

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

Architectural Flood and Spot Luminaires

Model name(s): AOK-960WoF-NV-L5-XX-XX70-15-P

Remark: The first "XX" can be "00" for without sensor or "PH" for Plug-In photocontrol, The last "XX" represents different CCT as below: 30=3000K, 40=4000K, 50=5000K, 57=5700K, "P" represents mounting option which can be as following: A; B; C

Representative (Tested) Model:

AOK-960WoF-NV-L5-00-3070-15-C

AOK-960WoF-NV-L5-00-5770-15-C

Model Different: All construction and rating are the same, except CCT

Test & Report By:

Leo Wang

Engineer: Leo Wang

Date: Jan.16,2020

Review By:

Garman Mo

Manager: Garman Mo

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 A2LA, or any agency of the Federal Government.

1.1 Product Information:


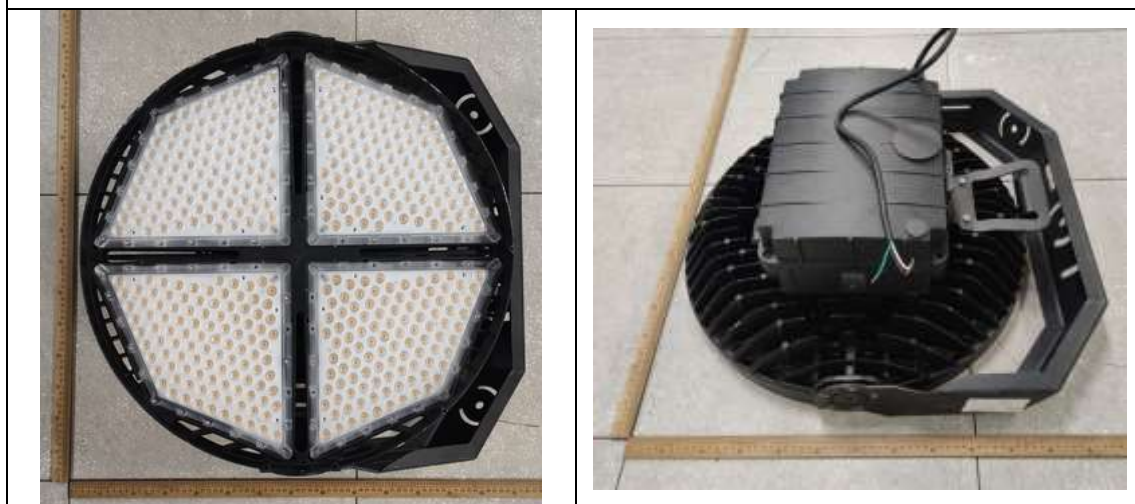
Organization Name	Antec Lighting Inc	
Brand Name	 Quality, Honesty, Service and Innovation	
Model Number	AOK-960WoF-NV-L5-XX-XX70-15-P	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Architectural Flood and Spot Luminaires	
Rated Voltage / Frequency	100-277Vac, 50/60Hz	
Nominal Power	960W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,4000K,5000K,5700K	
LED Manufacturer	LUMILEDS	
LED Model	LUXEON 5050	
Sample Number	JAE191234-C1(3000K),C2(5700K)	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Photo


1.2 Test Specifications:

Date of Receipt	Dec.29,2019
Date of Test	Dec.31,2019
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 C78.377-2008 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

1.3 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 Electrical, Photometric and Chromaticity Measurements

Test date	2019-12-31	Test Ambient:	25±1 °C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	AOK-960WoF-NV-L5-00-3070 -15-C	Total Operating Time (min)	90

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JAE191234-	120.1	60	8.505	1021	0.9995	2.48
C1	277.2	60	3.497	953.9	0.9841	8.41
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer

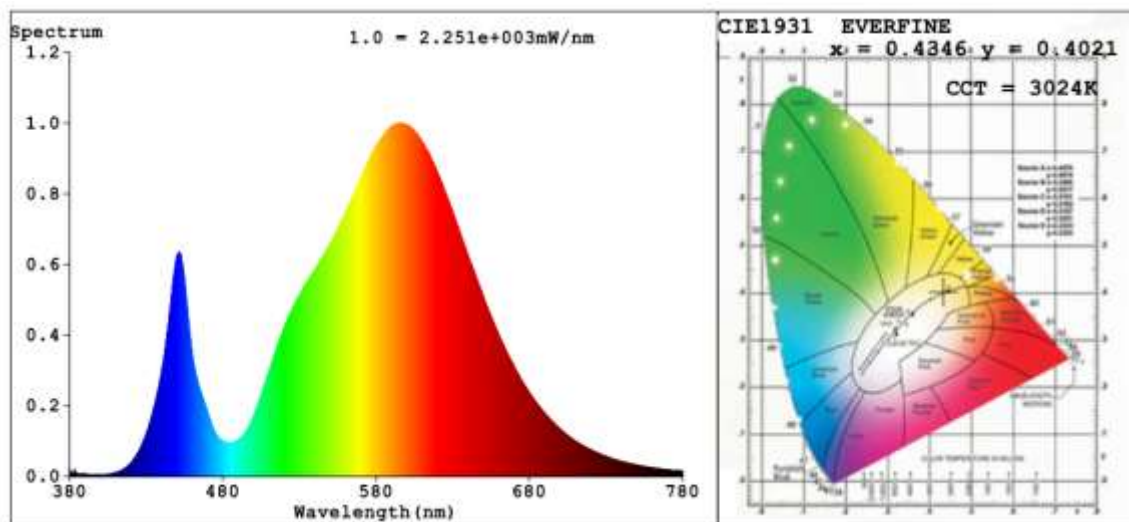
Method(Self-absorption:1.1205):

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	70	R9	0
Frequency (Hz)	60	R2	83	R10	59
CCT (K)	3024	R3	92	R11	64
Duv	-0.0005	R4	70	R12	48
Chromaticity (x, y)	x=0.4346 y=0.4021	R5	69	R13	73
Chromaticity (u', v')	u'=0.2499 v'=0.5202	R6	75	R14	95
Color Rendering Index (CRI)	73.3	R7	80	R15	64
R9	0	R8	49	--	--

Photometric Measurement – Goniophotometer Method(Test Distance: 26.000m):

Parameter	Result		DLC V4.4 Pass Criteria	
Test Voltage (V)	120.1	277.2	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	137469	136199	>=10000 (-10%)	
Luminous Efficacy (lm/W)	134.64	142.79	Standard: >= 105(-3%)	Premium: >= 130(-3%)
Zonal lumens in the 0-90 °zone (%)	99.6	--	>= 85(-3)	
Beam Angle (°)	21.1	--	--	
Center Beam Candle Power (cd)	448318	--	--	

Spectral Power Distribution & Chromaticity Diagram

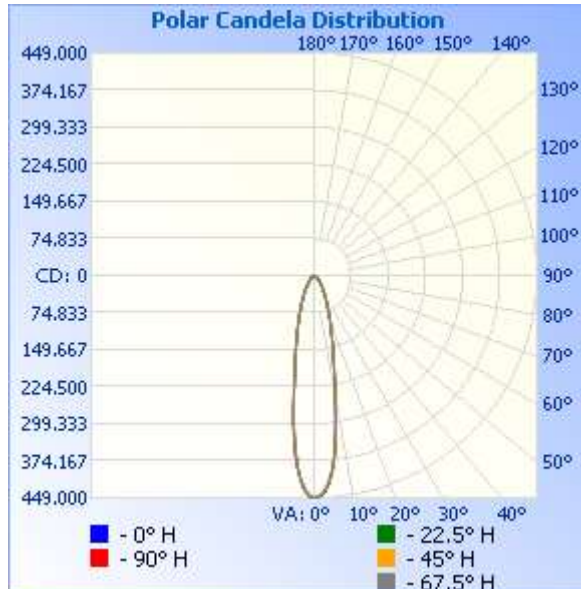


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	99,414.7	72.4%
0-40	115,758.5	84.3%
0-60	131,671.0	95.9%
60-90	5,124.0	3.7%
70-100	1,702.9	1.2%
90-120	46.5	0%
0-90	136,795.0	99.6%
90-180	569.6	0.4%
0-180	137,364.6	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	32,363.3	23.6%	90-100	8.8	0%
10-20	39,875.6	29.0%	100-110	14.1	0%
20-30	27,175.8	19.8%	110-120	23.6	0%
30-40	16,343.8	11.9%	120-130	41.8	0%
40-50	9,884.5	7.2%	130-140	67.6	0%
50-60	6,028.0	4.4%	140-150	107.3	0.1%
60-70	3,429.9	2.5%	150-160	153.1	0.1%
70-80	1,488.7	1.1%	160-170	114.9	0.1%
80-90	205.4	0.1%	170-180	38.3	0%

Photometric Data



Illuminance at a Distance

Center Beam fc	Beam Width
28,019.9 fc	1.5 ft 1.5 ft
7,005.0 fc	3.0 ft 3.0 ft
3,113.3 fc	4.5 ft 4.5 ft
1,751.2 fc	6.0 ft 6.0 ft
1,120.8 fc	7.5 ft 7.5 ft

Vert. Spread: 21.3°
Horiz. Spread: 21.4°

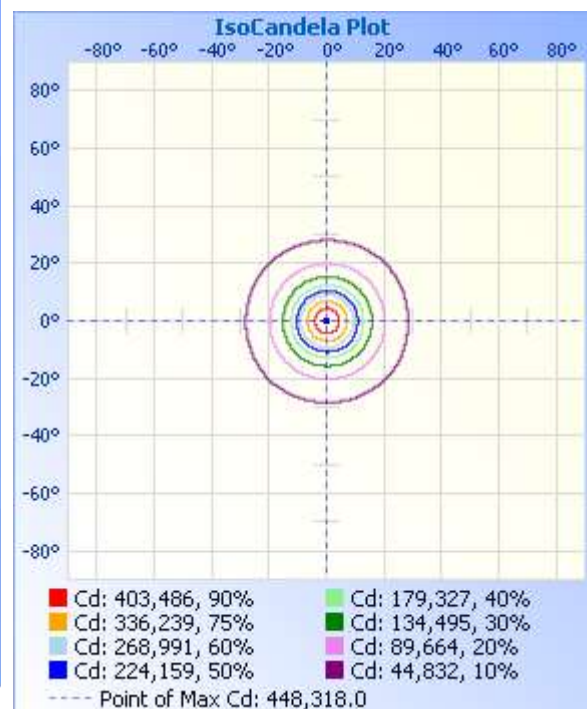
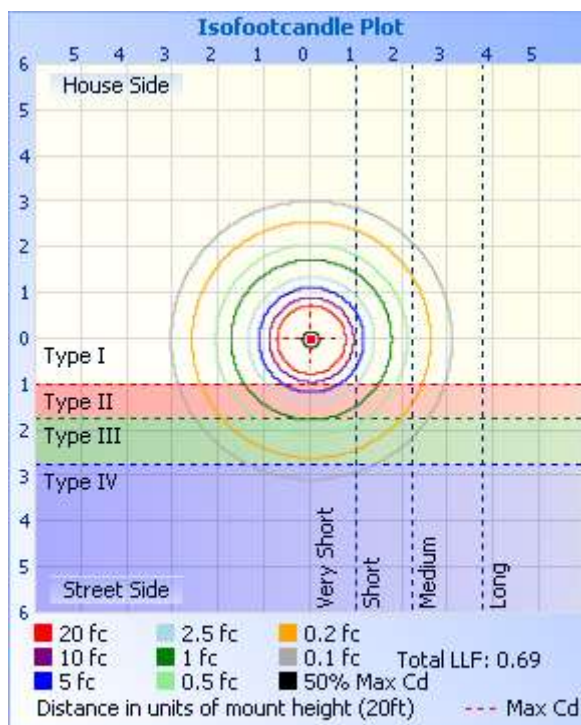


Table--1 UNIT: ×100cd

C (DEG) □ (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	4483	4483	4483	4483	4483	4483	4483	4483	4483	4483	4483	4483	4483	4483	4483	4483	
5	3885	3919	3966	4002	4027	4031	4023	4007	3998	3957	3916	3885	3873	3864	3863	3868	
10	2368	2396	2425	2447	2457	2465	2455	2432	2446	2412	2375	2340	2332	2329	2336	2355	
15	1408	1421	1434	1444	1443	1451	1440	1432	1417	1411	1397	1386	1383	1382	1385	1395	
20	883	895	902	908	908	912	910	903	906	901	893	886	882	882	882	887	
25	573	580	585	589	592	593	592	590	591	587	580	577	575	572	571	576	
30	379	384	388	392	395	396	396	394	395	392	387	384	383	382	381	384	
35	249	250	251	257	260	259	258	260	261	256	251	250	250	246	244	249	
40	170	172	174	177	179	180	180	180	180	178	174	171	171	169	168	171	
45	123	124	125	126	127	128	128	129	129	127	124	123	123	121	120	123	
50	91.6	92.8	93.9	94.7	94.7	95.2	95.8	96.4	96.0	95.1	93.5	92.2	91.4	90.3	90.3	91.8	
55	65.1	65.8	66.2	66.3	66.2	66.5	67.2	67.5	67.2	67.0	66.3	65.2	64.6	64.0	64.4	65.3	
60	47.7	48.2	48.4	48.4	48.3	48.7	48.9	49.3	48.9	48.9	48.3	47.8	47.2	47.2	47.4	48.0	
65	34.0	34.3	34.5	34.4	34.4	34.7	35.0	35.2	35.1	34.9	34.5	33.9	33.6	33.6	33.9	34.3	
70	22.8	23.0	23.1	22.8	22.8	23.1	23.5	23.4	23.3	23.2	23.1	22.3	22.2	22.3	22.8	22.8	
75	13.7	13.9	14.1	13.8	13.7	13.9	14.4	14.5	14.2	14.2	14.0	13.5	13.2	13.4	13.8	14.0	
80	6.18	6.30	6.34	6.23	6.05	6.28	6.58	6.65	6.49	6.47	6.30	6.04	5.75	5.90	6.18	6.40	
85	1.22	1.21	1.13	1.28	1.29	1.38	1.17	1.35	1.39	1.26	1.11	1.12	0.99	1.04	1.08	1.19	
90	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	
95	0.08	0.08	0.08	0.07	0.07	0.07	0.08	0.08	0.07	0.07	0.07	0.08	0.07	0.07	0.08	0.08	
100	0.11	0.11	0.10	0.09	0.09	0.09	0.10	0.10	0.09	0.09	0.09	0.09	0.09	0.09	0.10	0.10	
105	0.15	0.15	0.14	0.13	0.12	0.12	0.14	0.14	0.12	0.12	0.12	0.12	0.12	0.12	0.14	0.15	
110	0.22	0.21	0.19	0.17	0.17	0.17	0.18	0.19	0.17	0.16	0.17	0.18	0.17	0.17	0.19	0.21	
115	0.29	0.28	0.25	0.21	0.22	0.20	0.24	0.26	0.23	0.22	0.24	0.22	0.23	0.19	0.27	0.30	
120	0.38	0.37	0.34	0.27	0.22	0.26	0.32	0.33	0.30	0.29	0.34	0.32	0.26	0.27	0.37	0.38	
125	0.51	0.51	0.44	0.44	0.44	0.44	0.40	0.46	0.39	0.41	0.47	0.53	0.50	0.46	0.52	0.56	
130	0.70	0.68	0.53	0.59	0.60	0.58	0.50	0.60	0.55	0.60	0.62	0.78	0.69	0.65	0.74	0.77	
135	0.98	0.91	0.68	0.84	0.84	0.81	0.65	0.81	0.79	0.86	0.83	1.12	0.94	0.93	0.92	1.07	
140	1.39	1.28	0.72	1.13	1.11	1.13	0.77	1.12	1.12	1.20	1.01	1.52	1.26	1.40	1.00	1.52	
145	1.97	1.77	1.09	1.59	1.23	1.55	1.10	1.57	1.64	1.74	1.31	2.22	1.45	2.13	1.84	2.13	
150	2.96	2.54	1.85	2.27	2.47	2.37	1.28	2.36	2.43	2.58	1.57	3.45	3.00	3.26	3.67	2.67	
155	4.03	3.45	2.80	3.12	3.46	3.37	2.05	3.45	3.33	3.38	1.94	4.80	3.77	3.84	4.87	2.26	
160	4.56	3.83	3.59	3.76	4.26	3.96	3.40	3.83	3.93	3.93	3.72	5.43	5.08	4.55	4.45	3.00	
165	4.58	4.12	3.93	3.20	3.68	3.12	4.19	3.96	4.06	3.99	4.02	4.84	4.04	3.94	4.20	4.29	
170	4.33	4.32	4.09	3.88	3.44	3.71	4.48	4.13	4.09	4.07	4.00	4.06	4.52	4.01	4.28	4.46	
175	4.04	4.16	3.88	3.80	3.91	3.55	4.30	4.03	3.92	3.94	3.96	3.84	4.15	3.89	3.53	4.15	
180	3.75	3.85	3.64	3.61	3.46	3.17	3.86	3.73	3.75	3.75	3.85	3.64	3.63	3.46	3.19	3.87	

2.2 Electrical, Photometric and Chromaticity Measurements

Test date	2019-12-31	Test Ambient:	25±1 °C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	AOK-960WoF-NV-L5-00-5770 -15-C	Total Operating Time (min)	90

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JAE191234-	120.0	60	8.711	1026	0.9815	2.87
C2	277.0	60	3.556	958.6	0.9731	8.92
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer

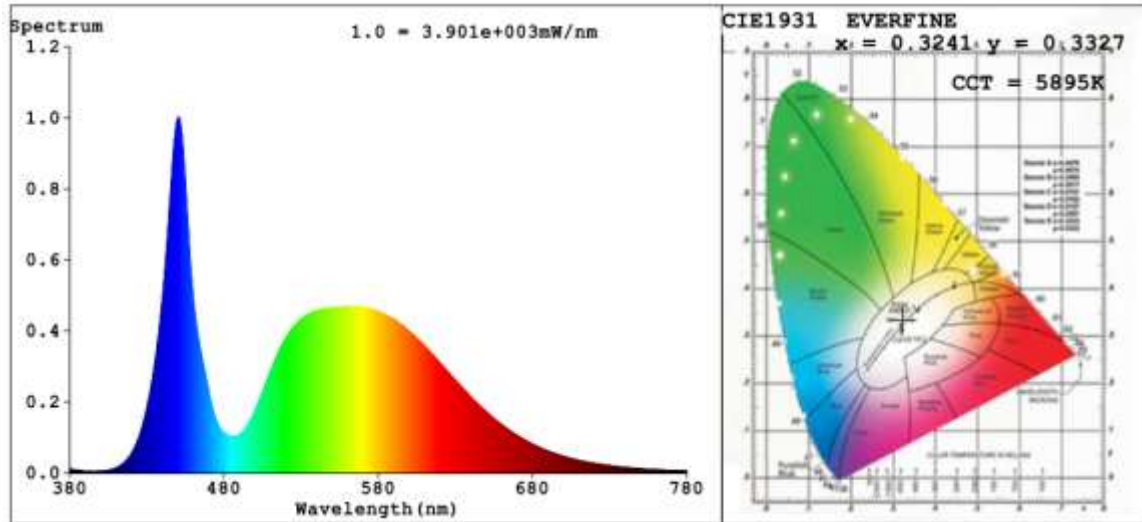
Method(Self-absorption:1.1203):

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	75	R9	0
Frequency (Hz)	60	R2	79	R10	48
CCT (K)	5895	R3	80	R11	74
Duv	-0.0005	R4	77	R12	45
Chromaticity (x, y)	x=0.3241 y=0.3327	R5	75	R13	75
Chromaticity (u', v')	u'=0.2044 v'=0.4720	R6	71	R14	88
Color Rendering Index (CRI)	75.6	R7	83	R15	72
R9	0	R8	65	--	--

Photometric Measurement –Spectroradiometer Method:

Parameter	Result		DLC V4.4 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	148014	146647	>=10000 (-10%)	
Luminous Efficacy (lm/W)	144.26	152.98	Standard: >= 105(-3%)	Premium: >= 130(-3%)

Spectral Power Distribution & Chromaticity Diagram



2.3 Performance Assessment:

Model name	CCT(K)	Total Luminous (lm)	Power (W)	Luminous Efficacy (lm/W)
AOK-960WoF-NV-L5-00-3070-15-C	3000K	137469	1021	134.64
AOK-960WoF-NV-L5-00-4070-15-C	4000K	141687 ^{*1}	1024 ^{*2}	138.37 ^{*3}
AOK-960WoF-NV-L5-00-5070-15-C	5000K	145905 ^{*1}	1024 ^{*2}	142.49 ^{*3}
AOK-960WoF-NV-L5-00-5770-15-C	5700K	148014	1026	144.26

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

$$141687 = (148014 - 137469) / 5 * 2 + 137469$$

$$145905 = (148014 - 137469) / 5 * 4 + 137469$$

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

$$1024 = (1021 + 1026) / 2$$

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

$$138.37 = 145905 / 1024$$

$$142.49 = 145905 / 1024$$

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-423	2 meter Integrating Sphere	Verified by D204 standard lamp	
ST-R-327	Spectral analysis system HAAS-2000	Verified by D204 standard lamp	
ST-R-332	Standard Lamp	2019-07-09	2020-07-08
ST-R-333	Power Meter for Integrating Sphere	2019-06-27	2020-06-26
ST-R-405	Temperature Probe for Integrating Sphere	2019-01-24	2020-01-23
ST-R-355	Goniophotometer system	Verified by D908S standard lamp	
ST-R-359	Standard Lamp	2019-07-09	2020-07-08
ST-R-358	Power Meter for Goniophotometer	2019-06-27	2020-06-26
ST-R-354	hygrothermograph for Goniophotometer	2019-06-28	2020-06-27
Expand Uncertainty: Photometric Measurement (Sphere):3.06%, k=2 Chromaticity Measurement(Sphere):43.46K, k=2 Photometric Measurement(Goniophotometer):3.38%, k=2			

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