



**FXGR-N1-XR79-0R & FXGR-W1-XR79-0R
Dual-Beam Focusable Reflector Pair
for Cree XLamp™ XR-E LEDs**

- Produces Narrow and Wide Beam Patterns
- Patent Pending
- High efficiency
- Compact size
- Custom versions can be made for most LEDs

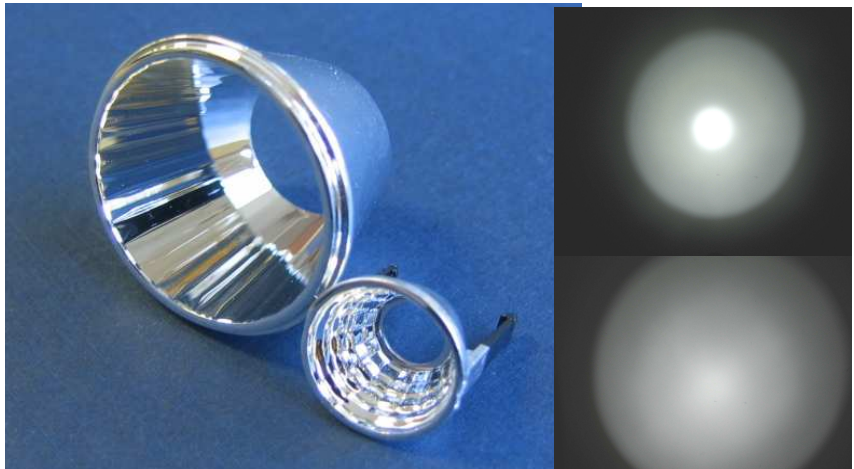
The FXGR-N1-XR79-0R and FXGR-W1-XR79-0R reflector pair has been specifically designed for the Cree XLamp XR-E LEDs.

Software-optimized profiles combined with precision facets provide a wide “flood” beam from a compact reflector and a narrow focused beam from a large secondary reflector. In combination, this reflector pair can provide either of these useful beam patterns.

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

Typical applications are one requiring adjustable beam patterns, such as:

- Flashlights
- Bicycle lights
- Mining lights and head lights
- Many other applications requiring quick changes between flood and spot patterns



Cree® XLamp is a trademark of Cree, Inc. For technical information about these LEDs please refer to the CREE® XLAMP datasheet or visit:



<http://www.cree.com/products/xlamp.asp>

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General Characteristics



Materials: Black Polycarbonate with vacuum aluminum coating, protected by clear coat lacquer.
 Operating Temperature range: -40deg C / + 100 deg C
 Storage Temperature range: -40deg C / + 100 deg C

Please note that small defects in the reflective coating, and flow lines and weld lines on the surfaces of the reflectors are acceptable if the optical performance of the reflector is within the specification described in the section "OPTICAL CHARACTERISTICS"

IMPORTANT NOTE – Reflector handling and cleaning:

- Handling: Always handle the reflectors by the outside surfaces or flange. Never touch the inside surfaces of the reflector with fingers; finger oils and contamination will absorb or refract light.
- Cleaning: Clean reflectors only if necessary. Use only soap and water to clean the surfaces and reflectors. Never expose the reflectors to alcohol, as it will damage the plastic.

Optical Characteristics:

Narrow Beam (spot with spill)		
Central spot full-angle, @ 50%-peak	4 degrees	
Central spot full-angle, @ 10%-peak	8 degrees	
Peak intensity, center of spot	29 candela/lumen	
Perceived cut-off, full-angle	~45 degrees	
Intensity at 15 degrees from center	2.5 candela/lumen	
Wide Beam (flood)		
Full-angle, @ 50%-peak	36 degrees	
Full-angle, @ 10%-peak	75 degrees	
Peak intensity, center of beam	1.3 candela/lumen	
Perceived cut-off, full-angle	~70 degrees	
Intensity at 30 degrees from center	0.6 candela/lumen	



- (1) The typical divergence varies with LED color due to different chip size and chip position tolerance. To calculate the on-axis intensity, multiply the on-axis efficiency of the reflector (candela/lumen) by the total flux of the Cree LED used. See "Illumination Calculations" below. For more detail on flux binning please check the Cree LED datasheet at [Cree XLamp LED](#)
- (2) Luminous intensity depends on the flux binning and tolerances of the LEDs. Please refer to the Cree XLamp datasheet for more details on flux binning and mechanical tolerances.
- (3) Typical illuminance measured in lux per lumen (E) with typical Cree 7090 XR-E LED. To estimate the illuminance in lux, multiply the typical illuminance E by the flux in lumen of the LED used. See "Illumination Calculations" below.

Illumination Calculations

To calculate peak candela: Find the central spot "peak intensity" value in the table above. It is 35 candela/lumen". Multiply this value by the lumens output from your LED (refer to the XLamp LED datasheet ([Cree XR-E LED datasheet](#) or [Cree XR LED datasheet](#)) for nominal lumens values. OR for a more accurate calculation, refer to the intensity binning tables [Cree XLamp binning](#).

Example – If the narrow beam pattern is produced with a cool white Cree XR-E LED at 350 mA, the typical luminous flux of the LED is 80 lumens:

The calculation is: (35 candela/lumen) x (80 lumens) = 2800 candela peak on-axis.

The central spot beam angle specified in the table above is 4 degrees full beam-width measured at half-peak. This means at 2 degrees off-axis (half of 4 degrees), the intensity should be half of 2800 candela, or 1400 candelas.

1 candela at 1-meter distance produces 1 Lux. This means the peak intensity at 1 meter will be 2800 lux. The intensity decreases as a function of the distance squared, so at 2 meters the peak intensity will be $2800 / (2^2) = 700$ lux. At 3 meters distance, the peak intensity will be $2800 / (3^2) = 311$ lux.

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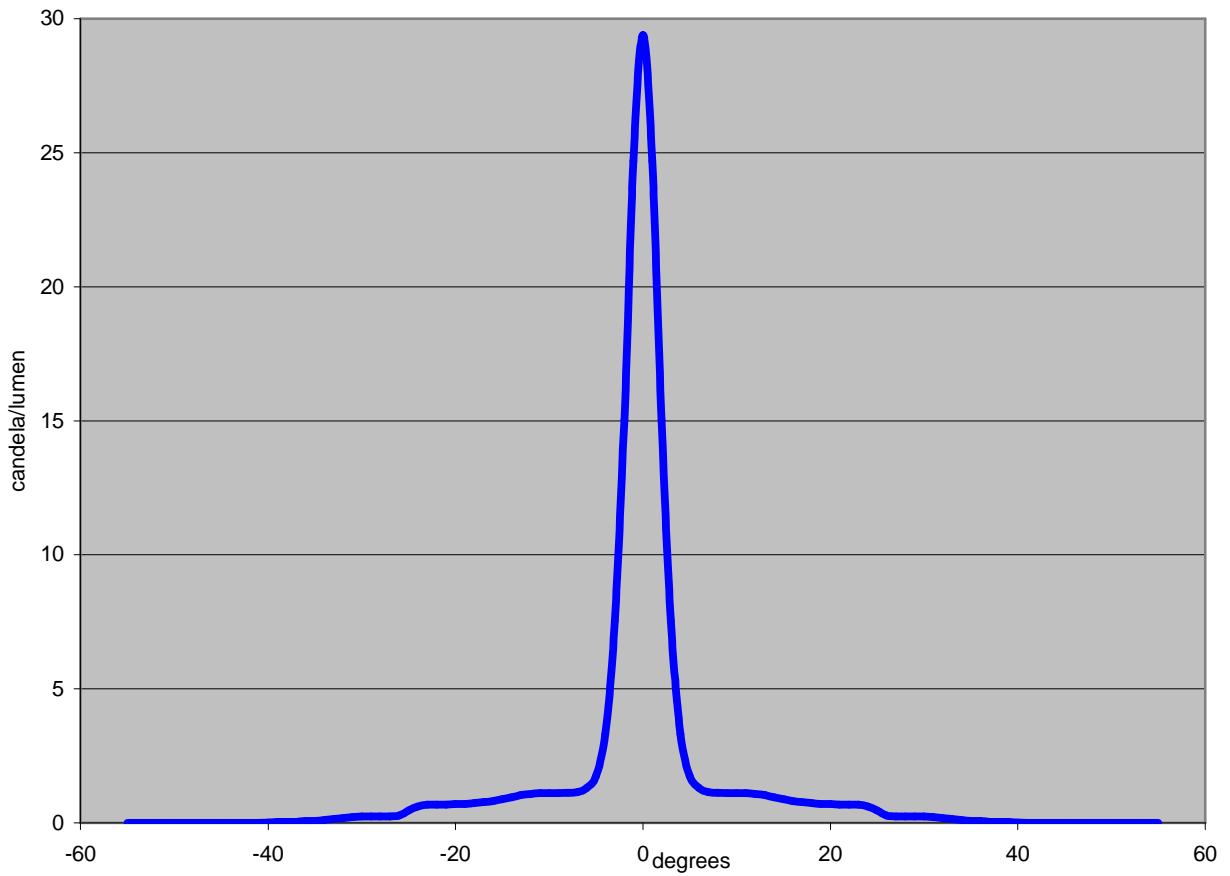


Figure 1. Narrow Beam Profile - candela/lumen vs. degrees off-axis

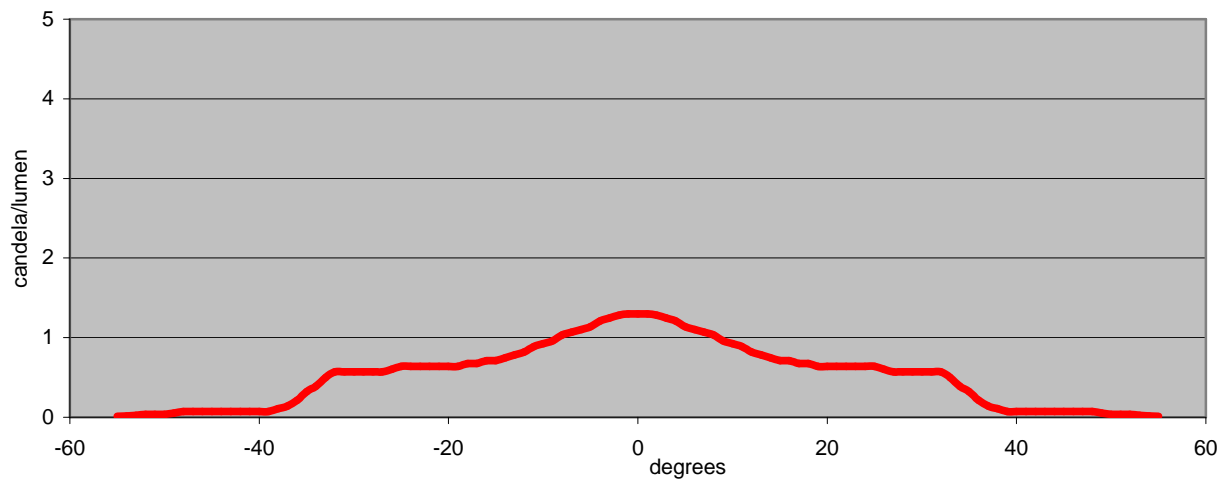


Figure 2. Wide Beam (Flood) Profile - candela/lumen vs. degrees off-axis



Mechanical Characteristics

The large reflector part (FXGR-N1-XR79-0R) produces the “narrow beam” component of the illumination pattern when moved into the extended position as shown in Figure 3 and Figure 4 below. The flange should be used for holding this part in the lamp assembly, to facilitate easy and accurate movement of this part relative to the small reflector and LED.

The small reflector part (FXGR-W1-XR79-0R) produces the “wide beam” illumination pattern when the large reflector is fully retracted as shown in Figure 4. To permit full retraction, the LED must be mounted on a heat-sink/pedestal feature (blue part), which is part of the lamp or flashlight. The snap-fit teeth allow the small reflector to clip onto the heat-sink/pedestal securely.

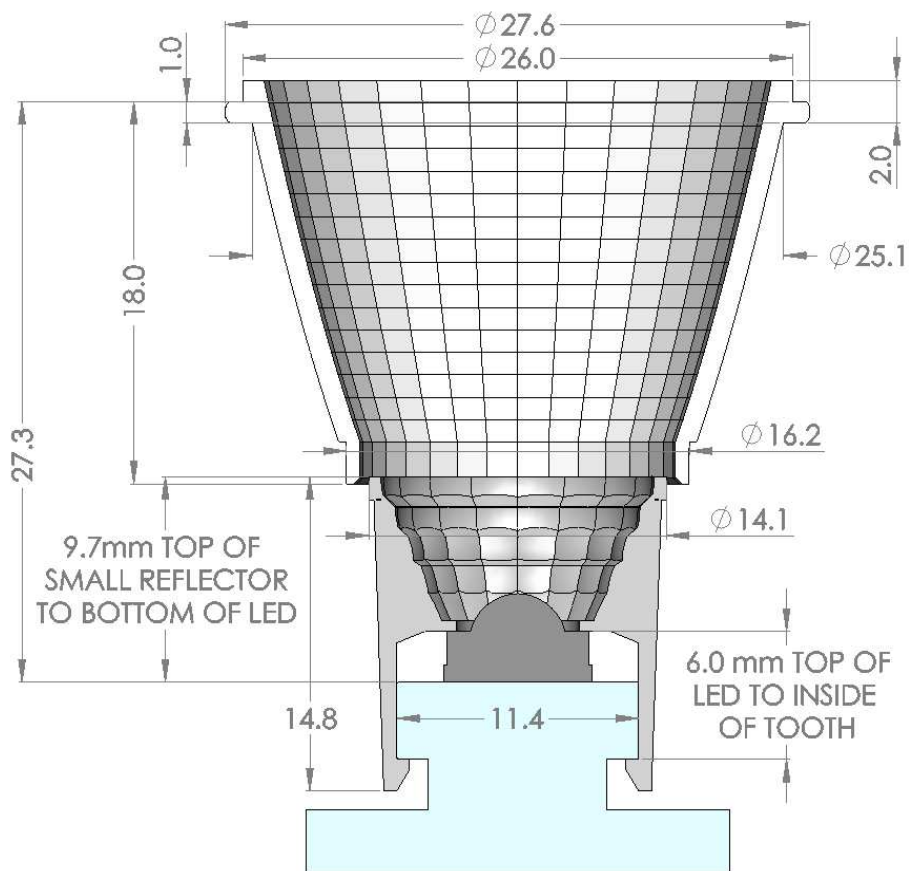
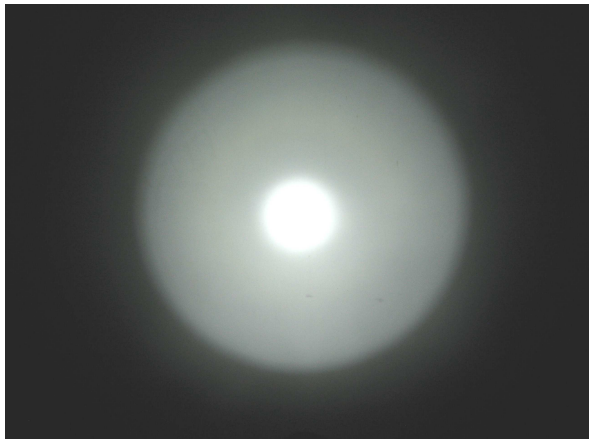


Figure 3. Dimensions of reflectors and assembly, shown in extended (narrow beam) position. The heat-sink/pedestal (blue part) is part of the lamp, and is not provided by Fraen Corporation.

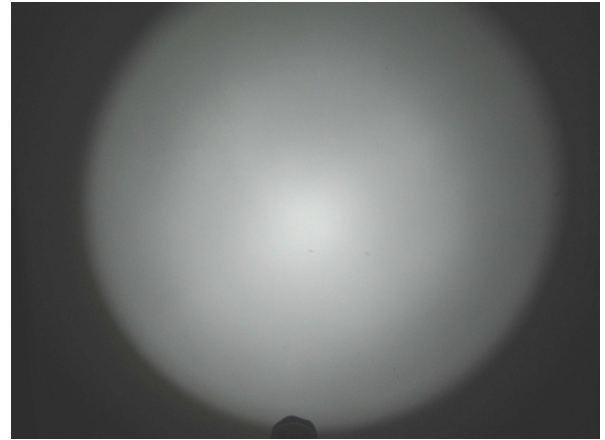


View and dimensions of reflector on XLAMP LED:

Narrow Beam Position



Wide Beam Position



Large reflector extended



13 mm travel distance

Large reflector retracted



Figure 4. Extending and retracting the large reflector by 13 mm changes the illumination pattern from narrow beam to wide flood pattern. The heat-sink/pedestal (blue part) is part of the lamp, and is not provided by Fraen Corporation.

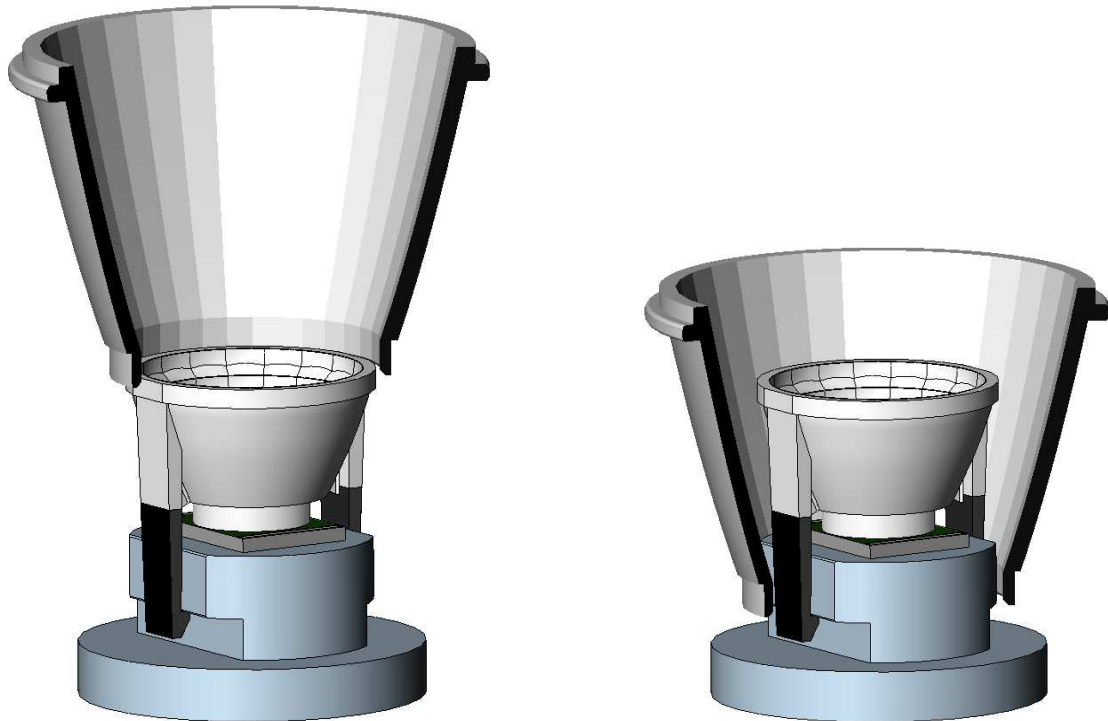


Figure 5. Section view of large reflector, showing position relationship to small reflector and LED.

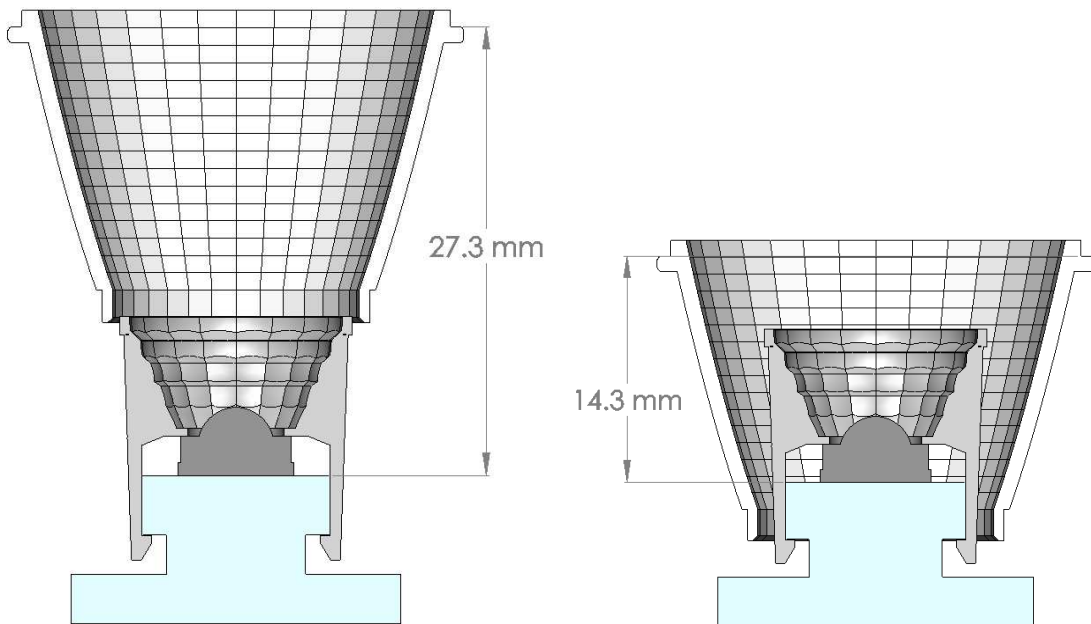


Figure 6. Distance from the bottom of the LED to the top of the large reflector flange, extended versus retracted.



Ordering Part Numbers

FXGR-N1-XR79-0R Large, narrow-beam reflector

FXGR-W1-XR79-0R Small, wide-beam reflector

NOTE: A "Dual-Beam Focusable Reflector Pair" consist of one of each of the above part numbers.
Order separately, but use in pairs.

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Document Revision Record

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