Test Report

Client Name	:	Shenzhen Sinoco Lighting Technologies Co.,Ltd.
Address	:	G building,Shasi , High-Tec ,Industrial park,Shajing Town,Baoan District,Shenzhen, Guangdong,China
Product Name	:	LED street light
Date	:	2019-12-31

Shenzhen Anbotek Pengcheng Compliance Laboratory Limited

Report No.:	PCANL191224004-01
Product Description:	LED street light
Electrical Rating:	220-240VAC, 50Hz, 60W
Model No.:	ST-52-60W I
Model Difference:	N/A
Test Date:	2019-12-24
Test Standard:	LM-79-08
Test Laboratory:	Shenzhen Anbotek Pengcheng Compliance Laboratory Limited
Testing location:	Zone B, 1/F., Building 2, Hengchangrong High Tech Industrial Park, Huangtian, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.

Tested by **Reviewed by**

Ocean Deng Flora Zhang

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or use in part without prior written consent from Shenzhen Anbotek Pengcheng Compliance Laboratory Limited.

General Information

Applicant:	Shenzhen Sinoco Lighting Technologies Co.,Ltd.
Applicant Address:	G building,Shasi , High-Tec ,Industrial park,Shajing Town,Baoan District,Shenzhen, Guangdong,China
Manufacturer:	Shenzhen Sinoco Lighting Technologies Co.,Ltd.
Manufacturer Address:	G building,Shasi , High-Tec ,Industrial park,Shajing Town,Baoan District,Shenzhen, Guangdong,China
Brand Name:	SINOCO
Tested Model:	ST-52-60W I
Nominal CCT	3000K

Summary of Result

Test Item	**Test Result**	
	Luminous Flux (lm)	**Luminous Efficacy (lm/W)**
Integrating Sphere Test	9142.6	151.82
Goniophotometer Test	9120.8	152.01

1 Test Condition

1.1 Air Temperature

The ambient temperature in which measurements are being taken shall be maintained at 25°C±1°C, measured at a point not more than 1 m from the SSL product and at the same height as the SSL product. The temperature sensor shall be shielded from direct optical radiation from the SSL product and optical radiation from any other source. If measurements are performed at other than this recommended temperature, this is a non-standard condition and shall be noted in the test report.

1.2 Thermal Conditions for Mounting SSL Products

The method of mounting can be the primary path for heat flow away from the device and can affect measurement results significantly. The SSL product under test shall be mounted to the measuring instrument so that heat conduction through supporting objects causes negligible cooling effects. If the SSL product under test is provided with a support structure that is designated to be used as a component of the luminaire thermal management system, the product shall be tested with the support structure attached. Any such support structure included in the measurement shall be reported.

1.3 Air Movement

The incidence of air movements on the surface of a SSL product under test may substantially after electrical and photometric values. Air flow around the SSL product being tested should be such that normal convective air flow induced by device under test is not affected.

1.4 Waveshape of AC Power Supply

The AC power supply, while operating the SSL product, shall have a sinusoidal voltage waveshapeat the prescribed frequency typically 50/60 Hz or 50 Hz) such that the RMS summation of the harmonic components does not exceed 3 percent of the fundamental during operation of the test item.

1.5 Voltage Regulation

The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.

1.6 Seasoning

For the purpose of rating new SSL products, SSL products shall be tested with no seasoning.

1.7 Stabilization

Before measurements are taken, the SSL product under test shall be operated long enough to reach stabilization and temperature equilibrium. The time required for stabilization depends on the type of SSL products under test. The stabilization time typically ranges from 30 min to 2 or more hours for large SSL products.

1.8 Operating Orientation

The SSL product under test shall be evaluated in the operating orientation recommended by the manufacturer for an intended use of the SSL product. Stabilization and photometric measurements of SSL products shall be done in such operating orientation.

2 Test Method

2.1 Integrating Sphere Measurement

The integrating sphere system includes AC power source, digital power meter, DC power supply, spectrophotometer, and integrating sphere. The system is calibrated by standard lamp before measurement weekly. The standard lamp has been calibrated regularly and traced to the National Primary Standard.

The 4π geometry was used to measure total luminous, luminous efficacy, chromaticity coordinates, correlated color temperature, and color rendering index, the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm. The product was operated in its intended orientation and was recorded in the report.

2.2 Goniophotometer Measurement

The goniophotometer system is calibrated by standard lamp before measurement weekly. The standard lamp has been calibrated regularly and traced to National Primary Standards.

Type C goniophotometer was used for measuring total luminous flux, luminous efficacy, luminous intensity distribution, and color angular uniformity, which were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals. The product was operated in its intended orientation and was recorded in the report.

2.3 Electrical Measurement

According to ANSI C82.77-2002, the measurement was made using a digital power meter and power supply, the SSL product under test was operated at rated voltage and stabilized enough before measurement. The total harmonic distortion of current and power factor can be calculated from the digital power meter. The digital power meter was calibrated regularly and traced to National Primary Standards.

3 Test Result

3.1 Integrating Sphere

Temperature (°C)	Test Humidity	Orientation	Stabilization Time(min)	Test Time(min)	Number of hours operated prior to measurement
25.1	55%RH	Face Down	30min	1min	0

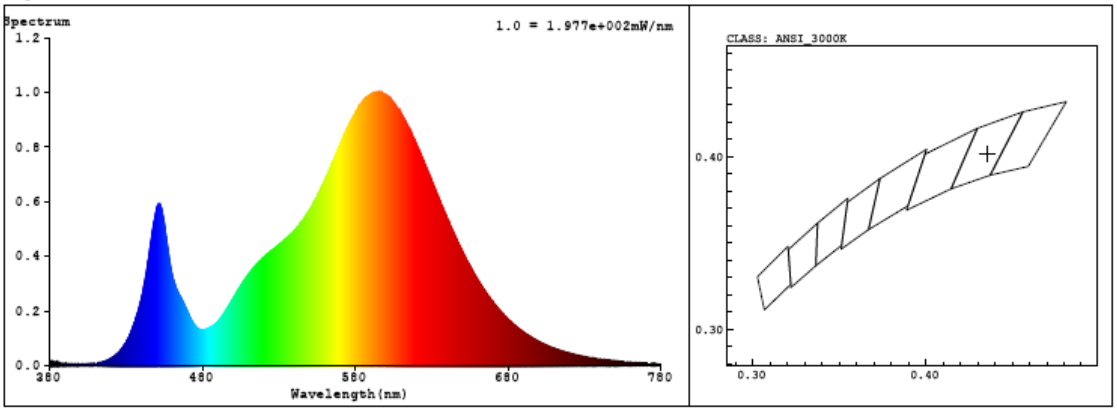
Input Voltage (V)	Frequency (Hz)	Current (A)	Power Factor	Power(W)	Correction factors
229.96	50	0.2670	0.9808	60.22	1.2228

Luminous Flux (lm)	Radiant Flux (W)	CCT (K)	Duv	Luminous Efficacy (lm/W)
9142.6	25.96	3006	-0.0009	151.82

Ra	x	y	u'	v'
72.8	0.4352	0.4013	0.2507	0.5200

R1	R2	R3	R4	R5
69	85	94	68	70
R6	R7	R8	R9	R10
81	75	41	-36	67
R11	R12	R13	R14	R15
64	58	73	97	60

Spectral Distribution & Chromaticity Diagram



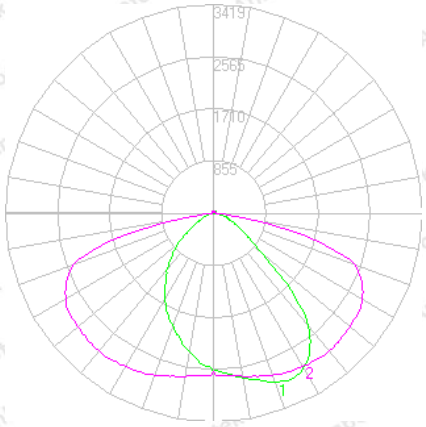
3.2.Goniophotometer

Temperature (°C)	Test Humidity	Orientation	Stabilization Time(min)	Test Time(min)	Number of hours operated prior to measurement
25.1	54%	Face down	30	45	0

Input Voltage (V)	Frequency (Hz)	Current (A)	Power Factor	Power (W)
230.03	50	0.2660	0.9802	60.00

Luminous Flux (lm)	CBCP (cd)	Beam Angle (50%)[C0/180]	Beam Angle (50%)[C90/270]	Luminous Efficacy (lm/W)
9120.8	2589	154.0	85.0	152.01

Luminous Intensity Distribution



Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixt
0-20	985.81	10.80	10.80
0-30	2195.6	24.10	24.10
0-40	3785.00	41.50	41.50
0-60	7101.87	77.90	77.90
0-80	8851.14	97.00	97.00
0-90	8957.63	98.20	98.20
10-90	8709.94	95.50	95.50
20-40	2799.18	30.70	30.70
20-50	4542.48	49.80	49.80
40-70	4478.03	49.10	49.10
60-80	1749.26	19.20	19.20
70-80	588.11	6.40	6.40
80-90	106.50	1.20	1.20
90-110	54.49	0.60	0.60
90-120	79.47	0.90	0.90
90-130	101.97	1.10	1.10
90-150	139.70	1.50	1.50
90-180	163.13	1.80	1.80
110-180	108.64	1.20	1.20
0-180	9120.76	100.00	100.00

Total Luminaire Efficiency = 100.00%

Zone	Lumens
0-10	247.70
10-20	738.12
20-30	1209.79
30-40	1589.4
40-50	1743.3
50-60	1573.58
60-70	1161.16
70-80	588.11
80-90	106.50
90-100	28.33
100-110	26.16
110-120	24.98
120-130	22.50
130-140	20.02
140-150	17.71
150-160	12.90
160-170	7.93
170-180	2.60

Luminous Intensity (cd) Distribution Data

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	2589	2589	2589	2589	2589	2589	2589	2589	2589	2589	2589	2589	2589	2589	2589	2589	2589
1	2578	2596	2614	2614	2667	2614	2587	2560	2542	2560	2587	2614	2667	2614	2614	2596	2578
2	2596	2614	2623	2614	2676	2605	2569	2524	2524	2524	2569	2605	2676	2614	2623	2614	2596
3	2632	2623	2632	2623	2676	2596	2560	2515	2506	2515	2560	2596	2676	2623	2632	2623	2632
4	2632	2641	2641	2623	2667	2596	2542	2506	2506	2506	2542	2596	2667	2623	2641	2641	2632
5	2650	2650	2650	2641	2676	2596	2533	2471	2471	2471	2533	2596	2676	2641	2650	2650	2650
10	2739	2721	2703	2694	2721	2578	2462	2345	2309	2345	2462	2578	2721	2694	2703	2721	2739
15	2829	2838	2811	2757	2775	2578	2372	2193	2130	2193	2372	2578	2775	2757	2811	2838	2829
20	2954	2945	2936	2846	2838	2551	2283	2041	1951	2041	2283	2551	2838	2846	2936	2945	2954
25	3008	3026	3061	2981	2873	2515	2184	1889	1808	1889	2184	2515	2873	2981	3061	3026	3008
30	2936	3052	3187	3079	2909	2471	2077	1737	1611	1737	2077	2471	2909	3079	3187	3052	2936
35	2721	2918	3276	3196	2936	2426	1969	1549	1378	1549	1969	2426	2936	3196	3276	2918	2721
40	2417	2694	3258	3285	2936	2345	1826	1343	1182	1343	1826	2345	2936	3285	3258	2694	2417
45	1790	2283	3169	3357	2936	2247	1647	1155	967	1155	1647	2247	2936	3357	3169	2283	1790
50	1056	1602	3008	3384	2909	2095	1405	922	734	922	1405	2095	2909	3384	3008	1602	1056
55	680	895	2605	3410	2891	1880	1137	644	519	644	1137	1880	2891	3410	2605	895	680
60	465	555	2077	3410	2811	1513	779	385	340	385	779	1513	2811	3410	2077	555	465
65	304	340	1137	3321	2676	1047	367	233	215	233	367	1047	2676	3321	1137	340	304
70	215	233	340	2838	2444	465	179	152	143	152	179	465	2444	2838	340	233	215
75	143	161	206	1987	1719	116	98	72	72	72	98	116	1719	1987	206	161	143
80	107	98	116	976	662	45	45	27	36	27	45	45	662	976	116	98	107
85	54	54	72	251	81	45	27	18	18	18	27	45	81	251	72	54	54
90	36	36	36	45	36	27	27	18	18	18	27	27	36	45	36	36	36
95	36	36	27	27	36	18	27	27	18	27	27	18	36	27	27	36	36
100	36	18	27	27	27	18	36	18	18	18	36	18	27	27	27	18	36
105	18	18	18	27	27	36	27	18	18	18	27	36	27	27	18	18	18
110	18	18	27	36	36	27	18	18	18	18	18	27	36	36	27	18	18
115	36	27	27	27	27	27	27	18	18	18	27	27	27	27	27	27	36
120	18	18	18	27	27	27	27	18	18	18	27	27	27	27	18	18	18
125	36	18	36	27	27	18	27	18	18	18	27	18	27	27	36	18	36
130	36	27	27	36	27	27	36	18	18	18	36	27	27	36	27	27	36
135	36	27	27	18	27	18	36	27	36	27	36	18	27	18	27	27	36
140	36	18	27	27	27	36	36	18	36	18	36	36	27	27	27	18	36
145	18	36	27	27	36	36	27	36	18	36	27	36	36	27	27	36	18
150	36	27	27	27	27	27	36	27	36	27	36	27	27	27	27	27	36
155	36	18	36	18	36	27	36	18	36	18	36	27	36	18	36	18	36
160	18	18	18	36	36	27	27	36	36	36	27	27	36	36	18	18	18
165	18	36	18	27	27	27	27	36	36	36	27	27	27	27	18	36	18
170	36	18	27	36	27	27	36	36	18	36	36	27	27	36	27	18	36
175	36	36	18	36	27	18	36	18	36	18	36	18	27	36	18	36	36
180	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25

1 Test Equipment

Equipment Name	Manufacturer	Model No	Reference No	Calibration Due Date
Integrating Sphere (2.0m)	EVERFINE	YF-1000	SE-599	Before use
Standard Lamp	SENSING	DC24V100W	SE-2091	2020-05-06
Digital Power Meter	YOKOGAWA	WT210	SE-074	2020-05-06
Goniophotometer System	SENSING	GMS-3000	SE-450	Before use
Digital Power Meter	YOKOGAWA	WT310	SE-381	2020-05-06
AC Power Source	HUAYANG	HY9010	SE-114	2020-05-06
DC Power Source	EVERFINE	WY605	SE-605	2020-05-06
Temperature Sensor	WALVICO	HG126D	SE-616	2020-05-06

Measurement Uncertainty Statement:

Φ :Urel=2.78% (k=2)
$U_p(u')$: Urel=0.04%
$U_p(v')$:Urel=0.02%

Attachment A – Product Photo

*****END OF TEST REPORT*****