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Test report of

IES LM-79-08

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

Rendered to:

Zhongshan Litian Lighting Co., Ltd.
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For products:

High Bay Luminaires for Commercial and Industrial Buildings

Models No.:

LT-GK-006-240W-30K

Test Date:	Apr. 11, 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/LM79-08/01
Test Note:	

Complied by:	**Reviewed by:**
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May. 3, 2018	**May. 3, 2018**

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
3.3 Color Rendering Details 6
3.4 Additional test at 277V 6
4. Test Data 7
4.1 Spectral Distribution 7
4.2 ANSI Chromaticity Quadrangles Diagram 7
4.3 Goniometry Test Data 8
4.4 Zonal Lumen Summary 8
4.5 Polar Curves 9
4.6 Candela Tabulation 10
Appendix 1 Product Photo 11

1. General

1.1 Product Information

Brand Name	LI-TIAN LIGHTING
Category	Indoor
General Application	High Bay
Product Type	High Bay Luminaires for Commercial and Industrial Buildings
Model Number	LT-GK-006-240W-30K
Rated Inputs	100-277V, 50/60Hz
Rated Power	240W
Rated Light output	28800lm
Declared CCT	3000K
Power Supply	N/A
LED Package, Array or Module	Model: 2835 0.5W White SMD LED, manufactured by Wincens Optoelectronics (Shenzhen)co.,Ltd
Receipt Samples	1 unit
Sample Code of lab.	1803291010111+3000K PCB
Date of Receipt Samples	Mar. 29, 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 (2 meter sphere)	LC-I-900	SPR3000	Before use	Before use
Standard lamp	LC-PL-I-011	D204C	2017-09-07	2018-09-06
Luminous Flux Standard Lamp	LC-PL-I-003	24V100W	2017-09-22	2018-09-21
Goniophotometer(with mirror)	LC-I-902	GMS2000	2017-05-07	2018-05-06
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

2. Test conducted and method

The luminaire 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	120.00 V~60Hz	120.01 V~60Hz
Input Current(A)	1.876	1.873
Total Power(W)	224.50	224.08
Power Factor	0.997	0.997
I-THD	4.81%	-
Off-state Power(W)	-	-

3.2 Photometric data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Total Lumens(lm)	-	27143.88
Luminaire Efficacy(Lm/W)	-	121.13
Correlated Color Temperature (CCT)(K)	2976	-
Color Rendering Index (CRI)	82.2	-
R9	7	-
Chromaticity Coordinate (x,y)	x=0.4352 y=0.3976	-
Chromaticity Coordinate (u,v)	u=0.2523 v=0.3457	-
Chromaticity Coordinate (u',v')	u'=0.2523 v'=0.5185	-
Duv	-0.00238	-
Zone Lumens between 20-50 °	-	47.80%

3.3 Color Rendering Details

R1	R2	R3	R4	R5	R6	R7	R8
82	93	94	79	82	91	80	57
R9	R10	R11	R12	R13	R14	R15	-
7	84	78	73	85	97	74	-

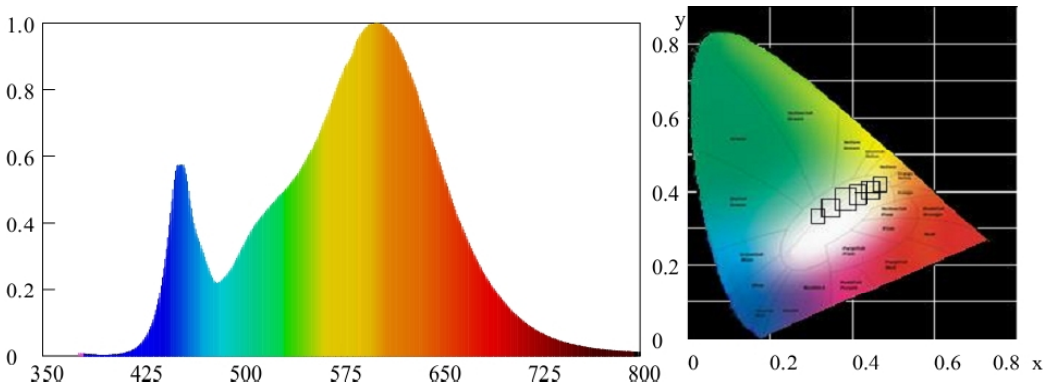
3.4 Additional test at 277V

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Input Voltage & Frequency	277.06V~60Hz	-
Power Factor	0.945	-
I-THD	8.57%	-

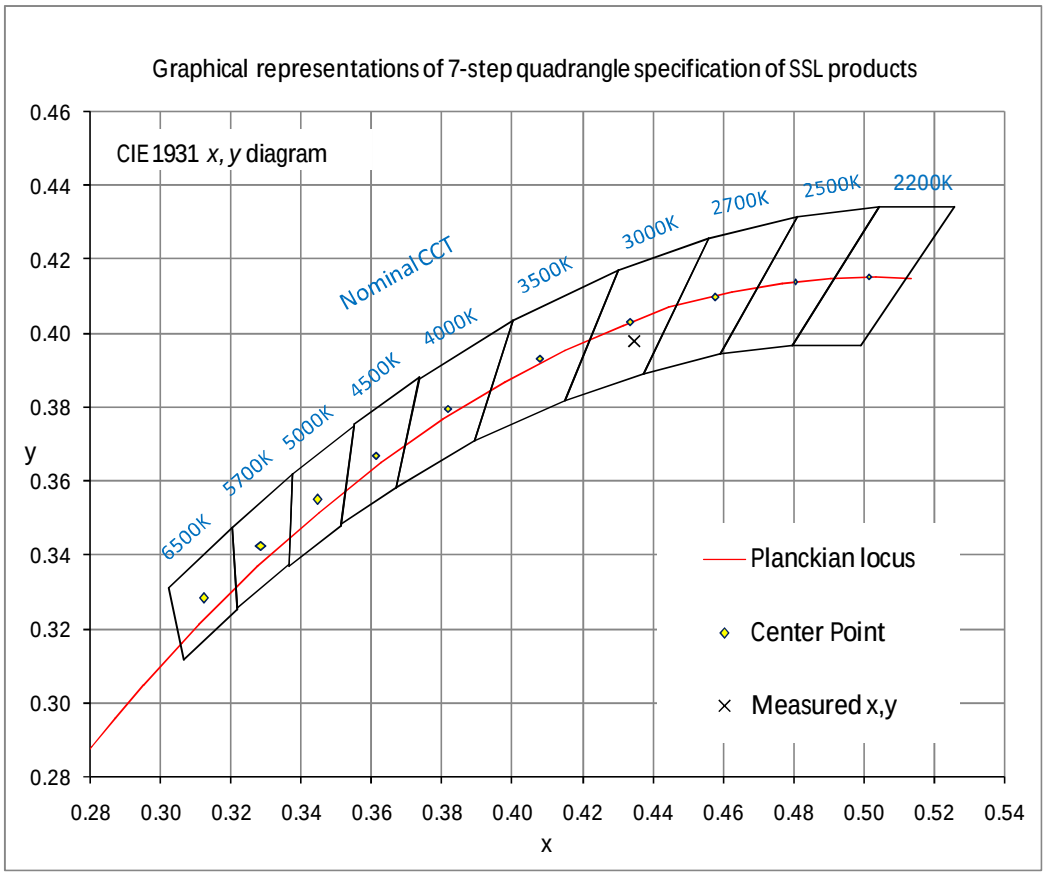
Note: N.A.

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 w/Sides
Spacing Criteria (0-180)	1.20	Luminous Length	0.58 m
Spacing Criteria (90-270)	1.30	Luminous Width	0.39 m
Spacing Criteria (Diagonal)	1.36	Luminous Height	0.02 m
Test Distance	29.79 m	-	-

4.4 Zonal Lumen Summary

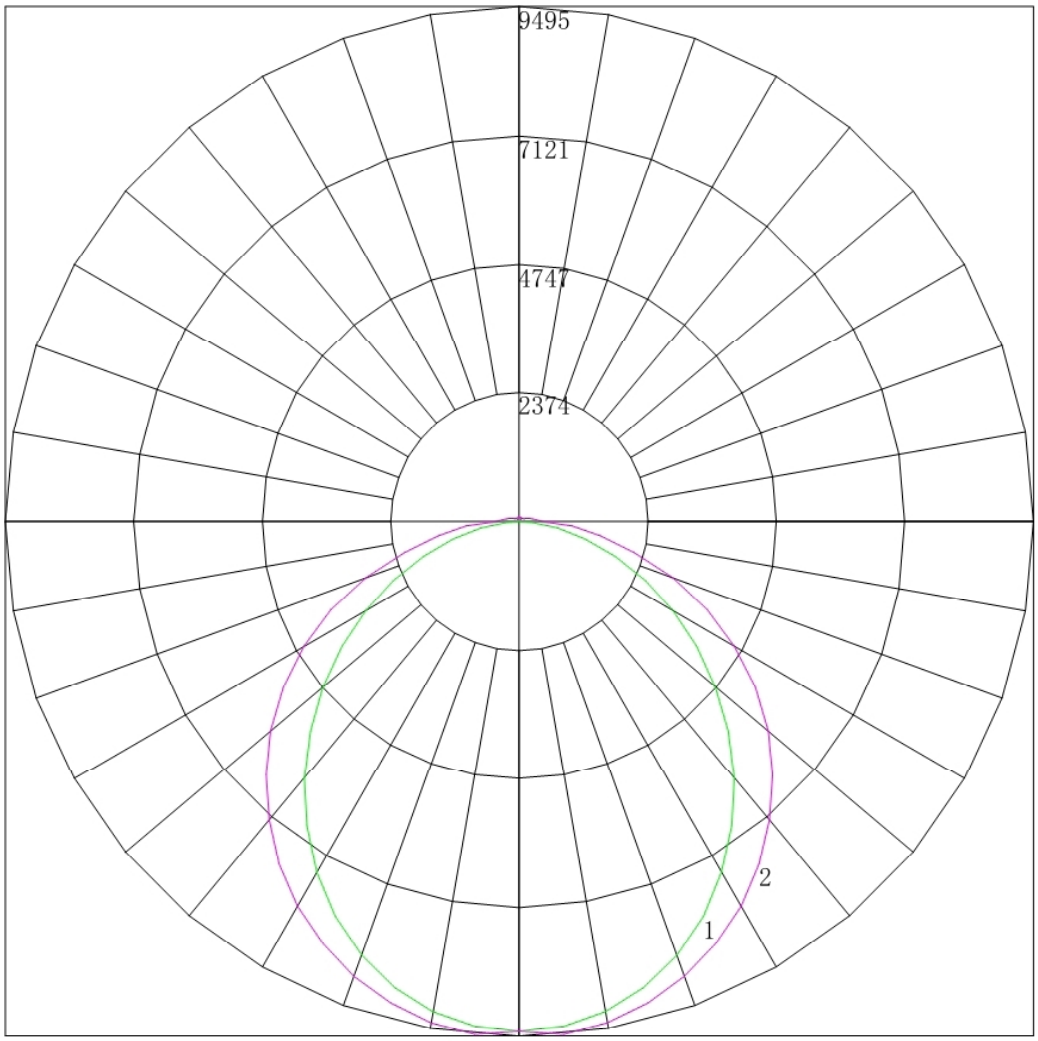
Zone	Lumens	%Lamp	%Fixt
0-20	3426.78	12.60	12.60
0-30	7236.55	26.70	26.70
0-40	11768.99	43.40	43.40
0-60	20571.63	75.80	75.80
0-80	25781.04	95.00	95.00
0-90	26591.59	98.00	98.00
10-90	25701.99	94.70	94.70
20-40	8342.21	30.70	30.70
20-50	12978.29	47.80	47.80
40-70	12027.18	44.30	44.30
60-80	5209.41	19.20	19.20
70-80	1984.87	7.30	7.30
80-90	810.55	3.00	3.00
90-110	317.53	1.20	1.20
90-120	384.20	1.40	1.40
90-130	430.96	1.60	1.60
90-150	495.98	1.80	1.80
90-180	552.30	2.00	2.00
110-180	234.77	0.90	0.90
0-180	27143.89	100.00	100.00

Total Luminaire Efficiency = 100.00%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	889.60
10-20	2537.18
20-30	3809.77
30-40	4532.44
40-50	4636.08
50-60	4166.56
60-70	3224.54
70-80	1984.87
80-90	810.55
90-100	205.90
100-110	111.64
110-120	66.66
120-130	46.76
130-140	33.51
140-150	31.51
150-160	29.88
160-170	19.79
170-180	6.65

4.5 Polar Curves

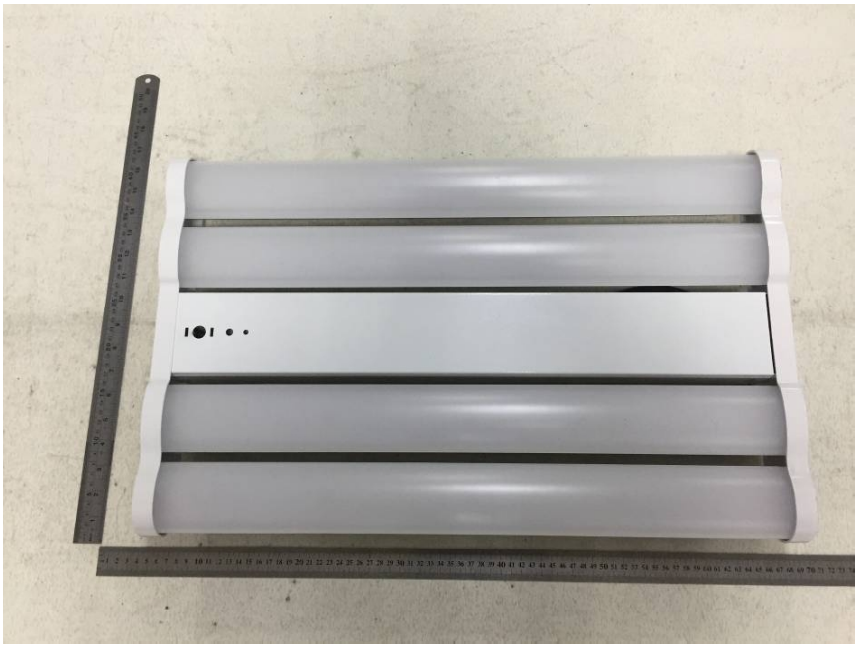


Maximum Candela = 9494.768 Located At Horizontal Angle = 90, Vertical Angle = 5
1 - Vertical Plane Through Horizontal Angles (0 - 180)
2 - Vertical Plane Through Horizontal Angles (90 - 270)

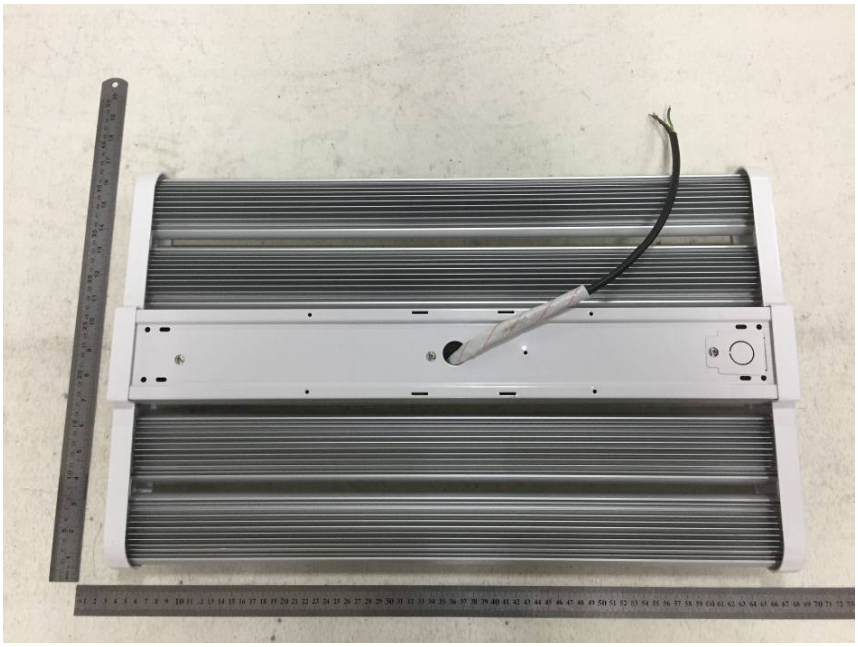
4.6 Candela Tabulation

	0	15	30	45	60	75	90
0	9404.459	9404.459	9404.459	9404.459	9404.459	9404.459	9404.459
5	9348.390	9344.449	9352.063	9359.267	9361.544	9367.234	9494.768
10	9181.519	9179.501	9197.111	9218.370	9232.789	9250.695	9383.539
15	8899.393	8907.219	8944.036	8984.196	9025.100	9061.666	9190.657
20	8516.255	8536.003	8598.589	8670.699	8739.039	8789.957	8927.702
25	8040.113	8066.088	8160.795	8265.690	8363.859	8440.500	8594.224
30	7472.750	7516.623	7646.364	7793.807	7923.932	8037.610	8195.664
35	6844.865	6907.111	7057.877	7241.707	7424.634	7561.706	7727.659
40	6183.163	6228.034	6422.442	6650.179	6865.007	7023.877	7191.616
45	5455.156	5539.802	5745.802	6020.479	6269.223	6442.729	6618.088
50	4730.263	4811.166	5041.141	5354.417	5634.200	5821.235	6001.602
55	4000.032	4090.517	4360.442	4692.014	4980.237	5174.808	5317.774
60	3271.135	3387.887	3663.992	4019.567	4302.146	4465.000	4592.309
65	2569.828	2695.705	2997.943	3341.750	3590.238	3720.774	3832.979
70	1889.436	2009.566	2374.080	2664.188	2844.734	2929.139	3010.544
75	1263.999	1440.089	1764.062	1964.604	2105.777	2155.134	2198.788
80	707.982	907.757	1185.134	1359.491	1455.175	1501.781	1525.132
85	256.849	443.230	645.297	805.603	897.479	947.690	983.467
90	18.111	90.102	196.093	317.998	372.745	413.059	416.703
95	10.057	35.243	112.164	194.103	257.559	295.383	313.753
100	14.195	24.768	76.903	143.249	198.566	231.851	247.011
105	16.331	15.584	54.498	106.418	152.859	181.367	194.308
110	21.582	17.540	44.902	80.338	117.617	142.633	154.081
115	25.498	20.362	28.743	64.378	90.381	110.569	119.058
120	30.081	30.559	29.154	58.413	75.710	88.336	94.613
125	34.620	39.723	30.464	35.165	69.689	79.341	83.426
130	35.955	41.722	30.817	39.246	41.124	68.558	76.226
135	37.379	42.433	34.876	37.163	44.251	43.585	42.951
140	43.031	47.791	51.507	38.667	43.519	47.937	50.216
145	48.905	53.727	57.525	46.815	44.336	46.826	48.147
150	54.156	57.573	61.408	65.515	51.605	48.262	48.740
155	60.163	60.995	63.983	72.078	73.218	66.365	63.495
160	59.629	60.397	67.381	71.950	77.302	78.333	79.315
165	60.786	60.707	64.589	71.419	74.023	77.245	81.514
170	66.393	66.396	65.806	68.111	71.053	71.121	69.663
175	71.154	71.443	70.866	69.596	69.734	68.454	65.725
180	73.082	73.082	73.082	73.082	73.082	73.082	73.082

Appendix 1 Product Photo



Picture 1



Picture 2

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