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

For products:

LED Lamp

Models:

LED-8084M42, LED-8084M42C

Test date: Oct 7, 2014 to Oct 10, 2014
Test laboratory: LCTECH (Zhongshan) Testing Service Co.,Ltd
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Xiaolan, Zhongshan, Guangdong, China
Laboratory note: N/A

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Oct 15, 2014

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Oct 15, 2014

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1 General

1.1 Product Information

Brand Name	Light Efficient Design
Trade Mark	-
Luminaire Type	LED Lamp
Model Number	LED-8084M42, LED-8084M42C
Rated Inputs	120-277VAC,50/60Hz
Rated Power	45 W
Rated Initial Lamp Lumens	4000 lm
Declared CCT	4000 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



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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	277.00 V~60Hz
Input Current	0.173 A	0.169 A
Total Power	44.10 W	43.86 W
Power Factor	0.921	0.938
I-THD	12.73%	-

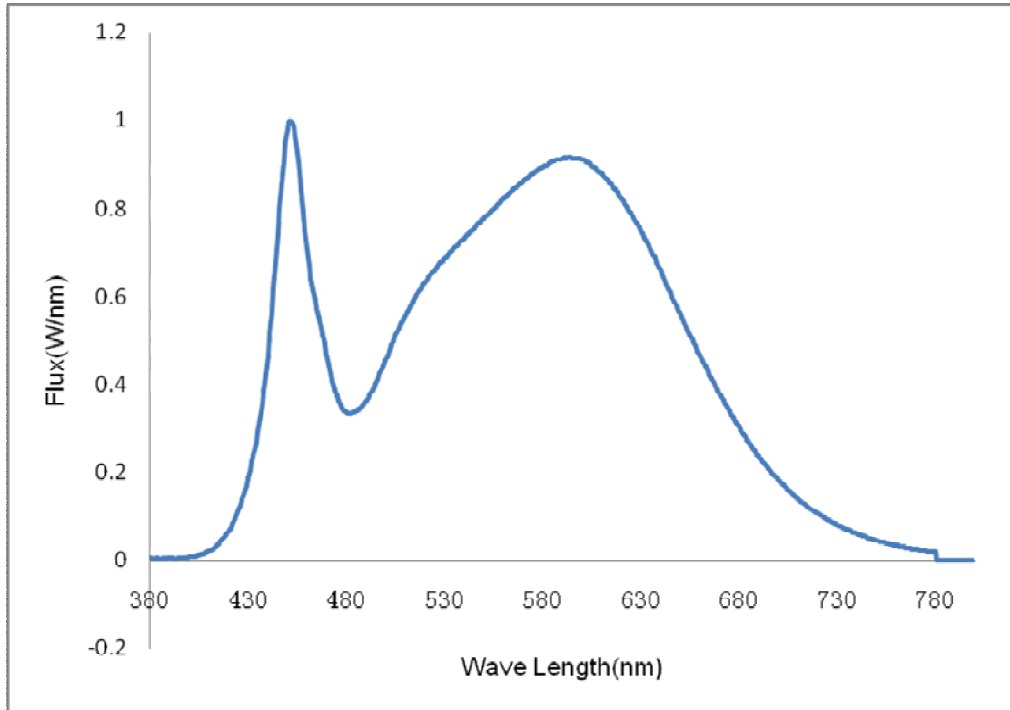
3.2 Photometric data

Criteria Item	Result (Sphere)	Result (Goniophotometer)
Total Lumens	4273.20 lm	4305.45 lm
Luminaire Efficacy	96.90 lm/W	98.16 lm/W
Correlated Color Temperature (CCT)	4085 K	-
Color Rendering Index (CRI)	85.8	-
R9	27	-
Chromaticity Coordinate (x,y)	x= 0.3765 y= 0.3732	-
Chromaticity Coordinate (u,v)	u= 0.2239 v= 0.3329	-
Chromaticity Coordinate (u',v')	u'= 0.2239 v'= 0.4994	-
Duv	-0.0005	-
Spacing Criteria (0-180)	-	-
Spacing Criteria (90-270)	-	-
Zonal Lumen between 0-60°	-	18.57%

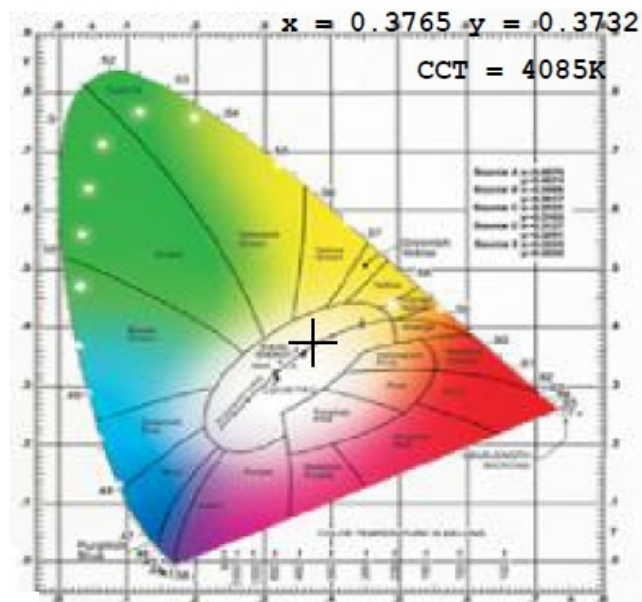
Note: N.A.

4 Test Data

4.1 Spectral Distribution

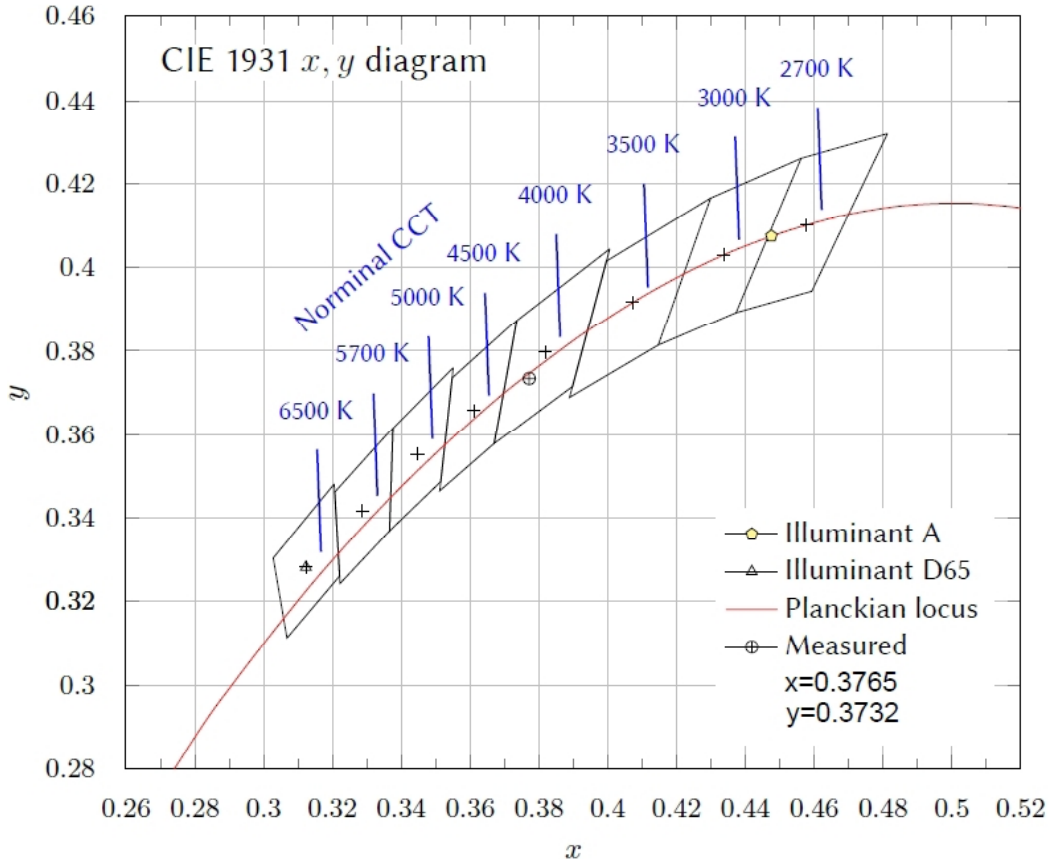


4.2 Chromaticity Diagram (CIE 1931)





4.3 ANSI Chromaticity Quadrangles Diagram



4.4 Color Rendering Details

R1	R2	R3	R4	R5
85	91	95	84	84
R6	R7	R8	R9	R10
87	89	72	27	78
R11	R12	R13	R14	R15
83	65	86	97	80



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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

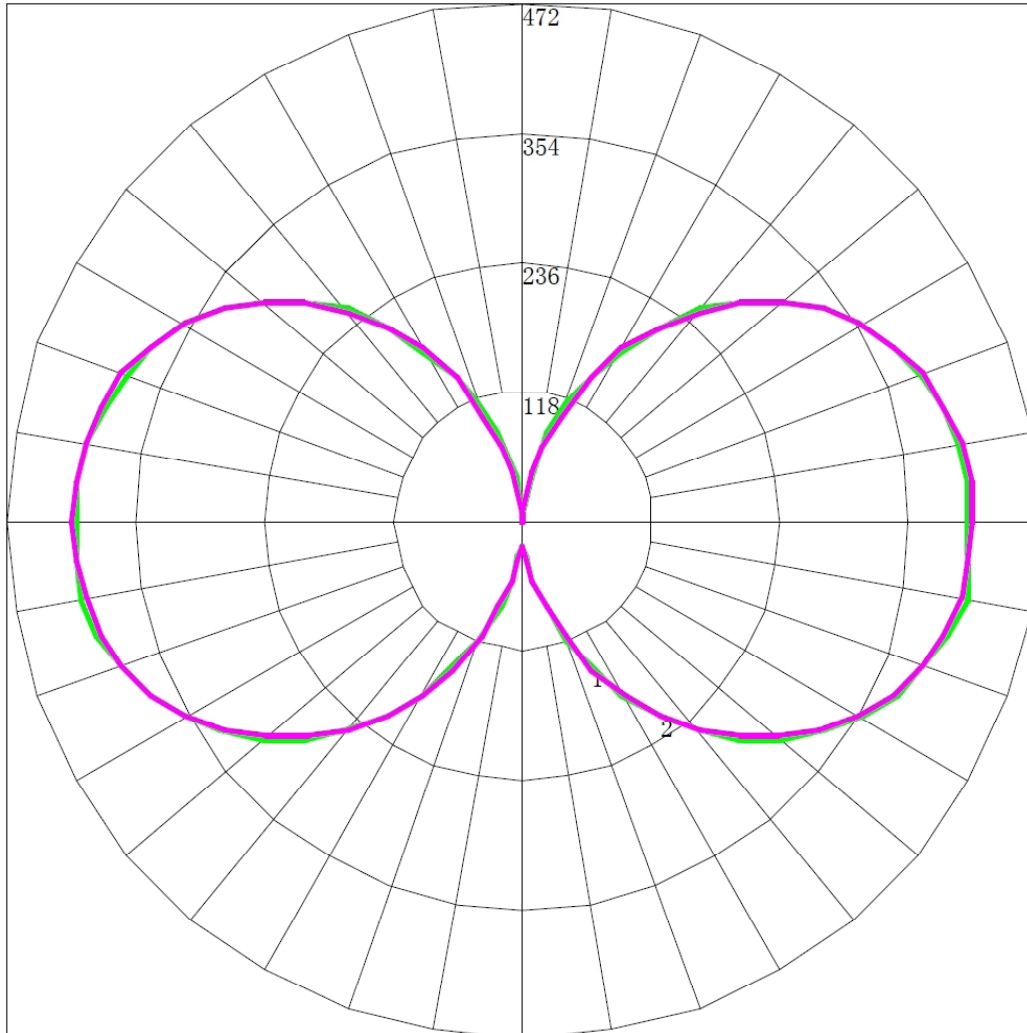
Zone	Lumens	%Lamp	%Fixt
0-30	99.94	2.3	2.3
0-40	244.62	5.7	5.7
0-60	799.38	18.6	18.6
0-90	2153.36	50	50
90-120	1353.76	31.4	31.4
90-130	1677.34	39	39
90-150	2055.59	47.7	47.7
90-180	2152.11	50	50
0-180	4305.47	100	100

Zone	Lumens
0-10	3.97
10-20	24.28
20-30	71.69
30-40	144.68
40-50	232.28
50-60	322.48
60-70	402.82
70-80	460.68
80-90	490.47
90-100	490.57
100-110	460.32
110-120	402.87
120-130	323.58
130-140	233.39
140-150	144.86
150-160	71.43
160-170	23.25
170-180	1.84



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4.7 Polar Curves



Maximum Candela = 472.18 Located At Horizontal Angle = 45, Vertical Angle = 90
1 - Vertical Plane Through Horizontal Angles (0 - 180)
2 - Vertical Plane Through Horizontal Angles (90 - 270)



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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	24.47	24.47	24.47	24.47	24.47	24.47	24.47
5	34.70	35.22	35.52	35.90	35.05	35.11	36.50
10	56.59	54.93	55.18	55.21	56.24	56.02	56.37
15	80.31	81.50	82.05	81.65	81.95	81.50	82.04
20	115.56	113.64	114.63	113.41	115.37	113.32	113.44
25	147.92	150.72	156.48	153.60	158.89	151.99	153.19
30	182.45	188.94	195.66	193.62	196.18	186.62	184.86
35	216.66	225.51	236.09	236.33	238.54	225.91	216.58
40	251.72	259.52	277.03	272.03	276.78	260.47	249.66
45	281.47	294.44	310.52	308.26	311.79	293.92	278.74
50	309.26	324.85	344.54	340.66	345.51	323.59	306.00
55	336.08	351.77	375.65	369.87	376.24	351.69	331.64
60	359.18	376.06	402.69	396.84	403.32	375.53	355.51
65	377.43	397.16	424.74	419.59	425.61	396.58	374.59
70	391.12	415.57	443.77	438.19	441.86	413.81	389.91
75	402.96	429.54	455.80	452.35	451.82	426.07	399.27
80	411.54	439.71	463.95	462.50	461.65	435.04	407.84
85	410.13	443.83	469.61	469.57	466.26	441.47	410.94
90	409.29	446.48	471.39	472.18	467.80	445.03	412.08
95	408.92	445.28	469.93	470.37	465.90	443.05	411.83
100	404.66	439.00	463.61	463.79	459.00	436.17	407.20
105	396.86	428.55	455.67	455.27	451.73	427.30	399.52
110	388.19	414.43	441.29	440.98	439.89	415.00	389.54
115	376.46	397.88	422.54	425.10	420.89	398.00	375.58
120	356.82	376.87	401.74	402.74	400.51	376.22	356.69
125	334.79	353.46	375.56	376.94	375.10	351.71	334.87
130	311.17	324.55	345.40	345.08	345.38	324.69	311.22
135	282.56	292.55	313.54	310.02	312.25	295.22	283.57
140	251.35	260.85	278.92	277.36	277.32	261.38	249.48
145	216.11	226.12	237.76	236.92	235.92	226.15	217.24
150	179.49	185.11	197.29	196.95	195.62	184.15	181.78
155	146.04	154.17	160.15	158.15	156.75	143.65	144.56
160	115.68	114.06	118.33	116.47	118.00	109.02	102.67
165	85.88	86.65	83.32	76.81	75.63	77.47	69.79
170	39.16	41.39	44.78	42.49	44.38	44.30	43.92
175	5.15	4.78	5.51	5.56	6.25	6.52	8.23
180	1.30	1.30	1.30	1.30	1.30	1.30	1.30

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