



LM-79-08 Test Report

for

GREEN CREATIVE LTD

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

WALL PACK

Model: 20HIDWP/840/277V/EX39

20HIDWP/840/277V/E26

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ18020011a

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/840/277V/EX39

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
146.1	2865.5	19.61	0.9870
CCT (K)	CRI	Stabilization Time (Light & Power)	
3990	84.7	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

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Sample Photos



20HIDWP/840/277V/EX39



20HIDWP/840/277V/E26

Equipment Under Test (EUT)

Name	: WALL PACK
Model	: 20HIDWP/840/277V/EX39
Electrical Ratings	: 120-277V, 60Hz
Product Description	: EX39/E26 base, 4000K
Manufacturer	: GREEN CREATIVE LTD
Address	: 756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai

Note: Model 20HIDWP/840/277V/EX39 and model 20HIDWP/840/277V/E26 are identical except their different screw base. Model 20HIDWP/840/277V/EX39 is EX39 base. 20HIDWP/840/277V/E26 is E26 base. Model 20HIDWP/840/277V/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)	0.166	0.083
Power Factor	0.9870	0.8863
Test Power (W)	19.61	20.40
THD A%	14.44	22.76
Luminous Efficacy (lm/W)	146.1	145.5
Total Luminous Flux (lm)	2865.5	2967.5
Color Rendering Index (CRI)	84.7	
R9	16	
Correlated Color Temperature (CCT) (K)	3990	
Chromaticity (Chroma x, Chroma y)	(0.3808, 0.3768)	
Chromaticity (Chroma u, Chroma v)	(0.2254, 0.3344)	
Chromaticity (Chroma u', Chroma v')	(0.2254, 0.5016)	
Duv	-0.0002	
Average Beam Angle (°)	117.3	
Center Beam Candle Power (cd)	853	
Spacing Criteria	1.24 (0°-180°)/ 1.26 (90°-270°)	
Zonal Lumens in the 0°-60°Zone	67.24%	
Zonal Lumens in the 60°-90°Zone	26.07%	
Zonal Lumens in the 90°-120°Zone	6.30%	
Zonal Lumens in the 120°-180°Zone	0.39%	

Special Color Rendering Indices	
R1	84
R2	92
R3	96
R4	82
R5	83
R6	88
R7	86
R8	66
R9	16
R10	80
R11	81
R12	64
R13	86
R14	98
Rf	83
Rg	95

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

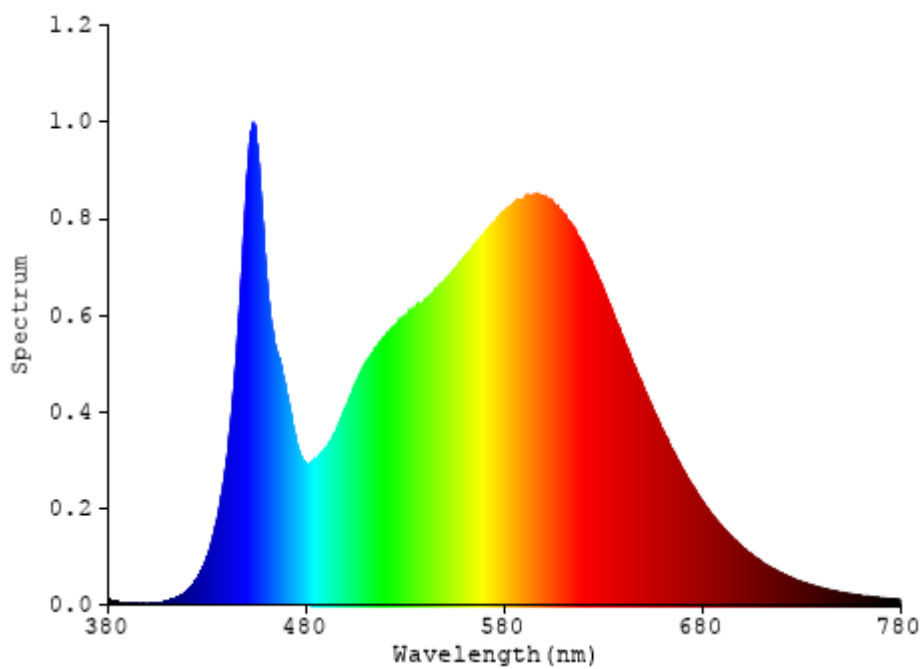


Chart 1: Spectral Power Distribution

Zonal Lumen Tabulation

$\gamma(^{\circ})$	Lumens	% Total
0- 10	80.946	2.82%
10- 20	231.717	8.09%
20- 30	351.094	12.25%
30- 40	420.745	14.68%
40- 50	436.477	15.23%
50- 60	405.788	14.16%
60- 70	338.795	11.82%
70- 80	245.927	8.58%
80- 90	162.406	5.67%
90-100	101.688	3.55%
100-110	56.156	1.96%
110-120	22.552	0.79%
120-130	6.248	0.22%
130-140	2.348	0.08%
140-150	1.343	0.05%
150-160	0.768	0.03%
160-170	0.38	0.01%
170-180	0.114	0.00%
Total	2865.5	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	1926.767	67.24%
60- 90	747.128	26.07%
0-90	2673.895	93.31%
90- 180	191.597	6.69%
0- 180	2865.5	100%

Table 3: Zonal Lumen Data

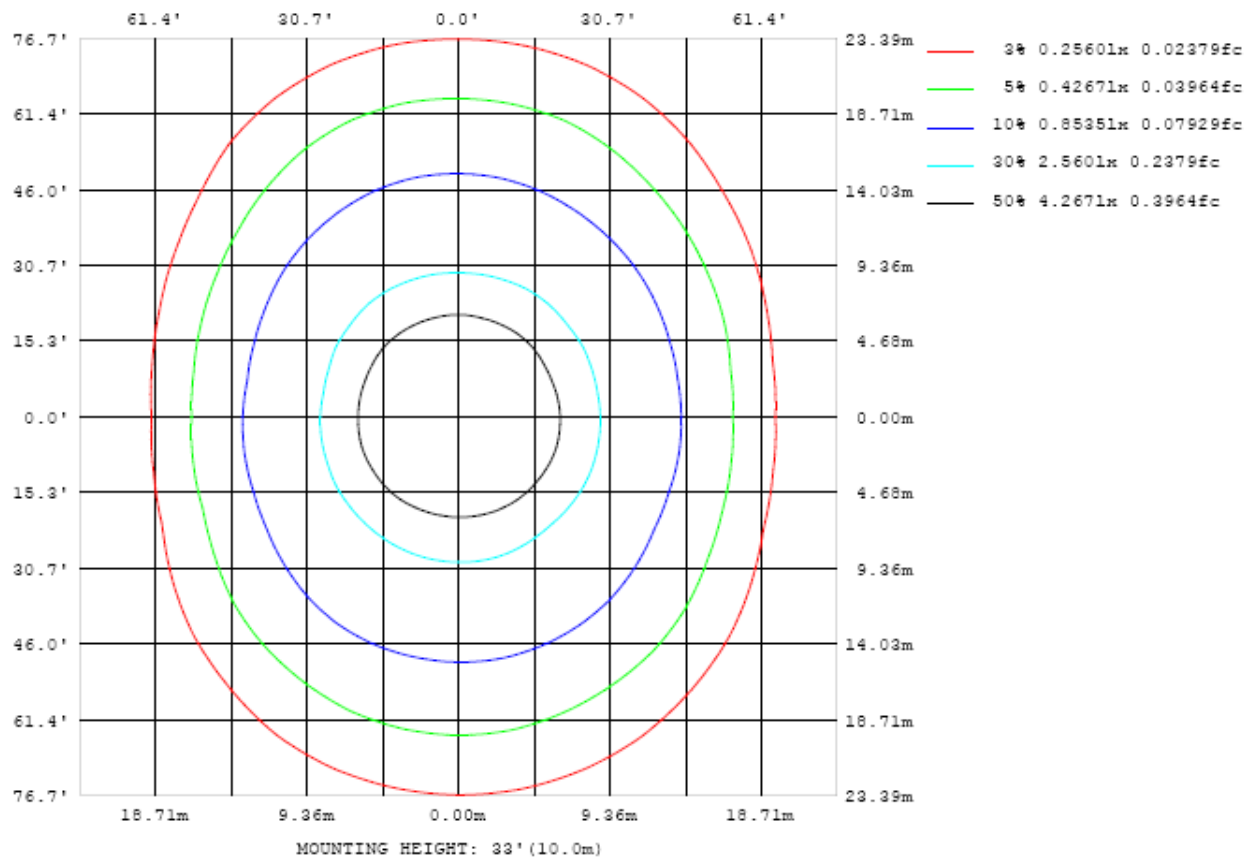


Chart 2: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots

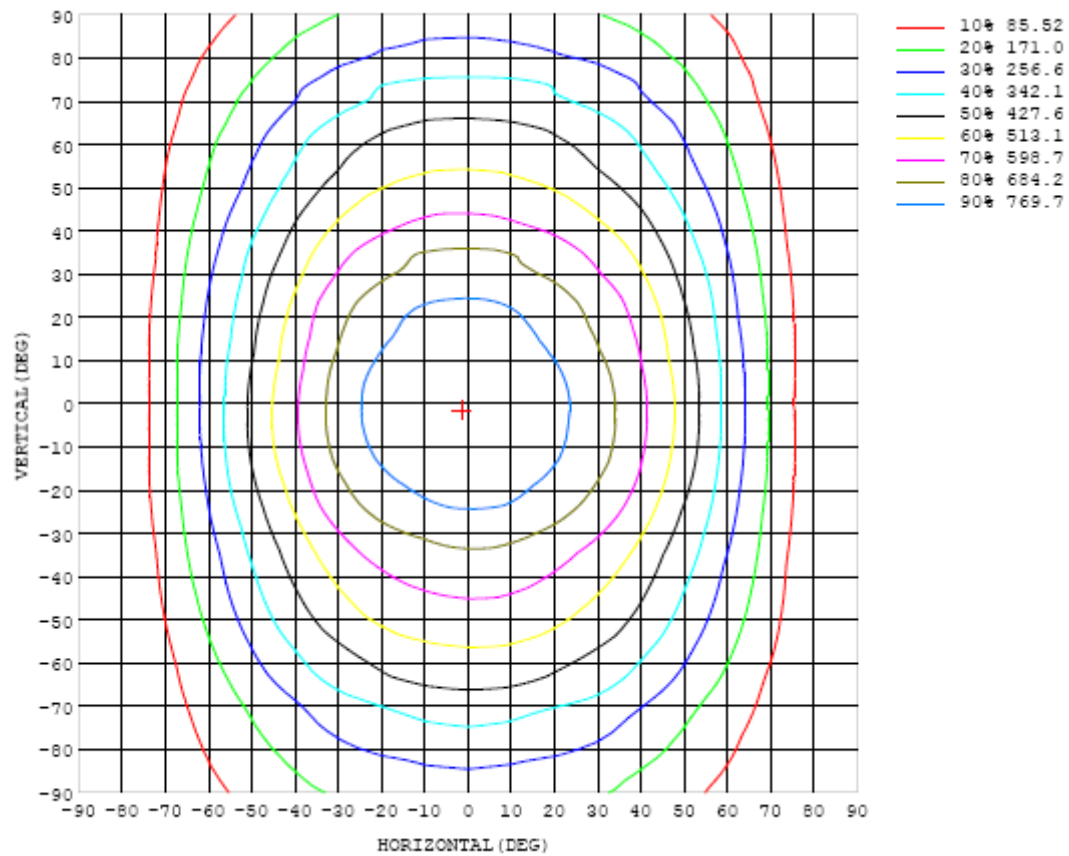


Chart 3: Isocandela Plot

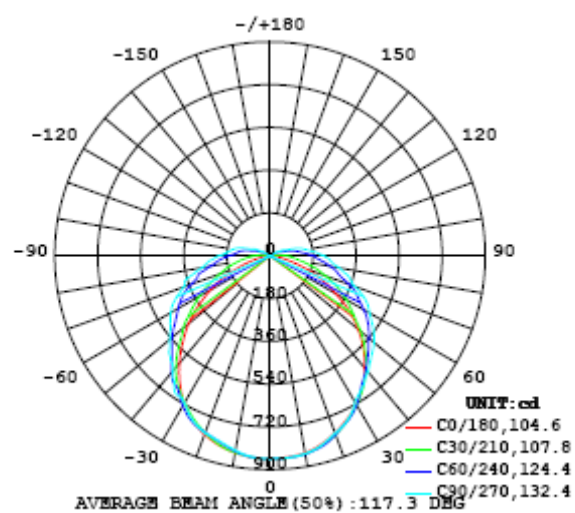


Chart 4: Polar Candela Distribution

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	851	851	854	854	853	855	853	853	853	852	852	852	851	851	851	854	853	852	852
10	842	845	845	846	848	847	847	847	846	845	845	846	844	843	841	840	843	843	842
15	822	823	826	829	832	831	832	829	827	826	826	826	827	826	826	825	825	826	826
20	793	793	797	801	803	802	801	797	795	794	794	793	795	799	801	801	800	801	800
25	760	761	764	766	763	761	767	769	766	764	764	764	763	762	763	768	769	769	767
30	721	724	728	725	721	723	725	723	716	711	712	716	721	722	717	720	722	722	718
35	675	679	683	679	677	670	667	674	676	675	672	668	662	667	671	668	667	663	657
40	616	621	625	626	621	614	624	633	638	638	634	627	622	614	613	608	598	595	590
45	553	557	561	562	564	572	581	593	600	599	595	589	580	567	547	536	526	524	517
50	481	484	486	495	510	527	540	557	568	568	563	553	539	518	491	464	453	452	445
55	404	409	410	424	454	483	502	516	527	527	521	513	498	471	438	405	382	374	364
60	316	327	341	368	404	434	452	466	479	481	474	464	445	421	387	344	308	297	288
65	241	251	269	308	348	378	404	424	438	441	435	423	398	363	330	286	241	218	207
70	161	176	207	247	290	329	354	364	374	377	371	360	343	316	272	227	184	148	130
75	89.2	108	150	193	227	264	296	318	335	341	335	319	292	253	213	170	127	88.8	71.7
80	42.3	57.3	95.8	137	178	220	256	276	289	294	289	276	252	216	172	125	81.0	45.1	31.5
85	12.9	24.5	55.4	96.7	142	179	211	234	248	254	249	237	211	180	138	93.6	51.7	21.4	10.5
90	3.03	8.77	29.9	64.7	105	147	179	200	218	225	221	206	181	149	108	65.9	30.2	8.52	1.48
95	0.76	3.15	15.8	42.9	73.4	108	142	164	181	187	181	168	142	109	75.3	43.9	17.3	3.98	0.00
100	0.62	2.34	7.70	21.1	48.7	82.6	112	132	147	152	149	137	115	85.2	47.2	21.6	9.81	2.27	0.00
105	0.62	2.27	6.56	14.9	27.7	51.2	78.3	102	118	122	117	101	74.6	48.6	28.6	15.5	6.79	1.85	0.20
110	0.76	1.76	4.42	10.3	19.9	36.5	51.2	61.9	70.3	73.2	70.9	62.8	53.0	36.2	18.9	9.49	4.78	1.87	0.35
115	0.83	1.56	3.31	6.07	9.60	19.7	31.6	42.3	53.3	56.4	51.2	40.2	29.1	17.3	10.6	7.23	3.75	1.74	0.46
120	0.90	1.45	2.60	4.31	7.60	10.5	13.9	17.9	22.9	24.7	21.4	17.5	14.5	11.4	7.22	4.91	3.15	1.64	0.56
125	0.93	1.31	2.21	3.38	4.66	7.49	9.29	13.7	16.6	16.7	16.1	12.3	9.17	7.10	5.38	4.01	2.70	1.54	0.67
130	1.01	1.27	1.97	2.81	3.71	4.71	5.59	6.38	6.82	6.50	6.47	6.42	5.86	5.15	4.26	3.35	2.37	1.47	0.83
135	1.08	1.26	1.77	2.41	3.05	3.69	4.22	4.54	4.54	4.29	4.37	4.59	4.50	4.11	3.51	2.90	2.17	1.45	1.00
140	1.12	1.26	1.61	2.14	2.61	3.05	3.41	3.61	3.56	3.44	3.53	3.69	3.66	3.39	2.98	2.50	1.89	1.43	1.15
145	1.15	1.26	1.47	1.85	2.28	2.55	2.81	2.96	2.93	2.87	2.93	3.03	3.02	2.84	2.58	2.21	1.73	1.42	1.27
150	1.14	1.23	1.37	1.64	1.97	2.22	2.35	2.45	2.44	2.41	2.47	2.54	2.54	2.47	2.25	1.91	1.57	1.39	1.32
155	1.14	1.21	1.29	1.43	1.71	1.89	2.07	2.14	2.11	2.09	2.13	2.23	2.25	2.12	1.95	1.65	1.49	1.36	1.33
160	1.14	1.19	1.25	1.33	1.43	1.64	1.83	1.90	1.89	1.87	1.92	1.98	2.03	1.92	1.61	1.53	1.42	1.29	1.38
165	1.14	1.17	1.21	1.26	1.32	1.37	1.39	1.42	1.47	1.51	1.50	1.49	1.48	1.47	1.46	1.40	1.34	1.28	1.36
170	1.16	1.17	1.20	1.23	1.27	1.29	1.32	1.34	1.36	1.37	1.38	1.39	1.39	1.39	1.37	1.36	1.33	1.27	1.25
175	1.20	1.18	1.18	1.20	1.21	1.22	1.23	1.25	1.26	1.28	1.28	1.29	1.29	1.29	1.29	1.31	1.32	1.33	1.32
180	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20

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	852	852	851	851	851	851	850	849	850	850	849	849	850	851	851	851	850		
10	842	842	841	839	837	835	833	832	831	832	832	834	837	839	840	840	841		
15	826	825	823	817	815	812	810	809	809	809	810	810	812	814	818	819	820		
20	800	798	793	789	789	792	792	793	794	793	790	787	784	782	784	789	791		
25	766	761	757	759	766	770	769	766	765	765	765	764	759	750	747	751	756		
30	716	712	714	724	729	729	724	720	718	718	720	724	725	717	707	709	717		
35	654	655	670	677	675	678	692	697	696	695	685	673	673	673	667	662	669		
40	582	590	614	619	634	639	638	635	631	632	635	638	628	620	622	613	611		
45	508	522	539	569	580	579	588	593	592	589	582	576	580	574	563	555	544		
50	436	453	473	498	518	535	546	549	546	545	541	531	519	512	502	486	474		
55	359	375	404	435	463	484	500	509	509	505	494	480	466	452	434	415	404		
60	299	316	341	373	409	443	468	480	481	476	461	437	414	394	374	350	325		
65	222	248	278	318	368	405	426	436	437	435	425	403	373	338	309	276	244		
70	148	185	223	270	317	349	370	382	384	381	370	353	332	291	242	208	176		
75	88.3	130	180	220	264	311	341	352	353	352	340	309	273	240	194	148	112		
80	46.8	88.9	133	178	220	254	275	286	288	286	276	260	233	192	147	98.2	57.7		
85	22.4	55.5	95.8	138	179	213	239	252	255	252	238	214	186	150	105	60.5	26.4		
90	8.63	29.1	61.4	101	140	172	195	209	212	207	195	174	145	109	70.6	34.8	10.9		
95	3.43	18.4	46.2	77.7	112	141	163	176	178	173	161	140	112	78.1	45.3	19.0	4.15		
100	2.19	8.82	25.4	52.6	91.2	121	142	156	158	153	141	120	94.5	60.9	27.4	8.74	1.73		
105	1.45	5.66	13.3	29.2	57.0	82.7	107	123	127	123	108	86.1	57.6	36.3	15.2	5.08	1.63		
110	1.19	4.08	9.84	17.6	39.3	58.8	71.4	80.2	82.3	79.1	68.4	58.6	35.9	17.9	8.87	3.93	1.29		
115	1.00	3.08	5.71	10.1	19.7	33.9	46.0	57.6	63.8	58.2	44.5	33.0	20.9	9.52	4.96	2.72	1.24		
120	0.88	2.38	4.13	7.03	9.64	15.1	23.3	29.3	32.0	30.7	24.0	14.6	8.81	5.59	3.50	2.07	1.16		
125	0.84	1.99	3.19	4.41	6.58	9.91	11.8	11.6	11.5	11.8	12.1	8.51	5.36	3.69	2.61	1.80	1.11		
130	0.86	1.69	2.59	3.53	4.30	4.97	5.36	5.97	7.16	6.72	5.48	4.49	3.74	2.95	2.23	1.63	1.09		
135	0.89	1.50	2.21	2.85	3.42	3.81	3.90	3.65	3.65	3.95	3.93	3.52	3.01	2.48	1.99	1.50	1.11		
140	0.96	1.37	1.95	2.37	2.72	2.90	2.86	2.70	2.69	2.91	2.97	2.78	2.49	2.15	1.82	1.40	1.10		
145	1.07	1.28	1.68	2.07	2.28	2.41	2.40	2.32	2.31	2.44	2.47	2.36	2.16	1.93	1.65	1.36	1.11		
150	1.19	1.24	1.43	1.73	1.91	2.01	2.02	1.98	1.97	2.03	2.03	1.96	1.87	1.71	1.46	1.33	1.10		
155	1.27	1.25	1.28	1.40	1.57	1.67	1.70	1.64	1.63	1.69	1.73	1.72	1.63	1.43	1.34	1.31	1.08		
160	1.34	1.27	1.25	1.17	1.20	1.28	1.29	1.39	1.44	1.47	1.46	1.39	1.33	1.30	1.29	1.27	1.09		
165	1.37	1.30	1.22	1.22	1.18	1.12	1.16	1.07	1.11	1.16	1.18	1.21	1.23	1.24	1.26	1.21	1.11		
170	1.33	1.33	1.24	1.17	1.17	1.14	1.06	1.03	1.09	1.12	1.13	1.18	1.19	1.19	1.24	1.17	1.15		
175	1.18	1.13	1.13	1.07	1.00	0.99	0.98	1.00	1.04	1.06	1.07	1.08	1.10	1.16	1.16	1.20	1.20		
180	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20		

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.

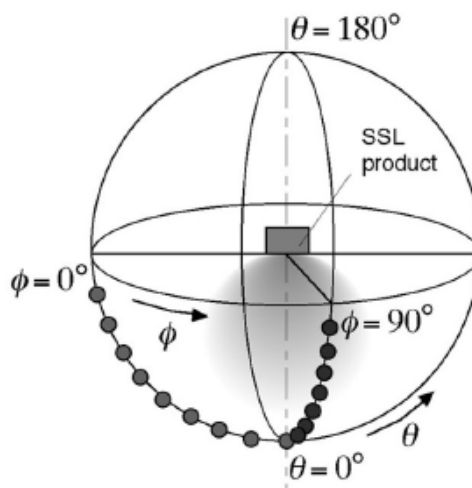
Color Characteristics Measurements

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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