



Report No.: GZE160820-C

NVLAP LAB CODE 201011-0

LM-79-08 Test Report

For

LIGHT EFFICIENT DESIGN

(Brand Name:N/A)

188 S. Northwest Highway Cary, IL60013

LED Lamp

Model name(s): LED-7311-40A

Representative (Tested) Model: LED-7311-40A

Model Different: N/A

Test & Report By:

Garman Mo

Engineer: Garman Mo

Date: Aug 19,2016

Review By:

Tommy Liang

Manager: Tommy Liang

Note: 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

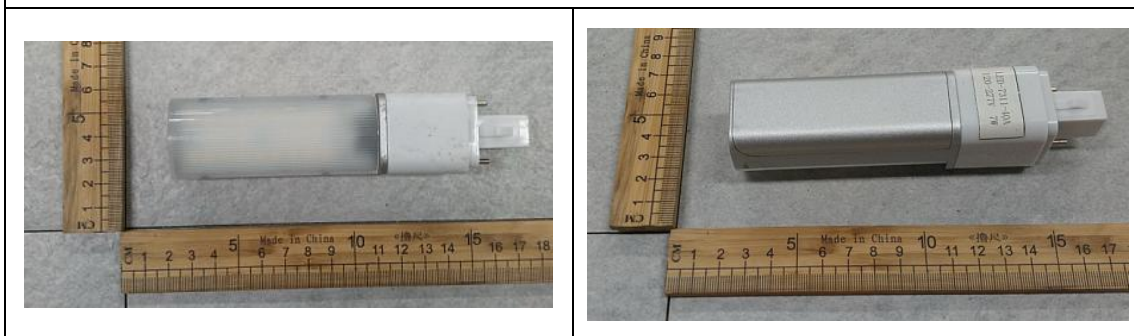
Fax: 8620-32290422

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

1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN	
Brand Name	N/A	
Model Number	LED-7311-40A	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	LED Lamp	
Rated Voltage / Frequency	120-277Vac, 50/60 Hz	
Nominal Power	7W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K	
LED Manufacturer	Samsung Electronics LED Business	
LED Model	SPMWHT327F*****	
Sample Number	GZE160820-C1(4000K)	
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	Aug 13,2016
Date of Test	Aug.14,2016
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

<p>1) Photometric and Light Distribution Measurement – Goniophotometer Method:</p> <p>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.</p>
<p>2) Chromaticity Measurement – Sphere-Spectroradiometer Method:</p> <p>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.</p>
<p>3) Electrical Measurements:</p> <p>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.</p>

2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2016-08-14	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-7311-40A		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160820-C1	120.0	60	0.0614	6.66	0.9039	18.82

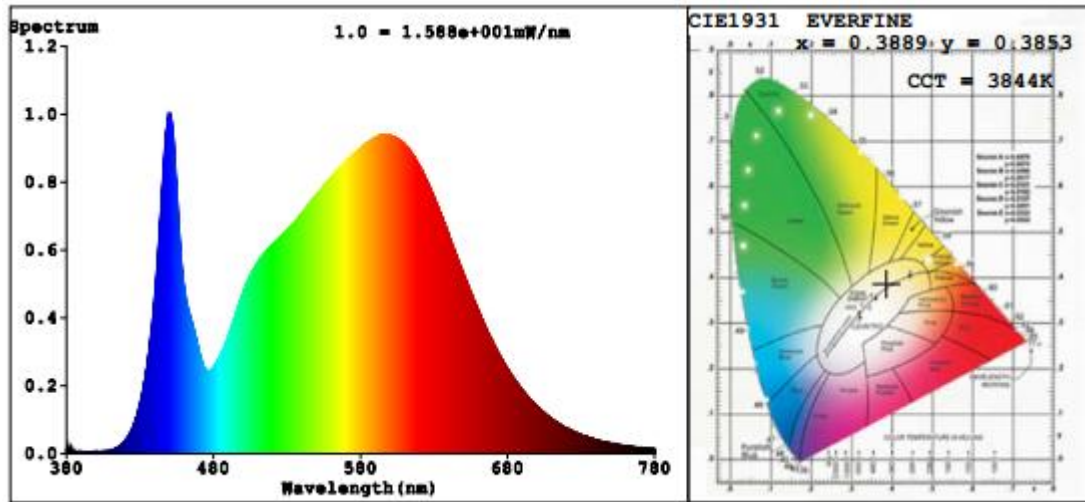
Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	15
Frequency (Hz)	60	R2	89	R10	75
CCT (K)	3844	R3	95	R11	83
Duv	0.0016	R4	83	R12	65
Chromaticity (x, y)	x=0.3889 y=0.3853	R5	82	R13	84
Chromaticity (u', v')	u'=0.2272 v'=0.5065	R6	85	R14	97
Color Rendering Index (CRI)	84.0	R7	87	R15	76
R9	15	R8	67	--	--

Photometric Measurement – Goniophotometer Method :

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	892.84
Luminous Efficacy (lm/W)	134.06
Beam Angle (°)	110
Center Beam Candle Power (cd)	291

Spectral Power Distribution & Chromaticity Diagram

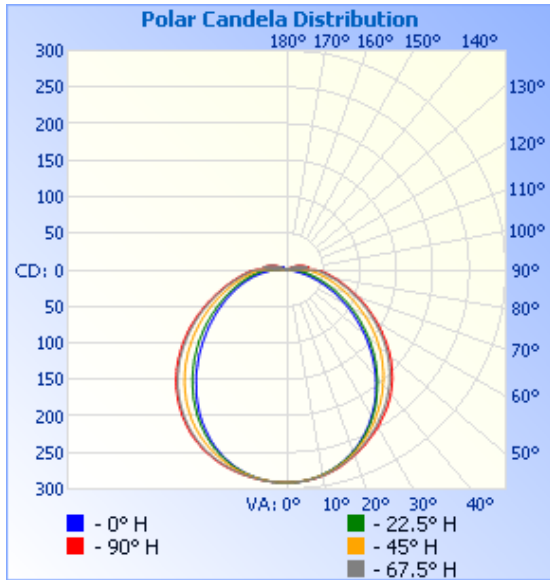


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	225.3	25.2%
0-40	368.0	41.2%
0-60	647.1	72.5%
60-90	221.1	24.8%
70-100	126.8	14.2%
90-120	23.3	2.6%
0-90	868.1	97.2%
90-180	24.7	2.8%
0-180	892.8	100%

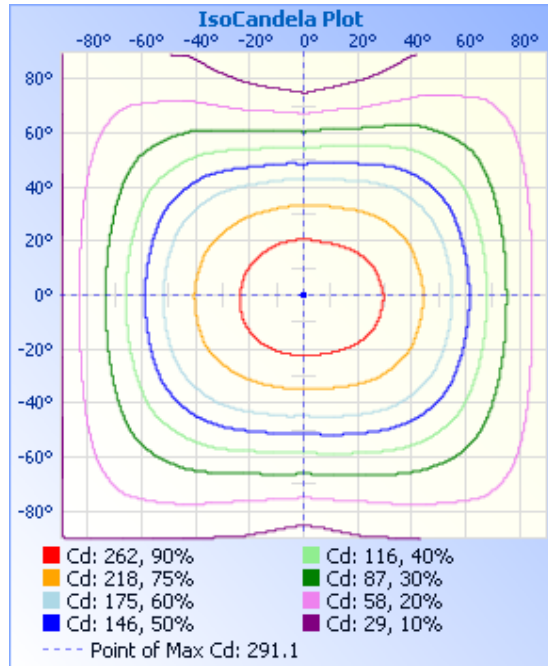
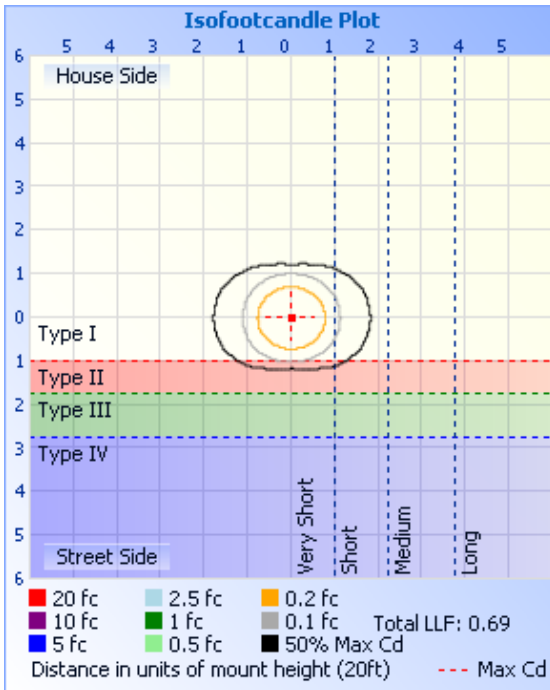
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	27.5	3.1%	90-100	10.0	1.1%
10-20	78.7	8.8%	100-110	9.7	1.1%
20-30	119.0	13.3%	110-120	3.7	0.4%
30-40	142.7	16.0%	120-130	0.6	0.1%
40-50	146.9	16.5%	130-140	0.2	0%
50-60	132.2	14.8%	140-150	0.2	0%
60-70	104.2	11.7%	150-160	0.2	0%
70-80	72.4	8.1%	160-170	0.1	0%
80-90	44.5	5.0%	170-180	0.0	0%

Photometric Data



	Center Beam fc	Beam Width	
17.0ft	1.01 fc	40.3 ft	59.3 ft
34.0ft	0.25 fc	80.7 ft	118.7 ft
51.0ft	0.11 fc	121.0 ft	178.0 ft
68.0ft	0.06 fc	161.4 ft	237.4 ft
85.0ft	0.04 fc	201.7 ft	296.7 ft
102.0ft	0.03 fc	242.0 ft	356.1 ft

■ Vert. Spread: 99.7°
■ Horiz. Spread: 120.4°



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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	291	291	290	291	291	291	290	290	291	291	290	291	291	291	290	290	291
1	291	291	290	291	291	291	290	290	291	291	291	291	291	291	290	290	291
2	291	291	290	290	291	291	290	290	291	291	291	291	291	291	290	289	291
3	290	290	290	290	290	290	290	289	291	291	290	291	291	290	290	289	290
4	290	290	290	290	290	290	290	289	290	290	290	290	290	290	289	288	290
5	289	289	289	289	290	290	290	289	290	290	290	290	290	290	289	288	289
6	289	289	288	289	289	289	289	288	289	289	289	290	290	289	288	287	289
7	288	288	288	288	288	289	289	288	289	289	289	289	289	289	287	286	288
8	287	287	287	287	288	288	288	287	288	288	288	289	289	288	287	285	287
9	286	286	286	287	287	287	287	286	287	287	287	288	288	287	286	284	286
10	284	284	285	285	286	286	286	285	286	286	286	287	288	287	285	283	284
11	283	283	284	285	285	285	285	284	284	285	285	287	287	286	284	282	283
12	281	282	282	283	283	284	284	283	283	283	284	286	286	285	282	280	281
13	280	280	281	282	282	283	282	281	281	282	283	285	286	284	281	279	280
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15	276	276	277	279	279	280	280	278	278	279	280	283	284	282	279	275	276
16	274	274	276	277	278	278	278	276	276	277	279	282	283	281	277	273	274
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22	259	260	262	265	266	267	266	263	261	264	269	274	276	273	266	260	259
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24	253	254	257	260	262	263	260	258	256	258	264	271	272	269	262	254	253
25	250	251	254	258	260	260	258	254	252	255	262	269	271	267	260	251	250
26	246	248	251	256	258	259	255	252	248	253	260	267	269	265	257	248	246
27	243	244	248	253	255	256	253	248	246	249	258	265	267	263	255	245	243
28	239	241	245	251	254	253	250	245	242	246	255	263	265	261	252	242	239

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29	235	237	243	248	251	251	247	241	238	243	252	260	262	259	250	239	235
30	231	234	239	246	249	249	244	238	235	239	250	258	260	256	247	235	231
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59	96	104	127	142	147	145	134	118	112	121	137	151	155	150	135	109	96
60	91	100	122	138	142	142	130	114	108	116	134	146	151	146	131	105	91

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61	87	96	119	134	139	137	126	110	104	112	129	142	146	142	126	100	87
62	82	92	114	130	134	133	122	106	100	108	124	138	141	137	122	97	82
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86	2	17	37	49	52	52	46	35	26	36	46	53	55	52	40	19	2
87	1	16	35	47	49	50	43	33	23	34	43	50	52	49	38	18	1
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89	0	13	32	42	44	45	39	29	19	29	39	46	47	45	34	15	0
90	0	10	24	31	29	28	26	20	11	19	30	38	42	40	30	12	0
91	0	5	3	7	7	5	2	4	3	4	6	17	21	15	9	4	0
92	0	0	0	1	1	1	1	1	1	1	1	2	3	2	1	1	0

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93	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
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96	0	4	4	25	20	28	8	11	4	11	8	27	19	27	5	5	0
97	0	5	4	29	31	31	7	14	9	13	8	32	32	31	5	6	0
98	0	5	4	27	30	30	7	12	10	11	7	30	31	29	5	5	0
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106	0	0	2	18	20	19	4	1	3	1	3	20	21	19	2	0	0
107	0	0	2	17	19	18	3	0	6	1	3	19	20	18	2	0	0
108	0	0	2	16	18	17	3	0	6	1	2	17	19	17	2	0	0
109	0	0	2	15	17	16	2	0	6	1	2	15	18	15	1	0	0
110	0	0	1	14	16	15	2	0	6	1	2	14	16	14	1	0	0
111	0	0	1	13	15	14	2	0	6	1	1	12	15	12	1	0	0
112	0	0	1	11	14	12	1	0	6	1	1	11	13	11	1	0	0
113	0	0	1	10	12	11	1	0	6	1	1	9	12	9	1	0	0
114	0	0	0	9	11	9	1	0	6	1	1	8	10	8	0	0	0
115	0	0	0	7	10	8	1	0	6	1	1	6	9	6	0	0	0
116	0	0	0	6	9	7	0	0	6	1	0	5	7	5	0	0	0
117	0	0	0	5	7	5	0	0	6	1	0	4	6	4	0	0	0
118	0	0	0	4	6	4	0	0	6	1	0	3	5	3	0	0	0
119	0	0	0	3	5	3	0	0	6	1	0	2	4	2	0	0	0
120	0	0	0	2	4	2	0	0	6	0	0	1	3	1	0	0	0
121	0	0	0	1	3	1	0	0	6	1	0	0	2	0	0	0	0
122	0	0	0	0	2	0	0	0	6	1	0	0	1	0	0	0	0
123	0	0	0	0	1	0	0	0	6	0	0	0	0	0	0	0	0
124	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0

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125	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0
126	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0
127	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0
128	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
129	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
131	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
134	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
136	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
139	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
142	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
143	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
144	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
146	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
147	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
148	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
149	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
150	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
151	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
152	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
153	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
154	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
155	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
156	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0

Laboratory: Standard-Tech Co. Ltd Testing Center

NVLAP CODE: 201011-0

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157	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
158	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
159	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
160	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
161	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
162	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0
163	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
164	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0
165	0	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0
166	0	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0
167	0	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0
168	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0
169	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
171	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
172	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
173	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
174	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
176	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
177	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
178	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
179	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-336	2 meter Integrating Sphere	2016-07-01	2017-06-30
ST-R-331	Spectral analysis system HAAS-2000	2016-07-01	2017-06-30
D204	Standard Lamp	2016-07-01	2017-06-30
PF2010	Power Meter for Integrating Sphere	2016-07-01	2017-06-30
EE-09	Goniophotometer system	2016-07-01	2017-06-30
D908S	Standard Lamp	2016-07-01	2017-06-30
PF210	Power Meter for Goniophotometer	2016-07-01	2017-06-30
ST-R-181A	Temperature Tester	2016-07-01	2017-06-30
Uncertainty: Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

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