

Intematix ChromaLit™ *Remote Phosphor Light Source*

Product Features

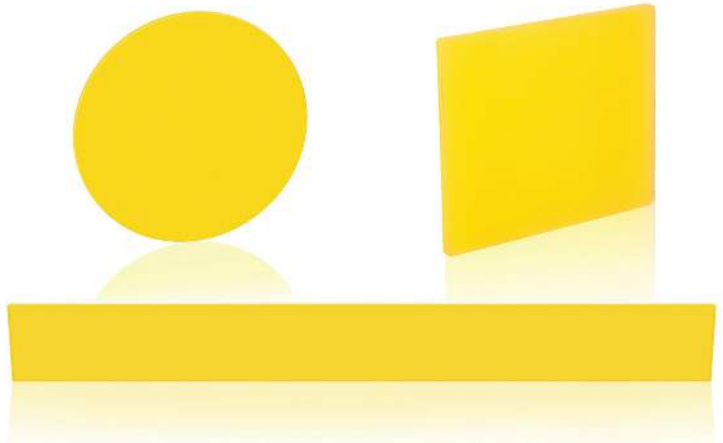
- Unsurpassed flexibility, 110 - 27,500 lumens per foot available through various design formats
- High CRI, up to 98 CRI available
- 3 SDCM color consistency
- Up to 30% higher system efficiency compared to white LED solutions

Application Benefits

- New colors with same blue light engine, streamlining supply and production of luminaires
- Uniform illuminance and appearance, no reflections or pixelation
- Consistency of lumens and color over life

Applications & Uses

- Down lights
- Spots and modules
- Entertainment
- Task lighting
- Under cabinet
- Panel lighting
- High bay



Horner Lighting - A200



CINEO - TrueColor LS

TABLE OF CONTENTS

Product Nomenclature	3
Minor Product Change Policy	3
Optical Characteristics	4
Color Binning Information	4
Relative Spectral Power Distribution	5
Intensity Distribution Diagrams	6
Performance Characteristics Over Wavelength	7
Relative Conversion Efficacy Over Temperature	7
Absolute Maximum and Minimum Ratings	8
Mechanical Characteristics	8
Reliability and Environmental Ratings	10
Handling Considerations	10
Company Information	10

Product Nomenclature

ChromaLit products are identified by the following product nomenclature:

Product order code

CL - ABC - DEFG - PC

Where:

CL - Designates the ChromaLit product family

A - Designates first digit in CRI

8 = 80 CRI minimum

BC - Designates the first two digits in CCT

30 = 3000K, 40 = 4000K, etc.

DEFG - Designates dimensions

R100 = 100mm Round

PC - Designates the standard polycarbonate material for ChromaLit

Example:

CL-840-R75-PC: ChromaLit, 80CRI, 4000K CCT, 75mm Round, Polycarbonate

Minor Product Change Policy

The rigorous qualification testing of ChromaLit products ensures product performance. Slight cosmetic changes which do not affect the form fit or function of the product may occur as Intematix continues product optimization.

Optical Characteristics

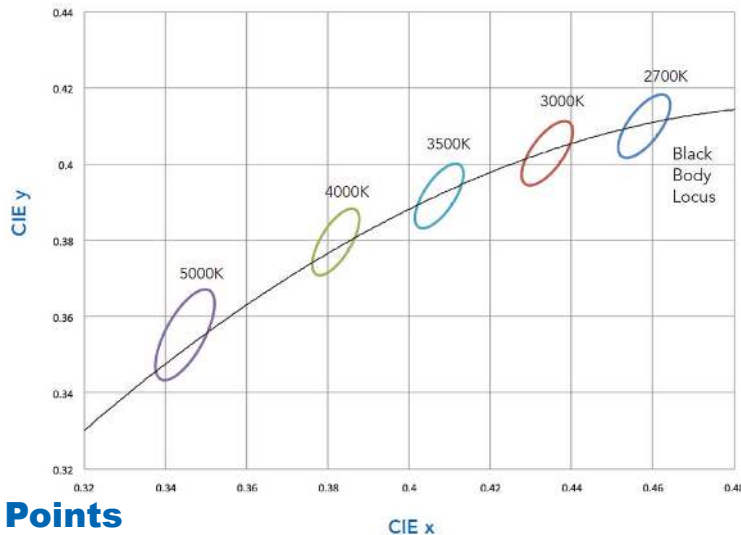
ChromaLit White Light Source Portfolio and Optical Performance Characteristics¹

Product	Nominal CCT ² (K)	Color Consistency ³		Min CRI ⁴	Viewing Angle (deg)	Conversion Efficacy ⁵ (Lm/W _{rad}) at 25°C	
		SDCM	CCT (K)			Min.	Typical
CL-827	2700	3	±70	80	115	165	180
CL-927	2700	3	±70	90	115	145	161
CL-830	3000	3	±90	80	115	185	202
CL-930	3000	3	±90	90	115	155	165
CL-835	3500	3	±110	80	115	190	210
CL-840	4000	3	±120	80	115	195	218
CL-750	5000	4	±170	70	115	215	230

Notes

- 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. Intematix maintains a tolerance of 0.5 SDCM on color consistency measurements.
- Correlated Color Temperature**
- Color Consistency** is dependent on the average dominant wavelength of blue LEDs. ChromaLit will achieve the color consistency values indicated in the table above with uniform blue LED average dominant wavelength. 2.5nm (±1.25nm) of average blue LED wavelength variation will provide 4 SDCM of color consistency for 5000K products. 5nm (±2.5nm) of average blue LED dominant wavelength variation will provide 5 SDCM of color consistency. Values are approximate; please refer to the ChromaLit binning diagram for exact bin definition.
- Minimum CRI** rating is based on reference design using blue LEDs with average dominant wavelength of 455nm. Blue LED populations with an average wavelength shorter than 455nm may result in CRI's below specified values.
- 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)

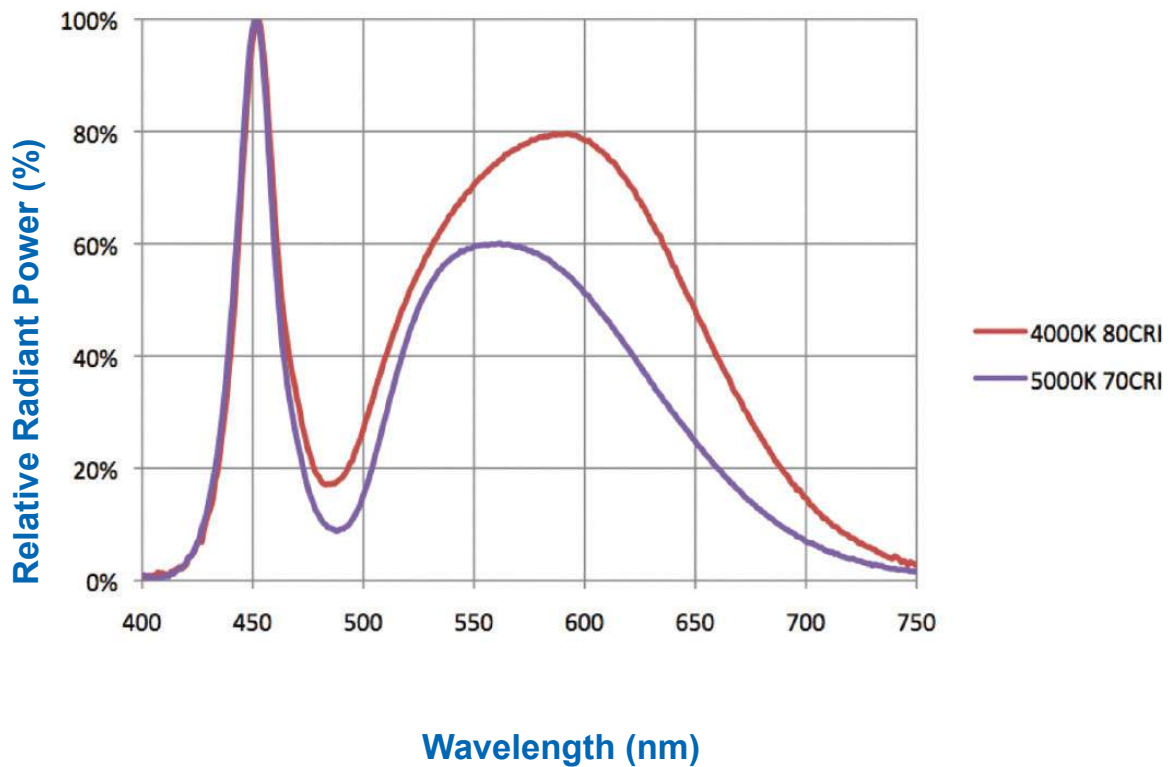
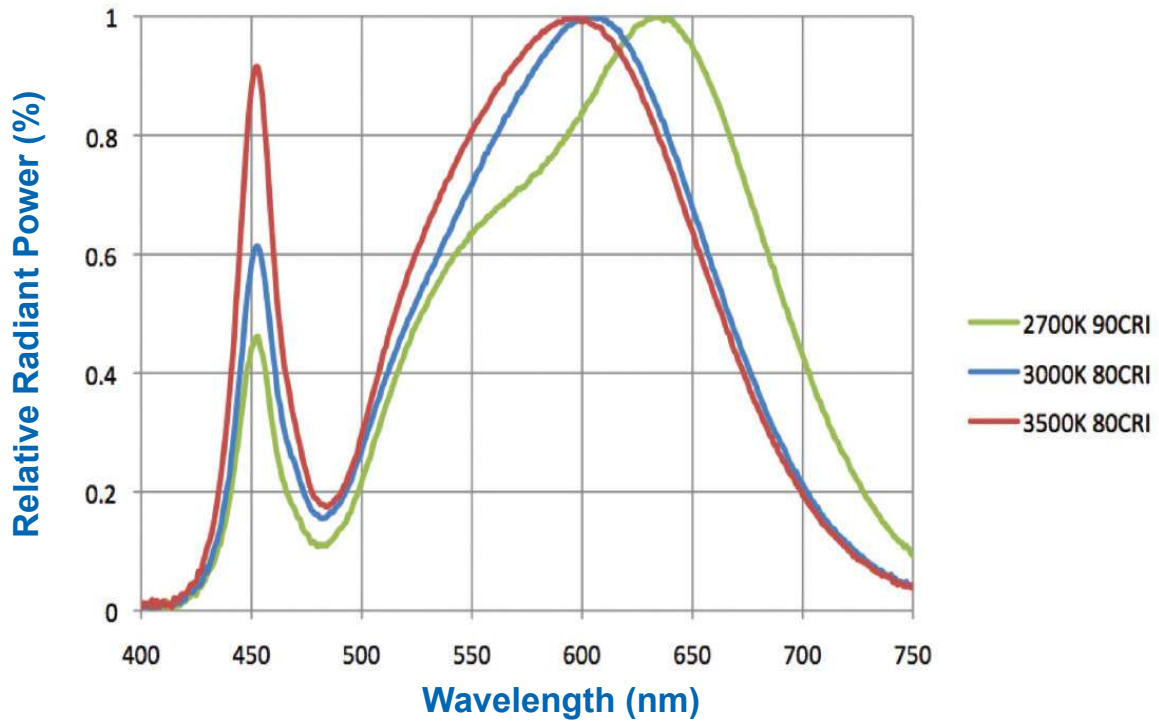
Color Binning Diagram



Color Bin Center Points

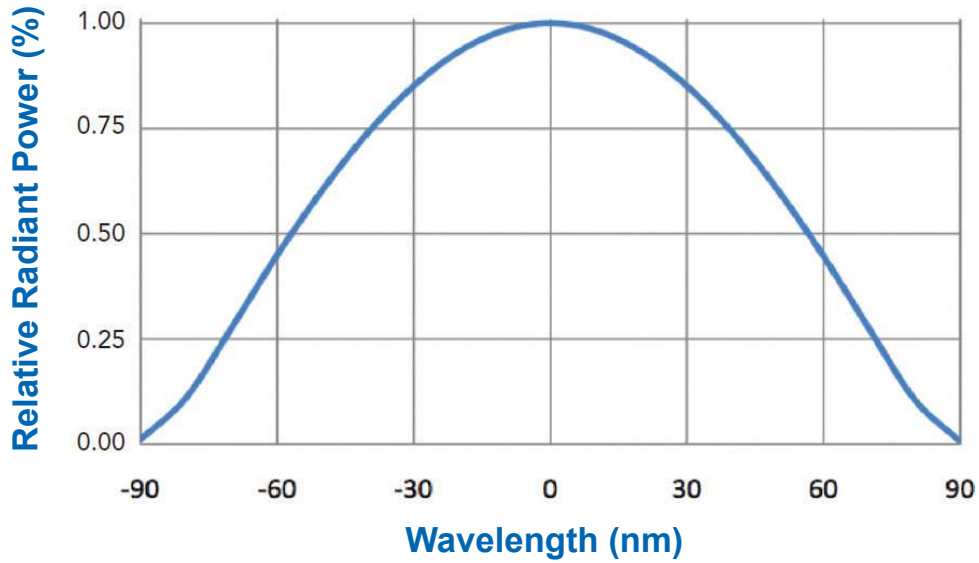
Nominal CCT (K)	x	y
3000	0.4338	0.4030
3500	0.4073	0.3917
4000	0.3818	0.3797
5000	0.3447	0.3553

Relative Spectral Power Distribution



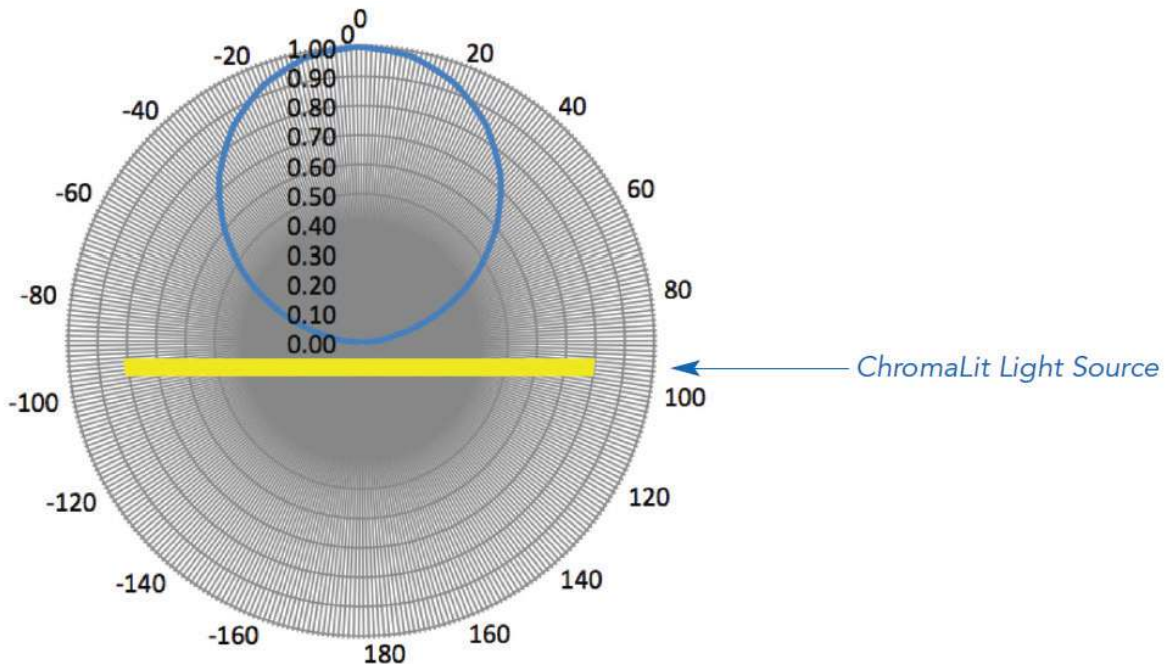
Intensity Distribution

Luminous Intensity Distribution Diagram¹



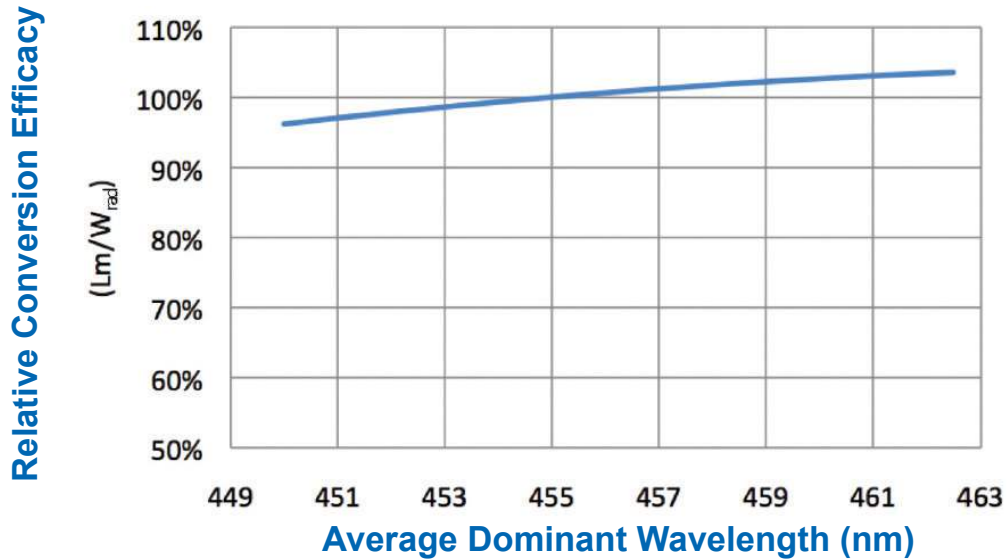
1. Intensity distribution pattern is characterized using CL-830-LR-PC products and reference design.

Luminous Intensity Polar Distribution Diagram



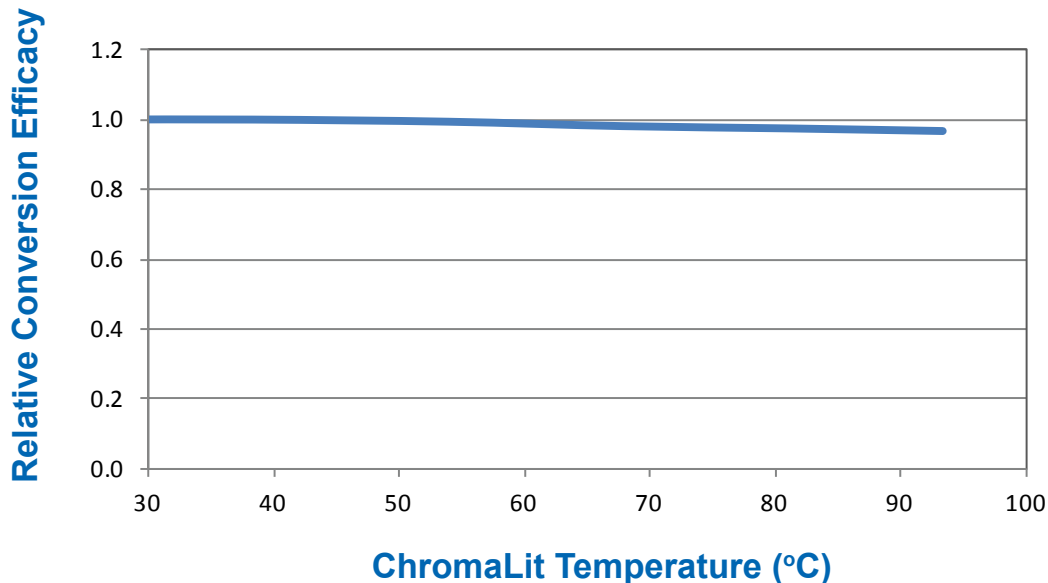
Performance Characteristics Over Wavelength

Relative Conversion Efficacy Over Wavelength¹



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

Relative Conversion Efficacy over Temperature



Relative CIE Chromaticity Shift Over Wavelength

	Average Dominant Wavelength				
	450nm	452.2nm	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

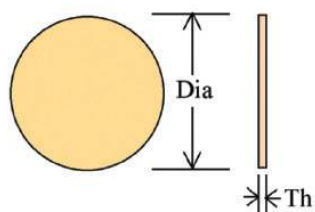
Absolute Maximum and Minimum Ratings

Description	Maximum and Minimum Values
Maximum operating temperature (Tmax ¹)	95°C
Minimum operating temperature	-40°C
Maximum storage temperature	95°C
Minimum storage temperature	-40°C
Response time to full light output	10µs

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

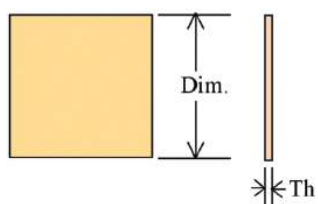
Mechanical Characteristics

ChromaLit Round Mechanical Diagram*



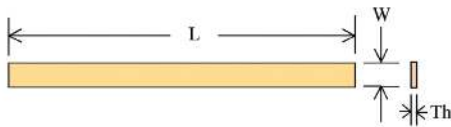
Dimension Designation	Diameter (mm) ¹	Diameter (in.)	Example Application	Typical Lumen Output (lm) ²
R23	22.5	0.9	Single LED	110-200
R34	34.0	1.3	Spot Lighting	220-400
SR	45.0	1.8	Down Light	440-800
LR	61.5	2.4		730-1300
R75	75.0	3.0		1100-2000
R100	100.0	3.9		2200-4000
R135	135.0	5.3	High Bay	3600-6600
R215	215.0	8.5		14000-16500

ChromaLit Square Mechanical Diagram*



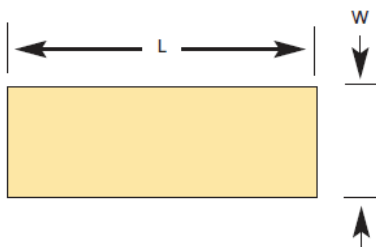
Dimension Designation	Dimensions LxW (mm) ¹	Dimensions LxW (in.)	Example Application	Typical Lumen Output (lm) ²
S21	21.0 x 21.0	0.8 x 0.8	Single LED	110-200
S40	40.0 x 40.0	1.6 x 1.6	Down Light	440-800
S55	55.0 x 55.0	2.2 x 2.2		730-1300
S65	65.0 x 65.0	2.6 x 2.6		1100-2000
S95	95.0 x 95.0	3.7 x 3.7		2200-4000
S120	120.0 x 120.0	4.7 x 4.7	High Bay	3600-6600
S200	200.0 x 200.0	7.9 x 7.9		14000-16500

ChromaLit Linear Mechanical Diagram*



Dimension Designation	Dimensions LxW (mm) ¹	Dimensions LxW (in.)	Example Application	Typical Lumen Output (lm) ²
L225	305.0 x 22.5	12.0 x 0.9	Task/Linear/ Panel Lighting	950-2400
L125	305.0 x 12.5	12.0 x 0.5		950-1400

ChromaLit Panel Mechanical Diagram*



Dimension Designation	Dimensions LxW (mm) ¹	Dimensions LxW (in.)	Example Application	Typical Lumen Output (lm) ²
P215	305.0 x 215.0	12.0 x 8.5	Custom	15000-27500

Notes

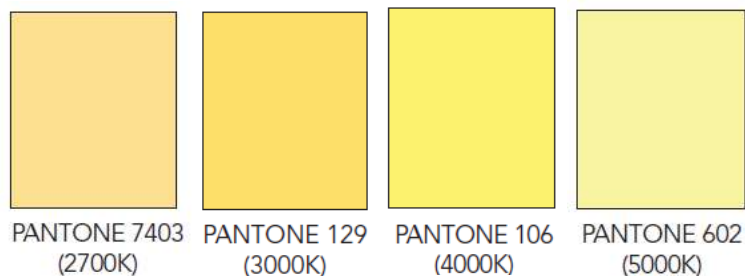
*Product performance based on reference design. Product specifications subject to change.

1. Typical dimension tolerances for length and width are $\pm 0.2\text{mm}$. Typical dimension tolerances for round is $\pm 0.2\text{mm}$ for $<100\text{mm}$ diameter. Typical dimension tolerances for round is $\pm 0.5\text{mm}$ for $\geq 100\text{mm}$ diameter.
2. Typical lumen output is estimated based on typical blue LED radiometric watts recommended.

Additional Mechanical Characteristics

Characteristic	Value
Thickness	2.1mm $\pm 0.1\text{mm}$
Orientation	Glossy side out, Matte side facing LED
Off-State Color (Glossy side, representation using PANTONE color match system)	PANTONE 7403 (2700K, 90CRI) PANTONE 129 (3000K, 80CRI) PANTONE 106 (4000K, 80CRI) PANTONE 602 (5000K, 70CRI)

Off-State Color



Reliability and Environmental Ratings

Description	Typical Values
Temperature / Humidity (non-condensing)	60°C 90% RH
Coefficient of Thermal Expansion	70 ppm / °C
Flame Rating ¹	HB
RoHS	RoHS Compliant
REACH	REACH Compliant

¹ Flame rating indicated based on UL rating of bulk material used for ChromaLit. Flammability is dependent on both material and geometry and ChromaLit has been tested to exceed higher flammability ratings in finished lighting products. V0 rated versions available upon request - please contact your Intematix sales representative for additional details.

Handling Considerations

Since a dirty or damaged phosphor layer could result in alteration in product performance, ChromaLit 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 (CDA).

About Intematix

Intematix develops essential phosphor materials to drive the LED lighting revolution. The company's comprehensive range of products and solutions can be used to build foundations for the world's LED lighting products and systems including general lighting, displays, automotive and many others. A broad selection of products and innovative delivery systems accelerate time-to-market, improve light quality and efficacy and reduce costs. For more information, please visit www.intematix.com.

INTEMATIX

46430 Fremont Boulevard ● Fremont, CA 94538

Tel: +1 510.933.3300 ● Fax: +1 510.668.0793

Sales@intematix.com

www.intematix.com/ChromaLit