

LM-79-08 Test Report

For

GREEN CREATIVE LTD

ROOM 3603, Level 36, Tower 1, Enterprise Square Five, 38 Wang Chiu Road, Kowloon Bay, KL, Hong Kong,
China

Self-Ballasted LED Lamp

Model Name(s):

100HID/840/277V/EX39/R

Representative (Tested) Model:

100HID/840/277V/EX39/R

Model Difference: N/A

Prepare by:



Engineer: Alan Wang

Date: 2020-04-16

Review by:



Technical Lead: Vincent Yuan

Issue Date: 2020-04-24

Revised Date: N/A

Note:

1. The results contained in this report pertain only to the tested samples.
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3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency of the Federal Government.

Laboratory: Dongguan New Testing Centre Co., Ltd

Address: 3F, No. 1 the 1st North Industry Road, Songshan Lake Science & Technology Park, Dongguan,
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Tel: 86-769-22212079

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Client Information:

Applicant Name:	GREEN CREATIVE LTD
Brand Name:	GREEN CREATIVE

Product Information:

Model Number:	100HID/840/277V/EX39/R
Product Type:	Self-Ballasted LED Lamp
Rating Input:	120-277Vac, 50/60Hz, 100W
Declared CCT:	4000K
Declared Light Output:	14000 lm
LED Manufacturer:	LG Innotek
LED Model:	LEMWS28R80JSZBLN
LED Quantity:	308 pcs

Test Information:

Standard Lamp:	Total Spectral Radiant Flux Standard Lamp, trace to NIST. 1. D908S for Gonio 2. D215S for Integrating Sphere
Date of Receipt Samples:	2020-04-06
Quantity of Receipt Samples:	1 pc
Sample Number:	2004060012-S1

Laboratory Information:

Test Laboratory:	Dongguan New Testing Centre Co., Ltd
Laboratory Address:	3F, No. 1 the 1 st North Industry Road, Songshan Lake Science & Technology Park, Dongguan, Guangdong, China
Laboratory Contact Name:	Neil Zhong
Laboratory Contact E-mail:	Neil_zhong@ntc-cert.com

Report Information:

Issued Date of Test Report:	2020-04-24
Revised Date of Test Report:	N/A
Test Report No.:	NTCLR20040017
Remark (If applicable):	N/A

Test Specification:	
Date of Test	2020-04-15
Test Item	1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Fidelity Index 8. Gamut Index 9. Local Chroma Shift 10. THD and PF
Reference Standard	IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products ANSI C78.377-2017 Specifications for the Chromaticity of Solid State Lighting Products CIE 13.3-1995 Method of Measuring and Specifying Color Rendering Properties of Light Sources CIE 15-2004 Technical Report Colorimetry ANSI IES TM-30-18 IES Method for Evaluating Light Source Color Rendition ANSI C78.77-10-2014 Harmonic Emission Limits – Related Power Quality Requirements IES TM-15-11 Luminaire Classification System for Outdoor Luminaires Addendum A for IES TM-15-11 Backlight, Uplight, and Glare (BUG) Ratings

Test Methods:
<p>1. Photometric and Electrical Measurements – Light Distribution Method:</p> <p>Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at $25\text{ }^{\circ}\text{C} \pm 1^{\circ}\text{C}$, 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 required Voltage and Frequency. It was stabilized before measurement was made. Luminous Flux, Luminaire Efficacy and Zonal Lumen were calculated from the software taken at 1° vertical intervals and 15° horizontal intervals.</p>
<p>2. Photometric and Electrical Measurements – Integrating Sphere Method:</p> <p>Photometric parameters were measured using an integrating sphere, as spectroradiometer and software. The ambient temperature condition inside the sphere was measured at $25\text{ }^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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 require Voltage and Frequency. It was stabilized before measurement was made. Chromaticity Coordinates, Correlated Color Temperature and Color Rendering Index were calculated from the spectral radiant flux measurements taken at least 1 nm intervals over the rage of 380 to 780 nm.</p>
<p>3. THD and PF Measurements:</p> <p>The sample was tested according to the ANSI C82.77-2002, the sample was operated at requirement Voltage and Frequency, and was stabilized before measurement. The Total Harmonic Distortion was calculated from the Digital Power Meter.</p>

Integrating Sphere Test Results:

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
25.3	55.7	Face Down	90	10

Electrical Data:

Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	0.8573	103.0	0.9979
277.0	60	0.3857	102.1	0.9523

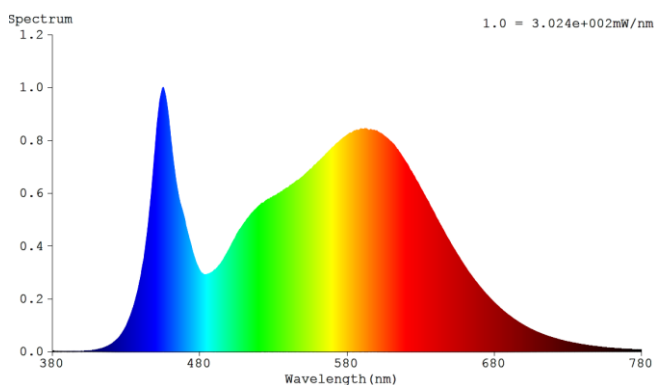
Color Data:

Voltage (V)	CCT (K)	R _a	R _f	R _g	R _{cs, h1}	Chromaticity, (x, y)	Chromaticity, (u', v')	Duv
120.0	4100	83.4	83	93	-12%	(0.3759, 0.3730)	(0.2236, 0.4992)	-0.00042
277.0	4080	83.3	83	94	-12%	(0.3769, 0.3743)	(0.2238, 0.5000)	-0.00011

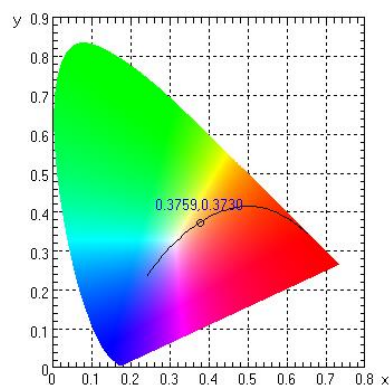
Specify Color Rendering:

Voltage (V)	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
120.0	82	92	96	80	82	87	85	64	9	79	79	61	85	98	76

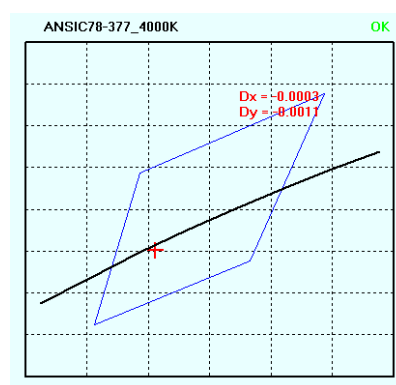
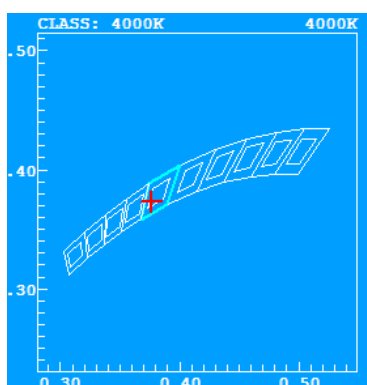
Spectral Power Distribution (120V)



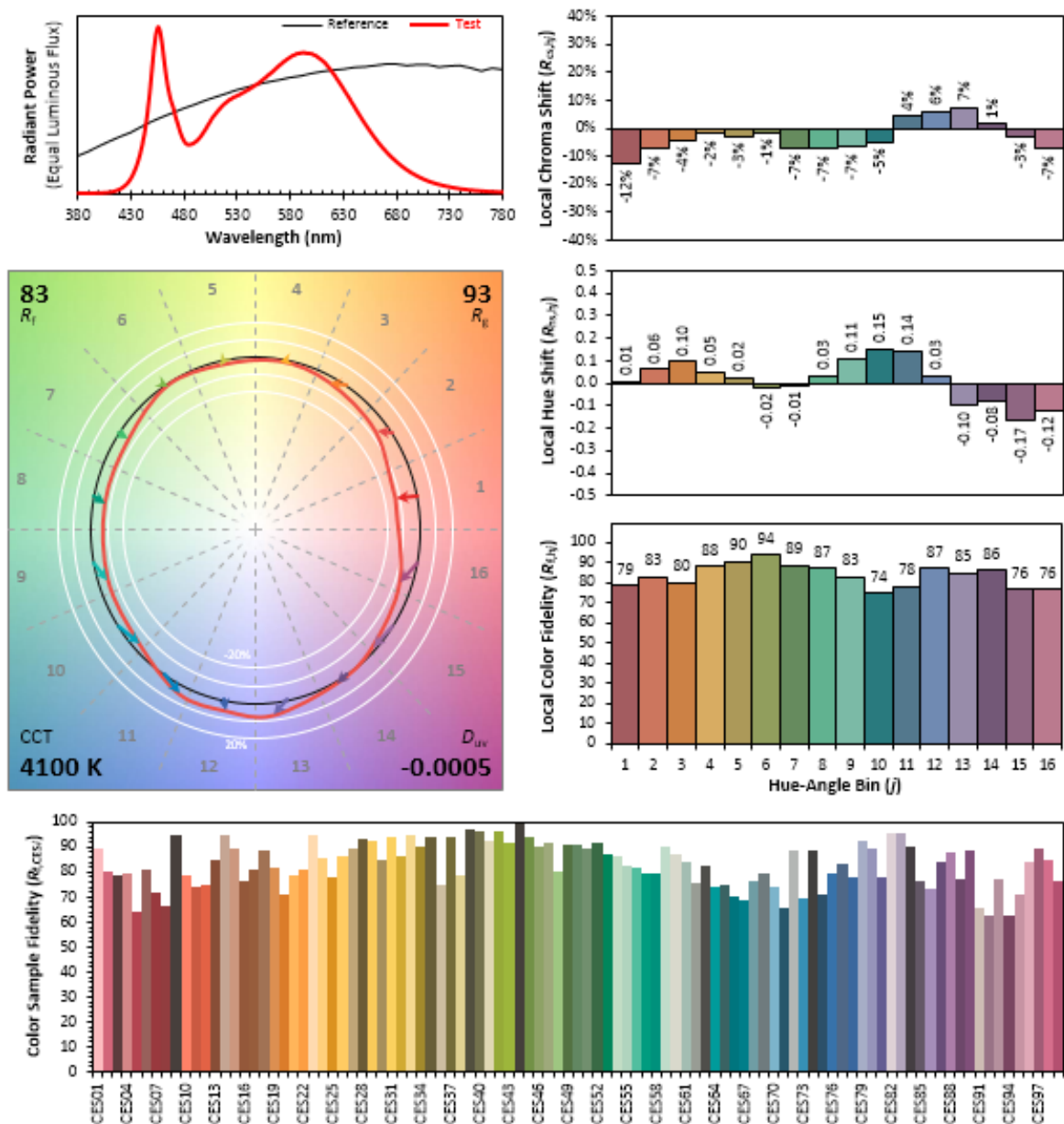
Chromaticity Diagram (120V)



Nominal CCT Quandrangle (120V)



IES TM-30-18 Color Rendition Result (120V):



Spectrum Data (120V):

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	0.0023	447	0.5950	514	0.5159	581	0.8242	648	0.4345	715	0.0628
381	0.0040	448	0.6574	515	0.5230	582	0.8286	649	0.4252	716	0.0607
382	0.0026	449	0.7261	516	0.5286	583	0.8293	650	0.4157	717	0.0588
383	0.0022	450	0.7918	517	0.5357	584	0.8333	651	0.4060	718	0.0568
384	0.0019	451	0.8597	518	0.5401	585	0.8370	652	0.3963	719	0.0552
385	0.0024	452	0.9090	519	0.5462	586	0.8385	653	0.3871	720	0.0533
386	0.0022	453	0.9554	520	0.5511	587	0.8397	654	0.3779	721	0.0519
387	0.0022	454	0.9816	521	0.5562	588	0.8397	655	0.3686	722	0.0503
388	0.0023	455	0.9990	522	0.5624	589	0.8430	656	0.3605	723	0.0487
389	0.0021	456	0.9897	523	0.5637	590	0.8432	657	0.3508	724	0.0474
390	0.0022	457	0.9669	524	0.5678	591	0.8433	658	0.3422	725	0.0457
391	0.0022	458	0.9293	525	0.5732	592	0.8445	659	0.3333	726	0.0443
392	0.0021	459	0.8855	526	0.5770	593	0.8442	660	0.3251	727	0.0430
393	0.0022	460	0.8315	527	0.5789	594	0.8411	661	0.3166	728	0.0416
394	0.0021	461	0.7795	528	0.5823	595	0.8403	662	0.3078	729	0.0404
395	0.0024	462	0.7302	529	0.5849	596	0.8420	663	0.2995	730	0.0390
396	0.0026	463	0.6873	530	0.5894	597	0.8398	664	0.2924	731	0.0378
397	0.0027	464	0.6462	531	0.5912	598	0.8392	665	0.2848	732	0.0367
398	0.0029	465	0.6140	532	0.5931	599	0.8376	666	0.2771	733	0.0356
399	0.0027	466	0.5836	533	0.5993	600	0.8372	667	0.2696	734	0.0345
400	0.0032	467	0.5595	534	0.6008	601	0.8324	668	0.2631	735	0.0332
401	0.0035	468	0.5404	535	0.6054	602	0.8297	669	0.2557	736	0.0322
402	0.0038	469	0.5206	536	0.6074	603	0.8272	670	0.2486	737	0.0312
403	0.0044	470	0.4992	537	0.6127	604	0.8236	671	0.2421	738	0.0303
404	0.0046	471	0.4706	538	0.6163	605	0.8186	672	0.2355	739	0.0292
405	0.0049	472	0.4489	539	0.6202	606	0.8134	673	0.2285	740	0.0284
406	0.0055	473	0.4279	540	0.6219	607	0.8097	674	0.2222	741	0.0274
407	0.0061	474	0.4075	541	0.6276	608	0.8051	675	0.2163	742	0.0266
408	0.0069	475	0.3858	542	0.6315	609	0.7996	676	0.2102	743	0.0258
409	0.0079	476	0.3649	543	0.6356	610	0.7949	677	0.2045	744	0.0249
410	0.0088	477	0.3483	544	0.6391	611	0.7891	678	0.1983	745	0.0243
411	0.0099	478	0.3325	545	0.6436	612	0.7839	679	0.1927	746	0.0234
412	0.0113	479	0.3204	546	0.6482	613	0.7756	680	0.1871	747	0.0225
413	0.0127	480	0.3098	547	0.6505	614	0.7674	681	0.1817	748	0.0220
414	0.0143	481	0.3007	548	0.6548	615	0.7601	682	0.1767	749	0.0212
415	0.0164	482	0.2972	549	0.6593	616	0.7530	683	0.1714	750	0.0206
416	0.0185	483	0.2930	550	0.6635	617	0.7439	684	0.1659	751	0.0200
417	0.0210	484	0.2925	551	0.6695	618	0.7352	685	0.1615	752	0.0193
418	0.0236	485	0.2938	552	0.6741	619	0.7263	686	0.1559	753	0.0188
419	0.0267	486	0.2957	553	0.6799	620	0.7180	687	0.1516	754	0.0181
420	0.0298	487	0.2977	554	0.6850	621	0.7105	688	0.1473	755	0.0176
421	0.0339	488	0.3003	555	0.6910	622	0.6999	689	0.1427	756	0.0171
422	0.0386	489	0.3046	556	0.6928	623	0.6885	690	0.1389	757	0.0166
423	0.0434	490	0.3101	557	0.7011	624	0.6809	691	0.1344	758	0.0160
424	0.0487	491	0.3134	558	0.7074	625	0.6705	692	0.1305	759	0.0156
425	0.0540	492	0.3191	559	0.7108	626	0.6621	693	0.1262	760	0.0151
426	0.0611	493	0.3271	560	0.7169	627	0.6502	694	0.1223	761	0.0146
427	0.0690	494	0.3331	561	0.7223	628	0.6421	695	0.1188	762	0.0142
428	0.0777	495	0.3413	562	0.7271	629	0.6320	696	0.1152	763	0.0138
429	0.0875	496	0.3499	563	0.7323	630	0.6204	697	0.1114	764	0.0133
430	0.0974	497	0.3601	564	0.7391	631	0.6111	698	0.1081	765	0.0128
431	0.1103	498	0.3697	565	0.7438	632	0.6004	699	0.1046	766	0.0126
432	0.1241	499	0.3798	566	0.7507	633	0.5906	700	0.1013	767	0.0122
433	0.1380	500	0.3892	567	0.7553	634	0.5798	701	0.0980	768	0.0118
434	0.1539	501	0.3999	568	0.7620	635	0.5706	702	0.0950	769	0.0114
435	0.1707	502	0.4118	569	0.7671	636	0.5592	703	0.0921	770	0.0110
436	0.1899	503	0.4219	570	0.7737	637	0.5482	704	0.0889	771	0.0108
437	0.2121	504	0.4304	571	0.7767	638	0.5379	705	0.0862	772	0.0104
438	0.2345	505	0.4435	572	0.7838	639	0.5287	706	0.0837	773	0.0102
439	0.2626	506	0.4530	573	0.7894	640	0.5171	707	0.0808	774	0.0098
440	0.2879	507	0.4627	574	0.7928	641	0.5060	708	0.0783	775	0.0094
441	0.3226	508	0.4690	575	0.7982	642	0.4963	709	0.0757	776	0.0092
442	0.3516	509	0.4777	576	0.8032	643	0.4854	710	0.0737	777	0.0091
443	0.3930	510	0.4862	577	0.8074	644	0.4756	711	0.0714	778	0.0088
444	0.4368	511	0.4929	578	0.8120	645	0.4654	712	0.0691	779	0.0087
445	0.4832	512	0.5020	579	0.8159	646	0.4552	713	0.0667	780	0.0088
446	0.5395	513	0.5080	580	0.8203	647	0.4446	714	0.0646		N/A

Goniophotometer Test Results:

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
25.3	55.7	Face Down	90	25

Electrical Data:

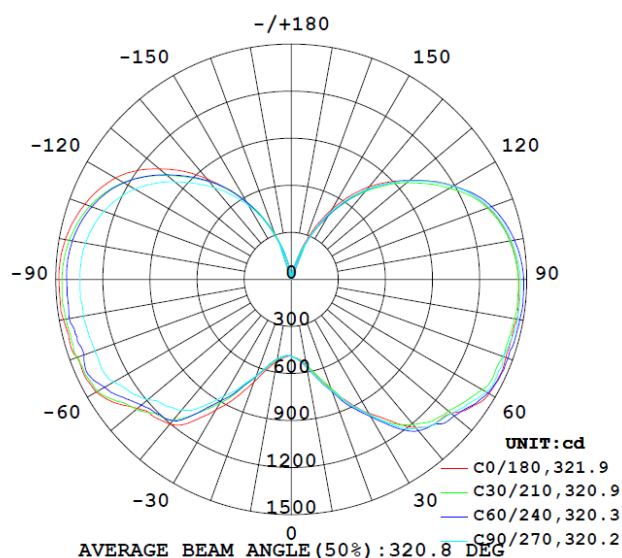
Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	0.8573	103.0	0.9979

Goniophotometer Data:

Parameter	Results
Total Luminous (lm)	14583.7
Luminous Efficacy (lm/w)	141.59
Zonal Lumens Distribution (0-60°)	23.8%
Zonal Lumens Distribution (60-90°)	30.8%
Zonal Lumens Distribution (0-90°)	54.7%
Zonal Lumens Distribution (90-120°)	29.4%
Zonal Lumens Distribution (90-180°)	45.3%
Zonal Lumens Distribution (0-180°)	100.0%
Zonal Lumens Distribution (120-180°)	15.9%
Beam Angle (°)	320.8

Luminous Intensity Distribution Diagram:

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM

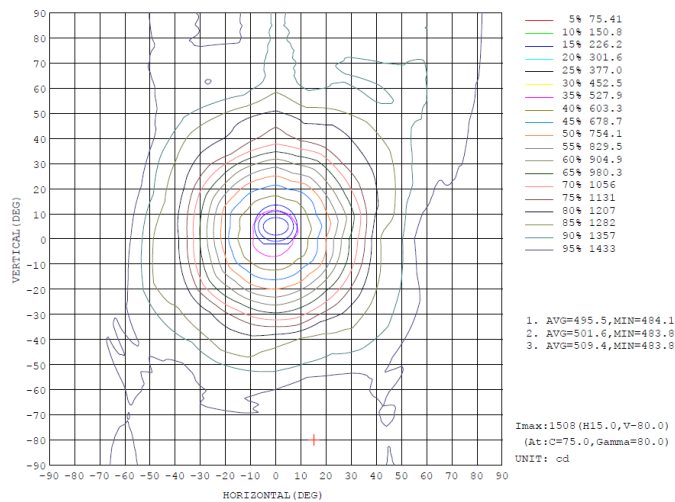


Zonal Flux Diagram:

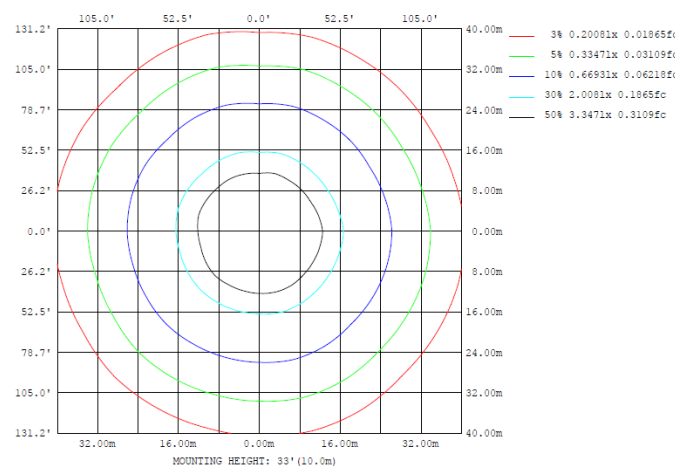
ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	zone	total	lum, lamp
10	552.7	570.5	567.1	553.9	528.8	519.4	515.7	529.9	0- 10	49.20	49.20	0.34,0.34
20	747.7	767.8	755.7	751.3	695.0	670.7	653.3	674.2	10- 20	176.1	227.3	1.56,1.56
30	983.5	1012	996.7	987.7	960.6	914.4	861.0	914.8	20- 30	388.6	615.8	4.22,4.22
40	1233	1222	1239	1234	1204	1156	1088	1157	30- 40	681.8	1298	8.9,8.9
50	1330	1314	1330	1360	1280	1282	1193	1225	40- 50	965.4	2263	15.5,15.5
60	1455	1412	1435	1451	1435	1367	1306	1330	50- 60	1214	3477	23.5,23.8
70	1454	1421	1438	1468	1449	1394	1332	1357	60- 70	1412	4889	35.5,35.5
80	1458	1429	1464	1487	1474	1404	1345	1383	70- 80	1515	6403	43.9,43.9
90	1449	1422	1460	1483	1480	1405	1346	1383	80- 90	1572	7975	54.7,54.7
100	1416	1386	1424	1450	1462	1389	1331	1343	90-100	1559	9534	65.4,65.4
110	1337	1303	1341	1368	1400	1328	1271	1298	100-110	1460	10994	75.4,75.4
120	1194	1145	1189	1210	1294	1208	1152	1167	110-120	1268	12262	84.1,84.1
130	983.4	955.6	977.2	991.9	1098	1016	968.7	971.6	120-130	991.0	13253	90.9,90.9
140	771.8	725.1	749.0	755.7	838.3	801.1	763.7	758.1	130-140	688.2	13941	95.6,95.6
150	513.8	460.4	497.9	495.4	566.0	563.8	543.9	521.5	140-150	411.7	14352	98.4,98.4
160	236.1	199.3	209.0	239.3	296.6	300.5	285.7	289.8	150-160	183.0	14535	99.7,99.7
170	53.14	37.06	38.52	49.40	82.14	88.48	82.94	66.73	160-170	45.14	14581	100,100
180	0.9729	0.9640	1.007	0.9626	0.9783	0.9616	1.013	0.9626	170-180	3.122	14584	100,100
DEG	LUMINOUS INTENSITY:cd Less than 35% Percent = 82.9 %									UNIT:lm		

Isocandela Diagram:



Isolux Diagram:



Luminous Distribution Intensity Data:

Table--1

UNIT: cd

C (DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
Y (DEG)	0	489	489	489	489	489	489	489	489	489	489	489	489	489	489	489	489	489	489
5	508	510	512	513	515	514	513	512	510	508	506	503	499	498	494	493	490	492	491
10	553	555	556	570	568	570	567	562	557	554	546	541	529	531	519	519	514	517	516
15	638	633	635	660	659	656	655	652	640	641	617	623	591	601	576	583	570	573	571
20	749	735	735	768	761	766	756	756	746	751	723	734	695	699	660	671	657	665	663
25	864	866	880	893	895	888	875	881	875	881	848	863	828	808	777	784	766	766	752
30	984	982	994	1012	1009	1001	997	1003	1011	988	967	986	961	946	910	914	892	886	861
35	1101	1110	1122	1129	1152	1127	1135	1133	1143	1141	1102	1120	1107	1082	1044	1042	1037	1019	990
40	1233	1221	1207	1222	1259	1272	1239	1219	1218	1234	1225	1231	1204	1194	1171	1156	1176	1133	1088
45	1298	1283	1275	1274	1302	1332	1299	1272	1260	1270	1289	1266	1239	1263	1216	1211	1210	1184	1138
50	1330	1318	1307	1314	1355	1355	1330	1315	1315	1360	1325	1287	1280	1330	1288	1252	1246	1223	1193
55	1409	1382	1355	1374	1404	1420	1380	1388	1390	1418	1396	1369	1373	1403	1355	1319	1310	1307	1253
60	1455	1414	1406	1412	1448	1478	1435	1425	1431	1451	1434	1434	1435	1464	1424	1367	1375	1378	1306
65	1462	1447	1426	1420	1466	1490	1447	1437	1438	1468	1443	1458	1454	1472	1446	1389	1430	1411	1336
70	1454	1453	1437	1421	1469	1491	1438	1442	1444	1468	1444	1452	1449	1459	1455	1394	1405	1415	1332
75	1454	1463	1436	1419	1475	1496	1453	1444	1457	1483	1443	1460	1466	1471	1453	1395	1412	1434	1338
80	1458	1476	1445	1429	1478	1510	1464	1455	1464	1487	1445	1477	1474	1470	1458	1404	1436	1440	1345
85	1454	1477	1446	1425	1481	1508	1461	1454	1467	1486	1436	1476	1478	1474	1466	1405	1430	1444	1349
90	1449	1476	1446	1422	1481	1505	1460	1454	1467	1483	1427	1480	1480	1470	1460	1405	1431	1440	1346
95	1438	1464	1434	1410	1468	1491	1447	1443	1458	1472	1411	1474	1476	1464	1453	1402	1430	1437	1344
100	1416	1441	1412	1386	1443	1466	1424	1423	1436	1450	1389	1457	1462	1444	1436	1389	1416	1421	1331
105	1384	1405	1378	1350	1408	1430	1390	1391	1401	1415	1358	1429	1436	1415	1407	1364	1391	1395	1307
110	1337	1356	1330	1303	1358	1378	1341	1345	1351	1368	1315	1390	1400	1374	1366	1328	1353	1355	1271
115	1275	1289	1261	1242	1287	1311	1275	1280	1286	1299	1259	1331	1354	1317	1310	1276	1303	1299	1220
120	1194	1199	1164	1145	1190	1220	1189	1196	1203	1210	1185	1250	1294	1244	1236	1208	1232	1230	1152
125	1093	1094	1063	1051	1088	1111	1087	1092	1094	1105	1090	1152	1208	1151	1141	1120	1142	1142	1067
130	983	979	960	956	982	991	977	980	978	992	986	1040	1098	1040	1032	1016	1039	1029	969
135	878	863	847	846	864	866	866	870	865	878	883	929	976	929	921	908	929	910	866
140	772	745	731	725	745	737	749	753	750	756	779	812	838	822	813	801	819	791	764
145	647	622	602	604	611	610	621	616	627	627	660	685	697	706	699	688	703	675	656
150	514	491	465	460	471	479	488	474	497	495	535	538	566	581	573	564	568	555	544
155	375	354	330	316	335	343	336	334	362	360	391	390	431	442	445	434	434	425	426
160	236	234	208	199	204	213	209	214	244	239	265	249	297	296	309	300	287	290	286
165	122	127	106	95.3	98.3	105	107	110	125	125	148	140	178	171	182	187	179	183	174
170	53.1	51.7	40.8	37.1	36.4	38.4	38.5	40.2	45.2	49.4	56.4	62.6	82.1	75.3	85.1	88.5	87.8	85.0	82.9
175	14.0	13.7	9.70	7.83	7.62	8.42	8.74	11.7	13.3	13.7	18.5	20.3	25.3	25.6	29.0	29.2	30.2	29.9	29.6
180	0.97	0.97	0.96	0.96	0.96	1.00	1.01	0.98	0.96	0.96	0.96	0.96	0.98	0.97	0.97	0.96	0.96	0.99	1.01

Table--2

UNIT: cd

C (DEG)	285	300	315	330	345														
Y (DEG)	0	489	489	489	489	489													
5	495	496	499	501	505														
10	520	521	530	535	545														
15	583	579	588	609	616														
20	677	660	674	709	704														
25	788	766	793	815	823														
30	900	882	915	934	933														
35	1014	989	1029	1058	1068														
40	1134	1122	1157	1158	1199														
45	1201	1193	1204	1212	1238														
50	1251	1215	1225	1229	1300														
55	1310	1284	1280	1295	1358														
60	1366	1330	1330	1336	1393														
65	1385	1362	1375	1358	1424														
70	1384	1358	1357	1354	1412														
75	1386	1367	1367	1356	1415														
80	1400	1380	1383	1368	1419														
85	1402	1383	1383	1375	1422														
90	1400	1379	1383	1372	1415														
95	1395	1375	1379	1367	1404														
100	1382	1359	1363	1352	1384														
105	1358	1333	1336	1327	1354														
110	1323	1290	1298	1288	1310														
115	1272	1236	1244	1236	1252														
120	1202	1165	1167	1167	1173														
125	1114	1073	1075	1077	1077														
130	1015	966	972	970	969														
135	911	861	864	860	863														
140	808	762	758	751	760														
145	695	656	647	635	645														
150	574	541	521	513	525														
155	436	408	393	382	397														
160	289	277	260	254	263														
165	170	168	152	143	144														
170	77.7	79.7	66.7	63.2	63.4														
175	27.0	25.3	23.3	20.8	18.2														
180	0.97	0.96	0.96	0.96	0.96														

THD and PF Measurement Test Results:

Electrical Measurement:

Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor	iTHD(%)
120.0	60	0.8573	103.0	0.9979	3.36
277.0	60	0.3857	102.1	0.9523	11.33

Photo of Sample:



Equipment List:

Equipment ID	Equipment Name	Last Cal.	Due Cal.
NTC-F01-001	Goniophotometer System	2019-11-13	2020-11-12
NTC-F01-006	2.0 meter Integrating Sphere	2019-11-13	2020-11-12
NTC-F01-012	Standard Lamp	2019-11-13	2020-11-12
NTC-F01-013	Standard Lamp	2019-11-13	2020-11-12
NTC-F01-031	Digital Power Meter	2019-08-22	2020-08-21
NTC-F01-019	Temperature & Humidity Meter	2019-11-15	2020-11-14

*******End of Report*******