



Report No.: STD161215NB-D

NVLAP LAB CODE 201011-0

LM-79-08 Test Report

For

CEA GROUP INTERNATIONAL CO.,LTD

(Brand Name: CEA EAEC)

Sanjiali Industrial Zone Zhucheng Road Panshi North baixiang Yueqing Zhejiang
China

Outdoor Non-Cutoff and Semi-Cutoff Wall-Mounted Area Luminaires

Model name(s): LWP2-100

Representative (Tested) Model: LWP2-100(2700K)
LWP2-100(5700K)

Model Different: All construction and rating are the same, except CCT

Test & Report By:

Charman Chen

Engineer: Charman Chen

Date: Dec.21,2016

Review By:

Tommy Liang

Manager: Tommy Liang

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

Laboratory: Standard-Tech Co. Ltd Testing Center

NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2

Address: Standard-Tech Building, No.6 Guanhong Road,Guangzhou Science City, Guangzhou 510663, China

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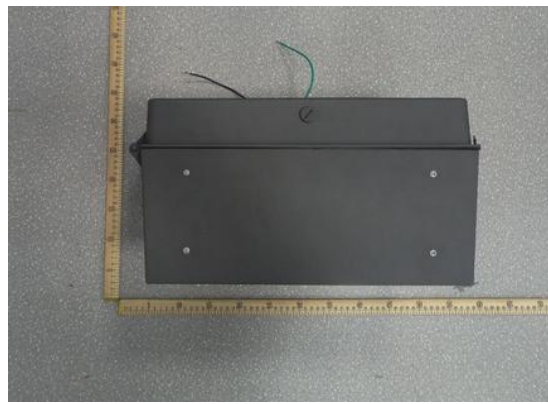
Fax: 8620-32290422

<http://www.standard-tech.com>

1.1 Product Information:

Organization Name	CEA GROUP INTERNATIONAL CO.,LTD	
Brand Name	CEA EAEC	
Model Number	LWP2-100	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Outdoor Non-Cutoff and Semi-Cutoff Wall-Mounted Area Luminaires	
Rated Voltage / Frequency	100 -277Vac, 50/60 Hz	
Nominal Power	100W	
Rated Initial Lamp Lumen	--	
Declared CCT	2700K,3000K,3500K,4000K,4500K,5000K,5700K	
LED Manufacturer	Zhongshan Dongguan Star Photoelectric Technology Co.,Ltd.	
LED Model	5730	
Sample Number	STD161215NB-D1(2700K), D2(5700K)	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Photo



1.2 Test Specifications:

Date of Receipt	Dec.18,2016
Date of Test	Dec.19,2016
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 C78.377-2008 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

1.3 Test Methods

<p>1) Photometric and Light Distribution Measurement – Goniophotometer Method:</p> <p>Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$, 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 277 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.</p>
<p>2) Chromaticity Measurement – Sphere-Spectroradiometer Method:</p> <p>Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$. 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 277 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.</p>
<p>3) Electrical Measurements:</p> <p>Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$. The sample was operated at 277 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.</p>

2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2016-12-19	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LWP2-100(2700K)		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD161215	120.0	60	0.8074	95.00	0.9805	10.25
NB-D1	277.0	60	0.3692	93.31	0.9124	13.41
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

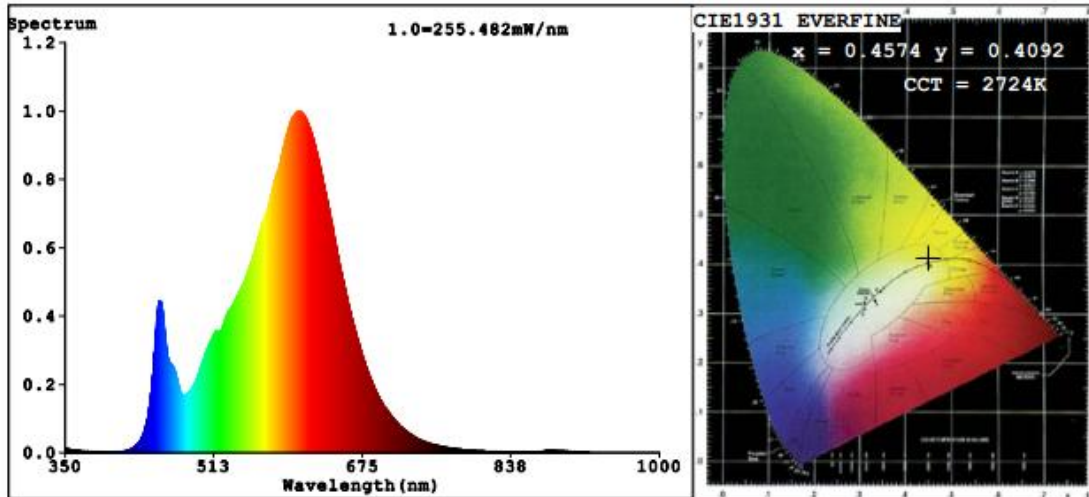
Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0V	R1	80	R9	1
Frequency (Hz)	60	R2	92	R10	82
CCT (K)	2724	R3	94	R11	77
Duv	-0.0003	R4	78	R12	73
Chromaticity (x, y)	x=0.4574 y=0.4092	R5	80	R13	83
Chromaticity (u', v')	u'=0.2615 v'=0.5264	R6	91	R14	98
Color Rendering Index (CRI)	81.1	R7	79	R15	72
R9	1	R8	54	--	--

Photometric Measurement – Goniophotometer Method :

Parameter	Result		DLC V4.0 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	11721	11437	>=300-5000 (±10%)	
Luminous Efficacy (lm/W)	123.38	122.57	--	
Total Luminous (lm)(0 °-90 °zone)	9317.0	9095.5	--	
Luminous Efficacy (lm/W) (0 °-90 °zone)	98.07	97.48	Standard: >= 90(-3%)	Premium: >= 110(-3%)
Zonal lumens in the 80-90 °zone (%) (0-90 °zone)	12.92	--	<=10(+3)	
Beam Angle (°)	108.6	--	--	
Center Beam Candle Power (cd)	2266	--	--	

Spectral Power Distribution & Chromaticity Diagram

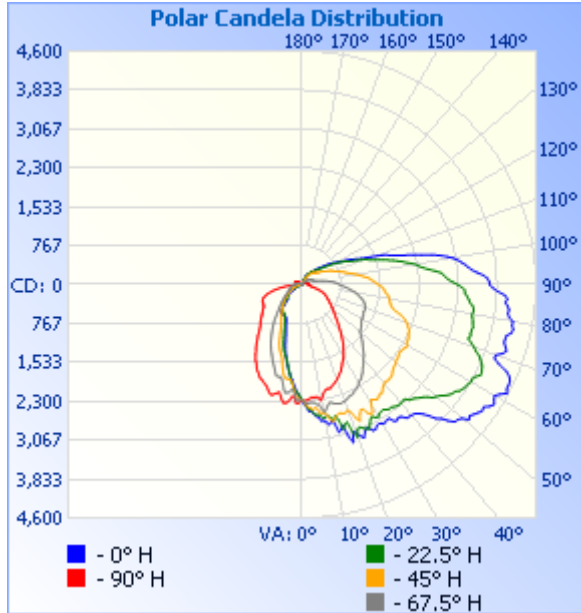


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1,695.0	14.5%
0-40	2,763.4	23.6%
0-60	5,327.1	45.4%
60-90	3,989.9	34%
70-100	3,514.4	30%
90-120	1,992.9	17%
0-90	9,317.0	79.4%
90-180	2,412.7	20.6%
0-180	11,729.6	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	214.0	1.8%	90-100	967.0	8.2%
10-20	596.3	5.1%	100-110	651.7	5.6%
20-30	884.6	7.5%	110-120	374.2	3.2%
30-40	1,068.4	9.1%	120-130	213.7	1.8%
40-50	1,200.1	10.2%	130-140	116.0	1%
50-60	1,363.6	11.6%	140-150	61.9	0.5%
60-70	1,442.6	12.3%	150-160	24.2	0.2%
70-80	1,343.5	11.5%	160-170	3.7	0%
80-90	1,203.9	10.3%	170-180	0.3	0%

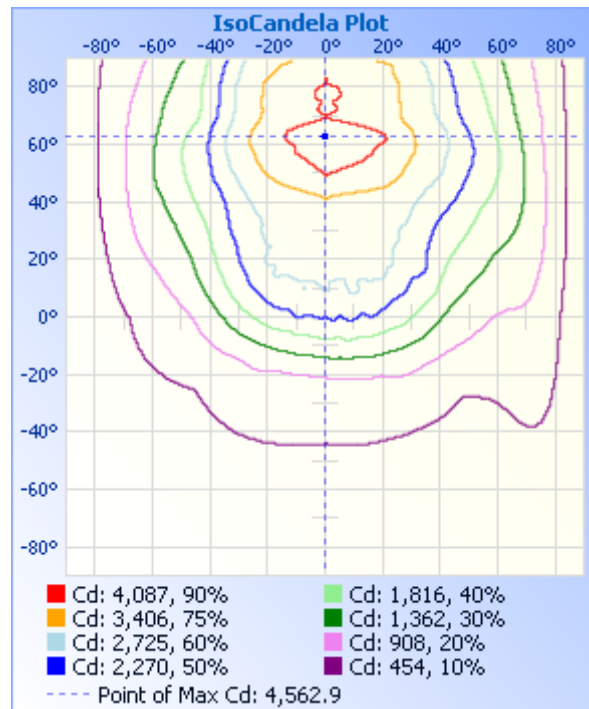
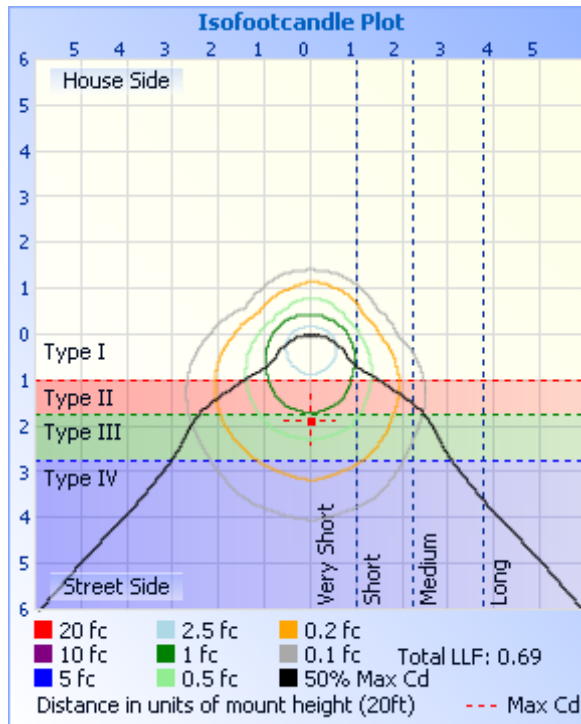
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	7.84 fc	44.2 ft	34.7 ft
34.0ft	1.96 fc	88.5 ft	69.3 ft
51.0ft	0.87 fc	132.7 ft	104.0 ft
68.0ft	0.49 fc	176.9 ft	138.7 ft
85.0ft	0.31 fc	221.2 ft	173.4 ft
102.0ft	0.22 fc	265.4 ft	208.0 ft

■ Vert. Spread: 104.9°
■ Horiz. Spread: 91.1°



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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	2266	2266	2266	2266	2266	2266	2266	2266	2266	2266	2266	2266	2266	2266	2266	2266
5	2208	2268	2466	2562	2547	2534	2473	2333	2221	2097	2018	1964	1954	2004	2012	2080
10	2305	2567	2692	2652	2753	2652	2559	2551	2268	1991	1750	1632	1627	1618	1872	2084
15	2248	2474	2811	2846	2960	2759	2661	2429	2120	1709	1514	1288	1276	1362	1521	1870
20	2100	2538	2813	3019	3108	3202	2633	2443	1993	1534	1152	951	935	1042	1304	1656
25	1994	2414	3018	3077	3120	3132	2723	2373	1817	1290	906	766	746	806	1007	1437
30	1801	2373	2892	3119	3161	3003	2711	2230	1629	1045	772	695	681	693	817	1216
35	1578	2289	2753	3076	3260	2992	2645	2078	1403	835	674	685	696	645	701	999
40	1360	2160	2677	3116	3356	3039	2525	1880	1158	686	597	606	585	598	602	790
45	1166	1918	2699	3298	3732	3162	2508	1687	957	559	518	470	406	473	512	621
50	1058	1835	2648	3733	4099	3433	2404	1497	807	467	439	392	429	370	429	516
55	955	1806	2711	3975	4329	3670	2330	1418	695	379	352	325	311	328	349	422
60	871	1741	2849	4014	4373	3835	2386	1363	593	317	268	239	184	279	277	344
65	851	1743	2821	4112	4511	3905	2307	1331	515	266	219	141	145	172	215	290
70	823	1761	2759	3699	4051	3603	2190	1321	417	233	164	87.8	77.3	101	169	256
75	708	1703	2444	3620	4135	3454	1858	1251	282	203	80.8	32.7	22.2	47.8	135	235
80	518	1464	2311	3583	4211	3395	1743	1108	178	168	34.2	4.36	4.64	10.7	85.1	218
85	280	1258	2215	3476	4012	3292	1642	919	137	136	27.0	4.98	5.41	8.99	62.9	188
90	132	1062	2049	3235	3692	3065	1502	741	123	114	21.4	5.40	5.92	7.70	47.6	148
95	114	917	1818	2965	3352	2735	1341	620	124	94.4	17.3	5.54	6.23	6.46	37.7	122
100	125	789	1525	2573	3016	2282	1114	436	125	77.8	14.1	5.54	6.08	5.62	31.6	108
105	135	627	1255	2097	2265	1856	910	289	120	59.5	11.6	5.54	5.91	5.28	27.5	94.3
110	135	414	983	1666	1712	1433	761	239	112	44.6	9.64	5.39	5.74	4.92	23.1	84.5
115	130	303	794	1223	1203	1111	655	212	99.1	34.3	8.01	5.17	5.40	4.81	19.1	70.8
120	118	248	649	976	926	898	530	188	81.5	26.2	6.44	4.88	4.95	4.30	15.1	55.2
125	95.1	208	528	757	750	686	440	166	61.1	19.9	4.87	4.13	4.35	3.79	11.8	40.9
130	67.0	196	393	559	586	522	379	135	43.6	15.4	3.81	3.96	4.01	3.51	9.32	29.4
135	45.3	163	331	423	457	418	332	104	31.0	11.8	3.08	3.46	3.58	3.26	7.13	20.8
140	30.2	125	287	335	359	347	301	74.2	22.1	9.24	3.08	3.40	3.38	3.26	5.27	14.2
145	20.5	85.2	258	282	284	297	241	42.6	15.7	7.37	3.31	3.46	3.44	3.37	3.55	9.80
150	13.5	45.8	198	232	239	242	171	16.3	10.3	5.67	3.45	3.57	3.56	3.63	3.30	6.26
155	8.62	15.0	119	173	192	175	86.5	8.69	6.40	4.21	3.59	3.71	3.70	3.74	3.50	3.97
160	5.13	5.96	45.8	99.5	118	91.0	32.3	3.87	3.93	3.60	3.78	3.96	3.81	3.82	3.64	3.47
165	3.54	3.16	4.35	33.5	44.7	29.7	2.10	2.20	3.74	3.91	4.04	4.13	3.95	3.82	3.67	3.58
170	3.82	3.32	3.03	2.67	2.55	2.36	2.23	2.51	3.65	3.88	4.15	4.13	3.90	3.60	3.53	3.44
175	3.85	3.91	3.50	3.09	2.93	2.75	2.77	3.02	3.51	3.52	4.15	4.13	3.89	3.51	3.50	3.47
180	3.57	3.97	3.73	3.48	3.15	3.04	3.11	3.08	3.51	3.55	3.78	3.74	3.50	3.03	3.11	3.08

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2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2016-12-19	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LWP2-100(5700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD161215	120.0	60	0.8074	96.52	0.9962	11.24
NB-D2	277.0	60	0.3677	95.21	0.9347	14.75
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method:

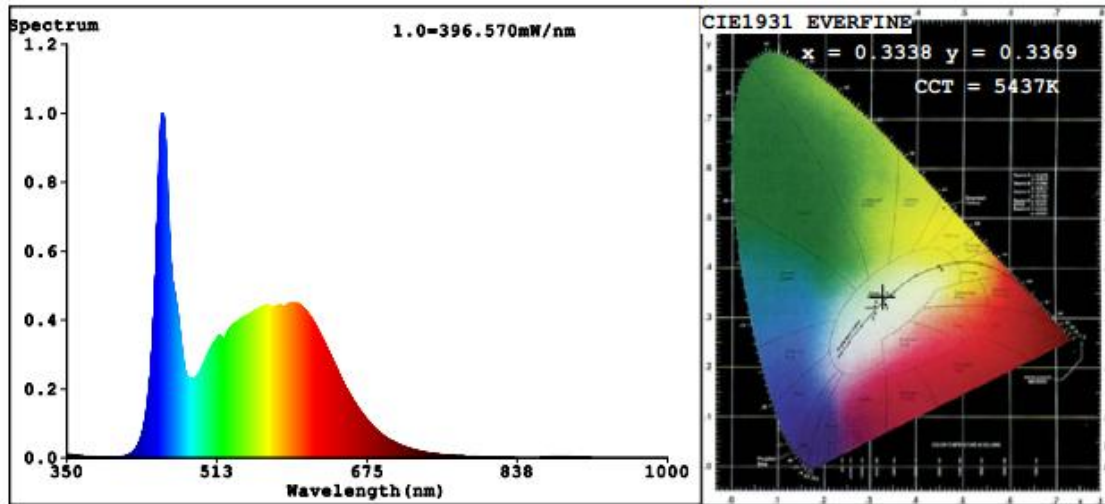
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	88	R9	30
Frequency (Hz)	60	R2	94	R10	84
CCT (K)	5437	R3	94	R11	85
Duv	-0.0028	R4	86	R12	63
Chromaticity (x, y)	x=0.3338 y=0.3369	R5	87	R13	90
Chromaticity (u', v')	u'=0.2094 v'=0.4756	R6	88	R14	98
Color Rendering Index (CRI)	87.2	R7	87	R15	85
R9	30	R8	73	--	--

Photometric Measurement – Sphere-Spectroradiometer Method :

Parameter	Result		DLC V4.0 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	12364	12179	5000-10000 (±10%)	
Luminous Efficacy (lm/W)	128.10	127.92	--	
Total Luminous (lm) (0°-90° zone)	9817	9670.1	--	
Luminous Efficacy (lm/W) (0°-90° zone)	101.71	101.57	Standard: >= 95(-3%)	Premium: >= 115(-3%)

* These values are calculated assuming ZLD of 0°-90° zone is 79.4% (see “Zonal Lumen Tabulation” on page 5).

Spectral Power Distribution & Chromaticity Diagram



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2.3 Performance Assessment:

Model name	CCT(K)	Total Luminous (lm)	Power (W)	Luminous Efficacy (lm/W)
LWP2-100(2700K)	2700K	11721	95.00	123.38
LWP2-100(3000K)	3000K	11828	95.76	123.52
LWP2-100(3500K)	3500K	11935	95.76	124.64
LWP2-100(4000K)	4000K	12043	95.76	125.76
LWP2-100(4500K)	4500K	12150	95.76	126.88
LWP2-100(5000K)	5000K	12257	95.76	128.00
LWP2-100(5700K)	5700K	12364	96.52	128.10

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

$$11828 = (12364 - 11721) / 6 + 11721$$

$$11935 = (12364 - 11721) / 6 + 11828$$

$$12043 = (12364 - 11721) / 6 + 11935$$

$$12150 = (12364 - 11721) / 6 + 12043$$

$$12257 = (12364 - 11721) / 6 + 12257$$

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

$$95.76 = (95.00 + 96.52) / 2$$

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

$$123.52 = 11828 / 95.76$$

$$124.64 = 11935 / 95.76$$

$$125.76 = 12043 / 95.76$$

$$126.88 = 12150 / 95.76$$

$$128.00 = 12257 / 95.76$$

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-336	2 meter Integrating Sphere	2016-07-01	2017-06-30
ST-R-331	Spectral analysis system HAAS-2000	2016-07-01	2017-06-30
D204	Standard Lamp	2016-07-01	2017-06-30
PF2010	Power Meter for Integrating Sphere	2016-07-01	2017-06-30
EE-09	Goniophotometer system	2016-07-01	2017-06-30
D908S	Standard Lamp	2016-07-01	2017-06-30
PF210	Power Meter for Goniophotometer	2016-07-01	2017-06-30
ST-R-181A	Temperature Tester	2016-07-01	2017-06-30
Uncertainty: Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

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

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