FL3 SERIES LENSES
for LUXEON™ LEDs

- **High efficiency**
- **Available in 2 different beams**
- **35mm diameter, sized for MR11 lamp applications**
- **Patent Pending**

The FL3 series Low Profile Tri-lens module is available for LUXEON™ LED Emitters (1W, 3W, 5W) with Lambertian radiation pattern.

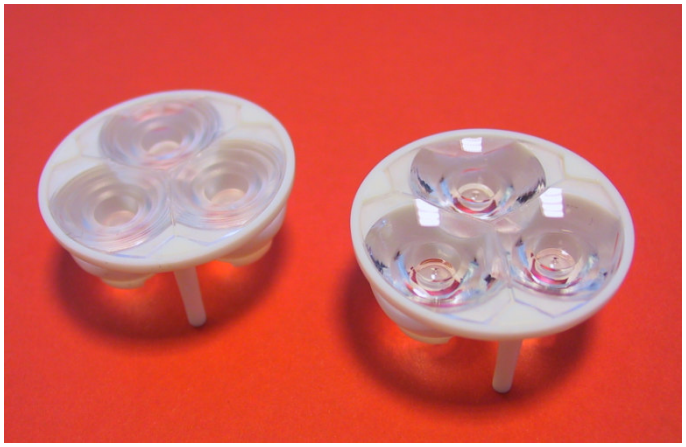
A software-optimized aspheric profile combined with front shaped micro-lens arrays enable the generation of two different lens models: narrow beam and medium beam.

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

These lenses are assembled with a 35mm diameter holder. The holder assures the proper relative placement between the lens and the LUXEON™ LED Emitters. 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.fraensrl.com).

Typical applications are:

- Reading lamps
- Signs
- Architectural Lighting
- Street Lights
- Most application where uniformity and high intensity over a wide angle 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

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General Characteristics

Lens Material	Optical Grade PMMA
Holder Material	PC ABS
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.

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"

IMPORTANT NOTE – Lenses handling and cleaning*:*
Handling: Always use gloves to handle lenses and/or handle the lenses only by the flange. Never touch the outside surfaces of the lenses with fingers; finger oils and contamination will absorb or refract light.
Cleaning: Clean lenses only if necessary. Use only soap and water to clean the surfaces and lenses. Never expose the lenses to alcohol, as it will damage the plastic.

Optical Characteristics: with Lambertian Emitter

		Typical beam total divergence (degrees)		
Lens Part Number	Type of lens	Red, Orange, Amber LED	Blue, Cyan, Green LED	White LED
FL3-HNB1-LLE-H	Narrow beam	10.0	12.0	11.0
FL3-HMB1-LLE-H	Medium beam	18.0	20.0	24.0

The typical total divergence is the full angle measured where the luminous intensity is half of the peak value. The typical divergence may change with different color LEDs due to different chip size and chip position tolerance.

		Typical on axis efficiency (cd/lm)		
Lens Part Number	Type of lens	Red, Orange, Amber LED	Blue, Cyan, Green LED	White LED
FL3-HNB1-LLE-H	Narrow beam	11.2	16.0	15.0
FL3-HMB1-LLE-H	Medium beam	3.4	4.6	4.1

To estimate 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 .

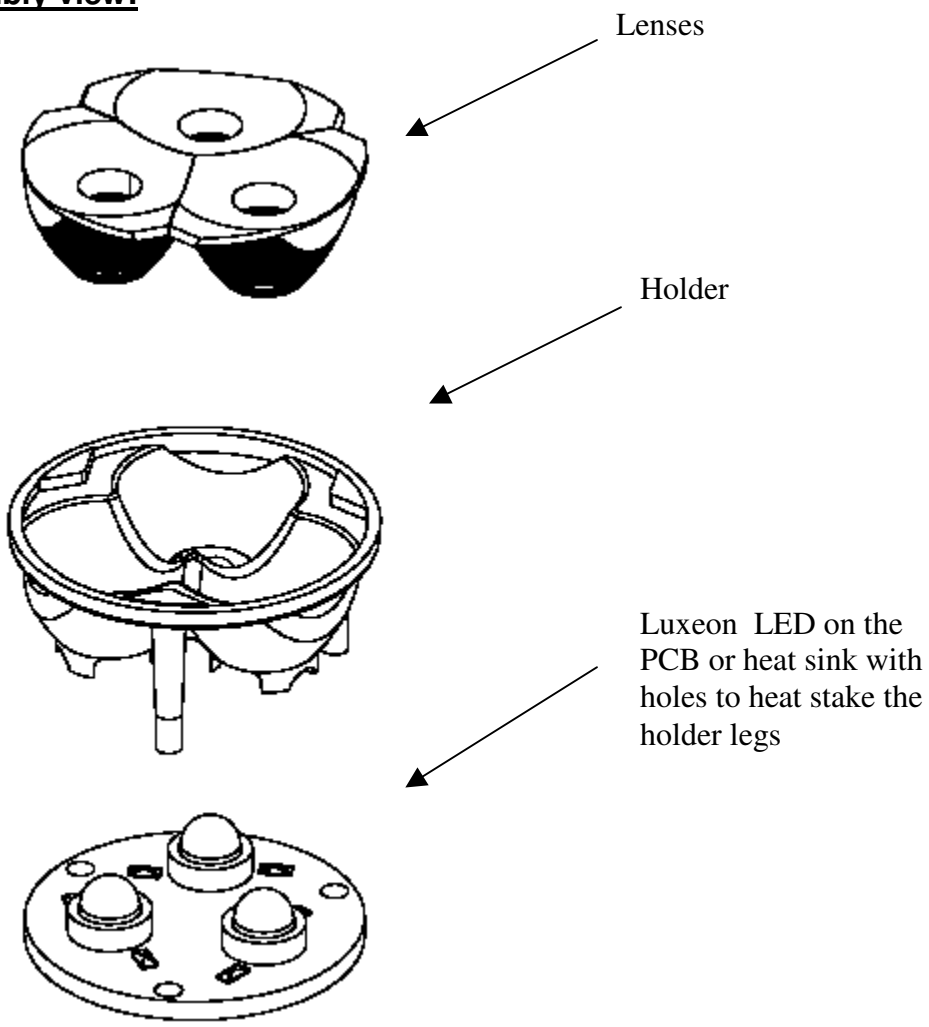
Luminous intensity depends on the flux binning and tolerances of the LEDs. Please refer to the Luxeon datasheet for more details on flux binning and mechanical tolerances.

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

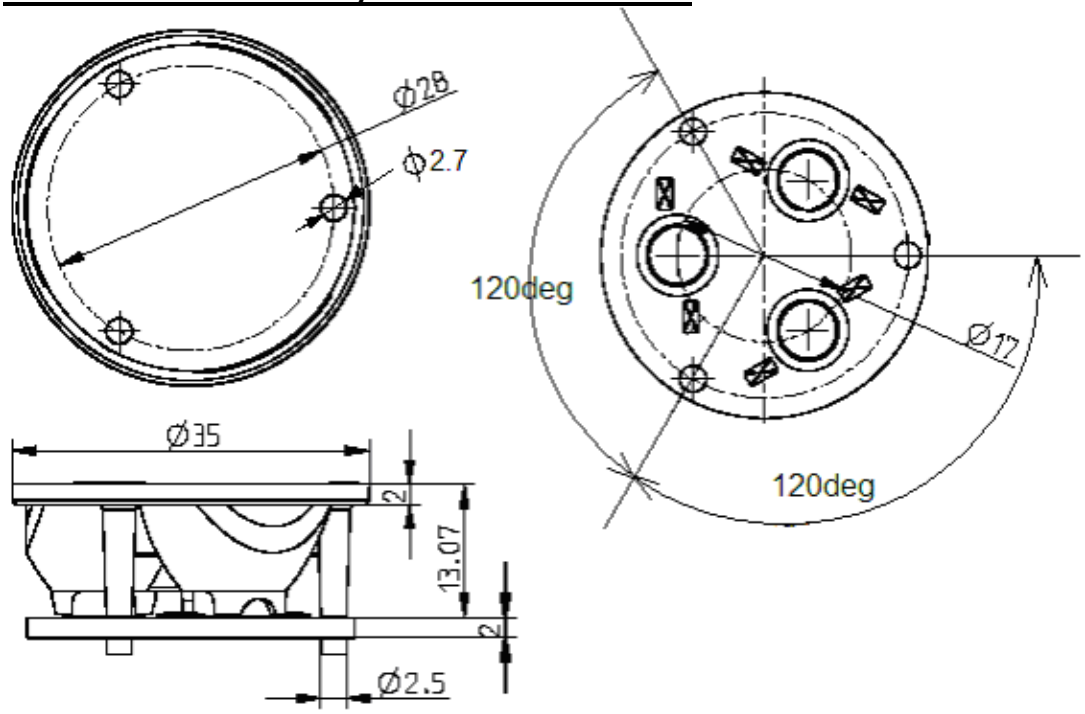
Mechanical Characteristics

For best optical performance (shown above), correct mechanical position of the lens on the LED is critical. To achieve correct lens position on the LED, the module comes pre-assembled in a holder.

Lens + holder assembly view:



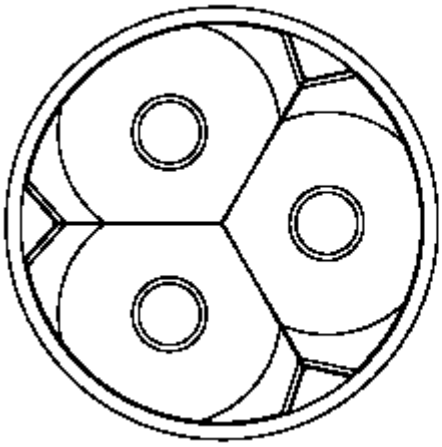
Lens + Holder assembly dimensions on PCB:



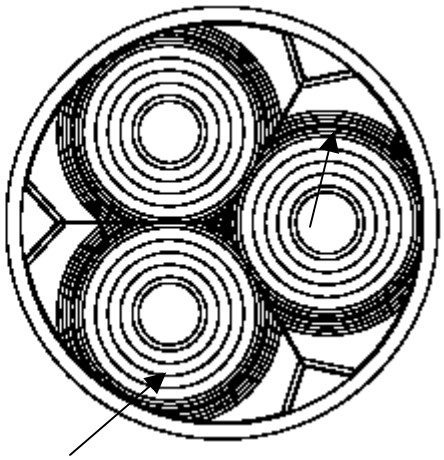
Tolerances : +/- 0.2mm

The lens can be identified by the front view:

Narrow beam lens:

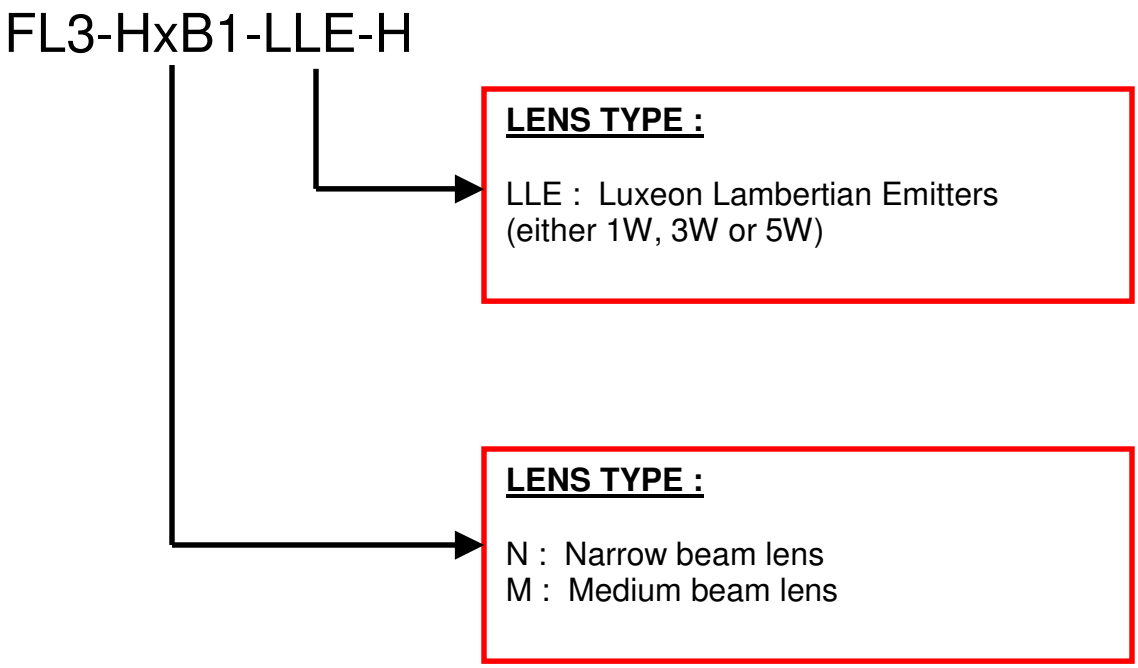


Medium beam lens:



Light texture on the top lens

Ordering part numbers



Document Revision Record

Rev	Date	Author	Description
01	04-01-2005	M. Thorallier	Preliminary Release
02	08-25-2006	S.A.H.	Replace Preliminary Release