

LM-79-08 Test Report

For

Antec Lighting Inc

(Brand Name: )
Quality, Honesty, Service and Innovation

Uniy C, 3979 E Guasti Road, Ontario, CA 91761

Model name(s):

AOK-50WiP-NV-L3-XX-XX80-T5-A

Report Type: Testing and Report According to IES LM-79-2008
Type of Luminaire: Outdoor Pole/Arm-Mounted Area and Roadway Luminaires
Report Date: 2019-03-25
Ningbo TengLi Testing Co., Ltd
Prepared By: 2nd floor, Block B, Ningbo Testing and Certification Base,
No. 66 Qingyi Road, Ningbo National Hi-Tech Zone,
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Test & Report By:

Xeon Ren

Engineer: Xeon Ren

Review By:

Johnson Sun

Manager: Johnson Sun

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

1.1 Product Information:		
Model Number	AOK-50WiP-NV-L3-XX-XX80-T5-A	
Remark	The first “XX” can be “00” for without sensor or “SN” for with sensor function or “PH” for Plug-In photocontrol The second “XX” represents different CCT as below: 30=3000K, 35=3500K, 40=4000K, 50=5000K, 57=5700K;	
Representative (Tested) Model	AOK-50WiP-NV-L3-00-3080-T5-A AOK-50WiP-NV-L3-00-5780-T5-A	
Model Difference	All construction and rating are the same, except CCT	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Outdoor Pole/Arm-Mounted Area and Roadway Luminaires	
LED Manufacturer	LUMILEDS	
LED Model	3000K: L130-3080003000X21 5000K: L130-5780003000X21	
Dimming	Dimmable	
Sample Number	JAE180920-OTB1(3000K) JAE180920-OTB2(5700K)	
Date of Receipt	2019-03-08	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

1.2 Rated Values:	
Rated Voltage / Frequency	100-277Vac, 50/60Hz
Nominal Power	50W
Rated Initial Lamp Lumen	--
Declared CCT	3000K, 3500K, 4000K, 5000K, 5700K;

1.3 Test Specifications:

Test item	<ol style="list-style-type: none"> 1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Electrical Parameters
Reference Standard	<ol style="list-style-type: none"> 1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2015 Specifications for the Chromaticity of Solid State Lighting Products 3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 4. CIE 15-2004 Technical Report Colorimetry 5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source 6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	QD25

1.4 Test Methods

1) Photometric and Light Distribution Measurement – Goniophotometer Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, 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 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals.

2) Chromaticity Measurement – Sphere-Spectroradiometer Method:

Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral power distribution taken at 5 nm intervals over the range of 380 to 780 nm.

3) Electrical Measurements:

Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Voltage, frequency, current, power, power factor and total harmonic distortion were measured by and read from the power meter.

2.1 Summary of Test Result

Criteria Item	Measured Value			Compliance	Requirement (DLC V4.4)	
Power (W)	3000K	120V	49.07	N/A	N/A	
		277V	48.04			
	5700K	120V	48.99			
		277V	48.26			
Power Factor	3000K	120V	0.9964	Pass	>= 0.9(-3%)	
		277V	0.9156			
	5700K	120V	0.9942			
		277V	0.9210			
THD %	3000K	120V	2.12	Pass	<= 20(+5)	
		277V	5.75			
	5700K	120V	2.37			
		277V	5.42			
CRI	3000K	82.9		Pass	>= 65(-2)	
	5700K	82.5				
CCT (K)	3000K	3062		Pass	<=5700K	
	5700K	5516				
Luminous Intensity Distribution	Zonal lumens in the 0-90 °		99.6%	Pass	>= 100(-1)	
	Zonal lumens in the 80-90 °		0.5%	Pass	<= 10(+3)	
Total Luminous	3000K	120V	5955.0	Pass	>=1000(-10%)	
		277V	6023.7			
	5700K	120V	6274			
		277V	6386			
Luminous Efficacy	3000K	120V	121.36	Pass	Standard: >= 95(-3%)	Premium: >= 115(-3%)
		277V	125.39			
	5700K	120V	128.07			
		277V	132.32			

2.2 Electrical, Photometric and Chromaticity Measurements

Test date	2019-03-19	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	AOK-50WiP-NV-L3-00-3080-T5-A		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JAE180920-OTB1	120.0	60	0.4104	49.07	0.9964	2.12
	277.1	60	0.1894	48.04	0.9156	5.75

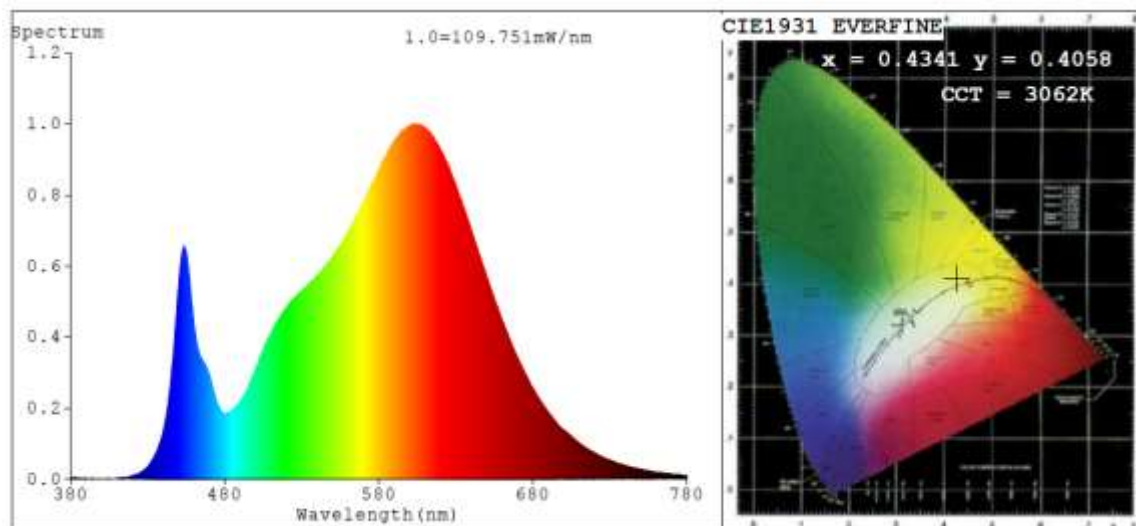
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	8
Frequency (Hz)	60	R2	91	R10	79
CCT (K)	3062	R3	97	R11	80
Duv	0.0011	R4	81	R12	66
Chromaticity (x, y)	x=0.4341 y=0.4058	R5	81	R13	84
Chromaticity (u', v')	u'=0.2480 v'=0.5216	R6	89	R14	99
Color Rendering Index (CRI)	82.9	R7	83	R15	74
R9	8	R8	60	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	5955.0	6023.7
Luminous Efficacy (lm/W)	121.36	125.39
Zonal lumens in the 0-90 °	99.6%	--
Zonal lumens in the 80-90 °	0.5%	--
Beam Angle (°)	142.0	--
Center Beam Candle Power (cd)	938	--

Spectral Power Distribution & Chromaticity Diagram



Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	807.6	13.6%
0-40	1,492.3	25.1%
0-60	4,164.7	69.9%
60-90	1,768.2	29.7%
70-100	384.1	6.5%
90-120	15.3	0.3%
0-90	5,932.9	99.6%
90-180	21.6	0.4%
0-180	5,954.5	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	90.3	1.5%	90-100	6.3	0.1%
10-20	268.2	4.5%	100-110	4.9	0.1%
20-30	449.1	7.5%	110-120	4.0	0.1%
30-40	684.7	11.5%	120-130	2.9	0%
40-50	1,077.1	18.1%	130-140	1.7	0%
50-60	1,595.4	26.8%	140-150	0.9	0%
60-70	1,390.3	23.3%	150-160	0.5	0%
70-80	348.7	5.9%	160-170	0.2	0%
80-90	29.1	0.5%	170-180	0.1	0%

Photometric Data

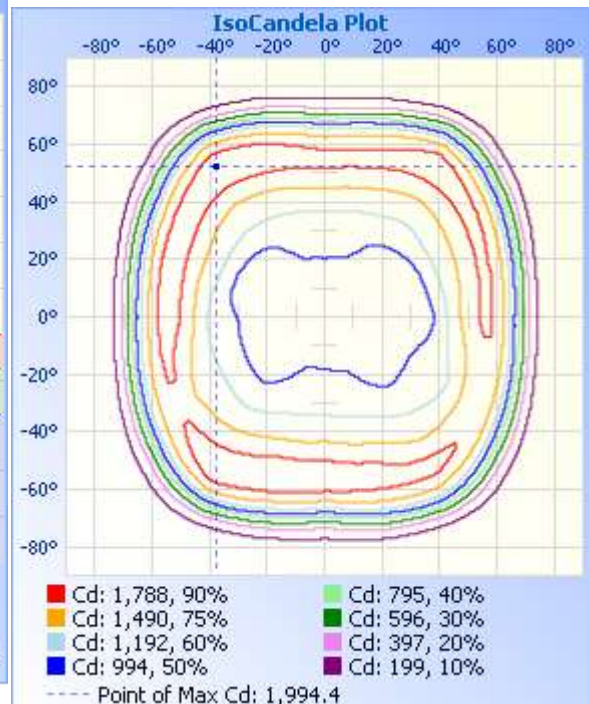
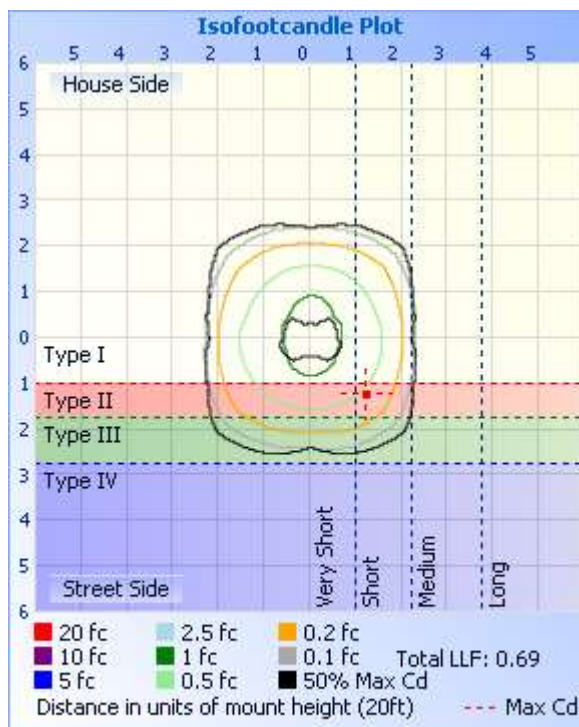
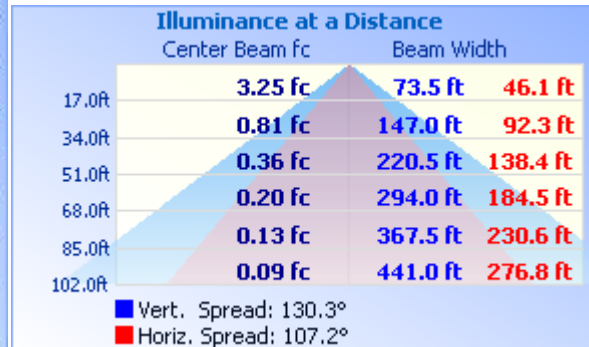
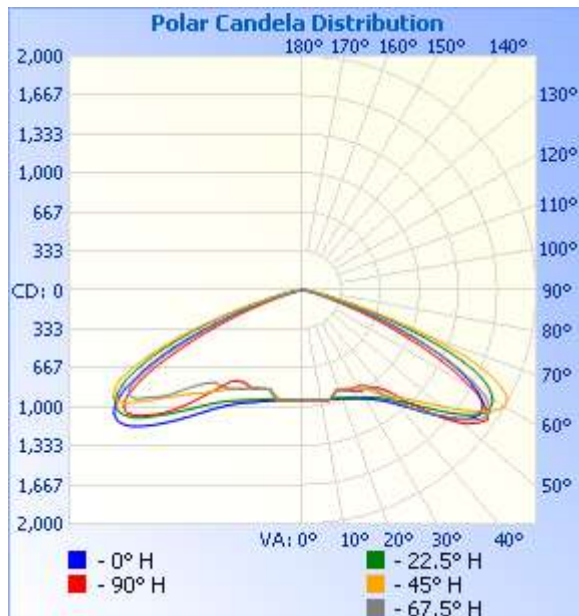


Table--1

UNIT: cd

C (DEG) γ (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5			
0	938	938	938	938	938	938	938	938	938	938	938	938	938	938	938	938			
5	943	936	942	938	939	939	940	942	945	943	946	944	940	940	941	942			
10	953	948	951	947	950	949	951	955	954	953	963	957	956	954	956	953			
15	933	926	932	962	964	962	948	949	961	948	965	979	979	973	950	938			
20	900	889	889	979	989	983	901	907	906	904	906	1006	1012	994	899	899			
25	934	906	909	1009	1022	1014	925	938	946	937	942	1050	1058	1036	929	925			
30	934	894	937	1053	1073	1058	959	951	991	987	985	1106	1122	1089	968	977			
35	947	973	1051	1119	1147	1123	1068	1022	1018	1078	1054	1190	1221	1163	1030	1028			
40	1074	1164	1146	1221	1276	1232	1190	1240	1128	1192	1181	1328	1377	1283	1129	1063			
45	1366	1329	1262	1393	1477	1396	1327	1462	1428	1281	1355	1532	1585	1460	1245	1121			
50	1654	1563	1450	1617	1709	1629	1545	1706	1764	1445	1564	1778	1811	1681	1412	1320			
55	1834	1779	1704	1813	1853	1846	1806	1902	1934	1711	1790	1949	1940	1864	1647	1600			
60	1671	1816	1918	1810	1727	1879	1990	1799	1667	1723	1953	1906	1805	1852	1871	1722			
65	1087	1404	1822	1510	1281	1616	1819	1297	1091	1321	1810	1529	1336	1527	1639	1264			
70	478	675	1168	883	665	951	1149	612	476	629	1099	910	674	945	1020	618			
75	129	180	410	325	248	351	376	168	134	182	355	343	271	361	319	172			
80	34.1	45.0	96.1	99.9	87.4	107	90.8	46.4	36.4	45.1	80.5	111	102	111	70.8	43.4			
85	12.1	15.7	23.2	24.5	22.6	26.5	23.7	16.2	13.0	13.2	17.5	27.9	24.8	26.3	16.3	13.2			
90	6.03	8.84	11.9	10.7	9.17	10.6	11.9	8.91	6.03	4.90	3.30	2.58	3.32	2.53	3.50	4.94			
95	5.35	8.47	11.4	8.32	7.42	8.28	11.4	8.52	5.25	3.73	2.41	1.32	0.95	1.31	2.54	3.74			
100	5.06	7.92	9.22	7.45	6.91	7.38	9.24	8.01	4.98	3.15	2.51	1.42	0.63	1.37	2.58	3.19			
105	5.06	6.90	7.76	6.32	6.10	6.27	7.93	7.12	5.11	2.95	2.57	1.61	1.03	1.68	2.75	2.96			
110	5.22	6.03	6.12	6.18	5.70	6.17	6.24	6.44	5.15	2.97	2.58	2.18	1.37	2.21	2.78	2.97			
115	5.19	4.82	5.14	5.32	5.75	5.57	4.87	5.22	5.19	2.92	2.59	2.37	1.81	2.36	2.82	2.98			
120	5.02	4.08	4.10	4.43	4.70	4.83	3.98	4.49	5.32	3.90	2.19	2.37	1.85	2.44	2.07	4.06			
125	4.10	3.05	3.75	3.64	2.97	4.10	3.21	3.30	4.61	4.66	1.51	2.20	1.89	2.44	1.85	4.42			
130	2.69	2.55	3.84	2.77	2.31	2.72	3.10	2.61	2.71	4.54	1.83	1.66	1.84	1.65	2.08	3.99			
135	2.03	2.03	4.68	1.82	1.89	1.79	3.79	1.90	1.69	2.12	2.04	1.38	1.36	1.18	1.97	1.84			
140	1.53	1.50	4.29	1.26	1.63	1.26	4.74	1.50	1.38	1.21	1.22	0.87	1.16	0.92	1.16	1.18			
145	1.08	2.05	3.47	1.03	1.34	1.15	4.64	1.53	0.76	0.87	0.79	0.75	0.87	0.73	0.82	0.76			
150	0.76	3.71	1.66	0.87	1.08	0.95	1.24	3.29	0.70	0.81	0.56	0.64	0.76	0.69	0.68	0.71			
155	1.92	2.63	0.74	0.76	0.81	0.84	0.79	2.42	1.63	0.75	0.56	0.67	0.69	0.64	0.62	0.61			
160	1.19	0.98	0.73	0.73	0.79	0.84	0.82	0.87	0.84	0.74	0.72	0.76	0.70	0.68	0.61	0.55			
165	0.92	0.89	0.79	0.76	0.78	0.84	0.83	1.27	1.27	1.26	0.88	0.79	0.72	0.71	0.76	0.75			
170	0.91	0.91	0.80	0.79	0.77	0.84	0.83	1.12	1.03	0.91	0.89	0.79	0.76	0.73	0.79	0.77			
175	0.90	0.90	0.82	0.81	0.76	0.84	0.84	1.00	0.88	0.85	0.90	0.79	0.80	0.75	0.81	0.78			
180	0.90	0.89	0.87	0.82	0.76	0.84	0.84	0.90	0.84	0.84	0.90	0.79	0.81	0.76	0.82	0.82			

2.3 Electrical, Photometric and Chromaticity Measurements

Test date	2019-03-15	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	AOK-50WiP-NV-L3-00-5780-T5-A		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JAE180920-OTB2	120.0	60	0.4106	48.99	0.9942	2.37
	277.0	60	0.1891	48.26	0.9210	5.42

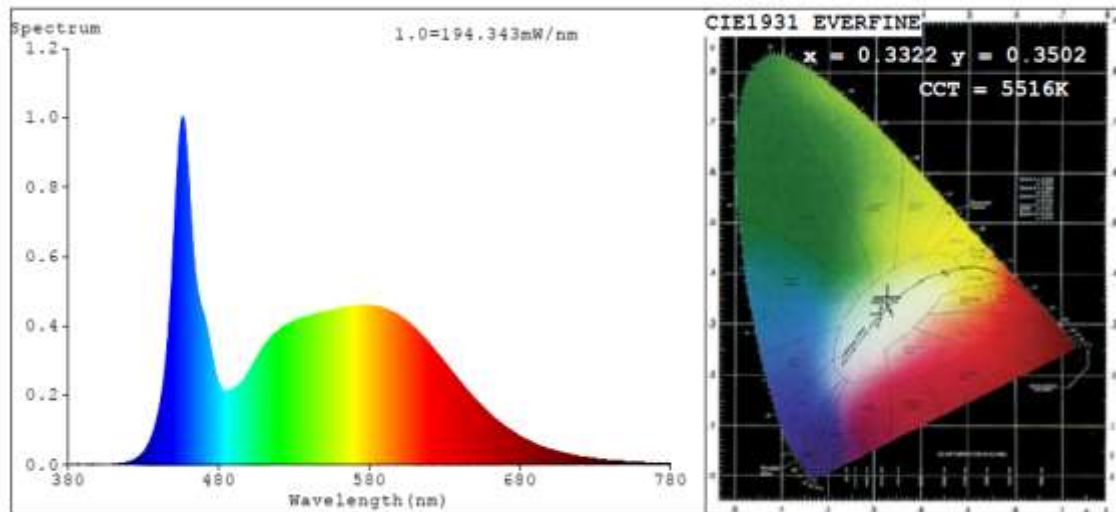
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	4
Frequency (Hz)	60	R2	91	R10	76
CCT (K)	5516	R3	94	R11	77
Duv	0.0048	R4	78	R12	54
Chromaticity (x, y)	x=0.3322 y=0.3502	R5	80	R13	84
Chromaticity (u', v')	u'=0.2032 v'=0.4821	R6	85	R14	97
Color Rendering Index (CRI)	82.5	R7	85	R15	75
R9	4	R8	65	--	--

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	6274	6386
Luminous Efficacy (lm/W)	128.07	132.32

Spectral Power Distribution & Chromaticity Diagram



.4 Performance Assessment:

Model name	CCT(K)	Total Luminous (lm)	Power (W)	Luminous Efficacy (lm/W)
AOK-50WiP-NV-L3-00-3080-T5-A	3000K	5955.0	49.07	121.36
AOK-50WiP-NV-L3-00-3580-T5-A	3500K	6019 ^{*1}	49.03 ^{*2}	122.76 ^{*3}
AOK-50WiP-NV-L3-00-4080-T5-A	4000K	6083 ^{*1}	49.03 ^{*2}	124.07 ^{*3}
AOK-50WiP-NV-L3-00-5080-T5-A	5000K	6210 ^{*1}	49.03 ^{*2}	126.66 ^{*3}
AOK-50WiP-NV-L3-00-5780-T5-A	5700K	6274	48.99	128.07

*1: This value is calculated and the calculation formula is as below:

$$6019 = (6274 - 5955.0) / 5 * 1 + 5955.0$$

$$6083 = (6274 - 5955.0) / 5 * 2 + 5955.0$$

$$6210 = (6274 - 5955.0) / 5 * 4 + 5955.0$$

*2: This value is calculated and the calculation formula is as below:

$$49.03 = (49.07 + 48.99) / 2$$

*3: This value is calculated and the calculation formula is as below:

$$122.76 = 6019 / 25.96$$

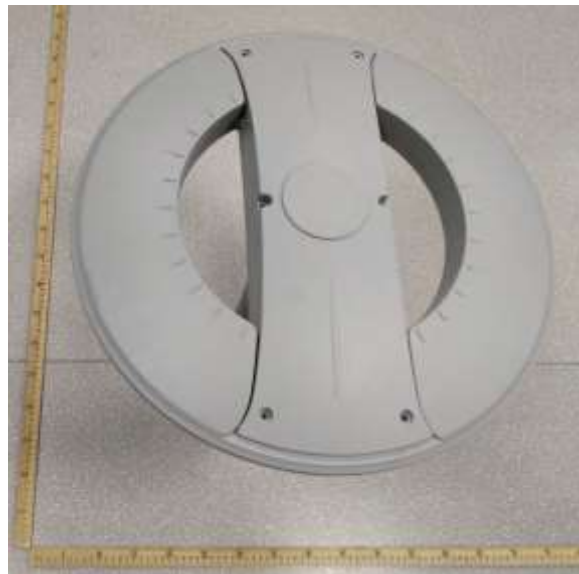
$$124.07 = 6083 / 25.96$$

$$126.66 = 6210 / 25.96$$

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-702	2 meter Integrating Sphere	Verified by D204 standard lamp	
ST-R-701	Spectral analysis system HAAS-2000	Verified by D204 standard lamp	
ST-R-705	Standard Lamp	2019-02-07	2020-02-06
ST-R-704	Power Meter for Integrating Sphere	2019-01-06	2020-01-05
ST-R-714	Goniophotometer system	Verified by D908S standard lamp	
ST-R-710	Standard Lamp	2019-02-12	2020-02-11
ST-R-711	Power Meter for Goniophotometer	2019-01-06	2020-01-05
Uncertainty: Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

4. Product Photo



******* END OF REPORT *******