimmable: Electronic Low Voltage or Incandescent Dimmers	



### H455ICAT120D ICAT rated, New Construction

- For direct contact with air- permeable insulation in insulated ceilings (may also be used in non-insulated ceilings)
  - AIR-TITE™ meets restricted airflow requirements per ASTM E-283 test standard
  - Driver: 120V, 50/60Hz, rated for FCC Consumer Limits
  - <15 Watts
  - Dimmable with most standard electronic low voltage or incandescent dimmers to 15% (5% on dimmers with low-end trim adjustment)
- (Refer to dimming features section for further details, and check online for the latest updates in specification sheets)*
- Dimensions: 9-1/2"L x 13"W x 7-7/8"H (with 1/2" plaster lip) - Ceiling cutout: 4-1/2"



### H455RICAT120D ICAT rated, Remodel

- Designed for installation from below the finished ceiling
  - For direct contact with air- permeable insulation in insulated ceilings (may also be used in non-insulated ceilings)
  - AIR-TITE™ meets restricted airflow requirements per ASTM E-283 test standard
  - Driver: 120V, 50/60Hz, rated for FCC Consumer Limits
  - <15 Watts
  - Dimmable with most standard electronic low voltage or incandescent dimmers to 15% (5% on dimmers with low-end trim adjustment)
- (Refer to dimming features section for further details, and check online for the latest updates in specification sheets)*
- Dimensions: 14-3/4"L x 5"W x 5-1/2"H - Ceiling cutout: 4-1/4"

## Energy Data/ NON-IC Housings

Min. Operating Temp: -30°C / -22°F EMI/RFI Emissions FCC47CFR Part 18, Consumer Limits

Sound Rating: Class A standards

Input Voltage: Universal 120V - 277V

Power Factor: >0.90

Input Frequency: 50/60Hz

THD: <20%

Rated Wattage: 15W max.

Input Power: 13.9W

Input Current: 121mA

Dimmable: 0-10V Controls

Maximum NON-IC (NON-Insulated Ceiling) Ambient Room Temperature: 40°C / 104° F (Continuous Operation)



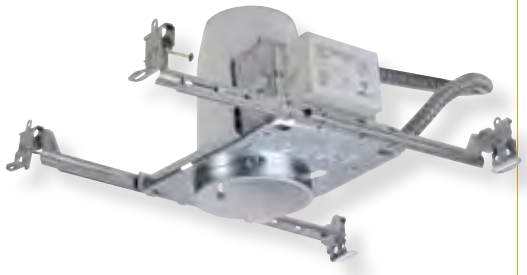
### H455TUNVD010 Non-IC rated, New Construction

- For non-insulated ceilings
- Insulation must be kept 3" from all sides and top of housing
- AIR-TITE™ meets restricted airflow requirements per ASTM E-283 test standard
- Driver: 120V-277V (90V-305V) 50/60Hz Commercial / Residential (rated for FCC Consumer Limits)
- <15 Watts
- Dimmable to 10% with 0-10V DC dimming controls (2-low voltage control wires required)  
*(Refer to dimming features section for further details, and check online for the latest updates in specification sheets)*
- Dimensions: 5-1/2"L x 8"W x 5-1/2"H (with 1/2" plaster lip) - Ceiling cutout: 4-1/2"



### H455RTUNVD010 Non-IC rated, Remodel

- Designed for installation from below the finished ceiling
- For non-insulated ceilings
- Insulation must be kept 3" from all sides and top of housing
- AIR-TITE™ meets restricted airflow requirements per ASTM E-283 test standard
- Driver: 120V-277V (90V-305V) 50/60Hz Commercial / Residential (rated for FCC Consumer Limits)
- <15 Watts
- Dimmable to 10% with 0-10V DC dimming controls (2-low voltage control wires required)  
*(Refer to dimming features section for further details, and check online for the latest updates in specification sheets)*
- Dimensions: 14-3/4"L x 5"W x 5-1/2"H - Ceiling cutout: 4-1/4"



### H455TCPUNVD010 Non-IC rated, Chicago Plenum New Construction

- Non-IC rated, Chicago Plenum New Construction
- Insulation must be kept 3" from all sides and top of housing
- AIR-TITE™ meets restricted airflow requirements per ASTM E-283 test standard
- Driver: 120V-277V (90V-305V) 50/60Hz Commercial / Residential (rated for FCC Consumer Limits)
- <15 Watts
- Dimmable to 10% with 0-10V DC dimming controls (2-low voltage control wires required)  
*(Refer to dimming features section for further details, and check online for the latest updates in specification sheets)*
- Dimensions: 5-1/2"L x 8"W x 7-1/8"H (with 1/2" plaster lip) - Ceiling cutout: 4-1/2"



## Halo LED H4 Light Engine Features

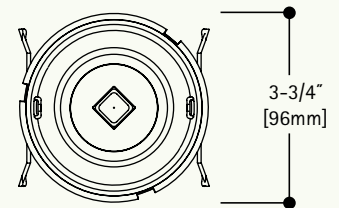
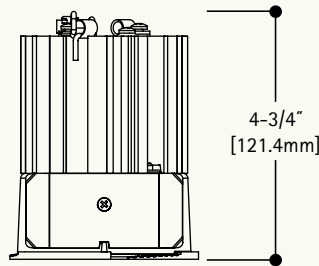
- LED package consisting of an engineered conglomeration of multiple LEDs to create one virtual source, for a productive "cone of light"
- Specially designed LED and heat sink integration to ensure extended life of the LED package to well over the 70% lumen/50,000 hour rating
- Heat sink features durable die-cast and extruded aluminum construction that conducts heat away from the LED package and keeps LED junction temperatures at specified level
- LED emits no ultraviolet and only minimal infrared wave lengths
- Does not emit heat like traditional light sources
- Designed for interchangeable trim choices; select from multiple reflector, baffle and lens trim options
- H4 LED Light Engines offer ENERGY STAR® Qualification when used with designated Halo H4 LED Trims\*
- H4 LED Light Engines can be used to meet State of California Title 24 2008 and International Energy Conservation Code – IECC 2009 High Efficacy requirements when used with designated H4 LED Trims\*
- RoHS Compliant

\*Refer to Compliance Matrix for qualified selection of H4 LED Light Engines and Trims

See [www.cooperlighting.com](http://www.cooperlighting.com) – HALO web for product specification sheets



QUALIFIED AND COMPLIANT WITH DESIGNATED LED LIGHT ENGINES AND TRIMS



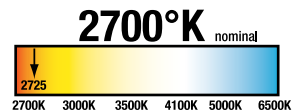
## Halo LED H4 Light Engine Performance

- 550 design lumens\*
- 534 - 700 lumens depending upon color temperature and trim selected\*
- Four Correlated Color Temperature options
- 14 Watts (Driver integral to housing)
- Over 80 CRI
- Lumen Maintenance 70% lumens/ 50,000 hours
- Up to 50 Lumens per Watt

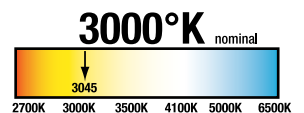
\*Design lumens are a general guide based on nominal lumens delivered with a White Baffle or White Reflector. Trim type and color temperature determines the delivered lumen value. Example: TL400WH05 White Reflector: 2700°K H4 Light Engine delivers 551 lumens while 4000°K H4 LED Light Engine delivers 653 lumens. Refer to the photometry section for additional examples and online for photometric files.

### H4 LED Light Engines

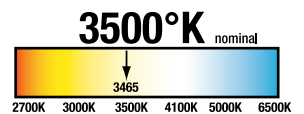
EL405827



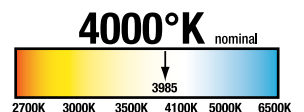
EL405830



EL405835



EL405840



## Halo LED H4 Trims Selection

Multiple 4" baffle and reflector options allow the Halo H4 LED recessed downlight to be used in a variety of interior spaces. Choose the desired reflector finish and trim style to meet the needs of the application. Accessory trim ring options in metallic finishes are available for a designer look.



QUALIFIED AND COMPLIANT WITH DESIGNATED LED LIGHT ENGINES AND TRIMS



## Halo LED H4 Trim Features

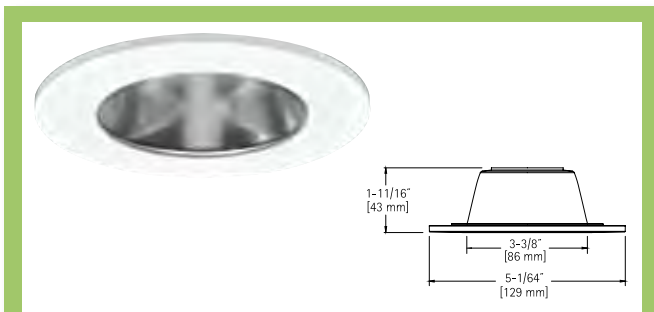
- True 4" - Trim designs and dimensions match Halo 4" H99 and H1499 series for a consistent, true 4" family
- Precision formed aluminum reflectors and baffles with die-cast trim rings for high-quality fit and finish
- Standard trim ring provides clearance for remodeler flange and gasket
- Trim gasket provides AIR-TITE™ seal, and compliance where local codes require a gasket on lensed shower-rated trims
- Accessory die-cast trim rings in designer finishes – mix and match with baffles and reflectors
- Solite® lensed trims offer high-clarity glass lenses for high-lumen transmission along with a subtle diffusion of source brightness

- Solite® lensed models are Wet Location listed for Shower Applications
- Solite® lensed white baffle and white reflector models offers ANTIMICROBIAL paint finish – standard
- H4 LED Trims offer ENERGY STAR® Qualification when used with designated Halo H4 LED Light Engines\*
- H4 LED Trims can be used to meet State of California Title 24 2008 and International Energy Conservation Code – IECC 2009 High Efficacy requirements when used with designated Halo H4 LED Light Engines\*

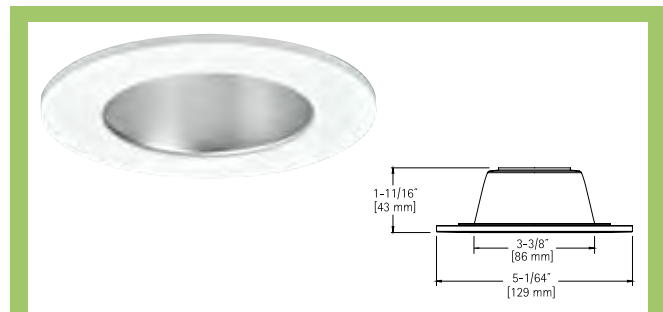
\*Refer to Compliance Matrix for qualified selection of H4 LED Light Engines and Trims

See [www.cooperlighting.com](http://www.cooperlighting.com) – HALO web page for product specification sheets

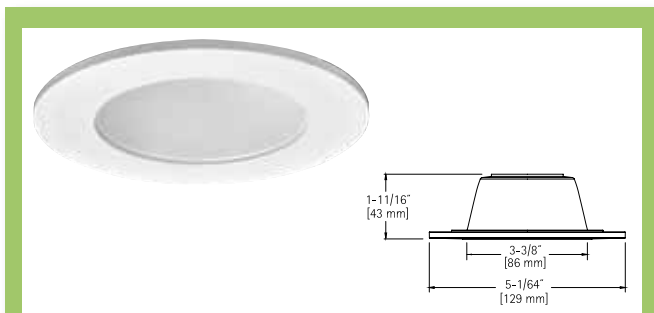
## Open Reflector and Baffle Trims



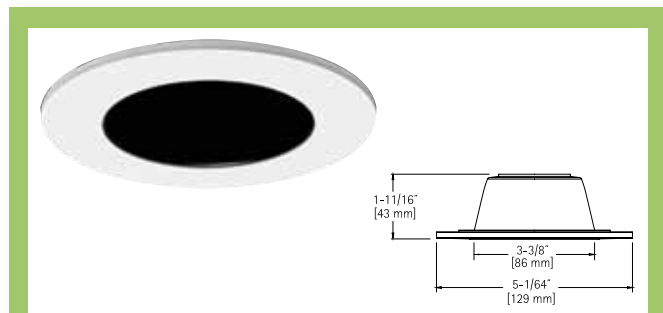
TL400SC  
Specular Clear Reflector, White Trim Ring



TL400H  
Haze Reflector, White Trim Ring

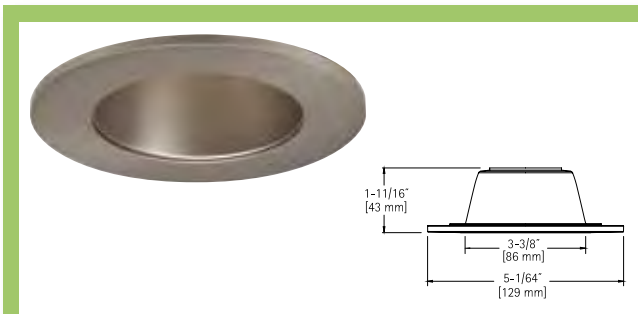


TL400WH  
White Reflector, White Trim Ring

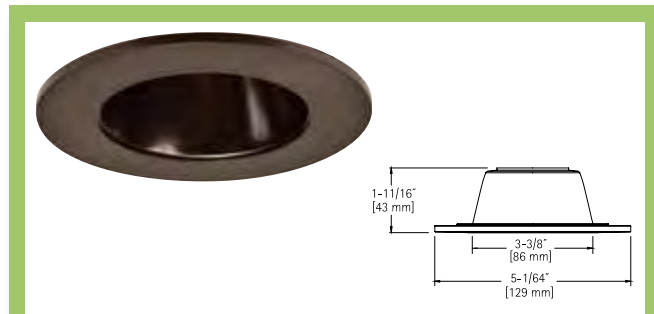


TL400SBK  
Specular Black Reflector, White Trim Ring

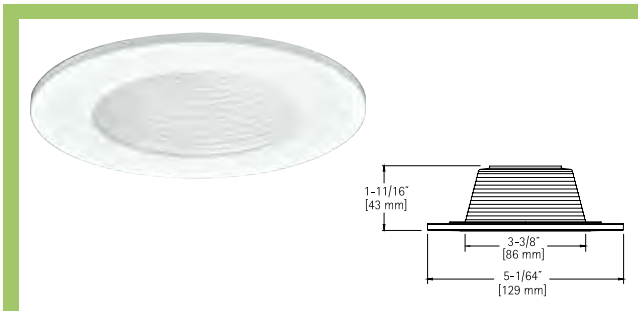
Open Reflector and Baffle Trims



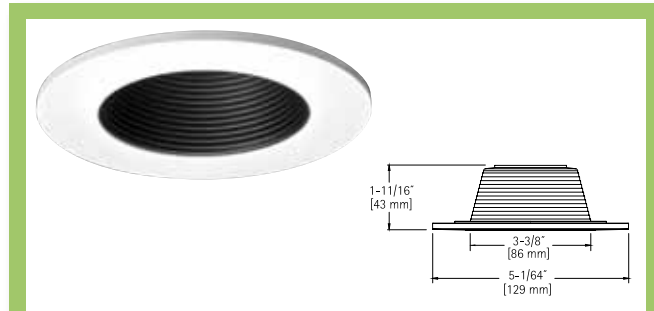
TL400SN  
Satin Nickel Reflector, Satin Nickel Trim Ring



TL400TBZ  
Tuscan Bronze Reflector, Tuscan Bronze Trim Ring



TL401WB  
White Baffle, White Trim Ring



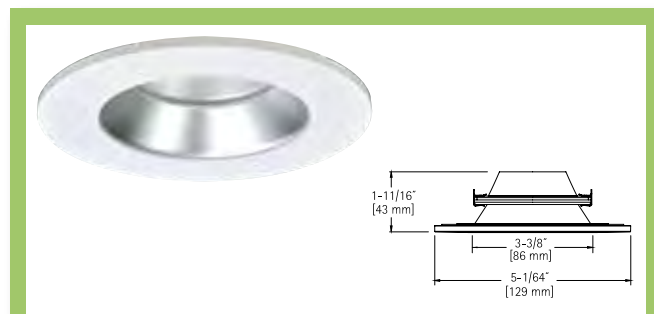
TL401BB  
Black Baffle, White Trim Ring

Solite® Regressed Lens Reflector and Baffle Trims

Wet Location listed for Shower Applications



TL402SCS  
Specular Clear Reflector with Solite® Regressed Lens, White Trim Ring



TL402HS  
Haze Reflector with Solite® Lens, White Trim Ring

Solite® Regressed Lens Reflector and Baffle Trims

Wet Location listed for Shower Applications



**ANTIMICROBIAL FINISH**

**TL402WHS**  
White Reflector with Solite® Lens, White Trim Ring

**TL402SBKS**  
Specular Black Reflector with Solite® Lens, White Trim Ring

**TL402SNS**  
Satin Nickel Reflector with Solite® Lens, Satin Nickel Trim Ring

**TL402TBZS**  
Tuscan Bronze Reflector with Solite® Lens, Tuscan Bronze Trim Ring

**ANTIMICROBIAL FINISH**

**TL403WBS**  
White Baffle with Solite® Lens, White Trim Ring

**TL403BBS**  
Black Baffle with Solite® Lens, White Trim Ring

Halo LED H4 Designer Trim Rings



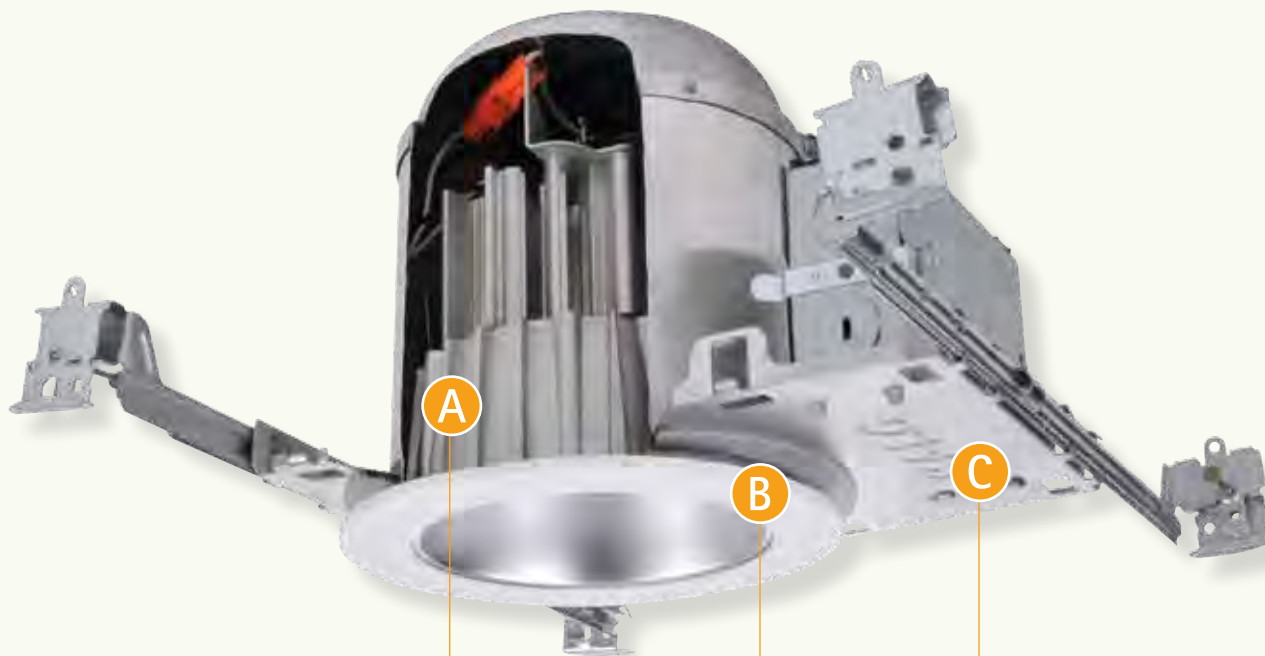
**TRM400**  
Designer Trim Rings

- Optional accessory
- Die-cast trim ring
- Thin Profile provides subtle ceiling appearance (0.120" at OD and 0.180" at ID)

<b>TRM400PC</b>	<b>Polished Chrome</b>
<b>TRM400BK</b>	<b>Black</b>
<b>TRM400WH</b>	<b>White</b>
<b>TRM400SN</b>	<b>Satin Nickel</b>
<b>TRM400TBZ</b>	<b>Tuscan Bronze</b>

## The Halo LED H7 consists of three parts:

- A) H7 LED Module – choose a LED Module from three lumen packages, each with four color temperatures available
- B) H7 LED Trims – multiple trim styles and finishes to choose
- C) H7 LED Housing – choose Halo dedicated LED housings or retrofit into existing 6" nominal aperture housings



### A LED Module

- H7 LED Module's are designed for new LED housings or retrofit into an existing 6" nominal compatible housing using the Edison screw – base adaptor included with every H7 LED Module
- H7 LED lumen package options: 600 series, 900 series and 1200 series
- H7 LED color temperature options: 2700°K, 3000°K, 3500°K, 4000°K

### B LED Trim

- H7 LED trims are available in open or regressed Solite® and Frost lens styles with multiple reflector and baffle finishes
- Precision trim designs and materials provide high quality fit, form and finish
- Wide selection of LED trim options allow H7 LED to be used in a variety of interior spaces

### C LED or Retrofit Housing

- H750 LED housings incorporate the popular Halo customer-friendly installation features
- LED connector is a non-screw base luminaire disconnect offering easy installation and qualification as a high-efficacy luminaire
- Retrofit existing incandescent 6" nominal aperture housings with Edison screw-base adaptor (supplied with LED Module)

The Halo LED H7 collection offers the widest selection of performance-designed recessed LED downlights. With Halo the benefits of LED technology are fully realized for general lighting applications. Halo H7 LED offers a complete collection of 6" LED Modules with selection of three powerful lumen packages and four industry – standard color temperatures. Each series of Halo LED H7 Modules are designed to work in new construction or retrofit into existing 6" compatible housings.

H7 LED provides excellent color rendering and superior optical design with smooth beam distribution. For added versatility and flexibility Halo LED H7 trims are designed to work interchangeably with all H7 series of LED Modules. And H7 LED offers dimming as a standard feature – standard (incandescent-type) dimming and 0-10VDC controlled dimming depending upon the LED Module selected.

## Halo LED H7 Module Features

- LED package consists of an engineered conglomeration of multiple LEDs to create one virtual source, for a productive "cone of light"
- H7 LED Module's specially designed heat sink ensures extended life of LED package for over 50,000 hours
- LED emits no ultraviolet and only minimal infrared wavelengths
- LED does not emit heat like traditional light sources
- Designed for interchangeable trim choices; select from multiple reflector, baffle and lens trim options
- LED Driver (power supply) integral to the LED Module for ease in retrofit of existing incandescent housings
- LED Driver designed for high efficiency and long life operating the LED package for over 50,000 hours
- Dimmable to 15% and below depending upon H7 LED Module (refer to LED Module specifications)

- Non-screw base LED connector meets high-efficiency code requirements and simplifies installation
- H7 LED Modules exceed ENERGY STAR® Qualification with designated Halo H7 LED trims\*
- H7 LED can be used to meet State of California Title 24 2008 and International Energy Conservation Code – IECC 2009 High efficacy requirements when used with designated H7 LED trims\*
- RoHS Compliant

\*Refer to Compliance Matrix for qualified selection of H7 LED Modules and trims

See [www.cooperlighting.com](http://www.cooperlighting.com) – HALO web page for product specification sheets



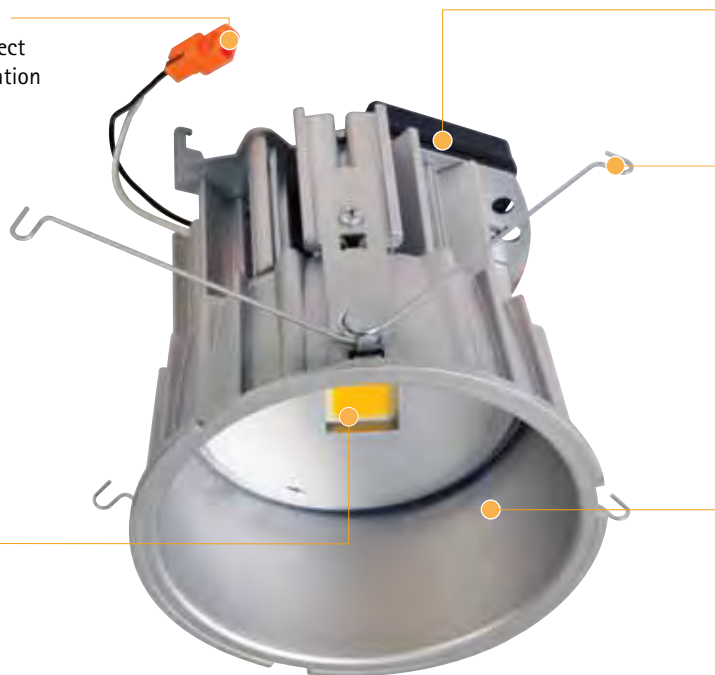
QUALIFIED AND COMPLIANT WITH DESIGNATED LED MODULES AND TRIMS

Dedicated LED connector is a UL and CSA listed luminaire disconnect (non-screw base) for easy installation in Halo H750 LED housings, and compliance with Title 24 as well as rebate programs.



Edison screw-base adapter (included) for easy retrofit of existing incandescent housings.

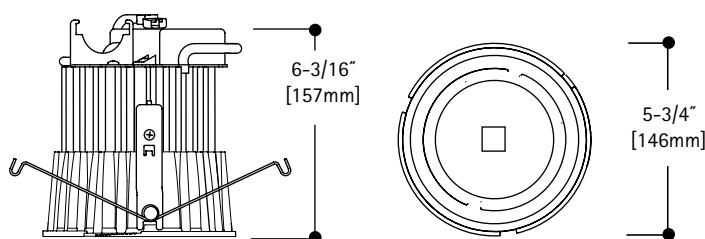
The compact LED package creates one virtual source of light for a productive "cone of light."



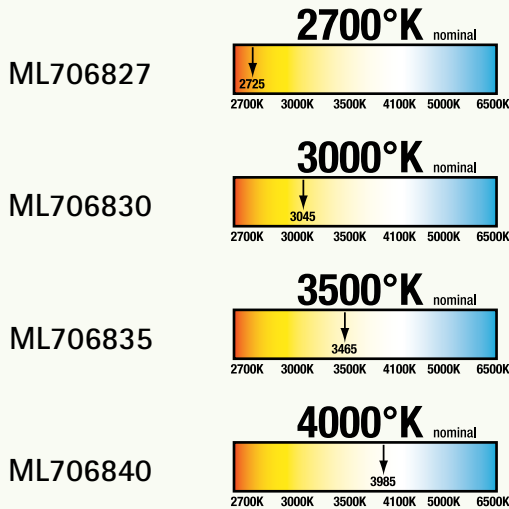
LED driver (power supply) designed for high efficiency and long life in operating the LED package for well over 50,000 hours.

Torsion springs for secure retention in the housing holding trim tightly against the ceiling.

Heat sink features durable die-cast aluminum construction that conducts heat away from the LED package keeping LED junction temperatures at a specified level to ensure extended life well over 50,000 hours rated for even in insulated ceilings in the 600 series and 900 series, and non-insulated ceilings in the 1200 series.



## 600 Series LED Modules



QUALIFIED AND COMPLIANT WITH DESIGNATED LED MODULES AND TRIMS

## 600 Series Performance Features

- 600 design lumens\*
  - Four Correlated Color Temperature options
  - 13.8 Watts
  - Over 80 CRI
  - Lumen Maintenance: 70% lumens / 50,000 hours
  - IC tested and rated for installation in housings having direct contact with insulation
  - Dimming: Most standard 120V Electronic Low Voltage (recommended) and Incandescent/ Magnetic Low Voltage dimmers with dimming to 15%, and to 5% using dimmers with low-end trim adjustment
  - 416 - 793 lumens depending upon color temperature and trim selection\*
  - Up to 57 Lumens per Watt
  - Fits Halo LED housings OR retrofits into existing 6" aperture compatible housings
  - Retrofit Edison screw-base adapter included
- \*Design lumens are a general guide based on nominal lumens delivered with a White Baffle or White Reflector. Trim type and color temperature determines the delivered lumen value. Example: 494P06 White Reflector: 2700°K 600 Series Module delivers 604 lumens while the 4000°K 600 Series Module delivers 716 lumens. Refer to the photometry section for additional examples, and online for photometric files

## 600 Series Energy Data

- Minimum Starting Temp: -30°C / -22°F
- Sound Rating: Class A standards
- Input Voltage: 120V
- Power Factor: >0.90
- Input Frequency: 50/60Hz
- THD: <20%
- Rated Wattage: 13.8W
- Input Power: 13.8W
- Input Current: 126mA
- Maximum IC (Insulated Ceiling) Ambient Room Temperature: 25°C / 77°F (Continuous Operation)
- Maximum Non-IC Ambient Room Temperature: 40°C / 104°F (Continuous Operation) (Values at non-dimming line voltage)

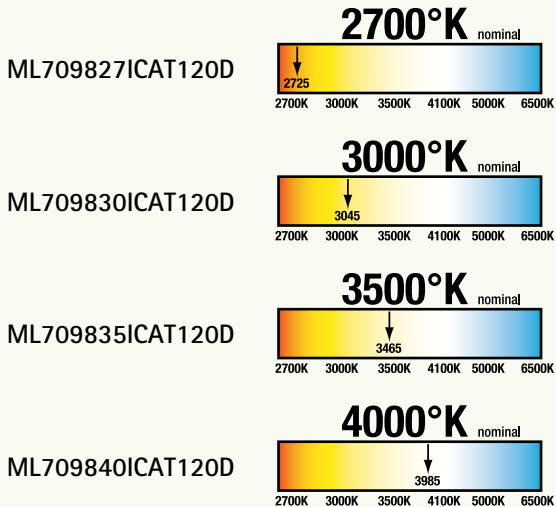


65W Incandescent BR30 Reflector Lamp



18W Compact Fluorescent Luminaire

## 900 Series LED Modules



QUALIFIED AND COMPLIANT WITH DESIGNATED LED MODULES AND TRIMS

## 900 Series Performance Features

- 900 design lumens\*
  - 511 - 945 lumens depending upon color temperature and trim selection
  - Four Correlated Color Temperature options
  - 14.3 Watts
  - Over 80 CRI
  - Lumen Maintenance: 70% lumens / 50,000 hours
  - IC tested and rated for installation in housings having direct contact with insulation
  - Dimming: Most standard 120V Electronic Low Voltage (recommended) and Incandescent/ Magnetic Low Voltage dimmers with dimming to 15%, and to 5% using dimmers with low-end trim adjustment
  - Up to 66 Lumens per Watt
  - Fits Halo LED housings OR retrofits into existing 6" aperture compatible housings
  - Retrofit Edison screw-base adapter included
- \*Design lumens are a general guide based on nominal lumens delivered with a White Baffle or White Reflector. Trim type and color temperature determines the delivered lumen value. Example: 494P06 White Reflector: 2700°K 900 Series Module delivers 773 lumens while the 3500°K 900 Series Module delivers 897 lumens. Refer to the photometry section for additional examples, and online for photometric files

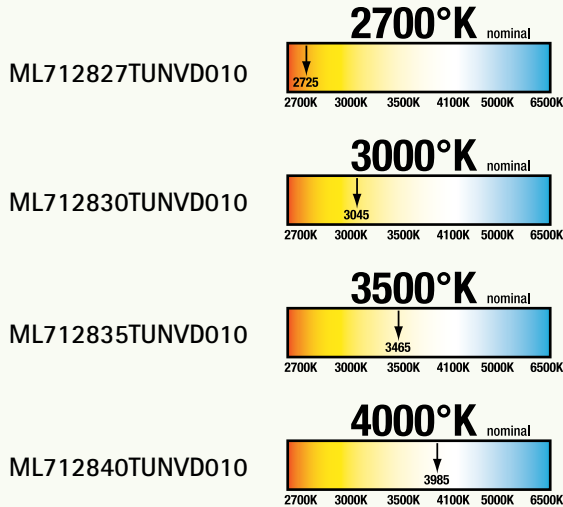
## 900 Series Energy Data

- Minimum Starting Temp: -30°C / -22°F
- Sound Rating: Class A standards
- Input Voltage: 120V
- Power Factor: >0.90
- Input Frequency: 50/60Hz
- THD: <20%
- Rated Wattage: 14.3W
- Input Power: 14.3W
- Input Current: 700mA
- Maximum IC (Insulated Ceiling) Ambient Room Temperature: 25°C / 77°F (Continuous Operation)
- Maximum Non-IC Ambient Room Temperature: 40°C / 104°F (Continuous Operation) (Values at non-dimming line voltage)





## 1200 Series LED Modules



QUALIFIED AND COMPLIANT WITH DESIGNATED LED MODULES AND TRIMS

## 1200 Series Performance Features

- 1200 design lumens\*
  - 862 - 1541 lumens depending upon color temperature and trim selection
  - Four Correlated Color Temperature options
  - 24.8 Watts
  - Over 80 CRI
  - Lumen Maintenance: 70% lumens / 50,000 hours
  - Rated and warranted for installation in NON-Insulated ceilings only
  - Insulation must be 3" or more from all sides and top of housing
  - Dimming: 0-10V DC Dimming Controls (2-wire low voltage control connection on driver), with dimming to 10%
  - Fits Halo LED housings or retrofits into existing 6" aperture compatible Non-IC housings (Non-Dim ON/OFF only)
  - Retrofit Edison screw-base adapter included
  - Compatible for dimming with Halo LED housings that include 2-wire low voltage 0-10V control wiring: H750TD010, H750RTD010, H750TCPD010
- \*Design lumens are a general guide based on nominal lumens delivered with a White Baffle or White Reflector. Trim type and color temperature determines the delivered lumen value. Example: 494WB06 White Baffle: 2700°K 1200 Series Module delivers 1296 lumens while the 3500°K 1200 Series Module delivers 1424 lumens. Refer to the photometry section for additional examples, and online for photometric files

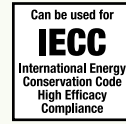
## 1200 Series Energy Data

Minimum Starting Temp: -30°C / -22°F  
 Sound Rating: Class A standards  
 Input Voltage: UNV (90 - 305V)  
 Power Factor: >0.90  
 Input Frequency: 50/60Hz  
 THD: <20%  
 Rated Wattage: 24.8W  
 Input Power: 24.8W  
 Input Current: 1240mA  
 Maximum Non-IC Ambient Room Temperature: 40°C / 104°F (Continuous Operation)  
 (Values at non-dimming line voltage)



## Halo LED H7 Trim Selection

Multiple baffle and reflector options allow Halo H7 LED recessed downlight to be used in a variety of interior spaces. Choose the desired reflector finish and trim style to meet the needs of the application. Accessory trim ring options in metallic finishes are available for a designer look.

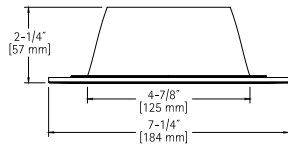


QUALIFIED AND COMPLIANT WITH DESIGNATED LED MODULES AND TRIMS

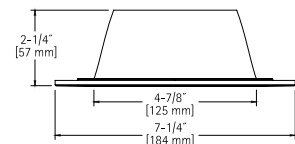
## Halo LED H7 Trim Features

- Precision formed aluminum reflectors and baffles with die-cast trim rings for high-quality fit and finish
  - Standard trim ring provides clearance for remodeler flange and gasket
  - Trim gasket provides AIR-TITE seal, and compliance to select local codes that require a gasket on lensed shower-rated trims
  - Accessory die-cast trim rings in designer finishes – mix and match with baffles and reflectors
  - Solite® lensed trims offer high-clarity glass for high-lumen transmission along with a subtle diffusion of source brightness
  - Lensed models are Wet Location listed for shower applications
  - Solite® lensed white baffle model offers ANTIMICROBIAL paint finish – standard
  - H7 LED trims offer ENERGY STAR® Qualification when used with designated Halo H7 LED Modules\*
  - H7 LED can be used to meet State of California Title 24 2008 and International Energy Conservation Code – IECC 2009 High Efficacy requirements when used with designated Halo H7 LED Modules\*
- \*Refer to Compliance Matrix for qualified selection of H7 LED Modules and Trims
- See [www.cooperlighting.com](http://www.cooperlighting.com) – HALO web page for product specification sheets

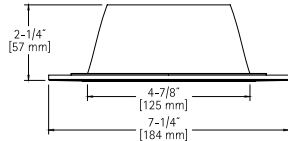
## Open Reflector and Baffle Trims



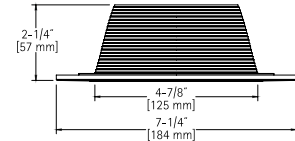
494SC06  
Specular Clear Reflector, White Trim Ring



494H06  
Haze Reflector, White Trim Ring



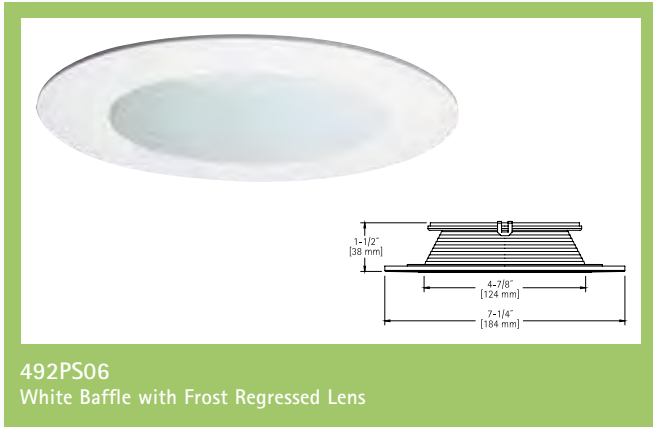
494P06  
White Reflector, White Trim Ring



494WB06  
White Baffle, White Trim Ring

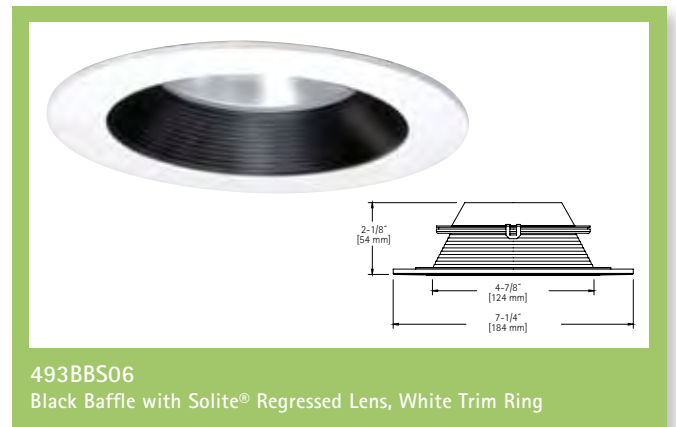
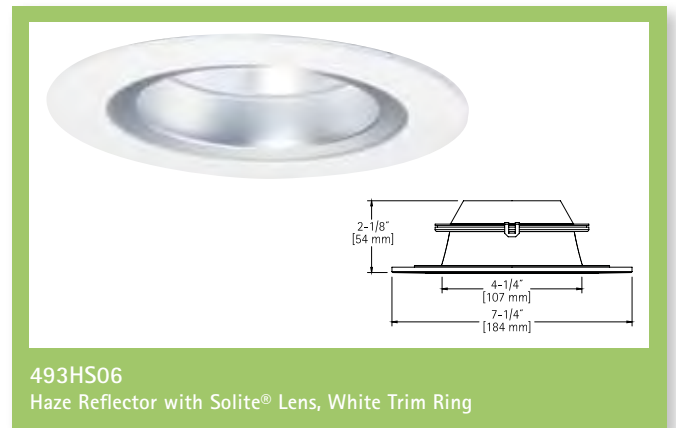
Frost Regressed Lens Trim

Wet Location listed for Shower Applications



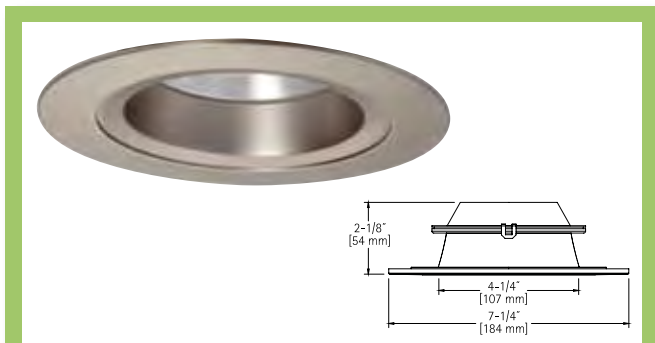
Solite® Regressed Lens Reflector and Baffle Trims

Wet Location listed for Shower Applications



Solite® Regressed Lens Reflector and Baffle Trims

Wet Location listed for Shower Applications



493SNS06  
Satin Nickel Reflector with Solite® Lens , Satin Nickel Trim Ring



493TBZS06  
Tuscan Bronze Reflector with Solite® Lens , Tuscan Bronze Trim Ring

Halo LED H7 Designer Trim Rings



TRM490  
Designer Trim Rings

- Optional accessory
- Die-cast trim ring
- Thin Profile provides subtle ceiling appearance (.120" at OD and .180 at ID)

TRM490PC	Polished Chrome
TRM490BK	Black
TRM490WH	White
TRM490SN	Satin Nickel
TRM490TBZ	Tuscan Bronze



## Halo LED H7 Housing Features

- H7 LED 6" nominal aperture housings are available for IC insulated ceilings (air-permeable insulation) and Non-IC non-insulated ceilings
  - The "AT" AIR-TITE™ designated housings meet restricted airflow requirements per ASTM E-283 standard, and save energy restricting airflow from living spaces to unconditioned attic or plenum
  - H7 LED housings include standard Halo features:  
Got Nail!™ Bar hangers with pre-installed nail & integral T-grid clip  
Slide-N-Side™ wire traps and Quick-Connects for tool-less wiring outside the junction box  
Pass-N-Thru™ Bar Hanger feature for tool-less shortening of bars without removal from frame
  - LED connector is a UL and CSA Listed Luminaire Disconnect. This dedicated non-screw base connector offers easy installation, and meets California Title-24 requirement for a non-screw base socket connection in high-efficacy luminaires
  - Labels:  
UL/cUL 1598 Listed Luminaire  
UL/cUL Listed for Damp Location  
UL/cUL Listed for Feed Through (new construction)  
UL/cUL Listed for Wet Location with select trims
  - H7 LED housings meet ENERGY STAR® Qualification with designated H7 LED Modules and H7 LED trims\*
  - H7 LED housings can be used to meet State of California Title 24 2008 and International Energy Conservation Code – IECC 2009 High Efficacy requirements when used with designated H7 LED Modules and H7 LED trims\*
- \*Refer to Compliance Matrix for qualified selection of H7 LED Modules and Trims
- See [www.cooperlighting.com](http://www.cooperlighting.com) – HALO web page for product specification sheets



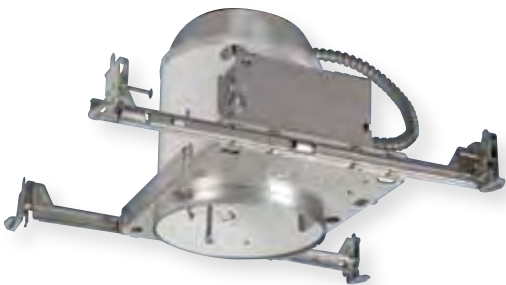
### H750ICAT ICAT Rated, New Construction

- For use with Halo H7 LED 600 Series and 900 Series LED Modules
- For direct contact with air-permeable insulation in insulated ceilings (may also be used in non insulated ceilings)
- AIR-TITE™ meets restricted airflow requirements per ASTM E-283 test standard
- Rated for 15 Watts maximum
- Dimensions: 10-1/2"L x 7-1/2"W x 7-1/2"H (with 1/2" plaster lip) - Ceiling cutout: 6-1/2"



### H750RICAT ICAT Rated, Remodel

- For use with Halo H7 LED 600 Series and 900 Series LED Modules
- Installs from below the ceiling in 1/2" or 5/8" ceiling material (may also be used in non insulated ceilings)
- For direct contact with air-permeable insulation in insulated ceilings
- AIR-TITE™ meets restricted airflow requirements per ASTM E-283 test standard
- Rated for 15 Watts maximum
- Dimensions: 13-1/4"L x 6-7/8"W x 7-1/2"H - Ceiling cutout: Match template supplied with housing - (6-1/4" typical)



### H750T Non-IC Rated, New Construction

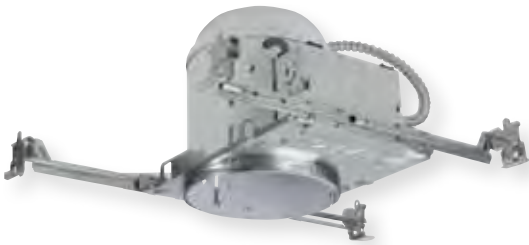
- For use with Halo H7 LED 600 Series and 900 Series LED Modules
- May be used with Halo H7 1200 series LED Modules for non-dim ON/OFF applications
- For installation in NON-Insulated ceilings only
- Insulation must be 3" or more from all sides & top of housing
- Housing becomes AIR-TITE™ with Halo LED H7 Collection Modules (Modules meet restricted airflow requirements per ASTM E-283)
- Rated for 25 Watts maximum
- Use H277, H347, step-down transformers in 277V and 347V installations (one transformer powers a circuit of LED - refer to H277, H347 application information)
- Dimensions: 10-1/2"L x 7-1/2"W x 7-1/2"H (with 1/2" plaster lip) - Ceiling cutout: 6-1/2"



## H750TCP

### Non-IC Rated, New Construction or Remodel Construction

- For use with Halo H7 LED 600 Series and 900 Series LED Modules
- May be used with Halo H7 1200 series LED Modules for non-dim ON/OFF applications
- Chicago Plenum construction and rating
- NON-Insulated ceilings only - Insulation must be 3" or more from all sides and top
- "Boat-shaped" plaster frame allows installation from below the ceiling for remodeling (simply remove bar hangers)
- Housing becomes AIR-TITE™ with H7 Collection LED Modules (Modules meet restricted airflow requirements per ASTM E-283)
- Rated for 25 Watts maximum
- Use H277, H347 step-down transformers in 277V and 347V installations (one transformer powers a circuit of LED - refer to H277, H347 application information)
- Dimensions: 10-1/2"L x 6-1/8"W x 7-1/2"H (with 1/2" plaster lip) - Ceiling cutout: 6-1/2"



## H750TD010

### Non-IC Rated, New Construction

- For use with Halo H7 LED 1200 Series LED Modules when dimming is required
- NON-Insulated ceilings only - Insulation must be 3" or more from all sides and top
- Housing becomes AIR-TITE™ with H7 Collection LED Modules (Modules meet restricted airflow requirements per ASTM E-283)
- Rated for 25 Watts maximum
- 0-10V DC 2-wire Low Voltage dimming control wiring and connector provided - matching the 0-10V dimming control connector on 1200 Series LED Modules
- Partitioned compartment in junction box for 0-10V DC low voltage dimming connections, provided for installer when required by applicable local or national code
- Use H347 step-down transformers in 347V installations (one transformer powers a circuit of LED - Refer to H347 application information)
- Dimensions: 10-1/2"L x 7-1/2"W x 7-1/2"H H (with 1/2" plaster lip) - Ceiling cutout: 6-1/2"



## H750RTD010

### Non-IC Rated, Remodel Construction

- For use with Halo H7 LED 1200 Series LED Modules when dimming is required
- Installs from below the ceiling
- NON-Insulated ceilings only - Insulation must be 3" or more from all sides and top
- Housing becomes AIR-TITE™ with H7 Collection LED Modules (Modules meet restricted airflow requirements per ASTM E-283)
- Rated for 25 Watts maximum
- 0-10V DC 2-wire Low Voltage dimming control wiring and connector provided - matching the 0-10V dimming control connector on 1200 Series LED Modules
- Partitioned compartment in junction box for 0-10V DC low voltage dimming connections, provided for installer when required by applicable local or national code
- Use H347 step-down transformers in 347V installations (one transformer powers a circuit of LED - Refer to H347 application information)
- Dimensions: 13-1/4"L x 6-7/8"W x 7-1/2"H - Ceiling cutout: Match template supplied with housing (6-1/4" typical)



## H750TCPD010

### Non-IC Rated, New Construction or Remodel Construction

- For use with Halo H7 LED 1200 Series LED Modules when dimming is required
- Chicago Plenum construction and rating
- NON-Insulated ceilings only - Insulation must be 3" or more from all sides and top
- "Boat-shaped" plaster frame allows installation from below the ceiling for remodeling
- Housing becomes AIR-TITE™ with H7 Collection LED Modules (Modules meet restricted airflow requirements per ASTM E-283)
- Rated for 25 Watts maximum
- 0-10V DC 2-wire Low Voltage dimming control wiring and connector provided - matching the 0-10V dimming control connector on 1200 Series LED Modules
- Partitioned compartment in junction box for 0-10V DC low voltage dimming connections, provided for installer when required by applicable local or national code
- Use H347 step-down transformers in 347V installations (one transformer powers a circuit of LED - Refer to H347 application information)
- Dimensions: 10-1/4"L x 6-1/8"W x 7-1/2"H (with 1/2" plaster lip) - Ceiling cutout: 6-1/2"

## Installation Features

Whether you are building new construction or have an existing space with recessed housings already installed, you can start saving money and energy by switching to LED lighting. For new construction, use a dedicated Halo LED H750 series housing that is already wired to accept the Halo LED Module. For existing housings, the LED Modules can be easily installed with the Edison Base Adapter (included) - no special tools or rewiring needed. The Halo LED Module is designed to fit into dedicated Halo LED housings, existing Halo or All-Pro housings, or other existing 6" compatible aperture housings. If used in recessed housings other than Halo or All-Pro the Cooper Lighting 3-year warranty applies to the LED Module and Trim only. As with any electrical installation, a qualified electrician must ensure compatibility of use with a particular housing; this includes all applicable national and local electrical and building codes. Installer is responsible to properly retain the LED Module and Trim in a housing at time of installation. For retrofit of housings with torsion spring brackets the housing must accommodate torsion springs and provide space for the Module to fit. For housings without torsion spring brackets the ML7RAB retrofit adaptor band is available.

H7 LED Modules may be used in existing Installations of the following Halo and All-Pro housings: H7ICAT, H7ICATNB, H7ICT, H7ICTNB, H7RICT, H7RICAT, H7RT, H7T, H7TNB, EI700AT, EI700NB, EI700ATNB, EI700RAT, EI700RAT, EI700, ET700, EI700R, ET700R. 1200 Series modules can only be used in Non-IC housings.



## Easy Installation in New Construction


- 


1 Install H750x series LED housing in ceiling joists and make wiring connections.
- 


2 Connect LED Module with housing wiring.
- 

3 Install LED Module with trim in LED housing.

## Retrofit Made Simple

- 

1 Remove trim (and socket plate if present) from existing housing. Install Edison base adapter into recessed housing screw-base socket.
- 

2 Plug Edison base adapter cable's connector onto LED Module connector. Clip existing screw-base onto LED Module bracket.
- 

3 Install LED Module with trim in existing housing.

ML7RAB retrofit adapter band may offer retrofit opportunity in housings that do not have torsion spring trim mounting brackets.

## ML7RAB Retrofit Adapter Band for Housings without Torsion Spring Trim Mounting Brackets

- The ML7RAB provides torsion spring mounting capability for housings that do not have torsion spring brackets



ML7RAB Retrofit Adapter Band



### Halo LED Retrofit Adapter- 4 Pack Order: ML7RAB

- 4 - Retrofit Adapter Bands
- 16 - Metal-piercing screws (4 per adapter)
- 8 - Retrofit Lever-action Wire Nuts (2 per adapter)

New Construction Review Open White Baffle Trim Category

Luminaire Summary

	LED	Incandescent		Compact Fluorescent	
	H750ICAT 494WB06 ML706830	H7ICAT 310W 65W BR30	H7ICAT 310W 75W BR30	H271ICAT 406WWB 18W DTT	H272ICAT 406WWB 26W DTT
Light Source	ML706830	65W BR30	75W BR30	18W DTT	26W DTT
Color Temp	3000°K	2800°K	2800°K	3000°K	3000°K
CRI	80	100	100	82	82
Input Power	13.6	65	75	22	28
Rated Life	50,000 <sup>1</sup>	2,000 <sup>2</sup>	2,500 <sup>2</sup>	10,000 <sup>2</sup>	10,000 <sup>2</sup>
Source Lumens	NA <sup>6</sup>	755	900	1150	1710
Luminaire Efficiency	NA <sup>6</sup>	78%	78%	56%	55%
Delivered Lumens	644	589	702	644	941
Dimming	Standard	Standard	Standard	(3)	(3)
<b>Compliance</b>					
ENERGY STAR®	Qualified	No	No	Qualified	Qualified
California Title 24-2008	Meets	No	No	Meets	Meets
IECC-2009 High-Efficiency	Meets	No	No	Meets	Meets
<b>Application Summary</b>					
Room (80/50/20)	21x21x8	21x21x8	21x21x8	21x21x8	21x21x8
Target Light Levels (fc)	17	13	15	15	13
Light Loss Factor (LLF)	0.846	0.900	0.900	0.765	0.765
Quantity of Luminaires	16	12	12	12	9
Power Density (W/sq. ft.)	0.54	1.77	1.53	0.80	0.57
<b>Operation Cost Summary</b>					
Years of operation					
12hrs/day - 365 days/yr	3	3	3	3	3
Energy (\$0.10/kWh)	\$286	\$1,025	\$1,183	\$347	\$331
Lamps Replaced <sup>(4)</sup>	0	144	115	21	16
Estimated Lamp Cost <sup>(5)</sup>	-	\$2.50	\$2.50	\$6.00	\$6.00
Maintenance	-	\$360	\$288	\$126	\$96
Total Operational Cost	\$286	\$1,385	\$1,470	\$473	\$427

Retrofit Review Open White Baffle Trim Category

Luminaire Summary

	LED	Incandescent		
	494WB06 ML706830	White Baffle	White Baffle	White Baffle
Light Source	ML706830	65W BR30	75W BR30	40W A19
Color Temp	3000°K	2800°K	2800°K	2800°K
CRI	80	100	100	100
Input Power	13.6	65	75	40
Rated Life	50,000 <sup>1</sup>	2,000 <sup>2</sup>	2,500 <sup>2</sup>	1,500 <sup>2</sup>
Source Lumens	NA <sup>6</sup>	755	900	495
Luminaire Efficiency	NA <sup>6</sup>	78%	78%	75%
Delivered Lumens	644	589	702	371
Dimming	Standard	Standard	Standard	Standard
<b>Compliance</b>				
ENERGY STAR®	Qualified	No	No	No
California Title 24-2008	Meets <sup>(7)</sup>	No	No	No
IECC-2009 High-Efficiency	Meets	No	No	No
<b>Application Summary</b>				
Room (80/50/20)	21x21x8	21x21x8	21x21x8	21x21x8
Target Light Levels (fc)	17	17	21	11
Light Loss Factor (LLF)	0.846	0.900	0.900	0.900
Quantity of Luminaires	16	16	16	16
Power Density (W/sq. ft.)	0.54	2.36	2.72	1.45
<b>Operation Cost Summary</b>				
Years of operation				
12 hrs/day - 365 days/yr	3	3	3	3
Energy (\$0.10/kWh)	\$286	\$1,367	\$1,577	\$841
Lamps Replaced <sup>(4)</sup>	0	154	123	205
Estimated Lamp Cost <sup>(5)</sup>	-	\$2.50	\$2.50	\$2.50
Maintenance	-	\$385	\$308	\$513
Total Operational Cost	\$286	\$1,752	\$1,884	\$1,353

NOTES:

- <sup>(1)</sup> Rated life of an LED system represents only a 30% depreciation in light output without a complete system failure
- <sup>(2)</sup> Rated life of traditional sources are defined as the time in which 50 lamps out of 100 fail.
- <sup>(3)</sup> Order a different system to obtain dimming feature.
- <sup>(4)</sup> Lamp replacements are based upon predicted mortality curves published by major lamp manufacturers.
- <sup>(5)</sup> Lamp cost of an LED system is zero for 3 year evaluation. The replacement Module is expected to occur when the owner is dissatisfied with the light levels well beyond 50,000 hours of operation.
- <sup>(6)</sup> LED luminaires are measured in total delivered lumens using absolute photometry. This means there is no differentiation for measured values between the sources and luminaire. Therefore, a LED luminaire is considered 100% efficient in delivering total lumens.
- <sup>(7)</sup> Restricted to housings that do not include a medium base (E26) socket.



# HALO LED H4 AND H7 COLLECTION - STANDARD DIMMING FEATURES

## Standard Dimming Control

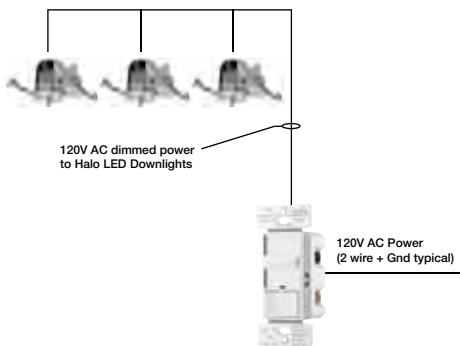
Standard "incandescent type" 120V line voltage dimming is offered on H4 collection: H455ICAT120D, H455RICAT120D housings and on H7 collection 600 and 900 Series LED Modules. This is a common type of dimming for residential and light commercial applications.

### 120VAC Standard Dimming – Incandescent and Magnetic Low Voltage Dimmers

Standard 120VAC line voltage dimmers for incandescent and magnetic low voltage loads control the light source with "forward phase control". With forward phase control the dimmer "chops" the forward part of the AC wave to deliver less or more power to the light source. Halo H4: H455ICAT120D, H455RICAT120D, and H7: 600 Series and 900 Series LED are generally compatible with this type of dimmer, but minimum load requirements of the dimmer may require four or more LEDs on the circuit. In addition, digital or smart versions of incandescent and magnetic low voltage dimmers are not compatible for circuits with LEDs only (digital versions of incandescent dimmers require an incandescent load on the circuit). Therefore the recommended dimmer for many LED applications, especially for less than four LEDs and digital dimmer types is the electronic low voltage dimmer.

### 120VAC Standard Dimming – Electronic Low Voltage

Standard 120VAC line voltage dimmers for electronic low voltage loads control the light source with "reverse phase control". With reverse phase control the dimmer "chops" the back part of the AC wave to deliver less or more power to the light source. Halo H4: H455ICAT120D, H455RICAT120D, and H7: 600 Series and 900 Series LED are compatible with this type of dimmer providing there is a neutral connection on the dimmer (connected to neutral wire in the wall box). An ELV dimmer can typically control a minimum of one LED on the circuit. In addition, digital or smart versions of electronic low voltage dimmers (with a neutral connection) are compatible for circuits with LEDs only. Therefore, an electronic low voltage is the only recommended dimmer for less than four LEDs and when a digital type dimmer is desired.



H7 Collection	
"600 Series" Modules	
ML706827	
ML706830	
ML706835	
ML706840	
"900 Series" Modules	
ML709827ICAT120D	
ML709830ICAT120D	
ML709835ICAT120D	
ML709840ICAT120D	
H4 Collection	
Housings with Driver	
H455ICAT120D	
H455RICAT120D	

## Recommended Electronic Low Voltage Digital and Analog Dimmers, Minimum Circuit Load of One LED Module, Dimming to 15% – Requires a neutral in the wall box

LUTRON®*			
Divia®	DVELV Series	Nova T®	NTELV & NTLV Series
Maestro®	MAELV Series	Skylark®	SELV Series
Nova®	NLV Series	Vierti®	VTELV Series

LEVITON			
Acanti®	ACE. Series	(Electronic low voltage dimmer with low end programmable trim from control panel for dimming to less than 5%)	
IlumaTech™	IPE. Series	(Electronic low voltage dimmer with low end manual trim behind face plate for dimming to less than 5%)	
Vizia +	VPE. Series	(Electronic low voltage dimmer with low end programmable trim from control panel for dimming to less than 5%)	

\*Refer to Lutron "LED Product Report Card" for additional information.

## Incandescent Dimmers with Minimum Brightness Adjustment (Low End Trim), Circuit Load of 4 LED Modules or More, Dimming to 5%

LEVITON	
Ilumatech™	IP10/IP40/IPM406/IPM10 Series dimmers
Acanti®	ACI/ACE/ACX/ATI Series (Programmable trim)
Vizia +	VPI/VPE/VPX. Series (Programmable trim)

Acanti®, IlumaTech™, SureSlide™, TrueTouch™, Trimatron™, Vizia+, are products and registered trademarks of Leviton Manufacturing Co., Inc. LUTRON®, Divia®, Maestro®, Nova®, NovaT®, Skylark®, Vierti®, Ariadni®, Ceana™, Centurion®, Glyder®, Lumea™, Lyneo™, Quoto™, Dalia™, HomeWorks®, are products and registered trademarks of Lutron Electronics Co., Inc. Miro is product of Watt Stopper®/Legrand®

## Incandescent / Magnetic Low Voltage Analog Standard Dimmers with Circuit Load of 4 LED Modules or More, Dimming to 15%

### COOPER WIRING DEVICES

ASPIRE™	9530, 9532, 9538, 9540
Decorator Slide	DI06P, DI10P
Decorator Full-Slide	SI061, SI06P, SI10P
Toggle	6441, 6443, 6453
Rotary	6001, 6013, 6000, 6003, 6020, 6023
Architectural Rotary	RAI10, RAI15, RAI20

### LUTRON®\*

Ariadni®	.....AY/TG Series	Lumea™	.....LG Series
Ceana™	.....CN Series	Lyneo™	.....LX Series
Centurion®	...C Series	Nova®	.....N Series
Dalia™	.....DL Series	NovaT®	.....NT/NTB/NTA Series
Divia®	.....DV Series	Quoto™	.....Q Series
Glyder®	.....GL Series	Skylark®	.....S Series

\*Refer to Lutron "LED Product Report Card" for additional information.

### LEVITON™

IlumaTech™	IPI/RPI. Series	Trimatron™	6681/6683/6602
Sureslide™	663. Series	True Touch™	6606-ILM

## Whole House Integrated Control Systems

### LUTRON®\*

HomeWorks®	HW-RPM-4A-120 Remote Power Module-Adaptive Dimming
	HW-RPM-4V-120 Remote Power Module-Dimming
	HWD-5NE, HRD-5NE Wired Maestro and RF Maestro Local Controls

\*Refer to Lutron "LED Product Report Card" for additional information.

## Commercial Integrated Control Systems

### LUTRON®\*

Commercial Panel Systems	LP-RPM-4A120 Remote Power Module - Adaptive Dimming
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\*Refer to Lutron "LED Product Report Card" for additional information.

## Universal Wireless Dimmers ( Incandescent, Magnetic Low Voltage, Electronic Low Voltage), Minimum Circuit Load of Two LED Modules, Dimming to 15%

### Watt Stopper®

Miro Universal	DRD4 Series Dimmers
	DCD267 Series Dimmers
	DCD68 (series multilocation - When used with DRD4 or DCD267 series master dimmers)

## Incandescent Wireless Dimmers, Minimum Circuit Load of Five LED Modules, Dimming to 15%

A 15W minimum incandescent load or a neutral in the wall box are recommended to reliably dim

### Watt Stopper®

Miro Incandescent	DRD2 Series Dimmers
	DCD26 Series Dimmers
	DCD68 (series multilocation - When used with DRD2 or DCD26 series master dimmers)

## Application Notes

- LED Dimming performance may vary from incandescent dimming. Performance results may vary based upon dimmer model, manufacturer, circuit wiring and circuit loading.
- Dimmer maximum load rating with LED may differ from published Incandescent and Electronic Low Voltage dimmer ratings. Consult dimmer manufacturer for maximum dimmer load with Halo LED.
- There are no warranties of performance or compatibility implied.

**SPECIAL NOTE:** Incandescent Digital Dimmers (also called Smart or Multi-Location) require an incandescent load therefore on circuit loads with LED Modules - use electronic low voltage dimmers (refer to Electronic Low Voltage dimmer matrix).

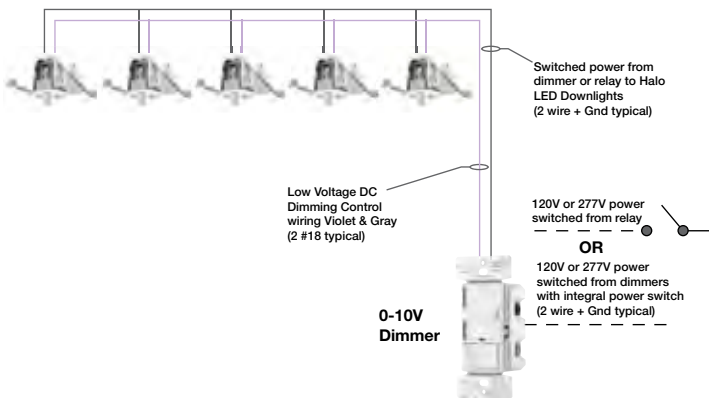
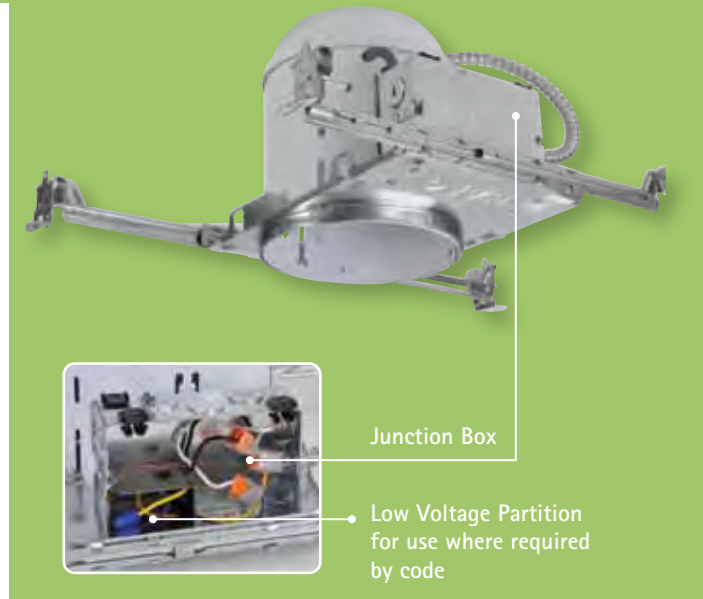
# HALO LED H4 AND H7 COLLECTION - 0-10V DIMMING FEATURES

## 0-10V DC Dimming Control

0-10VDC low voltage dimming is offered on H4 collection: H455TUNVD010, H455TCPD010, H455RTD010 housings and on H7 collection 1200 Series LED Modules. This is a common type of dimming for many commercial applications. In addition these H4 LED housings and 1200 Series LED Modules are rated for and may also be used in residential applications as well. H4 and H7 LED housings with suffix code "D010" are designed specifically for use with 0-10V DC dimming and provide the low voltage 2 wire 0-10V wiring connections in the junction box of the housing. In many installations code requires the contractor must separate the low and line voltage wiring in the junction box. With the "D010" housings the low voltage connections are partitioned from the line voltage. This special partition saves the contractor time and expense of installing a code required barrier in the junction box.

### 0-10V Low Voltage Dimming

0-10V DC dimmers are quite commonly used with 0-10V fluorescent dimming ballasts such as Mark-7® or Quictronic Helios™ or TVE™ that operate using two low voltage dimming wires that are separate from the 120V AC or 277V AC power. Switching on/off is controlled via the line voltage power (120V AC or 277V AC) input to the dimmer and then dimming operation is controlled with the 0-10V DC low voltage wiring connection between the dimmer and the LED driver. The control signal runs on two low voltage control wires (color coded violet and gray). The 0-10V dimmer operates on a "sinking" control signal where the dimmer uses a different level of the control voltage to set the desired dimming level.



H7 Collection
"1200 Series" Modules
ML712827TUNVD010
ML712830TUNVD010
ML712835TUNVD010
ML712840TUNVD010
H750TD010 Series
Housings - Include
2-Wire 0-10V Control
Connection for 1200

Series Housings
H750TD010
H750RTD010
H750TCPD010

H4 Collection
Housings with Driver
H455TUNVD010
H455TCPD010
H455RTD010

## Dimmer Matrix

### 0-10V DC Low Voltage Dimmers

#### LUTRON®

Nova-T <sup>®</sup>	NFTV- and PP-20 relay
Nova <sup>®</sup>	NFTV- and PP-20 relay
Radio Touch <sup>®</sup>	RTA-RX-F-347 RTA-RX-F-347 RTA-WX- RTA-TX-
Grafik Eye <sup>®</sup>	QS QSG-P120 GRX-IT

Leviton IllumaTech™	IP710-DL
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Hunt	PS-010
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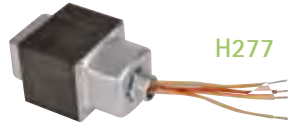
## Application Notes

1. LED Dimming performance may vary from incandescent and fluorescent dimming. Performance results may vary based upon dimmer model, manufacturer, circuit wiring and circuit loading.
2. Consult dimmer manufacturer for the latest dimmer information, line voltage rating and compatibility.
3. Dimmer rating with LED may differ from published dimmer ratings. Consult dimmer manufacturer for further information.
4. There are no warranties of performance or compatibility implied.

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## H277 and H347 Step-Down transformers

**H277** – For use with 600 Series and 900 Series. (1200 Series is already 277V capable). The H277 transformer steps 277 line voltage down to 120 volts. Attaches to knockout on first fixture's junction box in a circuit and is 300VA rated (15 - 600 Series or 900 Series Modules max.).



**H277**

H277 is a UL Recognized Component listed under the luminaire UL/cUL listing for Non-IC housings.

### Transformer Load – H277 (300VA)

1. H277 Transformer at full loading consumes a maximum of 16W of power.
2. When dimmer or switch is on the secondary (120V) side of the transformer power is consumed by the transformer when the dimmer or switch is in "OFF" mode at 6.5W, and in "ON" mode at 16W maximum with full loading.
3. When a dimmer or switch is on the primary (277V) side of the transformer, power is consumed only in "ON" mode to a maximum of 16W under full loading.

### APPLICATION NOTE:

H277 and H347 step-down transformers are qualified to drive multiple Halo LED Modules on a single circuit in Non-IC construction. Installation of these transformers on individual fixtures on circuits with multiple LED loads is not recommended. Installation of individual H277 or H347 transformers on each LED downlight fixture in multiple LED loaded circuit is not recommended due to resulting multiple inductive currents pulled by each transformer; in this

**H347** – For use with 600 Series, 900 Series and 1200 Series. The H347 transformer steps 347 line voltage down to 120 volts. Attaches to knockout on first fixture's junction box in a circuit and is 75VA rated (3 - 600 Series or 900 Series; 2 - 1200 Series Modules max.).



**H347**

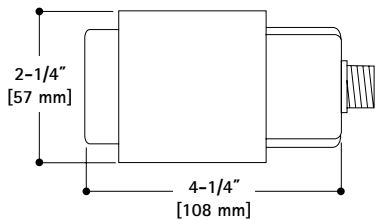
H347 is a CSA/UL Listed Component for us under the luminaire UL/cUL listing with Non-IC housings.

### Transformer Load – H347 (75VA)

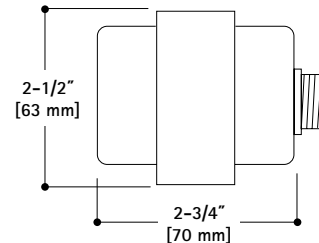
1. H347 Transformer at full loading consumes a maximum of 15W of power.
2. When dimmer or switch is on the secondary (120V) side of the transformer power is consumed by the transformer when the dimmer or switch is in "OFF" mode at 2.5W, and in "ON" mode at 15W maximum with full loading.
3. When a dimmer or switch is on the primary (347V) side of the transformer power is consumed only in "ON" mode to a maximum of 15W under full loading.

situation the majority of the power would then be reactive (VARs) and not real (WATTS). If H277 or H347 transformers should be used individually on each LED fixture in a single circuit, then that circuit should be sized for lowered power factor as well as increased apparent power on the circuit. H277 and H347 are UL/cUL listed for use with Halo housings: H750T, H750TCP, H7T, H7TNB, H7RT, H750TD010, H750RTD010 and H750TCPD010 housings.

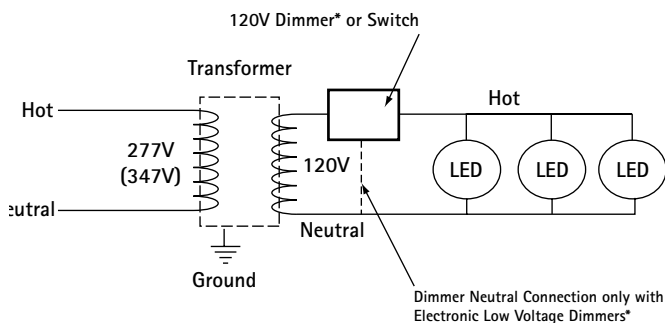
**H277**



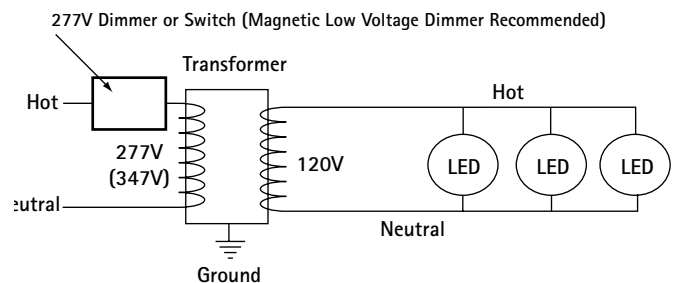
**H347**



### Transformer with Dimmer or Switch on Secondary



### Transformer with Dimmer or Switch on Primary



\*Refer to dimming features section

## Halo H4 LED Downlight Photometry

### White Baffle, Open

<b>Trim</b> TL401WB	<b>LED Module, 3500K</b> EL405835
------------------------	--------------------------------------

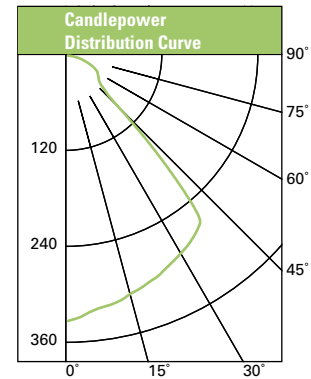
**Spacing Criteria = 1.3**  
**Lumens per Watt = 44.17**  
**Test No. P20077**

LUMINANCE (Average Candela/M <sup>2</sup> )	
Degrees	Avg. 0° Luminance
45	15868
55	10318
65	11087
75	9528
85	7074

Candela Distribution	
Degrees Vertical	Candela
0	332
5	322
15	308
25	293
35	276
45	91
55	48
65	38
75	20
85	5
90	0

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Fixture
0-30	254	N/A	40.7
0-40	427	N/A	68.5
0-60	558	N/A	89.7
0-90	623	N/A	100
0-180	623	N/A	100

Cone of Light		
Distance to Illuminated Plane	Initial Nadir Foot Candles	Beam Diameter (ft)
5' 6"	11	10.1
7' 0"	7	12.9
8' 0"	5	14.8
9' 0"	4	16.6
10' 0"	3	18.4



### White Baffle, Solite Lens

<b>Trim</b> TL403WBS	<b>LED Module, 3500K</b> EL405835
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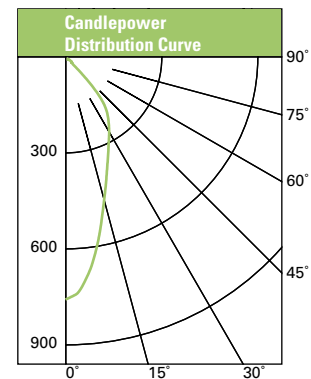
**Spacing Criteria = 0.6**  
**Lumens per Watt = 44.27**  
**Test No. P20081**

LUMINANCE (Average Candela/M <sup>2</sup> )	
Degrees	Avg. 0° Luminance
45	18309
55	5589
65	5543
75	4288
85	2829

Candela Distribution	
Degrees Vertical	Candela
0	753
5	698
15	464
25	317
35	234
45	105
55	26
65	19
75	9
85	2
90	0

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Fixture
0-30	341	N/A	54.6
0-40	487	N/A	78.0
0-60	594	N/A	95.1
0-90	624	N/A	100
0-180	624	N/A	100

Cone of Light		
Distance to Illuminated Plane	Initial Nadir Foot Candles	Beam Diameter (ft)
5' 6"	25	7.1
7' 0"	15	9.0
8' 0"	12	10.3
9' 0"	9	11.6
10' 0"	8	12.9



### Specular Clear, Open

<b>Trim</b> TL400SC	<b>LED Module, 3500K</b> EL405835
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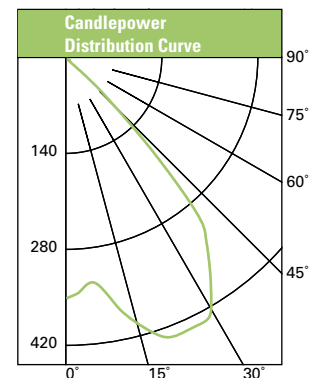
**Spacing Criteria = 1.3**  
**Lumens per Watt = 48.54**  
**Test No. P20074**

LUMINANCE (Average Candela/M <sup>2</sup> )	
Degrees	Avg. 0° Luminance
45	19879
55	1290
65	1167
75	953
85	1415

Candela Distribution	
Degrees Vertical	Candela
0	349
5	331
15	399
25	433
35	363
45	114
55	6
65	4
75	2
85	1
90	0

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Fixture
0-30	346	N/A	50.5
0-40	573	N/A	83.6
0-60	679	N/A	99.0
0-90	686	N/A	100
0-180	686	N/A	100

Cone of Light		
Distance to Illuminated Plane	Initial Nadir Foot Candles	Beam Diameter (ft)
5' 6"	12	10.3
7' 0"	7	13.1
8' 0"	6	15.0
9' 0"	4	16.9
10' 0"	4	18.8



## Halo H4 LED Downlight Photometry

### Specular Clear, Solite Lens

<b>Trim</b> TL402SCS	<b>LED Module, 3500K</b> EL405835
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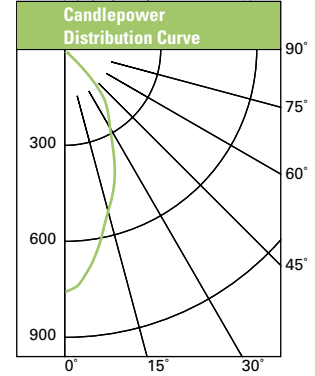
**Spacing Criteria = 0.7**  
**Lumens per Watt = 43.53**  
**Test No. P20078**

LUMINANCE (Average Candela/M <sup>2</sup> )	
Degrees	Avg. 0° Luminance
45	15694
55	2795
65	2042
75	953
85	1415

Candela Distribution	
Degrees Vertical	Candela
0	751
5	702
15	516
25	358
35	231
45	90
55	13
65	7
75	2
85	1
90	0

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Fixture
0-30	375	N/A	61.1
0-40	519	N/A	84.7
0-60	603	N/A	98.3
0-90	613	N/A	100
0-180	613	N/A	100

Cone of Light		
Distance to Illuminated Plane	Initial Nadir Foot Candles	Beam Diameter (ft)
5' 6"	25	7.1
7' 0"	15	9.0
8' 0"	12	10.3
9' 0"	9	11.6
10' 0"	8	12.9



## 600 Series Halo LED Downlight Module Photometry

### White Baffle, Open

<b>Trim</b> 494WB06	<b>LED Module, 3500K</b> ML706835
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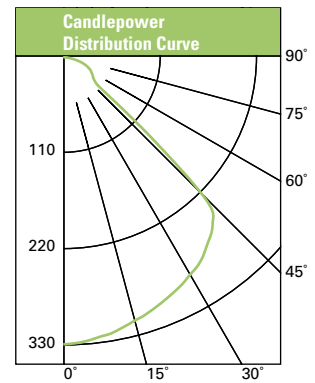
**Spacing Criteria = 1.3**  
**Lumens per Watt = 49.05**  
**Test No. P30049**

LUMINANCE (Average Candela/M <sup>2</sup> )	
Degrees	Avg. 0° Luminance
45	25891
55	5778
65	6349
75	6098
85	3622

Candela Distribution	
Degrees Vertical	Candela
0	328
5	325
15	312
25	297
35	278
45	232
55	42
65	34
75	20
85	4
90	0

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Fixture
0-30	257	N/A	37.9
0-40	430	N/A	63.5
0-60	619	N/A	91.4
0-90	677	N/A	100
0-180	677	N/A	100

Cone of Light		
Distance to Illuminated Plane	Initial Nadir Foot Candles	Beam Diameter (ft)
5' 6"	12	10.3
7' 0"	7	13.1
8' 0"	6	15.0
9' 0"	4	16.9
10' 0"	4	18.8



### White Baffle, Solite Lens

<b>Trim</b> 493WBS06	<b>LED Module, 3500K</b> ML706835
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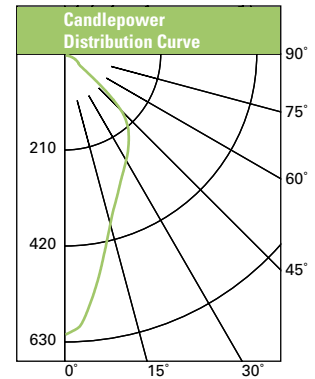
**Spacing Criteria = 0.6**  
**Lumens per Watt = 47.28**  
**Test No. P30052**

LUMINANCE (Average Candela/M <sup>2</sup> )	
Degrees	Avg. 0° Luminance
45	21516
55	5793
65	5379
75	4392
85	3010

Candela Distribution	
Degrees Vertical	Candela
0	611
5	559
15	380
25	292
35	240
45	174
55	38
65	26
75	13
85	3
90	0

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Fixture
0-30	293	N/A	44.9
0-40	444	N/A	67.9
0-60	610	N/A	93.5
0-90	653	N/A	100
0-180	653	N/A	100

Cone of Light		
Distance to Illuminated Plane	Initial Nadir Foot Candles	Beam Diameter (ft)
5' 6"	20	8.1
7' 0"	12	10.3
8' 0"	10	11.8
9' 0"	8	13.3
10' 0"	6	14.7



## 600 Series Halo LED Downlight Module Photometry

### Specular Clear, Open

<b>Trim</b> 494SC06	<b>LED Module, 3500K</b> ML706835
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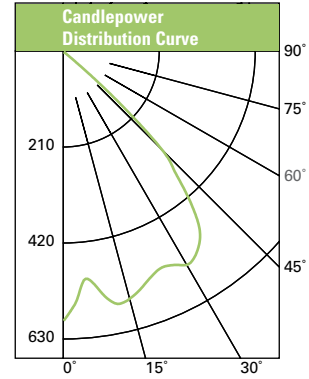
**Spacing Criteria = 1.3**  
**Lumens per Watt = 50.65**  
**Test No. P30050**

Candela Distribution	
Degrees Vertical	Candela
0	422
5	360
15	401
25	372
35	370
45	222
55	1
65	1
75	0
85	0
90	0

LUMINANCE (Average Candela/M <sup>2</sup> )	
Degrees	Avg. 0° Luminance
45	24775
55	138
65	187
75	0
85	0

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Fixture
0-30	323	N/A	46.2
0-40	552	N/A	79.0
0-60	699	N/A	99.9
0-90	699	N/A	100
0-180	699	N/A	100

Cone of Light		
Distance to Illuminated Plane	Initial Nadir Foot Candles	Beam Diameter (ft)
5' 6"	14	10.8
7' 0"	9	13.8
8' 0"	7	15.7
9' 0"	5	17.7
10' 0"	4	19.6



### Specular Clear, Solite Lens

<b>Trim</b> 493SCS06	<b>LED Module, 3500K</b> ML706835
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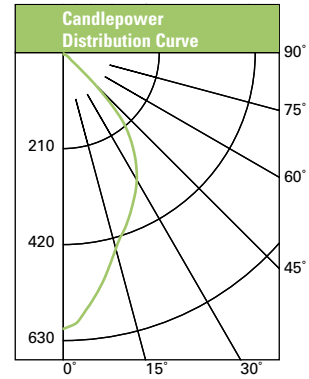
**Spacing Criteria = 0.8**  
**Lumens per Watt = 46.41**  
**Test No. P30051**

Candela Distribution	
Degrees Vertical	Candela
0	603
5	566
15	445
25	363
35	276
45	126
55	19
65	8
75	0
85	0
90	0

LUMINANCE (Average Candela/M <sup>2</sup> )	
Degrees	Avg. 0° Luminance
45	19462
55	3618
65	2068
75	0
85	0

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Fixture
0-30	346	N/A	53.9
0-40	517	N/A	80.7
0-60	632	N/A	98.5
0-90	641	N/A	100
0-180	641	N/A	100

Cone of Light		
Distance to Illuminated Plane	Initial Nadir Foot Candles	Beam Diameter (ft)
5' 6"	20	8.6
7' 0"	12	10.9
8' 0"	9	12.5
9' 0"	7	14.0
10' 0"	6	15.6



### Frost Highly Diffuse Lens

<b>Trim</b> 492PS06	<b>LED Module, 3500K</b> ML706835
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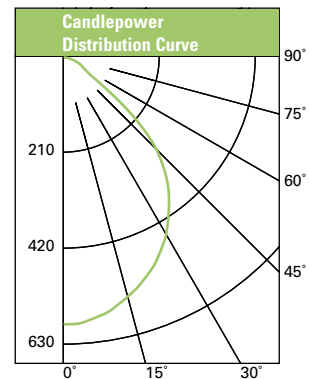
**Spacing Criteria = 1.2**  
**Lumens per Watt = 33.16**  
**Test No. P30055**

Candela Distribution	
Degrees Vertical	Candela
0	250
5	248
15	232
25	208
35	172
45	124
55	40
65	19
75	10
85	2
90	0

LUMINANCE (Average Candela/M <sup>2</sup> )	
Degrees	Avg. 0° Luminance
45	9610
55	3822
65	2464
75	2117
85	1258

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Fixture
0-30	185	N/A	40.3
0-40	292	N/A	63.9
0-60	426	N/A	93
0-90	458	N/A	100
0-180	458	N/A	100

Cone of Light		
Distance to Illuminated Plane	Initial Nadir Foot Candles	Beam Diameter (ft)
5' 6"	8	10.5
7' 0"	5	13.4
8' 0"	4	15.3
9' 0"	3	17.2
10' 0"	2	19.1



## 900 Series Halo LED Downlight Module Photometry

### White Baffle, Open

<b>Trim</b> 494WB06	<b>LED Module, 3500K</b> ML709835ICAT120D
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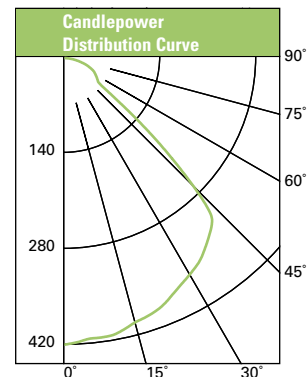
**Spacing Criteria = 1.3**  
**Lumens per Watt = 63.18**  
**Test No. P20256**

LUMINANCE (Average Candela/M <sup>2</sup> )	
Degrees	Avg. 0° Luminance
45	21002
55	5732
65	6224
75	5928
85	4401

Candela Distribution	
Degrees Vertical	Candela
0	418
5	411
15	399
25	378
35	351
45	271
55	60
65	48
75	28
85	7
90	0

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Fixture
0-30	328	N/A	36.8
0-40	547	N/A	61.4
0-60	808	N/A	90.6
0-90	891	N/A	100
0-180	891	N/A	100

Cone of Light		
Distance to Illuminated Plane	Initial Nadir Foot Candles	Beam Diameter (ft)
5' 6"	14	11.4
7' 0"	9	14.5
8' 0"	7	16.5
9' 0"	5	18.6
10' 0"	4	20.7



### White Baffle, Solite Lens

<b>Trim</b> 493WBS06	<b>LED Module, 3500K</b> ML709835ICAT120D
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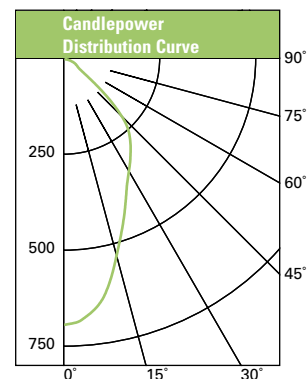
**Spacing Criteria = 0.8**  
**Lumens per Watt = 60.72**  
**Test No. P20250**

LUMINANCE (Average Candela/M <sup>2</sup> )	
Degrees	Avg. 0° Luminance
45	16585
55	5828
65	4409
75	3811
85	2515

Candela Distribution	
Degrees Vertical	Candela
0	692
5	672
15	528
25	383
35	301
45	214
55	61
65	34
75	18
85	4
90	0

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Fixture
0-30	389	N/A	45.5
0-40	578	N/A	67.7
0-60	797	N/A	100
0-90	854	N/A	100
0-180	854	N/A	100

Cone of Light		
Distance to Illuminated Plane	Initial Nadir Foot Candles	Beam Diameter (ft)
5' 6"	23	8.6
7' 0"	14	10.9
8' 0"	11	12.5
9' 0"	9	14.0
10' 0"	7	15.6



### Specular Clear, Open

<b>Trim</b> 494SC06	<b>LED Module, 3500K</b> ML709835ICAT120D
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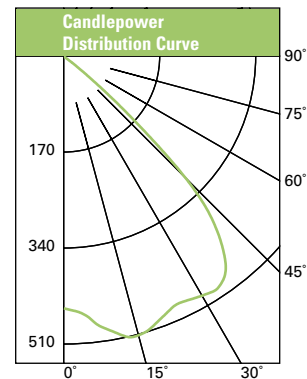
**Spacing Criteria = 1.4**  
**Lumens per Watt = 67.08**  
**Test No. P20254**

LUMINANCE (Average Candela/M <sup>2</sup> )	
Degrees	Avg. 0° Luminance
45	23792
55	191
65	130
75	0
85	0

Candela Distribution	
Degrees Vertical	Candela
0	446
5	461
15	511
25	482
35	488
45	307
55	2
65	1
75	0
85	0
90	0

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Fixture
0-30	414	N/A	43.8
0-40	716	N/A	75.8
0-60	944	N/A	99.9
0-90	945	N/A	100
0-180	945	N/A	100

Cone of Light		
Distance to Illuminated Plane	Initial Nadir Foot Candles	Beam Diameter (ft)
5' 6"	16	11.3
7' 0"	10	14.3
8' 0"	7	16.4
9' 0"	6	18.4
10' 0"	5	20.5



# HALO LED DOWNLIGHT PHOTOMETRY

## 900 Series Halo LED Downlight Module Photometry

### Specular Clear, Solite Lens

<b>Trim</b> 493SCS06	<b>LED Module, 3500K</b> ML709835ICAT120D
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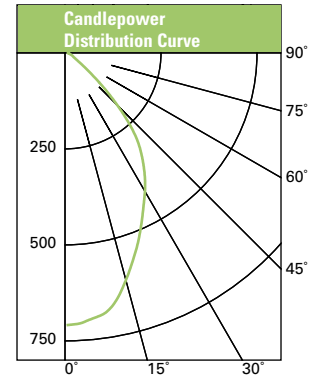
**Spacing Criteria = 0.9**  
**Lumens per Watt = 59.86**  
**Test No. P20251**

Candela Distribution	
Degrees Vertical	Candela
0	710
5	698
15	607
25	468
35	347
45	168
55	29
65	12
75	1
85	0
90	0

LUMINANCE	
(Average Candela/M <sup>2</sup> )	
Degrees	Avg. 0° Luminance
45	13020
55	2771
65	1556
75	212
85	0

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Fixture
0-30	453	N/A	53.7
0-40	669	N/A	79.4
0-60	828	N/A	98.3
0-90	843	N/A	100
0-180	843	N/A	100

Cone of Light		
Distance to Illuminated Plane	Initial Nadir Foot Candles	Beam Diameter (ft)
5' 6"	23	8.8
7' 0"	14	11.2
8' 0"	11	12.8
9' 0"	9	14.4
10' 0"	7	15.9



### Frost Diffuse Lens

<b>Trim</b> 492PS06	<b>LED Module, 3500K</b> ML709835ICAT120D
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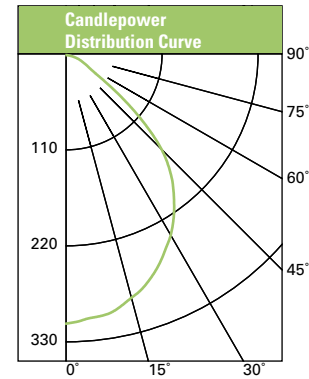
**Spacing Criteria = 1.2**  
**Lumens per Watt = 42.17**  
**Test No. P20247**

Candela Distribution	
Degrees Vertical	Candela
0	308
5	303
15	289
25	260
35	218
45	160
55	66
65	27
75	14
85	3
90	0

LUMINANCE	
(Average Candela/M <sup>2</sup> )	
Degrees	Avg. 0° Luminance
45	12400
55	6306
65	3501
75	2964
85	1886

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Fixture
0-30	230	N/A	38.8
0-40	367	N/A	61.7
0-60	548	N/A	92.3
0-90	594	N/A	100
0-180	594	N/A	100

Cone of Light		
Distance to Illuminated Plane	Initial Nadir Foot Candles	Beam Diameter (ft)
5' 6"	10	10.7
7' 0"	6	13.6
8' 0"	5	15.5
9' 0"	4	17.5
10' 0"	3	19.4



## 1200 Series Halo LED Downlight Module Photometry

### White Baffle, Open

<b>Trim</b> 494WB06	<b>LED Module, 3500K</b> ML712835TUNVD010
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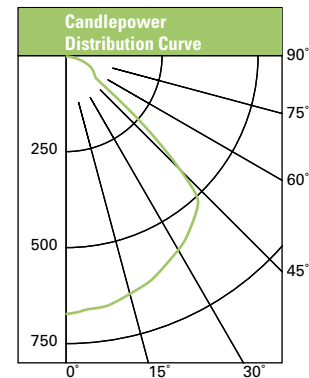
**Spacing Criteria = 1.3**  
**Lumens per Watt = 54.13**  
**Test No. P20153**

Candela Distribution	
Degrees Vertical	Candela
0	671
5	661
15	641
25	605
35	559
45	434
55	95
65	76
75	45
85	11
90	0

LUMINANCE	
(Average Candela/M <sup>2</sup> )	
Degrees	Avg. 0° Luminance
45	33635
55	9076
65	9855
75	9528
85	6916

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Fixture
0-30	524	N/A	36.8
0-40	875	N/A	61.4
0-60	1292	N/A	90.7
0-90	1424	N/A	100
0-180	1424	N/A	100

Cone of Light		
Distance to Illuminated Plane	Initial Nadir Foot Candles	Beam Diameter (ft)
5' 6"	22	11.4
8' 0"	10	16.5
10' 0"	7	20.7
12' 0"	5	24.8
14' 0"	3	28.9





## 1200 Series Halo LED Downlight Module Photometry

### White Baffle, Solite Lens

<b>Trim</b>	<b>LED Module, 3500K</b>
<b>493WBS06</b>	<b>ML712835TUNVD010</b>

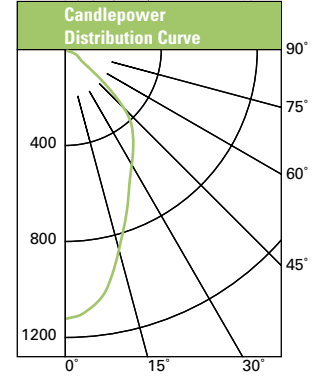
**Spacing Criteria = 0.8**  
**Lumens per Watt = 52.14**  
**Test No. P20147**

LUMINANCE	
(Average Candela/M <sup>2</sup> )	
Degrees	Avg. 0° Luminance
45	26815
55	9363
65	7132
75	6140
85	4401

Candela Distribution	
Degrees Vertical	Candela
0	1115
5	1082
15	854
25	623
35	488
45	346
55	98
65	55
75	29
85	7
90	0

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Fixture
0-30	630	N/A	45.6
0-40	936	N/A	67.7
0-60	1290	N/A	93.4
0-90	1382	N/A	100
0-180	1382	N/A	100

Cone of Light		
Distance to Illuminated Plane	Initial Nadir Foot Candles	Beam Diameter (ft)
5' 6"	37	8.6
8' 0"	17	12.5
10' 0"	11	15.6
12' 0"	8	18.7
14' 0"	6	21.8



### Specular Clear, Open

<b>Trim</b>	<b>LED Module, 3500K</b>
<b>494SC06</b>	<b>ML712835TUNVD010</b>

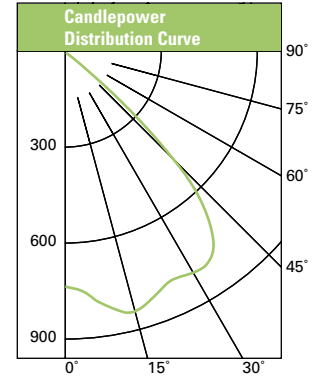
**Spacing Criteria = 1.4**  
**Lumens per Watt = 58.6**  
**Test No. P20151**

LUMINANCE	
(Average Candela/M <sup>2</sup> )	
Degrees	Avg. 0° Luminance
45	38595
55	382
65	130
75	0
85	0

Candela Distribution	
Degrees Vertical	Candela
0	732
5	756
15	838
25	786
35	789
45	498
55	4
65	1
75	0
85	0
90	0

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Fixture
0-30	676	N/A	43.8
0-40	1165	N/A	75.6
0-60	1543	N/A	100.2
0-90	1541	N/A	100
0-180	1541	N/A	100

Cone of Light		
Distance to Illuminated Plane	Initial Nadir Foot Candles	Beam Diameter (ft)
5' 6"	26	11.3
8' 0"	12	16.4
10' 0"	8	20.5
12' 0"	5	24.6
14' 0"	4	28.7



### Specular Clear, Solite Lens

<b>Trim</b>	<b>LED Module, 3500K</b>
<b>493SCS06</b>	<b>ML712835TUNVD010</b>

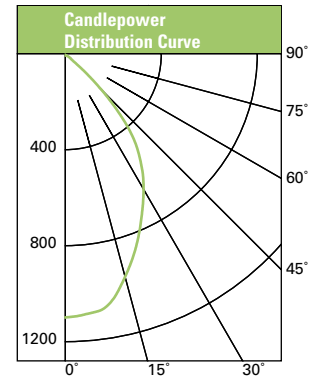
**Spacing Criteria = 1.0**  
**Lumens per Watt = 51.16**  
**Test No. P20148**

LUMINANCE	
(Average Candela/M <sup>2</sup> )	
Degrees	Avg. 0° Luminance
45	21080
55	4490
65	2593
75	423
85	0

Candela Distribution	
Degrees Vertical	Candela
0	1095
5	1084
15	966
25	759
35	560
45	272
55	47
65	20
75	2
85	0
90	0

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Fixture
0-30	725	N/A	53.4
0-40	1074	N/A	79.2
0-60	1332	N/A	98.2
0-90	1356	N/A	100
0-180	1356	N/A	100

Cone of Light		
Distance to Illuminated Plane	Initial Nadir Foot Candles	Beam Diameter (ft)
5' 6"	36	8.9
8' 0"	17	13.0
10' 0"	11	16.2
12' 0"	8	19.5
14' 0"	6	22.7



## 1200 Series Halo LED Downlight Module Photometry

### Frost Diffuse Lens

<b>Trim</b> 492PS06	<b>LED Module, 3500K</b> ML712835TUNVD010
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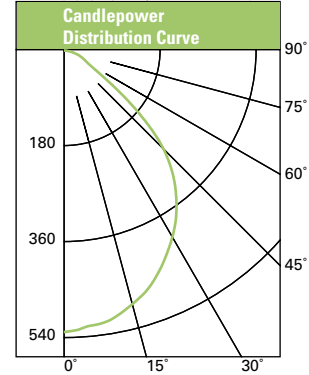
**Spacing Criteria = 1.2**  
**Lumens per Watt = 36.82**  
**Test No. P20144**

LUMINANCE (Average Candela/M <sup>2</sup> )	
Degrees	Avg. 0° Luminance
45	20692
55	10032
65	5705
75	4870
85	3144

Candela Distribution	
Degrees Vertical	Candela
0	528
5	519
15	493
25	440
35	368
45	267
55	105
65	44
75	23
85	5
90	0

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Fixture
0-30	392	N/A	39.3
0-40	621	N/A	62.3
0-60	922	N/A	92.5
0-90	997	N/A	100
0-180	997	N/A	100

Cone of Light		
Distance to Illuminated Plane	Initial Nadir Foot Candles	Beam Diameter (ft)
5' 6"	17	10.6
8' 0"	8	15.4
10' 0"	5	19.2
12' 0"	4	23.1
14' 0"	3	26.9



## Photometry Summary

H4 LED Light Engine	Trim Model	TL400SC	TL400H	TL400WH	TL401WB	TL402SCS	TL402HS	TL402WHS	TL403WBS
	Trim Type	Open Specular Reflector	Open Haze Reflector	Open White Reflector	Open White Baffle	Solite® Lens Specular Clear Reflector	Solite® Lens Haze Reflector	Solite® Lens White Reflector	Solite® Lens White Baffle
EL405827	LUMENS	603	566	551	539	535	534	539	536
EL405830	LUMENS	655	619	606	593	584	575	590	584
EL405835	LUMENS	686	653	636	623	613	613	630	624
EL405840	LUMENS	700	667	653	639	624	615	629	625

600 Series LED Module	Trim Model	494P06	494WB06	494H06	494SC06	492PS06	493WBS06	493SCS06	493HS06	493BBS06	493SNS06	493TBZS06
	Trim Type	Open White Reflector	Open White Baffle	Open Haze Reflector	Open Specular Reflector	Frost Diffused Lens Shower Trim	Solite® Lens White Baffle	Solite® Lens Specular Clear Reflector	Solite® Lens Haze Reflector	Solite® Lens Black Baffle	Solite® Lens Satin Nickel Reflector	Solite® Lens Tuscan Bronze Reflector
ML706827	LUMENS	605	604	634	640	416	599	592	581	498	506	474
ML706830	LUMENS	693	686	721	756	480	684	676	654	571	575	543
ML706835	LUMENS	663	677	674	699	458	653	641	628	543	553	512
ML706840	LUMENS	722	716	758	793	500	714	708	691	597	602	563

900 Series LED Module	Trim Model	494P06	494WB06	494H06	494SC06	492PS06	493WBS06	493SCS06	493HS06	493BBS06	493SNS06	493TBZS06
	Trim Type	Open White Reflector	Open White Baffle	Open Haze Reflector	Open Specular Reflector	Frost Diffused Lens Shower Trim	Solite® Lens White Baffle	Solite® Lens Specular Clear Reflector	Solite® Lens Haze Reflector	Solite® Lens Black Baffle	Solite® Lens Satin Nickel Reflector	Solite® Lens Tuscan Bronze Reflector
ML709827ICAT120D	LUMENS	773	768	781	816	511	735	726	711	620	627	588
ML709830ICAT120D	LUMENS	814	807	821	859	538	773	762	750	653	661	618
ML709835ICAT120D	LUMENS	897	891	907	945	594	854	843	824	718	729	680
ML709840ICAT120D	LUMENS	877	871	888	924	574	839	828	802	706	706	669

1200 Series LED Module	Trim Model	494P06	494WB06	494H06	494SC06	492PS06	493WBS06	493SCS06	493HS06	493BBS06	493SNS06	493TBZS06
	Trim Type	Open White Reflector	Open White Baffle	Open Haze Reflector	Open Specular Reflector	Frost Diffused Lens Shower Trim	Solite® Lens White Baffle	Solite® Lens Specular Clear Reflector	Solite® Lens Haze Reflector	Solite® Lens Black Baffle	Solite® Lens Satin Nickel Reflector	Solite® Lens Tuscan Bronze Reflector
ML712827TUNVD010	LUMENS	1325	1296	1338	1398	862	1244	1227	1206	1051	1060	1024
ML712830TUNVD010	LUMENS	1356	1348	1375	1429	952	1320	1320	1275	1115	1124	1059
ML712835TUNVD010	LUMENS	1438	1424	1473	1541	997	1382	1356	1329	1161	1170	1105
ML712840TUNVD010	LUMENS	1427	1414	1444	1506	933	1346	1328	1295	1130	1144	1075

# HALO LED COMPLIANCE MATRIX

## SYMBOL QUALIFICATION STANDARD

ES ENERGY STAR® Program Requirements for Solid State Lighting Luminaires Eligibility Criteria  
 T24 California Energy Commission 2008 Building Energy Efficiency Standards, California Code of Regulations Title 24, Part 1 -- High Efficacy Luminaire  
 IECC 2009 International Energy Conservation Code® -- "High Efficacy Lamps" and Section 404 "Electrical Power and Lighting Systems"

## SYMBOL BASE STANDARDS FOR COMPLIANCE

ES Lumens & Efficacy <4.5" aperture = 345 Lumens and >4.5" aperture = 575 Lumens; plus a minimum 35 LpW  
 T24 Efficacy >5 Watts to 15W = 40 LpW and >15W to 40W = 50 LpW  
 IECC Efficacy Efficacy standards with minimum LpW based upon lamp / source wattage. Refer to 2009 IECC "High-Efficacy Lamps"

1 Qualification Note: There are more details associated with these standards. Consult the specific standard for complete qualification and compliance requirements.  
 2 Compliance Note: Efficacy is measured in Lumens per Watt (LpW).

H4 LED	TL400SC	TL400H	TL400WH	TL401WB	TL402SCS	TL402HS	TL402WHS	TL403WBS	TL400SN	TL400TBZ	TL400SRK	TL401BBT	TL402SNS	TL402TBZS	TL402SRKS	TL403BBS
EL405827	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	T24	T24	T24	T24	*	*	*	*	*	*	*	*	*	*	*	*
	IECC	IECC	IECC	IECC	*	*	*	*	*	*	*	*	*	*	*	*
EL405830	ES	ES	ES	ES	ES	ES	ES	ES	*	*	*	*	ES	ES	ES	ES
	T24	T24	T24	T24	T24	T24	T24	T24	*	*	*	*	*	*	*	*
	IECC	IECC	IECC	IECC	IECC	IECC	IECC	IECC	*	*	*	*	*	*	*	*
EL405835	ES	ES	ES	ES	ES	ES	ES	ES	*	*	*	*	ES	ES	ES	ES
	T24	T24	T24	T24	T24	T24	T24	T24	*	*	*	*	*	*	*	*
	IECC	IECC	IECC	IECC	IECC	IECC	IECC	IECC	*	*	*	*	*	*	*	*
EL405840	ES	ES	ES	ES	ES	ES	ES	ES	ES	*	*	*	ES	ES	ES	ES
	T24	T24	T24	T24	T24	T24	T24	T24	*	*	*	*	*	*	*	*
	IECC	IECC	IECC	IECC	IECC	IECC	IECC	IECC	*	*	*	*	*	*	*	*

600 Series	494P06	494WB06	494SC06	494H06	493SCS06	493HS06	493WBS06	493BBS06	493SNS06	493TBZS06	492PS06
ML706827	*	*	*	*	*	*	*	*	*	*	*
	T24	T24	T24	T24	*	*	*	*	*	*	*
	IECC	IECC	IECC	IECC	*	*	*	*	*	*	*
ML706830	ES	ES	ES	ES	ES	ES	ES	*	*	*	*
	T24	T24	T24	T24	T24	T24	T24	*	*	*	*
	IECC	IECC	IECC	IECC	IECC	IECC	IECC	*	*	*	*
ML706835	ES	ES	ES	ES	ES	ES	ES	*	*	*	*
	T24	T24	T24	T24	T24	T24	T24	*	*	*	*
	IECC	IECC	IECC	IECC	IECC	IECC	IECC	*	*	*	*
ML706840	ES	ES	ES	ES	ES	ES	ES	*	*	*	*
	T24	T24	T24	T24	T24	T24	T24	*	*	*	*
	IECC	IECC	IECC	IECC	IECC	IECC	IECC	*	*	*	*

900 Series	494P06	494WB06	494SC06	494H06	493SCS06	493HS06	493WBS06	493BBS06	493SNS06	493TBZS06	492PS06
ML709827ICAT120D	*	*	*	*	*	*	*	*	*	*	*
	T24	T24	T24	T24	T24	T24	T24	T24	T24	T24	*
	IECC	IECC	IECC	IECC	IECC	IECC	IECC	IECC	IECC	IECC	*
ML709830ICAT120D	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	*
	T24	T24	T24	T24	T24	T24	T24	T24	T24	T24	*
	IECC	IECC	IECC	IECC	IECC	IECC	IECC	IECC	IECC	IECC	*
ML709835ICAT120D	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	*
	T24	T24	T24	T24	T24	T24	T24	T24	T24	T24	*
	IECC	IECC	IECC	IECC	IECC	IECC	IECC	IECC	IECC	IECC	*
ML709840ICAT120D	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
	T24	T24	T24	T24	T24	T24	T24	T24	T24	T24	T24
	IECC	IECC	IECC	IECC	IECC	IECC	IECC	IECC	IECC	IECC	IECC

1200 Series	494P06	494WB06	494SC06	494H06	493SCS06	493HS06	493WBS06	493BBS06	493SNS06	493TBZS06	492PS06
ML712827TUNVD010	*	*	*	*	*	*	*	*	*	*	*
	T24	T24	T24	T24	*	*	*	*	*	*	*
	IECC	IECC	IECC	IECC	*	*	*	*	*	*	*
ML712830TUNVD010	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
	T24	T24	T24	T24	T24	T24	T24	*	*	*	*
	IECC	IECC	IECC	IECC	IECC	IECC	IECC	*	*	*	*
ML712835TUNVD010	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
	T24	T24	T24	T24	T24	T24	T24	*	T24	*	*
	IECC	IECC	IECC	IECC	IECC	IECC	IECC	*	IECC	*	*
ML712840TUNVD010	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
	T24	T24	T24	T24	T24	T24	T24	*	T24	*	*
	IECC	IECC	IECC	IECC	IECC	IECC	IECC	*	IECC	*	*

**\* NOTE:**

Halo is committed to providing the latest in qualification testing to ENERGY STAR® SSL, Title 24-2008 and IECC-2009 standards. With continuing improvements in LED technology and Halo's commitment to continuous updates in qualification testing, refer to LED Module and Light Engine product specification sheets online for the latest in compliance qualification status. As an ENERGY STAR® Partner, Cooper Lighting adheres to the stringent standards of ENERGY STAR® SSL, and maintains the highest level of compliance qualification.

## Case Study

**Project:**  
*Pizza Fusion restaurant, Naperville, IL*

The Pizza Fusion restaurant, whose motto is "Saving the Earth, one pizza at a time," serves up one of America's favorite foods with a new twist—organic gourmet pizza free of artificial additives. Tom Katsenos, proprietor of the chain's first Midwest franchise in Naperville, Illinois, says every detail of the company's operations is evaluated from an environmental perspective to minimize its ecological footprint. From delivering food in company-owned hybrid vehicles and offsetting 100 percent of power consumption with the purchase of renewable wind energy certificates to building LEED-certified restaurants, he says he's committed to being a leader in not only the pizza industry, but in a better quality of life. To achieve this ambitious goal, the restaurant had to use significantly less energy than a typical restaurant without sacrificing employee and customer comfort. Wanting each product used to have an environmentally friendly story behind it, the general lighting is provided by nearly 30 Halo recessed LED downlights. With each downlight drawing fewer than 14W, the LEDs use less than one-fourth the electricity of comparable incandescent lamps and will last 10 to 12 years before needing to be replaced. The LED Modules are easily dimmed for an intimate ambiance and mood setting at night and have a rated service life of 50,000 hours with 70% lumen maintenance. Katsenos says the results have been excellent. The LED lighting not only provides an energy-effective, visually comfortable dining environment, it is now part of the story of Pizza Fusion's enhanced commitment to green business operations. A visually comfortable dining environment is now part of the story of Pizza Fusion's enhanced commitment to green business operations.



Lighting Designer: FSG Lighting  
 Photography: Jeffrey Ross, Boschke Photography, Inc.



## Case Study

**Project:** *North Delta Secondary, Theatre House Lights*  
*Delta School District, Delta, BC Canada*



The school district of Delta, British Columbia wanted to save on both energy and maintenance costs. Their school theater, in conjunction with BC Hydro, commissioned the project to replace 72–200W incandescent luminaires with 72–Halo LED's operating at less than 15W. This was a one-to-one retrofit that saved the school district 93% on energy cost. The maintenance schedule on these luminaires had been a group re-lamp carried out twice a year. The Halo LED delivered significant value by eliminating the maintenance cost and reducing the risk to personnel and property associated with the re-lamping of this installation with its high vaulted ceilings. Halo LED provided a product that is estimated to deliver over 70% of its initial lumens for over 16 years (based upon the school's energy and maintenance schedules).

The payback on this retrofit was 2.4 years including material, labor, energy savings and a rebate of \$60 per luminaire from BC Hydro.

The photo illustrates a spectacular lighting design providing a downlight architectural appeal while delivering even illumination.



## Case Study

*Project: 2009 Greenhaven Eco-Friendly Showcase House, Atlanta, GA*

Atlanta's newest model for green building and sustainable design by Pace Home Builders, Greenhaven is the first eco-friendly neighborhood community in east Cobb County that showcases the latest in green building techniques, sustainable design, state-of-the-art technology and energy efficiency. Designed to teach designers, builders, and home owners that eco-living is attainable, a 7,000 square foot Show Home incorporates some of the housing industry's most advanced technologies including Halo LED recessed downlighting. Chosen for its energy efficiency, high-quality construction, performance, and its ENERGY STAR® rating, the Halo LED downlights will provide energy savings in excess of 70% when compared with a 65 incandescent reflector lamp, which gives comparable light distribution. Not only are they energy efficient, but LEDs contain no mercury, so disposal is not a concern when the units are eventually replaced.

And with 70% of lumens remaining after 50,000 hours of operation, replacement of the Halo LED downlights will be years away – that's over 20 years when operated at 6-hours per day. The downlights themselves are constructed of durable die-cast aluminum, which conducts heat away from the LED components to maximize life, and feature an optical design providing good cutoff, more than 600 productive beam lumens, and low glare. The Halo LED down lights are installed throughout the home, including the bathroom with a shower-rated lens trim.

Builder: Pace Homebuilders  
Photography: Eric Prine, Attic Fire Photography

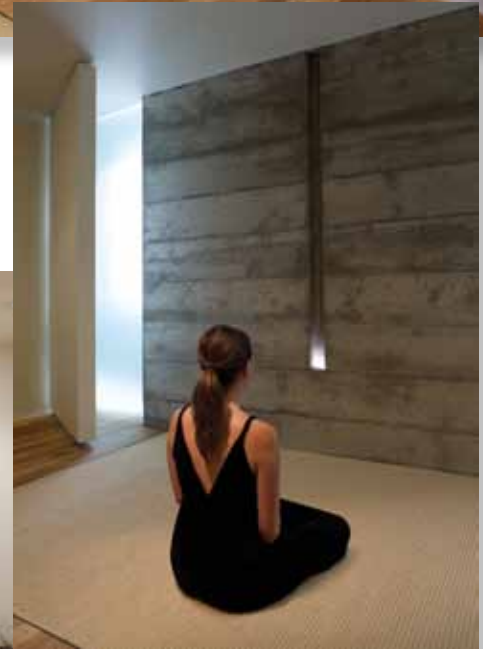


## Case Study

**Project:**  
*2009 San Francisco Decorator Showcase Houses- San Francisco, CA*

Since 1977, the San Francisco Decorator Showcase has raised more than \$10 million for San Francisco University High School's financial aid program. The 32nd annual event, attended by nearly 20,000 people, was held within a Georgian mansion built in 1910. More than 30 designers transformed 38 rooms including Kevin Hackett and Jessica Weigley of Siol, who designed a meditation space in a 16-ft. by 16-ft. room on the concept of "A Sacred Place to Dwell." The existing lights consisted of 12 typical fluorescent, non-dimmable, recessed downlights with exposed elements. Weigley and Hackett wanted the lighting to produce the right atmosphere, enable user control, and be energy efficient, as sustainable design is a core philosophy for their firm. They also planned to display several pieces of art, so as in any art exhibit, lighting was a major consideration in their design.

The designers selected Halo LED downlights, which allowed them to illuminate the entire space with the same energy as consumed by a single incandescent lamp. Weigley points out that the LED recessed downlights create a wonderful light that has allowed the art to stand cleanly on its own and that overall the room emits a sense of peace. She notes that they are excited to finally have a LED recessed fixture that generates a quality of light suitable for the most elegant home as well as to illuminate art.



Siol (Meditation Room); San Francisco, CA  
Lighting Designers: Kevin Hackett and Jessica Weigley  
Photography: Paul Dyer Photography

# ORDERING INFORMATION

## H4 Collection – SAMPLE NUMBER: H455ICAT120D – EL405830 – TL400SC

Order Housing, LED Light Engine and Trim separately

H4 LED Housing	H4 LED Light Engine	Trim Options	Accessories <i>(see product details for application information)</i>
<p><b>H455ICAT120D</b> = 4" Dedicated LED Insulated Ceiling AIR-TITE™ Housing, 120V Driver with standard Dimming</p> <p><b>H455RICAT120D</b> = 4" Dedicated LED Insulated Ceiling AIR-TITE™ Remodel Housing, 120V Driver with standard Dimming</p> <p><b>H455TUNVD010</b> = 4" Dedicated LED Non-IC AIR-TITE™ Housing, 120V-277V Driver with 0-10V Dimming</p> <p><b>H455TCPUNVD010</b> = 4" Chicago Plenum Dedicated LED Non-IC AIR-TITE™ Housing, 120V-277V Driver with 0-10V Dimming</p> <p><b>H455RTUNVD010</b> = 4" Dedicated LED Non-IC AIR-TITE™ Remodel Housing, 120V-277V Driver with 0-10V Dimming</p>	<p><b>EL405</b> = 4" LED Downlight Light Engine, H4 Collection</p> <p><b>8</b> = 80 CRI</p> <p><b>27</b> = 2725°K <b>30</b> = 3045°K <b>35</b> = 3465°K <b>40</b> = 3985°K</p>	<p><b>TL400SC</b> = Specular Clear Reflector, White Ring</p> <p><b>TL400H</b> = Haze Reflector, White Ring</p> <p><b>TL400WH</b> = White Reflector, White Ring</p> <p><b>TL400SN</b> = Satin Nickel Reflector, Satin Nickel Ring</p> <p><b>TL400TBZ</b> = Tuscan Bronze Reflector, Tuscan Bronze Ring</p> <p><b>TL400SBK</b> = Black Specular Reflector, White Ring</p> <p><b>TL401WB</b> = White Baffle, White Ring</p> <p><b>TL401BB</b> = Black Baffle, White Ring</p> <p><b>TL402SCS</b> = Solite® Lens, Specular Clear Reflector and White Ring, Shower Rated</p> <p><b>TL402HS</b> = Solite® Lens, Haze Reflector and White Ring, Shower Rated</p> <p><b>TL402WHS</b> = Solite® Lens, White Reflector and White Ring, Shower Rated</p> <p><b>TL402SNS</b> = Solite® Lens, Satin Nickel Reflector and Satin Nickel Ring, Shower Rated</p> <p><b>TL402TBZS</b> = Solite® Lens, Tuscan Bronze Reflector and Tuscan Bronze Ring, Shower Rated</p> <p><b>TL402SBKS</b> = Solite® Lens, Black Specular Reflector and White Ring, Shower Rated</p> <p><b>TL403WBS</b> = Solite® Lens, White Baffle and White Ring, Shower Rated</p> <p><b>TL403BBS</b> = Solite® Lens, Black Baffle and White Ring, Shower Rated</p>	<p><b>Thin Profile Designer Trim Rings</b></p> <p><b>TRM400WH</b> = White</p> <p><b>TRM400BK</b> = Black</p> <p><b>TRM400SN</b> = Satin Nickel</p> <p><b>TRM400TBZ</b> = Tuscan Bronze</p> <p><b>TRM400PC</b> = Polished Chrome</p>

## H7 600 Series – SAMPLE NUMBER: H750ICAT – ML706830 – 493WBS06

Order Housing, LED Light Engine and Trim separately

Housing	LED Module	Trim Options	Accessories <i>(see product details for application information)</i>
<p><b>H750ICAT</b> = 6" Dedicated LED Insulated Ceiling, AIR-TITE™ Housing</p> <p><b>H750RICAT</b> = 6" Dedicated LED Insulated Ceiling, AIR-TITE™ Remodel Housing</p> <p><b>H750T</b> = 6" Dedicated LED Non-IC Housing</p> <p><b>H750TCP</b> = 6" Chicago Plenum Dedicated LED Non-IC Housing</p>	<p><b>ML706</b> = 6" LED Module, H7 Collection 600 Series</p> <p><b>8</b> = 80 CRI</p> <p><b>27</b> = 2725°K <b>30</b> = 3045°K <b>35</b> = 3465°K <b>40</b> = 3985°K</p>	<p><b>494P06</b> = Matte White Reflector, White Ring</p> <p><b>494WB06</b> = White Baffle, White Ring</p> <p><b>494H06</b> = Haze Reflector, White Die-Cast Trim Ring</p> <p><b>494SC06</b> = Specular Reflector, White Ring</p> <p><b>492PS06</b> = Frost Regressed Lens, White Baffle and Trim Ring, Shower Rated</p> <p><b>493WBS06</b> = Solite® Regressed Lens, Upper Reflector, White Baffle and Ring with Antimicrobial Paint (Standard), Shower Rated</p> <p><b>493SCS06</b> = Solite® Regressed Lens, Upper Reflector, Specular Clear Die-Cast Reflector and White Ring, Shower Rated</p> <p><b>493HS06</b> = Solite® Regressed Lens, Upper Reflector, Haze Reflector and White Ring, Shower Rated</p> <p><b>493SNS06</b> = Solite® Regressed Lens, Upper Reflector, Satin Nickel Reflector and Ring, Shower Rated</p> <p><b>493TBZS06</b> = Solite® Regressed Lens, Upper Reflector, Tuscan Bronze Reflector and Ring, Shower Rated</p> <p><b>493BBS06</b> = Solite® Regressed Lens, Black Baffle with White Ring, Shower Rated</p>	<p><b>OT400P</b> = Oversize White Metal Ring 6" ID x 9-1/4" OD</p> <p><b>OT403P</b> = Oversize White Plastic Ring 6" ID x 8" OD</p> <p><b>H277</b> = 300VA Transformer - Steps 277 Line Voltage down to 120V <i>(see App. Note)</i></p> <p><b>H347</b> = 75VA Transformer - Steps 347 Line Voltage down to 120V <i>(see App. Note)</i></p> <p><b>Thin Profile Designer Trim Rings:</b></p> <p><b>TRM490WH</b> = White</p> <p><b>TRM490SN</b> = Satin Nickel</p> <p><b>TRM490TBZ</b> = Tuscan Bronze</p> <p><b>TRM490BK</b> = Black</p> <p><b>TRM490PC</b> = Polished Chrome</p>

Note: Specifications and dimensions are subject to change without notice.

# ORDERING INFORMATION

## H7 900 Series – SAMPLE NUMBER: H750ICAT – ML709830ICAT120D – 493WBS06

Order Housing, LED Light Engine and Trim separately

Housing	LED Module				Trim Options	Accessories <i>(see product details for application information)</i>
		8		ICAT120D		
<p><b>H750ICAT=</b> 6" Dedicated LED Insulated Ceiling, AIR-TITE™ Housing</p> <p><b>H750RICAT =</b> 6" Dedicated LED Insulated Ceiling, AIR-TITE™ Remodel Housing</p> <p><b>H750T =</b> 6" Dedicated LED Non-IC Housing</p> <p><b>H750TCP =</b> 6" Chicago Plenum Dedicated LED Non-IC Housing</p>	<p><b>ML709 =</b> 6" LED Module, H7 Collection 900 Series</p>	<p>8 = 80 CRI</p>	<p>27 = 2725°K</p> <p>30 = 3045°K</p> <p>35 = 3465°K</p> <p>40 = 3985°K</p>	<p><b>ICAT120D =</b> High Lumen LED, Insulated Ceiling AIR-TITE™ Rated with 120V Standard Dimming</p>	<p><b>494P06 =</b> Matte White Reflector, White Ring</p> <p><b>494WB06 =</b> White Baffle, White Ring</p> <p><b>494H06 =</b> Haze Reflector, White Die-Cast Trim Ring</p> <p><b>494SC06 =</b> Specular Reflector, White Ring</p> <p><b>492PS06 =</b> Frost Regressed Lens, White Baffle and Trim Ring, Shower Rated</p> <p><b>493WBS06 =</b> Solite® Regressed Lens, Upper Reflector, White Baffle and Ring with Antimicrobial Paint (Standard), Shower Rated</p> <p><b>493SCS06 =</b> Solite® Regressed Lens, Upper Reflector, Specular Clear Die-Cast Reflector and White Ring, Shower Rated</p> <p><b>493HS06 =</b> Solite® Regressed Lens, Upper Reflector, Haze Reflector and White Ring, Shower Rated</p> <p><b>493SNS06 =</b> Solite® Regressed Lens, Upper Reflector, Satin Nickel Reflector and Ring, Shower Rated</p> <p><b>493TBZ06 =</b> Solite® Regressed Lens, Upper Reflector, Tuscan Bronze Reflector and Ring, Shower Rated</p> <p><b>493BBS06 =</b> Solite® Regressed Lens, Black Baffle with White Ring, Shower Rated</p>	<p><b>OT400P =</b> Oversize White Metal Ring 6" ID x 9-1/4" OD</p> <p><b>OT403P =</b> Oversize White Plastic Ring 6" ID x 8" OD</p> <p><b>H277 =</b> 300VA Transformer - Steps 277 Line Voltage down to 120V <i>(see App. Note)</i></p> <p><b>H347 =</b> 75VA Transformer - Steps 347 Line Voltage down to 120V <i>(see App. Note)</i></p> <p><b>Thin Profile Designer Trim Rings:</b></p> <p><b>TRM490WH =</b> White</p> <p><b>TRM490SN =</b> Satin Nickel</p> <p><b>TRM490TBZ =</b> Tuscan Bronze</p> <p><b>TRM490BK =</b> Black</p> <p><b>TRM490PC =</b> Polished Chrome</p>

## H7 1200 Series – SAMPLE NUMBER: H750TD010 – ML712827TUNVD010 – 494P06

Order Housing, LED Light Engine and Trim separately

Housing	LED Module				Trim Options	Accessories <i>(see product details for application information)</i>
		8		TUNVD010		
<p><b>H750TD010 =</b> 6" Dedicated LED Non-IC Housing, with 2-wire 0-10V DC Dimming Control Connection</p> <p><b>H750RTD010 =</b> 6" Dedicated LED Non-IC Remodel Housing, with 2-wire 0-10V DC Dimming Control Connection</p> <p><b>H750TCPD010 =</b> 6" Chicago Plenum Dedicated LED Non-IC Housing, with 2-wire 0-10V DC Dimming Control Connection</p>	<p><b>ML712 =</b> 6" LED Module, H7 Collection 1200 Series</p>	<p>8 = 80 CRI</p>	<p>27 = 2725°K</p> <p>30 = 3045°K</p> <p>35 = 3465°K</p> <p>40 = 3985°K</p>	<p><b>TUNVD010 =</b> Non-IC, 120V-277V UNV Module with 0-10V DC Dimming</p>	<p><b>494P06 =</b> Matte White Reflector, White Ring</p> <p><b>494WB06 =</b> White Baffle, White Ring</p> <p><b>494H06 =</b> Haze Reflector, White Die-Cast Trim Ring</p> <p><b>494SC06 =</b> Specular Reflector, White Ring</p> <p><b>492PS06 =</b> Frost Regressed Lens, White Baffle and Trim Ring, Shower Rated</p> <p><b>493WBS06 =</b> Solite® Regressed Lens, Upper Reflector, White Baffle and Ring with Antimicrobial Paint (Standard), Shower Rated</p> <p><b>493SCS06 =</b> Solite® Regressed Lens, Upper Reflector, Specular Clear Die-Cast Reflector and White Ring, Shower Rated</p> <p><b>493HS06 =</b> Solite® Regressed Lens, Upper Reflector, Haze Reflector and White Ring, Shower Rated</p> <p><b>493SNS06 =</b> Solite® Regressed Lens, Upper Reflector, Satin Nickel Reflector and Ring, Shower Rated</p> <p><b>493TBZ06 =</b> Solite® Regressed Lens, Upper Reflector, Tuscan Bronze Reflector and Ring, Shower Rated</p> <p><b>493BBS06 =</b> Solite® Regressed Lens, Black Baffle with White Ring, Shower Rated</p>	<p><b>OT400P =</b> Oversize White Metal Trim Ring 6" ID x 9-1/4" OD</p> <p><b>OT403P =</b> Oversize White Plastic Trim Ring 6" ID x 8" OD</p> <p><b>H347 =</b> 75VA Transformer - Steps 347 Line Voltage down to 120V <i>(see App. Note)</i></p> <p><b>Thin Profile Designer Trim Rings:</b></p> <p><b>TRM490WH =</b> White</p> <p><b>TRM490SN =</b> Satin Nickel</p> <p><b>TRM490TBZ =</b> Tuscan Bronze</p> <p><b>TRM490BK =</b> Black</p> <p><b>TRM490PC =</b> Polished Chrome</p>

Note: Specifications and dimensions are subject to change without notice.



### 3 Year Product Limited Warranty

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Cooper Lighting (The Company) warrants the HALO LED Modules, HALO LED housings and HALO LED trims against defects in material or workmanship for a period of three years from date of original purchase, and agrees to repair or, at the company's option, replace a defective product without charge for either replacement parts or labor during such time. This does not include labor to remove or install fixtures. If H7 Collection LED retrofit modules are installed in housings other than Halo or ALL-Pro, the Cooper Lighting 3-year warranty applies to the LED Module and LED trim only.

This warranty is extended only to the original purchaser of the product. A purchaser's receipt or other proof of date of original purchase acceptable to the Company is required before warranty performance shall be rendered.

This warranty only covers product failure due to defects in materials or workmanship which occurs in normal use. It does not cover the failure of product caused by accident, misuse, abuse, lack of reasonable care, alteration, or faulty installation, subjecting the product to any but the specified electrical service or any other failure not resulting from defects in materials or workmanship. Damage to the product caused by separately purchased, non-Company supplied components and corrosion or discoloration of components are not covered by this warranty. There are no express warranties except as described above.

THE COMPANY SHALL NOT BE LIABLE FOR INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THE PRODUCT OR ARISING OUT OF ANY BREACH OF THIS WARRANTY. ALL IMPLIED WARRANTIES, IF ANY, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE DURATION OF THIS EXPRESS WARRANTY.

Some states do not allow the exclusion or limitation of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions or limitations may not apply to you.

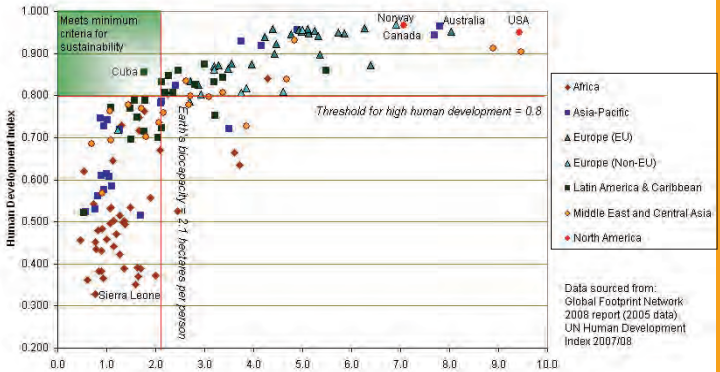
No other warranty, written or verbal, is authorized by the Company. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

To obtain warranty service, please write to Cooper Lighting, 1121 Highway 74 South, Peachtree City, Georgia 30269. Enclose product model number and problems you are experiencing, along with address and telephone number. You will then be contacted with a solution or a Return Goods Authorization number and full instructions for returning the product. All returned products must be accompanied by a Return Goods Authorization Number issued by the Company and must be returned freight prepaid. Any product received without a Return Goods Authorization Number from the Company will be refused.

Cooper Lighting is not responsible for merchandise damaged in transit. Repaired or replaced products shall be subject to the terms of this warranty and are inspected when packed. Evident or concealed damage that is made in transit should be reported at once to the carrier making the delivery and a claim filed with them.

Sustainability: Meet the needs of the present generation without compromising the ability of future generations to meet their own needs.

## Human Welfare and Ecological Footprints



The chart is a graphic presentation showing what is necessary for countries to maintain an acceptable standard of living while also living at a globally sustainable level. On a global scale it is critical to know whether humanity is living within the carrying capacity of the planet – are humans living sustainably on planet Earth? The Ecological footprint measures human consumption in terms of the biologically productive land needed to provide the resources, and absorb the wastes of the average global citizen.

In 2008 it required 2.7 global hectares per person, 30% more than the natural biological capacity of 2.1 global hectares (assuming no provision for that needed for other organisms). The resulting ecological deficit must be met from unsustainable sources - use of stored resources including fossil fuels, and "mining" natural resources including coal, forests and fisheries at greater than their rate of regeneration. The figure (top) indicates the sustainability of a range of countries in terms of the Ecological Footprint compared to the UN Human Development Index (a measure of standard of living). [1]

The technology of Light Emitting Diodes (LED's) offer future generations access to the natural resources we enjoy today to maintain our standard of living. SustainabLEDesign™, Cooper Lighting's initiative demonstrating the impact of sustainable LED luminaires, teaches lighting consumers both monetary and non-monetary effects when selecting LED solutions to solve lighting needs.

Energy and maintenance are primary monetary values consumers can tangibly measure when selecting lighting products. Intangible metrics are the impact of disposal and emissions of toxic materials that, when improperly disposed, can leach into the natural water supply and emit greenhouse gases that affect the earth's climate.

The HALO LED offers new solutions to save energy, extend maintenance cycles, and provide controls that dramatically create sustainable lighting designs. Join Cooper Lighting's continued efforts to be environmentally responsible while offering consumers a financial return on their investment.

[1] <http://en.wikipedia.org/wiki/Sustainability>

## SustainabLEDesign™ - HALO LED

- 75% less energy than a 65W BR30 incandescent lamp. (e.g. 600 series ML706830)
- Provides 70% of initial lumens at 50,000 hours while over 35 incandescent lamps rated at 2,000 hours would have to be replaced in the same time period.
- RoHS compliant meaning it does not contain mercury, lead or PCB's
- Reduces the following greenhouse gasses generated during electricity production.
  - Carbon Dioxide (CO<sub>2</sub>)
  - Methane Gas (CH<sub>4</sub>)
  - Nitrous Oxide (N<sub>2</sub>O) - Fluorinated gases such as hydrofluorocarbon, Perfluorocarbon and Sulfur Hexafluoride (ozone-depleting substances - i.e. CFCs, HCFCs and halons).

# SustainableLEDDesign™

Sustainable products should demonstrate that they are either recyclable, refurbishable or biodegradable. The materials used should not contain known hazardous material as identified by RoHS.

## Halo LED Heat Sink Module

- Aluminum heat sink
- LED package consisting of aluminum, InGN diodes, silicone, gold wire and phosphors
- Copper wire with THHN insulation
- Nylon and polycarbonate plastics



## Driver

- Potted electronics assembly



## Housing

- Considered a permanent part of the installation and unlikely to be removed
- Housings are a mix of steel and aluminum parts



## Trim

- Trim ring and reflector are made of aluminum
- Glass lenses are used on some trims



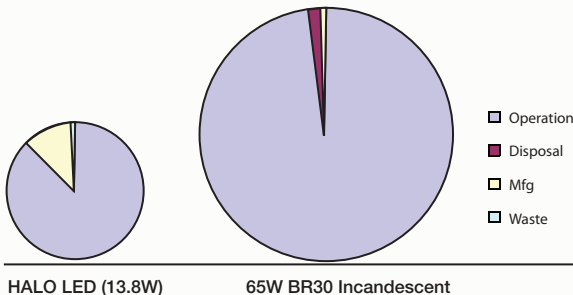
Sustainability considers the impact on the environment during operation. The table below provides a relative indicator on the introduction of hazardous materials and greenhouse gases when various lighting systems are used. HALO LED lighting provides the lowest impact for the delivered lumens (around 650 lumens for Halo LED 600 Series) as outlined in the table below.

	System wattage	CO <sub>2</sub> <sup>1,2</sup>	NO <sup>1,3</sup>	SO <sub>2</sub> <sup>1,4</sup>	Mercury	PCB's	Lead
Halo LED	13.8	1,129	2	7	None	None	None
26W CFL	28	2,298	4	15	<0.02 <sup>5</sup>	None	<0.4
100W A19	100	8,189	14	52	None	None	Traces <sup>6</sup>
65W BR30	65	5,322	9	34	None	None	Traces <sup>6</sup>

<sup>(1)</sup> Pounds per 50,000 hours per luminaire. <sup>(2)</sup> CO<sub>2</sub> = Carbon dioxide <sup>(3)</sup> NO = Nitrogen Oxide <sup>(4)</sup> SO<sub>2</sub> = Sulfur dioxide <sup>(5)</sup> % by weight <sup>(6)</sup> From solder connections

# SustainableLEDDesign™

Sustainable solutions also evaluate the amount of natural resources consumed during the life cycle of the product. Halo LED 600 Series, for example, is considerably better than the 65W BR30 recessed downlight that delivers around 650 lumens.



The chart indicates the impact of these products to the overall consumption of natural resources. As shown, the Halo LED 600 Series reduces the consumption of natural resources as compared to a 65W BR30.

[Note that public research funding from independent researchers have been made available with the goal to develop measurement systems that determine natural resource consumption for various products. Prestigious universities are leading this effort. We should expect further refinement over time since this is a new field of study.]

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**The Cooper Lighting Family**

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