

FAQs

Below are some common comments and frequently asked questions that are raised when discussing Seesmart LED products and customer service. Contact Seesmart at 1-877-578-2536 between 9 a.m. to 5 p.m. PST, Monday through Friday and/or visit www.seesmartled.com for more information.

Basic LED Terminology Q&A

Why use LEDs?

Here are just some of the basic benefits and advantages of using LEDs for general illumination:

- LEDs (Light-Emitting Diodes) are approximately 10 times more efficient than incandescent bulbs at turning energy into light.
- LEDs can emit light of an intended color without the use of color filters that traditional lighting methods may need.
- The solid package of an LED can be designed to focus its light from the source. Incandescent and fluorescent lights often require an external reflector to collect light and direct it in a usable manner.
- When used in applications where dimming is required, LEDs do not change their color tint as the current passing through them is lowered, unlike incandescent lamps, which turn yellow.
- LEDs are ideal for use in applications that are subject to frequent on-off cycling, unlike fluorescent lamps that burn out more quickly when cycled frequently.
- LEDs produce more lumens per watt than traditional incandescent bulbs.
- Since LEDs are solid state electronic components, they are difficult to damage with external shock. Fluorescent and incandescent bulbs are easily broken if dropped on the ground or experience extreme shock or vibration.
- LEDs can be designed to have extremely long life spans of 30,000 to as many as 100,000 hours. By contrast, fluorescent tubes typically are rated at about 10,000 hours, and incandescent light bulbs at 1,000-2,000 hours.
- LEDs mostly fail by dimming over time, rather than the abrupt burn-out of incandescent bulbs.
- LEDs light up to full brightness very quickly compared to other light sources.
- LEDs are typically very small, allowing for new design concepts and methods for general illumination products.
- LEDs do not contain mercury, as compact fluorescent lamps do.

Watts vs. Lumens

A watt is the measure of power consumption, and is the common way incandescent light bulbs are identified -- for example 60-watt, 75-watt and 100-watt. When purchasing a light bulb, however, what you really should look for is lumens, which is the measure of light output. When you purchase a 60-watt incandescent bulb, you are getting about 800 lumens. Due to the way that LEDs produce light, it is possible that an LED bulb or fixture that produces less lumens can appear just as bright if not brighter than the original light source being replaced.

Seesmart Customer Q&A

How can I get information about Seesmart products?

Here are a few ways to find information about Seesmart products:

- Go to the www.seesmartled.com website. The website contains information about LED technology, product specification sheets, and supporting documentation for products and services.
- E-mail support@seesmartled.com with specific questions.
- Call Seesmart Corporate Headquarters at 1-877-578-2536 with specific questions.
- Contact your local Seesmart Distributor or Dealer.

I have a Seesmart product that seems to be not working properly. What should I do?

Customers that bought their product through one of Seesmart's Distributors or Dealers must contact and process their return through their dealer or distributor. Customers that purchased their product directly from Seesmart may do the following:

1. Contact Seesmart for an Return Merchandise Authorization (RMA) Number Request form by calling 1-877-578-2536 or e-mailing returns@seesmartled.com.
2. Fill out the RMA form and send it to returns@seesmartled.com or fax it to the number on the form along with the invoice from the original sale.
3. Seesmart will issue an RMA number that you can write on the form as well as the outside of the box you ship back to Seesmart.
4. Seesmart will send you shipping labels electronically to cover shipping costs via ups.com to the email address noted on the RMA form.
5. Once defective product is received by Seesmart and is proven defective, Seesmart will enter an order for the replacement and use the RMA number as the PO number.

Seesmart LED Product Q&A – All Products

What does Seesmart do for heat sinking, thermal management, and LED junction temperature

Seesmart engineers its products with quality and durability as a top priority. Careful design and consideration goes into designing the appropriate thermal management system to more than adequately handle the heat that is generated at the light source chip and by the LED driver electronics to prevent damage and premature failure. Heat sinks are developed and made for each specific application to maximize the surface area for maximum cooling action. Methods for mounting and maintaining the thermal contact of components to the specially-designed heat sinks include using specific thermal greases and thermal tapes, as well as maximizing the layout of the components to take advantage of the thermal management features while maintaining good product aesthetics. All of these considerations are made for current and future products in development to make sure that LED performance degradation is minimized over the useful lifetime of the product.

What are the color temperature stability, CRI, and “binning” policies of the LEDs used in Seesmart products?

Seesmart factories selectively choose only top quality LED direct manufacturers and trustworthy suppliers for high quality LEDs that meet the desired and/or required design specifications for each product. Only LEDs that consistently and accurately perform according to the specifications for the product are procured for use in the lamps and luminaires. The LEDs are tested for chromaticity (color) and luminous flux (brightness) and then sorted before they are packaged and shipped from their respective factory ready to use per the product application requirement (i.e. on roll for pick and place machine or insertion machine, in bin/box for manual application, blister-pack, etc.).

How long is the warranty for Seesmart products?

Seesmart offers a full three (3) year warranty on residential products and a full five (5) year warranty on commercial/industrial products. Contact your Seesmart representative for a complete copy of the warranty statement and for warranty coverage on a particular Seesmart product.



Technical Bulletin

Do photometric tests follow IESNA LM79-08 methods?

While Seesmart performs its own qualification and performance testing for all of its products, Seesmart ships their products to a number of different independent laboratories for performance and safety testing. For photometric testing in particular, most products are sent to Lighting Sciences, Inc. in Arizona to complete a full complement of color and basic photometric testing that is done according to IESNA (Illuminating Engineering Society of North America) LM79-08 specifications and procedures. Complete test reports and IES design files are available for most Seesmart products.

How are life expectancy and lumen maintenance testing performed? Does Seesmart follow IESNA LM 80-08?

Seesmart performs careful analysis of the components specified for a given product to ensure utmost quality and durability for the product in a given intended environment. Seesmart evaluates the long-term performance of a given product using simulated long-term tests in specific environments (temperature cycling), real-life and real-time testing, and running calculations based on operating performance (spectral shift non-contact calculations, Lumen measurement over time estimations, and other formulas) to estimate longevity of the lumen output. Improvements in testing methods and standardizing the testing procedures in all manufacturing locations according to Seesmart criteria are made on a regular basis.

The specification sheets do not say who the manufacturer of the LED's are, or if they have been tested to LM79 or LM80 (which are the IES standards for testing LED's).

We do indeed have our products tested according to IESNA LM79-08 when getting photometric test reports and IES files generated by the third party test lab we use. They are certified and approved by the Department of Energy to carry out this testing. IESNA LM80-08 test data is somewhat difficult to come by, but we do obtain and/or test all relevant data as it is available. It does take time to complete this testing, which amounts to life testing essentially, and then takes time to generate the reports according to the standards. In the meantime, we do have data available from testing that is carried out for various LEDs that are used in the various products that Seesmart offers. The LEDs and their manufacturers used vary with products. We only use quality LEDs from quality LED manufacturers such as Cree, Bridgelux, Epistar, and Nichia.

What kind of board design and solder are being used?

Seesmart driver electronics Printed Circuit Boards (PCB) are laid out to optimize the available space as well as maintain operating efficiencies (mainly thermal). Some driver PCBs use FR4 circuit boards for thru-hole and surface mount LED components, while select products use a special metallic board when necessary. Depending on the construction methods, quantities, and manufacturing equipment available, driver components and/or LEDs may be wave soldered, reflow soldered, or even hand soldered using high quality solder based on the application.

What is the driver design used in Seesmart products?

Seesmart chooses high quality components in the design and the layout of the driver components. Driver footprint for each product is a key to product look and feel, however, the performance of the driver is more important. Longevity, which includes both time and quality of light output considerations, is part of the key to having a quality product. The life of the product is only as long as the weakest component. Along with that, the design of the driver allows for a lot of flexibility and capabilities to be built in for the end user. Seesmart is continuously looking at ways to provide more usability and features that will allow their LED light product(s) to be used in many environments (hot, cold, inside, outside, damp, hazardous (explosive), etc.) and be compatible with many different lighting control systems (i.e. dimmers, daylight harvesting control systems, and point-of-use motion/light sensing units, etc.). Check with your Seesmart representative for listing of what products are rated or certified for particular operating environments.

Whose chips are being used in Seesmart products and what is lumen output?

Seesmart uses different LED chips from Cree, Nichia, and Bridgelux for different applications, based on the needs, looks, and requirements for the particular product. Lumen output is of course a function of the type and quantity (if more than one) of LED chip being used. Please refer to the specification sheet for the desired product for the expected lamp/luminaire Lumen output.

What standards and regulations does Seesmart adhere to for its products?

Recent political and legislative changes along with unstable global economies has dictated a more rapid adoption of Solid State Lighting solutions. Array LED replacement lamps offer a high quality, extremely efficient solution and are currently tested to the following standards supported by the Department of Energy.

- IESNA LM-79 - Electrical and Photometric Measurements (Standard in final review)
- ANSI C78.377A - Specification for Chromaticity of White SSL Products (Under initial committee review)
- IESNA LM-80 - Lumen depreciation - Lifetime for LED chip only. This does not cover the performance of the entire LED system within a lamp/fixture. Lamp/Fixture life performance will be addressed by IESNA TM-21 when it is done and released.
- UL 8750 – Standard for LED products.
- ANSI C78.377A - Specification for Chromaticity of White SSL Products (Under final revision)
- ANSI C78.377B - Specification for Chromaticity of “Broader Range” White SSL Products (Under initial committee review)
- NEMA/ANSI C82.XX1 – Specification for power supply/driver.
- UL standard OOLV - This category covers products employing light-emitting-diode (LED) lamp technologies, with a driver or power supply, intended for direct connection to a lampholder. This category also covers products employing LED lamp technologies with control circuitry but without a driver or power supply for connection to a lampholder for alternating- or direct-current supplies.
- IEC 61000-4-5 - Electromagnetic Compatibility (EMC), Testing and Measurement Techniques – Surge Immunity Test
- IEC 61000-4-12 - Electromagnetic Compatibility (EMC), Testing and Measurement Techniques – Ring Wave Immunity Test

What Seesmart products are UL listed?

The following products are currently UL listed. Additional products will be added as testing is completed.

| SKU | Description |
|--------|--|
| 160013 | 50W, CWC, Low Bay |
| 180055 | PAR38, 6W, WWC, 120V, 100 DEGREE |
| 180056 | PAR38, 6W, CWC, 120V, 100 DEGREE |
| 180057 | PAR38, 6W, WWC, 120V, 18 DEGREE |
| 180058 | PAR38, 6W, CWC, 120V, 18 DEGREE |
| 200032 | * TUBE LIGHT, 2 FOOT, 8W, WWF, SINGLE END POWER, 120V |
| 200033 | * TUBE LIGHT, 2 FOOT, 8W, DWF, SINGLE END POWER, 120V |
| 200034 | * TUBE LIGHT, 2 FOOT, 8W, CWF, SINGLE END POWER, 120V |
| 200035 | * TUBE LIGHT, 2 FOOT, 8W, NWF, SINGLE END POWER, 120V |
| 200036 | * TUBE LIGHT, 4 FOOT, 15W, WWF, SINGLE END POWER, 120-277V |
| 200037 | * TUBE LIGHT, 4 FOOT, 15W, DWF, SINGLE END POWER, 120-277V |

| SKU | Description |
|--------|--|
| 200038 | * TUBE LIGHT, 4 FOOT, 15W, CWF, SINGLE END POWER, 120-277V |
| 200039 | * TUBE LIGHT, 4 FOOT, 15W, NWF, SINGLE END POWER, 120-277V |
| 200040 | * TUBE LIGHT, 4 FOOT, 15W, WWC, SINGLE END POWER, 120-277V |
| 200041 | * TUBE LIGHT, 4 FOOT, 15W, DWC, SINGLE END POWER, 120-277V |
| 200042 | * TUBE LIGHT, 4 FOOT, 15W, CWC, SINGLE END POWER, 120-277V |
| 200043 | * TUBE LIGHT, 4 FOOT, 15W, NWC, SINGLE END POWER, 120-277V |
| 200044 | * TUBE LIGHT, 2 FOOT, 8W, WWC, SINGLE END POWER, 120V |
| 200045 | * TUBE LIGHT, 2 FOOT, 8W, DWC, SINGLE END POWER, 120V |
| 200046 | * TUBE LIGHT, 2 FOOT, 8W, CWC, SINGLE END POWER, 120V |
| 200047 | * TUBE LIGHT, 2 FOOT, 8W, NWC, SINGLE END POWER, 120V |
| 200048 | * TUBE LIGHT, 5 FOOT, 19W, WWF, SINGLE END POWER, 120-277V |
| 200049 | * TUBE LIGHT, 5 FOOT, 19W, DWF, SINGLE END POWER, 120-277V |
| 200050 | * TUBE LIGHT, 5 FOOT, 19W, CWF, SINGLE END POWER, 120-277V |
| 200051 | * TUBE LIGHT, 5 FOOT, 19W, NWF, SINGLE END POWER, 120-277V |
| 200052 | * TUBE LIGHT, 5 FOOT, 19W, WWC, SINGLE END POWER, 120-277V |
| 200053 | * TUBE LIGHT, 5 FOOT, 19W, DWC, SINGLE END POWER, 120-277V |
| 200054 | * TUBE LIGHT, 5 FOOT, 19W, CWC, SINGLE END POWER, 120-277V |
| 200055 | * TUBE LIGHT, 5 FOOT, 19W, NWC, SINGLE END POWER, 120-277V |
| 200056 | * TUBE LIGHT, 3 FOOT, 12W, WWF, SINGLE END POWER, 120-277V |
| 200057 | * TUBE LIGHT, 3 FOOT, 12W, DWF, SINGLE END POWER, 120-277V |
| 200058 | * TUBE LIGHT, 3 FOOT, 12W, CWF, SINGLE END POWER, 120-277V |
| 200059 | * TUBE LIGHT, 3 FOOT, 12W, NWF, SINGLE END POWER, 120-277V |
| 200060 | * TUBE LIGHT, 3 FOOT, 12W, WWC, SINGLE END POWER, 120-277V |
| 200061 | * TUBE LIGHT, 3 FOOT, 12W, DWC, SINGLE END POWER, 120-277V |
| 200062 | * TUBE LIGHT, 3 FOOT, 12W, CWC, SINGLE END POWER, 120-277V |
| 200063 | * TUBE LIGHT, 3 FOOT, 12W, NWC, SINGLE END POWER, 120-277V |
| 200068 | * TUBE LIGHT, 6 FOOT, 12W, WWC, SINGLE END POWER, 120-277V |
| 200069 | * TUBE LIGHT, 6 FOOT, 12W, DWC, SINGLE END POWER, 120-277V |
| 200070 | * TUBE LIGHT, 6 FOOT, 12W, CWC, SINGLE END POWER, 120-277V |
| 200071 | * TUBE LIGHT, 6 FOOT, 12W, NWC, SINGLE END POWER, 120-277V |
| 200076 | * TUBE LIGHT, 6 FOOT, 12W, WWF, SINGLE END POWER, 120-277V |
| 200077 | * TUBE LIGHT, 6 FOOT, 12W, DWF, SINGLE END POWER, 120-277V |
| 200078 | * TUBE LIGHT, 6 FOOT, 12W, CWF, SINGLE END POWER, 120-277V |
| 200079 | * TUBE LIGHT, 6 FOOT, 12W, NWF, SINGLE END POWER, 120-277V |

* Final approval pending.

What Seesmart products are Intertek (ETL) listed?

The following products are currently Intertek (ETL) listed. Additional products will be added as testing is completed.

| SKU | Description |
|--------|---|
| 120001 | * High Bay, 100W, DW, 120-277V |
| 200000 | Tube Light, 2 Foot, 8W, WWF, 120-277V |
| 200001 | Tube Light, 2 Foot, 8W, DWF, 120-277V |
| 200002 | Tube Light, 2 Foot, 8W, CWF, 120-277V |
| 200003 | Tube Light, 2 Foot, 8W, NWF, 120V |
| 200004 | Tube Light, 4 Foot, 15W, WWF, 120-277V |
| 200005 | Tube Light, 4 Foot, 15W, DWF, 120-277V |
| 200006 | Tube Light, 4 Foot, 15W, CWF, 120-277V |
| 200007 | Tube Light, 4 Foot, 15W, NWF, 120-277V |
| 200008 | Tube Light, 4 Foot, 15W, WWC, 120-277V |
| 200009 | Tube Light, 4 Foot, 15W, DWC, 120-277V |
| 200010 | Tube Light, 4 Foot, 15W, CWC, 120-277V |
| 200011 | Tube Light, 4 Foot, 15W, NWC, 120-277V |
| 200012 | Tube Light, 2 Foot, 8W, WWC, 120V |
| 200013 | Tube Light, 2 Foot, 8W, DWC, 120V |
| 200014 | Tube Light, 2 Foot, 8W, CWC, 120V |
| 200015 | Tube Light, 2 Foot, 8W, NWC, 120V |
| 200016 | Tube Light, 5 Foot, 19W, WWC, 120-277V |
| 200017 | Tube Light, 5 Foot, 19W, DWC, 120-277V |
| 200018 | Tube Light, 5 Foot, 19W, CWC, 120-277V |
| 200019 | Tube Light, 5 Foot, 19W, NWC, 120-277V |
| 200020 | Tube Light, 5 Foot, 19W, WWF, 120-277V |
| 200021 | Tube Light, 5 Foot, 19W, DWF, 120-277V |
| 200022 | Tube Light, 5 Foot, 19W, CWF, 120-277V |
| 200023 | Tube Light, 5 Foot, 19W, NWF, 120-277V |
| 200024 | Tube Light, 3 Foot, 12W, WWC, 120-277V |
| 200025 | Tube Light, 3 Foot, 12W, DWC, 120-277V |
| 200026 | Tube Light, 3 Foot, 12W, CWC, 120-277V |
| 200027 | Tube Light, 3 Foot, 12W, NWC, 120-277V |
| 200028 | Tube Light, 3 Foot, 12W, WWF, 120-277V |
| 200029 | Tube Light, 3 Foot, 12W, DWF, 120-277V |
| 200030 | Tube Light, 3 Foot, 12W, CWF, 120-277V |
| 200031 | Tube Light, 3 Foot, 12W, NWF, 120-277V |
| 200032 | * Tube Light, 2 Foot, 8W, WWF, Single End Power, 120V |
| 200033 | * Tube Light, 2 Foot, 8W, DWF, Single End Power, 120V |

| SKU | Description |
|--------|--|
| 200034 | * Tube Light, 2 Foot, 8W, CWF, Single End Power, 120V |
| 200035 | * Tube Light, 2 Foot, 8W, NWF, Single End Power, 120V |
| 200036 | * Tube Light, 4 Foot, 15W, WWF, Single End Power, 120-277V |
| 200037 | * Tube Light, 4 Foot, 15W, DWF, Single End Power, 120-277V |
| 200038 | * Tube Light, 4 Foot, 15W, CWF, Single End Power, 120-277V |
| 200039 | * Tube Light, 4 Foot, 15W, NWF, Single End Power, 120-277V |
| 200040 | * Tube Light, 4 Foot, 15W, WWC, Single End Power, 120-277V |
| 200041 | * Tube Light, 4 Foot, 15W, DWC, Single End Power, 120-277V |
| 200042 | * Tube Light, 4 Foot, 15W, CWC, Single End Power, 120-277V |
| 200043 | * Tube Light, 4 Foot, 15W, NWC, Single End Power, 120-277V |
| 200044 | * Tube Light, 2 Foot, 8W, WWC, Single End Power, 120V |
| 200045 | * Tube Light, 2 Foot, 8W, DWC, Single End Power, 120V |
| 200046 | * Tube Light, 2 Foot, 8W, CWC, Single End Power, 120V |
| 200047 | * Tube Light, 2 Foot, 8W, NWC, Single End Power, 120V |
| 200048 | * Tube Light, 5 Foot, 19W, WWC, Single End Power, 120-277V |
| 200049 | * Tube Light, 5 Foot, 19W, DWC, Single End Power, 120-277V |
| 200050 | * Tube Light, 5 Foot, 19W, CWC, Single End Power, 120-277V |
| 200051 | * Tube Light, 5 Foot, 19W, NWC, Single End Power, 120-277V |
| 200052 | * Tube Light, 5 Foot, 19W, WWF, Single End Power, 120-277V |
| 200053 | * Tube Light, 5 Foot, 19W, DWF, Single End Power, 120-277V |
| 200054 | * Tube Light, 5 Foot, 19W, CWF, Single End Power, 120-277V |
| 200055 | * Tube Light, 5 Foot, 19W, NWF, Single End Power, 120-277V |
| 200056 | * Tube Light, 3 Foot, 12W, WWC, Single End Power, 120-277V |
| 200057 | * Tube Light, 3 Foot, 12W, DWC, Single End Power, 120-277V |
| 200058 | * Tube Light, 3 Foot, 12W, CWC, Single End Power, 120-277V |
| 200059 | * Tube Light, 3 Foot, 12W, NWC, Single End Power, 120-277V |
| 200060 | * Tube Light, 3 Foot, 12W, WWF, Single End Power, 120-277V |
| 200061 | * Tube Light, 3 Foot, 12W, DWF, Single End Power, 120-277V |
| 200062 | * Tube Light, 3 Foot, 12W, CWF, Single End Power, 120-277V |
| 200063 | * Tube Light, 3 Foot, 12W, NWF, Single End Power, 120-277V |
| 200064 | Tube Light, 6 Foot, 23W, WWC, 120-277V |
| 200065 | Tube Light, 6 Foot, 23W, DWC, 120-277V |
| 200066 | Tube Light, 6 Foot, 23W, CWC, 120-277V |
| 200067 | Tube Light, 6 Foot, 23W, NWC, 120-277V |
| 200068 | * Tube Light, 6 Foot, 23W, WWC, Single End Power, 120-277V |
| 200069 | * Tube Light, 6 Foot, 23W, DWC, Single End Power, 120-277V |
| 200070 | * Tube Light, 6 Foot, 23W, CWC, Single End Power, 120-277V |
| 200071 | * Tube Light, 6 Foot, 23W, NWC, Single End Power, 120-277V |

| SKU | Description |
|--------|--|
| 200072 | Tube Light, 6 Foot, 23W, WWF, 120-277V |
| 200073 | Tube Light, 6 Foot, 23W, DWF, 120-277V |
| 200074 | Tube Light, 6 Foot, 23W, CWF, 120-277V |
| 200075 | Tube Light, 6 Foot, 23W, NWF, 120-277V |
| 200076 | * Tube Light, 6 Foot, 23W, WWF, Single End Power, 120-277V |
| 200077 | * Tube Light, 6 Foot, 23W, DWF, Single End Power, 120-277V |
| 200078 | * Tube Light, 6 Foot, 23W, CWF, Single End Power, 120-277V |
| 200079 | * Tube Light, 6 Foot, 23W, NWF, Single End Power, 120-277V |
| 200087 | * Tube Light, 4 Foot, 15W, WWF, 12V |
| 200088 | * Tube Light, 4 Foot, 15W, NWF, 12V |
| 200089 | * Tube Light, 4 Foot, 15W, CWF, 12V |
| 200090 | * Tube Light, 4 Foot, 15W, DWF, 12V |

* Final approval pending.

Do you manufacture your own LED packages, arrays, and modules, or do you purchase them? If you purchase them, what brand and model number of LED packages, arrays and modules do you purchase?

Seesmart specifies and then purchases LED chips, packages, arrays, and/or modules to fit the exact performance requirements on a product-by-product and/or product family basis. Seesmart uses top quality LEDs that have been proven over time and in many applications throughout the industry to ensure longevity and quality of light for the given intended application base. Top LED manufacturers such as Cree®, Nichia, Bridgelux, and Epistar are used in most applications. Contact Seesmart for a specific product's LED selection.

How were the life ratings of your LED offerings determined? Do the life ratings of your LED offerings differ from the life ratings of the LED packages, arrays and modules built into your offerings?

Until IESNA TM-21, Method for Estimation of LED, Life is developed and completed (end of 2010...?), Seesmart uses time based extrapolation and performance testing methods to corroborate theorized life projections. Accelerated life testing and life cycles for each component in a product build assembly are closely examined for additional verification. LED manufacturer provided IESNA LM80-08 testing data is also used to confirm overall product system lifetime performance based on the product build methods, materials, and driven-intensity. For example, LED lumen maintenance and other performance may be guaranteed by driving the LEDs at a current that is lower than the maximum rating.



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Were the life ratings / lumen maintenance of the LED packages, arrays and modules built into your LED offerings determined by an independent lighting laboratory in accordance with LM-80-08 procedures?

Lighting and other testing laboratories are developing capabilities and methods for testing LEDs according to IESNA LM80-08 standards. Until such services are available, which may also be tied into IESNA TM-21, Method for Estimation of LED Life, LED manufacturer-provided IESNA LM80-08 test reports must be used in conjunction with other product-based construction, materials, and driver evaluations to determine the longevity of the overall product in relation to the LED life expectancy. Seesmart is actively determining the availability for such testing services at various laboratories, and will utilize those services for products that do not have adequate full system and/or LED manufacturer-provided IESNA LM80-08 test reports available.

Has Seesmart submitted products to DOE's CALiPER program

Seesmart representatives have attended multiple seminars and workshops for the Department of Energy's CALiPER program in order to prepare and submit the information and product for testing to prove that LED products, Seesmart LED T8 Tubes in particular, are indeed ready for general interior lighting needs. Since the CALiPER program anonymously randomly selects and procures products for testing, Seesmart does not and cannot submit products for testing and evaluation.

Does Seesmart belong to the Quality Advocates program for DOE?

Seesmart is currently evaluating and determining the course of action necessary to join the Solid State Lighting Quality Advocates program for the Department of Energy. Seesmart is working on developing the Lighting Facts information and the layout of the label for incorporation into its packaging design and inclusion on our website when the full analysis is complete and Seesmart pledges its commitment to being a part of the program. No estimate for pledge is available at this time.

Are Seesmart LED products Energy Star qualified?

Seesmart is an Energy Star Partner that has been working on ensuring that relevant products that can be categorized and recognized in the lighting Energy Star categories. Check with your Seesmart representative for updates on when products are submitted and approved by Energy Star.

If most LED light levels are designed to only degrade less than 30% over 5 years (of continual non-stop use), what happens to the light after that? Like say 10 years?

Seesmart products that are under warranty for 5 years are typically designed to last more than 50,000 hours as far as the lumen level (light output) staying above the 70% (L_{70}) threshold rating. What typically happens is that most LED lights will continue to operate well beyond the 50,000 hours and just continue to do what LEDs do and get dimmer and dimmer over the years. Since it is gradual, it will actually be somewhat difficult to notice if you go in and out of the space on a regular basis. That is why future generations of our products will have light level sensors built in so that it can provide the feedback to the user when the light level has reached a certain level.

Can you tell me the difference between our product line being retro-fitted, installed, and used in the United States compared to other countries (i.e. size & shape of fixtures, bases, sockets, as well as power supplies; volts, hertz etc.)?

That is a little difficult to answer without knowing any specific products that may be in question. However, in general, our products are made to be as universal as possible. Many products work with 'universal voltage' so that the driver electronics will automatically work with any voltage from 95 VAC through 277VAC. Low voltage products usually work on 12V AC or DC. For the AC products, they are also able to work on 50 or 60 Hertz so that they are compatible with some of the different frequencies that may be found around the world. As far as connectors go, most products are made with the most common base/connector for the given family or application type. For instance, the tube lights utilize the medium bi-pin (G13) configuration which is standard for most T8 style fluorescent tubes. Screw-in bases typically will work with their close counterparts. For example, medium Edison screw in bases usually work for both 26 and 27 mm applications. This is true also for the Mogul E39/E40 base as another example.

Will Seesmart dimmable lamps work with ANY dimmer?

Seesmart dimmable lamps will work with most 120 VAC dimming switches and systems. However, some dimming systems require a minimum load to operate properly. Seesmart lamps are energy efficient and consume a low amount of power. With only a few LED lamps in a circuit, they may not meet the minimum load required for an existing dimming system. As a result the LED lamps may glow or may not dim properly. Please consult the manufacturer of the dimming system for minimum load requirements, or contact Seesmart to help you determine the proper dimming system to operate your LED lamps.

Seesmart LED Product Q&A – LED High Bay Lights

How susceptible are Seesmart LED High Bay lights to voltage spikes and brown outs, and how is fixture performance affected by them?

The electronics within the driver of the LED High Bay Lights has voltage suppression built in so that it will only take and handle the voltage it needs between 110-277 VAC. Over voltage is not a concern unless it is connected to power that is consistently higher than 305 volts, which typically means that there is a faulty transformer or other component within the power delivery system. However, note that it is not designed for 480 VAC operation. Brown outs or other consistent power cuts are fine with the LED High Bay Lights. It is capable of turning off and then turning right back on right away without any detrimental effects. In fact, instant on/off is one of the best features of the LED High Bay Lights. For instance, an occupancy (motion) sensor(s) may be used with the LED High Bay Lights so that the lights only turn on when there is activity within the area. We have been using an occupancy sensor on our LED High Bay Lights in our corporate warehouse for many months now without any problems whatsoever.

Are the 100W LED High Bay Lights (SKU #120001) UL approved?

Seesmart decided to utilize the safety certification services of Intertek to approve and mark (ETL mark) the entire 100W LED High Bay product line.



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The 100 watt LED fixture in the gym produces 6,000 lumens. The 6 lamp fluorescent fixture we purposed is 351 watts, and produces 26,400 lumens. If they are purposing a 1 for 1 replacement with the existing fixture, they end result will be less than $\frac{1}{4}$ the light they have now. If the school is looking to maintain the light level they have now, they will need 5 times the amount of fixtures they have now.

The quality of the light must also be factored in when comparing and evaluating the overall performance of a lighting product and application. While the rated output of fluorescent tubes and a given fixture that they are included in, the color temperature, visual effective lumens, and the distribution of that light must be taken into account. With the available color temperatures, lighting color and the output can be tailored more to a given environment and/or use of space. LED light is much more directional with all of the light being cast in the direction of the fixture/lamp mounting position instead of essentially 180 degrees of light being lost to the top/reflector. LED light also plays more to the scotopic part of the human eye, with a greater intensity as perceived by the human eye. We have placed high bay lights in many gymnasiums, warehouses, and other locations with 20-30' high mounting heights with fantastic outcomes and no complaints.

Seesmart LED Product Q&A – LED T8 Tube Lights

The linear tube light is listed at 15 watt and 1500 lumens. A standard T8 lamp is about 30 watts and rated at 2900 lumens. The High Performance T8 (HPT8) lamps that NYSERDA offers rebates for are 28 watts and 3100 lumens. The LED tube is offering half the wattage, but also half the light output. The lumen maintenance on the LED is about 70% (amount of light being emitted from the LED at end of life) versus about 90% for the T8 lamp. The HPT8 lamp has an average life of 36,000 hours with a cost of about \$4.00.

While it is possible for a good quality high performance HO fluorescent tube to last up to 36,000 hours, it is also conceivable that LEDs will maintain light levels will into and sometimes beyond the rated 50,000 hours in some cases. However, since LEDs do degrade over time, it is important to note the rated projected life of the LEDs compared to the fluorescent tubes. The 70% degradation may start to become measureable more in the 45-50K hour age of the product. ROI and savings calculations can be made to compare the savings over the life of the LED product compared to fluorescent products to determine the difference with LEDs over the life of the products. Rebate approval is in the works with many different utility companies and other agencies that will offer similar cost reimbursements and further savings.

I did an experiment where I took an LED tube lamp and connected an amp meter in series with it and plugged it into 120 volts and then into 208 volts. In both instances the current measured 0.17 Amps. So if you do the math, you get 12.24 Watts at 120 Volts and 21.216 Watts at 208 Volts. Am I missing something?

The Amperage measurements were most likely taken off of one phase of the 208 three phase service, which is 120 volts. Therefore, the current and ultimate power consumption would be the same as the measurement taken on the straight 120 volt single phase service. The 208 wye transformer is used a lot in commercial because it can be adapted to 120 volt lighting and then use the 208 volt power for air conditioning. Large 3 phase power equipment like AC is much cheaper in 3 phase configurations.



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What is color shift in Kelvin degrees over the following life of the LEDs at 10,000 hours, 25,000 hours, and 50,000 hours?

We are still collecting data on this especially since the amount of color and lumen depreciation are difficult to quantify through extrapolation only. From the data that has been collected from real time and then extrapolated from test data, there could be a slight color shift over the life of the product into more of the blue part of the color spectrum. However, the amount of shift and the time at which there is a measurable and/or detectable change has yet to be determined and can be most dependent on the color temperature selected.

What is the lumen depreciation over the following life of the LEDs at 10,000 hours, 25,000 hours, and 50,000 hours?

We are still collecting data on this despite extrapolation methods that can be used based on 1,000 and 6,000 hour testing. From the data that has been collected from real time and then extrapolated from test data, the tubes have been designed to last so that the lumen depreciation will be no more than 30% at the 50,000 hour mark in the tube's lifetime. We are working a system to be able to track hours of use and then the light output at various stages.

Does the warranty cover excessive color shifting, excessive lumen depreciation beyond the stated specifications that might occur?

We are currently working on methods and a system to be able to accurately and adequately establish and verify a claim system with regard to measuring, recording, and then re-measuring should a request or warranty claim be filed.