

LM-79-08 Test Report

For

LIGHT EFFICIENT DESIGN**(Brand Name:N/A)**

188 S. Northwest Highway Cary, IL60013

LED Luminaires

Model name(s): LED-8046M40C-A

Representative (Tested) Model: LED-8046M40C-A

Model Different: N/A

Test & Report By:

Garman Mo

Engineer: Garman Mo

Date: Mar.22,2017

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.

Laboratory: Standard-Tech Co. Ltd Testing Center**NVLAP CODE: 201011-0**

Report Format Number STD/QR4909-A/2

Address: Standard-Tech Building, No.6 Guanhong Road, Guangzhou Science City, Guangzhou 510663, China

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1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN	
Brand Name	N/A	
Model Number	LED-8046M40C-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	65W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K	
LED Manufacturer	Samsung	
LED Model	LM561B	
Sample Number	GZE161214-K1	
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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, 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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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.

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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-8046M40C-A		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
GZE161214-K1	277.0	60	0.2454	65.42	0.9624
	347.0	60	0.1946	64.44	0.9545

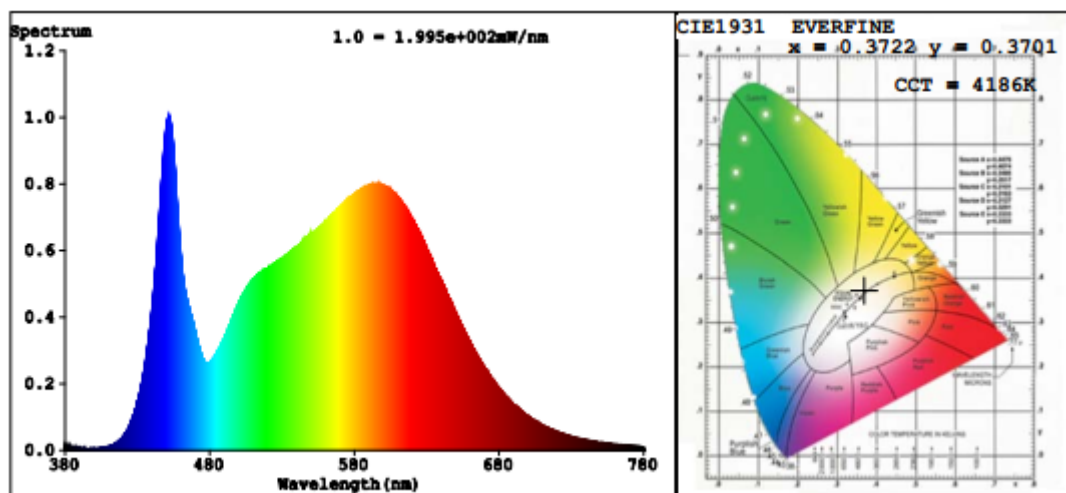
Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	84	R9	16
Frequency (Hz)	60	R2	91	R10	79
CCT (K)	4186	R3	96	R11	84
Duv	-0.0007	R4	84	R12	66
Chromaticity (x, y)	x=0.3722 y=0.3701	R5	84	R13	86
Chromaticity (u', v')	u'=0.2223 v'=0.4974	R6	87	R14	98
Color Rendering Index (CRI)	85.1	R7	87	R15	78
R9	16	R8	68	--	--

Photometric Measurement – Goniophotometer Method :

Parameter	Result	
Test Voltage (V)	277.0	347.0
Frequency (Hz)	60	60
Total Luminous (lm)	9619.4	9248.4
Luminous Efficacy (lm/W)	147.04	143.52
Beam Angle (°)	278.6	--
Center Beam Candle Power (cd)	336	--

Spectral Power Distribution & Chromaticity Diagram

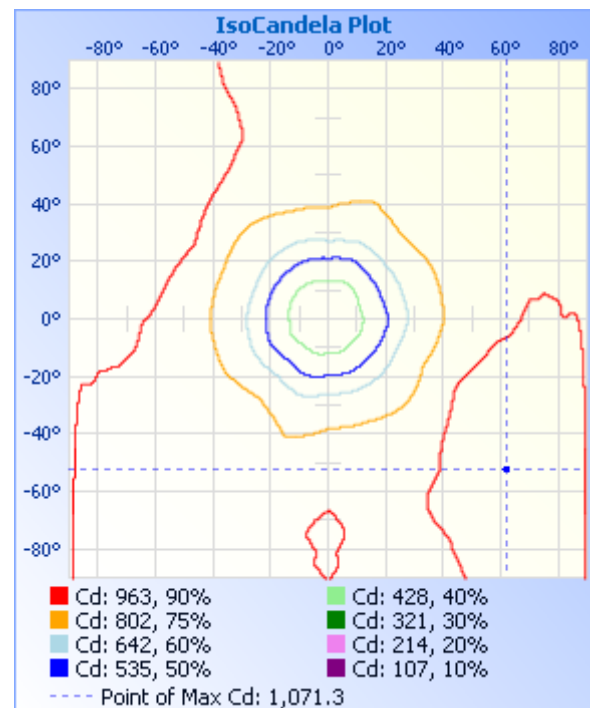
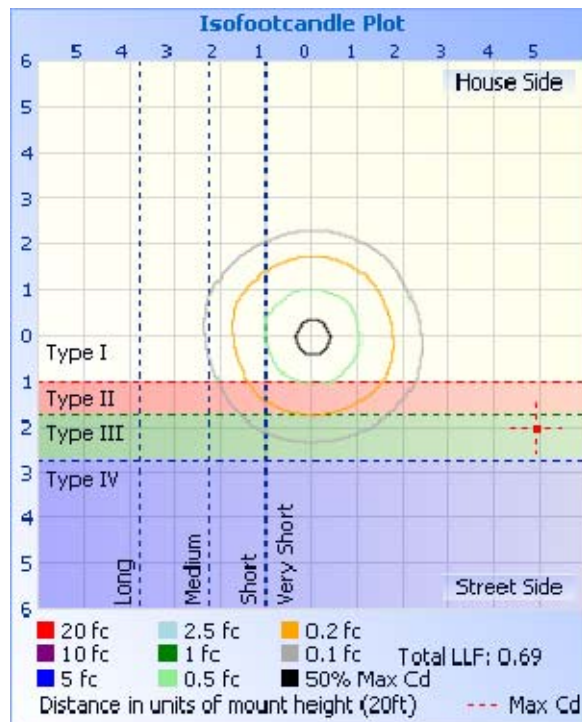
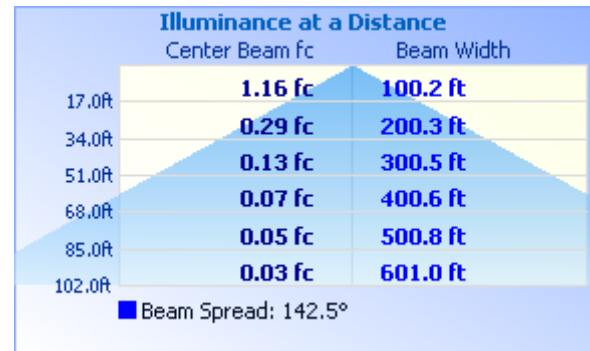
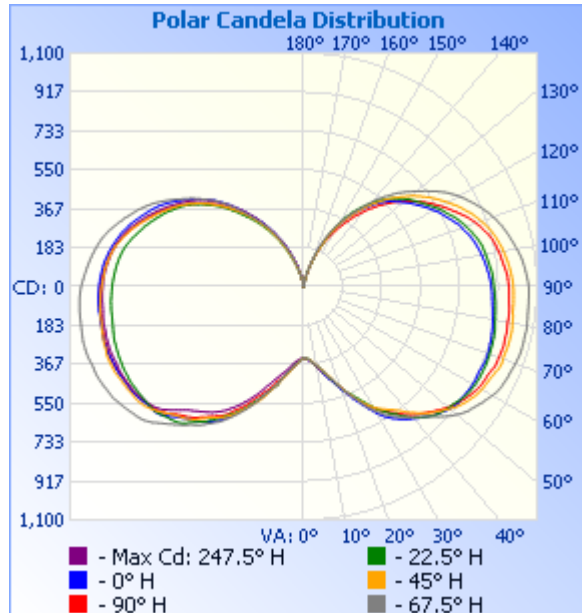


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	448.0	4.7%
0-40	920.1	9.6%
0-60	2,423.1	25.2%
60-90	3,003.6	31.2%
70-100	3,067.5	31.9%
90-120	2,745.1	28.5%
0-90	5,426.7	56.4%
90-180	4,193.4	43.6%
0-180	9,620.1	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	35.3	0.4%	90-100	1,014.4	10.5%
10-20	131.2	1.4%	100-110	935.0	9.7%
20-30	281.6	2.9%	110-120	795.7	8.3%
30-40	472.1	4.9%	120-130	624.3	6.5%
40-50	667.4	6.9%	130-140	435.9	4.5%
50-60	835.6	8.7%	140-150	253.8	2.6%
60-70	950.5	9.9%	150-160	109.7	1.1%
70-80	1,016.9	10.6%	160-170	23.6	0.2%
80-90	1,036.2	10.8%	170-180	0.9	0%

Photometric Data



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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	336	336	336	336	336	336	336	336	336	336	336	336	336	336	336	336	336
1	335	335	335	335	337	337	339	341	341	341	342	339	339	338	337	335	335
2	339	337	336	337	340	339	342	344	346	346	346	345	343	342	341	338	339
3	343	341	340	339	342	342	346	349	351	350	352	351	348	348	345	344	343
4	347	343	344	343	347	346	352	354	357	355	360	358	358	352	351	349	347
5	350	348	347	349	352	350	358	360	365	363	366	365	366	359	357	351	350
6	353	354	352	353	357	358	364	367	370	369	375	370	374	366	363	356	353
7	360	360	357	361	365	366	371	373	379	378	383	379	381	375	368	364	360
8	369	368	365	368	371	372	377	382	387	385	391	389	389	388	376	370	369
9	376	376	373	373	379	378	387	391	396	398	402	397	397	398	384	380	376
10	387	382	380	380	390	386	397	398	406	406	417	408	409	411	392	391	387
11	397	392	389	388	397	395	406	411	421	418	425	420	417	424	402	397	397
12	408	401	400	398	408	406	425	421	435	431	438	429	426	435	415	408	408
13	423	414	404	409	419	414	436	430	446	444	448	443	440	450	426	416	423
14	432	422	418	417	427	426	448	445	460	458	464	458	448	462	438	425	432
15	447	435	430	435	440	439	465	456	478	478	479	472	459	473	451	436	447
16	456	449	440	445	452	451	478	470	493	490	491	488	468	489	464	446	456
17	468	458	453	455	463	466	493	486	503	501	507	499	486	501	482	458	468
18	483	473	470	467	475	481	506	497	516	517	521	516	500	516	494	471	483
19	497	488	486	487	491	494	521	512	529	530	539	530	514	528	512	486	497
20	514	504	503	502	503	508	540	524	549	546	556	548	526	542	527	497	514
21	527	521	520	520	515	522	556	539	566	560	572	562	541	555	544	514	527
22	544	532	535	532	534	539	576	552	580	576	587	582	554	568	557	530	544
23	559	547	551	549	548	553	592	569	598	590	598	602	568	582	575	547	559
24	579	557	565	568	565	571	610	585	612	607	614	618	587	595	589	564	579
25	594	573	585	584	580	592	624	597	630	626	628	637	604	611	607	579	594
26	614	587	598	607	600	606	641	612	643	641	644	651	624	626	622	596	614
27	630	604	613	624	615	623	660	625	660	656	658	670	637	642	640	610	630
28	651	620	628	644	634	636	674	642	678	670	676	686	653	655	656	628	651

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29	667	639	644	660	646	653	691	655	693	685	690	704	666	671	667	641	667
30	689	655	655	678	661	666	704	672	712	697	704	718	686	684	685	657	689
31	705	674	669	691	672	682	721	684	726	711	715	735	704	698	699	670	705
32	722	688	678	708	687	695	734	699	744	727	725	751	715	710	714	687	722
33	735	703	689	721	699	711	753	713	754	740	735	762	728	725	726	699	735
34	748	716	697	735	713	723	767	724	767	756	743	777	737	737	743	711	748
35	758	732	708	746	724	738	786	736	777	769	754	789	748	752	758	721	758
36	772	744	718	759	737	753	803	747	788	785	764	804	757	763	775	733	772
37	783	762	730	769	749	764	824	757	797	795	778	816	769	774	789	741	783
38	792	776	743	780	763	779	845	763	806	809	790	828	779	783	804	750	792
39	801	793	758	789	775	790	860	771	812	820	805	836	793	796	816	757	801
40	809	805	774	801	789	805	873	780	817	836	817	850	805	808	832	767	809
41	820	818	786	812	799	815	881	786	827	853	825	864	814	817	844	776	820
42	828	829	801	825	810	827	891	794	835	864	835	875	824	826	859	787	828
43	839	841	814	836	817	839	898	803	845	874	842	889	831	834	869	795	839
44	848	850	829	851	827	847	905	815	854	879	850	900	841	841	879	807	848
45	858	860	840	865	836	856	910	826	866	885	856	914	851	846	885	823	858
46	866	868	854	883	846	862	915	839	880	889	866	926	863	853	893	836	866
47	874	874	862	897	855	867	920	854	891	895	876	941	877	856	898	854	874
48	881	880	874	912	867	871	924	863	903	901	886	957	886	860	905	867	881
49	889	885	883	927	875	874	930	873	911	908	899	969	897	863	909	883	889
50	897	890	896	938	886	878	936	879	916	913	908	980	904	868	915	893	897
51	904	893	906	952	893	882	941	886	918	915	919	988	910	873	922	903	904
52	908	897	918	962	901	886	944	891	920	917	926	995	913	878	928	909	908
53	910	902	926	973	909	889	948	897	922	918	936	999	918	880	935	915	910
54	911	910	934	978	916	893	949	901	927	920	941	1006	924	882	939	918	911
55	911	916	942	987	925	895	951	906	933	921	947	1012	930	883	944	922	911
56	913	920	947	994	930	899	953	908	937	923	950	1018	935	885	947	927	913
57	915	923	955	1003	937	902	953	912	942	924	952	1024	939	888	949	932	915
58	918	926	961	1010	942	903	952	918	946	925	954	1029	943	889	949	936	918
59	920	928	966	1018	948	904	951	923	948	927	957	1036	945	891	948	940	920
60	920	930	969	1026	952	903	948	929	949	929	960	1040	946	892	947	942	920

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61	921	931	972	1034	956	905	945	932	951	931	961	1044	947	895	946	946	921
62	921	933	975	1040	959	906	943	934	953	931	964	1046	948	897	946	948	921
63	920	934	978	1045	961	906	941	935	956	931	967	1049	950	900	948	949	920
64	918	934	981	1047	962	905	941	936	959	931	970	1053	953	901	950	951	918
65	920	934	986	1049	965	904	943	936	961	932	974	1056	958	901	954	953	920
66	922	934	990	1053	970	904	944	937	964	932	977	1059	962	900	959	954	922
67	923	934	996	1054	975	904	944	939	965	931	978	1061	965	901	961	953	923
68	926	934	1000	1056	978	902	939	941	966	930	978	1062	967	901	961	954	926
69	925	934	1002	1059	978	900	937	943	967	931	980	1062	970	900	958	955	925
70	924	932	1000	1063	979	898	934	942	969	930	983	1064	971	900	957	957	924
71	923	931	999	1065	980	897	933	942	973	929	982	1066	971	902	957	959	923
72	921	931	1000	1067	981	896	934	942	974	929	979	1069	971	901	958	959	921
73	919	930	1002	1069	983	893	933	941	973	927	978	1070	970	899	959	959	919
74	918	929	1003	1069	983	890	932	942	974	928	978	1070	970	897	960	958	918
75	917	928	1003	1069	980	890	932	942	975	926	977	1070	971	898	960	959	917
76	914	926	1003	1069	980	890	929	941	974	923	975	1071	970	899	959	959	914
77	913	925	1003	1068	981	887	927	939	975	921	973	1070	969	899	958	957	913
78	910	922	1003	1068	979	885	922	939	972	918	972	1067	968	897	956	957	910
79	907	919	1002	1070	978	882	918	938	971	917	970	1066	968	897	955	958	907
80	905	916	999	1069	976	880	915	937	971	915	967	1065	967	894	955	959	905
81	902	914	998	1066	977	878	912	935	970	914	967	1064	964	893	952	956	902
82	900	912	996	1066	977	875	909	935	970	914	967	1064	963	891	950	955	900
83	897	910	993	1064	976	873	906	935	971	913	966	1063	963	890	949	952	897
84	894	909	992	1064	975	870	905	935	972	912	965	1062	964	889	950	951	894
85	893	906	992	1063	972	869	904	934	971	911	964	1060	964	889	950	951	893
86	890	905	992	1063	970	868	904	933	970	910	962	1059	963	889	950	951	890
87	889	902	991	1063	969	867	902	932	969	908	960	1057	962	890	949	950	889
88	888	901	990	1062	969	866	899	931	967	906	958	1055	961	889	949	949	888
89	887	900	989	1062	968	865	896	929	966	904	956	1052	960	888	948	948	887
90	884	898	988	1061	967	864	893	927	965	903	952	1049	959	887	948	947	884
91	882	896	986	1058	965	863	891	925	963	901	950	1044	956	886	947	946	882
92	880	894	985	1055	963	861	887	921	960	899	947	1039	953	884	946	944	880

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93	877	893	982	1052	962	859	884	918	958	896	945	1035	949	883	945	943	877
94	874	891	979	1049	958	857	881	914	955	893	942	1029	946	881	943	940	874
95	871	888	976	1046	954	854	878	911	953	891	940	1025	942	880	942	937	871
96	868	884	972	1041	949	851	876	908	950	888	936	1020	939	878	939	934	868
97	864	881	969	1038	946	848	873	905	947	886	932	1016	934	877	936	930	864
98	861	878	965	1033	942	845	870	903	942	882	929	1010	931	874	933	927	861
99	857	875	961	1027	939	842	865	899	937	879	924	1004	926	872	930	923	857
100	853	872	957	1021	935	839	860	894	932	875	920	999	921	869	927	919	853
101	849	869	953	1014	931	836	857	890	927	869	914	993	916	867	924	914	849
102	845	866	948	1009	927	832	852	884	922	865	908	987	910	862	921	910	845
103	841	863	943	1002	922	829	848	879	916	859	900	980	904	857	917	903	841
104	835	858	938	997	918	824	843	871	910	853	892	973	895	853	913	899	835
105	831	852	932	990	910	818	838	864	903	844	885	964	888	847	908	892	831
106	825	846	926	984	903	813	832	855	898	838	875	955	879	841	902	884	825
107	819	839	919	978	894	807	826	848	890	829	868	945	868	833	895	878	819
108	812	833	912	969	886	801	820	837	882	823	859	934	860	826	888	869	812
109	805	826	903	963	878	794	812	830	875	814	850	924	850	818	882	861	805
110	799	820	894	953	868	788	805	818	866	806	839	912	841	810	876	851	799
111	793	813	886	946	860	781	797	809	858	800	829	903	830	804	869	842	793
112	786	805	877	936	848	776	791	799	847	790	817	890	821	795	862	832	786
113	776	798	869	925	839	769	784	792	839	782	808	880	807	788	854	821	776
114	768	789	859	917	826	762	777	779	829	773	796	869	799	779	845	813	768
115	759	781	846	904	814	753	768	767	821	765	784	860	789	770	834	801	759
116	748	770	837	895	802	744	762	758	811	756	776	847	781	763	827	789	748
117	742	760	826	883	789	737	752	747	803	748	764	836	769	754	816	781	742
118	733	753	815	872	779	730	745	738	792	739	754	822	759	745	808	769	733
119	726	745	802	862	766	723	737	727	783	731	743	811	747	736	798	759	726
120	716	736	790	849	754	713	729	718	772	720	734	795	737	728	789	748	716
121	706	725	780	838	743	706	719	708	759	712	723	779	724	717	780	738	706
122	698	714	767	824	730	698	708	699	749	701	713	766	713	707	768	726	698
123	687	705	756	813	720	690	700	688	734	692	700	749	700	699	757	714	687
124	678	695	743	797	707	679	689	679	723	681	690	735	687	687	743	705	678

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125	668	686	733	781	695	671	680	667	709	671	676	718	676	678	729	693	668
126	657	677	718	766	681	660	670	657	696	658	665	705	662	667	717	684	657
127	649	667	705	748	667	652	661	644	681	646	650	689	651	654	702	672	649
128	639	660	693	734	655	641	650	633	670	631	638	677	636	644	689	659	639
129	630	650	679	716	641	632	640	619	655	619	624	661	624	630	674	648	630
130	620	642	666	699	629	621	626	607	643	603	609	646	609	618	658	634	620
131	608	631	650	685	613	610	616	591	628	587	597	629	596	604	646	622	608
132	599	621	633	668	598	600	602	574	616	574	580	615	581	587	631	606	599
133	589	609	620	655	586	587	592	561	599	558	567	598	568	573	618	594	589
134	581	597	604	639	568	577	577	545	586	545	549	585	551	556	601	577	581
135	569	588	590	625	554	563	565	531	569	527	536	567	537	543	585	559	569
136	558	576	574	606	538	552	549	515	551	511	519	549	518	524	571	545	558
137	545	564	560	587	525	537	532	501	535	492	505	533	503	509	553	528	545
138	531	550	543	572	508	524	518	484	519	476	487	513	485	491	539	514	531
139	519	539	525	552	491	508	504	470	499	457	473	495	472	473	521	496	519
140	502	522	511	537	477	494	486	453	481	442	456	473	454	458	505	479	502
141	488	506	493	516	458	477	471	439	461	424	441	456	441	440	486	464	488
142	472	493	478	496	443	463	452	422	446	411	424	436	423	425	466	446	472
143	457	476	459	478	425	446	436	408	426	394	409	420	410	407	450	431	457
144	445	463	441	457	412	431	417	391	412	380	391	402	393	389	431	413	445
145	427	446	426	441	394	413	402	377	395	362	377	388	380	375	418	399	427
146	412	430	407	423	376	398	383	360	381	348	359	371	363	356	401	380	412
147	394	416	392	409	361	380	368	347	363	330	345	357	350	342	387	360	394
148	378	396	373	391	342	367	348	333	349	316	325	340	334	325	370	346	378
149	358	378	358	374	328	350	333	314	331	299	309	325	320	312	356	327	358
150	338	353	339	359	309	336	316	299	315	284	289	305	302	296	343	313	338
151	324	335	318	339	295	321	300	280	294	267	273	289	287	278	324	295	324
152	306	313	300	323	276	307	280	260	278	252	254	270	267	263	308	278	306
153	289	296	282	303	260	288	264	245	261	232	240	254	248	243	288	263	289
154	269	271	268	288	248	272	243	228	248	217	221	235	232	229	271	246	269
155	254	250	245	269	233	254	227	215	229	197	207	221	214	209	250	232	254
156	233	229	222	248	219	241	209	198	213	183	191	200	201	189	229	213	233

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157	214	205	206	232	202	224	196	184	195	165	172	185	184	174	213	193	214
158	198	192	186	211	183	210	181	167	177	152	158	169	169	159	192	177	198
159	176	174	170	195	168	193	167	154	162	135	141	156	152	146	174	160	176
160	154	153	150	173	150	179	148	137	143	119	124	136	135	129	159	148	154
161	139	138	132	149	134	162	131	124	130	108	109	118	122	112	141	133	139
162	115	121	114	134	123	147	117	110	113	91	98	107	109	97	129	115	115
163	99	105	93	116	107	129	103	98	102	79	86	89	97	82	111	102	99
164	82	93	84	99	93	112	92	84	86	68	74	77	76	69	93	88	82
165	67	85	68	90	78	101	77	73	74	59	60	60	59	59	80	76	67
166	57	70	51	76	69	87	66	62	61	46	51	51	48	47	69	65	57
167	42	52	38	65	58	75	56	51	50	39	41	42	33	38	54	53	42
168	34	36	25	52	43	61	44	44	40	30	31	33	23	29	43	44	34
169	26	24	19	38	34	51	35	34	31	23	25	25	15	22	35	38	26
170	17	13	14	25	26	36	27	28	24	18	19	16	8	17	24	27	17
171	13	8	9	16	19	22	20	22	18	13	14	11	6	12	17	20	13
172	10	6	8	12	12	17	15	15	13	10	10	8	5	8	12	13	10
173	9	5	8	10	8	13	11	12	9	8	7	5	4	6	8	9	9
174	7	3	6	7	7	11	9	9	7	5	5	4	3	4	6	8	7
175	5	4	3	4	5	7	6	5	5	4	4	3	3	3	4	5	5
176	3	3	3	3	4	5	4	4	3	3	3	3	2	2	3	3	3
177	2	3	3	3	3	4	3	3	2	2	2	2	2	2	2	2	2
178	2	2	2	2	3	3	3	2	2	2	2	2	2	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-336	2 meter Integrating Sphere	2016-07-01	2017-06-30
ST-R-331	Spectral analysis system HAAS-2000	2016-07-01	2017-06-30
D204	Standard Lamp	2016-07-01	2017-06-30
PF2010	Power Meter for Integrating Sphere	2016-07-01	2017-06-30
EE-09	Goniophotometer system	2016-07-01	2017-06-30
D908S	Standard Lamp	2016-07-01	2017-06-30
PF210	Power Meter for Goniophotometer	2016-07-01	2017-06-30
ST-R-181A	Temperature Tester	2016-07-01	2017-06-30
Uncertainty: Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

******* END OF REPORT *******