

## 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

### Security Lighting

Model Name(s):

514041##

Representative (Tested) Model:

51404141

#### Model Difference:

1. Product is Field-adjustable product, Wattage can adjust 7W and 14W.
2. Where ## denotes color temperature 41~50 identifies 4000K.

Prepare by:

*Derek Lai*

Engineer: Derek Lai

Date: 2019-09-24

Review by:

*Vincent Yuan*

Technical Lead: Vincent Yuan

Issue Date: 2019-10-18

Revised Date: N/A

Note:

1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd
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 1<sup>st</sup> North Industry Road, Songshan Lake Science & Technology Park, Dongguan,  
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Tel: 86-769-22212079

Website: <http://www.ntc-cert.com>

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**Product Information:**

Client Name:	ETI Solid State Lighting (Zhuhai) Ltd
Brand Name:	Commercial Electric
Model Number:	514041##(##=41-50)
Product Type:	Outdoor, Security Luminaires
Rating Input:	120Vac, 60Hz, 7W/14W
Declared CCT:	4000 K
Declared Light Output:	1200 lm
LED Manufacturer:	Samsung Electronics Co., LTD.
LED Model:	SPMWHX228FD5WAW0XX
LED Quantity:	30 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:	2019-09-14
Quantity of Receipt Samples:	1 pcs
Sample Number:	190914002-S1

**Laboratory Information:**

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

**Report Information:**

Issued Date of Test Report:	2019-10-18
Revised Date of Test Report:	N/A
Test Report No.:	NTCLR19090162
Remark (If applicable):	1. Product tested with the default maximum wattage, the default maximum wattage is 14W.

<b>Test Specification:</b>	
Date of Test	2019-09-18
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

<b>Test Methods:</b>
<p><b>1. Photometric and Electrical Measurements – Light Distribution Method:</b></p> <p>Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at <math>25\text{ }^{\circ}\text{C} \pm 1^{\circ}\text{C}</math>, 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 <math>1^{\circ}</math> vertical intervals and <math>15^{\circ}</math> horizontal intervals.</p>
<p><b>2. Photometric and Electrical Measurements – Integrating Sphere Method:</b></p> <p>Photometric parameters were measured using an integrating sphere, as spectroradiometer and software. The ambient temperature condition inside the sphere was measured at <math>25\text{ }^{\circ}\text{C} \pm 1^{\circ}\text{C}</math>. 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>

### Integrating Sphere Test Results:

#### Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
24.6	41.0	Face Down	90	10

#### Electrical Data:

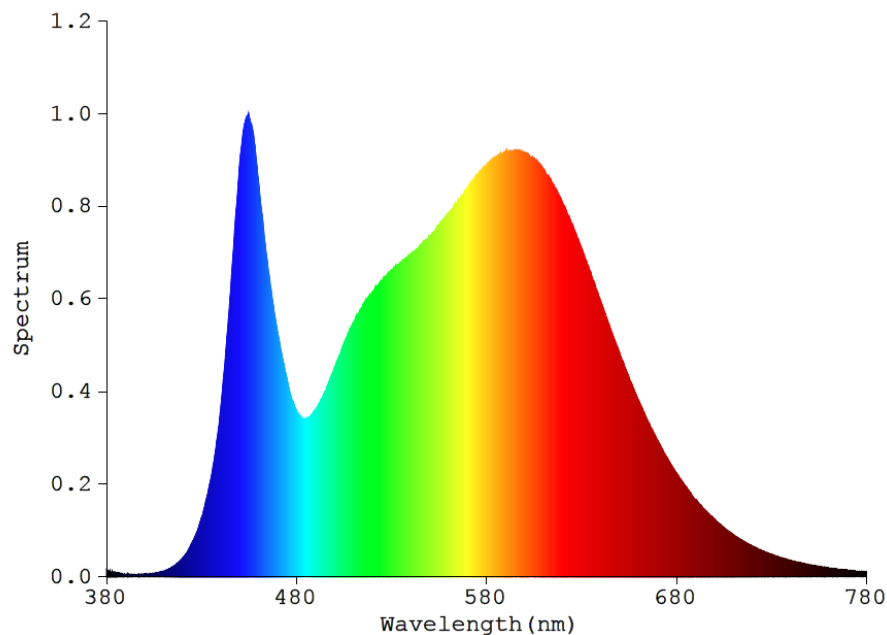
Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	0.1238	14.25	0.9562

#### Color Data:

Parameter	Result
CCT(K)	4105
Ra	85.0
R9	17
Chromaticity, x	0.3757
Chromaticity, y	0.3728
Chromaticity, u'	0.2235
Chromaticity, v'	0.4991
Duv	-0.00044

Special Color Rendering			
R1	84	R9	17
R2	92	R10	81
R3	96	R11	81
R4	82	R12	64
R5	84	R13	87
R6	89	R14	98
R7	86	R15	78
R8	67	-	-

### Spectrum Diagram:



### Goniophotometer Test Results:

#### Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
24.6	41.0	Face Down	90	25

#### Electrical Data:

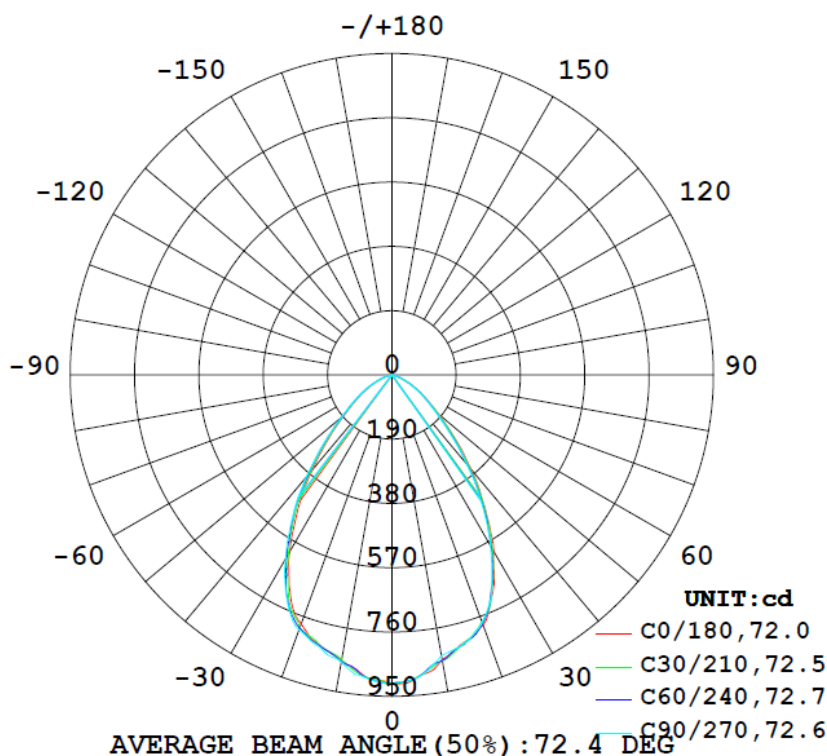
Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	0.1238	14.25	0.9562

#### Goniophotometer Data:

Parameter	Results
Total Luminous (lm)	1336.4
Luminous Efficacy (lm/w)	93.78
Zonal Lumens Distribution (0-85°)	100%
Zonal Lumens Distribution (90-180°)	0.1%
Beam Angle (°)	72.4

### Luminous Intensity Distribution Diagram:

#### LUMINOUS INTENSITY DISTRIBUTION DIAGRAM

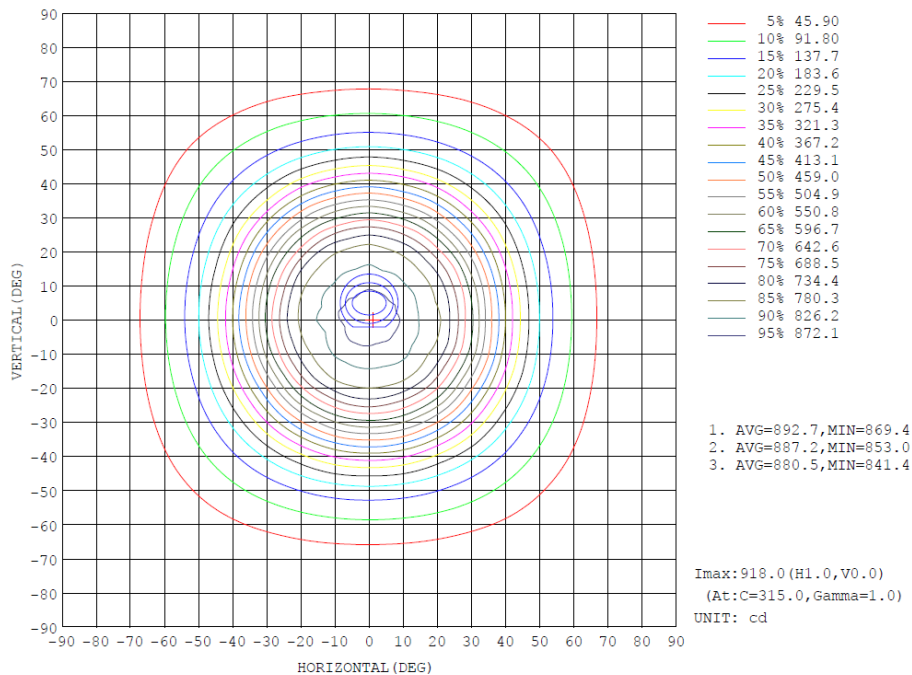


## Zonal Flux Diagram:

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	854.4	857.4	842.6	855.6	856.8	860.3	861.9	867.2	0~ 10	84.26	84.26	6.3, 6.3
20	787.5	782.4	779.2	780.7	783.6	793.4	801.3	788.2	10~ 20	232.7	317.0	23.7, 23.7
30	602.8	595.6	583.4	587.1	605.7	616.6	628.2	615.9	20~ 30	324.5	641.5	48, 48
40	363.2	356.9	344.8	351.6	366.1	384.1	393.5	380.4	30~ 40	302.2	943.6	70.6, 70.6
50	181.3	173.0	167.3	172.1	182.1	189.3	194.6	191.3	40~ 50	204.3	1148	85.9, 85.9
60	86.55	83.73	81.34	83.76	89.23	93.69	96.25	92.73	50~ 60	115.9	1264	94.6, 94.6
70	30.03	28.10	26.47	28.61	32.20	33.69	35.00	33.50	60~ 70	56.55	1320	98.8, 98.8
80	1.740	1.012	0.6987	1.430	2.495	3.183	3.795	3.176	70~ 80	15.01	1335	99.9, 99.9
90	0	0	0	0	0	0	0	0	80~ 90	0.3009	1336	99.9, 99.9
100	0	0	0	0	0	0	0	0	90~ 100	0	1336	99.9, 99.9
110	0	0	0	0	0	0	0	0	100~ 110	0	1336	99.9, 99.9
120	0	0	0	0	0.0149	0.0144	0.0128	0.0134	110~ 120	0.0006	1336	99.9, 99.9
130	0.0277	0.0332	0.0383	0.0338	0.1379	0.1470	0.1515	0.1404	120~ 130	0.0352	1336	100, 100
140	0.1203	0.1309	0.1388	0.1266	0.2707	0.3159	0.3260	0.3048	130~ 140	0.1168	1336	100, 100
150	0.2084	0.2309	0.2401	0.2199	0.4110	0.4724	0.4880	0.4582	140~ 150	0.1745	1336	100, 100
160	0.3011	0.3161	0.2988	0.3075	0.5618	0.6024	0.5973	0.5779	150~ 160	0.1817	1336	100, 100
170	0.3641	0.3858	0.3559	0.3452	0.5786	0.6085	0.5851	0.5682	160~ 170	0.1320	1336	100, 100
180	0.4918	0.5045	0.4774	0.4614	0.4922	0.5052	0.4798	0.4621	170~ 180	0.0447	1336	100, 100
DEG	LUMINOUS INTENSITY:cd Less than 35% Percent = 7.8 %									UNIT:lm		

## Isocandela Diagram:



# Luminous Distribution Intensity Data:

Table--1

UNIT: cd

C (DEG) γ (DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
0	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912	912
5	895	894	895	904	896	891	896	895	889	889	889	891	895	896	896	893	898	901	898
10	854	859	858	857	858	858	843	853	856	856	853	854	857	864	855	860	860	860	862
15	819	823	820	829	824	822	822	819	821	826	823	815	825	822	827	824	828	829	831
20	787	789	776	782	783	779	779	780	785	781	779	784	784	789	795	793	797	799	801
25	706	714	700	707	696	694	699	699	695	702	699	709	712	712	723	727	731	726	733
30	603	606	595	596	587	585	583	581	583	587	587	601	606	608	613	617	623	621	628
35	479	486	475	477	467	469	462	466	465	471	471	482	484	490	498	500	508	509	511
40	363	364	356	357	347	350	345	348	347	352	354	363	366	370	377	384	386	389	394
45	261	262	255	253	245	245	241	246	247	249	252	260	263	264	274	273	279	280	282
50	181	181	176	173	169	168	167	168	170	172	174	177	182	185	189	189	192	194	195
55	126	125	122	121	119	119	118	119	119	121	123	125	129	130	133	135	137	138	138
60	86.5	86.2	84.1	83.7	82.1	82.1	81.3	81.9	82.0	83.8	84.9	86.7	89.2	89.9	92.1	93.7	95.5	96.3	96.2
65	54.8	54.8	52.5	52.3	50.9	50.8	50.4	51.1	51.4	53.0	53.9	55.7	57.5	57.3	59.6	60.1	61.6	61.5	61.9
70	30.0	30.0	28.2	28.1	27.0	26.9	26.5	27.2	27.4	28.6	29.4	30.8	32.2	32.0	33.4	33.7	34.8	34.6	35.0
75	12.4	12.6	11.2	11.2	10.3	10.4	9.97	10.6	10.6	11.5	11.8	13.0	13.9	13.6	14.9	14.7	15.6	15.4	15.9
80	1.74	1.70	1.10	1.01	0.69	0.73	0.70	0.96	1.14	1.43	1.60	2.00	2.49	2.50	3.05	3.18	3.57	3.66	3.79
85	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.07	0.07	0.07	0.07	0.06
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	0.00	0.00	0.00	0.00	0.00
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	0.00	0.00	0.00	0.00	0.00	0.00
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	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115	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
120	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	0.02	0.01	0.01	0.01	0.01	0.01
125	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	0.07	0.07	0.07	0.07	0.07	0.07
130	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.14	0.14	0.14	0.15	0.15	0.15	0.15
135	0.07	0.08	0.08	0.08	0.09	0.08	0.09	0.09	0.08	0.08	0.08	0.07	0.21	0.22	0.22	0.23	0.24	0.24	0.24
140	0.12	0.13	0.13	0.13	0.14	0.14	0.14	0.14	0.13	0.13	0.12	0.12	0.27	0.28	0.30	0.32	0.32	0.33	0.33
145	0.17	0.18	0.18	0.19	0.20	0.20	0.19	0.19	0.19	0.18	0.16	0.16	0.34	0.36	0.37	0.40	0.41	0.42	0.41
150	0.21	0.22	0.23	0.23	0.24	0.24	0.24	0.24	0.23	0.22	0.20	0.20	0.41	0.43	0.44	0.47	0.49	0.50	0.49
155	0.25	0.27	0.29	0.28	0.28	0.28	0.27	0.28	0.27	0.26	0.26	0.23	0.48	0.48	0.52	0.54	0.55	0.56	0.55
160	0.30	0.32	0.33	0.32	0.31	0.31	0.30	0.32	0.31	0.31	0.31	0.29	0.56	0.56	0.58	0.60	0.61	0.61	0.60
165	0.33	0.36	0.36	0.36	0.35	0.33	0.33	0.35	0.34	0.35	0.33	0.32	0.57	0.59	0.60	0.63	0.63	0.61	0.61
170	0.36	0.39	0.39	0.39	0.36	0.35	0.36	0.36	0.36	0.35	0.34	0.35	0.58	0.59	0.60	0.61	0.61	0.59	0.59
175	0.41	0.43	0.44	0.43	0.41	0.41	0.39	0.40	0.40	0.39	0.39	0.39	0.53	0.55	0.56	0.55	0.55	0.53	0.52
180	0.49	0.51	0.51	0.50	0.49	0.48	0.48	0.45	0.45	0.46	0.47	0.49	0.49	0.51	0.51	0.51	0.49	0.48	0.48

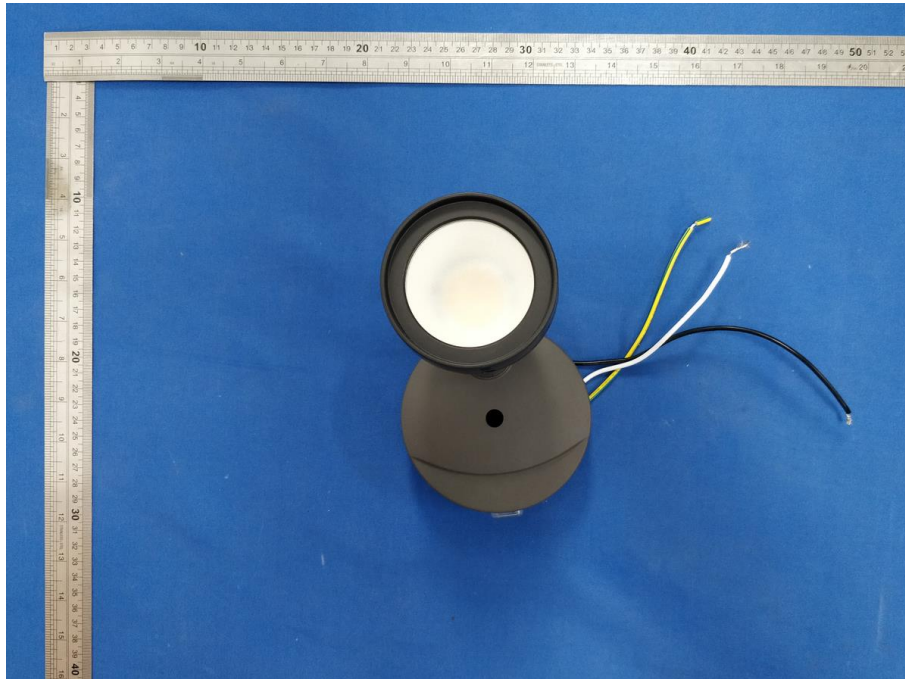
Table--2

UNIT: cd

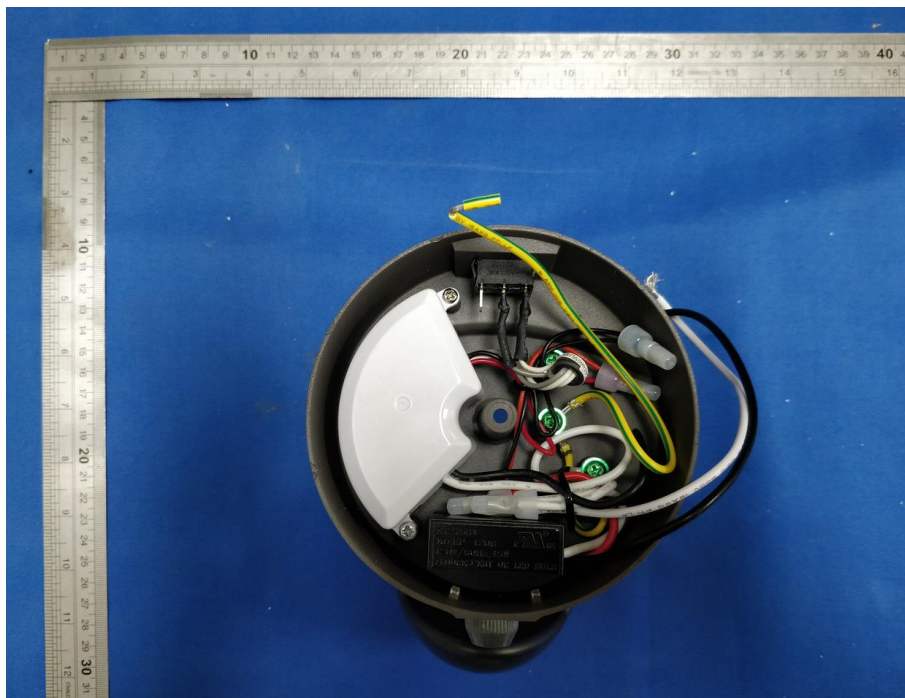
C (DEG) γ (DEG)	285	300	315	330	345														
0	912	912	912	912	912														
5	894	898	905	909	904														
10	860	861	867	868	858														
15	826	830	828	829	826														
20	799	792	788	788	784														
25	728	727	721	718	718														
30	622	622	616	620	612														
35	504	504	497	496	491														
40	385	386	380	381	371														
45	276	278	275	273	266														
50	194	194	191	188	185														
55	137	136	134	132	129														
60	95.3	94.3	92.7	91.3	89.2														
65	60.8	61.0	59.6	59.1	57.1														
70	34.4	34.4	33.5	33.2	31.7														
75	15.3	15.5	14.7	14.6	13.4														
80	3.65	3.55	3.18	2.86	2.31														
85	0.06	0.05	0.05	0.04	0.04														
90	0.00	0.00	0.00	0.00	0.00														
95	0.00	0.00	0.00	0.00	0.00														
100	0.00	0.00	0.00	0.00	0.00														
105	0.00	0.00	0.00	0.00	0.00														
110	0.00	0.00	0.00	0.00	0.00														
115	0.00	0.00	0.00	0.00	0.00														
120	0.01	0.01	0.01	0.01	0.01														
125	0.07	0.07	0.07	0.07	0.07														
130	0.15	0.15	0.14	0.14	0.14														
135	0.24	0.23	0.22	0.21	0.21														
140	0.32	0.31	0.30	0.28	0.28														
145	0.40	0.40	0.38	0.36	0.35														
150	0.48	0.46	0.46	0.43	0.42														
155	0.55	0.54	0.52	0.52	0.49														
160	0.60	0.59	0.58	0.58	0.56														
165	0.60	0.60	0.59	0.58	0.58														
170	0.58	0.56	0.57	0.57	0.57														
175	0.53	0.51	0.52	0.53	0.53														
180	0.45	0.45	0.46	0.47	0.49														



**Photo of Sample:**







**Equipment List:**

Equipment ID	Equipment Name	Last Cal.	Due Cal.
NTC-F01-001	Goniophotometer System	2018-11-16	2019-11-15
NTC-F01-006	2.0 meter Integrating Sphere	2018-11-16	2019-11-15
NTC-F01-012	Standard Lamp	2018-11-13	2019-11-12
NTC-F01-013	Standard Lamp	2018-11-13	2019-11-12
NTC-F01-031	Digital Power Meter	2019-08-22	2020-08-21
NTC-F01-019	Temperature & Humidity Meter	2018-11-12	2019-11-11

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