

LM-79-08 Test Report

For

LIGHT EFFICIENT DESIGN, LLC**(Brand Name: N/A)**

188 S.Northwest Highway, Cary, IL60013, USA

LED Lamps

Model name(s): LED-8144M50-A

Representative (Tested) Model: LED-8144M50-A

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

Test & Report By:

Garman Mo

Engineer: Garman Mo

Date: May.23,2018

Review By:

Univ Xie

Manager: Univ Xie

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

Tel: 8620-3229 0320

Fax: 8620-32290422

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

1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN, LLC	
Brand Name	N/A	
Model Number	LED-8144M50-A	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	LED Lamps	
Rated Voltage / Frequency	120 -277Vac, 50/60 Hz	
Nominal Power	30W	
Rated Initial Lamp Lumen	--	
Declared CCT	5000K	
LED Manufacturer	SAMSUNG ELECTRONICS CO., LTD	
LED Model	SPMWH1228FD5WAV0SE	
Sample Number	GZE1801030-H-M1	
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	May.15,2018
Date of Test	May.16,2018
Test item	<ol style="list-style-type: none">1. Total Luminous Flux2. Luminous Distribution Intensity3. Luminous Efficacy4. Correlated Color Temperature5. Color Rendering Index6. Chromaticity Coordinate7. Electrical Parameters
Reference Standard	<ol style="list-style-type: none">1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources4. CIE 15-2004 Technical Report Colorimetry5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source6. 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	2018-05-16	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-8144M50-A		

Electrical Measurement:

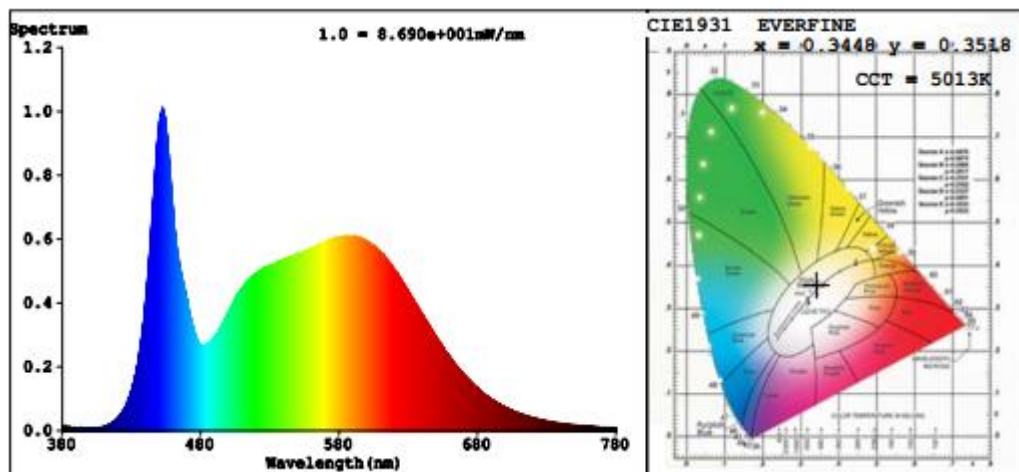
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE180103	120.0	60	0.2696	31.85	0.9845	12.14
0-H-M1	277.0	60	0.1289	33.29	0.9325	12.67

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	84	R9	16
Frequency (Hz)	60	R2	91	R10	77
CCT (K)	5013	R3	94	R11	84
Duv	0.0002	R4	85	R12	65
Chromaticity (x, y)	x=0.3448 y=0.3518	R5	85	R13	86
Chromaticity (u', v')	u'=0.2111 v'=0.4847	R6	86	R14	97
Color Rendering Index (CRI)	85.1	R7	87	R15	79
R9	16	R8	69	--	--

Photometric Measurement – Goniophotometer Method:

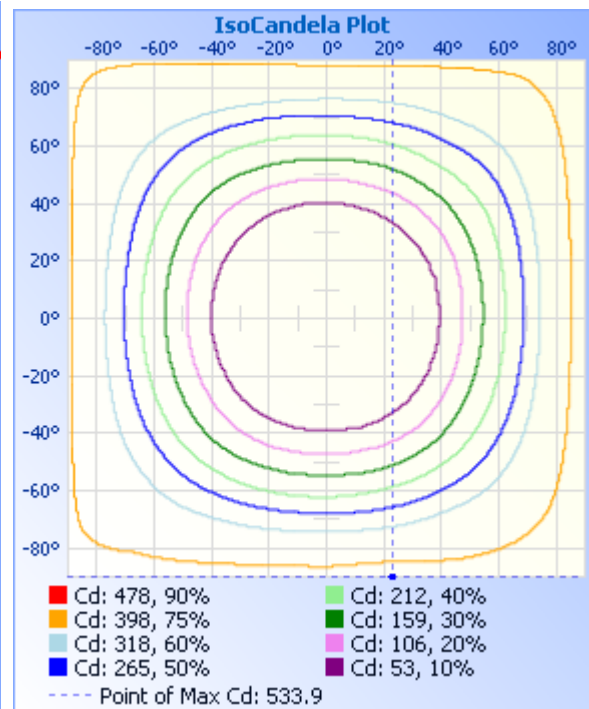
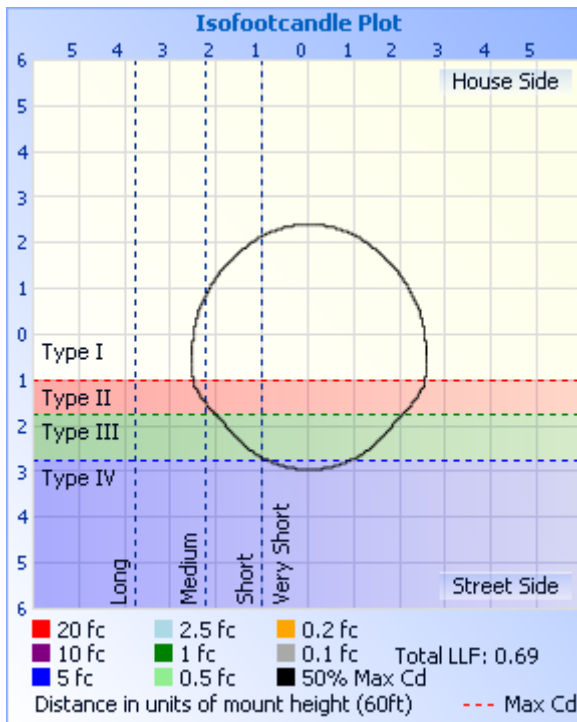
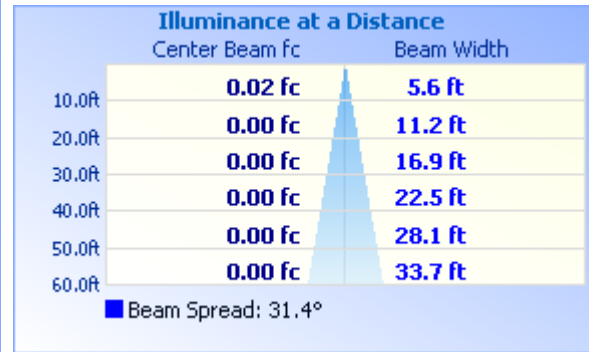
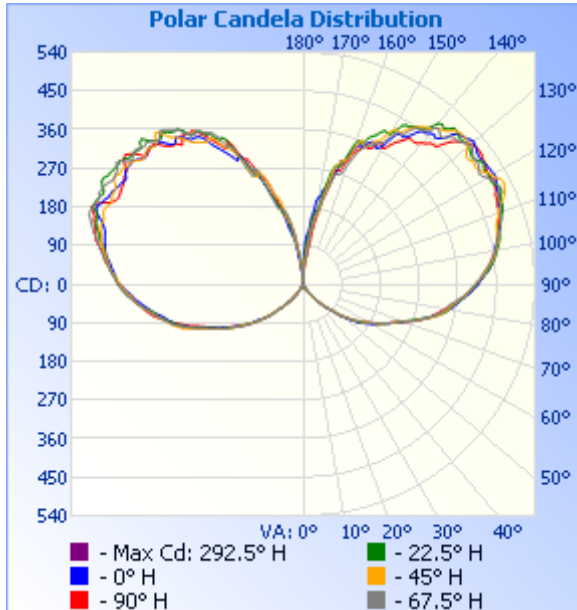
Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	4024.2	4161.6
Luminous Efficacy (lm/W)	126.35	125.01
Most worst Luminous/Highest Watts	120.88	
Beam Angle (°)	323.8	--
Center Beam Candle Power (cd)	2	--

Spectral Power Distribution & Chromaticity Diagram

Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	5.6	0.1%
0-40	26.5	0.7%
0-60	234.8	5.8%
60-90	982.6	24.4%
70-100	1,235.6	30.7%
90-120	1,490.6	37%
0-90	1,217.4	30.3%
90-180	2,807.0	69.7%
0-180	4,024.4	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	0.2	0.0%	90-100	482.6	12%
10-20	1.1	0.0%	100-110	510.4	12.7%
20-30	4.3	0.1%	110-120	497.6	12.4%
30-40	20.8	0.5%	120-130	447.1	11.1%
40-50	66.6	1.7%	130-140	371.5	9.2%
50-60	141.7	3.5%	140-150	269.5	6.7%
60-70	229.7	5.7%	150-160	158.5	3.9%
70-80	333.2	8.3%	160-170	61.7	1.5%
80-90	419.7	10.4%	170-180	8.1	0.2%

Photometric Data



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Candela Table - Type C

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
8	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
9	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10	2	2	2	2	2	3	3	3	3	3	3	3	2	2	2	2	2
11	2	2	2	2	2	3	3	3	3	3	3	3	3	3	2	2	2
12	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
13	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
14	3	3	3	3	3	3	3	4	4	4	3	4	3	3	3	3	3
15	3	3	3	4	4	4	4	4	4	4	4	4	4	4	3	3	3
16	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
17	4	4	4	4	4	5	5	5	5	4	5	4	4	4	4	4	4
18	4	4	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4
19	5	5	5	5	5	5	5	6	6	5	5	5	5	5	5	5	5
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22	6	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	6
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24	7	8	8	8	8	8	8	8	9	8	8	8	8	8	8	8	7
25	8	8	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8
26	9	9	9	10	9	9	9	10	10	10	10	10	10	9	9	9	9
27	10	10	10	10	10	10	10	10	11	11	11	11	10	10	10	10	10
28	10	10	11	11	11	11	11	11	12	12	12	12	11	11	11	11	10

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29	11	11	11	12	12	12	13	13	13	13	13	13	13	12	12	12	11
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61	191	187	189	188	185	199	206	205	204	213	215	213	207	199	201	197	191
62	197	195	197	195	194	207	212	214	212	219	221	218	214	206	210	202	197
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93	424	423	421	418	420	437	441	442	440	445	442	445	443	427	426	425	424
94	432	431	426	423	427	443	447	448	443	450	449	449	449	434	433	431	432
95	436	436	431	429	432	448	452	453	448	452	453	455	454	438	438	438	436
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102	460	466	464	461	462	471	470	478	472	483	482	489	493	469	468	468	460
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104	469	472	468	470	468	483	478	488	476	490	485	504	498	476	473	474	469
105	472	473	470	473	470	487	480	493	478	496	489	507	500	479	475	477	472
106	477	476	468	477	474	490	484	495	482	501	491	514	505	482	476	479	477
107	481	480	470	480	476	494	488	498	488	504	488	518	509	488	477	481	481
108	484	485	475	484	478	496	498	505	498	505	488	525	510	496	478	484	484
109	487	488	481	487	482	496	501	515	508	508	492	524	517	494	481	489	487
110	488	494	484	490	484	492	501	517	513	519	496	523	525	496	487	492	488
111	489	499	488	494	488	491	501	508	512	522	494	520	518	512	486	497	489
112	491	499	496	495	488	493	502	500	506	519	490	516	508	526	483	505	491
113	495	500	505	495	491	499	503	494	503	517	485	516	488	528	485	505	495
114	499	503	514	499	493	498	497	486	497	512	487	520	478	522	487	500	499
115	502	510	518	504	494	494	494	481	495	512	491	519	475	519	489	500	502
116	503	512	521	509	500	491	493	480	494	520	490	517	475	524	495	510	503
117	505	508	525	509	502	488	491	479	490	527	490	515	477	528	504	517	505
118	510	500	521	507	507	493	490	478	487	527	495	509	478	530	506	511	510
119	513	499	513	502	505	502	494	478	485	520	506	504	479	524	506	492	513
120	513	502	509	496	502	505	496	483	480	519	506	505	482	515	505	480	513
121	512	501	503	488	501	501	496	492	481	517	498	507	486	513	512	474	512
122	511	498	494	484	503	498	493	499	489	514	499	510	487	513	519	472	511
123	509	502	487	488	508	504	496	500	492	513	497	519	490	512	525	473	509
124	508	507	485	493	510	505	498	499	491	513	492	516	503	512	524	474	508

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125	506	500	487	495	510	501	497	501	490	509	493	499	510	516	515	476	506
126	506	495	488	496	514	499	495	504	489	501	488	492	512	524	509	478	506
127	508	492	483	496	515	496	490	505	482	499	480	496	505	530	511	474	508
128	512	496	483	501	515	489	482	496	474	500	473	500	493	534	507	470	512
129	515	499	490	507	513	486	476	483	471	495	474	500	474	529	499	470	515
130	518	504	500	507	509	488	474	478	476	493	477	493	472	524	500	475	518
131	514	503	507	501	501	491	472	480	479	504	481	489	476	523	504	484	514
132	510	499	510	495	495	486	466	476	478	506	477	492	478	523	503	493	510
133	506	499	509	489	488	479	458	474	472	490	471	488	477	514	499	500	506
134	504	502	508	491	478	471	460	475	471	481	474	480	469	499	495	495	504
135	494	507	505	486	462	472	463	467	470	475	488	475	456	487	494	484	494
136	473	506	497	473	445	471	460	460	455	475	493	481	447	480	493	479	473
137	464	494	488	469	445	474	451	455	444	482	479	488	442	477	490	480	464
138	460	489	484	475	442	471	448	448	445	477	460	484	441	485	489	483	460
139	463	494	481	481	434	458	435	441	453	469	454	476	430	492	491	491	463
140	459	489	474	473	430	439	432	434	447	465	445	470	437	492	490	496	459
141	453	470	467	459	422	432	425	427	440	465	433	463	447	487	478	488	453
142	453	460	464	455	419	428	417	425	427	453	419	446	443	485	465	476	453
143	444	453	459	452	421	419	407	424	424	434	414	434	439	479	465	466	444
144	430	453	451	449	421	407	399	413	424	433	409	431	442	480	463	461	430
145	418	449	446	441	410	394	386	396	419	435	404	433	433	483	456	459	418
146	414	443	436	422	402	382	378	387	407	429	400	429	421	490	444	457	414
147	416	442	422	418	393	375	387	375	386	417	403	421	408	495	433	455	416
148	413	436	418	416	382	388	395	376	374	414	402	416	393	476	434	450	413
149	394	416	421	403	369	406	384	384	362	398	389	411	381	447	436	435	394
150	373	403	412	387	367	393	387	374	351	388	369	396	366	432	433	425	373
151	363	404	394	376	377	368	377	345	339	391	364	367	364	437	429	424	363
152	360	405	377	373	373	348	337	326	325	381	352	364	378	444	421	428	360
153	369	397	374	367	357	317	310	302	335	345	336	343	364	429	404	416	369
154	370	386	366	359	351	300	298	295	333	323	319	303	334	405	389	392	370
155	363	380	355	356	352	287	299	295	311	305	290	277	321	386	380	369	363
156	357	372	351	348	353	289	308	290	282	284	277	280	319	363	384	365	357

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

Tel: 8620-3229 0320

Fax: 8620-32290422

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

157	350	358	358	340	345	286	293	283	272	275	272	294	298	363	386	364	350
158	350	354	363	325	336	295	272	251	275	276	283	286	266	378	375	363	350
159	341	358	346	307	327	262	239	227	249	251	281	257	267	381	366	344	341
160	325	344	317	290	311	227	204	204	232	226	268	221	265	359	343	330	325
161	306	316	306	275	296	203	197	199	212	213	249	200	247	344	319	311	306
162	301	296	303	268	278	210	202	211	191	201	223	184	226	326	296	304	301
163	299	286	298	269	277	204	187	210	188	190	213	183	203	306	273	299	299
164	266	288	289	264	275	184	154	178	183	172	209	182	186	287	281	277	266
165	249	282	272	235	244	146	129	157	161	167	197	176	184	272	293	260	249
166	244	265	236	219	220	116	114	146	134	163	161	176	171	260	292	244	244
167	229	236	210	202	202	83	103	145	125	153	148	167	159	238	264	227	229
168	224	201	179	180	171	70	89	129	116	129	150	155	134	235	231	219	224
169	207	177	160	168	155	60	71	96	108	108	143	138	127	217	218	218	207
170	204	175	161	158	136	45	50	67	100	96	102	116	128	205	213	202	204
171	196	164	146	136	106	35	41	71	65	84	91	88	101	188	197	186	196
172	168	152	125	107	78	29	35	54	52	75	82	77	70	162	187	178	168
173	156	126	95	69	63	17	27	36	48	61	63	68	62	153	159	153	156
174	123	111	86	67	59	7	17	21	34	36	48	47	34	132	144	148	123
175	120	96	71	54	54	4	14	11	16	25	37	33	22	126	131	139	120
176	112	83	54	46	36	4	6	5	8	11	12	17	11	117	106	128	112
177	99	63	33	33	32	4	4	4	4	5	6	5	5	95	81	105	99
178	77	58	32	21	29	10	10	9	9	9	6	4	3	68	68	77	77
179	70	58	30	18	17	24	18	18	27	21	13	5	4	51	44	57	70
180	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-331	2 meter Integrating Sphere	2017-07-01	2018-06-30
ST-R-327	Spectral analysis system HAAS-2000	2017-07-01	2018-06-30
D204	Standard Lamp	2017-07-12	2018-07-11
PF2010	Power Meter for Integrating Sphere	2017-07-01	2018-06-30
GO-R5000	Goniophotometer system	2017-07-01	2018-06-30
D908S	Standard Lamp	2017-07-12	2018-07-11
PF210	Power Meter for Goniophotometer	2017-07-07	2018-07-06
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 *******