



Report No.: GZE160820-E

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-7312-35-A

Representative (Tested) Model: LED-7312-35-A

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-7312-35-A	
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	3500K	
LED Manufacturer	Samsung Electronics LED Business	
LED Model	SPMWHT327F*****	
Sample Number	GZE160820-E1(3500K)	
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-7312-35-A		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160820-E1	120.0	60	0.0643	6.97	0.9032	18.02

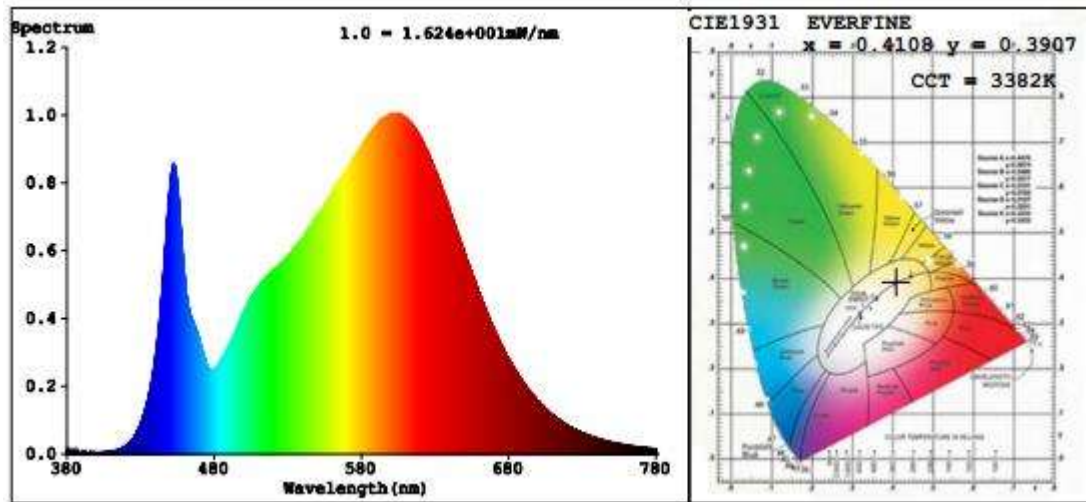
Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	84	R9	18
Frequency (Hz)	60	R2	92	R10	82
CCT (K)	3382	R3	97	R11	82
Duv	-0.0012	R4	83	R12	70
Chromaticity (x, y)	x=0.4108 y=0.3907	R5	84	R13	86
Chromaticity (u', v')	u'=0.2393 v'=0.5121	R6	90	R14	99
Color Rendering Index (CRI)	84.9	R7	85	R15	78
R9	18	R8	65	--	--

Photometric Measurement – Goniophotometer Method :

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	899.66
Luminous Efficacy (lm/W)	129.08
Beam Angle (°)	109.8
Center Beam Candle Power (cd)	295

Spectral Power Distribution & Chromaticity Diagram

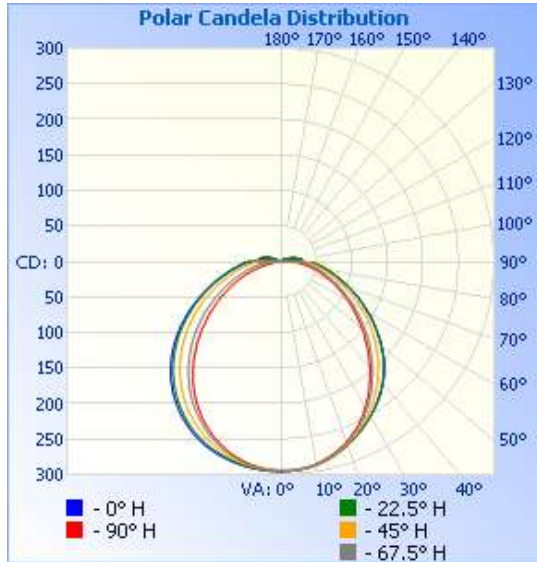


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	228.1	25.4%
0-40	372.5	41.4%
0-60	654.5	72.8%
60-90	221.0	24.6%
70-100	126.1	14%
90-120	22.8	2.5%
0-90	875.5	97.3%
90-180	24.1	2.7%
0-180	899.6	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	27.9	3.1%	90-100	10.0	1.1%
10-20	79.7	8.9%	100-110	9.5	1.1%
20-30	120.5	13.4%	110-120	3.3	0.4%
30-40	144.4	16.1%	120-130	0.6	0.1%
40-50	148.6	16.5%	130-140	0.2	0%
50-60	133.4	14.8%	140-150	0.2	0%
60-70	104.9	11.7%	150-160	0.2	0%
70-80	72.2	8.0%	160-170	0.1	0%
80-90	43.9	4.9%	170-180	0.0	0%

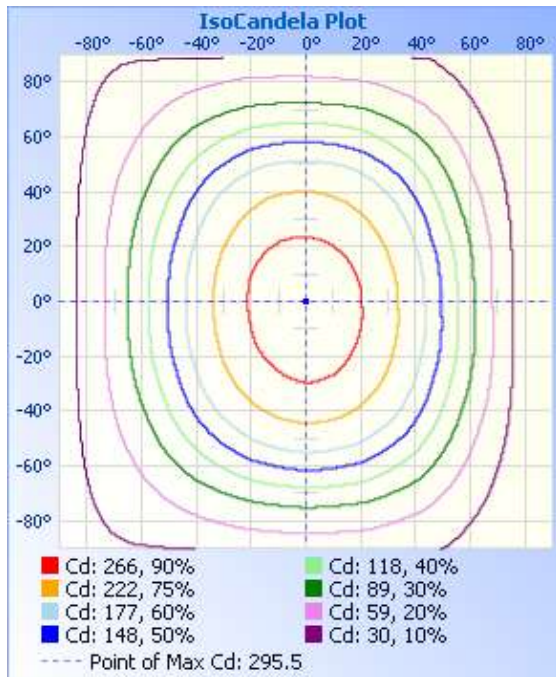
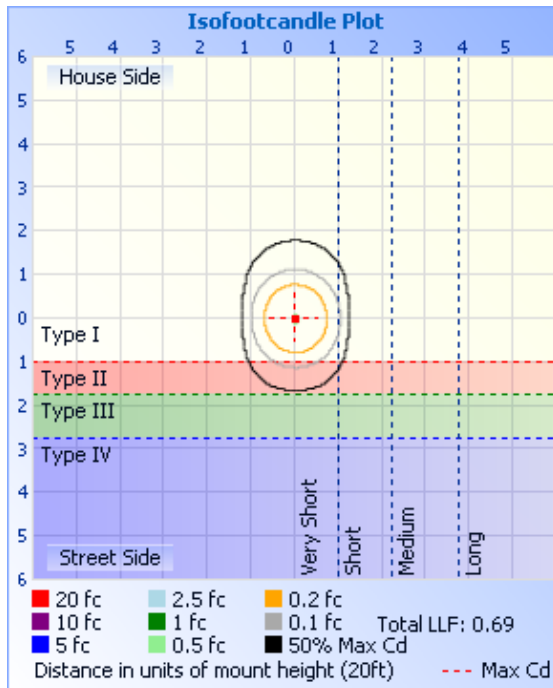
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	1.02 fc	58.7 ft	40.1 ft
34.0ft	0.26 fc	117.4 ft	80.3 ft
51.0ft	0.11 fc	176.1 ft	120.4 ft
68.0ft	0.06 fc	234.8 ft	160.5 ft
85.0ft	0.04 fc	293.5 ft	200.7 ft
102.0ft	0.03 fc	352.2 ft	240.8 ft

■ Vert. Spread: 119.8°
■ Horiz. Spread: 99.5°



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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	295	295	295	294	294	294	294	294	295	295	295	294	294	294	294	294	295
1	295	295	295	295	294	294	294	294	295	295	295	294	294	293	294	294	295
2	295	295	295	294	294	294	294	294	295	295	294	294	293	293	293	293	295
3	295	295	295	294	294	294	294	294	295	295	294	294	293	293	293	293	295
4	295	295	294	294	294	293	293	293	295	295	294	293	292	292	292	293	295
5	294	294	294	294	293	293	293	293	295	294	293	293	292	292	292	292	294
6	294	294	294	293	293	292	292	293	294	294	293	292	291	291	291	292	294
7	293	293	293	292	292	292	292	292	294	293	292	291	290	290	290	291	293
8	292	293	292	292	291	291	291	292	293	293	291	290	289	289	290	290	292
9	291	292	291	291	290	290	290	291	293	292	290	289	288	288	289	289	291
10	291	291	290	290	289	289	290	290	292	292	289	287	286	286	287	288	291
11	289	290	289	289	288	288	289	289	292	291	288	286	285	285	286	288	289
12	288	289	288	287	286	286	287	289	291	290	287	285	283	283	285	286	288
13	287	287	287	286	285	285	286	288	290	289	286	283	282	281	283	285	287
14	285	286	286	284	283	284	285	287	289	288	284	282	280	280	282	283	285
15	284	284	284	283	281	282	284	285	288	287	283	280	278	278	280	282	284
16	282	282	282	281	279	280	282	285	287	286	281	278	276	276	278	280	282
17	280	281	280	279	277	278	281	283	286	285	280	276	273	274	276	278	280
18	278	279	278	277	275	276	279	282	285	283	278	274	271	271	274	276	278
19	277	277	276	275	273	274	277	281	284	282	277	272	269	269	272	274	277
20	274	275	274	272	270	272	275	279	283	281	275	269	266	267	269	272	274
21	273	273	272	270	267	269	274	278	281	279	272	267	264	264	267	270	273
22	270	271	269	267	265	267	272	276	280	278	271	264	261	262	264	267	270
23	269	269	267	264	261	264	269	275	278	276	268	261	257	259	261	265	269
24	266	267	264	262	259	261	267	273	277	274	266	259	255	256	259	263	266
25	264	264	262	258	256	258	265	271	275	272	264	256	251	253	256	261	264
26	261	262	259	256	253	255	262	269	273	270	262	253	248	249	254	258	261
27	259	260	256	252	249	252	260	266	271	268	259	250	245	246	250	255	259
28	257	257	253	249	246	248	257	264	269	266	257	246	241	243	248	253	257

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29	254	255	250	245	242	246	255	262	267	263	254	244	238	239	244	250	254
30	252	252	247	241	238	241	252	260	264	261	251	240	234	236	242	248	252
31	249	250	244	237	234	238	249	257	262	259	249	237	230	232	238	245	249
32	246	247	241	234	230	234	246	254	260	256	245	233	226	228	235	243	246
33	244	244	238	230	225	231	243	252	257	253	243	229	221	224	232	240	244
34	241	241	234	227	222	227	239	249	254	250	239	226	218	220	228	237	241
35	239	238	231	222	217	223	235	246	252	247	236	222	213	216	225	234	239
36	236	235	227	218	213	219	232	243	248	245	233	219	209	212	221	231	236
37	233	231	224	213	208	215	228	239	246	241	229	214	205	208	218	228	233
38	230	229	220	209	204	211	224	236	242	238	226	210	200	203	214	225	230
39	227	226	216	205	199	206	221	233	240	235	222	206	196	198	210	221	227
40	224	223	213	200	196	202	217	230	236	231	218	202	191	195	207	219	224
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42	217	216	205	192	186	194	210	222	230	225	211	193	181	186	199	212	217
43	213	212	201	187	182	190	206	219	226	221	208	188	176	181	195	208	213
44	209	208	198	183	177	185	202	215	222	218	204	185	172	176	191	204	209
45	206	205	193	179	173	181	197	212	218	214	199	180	167	172	187	201	206
46	202	202	189	175	168	177	194	208	214	210	196	176	162	167	183	197	202
47	198	197	185	170	163	172	189	203	211	206	191	171	157	162	179	194	198
48	193	192	181	166	159	168	185	200	207	202	188	166	152	157	175	189	193
49	189	188	177	162	155	163	181	195	203	198	183	162	147	152	171	185	189
50	185	184	173	157	151	158	176	191	199	194	179	156	142	148	167	181	185
51	181	180	169	153	146	155	172	187	194	189	175	152	136	143	162	177	181
52	177	176	165	148	142	150	168	182	190	186	170	147	132	139	158	172	177
53	172	171	160	144	137	146	163	179	185	181	166	142	127	133	154	169	172
54	168	167	155	140	133	141	159	174	182	177	161	138	122	128	149	164	168
55	163	162	152	135	129	137	154	170	177	172	157	133	117	124	145	160	163
56	159	159	147	131	124	133	151	165	172	167	153	129	112	119	140	155	159
57	155	154	143	127	121	128	146	160	168	164	148	123	107	115	137	151	155
58	151	150	139	123	116	124	141	156	163	159	144	118	102	110	132	147	151
59	146	145	134	119	113	120	137	151	158	155	139	114	98	105	127	142	146

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60	141	141	130	115	109	116	132	147	154	150	134	109	93	101	123	138	141
61	138	137	126	111	104	112	129	142	149	145	130	105	88	96	119	134	138
62	133	132	122	106	101	107	124	137	145	141	125	100	84	92	115	129	133
63	129	129	118	103	97	104	120	133	139	136	122	96	79	88	110	125	129
64	124	124	114	99	94	100	116	128	134	132	117	92	75	83	106	121	124
65	121	120	110	95	90	96	111	124	130	127	112	87	71	79	102	117	121
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67	112	111	102	88	82	88	103	116	121	118	104	79	62	70	93	108	112
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71	96	96	87	74	69	75	88	99	103	101	88	63	45	56	79	93	96
72	92	92	84	71	65	72	84	95	100	97	84	59	42	52	75	89	92
73	89	89	80	68	62	68	81	91	96	93	80	56	37	49	72	86	89
74	85	85	77	65	59	65	77	87	92	90	76	53	33	45	68	82	85
75	82	82	74	62	56	62	74	84	88	85	73	49	29	43	65	79	82
76	78	78	71	59	53	59	71	80	84	82	70	46	25	39	62	75	78
77	75	75	68	57	50	57	68	77	81	79	66	43	22	36	59	72	75
78	72	72	65	54	47	54	65	74	78	75	63	40	19	34	56	69	72
79	69	69	62	52	44	51	62	70	74	72	60	37	17	31	53	66	69
80	66	66	59	49	41	49	59	68	72	69	57	34	14	29	51	63	66
81	63	63	57	46	39	46	57	65	68	66	54	32	11	26	48	60	63
82	60	61	54	44	35	44	54	62	66	63	51	30	10	24	45	57	60
83	58	58	52	42	33	42	52	59	63	60	49	27	7	22	43	55	58
84	55	55	50	40	30	39	49	57	60	58	46	25	6	20	40	52	55
85	53	53	47	38	27	37	47	55	58	55	44	23	4	18	39	50	53
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87	48	48	43	34	23	33	42	50	53	50	39	19	2	13	34	45	48
88	45	46	40	32	21	31	41	48	50	48	37	18	1	10	32	43	45
89	39	40	37	29	19	28	38	46	48	46	35	16	1	8	30	41	39
90	19	19	12	17	12	20	28	37	45	43	33	14	0	6	24	28	19

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91	2	1	1	2	4	5	4	11	22	22	18	6	0	2	3	7	2
92	1	1	1	1	0	1	1	1	6	5	1	1	0	1	1	1	1
93	1	1	1	0	0	1	1	1	1	1	1	1	0	0	1	1	1
94	1	2	8	1	0	1	3	1	1	1	2	1	0	1	2	1	1
95	7	15	10	5	1	2	9	14	1	3	5	1	0	2	3	7	7
96	25	30	9	13	4	8	13	31	18	23	5	6	0	5	3	24	25
97	29	30	9	14	8	11	12	31	30	31	5	7	0	4	3	27	29
98	28	28	8	12	10	9	11	30	31	30	5	6	0	4	3	26	28
99	26	27	8	11	9	6	8	28	30	28	5	5	0	3	3	25	26
100	25	25	7	8	8	4	3	27	28	27	5	4	0	2	3	24	25
101	24	24	7	4	7	2	5	25	27	25	4	2	0	1	3	22	24
102	23	23	6	3	5	1	8	24	26	24	4	1	0	1	2	21	23
103	22	22	6	2	2	0	7	23	24	23	4	1	0	0	2	20	22
104	20	20	6	1	1	0	6	22	23	22	4	1	0	0	2	19	20
105	20	19	5	1	1	1	6	20	22	20	3	0	0	0	2	18	20
106	18	18	5	0	3	0	5	19	21	19	3	0	0	0	2	17	18
107	17	17	4	0	4	0	4	18	20	18	3	0	0	0	2	16	17
108	16	16	4	0	5	1	3	16	18	17	2	0	0	0	2	15	16
109	15	15	3	0	5	1	2	14	17	15	2	0	0	0	1	14	15
110	15	14	2	0	5	1	2	13	16	14	2	0	0	0	1	13	15
111	14	12	2	0	6	1	1	11	15	12	1	0	0	0	1	12	14
112	12	11	2	0	6	1	1	9	13	10	1	0	0	0	1	11	12
113	11	10	1	0	6	1	0	8	11	9	1	0	0	0	1	9	11
114	10	8	1	0	6	1	0	6	10	7	1	0	0	0	0	8	10
115	8	7	0	0	6	1	0	5	8	6	0	0	0	0	0	7	8
116	7	5	0	0	6	1	0	4	7	5	0	0	0	0	0	6	7
117	6	4	0	0	6	1	0	2	6	4	0	0	0	0	0	4	6
118	5	3	0	0	6	1	0	2	5	3	0	0	0	0	0	3	5
119	4	2	0	0	6	0	0	1	3	2	0	0	0	0	0	2	4
120	3	1	0	0	6	0	0	0	2	1	0	0	0	0	0	1	3
121	2	1	0	0	6	0	0	0	1	0	0	0	0	0	0	1	2

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122	1	0	0	0	6	0	0	0	1	0	0	0	0	0	0	0	1
123	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0
124	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0
126	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0
127	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0
128	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	0	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	0
132	0	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	0
134	0	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	0
136	0	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	0
138	0	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	0
140	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
141	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
142	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
143	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
144	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
146	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
147	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
148	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
149	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
151	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
152	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0

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 NVLAP CODE: 201011-0

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153	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
154	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
155	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
156	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
157	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
158	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
159	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
160	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0
161	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
162	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0
163	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0
164	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0
165	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0
166	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0
167	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0
168	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
169	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
170	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
171	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
172	0	0	0	0	0	0	0	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

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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 *******

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