

LM-79-08 Test Report

For

CEA GROUP INTERNATIONAL CO LTD

(Brand Name:CEA)

Sanjiali Industrial Zone Zhucheng Road Panshi North baixiang Yueqing, Zhejiang, 325604,
CHINA

Model name(s): CSFL-70XX-Y

Report Type: Testing and Report According to IES LM-79-2008

**Type of
Luminaire:** Architectural Flood and Spot Luminaires

Report Date: 2018-08-21
Ningbo TengLi Testing Co., Ltd

Prepared By: 2nd floor, Block B, Ningbo Testing and Certification Base,
No. 66 Qingyi Road, Ningbo National Hi-Tech Zone,
Ningbo, Zhejiang

Test & Report By:

Bill Luo

Engineer: Bill Luo

Review By:

Johnson Sun

Engineer: Johnson Sun

Note: 1.The results contained in this report pertain only to the tested samples.

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

1.1 Product Information:		
Model Number	CSFL-70XX-Y	
Remark	<p>“XX” stands for different CCT: 30=3000K, 35=3500K, 40=4000K, 45=4500K, 50=5000K, 57=5700K.</p> <p>“Y” stands for different body color: B=Black; W=White; Z=Bronze; G=Grey.</p>	
Representative (Tested) Model	CSFL-7030-Y, CSFL-7057-Y	
Model Difference	All construction and rating are the same, except CCT	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Architectural Flood and Spot Luminaires	
LED Manufacturer	Guangzhou Hongli Opto-Electronic Co., Ltd.	
LED Model	HL-AT-2835DW-S1-08-PCT-HR3	
Dimming	N/A	
Sample Number	STD180222NB-A1(3000K), A2(5700K)	
Date of Receipt	Apr.01, 2018	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

1.2 Rated Values:	
Rated Voltage / Frequency	100 -277Vac, 50/60 Hz
Nominal Power	70W
Rated Initial Lamp Lumen	--
Declared CCT	3000K, 3500K, 4000K, 4500K, 5000K, 5700K

1.3 Test Specifications:

Test item	<ol style="list-style-type: none"> 1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Electrical Parameters
Reference Standard	<ol style="list-style-type: none"> 1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2015 Specifications for the Chromaticity of Solid State Lighting Products 3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 4. CIE 15-2004 Technical Report Colorimetry 5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source 6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	QD25

1.4 Test Methods

1) Photometric and Light Distribution Measurement – Goniophotometer Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, 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 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals.

2) Chromaticity Measurement – Sphere-Spectroradiometer Method:

Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral power distribution taken at 5 nm intervals over the range of 380 to 780 nm.

3) Electrical Measurements:

Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Voltage, frequency, current, power, power factor and total harmonic distortion were measured by and read from the power meter.

2.1 Summary of Test Result

Criteria Item	Measured Value			Compliance	Requirement (DLC V4.2)	
Power (W)	3000K	120V	65.48	N/A	N/A	
		277V	65.76			
	5700K	120V	66.61			
		277V	66.84			
Power Factor	3000K	120V	0.9950	Pass	>= 0.9(-3%)	
		277V	0.8920			
	5700K	120V	0.9959			
		277V	0.8931			
THD %	3000K	120V	7.02	Pass	<= 20(+5)	
		277V	18.82			
	5700K	120V	7.39			
		277V	18.55			
CRI	3000K	82.5		Pass	>= 65(-2)	
	5700K	82.1				
CCT (K)	3000K	2963		Pass	<=5700K	
	5700K	5658				
Luminous Intensity Distribution	Zonal lumens in the 0-90°:		99.9	Pass	>= 85(-3)	
Total Luminous	3000K	120V	6848.4	Pass	≥1000 lm	
		277V	6801.9			
	5700K	120V	7110			
		277V	7059			
Luminous Efficacy	3000K	120V	104.59	Pass	Standard: >= 95(-3%)	Premium: >= 115(-3%)
		277V	103.44			
	5700K	120V	106.74			
		277V	105.61			

2.2 Electrical, Photometric and Chromaticity Measurements

Test date	2018-04-02	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	CSFL-7030-Y		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD180222	120.0	60	0.5484	65.48	0.9950	7.02
NB-A1	277.0	60	0.2661	65.76	0.8920	18.82

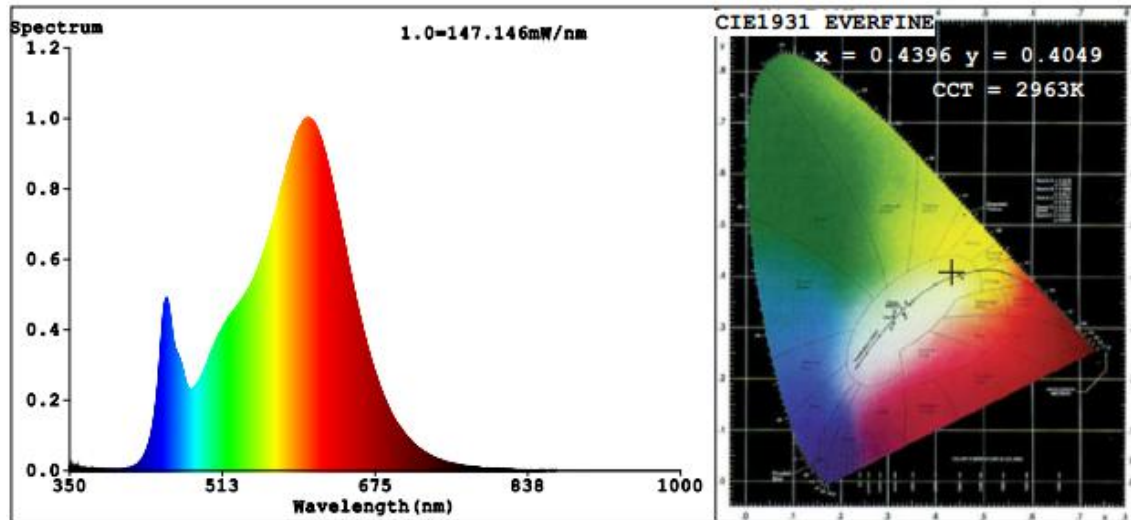
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	4
Frequency (Hz)	60	R2	93	R10	85
CCT (K)	2963	R3	93	R11	80
Duv	-0.0000	R4	80	R12	75
Chromaticity (x, y)	x=0.4396 y=0.4049	R5	82	R13	85
Chromaticity (u', v')	u'=0.2519 v'=0.5221	R6	93	R14	97
Color Rendering Index (CRI)	82.5	R7	80	R15	73
R9	4	R8	56	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	6848.4	6801.9
Luminous Efficacy (lm/W)	104.59	103.44
Worst Luminous/Highest Watts	103.44	
Zonal lumens in the 0-90° zone (%)	99.9	--
Beam Angle (°)	110.8	--
Center Beam Candle Power (cd)	2587	--

Spectral Power Distribution & Chromaticity Diagram

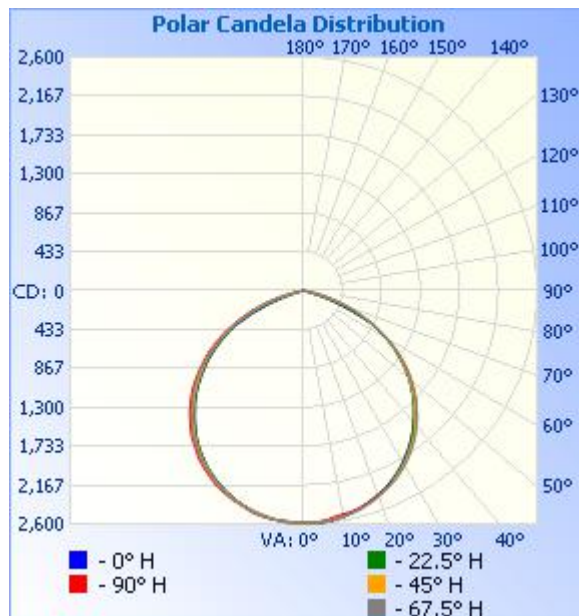


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	2,029.2	29.6%
0-40	3,333.3	48.7%
0-60	5,848.9	85.4%
60-90	991.5	14.5%
70-100	224.7	3.3%
90-120	1.0	0%
0-90	6,840.5	99.9%
90-180	6.8	0.1%
0-180	6,847.3	100%

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	%Total
0-10	245.4	3.6%	90-100	0.0	0%
10-20	706.1	10.3%	100-110	0.3	0%
20-30	1,077.7	15.7%	110-120	0.7	0%
30-40	1,304.1	19.0%	120-130	1.1	0%
40-50	1,343.6	19.6%	130-140	1.2	0%
50-60	1,172.0	17.1%	140-150	1.3	0%
60-70	766.8	11.2%	150-160	1.1	0%
70-80	215.9	3.2%	160-170	0.8	0%
80-90	8.8	0.1%	170-180	0.3	0%

Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
3.33M	21.6 fc	9.43 M	9.84 M
6.67M	5.41 fc	18.84 M	19.66 M
10.00M	2.40 fc	28.27 M	29.50 M
13.33M	1.35 fc	37.69 M	39.32 M
16.67M	0.87 fc	47.11 M	49.16 M
20.00M	0.60 fc	56.54 M	59.00 M

■ Vert. Spread: 109.4°
■ Horiz. Spread: 111.7°

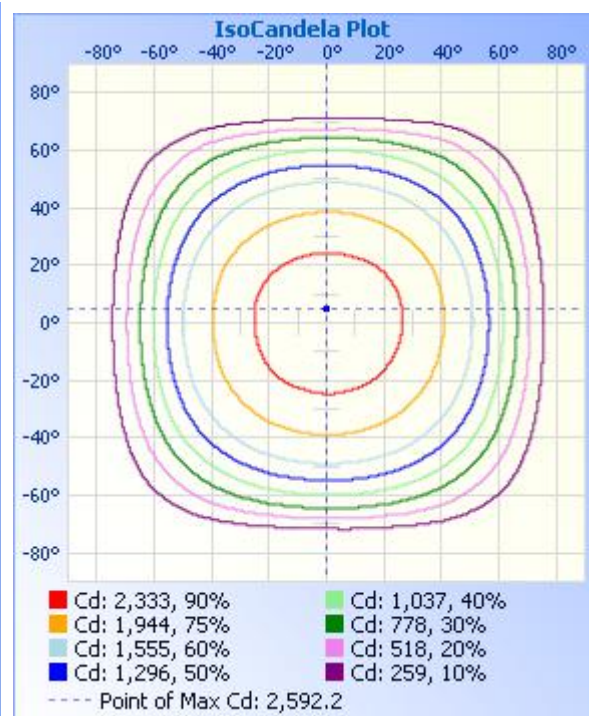
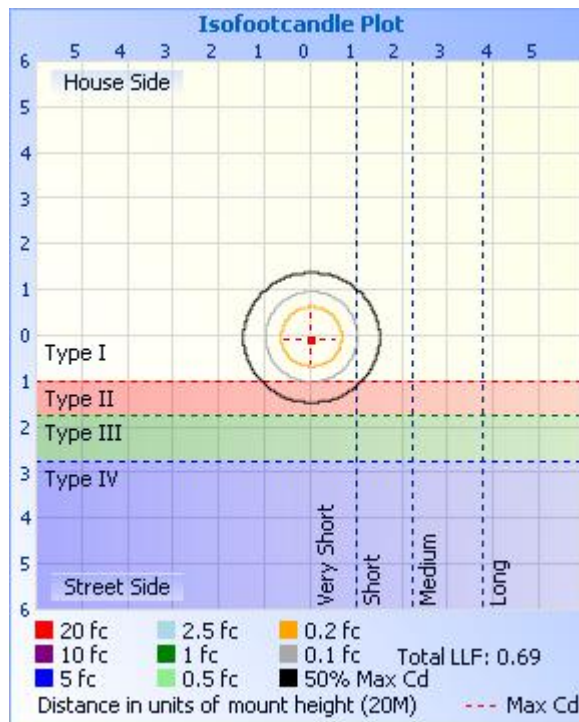


Table--1

UNIT: cd

C (DEG) γ (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	
0	2587	2587	2587	2587	2587	2587	2587	2587	2587	2587	2587	2587	2587	2587	2587	2587	
5	2572	2584	2584	2587	2592	2586	2586	2580	2572	2577	2578	2577	2584	2577	2581	2584	
10	2559	2556	2560	2560	2556	2558	2557	2555	2528	2544	2548	2542	2550	2542	2548	2552	
15	2506	2513	2508	2510	2498	2509	2508	2508	2492	2495	2493	2490	2491	2492	2494	2503	
20	2440	2450	2445	2435	2427	2431	2439	2440	2419	2429	2422	2415	2413	2416	2424	2435	
25	2359	2365	2357	2334	2327	2333	2349	2359	2338	2339	2333	2317	2320	2319	2332	2342	
30	2250	2257	2243	2217	2207	2217	2231	2251	2234	2227	2215	2202	2199	2204	2213	2228	
35	2115	2123	2100	2074	2068	2072	2093	2117	2094	2093	2079	2060	2058	2062	2076	2092	
40	1963	1969	1937	1911	1910	1908	1933	1959	1940	1939	1917	1896	1884	1897	1913	1936	
45	1785	1788	1747	1735	1732	1731	1743	1776	1770	1760	1731	1709	1706	1711	1732	1756	
50	1581	1579	1547	1537	1533	1535	1540	1571	1567	1558	1527	1505	1492	1506	1525	1558	
55	1351	1350	1328	1315	1305	1311	1319	1342	1340	1333	1298	1278	1261	1282	1303	1332	
60	1102	1101	1094	1074	1063	1066	1077	1084	1076	1071	1042	1016	1006	1023	1054	1081	
65	826	834	831	786	758	772	810	805	793	788	763	735	693	755	782	805	
70	547	550	559	419	342	409	538	527	515	512	475	385	332	399	498	524	
75	267	278	232	112	61.9	85.9	186	262	251	250	176	84.7	57.2	101	205	266	
80	76.1	84.2	22.3	11.4	10.6	9.88	14.3	63.0	62.7	59.6	16.1	11.1	11.0	11.3	19.2	78.6	
85	4.06	4.65	3.72	4.78	5.16	4.02	2.42	2.84	2.66	3.59	3.34	4.74	5.34	4.54	3.69	5.46	
90	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.25	0.28	0.09	0.03	0.06	0.14	0.19	
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.66	0.61	0.50	0.47	0.44	0.50	0.56	
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.16	1.10	0.99	0.77	0.89	0.69	0.89	1.03	
115	0.30	0.29	0.14	0.00	0.03	0.03	0.00	0.30	1.51	1.60	1.41	0.97	1.11	0.94	1.19	1.52	
120	0.66	0.52	0.26	0.22	0.33	0.22	0.22	0.47	1.84	1.85	1.59	1.49	1.58	1.25	1.31	1.66	
125	0.80	0.63	0.44	0.44	0.58	0.41	0.42	0.69	2.06	2.10	1.66	1.94	2.02	1.83	1.47	1.77	
130	1.07	0.77	0.50	0.69	0.80	0.72	0.58	0.97	2.42	2.26	1.80	2.27	2.15	2.11	1.66	1.93	
135	1.35	0.85	0.79	0.83	1.10	0.83	0.75	1.07	2.51	2.32	2.15	2.46	2.13	2.19	1.72	1.97	
140	1.43	1.13	0.94	1.19	1.44	1.19	0.94	1.30	2.48	2.37	2.40	2.57	2.52	2.33	1.91	2.00	
145	1.58	1.38	1.41	1.44	1.72	1.38	1.41	1.63	2.23	2.51	2.68	2.60	2.88	2.49	2.30	2.36	
150	1.35	1.76	1.63	1.63	1.85	1.77	1.69	2.05	2.36	2.73	3.01	2.82	3.02	2.73	2.80	2.60	
155	1.68	1.92	1.71	1.69	1.85	1.85	1.80	2.13	2.86	2.80	3.23	3.18	3.24	2.83	2.99	2.55	
160	2.31	2.01	2.04	1.82	1.94	2.02	2.11	2.16	3.38	3.01	3.28	3.45	3.39	3.13	3.10	2.83	
165	2.63	2.23	2.29	2.26	2.24	2.27	2.30	2.30	3.57	3.43	3.40	3.76	3.54	3.35	3.49	3.30	
170	2.83	2.89	3.04	3.12	3.29	2.96	2.91	2.77	3.49	3.45	3.43	3.81	3.71	3.76	3.69	3.44	
175	3.54	3.33	3.53	3.81	3.79	3.54	3.43	3.30	3.49	3.42	3.47	3.87	3.87	3.86	3.85	3.46	
180	3.44	3.45	3.67	3.87	3.87	3.52	3.54	3.38	3.33	3.45	3.40	3.62	3.82	3.74	3.52	3.49	

2.3 Electrical, Photometric and Chromaticity Measurements

Test date	2018-04-02	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	CSFL-7057-Y		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD180222	120.0	60	0.5574	66.61	0.9959	7.39
NB-A2	277.0	60	0.2702	66.84	0.8931	18.55

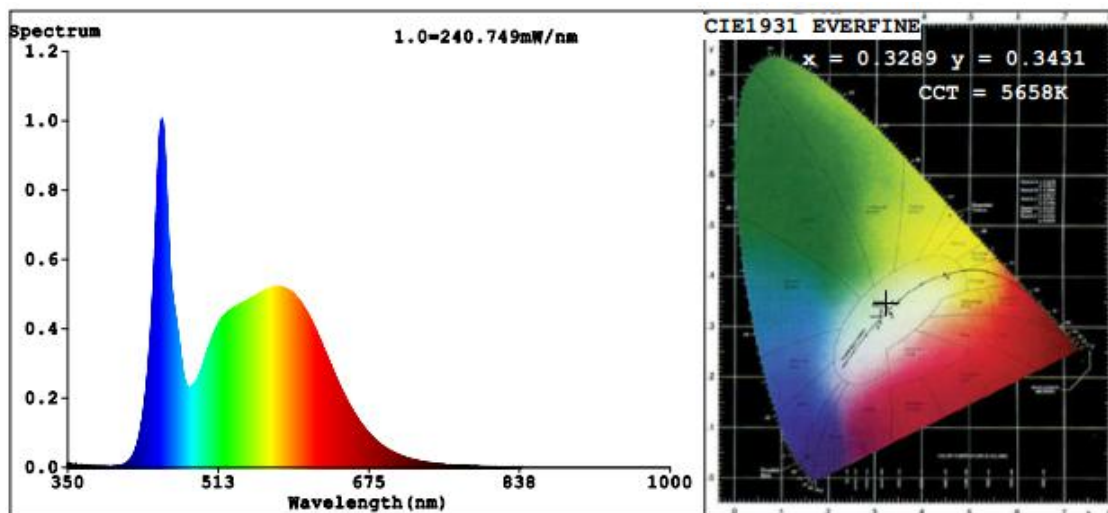
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	0
Frequency (Hz)	60	R2	88	R10	70
CCT (K)	5658	R3	92	R11	81
Duv	0.0027	R4	82	R12	59
Chromaticity (x, y)	x=0.3289 y=0.3431	R5	81	R13	82
Chromaticity (u', v')	u'=0.2036 v'=0.4781	R6	83	R14	96
Color Rendering Index (CRI)	82.1	R7	86	R15	74
R9	0	R8	65	--	--

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	7110	7059
Luminous Efficacy (lm/W)	106.74	105.61
Most Worst Luminous/Highest Watts	105.61	

Spectral Power Distribution & Chromaticity Diagram



2.4 Performance Assessment:

Model name	CCT(K)	Luminous Efficacy (lm/W)	Power (W)	Total Luminous (lm)
CSFL-7030-Y	3000K	104.59	65.48	6848.4
CSFL-7035-Y	3500K	105.02 ^{*1}	66.05 ^{*2}	6937 ^{*3}
CSFL-7040-Y	4000K	105.45 ^{*1}	66.05 ^{*2}	6965 ^{*3}
CSFL-7045-Y	4500K	105.88 ^{*1}	66.05 ^{*2}	6993 ^{*3}
CSFL-7050-Y	5000K	106.31 ^{*1}	66.05 ^{*2}	7022 ^{*3}
CSFL-7057-Y	5700K	106.74	66.61	7110

*1: This value is calculated and the calculation formula is as below:

$$105.02 = (106.74 - 104.59) / 5 * 1 + 104.59$$

$$105.45 = (106.74 - 104.59) / 5 * 2 + 104.59$$

$$105.88 = (106.74 - 104.59) / 5 * 3 + 104.59$$

$$106.31 = (106.74 - 104.59) / 5 * 4 + 104.59$$

*2: This value is calculated and the calculation formula is as below:

$$66.05 = (65.48 + 66.61) / 2$$

*3: This value is calculated and the calculation formula is as below:

$$6937 = 105.02 * 66.05$$

$$6965 = 105.45 * 66.05$$

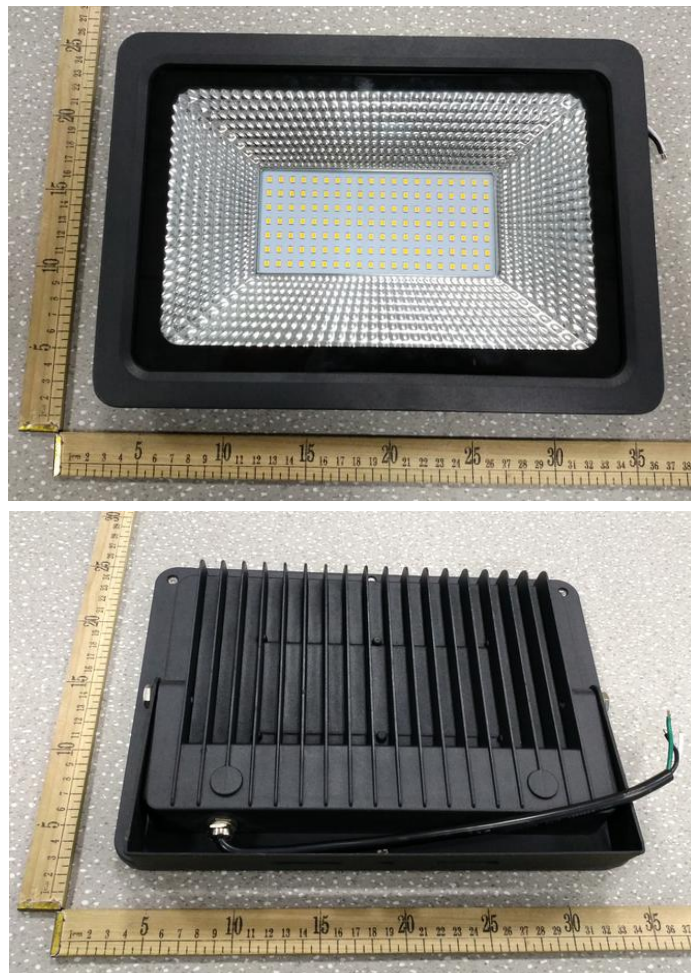
$$6993 = 105.88 * 66.05$$

$$7022 = 106.31 * 66.05$$

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-702	2 meter Integrating Sphere	Verified by D204 standard lamp	
ST-R-701	Spectral analysis system HAAS-2000	Verified by D204 standard lamp	
D204	Standard Lamp	2018-02-09	2019-02-08
ST-R-704	Power Meter for Integrating Sphere	2018-01-08	2019-01-07
ST-R-714	Goniophotometer system	Verified by D908S standard lamp	
D908S	Standard Lamp	2018-02-14	2019-02-13
ST-R-711	Power Meter for Goniophotometer	2018-01-08	2019-01-07
Uncertainty: Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

4. Product Photo



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