

Intematix ChromaLit™ Ellipse, Candle, Dome

Remote Phosphor Light Source



ChromaLit™ Ellipse, Candle and Dome light sources enable brighter, more energy efficient LED bulbs and lighting fixtures by providing wide angle lighting distribution, improved light quality, and greater design freedom. These remote phosphor light sources from Intematix provide highly uniform light distribution and are offered in a variety of lumen levels for applications in indoor and outdoor general lighting, decorative and retrofit light bulb designs.

Features & Benefits

- Omni-directional light distribution
- Glare-free LED light bulb design
- High color quality and color consistency
- Unprecedented design freedom for solid state lighting products and systems
- Streamlined supply and production of LED lighting systems
- Up to 30% higher system efficacy compared to conventional LED lighting designs

Applications & Uses

- LED retrofit light bulbs
- Portable consumer lighting
- Downlights
- Wall sconces
- Pendants
- Chandelier and other decorative applications
- Appliances

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Product Nomenclature

ChromaLit products are identified by the following product nomenclature:

Product order code

CL-ABC-DEFGH-IJ

Where

CL – Designates ChromaLit products

A – Designates first digit in CRI

BC – Designates the first two digits in CCT

DEF – Designates shape

–CAN Candle

–ELP Ellipse

–DOM Dome

GH – Product Identification Number

IJ – Designates material

Example:

CL-830-CAN15-PC represents ChromaLit Candle 15, 80CRI, 3000K CCT, polycarbonate family

Optical and Performance Characteristics¹

Product	CCT ² (K)	Color Consistency ³		Min CRI ⁴	Minimum Conversion Efficacy ⁵ (Lm/W _{rad}) at 25°C	Typical Conversion Efficacy ⁵ (Lm/W _{rad}) at 25°C
		SDCM	CCT (K)			
CL-827	2700	3	±70	80	155	165
CL-927	2700	3	±70	90	130	145
CL-830	3000	3	±90	80	175	185
CL-930	3000	3	±90	90	140	150
CL-835	3500	3	±110	80	180	190
CL-840	4000	3	±120	80	185	195
CL-750	5000	4	±170	70	210	220

Notes:

1. Performance based on reference design. Please refer to application note for details on reference design. Intematix maintains a tolerance of ±7% on luminous flux, radiant watt and CCT measurements.

2. Correlated color temperature

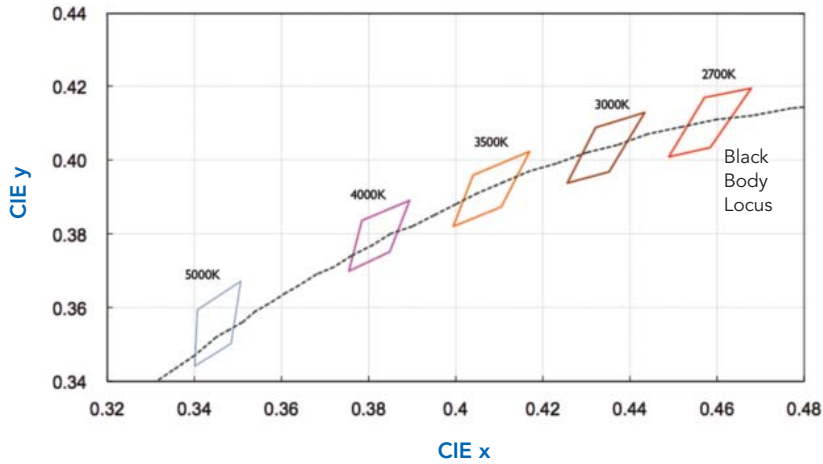
3. **Color Consistency** is dependent on the AVERAGE dominant wavelength of blue LEDs. ChromaLit will achieve 3 SDCM with uniform blue LED average dominant wavelength. 2.5nm (±1.25nm) of average blue LED wavelength variation will provide 4 SDCM of color consistency. 5nm (±2.5nm) of average blue LED dominant wavelength variation will provide 5 SDCM of color consistency. Values are approximate, please refer to bin diagram on the following page for exact bin definition.

4. **Minimum Color Rendering Index** rating is based on reference design using blue LEDs with average dominant wavelength of 455nm. Please refer to page 10 for more information on performance characteristics over wavelength.

5. **Conversion Efficacy** is the luminous flux (white light) output per radiant watt of blue light input to ChromaLit. W_{rad} is the radiometric power measured in watts. Conversion efficacy is rated based on reference operation and dominant blue LED wavelength of 455nm (peak wavelength of 450nm).

Optical Characteristics (Continued)

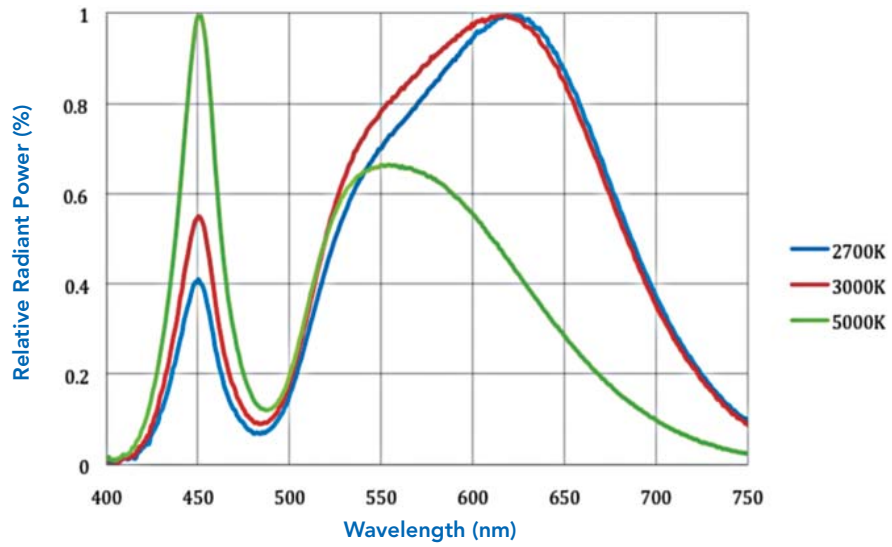
ChromaLit Binning Diagram



ChromaLit Bin Coordinates

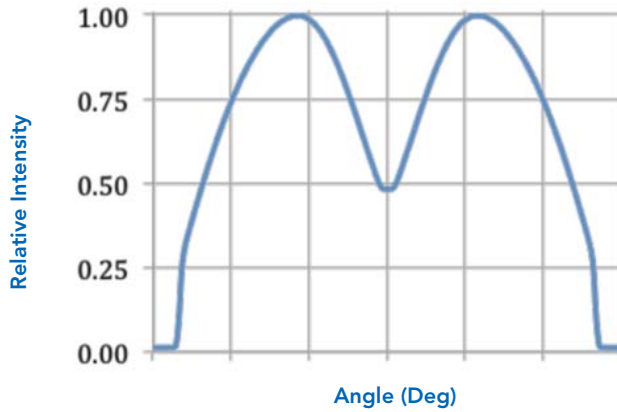
CCT(K)	x	y	CCT(K)	x	y	CCT(K)	x	y
2700K	0.4571	0.4169	3000K	0.4321	0.4088	3500K	0.4040	0.3959
	0.4489	0.4008		0.4256	0.3937		0.3994	0.3820
	0.4584	0.4034		0.4352	0.3968		0.4105	0.3873
	0.4679	0.4194		0.4434	0.4129		0.4170	0.4023
CCT(K)	x	y	CCT(K)	x	y			
4000K	0.3785	0.3836	5000K	0.3407	0.3594			
	0.3755	0.3699		0.3401	0.3442			
	0.3848	0.3751		0.3484	0.3503			
	0.3894	0.3890		0.3506	0.3671			

Relative Spectral Power Distribution



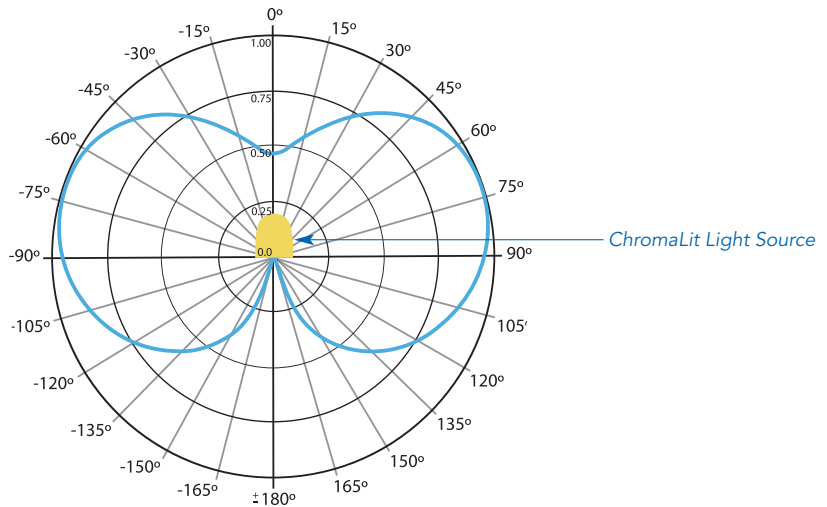
Intensity Distribution-Chromalit Ellipse

Luminous Intensity Distribution Diagram¹



Beam Angle (Full Angle)	280°
Maximum Intensity Angle (Half Angle)	75°

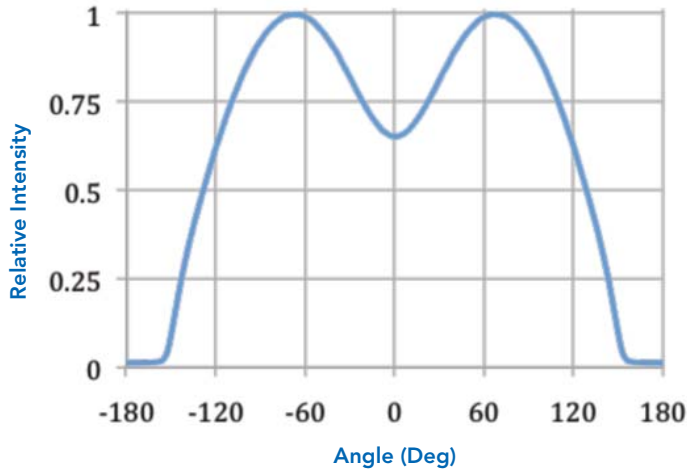
Luminous Intensity Polar Diagram



¹Intensity distribution pattern is characterized using CL-750-ELP60-PC products.

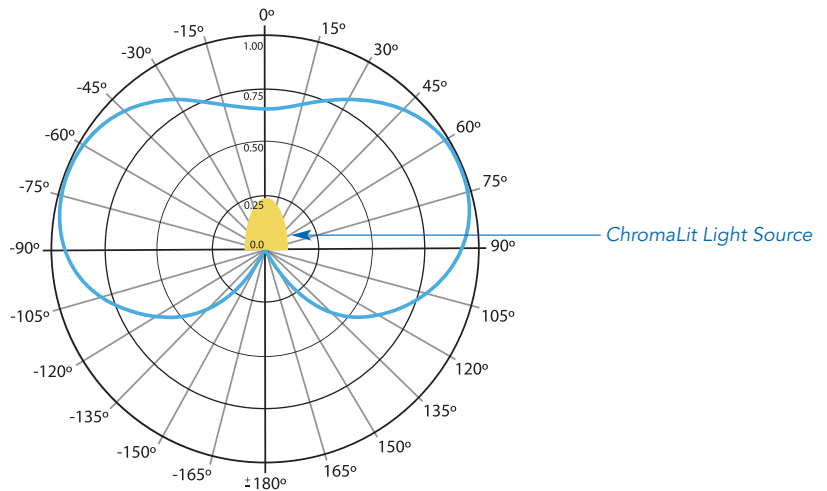
Intensity Distribution-Chromalit Candle

Luminous Intensity Distribution Diagram¹



Beam Angle (Full Angle)	255°
Maximum Intensity Angle (Half Angle)	70°

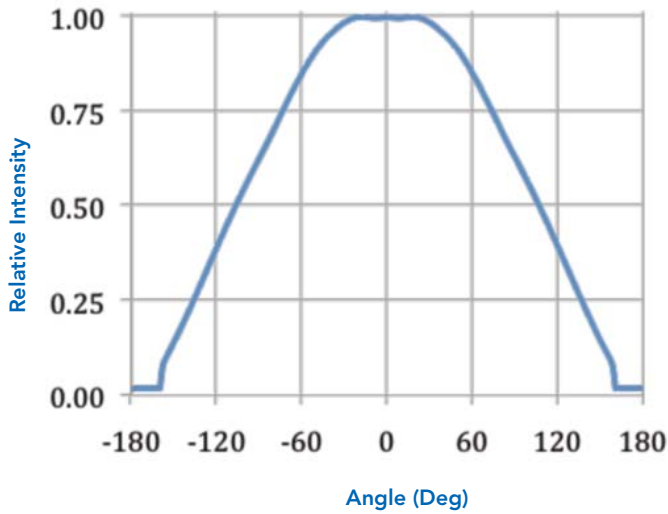
Luminous Intensity Polar Diagram



¹Intensity distribution pattern is characterized using CL-750-CAN40-PC products.

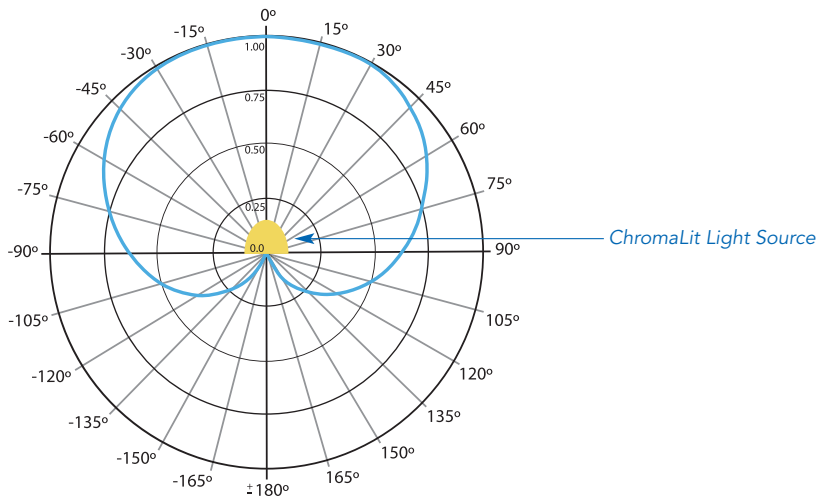
Intensity Distribution-ChromaLit Dome

Luminous Intensity Distribution Diagram¹



Beam Angle (Full Angle)	215°
Maximum Intensity Angle (Half Angle)	0°

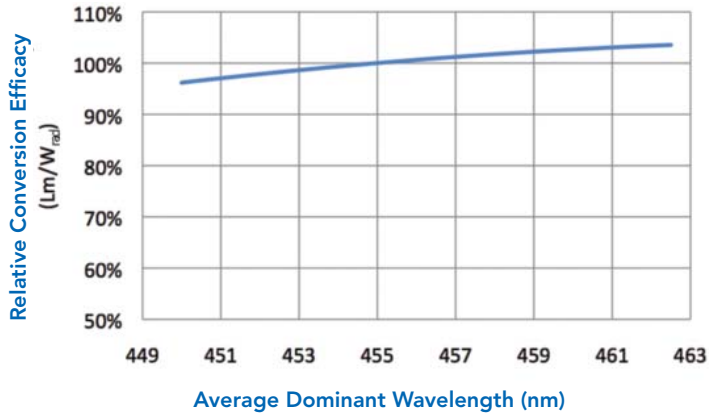
Luminous Intensity Polar Diagram



¹Intensity distribution pattern is characterized using CL-750-DOM60-PC products.

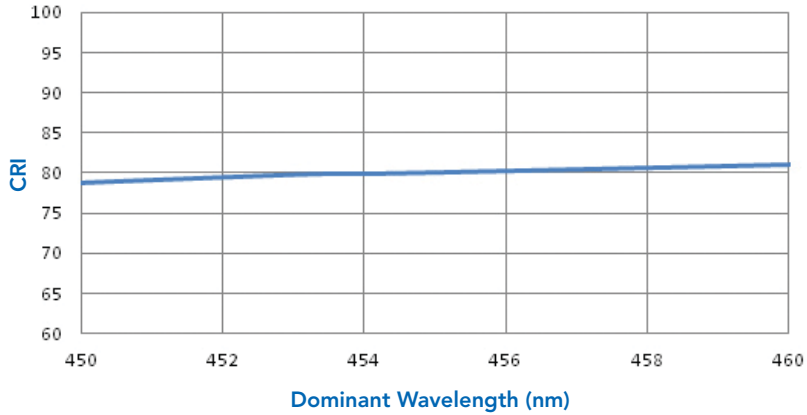
Performance Characteristics over Wavelength

Relative Conversion Efficacy over Wavelength¹



¹Relative conversion efficacy does not reflect performance of blue LED over dominant wavelength.

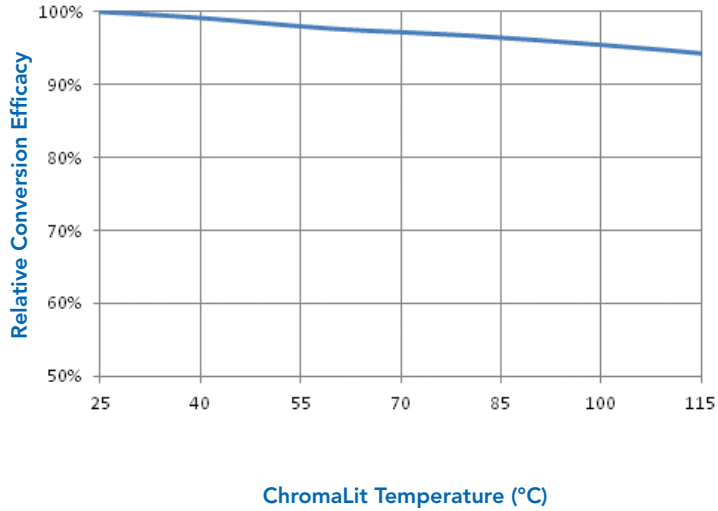
Minimum CRI over Wavelength



Relative CIE Chromaticity Shift over Wavelength

	Average Dominant Wavelength				
	450nm	452.5nm	455nm	457.5nm	460nm
Δ CIE X Coordinate	-0.003	-0.002	0	0.001	0.001
Δ CIE Y Coordinate	-0.014	-0.007	0	0.005	0.008

Relative Conversion Efficacy over Temperature



Absolute Maximum Ratings

Description	Maximum Values
Maximum operating temperature (Tmax ¹)	110°C
Minimum operating temperature	-40°C
Max storage temperature	110°C
Minimum storage temperature	-40°C

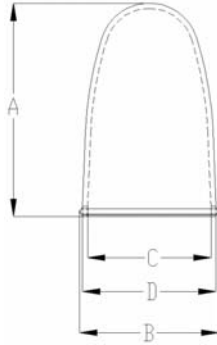
¹Tmax is the maximum temperature measured on the inner surface of ChromaLit. Please consult application guide for additional information on measurement location.

Mechanical Characteristics for ChromaLit

Material Properties

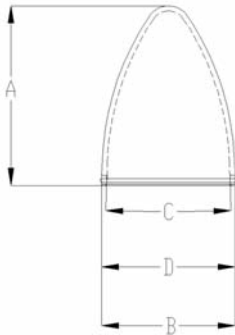
Description	Properties
Substrate Material	Polycarbonate
Coefficient of Thermal Expansion	70 ppm/°C

ChromaLit Ellipse



Dimension Designation	Example Application	Typical Lumen Output (lm) ¹	A. Height (mm/in.) ²	B. Maximum Diameter (mm/in.) ²	C. Inner Opening Diameter (mm/in.) ²	D. Outer Opening Diameter (mm/in.) ²	Thickness (mm/in.) ²
ELP30	LED retrofit lamp/ pathway lighting/ chandelier	200-350	26.4/1.0	17.2/0.6	14.5/0.6	16.4/0.6	1.0/0.04
ELP40		350-600	32.9/1.3	22.8/0.9	20.0/0.8	22.0/0.9	1.0/0.04
ELP60		550-850	40.4/1.6	26.3/1.0	23.5/0.9	25.5/1.0	1.0/0.04

ChromaLit Candle

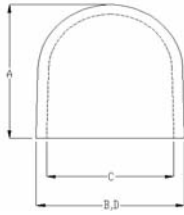


Dimension Designation	Example Application	Typical Lumen Output (lm) ¹	A. Height (mm/in.) ²	B. Maximum Diameter (mm/in.) ²	C. Inner Opening Diameter (mm/in.) ²	D. Outer Opening Diameter (mm/in.) ²	Thickness (mm/in.) ²
CAN15	LED retrofit lamp/lantern/ chandelier	70-150	16.0/0.6	11.9/0.5	9.5/0.4	11.4/0.4	1.0/0.04
CAN30		150-300	24.2/1.0	16.9/0.7	14.5/0.6	16.4/0.6	1.0/0.04
CAN40		300-700	35.0/1.4	26.6/1.0	24.0/0.9	26.0/1.0	1.0/0.04

¹ Typical lumen output is estimated based on 2700K, 80CRI and typical blue LED radiometric watts recommended. See application note for considerations for enclosed operations.

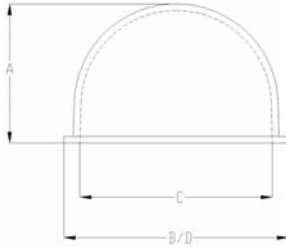
² Dimension tolerances are typically ±0.1mm.

ChromaLit Dome 15



Dimension Designation	Example Application	Typical Lumen Output (lm) ¹	A. Height (mm/in.) ²	B. Maximum Diameter (mm/in.) ²	C. Inner Opening Diameter (mm/in.) ²	D. Outer Opening Diameter (mm/in.) ²	Thickness (mm/in.) ²
DOM15	Miniature lamps/ landscape lighting/ single LED	100-200	13.8/0.5	14.0/0.6	12.0/0.5	14.0/0.6	1.0/0.04

ChromaLit Dome 40, 60, 100

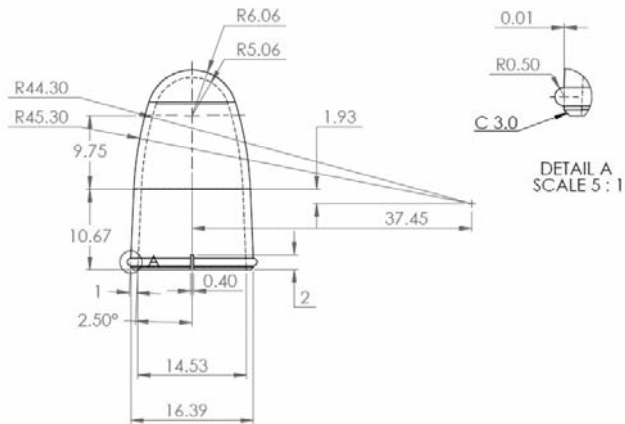


Dimension Designation	Example Application	Typical Lumen Output (lm) ¹	A. Height (mm/in.) ²	B. Maximum Diameter (mm/in.) ²	C. Inner Opening Diameter (mm/in.) ²	D. Outer Opening Diameter (mm/in.) ²	Thickness (mm/in.) ²
DOM40	LED retrofit lamp/	300-600	20.5/0.8	33.0/1.3	28.0/1.1	33.0/1.3	1.0/0.04
DOM60	pendants/wall sconce/	600-1000	26.1/1.0	42.0/1.7	37.0/1.5	42.0/1.7	1.0/0.04
DOM100	ceiling fixtures	1000-1600	34.1/1.3	55.0/2.2	50.0/2.0	55.0/2.2	1.0/0.04

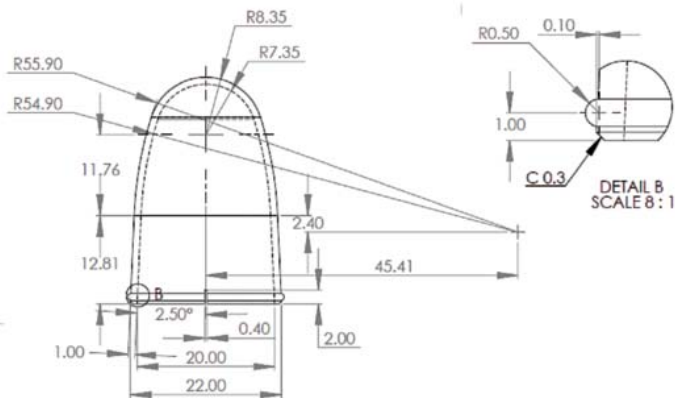
¹ Typical lumen output is estimated based on 2700K, 80CRI and typical blue LED radiometric watts recommended. See application note for considerations for enclosed operations.

² Dimension tolerances are typically $\pm 0.1\text{mm}$.

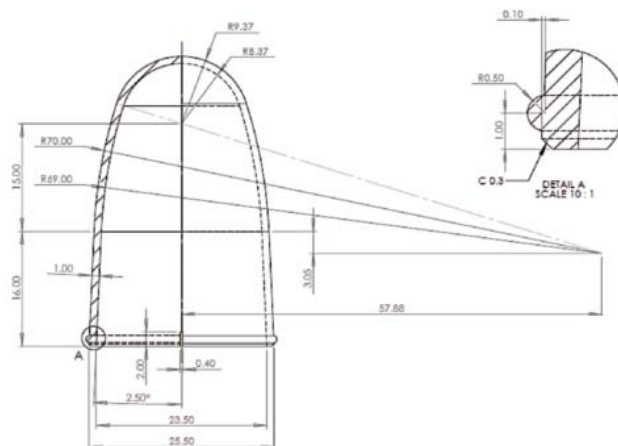
Mechanical Diagram, ChromaLit ELP30



Mechanical Diagram, ChromaLit ELP40

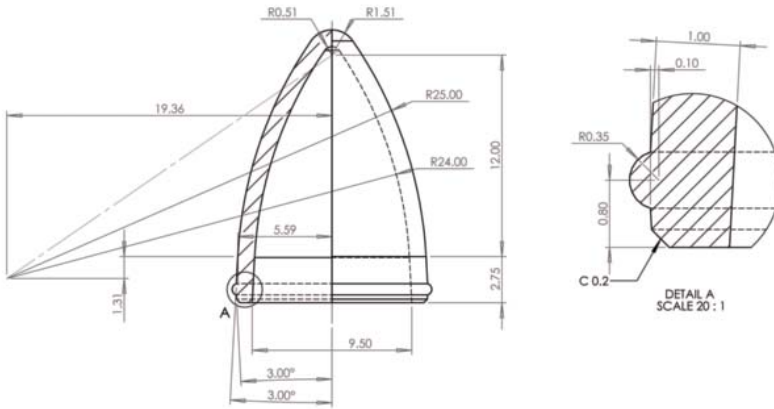


Mechanical Diagram, ChromaLit ELP60

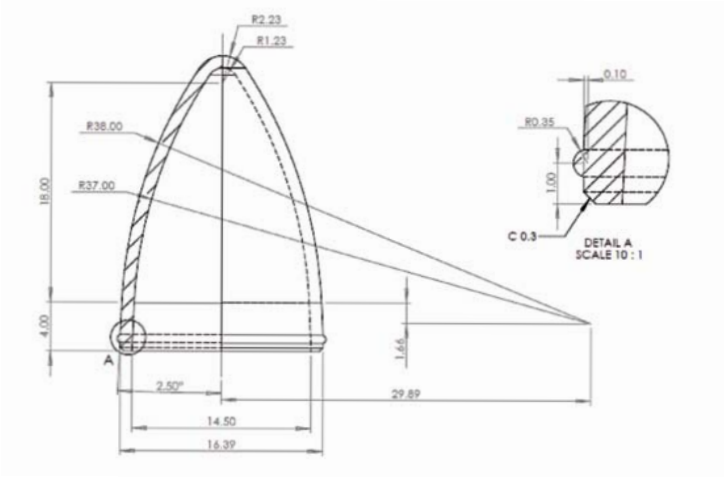


Notes:
All dimensions are in millimeters
Tolerances: ± 0.1 mm

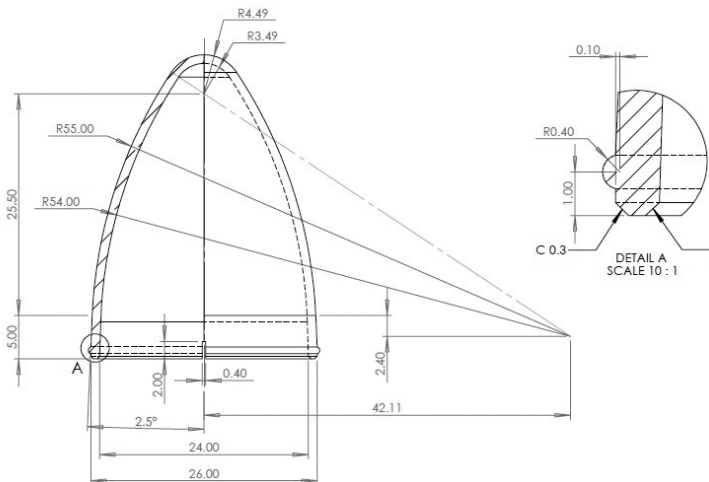
Mechanical Diagram, ChromaLit CAN15



Mechanical Diagram, ChromaLit CAN30

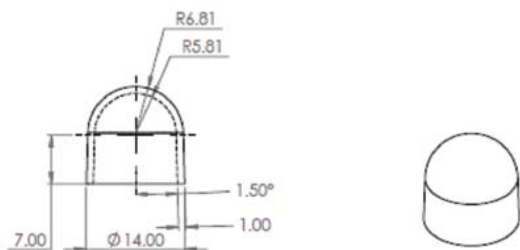


Mechanical Diagram, ChromaLit CAN40

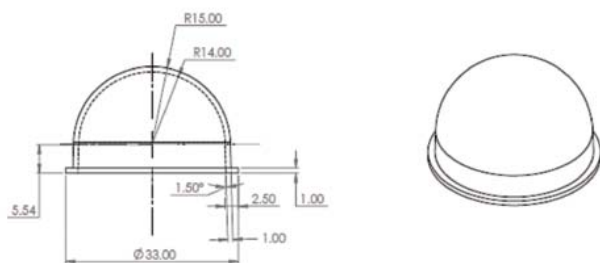


Notes:
All dimensions are in millimeters
Tolerances: ± 0.1 mm

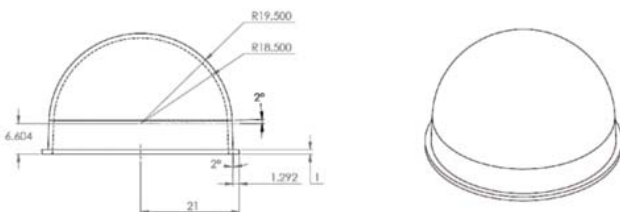
Mechanical Diagram, ChromaLit DOM15



Mechanical Diagram, ChromaLit DOM40

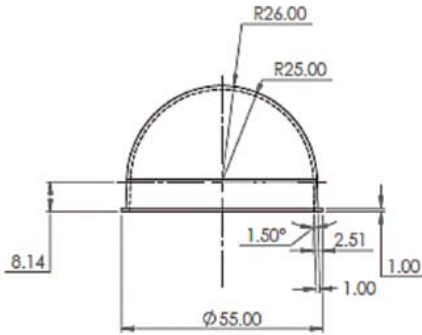


Mechanical Diagram, ChromaLit DOM60



Notes:
All dimensions are in millimeters
Tolerances: $\pm 0.1\text{mm}$

Mechanical Diagram, ChromaLit DOM100



Notes:
All dimensions are in millimeters
Tolerances: $\pm 0.1\text{mm}$

Reliability and Environmental Ratings

Description	Typical Values
Lumen maintenance	L70 50K hours at 85°C
Storage life	50K hrs
Storage humidity (non-condensing)	90%
RoHS	RoHS Compliant
REACH	REACH Compliant

Handling Considerations

As a dirty or damaged phosphor layer could result in alteration in product performance, ChromaLit light sources should be handled similarly to most optical components. It is best to handle the parts at the edges and prevent mechanical abrasion. If epoxies are used, they must be kept off of the entrance or exit apertures of ChromaLit, since they could greatly impact performance. If parts require cleaning, use a lint free tissue, isopropanol (IPA), or mild detergent. Dry using compressed air.

Company Information

Intematix Corporation is a materials development innovator, providing customizable, patented phosphors that serve as the foundation for high quality, energy efficient LED light. Intematix products enable attractive, vivid color quality, superior consistency, uniformity and stability. Headquartered in Fremont, California, Intematix maintains R&D, manufacturing, business and support operations in the United States, Asia and Europe.

To learn more about the company, please visit www.intematix.com

INTEMATIX

46430 Fremont Boulevard • Fremont, CA 94538

Tel: +1 (510) 933-3300 • Fax: +1 (510) 668-0793

chromalit@intematix.com

www.Intematix.com