

# IES LM-79-08

## MEASUREMENT AND TEST REPORT

For

### GREEN CREATIVE LTD

756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai, China

**Test Model: 6PLH/835/BYP**

<b>Report Type:</b>	Electrical and Photometric tests including: Luminous Flux, Color, Luminous Intensity Distribution
<b>Test Engineer:</b>	Daniel Duan <i>Daniel Duan</i>
<b>Report Number:</b>	R1KS160531001-10
<b>Test Date:</b>	2016-06-03 to 2016-06-04
<b>Report Date:</b>	2016-06-08
<b>Reviewed By:</b>	Jeanne Han/Safety Manager <i>Jeanne Han</i>
<b>Prepared By:</b>	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008
<b>Test Facility:</b>	Test facility was located at Pu Long Cun 69, Puxinghu Industrial Area, Tangxia Town, Dongguan, Guangdong, P.R.China.
<b>Accreditation:</b>	The NVLAP Lab Code is 200707-0.

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## 1. Product Description

### General Information:

One sample was received on 2016-06-01 and used for testing.

Model Tested: 6PLH/835/BYP  
Manufacturer: GREEN CREATIVE LTD  
Brand Name: GREEN CREATIVE  
Product Designation: PLV Lamp  
Burning Time Before Test: 0hour(For New Products)

### Rated Values:

Rated Voltage/Frequency: AC120-277V/60Hz  
Rated Power: 6W  
Nominal CCT: 3500K  
Nominal Lumen Output: 550lm

### Family Declaration:

*GREEN CREATIVE LTD*, hereby declare that there are some differences between our Multiple Models and testing products. Details as below:

Testing Model Number	Multiple listed Model Number	Difference	Details
6PLH/835/BYP	6PLH/835/BYP/E26 6PLH/835/BYP/GU24	Lamp base	The lamp base of test model is G24D; The lamp base of 6PLH/835/BYP/E26 is E26; The lamp base of 6PLH/835/BYP/GU24 is GU24;

## 2. Standards Used

- IESNA LM-79-08: Approved Method: Electrical & Photometric Measurement of Solid-state Lighting Products
- ANSI C82.77-2002: Harmonic Emission Limits – Related Power Quality Requirements for Lighting

## 3. Description of Test Equipment

Device	Manufacturer	Model No	Serial No	Test Range	Calibration date	Calibration due date
AC Power Supply	EVERFINE	VPS1030 PWM	1012017	0-150V, 0-300V	2016-03-04	2017-03-03
DC Power Supply	EVERFINE	WY12010	1009009	30V/5A	2016-03-04	2017-03-03
Power Meter	YOKOGAWA	WT-210	91KB35700	15/30/60/150/300/600 V	2016-03-04	2017-03-03
Goniophotometer	EVERFINE	GO-R5000	YG108492N10120001	1600mm,3000W/10A	2016-03-10	2017-03-09
Wireless Remote Sensor	N/A	433MHz	N/A	0°C~50°C;-20°C~60°C	2016-03-21	2017-03-20
Standard Light Source	EVERFINE	D908	1012003	N/A	2015-09-08	2016-09-07

Device	Manufacturer	Model No	Serial No	Test Range	Calibration date	Calibration due date
2.0m integrating sphere	EVERFINE	R98	11010018	R98	2015-11-09	2016-11-08
High accuracy array spectroradiometer	EVERFINE	HAAS-2000	1012016T	380-780nm	2016-03-10	2017-03-09
Digital Power Meter	EVERFINE	PF2010A	1011004	600V/20A	2015-07-24	2016-07-23
Digital CC&CV DC Power Supply	EVERFINE	WY305-V1	1101047	30V/5A	2015-07-27	2016-07-26
Temperature/humidity/clock	Victor	VC230	EE023	0~40°C0~90%	2016-03-21	2017-03-20
Standard Light Source	SENSING	N/A	LSD090808	N/A	2015-09-25	2016-09-24
Special zero-voltage synchronous switching AC	EVERFINE	DPS1010-YF	1011001T	30V/5A	2016-03-04	2017-03-03

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Shenzhen) attested that all calibration has been performed using suitable standards traceable to National Primary Standards and International System of Units (SI).

#### 4. Test Method

Product was tested with no seasoning. All stabilization and measurements were made in compliance with IES LM-79-08. The product was operated at rated voltage or at voltage required by manufacturer. The ambient temperature of the sample was maintained at 25°C±1°C during measurement. And relative humidity is less than 65%.

##### Integrating Sphere System

The system includes AC power source, digital power meter, DC power supply, spectrophotometer, and integrating sphere. The integrating sphere system is calibrated by standard light source before measurement.

4π geometry was used during measurement. The product was operated in its intended orientation in application and was recorded in this report.

The uncertainty of the light output (luminous flux) measurements is U=1.8% (K=2), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is U=20K (K=2), at the 95% confidence level. The uncertainty of the CRI is U=1.8(K=2), at the 95% confidence level.

The uncertainty of power meter AC current U=0.19 % of rdg, AC Voltage U=0.15% of rdg, Power U=0.20% (K=2), at the 95% confidence level.

##### Goniophotometer System

The goniophotometer system is calibrated by standard light source before measurement.

Type C goniophotometer was used for measuring total luminous flux, luminous intensity distribution, and color spatial uniformity. The product was operated in its intended orientation in application and was recorded in this report.

The uncertainty of the luminous intensity is U=1.6% (K=2) , at the 95% confidence level.

## 5. Test Result

### [Integrating Sphere System]

Total operating time for integrating sphere test: **1.0 hour**

Test orientation: **Base up**

#### Electrical Measurement

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
119.9	60	0.0525	6.135	0.975

#### Photometric Measurement

Luminous Flux (lm)	Radiant Flux (W)	Efficacy (lm/W)	CCT (K)	Duv
639.42	1.98	104.22	3615	-0.00341

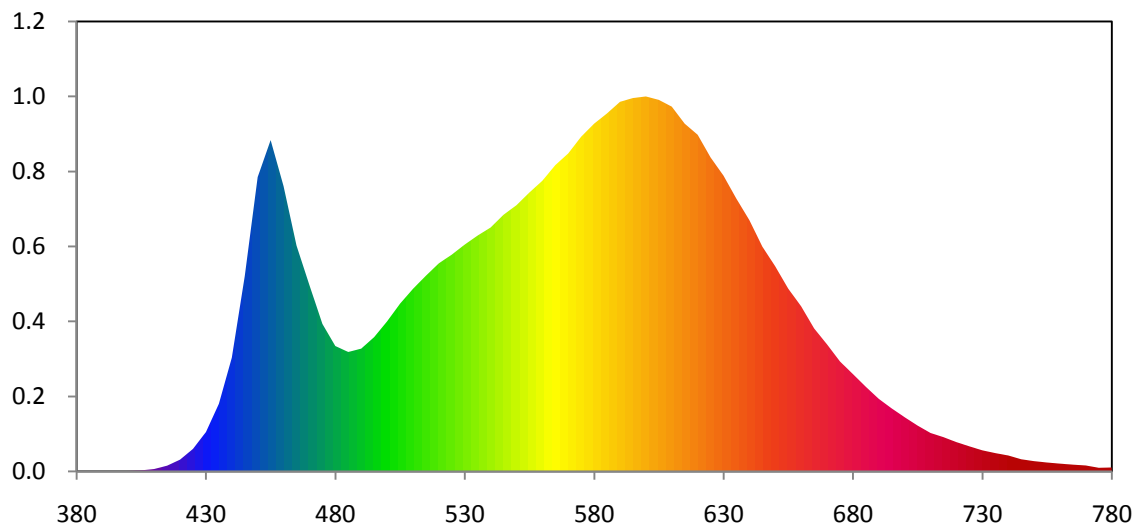
#### Chromaticity Coordinate

x	y	u	v	u'	v'
0.3958	0.3783	0.2346	0.3364	0.2346	0.5045

#### Color Rendering Index

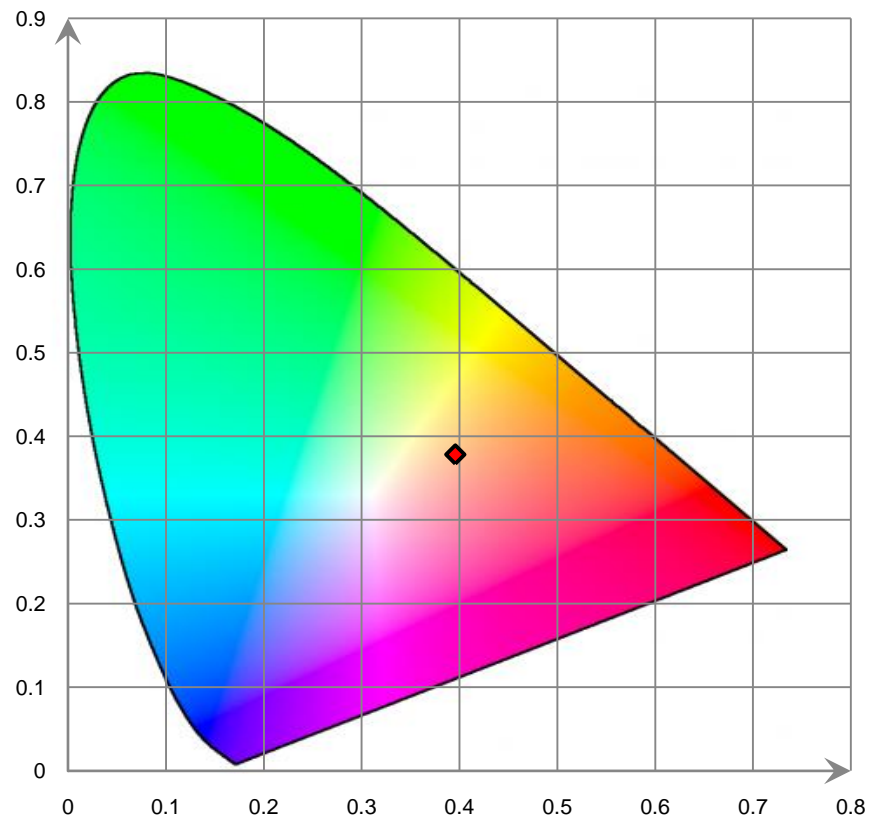
<b>Ra</b> 84.4			
R1 84	R2 94	R3 95	R4 81
R5 84	R6 90	R7 84	R8 64
R9 15	R10 84	R11 80	R12 69
R13 87	R14 98	R15 78	

### Relative Spectral Power Distribution

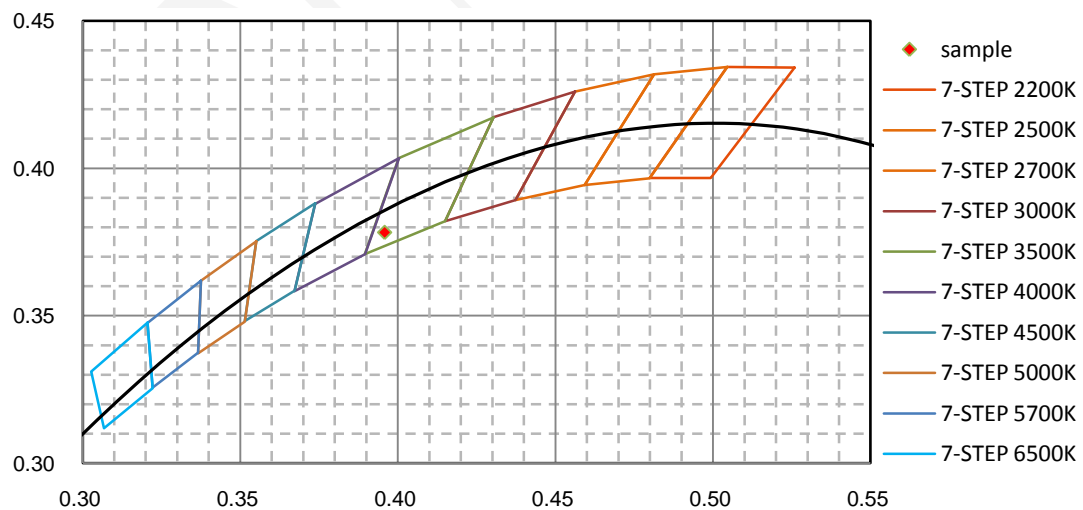


nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	1.200E-03	465	6.025E-01	550	7.100E-01	635	7.271E-01	720	6.700E-02
385	9.000E-04	470	4.968E-01	555	7.440E-01	640	6.699E-01	725	5.640E-02
390	7.000E-04	475	3.935E-01	560	7.753E-01	645	5.996E-01	730	4.900E-02
395	8.000E-04	480	3.345E-01	565	8.169E-01	650	5.468E-01	735	4.270E-02
400	1.400E-03	485	3.187E-01	570	8.481E-01	655	4.876E-01	740	3.260E-02
405	3.000E-03	490	3.275E-01	575	8.928E-01	660	4.403E-01	745	2.750E-02
410	6.600E-03	495	3.583E-01	580	9.275E-01	665	3.816E-01	750	2.390E-02
415	1.550E-02	500	4.003E-01	585	9.549E-01	670	3.389E-01	755	2.090E-02
420	3.160E-02	505	4.474E-01	590	9.857E-01	675	2.934E-01	760	1.820E-02
425	6.020E-02	510	4.869E-01	595	9.958E-01	680	2.597E-01	765	1.600E-02
430	1.051E-01	515	5.220E-01	600	1.000E+00	685	2.257E-01	770	9.800E-03
435	1.805E-01	520	5.551E-01	605	9.909E-01	690	1.936E-01	775	1.060E-02
440	3.034E-01	525	5.782E-01	610	9.729E-01	695	1.681E-01	780	7.400E-03
445	5.207E-01	530	6.050E-01	615	9.274E-01	700	1.446E-01		
450	7.851E-01	535	6.292E-01	620	8.979E-01	705	1.223E-01		
455	8.837E-01	540	6.506E-01	625	8.374E-01	710	1.026E-01		
460	7.607E-01	545	6.846E-01	630	7.888E-01	715	9.150E-02		

CIE 1931 x y Chromaticity Diagram



7-Step Chromaticity Quadrangles



## [Goniophotometer System]

Total operating time for luminous intensity distribution: **2.0 hours**

Test orientation: **Base up**

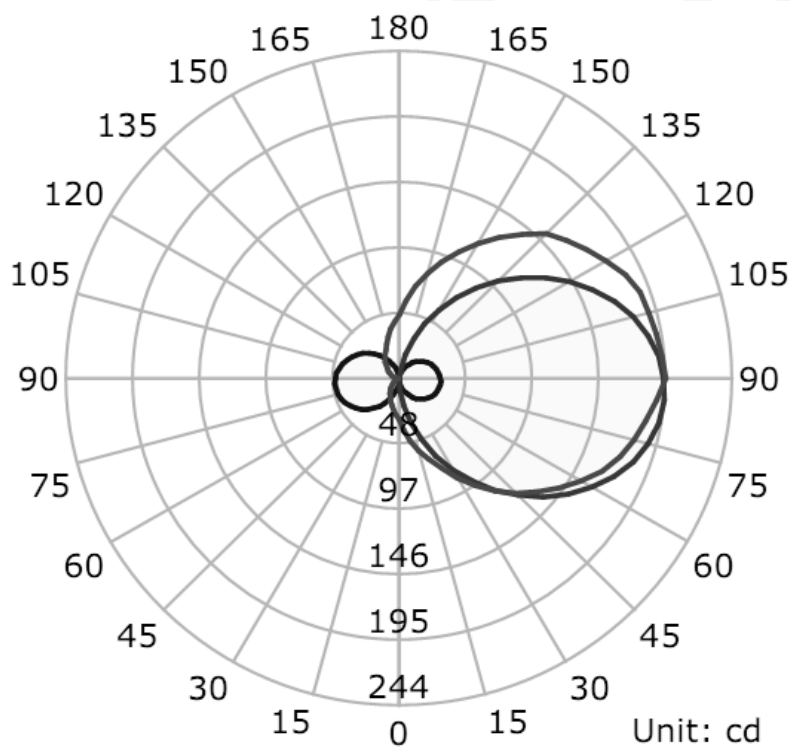
### Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.0	60	0.0510	6.03	0.977

### Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I <sub>max</sub> (cd)	S/MH (C0/180)	S/MH (C90/270)
643.8	106.77	195.78	5.85	8.18

### Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I <sub>max</sub> ):	259.2	137.3	136.8	137.2	167.6
Field Angle (10% I <sub>max</sub> ):	327.7	268.6	164.7	164.5	231.4

Luminous Intensity (cd) Distribution Data

C γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	3	3	3	3	3	3	3	3
5.0°	3	5	7	9	10	9	8	6
10.0°	5	9	14	19	21	20	17	11
15.0°	7	14	23	31	35	33	28	18
20.0°	10	20	33	44	49	47	39	26
25.0°	13	25	43	57	64	61	51	34
30.0°	15	31	52	71	79	76	64	42
35.0°	18	37	62	84	94	90	76	50
40.0°	20	42	72	97	109	105	87	58
45.0°	22	47	81	110	124	119	99	65
50.0°	24	52	89	122	138	132	110	72
55.0°	26	56	97	134	152	145	120	78
60.0°	28	60	104	144	164	157	129	84
65.0°	29	63	110	152	174	167	137	89
70.0°	30	66	115	160	183	175	144	93
75.0°	31	67	119	165	190	182	149	96
80.0°	31	69	121	169	194	186	152	98
85.0°	31	69	122	170	196	188	153	98
90.0°	31	68	121	169	195	187	153	98
95.0°	30	67	119	166	192	184	150	96
100.0°	29	65	116	162	186	178	146	93
105.0°	28	62	111	155	178	171	140	90
110.0°	27	59	105	147	169	162	132	85
115.0°	26	56	99	137	157	151	124	80
120.0°	24	51	91	127	145	139	114	73
125.0°	22	47	83	115	132	126	104	67
130.0°	20	42	74	103	118	113	93	60
135.0°	18	37	65	91	103	99	82	52
140.0°	16	31	56	78	89	85	70	45
145.0°	13	26	47	65	74	71	58	37
150.0°	11	21	37	52	59	57	47	30
155.0°	8	16	28	40	45	43	35	22
160.0°	6	11	15	28	32	30	24	15
165.0°	4	3	6	10	19	18	14	9
170.0°	1	0	0	1	7	7	6	4
175.0°	0	0	0	0	0	0	0	0
180.0°	0	0	0	0	0	0	0	0

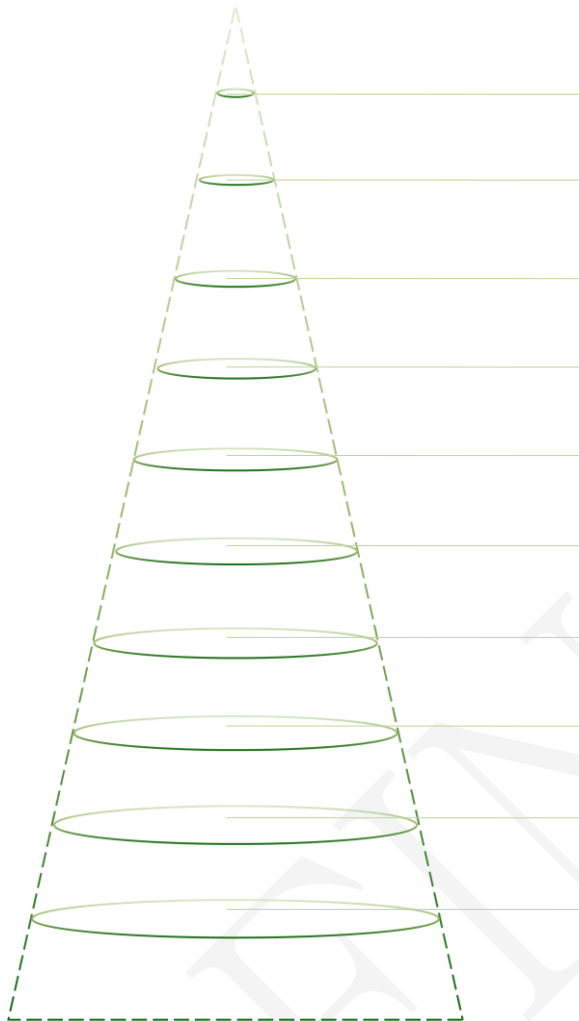


Luminous Intensity (cd) Distribution Data (cont.)

C γ	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	3	3	3	3	3	3	3	3
5.0°	4	2	1	0	0	0	1	2
10.0°	7	3	2	1	0	0	1	3
15.0°	10	5	2	1	0	1	2	4
20.0°	14	7	3	1	0	1	2	5
25.0°	18	10	5	2	0	1	3	7
30.0°	22	12	6	2	0	1	3	8
35.0°	26	14	7	2	1	1	4	10
40.0°	30	16	8	3	1	1	5	11
45.0°	33	18	9	3	1	1	5	12
50.0°	36	20	10	4	1	1	6	13
55.0°	39	21	11	4	1	2	6	14
60.0°	42	22	12	4	1	2	7	15
65.0°	44	24	12	5	1	2	7	16
70.0°	46	24	13	5	1	2	7	16
75.0°	47	25	13	5	1	2	8	17
80.0°	47	25	13	5	1	2	8	17
85.0°	48	25	13	5	1	2	8	17
90.0°	47	25	13	5	1	2	8	17
95.0°	46	25	13	5	1	2	8	16
100.0°	45	24	13	5	1	2	7	16
105.0°	43	23	12	5	1	2	7	15
110.0°	41	22	12	5	1	2	7	15
115.0°	39	21	11	5	1	2	6	14
120.0°	36	20	11	4	1	1	6	13
125.0°	33	18	10	4	1	1	5	12
130.0°	30	17	9	3	1	1	5	11
135.0°	26	15	8	3	1	1	4	10
140.0°	23	13	7	3	0	1	4	8
145.0°	19	11	6	2	0	1	3	7
150.0°	15	9	5	2	0	1	2	6
155.0°	12	7	4	1	0	0	2	4
160.0°	8	5	2	1	0	0	1	3
165.0°	5	3	2	1	0	0	1	2
170.0°	2	1	1	0	0	0	0	0
175.0°	0	0	0	0	0	0	0	0
180.0°	0	0	0	0	0	0	0	0

## Average Area Illumination Figure

**Angle:179.0°. Flux out:585.1lm**



Height (m)	Diameter (cm)	E <sub>avg</sub> (lx)	E <sub>max</sub> (lx)
0.5	114.59	0.06	10.29
1.0	229.18	0.01	2.57
1.5	343.77	0.01	1.14
2.0	458.36	0.00	0.64
2.5	572.95	0.00	0.41
3.0	687.54	0.00	0.29
3.5	802.12	0.00	0.21
4.0	917.00	0.00	0.16
4.5	1031.00	0.00	0.13
5.0	1146.00	0.00	0.10

### Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	0.1	0.01
5-10	0.4	0.07
10-15	1.3	0.20
15-20	2.6	0.41
20-25	4.5	0.71
25-30	6.9	1.07
30-35	9.7	1.51
35-40	12.9	2.00
40-45	16.3	2.54
45-50	19.9	3.10
50-55	23.6	3.66
55-60	27.1	4.21
60-65	30.5	4.73
65-70	33.4	5.19
70-75	35.8	5.56
75-80	37.6	5.84
80-85	38.7	6.02
85-90	39.1	6.07
90-95	38.6	6.00
95-100	37.5	5.82
100-105	35.7	5.54
105-110	33.3	5.16
110-115	30.3	4.71
115-120	27.1	4.21
120-125	23.6	3.67
125-130	20.1	3.12
130-135	16.6	2.57
135-140	13.2	2.05
140-145	10.1	1.57
145-150	7.3	1.13
150-155	4.9	0.76
155-160	2.9	0.46
160-165	1.4	0.22
165-170	0.5	0.07
170-175	0.1	0.01
175-180	0.0	0.00

Deg	Flux (lm)	%
0-5	0.1	0.01
0-10	0.5	0.08
0-15	1.8	0.28
0-20	4.5	0.69
0-25	9.0	1.40
0-30	15.9	2.47
0-35	25.7	3.98
0-40	38.6	5.99
0-45	54.9	8.53
0-50	74.8	11.62
0-55	98.4	15.29
0-60	125.6	19.50
0-65	156.0	24.23
0-70	189.4	29.42
0-75	225.3	34.99
0-80	262.9	40.83
0-85	301.6	46.85
0-90	340.7	52.91
0-95	379.3	58.92
0-100	416.8	64.74
0-105	452.5	70.28
0-110	485.8	75.45
0-115	516.1	80.16
0-120	543.2	84.37
0-125	566.8	88.04
0-130	586.9	91.16
0-135	603.5	93.73
0-140	616.7	95.78
0-145	626.7	97.35
0-150	634.0	98.48
0-155	638.9	99.24
0-160	641.9	99.70
0-165	643.3	99.92
0-170	643.8	99.99
0-175	643.8	100.00
0-180	643.8	100.00

## 6. Product Photo



\*\*\*\*\*END OF REPORT\*\*\*\*\*