

Recommended Product Performance Scale (Residential)

Version 1.1

This Recommended Product Performance Scale is a tool to help evaluate LED products to determine whether they are appropriate for a given application. The Scale compares performance values for the characteristics identified on the Lighting Facts Label to performance values for those same characteristics in standard residential lighting technologies.



Brand X — **Brand**

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.

Registration Number
Model Number
Type

Color Accuracy
Color Rendering Index (CRI)

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.

| | | | |
|----------------------------|--|----------------------|----|
| Lighting Facts Label Data | | | |
| Light Output (Lumens) | 840 | Watts | 9 |
| Lumens per Watt (Efficacy) | 93 | Color Accuracy (CRI) | 87 |
| Light Color (CCT) | 2900 (Warm White) | | |
| Color Temperature Scale | Warm White (2700K) Bright White (3000K) Daylight (4500K) 6500K | | |

All results are according to IESNA LM-79-2008: *Approved Method for the Electrical and Photometric Testing of Solid-State Lighting*. The U.S. Department of Energy (DOE) verifies product test data and results.

Visit www.lightingfacts.com for the *Label Reference Guide*.

Registration Number: ABC435TH4792023
Model Number: 18756CHT56428954RGHT1234H3
Type: 18756CHT56428954RGHT1234H3

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.



| Replacement Lamps | | Lumen Output |
|--|------|---------------------|
| Incandescent Omnidirectional Lamps: These values are typically used when calculating CFL equivalencies, and are recommended for comparing LED replacement lamp performance. | 25W | ≥ 250 |
| | 40W | ≥ 450 |
| | 60W | ≥ 800 |
| | 75W | ≥ 1100 |
| | 100W | ≥ 1600 |
| Halogen Directional Lamps and Recommended LED Replacement lamp levels | | varies [†] |

| | |
|--|------|
| <i>L-Prize™ 60-W "A"-Type Lamp Target Level**</i> | 900 |
| <i>L-Prize™ PAR-38 Reflector Lamp Target Level**</i> | 1350 |

Indoor Fixtures

| | | |
|---|--------|----------|
| Fluorescent Under-cabinet Kitchen Lighting (typical) and Recommended equivalent LED luminaires | ≥ 125 | per ft |
| Portable Desk Task Lights with CFLs (typical) and Recommended equivalent LED luminaires | ≥ 200 | |
| Fluorescent Cove Lighting (typical) and Recommended equivalent LED luminaires | ≥ 200 | per ft |
| Surface-mounted Luminaires with Directional Heads and CFLs (typical), and recommended equivalent LED luminaires | ≥ 200 | per head |
| Downlights with CFLs and recommended equivalent LED luminaires (by diameter) | < 4.5" | ≥ 345 |
| | > 4.5" | ≥ 575 |
| Ceiling-mounted Luminaires with Diffusers and CFLs, and recommended equivalent LED luminaires (by max. width) | < 8" | ≥ 375 |
| | > 8" | ≥ 750 |

Outdoor Fixtures

| | |
|--|-------|
| Step lights with CFLs and Recommended equivalent LED luminaires | ≥ 50 |
| Path lights with CFLs and Recommended equivalent LED luminaires | ≥ 100 |
| Wall-mounted porch lights with CFLs and Recommended equivalent LED luminaires | ≥ 150 |
| Outdoor pole/arm-mounted decorative luminaires and Recommended equivalent LED luminaires | ≥ 300 |

Note: recommended LED equivalency levels and performance data for incandescent, halogen, and fluorescent products were based on benchmark testing of conventional light sources by Pacific Northwest National Laboratory (PNNL) on behalf of the DOE Solid-State Lighting Program. The levels were used in the development of the initial ENERGY STAR SSL Luminaires and Integral LED Lamps criteria.

*Light output values for luminaires are derived from testing the entire luminaire (light source and fixture) and evaluating and losses that occur.

**The L Prize (www.lightingprize.org) is the first government-sponsored technology competition designed to spur lighting manufacturers to develop high-quality, high-efficiency solid-state lighting products to replace the common light bulb. There are currently no products on the market that meet the strict requirements of the competition.

† The recommended LED directional replacement lamp lumen level is equal to the target incandescent/halogen wattage multiplied by 10.

Efficacy (Lumens per Watt)

Measures efficiency. The higher the number, the more efficient the product.*

Reported as "Efficacy" on LM-79 test report.



| Replacement Lamps | | Lumens per watt |
|---|---------|-----------------|
| Incandescent | | 8-12 |
| Halogen | | 8-18 |
| CFL Reflector Lamps | | ≥ 33 |
| Recommended equivalent LED Decorative Lamp level | | ≥ 40 |
| Recommended equivalent LED Directional Lamp level (by diameter) | ≤ 20/8" | ≥ 40 |
| | > 20/8" | ≥ 45 |
| Recommended equivalent LED Omnidirectional Lamp level | < 10W | ≥ 50 |
| | ≥ 10W | ≥ 55 |
| Omnidirectional CFL lamps (typical) | < 10W | ≥ 50 |
| | 10-15W | ≥ 55 |
| | >15W | ≥ 65 |
| <i>L-Prize™ 60-W "A"-Type Lamp Target Level**</i> | | 90 |
| <i>L-Prize™ PAR-38 Reflector Lamp Target Level**</i> | | 123 |

Indoor Fixtures

| | |
|---|-------|
| Downlight Fixtures with Incandescent or Halogen Lamps | 5-15 |
| Halogen Track Lights | 9 |
| Downlight Fixtures with CFL Lamps | 20-35 |
| Fluorescent Under-Cabinet Kitchen Lighting and Recommended equivalent LED luminaires | ≥ 24 |
| Portable Desk Task Lights with CFLs and Recommended equivalent LED luminaires | ≥ 29 |
| Ceiling-mounted Luminaires with Diffusers and CFLs, and Recommended equivalent LED luminaires | ≥ 30 |
| Recommended equivalent LED Downlights | ≥ 35 |
| Recommended equivalent LED Surface-Mounted Luminaires with Directional Heads | ≥ 35 |
| Fluorescent Cove Lighting and Recommended equivalent LED luminaires | ≥ 45 |

Outdoor Fixtures

| | |
|--|------|
| Halogen Step Lights | 8 |
| CFL Step Lights | 16 |
| Recommended equivalent LED step lights | ≥ 20 |
| Wall-Mounted Porch Lights with CFLs and Recommended equivalent LED luminaires | ≥ 24 |
| Pathway Lights with CFLs and Recommended equivalent LED luminaires | ≥ 25 |
| Pole/Arm-Mounted Decorative Luminaires with CFLs and Recommended equivalent LED luminaires | ≥ 35 |

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*Efficacy values for replacement lamps correspond to lamp efficacy, while values for luminaires correspond to luminaire efficacy, which is derived from testing the entire luminaire and takes into account light losses from luminaire optical components.

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Color Rendering Index (CRI)

Measures color accuracy.

Color rendition is the effect of the lamp's light spectrum on the color appearance of objects.



| Color Rendition | Notes | CRI |
|-----------------|---|------|
| Poor | Not suitable for most applications | < 70 |
| Fair | Acceptable for some applications | ≥ 70 |
| Good | Typical CFLs* | ≥ 80 |
| Very Good | <i>L-Prize™ target level**</i> | 90 |
| Best Possible | Equivalent to incandescent lamp quality | 100 |

* Based on benchmark testing of conventional light sources by Pacific Northwest National Laboratory (PNNL) on behalf of DOE Solid-State Lighting Program.

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