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Test report of

IES LM-79-08

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

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For products:

High Bay Luminaires for Commercial and Industrial Buildings

Models No.:

LT-GK-006-300W-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.
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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-006-300W-30K
Rated Inputs	100-277V, 50/60Hz
Rated Power	300W
Rated Light output	34500lm
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.	180329101012+3000K PCB
Date of Receipt Samples	Mar. 29, 2018
Note	-



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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 C78.377-2015	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 $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$; 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 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.



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3. Test Result Summary

3.1 Electrical data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Input Voltage & Frequency	119.95 V~60Hz	120.04 V~60Hz
Input Current(A)	2.482	2.475
Total Power(W)	296.87	296.25
Power Factor	0.997	0.997
I-THD	4.43%	-
Off-state Power(W)	-	-

3.2 Photometric data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Total Lumens(lm)	-	34998.36
Luminaire Efficacy(Lm/W)	-	118.14
Correlated Color Temperature (CCT)(K)	2993	-
Color Rendering Index (CRI)	82.3	-
R9	7	-
Chromaticity Coordinate (x,y)	x=0.4338 y=0.3968	-
Chromaticity Coordinate (u,v)	u=0.2517 v=0.3453	-
Chromaticity Coordinate (u',v')	u'=0.2517 v'=0.5180	-
Duv	-0.0025	-
Zone Lumens between 20-50 °	-	47.90%

3.3 Color Rendering Details

R1	R2	R3	R4	R5	R6	R7	R8
82	93	94	79	82	91	81	57
R9	R10	R11	R12	R13	R14	R15	-
7	84	78	73	85	97	74	-

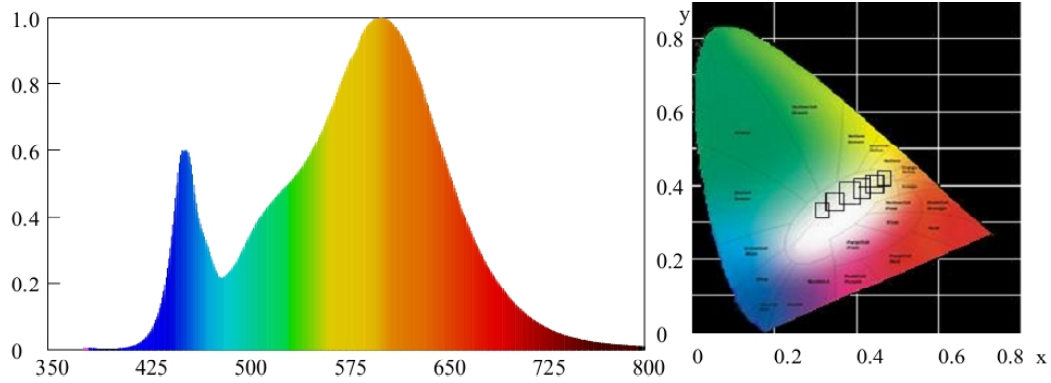
3.4 Additional test at 277V

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Input Voltage & Frequency	277.01V~60Hz	-
Power Factor	0.942	-
I-THD	9.54%	-

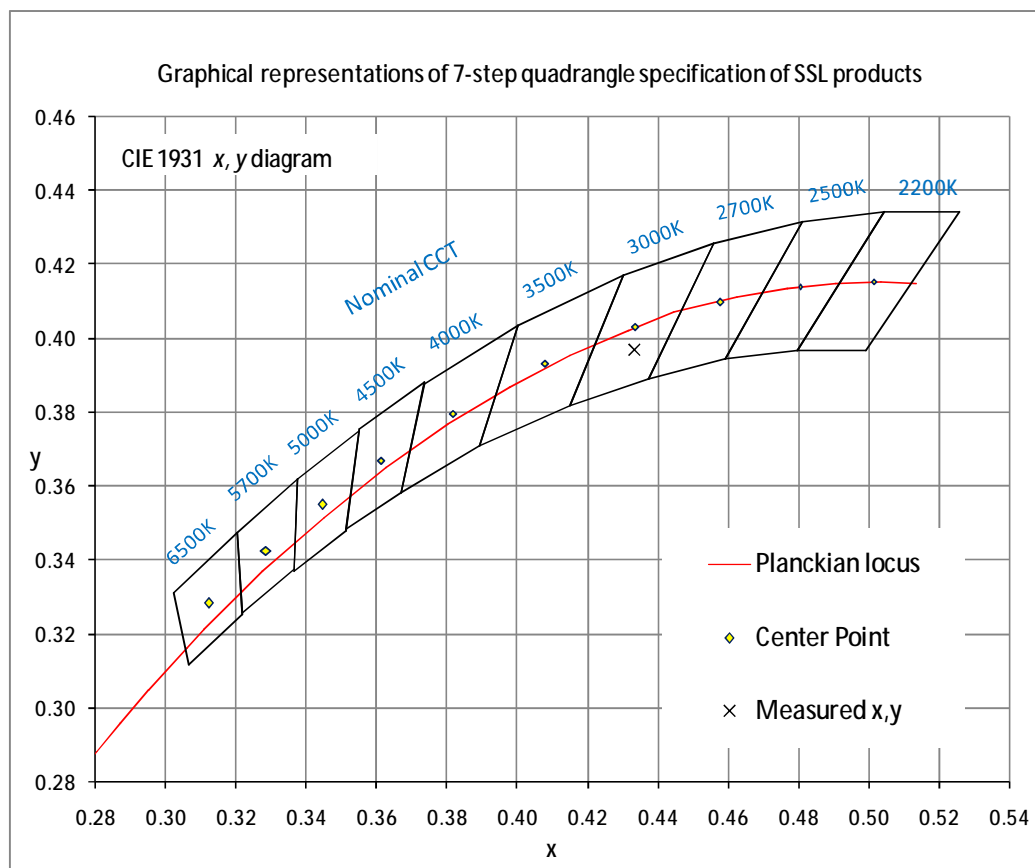
Note: N.A.

4. Test Data

4.1 Spectral Distribution



4.2 ANSI Chromaticity Quadrangles Diagram





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4.3 Goniometry Test Data

CIE Type	Direct	Basic Luminous Shape	Rectangular w/Sides
Spacing Criteria (0-180)	1.20	Luminous Length	0.78 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	4414.55	12.60	12.60
0-30	9327.63	26.70	26.70
0-40	15179.3	43.40	43.40
0-60	26560.05	75.90	75.90
0-80	33285.38	95.10	95.10
0-90	34311.35	98.00	98.00
10-90	33165.57	94.80	94.80
20-40	10764.75	30.80	30.80
20-50	16757.58	47.90	47.90
40-70	15548.75	44.40	44.40
60-80	6725.31	19.20	19.20
70-80	2557.31	7.30	7.30
80-90	1025.98	2.90	2.90
90-110	380.72	1.10	1.10
90-120	464.20	1.30	1.30
90-130	525.60	1.50	1.50
90-150	613.59	1.80	1.80
90-180	687.03	2.00	2.00
110-180	306.31	0.90	0.90
0-180	34998.38	100.00	100.00

Total Luminaire Efficiency = 100.00%

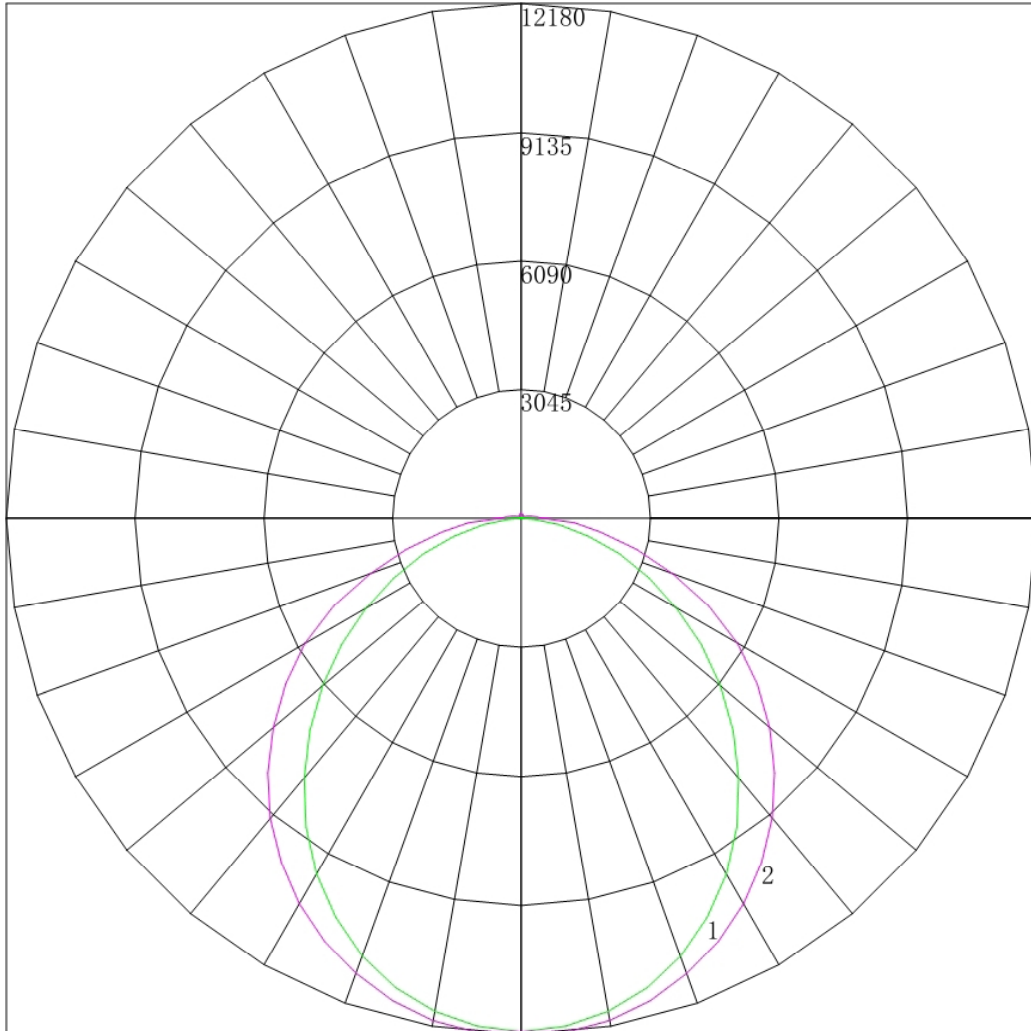
ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	1145.78
10-20	3268.77
20-30	4913.08
30-40	5851.68
40-50	5992.83
50-60	5387.92
60-70	4168.00
70-80	2557.31
80-90	1025.98
90-100	244.19
100-110	136.53
110-120	83.48
120-130	61.40
130-140	46.17
140-150	41.81
150-160	38.36
160-170	26.38
170-180	8.70



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4.5 Polar Curves



Maximum Candela = 12179.51 Located At Horizontal Angle = 90, Vertical Angle = 5
1 - Vertical Plane Through Horizontal Angles (0 - 180)
2 - Vertical Plane Through Horizontal Angles (90 - 270)



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4.6 Candela Tabulation

	<u>0</u>	<u>15</u>	<u>30</u>	<u>45</u>	<u>60</u>	<u>75</u>	<u>90</u>
0	12116.050	12116.050	12116.050	12116.050	12116.050	12116.050	12116.050
5	12042.030	12043.420	12049.730	12057.260	12063.020	12066.370	12179.510
10	11824.880	11828.430	11851.430	11876.710	11897.250	11914.890	12035.250
15	11473.510	11492.450	11525.150	11581.950	11624.090	11664.270	11789.810
20	10996.390	11018.120	11095.860	11174.270	11264.280	11326.860	11444.510
25	10392.190	10427.040	10533.020	10658.750	10783.800	10878.840	11021.880
30	9689.452	9729.476	9876.901	10053.010	10212.930	10339.170	10501.730
35	8883.708	8937.433	9131.118	9360.961	9567.617	9732.578	9899.435
40	7995.470	8092.374	8323.468	8593.452	8872.453	9060.495	9232.390
45	7076.466	7180.030	7451.275	7791.198	8088.075	8309.483	8474.575
50	6131.154	6244.517	6549.488	6947.757	7264.160	7511.680	7659.382
55	5184.949	5339.292	5661.003	6079.183	6425.031	6661.101	6811.348
60	4234.286	4402.884	4754.523	5193.023	5537.614	5761.685	5904.305
65	3325.538	3505.015	3901.253	4319.985	4625.223	4786.810	4887.571
70	2464.055	2660.401	3076.229	3453.331	3685.268	3779.016	3807.248
75	1651.621	1854.566	2285.699	2577.122	2711.428	2758.404	2818.179
80	906.474	1181.960	1535.847	1726.562	1808.747	1846.969	1897.172
85	324.751	561.183	855.563	1049.714	1157.974	1221.286	1257.573
90	16.632	108.078	228.278	331.847	440.316	461.342	487.847
95	12.842	43.044	136.271	236.879	312.981	359.406	378.453
100	15.294	30.323	93.143	173.751	240.796	282.001	299.919
105	24.346	22.258	66.258	129.676	185.763	221.147	236.278
110	30.054	24.619	56.442	97.846	143.462	173.996	186.242
115	33.978	27.092	45.203	79.148	110.974	136.018	146.406
120	38.793	38.409	39.683	74.887	93.358	109.257	116.587
125	42.049	50.575	41.886	56.968	89.557	99.894	104.612
130	45.437	55.543	42.264	53.815	69.113	90.887	97.845
135	49.718	59.108	44.957	50.820	58.988	63.132	71.097
140	56.317	64.566	65.874	52.705	59.808	66.553	69.431
145	62.828	70.448	78.008	58.693	60.272	64.146	66.236
150	68.981	73.278	84.906	82.996	64.558	64.081	64.907
155	69.338	74.837	87.177	95.138	92.134	80.926	77.597
160	73.708	75.171	89.179	97.557	103.389	102.303	102.896
165	81.511	81.721	86.486	96.734	99.744	104.162	109.040
170	86.594	87.558	88.088	90.079	95.122	95.918	96.822
175	91.187	91.836	91.670	90.632	90.129	90.085	87.380
180	92.444	92.444	92.444	92.444	92.444	92.444	92.444

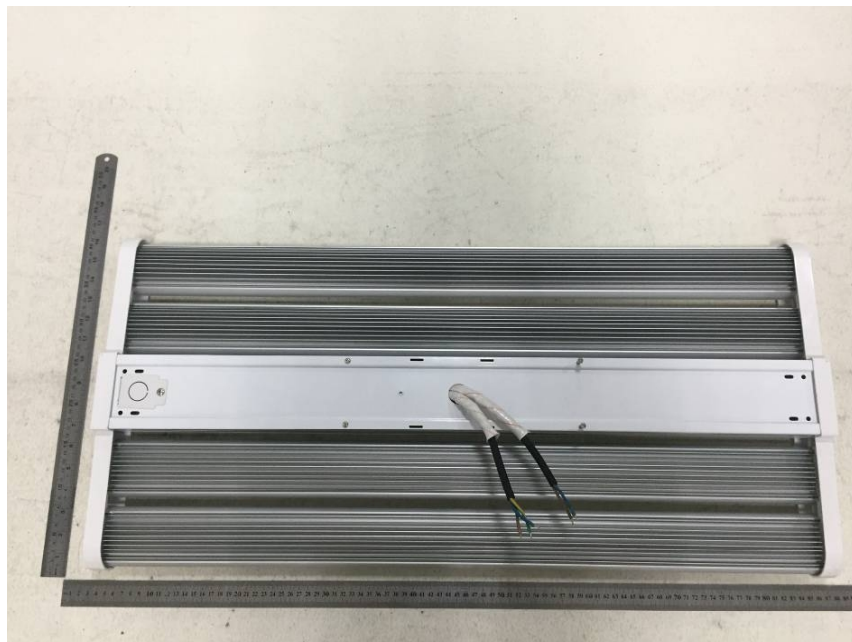


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Appendix 1 Product Photo



Picture 1



Picture 2

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