

## LM-79-08 Test Report

For

### ELEC-TECH INTERNATIONAL CO LTD

No.1 Jinfeng Road, Tangjiawan Town, Xiangzhou District, Zhuhai City, Guangdong  
Province, P.R. China 519085

### Inseparable SSL Luminaire

Model name(s):

565071##

Representative (Tested) Model:

56507111

**Model Difference: ##=11-30 intends CCT is 3000K, 4000K, and 5000K. (The product is color tunable luminaire, tunable from 3000K, 4000K and 5000K)**

Prepare By:



Engineer: Leo Liu

Date: 2018-04-26

Review By:



Technical Lead: Vincent Yuan

Date: 2018-04-26

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

**Product Information:**

Client Name:	ELEC-TECH INTERNATIONAL CO LTD
Brand Name:	Commercial Electric
Model Number:	565071##(##=11-30)
Product type:	Inseparable SSL Luminaire
Rating Input:	AC120V, 60Hz, 30W
Declared CCT:	3000K
Declared Light output:	2600lm
LED Manufacturer:	SAMSUNG
LED Model:	SPMWHX228FD5XXXXXX
LED Quantity:	176 pcs
Forward current of LED Chip:	160 mA
Date of Receipt Samples:	2018-04-10
Quantity of Receipt Samples:	3
Sample Number:	180410001-S1

**Laboratory Information:**

Test Laboratory:	Dongguan New Testing Centre Co., Ltd
Laboratory Address:	3F, No. 1 the 1 <sup>st</sup> North Industry Road, Songshan Lake Science & Technology Park, Dongguan, Guangdong, China
Laboratory Contact Name:	Neil Zhong
Laboratory Contact E-mail:	Neil_ntc@163.com

**Report Information**

Issued Date of Test Report:	2018-04-26
Revised Date of Test Report:	N/A
Test Report No.:	NTCR18040028
Remark (If applicable)	N/A

<b>Test Specifications:</b>	
Date of Test`	2018-04-26
Test item	1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate
Reference Standard	IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products CIE 13.3-1995 Method of Measuring and Specifying Color Rendering Properties of Light Sources CIE 15-2004 Technical Report Colorimetry

<b>Test Methods</b>
<p><b>1. Photometric and Electrical measurements – Light Distribution Method:</b></p> <p>Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at <math>25^{\circ}\text{C} \pm 1^{\circ}\text{C}</math>, measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 120 Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at <math>1^{\circ}</math> vertical intervals and <math>22.5^{\circ}</math> Vertical intervals.</p>
<p><b>2. Photometric and Electrical Measurements – Integrating Sphere Method:</b></p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at <math>25^{\circ}\text{C} \pm 1^{\circ}\text{C}</math>. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at 120 Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at least 5 nm intervals over the range of 380 to 780 nm.</p>

**Integrating Sphere Test Results**

**Test Condition:**

Test Ambient	Test Humidity	Orientation	Stabilization Time	Test Time
25.1 °C	52 %	Face Down	90 mins	25 mins

**Electrical Data:**

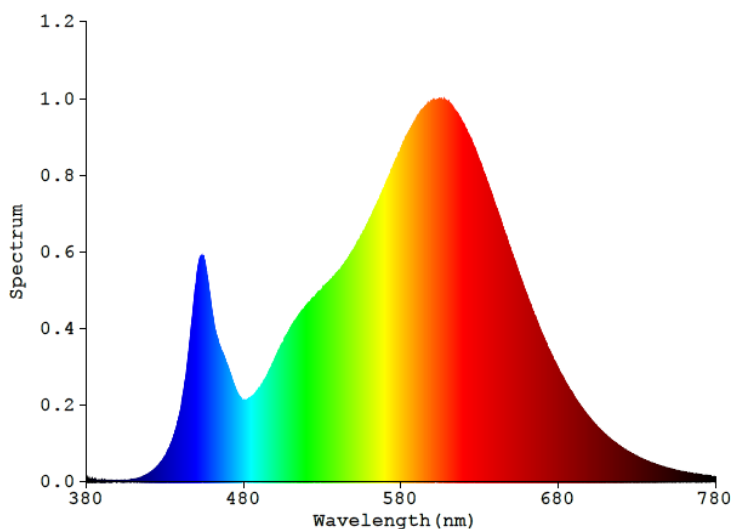
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	0.2369	27.98	0.9839

**Color Data:**

Parameter	Result
CCT (K)	3028
Color Rendering Index (CRI)	83.6
R9	13
Chromaticity, x	0.4327
Chromaticity, y	0.3986
Chromaticity u'	0.2502
Chromaticity v'	0.5186
Duv	-0.0016

Special Color Rendering			
R1	83	R9	13
R2	93	R10	83
R3	95	R11	80
R4	81	R12	73
R5	83	R13	85
R6	91	R14	98
R7	83	R15	76
R8	61	-	-

**Spectrum Diagram:**



**Goniophotometer Test Results:**

**Test Condition:**

Test Ambient	Test Humidity	Orientation	Stabilization Time	Test Time
25.2 °C	50 %	Face Down	90 mins	25 mins

**Electrical Data:**

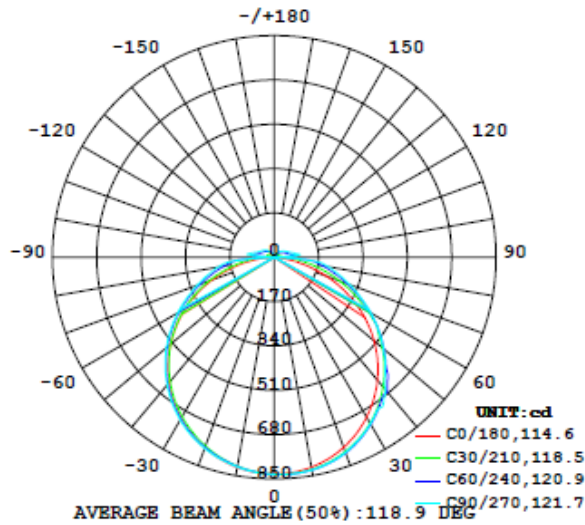
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	0.2369	27.98	0.9839

**Goniophotometer Data:**

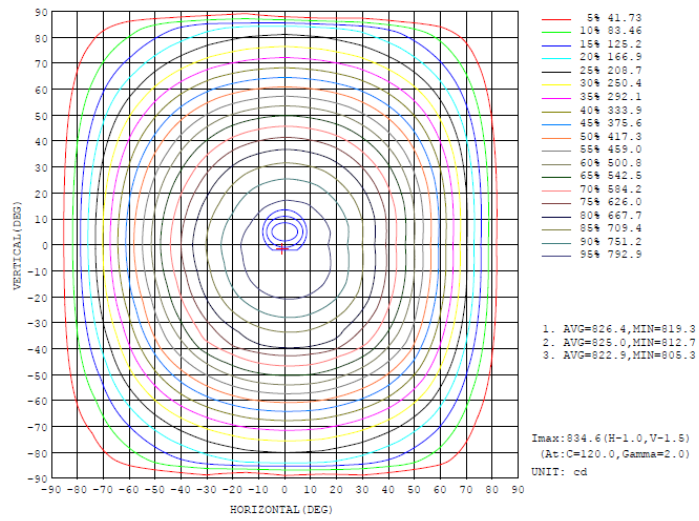
Parameter	Result
Total Luminous (lm)	2788.06
Total Luminous per foot (lm/ft)	N/A
Luminous Efficacy (lm/w)	99.65
Zonal Lumens Distribution (0-90°)	94.1%
Beam Angle (°)	118.9

**Luminous Intensity Distribution Diagram:**

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



**Isocandela Diagram:**



**Zonal Flux Diagram:**

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	Φlum, lamp
10	817.9	828.5	828.6	824.9	818.5	814.2	816.1	820.7	0- 10	78.96	78.96	2.82,2.83
20	776.3	798.4	797.3	788.2	778.1	772.9	780.1	782.6	10- 20	227.6	306.5	11.11
30	708.0	739.5	737.2	724.8	712.8	711.1	720.9	721.7	20- 30	348.7	655.3	23.5,23.5
40	614.6	655.1	663.5	638.6	626.0	628.1	638.7	638.3	30- 40	427.6	1083	38.5,38.8
50	499.7	557.5	546.6	541.8	518.3	526.6	539.7	534.1	40- 50	452.3	1536	55.1,55.1
60	364.1	421.7	426.6	408.9	393.2	410.1	427.2	413.8	50- 60	422.1	1958	70.2,70.2
70	212.8	285.0	308.6	277.1	252.5	284.8	314.8	284.4	60- 70	340.6	2299	82.5,82.5
80	62.36	163.9	209.6	160.6	107.7	170.3	217.4	167.2	70- 80	229.0	2528	90.7,90.7
90	0.0802	0.1178	19.87	0.1927	3.897	10.78	0.9858	4.301	80- 90	96.94	2625	94.1,94.1
100	0.6287	49.44	83.98	51.19	0.6066	52.45	92.13	82.15	90-100	38.67	2663	95.5,95.5
110	0.8233	36.37	59.70	38.94	1.126	41.15	63.60	41.64	100-110	43.21	2707	97.1,97.1
120	0.8913	28.52	47.46	30.60	1.128	34.57	52.42	34.70	110-120	31.77	2738	98.2,98.2
130	0.8297	21.10	36.20	22.65	1.086	28.03	42.57	27.97	120-130	22.76	2761	99.99
140	0.7295	14.99	25.61	15.32	0.6315	21.36	32.85	20.93	130-140	14.86	2776	99.6,99.6
150	0.6626	6.991	15.90	7.457	0.7524	12.71	24.00	12.80	140-150	8.069	2784	99.9,99.9
160	0.6914	2.343	2.219	2.613	0.6402	7.345	9.345	6.965	150-160	2.941	2787	100,100
170	0.7764	1.338	1.517	1.712	0.6903	2.295	4.101	1.398	160-170	0.7264	2788	100,100
180	0.8273	0.8272	0.8413	0.8144	0.8196	0.8265	0.8414	0.8137	170-180	0.1408	2788	100,100
DEG	LUMINOUS INTENSITY:cd Less than 35% Percent = 16.2 %										UNIT:lm	

**Luminous Distribution Intensity Data:**

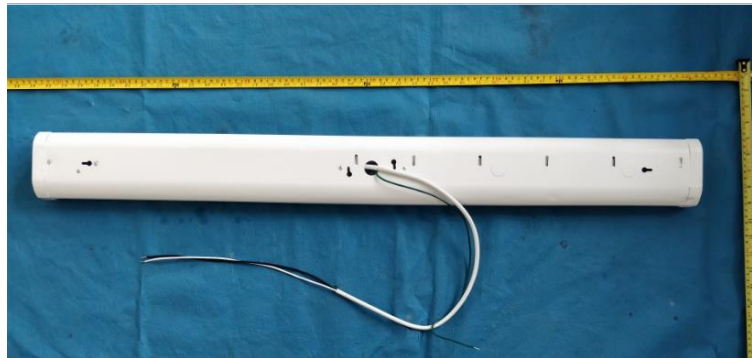
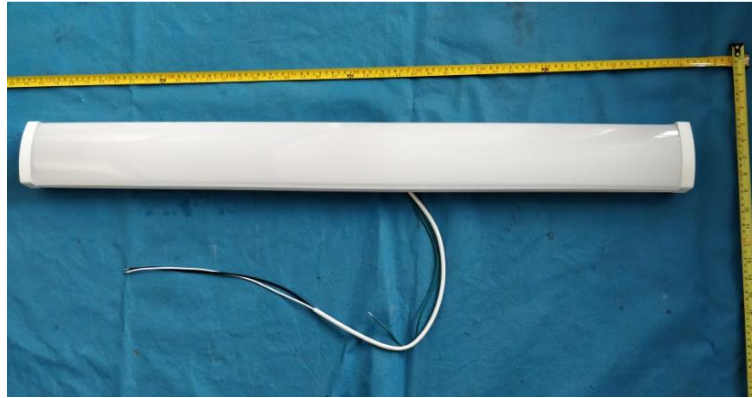
Table--1 UNIT: cd

C (DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
0	831	832	832	833	832	832	832	832	834	834	835	834	831	832	832	833	832	832	832
5	828	831	832	834	833	833	833	833	833	833	831	829	828	827	826	826	826	826	827
10	818	822	826	828	829	829	829	827	826	824	821	818	818	816	814	814	814	815	816
15	801	807	814	817	817	817	817	814	813	810	805	801	801	798	795	796	798	799	801
20	776	785	794	798	799	799	797	795	792	788	782	777	778	774	770	773	776	778	780
25	745	755	768	773	772	772	770	766	763	760	753	746	748	745	741	745	749	751	753
30	708	720	735	739	740	740	737	734	729	725	718	710	713	709	706	711	716	718	721
35	664	678	695	700	701	702	705	695	689	684	677	669	672	667	666	672	678	679	682
40	615	631	648	655	674	669	663	663	659	639	630	621	626	621	621	628	634	636	639
45	560	577	597	612	609	606	602	599	598	592	578	570	575	571	572	579	586	588	591
50	500	518	540	557	549	551	547	544	538	542	522	513	518	516	518	527	534	536	540
55	434	454	484	487	489	491	488	485	479	472	464	451	458	457	460	470	479	482	484
60	364	384	416	422	425	429	427	424	417	409	403	385	393	394	398	410	420	424	427
65	290	311	340	353	360	367	366	363	354	343	329	316	325	327	334	348	361	366	370
70	213	236	267	285	298	308	309	304	292	277	259	244	253	258	267	285	302	310	315
75	135	158	195	221	240	254	256	252	236	215	191	172	180	188	200	224	247	259	264
80	62.4	86.9	131	164	189	206	210	204	187	161	129	102	108	120	139	170	196	212	217
85	9.99	31.5	74.3	111	133	139	133	136	131	110	75.7	44.8	43.7	59.2	85.4	120	150	145	140
90	0.08	0.08	0.47	0.12	20.2	0.27	19.9	0.30	19.6	0.19	3.50	0.11	3.90	10.7	1.95	10.8	0.25	22.5	0.39
95	0.44	7.64	29.6	54.5	81.6	84.6	86.1	83.7	82.6	55.9	29.5	8.60	0.34	7.57	29.4	56.4	70.1	79.1	80.6
100	0.63	7.12	27.6	49.4	67.3	80.2	84.0	82.0	68.1	51.2	28.8	7.71	0.61	8.57	29.9	52.4	73.4	86.1	92.1
105	0.77	6.01	24.2	41.0	55.5	66.8	70.4	66.0	57.2	43.4	26.6	6.95	0.86	8.76	28.2	45.1	60.8	70.6	74.0
110	0.82	5.02	21.3	36.4	48.5	57.0	59.7	57.5	50.3	38.9	23.8	6.22	1.13	8.30	26.3	41.2	53.1	60.8	63.6
115	0.87	3.81	18.5	32.3	43.3	50.5	53.3	51.5	45.1	34.8	20.8	5.42	1.24	7.91	24.2	37.8	48.6	55.1	57.4
120	0.89	3.13	16.0	28.5	38.4	45.1	47.5	46.0	40.2	30.6	18.0	3.80	1.13	6.72	22.0	34.6	44.3	50.2	52.4
125	0.96	1.52	14.4	24.6	33.6	39.6	41.8	40.4	35.1	26.4	16.1	2.98	1.13	2.77	20.9	31.2	40.2	45.4	47.4
130	0.83	1.89	11.1	21.1	28.8	34.2	36.2	34.9	30.1	22.6	12.9	1.51	1.09	2.43	18.1	28.0	35.9	40.8	42.6
135	0.76	1.38	7.66	19.7	24.4	29.1	30.7	29.6	25.5	19.3	9.34	2.48	0.87	5.35	14.6	25.7	31.9	36.3	37.9
140	0.73	1.60	6.31	15.0	21.3	24.1	25.6	24.6	21.8	15.3	6.61	2.20	0.63	4.96	11.7	21.4	28.5	31.5	32.8
145	0.73	1.77	1.98	9.15	16.4	19.9	21.7	22.4	17.4	10.4	1.32	1.91	0.67	4.01	1.36	16.7	24.2	27.5	28.2
150	0.66	1.74	2.11	6.99	10.1	14.3	15.9	14.7	10.7	7.46	2.01	1.44	0.75	2.88	3.30	12.7	18.6	22.2	23.0
155	0.69	1.72	2.02	1.71	7.04	8.58	9.37	8.83	7.77	1.86	2.20	1.87	0.81	2.62	5.96	1.99	13.9	16.2	17.3
160	0.69	1.31	1.77	2.34	1.28	1.44	2.22	1.99	1.90	2.61	1.89	1.74	0.84	1.95	4.32	7.35	2.08	2.13	9.94
165	0.72	1.19	1.97	1.34	1.61	2.02	2.70	2.55	2.13	1.78	1.81	1.78	0.96	2.00	2.50	4.54	6.43	7.62	7.99
170	0.78	0.77	0.90	1.34	1.76	1.55	1.52	1.96	1.73	1.71	1.80	1.24	0.88	1.75	1.90	2.29	2.99	3.97	4.10
175	0.84	0.90	1.21	1.58	1.64	1.48	1.55	1.36	1.52	1.41	1.00	0.85	0.88	1.42	1.65	1.74	1.61	1.51	1.75
180	0.84	0.85	0.84	0.83	0.83	0.83	0.84	0.80	0.82	0.81	0.81	0.83	0.82	0.85	0.84	0.83	0.83	0.83	0.84

Table--2 UNIT: cd

C (DEG)	285	300	315	330	345
0	832	834	834	835	834
5	828	831	831	832	831
10	817	820	821	823	822
15	802	804	804	806	807
20	781	784	783	783	784
25	754	757	755	755	755
30	721	724	722	721	719
35	682	685	683	681	677
40	639	641	638	636	630
45	590	592	588	585	577
50	538	539	534	529	520
55	482	482	476	470	458
60	424	422	414	405	391
65	366	361	349	337	320
70	309	301	284	268	246
75	258	246	223	198	172
80	212	195	167	133	99.6
85	131	126	111	75.5	39.8
90	5.77	0.18	4.30	6.45	0.22
95	93.7	89.2	60.7	32.2	8.01
100	85.8	72.8	52.2	30.3	8.31
105	70.1	60.6	45.3	28.7	8.19
110	60.7	53.4	41.6	26.4	7.74
115	55.3	48.9	38.1	24.2	7.01
120	50.4	44.6	34.7	22.4	5.86
125	45.5	40.3	31.2	20.0	1.88
130	40.9	35.9	28.0	17.6	1.85
135	36.1	31.9	24.7	14.5	4.22
140	31.4	28.0	20.9	11.7	3.72
145	27.4	23.2	16.4	1.92	2.94
150	21.9	18.3	12.8	3.64	2.29
155	16.0	13.9	1.88	5.89	1.90
160	1.80	3.32	6.96	3.70	1.56
165	7.11	5.82	3.82	2.00	1.42
170	3.49	3.02	1.40	1.30	0.97
175	1.86	1.78	1.57	1.42	1.00
180	0.80	0.82	0.81	0.81	0.83





**Equipment List:**

Equipment ID	Equipment Name	Last Cal.	Due Cal.
NTC-F01-001	Goniophotometer System	2017-11-18	2018-11-17
NTC-F01-006	2.0 meter Integrating Sphere	2017-11-18	2018-11-17
NTC-F01-013	Standard Lamp	2017-11-18	2018-11-17
NTC-F01-031	Digital Power Meter	2017-11-18	2018-11-17
NTC-F01-019	Temperature & Humidity Meter	2017-11-23	2018-11-22



NVLAP LAB CODE 600150-0

Report No: NTCR18040028

Report Version: V1.1

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