

LM-79-08 Test Report

For

Antec Lighting Inc

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

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

Architectural Flood and Spot Luminaires

Model name(s): AOK-400WoF-HV-X5-XX-XX70-30-P

Remark: The first "XX" can be "00" for without sensor or "SN" for with Photocontrol function. The second "XX" represents different CCT as below: 30=3000K, 40=4000K, 50=5000K, 57=5700K; "P" can be blank A or B, blank is ceiling and wall mounted, "A" stands for Ceiling mounted only, "B" stands for Wall mounted only.

Representative (Tested) Model:
AOK-400WoF-HV-X5-00-3070-30-A
AOK-400WoF-HV-X5-00-5770-30-A

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

Test & Report By:

Clint Chen

Engineer: Clint Chen

Date: Jul.29,2018

Review By:

John Li

Manager: John Li

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.

Laboratory: Standard-Tech Co., Ltd Testing Center
NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2


Address: Standard-Tech Building, No.6 Guanhong Road,Guangzhou Science City, Guangzhou 510663, China

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<http://www.standard-tech.com>

1.1 Product Information:

Organization Name	Antec Lighting Inc	
Brand Name	 Quality, Honesty, Service and Innovation	
Model Number	AOK-400WoF-HV-X5-XX-XX70-30-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	200-480V ac, 50/60 Hz	
Nominal Power	400W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K, 4000K, 5000K, 5700K.	
LED Manufacturer	Lumileds	
LED Model	L150-3070500600000 L150-5770500600000	
Sample Number	JAE180410-G1(3000K), G2(5700K)	
Lamp Length	--	mm
Lamp Width	--	mm
Number of Units (modular products)	N/A	s

Photo

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1.2 Test Specifications:

Date of Receipt	Jul.23,2018
Date of Test	Jul.25,2018
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
Reference Work Instruction	QD25

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
(Refer to Work Instruction QD25)

Test date	2018-07-25	Test Ambient:	25.2 °C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	AOK-400WoF-HV-X5-00-3070-30-A		

Electrical Measurement :

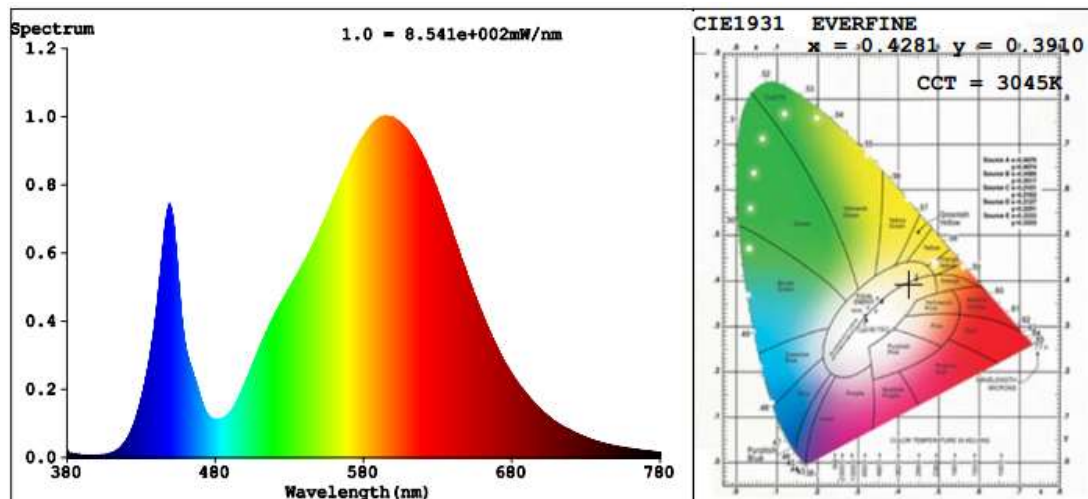
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JAE180410	277.0	60	1.5183	413.5	0.9832	8.88
-G1	480.0	60	0.8993	409.5	0.9487	11.66
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement -Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	72	R9	0
Frequency (Hz)	60	R2	84	R10	62
CCT (K)	3045	R3	93	R11	66
Duv	-0.0041	R4	71	R12	55
Chromaticity (x, y)	x=0.4281 y=0.3910	R5	71	R13	74
Chromaticity (u', v')	u'=0.2505 v'=0.5148	R6	77	R14	96
Color Rendering Index (CRI)	74.8	R7	79	R15	67
R9	0	R8	51	--	--

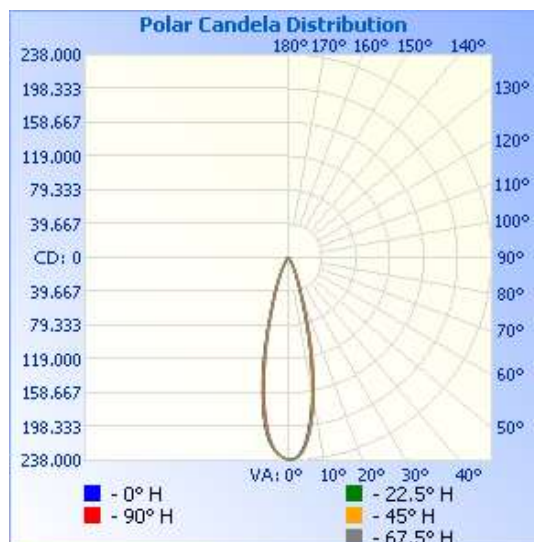
Photometric Measurement –Goniophotometer Method:

Parameter	Result		DLC V4.3 Pass Criteria	
Test Voltage (V)	277.0	480.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	64126	64221	>=30000(-10%)	
Luminous Efficacy (lm/W)	155.08	156.83	Standard: >= 10(-3%)	Premium: >= 120(-3%)
Most Worst Luminous/Highest Watts	155.08			
Zonal lumens in the 0-90 °zone (%)	99.7	--	>=85(-3)	
Beam Angle (°)	26.7	--	--	
Center Beam Candle Power (cd)	236681	--	--	

Spectral Power Distribution & Chromaticity Diagram

Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	55,500.6	86.6%
0-40	58,981.9	92.1%
0-60	62,214.2	97.1%
60-90	1,639.6	2.6%
70-100	618.5	1%
90-120	12.9	0%
0-90	63,853.9	99.7%
90-180	217.9	0.3%
0-180	64,071.8	100%

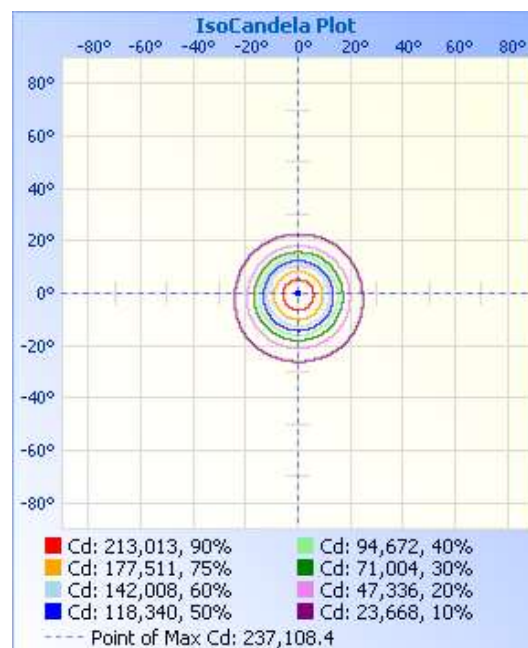
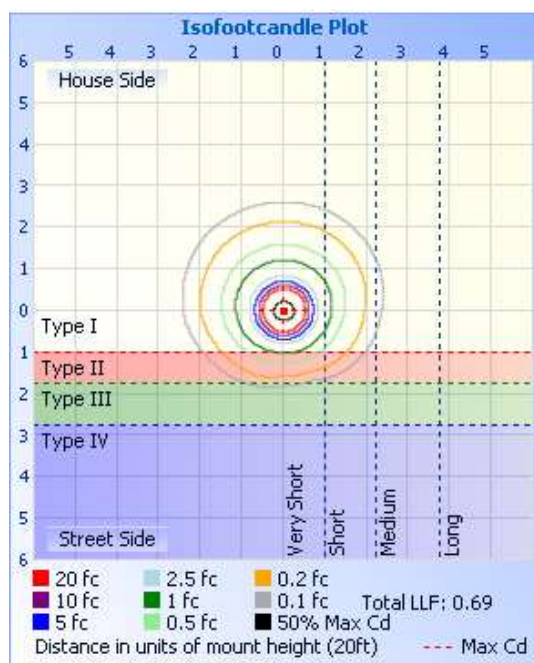
Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	%Total
0-10	19,350.6	30.2%	90-100	5.8	0%
10-20	25,739.9	40.2%	100-110	3.2	0%
20-30	10,410.1	16.2%	110-120	3.8	0%
30-40	3,481.3	5.4%	120-130	5.5	0%
40-50	1,783.1	2.8%	130-140	15.5	0%
50-60	1,449.2	2.3%	140-150	44.2	0.1%
60-70	1,026.9	1.6%	150-160	70.0	0.1%
70-80	506.4	0.8%	160-170	51.8	0.1%
80-90	106.3	0.2%	170-180	17.9	0%

Photometric Data


Illuminance at a Distance

	Center Beam fc	Beam Width
17.0ft	819.0 fc	8.1 ft 8.1 ft
34.0ft	204.7 fc	16.1 ft 16.2 ft
51.0ft	91.0 fc	24.2 ft 24.2 ft
68.0ft	51.2 fc	32.2 ft 32.3 ft
85.0ft	32.8 fc	40.3 ft 40.4 ft
102.0ft	22.7 fc	48.3 ft 48.5 ft

■ Vert. Spread: 26.7°
 ■ Horiz. Spread: 26.7°



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Table--1

UNIT: ×100cd

C (DEG) Y (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	2367	2367	2367	2367	2367	2367	2367	2367	2367	2367	2367	2367	2367	2367	2367	2367	
5	2194	2194	2194	2189	2197	2213	2224	2232	2231	2223	2220	2221	2218	2218	2203	2198	
10	1635	1606	1594	1596	1601	1617	1643	1678	1704	1730	1742	1743	1741	1724	1706	1678	
15	922	883	854	844	843	861	886	925	974	1008	1016	1028	1024	997	967	944	
20	435	399	376	363	356	370	391	411	446	486	494	507	504	494	474	458	
25	212	191	182	177	169	173	184	197	217	242	255	260	261	257	249	237	
30	104	93.7	89.8	87.7	81.9	81.9	86.3	94.1	104	116	126	123	125	123	122	117	
35	53.3	47.9	45.4	43.1	40.7	41.5	44.1	48.1	52.6	57.5	61.7	60.3	60.2	59.6	60.0	58.5	
40	30.2	27.3	25.1	23.0	22.2	22.9	24.4	27.0	29.8	33.2	35.2	35.0	34.8	34.6	34.8	33.9	
45	23.6	21.5	19.2	16.9	16.3	17.2	18.2	20.4	23.2	25.4	27.1	27.2	27.0	26.9	27.1	26.1	
50	20.2	17.8	15.2	13.0	12.2	13.3	14.8	16.3	19.4	22.1	23.8	24.0	23.7	23.8	23.6	22.5	
55	17.4	14.7	12.0	10.2	8.76	9.46	12.2	13.3	16.3	19.2	21.0	21.4	21.1	21.1	21.0	19.6	
60	14.9	11.7	9.32	8.07	5.55	5.62	9.24	11.3	13.5	16.5	18.3	18.8	18.5	18.7	18.5	16.9	
65	12.2	8.82	6.13	3.59	2.14	2.37	5.82	8.74	10.7	13.5	15.3	16.1	15.6	15.9	15.7	14.0	
70	8.88	6.34	2.16	0.11	0.07	0.12	2.76	5.65	7.90	10.3	11.8	12.5	12.2	12.6	12.3	10.9	
75	5.61	3.55	0.88	0.03	0.01	0.04	1.27	3.32	5.15	6.78	7.98	8.51	8.36	8.66	8.42	7.34	
80	2.90	1.59	0.37	0.02	0.02	0.05	0.56	1.68	2.65	3.62	4.39	4.69	4.66	4.75	4.68	4.05	
85	0.92	0.45	0.10	0.03	0.05	0.07	0.14	0.44	0.77	1.12	1.43	1.57	1.54	1.53	1.53	1.33	
90	0.03	0.03	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.09	0.16	0.20	0.21	0.20	0.18	0.12	
95	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.04	0.08	0.11	0.11	0.11	0.09	0.05	
100	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.03	0.05	0.06	0.05	0.04	0.02	
105	0.03	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	
110	0.04	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.03	0.03	0.01	0.01	0.02	0.02	0.02	
115	0.05	0.06	0.06	0.05	0.05	0.05	0.05	0.04	0.04	0.03	0.03	0.02	0.02	0.02	0.02	0.02	
120	0.07	0.05	0.07	0.06	0.06	0.05	0.05	0.04	0.05	0.04	0.03	0.02	0.02	0.03	0.02	0.02	
125	0.08	0.09	0.08	0.08	0.07	0.07	0.07	0.07	0.06	0.06	0.03	0.03	0.03	0.03	0.03	0.04	
130	0.15	0.14	0.11	0.11	0.11	0.11	0.11	0.13	0.12	0.09	0.06	0.05	0.06	0.06	0.06	0.09	
135	0.27	0.25	0.18	0.18	0.18	0.19	0.18	0.24	0.23	0.18	0.12	0.12	0.16	0.15	0.13	0.24	
140	0.48	0.45	0.28	0.34	0.32	0.32	0.27	0.44	0.47	0.42	0.23	0.33	0.44	0.35	0.31	0.57	
145	0.69	0.77	0.43	0.60	0.56	0.57	0.38	0.77	0.72	0.88	0.38	0.83	1.01	0.76	0.67	1.11	
150	1.36	1.32	0.79	0.94	0.95	0.94	0.39	1.23	1.36	1.40	1.00	1.41	1.63	1.32	0.72	1.76	
155	1.88	1.81	0.78	1.32	1.48	1.26	0.62	1.47	1.83	1.73	1.59	1.63	2.02	1.88	1.24	2.26	
160	2.22	2.00	1.19	1.70	1.99	1.57	1.28	1.62	2.02	2.07	1.82	1.56	2.35	2.16	1.76	2.26	
165	1.89	1.52	1.47	1.56	2.20	1.52	1.50	1.59	2.05	2.08	1.82	1.91	2.30	2.17	1.94	1.89	
170	1.61	1.79	1.52	1.61	1.96	1.62	1.56	1.70	1.53	1.54	1.87	2.14	1.99	2.03	2.00	2.05	
175	1.98	1.86	1.93	1.78	1.67	1.78	2.09	1.82	1.93	1.93	1.97	2.14	1.89	1.81	1.96	2.15	
180	1.88	1.87	2.08	1.89	1.66	1.91	2.17	1.84	1.86	1.87	1.84	2.06	1.87	1.67	1.90	2.16	

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2018-07-25	Test Ambient:	25.2 °C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	AOK-400WoF-HV-X5-00-5770-30-A		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JAE180410	277.0	60	1.5547	412.3	0.9574	9.02
-G2	480.0	60	0.8954	408.6	0.9507	12.13
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

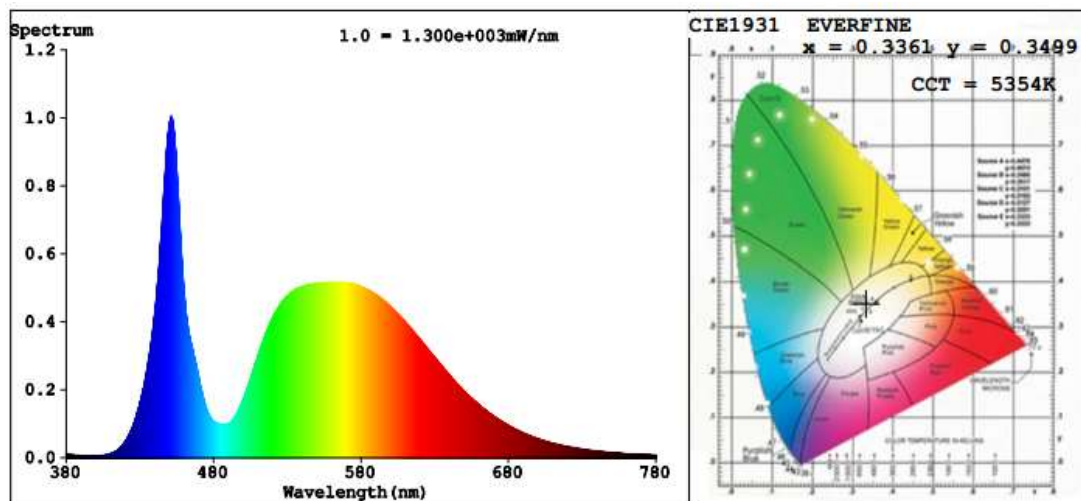
Chromaticity Measurement -Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	72	R9	0
Frequency (Hz)	60	R2	78	R10	46
CCT (K)	5354	R3	81	R11	71
Duv	0.0029	R4	74	R12	40
Chromaticity (x, y)	x=0.3361 y=0.3499	R5	72	R13	72
Chromaticity (u', v')	u'=0.2059 v'=0.4825	R6	69	R14	89
Color Rendering Index (CRI)	73.6	R7	83	R15	67
R9	0	R8	61	--	--

Photometric Measurement –Spectroradiometer Method:

Parameter	Result		DLC V4.3 Pass Criteria	
Test Voltage (V)	277.0	480.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	68208	68359	>=30000(-10%)	
Luminous Efficacy (lm/W)	165.43	167.30	Standard: >= 100(-3%)	Premium: >= 120(-3%)
Most Worst Luminous/Highest Watts	165.43			

Spectral Power Distribution & Chromaticity Diagram



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2.3 Performance Assessment:

Model name	CCT(K)	Total Luminous (lm)	Power (W)	Luminous Efficacy (lm/W)
AOK-400W _o F-HV-X5-00-3070-30-A	3000	64126	413.5	155.08
AOK-400W _o F-HV-X5-00-4070-30-A	4000	65759 ^{*1}	412.90 ^{*2}	159.26 ^{*3}
AOK-400W _o F-HV-X5-00-5070-30-A	5000	67392 ^{*1}	412.90 ^{*2}	163.22 ^{*3}
AOK-400W _o F-HV-X5-00-5770-30-A	5700	68208	412.3	165.43

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

$$65759 = (68208 - 64126) / 5 * 2 + 64126$$

$$67392 = (68208 - 64126) / 5 * 4 + 64126$$

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

$$412.9 = (413.5 + 412.3) / 2$$

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

$$159.26 = 65759 / 412.9$$

$$163.22 = 67392 / 412.9$$

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-331	2 meter Integrating Sphere	2018-07-01	2019-06-30
ST-R-327	Spectral analysis system HAAS-2000	2018-07-01	2019-06-30
D204	Standard Lamp	2017-07-12	2018-07-11
PF2010	Power Meter for Integrating Sphere	2018-07-01	2019-06-30
GO-R5000	Goniophotometer system	2018-07-01	2019-06-30
D908S	Standard Lamp	2017-07-12	2018-07-11
PF210	Power Meter for Goniophotometer	2018-07-07	2019-07-06
Expand Uncertainty: Photometric Measurement (Sphere):2.04%, k=2 Chromaticity Measurement(Sphere):28.8K, k=2 Photometric Measurement(Goniophotometer):2.36%, k=2			

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