LM-79-08 Test Report

For

ETI Solid State Lighting (Zhuhai) Ltd

No.1, Zhongzhu Road South, Science & Technology Innovation Coast, High Tech District, Zhuhai City, Guangdong Prov., China 519085

Inseparable SSL Luminaire

Model Name(s):
514061##

Representative (Tested) Model:
51406111

Model Difference: ## can be 11-30 identical to Color Tunable, tunable 3000K, 4000K and 5000K.

Prepare by:

Derek Lai

Engineer: Derek Lai
Date: 2019-12-05

Review by:

Vincent Yuan

Technical Lead: Vincent Yuan
Issue Date: 2019-12-16
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, Guangdong, China
Tel: 86-769-22212079
Website: http://www.ntc-cert.com

Client Information:

Applicant Name:	ETI Solid State Lighting (Zhuhai) Ltd
Brand Name:	Commercial Electric, ETI, Hampton Bay
Factory 1 Name:	NVC Vietnam Lighting and Technology Co. LTD
Factory 1 Address:	Yen Phong Industrial Park Phase 1, Long Chau Ward, Yen Phong District, Bac Ninh province, Vietnam
Factory 2 Name:	ETI Solid State Lighting (Zhuhai) Ltd
Factory 2 Address:	No.1, Zhongzhu Road South, Science & Technology Innovation Coast, High Tech District, Zhuhai City, Guangdong Prov., China 519085

Product Information:

Model Number:	514061##(##=11-30)
Product Type:	Outdoor, Security Luminaires
Rating Input:	120Vac, 60Hz, 28W
Declared CCT:	3000K/4000K/5000K
Declared Light Output:	2400 lm
LED Manufacturer:	Samsung Electronics Co., LTD.
LED Model:	SPMWHX228FD5WAW0XX
LED Quantity:	60 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:	2019-11-27
Quantity of Receipt Samples:	1 pcs
Sample Number:	191127003-S1

Laboratory Information:

Test Laboratory:	Dongguan New Testing Centre Co., Ltd
Laboratory Address:	3F, No. 1 the 1st North Industry Road, Songshan Lake Science & Technology Park, Dongguan, Guangdong, China
Laboratory Contact Name:	Neil Zhong
Laboratory Contact E-mail:	Neil_ntc@163.com

Report Information:

Issued Date of Test Report:	2019-12-16
Revised Date of Test Report:	N/A
Test Report No.:	NTCLR19120001
Remark *(If applicable)*:	N/A

Test Specification:	
Date of Test	2019-12-04
Test Item	1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate
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

Test Methods:

1. Photometric and Electrical Measurements – Light Distribution Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at 25 °C ± 1°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° horizonal intervals.

2. Photometric and Electrical Measurements – Integrating Sphere Method:

Photometric parameters were measured using an integrating sphere, as spectroradiometer and software. The ambient temperature condition inside the sphere was measured at 25 °C± 1°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.

Integrating Sphere Test Results for 3000K:

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
24.9	41.2	Face Down	90	10

Electrical Data:

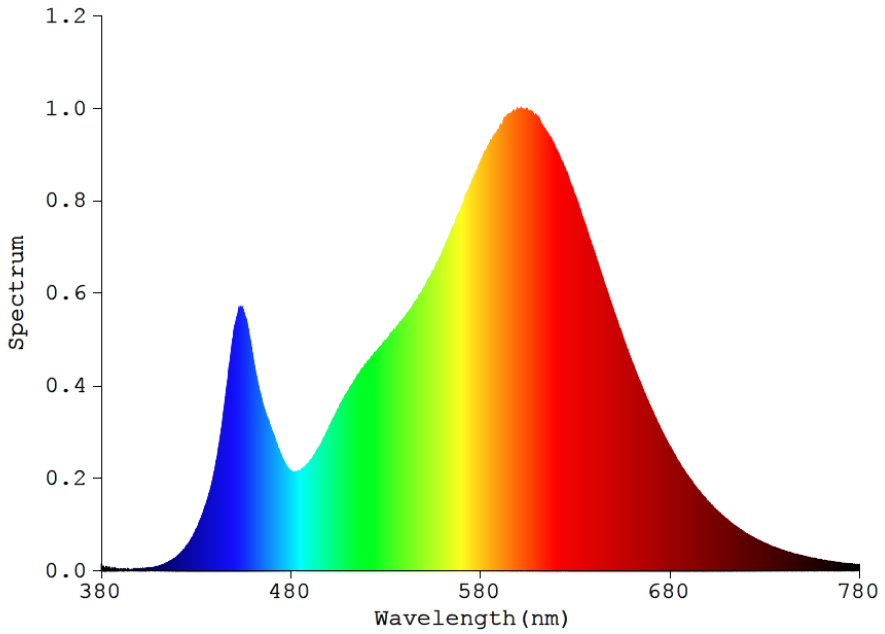
Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	0.2210	26.35	0.9898

Color Data:

Parameter	Result
CCT(K)	3053
Ra	81.8
R9	5
Chromaticity, x	0.4304
Chromaticity, y	0.3968
Chromaticity, u'	0.2495
Chromaticity, v'	0.5175
Duv	-0.00202

Special Color Rendering			
R1	81	R9	5
R2	92	R10	80
R3	95	R11	77
R4	79	R12	71
R5	81	R13	83
R6	89	R14	98
R7	81	R15	74
R8	58	-	-

Spectrum Diagram:



Goniophotometer Test Results for 3000K:

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
24.9	41.2	Face Down	90	25

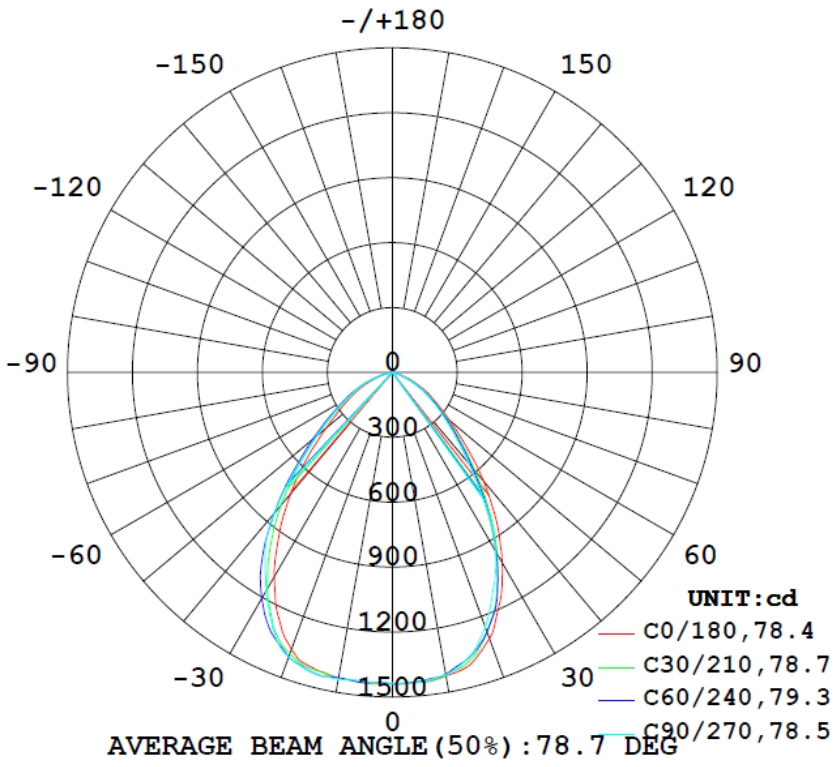
Electrical Data:

Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	0.2210	26.35	0.9898

Goniophotometer Data:

Parameter	Results
Total Luminous (lm)	2465.4
Luminous Efficacy (lm/w)	93.56
Zonal Lumens Distribution (0-60°)	93.0%
Beam Angle (°)	78.7

Luminous Intensity Distribution Diagram:

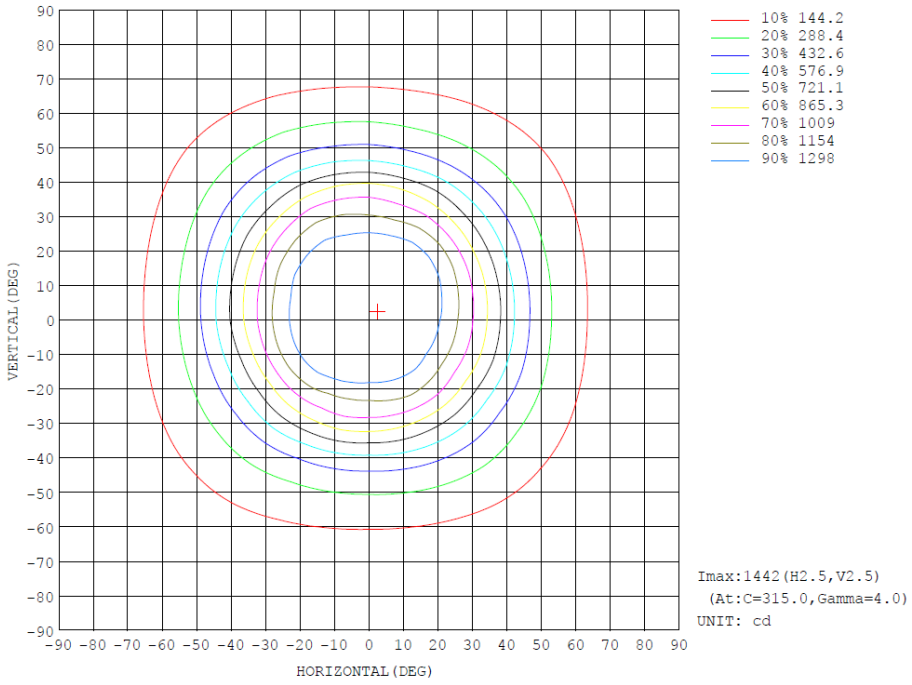


Zonal Flux Diagram:

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum,lamp
10	1424	1424	1419	1431	1433	1428	1439	1436	0- 10	136.8	136.8	5.55,5.55
20	1309	1285	1253	1323	1362	1387	1400	1388	10- 20	394.3	531.1	21.5,21.5
30	1015	970.2	952.9	995.4	1091	1186	1167	1140	20- 30	558.2	1089	44.2,44.2
40	653.8	587.8	549.5	609.4	732.2	818.4	850.7	735.5	30- 40	547.9	1637	66.4,66.4
50	345.7	323.4	298.7	322.5	399.6	469.8	457.1	400.9	40- 50	400.5	2038	82.6,82.6
60	187.5	165.2	153.3	174.3	215.9	249.0	244.6	219.4	50- 60	250.1	2288	92.8,92.8
70	66.61	48.46	43.41	58.52	88.32	111.6	115.3	95.65	60- 70	135.5	2423	98.3,98.3
80	2.857	0.5680	0.3566	1.144	8.487	17.19	22.04	11.26	70- 80	38.80	2462	99.9,99.9
90	0	0	0	0	0	0.0958	0.1756	0.0069	80- 90	1.792	2464	99.9,99.9
100	0	0	0	0	0.0020	0	0	0	90-100	0.0028	2464	99.9,99.9
110	0	0	0	0	0.0557	0.0408	0.0328	0.0459	100-110	0.0112	2464	99.9,99.9
120	0.0578	0.0743	0.0857	0.0616	0.1378	0.1232	0.1151	0.1303	110-120	0.0501	2464	99.9,99.9
130	0.1900	0.2125	0.2203	0.1898	0.3513	0.3451	0.3402	0.3431	120-130	0.1586	2464	99.9,99.9
140	0.3552	0.3857	0.3945	0.3549	0.5796	0.6281	0.6356	0.6199	130-140	0.2946	2464	100,100
150	0.4977	0.5273	0.5536	0.4870	0.8188	0.9001	0.9117	0.8781	140-150	0.3719	2465	100,100
160	0.6592	0.6674	0.6571	0.6422	1.058	1.116	1.087	1.066	150-160	0.3621	2465	100,100
170	0.7479	0.7781	0.7278	0.7138	1.117	1.167	1.115	1.079	160-170	0.2574	2465	100,100
180	0.9785	1.001	0.9245	0.9109	0.9807	1.006	0.9296	0.9164	170-180	0.0882	2465	100,100
DEG	LUMINOUS INTENSITY:cd Less than 35% Percent = 9.0 %									UNIT:lm		

Isocandela Diagram:



Luminous Distribution Intensity Data:

Table--1 UNIT: cd

γ (DEG) \ C (DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
0	1439	1437	1438	1438	1439	1438	1437	1438	1436	1437	1437	1437	1439	1437	1438	1438	1439	1438	1437
5	1437	1437	1434	1432	1434	1437	1437	1436	1434	1431	1429	1434	1439	1438	1439	1438	1440	1436	1434
10	1424	1428	1422	1424	1417	1416	1419	1420	1423	1431	1424	1428	1433	1436	1434	1428	1432	1437	1439
15	1396	1389	1380	1367	1366	1360	1362	1368	1384	1393	1406	1409	1414	1414	1421	1427	1434	1426	1436
20	1309	1295	1279	1285	1277	1265	1253	1261	1288	1323	1345	1352	1362	1370	1383	1387	1400	1392	1400
25	1174	1157	1138	1144	1146	1123	1103	1112	1130	1181	1208	1229	1246	1261	1300	1315	1325	1308	1306
30	1015	995	966	970	958	952	953	966	969	995	1023	1057	1091	1111	1155	1186	1207	1196	1167
35	839	820	781	772	760	755	749	769	782	805	815	859	913	947	985	1014	1049	1039	1026
40	654	635	594	588	574	559	549	559	573	609	628	671	732	765	801	818	849	857	851
45	482	468	439	437	425	412	403	407	414	443	462	502	554	586	618	630	648	647	627
50	346	340	325	323	315	306	299	301	304	323	336	362	400	427	455	470	478	467	457
55	255	250	238	238	231	224	217	221	226	240	250	268	292	308	330	342	351	346	336
60	187	180	169	165	159	155	153	157	163	174	183	198	216	226	241	249	257	253	245
65	124	116	105	101	95.6	93.7	93.5	97.8	103	113	121	134	149	159	171	178	183	181	177
70	66.6	60.4	51.6	48.5	44.4	43.5	43.4	47.3	51.2	58.5	64.0	75.8	88.3	95.5	106	112	117	117	115
75	24.4	21.8	15.6	14.0	11.5	11.2	10.9	13.1	14.9	20.3	22.6	30.4	38.9	43.7	51.9	55.7	60.0	60.4	60.3
80	2.86	1.94	0.85	0.57	0.40	0.36	0.36	0.41	0.52	1.14	2.05	4.75	8.49	10.8	16.2	17.2	21.6	20.3	22.0
85	0.20	0.15	0.06	0.03	0.00	0.00	0.00	0.01	0.05	0.13	0.18	0.25	0.34	0.42	0.65	0.88	1.29	1.26	1.12
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.10	0.15	0.17	0.18
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.02	0.02	0.01	0.01	0.01
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.05	0.04	0.04	0.04	0.03	0.03
115	0.01	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.02	0.01	0.01	0.00	0.08	0.08	0.07	0.07	0.07	0.06	0.06
120	0.06	0.06	0.07	0.07	0.09	0.09	0.09	0.08	0.08	0.06	0.05	0.04	0.14	0.13	0.12	0.12	0.12	0.12	0.12
125	0.12	0.11	0.13	0.14	0.15	0.15	0.15	0.14	0.14	0.12	0.11	0.10	0.23	0.23	0.21	0.22	0.21	0.21	0.21
130	0.19	0.19	0.20	0.21	0.23	0.22	0.22	0.21	0.21	0.19	0.18	0.16	0.35	0.35	0.34	0.35	0.34	0.34	0.34
135	0.27	0.28	0.29	0.30	0.32	0.31	0.31	0.30	0.28	0.27	0.27	0.24	0.48	0.48	0.48	0.49	0.48	0.49	0.49
140	0.36	0.36	0.38	0.39	0.40	0.38	0.39	0.38	0.36	0.35	0.33	0.33	0.58	0.59	0.60	0.63	0.62	0.64	0.64
145	0.43	0.44	0.45	0.46	0.48	0.49	0.48	0.47	0.45	0.41	0.38	0.39	0.70	0.72	0.74	0.77	0.77	0.79	0.78
150	0.50	0.52	0.54	0.53	0.56	0.56	0.55	0.54	0.51	0.49	0.45	0.44	0.82	0.85	0.86	0.90	0.91	0.93	0.91
155	0.58	0.61	0.64	0.60	0.61	0.61	0.60	0.60	0.58	0.56	0.56	0.50	0.93	0.95	0.99	1.01	1.03	1.04	1.01
160	0.66	0.68	0.70	0.67	0.65	0.67	0.66	0.67	0.65	0.64	0.63	0.60	1.06	1.06	1.10	1.12	1.12	1.12	1.09
165	0.70	0.73	0.74	0.72	0.71	0.70	0.69	0.72	0.71	0.71	0.68	0.67	1.10	1.13	1.16	1.19	1.18	1.15	1.13
170	0.75	0.77	0.78	0.78	0.75	0.73	0.73	0.74	0.73	0.71	0.71	0.72	1.12	1.14	1.16	1.17	1.16	1.12	1.12
175	0.83	0.85	0.87	0.86	0.84	0.82	0.79	0.80	0.80	0.79	0.78	0.79	1.06	1.08	1.10	1.09	1.07	1.05	1.01
180	0.98	1.01	1.01	1.00	0.97	0.95	0.92	0.90	0.90	0.91	0.92	0.94	0.98	1.01	1.01	1.01	0.98	0.96	0.93

Table--2 UNIT: cd

γ (DEG) \ C (DEG)	285	300	315	330	345
0	1438	1436	1437	1437	1437
5	1436	1437	1439	1437	1434
10	1433	1438	1436	1432	1432
15	1431	1429	1423	1415	1406
20	1399	1396	1388	1372	1342
25	1303	1313	1299	1261	1208
30	1148	1158	1140	1099	1047
35	997	980	936	895	866
40	820	782	736	703	676
45	599	583	553	529	504
50	436	420	401	385	363
55	318	307	295	283	267
60	233	228	219	211	197
65	170	164	156	148	135
70	110	104	95.6	89.1	77.7
75	56.0	52.1	44.8	40.2	31.6
80	17.6	16.2	11.3	9.14	5.67
85	0.78	0.58	0.40	0.35	0.28
90	0.13	0.08	0.01	0.00	0.00
95	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.01
105	0.01	0.02	0.02	0.03	0.04
110	0.03	0.04	0.05	0.06	0.06
115	0.06	0.07	0.08	0.08	0.09
120	0.12	0.12	0.13	0.13	0.15
125	0.21	0.21	0.22	0.23	0.25
130	0.34	0.34	0.34	0.34	0.37
135	0.49	0.48	0.48	0.48	0.50
140	0.63	0.61	0.62	0.60	0.61
145	0.77	0.77	0.75	0.73	0.73
150	0.90	0.89	0.88	0.84	0.84
155	1.02	1.01	0.99	0.98	0.94
160	1.10	1.08	1.07	1.07	1.05
165	1.12	1.12	1.11	1.09	1.08
170	1.10	1.08	1.08	1.09	1.06
175	1.03	0.99	1.00	1.03	1.02
180	0.90	0.91	0.92	0.92	0.95

Integrating Sphere Test Results for 5000K:

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
25.2	78.9	Face Down	90	10

Electrical Data:

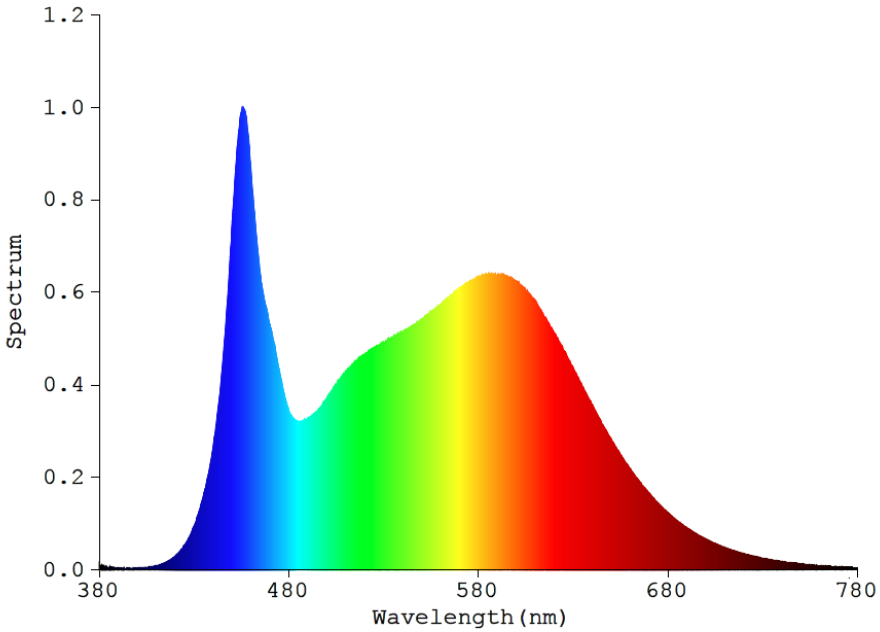
Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	0.2202	26.15	0.9896

Color Data:

Parameter	Result
CCT(K)	4881
Ra	84.1
R9	11
Chromaticity, x	0.3485
Chromaticity, y	0.3542
Chromaticity, u'	0.2127
Chromaticity, v'	0.4864
Duv	-0.00007

Special Color Rendering			
R1	84	R9	11
R2	94	R10	84
R3	94	R11	79
R4	79	R12	60
R5	83	R13	87
R6	89	R14	98
R7	84	R15	78
R8	65	-	-

Spectrum Diagram:



Goniophotometer Test Results for 5000K:

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
25.2	78.9	Face Down	90	25

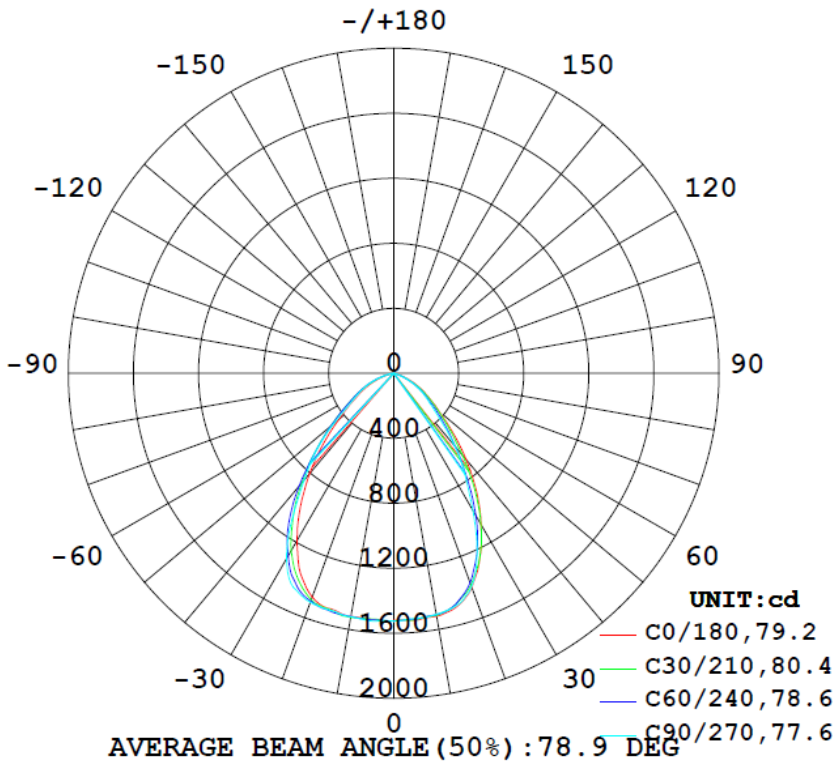
Electrical Data:

Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	0.2202	26.15	0.9896

Goniophotometer Data:

Parameter	Results
Total Luminous (lm)	2643.4
Luminous Efficacy (lm/w)	101.09
Zonal Lumens Distribution (0-60°)	93.0%
Beam Angle (°)	78.9

Luminous Intensity Distribution Diagram:

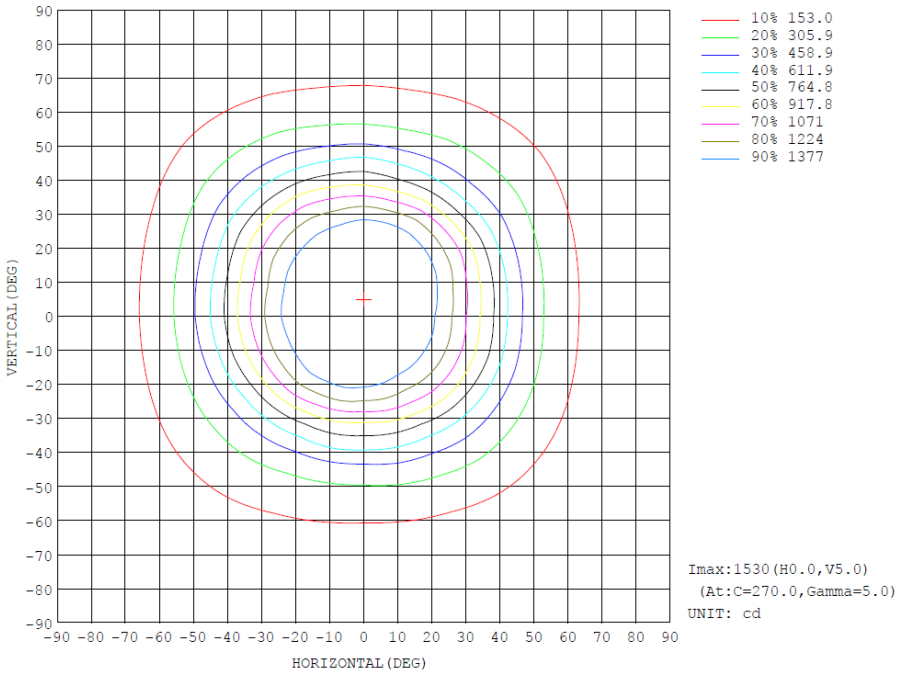


Zonal Flux Diagram:

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum,lamp
10	1517	1508	1506	1505	1518	1522	1521	1519	0- 10	144.9	144.9	5.48,5.48
20	1403	1382	1398	1427	1465	1487	1500	1479	10- 20	421.3	566.2	21.4,21.4
30	1074	1053	974.2	1096	1191	1289	1319	1253	20- 30	606.6	1173	44.4,44.4
40	694.4	625.7	584.3	628.4	804.4	902.9	856.2	783.3	30- 40	588.8	1762	66.6,66.6
50	365.2	344.0	298.4	334.4	441.9	508.9	482.4	417.4	40- 50	425.8	2187	82.7,82.7
60	196.5	177.5	162.1	186.7	236.2	268.6	251.8	233.8	50- 60	264.5	2452	92.8,92.8
70	68.94	51.79	46.06	63.30	98.64	122.6	124.6	103.1	60- 70	145.7	2598	98.3,98.3
80	2.574	0.5790	0.3727	1.282	10.48	19.21	23.59	12.18	70- 80	42.04	2640	99.9,99.9
90	0	0	0	0	0	0.1169	0.2000	0.0138	80- 90	1.973	2642	99.9,99.9
100	0	0	0	0	0.0087	0	0	0.0006	90-100	0.0035	2642	99.9,99.9
110	0	0.0002	0	0	0.0676	0.0488	0.0394	0.0565	100-110	0.0154	2642	99.9,99.9
120	0.0761	0.0893	0.0981	0.0733	0.1550	0.1413	0.1232	0.1461	110-120	0.0601	2642	99.9,99.9
130	0.2197	0.2375	0.2431	0.2123	0.3875	0.3802	0.3656	0.3791	120-130	0.1778	2642	99.9,99.9
140	0.3971	0.4245	0.4306	0.3896	0.6322	0.6841	0.6901	0.6790	130-140	0.3242	2642	100,100
150	0.5506	0.5757	0.6024	0.5323	0.8852	0.9729	0.9868	0.9498	140-150	0.4054	2643	100,100
160	0.7250	0.7246	0.7147	0.7014	1.140	1.202	1.173	1.148	150-160	0.3928	2643	100,100
170	0.8212	0.8550	0.7931	0.7810	1.213	1.258	1.204	1.162	160-170	0.2789	2643	100,100
180	1.070	1.095	1.012	0.9943	1.074	1.100	1.021	0.9991	170-180	0.0960	2643	100,100
DEG	LUMINOUS INTENSITY:cd Less than 35% Percent = 8.7 %									UNIT:lm		

Isocandela Diagram:



Luminous Distribution Intensity Data:

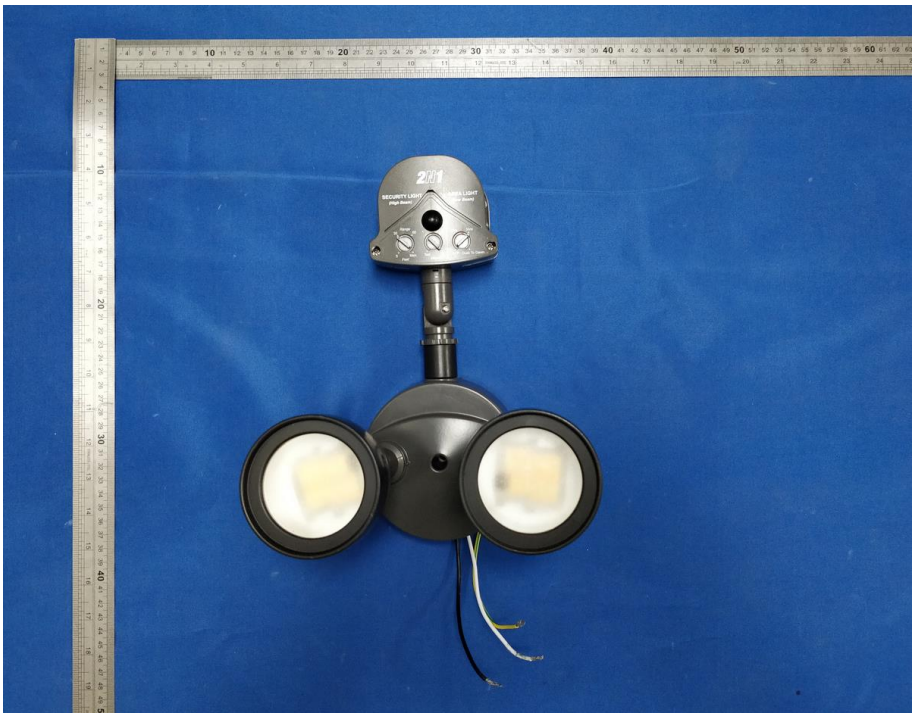
Table--1 UNIT: cd

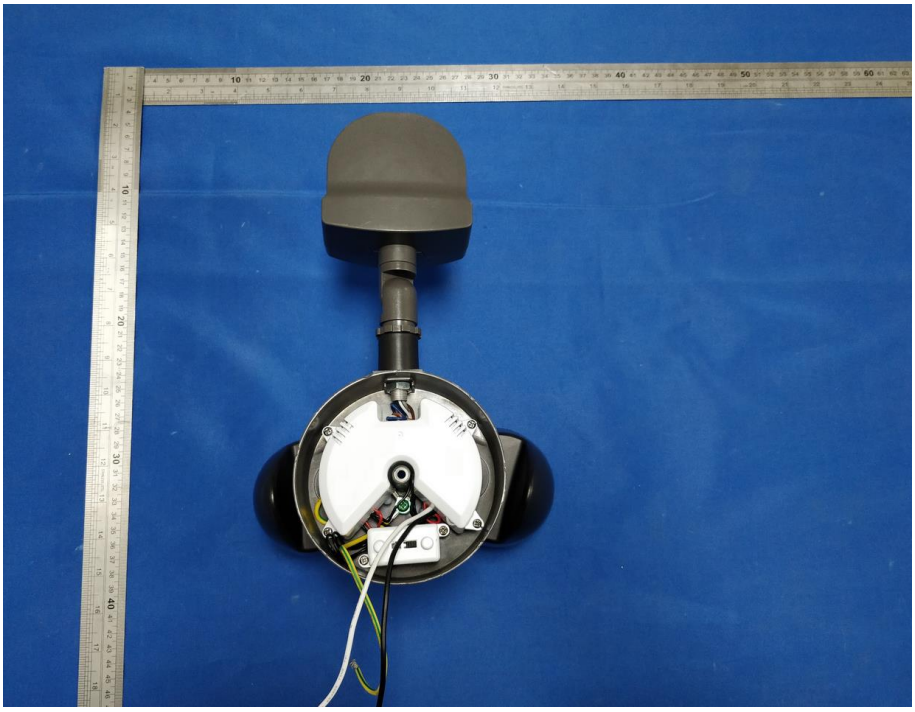
γ (DEG) \ C (DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
0	1522	1525	1524	1524	1524	1524	1524	1524	1525	1522	1523	1522	1522	1525	1524	1524	1524	1524	1524
5	1525	1523	1522	1522	1518	1515	1514	1516	1519	1519	1519	1520	1521	1518	1518	1518	1522	1528	1530
10	1517	1514	1513	1508	1508	1509	1506	1506	1503	1505	1506	1516	1518	1520	1525	1522	1519	1517	1521
15	1489	1489	1474	1476	1471	1475	1482	1480	1481	1482	1486	1491	1501	1508	1507	1516	1515	1512	1510
20	1403	1401	1387	1382	1373	1388	1398	1417	1420	1427	1431	1448	1465	1468	1485	1487	1492	1496	1500
25	1254	1257	1253	1236	1213	1219	1214	1253	1270	1306	1311	1328	1358	1360	1396	1415	1427	1443	1457
30	1074	1082	1072	1053	1010	997	974	1003	1030	1096	1123	1160	1191	1198	1262	1289	1299	1301	1319
35	889	888	869	836	785	777	767	782	790	846	897	957	1002	1018	1079	1115	1127	1099	1089
40	694	694	659	626	592	594	584	598	593	628	671	749	804	824	881	903	906	872	856
45	511	509	485	468	438	430	410	416	421	454	488	550	613	635	682	687	682	669	678
50	365	367	355	344	321	312	298	303	309	334	357	397	442	466	506	509	505	485	482
55	267	269	261	253	236	233	227	232	235	252	268	293	320	335	367	369	365	344	333
60	196	194	184	178	167	166	162	168	172	187	198	217	236	245	266	269	267	255	252
65	129	125	114	109	101	102	99.2	106	109	122	132	148	165	173	189	194	196	190	189
70	68.9	64.4	55.3	51.8	46.8	48.0	46.1	51.5	53.7	63.3	71.2	83.4	98.6	105	117	123	127	124	125
75	24.6	22.9	16.6	15.6	11.9	12.8	11.4	14.3	15.3	22.1	25.4	33.7	44.6	48.4	57.2	61.1	66.3	64.0	65.9
80	2.57	1.95	0.86	0.58	0.41	0.41	0.37	0.45	0.52	1.28	2.45	5.47	10.5	12.2	18.1	19.2	23.4	21.3	23.6
85	0.20	0.15	0.07	0.03	0.00	0.00	0.00	0.02	0.04	0.15	0.21	0.28	0.40	0.48	0.74	1.04	1.55	1.19	1.34
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.12	0.18	0.18	0.20
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.03	0.03	0.02	0.02	0.02
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.06	0.05	0.05	0.04	0.04	0.04
115	0.02	0.03	0.03	0.04	0.04	0.04	0.04	0.03	0.03	0.02	0.01	0.01	0.10	0.09	0.08	0.08	0.07	0.07	0.07
120	0.08	0.08	0.08	0.09	0.10	0.10	0.10	0.09	0.09	0.07	0.07	0.05	0.15	0.16	0.14	0.14	0.13	0.13	0.12
125	0.15	0.14	0.15	0.16	0.17	0.16	0.17	0.15	0.16	0.14	0.13	0.11	0.26	0.26	0.24	0.24	0.23	0.23	0.22
130	0.22	0.21	0.23	0.24	0.25	0.24	0.24	0.23	0.24	0.21	0.20	0.19	0.39	0.39	0.37	0.38	0.37	0.37	0.37
135	0.31	0.31	0.32	0.33	0.35	0.33	0.34	0.33	0.32	0.30	0.29	0.27	0.52	0.53	0.52	0.53	0.53	0.54	0.53
140	0.40	0.40	0.42	0.42	0.43	0.42	0.43	0.42	0.40	0.39	0.36	0.36	0.63	0.65	0.66	0.68	0.68	0.70	0.69
145	0.47	0.49	0.50	0.50	0.53	0.52	0.52	0.51	0.49	0.45	0.42	0.43	0.76	0.79	0.80	0.83	0.84	0.87	0.85
150	0.55	0.57	0.58	0.58	0.61	0.60	0.60	0.59	0.56	0.53	0.49	0.49	0.89	0.92	0.93	0.97	0.99	1.02	0.99
155	0.64	0.67	0.70	0.65	0.66	0.66	0.66	0.65	0.63	0.61	0.61	0.55	1.00	1.02	1.07	1.09	1.11	1.13	1.10
160	0.73	0.75	0.77	0.72	0.71	0.72	0.71	0.72	0.71	0.70	0.69	0.65	1.14	1.15	1.18	1.20	1.21	1.21	1.17
165	0.77	0.80	0.81	0.79	0.78	0.76	0.75	0.78	0.78	0.77	0.74	0.73	1.19	1.22	1.25	1.28	1.27	1.24	1.22
170	0.82	0.85	0.86	0.85	0.82	0.80	0.79	0.80	0.79	0.78	0.77	0.78	1.21	1.23	1.25	1.26	1.25	1.20	1.20
175	0.92	0.94	0.96	0.95	0.93	0.90	0.87	0.88	0.88	0.87	0.85	0.86	1.15	1.18	1.19	1.18	1.16	1.14	1.09
180	1.07	1.10	1.10	1.09	1.06	1.04	1.01	0.98	0.99	0.99	1.00	1.03	1.07	1.10	1.11	1.10	1.07	1.05	1.02

Table--2 UNIT: cd

γ (DEG) \ C (DEG)	285	300	315	330	345
0	1524	1525	1522	1523	1522
5	1529	1526	1524	1520	1521
10	1517	1524	1519	1523	1516
15	1509	1516	1506	1504	1500
20	1493	1496	1479	1464	1433
25	1450	1430	1410	1367	1300
30	1310	1300	1253	1204	1129
35	1058	1064	1033	1014	936
40	816	808	783	784	736
45	633	602	574	577	545
50	449	437	417	417	390
55	319	320	310	308	286
60	242	242	234	231	212
65	181	177	168	161	145
70	117	114	103	95.7	83.2
75	59.9	57.7	48.3	42.4	33.5
80	18.8	18.4	12.2	9.30	5.85
85	0.81	0.70	0.44	0.37	0.30
90	0.14	0.11	0.01	0.00	0.00
95	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.01	0.02
105	0.02	0.02	0.03	0.04	0.06
110	0.04	0.05	0.06	0.07	0.08
115	0.07	0.08	0.09	0.10	0.11
120	0.13	0.13	0.15	0.16	0.18
125	0.23	0.23	0.25	0.25	0.28
130	0.37	0.37	0.38	0.38	0.41
135	0.54	0.53	0.53	0.53	0.55
140	0.69	0.67	0.68	0.66	0.66
145	0.84	0.83	0.82	0.79	0.79
150	0.98	0.96	0.95	0.91	0.91
155	1.10	1.09	1.07	1.06	1.02
160	1.18	1.16	1.15	1.15	1.13
165	1.20	1.21	1.19	1.17	1.17
170	1.19	1.17	1.16	1.17	1.15
175	1.11	1.08	1.08	1.11	1.11
180	0.99	0.99	1.00	1.00	1.03

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************