

MORE THAN JUST A PRETTY BULB

How ENERGY STAR® Means Quality

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ENERGY STAR Certified Lamps



= Quality

= Acceptance

Transitioning from Incandescent



<http://www.shopviribright.com/viribright-announces-line-energy-star-certified-a19-led-light-bulbs/>

Acceptance, yes, but delight is even better



= Quality

= Acceptance

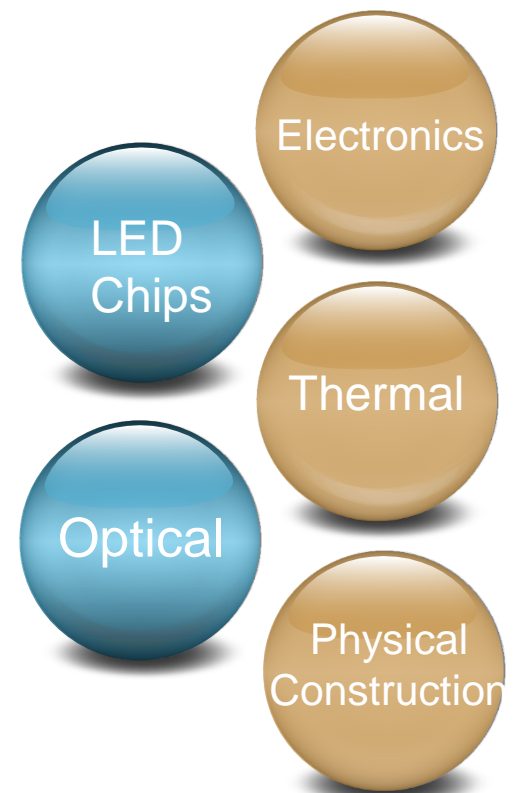
= Delight

How does an ENERGY STAR certified lamp ensure delight?

With the design and construction of lamps that meet and exceed thoroughly vetted, consensus based, technical requirements that confirm parametric **PERFORMANCE**

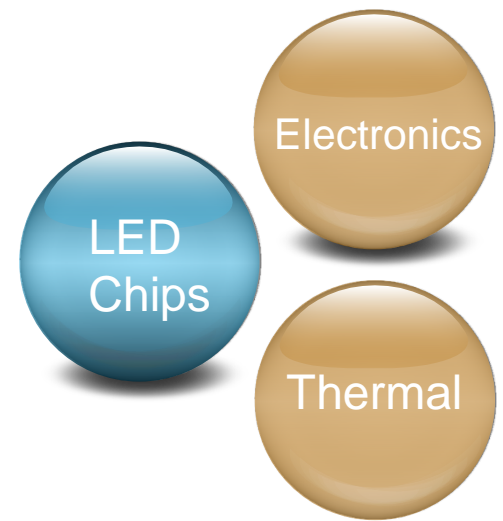
Designing for Performance

- Electronics
- LED Chips
- Thermal Management
- Optics
- Physical Construction



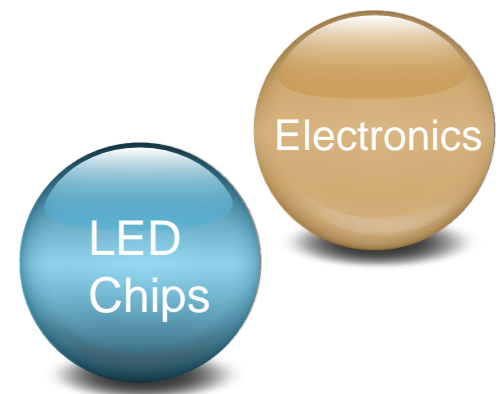
Color Appearance

- CCT limited to nominal values, including 2700K, 3000K, 3500K, 4000/4100K, 5000K, and 6500K
- 7-step limitation to ensure color consistency within a CCT bin
- 0.007 Du'v' distance limitation to ensure minimal color shift over time



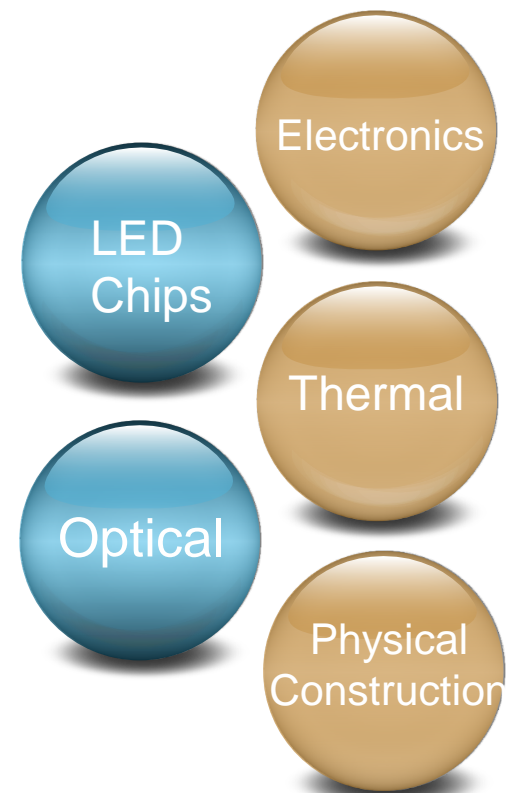
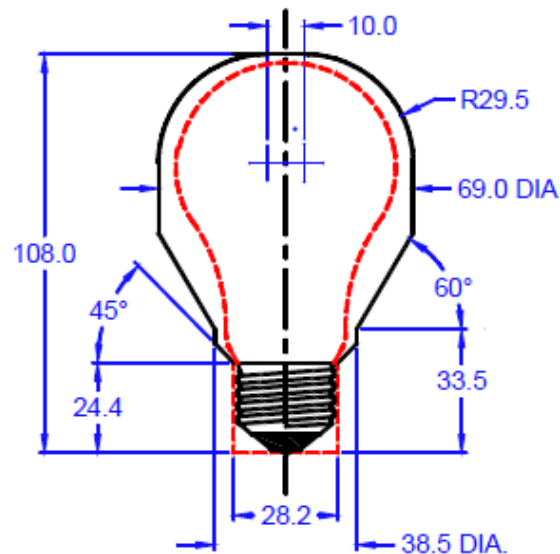
Color Rendition

- Minimum Ra value of 80 out of 100
- Many LED Lamps with 90+ CRI
- Positive R9 required for LED lamp

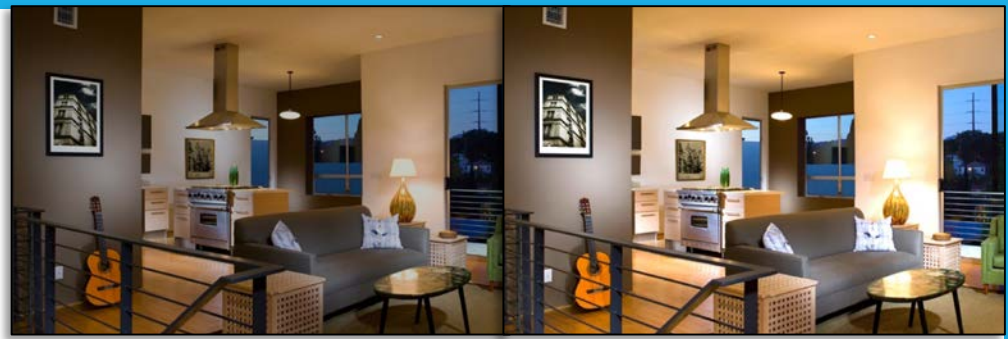


Fit

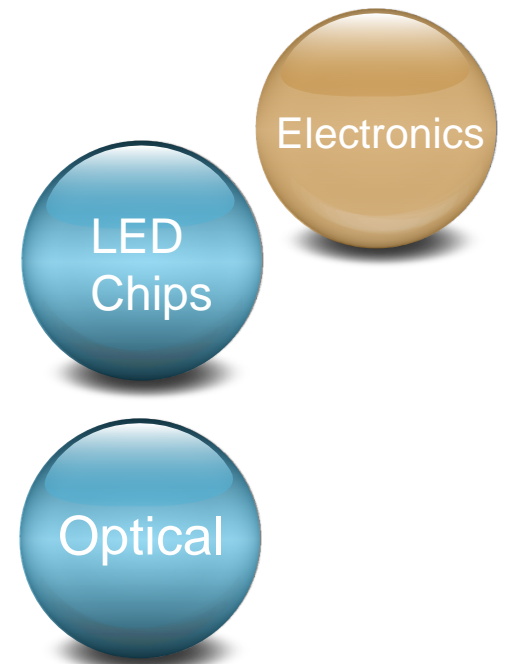
- Maximum and minimum lengths per industry standards
- Maximum diameter per industry standards



Light Output

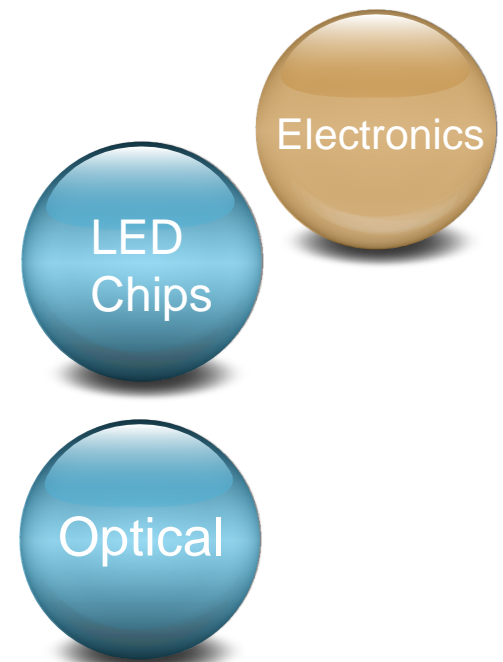
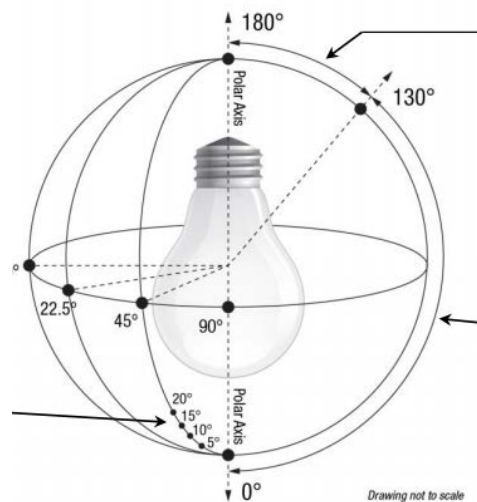


- Lumen range aligned with light output of traditional incandescent wattages
- Range specified – not too little and not too much
- Designed with just the right chips, driven at the right level



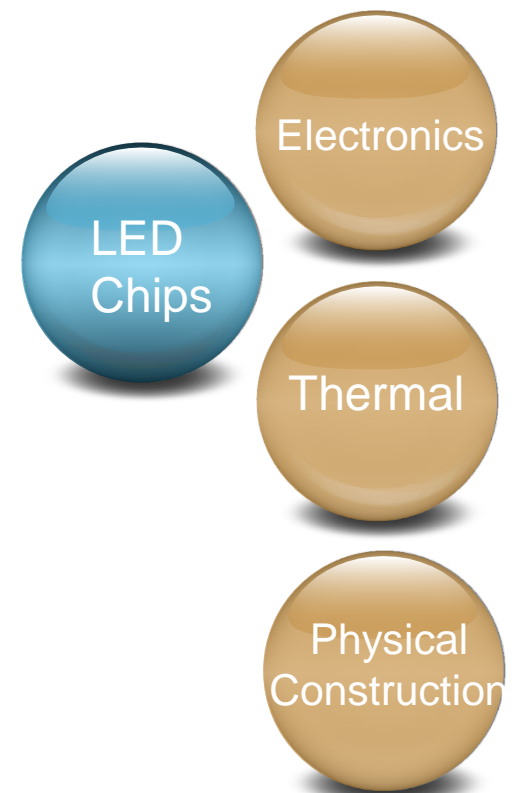
Light Distribution and Intensity

- Is the light where you expected?
 - Omnidirectional
 - Directional
- Do directional sources properly highlight objects?



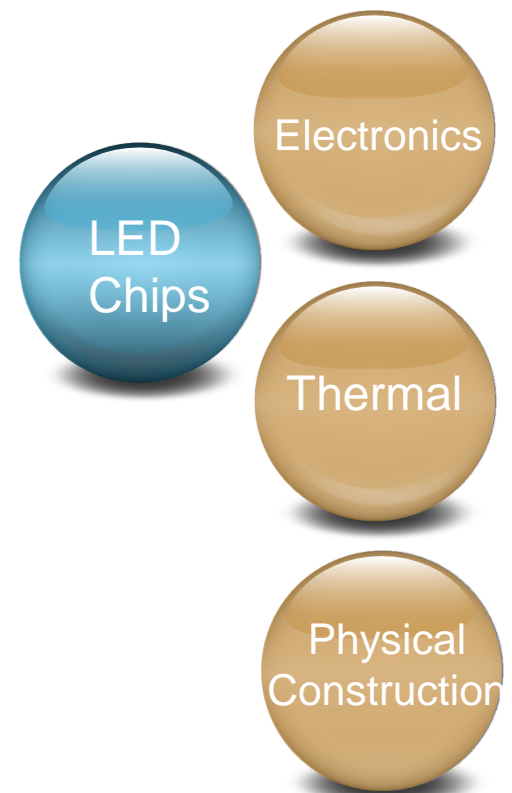
Product Lifetime

- ENERGY STAR Ambient and Elevated Temperature Life test is an evaluation of the lamp design and construction
- 6,000 hours with limited lumen depreciation



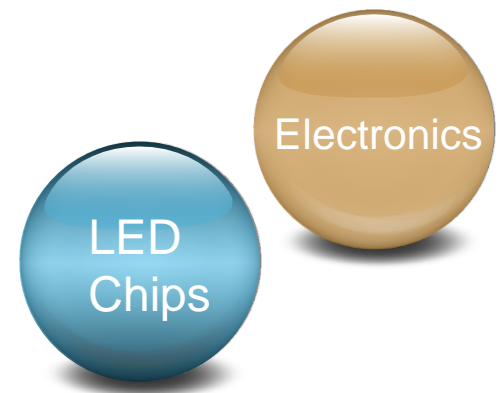
Testing for Anticipated Conditions

- Performance in downlights
- Performance in enclosed luminaires



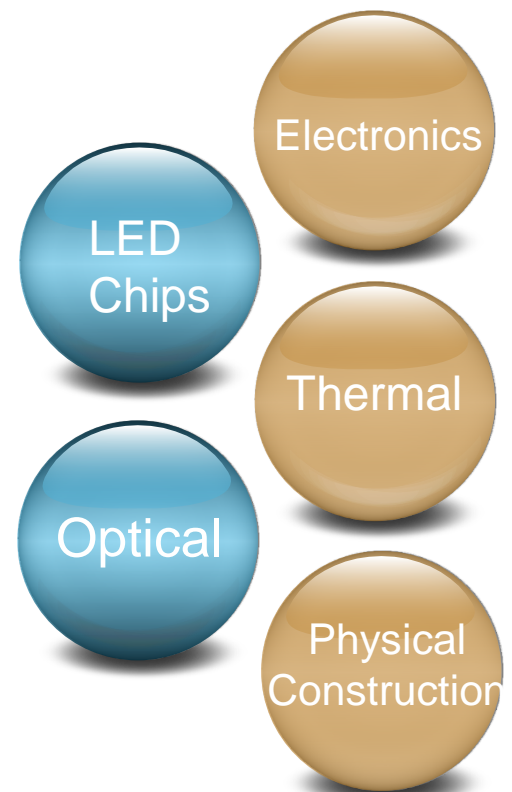
Controllability

- Dimming
- Color Tuning



Risks without ENERGY STAR

- Unexpected performance to unacceptable performance



Questions?

