

LM-79-08 Test Report

for

GREEN CREATIVE LTD

756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai

WALL PACK

Model: 20HIDWP/850/277V/EX39

20HIDWP/850/277V/E26

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ18020011b

The laboratory that conducted the testing detailed in this report has been accredited for SSL by NVLAP.

Review by:



Engineer: April Zou

Feb. 11, 2018



Approved by: 

Manager: Jim Zhang

Feb. 11, 2018

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

Test Summary

Sample Tested: 20HIDWP/850/277V/EX39

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
148.3	2878.4	19.41	0.9852
CCT (K)	CRI	Stabilization Time (Light & Power)	
5046	83.8	60	

Table 1: Executive Data Summary

Note: The above results are recorded/ derived from measurements made using an Integrating Sphere.

Test specifications:

Date of Receipt	: Feb. 06, 2018
Date of Test	: Feb. 08, 2018
Test item	: Total Luminous Flux, Luminous Distribution Intensity, Luminous Efficacy, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Electrical parameters
Reference Standard	: IESNA LM-79-2008 Approved Method for the Electrical and Photometric Measurements of Solid-State Lighting Products

TABLE OF CONTENT

LM-79-08 Test Report.....	1
Sample Photos.....	4
TEST RESULTS	5
Spectral Power Distribution	6
Zonal Lumen Tabulation.....	7
Luminous Intensity Distribution Plots.....	9
Luminous Intensity Data	10
EQUIPMENT LIST	12
TEST METHODS	12
Seasoning of SSL Product.....	12
Goniophotometer Method	12
Photometric and Electrical Measurements.....	12
Color Characteristics Measurements.....	13
Color Spatial Uniformity	13

Sample Photos



20HIDWP/850/277V/EX39



20HIDWP/850/277V/E26

Equipment Under Test (EUT)

Name	: WALL PACK
Model	: 20HIDWP/850/277V/EX39
Electrical Ratings	: 120-277V, 60Hz
Product Description	: EX39/E26 base, 5000K
Manufacturer	: GREEN CREATIVE LTD
Address	: 756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai

Note: Model 20HIDWP/850/277V/EX39 and model 20HIDWP/850/277V/E26 are identical except their different screw base. Model 20HIDWP/850/277V/EX39 is EX39 base. 20HIDWP/850/277V/E26 is E26 base. Model 20HIDWP/850/277V/EX39 was chosen to be representative model in this report.

TEST RESULTS

Test ambient temperature was 25.1 °C.

Base orientation was base up. Test was conducted without a dimmer in the circuit.

The stabilization time of the sample was 60 minutes, and the total operating time including stabilization was 95 minutes.

The photometric distance of Goniophotometer is 2.47 m.

Luminous data was taken at 0.5° vertical intervals and 10.0° horizontal intervals.

Parameter	Result	
Test Voltage (V)	120.0	277.0
Voltage frequency (Hz)	60	60
Test Current (A)	0.164	0.083
Power Factor	0.9852	0.8839
Test Power (W)	19.41	20.24
THD A%	15.74	22.48
Luminous Efficacy (lm/W)	148.3	147.1
Total Luminous Flux (lm)	2878.4	2977.1
Color Rendering Index (CRI)	83.8	
R9	14	
Correlated Color Temperature (CCT) (K)	5046	
Chromaticity (Chroma x, Chroma y)	(0.3441, 0.3540)	
Chromaticity (Chroma u, Chroma v)	(0.2098, 0.3238)	
Chromaticity (Chroma u', Chroma v')	(0.2098, 0.4857)	
Duv	0.0016	
Average Beam Angle (°)	118.0	
Center Beam Candle Power (cd)	853	
Spacing Criteria	1.26 (0°-180°)/ 1.26 (90°-270°)	
Zonal Lumens in the 0°-60°Zone	66.69%	
Zonal Lumens in the 60°-90°Zone	26.33%	
Zonal Lumens in the 90°-120°Zone	6.59%	
Zonal Lumens in the 120°-180°Zone	0.39%	

Special Color Rendering Indices	
R1	82
R2	88
R3	92
R4	84
R5	83
R6	84
R7	88
R8	70
R9	14
R10	72
R11	83
R12	63
R13	84
R14	96
Rf	82
Rg	97

Table 2: Test data per Goniophotometer Method

Note: According to CIE 1976 (u', v') diagram, $u' = u = 4x/(-2x+12y+3)$, $v' = 3v/2 = 9y/(-2x+12y+3)$.

Spectral Power Distribution

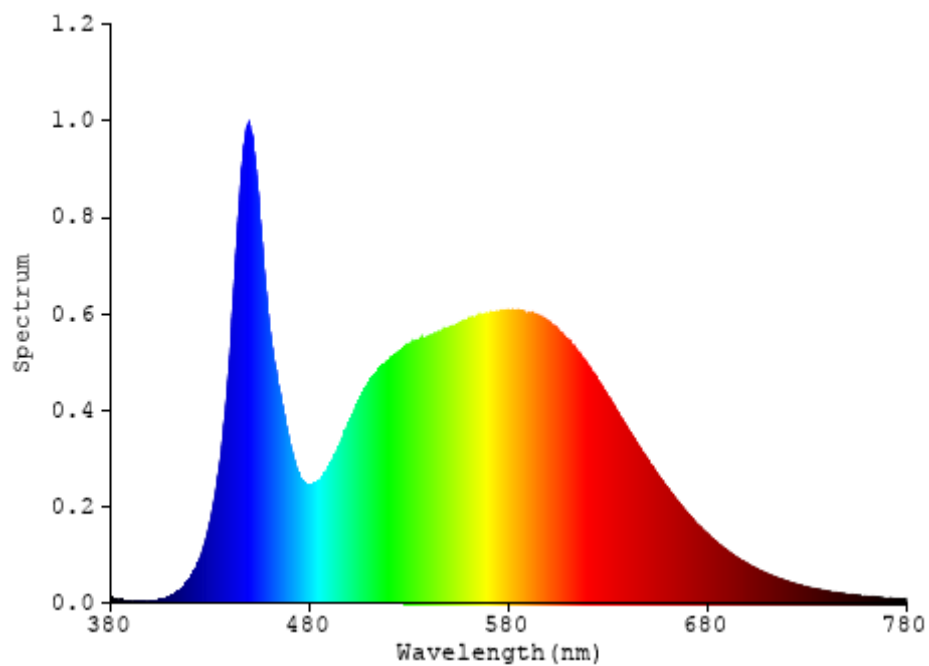


Chart 1: Spectral Power Distribution

Zonal Lumen Tabulation

$\gamma(^{\circ})$	Lumens	% Total
0- 10	80.697	2.80%
10- 20	230.344	8.00%
20- 30	348.941	12.12%
30- 40	417.598	14.51%
40- 50	434.979	15.11%
50- 60	407.008	14.14%
60- 70	342.388	11.89%
70- 80	248.698	8.64%
80- 90	166.801	5.79%
90-100	106.484	3.70%
100-110	59.315	2.06%
110-120	23.886	0.83%
120-130	6.838	0.24%
130-140	2.322	0.08%
140-150	1.156	0.04%
150-160	0.606	0.02%
160-170	0.286	0.01%
170-180	0.093	0.00%
Total	2878.4	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	1919.567	66.69%
60- 90	757.887	26.33%
0-90	2677.454	93.02%
90- 180	200.986	6.98%
0- 180	2878.4	100%

Table 3: Zonal Lumen Data

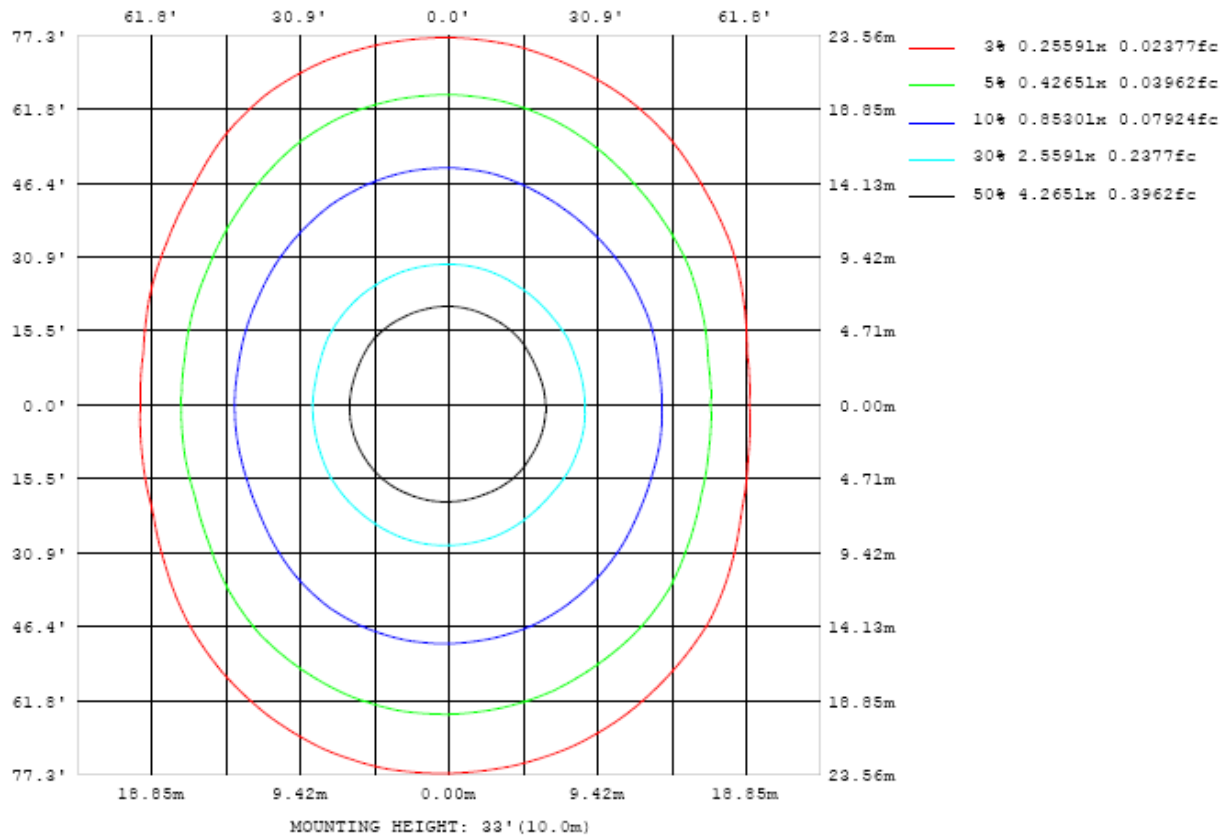


Chart 2: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots

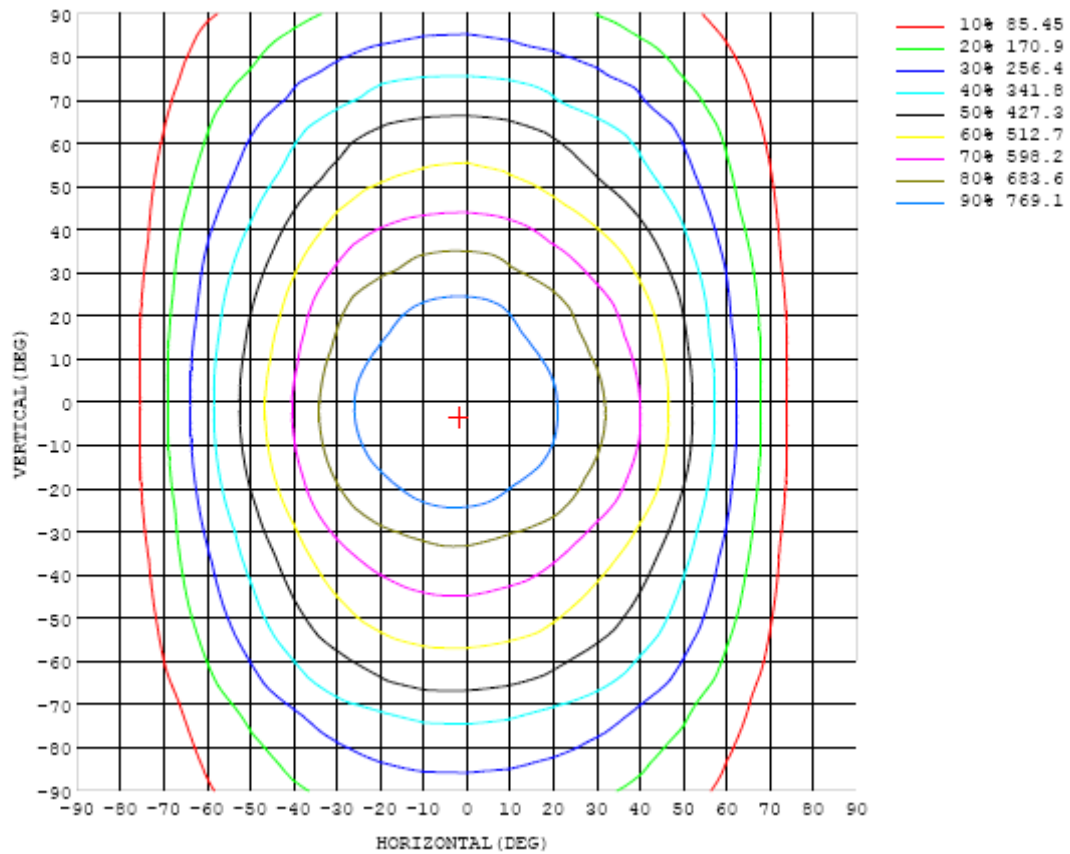


Chart 3: Isocandela Plot

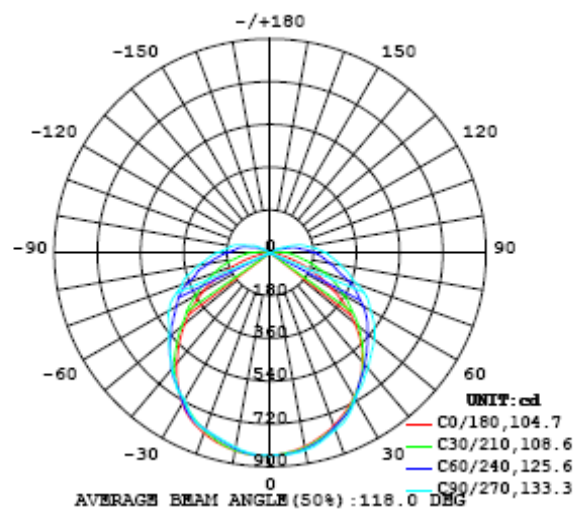


Chart 4: Polar Candela Distribution

Luminous Intensity Data

Table--1

UNIT: cd

C (DEG) y (DEG)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	853	853	853	853	853	853	853	853	853	853	853	853	853	853	853	853	853	853	853
5	844	843	843	845	847	850	850	852	851	851	851	851	851	854	854	854	853	853	854
10	828	828	831	833	834	836	838	841	843	843	844	845	845	844	845	845	847	846	845
15	803	805	809	810	813	816	816	819	821	822	825	826	829	831	829	829	830	831	829
20	774	778	781	783	784	783	783	785	790	793	796	797	799	803	806	806	806	808	807
25	739	742	746	748	747	746	751	755	759	762	767	770	770	769	771	775	777	778	777
30	700	703	705	703	706	712	709	705	704	708	714	720	728	733	730	731	734	734	732
35	654	658	656	656	659	655	655	661	667	672	675	674	671	678	685	683	681	677	672
40	597	604	602	604	596	601	614	621	628	634	638	635	631	626	628	626	613	608	605
45	535	540	545	543	546	554	571	584	590	596	599	597	589	581	566	550	543	539	537
50	460	467	477	481	495	512	530	550	559	567	569	562	549	532	507	483	473	468	466
55	379	385	391	413	444	469	492	513	522	530	532	526	511	486	452	418	397	393	392
60	291	301	320	356	395	426	447	466	476	484	486	479	465	439	401	358	331	325	319
65	216	227	252	299	343	371	399	424	438	445	448	435	412	384	348	305	266	245	236
70	138	152	188	240	284	325	349	369	381	386	390	380	364	334	288	248	206	166	158
75	70.8	87.3	134	182	224	262	292	316	333	339	338	325	303	269	236	193	148	104	90.9
80	28.3	44.5	85.9	129	178	218	252	276	292	298	298	284	260	227	183	137	97.2	56.0	42.2
85	8.29	18.6	50.9	95.0	142	183	219	241	257	262	262	249	224	190	147	102	58.1	25.9	16.5
90	0.22	7.46	30.7	68.8	114	153	186	210	226	232	230	216	191	160	119	78.9	36.1	10.5	0.52
95	0.27	3.25	14.2	43.9	77.4	117	148	174	189	195	194	180	156	124	81.3	47.5	20.6	4.94	0.18
100	0.20	1.91	7.67	20.8	52.6	90.5	117	139	154	157	156	145	122	94.9	57.6	25.7	10.5	2.58	0.16
105	0.21	1.27	5.04	13.0	28.4	51.8	81.6	107	122	127	126	113	88.2	56.8	31.2	15.8	6.99	1.48	0.18
110	0.27	0.94	3.60	8.51	16.9	31.8	49.5	63.6	73.5	78.3	75.3	65.4	52.6	35.1	20.0	11.0	4.92	1.00	0.24
115	0.31	0.61	2.31	5.79	11.4	19.9	30.9	41.1	52.3	55.1	53.3	44.2	33.0	21.4	13.6	7.77	3.48	0.79	0.30
120	0.42	0.69	1.74	3.81	7.10	11.7	17.9	24.1	29.9	32.5	31.6	26.0	20.0	13.2	8.69	5.14	2.47	0.67	0.36
125	0.48	0.70	1.45	2.66	4.75	7.79	10.7	13.5	15.6	16.3	16.1	14.4	12.1	8.88	5.97	3.56	1.87	0.62	0.43
130	0.57	0.70	1.23	2.02	3.11	4.63	6.52	8.36	9.74	10.1	10.1	8.93	7.49	5.52	3.96	2.59	1.52	0.64	0.53
135	0.67	0.71	1.06	1.67	2.37	3.17	4.07	4.82	5.31	5.37	5.54	5.30	4.74	3.87	2.93	2.04	1.25	0.67	0.66
140	0.74	0.73	0.96	1.40	1.87	2.38	2.87	3.33	3.52	3.48	3.72	3.67	3.34	2.79	2.21	1.67	1.04	0.68	0.77
145	0.79	0.77	0.87	1.18	1.54	1.85	2.15	2.42	2.51	2.48	2.61	2.65	2.46	2.12	1.78	1.36	0.92	0.72	0.86
150	0.81	0.80	0.83	0.97	1.24	1.49	1.67	1.82	1.89	1.89	1.94	1.99	1.86	1.67	1.39	1.04	0.83	0.75	0.90
155	0.85	0.84	0.84	0.86	0.97	1.15	1.31	1.40	1.43	1.43	1.45	1.48	1.40	1.23	1.03	0.88	0.82	0.79	0.90
160	0.89	0.88	0.87	0.87	0.88	0.89	0.97	1.07	1.09	1.11	1.11	1.08	0.99	0.90	0.87	0.85	0.85	0.85	0.89
165	0.93	0.91	0.90	0.89	0.87	0.86	0.85	0.83	0.81	0.80	0.81	0.81	0.83	0.85	0.86	0.86	0.88	0.89	0.91
170	0.99	0.98	0.96	0.94	0.92	0.90	0.89	0.87	0.86	0.86	0.86	0.86	0.87	0.88	0.90	0.92	0.93	0.93	0.93
175	0.98	0.96	0.94	0.93	0.92	0.91	0.90	0.90	0.89	0.89	0.89	0.90	0.90	0.92	0.93	0.94	0.96	0.98	0.99
180	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97

Table 4: Luminous Intensity Data

Table--2

UNIT: cd

C (DEG) y (DEG)	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350		
0	853	853	853	853	853	853	853	853	853	853	853	853	853	853	853	853	853		
5	854	853	853	852	851	851	850	849	849	848	848	847	846	845	845	845	845		
10	845	845	844	841	839	836	835	832	830	830	829	828	828	829	829	829	828		
15	830	827	824	819	816	814	812	810	809	807	805	802	801	801	802	803	803		
20	806	802	796	792	790	792	794	795	794	791	786	778	771	767	767	771	773		
25	774	767	762	763	767	770	770	767	764	763	760	753	743	733	728	731	737		
30	727	721	722	731	733	728	721	718	715	713	709	709	706	698	686	686	695		
35	667	667	679	688	682	679	687	687	683	681	672	655	650	652	644	637	646		
40	598	605	624	629	633	639	639	639	637	633	624	612	601	595	597	589	592		
45	530	537	553	565	582	592	593	591	591	585	576	563	547	541	543	535	531		
50	462	470	483	506	529	542	551	551	552	544	532	512	502	486	475	473	461		
55	391	406	423	447	471	494	507	514	515	506	486	466	449	436	420	404	379		
60	323	341	359	389	421	453	475	486	488	479	456	428	401	377	356	325	299		
65	245	279	301	334	379	415	437	444	446	436	415	393	364	327	296	255	223		
70	173	209	247	291	331	360	379	387	389	380	358	338	319	288	233	185	159		
75	109	149	202	241	273	315	340	352	352	341	321	300	267	228	189	130	89.7		
80	59.3	104	152	195	228	263	287	300	302	292	271	251	218	180	136	90.0	42.2		
85	29.1	67.2	113	154	192	219	243	256	258	249	229	208	179	146	97.5	53.8	20.4		
90	13.3	37.9	77.7	112	152	182	205	220	221	212	192	170	138	105	60.3	26.8	6.13		
95	6.14	22.4	49.9	84.1	119	148	170	183	185	177	160	140	110	82.4	44.1	17.5	3.00		
100	3.04	12.6	32.4	67.7	98.9	129	149	161	163	156	142	120	89.7	59.9	23.5	7.74	1.92		
105	1.43	7.32	17.2	40.3	62.9	95.4	116	128	132	124	109	83.2	56.7	35.8	13.2	5.46	1.52		
110	1.10	4.57	11.5	23.2	45.2	65.8	76.5	86.1	88.3	83.2	74.0	60.9	39.8	19.9	9.23	3.08	1.12		
115	0.97	3.26	6.47	12.6	23.0	39.1	53.2	67.5	70.3	62.7	48.7	34.0	20.5	8.59	4.93	2.20	0.86		
120	0.90	2.61	4.60	7.84	10.3	18.4	26.7	33.4	35.9	31.0	22.3	14.2	8.45	5.58	2.86	1.62	0.64		
125	0.85	2.12	3.45	4.84	7.24	10.6	13.0	12.8	12.3	12.8	12.7	7.85	5.37	3.30	2.25	1.24	0.88		
130	0.86	1.80	2.81	3.75	4.54	5.27	5.89	7.41	7.65	6.55	4.97	4.24	3.51	2.71	1.98	1.37	0.82		
135	0.88	1.62	2.37	3.03	3.59	4.07	4.26	4.07	3.39	3.76	3.70	3.33	2.81	2.31	1.83	1.32	0.85		
140	0.95	1.49	2.07	2.54	2.89	3.13	3.17	2.88	2.47	2.62	2.76	2.60	2.32	2.07	1.71	1.28	0.90		
145	1.02	1.30	1.82	2.23	2.47	2.62	2.62	2.38	2.10	2.17	2.32	2.25	2.09	1.92	1.57	1.23	0.95		
150	1.09	1.21	1.52	1.85	2.07	2.23	2.31	2.12	1.98	2.01	2.10	2.01	1.85	1.67	1.40	1.23	0.94		
155	1.13	1.17	1.28	1.42	1.60	1.76	1.77	1.72	1.68	1.68	1.74	1.72	1.61	1.41	1.28	1.15	0.92		
160	1.14	1.15	1.20	1.20	1.21	1.22	1.37	1.48	1.43	1.43	1.46	1.41	1.32	1.26	1.21	1.12	0.90		
165	1.08	1.15	1.14	1.11	1.17	1.18	1.14	1.14	1.07	1.03	1.13	1.18	1.20	1.18	1.13	1.07	0.95		
170	0.93	1.07	1.09	1.13	1.13	1.13	1.02	1.06	1.05	0.97	1.04	1.10	1.08	1.09	1.09	0.99	0.99		
175	1.01	1.02	1.02	1.03	1.02	0.99	0.99	0.99	0.95	0.96	0.98	0.99	1.01	1.01	1.01	1.01	1.00		
180	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97		

Table 5: Luminous Intensity Data

EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Aug. 23, 2017	Aug. 22, 2018
Digital Power Meter	PF2010A	HZTE028-01	Aug. 10, 2017	Aug. 09, 2018
AC Power Supply	DPS1060	HZTE001-06	Aug. 10, 2017	Aug. 09, 2018
DC Power Supply	WY12010	HZTE004-03	Aug. 10, 2017	Aug. 09, 2018
Standard Source	D908	HZTE012-01	Aug. 20, 2017	Aug. 19, 2018
Standard source	SCL-1400	HZTE012-02	Aug. 20, 2017	Aug. 19, 2018
Temperature and humidity recorder	JR900	HZTE018-01	Aug. 16, 2017	Aug. 15, 2018
Temperature recorder	JM624U	HZTE018-08	Aug. 17, 2017	Aug. 16, 2018

Table 6: Test Equipment List

TEST METHODS

Seasoning of SSL Product

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

Goniophotometer Method

Photometric and Electrical Measurements

An EVERFINE Type C Model GO-R5000 Goniophotometer was used to measure the intensity at each angle of distribution for each sample. The photometric distance is 2.475m for near-field measurement or 30m for far-field measurement. Bandwidth of spectroradiometer is 380nm-780nm.

Ambient temperature was measured at the same height of the sample mounted on the Goniophotometer equipment. Each SSL unit was operated on the client provided driver at the rated input voltage in its designated orientation.

The stabilization time typically ranges from 30 min (small integrated LED lamps) to 2 or more hours for large SSL luminaires). It can be judged that stability is reached when the variation (maximum – minimum) of at least 3 readings of the light output and electrical power over a period of 30 min, taken 15 minutes apart, is less than 0.5 %.

Electrical measurements including voltage, current, and power were measured using the Everfine Digital Power Meter.

Some graphics were created with Photometric Plus software.

The standard reference of the Goniophotometer system is halogen incandescent lamp, the intensity distribution type is omni-directional, and is traceable to the National Institute of Metrology P.R. China.

The uncertainty of goniophotometer system reported in this document is expanded uncertainty is 2.3% with a coverage factor k=2.

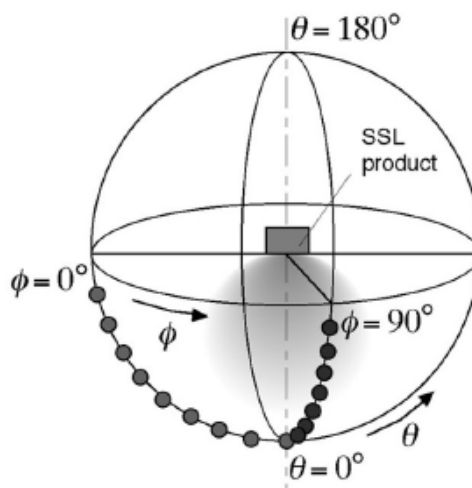
Color Characteristics Measurements

The color characteristics of SSL products include chromaticity coordinates, correlated color temperature, and color rendering index. These characteristics of SSL products may be spatially non-uniform, and thus, in order that they can be specified accurately, the color quantities shall be measured as values that are spatially average, weighted to intensity, over the angular range where light is intentionally emitted from the SSL product. The color characteristics measurements are using gonio-spectroradiometer.

Color Spatial Uniformity

The characteristics of SSL products may be spatially non-uniform, the chromaticity coordinate shall be measured at two vertical planes ($C=0^\circ/180^\circ$ and $C=90^\circ/270^\circ$) and at 10° or less intervals for vertical angle until the light output dropped to below 10% of the peak intensity. The averaged weighted chromaticity coordinate was calculated from these points. The data was then analyzed to check for delta color differences of the u' , v' chromaticity coordinates. The spatial non-uniformity of chromaticity, $\Delta u'v'$, is determined as the maximum deviation (distance on the CIE (u' , v') diagram) among all measured points from the spatially averaged chromaticity coordinate.

The geometry for the chromaticity measurement using gonio-spectroradiometer is shown as following.



*** End of Report ***

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