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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.
Block B 4/F, No.2 Yihui NO.2 Road Maohui Industry, Sisha, Henglan Town, Zhongshan City, Guangdong Provice, China 528478

For products:

High Bay Luminaires for Commercial and Industrial Buildings

Models No.:
LT-GK-UFO-200W-30K

Test Date:	Mar. 30, 2018 to Apr. 3, 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:**	
Bowen Pang	Bowen Pang	**Richard Li**	
Project Engineer		**Technical Manager**	
Apr. 17, 2018		**Apr. 17, 2018**	

Table of Contents

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-UFO-200W-30K
Rated Inputs	100-277V, 50/60Hz
Rated Power	200W
Rated Light output	23000lm
Declared CCT	3000K
Power Supply	N/A
LED Package, Array or Module	Model: JB3030 6-V, manufactured by Cree, Inc.
Receipt Samples	1 unit
Sample Code of lab.	180329101021+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	120.07V~60Hz	119.95V~60Hz
Input Current(A)	1.667	1.664
Total Power(W)	200.20	199.54
Power Factor	1.000	1.000
I-THD	2.34%	-
Off-state Power(W)	-	-

3.2 Photometric data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Total Lumens(lm)	-	22888.33
Luminaire Efficacy(Lm/W)	-	114.71
Correlated Color Temperature (CCT)(K)	3099	-
Color Rendering Index (CRI)	71.2	-
R9	-22	-
Chromaticity Coordinate (x,y)	x=0.4316 y=0.4048	-
Chromaticity Coordinate (u,v)	u=0.2468 v=0.3472	-
Chromaticity Coordinate (u',v')	u'=0.2468 v'=0.5209	-
Duv	0.00108	-
Zone Lumens between 20-50 °	-	52.80%

3.3 Color Rendering Details

R1	R2	R3	R4	R5	R6	R7	R8
69	79	87	69	66	69	80	50
R9	R10	R11	R12	R13	R14	R15	-
-22	50	63	41	70	92	63	-

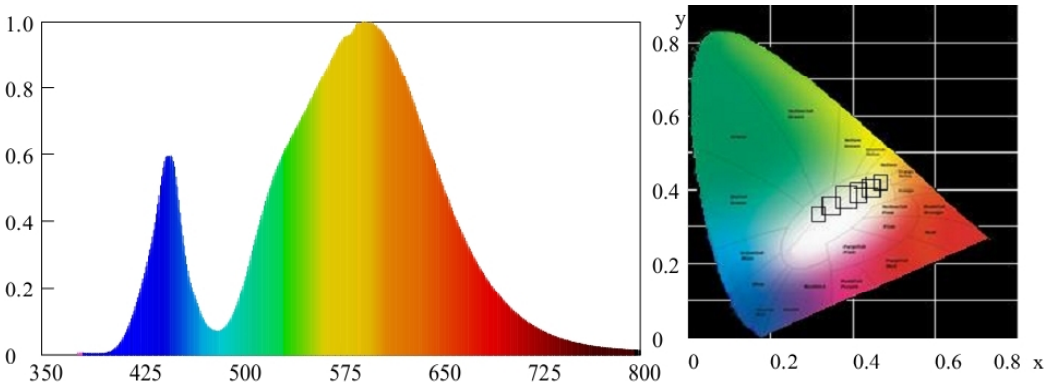
3.4 Additional test at 277V

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Input Voltage & Frequency	277.03V~60Hz	-
Power Factor	0.946	-
I-THD	4.32%	-

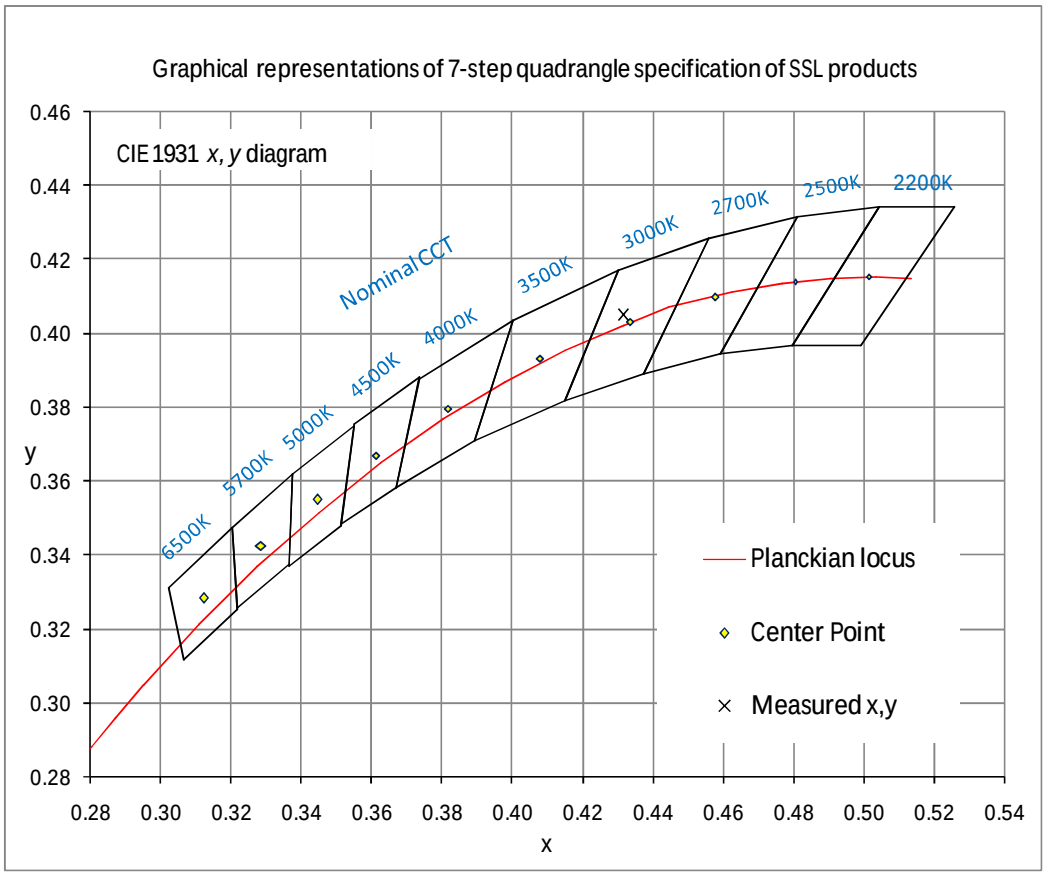
Note: N.A.

4. Test Data

4.1 Spectral Distribution



4.2 ANSI Chromaticity Quadrangles Diagram



4.3 Goniometry Test Data

CIE Type	Direct	Basic Luminous Shape	Circular
Spacing Criteria (0-180)	1.30	Luminous Length	0.28 m (Diameter)
Spacing Criteria (90-270)	1.30	Luminous Width	0.28 m (Diameter)
Spacing Criteria (Diagonal)	1.40	Luminous Height	0.00 m
Test Distance	29.79 m	-	-

4.4 Zonal Lumen Summary

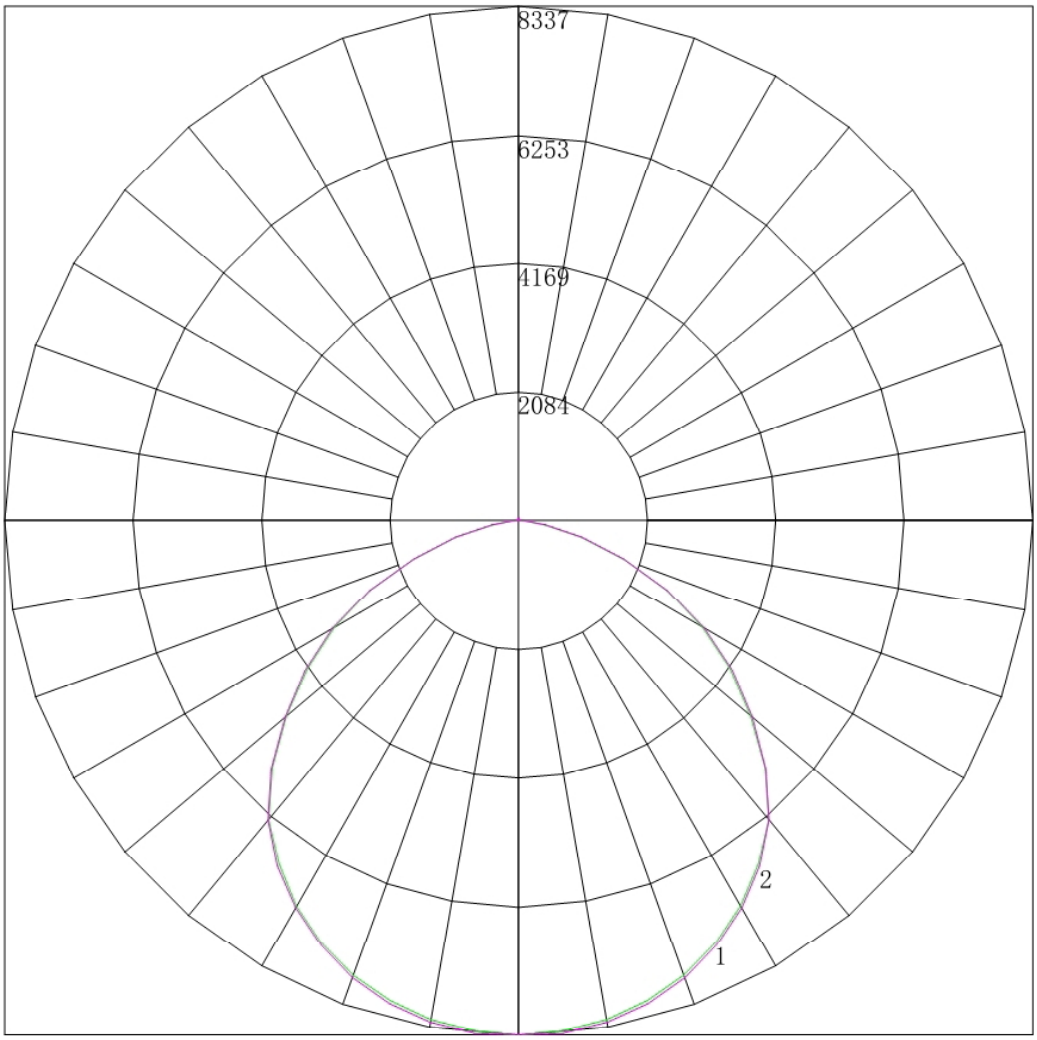
Zone	Lumens	%Lamp	%Fixt
0-20	3068.08	13.40	13.40
0-30	6553.16	28.60	28.60
0-40	10801.64	47.20	47.20
0-60	18907.35	82.60	82.60
0-80	22671.55	99.10	99.10
0-90	22823.26	99.70	99.70
10-90	22033.03	96.30	96.30
20-40	7733.55	33.80	33.80
20-50	12082.19	52.80	52.80
40-70	10726.42	46.90	46.90
60-80	3764.2	16.40	16.40
70-80	1143.49	5.00	5.00
80-90	151.71	0.70	0.70
90-110	12.37	0.10	0.10
90-120	19.61	0.10	0.10
90-130	27.65	0.10	0.10
90-150	43.86	0.20	0.20
90-180	65.05	0.30	0.30
110-180	52.68	0.20	0.20
0-180	22888.3	100.00	100.00

Total Luminaire Efficiency = 100.00%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	790.24
10-20	2277.85
20-30	3485.08
30-40	4248.47
40-50	4348.64
50-60	3757.08
60-70	2620.71
70-80	1143.49
80-90	151.71
90-100	5.50
100-110	6.87
110-120	7.24
120-130	8.04
130-140	7.55
140-150	8.66
150-160	9.58
160-170	8.26
170-180	3.34

4.5 Polar Curves

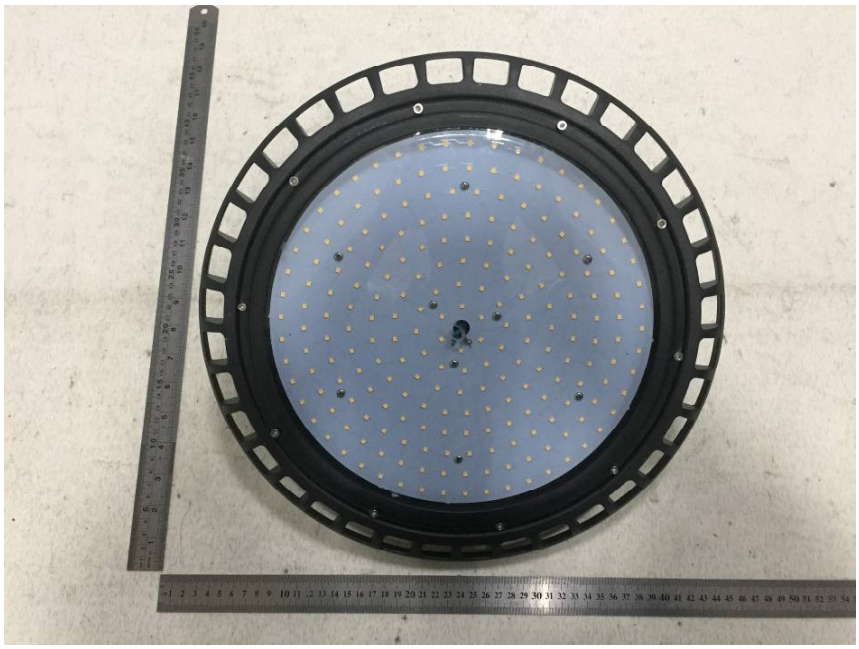


Maximum Candela = 8337.198 Located At Horizontal Angle = 90, Vertical Angle = 5
1 - Vertical Plane Through Horizontal Angles (0 - 180)
2 - Vertical Plane Through Horizontal Angles (90 - 270)

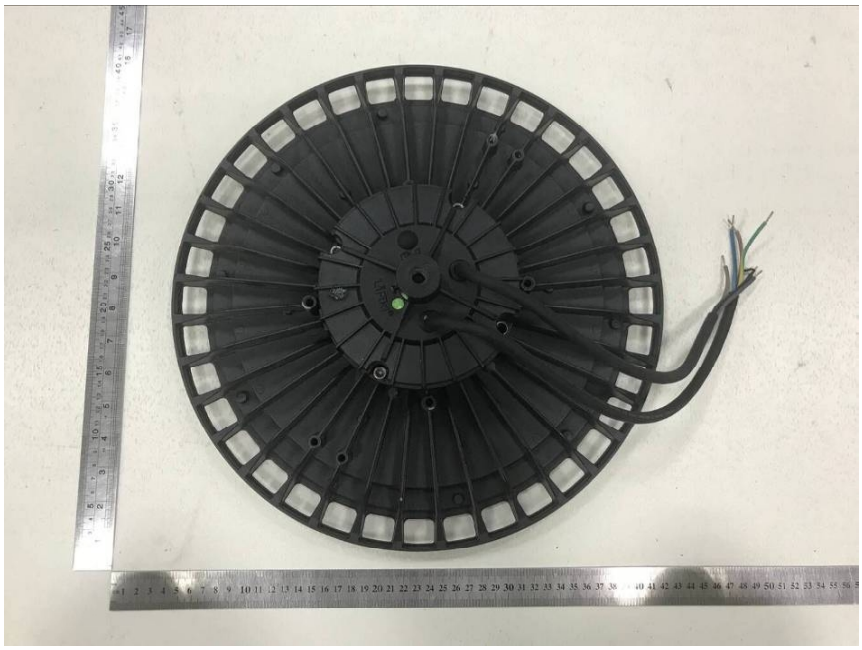
4.6 Candela Tabulation

	0	15	30	45	60	75	90
0	8332.234	8332.234	8332.234	8332.234	8332.234	8332.234	8332.234
5	8300.294	8294.086	8304.530	8308.729	8312.918	8306.982	8337.198
10	8208.019	8209.145	8210.740	8222.632	8232.815	8224.213	8254.320
15	8046.981	8053.659	8057.046	8067.542	8083.941	8064.477	8105.003
20	7840.251	7837.835	7843.031	7845.439	7849.169	7851.888	7877.252
25	7552.336	7548.385	7550.724	7555.004	7565.390	7562.777	7588.775
30	7201.869	7198.381	7205.470	7208.894	7218.139	7219.311	7238.212
35	6780.865	6778.961	6789.859	6804.417	6795.438	6801.686	6821.580
40	6306.626	6299.633	6306.218	6311.420	6305.751	6300.196	6319.141
45	5648.281	5621.804	5634.704	5644.920	5659.629	5647.915	5672.518
50	4908.751	4903.178	4924.339	4924.262	4937.171	4938.078	4938.963
55	4182.975	4202.493	4201.171	4210.038	4211.607	4223.556	4233.784
60	3442.559	3443.912	3441.835	3457.655	3448.560	3459.611	3475.588
65	2660.441	2647.880	2672.755	2645.829	2655.960	2648.625	2669.581
70	1837.998	1835.151	1843.773	1837.750	1828.868	1814.514	1802.191
75	1036.539	1030.611	1030.555	1049.499	1051.441	1053.182	1069.869
80	422.068	415.922	415.430	413.519	425.781	421.400	440.340
85	64.504	63.947	67.177	65.631	66.768	67.945	68.532
90	4.481	4.480	4.613	4.593	4.638	4.684	4.265
95	4.924	4.902	4.901	4.904	4.904	4.882	4.842
100	5.812	5.833	5.810	5.835	5.769	5.814	5.773
105	6.610	6.588	6.587	6.612	6.612	6.590	6.616
110	7.009	7.009	6.964	7.033	6.967	6.945	6.971
115	7.098	7.142	7.097	7.167	7.145	7.189	7.147
120	7.941	7.918	7.895	7.921	7.944	7.899	7.897
125	9.139	9.160	9.181	9.163	9.164	9.208	9.130
130	9.582	9.626	9.603	9.607	9.608	9.674	9.745
135	9.183	9.160	9.203	9.163	9.164	9.253	9.211
140	11.002	11.046	11.066	11.049	11.050	11.050	11.204
145	13.841	13.907	13.949	13.911	13.957	13.957	14.036
150	16.547	16.524	16.499	16.574	16.530	16.597	16.694
155	20.717	20.761	20.713	20.745	20.680	20.724	20.767
160	25.642	25.552	25.681	25.693	25.606	25.628	25.770
165	29.679	29.699	29.650	29.687	29.710	29.622	29.846
170	32.651	32.672	32.689	32.682	32.728	32.750	32.862
175	36.023	35.976	36.015	35.988	36.056	36.012	36.149
180	38.023	38.023	38.023	38.023	38.023	38.023	38.023

Appendix 1 Product Photo



Picture 1



Picture 2

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