



IESNA
SUSTAINING
MEMBER

Ref. No.: LCSP#64300001
Date of issue: Oct 15, 2014
Version: 1.0
Total pages: 11



Test report of

IES LM-79-08

Approved Method: Electrical and Photometric

Measurements of Solid-State Lighting Products

Rendered to:

LIGHT EFFICIENT DESIGN, DIV OF TADD LLC
188 S. Northwest Highway Cary, IL60013

For products:

LED Lamp

Models:

LED-8084M30, LED-8084M30C

Test date: Oct 7, 2014 to Oct 10, 2014
Test laboratory: LCTECH (Zhongshan) Testing Service Co.,Ltd
2/F., Technology and Enterprise Development Center, Guangyuan Road,
Xiaolan, Zhongshan, Guangdong, China
Laboratory note: N/A

Complied by:

Lin Qiu

Test Engineer

Oct 15, 2014

Reviewed by:

Richard Li

Technical Manager

Oct 15, 2014

The duplication of this report or parts of it and its use for advertising purposes is only allowed with permission of the testing laboratory. This report contains the result of the examination of the product sample submitted by the applicant. A general statement concerning the quality of the products from the series manufacture cannot be derived therefore. This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Table of Contents

1 General	3
1.1 Product Information	3
1.2 Standards or methods	4
1.3 Equipment list.....	4
2 Test conducted and method	5
2.1 Ambient Condition	5
2.2 Power Supply Characteristics.....	5
2.3 Seasoning and Stabilization	5
2.4 Electrical Instrumentation.....	5
2.5 Color Measurement Method	5
2.6 Total Luminous Flux Measurement Method.....	5
2.7 Luminous Intensity Distribution Measurement Method	5
2.8 Spatial Non-uniformity of Chromaticity.....	5
3 Test Result Summary	6
3.1 Electrical data.....	6
3.2 Photometric data.....	6
4 Test Data	7
4.1 Spectral Distribution	7
4.2 Chromaticity Diagram (CIE 1931).....	7
4.3 ANSI Chromaticity Quadrangles Diagram	8
4.4 Color Rendering Details	8
4.5 Goniometry Test Data.....	9
4.6 Zonal Lumen Summary	9
4.7 Polar Curves.....	10
4.8 Candela Tabulation	11

1 General

1.1 Product Information

Brand Name	Light Efficient Design
Trade Mark	-
Luminaire Type	LED Lamp
Model Number	LED-8084M30, LED-8084M30C
Rated Inputs	120-277VAC,50/60Hz
Rated Power	45 W
Rated Initial Lamp Lumens	4000 lm
Declared CCT	3000 K
Power Supply	Manufacturer: Mean Well Enterprises Co., LTD, Model: LPF-40D-48
Date of Receipt Samples	Oct 7, 2014
Quantity of Receipt Samples	1 unit

Photo



Picture 1



Picture 2



LCTECH



1.2 Standards or methods

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

No.	Name
ANSI/NEMA/ ANSLG C78.377-2011	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

ID	Instrument	Model name	Cal. date	Next cal. Date
AC Power supply	LC-I-923	CHP-500	2014-03-04	2015-03-03
AC Power supply	LC-I-953	APW-110N	2014-03-04	2015-03-03
Power analyzer	LC-I-928	WT210	2014-03-21	2015-03-20
Power analyzer	LC-I-954	WT210	2014-03-04	2015-03-03
Photometric colorimetric electric system (2 meter sphere)	LC-I-900	SPR3000	Before use	Before use
Standard lamp	LC-I-961	24V/100W	2013-10-22	2014-10-21
Goniophotometer(with mirror)	LC-I-902	GMS2000	2014-05-14	2015-05-13
Wireless temperature transmitter	LC-I-958	DWRP-B(0)	2014-08-19	2015-08-18
Wireless temperature transmitter	LC-I-959	DWRP-B(0)	2014-08-19	2015-08-18

2 Test conducted and method

2.1 Ambient Condition

The ambient temperature in which measurements are being taken was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, 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 both sphere-spectroradiometer system and goniophotometer.

Spectral radiant flux was measured by a sphere (2 meter)-spectroradiometer system, and the total luminous flux was calculated from these by software automatically.

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	277.00 V~60Hz	277.05 V~60Hz
Input Current	0.171 A	0.167 A
Total Power	43.50 W	43.26 W
Power Factor	0.918	0.937
I-THD	12.70%	-

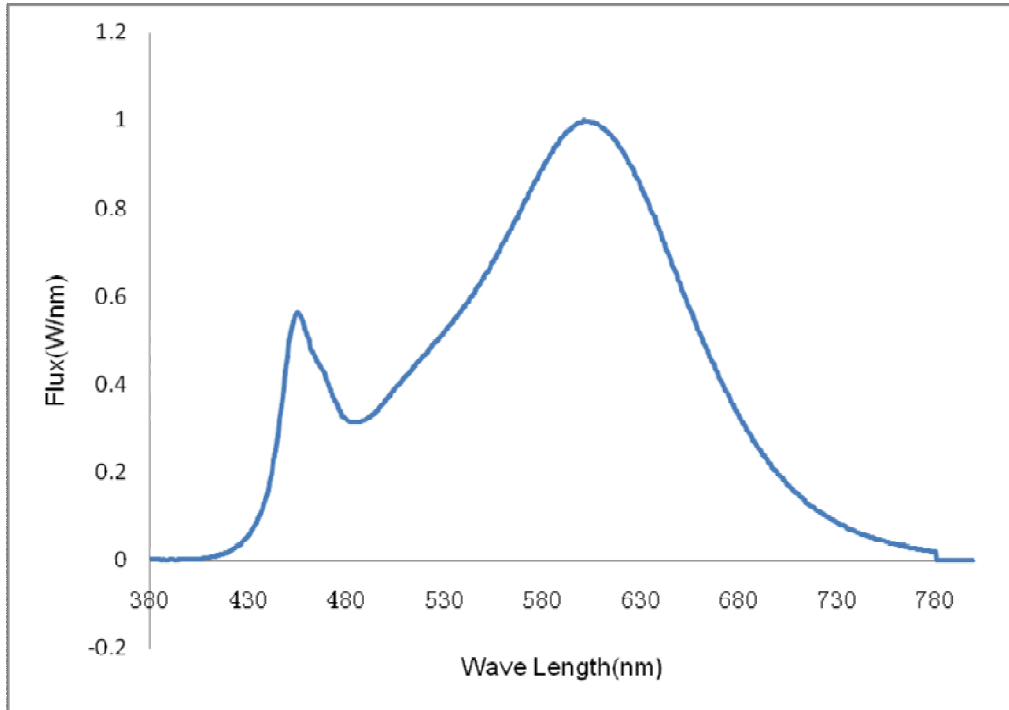
3.2 Photometric data

Criteria Item	Result (Sphere)	Result (Goniophotometer)
Total Lumens	4062.20 lm	4081.55 lm
Luminaire Efficacy	93.38 lm/W	94.35 lm/W
Correlated Color Temperature (CCT)	3136 K	-
Color Rendering Index (CRI)	84.4	-
R9	18	-
Chromaticity Coordinate (x,y)	x= 0.4269 y= 0.3992	-
Chromaticity Coordinate (u,v)	u= 0.2462 v= 0.3453	-
Chromaticity Coordinate (u',v')	u'= 0.2462 v'= 0.5180	-
Duv	-0.0005	-
Spacing Criteria (0-180)	-	-
Spacing Criteria (90-270)	-	-
Zonal Lumen between 0-60°	-	18.65%

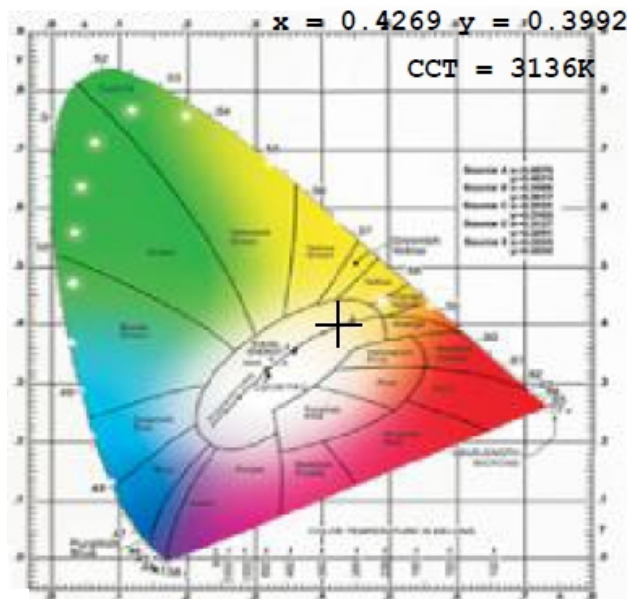
Note: N.A.

4 Test Data

4.1 Spectral Distribution

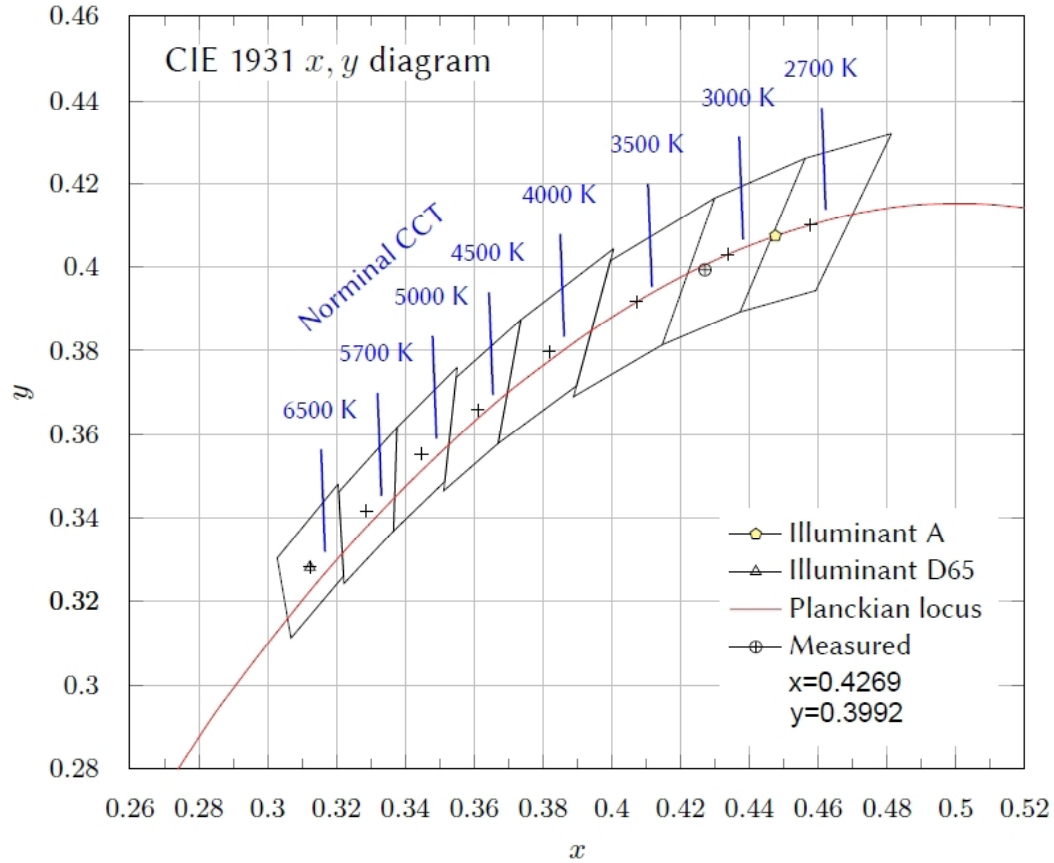


4.2 Chromaticity Diagram (CIE 1931)





4.3 ANSI Chromaticity Quadrangles Diagram



4.4 Color Rendering Details

R1	R2	R3	R4	R5
84	94	94	80	84
R6	R7	R8	R9	R10
93	83	63	18	87
R11	R12	R13	R14	R15
79	74	87	97	77



LCTECH



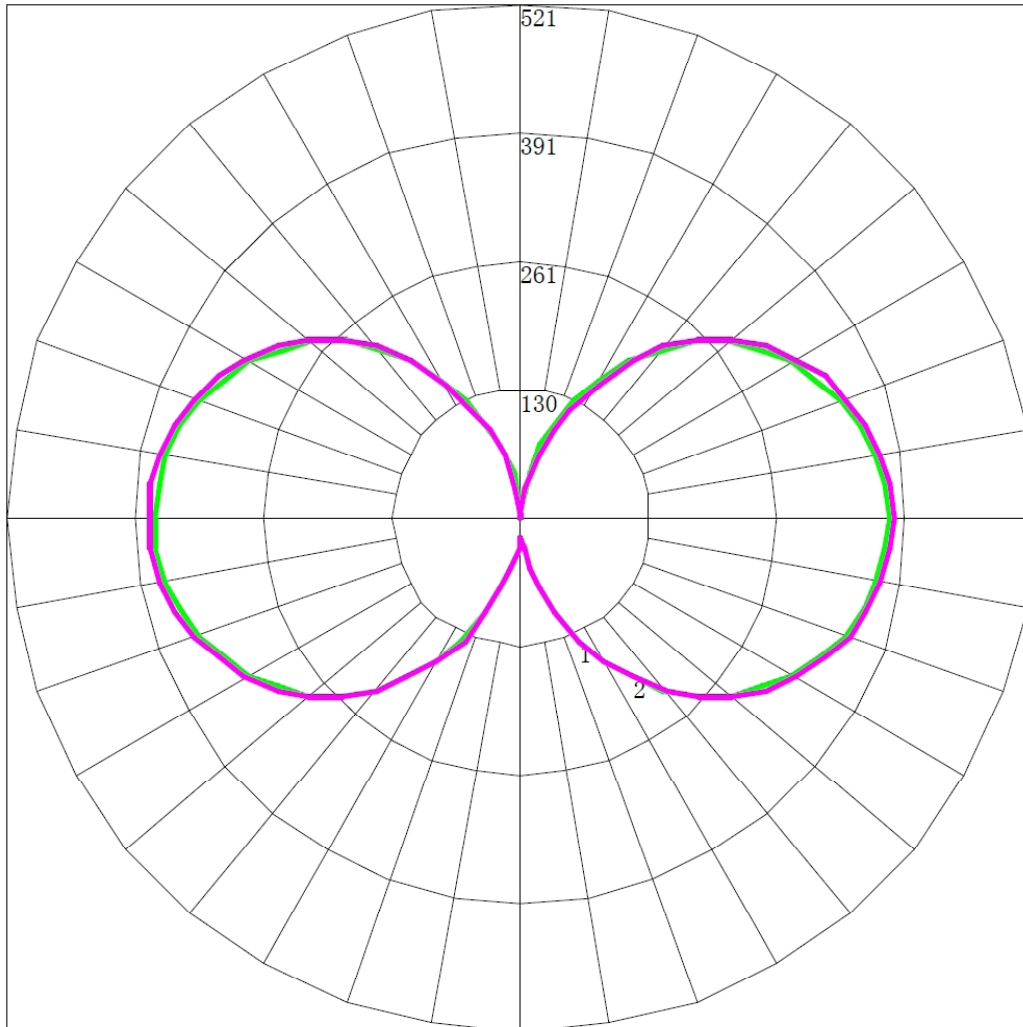
4.5 Goniometry Test Data

CIE Type	GeneralDiffuse	Basic Luminous Shape	Circular w/ Sides
Spacing Criteria (0-180)	N.A.	Luminous Length	0.08 m (Diameter)
Spacing Criteria (90-270)	N.A.	Luminous Width	0.08 m (Diameter)
Spacing Criteria (Diagonal)	N.A.	Luminous Height	0.16 m
Test Distance	18.35 m		

4.6 Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixt
0-30	94.68	2.3	2.3
0-40	232.72	5.7	5.7
0-60	761.03	18.6	18.6
0-90	2050.82	50.2	50.2
90-120	1286.46	31.5	31.5
90-130	1592.46	39	39
90-150	1946.08	47.7	47.7
90-180	2030.72	49.8	49.8
0-180	4081.54	100	100

Zone	Lumens
0-10	3.64
10-20	22.87
20-30	68.17
30-40	138.04
40-50	221.2
50-60	307.12
60-70	383
70-80	438.52
80-90	468.27
90-100	467.62
100-110	437.26
110-120	381.59
120-130	306
130-140	219.63
140-150	133.99
150-160	62.55
160-170	20.45
170-180	1.63



Maximum Candela = 521.27 Located At Horizontal Angle = 45, Vertical Angle = 90
1 - Vertical Plane Through Horizontal Angles (0 - 180)
2 - Vertical Plane Through Horizontal Angles (90 - 270)



LCTECH



4.8 Candela Tabulation

	<u>0</u>	<u>15</u>	<u>30</u>	<u>45</u>	<u>60</u>	<u>75</u>	<u>90</u>
0	19.75	19.75	19.75	19.75	19.75	19.75	19.75
5	31.42	31.96	31.99	32.33	32.69	32.00	32.19
10	51.65	52.51	52.42	53.43	52.11	51.84	51.16
15	74.43	76.31	77.39	81.20	76.86	74.78	73.96
20	103.63	106.53	110.85	114.33	108.29	103.82	102.60
25	139.60	144.03	146.84	155.03	148.88	142.64	137.96
30	168.92	175.51	186.57	200.32	188.11	173.84	169.00
35	197.99	206.83	228.74	244.87	228.54	207.71	198.33
40	227.62	237.63	265.34	289.19	265.79	237.91	228.37
45	253.22	264.02	298.48	331.28	300.43	264.52	253.22
50	279.11	290.77	331.18	368.34	331.55	289.88	279.78
55	300.42	315.36	361.98	402.22	361.59	314.24	302.61
60	319.70	335.75	385.82	434.62	387.54	336.06	323.25
65	334.90	351.88	407.29	460.44	411.05	351.74	339.31
70	348.57	364.75	424.88	481.82	428.02	365.24	353.58
75	359.50	374.34	438.60	498.21	441.64	375.99	363.81
80	367.26	382.32	449.06	511.66	453.54	384.33	371.34
85	370.13	384.37	456.38	519.24	459.48	387.18	375.13
90	371.98	386.57	458.49	521.27	461.53	389.05	377.11
95	369.81	385.08	455.66	516.63	460.06	388.50	375.48
100	364.60	380.31	449.21	504.95	452.71	382.67	370.28
105	357.36	374.06	439.47	493.47	443.67	374.88	362.60
110	346.93	364.13	424.98	477.60	428.17	365.71	351.62
115	332.78	350.76	406.70	455.21	409.48	352.67	339.25
120	316.79	332.76	384.39	430.53	387.36	335.19	323.19
125	297.21	312.76	360.19	400.83	361.74	314.78	302.63
130	275.74	288.79	329.28	365.70	331.55	291.83	281.85
135	250.79	261.97	295.70	327.77	296.32	265.30	256.23
140	222.88	233.53	261.89	287.23	261.61	233.19	227.03
145	194.34	203.84	222.19	239.98	221.37	194.59	196.65
150	162.35	170.03	181.38	194.99	171.12	156.06	155.35
155	132.55	136.06	139.98	148.39	126.36	114.11	121.39
160	99.48	103.50	98.65	109.49	96.11	81.49	92.77
165	75.76	73.49	72.18	77.09	67.21	60.02	68.30
170	43.71	40.88	43.95	45.33	43.02	36.63	29.58
175	2.44	2.69	3.08	3.06	3.44	3.53	3.10
180	1.44	1.44	1.44	1.44	1.44	1.44	1.44

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