LM-79-08 Test Report

For

LIGHT EFFICIENT DESIGN

(Brand Name:N/A)

188 S. Northwest HighwayCary, IL60013

LED Luminaires

Model name(s): LED-8046M57C-A

Representative (Tested) Model: LED-8046M57C-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-8046M57C-A	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	LED Luminaires	
Rated Voltage / Frequency	277-347Vac, 50/60 Hz	
Nominal Power	65W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K	
LED Manufacturer	Samsung	
LED Model	LM561B	
Sample Number	GZE161214-S1	
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 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 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 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 25º C ± 1º C. 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	2017-01-17	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-8046M57C-A		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
GZE161214-S1	277.0	60	0.2444	65.17	0.9625
	347.0	60	0.1945	64.40	0.9542

Chromaticity Measurement - Sphere-Spectroradiometer Method :

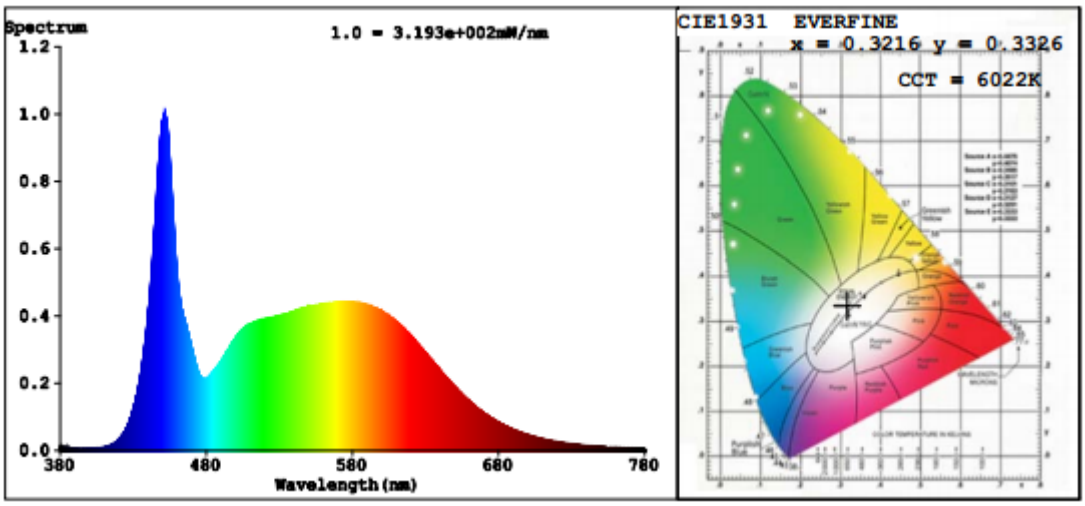
Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
CCT (K)	6022
Duv	0.0007
Chromaticity (x, y)	x=0.3216 y=0.3326
Chromaticity (u', v')	u'=0.2026 v'=0.4716
Color Rendering Index (CRI)	85.6
R9	18

Special Color Rendering Indices			
R1	84	R9	18
R2	90	R10	76
R3	93	R11	86
R4	86	R12	63
R5	85	R13	86
R6	85	R14	96
R7	88	R15	80
R8	72	--	--

Photometric Measurement – Goniophotometer Method :

Parameter	Result	
Test Voltage (V)	277.0	347.0
Frequency (Hz)	60	60
Total Luminous (lm)	9440.3	9285.1
Luminous Efficacy (lm/W)	144.86	144.18
Beam Angle (°)	282.7	--
Center Beam Candle Power (cd)	328	--

Spectral Power Distribution & Chromaticity Diagram



Zonal Lumen Tabulation

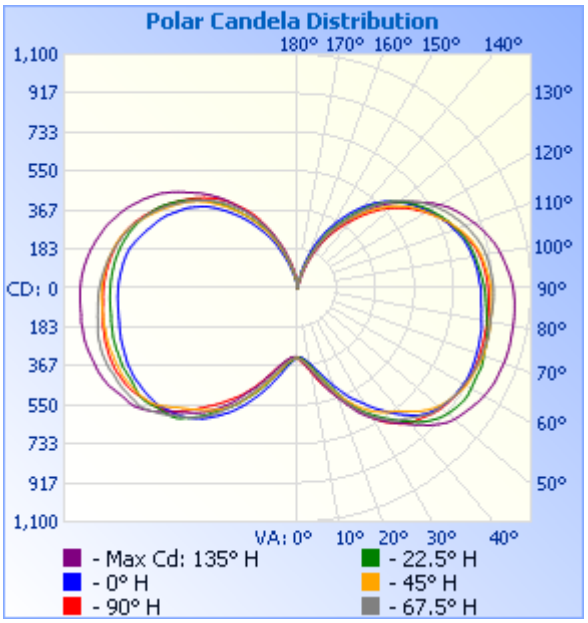
Zonal Lumen Summary

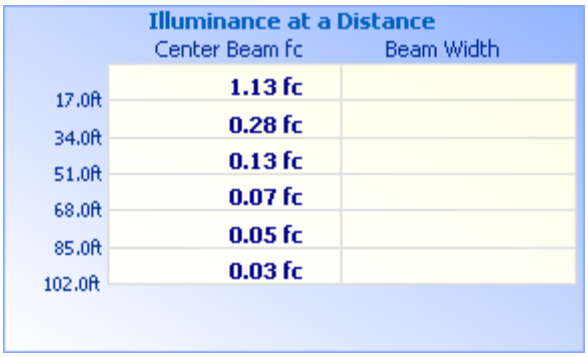
Zone	Lumens	% Luminaire
0-30	432.4	4.6%
0-40	888.5	9.4%
0-60	2,354.6	24.9%
60-90	2,939.8	31.1%
70-100	3,002.3	31.8%
90-120	2,697.6	28.6%
0-90	5,294.4	56.1%
90-180	4,146.6	43.9%
0-180	9,440.9	100%

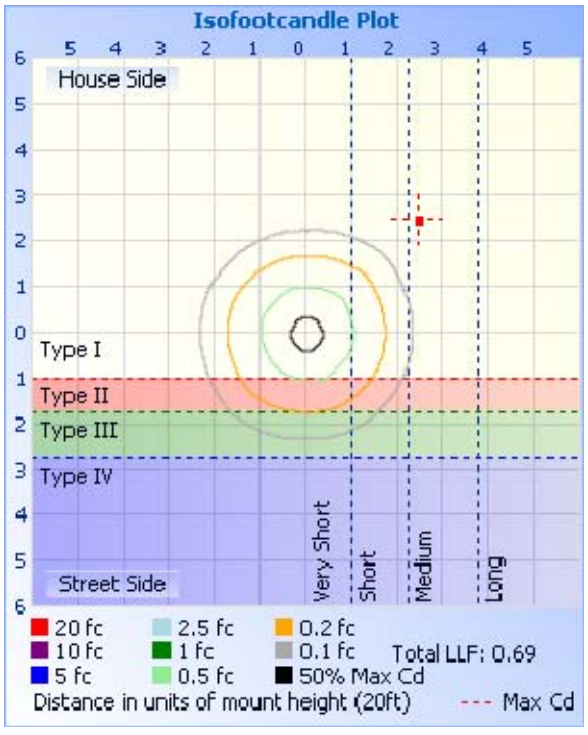
Lumens Per Zone

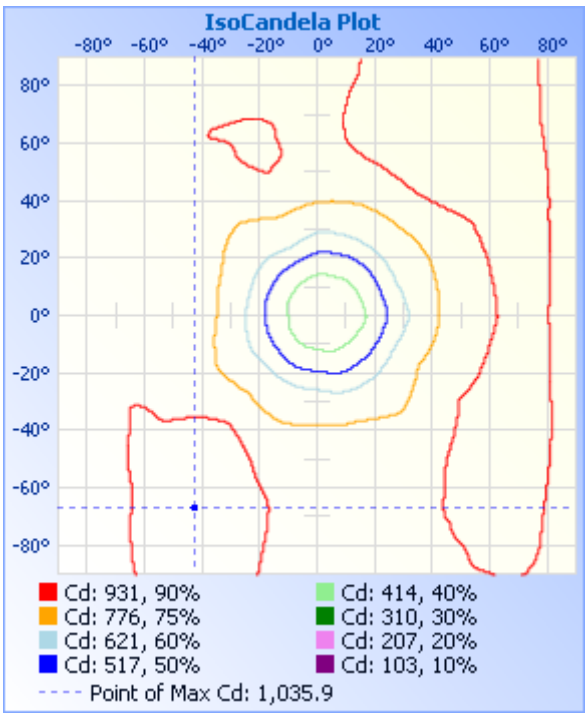
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	33.9	0.4%	90-100	993.5	10.5%
10-20	126.3	1.3%	100-110	918.2	9.7%
20-30	272.1	2.9%	110-120	785.9	8.3%
30-40	456.2	4.8%	120-130	619.4	6.6%
40-50	649.3	6.9%	130-140	435.3	4.6%
50-60	816.7	8.7%	140-150	255.1	2.7%
60-70	931.0	9.9%	150-160	112.0	1.2%
70-80	994.8	10.5%	160-170	25.8	0.3%
80-90	1,013.9	10.7%	170-180	1.4	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	328	328	328	328	328	328	328	328	328	328	328	328	328	328	328	328	328
1	326	328	331	333	336	329	329	329	330	330	329	329	329	323	323	323	326
2	326	330	333	336	343	334	334	333	334	332	330	329	328	323	323	323	326
3	327	332	338	341	348	342	341	340	339	335	332	330	328	323	324	324	327
4	330	335	342	348	355	349	346	346	345	340	336	332	330	324	325	327	330
5	335	340	348	352	361	354	355	355	352	347	341	334	331	326	327	330	335
6	339	346	355	358	368	363	363	364	357	351	345	340	333	330	331	335	339
7	346	353	362	366	378	371	373	370	367	357	349	345	337	333	335	342	346
8	352	360	372	374	385	379	379	381	377	364	355	352	343	340	340	348	352
9	357	368	381	386	399	393	393	391	387	372	365	358	348	348	346	355	357
10	365	376	391	395	410	405	402	399	399	381	376	364	357	354	352	362	365
11	373	387	404	405	421	415	416	411	413	393	386	373	364	362	359	371	373
12	385	397	414	416	436	430	431	418	424	401	395	383	370	369	366	382	385
13	396	411	426	430	450	444	441	430	436	411	409	393	378	383	376	390	396
14	404	421	436	444	462	454	454	442	447	422	418	407	387	390	388	403	404
15	417	435	450	457	474	468	471	459	463	434	431	414	396	402	396	414	417
16	428	449	462	472	487	480	486	474	480	445	442	429	404	417	411	426	428
17	442	464	478	484	496	500	502	485	492	462	457	441	417	426	423	435	442
18	455	479	495	501	513	516	514	502	507	476	468	456	431	439	434	452	455
19	470	496	508	517	527	530	533	518	520	488	481	467	443	452	443	465	470
20	483	512	525	535	541	540	547	529	536	505	498	480	458	470	464	476	483
21	498	534	538	550	554	553	563	547	550	518	511	498	471	482	477	491	498
22	512	551	554	568	571	565	576	562	566	533	528	514	486	500	494	501	512
23	529	571	566	583	589	580	596	583	580	546	540	532	501	514	507	518	529
24	544	588	582	601	603	594	611	597	597	561	557	545	516	531	522	531	544
25	561	604	595	615	618	607	631	616	613	574	570	564	528	545	535	547	561
26	575	624	612	634	638	623	649	630	625	591	588	579	543	564	549	560	575
27	589	640	625	649	653	635	663	646	642	608	603	597	559	579	569	578	589
28	600	658	639	667	670	648	678	662	655	621	618	615	572	599	586	592	600

29	614	671	649	681	685	659	690	673	670	636	632	632	587	613	608	610	614
30	627	685	662	697	703	672	705	686	681	648	645	652	598	629	622	622	627
31	645	697	673	709	717	684	717	697	695	662	660	668	612	643	640	637	645
32	660	712	686	722	735	698	732	708	709	674	671	688	624	661	654	649	660
33	676	724	694	734	750	712	744	716	719	688	683	702	640	674	672	664	676
34	688	739	703	747	761	723	758	727	734	702	692	718	653	687	686	676	688
35	704	750	711	761	774	737	771	735	746	721	702	731	668	696	702	691	704
36	720	765	722	771	786	748	782	747	759	739	710	747	682	707	715	704	720
37	734	778	728	781	799	759	796	759	767	753	718	760	695	715	731	719	734
38	751	793	737	787	809	767	807	769	777	768	728	773	711	725	742	730	751
39	763	805	745	794	818	777	823	781	786	781	735	785	726	733	755	744	763
40	777	820	757	801	827	785	836	788	796	797	745	794	743	741	765	756	777
41	790	832	767	810	832	793	853	801	804	809	754	804	756	752	777	773	790
42	805	849	779	817	836	802	865	812	812	824	765	812	774	764	786	788	805
43	817	859	793	827	842	810	881	828	819	836	775	823	789	779	799	799	817
44	830	871	804	835	847	822	897	841	824	843	784	833	806	792	811	813	830
45	839	882	818	846	854	832	909	856	830	849	794	846	821	808	825	823	839
46	849	890	828	855	860	845	923	866	834	853	806	858	831	819	841	835	849
47	855	900	840	864	867	855	933	872	839	858	819	867	844	834	854	846	855
48	862	907	848	869	871	866	946	879	844	861	831	879	852	844	871	857	862
49	866	915	858	873	877	875	954	883	850	865	845	888	861	855	884	866	866
50	872	920	865	876	881	881	962	887	856	870	856	899	868	864	900	878	872
51	877	926	872	878	884	889	968	891	860	877	867	908	876	873	912	886	877
52	883	930	878	882	887	893	973	897	862	884	876	919	882	882	925	897	883
53	888	935	884	885	891	897	979	903	863	890	882	927	884	893	935	905	888
54	890	938	888	890	894	901	983	907	866	896	888	931	889	903	947	915	890
55	894	942	893	894	897	904	989	911	868	899	893	933	895	909	954	921	894
56	896	945	898	899	900	908	994	913	870	900	898	935	903	915	960	929	896
57	898	947	903	900	903	911	1001	915	871	900	901	938	909	919	964	937	898
58	899	947	909	902	905	914	1006	917	871	899	904	942	916	923	969	941	899
59	901	946	913	903	908	917	1010	920	873	897	907	946	921	928	974	946	901
60	903	945	917	906	909	921	1014	924	874	896	911	949	925	932	981	951	903

61	904	943	918	908	910	924	1018	928	876	895	914	952	929	935	987	955	904
62	905	941	920	912	911	929	1022	931	877	896	917	954	930	937	995	959	905
63	905	941	921	914	913	934	1025	933	877	898	920	955	933	938	1002	962	905
64	904	940	922	916	915	936	1028	936	876	899	923	956	935	939	1006	963	904
65	904	941	922	918	916	936	1029	938	877	902	923	958	938	940	1011	964	904
66	903	942	924	919	916	938	1030	940	877	903	924	962	941	942	1014	966	903
67	902	942	927	921	915	939	1030	943	875	902	925	965	942	944	1017	972	902
68	901	940	929	922	916	941	1031	944	873	901	925	967	942	947	1019	975	901
69	900	937	930	923	916	942	1033	944	871	901	926	968	942	950	1021	979	900
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71	897	930	930	923	913	938	1035	943	869	901	928	970	943	953	1024	978	897
72	895	929	929	922	912	938	1035	944	868	901	929	971	942	952	1026	979	895
73	894	929	928	924	913	937	1035	947	867	900	930	970	941	951	1028	979	894
74	893	926	928	927	912	936	**1036**	947	866	900	930	968	941	951	1030	979	893
75	891	923	927	929	910	935	1035	946	863	900	929	968	940	952	1032	979	891
76	889	920	928	927	909	934	1034	945	863	898	930	968	937	952	1033	978	889
77	889	919	926	926	908	933	1033	944	861	896	928	966	936	952	1034	977	889
78	886	917	926	924	908	930	1032	945	859	895	927	963	935	952	1032	979	886
79	883	911	924	924	907	928	1031	944	856	893	928	958	934	951	1032	979	883
80	879	908	922	922	906	929	1031	945	855	893	928	956	932	948	1032	978	879
81	878	903	921	922	907	927	1031	944	854	890	926	953	929	945	1033	976	878
82	874	900	921	922	906	926	1030	943	853	888	927	952	926	946	1030	974	874
83	873	897	921	922	905	925	1029	943	852	888	925	948	926	944	1028	972	873
84	871	894	919	923	905	924	1028	942	851	888	925	946	924	942	1028	970	871
85	868	891	918	923	904	922	1027	941	850	887	925	944	921	941	1027	969	868
86	866	889	917	924	903	920	1025	941	850	886	925	943	919	942	1027	968	866
87	866	888	917	924	902	919	1023	940	849	886	925	942	918	941	1027	967	866
88	865	886	915	924	900	917	1021	939	848	885	925	941	918	941	1026	967	865
89	864	884	914	924	900	916	1018	938	847	884	924	938	917	941	1025	966	864
90	864	880	912	923	898	913	1016	936	846	883	923	934	916	941	1025	964	864
91	861	878	910	922	896	910	1013	934	845	882	921	931	913	940	1023	962	861
92	857	874	907	920	894	908	1008	931	843	881	920	928	912	938	1021	961	857

93	855	871	904	918	893	905	1003	928	841	880	917	925	909	936	1019	959	855
94	854	867	900	916	890	903	999	925	839	878	915	921	907	934	1017	957	854
95	852	864	897	914	888	899	994	922	837	876	911	917	905	932	1013	954	852
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97	848	857	889	910	882	892	984	915	833	873	907	909	899	927	1007	947	848
98	845	855	887	907	880	889	979	911	831	871	904	905	896	925	1002	942	845
99	842	851	883	905	876	884	974	906	828	869	901	900	893	922	999	938	842
100	839	849	880	902	873	878	969	901	826	866	896	896	890	919	994	934	839
101	835	846	875	899	868	873	963	894	822	863	893	891	887	915	989	930	835
102	832	843	871	895	864	866	957	886	819	860	888	886	884	912	983	926	832
103	828	839	864	891	857	860	950	879	814	857	884	881	880	907	978	920	828
104	825	835	857	885	850	852	942	871	809	853	879	874	876	902	971	916	825
105	820	831	852	880	844	846	935	863	802	849	875	869	871	898	965	910	820
106	816	825	844	873	837	836	925	853	796	845	868	863	866	892	960	903	816
107	810	820	838	866	831	827	917	845	788	840	863	858	860	888	953	896	810
108	803	814	828	861	823	820	908	836	781	836	856	851	855	881	948	889	803
109	798	808	820	853	814	808	900	827	775	831	848	846	848	876	939	880	798
110	791	802	810	847	803	800	890	816	767	826	840	839	842	869	932	871	791
111	785	795	799	839	796	790	879	807	761	820	831	831	834	859	922	862	785
112	778	789	791	832	788	782	870	797	753	815	821	823	828	852	914	854	778
113	774	781	782	823	778	771	860	789	747	808	810	814	819	844	907	847	774
114	766	776	773	814	770	763	851	779	739	800	801	805	810	836	898	835	766
115	757	768	760	806	760	752	840	771	734	795	790	795	803	828	890	825	757
116	751	760	750	797	752	744	830	761	727	788	781	786	792	816	879	815	751
117	744	752	740	789	741	733	819	752	721	780	769	776	783	806	869	802	744
118	736	743	729	779	730	723	809	741	712	772	760	768	773	797	857	792	736
119	728	736	720	769	720	712	794	731	705	766	749	757	765	786	847	780	728
120	719	727	709	761	707	705	782	719	695	757	740	748	755	774	838	771	719
121	711	721	701	749	697	694	767	707	686	749	729	737	746	763	825	758	711
122	701	711	691	739	685	683	753	697	676	738	718	728	735	754	815	746	701
123	694	703	681	727	673	673	736	685	667	727	710	716	726	741	802	736	694
124	684	693	672	717	663	662	719	675	660	718	699	705	715	731	792	723	684

125	676	683	660	703	650	651	705	660	650	705	690	693	705	718	779	714	676
126	667	674	651	690	639	638	689	648	642	695	678	684	694	707	764	701	667
127	657	664	639	678	624	627	676	632	630	683	669	673	686	697	750	688	657
128	649	655	625	664	613	614	659	619	619	672	658	664	675	685	733	677	649
129	638	643	614	653	599	602	646	604	607	658	648	651	664	675	720	663	638
130	630	630	600	638	584	589	628	592	597	646	636	638	656	662	704	654	630
131	618	621	589	623	573	577	614	577	585	631	625	629	645	652	686	641	618
132	606	607	573	611	558	561	596	561	574	620	609	616	635	638	672	629	606
133	597	596	557	595	545	548	583	547	557	604	597	606	622	623	657	615	597
134	585	581	544	581	529	530	565	529	545	592	582	593	613	611	645	599	585
135	575	567	528	564	511	513	550	514	528	575	566	583	600	595	629	586	575
136	562	554	515	550	497	499	530	496	511	562	551	569	590	582	612	569	562
137	549	538	498	533	479	482	514	482	497	545	534	558	577	566	598	555	549
138	537	524	485	514	464	469	492	464	479	532	522	544	566	548	580	538	537
139	521	506	468	498	446	452	471	449	465	514	504	532	552	534	566	521	521
140	508	488	451	478	427	438	454	431	449	496	490	517	541	516	546	507	508
141	492	473	437	462	413	421	434	418	435	480	472	501	525	502	531	490	492
142	478	453	420	440	395	408	419	402	418	460	458	489	512	485	511	476	478
143	461	437	407	423	381	390	400	390	404	445	441	473	495	472	491	458	461
144	445	417	390	403	364	375	385	374	386	427	426	461	478	454	475	443	445
145	431	401	373	385	349	357	366	362	371	414	408	445	465	437	454	424	431
146	412	383	359	371	332	343	351	344	352	397	393	432	449	422	437	406	412
147	397	366	342	355	319	326	333	326	337	383	374	415	437	404	418	391	397
148	379	353	328	342	303	311	318	311	320	366	359	400	420	389	401	373	379
149	366	335	311	324	287	292	299	291	307	354	340	380	406	371	387	359	366
150	350	322	298	302	273	276	284	275	291	339	326	364	386	357	369	342	350
151	333	305	280	285	256	256	265	260	277	325	309	344	369	339	354	327	333
152	320	290	261	266	242	236	249	242	258	304	294	329	347	321	336	308	320
153	303	270	246	252	224	221	231	224	242	288	277	310	329	306	321	289	303
154	288	249	230	235	205	203	217	209	225	270	262	294	309	286	303	274	288
155	269	233	218	217	190	189	197	194	205	253	245	273	292	270	285	258	269
156	251	214	200	202	171	173	177	180	188	231	227	256	269	253	271	245	251

157	237	201	182	184	157	159	163	157	169	215	211	236	247	237	252	228	237
158	219	186	168	171	142	143	145	138	156	194	193	218	232	223	236	210	219
159	203	171	152	152	126	132	126	115	140	176	179	202	216	205	217	195	203
160	186	156	139	133	114	111	108	100	127	161	163	184	203	193	200	177	186
161	167	137	124	119	98	97	96	88	110	144	150	169	186	176	185	163	167
162	153	123	109	104	81	83	70	73	92	132	136	151	167	156	165	146	153
163	135	108	98	93	72	72	50	61	81	113	118	137	153	141	149	131	135
164	120	94	85	78	60	61	37	50	69	96	106	119	137	124	133	119	120
165	108	83	74	63	50	50	28	44	57	82	92	102	123	109	117	103	108
166	93	69	63	53	39	42	19	32	42	70	80	92	110	97	106	88	93
167	81	59	53	44	31	32	11	20	33	59	69	76	97	83	91	78	81
168	67	49	46	33	25	24	8	17	24	43	52	64	83	72	78	67	67
169	55	39	37	26	19	20	6	14	15	33	41	52	71	58	65	55	55
170	46	33	28	19	14	14	5	10	13	21	33	41	61	49	55	46	46
171	35	25	23	15	10	11	5	7	9	12	24	33	48	40	44	37	35
172	27	20	16	10	7	8	3	5	7	8	18	26	39	30	34	30	27
173	21	15	11	7	5	5	3	3	4	6	13	19	32	23	26	23	21
174	14	11	7	5	4	4	3	3	3	5	10	15	25	19	19	17	14
175	10	8	5	3	3	3	2	2	2	4	7	11	18	13	14	12	10
176	7	5	3	2	2	2	2	2	2	3	5	7	12	9	10	9	7
177	5	3	2	2	2	2	2	2	2	2	4	5	7	6	6	6	5
178	3	2	2	2	2	2	2	2	2	2	3	4	5	4	5	4	3
179	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	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	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 ********