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IESNA SUSTAINING MEMBER

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Test report of

IES LM-79-08

Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Rendered to:

Light Efficient Design, LLC

188 S. Northwest Highway，Cary, IL 60013, USA

For products:

LED Lamps

Models No.:

LED-8088M/E30C-G4

Test Date:	May. 4, 2018 to May. 7, 2018
Test Item:	Total luminous flux, Luminous Efficacy, Electrical values, Luminous Intensity Distribution, Chromaticity coordinates, CCT and CRI, Spectral Power Distribution.
Test Lab.:	**LCTECH (Zhongshan) Testing Service Co., Ltd** 2/F., Technology and Enterprise Development Center, Guangyuan Road, Xiaolan, Zhongshan, Guangdong, China Tel:+86-760-22833366 Fax:+86-760-22833399 E-mail:Service@lccert.com http://www.lccert.com
Template No.:	LC-RT-PL-001 Rev.1.1
Test Note:	

Complied by:	**Reviewed by:**
Fish Tan	**Richard Li**
Project Engineer	**Technical Manager**
Jun. 6, 2018	**Jun. 6, 2018**

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1. General

1.1 Product Information

Brand Name	-
Product Type	LED Lamp
Model Number	LED-8088M/E30C-G4
Rated Inputs	220-347VAC, 50/60Hz
Rated Power	50W
Rated Light output	7300lm
Declared CCT	3000K
Power Supply	Integrated in lamp
LED Package, Array or Module	Not provided
Receipt Samples	1 unit
Sample Code of lab.	180423101004
Date of Receipt Samples	Apr. 23, 2018
Note	-

1.2 Standards or methods

The following standards are partly or totally used or referenced for test:

No.	Name
ANSI/NEMA/ ANSLG C78.377-2015	Specifications for the Chromaticity of Solid State Lighting Products
ANSI C82.77-2002	Harmonic Emission Limits—Related Power Quality Requirements for Lighting Equipment
CIE Pub. No. 13.3-1995	Method of Measuring and Specifying Color Rendering of Light Sources
CIE Pub. No. 15:2004	Colorimetry
IES LM-79-08	Electrical and Photometric Measurements of Solid-State Lighting Products

1.3 Equipment list

Instrument	ID	Model name	Cal. date	Next cal. Date
AC Power supply	LC-I-923	CHP-500	2018-01-10	2019-01-09
AC Power supply	LC-I-987	APW-110N	2018-01-10	2019-01-09
Power analyzer	LC-I-928	WT210	2018-01-05	2019-01-05
Power analyzer	LC-I-954	WT210	2018-01-10	2019-01-09
Multimeter	LC-I-972	Fluke 17B	2017-08-08	2018-08-07
Photometric colorimetric electric system[1] (2 meter sphere)	LC-I-900	SPR3000	Before use	Before use
Standard lamp[2]	LC-PL-I-011	D204C	2017-09-07	2018-09-06
Luminous Flux Standard Lamp[3]	LC-PL-I-003	24V100W	2017-09-22	2018-09-21
Goniophotometer(with mirror)	LC-I-902	GMS2000	2018-05-07	2019-05-06
Wireless temperature transmitter	LC-I-978	DWRF-B	2018-02-11	2019-02-10
Wireless temperature transmitter	LC-I-979	DWRF-B	2018-02-11	2019-02-10

Note:

1, Bandwidth of spectroradiometer is 1 nm.

2, halogen lamp, 100W, omni-directional type, and its traceability to NIM.

3, halogen lamp, 100W, omni-directional type, and its traceability to NIM.

2. Test conducted and method

The lamp was operated at least 2 hours to reach stabilization and temperature equilibrium before test.

2.1 Ambient Condition

The ambient temperature in which measurements are being taken was maintained at 25 °C ± 1°C; the air flow around the sample(s) being tested did not affect the performance.

2.2 Power Supply Characteristics

The AC power supply had a sinusoidal voltage wave shape at the prescribed frequency (60 Hz) such that the RMS summation of the harmonic components does not exceed 3 percent of the fundamental during operation of the test item.

The voltage of AC power supply (RMS voltage) applied to the device under test was regulated to within±0.2 percent under load.

2.3 Seasoning and Stabilization

No seasoning was performed in accordance with IESNA LM-79-08. And before the measurement, the sample was stabilized until the light output and power variations were less than 0.5% in 30 minutes intervals (3 readings, 15 minutes apart).

2.4 Electrical Instrumentation

The calibration uncertainties of the instruments for AC voltage and current were less than 0.2 percent, and the calibration uncertainty of the AC power meter was less than 0.5 percent(95 % confidence interval, k=2).

2.5 Color Measurement Method

Spectral radiant flux was measured by a sphere (2 meter)-spectroradiometer system, and the color characteristics (Color rendering index, correlated color temperature, chromaticity coordinate) were calculated from these by software automatically.

2.6 Total Luminous Flux Measurement Method

Total luminous flux was measured by type C goniophotometer system.

Light intensity distribution was measured by a type C goniophotometer (with mirror) which can keep the sample in burn position when the tests conduct, and the total luminous flux was calculated from the intensity data by software automatically.

2.7 Luminous Intensity Distribution Measurement Method

Luminous intensity distribution was measured by a mirror-type goniophotometer (Type C) which can keep the sample in burn position when the tests conduct, and the kinds of graph were generated by software automatically.

2.8 Spatial Non-uniformity of Chromaticity

The customer did not require this measurement.

3. Test Result Summary

3.1 Electrical data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Input Voltage & Frequency	347.00 V~60Hz	347.00 V~60Hz
Input Current(A)	0.165	0.166
Total Power(W)	53.54	53.64
Power Factor	0.933	0.934
I-THD	18.64%	-
Off-state Power(W)	-	-

3.2 Photometric data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Total Lumens(lm)	-[4]	7379.95
Luminaire Efficacy(Lm/W)	-	137.58
Correlated Color Temperature (CCT)(K)	3060	-
Color Rendering Index (CRI)	83.9	-
R9	14	-
Chromaticity Coordinate (x,y)	x=0.4305 y=0.3978	-
Chromaticity Coordinate (u,v)	u=0.2491 v=0.3453	-
Chromaticity Coordinate (u',v')	u'=0.2491 v'=0.5179	-
Duv	-0.0016	-
Zone Lumens between 0-60 °	-	78.87%

3.3 Color Rendering Details

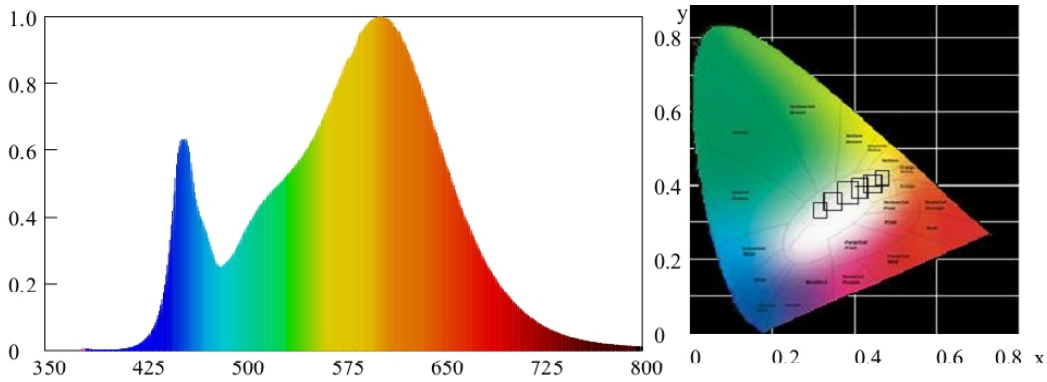
R1	R2	R3	R4	R5	R6	R7	R8
84	94	94	81	84	93	82	61
R9	R10	R11	R12	R13	R14	R15	-
14	87	80	73	87	97	77	-

Note:

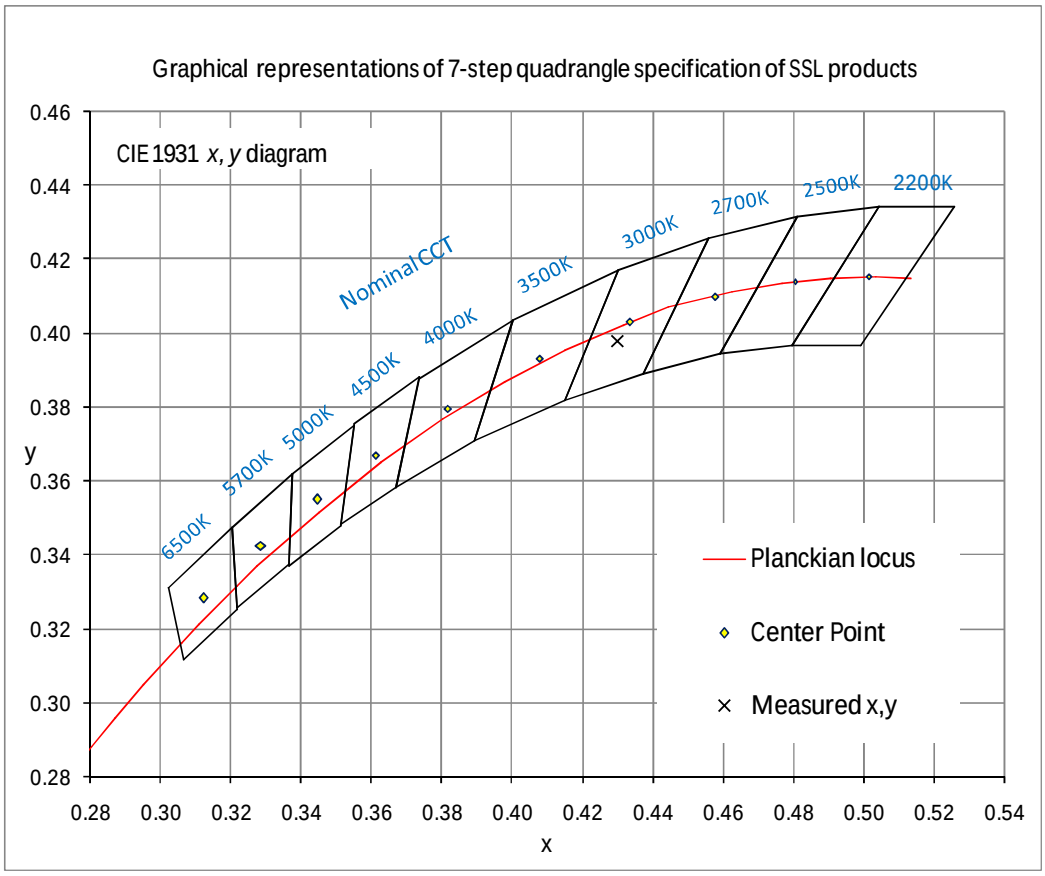
4, Self-absorption is 1.

4. Test Data

4.1 Spectral Distribution



4.2 ANSI Chromaticity Quadrangles Diagram



4.3 Goniometry Test Data

CIE Type	Direct	Basic Luminous Shape	Rectangular
Spacing Criteria (0-180)	1.28	Luminous Length	0.11 m
Spacing Criteria (90-270)	1.30	Luminous Width	0.07 m
Spacing Criteria (Diagonal)	1.40	Luminous Height	0.00 m
Test Distance	29.79 m		

4.4 Zonal Lumen Summary

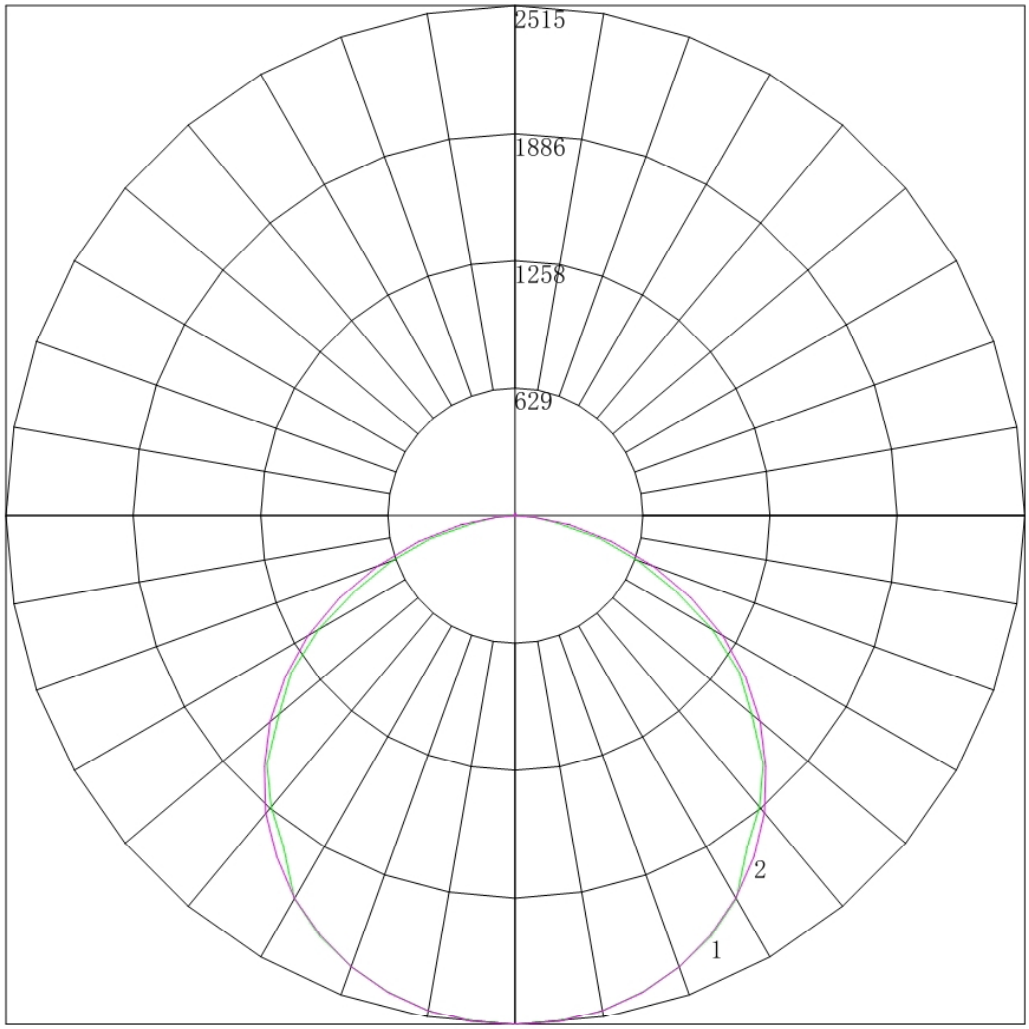
Zone	Lumens	%Lamp	%Fixt
0-20	925.70	12.50	12.50
0-30	1979.8	26.80	26.80
0-40	3259.99	44.20	44.20
0-60	5820.39	78.90	78.90
0-80	7222.62	97.90	97.90
0-90	7351.57	99.60	99.60
10-90	7113.13	96.40	96.40
20-40	2334.29	31.60	31.60
20-50	3676.57	49.80	49.80
40-70	3471.41	47.00	47.00
60-80	1402.23	19.00	19.00
70-80	491.21	6.70	6.70
80-90	128.95	1.70	1.70
90-110	13.60	0.20	0.20
90-120	16.00	0.20	0.20
90-130	18.35	0.20	0.20
90-150	22.66	0.30	0.30
90-180	28.39	0.40	0.40
110-180	14.79	0.20	0.20
0-180	7379.95	100.00	100.00

Total Luminaire Efficiency = 100.00%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	238.44
10-20	687.26
20-30	1054.09
30-40	1280.2
40-50	1342.28
50-60	1218.11
60-70	911.02
70-80	491.21
80-90	128.95
90-100	10.45
100-110	3.14
110-120	2.40
120-130	2.35
130-140	2.05
140-150	2.26
150-160	2.53
160-170	2.29
170-180	0.91

4.5 Polar Curves

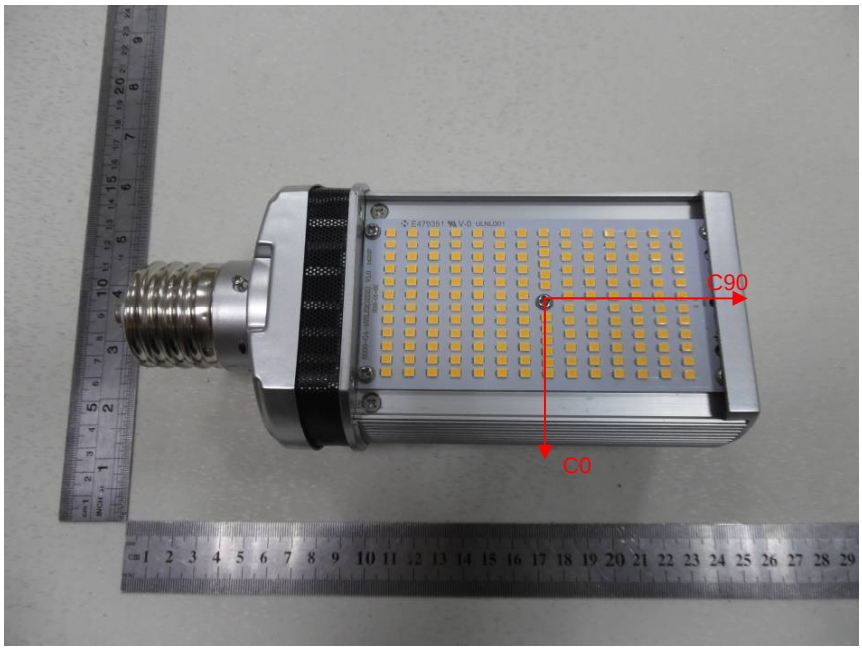


Maximum Candela = 2515.249 Located At Horizontal Angle = 0, Vertical Angle = 0
1 - Vertical Plane Through Horizontal Angles (0 - 180)
2 - Vertical Plane Through Horizontal Angles (90 - 270)

4.6 Candela Tabulation

	0	15	30	45	60	75	90
0	2515.249	2515.249	2515.249	2515.249	2515.249	2515.249	2515.249
5	2506.806	2507.908	2505.037	2506.581	2509.924	2506.405	2510.002
10	2480.143	2481.212	2476.616	2478.812	2481.526	2478.546	2480.493
15	2431.260	2435.604	2431.098	2435.718	2436.038	2430.788	2433.798
20	2366.823	2372.200	2368.704	2370.851	2370.578	2366.010	2366.840
25	2289.499	2290.555	2287.217	2286.870	2287.598	2282.209	2280.928
30	2182.401	2189.777	2184.853	2188.015	2183.758	2178.290	2178.711
35	1995.757	2012.897	2026.469	2067.388	2065.497	2054.031	2054.464
40	1877.105	1878.984	1875.118	1914.967	1925.947	1915.848	1915.246
45	1733.567	1735.722	1726.132	1722.601	1769.283	1760.188	1749.562
50	1522.037	1533.485	1561.834	1553.334	1582.446	1586.183	1579.932
55	1350.058	1350.630	1339.796	1374.046	1370.354	1391.837	1387.813
60	1120.753	1119.258	1140.404	1144.568	1164.456	1181.128	1182.939
65	871.450	884.330	907.089	923.522	941.885	961.785	957.776
70	645.255	648.963	661.718	684.742	710.731	724.331	725.105
75	431.947	423.165	436.790	458.577	477.091	500.127	493.757
80	209.308	230.762	245.699	260.258	276.098	286.136	274.731
85	88.878	89.912	94.436	97.599	101.230	107.251	100.604
90	27.552	26.928	25.335	21.583	19.775	18.365	9.716
95	3.111	8.013	11.334	8.449	5.551	2.875	1.323
100	2.222	3.338	5.111	4.891	3.774	2.875	1.765
105	2.222	2.670	3.331	3.335	3.108	2.433	2.204
110	2.222	2.225	2.664	2.889	2.663	2.433	2.204
115	2.222	2.225	2.443	2.666	2.441	2.211	2.204
120	2.222	2.225	2.664	2.666	2.441	2.433	2.204
125	2.666	2.670	2.664	2.666	2.885	2.653	2.644
130	2.666	2.670	2.664	2.666	2.663	2.653	2.644
135	2.666	2.670	2.664	2.445	2.441	2.433	2.202
140	2.666	2.670	2.886	2.887	2.884	3.095	3.084
145	3.555	3.560	3.553	3.776	3.771	3.759	3.965
150	4.000	4.226	3.997	4.222	4.215	4.201	4.404
155	5.333	5.562	5.329	5.555	5.325	5.528	5.286
160	7.110	7.119	7.105	7.109	7.100	7.075	7.048
165	8.443	8.454	8.438	8.219	8.209	8.180	8.369
170	8.888	8.899	8.882	8.886	8.875	8.844	8.811
175	9.777	9.789	9.770	9.998	9.763	9.728	9.692
180	10.327	10.327	10.327	10.327	10.327	10.327	10.327

Appendix A Product Photo



Picture 1

Picture 2

****End of test report****