

**LM-79-08 Test Report**

For

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

188 S.Northwest Highway, Cary, IL60013, USA

**LED Luminaires**

Model name(s): LED-7324-40K-G2

Representative (Tested) Model: LED-7324-40K-G2

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

Test &amp; Report By:

*Garman Mo*

Engineer: Garman Mo

Date: Feb.12,2017

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



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**1.1 Product Information:**

Organization Name	LIGHT EFFICIENT DESIGN, LLC	
Brand Name	N/A	
Model Number	LED-7324-40K-G2	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	LED Luminaires	
Rated Voltage / Frequency	120 -277Vac, 50/60 Hz	
Nominal Power	11W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K	
LED Manufacturer	SAMSUNG	
LED Model	SPMWHT327F*****	
Sample Number	GZE1707080-H-C1	
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	Feb.05,2018
Date of Test	Feb.06,2018
Test item	<ol style="list-style-type: none"> <li>1. Total Luminous Flux</li> <li>2. Luminous Distribution Intensity</li> <li>3. Luminous Efficacy</li> <li>4. Correlated Color Temperature</li> <li>5. Color Rendering Index</li> <li>6. Chromaticity Coordinate</li> <li>7. Electrical Parameters</li> </ol>
Reference Standard	<ol style="list-style-type: none"> <li>1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products</li> <li>2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products</li> <li>3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources</li> <li>4. CIE 15-2004 Technical Report Colorimetry</li> <li>5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source</li> <li>6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems</li> </ol>
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  $1^{\circ}$  vertical intervals and  $22.5^{\circ}$  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	2018-02-06	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-7324-40K-G2		

**Electrical Measurement:**

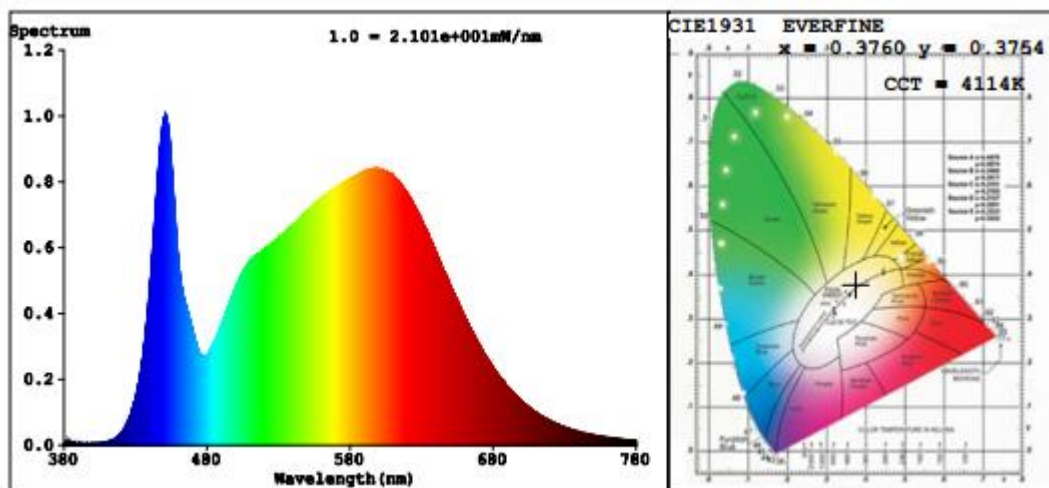
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE170708	120.0	60	0.0996	11.03	0.9231	37.22
0-H-C1	277.0	60	0.0442	10.73	0.8767	53.69

**Chromaticity Measurement - Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	85	R9	25
Frequency (Hz)	60	R2	91	R10	78
CCT (K)	4114	R3	95	R11	85
Duv	0.0007	R4	86	R12	66
Chromaticity (x, y)	x=0.3760 y=0.3754	R5	85	R13	86
Chromaticity (u', v')	u'=0.2227 v'=0.5003	R6	87	R14	98
Color Rendering Index (CRI)	86.1	R7	89	R15	80
R9	25	R8	71	--	--

**Photometric Measurement – Goniophotometer Method:**

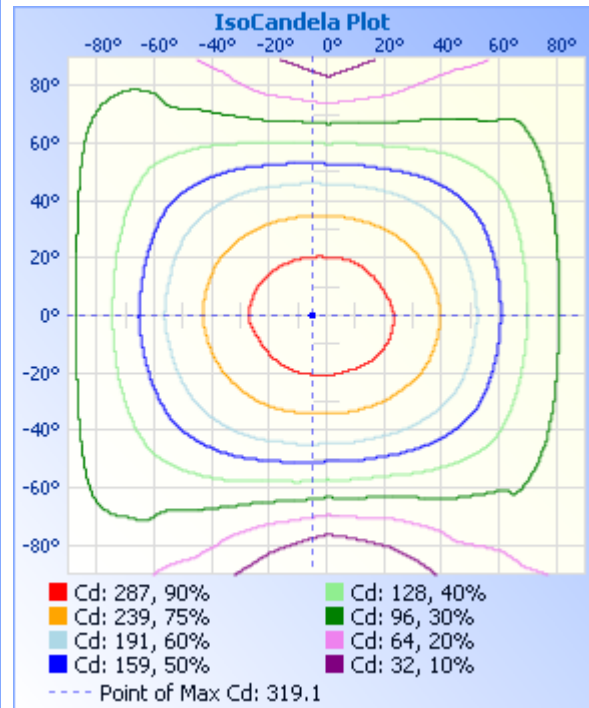
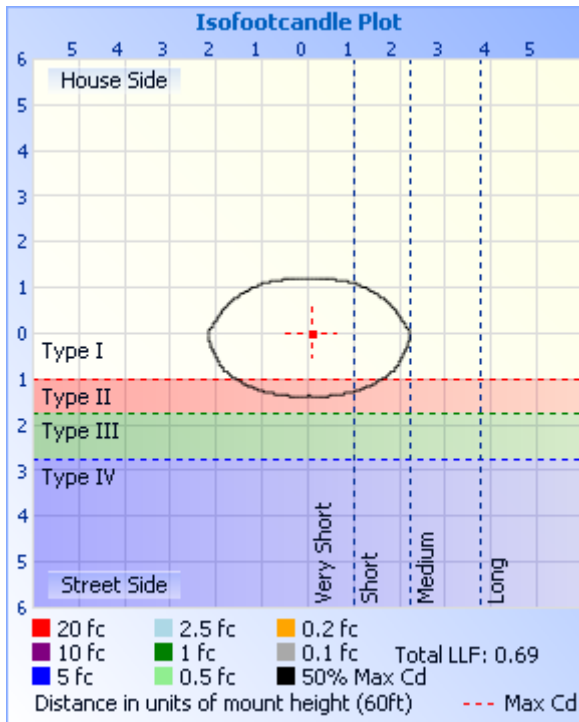
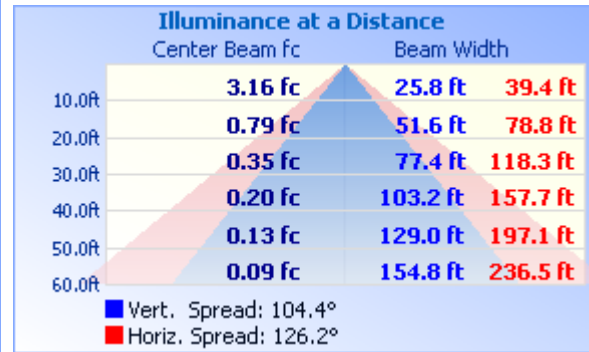
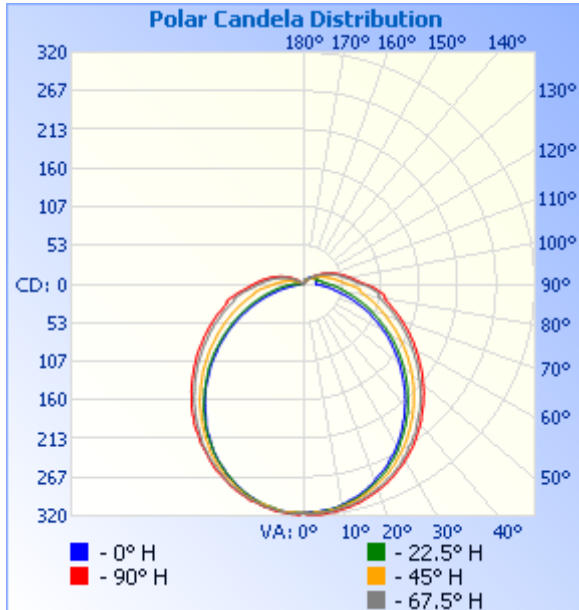
Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	1099.8	1045.5
Luminous Efficacy (lm/W)	99.71	97.44
Most worst Luminous/Highest Watts	94.79	
Beam Angle (°)	115.2	--
Center Beam Candle Power (cd)	316	--

**Spectral Power Distribution & Chromaticity Diagram**

**Zonal Lumen Tabulation**

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	244.3	22.2%
0-40	399.1	36.3%
0-60	709.0	64.5%
60-90	284.3	25.9%
70-100	203.4	18.5%
90-120	89.9	8.2%
0-90	993.3	90.3%
90-180	106.4	9.7%
0-180	1,099.7	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	29.9	2.7%	90-100	43.4	3.9%
10-20	85.4	7.8%	100-110	29.0	2.6%
20-30	129.0	11.7%	110-120	17.6	1.6%
30-40	154.8	14.1%	120-130	9.2	0.8%
40-50	160.9	14.6%	130-140	4.0	0.4%
50-60	149.0	13.5%	140-150	1.9	0.2%
60-70	124.2	11.3%	150-160	1.0	0.1%
70-80	93.7	8.5%	160-170	0.4	0%
80-90	66.3	6.0%	170-180	0.1	0%

**Photometric Data**



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	316	316	316	316	316	316	316	316	316	316	316	316	316	316	316	316	316
1	315	316	316	317	318	314	315	315	316	316	316	317	319	313	314	315	315
2	315	316	317	318	318	314	315	316	316	316	316	317	318	312	313	315	315
3	315	316	315	318	319	314	315	316	315	316	315	317	318	312	314	315	315
4	315	316	315	316	319	314	314	315	315	315	315	316	317	312	313	314	315
5	314	315	316	317	319	314	314	314	315	315	315	316	316	311	313	313	314
6	313	314	315	316	318	313	313	314	314	314	314	315	316	310	312	313	313
7	313	313	314	316	317	312	311	313	313	312	313	313	316	309	310	312	313
8	312	313	314	315	318	312	311	312	312	311	312	313	314	308	310	311	312
9	311	312	313	314	316	311	310	312	311	310	310	312	313	308	309	310	311
10	309	310	312	313	315	311	309	310	310	309	309	311	312	307	308	308	309
11	308	309	311	313	315	311	309	308	308	307	308	309	310	305	306	307	308
12	306	308	309	312	314	309	308	307	306	306	307	308	308	303	306	306	306
13	304	306	308	311	312	307	306	305	304	304	305	307	308	302	303	304	304
14	303	305	307	310	312	306	304	303	302	302	304	305	307	301	302	302	303
15	301	303	305	308	311	305	304	300	300	300	302	304	305	300	300	299	301
16	299	301	303	306	309	303	302	299	298	298	300	302	303	299	297	298	299
17	296	298	301	305	308	303	300	297	295	296	297	300	301	297	296	296	296
18	294	296	300	303	306	301	298	294	292	294	295	297	299	294	294	294	294
19	292	294	298	302	304	299	296	293	290	290	293	296	297	292	292	291	292
20	289	291	295	300	303	296	294	290	288	287	290	294	295	290	290	289	289
21	285	289	293	298	301	296	292	287	286	284	288	292	292	288	287	286	285
22	283	287	291	297	299	294	290	285	282	282	285	289	290	285	284	283	283
23	281	284	289	294	298	290	287	283	278	279	283	286	288	283	281	281	281
24	278	282	287	292	295	289	285	280	275	276	279	284	286	281	279	278	278
25	275	278	284	290	294	287	282	276	273	272	277	281	284	279	276	275	275
26	271	275	281	288	291	283	279	273	269	270	274	278	281	276	274	273	271
27	268	273	279	285	288	281	276	270	265	266	270	276	278	272	271	269	268
28	266	269	275	284	286	279	273	267	262	263	267	273	275	270	268	266	266

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29	262	266	272	280	284	276	270	262	258	258	264	270	271	267	265	263	262
30	258	263	270	277	281	273	267	259	254	255	260	267	268	264	261	258	258
31	255	259	266	275	279	270	263	255	250	251	256	264	266	261	259	254	255
32	251	255	263	272	276	268	259	252	246	248	253	261	263	258	256	251	251
33	247	252	260	268	273	265	256	248	243	243	248	257	260	255	252	247	247
34	244	248	257	266	271	261	253	243	239	240	245	253	256	252	248	243	244
35	239	244	253	263	268	258	249	239	234	235	241	249	253	249	245	240	239
36	235	241	249	259	264	255	246	236	228	231	237	246	250	245	241	236	235
37	232	236	246	258	261	253	242	231	224	226	233	243	247	242	237	232	232
38	227	232	242	253	258	249	238	226	220	223	229	239	244	239	234	227	227
39	223	229	239	249	255	245	235	222	215	218	225	236	239	235	230	224	223
40	219	225	235	246	251	242	230	217	211	213	221	232	237	232	226	219	219
41	215	220	231	243	249	238	226	214	206	208	217	227	233	229	222	215	215
42	210	216	228	239	244	235	223	209	201	203	213	224	230	225	219	212	210
43	207	212	224	237	241	231	218	205	197	199	208	221	226	222	215	207	207
44	202	207	219	232	238	227	214	200	192	193	203	217	222	218	211	203	202
45	197	204	216	229	235	224	211	195	187	189	200	212	218	214	206	199	197
46	193	199	212	226	231	220	207	191	181	185	195	208	215	211	202	194	193
47	188	195	209	222	227	216	201	186	177	180	191	205	211	207	198	190	188
48	183	191	205	218	224	213	198	182	173	176	187	201	207	204	194	185	183
49	179	186	200	214	220	209	193	176	168	171	183	197	203	200	190	181	179
50	175	182	197	210	217	205	189	172	162	165	178	193	199	196	186	176	175
51	171	178	192	206	213	201	185	167	156	161	174	189	195	193	182	172	171
52	166	173	189	202	209	197	181	162	151	156	169	186	192	188	179	168	166
53	160	169	184	199	206	194	176	157	147	151	165	181	188	184	175	164	160
54	156	164	180	195	202	189	172	152	142	145	161	177	183	181	170	159	156
55	151	160	176	192	198	185	168	148	136	140	156	173	180	178	167	155	151
56	147	155	172	188	194	181	163	143	131	136	152	169	177	174	163	150	147
57	142	151	168	184	191	178	159	138	126	131	147	165	173	170	160	146	142
58	138	146	164	181	187	174	156	133	121	126	143	161	169	167	155	142	138
59	133	141	160	176	183	170	151	128	115	121	139	158	165	163	152	138	133
60	128	137	156	173	180	167	147	124	110	116	136	153	161	159	148	133	128

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61	124	133	152	169	176	163	142	119	105	112	131	150	158	156	143	129	124
62	119	129	148	166	173	159	139	114	101	107	126	146	155	152	140	125	119
63	114	124	144	162	169	155	135	110	95	102	123	143	150	149	136	120	114
64	109	119	141	158	165	151	130	106	90	97	119	139	147	145	133	116	109
65	105	115	137	155	162	149	127	101	84	92	115	136	144	142	129	112	105
66	101	111	132	151	158	145	122	96	80	88	111	133	140	139	126	108	101
67	96	107	129	148	155	140	119	92	74	84	108	129	136	135	122	104	96
68	92	102	125	144	151	137	115	87	69	79	105	125	134	132	118	100	92
69	86	99	122	141	148	134	111	83	64	74	100	121	130	129	115	96	86
70	82	95	118	138	144	130	108	79	60	71	96	119	127	126	111	92	82
71	78	91	115	134	141	127	105	75	54	67	94	115	124	123	109	89	78
72	74	87	112	131	138	122	101	70	49	63	90	112	119	119	105	85	74
73	69	83	109	128	135	120	97	67	44	58	86	108	116	116	102	82	69
74	65	80	105	125	132	117	94	63	39	55	83	105	114	113	98	78	65
75	60	76	102	121	128	113	91	59	36	51	80	102	110	110	96	74	60
76	56	72	99	118	125	110	87	55	31	48	77	99	109	108	92	71	56
77	52	68	96	115	122	108	84	52	26	44	74	97	108	104	90	68	52
78	48	65	93	112	119	105	81	49	22	41	71	97	106	102	86	65	48
79	45	62	89	109	116	104	78	46	19	38	69	95	102	101	84	62	45
80	43	59	87	107	115	102	76	43	15	35	68	90	98	100	81	60	43
81	40	57	84	105	114	101	75	40	12	32	65	87	95	97	80	57	40
82	37	55	81	105	113	97	73	37	9	30	63	85	92	94	79	55	37
83	34	52	79	105	111	93	70	34	7	27	60	81	88	91	77	52	34
84	31	50	79	102	108	91	67	33	5	25	56	77	84	89	73	50	31
85	28	47	78	98	104	89	64	30	3	23	52	73	81	85	71	47	28
86	26	45	75	96	102	85	62	28	2	20	49	70	78	82	68	45	26
87	24	43	72	92	98	80	58	25	1	18	47	68	75	78	65	42	24
88	22	40	69	90	95	77	54	23	1	16	44	65	73	74	61	40	22
89	20	38	65	85	90	73	51	21	0	15	42	63	71	72	59	37	20
90	18	35	62	81	86	70	49	19	1	13	40	61	68	70	57	35	18
91	18	33	58	76	82	67	47	18	1	12	38	58	66	68	55	34	18
92	18	32	56	74	79	66	45	16	1	11	36	57	64	66	52	33	18

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93	18	31	54	71	76	63	43	15	1	10	35	55	62	64	51	31	18
94	18	29	52	69	74	61	41	14	1	9	33	53	60	62	49	30	18
95	18	28	50	67	71	59	40	13	1	8	31	51	58	60	47	29	18
96	18	27	48	65	70	57	38	12	1	7	30	49	56	58	46	28	18
97	17	26	47	63	67	55	36	11	1	7	28	47	54	56	44	27	17
98	18	26	45	61	66	53	35	10	1	6	27	45	52	55	43	26	18
99	18	25	44	59	63	51	33	9	1	5	25	43	50	53	41	25	18
100	18	24	42	57	61	50	31	9	1	5	24	42	48	51	39	24	18
101	19	23	41	56	59	48	30	7	0	5	23	40	46	49	38	23	19
102	19	23	39	54	58	46	29	7	1	4	21	38	44	47	37	23	19
103	19	22	38	52	56	45	27	6	0	4	20	37	43	45	35	22	19
104	19	22	36	50	54	43	26	6	1	4	19	35	41	44	34	21	19
105	19	22	35	49	52	41	24	5	1	4	17	33	39	42	32	21	19
106	18	21	34	47	50	40	23	5	1	3	16	32	37	41	31	20	18
107	18	20	32	46	49	38	22	5	0	3	15	30	36	39	30	19	18
108	18	20	31	44	47	36	20	4	0	3	14	28	34	37	28	19	18
109	19	19	30	42	45	34	19	5	0	3	13	27	32	35	27	18	19
110	19	19	28	40	43	33	18	4	0	3	12	25	31	34	26	18	19
111	20	18	27	39	42	31	17	4	0	3	11	24	29	33	25	18	20
112	20	18	26	37	40	29	16	4	0	3	10	22	27	31	24	17	20
113	19	17	25	36	39	28	14	3	0	3	9	21	26	30	23	17	19
114	19	17	24	34	36	26	14	3	0	3	9	19	24	28	21	17	19
115	19	17	23	32	35	24	12	3	0	2	8	18	23	27	20	17	19
116	18	17	22	31	33	23	12	3	0	2	8	17	21	25	19	17	18
117	19	17	21	29	32	22	11	2	1	2	7	15	20	24	18	17	19
118	17	17	20	28	30	20	10	2	1	2	6	14	18	22	18	16	17
119	17	16	19	26	28	19	9	2	1	2	6	13	17	21	17	16	17
120	16	16	18	25	27	18	8	2	1	2	5	12	16	20	16	16	16
121	16	16	17	24	25	16	8	2	1	2	4	11	14	19	15	15	16
122	15	15	17	23	24	15	7	2	2	2	3	10	13	17	14	15	15
123	15	15	16	21	23	14	6	2	1	1	2	9	12	16	14	15	15
124	15	15	15	20	21	13	5	2	1	1	2	8	11	15	12	14	15

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125	15	14	14	19	20	12	5	2	1	1	2	7	10	14	12	14	15
126	14	14	13	18	19	11	4	1	1	1	2	6	9	13	11	14	14
127	14	13	13	17	18	10	3	1	1	1	2	5	8	12	10	13	14
128	15	13	12	16	16	9	2	1	1	1	1	4	7	11	10	13	15
129	14	13	11	15	15	8	2	1	1	1	1	3	6	9	9	13	14
130	13	13	11	14	14	7	2	1	1	1	1	2	5	9	9	12	13
131	13	12	10	13	13	6	1	1	1	1	1	1	3	8	9	12	13
132	12	12	9	12	12	5	1	1	1	1	1	1	2	7	9	11	12
133	12	11	9	11	11	4	1	1	1	1	1	1	1	6	8	11	12
134	12	11	9	10	10	3	1	1	1	1	1	1	1	5	8	11	12
135	12	11	8	9	9	2	1	1	1	1	1	1	1	4	8	11	12
136	11	11	8	8	8	1	1	1	1	1	1	1	1	4	8	10	11
137	11	10	8	7	7	1	1	1	1	1	1	1	1	4	7	10	11
138	11	10	7	6	6	1	1	1	1	1	1	1	1	3	7	10	11
139	11	10	7	5	5	1	1	1	1	1	1	1	1	3	7	10	11
140	10	9	7	4	4	1	1	1	1	1	1	1	1	3	7	9	10
141	10	9	7	4	3	1	1	1	1	1	1	1	1	3	7	9	10
142	9	9	7	4	2	1	1	1	1	1	1	1	1	3	6	9	9
143	9	8	6	3	1	1	1	1	0	1	1	1	1	2	6	8	9
144	9	8	6	3	1	1	1	1	1	1	1	1	1	2	6	8	9
145	9	8	6	3	1	1	1	1	1	1	1	1	1	2	6	8	9
146	8	8	6	3	1	1	1	1	1	1	1	1	1	2	5	8	8
147	8	7	6	3	1	1	1	1	1	1	1	1	1	2	5	7	8
148	8	7	5	3	1	1	1	1	1	1	1	1	1	2	5	7	8
149	7	7	5	3	1	1	1	1	1	1	1	1	1	2	5	7	7
150	7	7	5	3	1	1	1	1	1	1	1	1	1	2	5	6	7
151	7	6	5	3	1	1	1	1	1	1	1	1	1	2	4	6	7
152	7	6	5	2	1	1	1	1	1	1	1	1	1	2	4	6	7
153	7	6	5	2	1	1	1	1	1	1	1	1	1	2	3	6	7
154	6	6	4	2	1	1	1	1	1	1	1	1	1	2	3	6	6
155	6	5	4	2	1	1	1	1	1	1	1	1	1	2	3	5	6
156	6	5	4	2	0	1	1	1	1	1	1	1	1	2	2	5	6

Laboratory: Standard-Tech Co. Ltd Testing Center

NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2

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157	5	5	4	2	1	1	1	1	1	1	1	1	1	2	2	5	5
158	4	5	4	2	1	1	1	1	1	1	1	1	1	2	5	4	
159	4	5	4	2	1	1	1	1	1	1	1	1	1	1	4	4	
160	4	4	3	2	1	1	1	1	1	1	1	1	1	1	4	4	
161	4	4	3	2	1	1	1	1	1	1	1	1	1	1	3	4	
162	4	4	3	2	1	1	1	1	1	1	1	1	1	0	1	3	4
163	4	4	3	2	0	1	1	1	1	1	1	1	0	0	1	3	4
164	4	3	3	1	1	1	1	1	1	1	1	1	1	0	3	4	
165	3	3	3	1	1	1	1	1	1	1	1	1	1	1	3	3	
166	4	3	3	1	1	1	1	1	1	1	1	1	1	0	1	2	4
167	3	3	2	1	1	1	1	1	1	1	1	1	1	0	1	2	3
168	3	3	2	1	1	1	1	1	1	1	1	1	1	0	1	2	3
169	2	2	2	1	1	1	1	1	1	1	0	1	1	0	1	2	2
170	2	2	2	1	1	1	1	0	1	1	1	1	1	0	1	1	2
171	2	2	2	1	1	0	1	1	1	0	1	1	1	0	1	1	2
172	2	2	1	1	1	0	0	1	1	1	1	1	0	0	1	0	2
173	1	1	1	1	1	1	1	0	1	0	1	1	1	0	0	1	1
174	1	1	1	1	1	0	0	1	1	1	1	1	0	0	0	1	1
175	1	1	1	1	0	0	1	0	1	1	1	1	1	1	0	0	1
176	1	1	1	1	0	1	1	0	0	1	1	1	0	0	1	0	1
177	0	1	1	1	0	0	1	1	1	1	1	1	0	0	0	0	0
178	1	1	1	1	0	0	1	1	0	1	1	1	0	0	0	0	1
179	0	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	0
180	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

**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 \*\*\*\*\***