

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/840/BYP

Report Type:	Electrical and Photometric tests including: Luminous Flux, Color, Luminous Intensity Distribution
Test Engineer:	Daniel Duan <i>Daniel Duan</i>
Report Number:	R1KS160531002-10
Test Date:	2016-06-03 to 2016-06-04
Report Date:	2016-06-08
Reviewed By:	Jeanne Han/Safety Manager <i>Jeanne Han</i>
Prepared By:	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
Test Facility:	Test facility was located at Pu Long Cun 69, Puxinghu Industrial Area, Tangxia Town, Dongguan, Guangdong, P.R.China.
Accreditation:	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/840/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: AC 120-277V/60Hz
Rated Power: 6 W
Nominal CCT: 4000K
Nominal Lumen Output: 560 lm

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/840/BYP	6PLH/840/BYP/E26; 6PLH/840/GU24	Lamp base	The lamp base of 6PLH/840/BYP is G24D; The lamp base of 6PLH/840/BYP/E26 is E26; The lamp base of 6PLH/840/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
2.0m integrating sphere	EVERFINE	R98	11010018	R98	2015-11-09	2016-11-08

Device	Manufacturer	Model No	Serial No	Test Range	Calibration date	Calibration due date
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°C 0~90%	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	0.0542	6.326	0.973

Photometric Measurement

Luminous Flux (lm)	Radiant Flux (W)	Efficacy (lm/W)	CCT (K)	Duv
656.32	2.041	103.75	4129	-0.00114

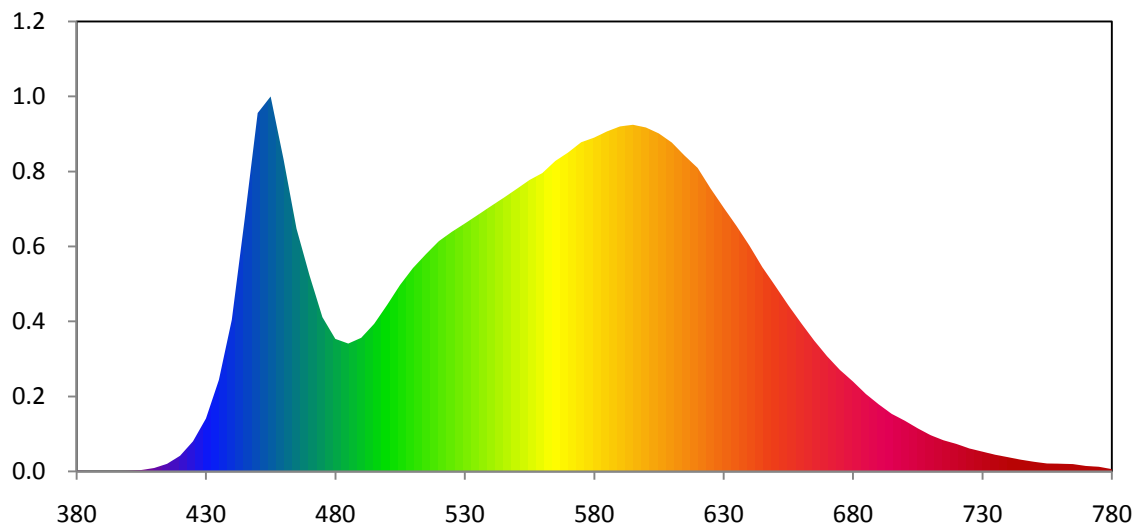
Chromaticity Coordinate

x	y	u	v	u'	v'
0.3742	0.3704	0.2235	0.3319	0.2235	0.4978

Color Rendering Index

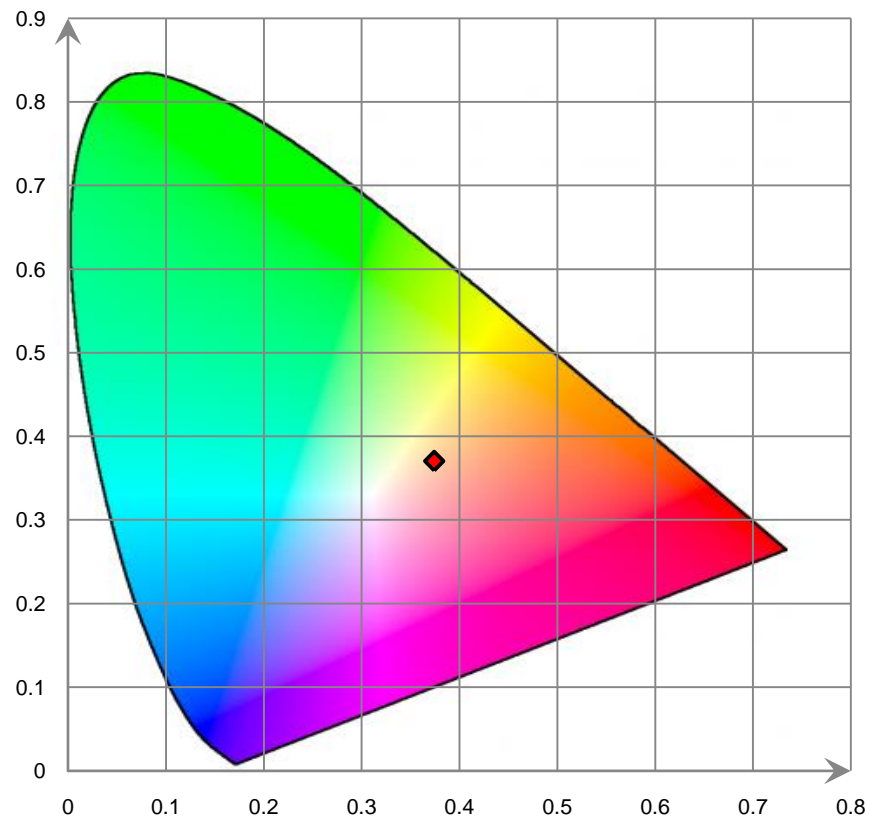
Ra 84.7			
R1 84	R2 92	R3 96	R4 82
R5 83	R6 87	R7 86	R8 67
R9 17	R10 79	R11 81	R12 64
R13 86	R14 98	R15 79	

Relative Spectral Power Distribution

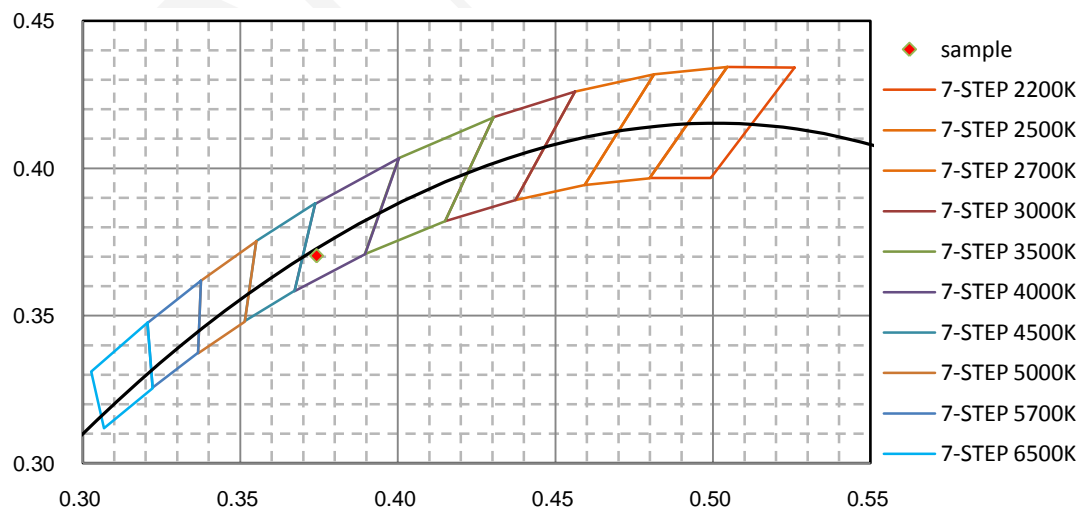


nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	1.900E-03	465	6.475E-01	550	7.531E-01	635	6.549E-01	720	6.130E-02
385	1.200E-03	470	5.236E-01	555	7.772E-01	640	6.022E-01	725	5.300E-02
390	8.000E-04	475	4.115E-01	560	7.958E-01	645	5.448E-01	730	4.460E-02
395	1.000E-03	480	3.535E-01	565	8.281E-01	650	4.947E-01	735	3.800E-02
400	1.700E-03	485	3.411E-01	570	8.508E-01	655	4.437E-01	740	3.130E-02
405	3.900E-03	490	3.564E-01	575	8.779E-01	660	3.956E-01	745	2.580E-02
410	9.300E-03	495	3.937E-01	580	8.902E-01	665	3.493E-01	750	2.130E-02
415	2.050E-02	500	4.440E-01	585	9.069E-01	670	3.074E-01	755	2.070E-02
420	4.190E-02	505	4.973E-01	590	9.201E-01	675	2.706E-01	760	1.970E-02
425	8.040E-02	510	5.425E-01	595	9.245E-01	680	2.400E-01	765	1.470E-02
430	1.412E-01	515	5.795E-01	600	9.173E-01	685	2.066E-01	770	1.260E-02
435	2.441E-01	520	6.142E-01	605	9.014E-01	690	1.788E-01	775	6.300E-03
440	4.046E-01	525	6.390E-01	610	8.773E-01	695	1.536E-01	780	5.200E-03
445	6.745E-01	530	6.611E-01	615	8.420E-01	700	1.355E-01		
450	9.559E-01	535	6.839E-01	620	8.094E-01	705	1.152E-01		
455	1.000E+00	540	7.070E-01	625	7.546E-01	710	9.690E-02		
460	8.323E-01	545	7.296E-01	630	7.040E-01	715	8.320E-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**

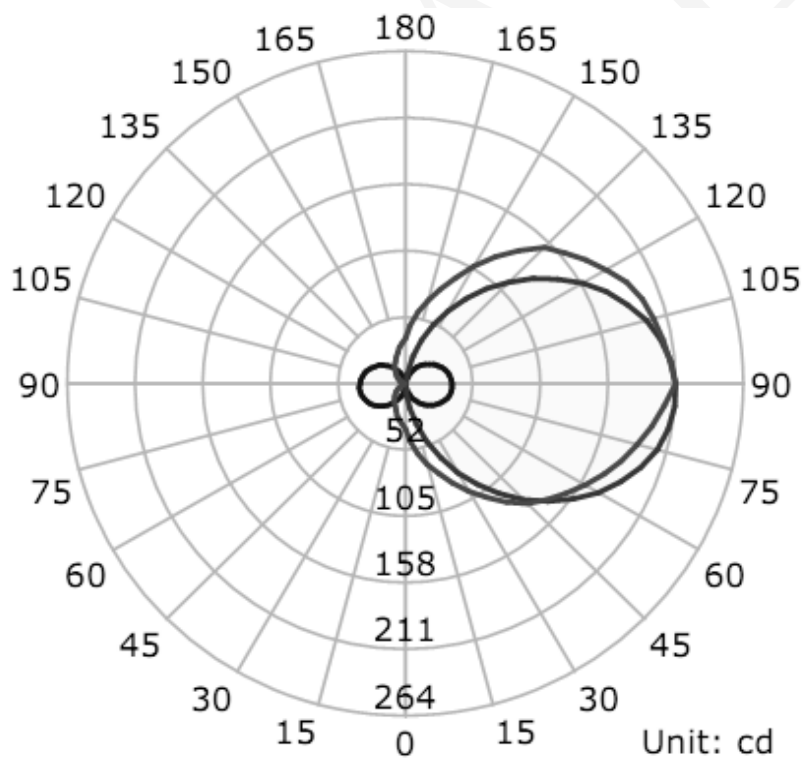
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.1	60	0.0530	6.22	0.975

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I _{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
666.7	107.19	211.61	6.82	9.97

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I _{max}):	281.1	139.0	137.8	138.0	174.0
Field Angle (10% I _{max}):	332.4	162.4	165.4	165.0	206.3

Luminous Intensity (cd) Distribution Data

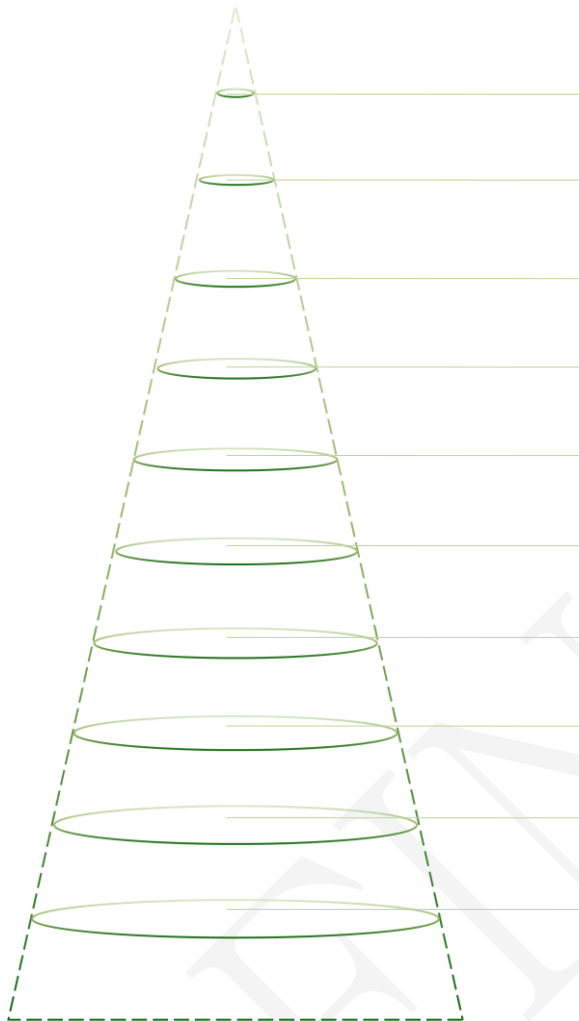
C γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	2	2	2	2	2	2	2	2
5.0°	2	4	6	7	9	8	7	5
10.0°	4	8	13	17	20	19	15	9
15.0°	7	14	22	29	34	32	26	15
20.0°	10	20	33	42	50	46	38	22
25.0°	13	27	44	56	66	61	50	29
30.0°	16	33	54	70	82	76	62	36
35.0°	19	40	65	83	98	92	74	43
40.0°	22	46	76	97	115	107	86	50
45.0°	25	52	86	110	131	122	98	56
50.0°	27	58	95	123	146	136	109	62
55.0°	30	64	104	135	161	149	119	68
60.0°	32	68	113	146	174	161	128	73
65.0°	33	73	120	155	186	172	136	77
70.0°	35	76	126	163	196	181	143	81
75.0°	36	79	130	170	204	189	148	83
80.0°	36	81	133	174	209	193	152	85
85.0°	37	81	135	176	212	196	153	86
90.0°	37	81	135	176	211	195	153	86
95.0°	36	80	133	174	209	193	151	84
100.0°	35	78	130	169	203	187	147	82
105.0°	34	75	125	163	195	180	141	79
110.0°	33	72	119	155	185	171	134	75
115.0°	31	68	112	145	173	160	126	70
120.0°	29	63	104	134	160	148	116	65
125.0°	27	57	95	122	146	135	106	59
130.0°	25	52	85	110	131	121	95	53
135.0°	22	46	76	97	115	106	84	47
140.0°	20	40	65	84	99	92	72	40
145.0°	17	33	55	71	83	77	60	33
150.0°	14	27	45	58	67	62	49	27
155.0°	11	21	34	44	52	48	37	20
160.0°	8	14	19	32	37	34	26	14
165.0°	5	5	7	13	23	20	15	8
170.0°	2	1	0	2	8	8	6	3
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°	2	2	2	2	2	2	2	2
5.0°	3	2	1	0	0	0	1	1
10.0°	5	3	1	1	0	0	1	2
15.0°	8	4	2	1	0	1	2	4
20.0°	11	6	3	1	0	1	3	6
25.0°	14	8	4	1	0	1	4	8
30.0°	17	10	5	2	0	1	5	10
35.0°	20	11	6	2	0	1	6	11
40.0°	23	13	7	2	1	2	7	13
45.0°	26	15	7	3	1	2	7	15
50.0°	28	16	8	3	1	2	8	16
55.0°	30	17	9	3	1	3	9	18
60.0°	32	18	9	3	1	3	10	19
65.0°	34	20	10	4	1	3	11	20
70.0°	35	20	10	4	1	3	11	20
75.0°	36	20	11	4	1	3	11	21
80.0°	36	21	11	4	1	4	11	21
85.0°	37	21	11	4	1	4	12	22
90.0°	36	21	11	4	1	4	12	21
95.0°	36	20	11	4	1	4	11	21
100.0°	35	20	10	4	1	3	11	21
105.0°	34	19	10	4	1	3	11	20
110.0°	32	18	10	3	1	3	10	20
115.0°	30	17	9	3	1	3	10	19
120.0°	28	16	8	3	1	3	9	17
125.0°	26	15	8	3	1	3	9	16
130.0°	23	14	7	2	0	2	8	15
135.0°	21	12	6	2	0	2	7	13
140.0°	18	10	5	2	0	2	6	12
145.0°	15	9	4	1	0	1	5	10
150.0°	12	7	3	1	0	1	4	8
155.0°	9	5	3	1	0	1	3	6
160.0°	6	4	2	1	0	1	2	5
165.0°	4	2	1	0	0	1	1	3
170.0°	2	1	0	0	0	0	1	1
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:638.4lm



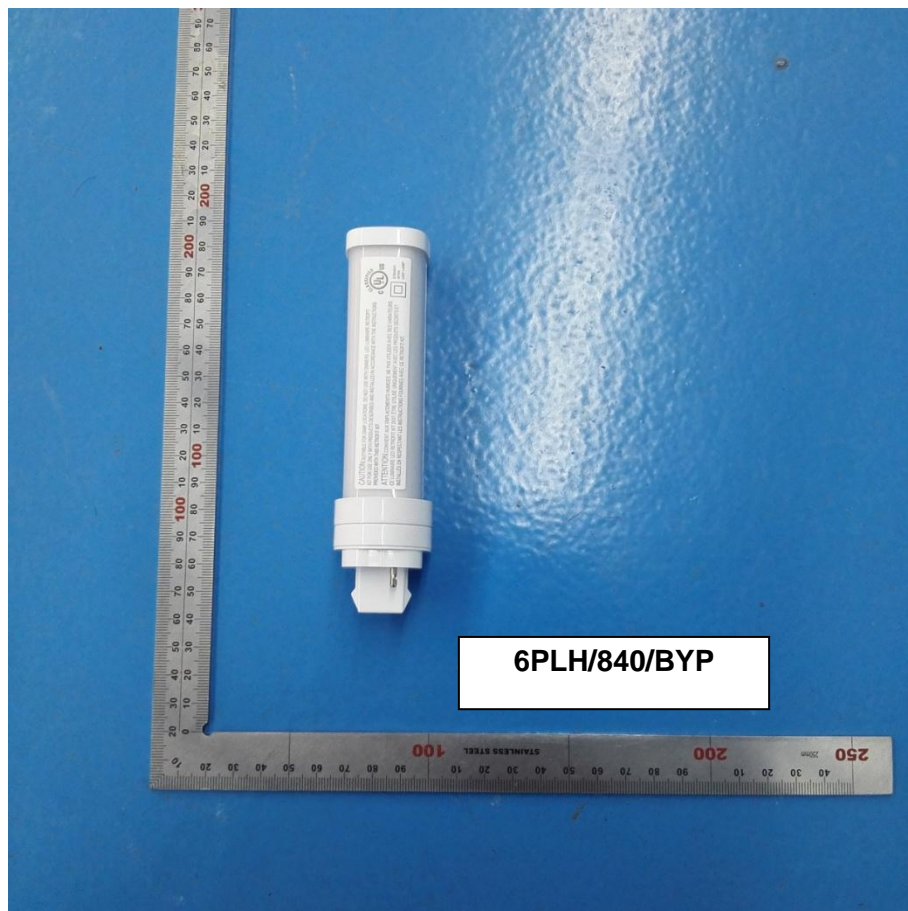
Height (m)	Diameter (cm)	E _{avg} (lx)	E _{max} (lx)
0.5	114.59	0.06	6.36
1.0	229.18	0.02	1.59
1.5	343.77	0.01	0.71
2.0	458.36	0.00	0.40
2.5	572.95	0.00	0.25
3.0	687.54	0.00	0.18
3.5	802.12	0.00	0.13
4.0	917.00	0.00	0.10
4.5	1031.00	0.00	0.08
5.0	1146.00	0.00	0.06

Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	0.1	0.01
5-10	0.4	0.06
10-15	1.2	0.18
15-20	2.5	0.38
20-25	4.4	0.66
25-30	6.8	1.02
30-35	9.7	1.45
35-40	12.9	1.93
40-45	16.4	2.46
45-50	20.1	3.02
50-55	23.9	3.58
55-60	27.5	4.13
60-65	31.0	4.65
65-70	34.1	5.12
70-75	36.8	5.51
75-80	38.7	5.81
80-85	40.0	6.00
85-90	40.5	6.08
90-95	40.2	6.03
95-100	39.1	5.87
100-105	37.3	5.60
105-110	34.9	5.23
110-115	31.9	4.79
115-120	28.6	4.29
120-125	25.0	3.75
125-130	21.3	3.20
130-135	17.7	2.65
135-140	14.1	2.12
140-145	10.8	1.63
145-150	7.9	1.19
150-155	5.4	0.80
155-160	3.3	0.49
160-165	1.6	0.24
165-170	0.5	0.08
170-175	0.1	0.01
175-180	0.0	0.00

Deg	Flux (lm)	%
0-5	0.1	0.01
0-10	0.4	0.07
0-15	1.6	0.24
0-20	4.2	0.62
0-25	8.6	1.29
0-30	15.4	2.31
0-35	25.0	3.75
0-40	37.9	5.69
0-45	54.3	8.15
0-50	74.4	11.16
0-55	98.3	14.74
0-60	125.8	18.87
0-65	156.9	23.53
0-70	191.0	28.65
0-75	227.7	34.16
0-80	266.5	39.97
0-85	306.5	45.97
0-90	347.0	52.05
0-95	387.2	58.08
0-100	426.3	63.95
0-105	463.6	69.54
0-110	498.5	74.77
0-115	530.4	79.56
0-120	559.0	83.85
0-125	584.0	87.60
0-130	605.3	90.80
0-135	623.0	93.45
0-140	637.1	95.56
0-145	647.9	97.19
0-150	655.8	98.38
0-155	661.2	99.18
0-160	664.5	99.67
0-165	666.1	99.91
0-170	666.6	99.99
0-175	666.7	100.00
0-180	666.7	100.00

6. Product Photo



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