

This technical topic provides minimum standards and acceptable assumptions for energy savings when specifying LED lamps as replacements for general purpose screw-in A-shape incandescent lamps.

### Minimum Standards

Replacement screw-in LED lamps must be omni-directional, ENERGY STAR® certified, and have a minimum efficacy of 70 lumens per watt.

### Modeling Protocols

The assumed reduction in wattage for replacement of incandescent lamps with generic, minimally compliant LEDs should be no more than 4.5:1. For example, a fixture using two 60W lamps should be modeled as  $120/4.5=27W$  after a retrofit with LEDs.

### Suggested Best Practices

When specifying LED replacements, aim for a lumen output within the range expected of the incandescent lamp being replaced (see reference table on page 2). Additionally, aim for a correlated color temperature (CCT) under 3500K to increase consumer acceptance.

### Sample Measure Description

“Replace all existing screw-in incandescent lamps with LEDs that are ENERGY STAR® rated, with an efficacy of greater than or equal to 70 lumens per watt and of equal or greater lumen output, and having a CCT less than 3500K and in a similar range as the removed lamps.”

Typical Light Output Reference Table



Rated Wattage of Incandescent Lamp	Light Output (Lumens)
25	250-449
40	450-799
60	800-1,099
75	1,100-1,599
100	1,600-1,999
125	2,000-2,549
150	2,550-3,000
200	3,001-3,999
300	4,000-6,000

### References

1. ENERGY STAR® Program Requirements for Light Bulbs: 9.2. Light Output: Omnidirectional ENERGY STAR Requirements: <http://tinyurl.com/ProgramReqs>
2. ENERGY STAR® Certified Light Bulbs: <http://tinyurl.com/CertifiedLightBulbs>
3. Image Labeled for reuse by Team Earth LED <http://tinyurl.com/jwa89aa>