



20mm Optic Solutions for Standard Luxeon 1,3,5W & 'Warm White' LED's



Carclo have an extensive range of lenses and holders compatible with Luxeon LED's. Our optics will give narrow, medium, wide or elliptical beam shapes and our holders will interface with Luxeon's emitter or star board LED's.

All Carclo optics have been optimised using computer raytracing software to maximise efficiency and provide the best possible beam shape. Our medium and wide angle optics have a unique ripple surface designed to create an even diffuse glow.

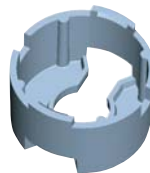
20mm Optics



Part Numbers

10003	Narrow Beam
10003/15	Medium Beam
10003/25	Wide Beam
10003/L25	Elliptical Beam
10034	Fibre Coupler

20mm Holders



Black
Clear
White

Emitter Holders



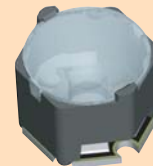
Circular Holder

10012
10024
10035

Star Board Holders

1 Watt

3/5 Watt



Hex Holder

10026
10036
10037

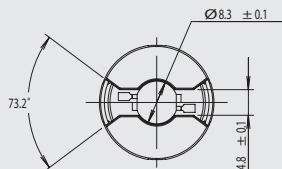
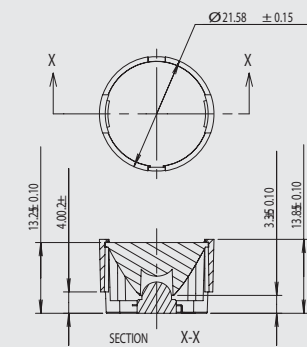


Hex Holder

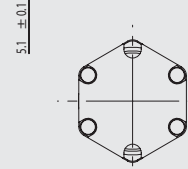
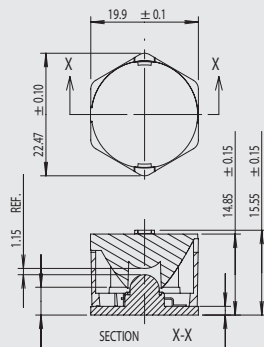
10043
10045
10044

Carclo's optics are moulded from clear Polycarbonate. which offers superior temperature capability and is suitable for environmental temperatures up to 120degC. Typical applications for Carclo Optics and Luxeon LED's are signals, beacons, domestic Lighting, signs, display lighting, street lighting and reading lamps.

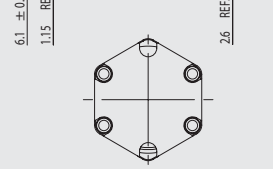
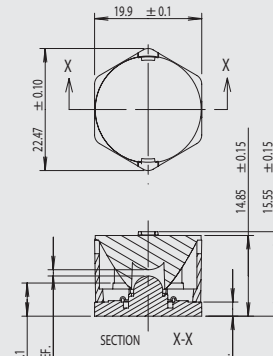
Detail Dimensions



Luxeon Emitter with 10012 Circular Holder



Luxeon 1W Star with 10026 Hex Holder



Luxeon 3/5W Star with 10043 Hex Holder

Carclo manufacture holders for other popular high brightness LED's.



For more information see: www.carclo-optics.com



1 Watt Luxeon		Total Beam Divergence (deg) ²				On-axis Performance (cd/lm) ¹			
Part No.	Desc..	White	Red/Amber	Blue/Cyan/Grn	Warm White	White	Red/Amber	Blue/Cyan/Grn	Warm White
10003.	Narrow	8	9	10	9	24	22	17	13
10003/15.	Medium.	19	13	15	17	5	7	7	5
10003/25.	Wide.	34	16	28	18	3	3	3	3
10003/L25.	Elliptical.	40x11	38x12	39x14	35 x 13	5	4	4	3

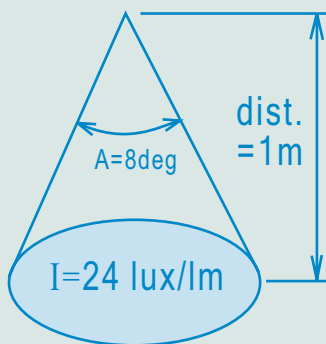
3 Watt Luxeon		Total Beam Divergence (deg) ²				On-axis Performance (cd/lm) ¹			
Part No.	Desc..	White	Red/Amber	Blue/Cyan/Grn	Warm White	White	Red/Amber	Blue/Cyan/Grn	Warm White
10003.	Narrow	9	N/K	N/K	N/K	21	N/K	N/K	N/K
10003/15.	Medium.	20	N/K	N/K	N/K	5	N/K	N/K	N/K
10003/25.	Wide.	32	N/K	N/K	N/K	2	N/K	N/K	N/K
10003/L25.	Elliptical.	40 x 11	N/K	N/K	N/K	4	N/K	N/K	N/K

5 Watt Luxeon		Total Beam Divergence (deg) ²				On-axis Performance (cd/lm) ¹			
Part No.	Desc..	White	Red/Amber	Blue/Cyan/Grn	Warm White	White	Red/Amber	Blue/Cyan/Grn	Warm White
10003.	Narrow	17	N/K	N/K	N/K	8	N/K	N/K	N/K
10003/15.	Medium.	27	N/K	N/K	N/K	3	N/K	N/K	N/K
10003/25.	Wide.	36	N/K	N/K	N/K	2	N/K	N/K	N/K
10003/L25.	Elliptical.	39 x 19	N/K	N/K	N/K	3	N/K	N/K	N/K

Notes:

- To calculate the on-axis intensity, multiply these values by the total flux (lm Lumens) of the LED used.
- The total divergence is the full angle measured where the luminous intensity is half the peak value - usually referred to as Full Width Half Max. The beam width is dependant on the LED chip size.

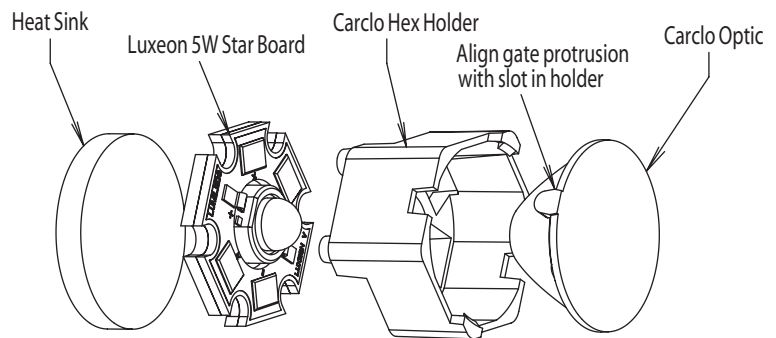
Illuminance Calculations



The diagram shows typical on-axis illuminance for a 1W white Luxeon with a narrow beam optic. Values for I can be substituted from the tables above. To calculate the illuminance at other distances, use the inverse square law $I=I/(d^2)$.

For example, at 3m, the on-axis illuminance will be $24/(3^2)=2.7$ lux/lumen. For absolute illuminance (in lux), multiply the result by the Luminous Flux (in Lumens).

Luminous Flux is usually indicated on LED datasheets or can be measured using an integrating sphere.



Assembly details showing Luxeon Star with Hex Holder



Typical Beam Pattern projected onto wall



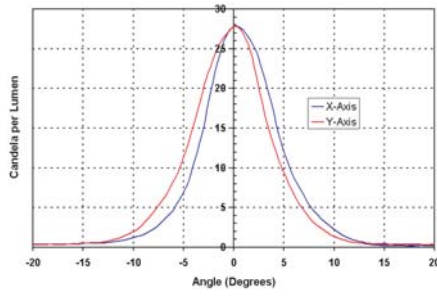
Holder/Optic/Star Board Assy



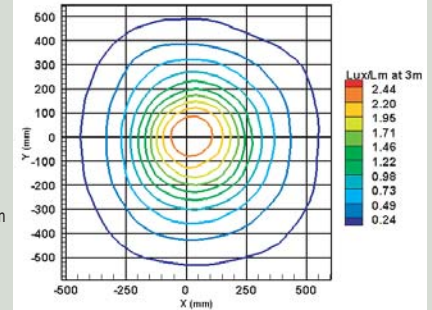
Luxeon 1 Watt Intensity & Luminance Measurements

There are currently four 20mm optics that fit the Luxeon holder, each gives a different beam profile which can be classified as narrow, medium, wide or line. The graphs show measured data for each optic when used with a 1W Luxeon LED. See pages 4,5 & 6 for similar results using the Luxeon 3W, 5W & 'Warm White' LED's.

Carclo Narrow Beam Optic and Luxeon 1W LED (White).

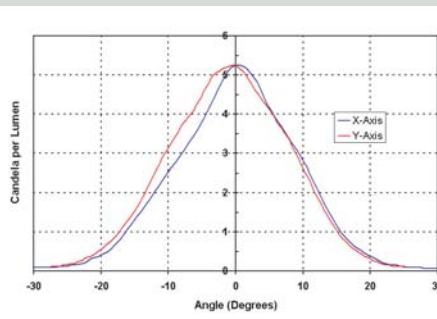


Right: Luminance map in Lux/Lumen at 3m Range

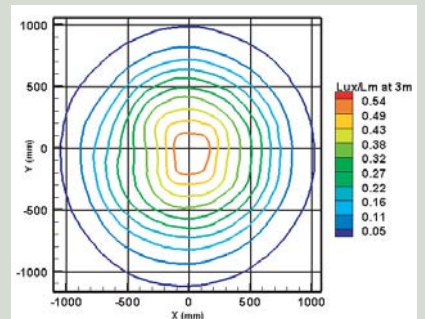


Left: Intensity Graph, Candela/Lumen v Angle in degrees

Carclo Medium Beam Optic and Luxeon 1W LED (White).

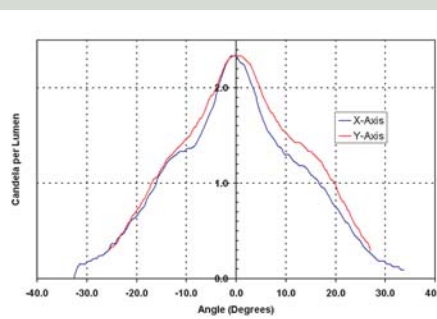


Right: Luminance map in Lux/Lumen at 3m Range

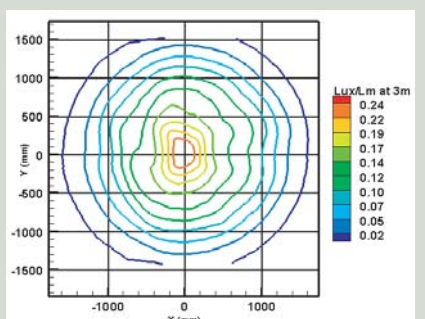


Left: Intensity Graph, Candela/Lumen v Angle in degrees

Carclo Wide Beam Optic and Luxeon 1W LED (White).

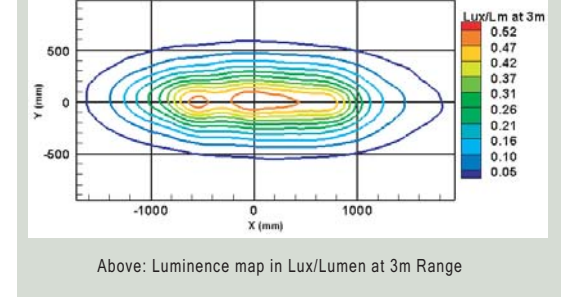
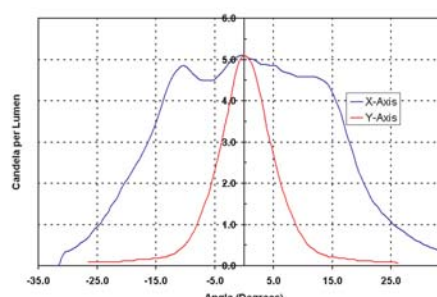


Right: Luminance map in Lux/Lumen at 3m Range



Left: Intensity Graph, Candela/Lumen v Angle in degrees

Elliptical (Line) Beam Optic and Luxeon 1W LED (White).



Above: Luminance map in Lux/Lumen at 3m Range

Above: Intensity Graph, Candela/Lumen v Angle in degrees

Notes:

- 1. Measurements made using a Luxeon 1W White LED @ 350mA. Asymmetry is usually a result of the LED wire bond, chip shape or misalignment between LED and optic.
2. Graphs show Candela per Lumen and Lux per Lumen. To calculate the absolute intensity and luminance, multiply by the total flux (in Lumens) of the Luxeon LED used.

LED OPTICS

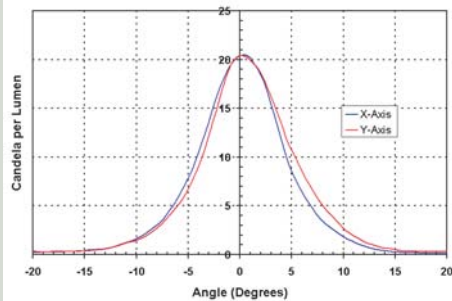




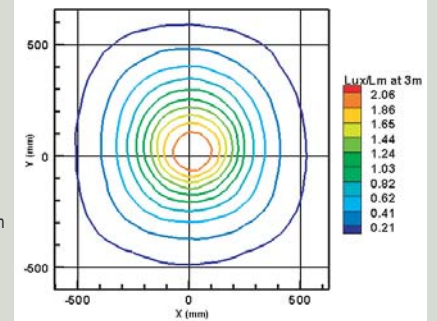
Luxeon 3 Watt Intensity & Luminance Measurements

There are currently four 20mm optics that fit the Luxeon holder, each gives a different beam profile which can be classified as narrow, medium, wide or line. The graphs show measured data for each optic when used with a 3W Luxeon LED. See page 3 for similar results using the Luxeon 1W LED.

Carclo Narrow Beam Optic and Luxeon 3W LED (White).

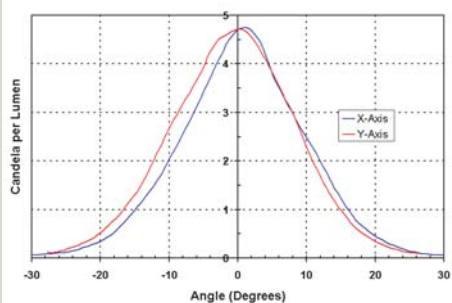


Right: Luminance map in Lux/Lumen at 3m Range

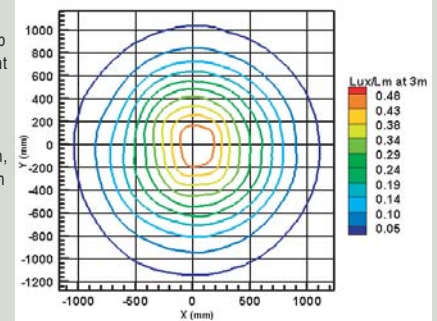


Left: Intensity Graph, Candela/Lumen v Angle in degrees

Carclo Medium Beam Optic and Luxeon 3W LED (White).

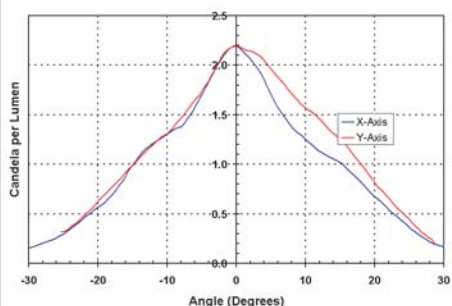


Right: Luminance map in Lux/Lumen at 3m Range

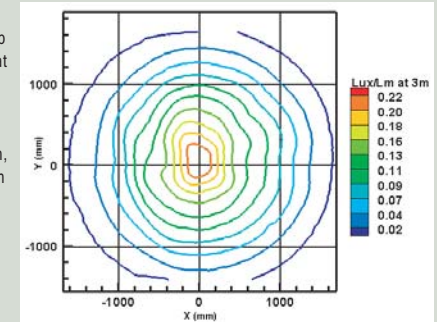


Left: Intensity Graph, Candela/Lumen v Angle in degrees

Carclo Wide Beam Optic and Luxeon 3W LED (White).

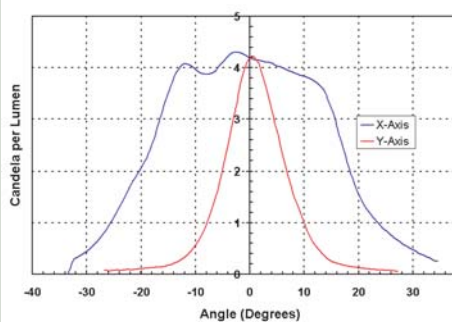


Right: Luminance map in Lux/Lumen at 3m Range

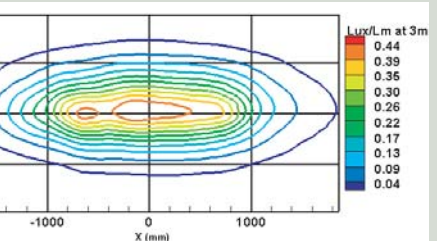


Left: Intensity Graph, Candela/Lumen v Angle in degrees

Elliptical (Line) Beam Optic and Luxeon 3W LED (White).



Right: Luminance map in Lux/Lumen at 3m Range



Above: Luminance map in Lux/Lumen at 3m Range

Above: Intensity Graph, Candela/Lumen v Angle in degrees

Notes:

1. Measurements made using a Luxeon 3W White LED @ 350mA. Asymmetry is usually a result of the LED wire bond, chip shape or misalignment between LED and optic.
2. Graphs show Candela per Lumen and Lux per Lumen. To calculate the absolute intensity and luminance, multiply by the total flux (in Lumens) of the Luxeon LED used.

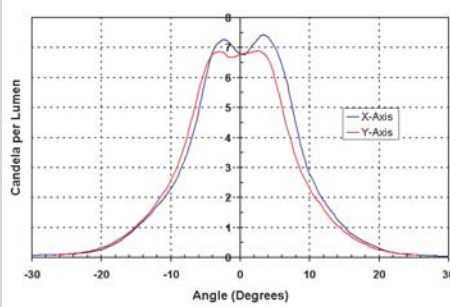
LED OPTICS



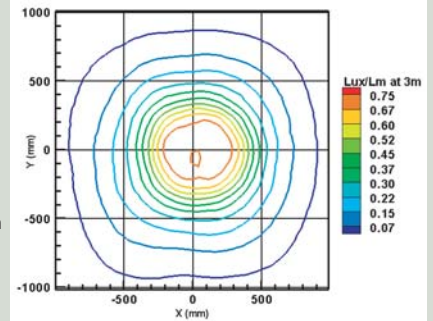
Luxeon 5 Watt Intensity & Luminance Measurements

There are currently four 20mm optics that fit the Luxeon holder, each gives a different beam profile which can be classified as narrow, medium, wide or line. The graphs show measured data for each optic when used with a 5W Luxeon LED. See page 3 for similar results using the Luxeon 1W LED.

Carclo Narrow Beam Optic and Luxeon 5W LED (White).

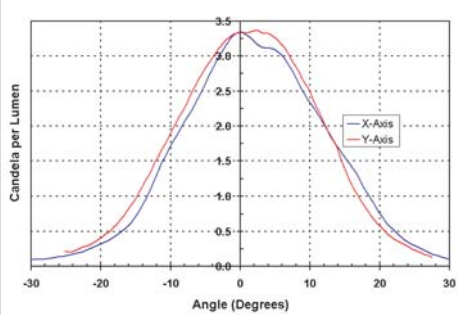


Right: Luminance map in Lux/Lumen at 3m Range

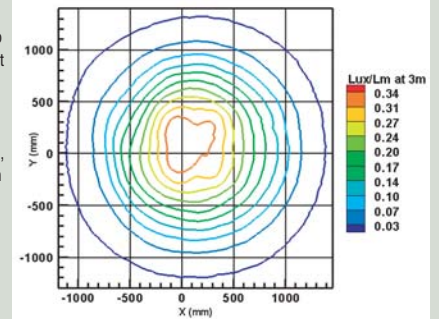


Left: Intensity Graph, Candela/Lumen v Angle in degrees

Carclo Medium Beam Optic and Luxeon 5W LED (White).

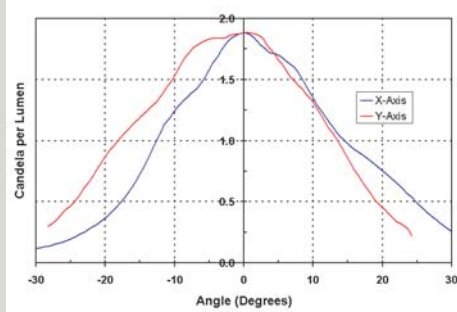


Right: Luminance map in Lux/Lumen at 3m Range

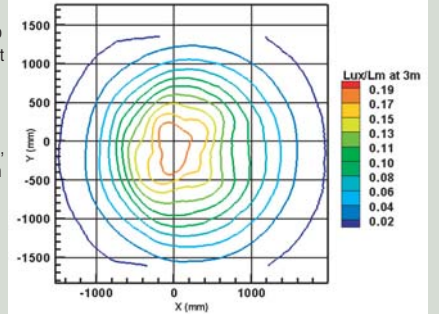


Left: Intensity Graph, Candela/Lumen v Angle in degrees

Carclo Wide Beam Optic and Luxeon 5W LED (White).

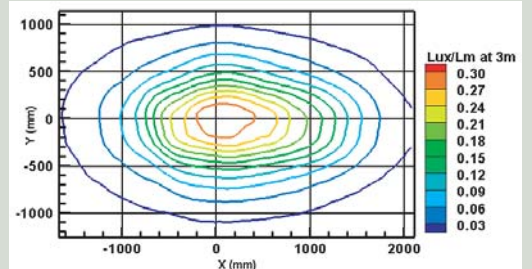
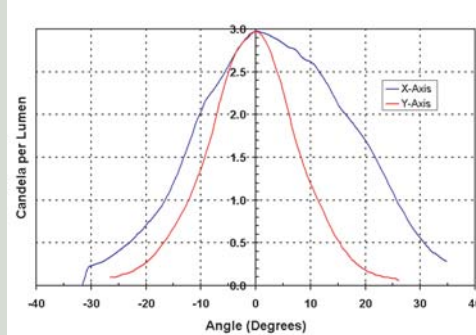


Right: Luminance map in Lux/Lumen at 3m Range



Left: Intensity Graph, Candela/Lumen v Angle in degrees

Elliptical (Line) Beam Optic and Luxeon 5W LED (White).



Above: Luminance map in Lux/Lumen at 3m Range

Above: Intensity Graph, Candela/Lumen v Angle in degrees

Notes:

- 1. Measurements made using a Luxeon 5W White LED @ 350mA. Asymmetry is usually a result of the LED wire bond, chip shape or misalignment between LED and optic.
2. Graphs show Candela per Lumen and Lux per Lumen. To calculate the absolute intensity and luminance, multiply by the total flux (in Lumens) of the Luxeon LED used.

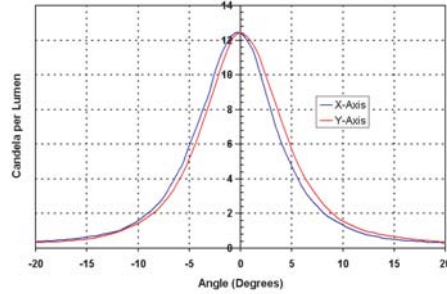
LED OPTICS



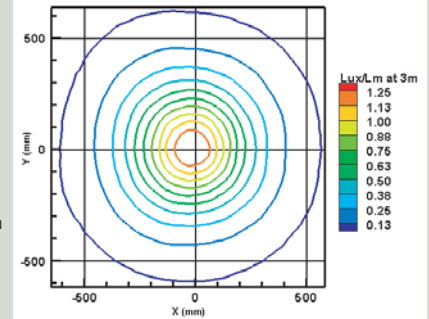
Luxeon 1W 'Warm White' Intensity & Luminance

There are currently four 20mm optics that fit the Luxeon holder, each gives a different beam profile which can be classified as narrow, medium, wide or line. The graphs show measured data for each optic when used with a 1W Warm White Luxeon LED. See page 3 for similar results using the Luxeon 1W LED.

Carclo Narrow Beam Optic and Luxeon 1W LED (Warm White).

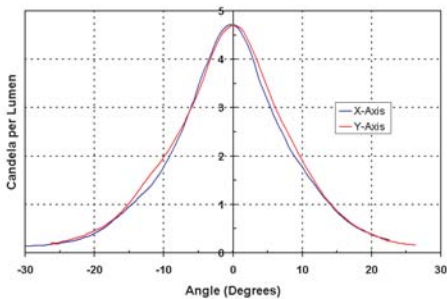


Right: Luminance map in Lux/Lumen at 3m Range

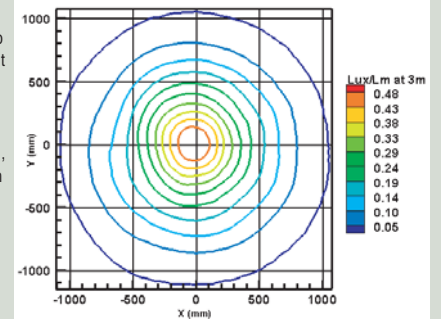


Left: Intensity Graph, Candela/Lumen v Angle in degrees

Carclo Medium Beam Optic and Luxeon 1W LED (Warm White).

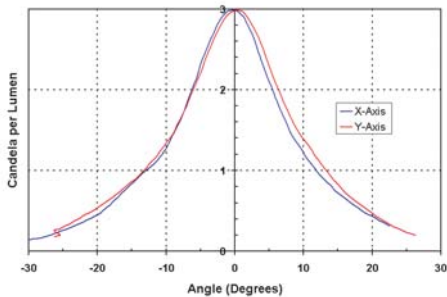


Right: Luminance map in Lux/Lumen at 3m Range

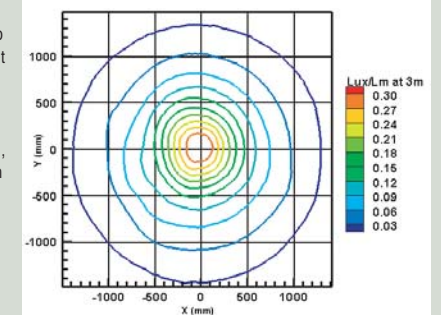


Left: Intensity Graph, Candela/Lumen v Angle in degrees

Carclo Wide Beam Optic and Luxeon 1W LED (Warm White).

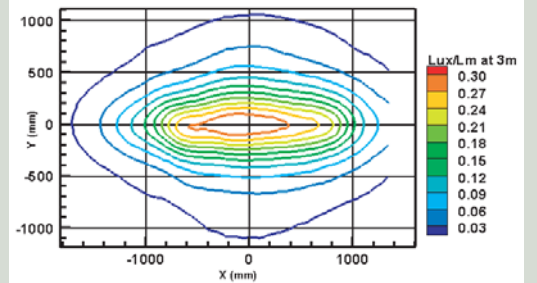
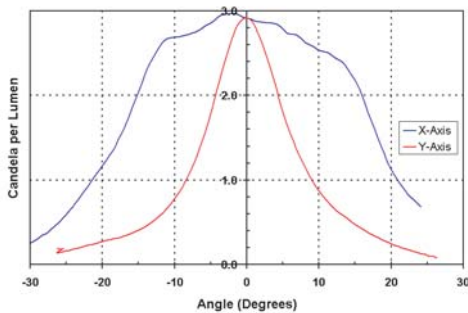


Right: Luminance map in Lux/Lumen at 3m Range



Left: Intensity Graph, Candela/Lumen v Angle in degrees

Elliptical (Line) Beam Optic and Luxeon 1W LED (Warm White).



Above: Luminance map in Lux/Lumen at 3m Range

Above: Intensity Graph, Candela/Lumen v Angle in degrees

Notes:

1. Measurements made using a Luxeon 1W Warm White LED @ 350mA. Asymmetry is usually a result of the LED wire bond, chip shape or misalignment between LED and optic.
2. Graphs show Candela per Lumen and Lux per Lumen. To calculate the absolute intensity and luminance, multiply by the total flux (in Lumens) of the Luxeon LED used.