LM-79-08 Test Report

for

GREEN CREATIVE LTD

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

WALL PACK

Model: 40HIDWP/840/277V/EX39

40HIDWP/840/277V/E26

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ18020011c

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

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Feb. 11, 2018

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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: **40HIDWP/840/277V/EX39**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
153.3	5969.0	38.93	0.9908

CCT (K)	CRI	Stabilization Time (Light & Power)
3963	84.5	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. 09, 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

40HIDWP/840/277V/EX39

40HIDWP/840/277V/E26

Equipment Under Test (EUT)	
Name	: WALL PACK
Model	: 40HIDWP/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 40HIDWP/840/277V/EX39 and model 40HIDWP/840/277V/E26 are identical except their different screw base. Model 40HIDWP/840/277V/EX39 is EX39 base. 40HIDWP/840/277V/E26 is E26 base. Model 40HIDWP/840/277V/EX39 was chosen to be representative model in this report.

TEST RESULTS

Test ambient temperature was 25.0℃.

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)	0.328	0.159
Power Factor	0.9908	0.8901
Test Power (W)	38.93	39.17
THD A%	9.55	16.10
Luminous Efficacy (lm/W)	153.3	152.4
Total Luminous Flux (lm)	5969.0	5969.0
Color Rendering Index (CRI)	84.5	
R9	15	
Correlated Color Temperature (CCT) (K)	3963	
Chromaticity (Chroma x, Chroma y)	(0.3822, 0.3783)	
Chromaticity (Chroma u, Chroma v)	(0.2257, 0.3350)	
Chromaticity (Chroma u', Chroma v')	(0.2257, 0.5025)	
Duv	0.0002	
Average Beam Angle (°)	117.6	
Center Beam Candle Power (cd)	1775	
Spacing Criteria	1.22 (0°-180°)/ 1.27 (90°-270°)	
Zonal Lumens in the 0°-60°Zone	66.77%	
Zonal Lumens in the 60°-90°Zone	26.38%	
Zonal Lumens in the 90°-120°Zone	6.49%	
Zonal Lumens in the 120°-180°Zone	0.36%	

Special Color Rendering Indices	
R1	83
R2	92
R3	96
R4	82
R5	83
R6	88
R7	86
R8	66
R9	15
R10	80
R11	81
R12	64
R13	86
R14	98
Rf	83
Rg	94

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

γ(°)	Lumens	% Total
0- 10	167.765	2.81%
10- 20	478.473	8.02%
20- 30	721.167	12.08%
30- 40	865.841	14.51%
40- 50	903.635	15.14%
50- 60	848.75	14.22%
60- 70	713.938	11.96%
70- 80	520.524	8.72%
80- 90	339.871	5.69%
90-100	218.7	3.66%
100-110	119.442	2.00%
110-120	49.159	0.82%
120-130	12.786	0.21%
130-140	4.312	0.07%
140-150	2.386	0.04%
150-160	1.388	0.02%
160-170	0.692	0.01%
170-180	0.194	0.00%
Total	5969.0	100%

γ(°)	Lumens	% Total
0- 60	3985.631	66.77%
60- 90	1574.333	26.38%
0-90	5559.964	93.15%
90- 180	409.059	6.85%
0- 180	5969.0	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

γ (DEG) \ C (DEG)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775
5	1773	1775	1773	1774	1773	1771	1771	1771	1769	1769	1766	1763	1763	1760	1758	1759	1757	1763	1763
10	1742	1742	1741	1744	1746	1748	1753	1753	1752	1751	1747	1743	1740	1736	1731	1728	1723	1725	1729
15	1691	1689	1690	1695	1701	1705	1713	1717	1716	1713	1710	1703	1700	1694	1688	1681	1673	1673	1677
20	1628	1627	1628	1634	1638	1641	1650	1657	1659	1658	1651	1645	1640	1636	1630	1624	1616	1612	1615
25	1556	1558	1561	1566	1564	1565	1574	1582	1589	1588	1581	1574	1568	1563	1556	1552	1545	1541	1547
30	1485	1486	1489	1488	1482	1480	1480	1485	1493	1493	1487	1481	1478	1472	1460	1452	1448	1443	1450
35	1407	1403	1397	1392	1388	1375	1372	1381	1395	1400	1393	1380	1368	1358	1351	1347	1337	1321	1318
40	1301	1292	1284	1276	1267	1263	1273	1288	1304	1309	1305	1290	1267	1243	1237	1234	1211	1190	1188
45	1160	1165	1165	1153	1145	1161	1173	1185	1212	1227	1216	1189	1166	1143	1115	1092	1070	1061	1065
50	1006	1013	1028	1024	1032	1053	1076	1107	1139	1155	1143	1114	1076	1033	993	939	931	940	947
55	843	860	869	887	919	952	995	1023	1054	1072	1062	1030	989	933	863	817	803	815	820
60	674	703	722	758	804	854	898	933	962	981	971	939	892	828	757	703	683	682	661
65	508	530	575	638	703	748	799	841	874	896	886	849	789	723	654	601	562	529	494
70	329	359	430	519	589	650	699	740	771	791	781	747	691	625	549	494	426	350	326
75	192	226	296	402	485	545	594	648	683	705	692	651	591	520	451	392	305	223	201
80	81.5	112	195	293	387	454	502	544	573	592	585	550	499	427	365	295	198	124	93.1
85	25.0	46.3	116	202	297	361	407	449	487	508	496	456	400	338	283	208	124	59.7	37.2
90	2.77	16.5	64.9	141	221	296	347	384	419	437	427	390	337	278	221	143	74.1	22.5	3.50
95	0.00	6.11	31.1	86.7	159	232	285	319	354	372	362	328	273	222	163	94.4	38.9	9.96	0.37
100	0.00	3.14	15.1	43.7	104	169	226	260	289	306	297	263	214	167	106	52.1	18.9	6.01	0.31
105	0.12	1.96	9.97	24.2	51.3	97.9	154	191	219	235	226	191	147	103	55.5	28.3	13.3	3.69	0.35
110	0.30	1.32	6.93	18.3	35.4	58.2	88.2	117	138	153	143	116	87.0	58.9	37.5	21.6	9.30	2.39	0.48
115	0.55	1.23	4.51	10.3	19.4	36.6	56.7	75.2	89.1	95.2	91.0	75.6	56.9	37.7	22.2	12.4	5.94	1.62	0.62
120	0.69	1.17	3.20	6.57	12.5	19.9	25.6	37.4	46.8	51.5	47.9	38.2	26.6	20.1	14.7	8.39	3.91	1.48	0.74
125	0.84	1.17	2.60	4.58	7.20	11.0	16.0	21.9	26.2	27.1	26.5	22.6	16.6	12.7	8.53	5.70	3.23	1.38	0.89
130	1.01	1.18	2.12	3.67	5.14	6.66	8.10	9.81	11.6	12.1	11.9	10.6	8.76	7.64	6.12	4.50	2.75	1.27	1.12
135	1.19	1.26	1.87	3.07	4.05	5.02	5.79	6.16	6.15	6.03	6.31	6.51	6.31	5.67	4.67	3.56	2.27	1.32	1.39
140	1.35	1.38	1.68	2.46	3.23	3.81	4.27	4.50	4.45	4.36	4.57	4.71	4.65	4.28	3.69	2.91	1.93	1.42	1.66
145	1.47	1.48	1.62	2.09	2.72	3.13	3.40	3.52	3.42	3.31	3.55	3.68	3.66	3.44	3.04	2.35	1.71	1.52	1.90
150	1.55	1.55	1.58	1.82	2.33	2.67	2.84	2.87	2.80	2.72	2.89	3.00	3.02	2.89	2.49	1.96	1.62	1.59	2.07
155	1.65	1.64	1.65	1.69	1.90	2.36	2.50	2.56	2.55	2.53	2.60	2.66	2.64	2.44	2.02	1.76	1.64	1.67	2.15
160	1.75	1.74	1.74	1.74	1.76	1.78	2.00	2.50	2.58	2.54	2.58	2.58	2.15	1.84	1.80	1.78	1.71	1.75	2.18
165	1.84	1.84	1.83	1.82	1.80	1.80	1.78	1.76	1.76	1.74	1.76	1.78	1.80	1.81	1.81	1.81	1.80	1.83	2.18
170	1.95	1.95	1.94	1.92	1.91	1.90	1.89	1.90	1.88	1.84	1.87	1.88	1.88	1.88	1.90	1.91	1.91	1.92	2.14
175	2.09	2.08	2.07	2.06	2.05	2.03	2.01	1.99	1.98	1.97	1.98	1.99	2.01	2.02	2.03	2.04	2.05	2.04	2.08
180	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01

Table 4: Luminous Intensity Data

Table--2 UNIT: cd

γ (DEG) \ C (DEG)	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350
0	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775
5	1762	1761	1761	1762	1762	1765	1765	1765	1766	1767	1768	1768	1770	1769	1768	1769	1769
10	1727	1727	1730	1731	1735	1739	1742	1744	1747	1749	1747	1748	1746	1742	1741	1740	1736
15	1674	1675	1679	1685	1690	1697	1704	1707	1711	1715	1713	1710	1706	1699	1694	1689	1686
20	1612	1613	1617	1621	1628	1637	1645	1650	1655	1660	1658	1654	1649	1641	1634	1629	1625
25	1545	1545	1547	1549	1550	1557	1571	1584	1592	1595	1589	1579	1574	1569	1564	1556	1552
30	1454	1461	1463	1461	1466	1480	1494	1508	1515	1521	1515	1504	1492	1484	1484	1480	1479
35	1326	1352	1367	1368	1375	1385	1401	1421	1432	1436	1427	1415	1408	1400	1398	1401	1402
40	1198	1227	1263	1280	1280	1292	1314	1330	1345	1349	1341	1327	1313	1305	1302	1307	1305
45	1071	1095	1137	1179	1195	1200	1208	1227	1242	1247	1236	1226	1216	1199	1200	1195	1178
50	952	961	996	1056	1095	1103	1123	1149	1170	1170	1147	1122	1106	1094	1079	1057	1021
55	817	829	860	923	990	1027	1048	1073	1095	1094	1070	1042	1007	983	950	888	846
60	669	700	740	806	891	942	968	992	1013	1010	987	955	918	871	804	731	688
65	509	569	631	707	787	852	885	906	924	922	899	864	817	763	670	585	532
70	351	429	517	599	685	755	780	801	816	813	796	759	715	647	547	445	367
75	231	312	409	488	568	642	673	697	712	709	683	640	598	528	426	330	236
80	123	215	302	380	464	546	587	604	617	616	593	553	500	407	312	222	124
85	61.0	130	216	306	387	456	500	515	529	524	502	465	416	325	228	135	58.2
90	27.2	82.2	164	244	317	391	440	455	469	467	443	406	342	258	172	84.4	22.0
95	13.6	47.7	110	184	256	323	371	391	403	400	374	338	273	194	114	47.3	10.4
100	7.45	27.4	69.1	133	192	251	300	321	332	329	302	264	206	139	71.3	26.0	6.68
105	4.60	17.7	42.6	85.4	139	196	241	262	271	267	243	208	147	92.2	45.2	16.0	5.18
110	3.20	11.4	24.9	54.7	98.1	136	172	192	199	195	175	145	103	56.4	21.8	10.0	4.01
115	2.56	8.59	15.0	25.4	51.0	88.6	126	146	150	148	130	92.3	52.2	23.4	14.5	7.28	3.12
120	2.16	6.66	10.9	17.0	26.1	35.6	57.8	74.3	80.3	75.2	55.9	36.3	24.5	15.6	9.38	5.99	2.53
125	1.85	5.46	8.74	11.3	14.7	20.4	29.0	32.1	31.0	31.6	28.7	19.3	13.4	9.72	7.83	4.97	1.98
130	1.78	4.58	7.16	9.03	10.4	11.6	13.2	15.3	15.3	14.6	12.3	10.4	9.34	8.09	6.53	4.27	1.67
135	1.82	3.82	6.00	7.50	8.54	9.19	9.35	8.96	8.36	8.48	8.62	8.37	7.77	6.85	5.55	3.74	1.56
140	1.96	3.54	5.23	6.34	7.20	7.66	7.70	7.34	6.89	7.02	7.19	7.10	6.69	5.88	4.83	3.35	1.63
145	2.00	2.70	4.42	5.41	6.05	6.48	6.55	6.30	6.02	6.08	6.19	6.08	5.70	5.13	4.18	2.73	1.84
150	2.09	2.41	3.78	4.65	5.17	5.44	5.51	5.37	5.19	5.19	5.25	5.20	4.98	4.50	3.46	2.34	1.99
155	2.18	2.21	2.72	4.76	4.76	4.74	4.74	4.65	4.55	4.53	4.58	4.57	4.62	4.30	2.84	2.23	2.07
160	2.21	2.25	2.29	2.51	4.20	6.26	5.61	5.32	5.13	5.17	5.50	6.24	5.59	2.86	2.28	2.27	2.11
165	2.21	2.21	2.20	2.22	2.25	2.28	2.71	3.38	4.09	4.04	3.26	2.60	2.24	2.21	2.21	2.23	2.11
170	2.19	2.19	2.17	2.16	2.17	2.16	2.14	2.12	2.10	2.08	2.09	2.11	2.13	2.14	2.16	2.19	2.10
175	2.12	2.12	2.12	2.11	2.10	2.08	2.07	2.05	2.03	2.03	2.03	2.05	2.07	2.09	2.11	2.12	2.10
180	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01

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 expended 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°/180° and C=90°/270°) 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, Δu'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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