

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-8144M40-A

Representative (Tested) Model: LED-8144M40-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

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

1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN, LLC	
Brand Name	N/A	
Model Number	LED-8144M40-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	4000K	
LED Manufacturer	SAMSUNG ELECTRONICS CO., LTD	
LED Model	SPMWH1228FD5WAT0SE	
Sample Number	GZE1801030-H-L1	
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 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	2018-05-16	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-8144M40-A		

Electrical Measurement:

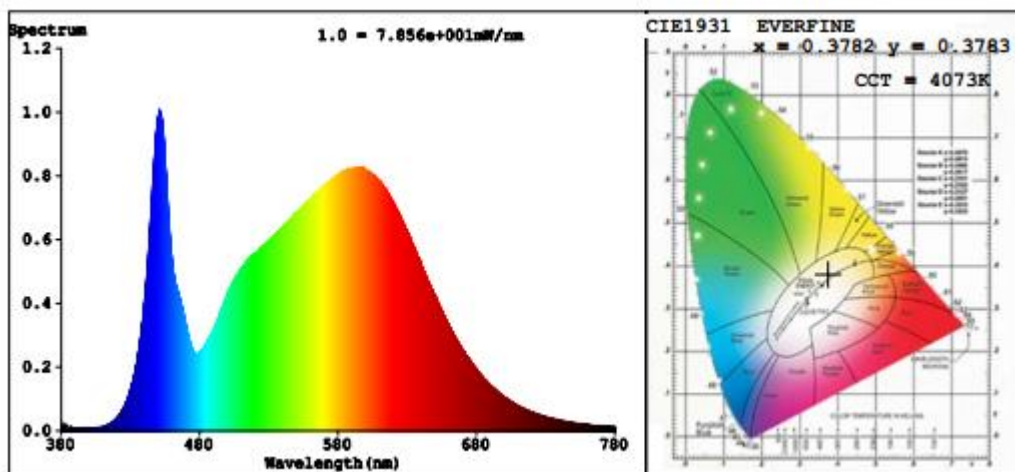
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE180103	120.0	60	0.2780	32.91	0.9864	10.36
0-H-L1	277.0	60	0.1304	33.84	0.9368	12.08

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	8
Frequency (Hz)	60	R2	89	R10	74
CCT (K)	4073	R3	95	R11	81
Duv	0.0014	R4	82	R12	61
Chromaticity (x, y)	x=0.3782 y=0.3783	R5	81	R13	83
Chromaticity (u', v')	u'=0.2230 v'=0.5019	R6	85	R14	97
Color Rendering Index (CRI)	82.9	R7	86	R15	75
R9	8	R8	65	--	--

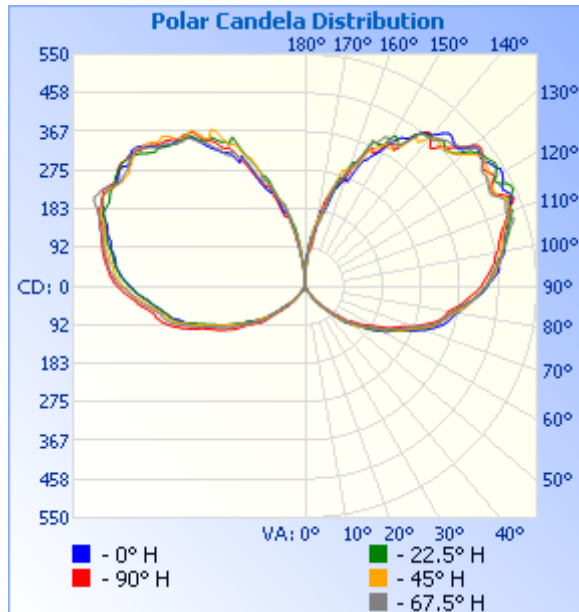
Photometric Measurement – Goniophotometer Method:

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	4094.9	4164.9
Luminous Efficacy (lm/W)	124.43	123.08
Most worst Luminous/Highest Watts	121.01	
Beam Angle (°)	316.9	--
Center Beam Candle Power (cd)	2	--

Spectral Power Distribution & Chromaticity Diagram

Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	6.2	0.2%
0-40	27.8	0.7%
0-60	238.0	5.8%
60-90	1,005.9	24.6%
70-100	1,265.3	30.9%
90-120	1,528.4	37.3%
0-90	1,243.9	30.4%
90-180	2,851.1	69.6%
0-180	4,095.0	100%

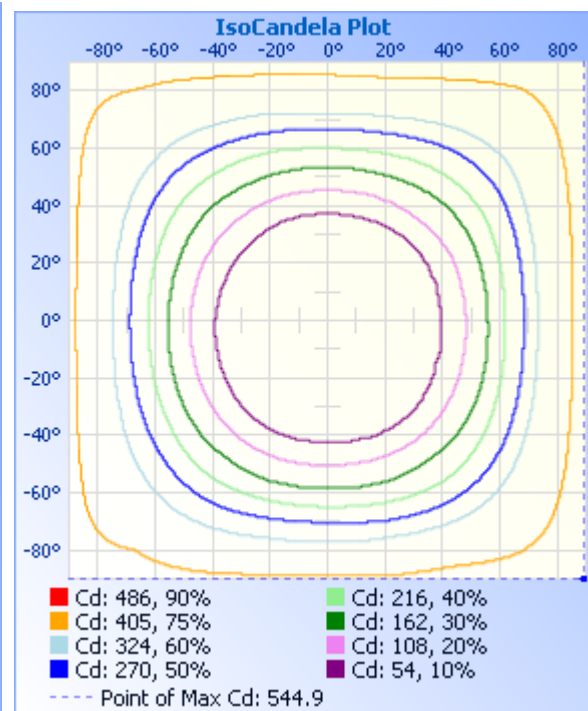
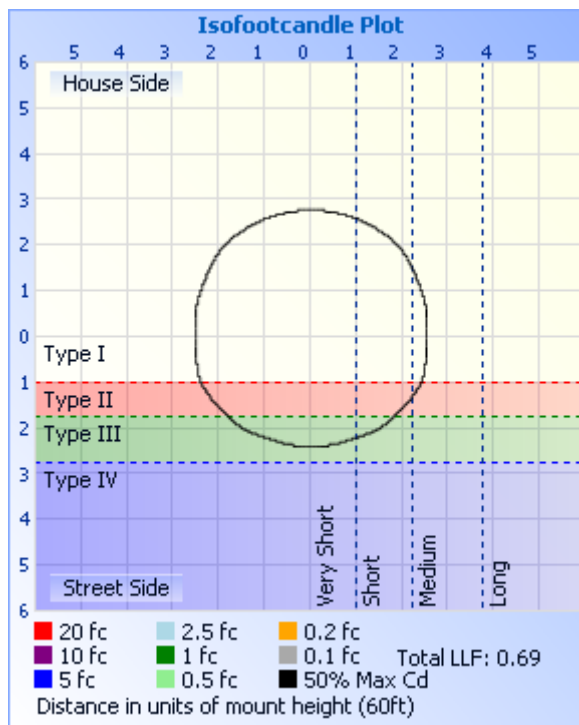
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	0.2	0.0%	90-100	494.8	12.1%
10-20	1.2	0.0%	100-110	521.5	12.7%
20-30	4.7	0.1%	110-120	512.1	12.5%
30-40	21.6	0.5%	120-130	459.3	11.2%
40-50	68.0	1.7%	130-140	370.0	9%
50-60	142.3	3.5%	140-150	267.6	6.5%
60-70	235.4	5.7%	150-160	157.9	3.9%
70-80	342.9	8.4%	160-170	59.7	1.5%
80-90	427.6	10.4%	170-180	8.2	0.2%

Photometric Data


Illuminance at a Distance

	Center Beam fc	Beam Width
10.0ft	0.02 fc	19.6 ft
20.0ft	0.00 fc	39.2 ft
30.0ft	0.00 fc	58.9 ft
40.0ft	0.00 fc	78.5 ft
50.0ft	0.00 fc	98.1 ft
60.0ft	0.00 fc	117.7 ft

■ Beam Spread: 88.9°



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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	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2
8	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	3	3
9	3	3	3	3	3	2	2	2	2	2	2	2	2	2	3	3	3
10	3	3	3	3	3	3	2	2	2	2	2	2	2	3	3	3	3
11	3	3	3	3	3	3	2	2	2	2	2	2	3	3	3	3	3
12	4	4	4	4	3	3	3	2	2	2	3	3	3	3	3	4	4
13	4	4	4	4	4	3	3	3	2	3	3	3	3	3	4	4	4
14	5	5	4	4	4	3	3	3	3	3	3	3	3	4	4	4	5
15	5	5	5	5	4	4	3	3	3	3	3	3	4	4	4	5	5
16	6	5	5	5	4	4	4	3	3	3	3	4	4	5	5	5	6
17	6	6	6	6	5	5	4	4	3	3	4	4	4	5	5	6	6
18	7	7	7	6	6	5	4	4	4	4	4	4	5	5	6	6	7
19	7	7	7	7	6	5	5	4	4	4	4	5	5	6	7	7	7
20	8	8	8	7	7	6	5	5	5	5	5	5	6	7	7	8	8
21	9	9	8	8	7	6	6	5	5	5	5	6	6	7	8	8	9
22	10	10	9	9	8	7	6	6	6	6	6	6	7	8	9	9	10
23	10	10	10	9	8	7	7	7	6	6	7	7	8	9	9	10	10
24	11	11	11	10	9	8	7	7	7	7	7	8	8	9	10	11	11
25	12	12	12	11	10	9	8	8	7	8	8	9	10	10	11	12	12
26	13	13	13	12	11	10	9	8	8	8	9	10	10	11	12	13	13
27	14	14	14	13	12	10	10	9	9	9	10	11	11	12	13	13	14
28	15	15	15	14	13	11	10	10	10	10	11	11	12	13	14	15	15

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29	16	16	17	15	14	12	11	10	11	11	12	13	13	13	15	16	16
30	20	18	18	17	15	13	13	11	12	11	12	13	14	15	17	18	20
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43	84	82	82	77	73	69	62	58	61	55	58	67	70	75	79	82	84
44	90	90	87	84	78	73	69	61	64	65	69	73	80	82	83	92	90
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48	129	124	123	117	105	104	100	88	90	89	93	100	109	113	121	125	129
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54	163	164	161	154	147	148	137	136	136	135	136	145	152	150	160	165	163
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56	180	179	175	171	163	159	158	144	149	149	158	158	165	169	172	180	180
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60	214	208	206	201	190	194	184	183	179	176	180	191	206	197	204	212	214

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61	222	215	214	206	197	202	189	191	188	184	188	202	213	208	213	220	222
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92	445	440	441	437	427	441	435	427	430	431	443	451	458	444	448	453	445

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93	451	444	447	440	432	445	440	432	436	438	449	456	463	449	455	455	451
94	459	451	453	445	437	451	444	436	441	442	454	462	466	453	459	459	459
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108	504	511	504	521	500	514	498	493	498	500	504	513	512	497	504	503	504
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110	517	522	516	508	512	519	522	501	510	509	514	521	523	509	511	515	517
111	521	523	521	510	518	518	531	507	511	510	518	532	521	512	511	519	521
112	525	521	519	514	532	516	526	511	519	507	518	540	519	514	508	522	525
113	532	525	523	517	538	513	519	510	524	506	522	543	521	513	507	530	532
114	535	535	518	513	526	510	513	503	525	507	526	537	525	517	511	536	535
115	529	545	507	503	513	508	519	492	523	511	522	536	529	524	510	533	529
116	523	544	501	493	499	509	527	482	520	513	518	531	527	528	510	525	523
117	523	537	501	492	498	508	527	478	514	513	513	520	523	528	507	514	523
118	532	520	502	493	500	510	522	481	510	513	508	511	516	530	502	503	532
119	536	514	503	496	509	508	515	487	507	516	503	505	515	533	494	501	536
120	540	522	502	499	519	505	514	489	513	520	499	503	516	531	490	500	540
121	540	528	503	503	517	505	515	489	517	520	499	505	518	533	483	503	540
122	533	534	512	500	511	509	515	489	519	521	497	504	523	532	482	506	533
123	529	538	517	500	506	517	519	487	519	522	496	503	526	533	483	506	529
124	525	532	516	506	508	530	532	491	510	523	502	506	524	532	485	503	525

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125	517	528	520	513	518	533	532	498	505	521	506	511	520	527	489	496	517
126	516	526	520	519	522	521	522	500	512	518	508	517	521	521	494	495	516
127	517	522	516	523	525	506	505	497	519	514	510	516	517	522	498	497	517
128	522	513	508	526	530	493	490	504	522	507	515	516	514	521	500	505	522
129	522	508	496	522	530	490	475	510	521	501	517	514	511	520	500	511	522
130	513	496	487	513	520	490	466	512	515	491	510	508	506	519	496	513	513
131	495	480	480	501	503	476	464	502	508	483	506	503	501	518	495	504	495
132	487	473	471	496	494	470	464	487	496	477	505	493	497	515	501	488	487
133	487	468	466	490	483	470	463	482	486	478	499	483	498	511	503	477	487
134	490	463	465	484	472	469	465	480	476	476	491	478	485	505	488	476	490
135	495	467	465	483	467	461	463	480	468	471	488	477	480	498	478	477	495
136	498	474	464	481	460	466	462	474	466	464	491	472	479	493	473	478	498
137	496	475	466	475	447	470	463	467	462	460	487	461	474	486	473	471	496
138	488	469	467	468	442	472	451	457	461	456	476	456	470	486	474	453	488
139	476	465	465	461	453	465	437	445	459	455	463	452	461	481	473	447	476
140	467	465	460	459	464	460	434	440	459	453	458	449	460	480	465	443	467
141	464	462	444	458	469	448	424	449	452	457	455	449	460	486	456	439	464
142	460	457	435	458	464	432	406	454	445	454	456	448	455	495	447	432	460
143	453	454	439	453	453	419	400	437	438	444	458	433	456	498	449	425	453
144	442	442	432	434	437	408	400	419	423	429	456	423	451	474	451	426	442
145	428	417	411	418	417	389	403	413	407	420	440	419	426	454	446	421	428
146	422	401	401	406	397	389	410	413	394	420	422	406	416	447	450	410	422
147	421	403	406	399	385	391	412	408	387	418	417	391	412	449	447	403	421
148	409	413	389	398	391	374	404	403	376	416	426	381	403	444	427	396	409
149	399	416	383	399	397	371	394	386	368	403	434	364	385	425	413	385	399
150	382	405	388	397	389	372	390	375	366	395	427	358	376	415	422	371	382
151	364	382	383	404	375	372	382	368	353	393	394	364	377	407	413	361	364
152	355	380	375	400	358	369	382	365	332	379	381	361	362	406	396	359	355
153	346	379	369	385	355	350	358	373	338	390	378	340	335	402	389	355	346
154	334	380	358	380	364	328	332	362	344	393	371	335	324	394	389	347	334
155	330	380	352	373	355	304	336	328	320	356	346	322	300	385	386	332	330
156	313	349	326	345	337	296	340	315	289	334	336	301	281	388	384	323	313

Laboratory: Standard-Tech Co., Ltd Testing Center

NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2

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157	291	321	307	325	327	292	324	300	266	321	330	279	267	376	361	307	291
158	268	315	303	309	315	273	300	282	250	302	303	265	254	350	338	297	268
159	268	313	300	300	283	261	285	274	243	280	275	282	256	334	331	282	268
160	273	296	298	286	266	270	274	279	236	278	259	267	249	323	316	271	273
161	260	266	290	268	258	252	254	260	244	267	243	246	225	296	282	272	260
162	246	271	289	260	252	205	230	243	233	238	232	239	212	281	272	269	246
163	241	244	268	262	245	181	203	219	204	223	222	216	185	279	275	249	241
164	215	226	241	236	246	155	178	195	184	207	209	208	172	260	254	228	215
165	192	212	222	216	229	138	170	181	181	199	204	206	171	240	229	205	192
166	180	186	196	186	216	121	153	181	177	199	191	190	169	243	205	199	180
167	182	173	188	161	204	108	136	159	166	177	166	171	167	232	198	193	182
168	186	174	172	153	183	87	121	133	150	167	148	151	145	206	196	198	186
169	162	164	160	149	152	73	107	109	139	150	134	136	132	193	198	189	162
170	135	144	153	142	125	66	88	101	128	143	122	127	109	180	170	152	135
171	123	143	138	118	108	58	82	91	108	128	117	104	95	171	147	132	123
172	125	127	128	112	89	43	59	78	101	109	103	85	82	151	138	126	125
173	117	107	109	105	83	33	47	56	76	79	78	68	70	142	128	124	117
174	102	102	83	96	88	24	33	53	62	62	62	58	56	137	117	105	102
175	88	83	66	75	81	9	19	37	57	45	45	44	44	121	96	87	88
176	77	69	57	64	63	4	11	25	38	33	25	22	19	97	82	74	77
177	65	56	53	53	60	4	5	11	13	14	13	10	8	77	66	65	65
178	39	36	41	38	45	7	5	5	5	5	5	5	4	69	57	38	39
179	32	20	28	27	27	20	13	10	6	6	7	8	6	47	37	30	32
180	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19

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 *******