

FLP SERIES LENSES for LUXEON™ LEDs: LUXEON I, III, and V, STAR and EMITTER

- High efficiency
- Available in 2 different beams
- Patent Pending

The FLP series offers 2 lenses especially designed for the Lumileds (1) LUXEON™ Lambertian LEDs.

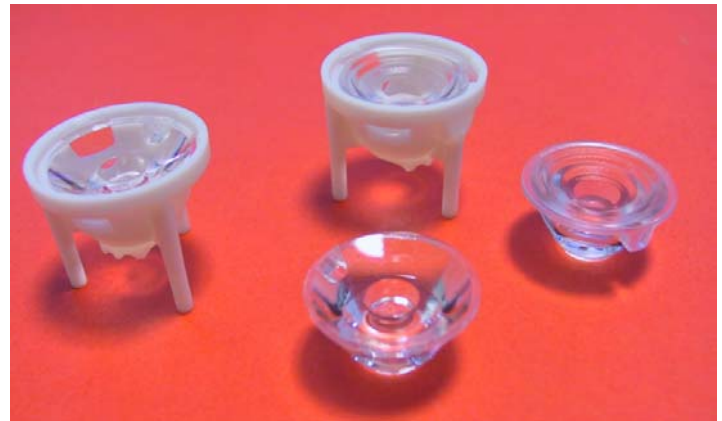
Software-optimized aspheric profile combined with a shaped front surface and a Fresnel profile, providing 2 different (narrow and medium beam) output patterns.

The high collection efficiency reaches 85% of the total flux emitted from the LED.

Each of these 2 lenses can be used alone on the Luxeon™ LEDs or with its specific holder. The holder assures the proper relative placement of the lens and the Luxeon™ LEDs. Heat staking the three legs of the holder to the customer's PCB or heat sink provides excellent optical and mechanical assembly (see Fraen Application Note FAN01-EN, at www.fraen.com).

Typical applications are:

- Reading lamps
- Signs
- Architectural Lighting
- Street lights
- Most application where a compact light source is required.



(1) LUXEON™ is a trademark of Lumileds Lighting, LLC. For technical specification on LEDs please refer to the LUXEON™ datasheet or visit <http://www.luxeon.com> or www.lumileds.com

(2) Typical beam divergence may change with different color LEDs.

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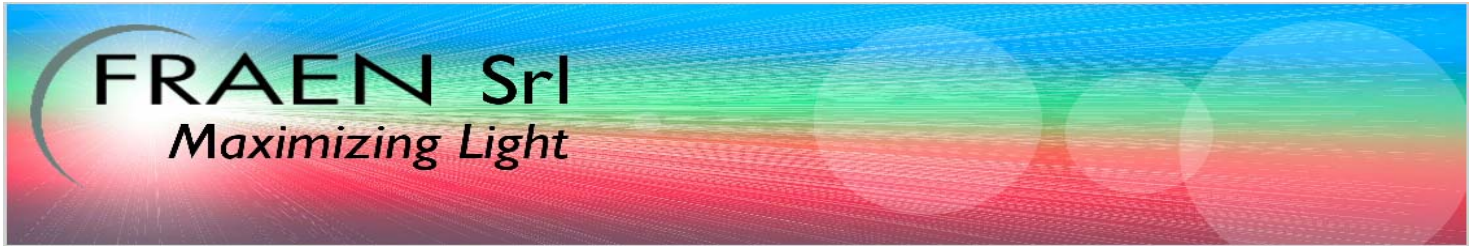
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General Characteristics

Lens Material	Optical Grade PMMA
Holder Material	PC ABS or Transparent PC
Operating Temperature range	-40deg C / + 80 deg C
Storage Temperature range	-40deg C / + 80 deg C

Average transmittance in visible spectrum (400 – 700nm) >90%, as measured using 3mm thick Optical Grade PMMA.

Optical Characteristics:

		Typical total beam divergence (deg) (3)		
Lens Part Number	Type of lens	Red, Orange, Amber LEDs ● ● ●	Blue, Cyan, Green LEDs ● ● ●	White LEDs ○
FLP-HNB3-LL-y	Narrow beam	10	12	12
FHS-HMB3-LL-y	Medium beam	25	30	30

- (3) The typical divergence varies with LED color due to different chip size and chip position tolerance.
The typical total divergence is the full angle measured where the luminous intensity is half of the peak value.

		Typical on-axis efficiency (cd/lm) (4)(5)				
Lens Part Number	Type of lens	Blue LEDs ●	Cyan LEDs ●	Green LEDs ●	Red, Orange, Amber LEDs ● ● ●	White LEDs ○
FLP-HNB3-LL-y	Narrow beam	14.2	15.5	15.5	10.9	13.4
FLP-HMB3-LL-y	Medium beam	5.0	5.0	5.0	5.1	4.9

- (4) To calculate the on-axis intensity, multiply the on-axis efficiency of the lens (cd/lm) by the total flux of the Luxeon LED used. For more detail on flux binning please check the Luxeon LED datasheet at <http://www.luxeon.com/>.

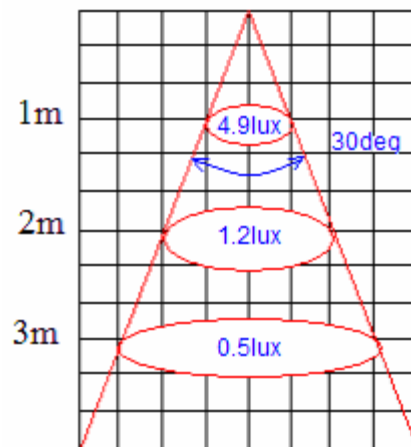
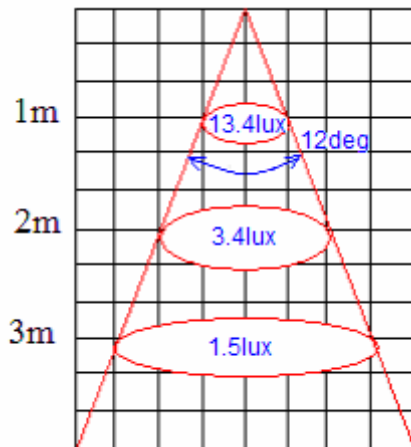
- (5) Luminous intensity depends on the flux binning and tolerances of the LEDs. Please refer to the Luxeon datasheet for more details on flux binning and mechanical tolerances.

Illumination Chart ^(5,8) for white Lambertian LUXEON™ LEDs

(8) Typical illuminance measured in lux per lumen (E) with typical Luxeon™ LEDs.
To estimate the illuminance in lux, multiply the typical illuminance E by the flux in lumen of the LED used.

With FLP-HNB3-LL-y lens:
Low Profile Narrow Beam lens for Lambertian Luxeon LEDs

With FLP-HMB3-LL-y:
Low Profile Medium Beam lens for Lambertian Luxeon LEDs



These values have been calculated using the efficiency values of the lens listed above and the formula $E = I / d^2$, where **E** is the irradiance in lux, **I** the intensity in cd, and **d** the distance between the lens output and the measured point.

Mechanical Characteristics

The FLP series of lenses has been designed specifically for the Luxeon Lambertian LEDs. They can be used with any non SMT Lambertian Luxeon LED:

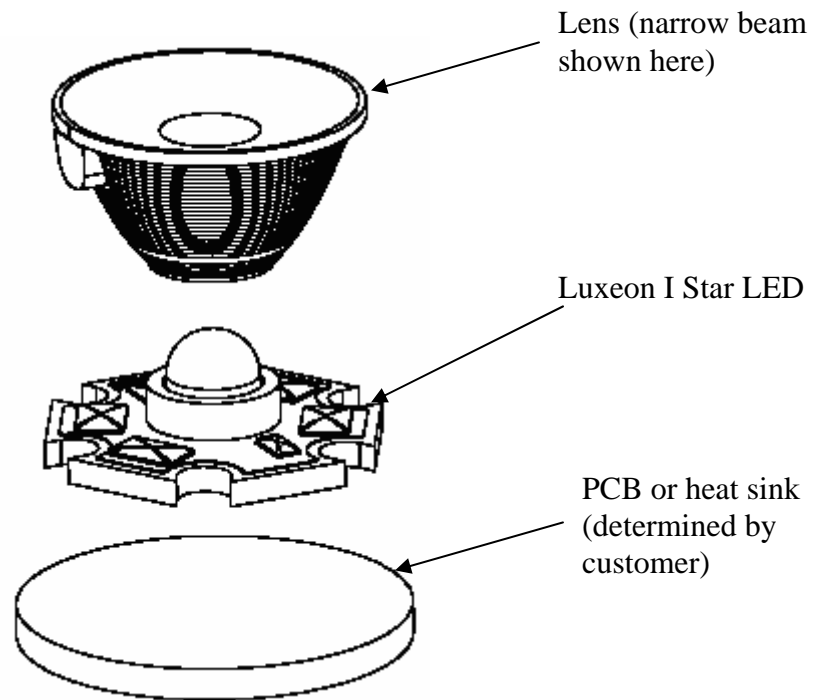
- Either Luxeon I), Luxeon III, or Luxeon V.
- Either Emitter or Star.

The FLP lenses can be used either **alone** or **with its unique holder**.

There is a unique holder for each of the above Luxeon LEDs due to the fact that the mechanical reference of the bottom of the lens is the top of the black ring of the Luxeon LED, but the holder reference may be either the top of the Star, or Star PCB, or Emitter mounting surface.

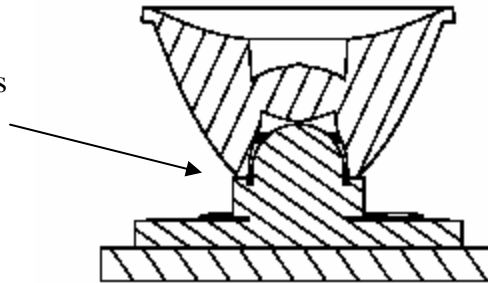
Please note that flow lines and weld lines on the external surfaces of the lenses are acceptable if the optical performance of the lens is within the specification described in the section "OPTICAL CHARACTERISTICS".

View of the assembly with the lens (if no holder is used):



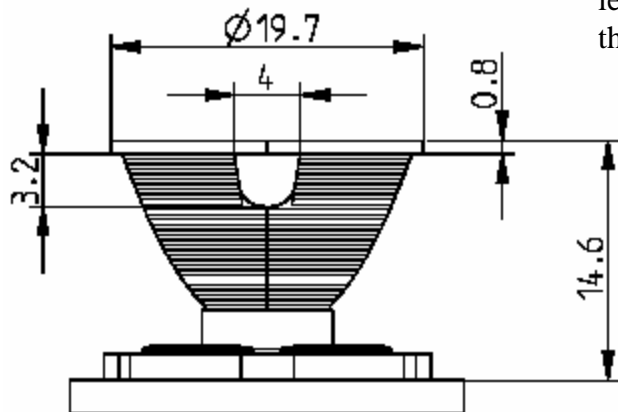
Drawing of the assembly with the lens (if no holder is used):

The bottom of the lens sits on the black ring of the Luxeon LEDs



B-B

This dimension represents the distance from the top of the lens to the bottom of the Luxeon I Star.

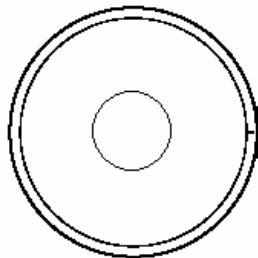


Dimensions tolerance is +/-0.2mm

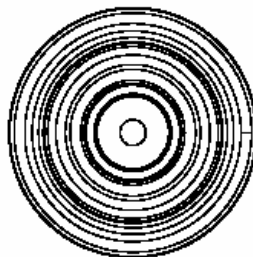
The outside mechanical dimensions of the lenses (Narrow and Medium beam) are the same, except the top of the lens. The lens can be recognized by the top view:

Top views:

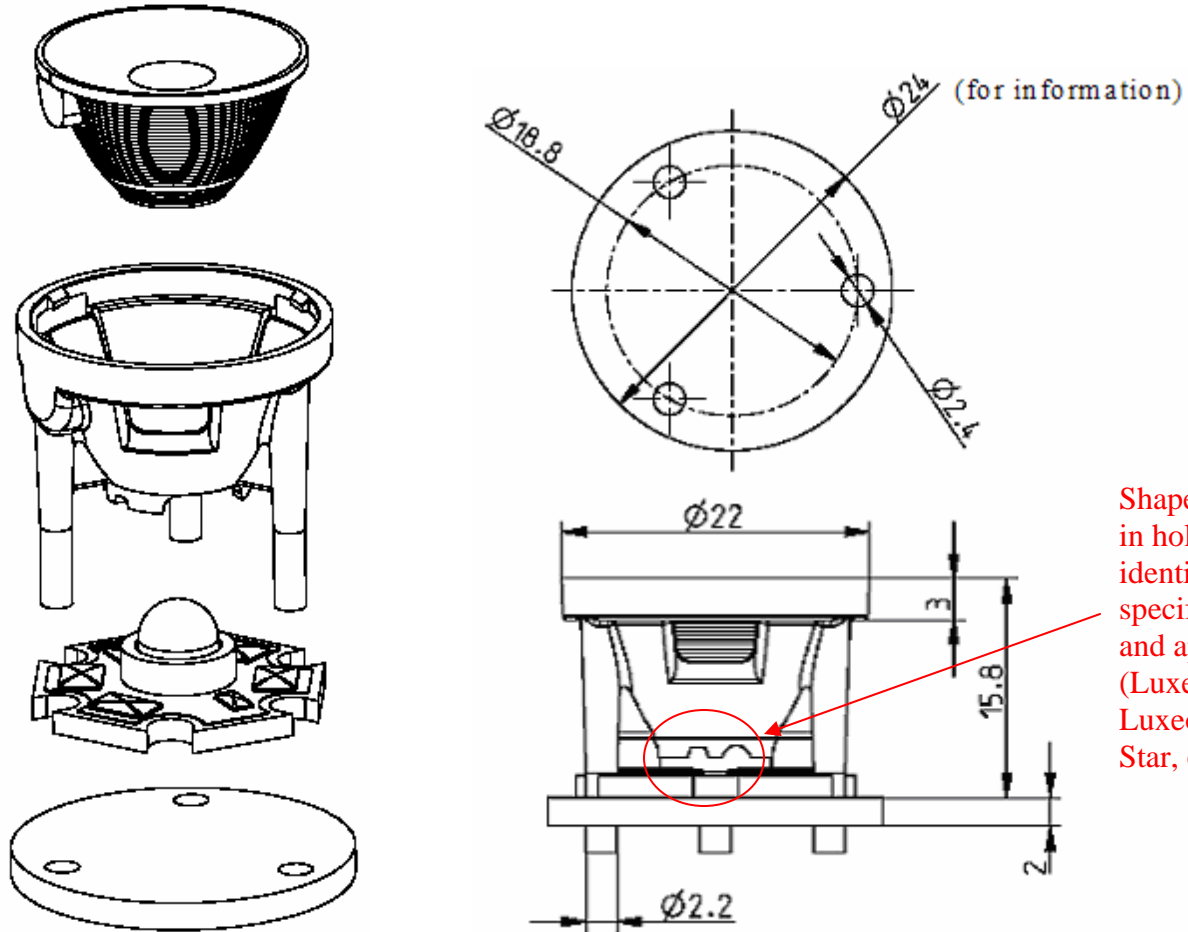
Narrow beam lens



Medium beam lens

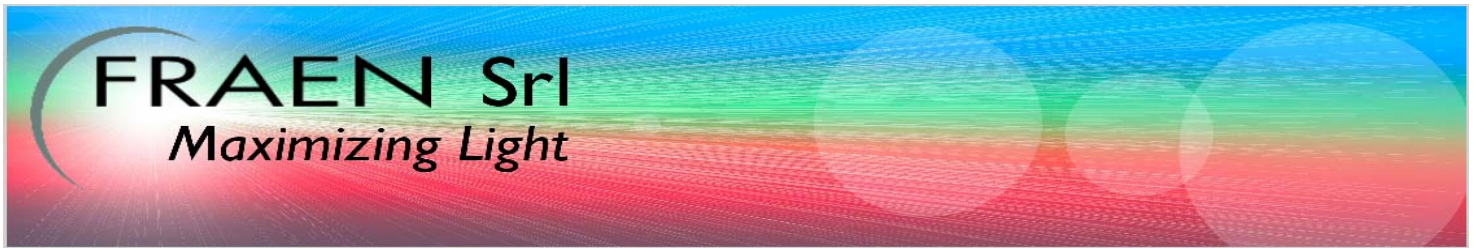


Lens + holder assembly view and dimensions:



Shape of cutout in holder identifies the specific holder and application (Luxeon I Star, Luxeon III or V Star, or Emitter).

Dimensions tolerance is +/-0.2mm



Ordering part numbers

FLP-HxB3-LL-y

OPTIONS:

0 = without holder
H = with holder

LENS TYPE:

HNB3 = Narrow beam lens
HMB3 = Medium beam lens

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