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-7320-40K-G2

Representative (Tested) Model: LED-7320-40K-G2

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

Test & Report By:

Biao Zhong

Engineer: Biao Zhong

Date: Mar.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.

1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN, LLC	
Brand Name	N/A	
Model Number	LED-7320-40K-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	Everlight Electronics Co., LTD	
LED Model	67-21S/KK5C-H402433Z6-2T	
Sample Number	GZE1711047-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	Jan.03,2018
Date of Test	Jan.05,2018
Test item	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	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 °C ±1 °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 ºC ±1 ºC. 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 ºC ±1 ºC. 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	2018-01-05	Test Ambient:	25.2 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-7320-40K-G2		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE171104 7-H-C1	120.0	60	0.1025	10.77	0.8752	42.13
	277.0	60	0.0470	10.44	0.8014	67.51

Chromaticity Measurement - Sphere-Spectroradiometer Method:

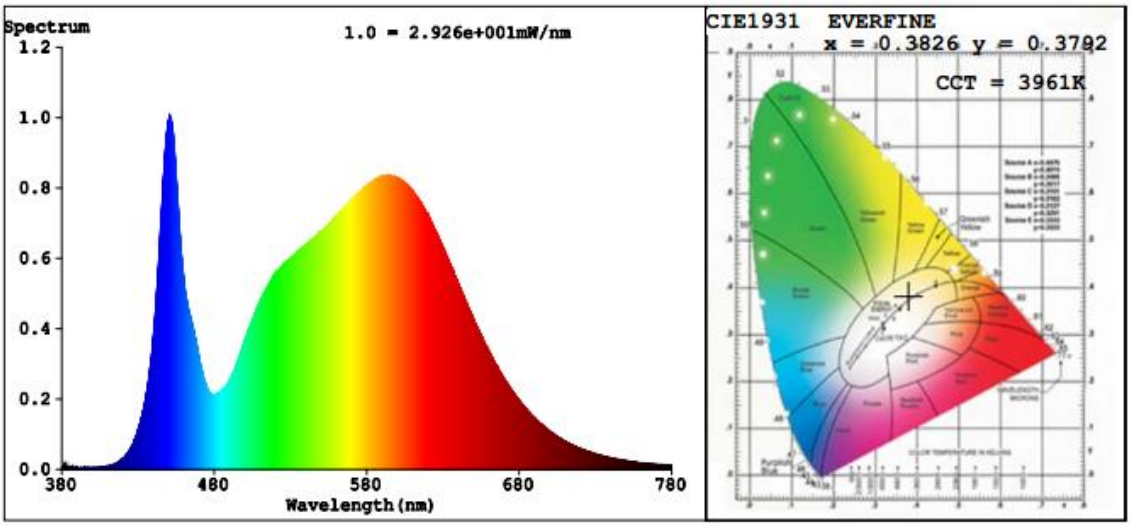
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	3961
Duv	0.0005
Chromaticity (x, y)	x=0.3826 y=0.3792
Chromaticity (u', v')	u'=0.2255 v'=0.5030
Color Rendering Index (CRI)	82.0
R9	6

Special Color Rendering Indices			
R1	80	R9	6
R2	88	R10	71
R3	93	R11	80
R4	81	R12	58
R5	80	R13	82
R6	83	R14	96
R7	86	R15	75
R8	64	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	1546.6	1445.2
Luminous Efficacy (lm/W)	143.60	138.43
Beam Angle ( )	280.9	--
Center Beam Candle Power (cd)	9	--

Spectral Power Distribution & Chromaticity Diagram

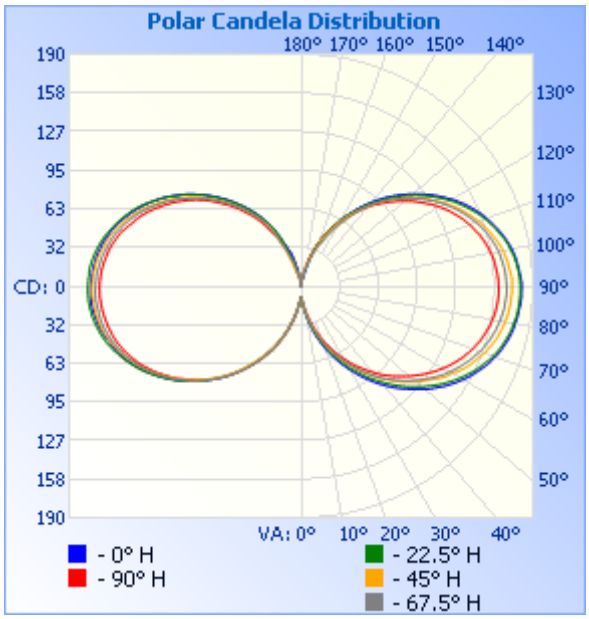


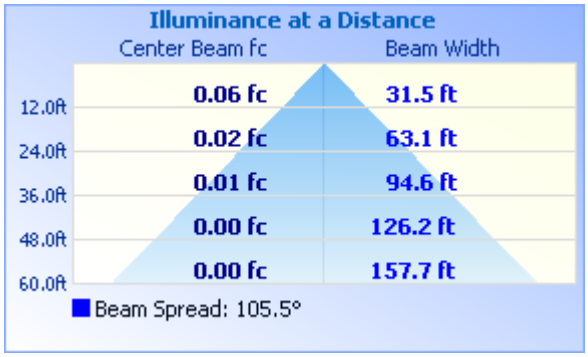
Zonal Lumen Tabulation

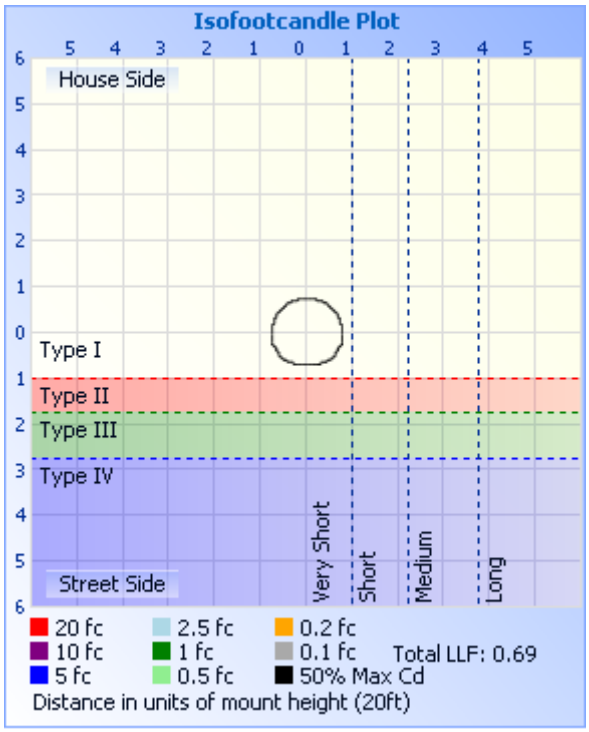
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	38.5	2.5%
0-40	91.2	5.9%
0-60	292.4	18.9%
60-90	502.5	32.5%
70-100	536.7	34.7%
90-120	493.0	31.8%
0-90	794.9	51.4%
90-180	753.0	48.6%
0-180	1,547.9	100%

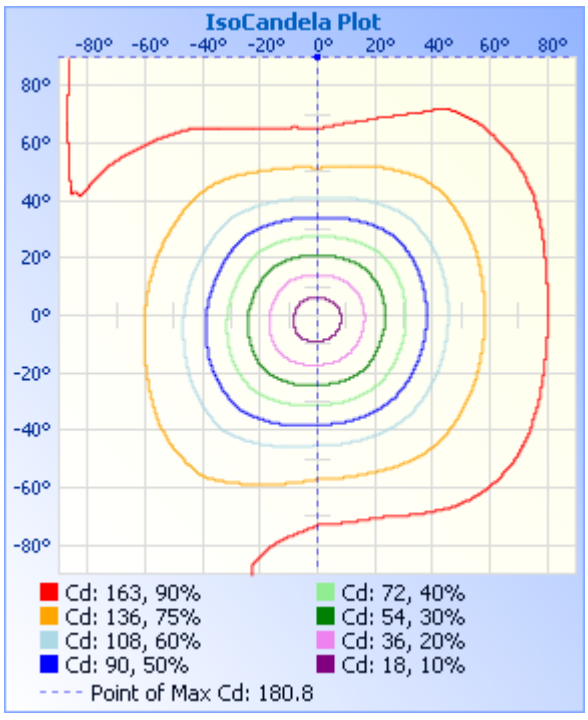
Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	% Total
0-10	1.5	0.1%	90-100	182.2	11.8%
10-20	9.8	0.6%	100-110	168.0	10.9%
20-30	27.2	1.8%	110-120	142.8	9.2%
30-40	52.7	3.4%	120-130	110.8	7.2%
40-50	84.0	5.4%	130-140	76.9	5%
50-60	117.2	7.6%	140-150	45.9	3%
60-70	148.0	9.6%	150-160	20.9	1.3%
70-80	171.3	11.1%	160-170	5.3	0.3%
80-90	183.2	11.8%	170-180	0.3	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	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
1	10	10	10	9	9	9	9	9	9	10	10	10	9	10	10	10	10
2	11	11	10	10	10	10	10	10	10	10	10	10	10	10	11	11	11
3	12	12	11	11	10	10	10	10	10	11	11	11	11	11	12	12	12
4	14	13	12	12	11	11	11	11	11	11	11	12	12	12	13	14	14
5	15	15	13	13	12	12	12	12	12	12	13	13	13	14	14	15	15
6	17	16	15	14	14	13	13	13	14	14	14	15	15	15	16	17	17
7	19	18	16	16	15	15	14	15	15	15	16	16	16	17	18	19	19
8	21	20	18	17	17	16	15	16	17	17	17	18	18	19	20	20	21
9	23	22	20	19	19	18	17	18	19	19	19	20	20	21	22	23	23
10	25	24	22	21	20	19	19	20	21	21	21	22	22	23	24	25	25
11	28	26	24	24	22	21	20	21	23	23	23	24	24	25	26	27	28
12	30	29	27	26	25	23	22	24	25	25	25	26	27	27	28	29	30
13	33	31	29	28	27	25	24	26	27	27	28	29	29	29	30	32	33
14	35	34	31	30	29	27	26	28	30	29	30	31	31	32	33	34	35
15	38	36	34	33	31	29	28	30	32	32	32	33	34	34	35	37	38
16	40	39	36	35	33	32	31	32	34	34	35	36	36	36	37	39	40
17	43	41	38	38	36	34	33	35	37	37	37	38	39	39	40	42	43
18	46	44	41	40	38	36	35	37	39	39	39	41	41	41	42	44	46
19	48	47	43	43	41	39	37	39	42	42	42	43	44	43	44	47	48
20	51	49	46	45	43	41	40	42	44	44	44	46	46	46	47	49	51
21	54	52	48	48	45	43	42	44	47	47	47	48	49	48	49	52	54
22	57	54	51	50	48	46	44	46	50	49	49	51	51	51	52	55	57
23	59	57	54	53	50	48	47	49	52	52	52	54	54	53	54	57	59
24	62	60	56	56	53	50	49	52	55	54	54	58	56	56	57	60	62
25	65	62	59	58	55	53	51	54	57	57	57	58	59	59	59	63	65
26	68	65	61	61	58	55	54	57	60	60	60	61	61	61	62	65	68
27	70	68	64	63	60	58	56	59	63	62	62	64	64	64	64	68	70
28	73	70	67	66	63	60	58	62	65	65	65	66	66	66	67	70	73

29	76	73	69	68	66	63	61	64	68	67	67	69	69	68	69	73	76
30	79	76	72	71	68	65	63	67	71	70	70	71	71	71	71	76	79
31	81	79	74	74	70	67	65	69	73	73	72	74	74	73	74	78	81
32	84	81	77	76	73	70	68	72	76	75	75	76	76	76	77	81	84
33	87	84	79	79	75	72	70	74	78	78	77	79	79	79	79	84	87
34	90	86	82	82	78	74	73	77	81	80	80	82	81	81	82	86	90
35	92	89	85	84	80	77	75	79	84	83	83	84	84	83	84	89	92
36	95	92	87	87	83	79	77	82	86	86	85	87	86	86	87	91	95
37	98	95	90	89	85	82	80	84	89	88	88	89	89	88	89	94	98
38	101	97	92	92	88	84	82	87	92	91	90	92	91	91	91	96	101
39	103	100	95	94	90	86	85	89	94	94	93	94	94	93	94	99	103
40	106	103	97	97	92	89	87	92	97	96	96	97	96	96	96	101	106
41	109	105	100	99	95	91	89	94	99	99	98	99	99	98	98	104	109
42	112	108	102	102	97	93	92	97	102	101	100	102	101	100	101	107	112
43	114	111	105	104	99	96	94	99	104	104	103	104	104	103	103	109	114
44	116	113	107	106	102	98	96	101	106	106	105	107	106	105	106	111	116
45	119	116	110	109	104	100	98	104	109	109	108	109	108	108	108	114	119
46	121	118	112	111	106	102	100	106	111	111	110	111	110	110	110	116	121
47	124	121	115	113	108	105	102	108	114	114	113	113	113	112	113	119	124
48	126	123	117	116	111	107	104	110	116	116	115	116	115	114	115	121	126
49	129	126	120	118	113	109	107	112	119	119	117	118	117	117	117	123	129
50	131	128	122	120	115	111	109	115	121	121	120	120	119	119	120	126	131
51	134	131	124	122	117	113	111	117	123	123	122	122	121	122	122	128	134
52	136	133	126	124	119	115	113	119	126	126	124	125	123	124	124	130	136
53	138	135	128	127	121	117	115	121	128	128	126	127	126	126	126	132	138
54	141	138	131	129	123	119	117	123	130	130	128	129	128	128	128	135	141
55	143	140	133	131	125	121	119	125	132	132	130	131	130	130	131	136	143
56	145	142	135	133	127	123	120	127	134	135	133	133	132	132	133	139	145
57	147	144	138	135	129	125	122	129	137	137	135	135	134	134	134	141	147
58	149	146	140	137	131	127	124	131	138	139	137	137	136	136	137	143	149
59	151	149	141	139	133	129	126	133	141	141	139	139	138	138	138	145	151
60	153	150	143	141	134	130	128	134	143	143	141	141	139	140	140	147	153

61	155	152	145	142	136	132	130	136	145	145	143	143	141	142	142	148	155
62	157	154	147	144	138	134	132	138	147	147	145	145	143	143	144	150	157
63	159	156	149	146	140	135	133	140	148	149	147	146	145	145	145	152	159
64	160	158	151	147	141	137	135	142	150	151	148	148	146	147	147	153	160
65	162	160	153	149	143	138	136	143	152	153	150	149	148	148	149	155	162
66	164	161	154	150	144	140	138	145	153	154	152	151	149	150	150	157	164
67	165	163	155	152	146	142	139	146	155	156	153	153	151	151	152	158	165
68	167	165	157	153	147	143	141	148	157	157	155	154	152	153	153	159	167
69	168	166	158	155	149	144	142	149	158	159	156	155	153	154	154	161	168
70	169	167	160	156	150	146	143	150	160	161	158	157	154	155	155	162	169
71	171	169	161	157	151	147	145	152	161	162	159	158	155	157	157	163	171
72	172	170	162	159	152	148	146	153	162	164	161	159	157	158	158	164	172
73	173	171	164	160	153	149	147	154	163	165	162	160	158	159	159	165	173
74	174	172	165	161	154	150	148	155	163	166	163	161	159	160	160	166	174
75	175	173	166	162	155	151	149	156	165	167	164	162	159	161	161	167	175
76	176	174	167	162	156	152	150	157	166	168	165	163	160	162	162	168	176
77	176	175	167	163	157	153	151	158	167	169	166	164	161	163	162	168	176
78	177	176	168	164	158	154	152	159	168	170	167	165	162	163	163	169	177
79	178	176	169	165	158	155	153	159	169	171	168	166	162	164	164	170	178
80	178	177	170	165	159	156	153	160	170	172	169	166	163	164	164	170	178
81	179	178	170	166	160	156	154	160	170	173	169	167	163	165	165	171	179
82	179	178	171	167	160	157	155	161	171	173	170	167	164	165	165	171	179
83	179	179	171	167	161	157	155	161	172	174	170	167	164	165	166	172	179
84	180	179	172	168	161	158	156	162	172	174	170	168	164	166	166	172	180
85	180	179	172	168	162	158	156	162	173	175	170	168	165	166	166	172	180
86	**181**	179	172	168	162	158	156	163	173	175	171	169	165	166	166	172	**181**
87	**181**	180	172	168	162	159	156	163	173	175	171	169	165	166	166	172	**181**
88	**181**	180	173	168	162	159	156	163	173	175	172	169	165	166	166	172	**181**
89	**181**	180	173	168	162	159	157	163	173	175	172	169	165	167	166	172	**181**
90	**181**	180	173	168	162	159	156	163	172	175	171	168	165	167	166	172	**181**
91	**181**	179	173	168	162	159	156	163	172	175	171	168	165	167	166	172	**181**
92	180	179	173	168	162	159	156	163	172	174	171	168	165	166	166	172	180

93	180	179	172	168	161	158	156	162	172	174	171	168	165	166	166	171	180
94	179	179	172	168	161	158	156	162	171	174	170	167	164	165	165	171	179
95	179	178	171	167	160	158	155	162	171	174	170	167	164	165	165	171	179
96	178	178	171	167	160	157	155	161	171	173	169	166	163	165	164	170	178
97	178	177	170	166	160	157	155	161	170	173	169	166	163	164	163	170	178
98	177	176	169	166	159	156	154	160	170	172	168	165	162	163	163	169	177
99	176	175	169	165	159	155	153	160	169	171	167	165	161	162	162	168	176
100	175	174	168	164	158	155	153	159	168	170	167	164	161	161	161	167	175
101	174	173	167	163	157	154	152	158	167	170	166	163	160	160	160	166	174
102	173	172	166	163	156	153	151	157	167	168	165	162	159	159	159	165	173
103	172	171	165	162	155	152	150	157	166	167	164	161	158	158	158	164	172
104	171	170	163	161	154	151	149	155	165	166	163	160	157	157	157	163	171
105	170	168	162	160	153	150	148	155	163	165	161	159	156	156	155	162	170
106	168	167	161	158	152	149	147	154	162	164	160	158	155	155	154	160	168
107	167	165	160	157	151	148	146	152	161	162	159	156	153	153	153	159	167
108	165	164	158	156	150	147	145	151	160	161	157	155	152	152	152	157	165
109	163	163	157	154	148	145	143	150	159	160	156	154	150	151	150	156	163
110	162	161	155	153	147	144	142	149	157	158	155	152	149	149	149	154	162
111	160	159	153	151	146	143	141	147	155	157	153	151	147	148	147	153	160
112	159	157	152	150	144	141	139	146	154	155	151	149	146	146	145	151	159
113	157	155	150	148	143	140	138	145	152	153	150	148	144	144	143	149	157
114	155	153	148	146	141	138	136	143	151	152	148	146	143	143	142	147	155
115	153	151	146	145	139	136	135	141	149	150	146	144	141	141	140	145	153
116	151	149	144	143	138	135	133	139	147	148	144	143	139	138	138	143	151
117	149	147	142	141	136	133	132	138	146	146	142	141	137	137	136	142	149
118	147	145	140	139	134	131	130	136	144	144	140	139	136	135	134	140	147
119	145	143	138	137	132	129	128	134	141	142	138	137	133	133	132	138	145
120	142	141	136	135	130	127	126	132	140	140	136	134	131	131	130	136	142
121	140	138	134	133	128	125	124	130	138	138	134	133	130	129	128	134	140
122	138	136	131	131	126	123	122	128	136	136	132	131	128	127	125	131	138
123	135	133	129	129	124	121	120	127	134	133	130	128	126	124	123	129	135
124	133	131	127	126	122	119	118	124	131	131	127	126	124	122	121	127	133

125	130	129	125	124	120	117	116	122	129	128	125	124	121	120	119	124	130
126	128	126	122	122	118	115	114	120	127	126	123	122	119	117	117	122	128
127	125	124	120	119	116	113	112	118	125	124	120	119	117	115	114	120	125
128	123	121	117	117	113	111	110	116	122	122	118	117	115	113	112	117	123
129	120	118	115	115	111	108	108	114	120	119	115	115	112	110	109	115	120
130	118	116	113	112	108	106	106	111	117	117	113	112	110	108	107	112	118
131	115	113	110	110	106	104	103	109	115	114	111	110	108	105	105	110	115
132	112	110	107	107	104	102	103	107	112	112	108	107	105	103	102	107	112
133	109	107	105	105	102	99	99	104	110	109	106	105	103	100	99	104	109
134	107	105	102	102	99	97	97	102	107	107	103	102	100	98	97	102	107
135	104	102	99	100	97	95	94	100	105	104	100	100	97	95	94	99	104
136	101	99	97	97	94	92	92	97	102	101	98	97	95	93	92	97	101
137	98	96	94	94	92	90	90	95	100	99	95	95	92	90	89	94	98
138	96	94	91	92	90	88	87	92	97	96	93	92	90	88	87	91	96
139	93	91	89	89	87	85	85	90	94	93	90	89	87	85	84	88	93
140	90	88	86	86	85	83	83	87	92	91	87	87	84	82	82	85	90
141	87	85	83	83	82	81	80	85	89	88	85	84	82	80	79	83	87
142	84	83	80	80	79	78	78	82	86	86	82	82	79	77	76	80	84
143	81	80	78	77	77	76	75	80	84	83	80	79	76	74	74	77	81
144	78	77	75	73	74	73	73	77	81	80	77	77	74	72	71	74	78
145	75	74	72	69	72	71	70	74	78	78	74	74	71	69	69	71	75
146	72	71	70	66	69	68	68	71	76	75	71	71	68	67	66	69	72
147	69	69	67	63	67	66	66	68	73	72	69	69	65	64	64	66	69
148	66	66	64	61	65	64	63	63	70	70	66	66	62	61	61	63	66
149	63	63	62	57	62	61	61	57	67	67	63	63	59	59	58	60	63
150	60	60	59	54	59	59	58	52	65	64	61	60	55	56	56	58	60
151	58	57	56	51	57	56	56	48	62	61	58	55	52	53	53	55	58
152	55	54	54	48	54	54	53	46	59	59	55	52	49	51	50	52	55
153	52	51	51	45	51	51	51	44	56	56	51	48	47	48	48	50	52
154	49	49	48	42	49	49	48	43	53	52	47	43	44	44	45	47	49
155	46	46	45	40	46	46	46	42	50	49	42	40	42	41	43	44	46
156	43	43	43	37	44	44	43	39	46	46	37	37	39	38	40	42	43

157	41	40	40	36	41	41	41	38	42	42	32	34	37	35	38	39	41
158	38	38	36	33	39	39	39	36	39	38	27	30	36	32	35	36	38
159	35	35	33	31	36	36	36	33	36	34	22	27	34	30	32	34	35
160	32	32	31	28	33	34	34	30	34	31	18	25	32	27	30	31	32
161	29	29	28	26	31	32	31	25	31	28	14	23	29	26	28	28	29
162	25	26	25	23	29	29	29	21	30	25	11	21	27	25	25	24	25
163	21	22	23	21	26	27	27	18	28	22	11	17	25	23	23	18	21
164	17	20	20	19	24	24	24	17	25	19	12	14	22	21	20	12	17
165	13	18	18	17	21	22	20	15	21	17	12	11	20	19	17	7	13
166	10	16	16	16	19	19	17	13	18	14	11	10	17	16	13	2	10
167	9	14	15	14	16	16	14	13	16	12	10	10	13	12	10	1	9
168	8	12	14	14	12	12	10	11	14	10	9	9	8	8	8	1	8
169	7	11	12	13	9	9	7	9	12	8	9	8	4	4	6	1	7
170	6	9	10	11	7	7	5	8	9	6	8	7	3	3	3	1	6
171	5	8	8	9	6	5	5	6	6	4	7	6	3	3	2	0	5
172	4	6	6	7	5	5	4	4	4	3	6	5	3	2	1	0	4
173	3	3	3	5	3	3	2	2	2	2	3	2	2	1	1	0	3
174	1	2	1	3	2	2	1	0	1	1	1	0	1	1	1	0	1
175	0	1	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0
176	0	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	0
178	0	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	0
180	0	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-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 ********