

# lighting facts

SSL Quality Advocates

## Label Reference Guide

This Guide is designed for retailers, distributors, lighting designers, utilities and energy efficiency organizations who regularly evaluate and select quality LED products for sale or promotion to consumers. The Lighting Facts™ label will allow the user to objectively compare one product's performance against manufacturer claims and other products.

### Comparing the Lighting Facts Label with IES LM-79 Test Results

Luminaire manufacturers who use the Lighting Facts Label with their products must represent the product performance values reported in the actual test results from IES LM-79: "Measuring Electrical and Photometric Performance of Solid-State Lighting Products." Lighting Facts LED Product Partners will need to ask luminaire manufacturers for their LM-79 test report to verify the accuracy of the reporting.

Figure 1 uses an [LM-79 Sample Test Report](#) to demonstrate that all of the essential information for the Lighting Facts label appears in the chart on page 5 of the report. Future versions of the Lighting Facts label may include additional metrics of quality, such as those related to reliability, product consistency, or construction.

**Light Output/Lumens**  
Measures light output. The higher the number, the more light is emitted.  
Reported as "Total Integrated Flux (Lumens)" on LM-79 test report.

**Watts**  
Measures energy required to light the product. The lower the wattage, the less energy used.  
Reported as "Input Power (Watts)" on LM-79 report.

**Lumens per Watt/Efficacy**  
Measures efficiency. The higher the number, the more efficient the product.  
Reported as "Efficacy" on LM-79 test report.

**IESNA LM-79-2008**  
Industry standardized test procedure that measures performance qualities of LED luminaires and integral lamps. It allows for a true comparison of luminaires regardless of the light source.

## Lighting Facts™

LED Product

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**Light Output (Lumens)** 840

**Watts** 9

**Lumens per Watt (Efficacy)** 93

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**Color Accuracy** 87  
Color Rendering Index (CRI)

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**Light Color** 2900 (Warm White)  
Correlated Color Temperature (CCT)

2700K 3000K 4500K 6500K

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Visit [www.lightingfacts.com](http://www.lightingfacts.com) for the Label Reference Guide.

All results are according to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

Brand X, 18756CHT56428954RGHT1234H3

**Color Rendering Index (CRI)**  
Measures color accuracy.  
Color rendition is the effect of the lamp's light spectrum on the color appearance of objects.

**Correlated Color Temperature (CCT)**  
Measures light color.  
"Cool" colors have higher Kelvin temperatures (3600–5500 K); "warm" colors have lower color temperatures (2700–3500 K). Color temperatures higher than 6500 are outside of the defined region for white light, but may be appropriate for outdoor applications.

Figure 1: LM-79 Chart Spectroradiometric Testing In Integrating Sphere	
PHOTOMETRIC	
Total Integrated Flux (Lumens)	407*
SPECTORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4302
Chromaticity Ordinate y	0.3840
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2550
Chromaticity Ordinate v'	0.5122
Correlated Color Temp CCT (K)	2945
Color Rendering Index (CRI)	96
Total Radiant Flux (milliWatts)	1579*
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (mA AC)	140
Input Power (Watts)	11
EFFICACY	
Lumens/Watt	37

## Why LM-79?

One of the most common misrepresentations of LED product performance is simply reporting the device performance without accounting for the influence of other components such as the driver, optics, and the overall luminaire design. Lighting metrics have traditionally compared light sources based on source efficacy, or rated lamp lumens divided by power into the “bulb.” This metric doesn’t apply to LEDs because these products have no standard lamp packages or lamp ratings and because LED performance depends on the thermal, electrical, and optical designs of the system or luminaire.

LM-79 is an industry standardized test procedure that specifies absolute photometry to measure performance qualities and luminaire efficacy of LED lighting products. Such an approach measures the amount of useful light generated by a luminaire divided by the amount of electricity needed to power it. This approach allows for a true comparison of luminaires and integrated lamps regardless of the light source.

## Assessing Product Quality

While the Lighting Facts label is a great tool for evaluating the quality of LED products, consider these additional queries as part of your product selection process:

- **Does the manufacturer use quality components?** Ask which LED chip or device supplier they use. There are just a few suppliers who make most of the LED chips. DOE partners with the following companies in conjunction with its SSL Commercialization program: Nichia, Cree, Lumileds, Osram and Seoul Semiconductor.
- **Does the luminaire manufacturer have the IESNA LM-80 test report?** The LED device supplier should have provided them with this report, which specifies a standard method for measuring lumen depreciation of LEDs. The report allows calculation of LED lifetime.
- **Is the warranty period sufficient?** If a manufacturer makes claims of very long lifetimes, they need to back those claims with long warranty periods.

- **Will the luminaire manufacturer provide you with a product sample?** Make sure it works to your own satisfaction. Compare it with the incumbent technology and other LED products.
- **Has the product been ENERGY STAR qualified?** Not all products will be eligible for ENERGY STAR initially, but products that are qualified are listed on the [ENERGY STAR qualified products list](#).