

Light quality of LED light bulbs

March 2014

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WHAT CONSTITUTES
QUALITY LIGHT?

1

Even light distribution

A high quality LED light bulb is able to evenly distribute the bright, highly concentrated light—with a flux of 200x that of halogen—within a very limited emitting area. The challenge is not only in redistributing the point light, but in ensuring it is uniform in order to create an even light (acceptable light curve).



Multi-LED lens
= hot spots and uneven light



Bad



Single source LED with Intelligent Optics
= even light distribution



Good

2

Anti-glare technology

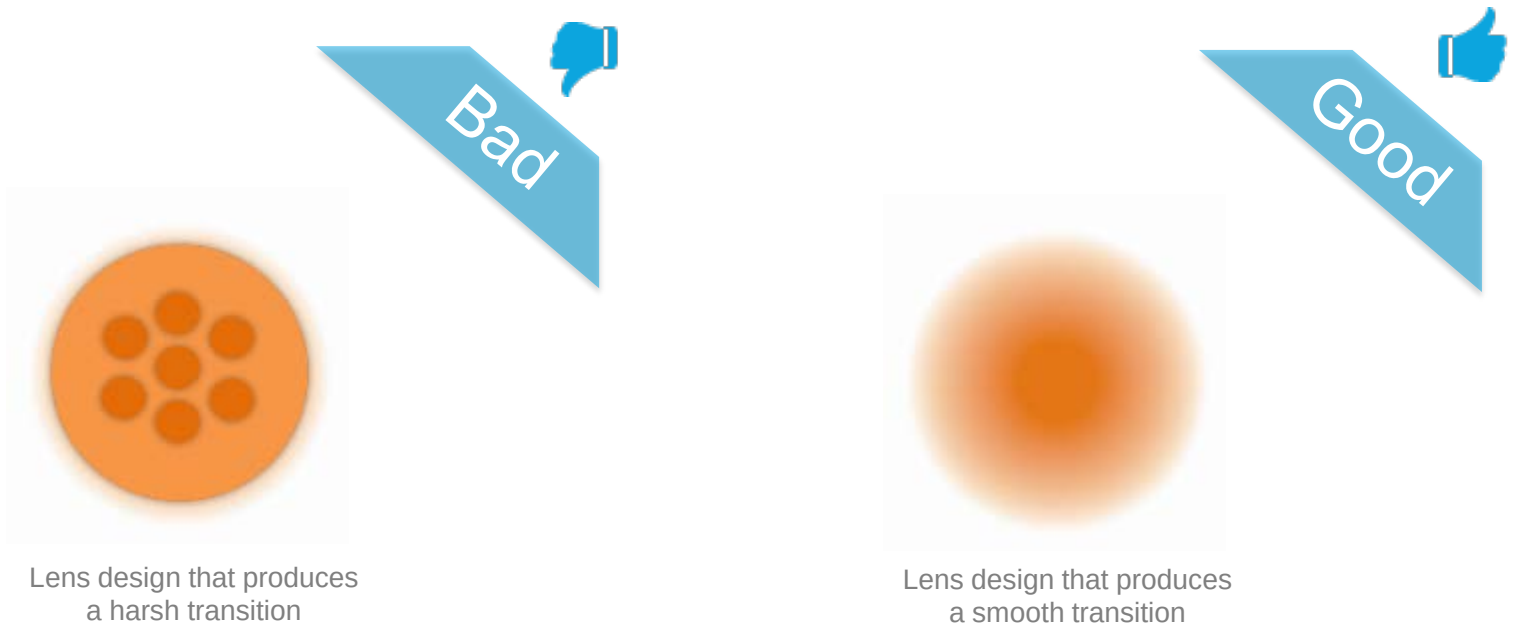
A high quality LED light bulb both maximizes the emitting area of luminaires and uniformly redistributes the ultra bright points of LEDs to remove glare. The challenge is in removing glare without lowering the light bulb's performance in other areas.



3

Gentle roll-off at edges

A high quality LED light bulb produces a gentle roll-off at the edges that fades out gradually instead of stopping suddenly. The challenge is in redistributing the light while minimizing light loss.





WHY OTHERS FALL SHORT

To produce a high quality LED light, the bulb must be designed in a way that can redistribute the ultra bright points of LEDs.

The aim of redistribution is to maximize the emitting area and to provide a uniform brightness. Most manufacturer's don't pay adequate attention to the design of the lens.

Without careful lens design, the product performance drops considerably (loss in lumens, lumen output, energy efficiency).

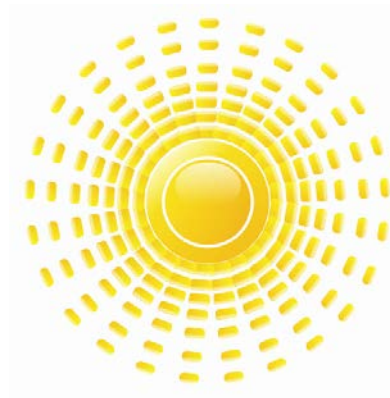


Leapfrog LED lens with
Intelligent Optics

1

Diffuser

Many manufacturers use diffusers to reduce the intense points in LEDs. However, this results in a lack of control over the spread of light, leading to a less accurate distribution (poor internal reflection) and lower efficiency. It also reduces the amount of light output.

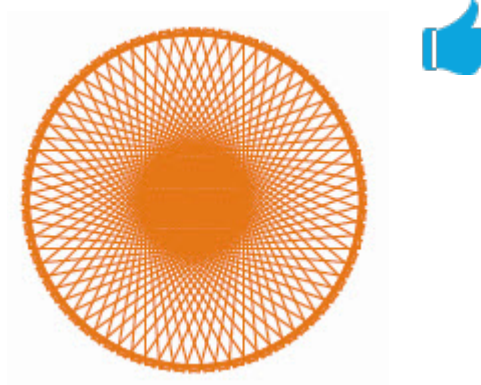


Lens diffuses ultra hot spot of LED
to emit uniform light

2

Reflectors

Direct imaging of light sources can be avoided and luminaire cutoff angle can be controlled with the use of reflector scales and multi-facet features. However, the light intensity is still high because the emitting area of the lens is smaller than a reflector.



Lens reflects light evenly to emit uniform light



THE LEAPFROG LIGHTING DIFFERENCE

Leapfrog Lighting LED light bulbs use *intelligent lens design*, integrating lens redistribution technology and reflectors. This solution distributes the light evenly over 100x the area of the original light source, which enhances the anti-glare effects without reducing the amount of emitted light.

This allows Leapfrog Lighting bulbs to achieve a high efficiency and better light distribution than anything else on the market today.



[PAR38](#)
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[Dimmable High Output Spotlight](#)



[PAR20](#)
[Dimmable High Output Spotlight](#)



[MR16](#)
[High Output Spotlight](#)



THE SOLUTION IS IN THE
DESIGN

Leapfrog Lighting bulbs take the light from the very high intensity of the LED source and through a patented, integrated lens-reflector design redistribute that light to a pleasing, soft-edged image reminiscent of well-loved, but inefficient, halogen bulbs.





WHO IS LEAPFROG
LIGHTING?

Leapfrog Lighting provides specification-grade LED products for **industrial, retail, and commercial** applications. We've created an innovative LED lighting solution that uses *Intelligent Optics* to provide architectural quality illumination unrivalled in the industry. Additionally, all our lamps are top performers in virtually all major efficiency-performance categories.



Testimonial

“Our clients
remark on how
beautiful the
gallery is now...”



Mr. John Newman, Associate Director
at Kinsman Robinson Galleries in Toronto, ON

ANY QUESTIONS?



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