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-8056M50-A

Representative (Tested) Model: LED-8056M50-A

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

Test & Report By:

Garman Mo

Engineer: Garman Mo

Date: May.18,2018

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-8056M50-A	
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	45W	
Rated Initial Lamp Lumen	--	
Declared CCT	5000K	
LED Manufacturer	SAMSUNG ELECTRONICS CO., LTD	
LED Model	SPMWH1228FD5WAR0SE	
Sample Number	GZE1801030-H-H1	
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.01,2018
Date of Test	May.02,2018
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	2018-05-02	Test Ambient:	25.2 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-8056M50-A		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE180103 0-H-H1	120.0	60	0.3719	43.86	0.9828	10.51
	277.0	60	0.1718	44.05	0.9257	13.98

Chromaticity Measurement - Sphere-Spectroradiometer Method:

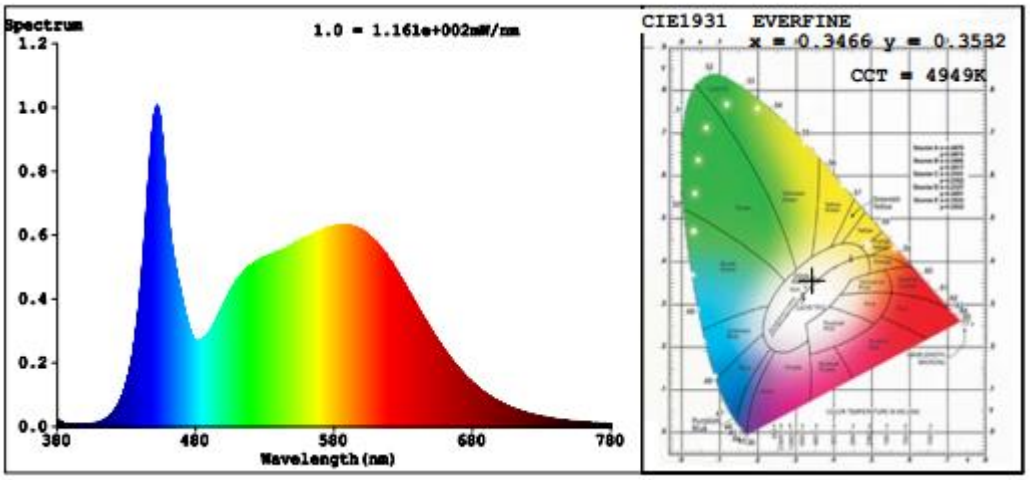
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	4949
Duv	0.0002
Chromaticity (x, y)	x=0.3466 y=0.3532
Chromaticity (u', v')	u'=0.2118 v'=0.4857
Color Rendering Index (CRI)	84.7
R9	16

Special Color Rendering Indices			
R1	83	R9	16
R2	91	R10	76
R3	94	R11	82
R4	83	R12	60
R5	83	R13	86
R6	85	R14	97
R7	88	R15	78
R8	69	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	5514.5	5560.5
Luminous Efficacy (lm/W)	125.73	126.23
Most worst Luminous/Highest Watts	125.19	
Beam Angle ( )	178.2	--
Center Beam Candle Power (cd)	962	--

Spectral Power Distribution & Chromaticity Diagram

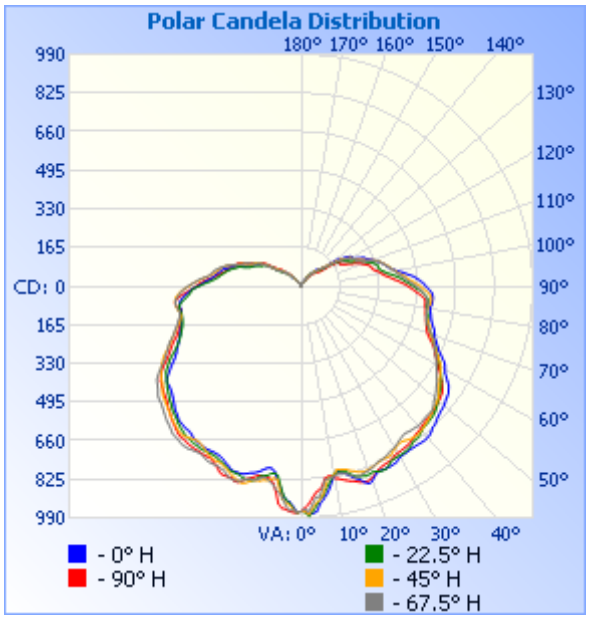


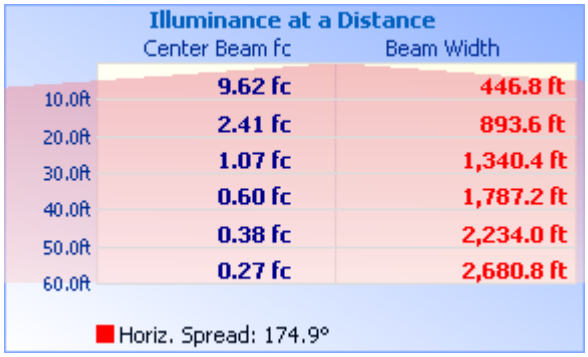
Zonal Lumen Tabulation

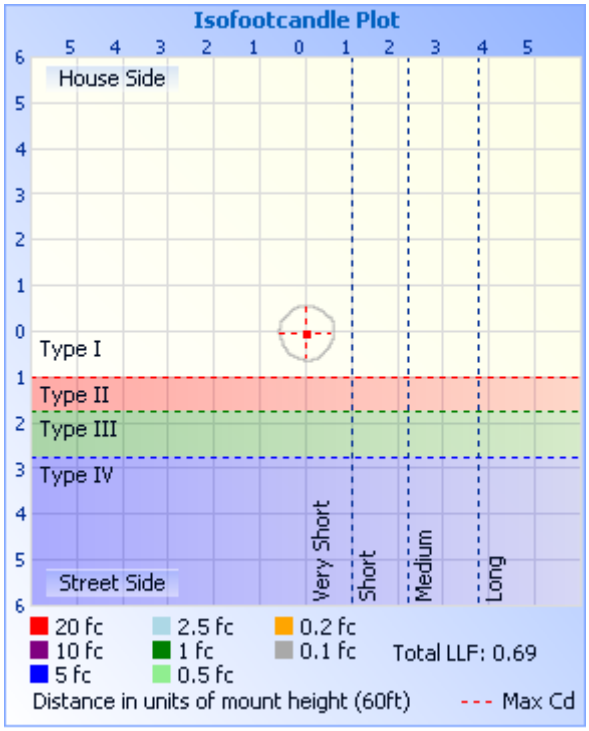
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	709.6	12.9%
0-40	1,218.3	22.1%
0-60	2,466.8	44.7%
60-90	1,765.3	32%
70-100	1,606.9	29.1%
90-120	1,053.7	19.1%
0-90	4,232.1	76.7%
90-180	1,282.6	23.3%
0-180	5,514.6	100%

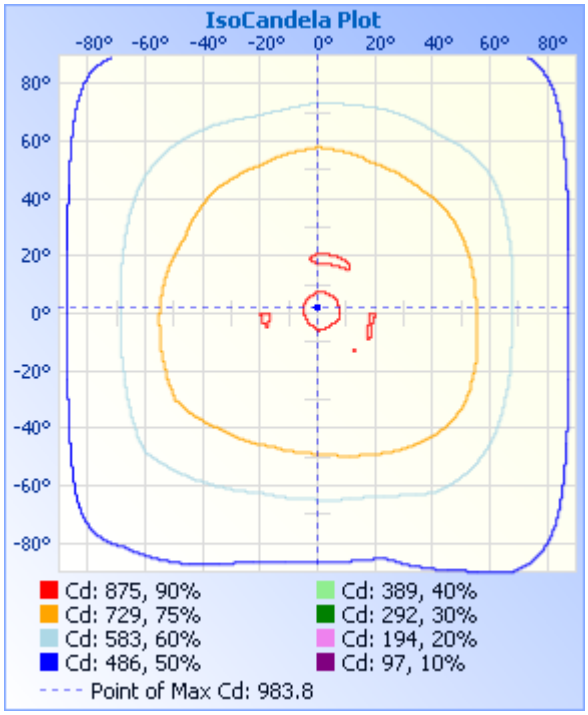
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	83.2	1.5%	90-100	458.1	8.3%
10-20	240.1	4.4%	100-110	352.7	6.4%
20-30	386.3	7.0%	110-120	242.9	4.4%
30-40	508.6	9.2%	120-130	138.4	2.5%
40-50	604.5	11.0%	130-140	62.8	1.1%
50-60	644.0	11.7%	140-150	21.8	0.4%
60-70	616.5	11.2%	150-160	4.8	0.1%
70-80	582.3	10.6%	160-170	0.9	0%
80-90	566.5	10.3%	170-180	0.2	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	962	962	962	962	962	962	962	962	962	962	962	962	962	962	962	962	962
1	964	967	964	952	947	957	961	965	967	968	967	966	968	961	962	963	964
2	971	**984**	975	962	931	936	951	946	944	951	954	957	967	956	952	960	971
3	972	963	949	933	907	916	924	920	924	928	937	959	963	973	958	955	972
4	965	939	929	903	884	899	896	906	916	916	928	940	955	972	964	965	965
5	933	915	917	903	875	873	851	872	896	893	914	911	952	942	954	951	933
6	915	902	894	868	860	842	828	831	860	853	877	888	934	915	943	936	915
7	897	875	859	835	828	819	822	809	834	815	832	876	886	890	915	915	897
8	873	854	827	830	820	813	816	807	802	807	828	856	851	868	871	874	873
9	843	832	826	828	821	816	818	821	789	809	836	846	834	847	846	844	843
10	816	811	815	825	833	821	820	834	787	820	843	837	828	834	835	824	816
11	807	811	798	817	837	835	829	848	794	824	843	829	827	827	822	812	807
12	812	809	800	815	845	846	844	852	804	830	850	839	828	824	828	817	812
13	821	809	803	822	851	847	855	854	814	845	851	849	831	822	834	826	821
14	830	821	808	828	857	851	862	856	821	856	852	852	841	823	839	841	830
15	844	834	817	839	862	858	863	861	826	858	865	850	850	829	842	852	844
16	855	846	822	849	868	864	864	856	832	858	875	860	857	832	847	857	855
17	865	850	831	850	876	868	864	848	839	855	879	868	871	841	855	863	865
18	881	853	835	845	878	874	864	843	842	849	874	874	880	849	862	874	881
19	892	857	836	842	880	875	863	836	841	847	868	877	879	850	866	890	892
20	887	854	834	838	875	870	858	827	841	845	859	875	870	833	863	894	887
21	873	851	832	835	867	862	852	820	838	844	853	872	872	828	863	876	873
22	862	853	828	830	857	857	843	817	828	840	845	860	873	829	854	863	862
23	857	859	824	821	850	848	839	818	821	833	838	853	872	829	840	850	857
24	859	861	821	817	844	845	838	818	813	826	832	850	863	831	835	841	859
25	859	860	818	816	841	844	836	816	807	822	829	847	851	828	832	835	859
26	859	854	818	813	839	845	830	813	802	818	831	847	844	825	834	834	859
27	858	843	819	809	837	850	820	811	801	814	828	848	835	816	832	835	858
28	857	838	817	803	833	856	813	808	802	813	825	847	830	809	829	835	857

29	850	838	808	798	827	860	806	802	803	814	820	844	832	803	826	827	850
30	844	837	802	796	823	858	802	800	804	816	813	838	832	800	824	821	844
31	842	837	795	791	822	855	800	797	803	815	806	835	831	799	819	814	842
32	841	836	791	783	820	852	797	793	802	816	800	836	830	799	814	809	841
33	839	834	791	778	818	848	795	787	801	814	796	838	831	799	808	806	839
34	839	830	795	773	816	848	795	782	799	814	796	842	830	799	804	800	839
35	839	825	800	770	813	848	791	778	796	812	798	846	829	803	804	797	839
36	840	817	804	771	810	846	789	775	791	809	803	846	828	805	804	797	840
37	841	817	806	774	804	842	787	771	785	808	808	846	825	806	802	800	841
38	843	816	806	775	799	838	785	767	782	805	811	843	823	807	802	806	843
39	844	810	804	776	796	835	781	767	782	801	813	839	824	804	803	811	844
40	841	803	801	778	794	832	775	766	780	796	811	838	819	801	805	814	841
41	839	798	798	777	789	830	776	760	778	791	807	836	813	794	802	815	839
42	833	796	793	774	785	827	780	755	775	785	801	829	806	788	800	814	833
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44	823	793	786	772	782	814	781	751	762	773	791	817	794	780	781	804	823
45	816	790	781	772	779	809	774	748	757	768	787	812	787	778	770	800	816
46	810	787	776	772	778	802	765	742	751	763	780	805	779	776	762	796	810
47	805	784	770	768	776	797	758	736	741	756	774	798	773	774	755	789	805
48	801	777	767	761	772	792	751	731	733	748	770	792	766	770	751	782	801
49	798	770	764	751	769	786	741	725	726	744	765	785	758	765	746	773	798
50	796	763	760	745	765	778	732	715	719	736	760	780	751	758	744	765	796
51	791	754	755	738	762	770	722	706	713	729	756	777	747	751	740	759	791
52	785	748	747	731	758	760	713	698	709	723	750	773	742	747	734	750	785
53	782	742	737	722	754	752	702	687	707	717	742	767	738	742	731	742	782
54	778	737	728	714	746	744	694	677	705	709	732	756	733	737	728	735	778
55	769	729	720	708	734	737	687	670	701	701	723	748	728	730	726	731	769
56	761	721	712	698	724	730	682	667	688	694	718	742	723	724	719	724	761
57	745	712	707	690	710	720	674	662	671	688	712	735	713	715	711	718	745
58	731	703	701	682	698	703	665	653	657	678	706	721	704	707	702	707	731
59	716	693	696	675	686	685	656	641	641	666	698	707	692	700	697	700	716
60	709	684	687	666	677	670	644	629	625	652	690	690	677	691	691	693	709

61	702	676	679	659	664	661	631	617	613	639	679	674	658	682	683	687	702
62	694	664	666	651	653	652	619	602	603	622	669	659	645	670	669	679	694
63	677	654	656	644	642	643	608	592	596	605	657	648	632	661	657	667	677
64	664	643	643	637	635	632	601	582	587	591	644	637	621	652	643	657	664
65	649	635	633	628	625	622	592	575	578	580	627	628	610	643	635	648	649
66	639	623	623	621	616	612	585	568	573	570	614	619	600	631	626	645	639
67	629	614	615	616	604	603	580	563	565	561	604	610	587	623	618	640	629
68	621	605	605	612	592	598	570	557	557	555	595	596	574	613	606	635	621
69	612	599	596	603	580	593	560	551	552	549	584	584	565	603	593	625	612
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74	582	561	565	558	555	578	539	517	530	528	538	546	536	554	552	575	582
75	576	558	559	552	552	578	536	518	527	526	533	540	532	551	546	565	576
76	572	557	553	550	550	578	533	520	526	524	529	535	529	547	540	558	572
77	569	555	549	548	546	577	532	520	525	524	529	532	525	544	534	552	569
78	566	551	546	547	543	575	533	521	524	526	532	531	522	542	528	546	566
79	562	547	546	548	542	573	536	520	524	527	536	534	522	539	521	541	562
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81	560	543	552	547	536	554	538	518	526	525	540	540	540	537	520	540	560
82	563	545	556	546	536	544	535	517	523	519	542	542	544	536	521	544	563
83	564	546	558	544	535	530	528	514	519	509	542	541	541	536	522	546	564
84	565	544	559	541	531	516	523	509	512	497	541	537	534	537	526	546	565
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86	563	530	552	528	508	493	507	491	492	478	529	523	507	534	528	533	563
87	559	518	545	521	494	481	498	481	480	473	520	516	489	529	526	525	559
88	551	508	531	512	482	470	484	466	470	467	508	507	472	521	519	516	551
89	542	492	521	503	469	456	466	451	457	454	493	496	461	507	510	509	542
90	532	481	510	490	456	442	453	438	442	437	478	484	449	496	501	500	532
91	525	466	496	480	445	429	438	426	429	422	468	470	439	486	491	494	525
92	514	454	484	469	429	412	423	416	418	405	456	456	429	477	483	486	514

93	505	441	469	456	416	397	414	411	406	389	440	446	415	469	474	474	505
94	492	431	459	446	400	385	408	405	394	378	427	433	400	462	467	464	492
95	482	421	448	438	388	378	399	400	385	367	413	416	386	456	457	451	482
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103	378	340	383	378	316	331	325	328	333	312	350	353	323	373	388	384	378
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105	366	339	368	364	310	317	294	302	312	295	332	334	313	361	373	371	366
106	357	336	361	359	307	310	284	294	303	286	321	323	307	358	368	362	357
107	351	329	354	353	304	300	273	282	292	279	305	309	302	355	357	352	351
108	343	321	347	345	296	284	263	271	281	265	291	298	296	345	349	346	343
109	334	312	336	331	288	265	254	263	263	246	284	285	290	334	339	337	334
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111	316	294	307	303	273	243	239	247	243	228	266	264	279	311	321	314	316
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113	301	277	287	272	251	243	242	232	224	221	241	250	250	287	299	299	301
114	297	264	275	261	237	242	233	224	218	215	230	238	240	277	285	288	297
115	286	252	266	259	226	239	222	213	214	207	225	225	231	268	277	279	286
116	273	239	258	258	216	231	210	203	205	199	222	215	224	265	271	269	273
117	262	232	253	256	207	213	203	197	201	189	222	210	219	252	260	262	262
118	251	225	250	251	201	190	195	194	201	185	215	205	211	239	248	256	251
119	248	219	247	245	194	174	176	180	194	183	207	196	203	228	236	248	248
120	250	215	241	238	191	156	153	170	186	183	190	185	195	223	232	240	250
121	247	208	231	225	190	139	136	155	172	169	180	169	188	221	228	234	247
122	237	203	222	214	189	128	127	135	153	159	159	155	185	220	228	230	237
123	224	195	213	206	182	114	119	122	138	144	134	140	169	219	223	222	224
124	210	185	205	194	169	107	114	115	124	125	130	123	148	216	214	217	210

125	200	172	189	177	154	98	110	111	120	111	130	117	137	215	204	205	200
126	192	160	175	162	129	98	105	104	118	103	125	113	129	206	187	189	192
127	176	149	161	148	112	101	97	101	107	103	115	107	122	190	175	163	176
128	157	131	144	134	103	100	92	95	101	107	106	102	114	163	153	150	157
129	132	118	135	127	98	94	95	90	101	103	101	98	113	144	140	130	132
130	121	111	129	121	95	91	92	81	98	97	101	92	107	133	134	118	121
131	115	109	124	118	93	82	85	77	90	82	98	86	96	127	129	118	115
132	110	105	109	111	91	77	76	72	83	75	83	82	88	121	123	119	110
133	108	98	103	107	84	74	67	70	76	74	77	76	81	119	115	114	108
134	107	94	97	95	80	68	68	63	70	69	73	78	76	119	104	101	107
135	104	89	89	89	82	60	61	59	68	66	71	71	74	111	95	97	104
136	97	88	87	86	75	54	56	54	51	55	65	65	70	98	89	93	97
137	94	85	90	84	72	48	56	45	47	51	58	58	65	91	84	87	94
138	86	84	83	76	69	43	43	41	44	45	54	54	57	90	79	88	86
139	83	79	73	71	68	39	38	37	37	42	45	48	49	90	78	87	83
140	78	77	74	68	59	34	33	31	34	35	42	44	45	88	74	83	78
141	71	72	72	63	55	29	31	26	27	28	37	37	42	78	71	75	71
142	66	67	65	54	51	26	27	23	24	25	32	31	36	71	64	65	66
143	60	59	56	51	46	22	23	20	22	22	27	28	30	67	63	64	60
144	54	55	53	48	42	20	20	18	19	20	23	25	26	55	59	57	54
145	49	47	47	40	36	17	17	17	18	19	21	22	23	52	47	47	49
146	45	43	43	38	31	16	16	14	15	17	19	19	20	49	44	43	45
147	39	34	37	30	28	14	14	13	13	14	18	18	20	39	35	37	39
148	34	30	30	26	24	13	14	12	11	13	15	17	16	32	31	31	34
149	30	26	27	23	21	11	13	10	11	12	13	15	15	27	27	27	30
150	25	24	24	21	19	10	10	9	9	10	12	13	14	25	25	24	25
151	22	21	21	18	16	9	9	8	8	9	10	11	13	22	21	22	22
152	20	18	19	16	14	7	8	7	7	8	9	10	10	22	19	19	20
153	18	17	17	14	13	6	7	6	6	7	8	9	10	18	17	18	18
154	17	15	15	13	12	6	6	5	5	6	6	8	8	16	16	17	17
155	16	14	14	11	10	5	5	4	4	5	6	7	7	15	14	15	16
156	14	13	12	10	9	4	4	4	4	4	5	6	6	13	13	14	14

157	13	12	10	9	8	4	4	3	3	4	4	5	5	11	11	12	13
158	11	10	9	8	7	3	3	3	3	3	4	5	5	10	10	11	11
159	10	9	8	7	6	3	3	3	3	3	3	4	4	10	9	9	10
160	9	8	7	6	5	3	3	2	2	3	3	4	4	8	8	8	9
161	7	7	6	5	4	2	2	2	2	3	3	3	3	7	7	7	7
162	6	6	5	4	3	2	2	2	2	2	3	3	3	6	6	6	6
163	6	5	4	3	3	2	2	2	2	2	2	3	3	5	5	5	6
164	5	4	4	3	3	2	2	2	2	2	2	3	3	4	4	5	5
165	4	4	3	3	2	2	2	2	2	2	2	2	2	4	4	4	4
166	3	3	3	2	2	2	2	2	2	2	2	2	2	3	3	4	3
167	3	3	3	2	2	2	2	2	2	2	2	2	2	3	3	3	3
168	3	3	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3
169	3	3	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3
170	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2
171	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
172	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2
173	2	2	2	2	1	1	1	2	1	2	2	2	2	2	2	2	2
174	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2
175	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2
176	2	2	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2
177	2	2	2	2	1	2	2	2	2	2	2	2	1	2	2	2	2
178	2	2	2	2	1	2	2	2	2	2	2	2	1	2	2	2	2
179	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
180	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

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 ********