LM-79-08 Test Report

For

LIGHT EFFICIENT DESIGN

(Brand Name:N/A)

188 S. Northwest HighwayCary, IL60013

LED Luminaires

Model name(s): LED-8046M57-A
LED-8046-DL-E40-A
Remark: The two models are the same product with two model names

Representative (Tested) Model: LED-8046M57-A

Model Different: N/A

Test & Report By:

Garman Mo

Engineer: Garman Mo
Date: Mar.30,2017

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.

1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN	
Brand Name	N/A	
Model Number	LED-8046M57-A, LED-8046-DL-E40-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	65W	
Rated Initial Lamp Lumen	--	
Declared CCT	5700K	
LED Manufacturer	Samsung	
LED Model	LM561B	
Sample Number	GZE161214-R1	
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 16,2017
Date of Test	Jan 17,2017
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 25º C ± 1º 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 25º C ± 1º 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	2017-01-17	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-8046M57-A		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
GZE161214-R1	120.0	60	0.5697	67.49	0.9872
	277.0	60	0.2445	65.54	0.9678

Chromaticity Measurement - Sphere-Spectroradiometer Method :

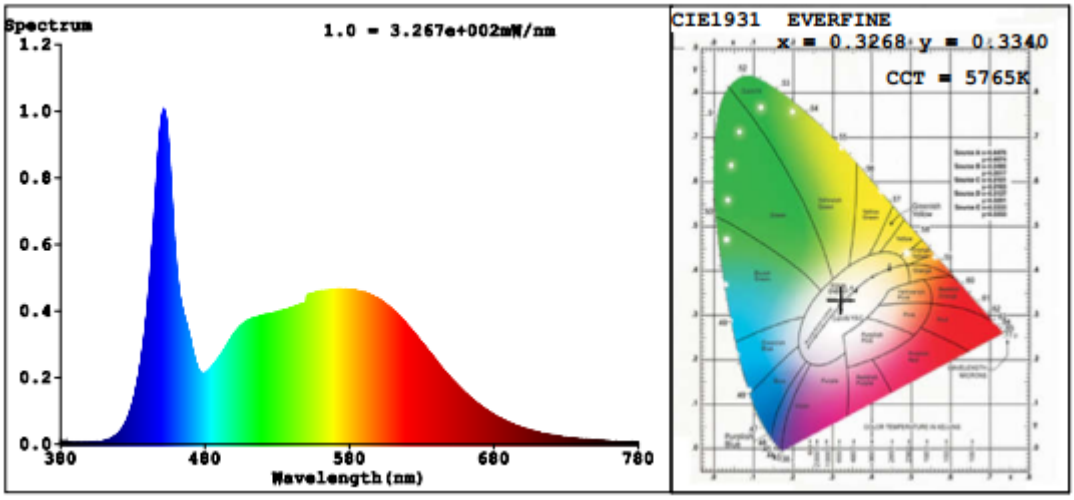
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	5765
Duv	-0.0011
Chromaticity (x, y)	x=0.3268 y=0.3340
Chromaticity (u', v')	u'=0.2057 v'=0.4731
Color Rendering Index (CRI)	85.1
R9	16

Special Color Rendering Indices			
R1	84	R9	16
R2	90	R10	76
R3	93	R11	85
R4	85	R12	64
R5	85	R13	86
R6	85	R14	96
R7	88	R15	80
R8	71	--	--

Photometric Measurement – Goniophotometer Method :

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	9498.8	9548.9
Luminous Efficacy (lm/W)	140.74	145.70
Beam Angle (°)	280.3	--
Center Beam Candle Power (cd)	339	--

Spectral Power Distribution & Chromaticity Diagram

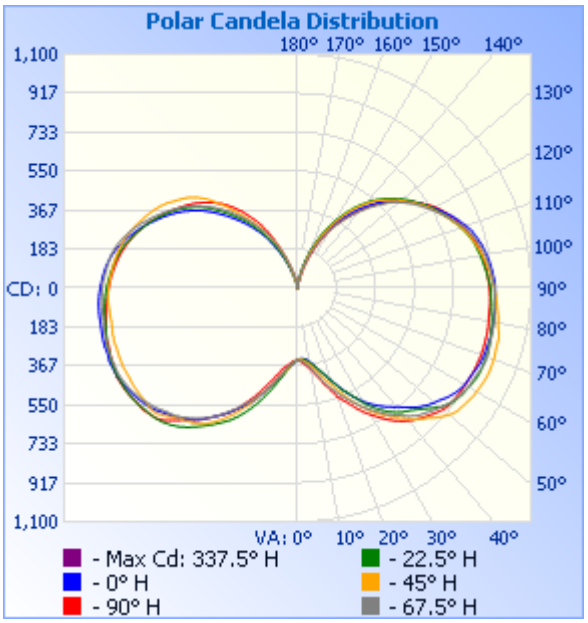


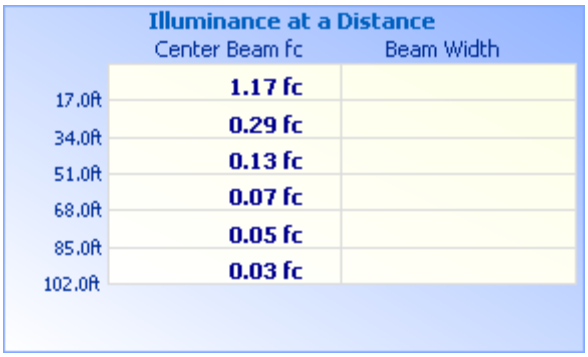
Zonal Lumen Tabulation

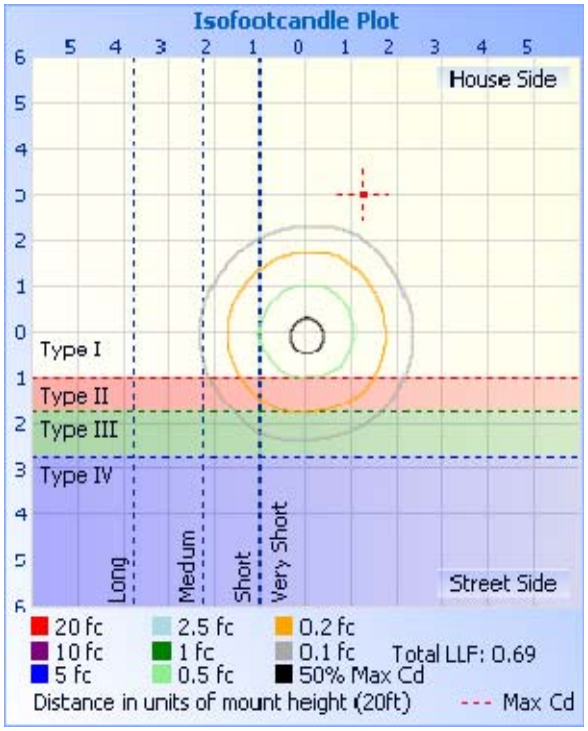
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	444.0	4.7%
0-40	909.7	9.6%
0-60	2,394.3	25.2%
60-90	2,966.2	31.2%
70-100	3,020.0	31.8%
90-120	2,694.0	28.4%
0-90	5,360.5	56.4%
90-180	4,138.9	43.6%
0-180	9,499.4	100%

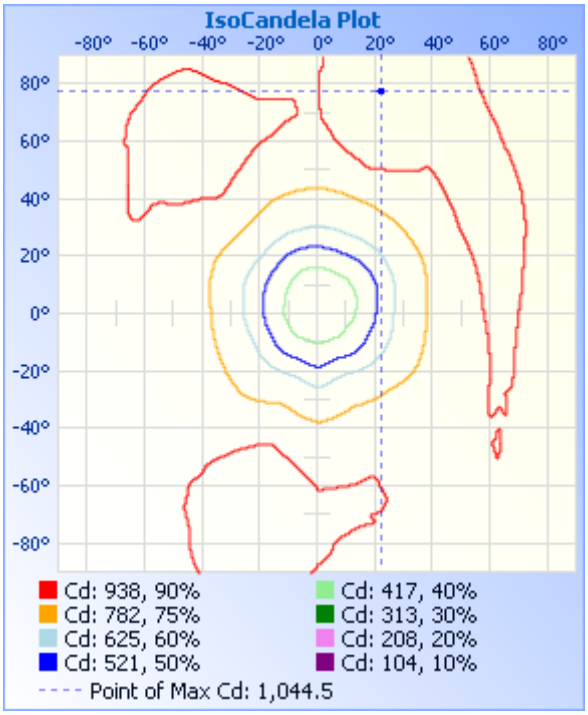
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	34.9	0.4%	90-100	995.4	10.5%
10-20	129.9	1.4%	100-110	916.5	9.6%
20-30	279.2	2.9%	110-120	782.2	8.2%
30-40	465.7	4.9%	120-130	618.0	6.5%
40-50	658.3	6.9%	130-140	435.4	4.6%
50-60	826.2	8.7%	140-150	255.7	2.7%
60-70	941.6	9.9%	150-160	110.1	1.2%
70-80	1,004.0	10.6%	160-170	24.2	0.3%
80-90	1,020.6	10.7%	170-180	1.3	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	339	339	339	339	339	339	339	339	339	339	339	339	339	339	339	339	339
1	335	335	336	339	340	341	342	343	342	341	341	340	340	338	336	334	335
2	333	334	336	341	344	344	346	348	348	346	344	342	341	339	335	333	333
3	333	334	337	343	348	351	352	356	355	351	349	346	344	340	335	333	333
4	333	335	340	346	352	358	360	365	363	356	356	353	347	341	335	333	333
5	334	338	344	352	358	366	369	372	368	365	365	359	353	343	337	334	334
6	335	341	348	359	364	374	376	383	376	376	374	364	359	347	341	338	335
7	340	345	352	364	371	379	383	394	382	386	381	373	365	353	345	341	340
8	343	350	358	370	379	389	390	403	393	397	390	383	371	362	352	345	343
9	350	355	364	380	386	397	399	415	404	411	398	392	375	369	358	351	350
10	357	361	371	389	396	409	413	426	413	423	409	407	383	378	364	358	357
11	364	367	379	400	408	423	419	440	426	437	422	422	392	384	373	367	364
12	372	375	390	411	418	434	430	451	437	450	431	428	406	395	381	375	372
13	381	381	401	424	432	445	445	463	449	466	443	443	417	401	388	385	381
14	392	393	414	435	443	459	458	482	465	484	457	456	426	408	399	397	392
15	401	402	425	452	459	473	477	498	475	499	471	470	444	424	411	407	401
16	413	412	437	466	475	493	488	510	488	517	486	482	457	433	418	420	413
17	424	424	454	477	488	508	505	527	500	533	500	494	470	444	432	432	424
18	436	434	464	492	506	525	522	541	517	553	515	512	486	454	450	449	436
19	451	449	477	504	523	540	535	560	534	568	528	524	501	471	461	463	451
20	462	462	490	516	543	557	555	575	549	585	546	540	521	485	472	478	462
21	477	481	510	529	554	570	572	595	565	603	563	553	536	501	486	489	477
22	490	494	527	545	568	587	592	612	578	618	582	568	555	513	503	506	490
23	507	511	541	556	580	601	607	632	594	636	600	580	570	530	515	527	507
24	523	527	560	571	596	620	623	652	605	650	614	594	587	549	531	541	523
25	540	539	576	584	610	641	636	666	618	667	633	605	604	565	543	557	540
26	555	552	594	599	628	655	652	682	628	681	648	621	625	583	558	570	555
27	571	571	608	612	643	670	663	695	642	697	667	637	641	598	571	589	571
28	585	586	627	628	660	680	675	710	658	708	682	649	653	615	588	602	585

29	602	606	643	641	672	693	688	723	669	720	699	664	670	629	603	616	602
30	614	626	661	655	688	703	698	737	683	733	712	677	682	649	624	628	614
31	629	640	675	666	701	717	710	750	695	744	727	693	695	663	641	643	629
32	640	658	693	681	716	728	719	767	709	757	743	706	706	678	660	656	640
33	654	673	706	693	728	740	733	781	720	768	755	721	721	690	678	673	654
34	664	689	719	709	745	750	742	791	735	781	769	732	734	705	692	685	664
35	677	701	731	722	757	764	754	805	747	792	778	746	749	717	708	699	677
36	688	717	748	736	770	776	763	817	761	806	789	758	764	732	720	710	688
37	700	728	759	747	781	783	775	831	775	817	796	767	775	744	736	723	700
38	708	741	775	760	794	792	786	842	786	830	803	779	788	758	748	734	708
39	720	751	788	770	803	801	796	854	798	841	808	787	798	768	761	749	720
40	729	762	803	784	813	810	811	863	808	853	816	798	811	780	771	760	729
41	742	768	816	798	824	818	824	876	819	862	822	806	821	789	784	772	742
42	752	777	831	809	831	828	840	891	826	870	827	816	837	801	795	783	752
43	766	785	841	821	839	839	851	900	834	879	836	824	850	811	807	796	766
44	778	796	854	829	847	848	863	910	840	886	844	834	866	824	817	810	778
45	792	806	865	836	854	857	871	917	846	894	855	839	881	834	827	827	792
46	804	819	878	842	861	864	879	926	854	899	865	844	891	848	835	843	804
47	812	830	893	852	869	872	886	935	860	904	875	851	902	859	845	857	812
48	823	845	904	858	876	878	889	945	869	909	885	858	907	872	854	875	823
49	831	857	917	867	884	885	893	953	877	912	891	867	913	884	864	889	831
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51	845	883	938	882	897	894	900	968	892	916	897	880	922	906	884	916	845
52	855	892	946	889	901	895	903	974	899	921	896	886	927	915	893	927	855
53	863	902	951	897	902	897	907	981	904	925	896	892	928	925	905	935	863
54	874	908	954	903	903	899	911	986	908	929	896	899	928	931	914	947	874
55	880	913	957	909	905	900	915	992	914	933	896	904	929	937	920	955	880
56	888	917	961	914	907	902	920	996	918	935	896	909	933	941	924	962	888
57	894	921	966	921	909	903	923	1000	923	936	897	913	936	945	928	968	894
58	901	924	969	924	909	904	928	1006	926	938	898	918	940	947	931	978	901
59	904	927	972	926	910	905	932	1011	931	940	899	922	942	950	934	987	904
60	908	931	974	929	911	906	935	1014	935	941	899	925	944	952	936	998	908

61	911	935	976	931	913	908	937	1016	938	942	899	928	945	954	938	1004	911
62	912	938	979	932	914	909	938	1017	941	942	898	931	946	955	940	1010	912
63	915	941	981	934	915	911	939	1020	943	943	899	934	948	956	943	1014	915
64	917	944	983	936	916	912	939	1024	946	945	900	936	949	957	946	1017	917
65	921	946	984	939	918	913	940	1030	947	945	901	937	947	958	949	1022	921
66	924	946	985	943	919	912	941	1033	948	945	901	937	944	960	953	1025	924
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69	933	946	984	949	920	907	946	1035	952	942	900	938	939	959	959	1038	933
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72	935	946	980	947	921	900	946	1041	948	937	898	939	934	952	964	1044	935
73	935	943	978	945	920	899	947	1042	950	938	900	938	931	950	965	1044	935
74	935	941	977	943	919	897	948	1039	949	937	901	937	931	949	966	1042	935
75	937	940	977	942	918	894	946	1038	949	932	898	936	931	948	968	1040	937
76	937	939	976	942	919	893	945	1036	948	929	899	935	931	943	968	1039	937
77	937	936	974	941	918	891	944	1036	947	928	895	933	927	939	967	1041	937
78	936	934	969	940	917	889	942	1033	945	924	893	933	925	936	968	1044	936
79	937	933	963	942	916	885	940	1032	944	922	893	932	921	933	967	**1045**	937
80	937	932	960	940	913	884	939	1032	944	920	892	930	916	929	966	1042	937
81	936	928	958	940	911	880	938	1030	944	920	893	929	914	924	963	1040	936
82	935	924	955	936	910	879	938	1029	944	919	893	928	911	923	962	1041	935
83	936	921	950	933	910	878	938	1028	943	918	893	928	907	920	961	1043	936
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85	934	917	944	933	909	877	936	1026	941	914	895	928	904	915	958	1039	934
86	932	915	941	931	909	876	934	1024	940	912	895	927	901	913	959	1037	932
87	931	913	938	931	909	875	932	1022	938	910	894	926	899	911	958	1037	931
88	932	913	935	931	907	874	929	1019	936	907	894	924	896	910	956	1036	932
89	931	911	932	930	905	874	926	1016	934	904	893	923	893	907	955	1035	931
90	931	910	928	928	904	873	923	1012	930	901	891	922	891	904	954	1034	931
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93	926	900	916	920	899	867	914	997	921	890	886	914	882	897	949	1028	926
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96	918	889	904	911	893	861	902	982	910	879	878	905	871	886	940	1019	918
97	915	886	899	907	890	858	898	977	906	875	876	902	867	883	935	1015	915
98	911	882	895	904	889	856	893	972	901	872	874	899	863	878	932	1011	911
99	908	879	889	901	886	853	888	967	895	867	871	896	859	874	928	1007	908
100	905	876	885	899	884	850	882	960	890	863	869	892	854	871	924	1002	905
101	901	871	880	895	881	847	877	954	883	857	865	888	850	867	921	998	901
102	896	868	875	890	877	843	869	946	876	852	863	884	844	863	917	993	896
103	892	864	869	884	873	839	862	941	867	846	859	877	839	858	913	988	892
104	887	860	864	878	869	834	853	932	857	840	856	871	834	854	906	982	887
105	881	855	858	873	865	827	844	925	849	832	851	863	828	848	902	976	881
106	876	849	852	866	859	822	838	916	839	824	847	856	823	844	894	971	876
107	870	844	847	859	854	815	830	909	831	817	841	847	815	837	888	966	870
108	865	836	838	850	848	809	820	899	821	808	837	839	809	831	879	961	865
109	857	831	831	844	843	800	809	889	811	802	830	830	802	825	870	952	857
110	849	823	823	836	836	795	801	880	801	794	824	822	795	817	862	944	849
111	839	816	817	826	828	785	791	870	792	787	819	811	786	811	852	935	839
112	830	808	809	816	824	777	783	862	780	778	812	803	779	805	844	926	830
113	822	799	799	805	813	771	771	850	771	771	805	792	773	798	834	919	822
114	811	792	791	796	807	763	761	842	759	762	798	779	764	790	823	910	811
115	803	786	781	784	799	756	750	830	746	754	794	771	755	782	810	903	803
116	792	778	774	773	790	748	742	821	737	744	787	759	744	774	801	892	792
117	779	768	765	765	783	742	732	809	725	736	781	750	737	767	792	882	779
118	771	760	755	753	774	733	720	799	716	725	774	737	728	758	777	871	771
119	760	753	747	744	766	726	712	785	704	715	768	728	720	751	768	859	760
120	750	745	739	734	756	718	700	774	694	708	760	717	711	743	756	852	750
121	737	737	731	725	747	711	691	759	682	697	752	708	703	735	744	841	737
122	727	727	722	714	735	702	679	746	672	689	743	695	693	726	734	830	727
123	719	718	711	703	722	695	669	730	658	678	735	686	685	716	723	817	719
124	707	707	702	695	711	685	656	713	647	667	724	674	675	709	713	805	707

125	698	697	691	684	697	675	646	699	632	654	713	664	668	699	702	794	698
126	686	688	682	675	687	667	632	683	621	644	704	652	658	692	692	779	686
127	674	678	671	663	674	655	622	671	607	630	694	639	650	682	680	767	674
128	664	671	660	651	660	646	608	655	595	619	685	628	641	675	667	750	664
129	652	660	651	640	649	633	596	642	580	605	674	613	633	665	657	733	652
130	642	650	640	628	636	622	582	625	564	592	665	601	622	654	644	719	642
131	629	640	631	617	625	606	570	612	550	577	651	586	611	646	633	703	629
132	618	629	619	603	611	593	553	594	532	564	639	574	602	635	619	689	618
133	603	619	610	591	600	574	536	579	517	546	621	559	590	627	607	673	603
134	588	607	598	574	585	557	523	561	499	529	607	546	581	615	592	661	588
135	576	595	586	557	570	537	507	546	485	514	587	529	569	603	576	645	576
136	561	584	576	544	557	521	494	526	467	496	566	516	559	593	563	628	561
137	549	571	564	527	540	502	477	506	453	481	548	500	545	580	547	613	549
138	533	560	554	514	526	484	464	489	436	463	525	487	534	568	535	595	533
139	517	546	540	498	508	469	447	467	423	449	506	469	519	553	519	581	517
140	504	535	524	480	489	451	433	451	406	432	481	452	506	540	503	563	504
141	488	519	512	467	474	437	416	432	393	419	463	439	491	523	490	544	488
142	475	503	496	449	455	420	403	418	377	401	441	422	477	505	473	528	475
143	458	490	482	435	440	407	385	400	362	386	424	408	460	491	458	508	458
144	444	473	465	417	423	389	371	386	345	366	405	391	446	474	440	491	444
145	427	460	451	403	409	374	354	369	332	351	389	377	426	459	425	470	427
146	410	442	434	386	393	356	341	355	315	332	371	360	411	438	407	449	410
147	397	428	415	369	378	341	324	336	302	318	357	346	392	420	389	433	397
148	380	410	399	355	366	324	310	320	285	299	340	328	378	397	375	414	380
149	368	391	378	337	350	311	292	299	270	284	325	316	360	372	358	399	368
150	351	376	363	325	335	295	277	282	250	265	304	305	344	352	344	381	351
151	338	358	345	309	313	279	257	262	230	249	286	289	320	328	326	367	338
152	320	343	330	293	294	259	240	244	214	230	267	270	301	309	305	350	320
153	303	324	310	279	273	243	221	224	197	215	252	253	277	284	286	336	303
154	289	310	292	259	255	224	203	209	182	197	234	233	257	259	265	319	289
155	271	292	276	245	240	209	190	190	166	180	218	218	232	239	249	300	271
156	257	273	255	227	220	191	173	178	153	165	200	201	208	217	231	283	257

157	240	257	238	211	203	178	160	160	138	144	185	186	190	198	212	263	240
158	223	237	218	192	184	161	143	140	124	128	165	168	171	175	196	248	223
159	210	221	200	177	168	142	129	125	106	112	141	154	151	152	176	228	210
160	195	202	186	163	154	128	112	110	90	98	125	136	128	134	161	208	195
161	180	184	169	148	135	112	99	101	80	77	106	120	115	112	141	195	180
162	163	169	155	132	124	100	89	83	67	60	90	110	99	97	124	176	163
163	145	152	135	120	108	86	74	71	56	48	72	94	88	80	110	157	145
164	131	138	117	105	90	75	64	60	45	35	59	83	75	67	95	142	131
165	115	122	105	91	81	64	54	47	36	26	47	68	63	59	84	123	115
166	101	106	91	80	67	51	46	38	27	18	34	60	56	56	71	111	101
167	90	95	77	68	52	44	36	30	20	15	28	46	44	54	63	96	90
168	76	82	65	59	45	36	28	23	16	10	20	35	40	50	57	81	76
169	64	70	54	49	34	29	23	17	12	8	15	29	34	34	48	69	64
170	54	57	42	40	27	23	16	12	9	7	9	18	23	21	40	58	54
171	43	48	37	32	20	17	12	9	6	5	5	12	17	15	36	46	43
172	35	37	27	25	15	14	8	6	5	4	4	8	9	15	26	37	35
173	27	30	21	18	11	10	5	5	4	3	3	5	6	12	21	29	27
174	21	23	16	12	8	6	4	3	3	3	3	3	4	11	16	22	21
175	15	16	12	8	5	4	3	2	2	2	2	2	4	8	12	15	15
176	11	12	8	6	3	3	2	2	2	2	2	2	3	5	9	11	11
177	8	7	5	3	2	2	2	2	2	2	2	2	2	3	5	7	8
178	5	5	3	2	2	2	2	2	2	2	2	2	2	3	3	4	5
179	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
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	2016-07-01	2017-06-30
ST-R-327	Spectral analysis system HAAS-2000	2016-07-01	2017-06-30
D204	Standard Lamp	2016-07-12	2017-07-11
PF2010	Power Meter for Integrating Sphere	2016-07-01	2017-06-30
GO-R5000	Goniophotometer system	2016-07-01	2017-06-30
D908S	Standard Lamp	2016-07-12	2017-07-11
PF210	Power Meter for Goniophotometer	2016-07-07	2017-07-06

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 ********