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-8056M50C-A

Representative (Tested) Model: LED-8056M50C-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-8056M50C-A	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	LED Luminaires	
Rated Voltage / Frequency	220 -347Vac, 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-V1	
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 277 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 277 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 277 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-8056M50C-A		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE180103 0-H-V1	277.0	60	0.1655	43.89	0.9575	13.86
	347.0	60	0.1394	43.98	0.9091	16.71

Chromaticity Measurement - Sphere-Spectroradiometer Method:

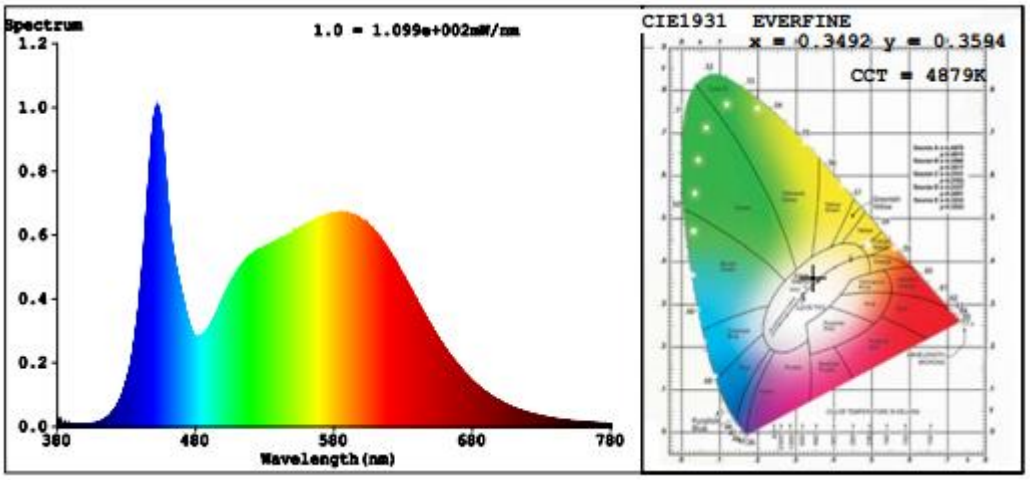
Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
CCT (K)	4879
Duv	0.0023
Chromaticity (x, y)	x=0.3492 y=0.3594
Chromaticity (u', v')	u'=0.2112 v'=0.4890
Color Rendering Index (CRI)	83.6
R9	10

Special Color Rendering Indices			
R1	82	R9	10
R2	89	R10	74
R3	94	R11	81
R4	82	R12	58
R5	82	R13	84
R6	85	R14	97
R7	88	R15	76
R8	67	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result	
Test Voltage (V)	277.0	347.0
Frequency (Hz)	60	60
Total Luminous (lm)	5622.8	5623.7
Luminous Efficacy (lm/W)	128.11	127.87
Most worst Luminous/Highest Watts	127.85	
Beam Angle ( )	179.5	--
Center Beam Candle Power (cd)	972	--

Spectral Power Distribution & Chromaticity Diagram

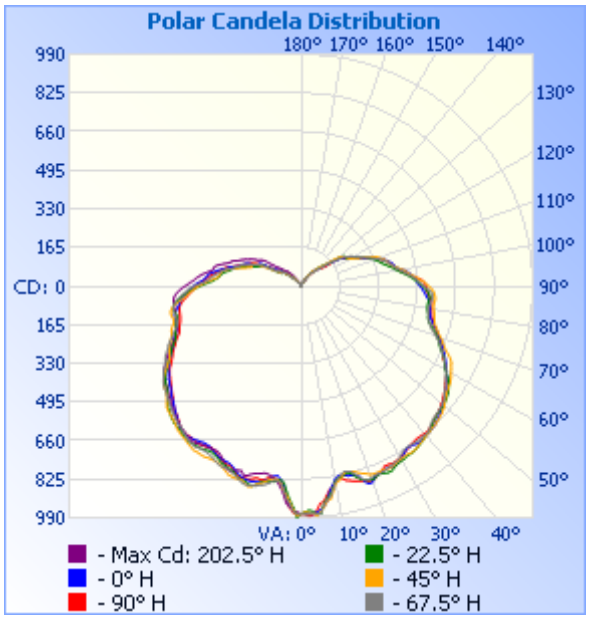


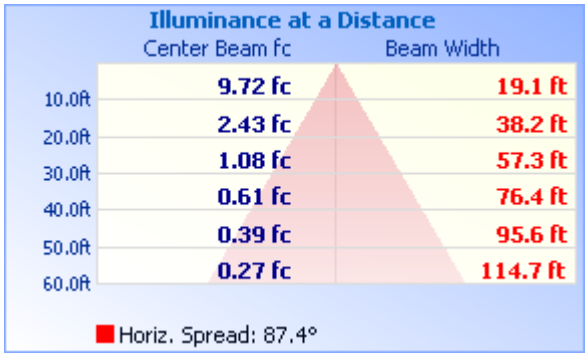
Zonal Lumen Tabulation

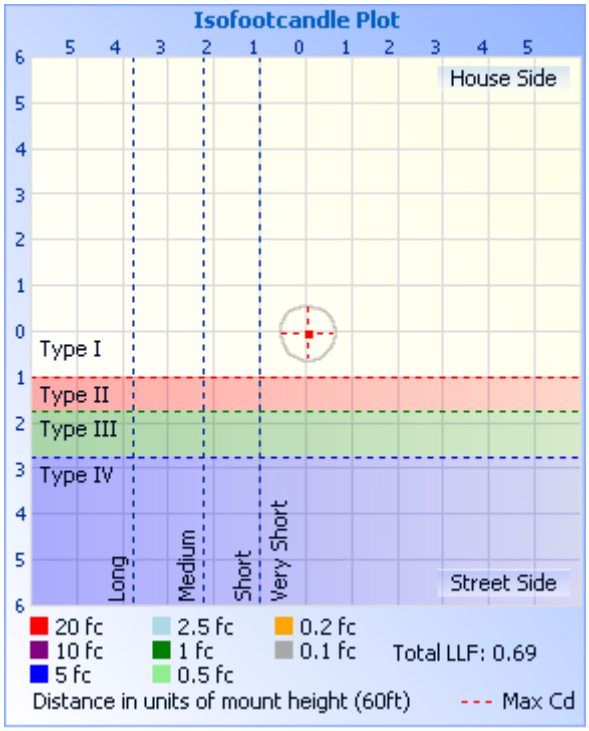
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	714.2	12.7%
0-40	1,230.0	21.9%
0-60	2,495.8	44.4%
60-90	1,811.9	32.2%
70-100	1,649.6	29.3%
90-120	1,080.3	19.2%
0-90	4,307.7	76.6%
90-180	1,315.2	23.4%
0-180	5,622.9	100%

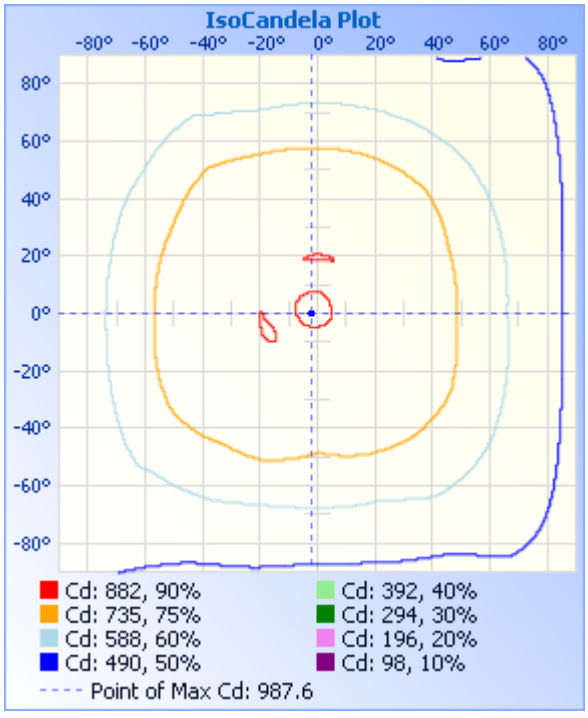
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	83.9	1.5%	90-100	470.7	8.4%
10-20	241.8	4.3%	100-110	361.2	6.4%
20-30	388.5	6.9%	110-120	248.4	4.4%
30-40	515.8	9.2%	120-130	140.3	2.5%
40-50	611.4	10.9%	130-140	65.4	1.2%
50-60	654.4	11.6%	140-150	23.0	0.4%
60-70	633.0	11.3%	150-160	5.1	0.1%
70-80	600.7	10.7%	160-170	0.9	0%
80-90	578.3	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	972	972	972	972	972	972	972	972	972	972	972	972	972	972	972	972	972
1	969	965	966	975	975	969	964	972	981	**988**	982	973	971	966	966	975	969
2	970	959	969	976	983	968	957	950	952	947	956	963	968	960	970	982	970
3	976	963	973	968	977	957	934	931	938	917	924	932	946	945	946	967	976
4	969	975	984	976	961	941	928	915	898	882	894	910	915	927	918	959	969
5	959	976	967	974	931	930	918	886	851	843	874	872	870	886	899	940	959
6	946	932	948	936	925	911	877	860	832	832	842	843	845	861	866	913	946
7	922	913	922	916	900	860	827	838	817	834	831	837	833	843	833	876	922
8	882	898	917	908	877	840	820	817	819	844	832	838	828	827	819	852	882
9	861	871	883	875	864	829	819	804	831	843	833	850	827	820	812	830	861
10	836	844	854	847	847	819	833	801	843	846	843	859	834	816	821	816	836
11	827	832	848	835	833	831	847	807	849	850	855	866	844	813	833	814	827
12	824	835	833	822	840	841	857	819	857	859	860	868	844	819	837	819	824
13	830	824	818	813	851	851	867	831	858	872	871	877	841	822	841	836	830
14	835	822	815	815	856	855	869	839	860	880	882	875	847	825	841	844	835
15	836	829	819	821	861	866	869	847	860	874	885	880	854	833	847	851	836
16	841	847	824	835	866	881	868	855	858	867	876	879	855	842	853	857	841
17	851	862	833	853	869	893	866	857	856	865	866	876	855	843	860	864	851
18	878	869	841	872	875	896	863	851	849	863	865	866	855	829	863	877	878
19	893	875	847	876	882	894	858	837	842	855	867	858	849	831	858	884	893
20	892	880	856	873	885	887	855	830	831	844	866	852	837	841	851	883	892
21	876	880	860	867	880	880	850	827	823	839	863	846	828	846	846	869	876
22	869	873	860	868	869	871	844	824	817	835	856	841	825	845	837	855	869
23	867	870	859	869	864	860	838	819	815	832	846	842	823	831	836	844	867
24	863	874	859	865	855	858	834	814	814	829	841	842	821	817	841	835	863
25	861	879	862	863	848	861	830	809	812	822	835	839	814	804	840	832	861
26	861	879	865	859	848	867	826	806	809	815	832	833	807	796	837	833	861
27	865	873	863	856	851	873	825	804	803	810	833	826	799	790	831	833	865
28	865	865	860	854	852	876	830	803	798	805	834	822	792	791	827	835	865

29	860	862	855	850	849	873	835	800	792	805	836	818	789	793	825	835	860
30	852	860	853	844	846	860	838	799	788	809	838	816	792	796	824	829	852
31	846	859	850	834	841	847	836	801	787	812	837	816	797	796	824	825	846
32	836	855	849	827	836	840	831	802	788	815	837	816	801	798	827	820	836
33	827	855	851	824	831	838	826	802	792	816	838	820	803	803	830	815	827
34	826	855	853	824	827	840	823	803	795	818	835	822	802	809	835	814	826
35	830	852	851	825	823	844	820	802	799	819	831	819	799	810	834	815	830
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37	837	844	843	828	817	841	816	801	804	817	822	810	800	803	824	818	837
38	836	841	840	827	818	837	812	798	803	814	818	805	801	801	821	819	836
39	833	835	836	826	819	834	806	795	799	808	815	799	797	796	815	819	833
40	833	831	833	827	822	832	803	792	797	803	812	793	796	793	812	823	833
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43	826	818	825	811	814	820	794	784	775	797	793	782	772	778	802	817	826
44	823	810	824	804	811	817	791	782	766	791	789	776	764	773	796	811	823
45	818	805	820	799	804	814	787	780	760	786	785	770	759	769	791	804	818
46	812	801	817	798	800	811	781	778	752	779	781	765	752	762	788	798	812
47	809	797	813	795	796	808	776	774	743	773	777	758	744	756	786	793	809
48	801	796	810	792	793	808	769	768	735	765	772	754	736	747	784	788	801
49	796	795	804	789	789	805	762	762	729	755	761	749	726	740	779	784	796
50	789	794	798	787	782	802	753	758	723	743	749	745	719	734	770	779	789
51	785	790	789	782	777	797	749	750	715	733	739	739	711	728	764	771	785
52	782	785	781	774	770	792	744	741	707	727	733	732	704	722	756	766	782
53	777	780	776	766	764	785	740	736	702	720	729	729	697	716	750	763	777
54	771	775	769	758	759	777	736	731	695	713	724	724	690	713	743	759	771
55	762	769	765	753	751	768	730	729	691	707	719	719	683	709	737	753	762
56	756	761	762	745	744	760	719	723	682	701	709	710	677	704	724	745	756
57	745	752	759	736	737	751	707	712	675	690	697	701	670	696	713	735	745
58	736	738	753	727	731	743	698	696	669	679	685	693	661	691	701	728	736
59	725	726	747	721	724	732	690	679	661	666	668	683	649	682	690	720	725
60	716	710	739	713	717	718	679	665	651	656	655	672	639	670	675	713	716

61	706	701	733	705	705	698	665	654	643	645	643	663	630	660	660	706	706
62	700	693	726	696	694	680	654	643	633	634	636	657	622	646	649	699	700
63	691	686	721	685	682	664	648	633	622	624	630	650	614	637	636	686	691
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67	656	642	665	644	652	626	621	591	591	584	605	611	578	591	607	640	656
68	645	633	653	635	644	618	610	582	584	578	599	598	567	581	601	631	645
69	636	627	644	622	634	609	598	580	576	574	593	587	557	572	590	619	636
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75	579	562	590	565	581	587	557	566	553	550	563	550	534	550	563	569	579
76	571	557	586	561	575	584	552	566	555	548	564	552	532	549	560	563	571
77	565	557	585	557	570	584	550	567	554	546	568	552	531	549	556	556	565
78	562	554	581	554	569	584	548	570	549	548	569	553	530	548	552	551	562
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82	555	546	571	555	561	580	552	570	525	544	539	547	516	549	543	555	555
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84	546	551	575	562	557	567	538	546	513	525	508	530	499	548	546	561	546
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86	534	548	572	561	546	543	512	515	496	498	483	509	482	539	531	563	534
87	528	544	568	558	541	527	496	504	486	486	474	497	472	530	518	560	528
88	522	538	564	549	538	515	481	492	478	468	462	486	464	521	499	555	522
89	516	530	556	538	536	500	467	482	471	448	451	476	457	509	486	547	516
90	508	521	547	524	533	486	456	469	461	433	440	461	451	497	473	535	508
91	502	508	535	514	529	473	444	455	452	416	425	439	443	483	464	523	502
92	496	499	524	503	523	455	430	446	439	399	411	420	434	473	452	509	496

93	493	488	511	495	514	437	417	433	425	384	398	407	420	461	441	497	493
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102	409	394	406	403	405	341	336	363	345	316	330	335	345	381	336	390	409
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104	401	374	390	391	396	339	324	343	324	303	307	309	329	370	329	377	401
105	394	365	385	386	391	336	316	334	313	294	292	298	318	357	326	372	394
106	387	359	383	381	382	333	307	320	302	285	280	292	305	346	323	366	387
107	379	352	377	372	376	327	295	304	291	277	266	285	293	333	320	361	379
108	370	346	371	364	366	320	284	293	279	266	253	278	283	323	314	354	370
109	360	341	362	354	353	311	273	282	270	256	245	274	274	317	303	345	360
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116	269	285	272	283	278	255	200	210	207	195	210	209	219	261	221	271	269
117	269	272	259	275	272	243	197	200	204	193	189	200	208	250	213	265	269
118	268	261	250	263	260	228	195	199	203	185	172	188	195	245	207	258	268
119	260	247	243	257	252	206	193	196	196	172	153	169	178	235	211	254	260
120	245	237	238	254	245	186	182	186	176	145	134	151	168	225	216	249	245
121	234	230	234	248	237	167	167	171	152	121	126	134	158	214	214	242	234
122	226	227	231	239	223	148	141	157	137	112	117	120	140	210	207	235	226
123	221	224	227	230	215	135	124	141	129	103	109	114	123	204	193	227	221
124	216	224	224	222	217	128	111	127	124	98	104	111	119	199	182	214	216

125	205	225	221	207	217	119	106	120	119	101	98	112	115	188	175	201	205
126	191	215	212	193	207	108	102	114	112	100	97	108	106	163	159	183	191
127	176	198	203	182	178	101	100	111	109	99	97	99	100	147	143	169	176
128	168	179	191	172	155	97	101	107	103	94	96	94	97	131	129	150	168
129	160	164	180	163	133	97	98	102	101	84	92	89	88	126	122	133	160
130	146	151	164	151	126	94	94	92	91	78	83	87	85	119	117	130	146
131	134	144	149	141	120	92	90	85	92	72	77	83	80	113	110	124	134
132	127	136	131	126	117	88	81	78	79	69	73	71	77	109	105	120	127
133	121	131	124	116	115	85	75	75	70	65	68	65	78	99	102	116	121
134	114	124	121	107	110	82	68	68	62	57	62	59	71	91	94	107	114
135	107	116	120	103	105	79	62	65	60	54	58	53	65	88	88	100	107
136	99	109	115	100	100	73	57	59	52	49	52	50	60	83	87	95	99
137	93	100	105	93	96	68	50	54	50	47	46	44	54	85	84	94	93
138	93	96	96	87	93	61	47	49	43	40	40	40	47	81	86	91	93
139	90	95	88	85	90	54	44	42	40	33	35	31	45	76	83	87	90
140	82	83	82	77	84	47	37	41	34	28	30	27	36	69	73	77	82
141	80	77	83	72	74	41	31	30	27	25	26	23	30	64	67	70	80
142	74	76	83	70	68	34	27	27	25	22	22	21	26	62	68	68	74
143	70	73	77	70	59	29	25	25	22	19	20	20	24	54	56	60	70
144	64	64	64	61	56	24	21	21	19	18	17	18	20	51	52	56	64
145	54	56	59	54	52	21	20	20	19	15	16	16	19	41	45	51	54
146	50	52	55	48	45	18	17	18	16	14	14	14	16	35	37	44	50
147	43	45	52	44	40	16	15	16	14	13	13	13	15	29	31	36	43
148	39	41	43	40	34	15	14	14	12	12	12	11	13	25	26	33	39
149	32	36	37	34	31	14	13	13	12	10	10	10	12	24	24	28	32
150	29	30	32	28	27	13	12	11	9	8	9	9	10	22	21	25	29
151	26	25	28	26	25	12	10	10	8	8	8	8	9	18	19	22	26
152	23	23	25	23	19	10	9	8	7	6	7	7	8	17	17	20	23
153	21	20	21	20	17	9	8	7	6	6	6	6	7	15	16	19	21
154	19	18	19	18	15	8	7	6	5	5	5	5	6	14	14	17	19
155	17	16	16	15	14	7	6	5	5	4	4	4	5	12	13	16	17
156	15	15	15	14	12	6	5	5	4	4	4	4	5	10	12	14	15

157	14	13	13	13	11	5	5	4	4	3	3	4	4	9	10	12	14
158	12	12	12	11	10	4	4	3	3	3	3	3	3	8	9	10	12
159	11	10	10	10	9	4	4	3	3	3	3	3	3	7	8	9	11
160	9	9	9	9	7	3	3	3	3	2	2	3	3	6	7	8	9
161	8	8	8	8	6	3	3	2	2	2	2	2	2	5	6	7	8
162	7	7	7	7	5	3	3	2	2	2	2	2	2	4	5	6	7
163	6	6	6	5	5	3	3	2	2	2	2	2	2	4	4	5	6
164	5	5	5	5	4	2	2	2	2	2	2	2	2	3	4	4	5
165	4	4	4	4	4	2	2	2	2	2	2	2	2	3	3	4	4
166	4	4	4	4	3	2	2	2	2	2	2	2	2	3	3	4	4
167	3	3	3	3	3	2	2	2	2	2	2	2	2	2	3	3	3
168	3	3	3	3	2	2	2	2	2	2	2	2	2	2	3	3	3
169	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	3
170	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2
171	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2
172	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	2	2
173	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
174	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2
175	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
176	2	2	2	2	1	2	2	2	2	2	1	2	2	2	2	2	2
177	2	2	2	2	1	2	2	2	2	1	2	2	2	2	2	2	2
178	2	2	2	2	1	2	2	2	2	2	1	2	2	2	2	2	2
179	2	2	2	1	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 ********