

Light quality of LED lamps



December 2012

What constitutes high quality LED light?

- **Even light distribution**

A high quality LED lamp is able to evenly distribute the bright, highly concentrated light—with a flux 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).

- **Anti-glare technology**

A high quality LED lamp 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 lamp's performance in other areas.

- **Gentle roll-off at edges**

A high quality LED lamp 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.



PAR30 Dimmable High Output Spotlight

Why most lamps fail to produce high quality LED light

To produce a high quality LED light, the lamp 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).



PAR38 Dimmable High Output Spotlight

- **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.

- **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.

The Leapfrog Lighting difference



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



MR16 Dimmable High Output Spotlight

The solution is in the design

Leapfrog Lighting lamps 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.

Additional specifications

PAR30

Dimmable
High Output
Spotlight

FEATURES

- Innovative anti-glare lens technology
- Available in warm and cool white
- Light output
 - > 850 lumens (warm white)
 - > 1000 lumens (cool white)
- Efficacy
 - > 75 lm/W (warm white)
 - > 80 lm/W (cool white)
- CRI > 82
- Power factor > 0.95
- 38 degree beam angle
- Compatible with most ANSI/ANSI/ANSI approved dimmers designed for LED use
- Comprehensive three-year warranty

Leapfrog Lighting's PAR30 LED lamp provides industry-leading output power and efficacy thanks to high-efficiency, high-reliability LED source and driver electronics. The lamp's innovative lens design creates a pleasing, glare-free light suitable for use in all indoor and unexposed outdoor down-lighting applications. The lamp also delivers the high CRI and ultra-consistent color temperature control critical to multi-lamp applications in hotels, restaurants, schools, office buildings, casinos, retail operations and other public spaces. With a life expectancy of 40,000 operating hours, this UL-registered lamp will provide more than 27 years of service at 4 hours per day.

Specifications

GENERAL	
Operating temperature	-10 to +50 °C
Life, lifetime	40,000 hours
Beam angle	38/37°
Weight	14.4 oz.
Dimensions*	PAR30L

OPTICAL	
Min. light output	850 lumens (warm white) (cool white)
Max. light output	1000 lumens (cool white)
Min. efficacy	> 75 lm/W (warm white)
Max. efficacy	> 80 lm/W (cool white)
Beam angle, FWHM	38 degree
CCT	3000K (warm white) or 5000K (cool white)
CRI*	> 82
Dim.*	< 4:00/0

ELECTRICAL	
Voltage, nominal	120 VAC
Power	12.7 Watts (warm white)
Power factor	> 0.95
Dimming range	Flicker free down to 10% light output

1. Lifetime as defined by IESNA LM-80
2. Compatible with ANSI C70-1-02/1 dimming requirements
3. Refer to ANSI C70-1-02/1 dimming requirements
4. CRI value by the "Total-CRI" method as per IESNA S-0
5. Dim. value and tolerance as per ANSI C70-1-02/1 dimming requirements, Table 1, page 4

Datasheets and IES files

You can obtain additional product specification information about all Leapfrog Lighting LED lamps by viewing our datasheets and IES files located in our Download Center:

<http://www.leapfroglighting.com/resources/download-center/>

Lighting Design Files - PAR30 13W - Rev 1.0, November 2012

- Drawing/Picture (dimensions in mm)
- IES File - PAR30 13W Warm White (3000K) (1001-P30LC-3001)

PAR30 13W (3000K)		
Beam angle	38°	3.00
Beam angle	37°	3.00
Beam angle	36°	3.00
Beam angle	35°	3.00
Beam angle	34°	3.00
Beam angle	33°	3.00
Beam angle	32°	3.00
Beam angle	31°	3.00
Beam angle	30°	3.00
Beam angle	29°	3.00
Beam angle	28°	3.00
Beam angle	27°	3.00
Beam angle	26°	3.00
Beam angle	25°	3.00
Beam angle	24°	3.00
Beam angle	23°	3.00
Beam angle	22°	3.00
Beam angle	21°	3.00
Beam angle	20°	3.00
Beam angle	19°	3.00
Beam angle	18°	3.00
Beam angle	17°	3.00
Beam angle	16°	3.00
Beam angle	15°	3.00
Beam angle	14°	3.00
Beam angle	13°	3.00
Beam angle	12°	3.00
Beam angle	11°	3.00
Beam angle	10°	3.00
Beam angle	9°	3.00
Beam angle	8°	3.00
Beam angle	7°	3.00
Beam angle	6°	3.00
Beam angle	5°	3.00
Beam angle	4°	3.00
Beam angle	3°	3.00
Beam angle	2°	3.00
Beam angle	1°	3.00
Beam angle	0°	3.00

Leapfrog Lighting PAR30 Drawings and IES files - Rev 1.0, November 2012

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Download Center

Get immediate access to Leapfrog Lighting technical data, including LED-bulb product specs and white papers.

Whitepapers

- [PDF The Measure of Performance: Key Efficiency Metrics in Assessing LED Lighting Technology](#) - This document examines the three most critical metrics in evaluating LED lighting for efficiency: efficacy, power factor, and light output.

Customer Stories

- [PDF Kinsman Robinson Galleries](#) - How LED lighting solved Kinsman Robinson Galleries' biggest business challenge: aesthetics.
- [PDF Tag Along Toys](#) - How a toy store created a better business experience through LED lighting.

Presentations

- [PDF Light quality of LED lamps](#) - What constitutes a high quality LED light? Why most lamps fail? What is the Leapfrog Lighting difference?
- [PDF Leapfrog Lighting product specifications](#) - Specifications for all Leapfrog Lighting LED lamps.

Product Data Sheets ←

- [PDF PAR30 DataSheet](#)
- [PDF PAR30 IES file](#)
- [PDF PAR38 DataSheet](#)
- [PDF PAR38 IES file](#)
- [PDF MR16 DataSheet](#)
- [PDF MR16 IES file](#)

Leapfrog Lighting online store



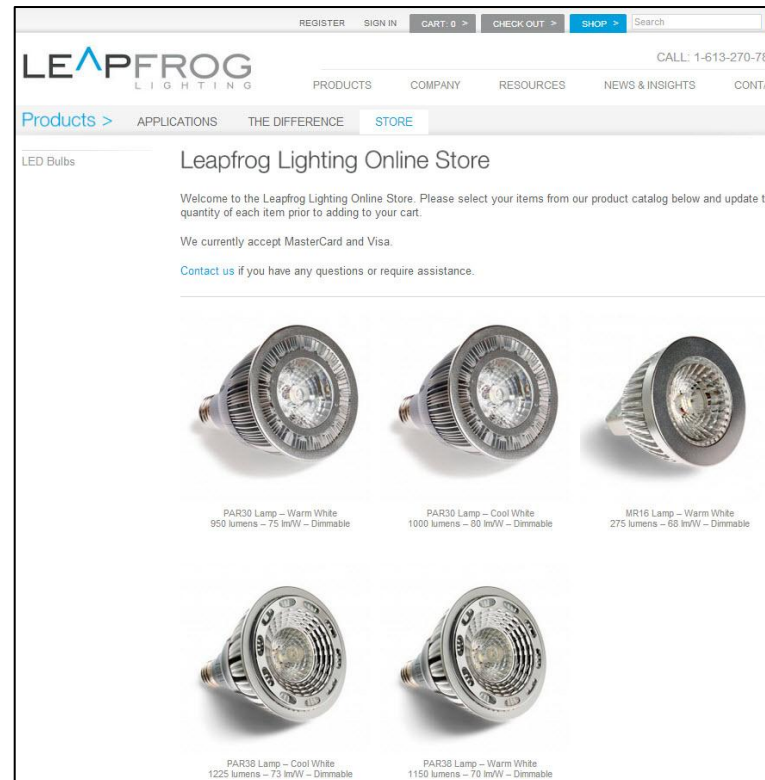
Product catalog and online store

Leapfrog Lighting conveniently lists and sells all products through the online store:

<http://www.leapfroglighting.com/products/buy/>

TIP:

Follow us on Facebook, Twitter, Google+, or LinkedIn for special, limited-time discounts as well as company and industry news. See the last page for details.



About 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.

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